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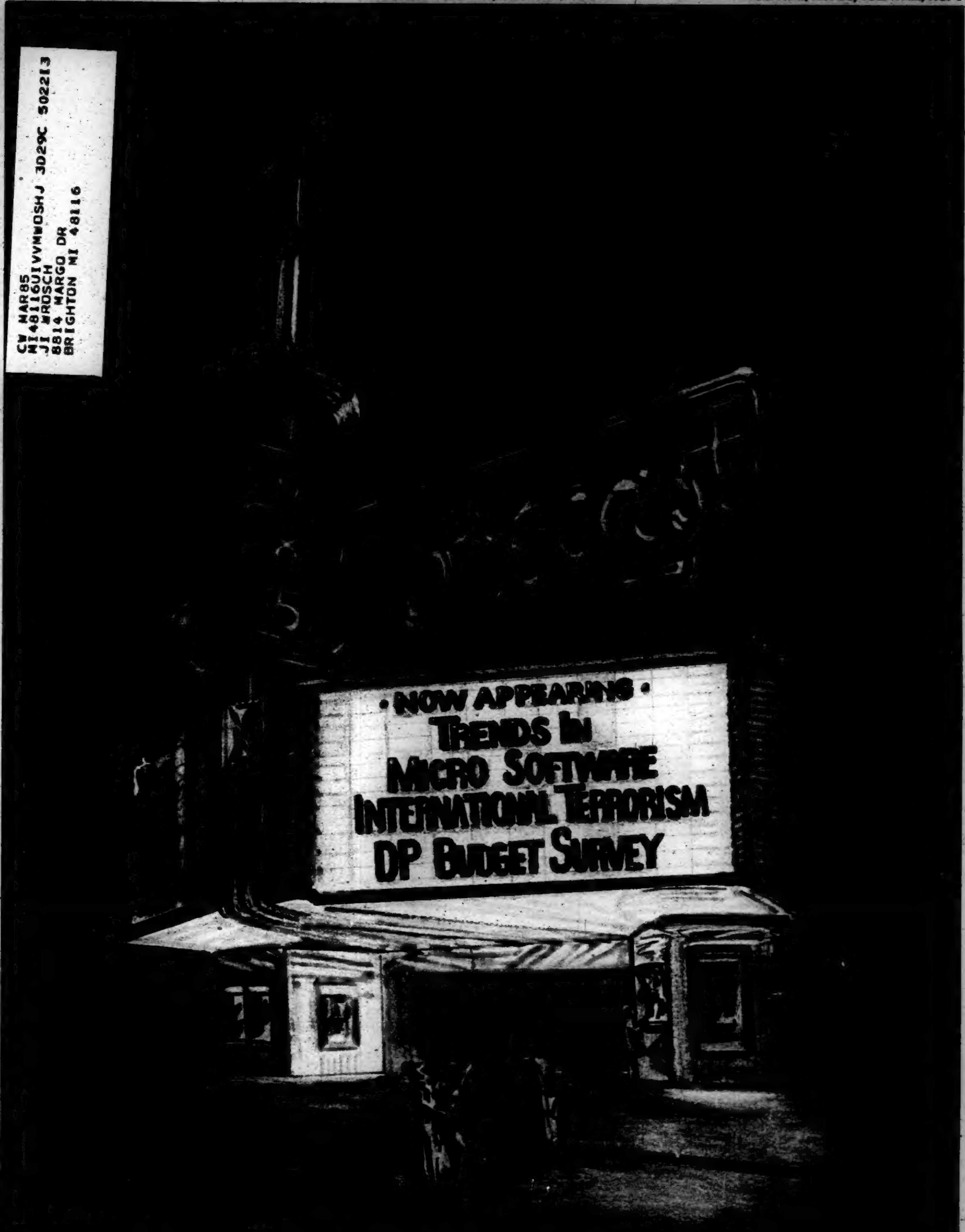
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The "intelligent terrorist," who recognizes the value of computer centers in maintaining the fabric of society, has not yet arrived in the U.S. However, terrorists have launched isolated attacks on data centers here, and respected authorities have issued warnings about the threat to fragile computer-based networks posed by terrorism.

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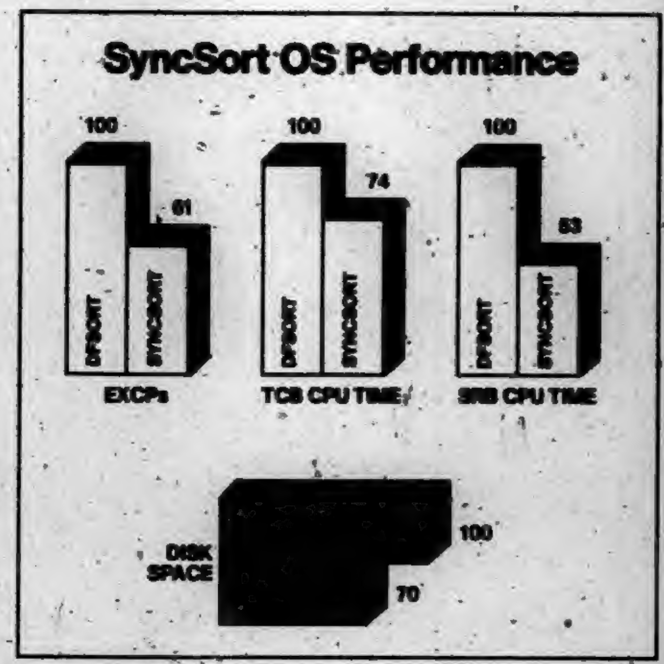
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ANNUAL DP BUDGET SURVEY

SOME WILL GO HUNGRY

By Donna Raimondi

Corporate data processing budgets are still growing but at a slower rate than over the past three years. Managers participating in *Computerworld's* annual DP budget survey reflected a conservative attitude toward spending, with indications that they will hire fewer staff, buy less software and in general try to make do with existing facilities to serve their organizations even as they expand services.

A greater percentage of respondents claimed an increase in their budgets for 1985 — 82.7% as opposed to 67% in 1984, but the growth rate in DP budgets slipped again for 1985. In a continuing downward spiral from last year's 12.4%, 1983's 17% and 1982's 20.3% increase rates, the DP managers surveyed recently indicated an overall increase in their

Continued on page 5

MICHAEL MEYER

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budgets of 9.89%.

The majority of respondents — 42% — felt no improvement at all from what Washington, D.C., officials have labeled the economic recovery. About a quarter of the managers said the economic recovery has had a beneficial effect on their DP budget; most of them noting slight increases in spending. Five of 40 respondents cited decreases resulting from the economy that ranged from hiring freezes to discharge of personnel.

When Congress cut the manpower allocation for the U.S. Army Corps of Engineers, office automation became necessary in order to cope with the work load, which remained the same, said Edward Gutwald at the corps' South Atlantic Division in Atlanta. But automating the office has cost money, especially in time and training, and there have been no extra people or money to do the jobs, he said.

The DP department has become more responsible for microcomputer expenses. This year, slightly more than half of the managers indicated that microcomputers will be purchased from their DP budgets, and 37.7% of micro expenses will come from end-user budgets. In 1984, microcomputers came 50:50 from DP and end-user budgets; in 1983, 19 managers said end-users paid for micros and only six indicated that DP departments paid.

> ***The majority of respondents — 42% — felt no improvement at all from what Washington, D.C., officials have labeled the economic recovery.***

Salaries — the single largest budget item — account for 43% of DP budgets — the same this year as last year. Increases in those departments reporting higher spending for salaries will average 7.3%, up from 5.7% a year ago. Programmer/analysts eat up the greatest share of the salaries budget — 29% — followed by computer operators at 17%, programmers at 14% and DP/MIS managers and systems analysts at 12% each.

The fastest growing item in the salary budget is the DP/MIS manager/director salary, which grew 6.6% from 1984. Computer operators have increased salary expenses by 6%, followed by programmer analysts, 4.9%, and programmers, 4.8%.

Fewer managers plan to hire new personnel in 1985 — 50% as opposed to 57% who planned to hire for 1984. Programmer analysts, computer operators and programmers head the list of new hires.

It is still not easy to find qualified personnel, but compared to the last two years, this problem is less severe. More than half (52.9%) of the respondents still claim to have had trouble finding qualified DP personnel in the past year, but last year the figure was 55%, and in 1983, 82% of respondents claimed difficulty.

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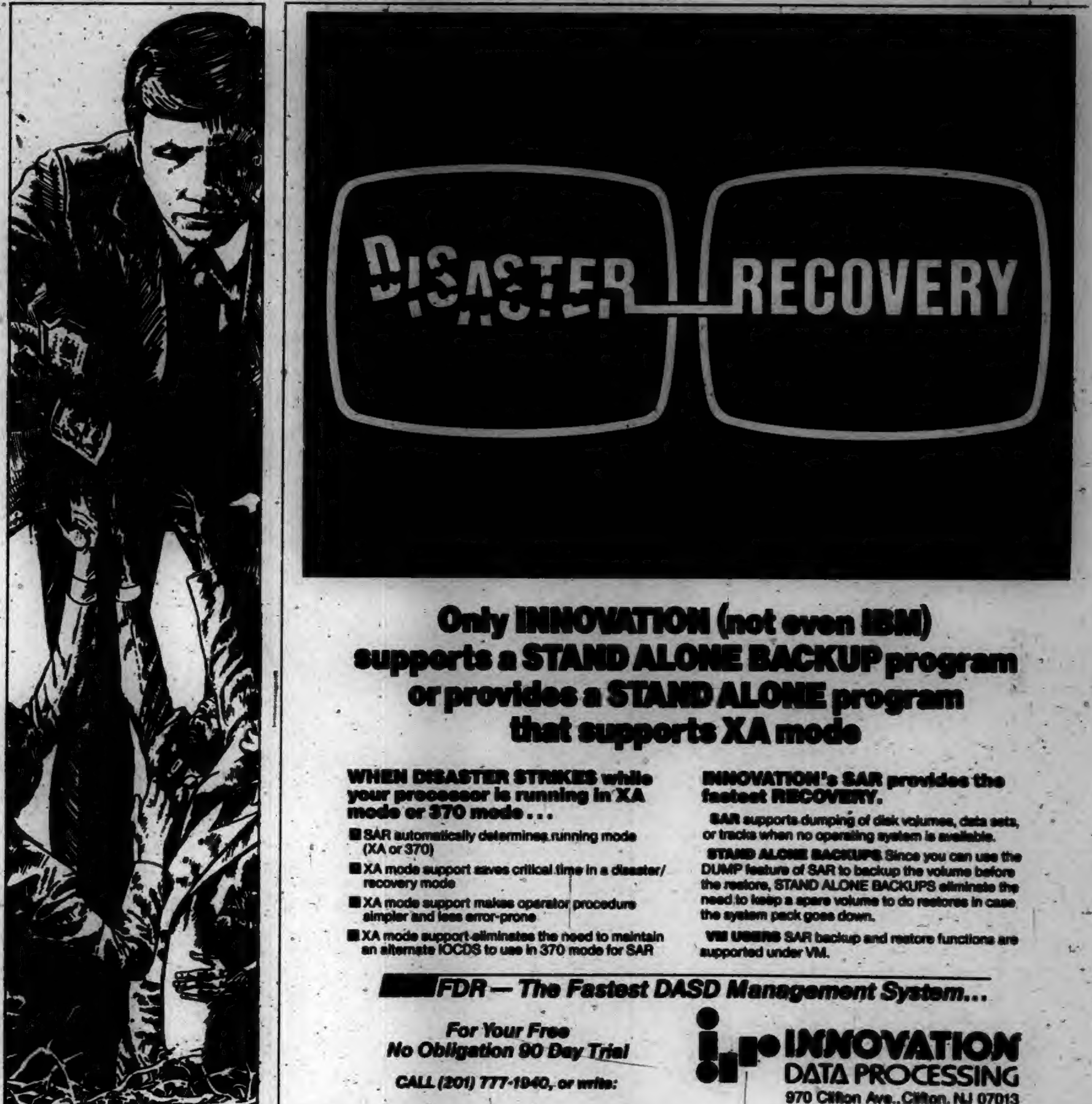

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ANNUAL DP BUDGET SURVEY

Continued from page 5

This year, systems programmer positions have been the most difficult to fill (33.3%) followed by programmer/analyst slots (25.9%).

There are not enough systems software specialists out there, said G. D. Springer, director of information systems at Atlantic Aviation Corp. in Wilmington, Del. It is also difficult to pay the salaries that such people command, he added.

There is an overall decrease of 3.8% in the personnel turnover rate. The majority of managers — 62.3% — said their turnover rate stayed the same, with 22.6% of companies experiencing less turnover and 15.1% claiming greater turnover.

Maintenance tasks

Maintenance tasks are taking up more of programmers' time, managers reported. The average proportion of time spent on maintenance came out to 55.3% this year, an overall increase from last year's 45.4%. New development tasks account for the rest of programmers' time. In 1983's survey, DP heads said that programmers shared their time equally between maintenance and new development.

Fewer DP shops will purchase software this year — only 67.3% of the group polled will acquire new software packages in 1985, as opposed to 80% who budgeted for software in last year's survey.

Software expenses comprise 12% of the total DP budget for 1985, broken down as follows:

- Application software — 7%.
- Systems software — 5%.

This is a decrease from last year when software accounted for 19.6% of the total budget and is more in line with 1983, when software costs averaged 10% of the total amount.

The majority of managers planning to acquire new software will buy business application packages such as accounting, financial and human resources packages. Others will add systems aids such as librarian and productivity packages. Four managers budgeted for data base management systems; several are buying fourth-generation languages and microcomputer products. Three DP heads will purchase micro-to-mainframe links.

Hardware vendors — especially IBM — should be happy to learn that 76.9% of the group surveyed plan to buy hardware products, as opposed to 70% last year. Of the 14 managers who will purchase mainframes, seven said they will install IBM's 4300 series and three are planning to acquire IBM 30 series machines.

In the minicomputer category, one manager plans to buy 10 IBM System/36 computers, and on order at six shops are four Digital Equipment Corp. VAX-11 computers, three Hewlett-Packard Co. HP 3000s and one HP 2000.

Peripherals are high on the managers' shopping lists, as are microcomputers. Of the 13 managers reporting plans for microcomputer purchases, one plans to acquire 400 Wang Laboratories, Inc. Professional micros, and another will install 100 unspecified microcomputers. Three respondents will purchase IBM Personal Computer ATs.

> *In answer to a question about their primary concerns for 1985, 18 out of 49 managers expressed distress about personnel — mentioning difficulties in finding, training, paying, retaining and getting enough productivity out of their staffs.*

Thirty-five percent of the total DP budget will go to hardware, broken down as follows:

- Mainframes — 18%.
- Minicomputers — 6%.
- Microcomputers — 4%.
- Peripherals — 7%.

The survey group reported that 37.1% of their allotted hardware monies will go to license fees for mainframes, and another 11.3% will pay for license fees for minis and superminis.

Microcomputer and data communications expenses showed up as the fastest growing budget items in this year's survey, although each category makes up less than 5% of the total DP budget. Microcomputer hardware spending increased by 28%, followed by data communications at 17%.

Minicomputer expenses — 6% of the total DP budget — showed a 14.9% increase rate over 1984 figures, followed by application software — 7% of the total budget — at 14.1% and systems software — 5% of the total budget — at 10.3%.

AT&T divestiture-related problems continue to plague many managers. More than 41% of survey respondents said the action has led to worsened conditions, including confusion and delays in communications planning, increased costs and more billing errors. More than half of the companies surveyed felt no impact from the divestiture, and a couple of managers used the divestiture to improve their communications procedures.

"The divestiture forced us to rethink our communications expenses," said Dennis Stelzer, president of NBC/Computer Services Corp. "I say, 'thanks AT&T,' " he added. "We worked on multiplexing lines to up the speeds to get more terminal devices on them, added different concentrator-type devices and changed some protocols. We went from asynchronous to bisynchronous to decrease the lines we needed," he said.

Concerns for 1985

In answer to a question about their primary concerns for 1985, 18 out of 49 managers expressed distress about personnel — mentioning difficulties in finding, training, paying, retaining and getting enough productivity out of their staffs.

Ten respondents said their greatest concerns were with microcomputers. Three of these managers are trying to find the microcomputer's place in overall long-range planning goals, two mentioned worries about linking their microcomputers to mainframes, and one each was concerned about evaluation, management or support of micros. One respondent mentioned a "contest of personal computer proliferation" in his company as one of his biggest concerns.

Eight DP heads said they are concerned with end-user problems. One each of the managers surveyed was trying to implement or increase information centers, four expressed problems with sufficient resources for user requests or services. One manager said the lack of user cooperation was a problem for him and another wished to increase the users' understanding of DP's functions.

Six managers said their greatest concern was with the overload on their hardware or services. One of these managers is faced with a 30% per year growth rate and worries about keeping his system's ability and quality; others are either trying to keep the load on the system manageable or trying to improve the system to state-of-the-art technology.

Communication among systems, divisions and networks was an expressed concern of six managers.

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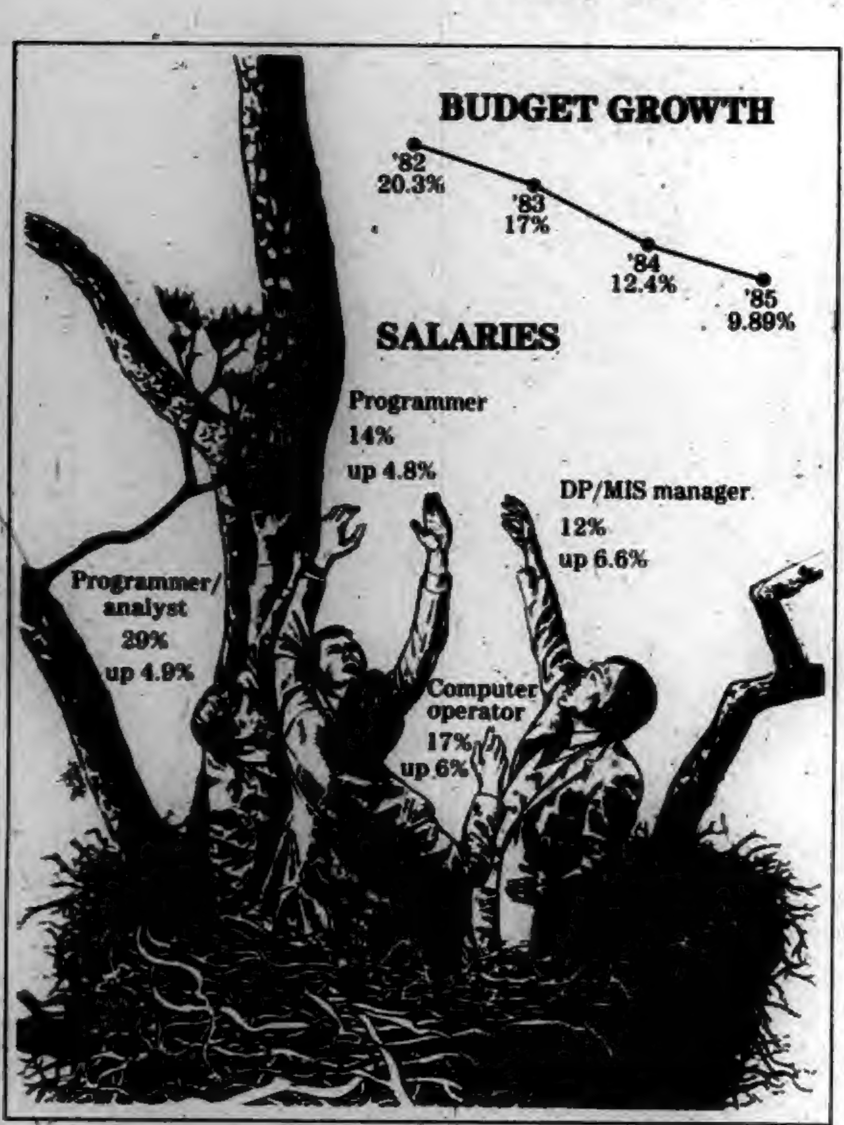


Qualified programmers, analysts difficult to find

Qualified data processing personnel are hard to find, according to more than half of the DP managers polled for *Computerworld*'s annual DP budget survey. Although some difficulty exists in locating staff for any slot in a DP department, the rarest find is a good systems programmer or programmer analyst, according to the group polled.

Finding programmer analysts with appropriate, applicable skills is a tough problem for Glenn Lukowicz of St. Luke's Hospital, in New Bedford, Mass. "The words to stress here are applicable and appropriate," Lukowicz said. He has hired college graduates who have learned plenty of theory that is not in line with present-day needs, he added. They do not know current standards, and they are five to six years behind the times, he said.

Lukowicz has advertised in newspapers and searched agencies for dedicated, competent, pride-oriented programmers with good program development standards, he said. He said he pays above-average salaries and offers a working environment that includes fast response time, color CRT terminals, flexible hours and participation in presentations of new products and decision making, and still has trouble finding people.

"[People do not] want to test or finalize their projects," he claimed, "they only want to code."

"We don't have IBM equipment — we have [Honeywell, Inc.] — and we don't even expect to find Honeywell experience," said John Kozial of the Dukane Corp. in St. Charles, Ill. Most of the systems people who come from college computer science programs are technically minded, and they do not understand the business applications they are called upon to develop, he said. They have difficulty comprehending the users' needs, he added.

Kozial said he finds that the people he interviews are more concerned with salaries or living in a nice area than with pride in their jobs, he said. Dukane — a company that generates revenues worth $40 million annually — pays competitive wages and offers above average working conditions, he said.

Trainees avoided

The company now avoids trainees because it is a lot of work to bring them up to snuff, and when they finally have a grasp on the work, they leave for higher salaried jobs, Kozial said.

"On performance reviews, the trainee will put down as an accomplishment what he has learned, not how [he] has helped the company," he said.

G. D. Springer, director of information systems at General Aviation Sales and Service in Wilmington, Del., noted three problems he has with hiring systems programmers: There are not enough systems programmers, there are even fewer systems people with [Cullinet Software, Inc.] IDMS experience, and even if he finds one, he cannot afford to pay him, he said.

In the Wilmington area, all three of these problems are exacerbated because 15 large banks — including Bankers Trust Co. and Chase Manhattan Bank — have moved here since the beginning of 1984 to take advantage of favorable, new state banking laws. Springer is competing with the banks for staff and finds that the salary — in the high twenties — that his company, which generates revenues worth $180 million annually, can offer a systems analyst with a degree and/or appropriate experience is not enough.

> *The last two resumes were distressing. One was from a person with a degree and no experience who wanted a salary of $30,000, the other from a person with minimal practical experience who wanted $39,000.*

The last two resumes he received distressed him, Springer said. One was from a person with a degree and no experience who wanted a salary of $30,000 a year, and the other was from a person with minimal practical experience in a small installation who wanted $39,000.

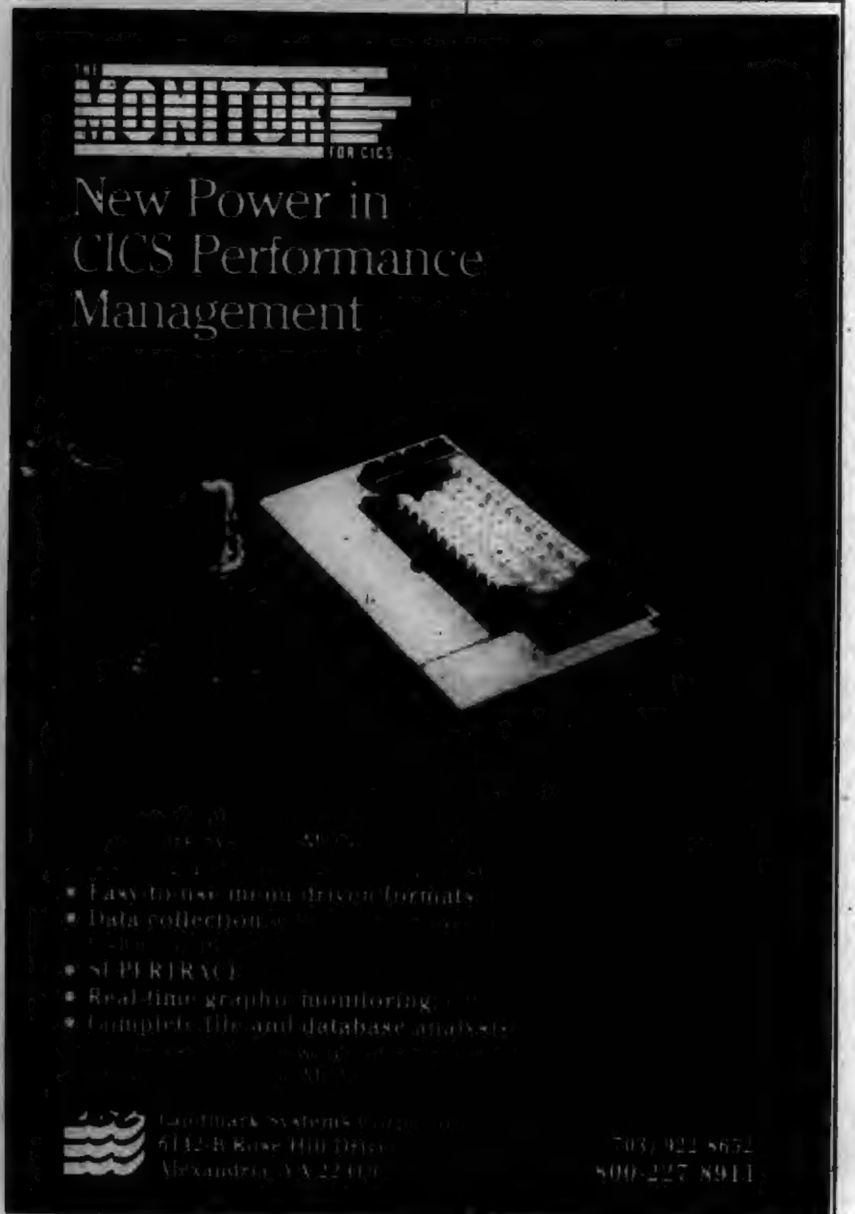
Once a good analyst is hired, Springer said, he is worth another $8,000 a year in the marketplace after gaining a couple of years of experience. Because General Aviation cannot give such hefty raises so quickly, analysts leave the company for greener pastures, he said.

Interns hired on per diem basis

Lukowicz of St. Luke's has partially solved his hiring problems by offering internships to vocational/technical high school students and students at post-high-school technical institutes. If he finds a particularly talented intern, he hires that person on a per diem basis until a position opens.

Springer advertises in newspapers and contacts agencies that specialize in locating the kind of people he needs, but he is not having much luck, he said. Kozial has worked out an admittedly nonscientific method for determining an interviewee's worth, he said. Looking first at how a person sells himself, he takes all sloppy or unreadable resumes and puts them aside. He then interviews the people with impressive resumes, spending a lot of time going over important points.

"Some know how to sell themselves, but they stretch the truth about what they know," he said. He avoids people with college degrees in other disciplines, such as psychology, because he has found over the years that they are in DP because it pays well and not because they like it, he added.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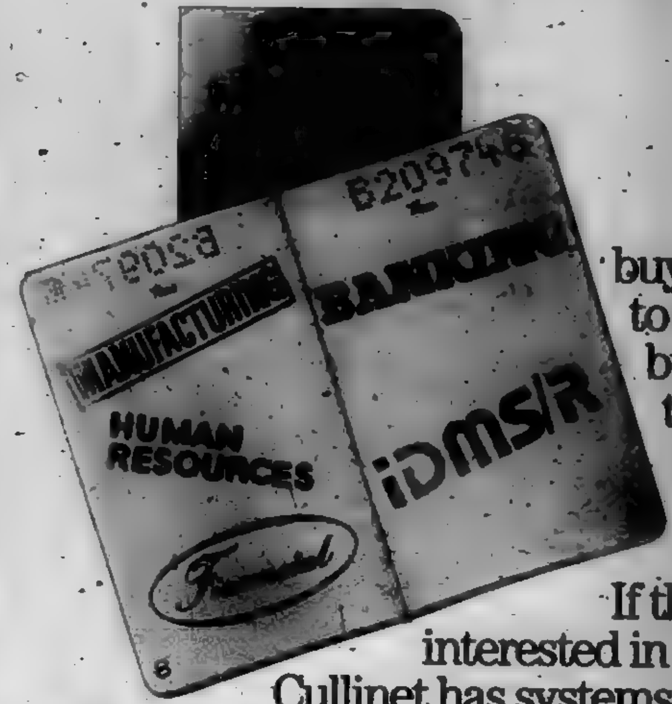

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DIALING FOR DOLLARS

Bruised and suffering from a few broken ribs, users are emerging from the first year of the AT&T divestiture sore but intact. And perhaps smarter. Although ill-equipped to capitalize on it yet, the heightened industry awareness foisted on users by the Bell system breakup has sown the seeds of change.

In this year of communications line back orders, facility service nightmares and burgeoning options, telecommunications managers have had to adapt to keep their heads above water. In an October speech to the Communications Managers Association on Long Island, N.Y., Donald Procknow, vice-chairman of AT&T Technologies, likened the environment created by divestiture to reading *War and Peace*. "Divert your attention for a minute, and it's hard to pick up again."

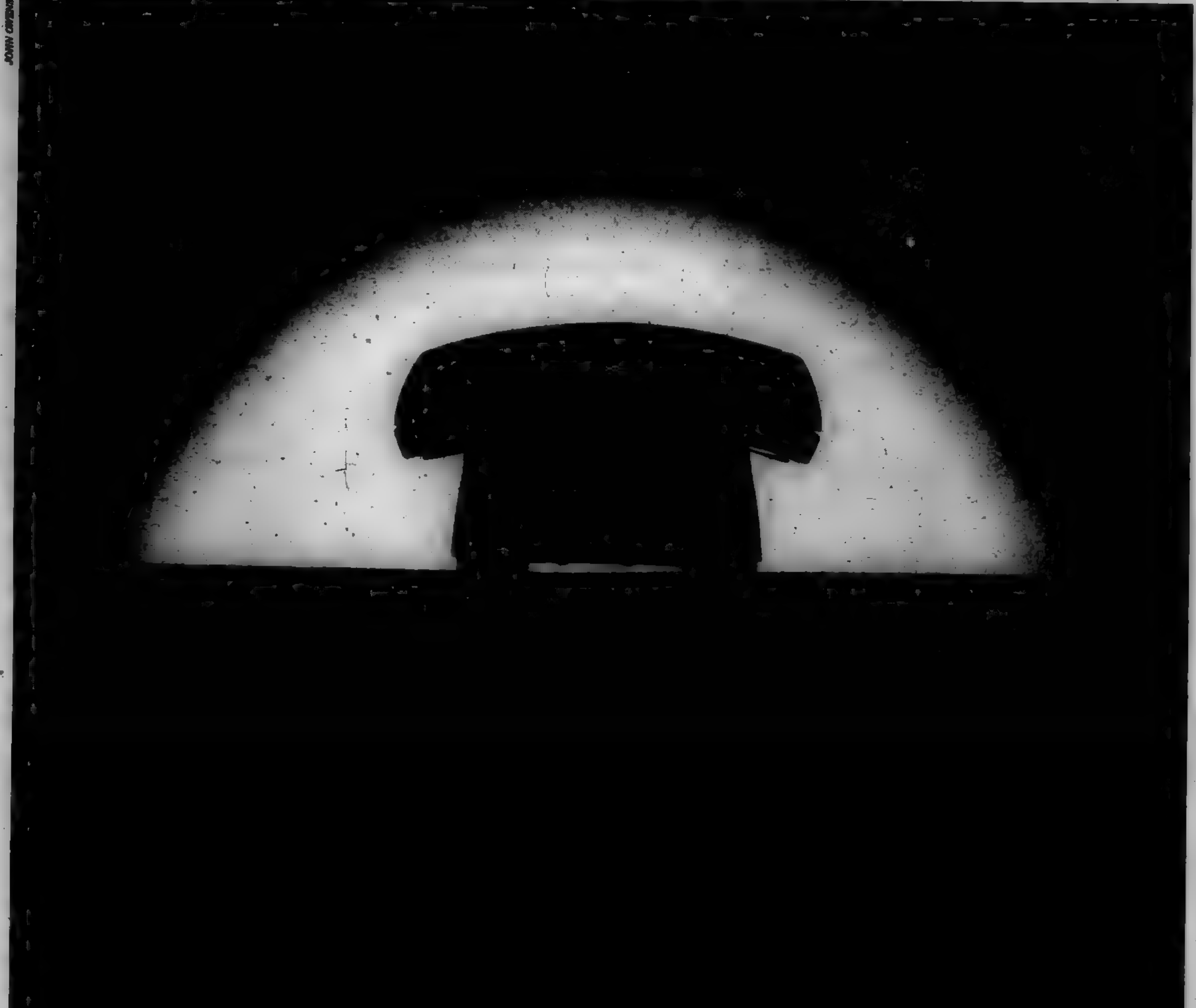
Users, however, have faced up to the task. The explosion of interest in T1 digital facilities is a good bellwether, showing the responsibility — in network design, implementation and management — that users are willing to shoulder now that it is no longer possible to do one-stop shopping with AT&T.

In retrospect, the communications users who foresaw the divestiture storm and, in anticipation, battened down the hatches by factoring delays into their plans and limiting expansion and moves, fared far better than those who hoped they would be able to weather the cataclysm.

Not even AT&T properly estimated how painful the dissection of the Bell operating companies would be. The first clue came early in the year when orders for communications lines began backing up, caught in a coordination glitch between AT&T Communications, the provider of long-distance facilities, and the divested Bell operating companies, which provide local connections.

Horror stories mounted. Line installation delays, which were running up

By John Dix



JOHN OWENS

to six months, were only part of it. Facilities were arbitrarily disconnected. Circuit records were bungled. Company accounts were lost. And many Bell service account representatives were reassigned, leaving the hapless user with nowhere to turn.

In July, the private-line logjam peaked at 44,300 back orders. Wats and 800-service back orders topped out at 36,000. Slowly, the millions of dollars AT&T poured into the job of cleaning up this mess began to take effect.

Today, 58% of private-line orders are installed on time, compared with 29% in July. In October, private-line back orders had been cut to 23,400. While admitting it has a long way to go, AT&T happily reports that Wats and 800-service orders are now nearing normalcy.

Concern over procuring and maintaining communications lines went hand-in-hand with worries this year about how much these facilities would cost.

Before the breakup actually occurred, analysts were predicting that the divested local Bell operating companies' rates would rocket through the roof and that long-distance rates would plummet.

> ***The divested Bell operating companies have successfully pushed many rate increases through their respective state public utility commissions but not to the tune many had forecast.***

Yes and no. The 22 divested Bell operating companies, now grouped within seven independent regional holding companies, have successfully pushed many rate increases through their respective state public utility commissions but not to the tune many had forecast. Long-distance rates have not seen any precipitous decline. To the contrary, some long-distance companies like MCI Communications Corp., have, in fact, raised their rates.

Given the state-by-state regulation of local rates, it's hard to quantify local increases. But this year, all divested Bell operating companies began charging federally approved line charges that include:

- Customer Access Line Charges (Calc) for businesses with multiple phone lines. Beginning in May, the divested Bell telephone companies began charging business customers a flat charge for each telephone line they operated. These charges ranged by state from a low of $2.25 to a legal maximum of $6 but averaged $5 per line per month.
- A $2 per line per month Calc for Centrex lines in place before July and the regular business Calc for Centrex lines installed thereafter.
- A $25 surcharge for private lines. The divested Bell operating companies started billing this surcharge in November, although it started to accrue in August. It applies to private lines that are connected to switching or other types of equipment that is capable of rerouting traffic into the local-exchange network. Because of this, the surcharge generally applies to voice circuits rather than data links. The surcharge applies to both ends of an interexchange circuit and only one end of a link that stays within the same exchange.

Implementation of access-line charges directly on business customers — changing somewhat the way the divested Bell operating companies recover costs from AT&T — resulted in a 6.1% reduction in AT&T's Message Toll Service and Wats service. This was the only AT&T rate change that materialized in 1984.

One change that never came about was AT&T's proposed private-line rates, originally filed in October 1983. These proposed rates were substantially higher than the old private-line tariffs because they reflected increases that the divested operating companies and other local-exchange carriers had proposed to charge AT&T for special access.

The special access dilemma

Special access is the type of connection local-exchange carriers provide long-distance companies to complete private-line circuits. Users never see this charge directly — long-distance private lines are procured from a single carrier who coordinates local connections at both ends of the circuit through exchange carriers — but as the long-distance carrier's cost to connect to the local network increases, it will usually be reflected in the rate it charges the end user.

A spokesman for the Federal Communications Commission said that the special access rates proposed by the local-exchange carriers ranged up to 800% depending on location and type of service. These increases were reflected in AT&T's proposed 1983 end-user private-line rates, although the actual increase was offset somewhat because AT&T had proposed lowering its cost per mile rate.

In 1984, the FCC found the special access rates to be unlawful and rejected them. As a result, the projected private-line rate shock never came about.

Page Montgomery, vice-president of Economics and Technology, Inc., a telecommunications consulting firm in Boston, said that because of this, many of his company's clients in the

Continued on page 12

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Continued from page 11

Fortune 100 are fairing well.

"Most of our clients that did budgets based on the proposed October 1983 numbers report that they are well under their budgets," he noted. "They might still be paying a little more than they did in 1983 — because of the $6 Calc, for example — but when you average it out, they are well below what they had projected."

We are, however, near the end of this grace period.

New rates expected

New special access rates are expected to be approved by the FCC and to be put in place by the local exchange carriers by Jan. 17. After analyzing these tariffs and compensating for them, AT&T is expected to refile its end-user private-line rates with the FCC around March 1, Montgomery said. "Under this scenario, these rates would go into effect sometime between April 16 and June 1."

Just what the new private-line rates will be is still unclear. Economist Alan Pearce, president of Information Age Economics in Washington, D.C., said the only thing that is certain for 1985 is "significant private-line rate restructuring, where some private-line offerings will go up in price, some will stay the same, and some will go down." Generally, Pearce expects to see the price of lower speed analog facilities to be increased and higher speed digital facilities to drop.

The length of the circuit will also have an effect on whether its cost increases or decreases. Montgomery said that AT&T may lower its private-line rates, but the end user will still see significant increases because of the way the tariffs are structured. Today, private lines are tariffed on an end-to-end basis, but in the future, AT&T will price out access components separately, components that will reflect the increased amount it has to pay local-exchange carriers for special access.

Longer circuits more economical

Under such a structure it becomes obvious that the longer circuits are more economical. Montgomery said that even when AT&T incorporated 100% to 110% special access increases into its proposed 1983 rates, private-line users that had circuits extending over 850 miles would have seen absolute rate reductions because of the offset effect of new, lower dollar-per-mile charges. The break-even point that will determine rate increases/decreases will drop below 850 miles now that the FCC has mandated that special access charges be lowered.

As a category of service, private-line rates will go up because they have been underpriced in the past, an FCC spokesman said. Additionally, the rates of alternate carriers can be expected to increase more than any AT&T rates. This is because the alternate carriers — including MCI Communications Corp. and GTE Sprint Communications Corp. — have been paying the same amount for special access since 1974. This amount will be increased over time until they pay the same amount as AT&T.

The FCC agreed to phase in the special access increases over time to lessen the blow to the alternate carriers. As an example, Western Union, Inc. will pay $300,000 in special access charges next year, and $500,000 — the full amount — by January 1986, according to Montgomery. "One expects that these higher rates will eventually be reflected in the carrier's end-user rates," the FCC spokesman said.

As private-line tariffs increase and the rate differences between carriers erode, users will be spurred to look for more drastic alternatives. By bypassing telephone companies — both local and long-distance carriers — users can take control of rates and realize other benefits, such as implementation of wide bandwidth facilities and control of installation schedules.

As a category of service, private-line rates will go up because they have been underpriced in the past.

Bypass became a byword in 1984, encouraged by rate turmoil, line delays and service problems, but is still more talked about than practiced. This is due, in part, to the fact that users are still waiting until the divestiture dust settles and all the rate cards have been played before calculating the potential of bypass.

Many large companies, however, already practice some type of bypass. According to Jerry Lucas, president of Telestrategies, Inc., a research and consulting firm in McLean, Va., "half of the companies in the Fortune 100 already have bypass systems in place or are very actively looking at [bypass]." He estimated the 1984 bypass market to be about $600 million.

There are three basic types of bypass:

- Circumvention of local telephone company circuits by linking buildings with line-of-sight microwave or infrared light systems.
- Sidestepping the local telephone company by running a direct link from a corporation or institution to a long-distance carrier's point-of-presence within a local telephone company's jurisdiction.
- Total bypass of all telephone companies by operating a private premises-to-premises communications system.

There are many technologies that can be used to achieve the types of bypass outlined. The most prevalent technology used in bypass is micro-

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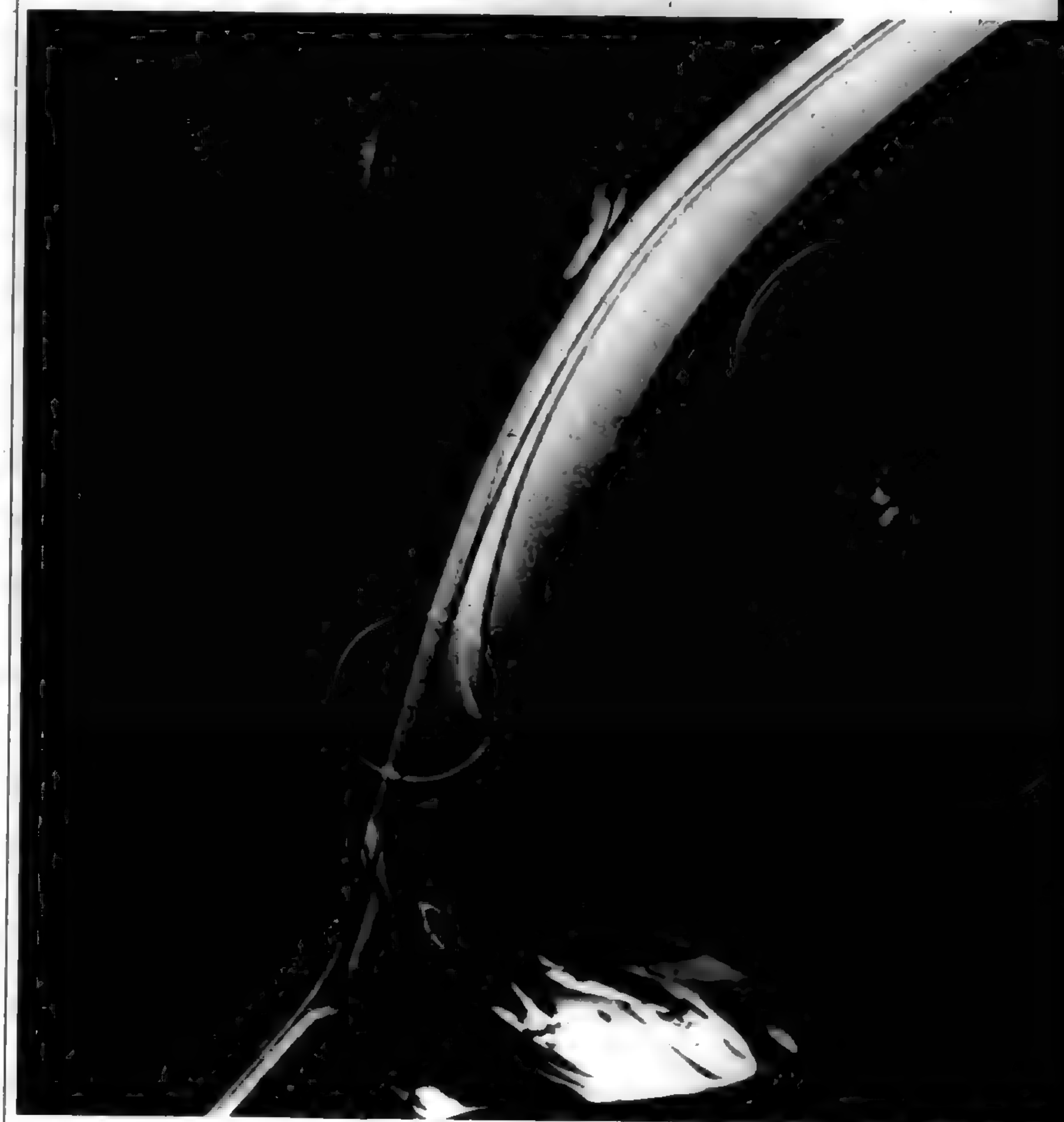

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wave radio systems, typically employed in the first manner mentioned.

Other technologies will mature next year. According to Mark Stahlman, a research analyst with Sanford C. Berstein and Co., an investment research and management firm in New York, "1985 is going to be a good year in terms of the coming to fruition of a lot of these technologies that have been in the development stage [during] the last two or three years. Whether or not the market will develop still remains to be seen."

One technology that Stahlman is predicting will be deployed next year is the use of CATV networks to bypass local telephone companies. "The major companies involved with CATV-based data and voice systems began developing systems in 1982 and 1983 and, given two- to three-year development cycles, 1985 is the year the major suppliers and some independents will begin testing."

Another promising technology that both Lucas and Stahlman are expecting to see further developed in 1985 is low-cost, two-way satellite systems. Using something called spread spectrum technology, companies like Equatorial Communications Co. of Moutain View, Calif., can offer services that use small, inexpensive, two-way satellite earth stations.

> *AT&T may lower its private-line rates, but the end user will still see significant increases because of the way the tariffs are structured.*

Stahlman said that spread spectrum technology, which enables use of small earth stations by replicating satellite signal elements, will be brought together with direct broadcast satellite (DBS) techniques in 1985 to spawn a new bypass market. DBS systems were originally conceived to broadcast television signals directly to homes, but because this market has been sluggish, "companies that invested in DBS are going to be compelled to try to address business communications problems." Xerox Corp.'s Computer Services Division recently announced a service that marries these two technologies.

The outlook for other bypass technologies looks less rosy. For example, digital termination systems (DTS), point-to-multipoint digital microwave systems that provide bypass of telephone company local loops, are floundering. Lucas said the problem is that "there isn't enough capacity for widespread use. No one has ever made a penny on data-only services," which are essentially what DTS systems are.

Like most bypass systems, DTS exists at the sufferance of established carriers. Lucas said that the DTS industry has been dampened by AT&T's proposed Dataphone Digital Service rates, its digital service, which are substantially lower than previous rates.

But bypass is not always justified economically. Indeed, Stahlman noted, one of the primary reasons corporations practice bypass is because telephone companies cannot provide needed facilities in a timely fashion. Additionally, some corporations bypass their local carriers because the needed service, perhaps a high-speed digital link, is not available.

Knowing this, many of the divested operating companies — including New York Telephone Co. in New York — are installing fiber-optic networks that some customers will be allowed to access directly.

Such market-driven responses are indicative of change within the telecommunications industry necessitated by AT&T divestiture. While obscured by the problems it created, the competitive benefits of the Bell system dissection will probably be, in the long run, good for the user. Pollyannas point to service options created, competitive pricing and the betterment of communications technology. Critics question the wisdom of removing incentives for divested Bell system companies to offer universal service at fair prices; they wonder what the long-term implications will be of commercializing Bell Laboratories — especially in light of heightened international technology competition — and ask, will the Bell system be put back together again in 10 years?

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Division of Advance Circuits

AT&T breakup expands equal access opportunities

By John Dix
CW Staff

As a condition of AT&T's divestiture, the former Bell operating companies are required to provide all long-distance carriers with the same quality connections to their local networks. By September 1985, under terms of the so-called equal-access divestiture provision, roughly one-third of all local telephone switches are to be upgraded for equal access. By September 1986, 70% of all exchange switches are to be updated.

Equal access essentially puts carriers like MCI Communications Corp. and GTE Sprint Communications Corp. on a footing equal to AT&T. It increases service quality of the alternate carriers, enables their services to be accessed by dialing a single digit as with AT&T and provides the carriers with the signaling elements necessary to provide accurate billing, all of which are factors important to corporate users.

As equal access becomes available, users will be asked by their local telephone company to choose a primary long-distance carrier. That carrier will henceforth be accessed by dialing the digit "1," just as the long-distance grid of AT&T has been selected for all these years.

In addition, users can access carriers other than their primary choice by dialing "10" and a three-digit carrier identification code. Known as the "10XXX" dialing option, this does away with the pre-equal access need to access alternate long-distance companies by dialing the carrier, entering an identification code and then dialing the desired number.

For corporate users, the advantages of equal access requires careful analysis of applicable tariffs. Once assessed, least-cost routing tables in a company's private branch exchange (PBX) can be updated so that traffic is automatically routed over alternate carriers where favorable tariffs are available.

Some PBX manufacturers' least-cost routing schemes are not capable of inserting the 10XXX digits needed to access nonprimary carriers. Besides ensuring that capability, users should find out how much reprogramming for equal access will cost and what it will entail — on-site updating or a new load from the vendor.

Latas: mapping the divested Bell companies

By John Dix
CW Staff

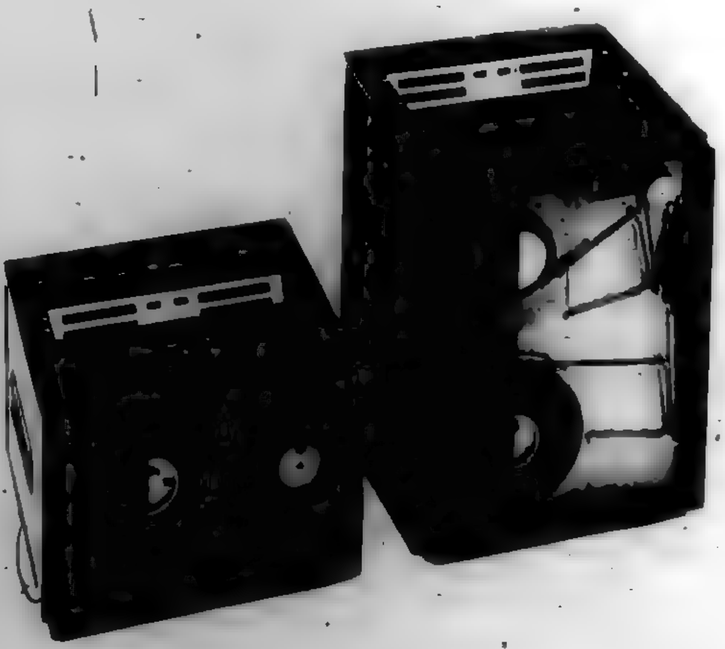
It is perhaps fitting that the acronym for Local Access Transport Area, or Lata, sounds like it belongs in a surveyor's lexicon, because it is in fact used to distinguish geographical boundaries.

When AT&T divested itself of the Bell operating companies, the jurisdiction of each local company was subdivided into areas known as Latas. These areas determine which traffic can be carried by the local operating companies and which has to be handled by a long-distance or inter-Lata carrier.

The 22 Bell operating companies were divided into more than 160 Latas, depending mostly on the population density of a given area. Wyoming, Rhode Island and Maine, for example, are among the states that are considered single Latas, whereas California has 1[illegible] Latas, and Texas has 14.

Logistically, the creation of Latas has vastly complicated the life of users. Circuits that were once the province of a single operating company may now cross a Lata and require the involvement of an inter-Lata carrier such as AT&T or MCI Communications Corp. That same circuit, once identified by a single number, may now have three circuit identification numbers, complicating record keeping and the reporting of service problems. Additionally, because inter-Lata and intra-Lata circuits share similar price differences as interstate vs. intrastate services once did, network cost optimization is more difficult.

Given the differences in Lata pricing, many consultants are advocating network configurations that minimize circuit contamination, a condition that results when a line crosses from one Lata into another. Circuits that are contained within Latas can be interconnected at hubs, which can in turn be networked, which would minimize inter-Lata circuits and at least theoretically limit expense.



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CLEAR AND PRESENT DANGER

By John Desmond

October 1983: A truck carrying a ton of explosives drives through sandbags into the courtyard of a U.S. Marine barracks in Beirut, Lebanon, and detonates with devastating force. The building collapses, and more than 240 Marines lose their lives. A terrorist group takes responsibility for the action.

MELVILLE, N.Y. — On the morning of August 22, 1984, at the General Electric Co. offices here, a man walked into the building with an attache case, deposited the case in a stairwell and walked out.

At 10 a.m. that day, a caller identifying himself as a member of the United Freedom Front (UFF) told a receptionist that a bomb had been planted in the building. Corporate security was notified, and a guard spotted the attache case in the stairwell. The case was conveniently labeled "bomb," according to Stanley Klein, chief of the terrorism section within the FBI's criminal investigation group. The bomb was a "standard terrorist-improvised explosive device" consisting of dynamite, a battery and a timer, Klein said.

The Suffolk County police began evacuating the building at 11:21 a.m., and at 11:26 a.m., the bomb went off. Walls buckled, windows shattered, half the roof was blown off, and the second-, third- and fourth-floor stairwells were heavily damaged. No one was injured, primarily because the terrorists furnished ample warning.

"The difference between terrorist groups in the U.S. and overseas is the level of violence they're willing to achieve," according to Klein. "In this country, terrorists want to make statements without turning people off. It doesn't seem to me that they're willing to take the step of going into loss of life."

The threat of terrorist attacks against U.S. data centers is a little-considered risk. But vulnerability to terrorists is not only a problem for U.S. military outposts in the Middle East, Western Europe or Central America. The U.S. has grown dependent upon complex data processing systems for its institutional well-being. The U.S. Marines could withdraw from Lebanon, but U.S. data centers cannot withdraw from their vulnerability to terrorist

Continued on page 16

Continued from page 15

attacks. Methods are available for analyzing and reducing the risk, but in the DP community, awareness of the seriousness of the problem is in small proportion to the risk itself.

Moreover, it can happen here.

In five instances between 1971 and 1975, IBM installations in the U.S. and Mexico were attacked. In March 1976, a Hewlett-Packard Co. electronic circuit manufacturing site in Palo Alto, Calif., was bombed. And in May 1976, bombs were exploded on two floors of a building housing the DP facilities of Central Maine Power in Kennebec, Maine, according to records compiled by Belden Menkus, a management consultant who in 1983 published *Notes on Terrorism and Data Processing*, an analysis of the threat of terrorism to DP centers.

> *'There is historical warrant to expect frontal assaults on data centers, placement of explosives on-site, vandalization and arson.'*
>
> — Belden Menkus, management consultant

These were all isolated incidents, according to Menkus, who concluded that terrorists have so far "failed to recognize the role of DP in perpetuating the social/economic structure." However, he added that "there is historical warrant to expect frontal assaults on data centers, placement of explosives on-site, vandalization and arson."

So perhaps the intelligent terrorist has not yet arrived. Yet in October, Georgetown University's Center for Strategic and International Studies (CSIS) in Washington, D.C., warned of the terrorist threat in a report titled, "America's Hidden Vulnerabilities." The report concluded that computer systems should be safeguarded against acts of terrorist sabotage intended to disrupt or cripple society. The report was compiled by a panel of military and foreign affairs experts, including Chairman R. James Woolsey, a former U.S. Navy undersecretary, and Robert H. Kupperman, a senior associate at CSIS who served as the panel's cochairman.

At a press conference announcing the report's conclusions, Woolsey said, "Imagine what would happen to the personal finances of everyone in this room if a terrorist destroyed records of bank accounts, investments, Social Security and mortgages all at once." The report states that vulnerable funds transfer networks exchange money equal to the federal budget — $845 billion — every two to four hours.

Kupperman told *Computerworld* that while the greatest terrorist threat is in Europe, "In the U.S., the prospects for terrorism are increasing." Spillover from areas such as the Middle East is possible here, he suggested, noting the attack on an IBM office in New York two years ago by the Black Liberation Army, an action protesting the company's business dealings in South Africa.

"Such organizations and maybe some more Weather Underground-like organizations are going to get it into their heads to hit computer facilities," he said. He advised DP and information center managers to take the terrorist threat seriously, to "begin to figure out how much protection will cost" and to take reasonable precautions against unexpected attack.

Sperry Corp. became more conditioned to expect the unexpected when, on Aug. 10, 1984, two persons entered a company defense plant in Eagan, Minn., and used hammers to smash military computer equipment. A back panel and power supply were damaged, causing a $55,000 to $65,000 loss. The pair gained entry despite the fact that the plant was surrounded by a fence and had posted guards.

According to Tom Kunz, in charge of facilities protection at the plant, the pair is believed to have shown false identification to pass through the gate. Since then, Kunz said, the plant has tightened security with improved badges, a reduced number of entry points and added guards. Kunz said, "When the object [of an intruder] is to go in and damage something, it makes for a very difficult situation."

The difficulty of protecting against the unpredictable is perhaps best expressed by Jake's Law, which says, "With a big enough hammer, you can break anything."

Jake's Law is promulgated by Donn P. Parker, a senior management systems consultant for SRI International, Inc., of Menlo Park, Calif., an acknowledged leader among security experts and the author of *Fighting Computer Crime*. SRI recommends that businesses adopt a realistically sober attitude about the threat of terrorism. "It certainly is a risk. The critical question is, how big a risk is it? Nobody knows," Parker said.

SRI has documented 32 attacks against buildings housing data centers in Italy, France and West Germany in the last five years, many by the Red Brigade in Italy, Parker said. In comparison, few attacks have taken place in the U.S., yet the nature of terrorists with the goal of disrupting society is to strike at any time. "All of a sudden, some organization we haven't heard about could pop up, and there could be massive attacks all over the country. People would ask why they weren't warned. It puts the criminal justice community in a very difficult position," Parker said.

Some have charged that the threat of terrorism in the U.S. is being blown out of proportion, especially by individuals who stand to profit from the fear of terrorism. Oliver Revell, the assistant director of the FBI's criminal investigation division, said in November that the nation is becoming unnecessarily alarmed about terrorism. "I think there are a number of people crying wolf and waiting for the sky to fall in," Revell said. "I get tired of hearing [about] the imminent doom they are predicting. We're the ones who have the terrorists on the run, not the other way around."

Parker is not so sure. His impression of those who have spoken about the threat of terrorism is that most are "conscientious people who have seen what can happen. They look at the U.S. as becoming dependent on fragile technology, and they feel a responsibility to speak out."

The question of how industry should respond to the terrorist threat is debated as much as the dimensions of the threat itself. The CSIS report recommends that companies perform risk analysis in which they estimate an annual expected loss. The theory states that "investment in any specific measure for risk reduction is economically justified when the measure's cost is less than the expected reduction in loss that it is intended to achieve," according to the report.

Risk analysis is among the federal government's Health Care Financing Administration's security requirements for Medicare contractors. According to Don Abramson, computer systems analyst with the System Security and Testing Group of the financing administration, "The problem with risk analysis is that a lot of people are not comfortable with trying to get broad estimates. Auditors want verifiable facts and figures. But we use experts to outline risks using common sense and a systemized approach, something that can inspire management to do something."

Total Assets Protection, Inc., an Arlington, Texas-based company specializing in computer security, performs a business impact analysis as opposed to a risk analysis.

"We go in and find out the value of keeping the data center up and running. We show them their exposures and vulnerabilities," said Dick Bessenhoffer, vice-president of facilities design and planning at the company.

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"We try to balance the risk with the cost to protect. You can't have protection costing more than the computer going down."

While practiced in various forms, risk analysis is not universally accepted. SRI, for instance, does not believe in risk analysis. "We do not base our recommendations on risk analysis, because there are no valid statistics on which you can justify spending money," Parker said. Figures used to discuss the impact of computer crime are often pulled from thin air, he said. Parker cited a recent American Bar Association study that estimated the impact of computer crime to be $145 million to $730 million, adding, "I say that's nonsense; that has nothing to do with reality." He said no valid statistical studies have been performed in the area, and there is no method of collecting such statistics.

At SRI, Parker said, "We base our recommendations on generally accepted practices or reasonable and prudent business practices. Companies should install significant physical safeguards [to ensure that] if anything does happen, [they will] avoid embarassment, the liability of stockholder suits and actions in court because they have done reasonable things." He said his clients "gradually come around to understanding the situation."

> *'The major deficiency [of DP security] is that most of these people can't see beyond their noses. They're living on the fact that nobody has blown up their place or come in with a gun.'*
>
> — Dick Bessenhoffer, Vice-president of facilities design and planning, Total Assets Protection, Inc.

IBM may have come to understand the situation better after the UFF planted a bomb in the company's Harrison, N.Y., offices in March. According to IBM spokesman Michael Dutton, IBM is now taking steps to protect its property from physical harm. Asked to detail the measures in effect, Dutton said, "It would be counterproductive for us to discuss publicly the steps we are taking to protect IBM property."

Practical protection

However, Dutton said that IBM does believe it is practical to protect itself against unpredictable incidents such as the UFF bombing. IBM's security personnel and DP professionals are working together to prevent damage to data centers, he said.

SRI recommends adopting the measures taken by companies like IBM to achieve a baseline of security. "We tell them they cannot afford not to do it," Parker said. Companies that follow SRI's recommendations "will probably wind up with less security than they should for the really bad things that can happen but more than they would have if it was a benign world out there," Parker said.

Few statistical figures exist on the adequacy of company and data center security, but security authorities give the impression that security could be better. SRI evaluates a firm's level of security on a scale of one to 10, 10 being most secure. Commenting on security levels the company has observed in its evaluations, Parker said the average SRI client has a security rating of five, but many have security ratings of two or three. "We try to move them up to six or seven — not eight or nine, that's too much," Parker said. "Security of six or seven is prudent and would reduce the loss from an attack."

Jack Bologna, who heads Computer Protection Systems, Inc., a corporate security firm in Plymouth,

Continued on page 19

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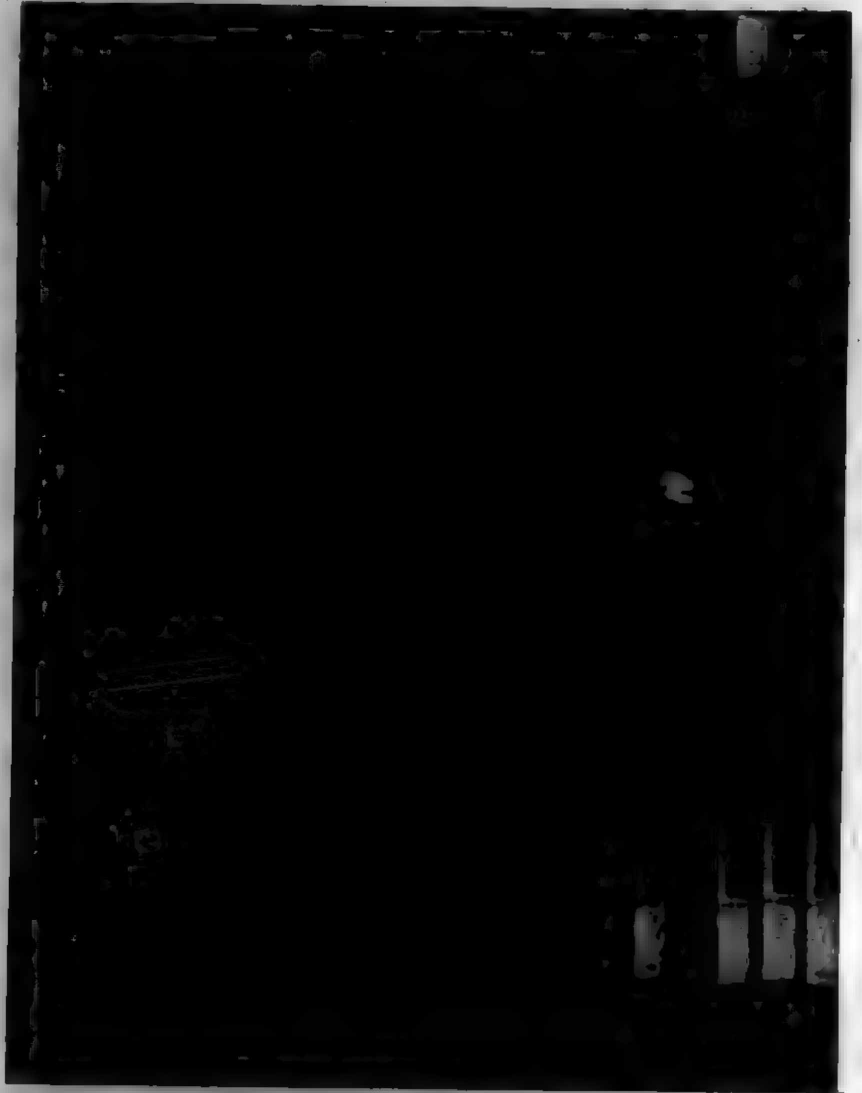
Security specialists outline basics of protection plan



MENLO PARK, Calif. — The basics of physical security for data centers have not changed in many years, according to Donn B. Parker of SRI International, Inc., one of the world's leading authorities on computer security. Parker was project manager of a 1982 report on computer security prepared for the U.S. Department of Justice in which 82 controls in use at seven computer field sites were reviewed.

Physical security methods employed at well-run computer centers included the following:

- Housing computers in one room and peripherals in a different room.
- Low building profile.
- Secure building perimeter.
- Emergency preparedness.
- Security for sensitive areas during unattended periods.
- Designated areas where smoking and eating are prohibited.
- Minimizing traffic and access to work areas.
- Physical access barriers.
- Remote terminal security.
- Universal use of badges.
- Alternative power supply.

The report suggested that baselines of security can be established for each business, be it bank, insurance company or manufacturer. Security experts and consultants should be able to agree on the objectives of a security program. Computer security administrators and the management responsible for security expenditures should agree on a number of specific controls. "As computer-using organizations adopt the baseline approach for selection of controls, they will increasingly rely on the best security controls used most successfully by other organizations," the report said.

> *'The key-thief problem can only be solved by permanently fastening the key to the person — not a pleasant idea.'*
>
> — Donn B. Parker, SRI International, Inc.

In his book *Fighting Computer Crime*, published in 1983, Parker suggested that access controls allow only authorized persons into the computer room, which should be built with a raised floor and false ceiling in the safest part of a building. He suggests allowing only operators, security officers, maintenance engineers, system programmers and escorted visitors into the computer room. And he recommends more remote access aids to restrict the presence of people in the computer room.

Among the more exceptional types of physical security devices is the proximity release door opener. Authorized persons wear a badge with a radio frequency transmitter inside. When close enough to an electrically locked door, the signal automatically opens it. A scanner ensures that no one follows behind. A computer could check to see if the badge wearer is authorized to enter at that day and time. If the person failed to leave by an expected time, an alarm would sound.

The method assumes the person entering is authorized to have the badge. "The key-thief problem can only be solved by permanently fastening the key to the person — not a pleasant idea," Parker stated. The author suggested that foolproof access control methods, probably those using physiological identifiers such as brain waves, will be perfected in the near future.

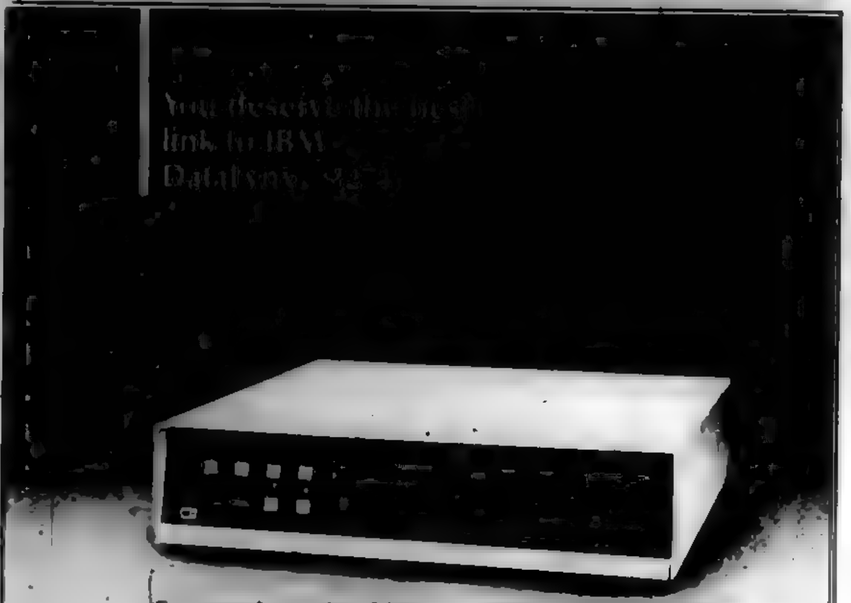
Total Assets Protection of Arlington, Texas, a company of computer security specialists and architectural and engineering consultants, has a systematic approach to serving its clients. Dick Bessenhoffer, vice-president of facilities design and planning for the firm, said a security evaluation begins at the property perimeter and works inside. Initial basics include fencing, alarms, cameras, lighting, a security force, patrols and local police cooperation. Next, doors, windows and location of data center are considered, then access control doors, alarm doors and motion detectors in certain areas.

For sensitive areas with two sets of doors and a foyer, Total Assets recommends a "mantrap," with access control devices on the inside and outside doors, augmented by closed-circuit television. The company also visits its clients' data centers at night, on the second or third shift, when employees are often less sensitive to security needs.

Companies should better coordinate data center security with their overall building security plans, suggested Oliver Wainwright, leader of the American Society for Industrial Security's Standing Committee on Physical Security. "I think you'll find a lack of coordination" between data processing staffs and building security staffs, Wainwright said. The committee focuses mainly on environmental controls such as temperature, plumbing and electrical systems; anti-intrusion methods such as indoor and outdoor perimeter devices and internal backup devices; and fire protection.

While the committee does not have broad, specific survey information on how well protected the Fortune 1,000 firms are, it did recently complete a survey of anti-intrusion hardware. Among the conclusions were that companies are moving toward more proprietary security systems that terminate in-house rather than at local police departments. The local police are being looked to more for backup, the survey showed. Of those responding, 41% said they would prefer to terminate alarms at the local police station, while 52% said they would prefer to terminate in-house.

Wainwright believes it is important for data centers to be protected with physical security systems. "Most data centers hold a great deal of intellectual property. If there is no protection, a company leaves itself open for a lot of liability," Wainwright said.



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Continued from page 17

Mich., estimated that 25% of Fortune 1,000 firms have no disaster recovery plans at all. Beyond that, he estimated that 25% to 50% of firms have inadequate plans. "They really don't believe there's a threat or else they're preoccupied with marketing and production issues and not physical security," he said.

Total Assets Protection's Bessenhoffer said most companies have inadequate physical security measures in place. "The major deficiency is that most of these people can't see beyond their noses. They're living on the fact that nobody has blown up their places or come in with a gun," he said.

Recommendations by the Georgetown University panel on how industry and government should respond to the threat of terrorism included providing tax write-offs for investments in risk reduction and reducing insurance costs for companies that invest in risk reduction.

Insurance aspect key

SRI judged the insurance premium aspect to be important. "We're strongly pushing that. The whole insurance industry has been a sleeping giant on this subject. It's never really understood just how fragile things have become," Parker said. "Once insurance companies set premiums based on the degree of security you have, it will become an important factor in how much a business will spend on physical protection."

That may take some time. According to Dean P. Felton, a vice-president at Marsh & McLennan Co. in New York, physical security is not directly reflected in insurance premiums. "I don't think any insurance person could say physical security in and of itself would be directly reflected in insurance rates. It would be reflected in the underwriter's attitude on whether to accept the risk."

The degree of physical security is considered when an insurance company is deciding to accept a risk, he said. A minimum standard of physical security is expected depending on the visibility of the business and its attractiveness as a target, Felton said. "That is not a formula-based approach, it's an emotional approach. You need that latitude because risks vary" he said.

Change in attitude

While he sees no momentum emerging for a change in attitude among underwriters to reflect degrees of physical security in premiums, he does see a change in the attitude of business. "There's an increasing sensitivity on a daily basis to the need for physical security at data centers," he said.

St. Paul Fire and Marine Co. of St. Paul, Minn., which in 1961 issued the first electronic data processing policy in the U.S., does recognize the value of physical security when setting premiums, according to Marr Haack, the firm's production manager of electronics and information technology. "The better risk is the more secure center," he said. A large data center with excellent security could pay premiums 25% to 50% less than the average large data center insured by St. Paul, Haack said.

Adding a caveat for DP centers, the FBI's Klein said, "If you look at terrorist groups throughout the world and note the fact they are becoming more sophisticated and that their targets seem to be ones that would have the greatest impact on American policy, it is certainly within the realm of feasibility that if terrorists could get to a company's computer, it would be a prime target."

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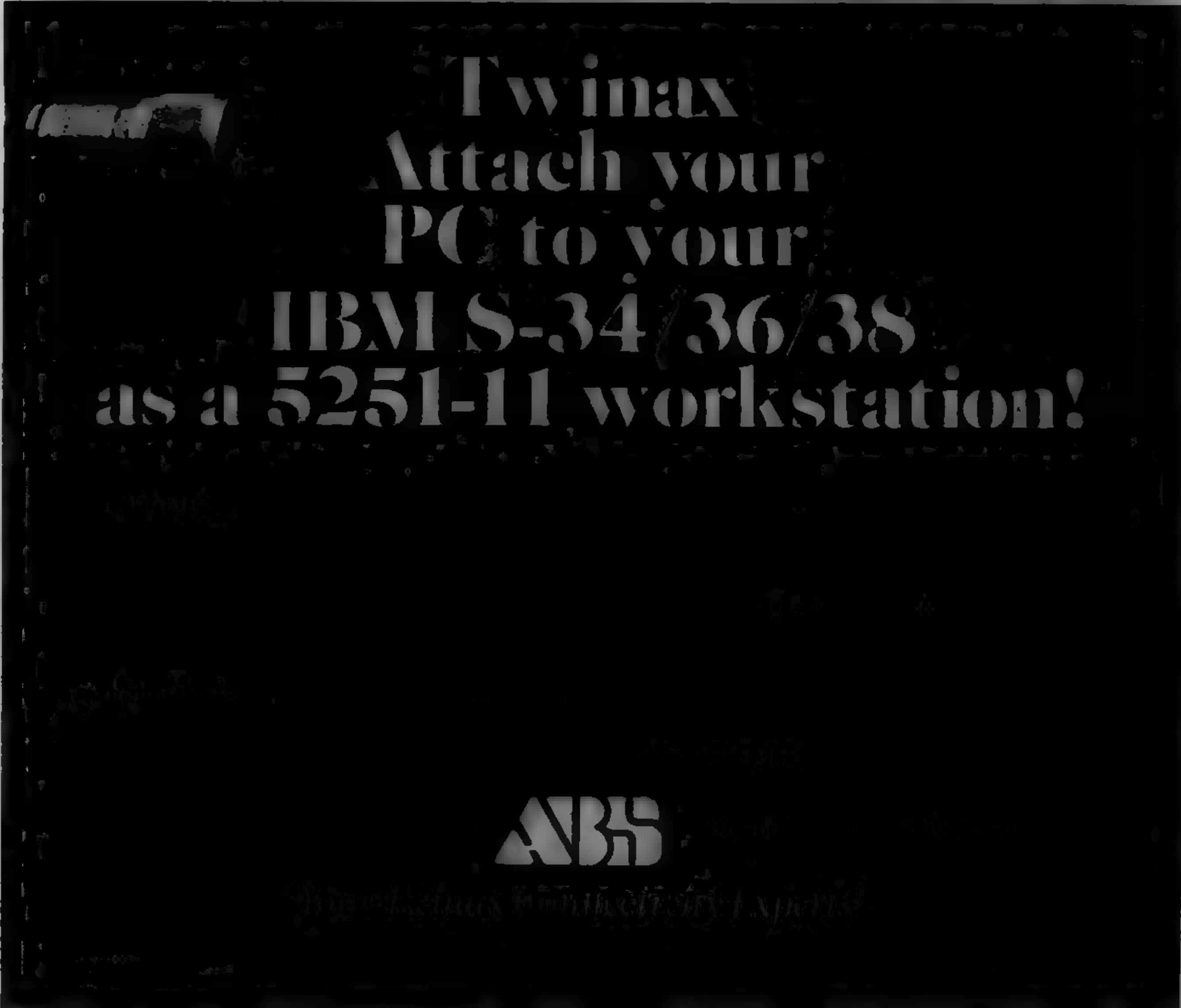

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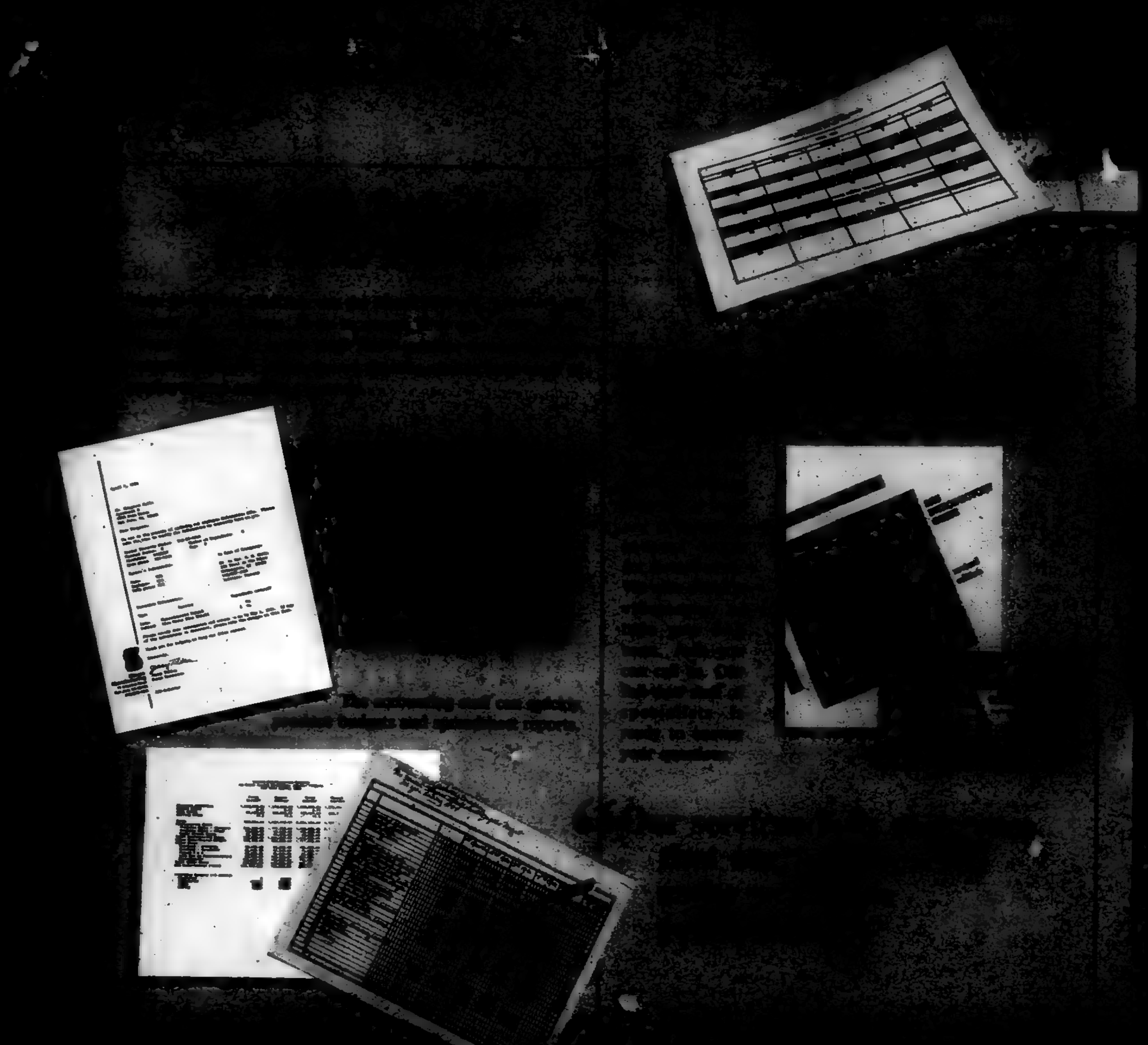

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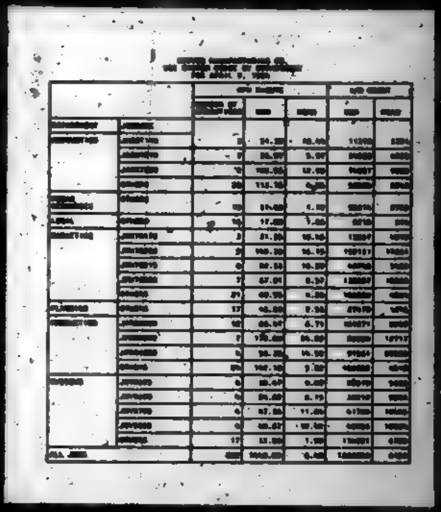

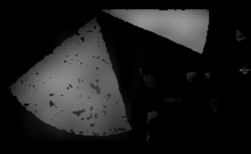

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Physical security system checks computer room access

MILWAUKEE — DP managers who need physical security cannot wait for the perfect system. Blue Cross/Blue Shield United of Wisconsin here and the Federal Reserve Bank of Chicago are using standard means to protect against unauthorized entry.

Blue Cross/Blue Shield United of Wisconsin has a multilevel physical security system that begins with perimeter security and carries into the computer room, according to Jordan D'Acquisto, security supervisor at the Milwaukee facility. All doors on the first floor are one way with no locks on the outside. Every door is checked by an alarm, except the main lobby entrance. At a security station in the lobby, visitors must sign in and be escorted by the person they are there to see.

All doors leading to the third-floor DP level are checked by an alarm, except for the elevator doors. Closed-circuit TV cameras with motion alarms monitor the DP floor, which is sectioned off. In the mainframe computer room, half the data center floor is completely enclosed in a room within a room. "If someone wants to sabotage our computer system, he would have to get into that secured area," D'Acquisto said. Six doors provide access to the main computer room, and each door has an alarm.

Access-card readers service the computer room doors. Employees have cards to get into assigned areas; some may have access to only one-half the computer room or to the tape library only.

Blue Cross/Blue Shield United has never experienced a serious attempt to damage its data center, D'Acquisto said. Unauthorized people have tried to walk into the building, "But they never really get past the first level of security," he said.

Minimum security required

To service government contracts such as Medicare, the Blue Cross data center is required by the federal government to have certain miminum security provisions. "The auditors tell us what we need and what we don't," D'Acquisto said.

The Privacy Act of 1974 required the government to institute certain minimum safeguards for protecting the integrity of medical records, according to Don Abramson of the Health Care Financing Administration, which administers the Medicare program. From these safeguards, certain minimum physical security standards emerged, along with data and operating security standards. "We had [more than] 100 Medicare contractors try to come up with standards over a period of years," Abramson said.

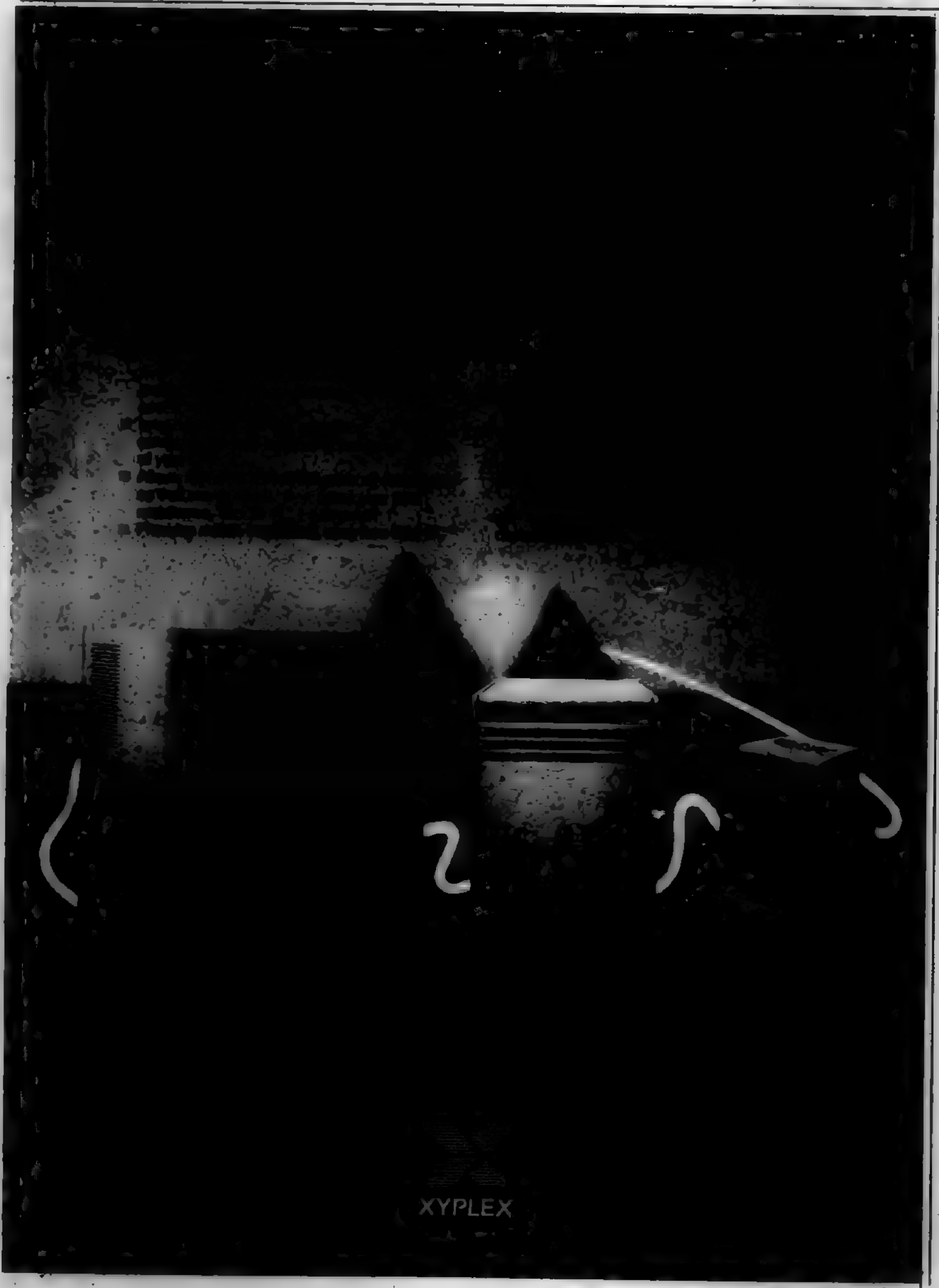
The minimum safeguards required include an authorization list of persons allowed to enter the computer room, tape library and terminal room; locks for all rooms with DP equipment; storage of sensitive data in secure areas during nonworking hours; a low-profile data center; and relocation of CPUs and sensitive data from potential hazard areas, such as kitchens and boiler rooms. The ideal location recommended for a data center should be a room with solid construction and windowless floor-to-ceiling walls. In the absence of that, companies should consider bars or alarms on the windows, metal doors, hinges on the inside of doors and access control for all doors, the government recommends.

To service government contracts such as Medicare, the Blue Cross data center is required by the federal government to have certain miminum security provisions.

Anyone entering protected areas of the Federal Reserve Bank of Chicago is required to wear a badge, according to George Coe, vice-president of the bank's Systems Communications Center. Access to tight security areas, such as the data center, is more controlled. Each control area has a sign-in desk, escorts are required for entry and TV monitors watch the entrances. The data center is located away from outside windows through which "someone could easily lob a grenade," Coe said.

All Federal Reserve banks coordinate their security with local police, the Federal Bureau of Investigation and with the military in certain cases. "I don't think there's any question" strong physical security is needed, Coe said. "The critical assets for us to stay in business are largely vested in our computer facilities. We would be totally remiss if we left our vault doors open. Leaving the data center doors open would be tantamount to the same thing."

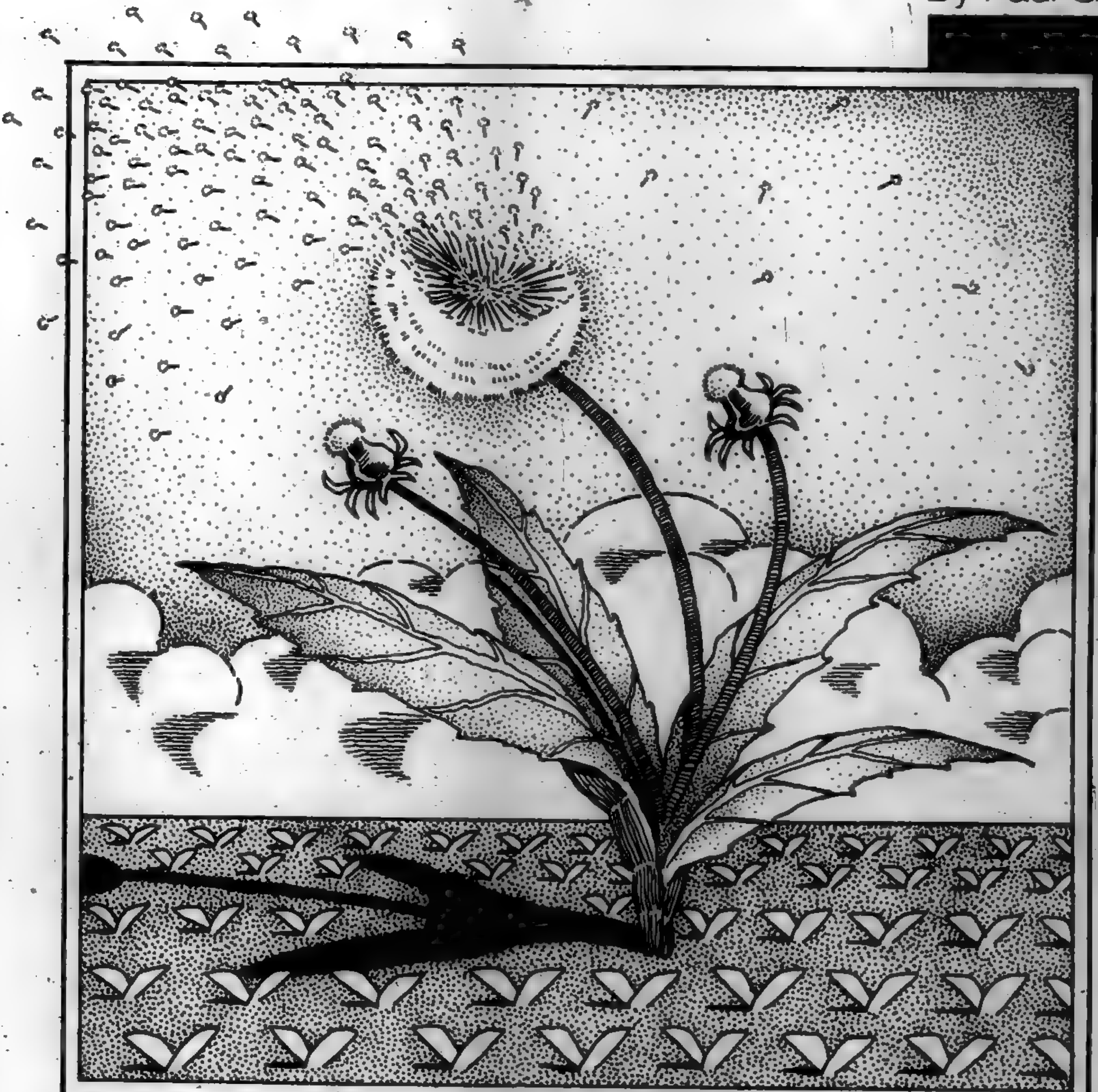
The Federal Reserve is also developing plans to relocate its facilities in the event of an incident that would "totally disable" the bank. The Disaster Relocation Center site will be the Reserve's most secure facility in Culpeper, Va., Coe said.



INDEPENDENT SOFTWARE VENDORS

SEEDS OF GROWTH

By Paul Gillin



RAY MEDICI

When the National Jewish Hospital/National Asthma Center in Denver was evaluating general ledger software two years ago, it settled first on a product from McCormack & Dodge Corp. (M&D). But it ended up installing a general ledger from Cullinet Software, Inc.

For the hospital, which is a Cullinet IDMS user, the choice was obvious. "Once we found out that Cullinet had purchased the M&D product and redesigned it for IDMS, that decided it," said Jim Harbin, director of the hospital's computer resource center. "It would be hard for me to buy anything other than Cullinet now. The one-vendor umbrella is important to me."

National Jewish Hospital/National Asthma Center is one of an increasing number of user organizations that have virtually standardized on software from one or two vendors. "When you get into a big data base environment you really don't want to rock the boat," Harbin said. "With multiple packages it can take days to find out where a problem is. But if I have a problem, now I have one place to go [for help]."

Continued on page 24

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It was not that long ago that the large system software market was rigidly stratified. Some vendors specialized in systems and utilities software, a few offered data base management systems (DBMS), still others specialized in applications packages and others offered productivity aids such as application development tools and data dictionaries.

However, those lines have been erased in the last two years as the software industry has undergone a dramatic, and some say necessary, restructuring. In the last 18 months the industry's major players have been moving broadly and aggressively into new markets. That development should have users thinking more carefully about their purchasing decisions, experts agree.

The changes have affected virtually every major software firm (see accompanying chart). And the result has been a storm of new product activity that is unprecedented among the independents. "This has been a tremendous year of frenetic product announcements and tremendous management upheaval," said Ann Morley, senior software consultant at International Data Corp., a Framingham, Mass.-based research firm. "The industry has been hyperventilating for the last 18 months."

Software market nearly saturated

The changes are not necessarily driven solely by the needs of the user. For the first time in its history, the software market is reaching its saturation point. Vendors that have grown happily at 40% to 50% per year in comfortable markets are finding new opportunities scarcer to come by. According to Morley, "These companies are now of the size that the only way to maintain their growth is to move into new markets."

For the data base vendors, the focus has been on "total solutions" — providing everything from packaged applications to programmer-oriented development aids. "These vendors will no longer sell just data bases but add-ons in things like office automation, networks and information center tools," said Shaku Atre, president of Atre International Consultants, Inc., in Rye, N.Y. "Satellite products will bring almost 50% of the future revenues for these vendors."

Applications vendors, who lack the data base foundation that is clearly an advantage in the "total solution" concept, are expanding into vertical markets and offering data base-like development tools that let users customize their applications or even create new ones.

In addition, both types of vendors have been active in areas like micro-mainframe links, OA, networks and vertical market applications.

Average sales rising

The effects of this large-scale shift are already being seen in the rapid escalation of average sales figures for the major sellers. "We have gone from an average sale of $50,000 to $75,000 up to an average of $250,000 to $500,000," said Dennis Yablonsky, president of Cincom Systems, Inc., echoing the comments of other vendor representatives.

The trend generally bodes well for users. If a company can buy all of its software from one vendor, it follows that the packages will be better integrated and more easily maintainable. In addition, a user of four or five major packages can often wield greater clout with the vendor. "If I have five products, I expect to get more attentive service than a user who has one product," said Donald Landry, vice-president of the systems division at GC Services Corp., a Houston-based financial services firm.

But there are pitfalls as well. Putting all your data processing eggs into one basket will necessarily tie your DP shop more tightly into one vendor. Such a commitment makes a close study of the available options more imperative than ever before.

National Jewish Hospital's Harbin admitted that his close ties to Cullinet harbor some dangers. "Competition drives prices down and allows

Continued on page 28

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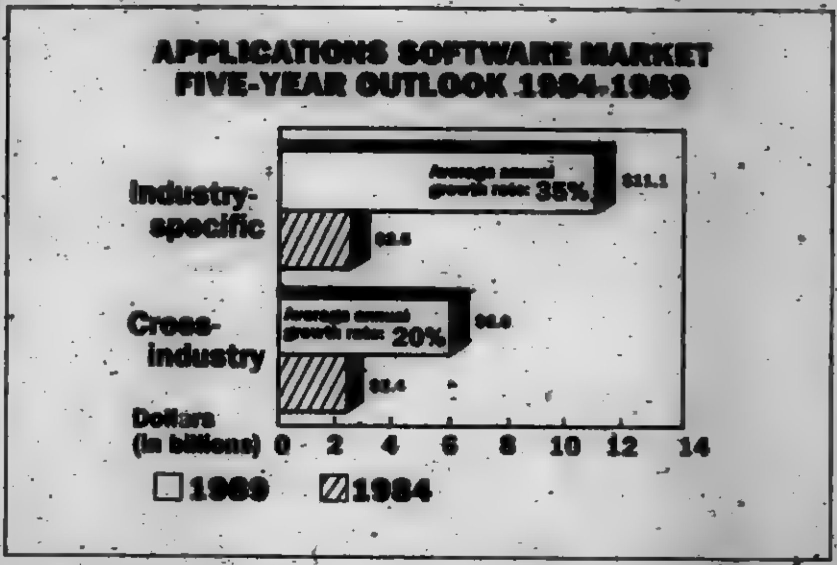

INPUT, INC. CHART

Continued from page 24

a [user] to negotiate," he said. "We don't have that option."

According to Jack Keen, vice-president and director of client programs at Input, Inc., a consulting and market research firm in Mountain View, Calif., "It's going to be extra important for the user to ask, 'Does this vendor have product expansion plans that are going to serve me for the long term?' "

Keen said the user should be looking at a number of new criteria, including the soundness of the vendor's management team, its R&D budget for strategic areas and its understanding of new markets. "If the vendor is uncertain about where it's going over the next several years, that should raise a warning flag," Keen said.

Users also need to examine their own needs more closely. Atre warned that because the data base vendors are now offering so many add-on products, "A $150,000 decision can easily add up to a $300,000 decision. For DP people it's like being a kid in a candy store," she said. "Each product may only cost $25,000. But they don't realize the costs associated with those products. For one thing, you have to train all those users."

However, the bottom line is that users will have a multitude of new offerings to choose from in coming years. The major new areas of activity blanket virtually the entire market.

Almost everybody who is anybody in the large-systems arena has announced a micro-mainframe link within the last two years. For some vendors, such as Management Science of America, Inc. (MSA) and Informatics General Corp., the technology has become a critical element to their chances for future success.

As a natural outgrowth of existing product lines, the links offer an almost guaranteed profit for the vendors. But because market pressures have been so intense in this area, the quality and features of the available options vary widely. For users who are leery about committing themselves to a particular vendor, one of the dozens of generic micro-mainframe links may be a better short-term solution.

It is clear, however, that micro-mainframe links are the doorway to the next major stage of data processing evolution — the distributed data base. "We'll see more of a move toward centralizing the data base on the mainframe with smaller versions on the micros and methods to link them together," Atre said.

With integration having recently become more than just a buzzword, vendors are scrambling to offer application development systems and information center software. The intention is to cut the development backlog by letting programmers code smaller applications more quickly and farming out requests for reports and queries to the end users. All the major data base vendors now offer application development aids.

"In the future the DBMS may become only a commodity. Application development, information centers

Continued on page 26

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INDEPENDENT SOFTWARE VENDORS

Continued from page 25

and [OA] tools may become the predominant factors by which people will select information management systems," said Adam Rin, vice-president of product planning and development at Computer Corp. of America, the data base vendor which entered all three of those markets this year.

Robert Goldman, president of Cullinet Software, Inc., added, "Our whole shift as a corporation has been toward addressing end-user requirements on the [micro] and on the mainframe."

More interesting has been the entry of application vendors into the data base-oriented application development market. Within the last 18 months M&D, MSA and Hogan Systems, Inc. have all introduced development aids. Software International Corp. plans to introduce a similar system next year. While those vendors lack the data base underpinning, they are clearly following the lead of the data base vendors in viewing programmer productivity as a hot area.

The effects will become apparent during 1985, according to Peter Lowber, senior market analyst at the Yankee Group, a Boston-based consulting firm. "I think we're going to finally see replacements for Cobol taken more seriously by DP," he said.

In the software industry, perhaps no move has been more dramatic in the last two years than the penetration of DBMS and systems software vendors into the packaged applications market.

Among the recent newcomers from the systems side are Cullinet, Cincom Systems and Computer Associates International, Inc. Applied Data Research, Inc. (ADR) has made a more tentative foray into applications through a joint development and marketing agreement with MSA. Software AG of North America, Inc. has agreements with 20 different applications vendors. Computer Corp. of America plans to announce an agreement soon.

The move seems a natural for these vendors. "Data base vendors are sitting in the driver's seat," Lowber said. "They have the foundation stuff to work all the way down to the applications level on the personal computer. Once you have the data base machinery, you can modify applications easily without having to go through and change every one."

Cullinet has made the most notable thrust into this area. With about 125 financial applications and over 100 manufacturing customers, the company now makes a quarter of its revenue from that market. Cullinet expects that percentage to double by 1987. The company also entered the banking market this year with the purchase of Bob White Software, Inc. and will probably move into the distribution area in 1985, according to Goldman.

Other vendors are setting less ambitious but still substantial goals. Cincom Systems forecasts a 15% to 25% share of revenues from applications in 1985. Computer Associates International expects applications revenues to total about $15 million, or less than 10%, by 1987.

These developments have clearly affected the strategies of the applications vendors, although they publicly downplay their significance. "We've always had a ton of competitive pressure on us," said Dennis Vohs, executive vice-president of MSA. "Companies are shifting their emphasis, but the competitive situation is not that different from what it has been."

Life in the fast lane tough for MSA

The most explosive segment of the software industry sputtered this year, and the largest independent took it on the chin. MSA, which had been the first software vendor to buy into the micro field when it acquired high-flying Peachtree Software, Inc. in 1981, announced in October that it would sell the retail side of that business. MSA said its technology-intensive mainframe strategies were simply incompatible with life in the fast lane of personal computer software.

Arguments aside, Peachtree's difficulties have caused the independents to take another look at the strategic role that micros will play. Most have decided to treat the software as an adjunct to, rather than a cornerstone of, their product lines.

Cullinet and others are instead planning to exploit the advantage of their mainframe experience to get into the market for dedicated workstations. Cincom Systems, for example, has plans to release both end-user and programmer workstations, probably based on the IBM Personal Computer AT/370, Yablonsky said.

The programmer workstations would include extracts of Cincom System's Mantis and TIS data base software. The user workstations would center around Cincom System's Series One Plus integrated software with programmed access to the Manage series of decision support software on the mainframe.

Opportunities created by growth

The market for general-purpose financial software is shrinking, but a new opening has appeared for applications geared to specific industries.

Over the next five years, Input is predicting a 35% annual growth rate for industry-specific applications, compared with 20% for cross-industry solutions. "There is an enormous restructuring going on in industries like discreet manufacturing, banking and finance, medicine and transportation as a result of deregulation and foreign competition," Keen said. "All this turmoil is creating opportunities."

The meteoric rise of vendors like Hogan (banking) and Shared Medical Systems, Inc. (medical) in industry-specific applications has not escaped the attention of the major independents. MSA, for example, has announced products or plans in the areas of purchasing, manufacturing and distribution. Cullinet already offers manufacturing software and acquired its way into banking this year. M&D is working on versions of its financial software for specific markets.

Perhaps the most interesting new approach has been that of Informatics General Corp. Informatics, which had admittedly overextended itself into nearly every segment of the software market for the last several years, reorganized this year. It divested itself of several businesses, including time-sharing, and threw itself into vertical markets.

"We are not trying to be all things to all people but rather all things to some people," said Ron Freeman, corporate vice-president of marketing. "We are going in on corporate verticals, targeting individual companies and treating them as industries." The company has set up separate divisions for applications and systems products and is targeting its efforts toward about 100 large companies, Freeman said. It is taking a departmental approach, looking to sell accounting software to the accounting department, law office applications to the corporate legal department and data base tools and micro-mainframe links to data processing.

"It's a very different business, and some companies grossly underestimate the difficulties of entering it," Keen said. "The people developing this software must have a good knowledge of the industry. Technical software people don't necessarily know how to deal with people on the user side. And applications software users require much more support from the vendor in terms of installation and training."

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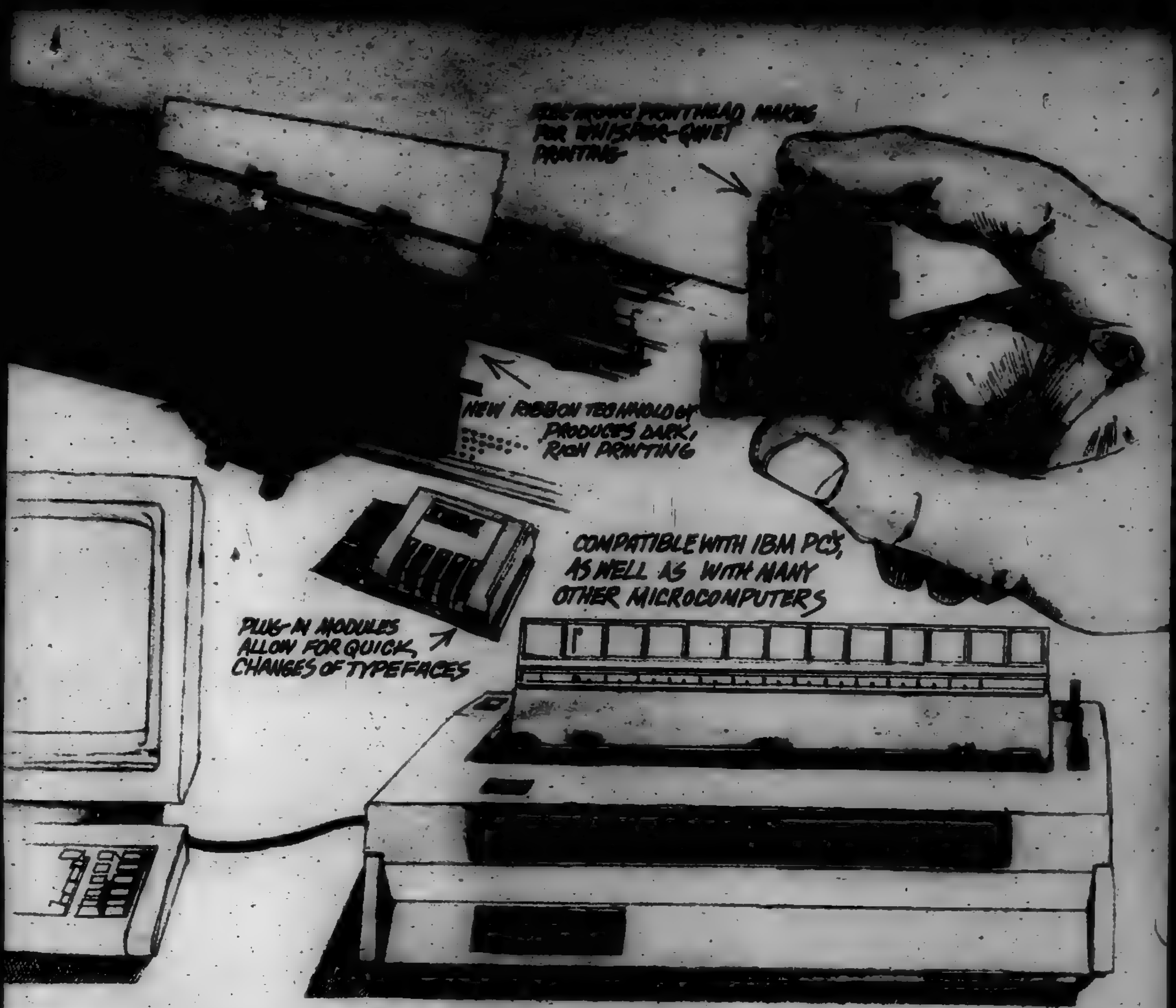
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Value of broad product line increases in purchasing

The breadth of a vendor's product line is becoming an increasingly important factor in software purchasing decisions, according to recent interviews with users. However, product functionality, vendor reputation and performance still top the list of considerations when purchasing software.

Although most users said their initial purchasing decisions would not hinge on other products offered by a vendor, they admitted that the issue can become more important the second time around.

"It's like politics. The incumbent is hard to replace," said Arnold Drouillard, manager of membership administration at Blue Cross/Blue Shield of Michigan in Detroit. "If I'm looking for a new package I'm going to go to the data center first and look at what [vendors' software] we've got already. I would say those vendors get an inside track."

Dick Lund, assistant vice-president of systems and programming at Wausau Insurance Companies in Wausau, Wis., said, "I think there will be a tremendous amount of fallout [in the industry] in the next few years. I would like to see us hooking up with one of the vendors who is going to survive."

Full product lines valuable

Nevertheless, Lund placed breadth of product line "fourth or fifth on the decision tree" behind financial stability of the vendor, ability to interface to existing software and fit between the product and the business need.

Most users agreed that the importance of a seller's other offerings depends upon the product they need. "If we were buying a financial package it would probably have an effect if one vendor had a set of related software," maintained Bobby Stewart, data processing manager for the city of Greensboro, N.C.

Drouillard added, "If I was looking for accounts receivable, I would be inclined to [take] a closer look [at] the company with a full product line."

Reformatting easier

However, one user dismissed the issue. "Years ago, interfacing [one product to another] used to be a problem. But because of coding flexibility today, it's just a matter of manipulating file formats to pass data," said Glenn Lukowicz, director of computer services at St. Luke's Hospital in New Bedford, Mass.

Lukowicz said the necessary reformatting programs should take a programmer no more than four hours to write.

St. Luke's is in the process of selecting Computer Associates International, Inc.'s (CAI) general ledger software over a general ledger package from Management Science America, Inc. (MSA).

According to Lukowicz, the CAI general ledger is a real-time package with good features and a much lower price than the MSA software. Even though the hospital already has two MSA software packages and does not have any other applications from CAI, Lukowicz said, "We have no worries about interfacing with MSA's payroll. We have already written mock interface programs to all of our home-grown applications in less than three hours."

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How to be in 16 places

Emerging mainframe software areas merit attention

Most observers agree that the frantic pace of new activity in the mainframe software market cannot continue much longer. Rather, 1985 will be a year of consolidation. There are, however, specific areas that bear closer watching. Based on interviews with vendors and market watchers, here are some of the currently emerging technologies.

Distributed data base management, a buzzword that is several years old, is moving closer to reality. Data base vendors who have spent 1984 trying to attach micros to mainframes will turn more attention to designing data bases that can take advantage of the link.

Distributed data base promises to be the next major evolutionary step in data processing, many analysts agree. But it presents a whole host of potential problems in areas like backup and recovery, security and concurrent access. Data base management system (DBMS) users should be carefully monitoring their vendors' activities in the previously mentioned areas and preparing for the necessary major organizational changes.

Networks a hot topic

In line with that, networks appear to be a hot, new area of interest. Both Cincom Systems, Inc. and Computer Corp. of America entered the network arena this year. Cullinet Software, Inc., while it has not announced a networking product, has signed agreements with Digital Equipment Corp., Data General Corp. and Wang Laboratories, Inc. to provide access to Cullinet's Information Database from those machines. While the three software vendors are taking very different approaches to networking, the common thread is finding new ways to deliver computing power to the departmental user. The past year has also seen much activity in office automation networks. Products will become available in 1985 which will effectively allow diverse OA systems to exchange documents.

Application development aids for both programmers and users have been very successful this year. With the emergence of good IBM Vsam interfaces, it is no longer necessary to have a DBMS to use them. Complaints about performance are beginning to melt as these tools consistently demonstrate two- to ten-fold productivity improvements over Cobol. Many DP shops are beginning to standardize on them for everything but the largest projects.

Links enhanced in '85

Micro-mainframe links, although barely two years old, improved by leaps and bounds in 1984. Although actual sales have yet to match the products' publicity, it appears that the links will come into widespread use in 1985, The mainframe software vendors will stress tighter connections to their own micro software, while the independent link sellers will enhance ease-of-use and performance features. Vendors have also indicated they will try to offer an alternative to expensive coaxial cabling to achieve the hookup.

One of the newer developments is the concept of tying micros into departmental minicomputers with the mainframe serving as a data base management machine. Most experts agree that existing links will soon overburden the host if it continues to bear the brunt of the extract and reformatting burden.

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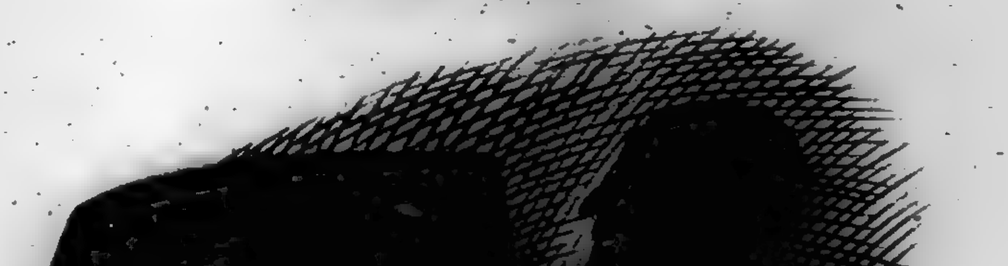

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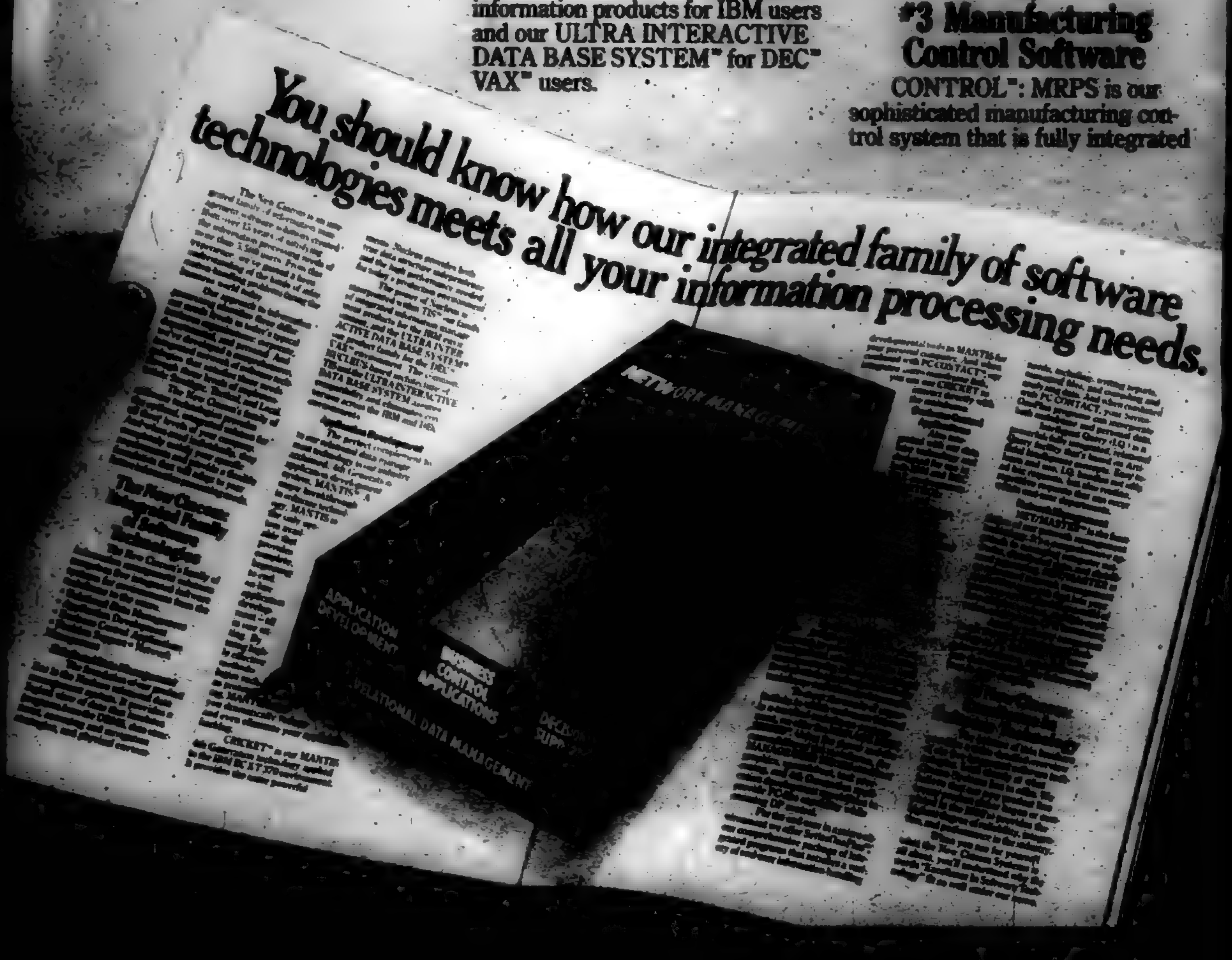
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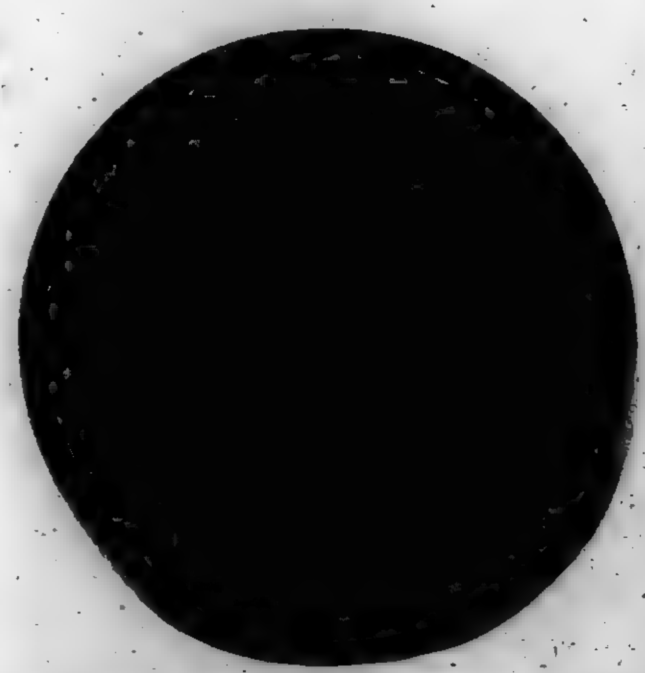
MICRO PRICING

SMALL CHANGE

By Eric Bender



JOHN OWENS

As supply finally caught up with demand in 1984, bloody price wars hit the microcomputer arena. Many suppliers went belly-up, and CPU prices plummeted 25% or more. But although this colorful spectacle drew widespread attention, it produced only limited benefits for corporate personal computing budgets, vendors, users and consultants agreed.

In the past year, the cost of "the so-called typical configuration, if anything, has gone up," said Henry Kee, vice-president for personal computing at Chemical Bank.

And while what you get for your money in microcomputers continues to improve dramatically, few analysts expect overall expenditures per user to drop in 1985. Among the reasons:

- Companies are moving to standardize more powerful hardware with greater storage capacity.
- Prices for leading micro software packages are holding relatively steady.
- Corporate moves to give users better communications links and enhanced output devices will tend to keep spending level.

Beyond that, the high costs involved in full support are only now becoming clear in many companies and are not expected to diminish significantly. "If everyone takes a look at what service and support costs, compared to computers, there will be no willing buyers," one dealer commented.

Total costs of installing and fully supporting a personal computer within a corporation range upward from $6,000, depending on frills, analysts estimated.

By the time you add up all the pieces, each desktop machine in a Fortune 1,000 company carries an $8,000 price tag, said Cyril Yansouni, vice-president of Hewlett-Packard Co.'s personal computer group in Cupertino, Calif. Component prices keep sliding, "but what people spend isn't dropping," he said.

System prices generally "have been reduced about 10% to 11% annually in the U.S.," noted Chris Christiansen, senior analyst at the Yankee Group in Cambridge, Mass. But he pointed out that despite major cuts by IBM and other suppliers, "only certain products are being discounted heavily and a lot of high-end machines are coming into the market."

Christiansen placed annual costs of a networked personal computer with micro-to-

Continued on page 34

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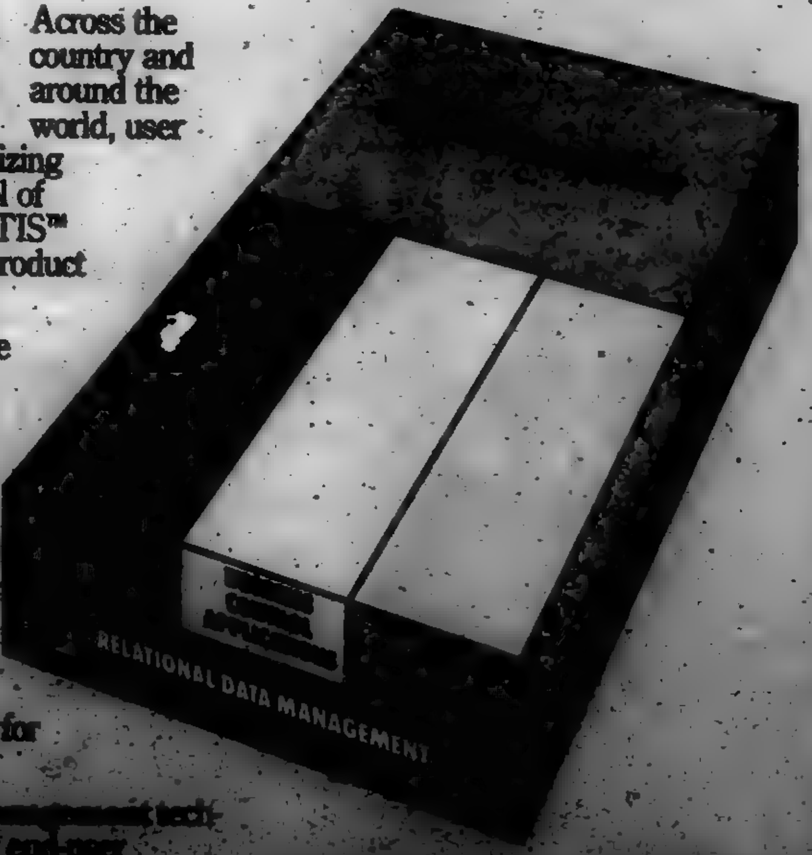

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MICRO PRICING

Continued from page 32

mainframe link (depreciated over three years and omitting support expenditures) at slightly over $10,000, and predicted that "the cost to put a machine on a desk will remain about the same."

Generally, in volume purchases, hardware discounts range around 20% and software discounts may run well over 30%, users said.

In 1984, list prices often had only a casual acquaintance with actual prices, as competition increased and many suppliers scrapped to make a deal.

Hardware

IBM last June finally slashed prices on its Personal Computer line, with system price tags dropping by up to 23%. As one example, a Personal Computer with 256K bytes of random-access memory and dual floppy drives (but no monitor) was repriced from $2,908 to $2,420.

> *While what you get for your money in microcomputers continues to improve dramatically, few expect overall expenditures per user to drop in 1985.*

In August, aggressive pricing for the new Personal Computer AT pressured costs further, and in the fall, a Big Blue promotional campaign cut prices once again. At the low end, prices were further weakened by a nationwide street fight between IBM's PCjr and Apple Computer, Inc.'s Apple IIe and Apple IIc computers. Some retailers were offering a 256K-byte, dual-floppy Personal Computer with monitor at below $2,000.

Beginning in the summer, Personal Computer-compatible manufacturers dropped prices to follow IBM, and others outside the compatible camp followed as well. Even Digital Equipment Corp. eventually followed suit, although the pricing for the Rainbow series remains high by industry standards.

Apple's Macintosh, the hottest personal computer introduction of the year, also saw a price cut in September, from $2,495 to $2,195. Retail prices since have reached as low as $1,500.

So what's ahead in 1985?

"We'll see a fire sale," forecast George Colony, president of Forrester Research in Cambridge, Mass. Colony expected a basic IBM Personal Computer to cost around $1,500 early this year, with the IBM Personal Computer XT priced in the $3,000 range.

Once again the crystal ball is clouded by the rumored introduction of a new IBM machine — this one positioned between the basic Personal Computer and the AT. The most popular rumors dwell on the launch of an Intel Corp. 80186-based "Personal Computer 2" with a $2,000 price tag sometime before spring.

Some DP executives also predict significant purchases of laptop micros. "The full-function laptop unit will change the culture of how we do things," Kee predicted. To date, full-function laptops have carried a premium price tag — for example, costs of the Data General Corp. Data General/One begin at $2,895.

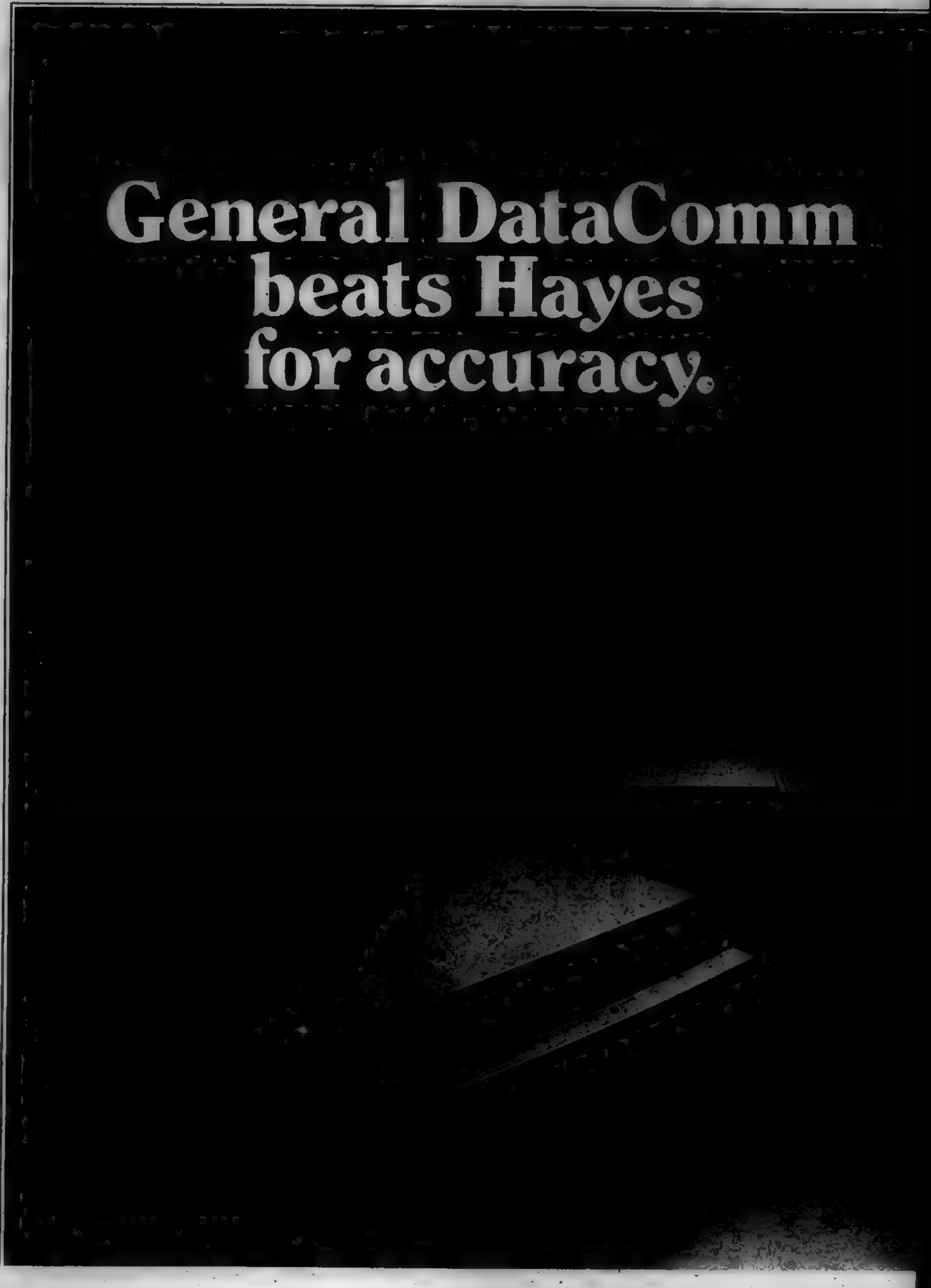
Software

Leading micro software applications such as Lotus Development Corp.'s 1-2-3 generally are maintaining their prices, although the real prices often are considerably below list. Less popular software often is priced far, far below.

"We're seeing the market begin to break into segments," said Andrew Langlois, assistant controller and former corporate MIS director at Moore McCormack Resources, Inc. in Stamford, Conn.

"Anyone in the Fortune 1,000 getting a high-end product with a high amount of productivity is not afraid to buy the functionality, because the company's going to get its value out of the software," Langlois said. But in smaller firms, "there's a lot of pressure from people who want to buy in the $75 to $150 range and know that it will be pretty decent."

Colony said that "the lead products can hold their prices," but once outside the handful of leading vendors, "the drop-off is very substantial."



As in hardware, many vendors seek to hold the line by offering upgraded products. In October, Micropro International Corp. finally dropped the price of Wordstar from $495 to $350 but soon followed by introducing Wordstar 2000 at $495.

However, list prices are even weaker in software than in hardware. "Suppliers will continue to maintain artificially high list prices," Christiansen said. "You can buy Lotus' [1-2-3, normally $495] for $300 and [Lotus' Symphony, listed at $695] for $400, if you're willing to go mail order. There's no reason to pay full price for software."

'More software packages'

Chemical Bank's Kee commented that "software prices are down substantially — however, we're getting more software packages."

In addition to more applications, this year many firms expect to begin to buy microcomputer operating environments such as IBM's Topview.

While micro software typically is licensed on a single user, single machine basis, Christiansen and others see continuing pressure on this policy from large corporations.

Other forms of licensing

Users may want to sign a license for companywide operations or buy one package to run on both a desktop machine and laptop or deliver programs from a departmental computer such as the IBM System/36 or from a local-area network server.

There are signs that large software vendors are moving to address these concerns. Micropro, for example, is signing corporate licensing agreements, and Ashton-Tate has established networking pricing. But new policies need heavyweight backing, Christiansen suggested.

"IBM will have to step in to decide how to price and support and protect software across a network," he said.

Peripherals

To no one's surprise, microcomputer storage prices continue to slide as manufacturing volumes increase and technology improves. As one example, add-on 10M-byte hard disk drives now can be purchased for well below $1,000.

Colony predicted "a complete collapse in disk drive prices, mainly pushed by the 20M-byte drive" in IBM's Personal Computer AT. The move toward high-density microfloppy drives also should improve price/performance.

But users are likely to purchase greater capacity and end up spending at least as much as in earlier years.

> *Some DP executives predicted significant purchases of laptops. 'The full-function laptop unit will change the culture of how we do things.'*
>
> — Henry Kee, vice-president, personal computing, Chemical Bank.

Printer, plotter prices

Printer and plotter costs also dropped in 1984 as a huge array of products made its debut.

"Printer technology is moving very fast," Langlois noted. "There's a very sharp rise in what you can get for a given price."

However, once again these savings are being offset by turns toward increased performance, particularly in devices supporting enhanced graphics. Many firms are undecided on the overall budget impact of new types of high-end products, such as HP's $3,495 desktop Laserjet printer.

Communications

"The user is no longer satisfied with local processing; he wants corporate data," Kee said.

This crucial shift is changing the entire environment for personal computers in business, with strong impact on communications costs, both for installation and ongoing use.

Budgets vary widely, as each company develops its own system.

Modem costs

In basic asynchronous communications, modem prices continue to fall, with 300 bit/sec hardware/software packages selling for lit-

Continued on page 37

And we can prove it.

We put our 1200 bps modem to the critical test. We stacked it up against Hayes, one of the "smart" modems.

The Performance

Hundreds of phone calls were carefully monitored, analyzed, and verified by telecommunications engineers. After exhaustive testing, the results were conclusive: when line quality was good, our modem was one and a half times more accurate than Hayes. When line quality was bad, however, our modem was up to ten times more accurate. And when line quality was really bad, their error rate shot up to as much as 100 times ours! The errors ranged from misspelled words to incorrect numbers. The implications for modern business are understandably serious.

The Reliability

Then we went inside and did a component count. The final score: Hayes 252, us 155. This can be viewed two ways: Either Hayes has a 60% better chance of developing part failure, or our modem has a 60% better chance of delivering higher reliability.

Eliminating operator risk is as important to us as eliminating errors. With our modem there's virtually no risk of electrical damage because there are no internal switches to deal with. General DataComm modems automatically select all call parameters.

The Company

The General DataComm intelligent modem is the newest product of a company that has been designing data communication systems for 15 years. A company whose customer list is a "Who's Who" of international business. Most of the Bell operating companies, and other telephone companies in the U.S. and Canada. Major banks. Brokerage firms. And many of the Fortune "500."

We build multiplexers, modems, local area and digital network products, and the most complete networking systems on the market. Now we're applying the technology that won the respect of big business and Bell to the personal computer market. With a line of 300 and 1200 bps modems and our own communications software.

The General DataComm modem. We put it to the critical test. Now it's ready for the ultimate test. Yours. To find the dealer nearest you, contact the Personal Computer Products Dept., (203) 574-1118. General DataComm, Middlebury, CT 06762-1299.

General DataComm

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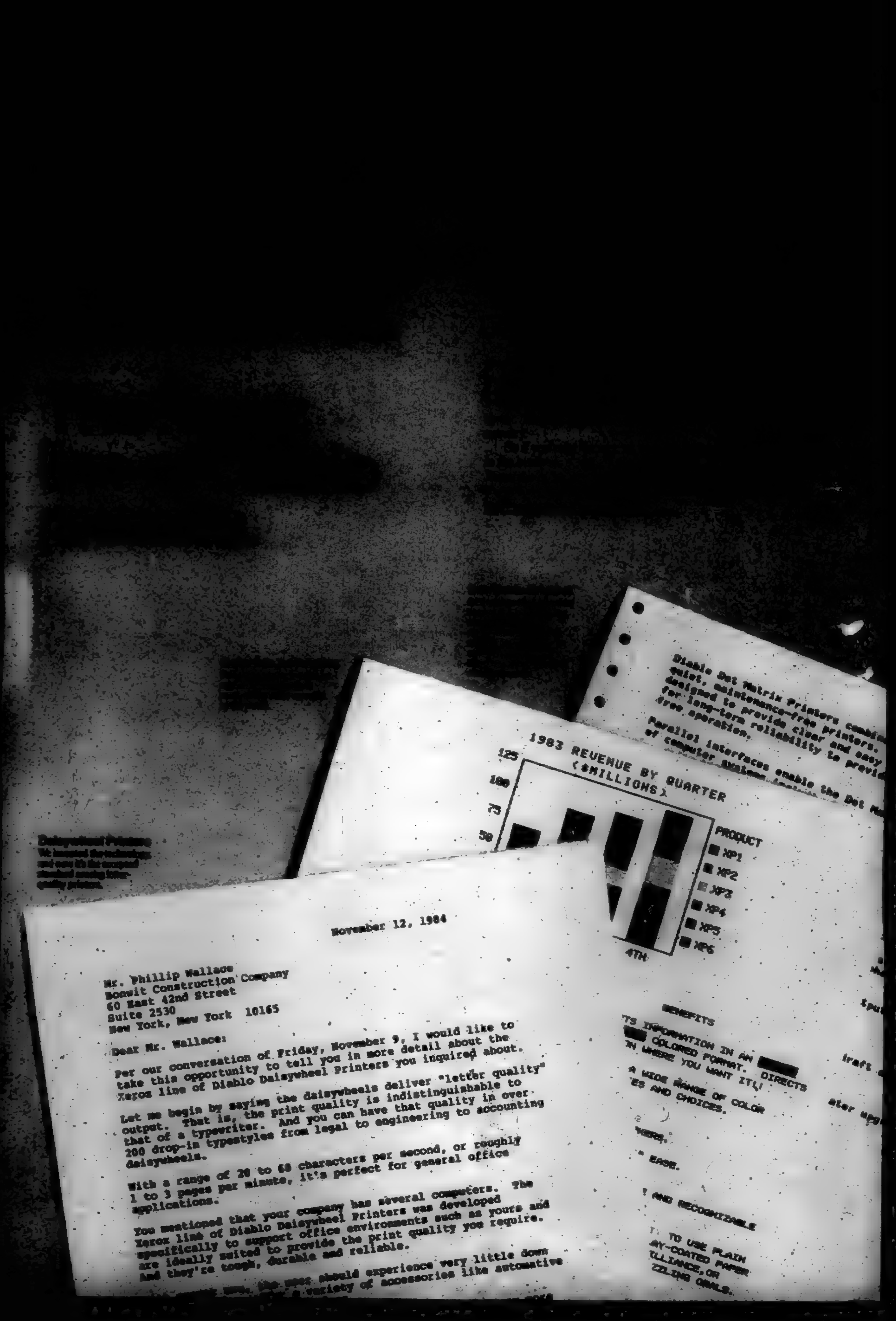

Daisywheel Printers
We invented the technology, and now it's the accepted standard among letter-quality printers.

November 12, 1984

Mr. Phillip Wallace
Bonwit Construction Company
60 East 42nd Street
Suite 2530
New York, New York 10165

Dear Mr. Wallace:

Per our conversation of Friday, November 9, I would like to take this opportunity to tell you in more detail about the Xerox line of Diablo Daisywheel Printers you inquired about.

Let me begin by saying the daisywheels deliver "letter quality" output. That is, the print quality is indistinguishable to that of a typewriter. And you can have that quality in over 200 drop-in typestyles from legal to engineering to accounting daisywheels.

With a range of 20 to 60 characters per second, or roughly 1 to 3 pages per minute, it's perfect for general office applications.

You mentioned that your company has several computers. The Xerox line of Diablo Daisywheel Printers was developed specifically to support office environments such as yours and are ideally suited to provide the print quality you require. And they're tough, durable and reliable.

experience very little down

a variety of accessories like automative

Diablo Dot Matrix Printers combine
quiet, maintenance-free printers.
designed to provide clear and easy
for long-term reliability to provide
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Parallel interfaces enable the Dot M
of computer systems

BENEFITS

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COLORED FORMAT. DIRECTS
N WHERE YOU WANT IT!

A WIDE RANGE OF COLOR
ES AND CHOICES.

KERS.

EASE.

AND RECOGNIZABLE

TO USE PLAIN
AY-COATED PAPER
LLIANCE, OR
ZZLING GOALS.

MICRO PRICING

Continued from page 35

tie over $100 at retail and 1,200 bit/sec packages available for as little as $400, vendors said.

A wave of 2,400 bit/sec modems targeted at personal computers hit the market this fall, priced at $800 and up.

Local-area network connection prices also are moving down.

Card costs now run from $500 to $800 and will move toward the $300 to $700 range this year, said Joseph Hughes, marketing vice-president at Corvus Systems, Inc. in San Jose, Calif.

From $695 to $500

Colony predicted that the IBM PC Network's $695 hardware connection price tag "will erode fairly quickly to $500."

> *A large internal user group may solve many support problems. If you call Lotus Development Corp. with a question about 1-2-3, 'you can sit in a queue for 30 minutes and give up. . . . Within our home office, almost all use is 1-2-3-based," and hotshot users can answer most questions.*
>
> — Steve Keese, John Hancock Mutual Life Insurance Co., Boston.

However, others cautioned that hardware connection represents a relatively small slice of total network costs.

Moves toward increased storage capacities and additional software services may boost the net bills.

Support and training

With the early struggles to establish microcomputer acquisition and support policies behind them, many corporations now are getting a better grip on support requirements.

"But if you ask around, you get a variety of answers, none of which I'm comfortable with," the Yankee Group's Christiansen said. "For one thing, everyone does training differently."

Although both hardware and software products are becoming easier to use and reasonably helpful on-disk tutorials are appearing in increasing numbers, considerable training and hand-holding are still needed.

Training costs range from nothing (unpaid overtime) to more than $1,000 per trainee for external courses, users said.

In many organizations, support requirements are growing so large "that the cost per computer is no longer as it would seem," said Ralph Wagner, president of Microsource Financial, a Boston-based reseller to large firms.

Wagner pointed out that if a company that buys 100 personal computers then "opens up a support department with five people, that's at least $150,000 per year, and those computers are no longer economical."

Solution to support problems

On the other hand, the emergence of a large internal user group may solve many of the support problems that have crippled personal computers since birth.

If you call Lotus with a question about its 1-2-3 package, "you can sit in a queue for 30 minutes and give up," said Steve Keese, senior coordinator for office automation at John Hancock Mutual Life Insurance Co. in Boston.

But "within our home office, almost all use is 1-2-3-based," and hotshot users can answer most questions, Keese noted.

Overall maintenance charges

Overall hardware maintenance charges seem relatively limited, and handling repairs on a time-and-materials basis rather than a service contract saves money, according to DP managers.

"In a population of about 70 [personal computers], we have spent about $2,000 in the past year," Langlois said.

"A maintenance contract on those machines would have been about $16,000," he added.

Major vendors typically charge 12% to 15% of list price for an annual service contract, he said.

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TeleVideo 922

DEC VT220

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2. Our ESCAPE key is located above the TAB key, right where you'd expect to find it.

Theirs isn't.

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3. Take a look below at the 922 keyboard. That's a true accounting keypad, complete with a Clear Entry, Double Zero and a TAB key. Not merely the numeric keys you get with the VT220.

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VT220 Display Screen.

5. And after we built a better keyboard, we built a better terminal. With exceptional reliability. Quality. Advanced ergonomics. Everything you'd expect from the industry ANSI leader.

The new 922 is available now and priced to move now. And it's backed by a worldwide sales and support network.

6. Here are 5 more advantages to the 922.

	TeleVideo 922	DEC VT220
Programmable Function Keys	15 (30 with shift)	15 (shifted only)
True Accountant Keypad	YES	NO
Plug-in Graphics Upgrade Option	YES	NO
Full Tilt & Swivel	YES	NO
Enhanced ANSI Mode	YES	NO

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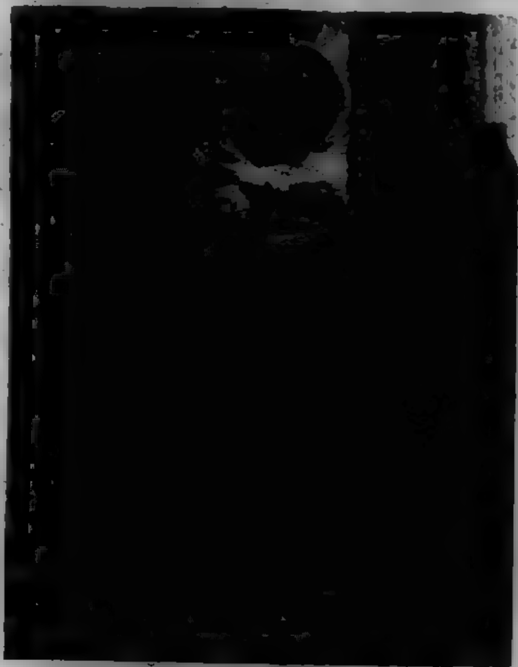
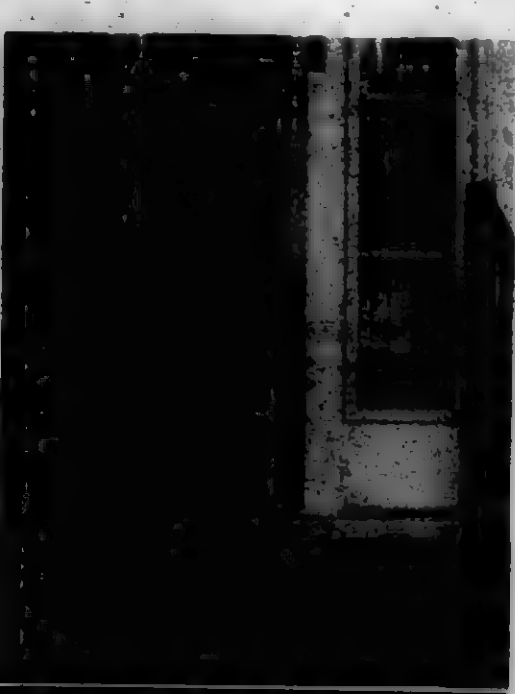
The TeleVideo® 922
TeleVideo Systems, Inc.





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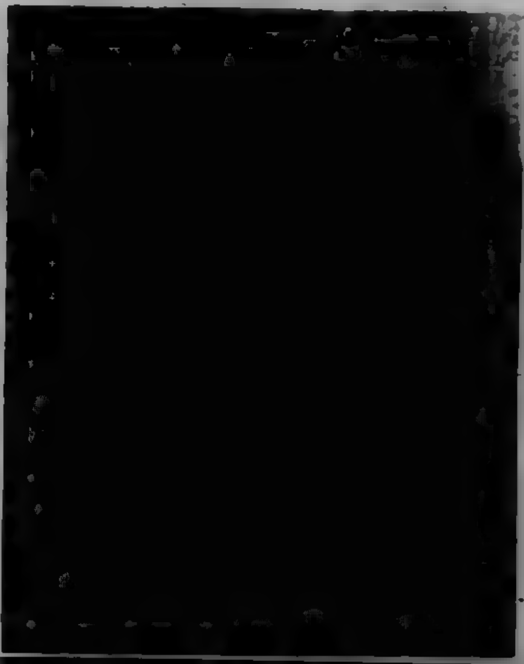


HOW MUCH IS ENOUGH?

By Tom Henkel

Long considered a mixture of scientific evaluation, old-fashioned horse sense and a little black magic, the task of capacity planning is on the brink of a major upheaval.

The skyrocketing demand for corporatewide processing power is threatening to upset the delicate balance that, in the past, has allowed DP executives to remain one step ahead of users' demands. As a result, many DP executives will be forced to alter significantly their approach — and dedication — to capacity planning.

The most troublesome issue facing capacity planning experts is how to accommodate the growing number of microcomputer and intelligent terminal users who want access to information stored in corporate mainframes.

Because few companies currently offer large numbers of micro users access to mainframe data, most capacity planning researchers agree that no one really knows what kinds of problems will crop up as DP operations become more complex. Clearly, as more users are given interactive access to mainframe-stored data, there will be a heavier strain on the system, its networking facilities and its software. But how devastating that impact will be remains largely theoretical.

The essence of any DP executive's job is to keep the company's computer system running and provide the resources to allow other departments to function smoothly. But to continue providing those services, many researchers now contend, the DP executive must look beyond the hardware in a raised-floor computer room and evaluate how microcomputers, controllers and networks will affect the overall corporate data resource.

For example, take the hypothetical case of a series of terminals in Dallas connected to a Boston-based IBM 3080 series mainframe via 4,800 bit/sec modems. The terminals are routed through Chicago, using IBM's

Continued on page 40

CAPACITY PLANNING

Continued from page 39

Systems Network Architecture. According to a simulation package developed by BGS Systems, Inc. in Waltham, Mass., the addition of two microcomputers to the Dallas operation, each demanding large amounts of data (about 1M byte) from the Boston-based host, would increase the network response time from roughly five seconds to over 20 seconds.

While noting that the hypothetical example is not as accurate as working with an actual system configuration, Robert P. Goldberg, BGS' senior vice-president of technology, said the case is typical of the performance degradation that may occur when several micro users are linked to a host processor.

Goldberg claimed that many DP executives would face a nightmare if even a handful of microcomputer users was to request significant amounts of data from a host processor at the same time. For example, Goldberg said, it could take anywhere from 30 to 45 minutes to download 1M byte of data to a microcomputer.

A solution

To solve the problem, Goldberg said, the DP executive can take several courses of action, such as upgrading modems to accommodate a higher transmission speed or upgrading communications controllers or the host processor.

To evaluate those options, modeling packages, such as those developed by BGS, Candle Corp. in Los Angeles, Morino Associates, Inc. in Vienna, Va., and Boole & Babbage, Inc. in Sunnyvale, Calif., will become essential tools to capacity planners, Goldberg contended.

While Goldberg may display an understandable bias to modeling software, independent researchers seem to agree that modeling packages will become as essential to the capacity planner as spreadsheet programs have become to financial planners.

James Sprung, a group leader with Mitre Corp., an independent research organization in McLean, Va., said that the use of more effective methods to capture and evaluate computer performance data is an important part of capacity planning. But Sprung quickly added that good software packages are only part of the solution. The DP executive must also develop a keen understanding of the types of computer services that end-user departments really need and provide the technical assistance to help nontechnical users to use the system efficiently.

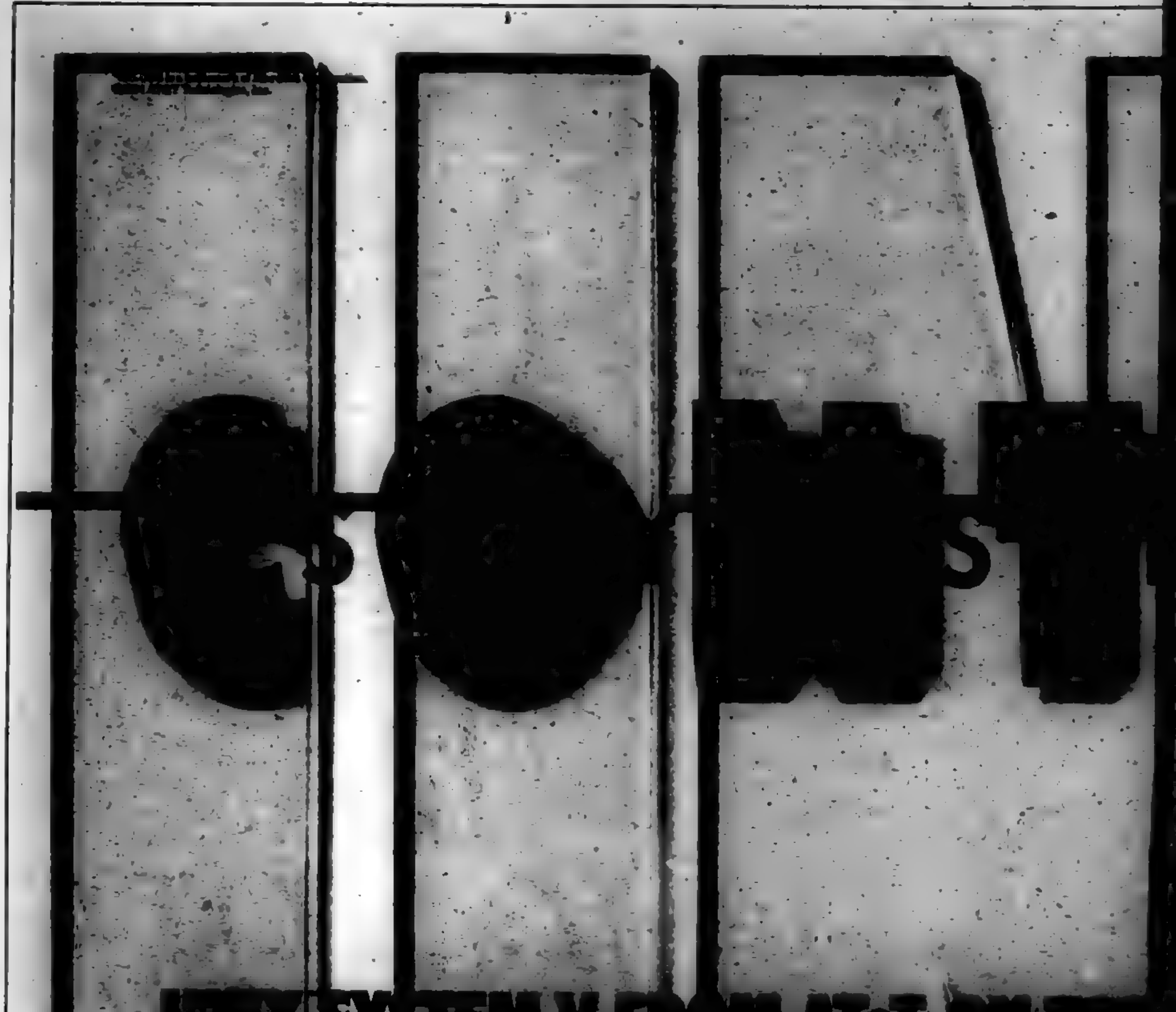
Noting that communications with end users has not been a traditional strong point for DP executives, Sprung said the onslaught of information-hungry end users may cause many DP executives to become very possessive of mainframe computer resources. The unfortunate result may be a DP department that develops services to suit the personal interests of the DP executive, while projects that would be more productive to the company as a whole are neglected.

Better communications with end users may also be a saving grace for DP executives charged with keeping an entire corporation's data resources operating smoothly. By explaining potential problems to users, the DP department can avert some problems before they happen, noted Shelly Weinberg, a senior staff member at IBM's Information Systems Management Institute in Los Angeles, an organization that operates classes geared toward aiding DP executives and other corporate managers to manage computer resources better.

BGS' Goldberg noted that if the microcomputer users in the hypothetical networking problem gave the DP department advance notice that they each needed 1M byte of data from the host, the response time degradation could probably be avoided. Goldberg suggested that it may be wise for corporations to set down a series of rules governing end-user host access.

But too many rules can drive users away from a system, noted John Murray, director of management information services for Rayovac Corp. in Madison, Wis. Murray contended that the DP department must be ready to accommodate the users' needs while at the same time trying to educate end users to use the system correctly.

Rayovac currently employs one full-time person to perform the capacity planning function and two others



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CAPACITY PLANNING

to man an information center. With six corporate microcomputers having access to the company's IBM mainframes, Rayovac until fairly recently evaluated only mainframe-generated reports to perform capacity planning, Murray said. Now, through an information center, DP department representatives are beginning to work with end users.

Small and medium-size companies can sometimes take a personal approach to training that is impractical in large corporations. Pittsburgh's Mellon Bank, ranked the 12th largest in the country, is now experimenting with a project to limit the number of people with direct access to the firm's IBM mainframes (two 3081s, a 3083 and a 3033-U) to conserve processor resources.

This experiment is being done through what capacity planner Ed Williams called "near-micros" — dumb terminals with the inbred ability to run microcomputer programs, such as spreadsheets. The near-micros, he said, have the ability to perform operations with mainframe data but do not have the ability to access that information directly. Information for use on the near-micros is requested by a microcomputer, typically located in a department manager's office. The mainframe data is loaded into the micro then funneled to the near-micros.

To augment the project, Williams said, Mellon Bank has developed an internal users group to allow users to share experiences. The group also serves as a vehicle to disseminate information about the system.

But Williams admitted that a larger capacity planning issue may be looming on Mellon Bank's horizon. In addition to providing internal DP services, Mellon also sells computer services to approximately 200 other banks. Currently, very few of the client banks have the ability to download Mellon data into intelligent terminals and microcomputers. But Williams believes it will only be a matter of time until more financial organizations demand the capability.

Noting that it may be much easier to get Mellon employees to cooperate with rules for operating the system than paying customers in outside organizations, Williams is concerned that contention for mainframe data could become a problem in the future. "The only thing that saves you is probability," Williams said, adding that the chances of a large percentage of the user base requesting mainframe data at exactly the same time is somewhat remote.

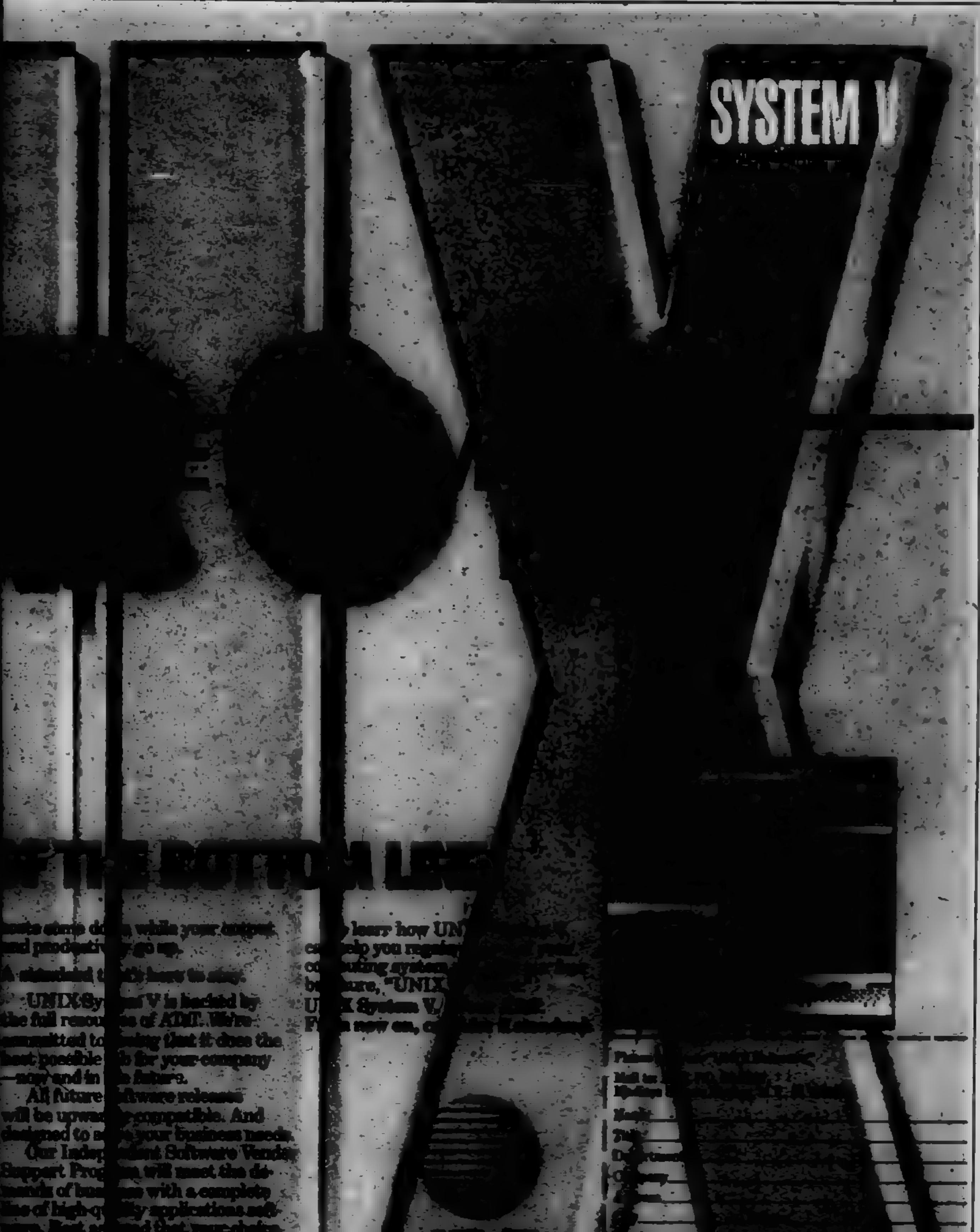
Currently gearing up its capacity planning effort to manage system resources better and possibly accommodate approximately 15 IBM Personal Computers is Peter, Howell & Heather, Inc. in Baltimore. According to senior business analyst Ryan Souther, the company is currently developing protocols to connect the IBM micros to the company's Honeywell, Inc. DPS 8/70 mainframe.

"Right now ignorance is bliss," Souther said, noting that he has been working for the past six months with Honeywell's Soms performance monitoring package to compile weekly and long-term performance reports and performing regression analysis on the results. Souther admitted, however, that he has not performed any simulations to evaluate what impact the micros may have on the system.

The influence of systems and users outside the computer room currently seems to be having an impact only on a few companies. According to Phil Howard, editor and publisher of "EDP Performance Review," a newsletter published in Phoenix, only a few of the top Fortune 500 companies are trying to find new ways to do capacity planning accurately.

IBM's Weinberg said more than three-fourths of the users who attend the Information Systems Management Institute come from MVS shops. But Weinberg added that the attendees seem to be split between big 30 series IBM mainframes and smaller 30 series machines.

"We're one to two years away from understanding this well enough," Weinberg said, adding that it will take at least that long before companies start connecting micros and intelligent terminals to host processors in significant enough numbers for researchers to develop any concrete solutions to the capacity planning issue. Until then, Weinberg admitted, there will be a great deal of uncertainty surrounding accurate capacity planning.



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Capacity planning key in growing role of DP execs

By [illegible]
CW Staff

The increasing demands for accurate capacity planning are tightly bundled into a changing role for DP executives in many corporations.

The demands of information-hungry users coupled with the financial benefits companies can reap with a finely tuned computer system has put the DP executive into a highly visible position.

Traditionally viewed as a poor performer when it comes to meeting deadlines, making accurate predictions and dealing with end users, most researchers agree the DP executive who fails to shape up under the corporate spotlight may find himself cast off into the darkness.

There is little disagreement among industry observers that the head of data processing will eventually wield as much power as the chief financial officer in many corporations. In some large companies, the head of DP is already considered a vital resource when making future corporate plans. In others, the DP chief is still excluded from key corporate decisions.

Compatibility a vital issue

For example, H. Alfred Colby, senior vice-president of information services at John Hancock Mutual Life Insurance Co. in Boston, recently noted that he is often called upon to analyze the viability of the DP center of a small company John Hancock is planning to acquire. Colby added that a few years ago, upper management did not give much consideration to whether the data center of a potential acquisition would fit in with John Hancock's existing configuration. Now, Colby said, management views that compatibility as a vital issue.

The capacity-planning issue appears to be one of the first significant challenges along the DP executive's path to increased power.

"Running out of capacity is the most severe problem an MIS department can have," noted John Murray, director of management information services for Rayovac Corp. in Madison, Wis.

Capacity planning an issue of control

Murray contends that effective capacity planning boils down to an issue of control. If the DP executive can manage to keep the corporate DP facility running on an even keel, he will undoubtedly be viewed as a dependable and vital member of the top management team. But if the DP executive fails, he may find himself being shunned by an upper management that feels that inviting the DP executive to help out with top-level decisions will only confuse the issue with technical jargon.

A poor job of capacity planning may also have lasting negative effects on the DP executive's career, as well as on top management's view of the DP department as a whole, noted Shelly Weinberg, a senior staff member of IBM's Information Management Institute in Los Angeles.

Weinberg noted that it takes a while to rebuild top managers' confidence in a DP executive's decision-making capabilities after a botched capacity-management decision leads to an unacceptable response time or undeliverable services.

To counter that possibility, Weinberg recommends the DP executive take several steps:

- Get top management involved in making key DP decisions. Rayovac's Murray agreed with the suggestion, but noted that many top executives are still quite intimidated by technology. Murray suggested the DP executive should get top executives involved without overburdening them with technical details.
- Focus on doing small tasks well. Weinberg suggests that DP executives who are just developing a capacity-management plan can often enjoy greater success by focusing on small tasks as opposed to embarking on a program that is overly ambitious.
- Capacity-management projects that are undertaken should be well measured and analyzed so that trends can be gleaned for future projects.
- Take steps to isolate the most rapidly changing aspects of a system from its vital bread-and-butter segments. "The world is changing so fast you are sometimes unable to make accurate predictions," Weinberg explained.

For example, he noted that a system used to support an information center should not, if possible, be used to support applications fundamental to the smooth operation of the business.

There do not appear to be any general rules governing how much manpower a company should devote to capacity planning.

Most users contacted had at least one full-time employee devoted to capacity planning. Most were also quick to point out that the scope of the operation can have a strong influence on the number of people needed.

Most experts note that even a part-time capacity planner is, in the long run, better than no planner at all. Most also contend that the use of commercially available capacity management tools make the capacity management job much easier.

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Even with all its power, the VAX 8600 system conserves floor space. The CPU fits into the same size cabinet as the VAX-11/780 CPU. Power consumption and air conditioning requirements are similar, too.

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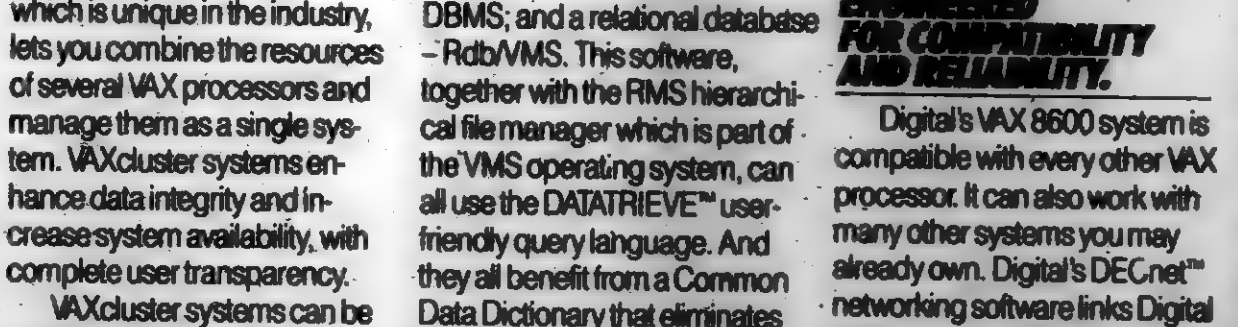
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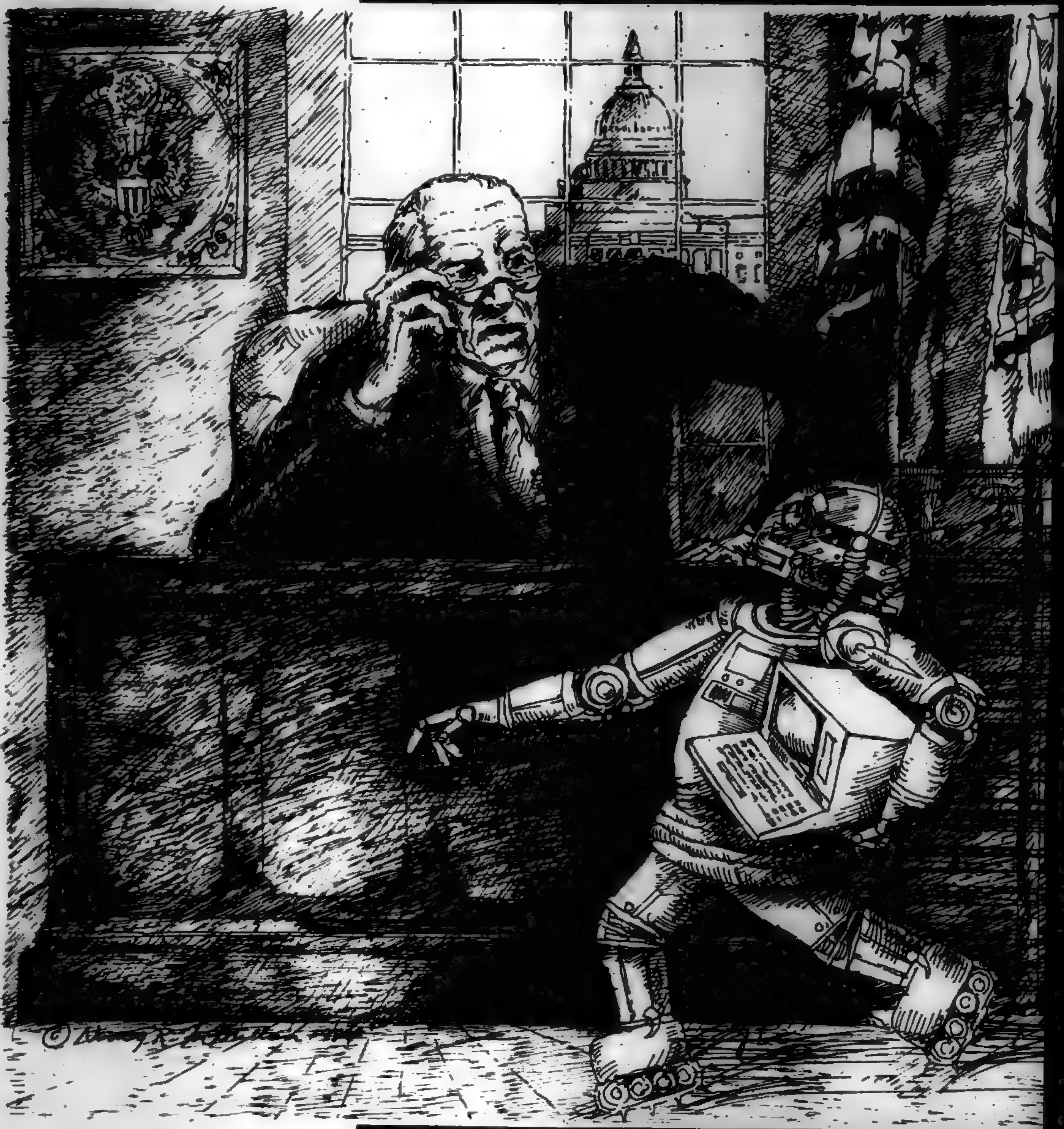
HIGH-TECH LEGISLATION

TIME TO GET MOVING

By Mitch Betts



“I personally believe that representative government is alive and well and functioning the way it was intended to function — not very well. I really believe that our whole system of diffusion of powers was designed to build some impasse in the government and to make it difficult for the government to accumulate the necessary power to make major decisions.

“We are really a crisis-activated institution. And that . . . means we don't do anything unless there's a consensus out there that unless we do something, something very bad is going to happen. And that means we're almost inevitably behind the curve.”

— retiring U.S. Rep. Barber B. Conable Jr. (R-N.Y.), quoted in *Congressional Quarterly*.

Consider, for a moment, the following recent events:

■ Congress worked six years to produce a computer crime law that, in the end, was limited to breaches of the federal government's own computers. The provision was attached — in violation of House rules — to a catchall budget bill that was overdue. The Senate had never voted on the merits of the bill, never held hearings on it, and it is likely

Continued on page 51

NANCY McMILLAN

HIGH-TECH LEGISLATION

Congress to address array of computer issues in '85

A look at Congress' agenda for 1985 illustrates the broad range of computer-related policy issues that already have been identified by members of Congress and industry lobbyists:

- **The House and Senate judiciary committees** are expected to revisit the federal policy toward computer crime. After approving legislation in 1984 that outlaws unauthorized access to federal computers, the committees will hold hearings to study the expansion of that law to cover computers used in interstate commerce..
- **U.S. Sen. Patrick J. Leahy** (D-Vt.) wants to a nend current wiretap law to make it illegal to intercept data communications without a warrant. U.S. Rep. Ron Wyden (D-W.Va.) wants to make it illegal to gain unauthorized access to computerized medical records.
- **The House Subcommittee on Transportation, Aviation and Materials**, chaired by U.S. Rep. Dan Glickman (D-Kan.), will monitor security procedures used for the federal government's computers.

Dan Quayle

- **Several legislators and trade associations** will push for curbs on illegal software copying.
- **The computer industry** will try to retain and obtain favorable tax benefits at the same time Congress tries to reduce the federal budget deficit, simplify the tax code and remove tax loopholes. Computer dealers and lessors want three-year, accelerated depreciation for computer equipment, and the electronics industry wants a 25% research tax credit and no change in the tax code's preferential treatment of long-term capital gains.
- **President Reagan's Commission on Industrial Competitiveness** will urge Congress to create a Cabinet-level Department of Science and Technology.
- **The House Ways and Means Committee** plans to hold oversight hearings about the Internal Revenue Service, including the IRS' extensive automation plans.
- **The House Subcommittee on Government Information, Justice and Agriculture**, chaired by U.S. Rep. Glenn English (D-Okla.), will monitor the electronic filing systems of the U.S. Securities and Exchange Commission, the U.S. Patent and Trademark Office and other federal agencies.
- **Congress will again grapple with the Export Administration** Act to determine which branch of the government will control exports of electronic equipment to Soviet bloc countries.
- **The House Subcommittee on Health and Safety** is expected to monitor the issue of health hazards from VDTs, including the study under way by the National Institute for Occupational Safety and Health.

To its credit, Congress is aware of the challenge it faces in monitoring and legislating on these and other issues, and reforms are being discussed. U.S. Sen. Dan Quayle (R-Ind.), for example, is leading the charge for reform of the Senate's committee system.

"We are spread too thin. We serve on too many committees and subcommittees," Quayle said in October. "It is not humanly possible to give proper attention to the 13, 15 or 17 committees and subcommittees that some of us serve on. . . . We do not have time to become experts in the areas we are most interested in."

Quayle's reforms would limit the number of panels on which a senator can serve and would encourage the use of a computerized scheduling system for committee meetings.

Also in the mood for reform is the House Science and Technology Committee, chaired by U.S. Rep. Don Fu-

Continued on page 51

Patrick J. Leahy

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Clearinghouse helps keep Congress focused on future

At the Congressional Clearinghouse on the Future, the mission is to help legislators look beyond their next election campaign by holding seminars and publishing reports that bring the thoughts of top futurists to the attention of legislators and their staffs.

Clearinghouse Director Lena Lupica said "We're definitely making headway," but admitted it is particularly difficult to overcome the "two-year mentality" of House members. "The first year they work on the budget, and the second year they're running for office. It's amazing they get anything done . . . considering the pressures that are on them."

But Lupica said the very existence of the clearinghouse — which, she noted, is funded out of Congress' office budget — shows that Congress recognizes the need to deal with America's high-tech issues. "A lot of members of Congress are interested in these issues and are trying to learn all they can," she said.

'Tons of questions'

Also optimistic is William R. Moroney, president of the Electronic Funds Transfer Association (EFTA), who said that many legislators and staff members are conversant about high-tech issues and are very eager to learn. "The experience level, as far as technology goes, seems to be improving in Congress," he said. "They ask tons of questions."

Likewise, Vico E. Henriques, president of the Computer and Business Equipment Manufacturers Association, commented, "I am more encouraged than discouraged about Congress." He cited the 1984 enactment of legislation encouraging joint research ventures as a sign that Congress is beginning to understand the high-tech marketplace.

Glickman

But the question remains whether the well-intentioned Congress can keep up with the rapid pace of technological change in the computer age without some changes. The consensus of the political analysts seems to be that Congress should strive to set broad goals on high-tech policy issues and then turn to outside technical advisors for help with the details.

"When Congress tries to legislate specific types of technology, I think it makes a big mistake. Congress should be in the business of setting goals," said the EFTA's Moroney. "Congress seems to be headed in that direction, and I think that's good."

The solution, according to U.S. Rep. Lee H. Hamilton (D-Ind.), is for Congress to "forge a better relationship with the scientific and engineering communities" and rely on the U.S. Office of Technology Assessment and other support groups to provide technical guidance for policy-making.

Hamilton

Therese Sheehy, manager of governmental affairs for the Data Processing Management Association (DPMA), said that an overworked Congress will increasingly need to rely on congressional support groups, think tanks, industry coalitions and blue-ribbon panels to cope with its high-tech agenda. The DPMA's computer crime committee is now drafting model legislation for consideration by federal and state lawmakers, she said.

In the computer crime area, experts have long supported the idea of creating a blue-ribbon commission to develop strategies for combating computer abuses. For example, in 1984 Rep. Dan Glickman's (D-Kan.) subcommittee recommended formation of a national commission on computer security and privacy on the grounds that "the breadth and multijurisdictional character of these issues prevent any single agency or congressional committee from dealing comprehensively with them."

According to another leading proponent of the commission idea, Robert P. Campbell, president of Advanced Information Management, Inc. of Woodbridge, Va., "It's time for Congress to catch up and legislatively stimulate a solution [to the computer crime problem]." Whatever the reforms, the computer community hopes it never sees another congressional session like last October's, when the computer crime bill was sliced up and glued to a budget resolution just before adjournment.

"I would hope we don't see a sharp turn toward that method," the DPMA's Sheehy said. "I'd like to see a more ponderous approach, considering the far-reaching effects of national legislation."

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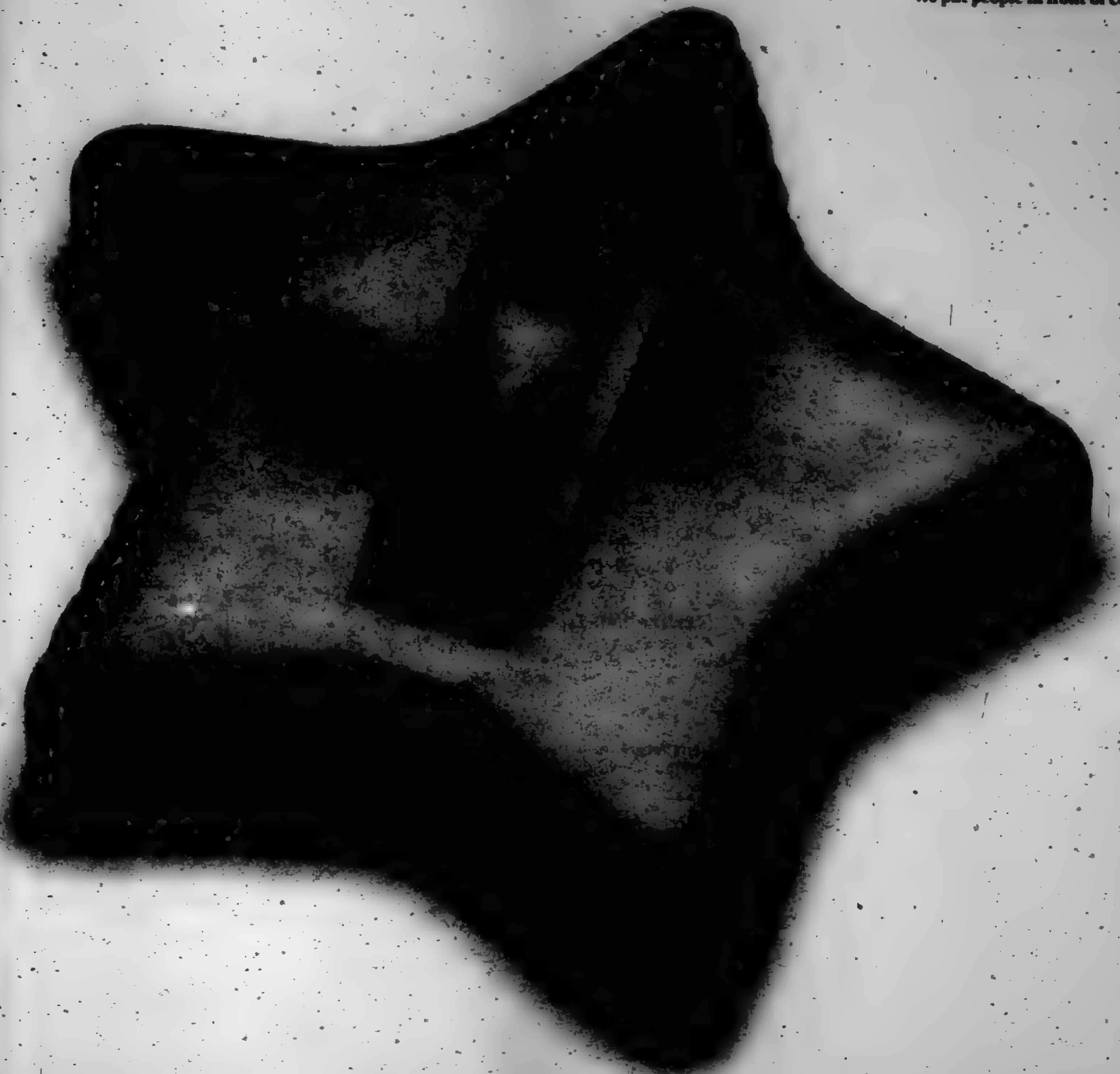

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High-tech issues looming large on House agenda

In 1983, the Congressional Clearinghouse on the Future surveyed the committee staff members of the U.S. House of Representatives to find out what future issues they thought warranted congressional attention. The result was a publication called *The Future Agenda*.

The following computer-related issues were identified:

- **Armed Services.** Electronic weaponry raises questions about reliance on electronics vs. reliance on human judgment.
- **Banking, Finance and Urban Affairs:** Electronic funds transfers raise concerns about computer crime and privacy and the applicability of federal banking laws.
- **Education and Labor:** This committee will monitor the use of computers and telecommunications for education; educating and retraining the labor force for the service-oriented economy; and the effects of office automation on productivity, morale and employment.
- **Energy and Commerce:** Emerging issues of industrial robots include displacement of laborers and declining employee morale.
- **Foreign Affairs:** Transborder data flow issues should be the subject of debate, including the effect that data barriers have on multinational corporations.
- **House Administration:** This committee will monitor the use of computers by Congress and explore the use of teleconferencing for hearing testimony.
- **Judiciary:** The committee plans to study computer privacy issues, the applicability of the First Amendment to electronic media, the use of computers in the courthouse and computer crime.
- **Public Works and Transportation:** Electronic funds transfers, electronic mail, teleconferencing and personal computers may reduce the demand for traditional transportation services.
- **Science and Technology:** The committee will explore the roles that patent law, federal research funds, tax incentives and other government policies play in high-technology innovation.
- **Ways and Means:** The committee said it will investigate unfair trading practices in the international computer chip market.

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HIGH-TECH LEGISLATION

Continued from page 46

that only a few senators read the bill before it became federal law.

- For the last four years, Congress has failed to pass an authorization bill for the National Science Foundation because of jurisdictional squabbles between the Senate Committee on Commerce, Science and Transportation and the Committee on Labor and Human Resources.
- The House panel that has taken a lead role in studying computer security is the House Subcommittee on Transportation, Aviation and Materials, which seemingly has little jurisdiction over computers.

No doubt the U.S. Congress is a brave experiment in representative democracy. But it also is an institution that is facing an identity crisis brought on by paralyzing rules and procedures, proliferating committees, a heavy work load consisting of trivial duties rather than statesmanship and, more generally, the rapid pace of contemporary American life, according to several congressional observers.

"With too much work and too few resources, Congress will have to ignore many issues that need addressing," wrote William L. Renfro in the December issue of *The Futurist*. Renfro, a former congressional aide and now president of Washington, D.C.-based Policy Analysis Co., presented a gloomy assessment of Congress that concluded: "Thus, at a time when the country more than ever needs clear decisions on the complex questions of the next decade, Congress is increasingly unable to meet its responsibilities and is losing its strong central role as a decision-making body representing the people."

"Keeping up with technological change has become a formidable challenge for Congress," observed U.S. Rep. Lee H. Hamilton (D-Ind.) in mid-1984. "The job of keeping up is most difficult because members of Congress, most of whom have little technical background, are being asked not only to understand the workings of computers, satellites and the like, but also to make decisions on the regulation of these devices."

Hamilton noted that some laws written just four years ago are already outdated. "In many cases," he said, "information technology simply leapfrogs over these laws and renders them ineffective or irrelevant. Problems of copyright law, computer crime, national security and personal privacy have jumped to the top of the nation's agenda."

Ron Wyden

Continued from page 67

qua (D-Fla.).

The committee in 1984 convened a two-year Task Force on Science Policy to explore such issues as: the role of Congress in science policy-making; the impact of the information age on science; the need for Congress to strengthen its ability to judge the quality of research programs; and how to finance research programs.

Over the years, of course, Congress also has created a bevy of support groups to produce expert reports and advice on technical issues. These organizations include the General Accounting Office, the Office of Technology Assessment (OTA), the Congressional Budget Office, the Congressional Clearinghouse on the Future and the Congressional Research Service.

OTA, for example, produced a report on electronic banking in 1984 and will report in 1985 on a variety of computer topics, including the vulnerability of government computers to security breaches and VDT health issues.

> *'We are spread too thin. We serve on too many committees and subcommittees . . . It is not humanly possible to give proper attention to the 13, 15 or 17 committees and subcommittees that some of us serve on.*
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THE CHANGING LANDSCAPE

By Peter Bartolik

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The private branch exchange (PBX) industry in the U.S. has many of the characteristics of a hard-charging, high-growth market. This impression is heightened by the presence of some 40 equipment suppliers, the opportunities provided by the breakup of the Bell system and by IBM's acquisition of Rolm Corp. Yet for all its appearances, the projected revenue growth of the industry as a whole is remarkably low, which raises a question: Can the PBX industry support all the players?

Although the value of PBX shipments was projected to grow by 10% to $2.7 billion in 1984, according to International Data Corp. (IDC), a Framingham, Mass.-based market research firm, the compound growth rate through 1988 is expected to be only 6.5%.

The numbers are misleading in a variety of ways. The top three suppliers, AT&T, Northern Telecom, Inc. and Rolm, account for more than half of the total revenues, and much of the growth, in the market. Also, the market is quite segmented, with high-end systems and low-end systems projected by IDC and Hambrecht and Quist, Inc., another market research firm, to

[redacted]

EWING GALLOWAY

PBX

represent the fastest growing segments. The mid-range systems will experience low growth, according to IDC, or even decline, according to Hambrecht and Quist.

After accounting for the big three, there are 14 vendors with significant market shares (over 1% of the total) fighting for a piece of the remaining pie, according to market research firm Northern Business Information, Inc., in addition to a third tier of vendors that has yet to earn any significant share of the market.

Observers generally agree that there are too many second- and third-tier companies chasing too few dollars, and a shakeout is inevitable over the next few years as companies that cannot keep up with state-of-the-art products fall out of the race. That, however, has not deterred a number of start-up companies and a number of foreign companies from entering the U.S. market.

The reason for the low overall growth projections is relatively simple: Unlike computer users, PBX users do not need to update equipment every three years or so to stay with the leading edge. Nor do PBX users need to acquire additional machines to alleviate increasing backlogs of processing demand. Kenneth Oshman, Rolm president, once characterized the industry predicament in simple terms, saying, "The beauty of telecommunications systems is that everybody needs one. The problem is that they only need one."

The problem is that the market is relatively saturated, and much of the growth lies in tapping the replacement market. In effect, the business goals of many companies rest on the strategy of capturing a portion of AT&T's aging customer base while also offering highly targeted new products to first-time users.

But there are a number of strategies being employed by the companies currently in the market:

- Develop a broad line of products from low-end to high-end and focus development efforts on tying into office automation equipment;
- Focus on a particular size of PBX and try to establish a broad market;
- Target a vertical market such as hotels and motels or financial institutions;
- Tap into the vast resale market represented by the regional telephone holding companies spun off from the Bell system and interconnect companies.

According to Charles Robbins, an analyst with IDC, "even 1% of the market is substantial," and being small in the large scale of things is not necessarily a losing posture. With future revenue growth expected to depend more and more on enhancements to existing systems and add-on products for existing customers, an established customer base can provide steady revenue growth. Those who have most to fear, according to Robbins, are the smaller companies caught in a generalist, broad-based strategy and new start-up companies that have not been able to bring their products to market quickly enough.

Kevin Sara of Northern Business Information said that small companies can survive the shakeout of the industry by offering "very strong" products that address particular segments of the market. While vertical markets offer opportunities, companies can also carve out "large-size niches," according to Sara, by marketing sophisticated products such as large switching systems. Other companies may develop products "tuned for office automation," he added.

Despite the great expectations that generally have accompanied the Rolm/IBM merger, 1985 is not expected to bring vast changes to the PBX market. According to Robbins, 1985 is the year for the various companies to "deliver the products they have been promising."

Sara said he does expect Northern Telecom to announce products integrating its communications offerings with office automation technology. He also said that while Rolm may announce some low-end products during the year, it will take the company two or three years to develop major products and to bring them to market.

One factor that will greatly influence the industry over the next few years is the performance of AT&T in a deregulated environment. Sara said that companies may start dropping out of contention once AT&T "gets

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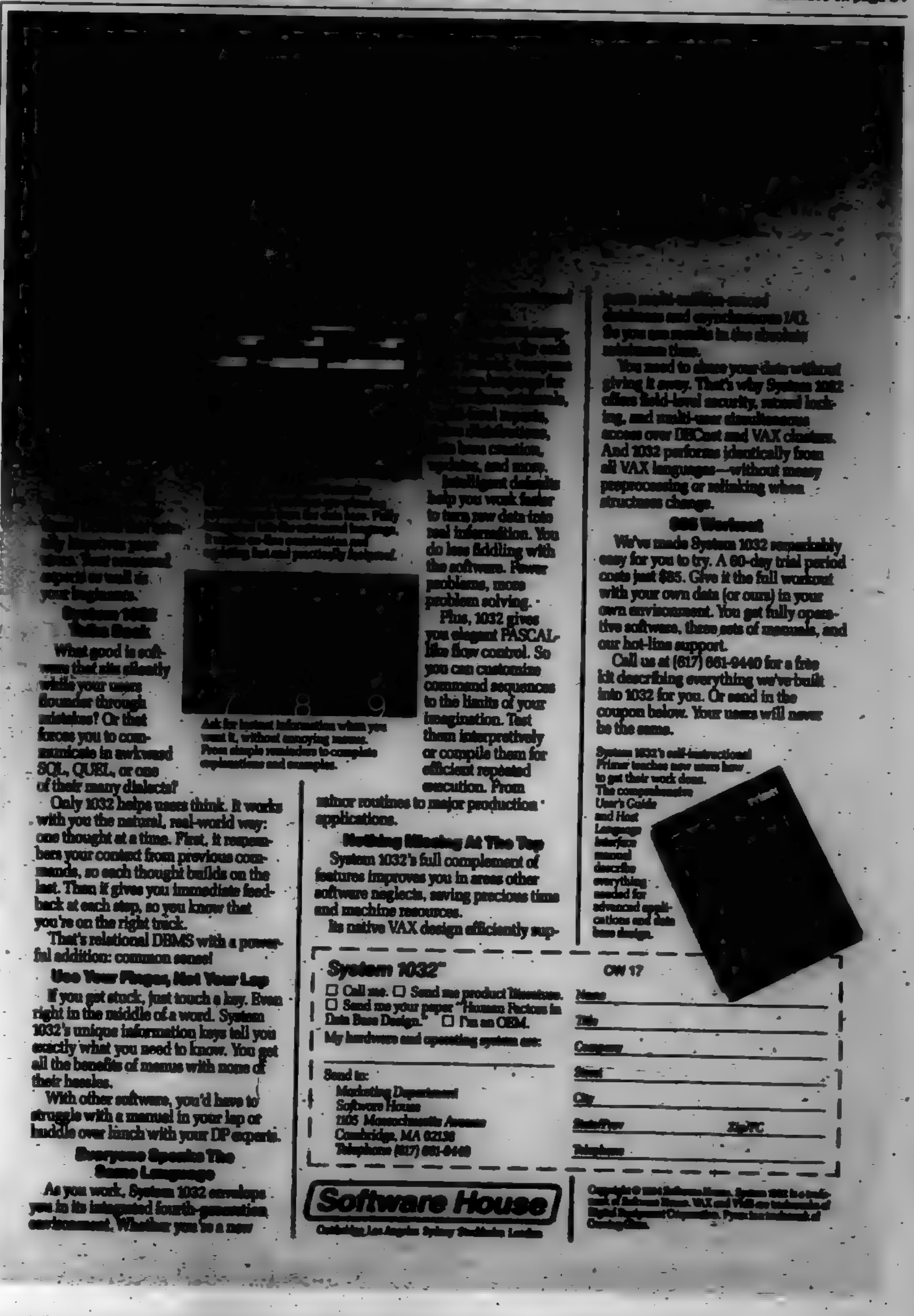

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Continued from page 53

its factories moving again." However, he noted, AT&T's market share has been deteriorating for some time and since deregulation AT&T has made "very little progress" overcoming manufacturing problems. "The more [AT&T's] situation deteriorates, the harder it will be to fulfill AT&T's large ambitions," Sara said.

A recent survey of 635 companies by The Market Information Center, Inc., Framingham, Mass., found very little loyalty to AT&T. According to Barry Gilbert, vice-president of the market research firm, the survey indicated that "Rolm has a good image created out there . . . [but] AT&T has nowhere to go but down."

While 42.2% of the respondents currently had AT&T PBX systems, compared to 24.4% with Rolm systems, when asked what system they would choose if they were to install a new PBX, 35.7% of 264 respondents indicated Rolm, 18.9% indicated Northern Telecom, and AT&T came in third at 16.8%.

An additional factor facing the PBX industry is foreign competition. Northern Business Information's 1984 ranking of the top 17 PBX suppliers included eight foreign suppliers. Topping the list of foreign suppliers after Canada's well-established Northern Telecom was NEC Corp.

> *IBM, with the acquisition of Rolm, has quickly become a leading player in the industry. Analysts believe it will take two years before the merger produces major products to tie PBXs to IBM's overwhelming installed base of computers.*

NEC has scored big by selling large systems through several of the regional holding companies formed by the AT&T divestiture; the company has also been promoting itself as an office systems supplier. The problem for NEC, according to IDC's Robbins, is establishing distribution channels that do not compete with each other. He noted that Northern Telecom recently dropped some distributors that were competing against the regional telephone holding companies that also sell Northern Telecom equipment.

Trends on the PBX front

Before the actual merger announcement from Rolm and IBM this past year, the big news on the PBX front was the growing trend of PBX dealers linking up with computer vendors on joint development projects and computer-PBX interface architectures. First came IBM's earlier minority ownership in Rolm, followed by a similar arrangement whereby Wang Laboratories, Inc. acquired a minority ownership share of Intecom, Inc. Intecom is a vendor of large PBX systems that has scored early in sales agreements with the divested Bell operating companies and has moved ahead to develop a niche in the sale of multitenant systems.

Robbins noted that most leading computer vendors have established agreements with leading PBX companies to develop interface architectures. That, according to Robbins, "is the battle for the office." This year, he said, there will be more PBXs integrating with local nets.

Intelligent file servers

While there has been occasional consideration of PBXs at the hub of local-area networks, Robbins does not see the PBX playing a central role in high-speed networks. However, he added, he expects to see PBX vendors develop equipment to serve as intelligent file servers in networks, and he predicted that Northern Telecom will soon come out with a system that will serve as a departmental file server.

Office automation and communications

The most obvious question facing the integration of OA and communications is what role IBM will play. Following a number of unsuccessful attempts to develop PBX-type equipment by itself and through joint developments, IBM, with the acquisition of Rolm, has quickly become a leading player in the industry. Analysts believe it will take two years before the merger produces major products to tie PBXs to IBM's overwhelming installed base.

Undoubtedly, however, the prestige of the IBM name will greatly enhance the image of Rolm, particularly as the roles of communications manager and management information systems manager grow closer.

According to Robbins, "A lot of companies looked at Rolm as a key player but were concerned about what kind of support they would get from Rolm. That will now be addressed over time by the money available from IBM."

Somewhat overlooked during the excitement generated by new PBX products is the aging base of the divested Bell operating companies' Centrex installations. Robbins said that the divested Bell operating companies have made a commitment to electronic Centrex and that some start-up companies are focusing on providing enhanced features to tie into electronic Centrex. However, the general feeling among analysts is that a majority of current Centrex customers will migrate toward PBX systems when they decide to update.

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Users willing to bypass AT&T PBXs for rivals

FRAMINGHAM, Mass. — A recent survey of more than 600 people who make decisions on the purchase of telecommunications equipment revealed strong interest in using private branch exchange (PBX) equipment manufactured by vendors other than AT&T.

"There is not a lot of loyalty to AT&T [in the PBX market] like there is to IBM in the computer equipment market," noted Barry S. Gilbert, vice-president of the Market Information Center, Inc., based here, which recently published the survey.

"The PBX Market, A User Survey" polled 626 companies on their current PBX equipment and their future purchase plans. Not surprisingly, AT&T had the largest installed base among those users — 42.2% — with Rolm Corp. following at 24.4% and Northern Telecom, Inc. coming in third with 16%.

However, when asked if they would recommend their current PBX to other users, only 68% of AT&T PBX users said they would. Northern Telecom received a favorable response from 98% of its users, and Rolm received a 91% favorability rating.

Of 110 respondents who said they have definite plans to install new PBX systems within the next year, 28.2% said they would install Rolm systems, 20% said AT&T systems and 17% said Northern Telecom systems.

The survey also revealed that nearly 90% of new purchases will be digital systems and that 79% will be used in an integrated voice and data environment. Furthermore, 56% plan on integrating PBX equipment into local-area networks.

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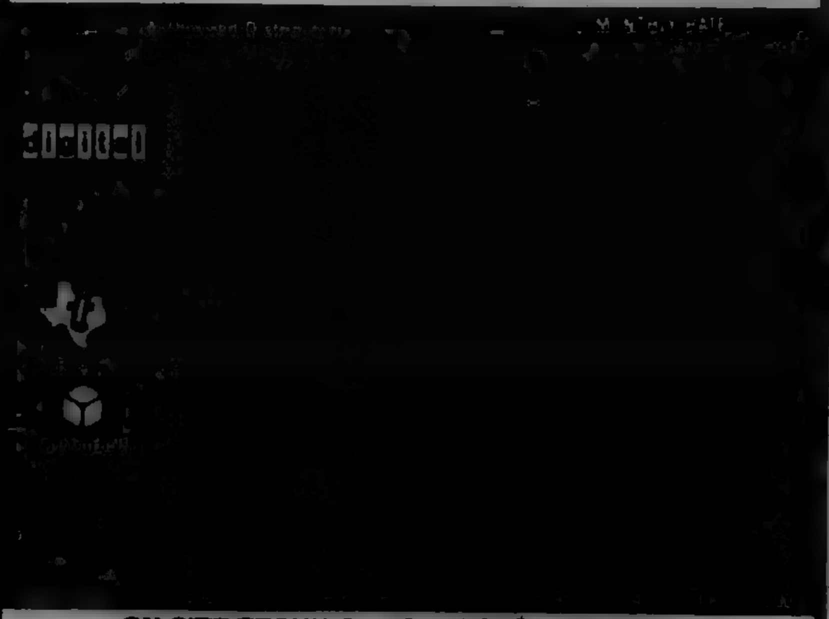

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INTERSTATE BANKING

A BRIDGE TOO FAR?

One of the largest users of data processing services, the banking industry, is undergoing great change. Once an industry burdened with restrictions on services, interest rates and geographical expansion, commercial and thrift banks are expanding, both in the types of products they can offer and in the places where they do business.

This year, bankers' eyes are focused on another aspect of deregulation: interstate banking, or the establishment of branches across state lines.

The U.S. Supreme Court is expected to decide whether or not it will hear a case on the validity of "regional compacts" established by several state legislatures in order to discourage takeovers by large institutions from outside their borders. This combines with a continuing congressional battle over interstate banking laws and a move by the comptroller of the currency in November giving 13 bank holding companies approval to open 29 banks in nine states, putting interstate banking in the forefront of banking issues.

Communications capabilities and flexibility within computer departments are prevalent among the concerns expressed by bankers when *Computerworld* posed the question: What will MIS departments need to supply their parent banks in order for them to compete in the new banking environment?

As the largest institution in New England and one of the parties in the case being presented to the Supreme Court,

Continued on page 58

MORT RABINOW

By Maura McEnaney

UCC-7
UCC-1
UCC-2

[illegible]

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INTERSTATE BANKING

Continued from page [illegible]

Bank of Boston has been an aggressor in the interstate banking market. The institution has a toehold in every one of the six New England states and received permission from the controller of the currency to start five bank branches in Florida.

"We see technology as a competitive weapon that will allow us to move out into the customer space but lock out the competition in the process," said William Synnott, senior vice-president at the Bank of Boston's Information Systems and Services Group. "Electronic banking is going to be the facilitator in interstate banking." Synnott said.

With two data centers, a worldwide communications network, a joint-venture automated teller network and a wide base of debit cards, Bank of Boston is out to illustrate what many bankers feel is the key to survival — providing less expensive services to a wider customer base.

According to Synnott, the bank is putting together a technical architecture that will be flexible enough to accommodate a variety of services, products and locations.

"A bank that has a worldwide telecommunications system in place is going to be in a much better position than those who have a splintered array." he said. Bank of Boston is also working to implement an electronic document transmission system that would provide access to multinational corporations. Through a local-area network in Europe, customers could sit down at a terminal, transmit a letter or document that would go directly to one of the institution's international nodes and then feed into a network in the U.S.

Providing processing services to other institutions is already a main part of the bank's business, but the bank will continue to make advances in that direction, Synnott said. "We run the railroad, and they pay us a fee to ride on it."

But connecting systems within an institution is not the only challenge facing banks today. Bancone in Columbus, Ohio, is the state's second largest holding company, with $8 billion in assets. In banking circles, the bank is considered to have a progressive attitude toward technology, with an extensive automated teller machine (ATM) and electronic funds transfer networks. The bank has also been a partner in several large mergers over the past few years.

John Fisher, Bancone senior vice-president, said mergers with other large institutions can create a problem as to what to do with two very different data centers. To date, there have been two approaches taken in the Ohio market, Fisher said.

Some holding companies have deferred commingling their data processing departments; others have moved quickly to provide centralized processing. Dealing with merged DP departments can be "gut tearing," he said, and future success depends on management's ability to cope with the experience.

According to Fisher, "I don't think DP departments can prepare for interstate banking, just react to the result of it." Nevertheless, he said, DP executives who have gone through large intrastate mergers are in a "better mental framework to deal with interstate banking."

Bank of Boston's Synnott agreed. "If you have 10 banks in 10 states, you have 10 different data centers. . . . If you were starting from scratch, it would be a lot easier."

> *Bank of Boston is putting together a technical architecture that will be flexible enough to accommodate a variety of services. The bank is working to implement an electronic document transmission system that would provide access to multinational corporations. Through a local-area network in Europe, customers could transmit a letter or document that would go directly to one of the institution's international nodes and then feed into a network in the U.S.*

In addition to these management requirements, like other institution leaders, Fisher said, "banks that have built large telecommunications installations will be better prepared than those who stay at home tending the store."

Given the array of expansion possibilities, exactly what to prepare for is a problem at some banks. "As a DP manager, you really don't know what's going to happen; you don't know what kind of a situation the parent is going to drive you into," said C. Thomas Cook, first vice-president of Security Pacific Automation Co. and former MIS director at First Interstate Bank in Los Angeles.

According to Cook, flexibility within bank DP departments is the main issue. "We really don't know what effect deregulation is going to have." If state barriers are broken down, institutions can get access to new markets either through blanketing ATMs, establishing loan centers or buying a franchise, he said. "Each

Continued on page [illegible]

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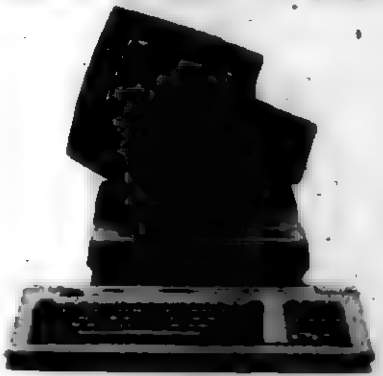

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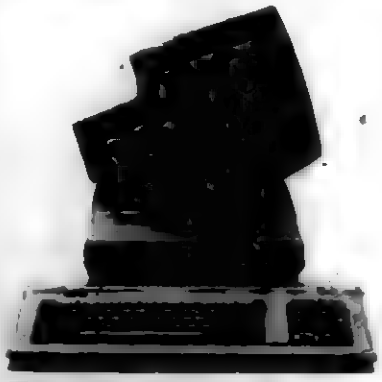

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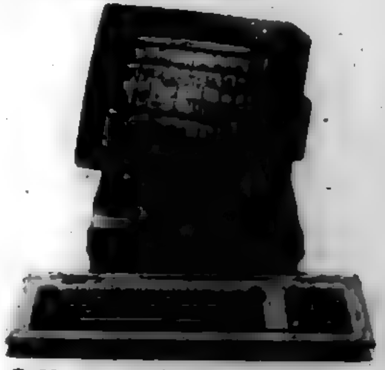

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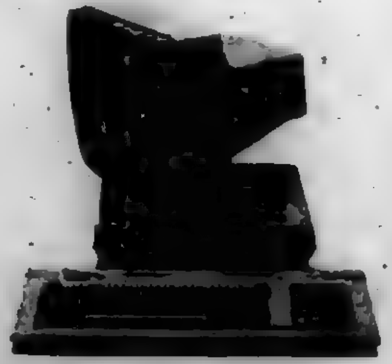

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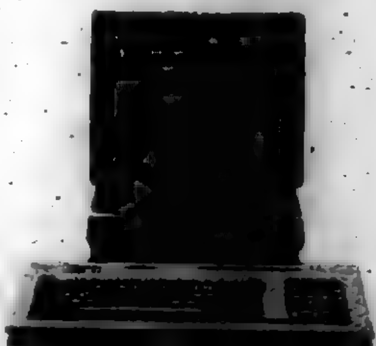

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10 The Esprit (Haseltine) 1400, 1410 or 1500*..

11 ADDS Regent 20, 25 and Viewpoint†.

12 And Qume's QVT 102*

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18 The Ampex 210 is from the Computer Products Division of Ampex Corporation. One of The Signal Companies

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Continued from page 58

brings with it a different technological solution. . . . You can't have a cookie-cutter solution to any of those, so, from state to state, it's going to be different."

One institution that has taken a slightly different approach toward interstate banking is First Interstate Bank. Through franchising, First Interstate has established more than 1,000 branches that employ 8,000 ATMs in 11 Western states.

In 1976, the bank embarked on a network tie-in that allows First Interstate's ATMs to communicate to six remote sites and then to a central data base site in El Segundo, Calif. "We built an interstate network early in the game, and that is our success," said Rick Higgins, executive vice-president in charge of research and development with First Interstate Services Co., the bank's DP subsidiary.

But according to Higgins, First Interstate too, is looking toward the future. "We took IBM Systems Network Architecture and built a network based on that methodology. That has been good to us," he said. However, First Interstate is looking to build gateways that will provide network access to more than just Interstate customers.

The bank has installed its own satellite dishes in five Western locations, and in Portland, Ore., the bank is experimenting with providing communications through a CATV network.

While First Interstate developed its communications architectures over time, Bankers Trust Co. in New York has plunged into things a bit more rapidly. Last May, Bankers Trust established a position to create and develop a strategic communications architectural environment to integrate systems through a common network.

Although the institution has sold most of its retail operations, it is concentrating heavily on providing financial services throughout the world. Carmine Vona, senior vice-president of the bank's technology department, is in charge of overseeing that project. According to Vona, today's banking systems must operate on a global level and be integrated within the institution at both high and low employee levels. "The thrust is no longer brick and mortar," Vona said. In order to establish a national banking position, "all we need is an intelligent terminal and a telephone line," he said.

Systems must also be able to handle a vast amount of reporting requirements levied in response to the industry's volatility and the failure of institutions like Continental Illinois and Seattle First in Washington, he said. "We are not going to be denied from entering new businesses because of a failure to meet reporting requirements," Vona said.

According to Vona, through the new network, Banker's Trust will have a standardized informational process that will allow it to keep track of customers doing different lines of business with the company. Bankers Trust is preparing "to jump onto any new opportunity that is either already available to us or provided to us through deregulation," he said.

"If there are customers in Florida that are interested in us, we intend to reach them and compete with the bank that has offices in Florida."

INTERSTATE BANKING

Deregulation leads banks to up DP equipment demands

While bankers are facing the problem of how to gear up their DP departments for deregulation, the new environment is putting additional pressures on vendors as well.

Over the next several years, vendors must respond to bankers' needs of providing more functions at less cost, according to C. Thomas Cook, first vice-president of Security Pacific Automation Co. in Los Angeles.

"All financial institutions will [pressure vendors] to bring in more function at less cost," he said. These demands, combined with the rapid changes in technology, will shorten the life cycle of the products, Cook maintained.

> ***Software development is moving slowly in the financial services industry. As a result, software houses and banks alike are willing to pay a tremendous premium for financial applications developers*** — **Kevin Scully, vice-president and division manager of financial systems at Logica, Inc.**

The incompatibility of systems and the specific software needs of institutions today require most banks to tailor software to suit their own needs. At Bank of Boston, the MIS department consists of 550 professionals working in systems development, communications and DP. "We have to write our own software," said William Sennett, senior vice-president, because the lack of standards provides no connection between the bank's IBM, Digital Equipment Corp. and Wang Laboratories, Inc. systems.

This need for specialization has opened the door for financial institutions to market products of their own. Last summer, Bankers Trust in New York established a marketing group for the bank's software products, time-sharing and information services. According to Carmine Vona, senior vice-president of the bank's technology department, the group will market Resources Management On-Line System, a foreign exchange trading module. The institution is also planning on releasing modules for liability management, government security training, money market instruments and municipal securities training.

According to Kevin Scully, vice-president and division manager of financial systems at Logica, Inc., an international computer software company that specializes in financial services, low-volume banks will continue to buy off-the-shelf software, but in the end they will pay the price for not coming up with the customized solutions developed by large institutions.

According to Scully, software development is moving slowly in the financial services industry. "The technology is there," but software isn't coming out fast enough to keep up with the demands of the marketplace, Scully said. As a result, software houses and banks alike are willing to pay a tremendous premium for financial applications developers, Scully said.

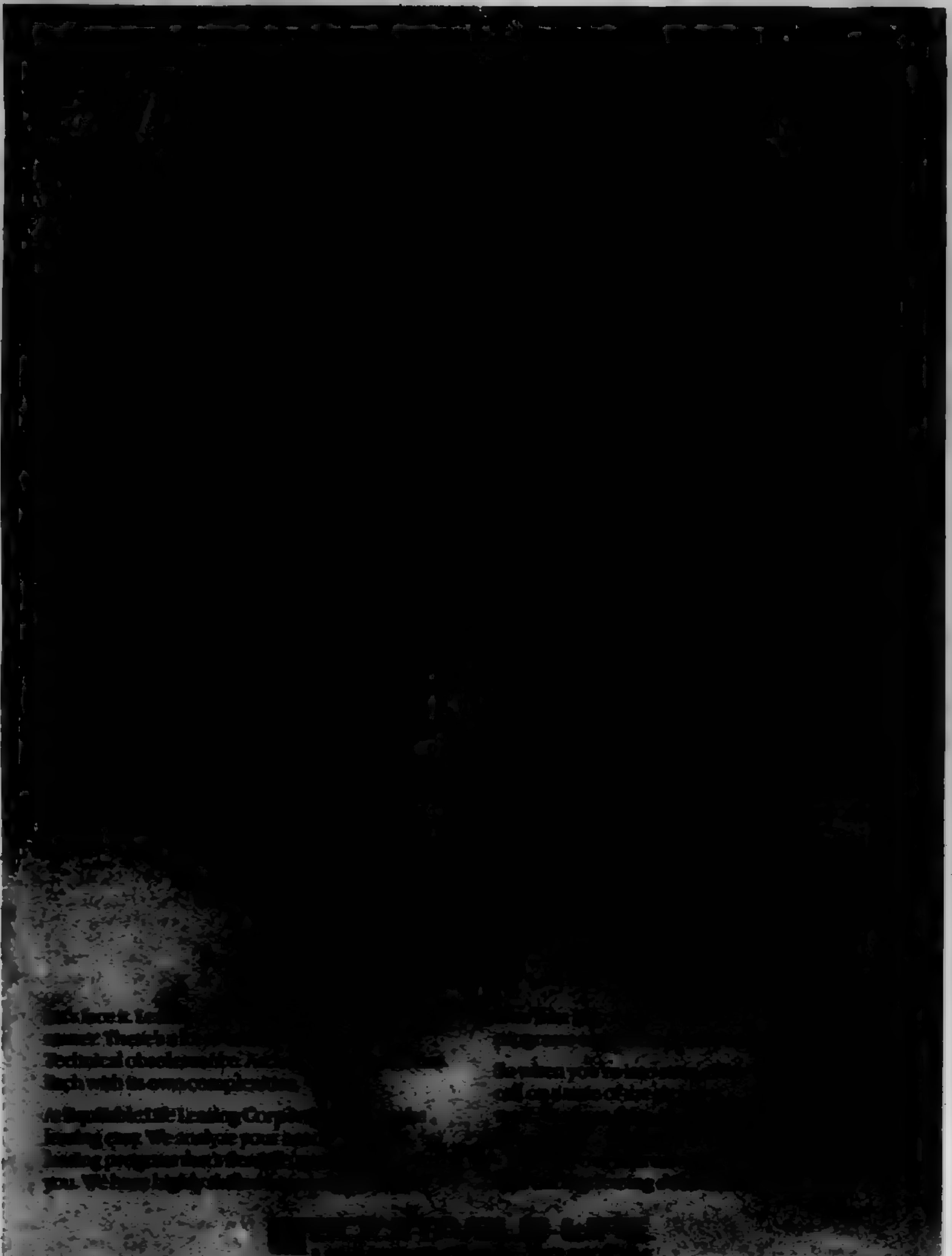
George L. McTavish, president of Dallas-based Hogan Systems, Inc., a financial software vendor, acknowledged that his company's biggest challenge was providing those products that keep banks competitive and seeing that they are implemented in a timely fashion.

Keeping up with technology should not be a piecemeal approach, according to Robert Metzler, vice-president systems development at First Computer Services, Inc., a DP subsidiary of First Union National Bank in Charlotte, N.C.

"We are seeing the industry reach a point where the demand for automated functions continues to accelerate and technology is advancing faster than it can be incorporated into many existing systems," Metzler said. "Systems and pieces of systems are upgraded and replaced on a regular basis."

To change that approach, Metzler suggests an automated approach to automation development, using computer-aided design and manufacturing. "We have provided the financial institutions with automated equipment, but we have not developed an automated function for those who are providing the automation.

"Only after the financial industry demands coherent automated systems designed by systems architects and built by a process supported by an integrated set of automated tools, will we be able to rise above piecemeal, inefficient and costly systems," he said.



IBM'S SOFTWARE STRATEGIES

DRESSED FOR SUCCESS

By John Gallant

Beyond the bright searchlights of science,
Out of sight of the windows of sense,
Old riddles still bid us defiance,
Old questions of Why and Whence.'
— William Cecil Dampier-Whetham

Trying to predict the large systems software products IBM will announce in 1985 or attempting to divine the software strategies the blue giant will advance in the upcoming year is like trying to solve a modern-day riddle as baffling as the ancient conundrum posed by the Sphinx.

Just as the Sphinx sat soundlessly contemplating the shifting desert sands, IBM reflects on the changing fortunes of the computer industry from its lofty position, weaving the stratagems that ensure its dominance over that realm. IBM's public pronouncements regarding its future intentions are few, and its pilots are close-mouthed about the corporate ship's course. Those who attempt to foretell the computer colossus' moves do so at their own risk. Experts can appear as uninformed as the common man when IBM changes tack, seemingly without warning.

In an industry characterized by a handful of moderately large companies and a multitude of smaller, fledgling firms and

Continued on page 62

IBM'S SOFTWARE STRATEGIES

TYPES OF PACKAGED SOFTWARE BY PROCESSOR SIZE
U.S. VENDORS, WORLDWIDE REVENUES
(Dollars in millions)

	1983				1989			
	System/ Utility	Application Tools	Application Software	Total Packages	System/ Utility	Application Tools	Application Software	Total Packages
Independents								
Large-Scale System	195	420	740	1,355	1,055	2,555	3,265	6,875
Medium-Scale System	255	580	980	1,815	1,510	5,520	7,295	14,325
Micro System	115	295	330	740	985	4,475	4,700	10,160
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hardware Manufacturers								
Large-Scale System	815	340	115	1,270	3,975	1,700	290	5,965
Medium-Scale System	1,335	735	295	2,365	6,760	3,940	1,090	11,790
Micro System	230	235	105	570	2,515	2,090	675	5,280
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

IDC CHART

Continued from page 61

niche-dwellers, IBM is the Goliath of the software world. According to International Data Corp. (IDC), a Framingham, Mass.-based market research firm, IBM's software revenues for 1983 were $2.4 billion. New York-based investment firm E. F. Hutton & Co.'s Michael Geran, vice-president of research, put that figure closer to $2.6 billion, an amount that dwarfs the revenues of even the largest independent software supplier.

"IBM is obviously the dominant company in software," said Harry Edelson, managing partner of Edelson Technology Partners, a venture capital firm located in Saddle Brook, N.J. "The whole world is based on IBM software. There are really no other big companies in software. There are a lot of DBMS and applications companies, but no real giants. Every one of them has gone for a niche based on IBM's hardware and software. Software is the key to the future, and IBM holds that key."

Some say the riddle of IBM's software strategy is as simple as the following:

Q. Where can a $40 billion company go?

A. Anywhere it wants.

But according to others, that interpretation is overly broad and belies IBM's real position in the increasingly complex large systems software marketplace. Despite its size, analysts say, IBM is faced with some very real constraints and problems — which even the smallest software companies experience — in maneuvering the software straits.

What are those constraints? For one, observers say, IBM is locked into an evolutionary migration path that precludes, or at least hampers, the introduction of technologically innovative software products. Since the customer upheavals surrounding the announcement of its 360 series mainframes in the mid-1960s, IBM has followed this evolutionary track in most of the product areas in which it competes.

No software surprises from IBM

"I do not think you will see any surprises in software next year from IBM," E. F. Hutton's Geran said. "IBM is locked into an evolutionary course that started more than 20 years ago. It just keeps adding layers of functionality to its existing software. That, by its very nature, inhibits innovation. IBM cannot set the clock back to time zero. The company is also limited in what it can do by the size and disparity of its user base.

"For the independent suppliers," he continued, "I would not predict any major threats from IBM in the short term. If they can follow the evolutionary course, they can stay current with or move ahead of IBM."

Dennis Vohs, executive vice-president of Management Science America, Inc. (MSA), an Atlanta-based supplier of large systems applications software, echoed Geran's comments.

"IBM has a couple of problems in the area of software," he said. "It tries to develop software that fits the entire spectrum of users, but it still has to provide things for its top users, who have problems far more complex than others. As a result of solving problems for the big guys, IBM does not make software that is easy for the little guys to use. When

Continued on page 72

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IBM software revenues, package prices expected to rise

While it may be risky to predict the market areas in which IBM will make its presence felt more strongly next year or to foretell the actual products Big Blue will announce, two things seem certain about IBM and software.

One is that software will play an increasingly important part in the revenue growth of the world's No. 1 computer maker (see chart page 72). Another is that IBM's software prices will continue to rise — perhaps dramatically.

According to Francis Gens, director of information systems research for the Yankee Group, a Boston-based market research firm, IBM's software revenue made up 4.9% of its total revenue in 1982, a figure that rose to 5.7% of IBM's $40 billion total revenue in 1983.

He said IBM's software revenue would be nearly 6.5% of the total in 1984 and is expected to grow to 8% of total revenues by year-end 1985. By the decade's end, he added, software will represent between 15% and 20% of IBM's total revenues.

Gens' estimates are conservative in comparison with other predictions. According to Robert Djurdjevic, president of Annex Research, a market research firm located in Phoenix, IBM's software revenues will represent between 7% and 10% of the company's total revenue for 1984 alone, a figure that translates into software revenues of between $3.2 million and $4.8 billion.

'A sizable portion of the total'

"By the end of 1985," Djurdjevic said, "software will represent a very sizable portion of the total. That growth within the total is significant when you consider that IBM's business as a whole is growing [currently] by about 15% a year."

"Unquestionably, IBM is looking to software for increased revenue," Gens noted. "IBM is risking financial stability by converting a large portion of its hardware base from lease to purchase. Historically, that leased base helped IBM flatten out the highs and the lows in its revenue picture. To offset that shift, IBM is, in effect, building up a large rental base in software. Software revenues will not totally offset that hardware shift, but they will mitigate it somewhat."

Combined with the lease/purchase shift, IBM is confronted with falling hardware prices that increase its reliance on software revenues. To ensure that software revenues continue to grow, analysts said, IBM must both sell more software and increase the price of its software products.

Will get firms to buy more software

"I think [IBM] sees software revenue becoming as much as 40% to 50% of total revenues 10 years from now," said Martin Goetz, president of Applied Data Research, Inc., a Princeton, N.J.-based supplier of systems software. "[IBM] will move to get companies to buy more software. The amount of software data processing departments currently buy is quite discretionary."

The upward pricing strategy is a more worrisome trend as far as users are concerned. "Software prices are going to go up, and they are going to go up dramatically. I believe that IBM's stated goal is that, by 1988, it wants its software revenue to equal its mainframe revenue," said Marc Butlein, vice-president of Gartner Group, Inc., a market research firm in Stamford, Conn. "If you look at the implications of that statement, it suggests that IBM will have to increase software revenues by about 50% a year."

According to Djurdjevic, IBM has very nearly done just that. Between 1980 and 1984, he said, IBM's software revenue has grown at a 49.8% compound annual rate in the U.S. To maintain that type of growth, Djurdjevic predicted that IBM will raise software prices between 30% and 50% during the next two years. He said also that IBM will increase the frequency of new releases for existing software products, with each release marked by a higher price tag.

"All IBM has to do is look at the price of, say, its Cobol compiler or its Cobol runtime library, figure out how many installations use the products and raise the price $5 a month," said Philip Dorn, president of N.Y.-based Dorn Computer Consultants, Inc. "It does not take much in terms of price increases to come up with some substantial revenue because of IBM's incredible user base."

Value pricing

According to Butlein, IBM may also begin to advance a newly formulated pricing strategy that could have a dramatic effect on users — value pricing. "Value pricing means that every time a user logs on to the software, you pay the vendor something. The more you use a product, the more you pay. . . . the net effect is that the user will wind up paying more money."

Thus, analysts said, IBM's software strategies for 1985 clearly will be formulated in light of the computer giant's bottom-line requirements.

Djurdjevic noted, "Unlike other companies that develop a product first and then build a business plan around it, the business plan comes first at IBM."

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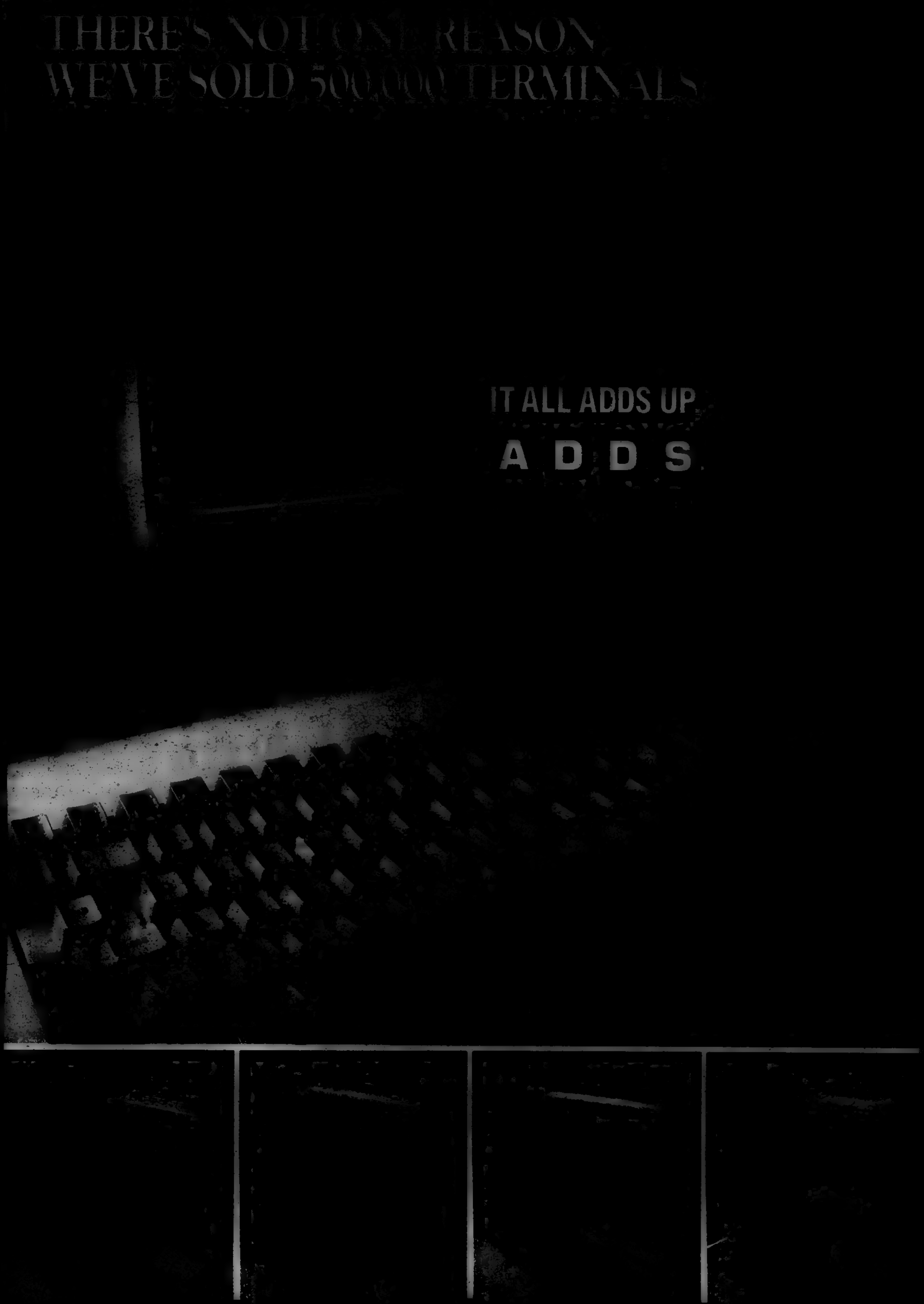
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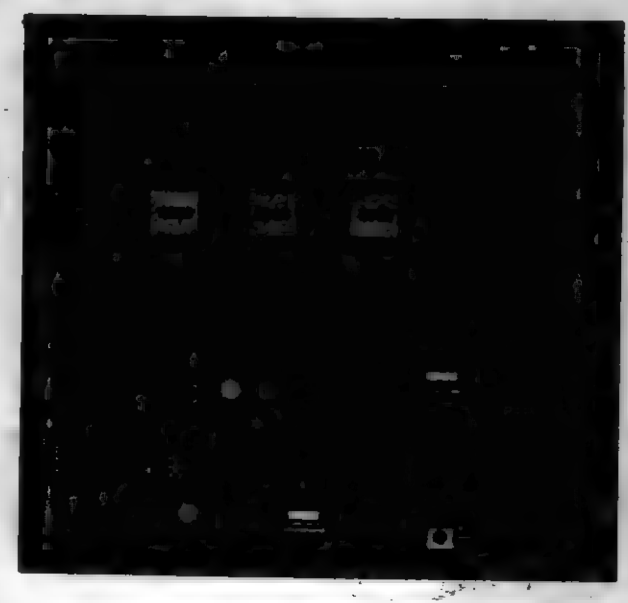

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XA guiding course of IBM operating systems, software

It appears that IBM's moves in the operating systems and systems software arena can be summed up in two words: Extended Architecture (XA). According to analysts interviewed by *Computerworld*, 1985 will see IBM continuing to emphasize the flagship of its operating systems line — MVS/XA — and perhaps introducing an XA version of its increasingly popular VM operating system. In addition, Big Blue may announce new releases of its systems software, designed to utilize the 31-bit addressing space that XA provides.

"I do not expect anything to happen with plain [MVS/SP]. It will be functionally stabilized fairly soon," said Philip Dorn, president of N.Y.-based Dorn Computer Consultants, Inc. "Eventually, everyone will have to be MVS/XA customers because the next generations of machines will be XA machines. I would guess that by the end of 1985, 60% to 70% of all MVS shops will have migrated up to XA."

Major releases each year

According to Robert Djardjevic, a computer industry analyst and president of Annex Research, a market research firm located in Phoenix, users of MVS/XA can expect at least two major releases of that operating system each year until the end of the decade, with each release accompanied by a price increase. Most analysts predicted that IBM's soon-to-be-released high-end processors — code-named Sierra — will likely boast new functions that only MVS/XA users will be able to utilize. That, observers said, represents another of IBM's strategies for encouraging upward conversions from other operating systems.

"I think there will also be new systems software coming out from IBM, including compilers and perhaps a data base management system that takes advantage of XA's additional memory and address space," said Martin Goetz, president of Applied Data Research, Inc., a Princeton, N.J.-based supplier of systems software. "I think IBM will force users to upgrade through improved software that only works with XA. Also, IBM traditionally comes out with newer [peripheral] devices that only the top operating system will support."

But in light of the rumored introduction of the Sierra line, most observers said IBM will probably be content to leave MVS/XA itself unchanged for the coming year.

"Next year is complicated," said Harry Edelson, managing partner of Edelson Technology Partners, a venture capital firm in Saddle Brook, N.J. "With the Sierra line to be introduced, you could see some major shifts in IBM's revenue base. It is doubtful that you will see new wrinkles in [operating systems] software in light of that. You probably won't see much of a software thrust until . . . the machines are delivered."

One operating systems software thrust that analysts said is overdue from IBM is the introduction of an XA version of VM, a strong interactive environment that continues to win adherents in the user community. VM/XA would allow users to use the 31-bit addressing space of XA and help them overcome virtual memory constraints.

According to Shaku Atre, president of Rye, N.Y.-based Atre International Consultants, Inc., VM is rapidly becoming a strategic product for IBM. "I think IBM is moving more forcefully in the VM area in order to satisfy the information center type of environments. Most of the announcements you will see in the MVS/XA area you will also see in the VM arena. VM has been sidetracked for years, but I think IBM has realized that VM is a much better interactive processing system than just MVS with TSO."

"When is VM/XA going to appear?," Dorn asked. "I will tell you that a lot of users have [complained] about that one. It is long overdue. I personally do not understand what problem IBM is having with VM/XA. It is obviously a critical system for [IBM] today."

Debut of 31-bit systems software

In addition to the possible introduction of VM/XA, a number of IBM observers said the industry giant will make available 31-bit versions of important systems software. According to Francis Gens, director of information systems research for the Boston-based market research firm the Yankee Group, IBM started down that path with the introduction of subsystems such as its Network Communications Control Facility and Vtam for MVS/XA.

"In terms of software," Gens said, "1985 will be the year of virtual storage constraint relief. XA allowed users to address memory over the 16M-byte line, but much of the systems software is still limited to that line. It is possible that IBM will announce 31-bit versions of subsystems such as CICS and IMS and other software that will be able to operate above the 16M-byte line."

What will be the fate of IBM's third major operating system — DOS/VSE — in the coming months? Analysts seemed to feel that IBM would love to kill off DOS/VSE and support only two major operating systems — if it only could.

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IBM to play hardball with applications software?

"If you had asked me a year ago what IBM would be doing in applications, I would have said 'nothing special.' But all the announcements of IBM's microcomputer software this year have caused me to scratch my head and think maybe the game is going to change. I never thought IBM would get into micro software, but it sure did. That is not a precursor to getting into the mainframe applications area, but I am not as sure as I was that IBM will continue to do nothing," said Philip Dorn, president of N.Y.-based Dorn Computer Consultants, Inc.

As with Dorn, many IBM watchers are puzzled by Big Blue's strategy in the increasingly lucrative large systems applications market. With the exception of some very widely installed packages, such as its Copics and Mapics manufacturing software, IBM has not played a big part in the evolution of applications software.

Because developing applications requires massive resources and because most of the widely installed packages supplied by the independents have enjoyed years of fine tuning, many analysts said IBM would have a difficult time making its presence felt in that market.

Despite concessions, insiders uneasy

In addition, observers said, IBM would probably not be able to overcome the huge conversion problem involved in trying to edge out existing installed products. And, they noted, applications tied to IBM's aging IMS or fledgling DB 2 data base management system (DBMS) would be unlikely to meet with widespread user approval. Despite the sense that IBM has conceded the applications market, for the most part, to the independents, insiders share Dorn's uneasiness. If the ubiquitous blue force were to rear its head in the applications arena, could it turn the tide on the independents?

"I think IBM has conceded the market for the time being, but I do not know that it has decided to concede it forever. IBM has stated that its corporate objective is to be a big factor in every single market, and applications software is certainly a sizable market," said Dennis Vohs, executive vice-president of Management Science America, Inc., an Atlanta-based supplier of large systems applications software.

"IBM has had its hands full with systems software," said Francis Gens, director of information systems research for the Yankee Group, a Boston-based market research firm. "That software has faced the least competition, and it has great price flexibility and the strongest hold on users. In light of that, I think it unlikely that you will see any major moves from IBM in this area."

One area into which a number of observers said IBM may move next year is scientific and engineering applications. "I think next year we will continue to see improvements in the applications areas where IBM is strong, such as manufacturing, and we will see the introduction of products targeted to the scientific area," said Michael Geran, vice-president of research for New York-based investors E. F. Hutton & Co.

Analysts were split over whether IBM would choose to enter the applications arena by acquiring marketing rights to third-party software or even purchasing outright one of the independent suppliers. IBM has exhibited a growing inclination to do just that, as evidenced by its acquisition of Rolm Corp., its interest in Sytek, Inc. and its marketing arrangements with Artificial Intelligence Corp. and Comshare, Inc.

Independents have head start

"IBM really does not have the expertise to write a major application," said Marc Butlein, vice-president of Gartner Group, Inc., a market research firm in Stamford, Conn. "If you were going to supply an application, would you start from scratch or would you go out and buy someone else's product? . . . I think the independents have too much of a head start, and the expertise is with the independents."

The Yankee Group's Gens echoed Butlein's sentiments. "IBM will be encouraging more deals with the independent applications vendors," he said. "In nonstrategic areas, IBM is depending more heavily on outside companies. The larger IBM becomes, the more difficult growth becomes."

But Dorn disagreed. "An acquisition? Well, that would get IBM in with both feet, wouldn't it? On the other hand, most of the independents have produced software that works in multiple environments. Could IBM be a software vendor dealing with all those other subsystems that are not its own? That is hard to figure," he said.

Observers said that any move by IBM into applications would probably have to be preceded by some attempt on Big Blue's part to shore up its sagging DBMS house, considering that the DBMS is quickly becoming the core component in most vendors' applications strategies.

Explained Vohs, "To have a big share of the market to go after and reduce the amount of expense that goes into development, IBM is going to want to get a pretty dominant share of the DBMS market, which it slipped in this year."

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IBM sliding, independents climbing in DBMS market

To say that IBM is losing ground in the data base management system (DBMS) arena is technically correct, but the statement belies IBM's dominance in that market segment. According to "IBM Software Environment," a report from Framingham, Mass.-based International Data Corp., a market research firm, IBM's IMS product and its relational offspring DB 2 account for some 60% of the installed DBMS base today.

But IBM is slipping. Independents are slowly gaining market share against the aging, hierarchical IMS and the nonproduction-quality DB 2. Thus, many analysts ponder what IBM's strategy will be in the upcoming year in this critical market.

"I think IBM is trying to make DB 2 a more production-oriented DBMS," said Martin Goetz, president of Applied Data Research, Inc. (ADR), a Princeton, N.J.-based supplier of systems software. "DB 2 is currently thought of as a system to complement IMS. But as IBM gains experience with the product, to the extent that the company can improve its performance, I am sure it will."

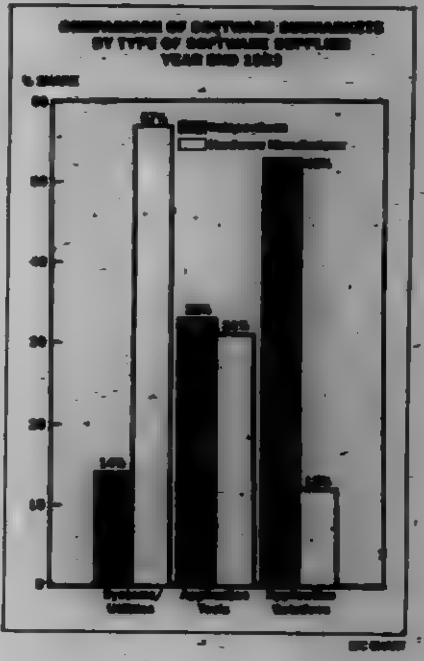
"I am not convinced of how serious IBM is with the DB 2 strategy," said Philip Dorn, president of New York-based Dorn Computer Consultants, Inc. "It is an important product, but I cannot find a clear line on IBM's software strategies in a lot of areas, and this is one. The only strategy I can see is the one IBM announced publicly, which is a side-by-side arrangement. You are essentially running two logical machines, an IMS machine and a DB 2 machine with some crisscrossing."

Most observers said IBM would follow a side-by-side strategy of improving the performance characteristics of DB 2 while continuing to patch and add minor enhancements to IMS. IMS must be supported, they said, because of its huge user base and the massive investment in software IBM's clients have made during the product's 14-year lifetime.

One possible solution to DB 2's performance problems, insiders said, might be found in upcoming hardware announcements. Some analysts predicted a microcoded version of DB 2 will be one of the features included in the Sierra line.

"A microcode version of DB 2 is the next logical step," said Michael Geran, vice-president of research for the New York-based investment firm E. F. Hutton & Co. "IBM wants to, and has to, improve the functional interfaces and the overall functionality of DB2, and one way to do that is through microcode. I do not think IBM is worried about opening up DB 2 to the [plug-compatible manufacturers]. PCMs are no longer an issue in the computer industry; their market share is just too small."

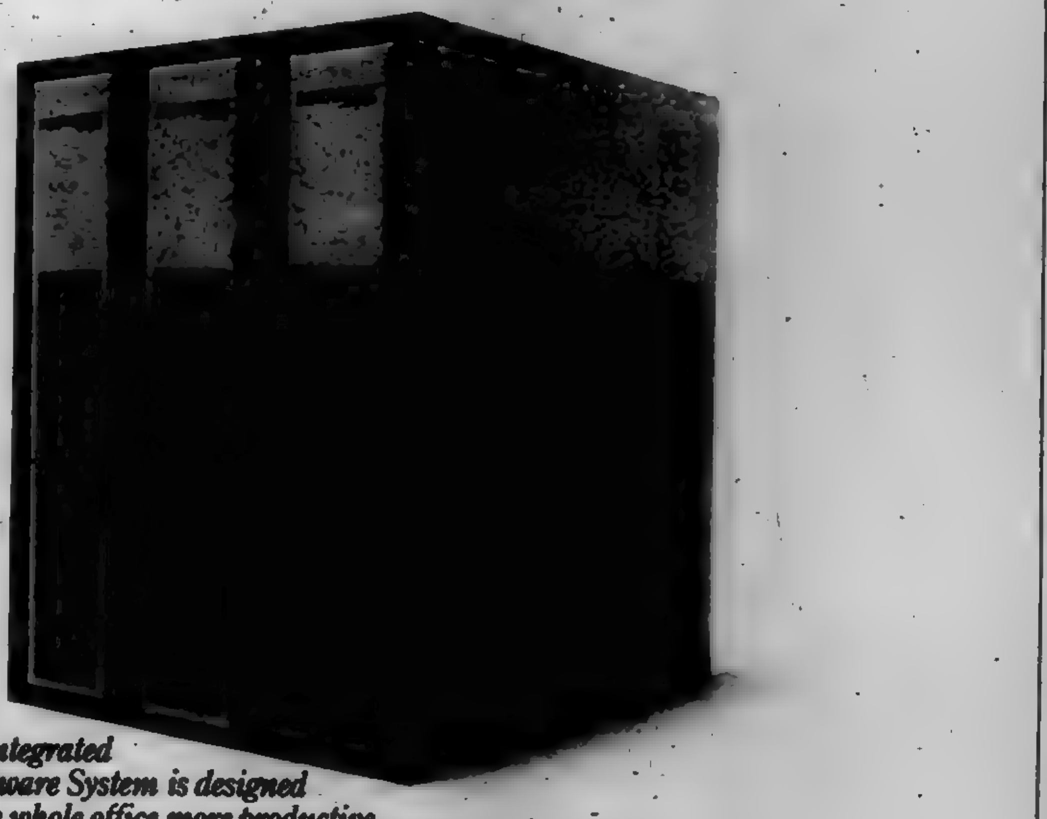
Shaku Atre, president of Rye, N.Y.-based Atre International Consultants, Inc., agreed. "I think performance is the No. 1 feature IBM has to improve with DB 2. To make anything production-quality, you have to have better performance and less real memory use. It is possible that IBM will put some of the access methods into microcode."



But ADR's Goetz said IBM has shown no signs of making such a move. "I believe a microcoded version of DB 2 is possible, but in briefings we have had with IBM, we have been told that there are no plans to put any part of the product into microcode. IBM does not even believe that DB 2 will be stabilized for two or three years."

One move that analysts said is possible is the introduction of a fourth-generation-language-based application development facility and related programmer productivity tools. IBM's Development Management System (DMS) and its Application Development Facility (ADF) are recognized as less than cutting edge technologies, and IBM may attempt to boost its fortunes in that growing market by announcing a more advanced system based on one of its DBMS.

"IBM does not have a good fourth-generation application development language," Goetz said. "IBM's DMS and ADF are very poor products. The company has a very large group of people in Dallas working on the development of a fourth-generation system."



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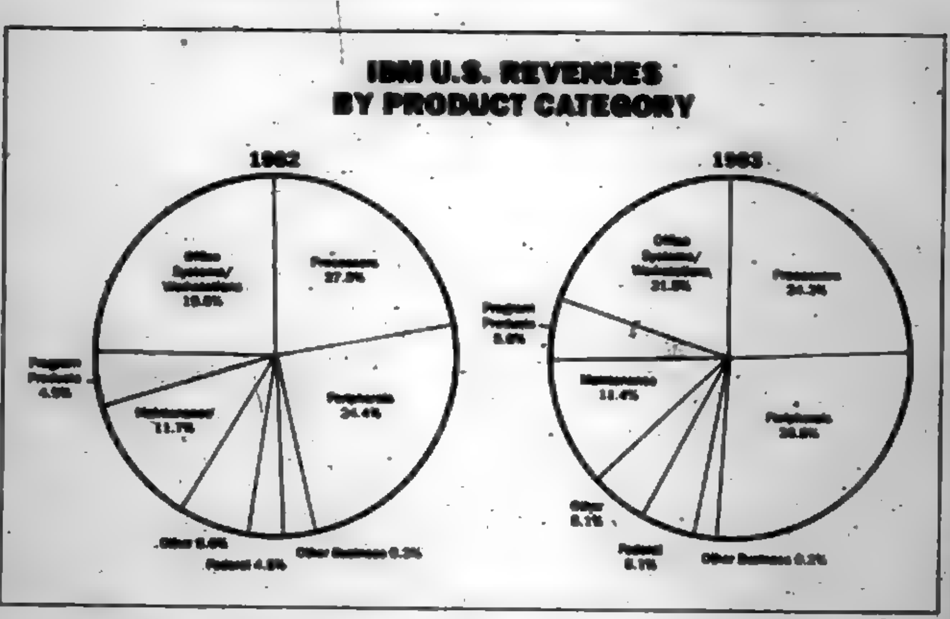

Continued from page 62

IBM builds software, it takes in the whole market spectrum, which makes it very difficult for IBM to satisfy an individual user."

Also, Vohs said, IBM's sheer size can sometimes limit its mobility. That represents an important limitation considering that timing is often a critical factor in the success of a software product. "It takes IBM an inordinate amount of time to run a potential product by all the people who have to review it. The software, for example, may have to be reviewed by the disk people, the 4300 series people and the IMS [data base management system] people. The product has to be compatible in all those environments. Other software companies, being much smaller, can be more versatile in introducing new technology."

And despite its aura of invincibility, IBM's resources are not limitless. Even Big Blue must target its limited technical manpower and its finite — albeit massive — research and development budget toward those market areas in which it can compete most effectively.

That assignment of resources, many analysts said, explains why IBM has dominated some sectors of the large systems software arena, such as operating systems and systems software, and why it has been less successful in others, such as prepackaged applications.

"IBM's technical manpower is limited, as with all companies, so it concentrates on the areas in which it does well," Geran said. "It has been a case of diversion of resources. IBM has so many things going at once that it has not really had time to focus on areas such as applications. Thus, IBM selectively concedes portions of the [software] market to the independents who can then gain ground in those areas."

"IBM has too many things on its plate," said Marc Butlein, vice-president of Gartner Group, Inc., a market research firm located in Stamford, Conn. "For example, IBM has about 500 people who rewrite and support the VM [operating system] alone. That is one helf of an investment. IBM has only so many resources, and it wants to leverage them where it can."

Such internal constraints make it reasonably clear that, despite impressions to the contrary, IBM cannot stride at will in all niches of the large systems software market — at least not all at once. Thus, in the absence of a public statement of intent, outsiders are left to peer into a rather foggy crystal ball to predict where IBM will move in the coming year.

Observers see IBM continuing support of SNA

Observers expect to see little in the realm of important announcements in Systems Network Architecture (SNA) and communications software for the upcoming year. They said IBM will continue to strengthen its commitment to SNA and to centralization and the reliance on mainframe processors in a distributed environment that SNA makes possible. Analysts said IBM may announce network management products, and they said users can expect enhancements to IBM's existing communications software.

"I think IBM is definitely interested in tying everything in to the host," said Dennis Vohs, executive vice-president of Management Science America, Inc., an Atlanta-based supplier of large systems applications software. "SNA is addressing that strategy. IBM is saying, 'Use your mainframe system as your storage.' "

A number of observers said they believe IBM is growing receptive to the need to accommodate evolving worldwide communications standards, such as the Open Systems Interconnect and X.25.

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Computerworld
P.O. Box 880
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C*omputerworld* wants to know more about you, our readers, and provide a forum for you to express your opinions on issues related specifically to your job and more generally to the computer industry. Pick a statement or two from those below and tell us your opinions. The last statement invites you to sound off on a topic of your choice.

In the blank space below or on a separate sheet of paper, respond in up to 200 words to as many of the following statements as you wish.

[illegible]

1.
The further I keep end users away from the mainframe data base, the better.

2.
The spread of micros threatens the control and authority of the DP department.

3.
Cobol is an out-of-date language, but we're sticking with it.

4.
Vendors keep announcing micro-to-mainframe links, but I haven't found one available right now that works for my company.

5.
Hackers are just kids playing with computers. Any system that can't keep them out deserves to be infiltrated.

6.
Senior management still treats DP as a back-room service.

7.
Unix is a language kept alive only by vendor and media hype.

We might run your responses in future *Computerworlds*. If you'd like your name and company affiliation withheld from publication, just say so.

Your name ______________________ **Your title** ______________________

Company name and primary industry ______________________ **Company's location** ______________________

How many people work in your DP department? ______________ **What is the DP department's annual budget?** ______________

What topics would you like to see covered in greater depth in *Computerworld*? (more software product evaluations, for instance, or management issues, technology updates, etc.)

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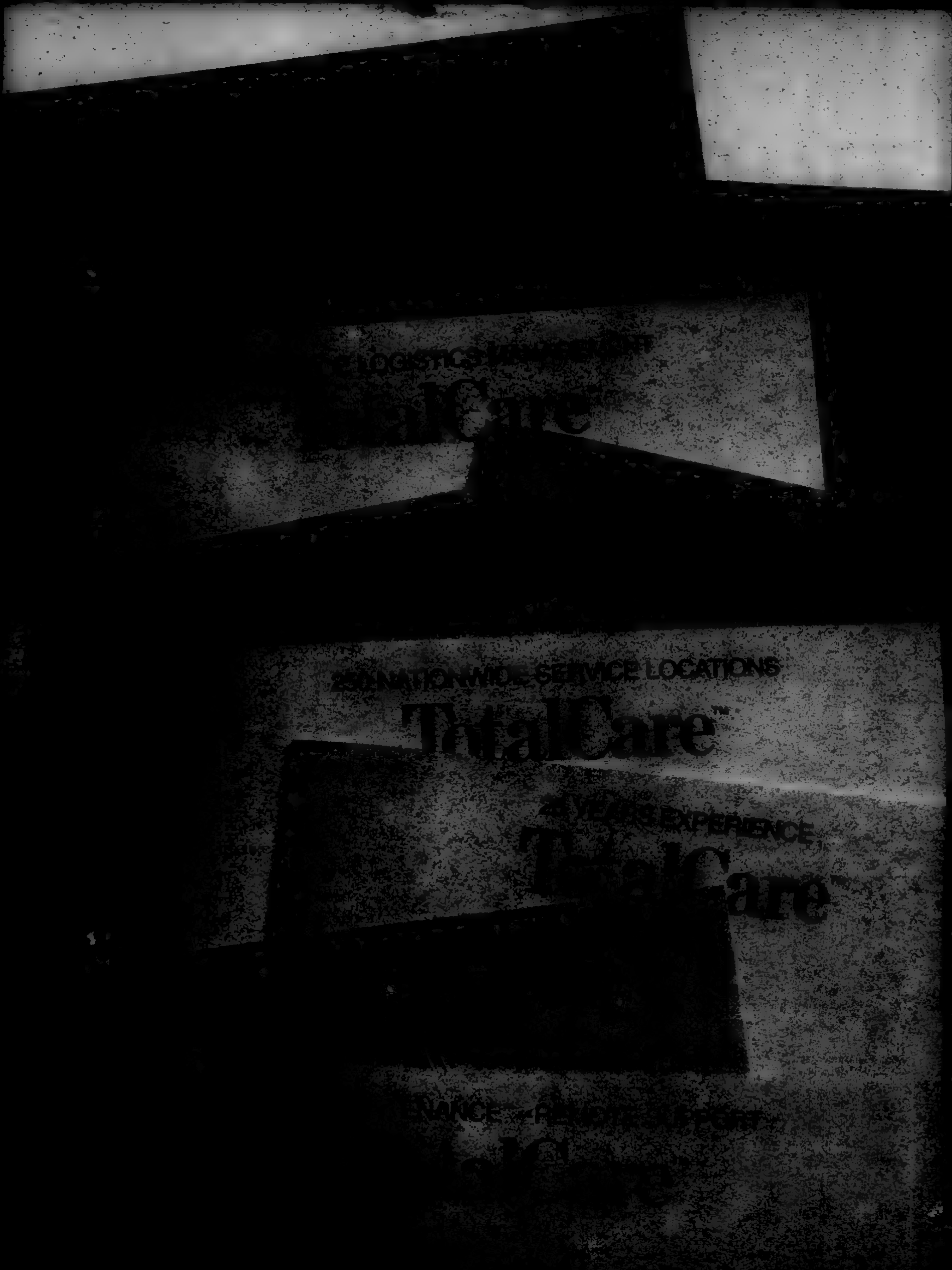
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TOOLS OF THE TRADE

By Paul Korzeniowski

Six years ago, corporate pilgrims were lured from a land of calculators and mainframe-produced, green-line paper reports to a new world of microcomputers. There, the pioneers discovered an abundance of white-collar riches.

Electronic spreadsheets swiftly manipulated rows and columns of numbers and allowed managers to examine a number of hypothetical budgets.

With a data base manager, an administrator could store records of department purchases and quickly find the name of the typewriter ribbon supplier. Word processing software allowed even the one-finger typist to compose a memo for his supervisor. Using communications software, a stock analyst could capture stock market information and insert it into his spreadsheet.

As word spread of the riches the new world offered, many joined the pioneers. Others were content with the calculators and mainframe tools.

Today, the pioneers are further extending the microcomputer software frontier. Classes of software that do not fall under the mantle of the four traditional applications are being explored. These applications consist of project management, presentation graphics, outline processing, desktop managers and "mindware."

The explorers are few. But many companies are still attempting to convince workers to supplement the green-line reports and calculators.

While some question what riches the new frontier offers, others are convinced that its benefits are so great that old-world hard-liners will be lured to the new world.

Project management

For years, mainframe project management software has been available. Slowly, it is moving into the microcomputer arena. Project management packages allow a user to break a project, whether it be building a hotel or developing an application, into a series of steps. Each step's cost, deadline and necessary resources (material and personnel) are entered into a micro.

Using critical path analysis or Gantt chart techniques, the software illustrates a project's progress and monitors resources and costs.

Although microcomputer project management packages have been available for a few years, they have yet to gain a foothold in most corporations. "We have some interest in project management packages," Ron Goldfarb, manager of office automation at Pratt & Whitney Aircraft Group in Hartford, Conn., said. "I expect it to increase as these packages get better."

First-generation project management packages were limited by storage space (most run in 256K bytes of random-access memory) and by the weak processing power of the IBM Personal Computer. "Most packages did little other than automate a manual task," according to James Haner, an indepedent microcomputer consultant with Dynacomp in Palmdale, Calif.

"The user did not gain the ability to perform 'what-if' calculations that make microcomputer packages useful." Other limitations are the packages' slow printing speeds, less than adequate documentation and non-user-friendly features.

Some of these limitations are being overcome. "There has been a fundamental change in project management packages," said Richard Strauss, vice-president, products at Corporate Software, Inc., a Waltham, Mass., software distributor. "At first, packages only tracked one project at a time. Now, there are packages that monitor a number of people and a number of projects. That capability is what most managers require."

But even with initial limitations overcome, it is not clear how many people will buy project management packages. "There is a big market for project management," Strauss claimed. "Now, it is used primarily by the MIS manager and has yet to hit other markets."

Robert Lefkowits, director of microcomputer system software research at Infocorp in Cupertino, Calif., disagreed, "Project management is still a solution looking for a problem. It has been available on mainframes for 15 years and it hasn't been popular. Some people use it but most do not have the discipline or the need for it."

Presentation graphics is another emerging software category that has been available for a few years. With Lotus Development Corp.'s 1-2-3 came the ability to transform a spreadsheet budget into a chart or graph. "We had been pushing presentation graphics for two years without much success," Goldfarb said. "It is only recently that

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Micro managers lament missing links

While software manufacturers have been busily developing new categories of software such as outline processing and "mindware," microcomputer managers continue to search for a complete micro-to-mainframe link.

"Despite all the hype, we are still missing the complete link that would allow a user to access data regardless of where it resides and easily insert it into a package like [Lotus Development Corp.'s] 1-2-3," noted Ron Goldfarb, manager of office automation at Pratt & Whitney Aircraft Group in Hartford, Conn.

The absence of this link has prevented many corporations from effectively integrating mainframe and microcomputer data.

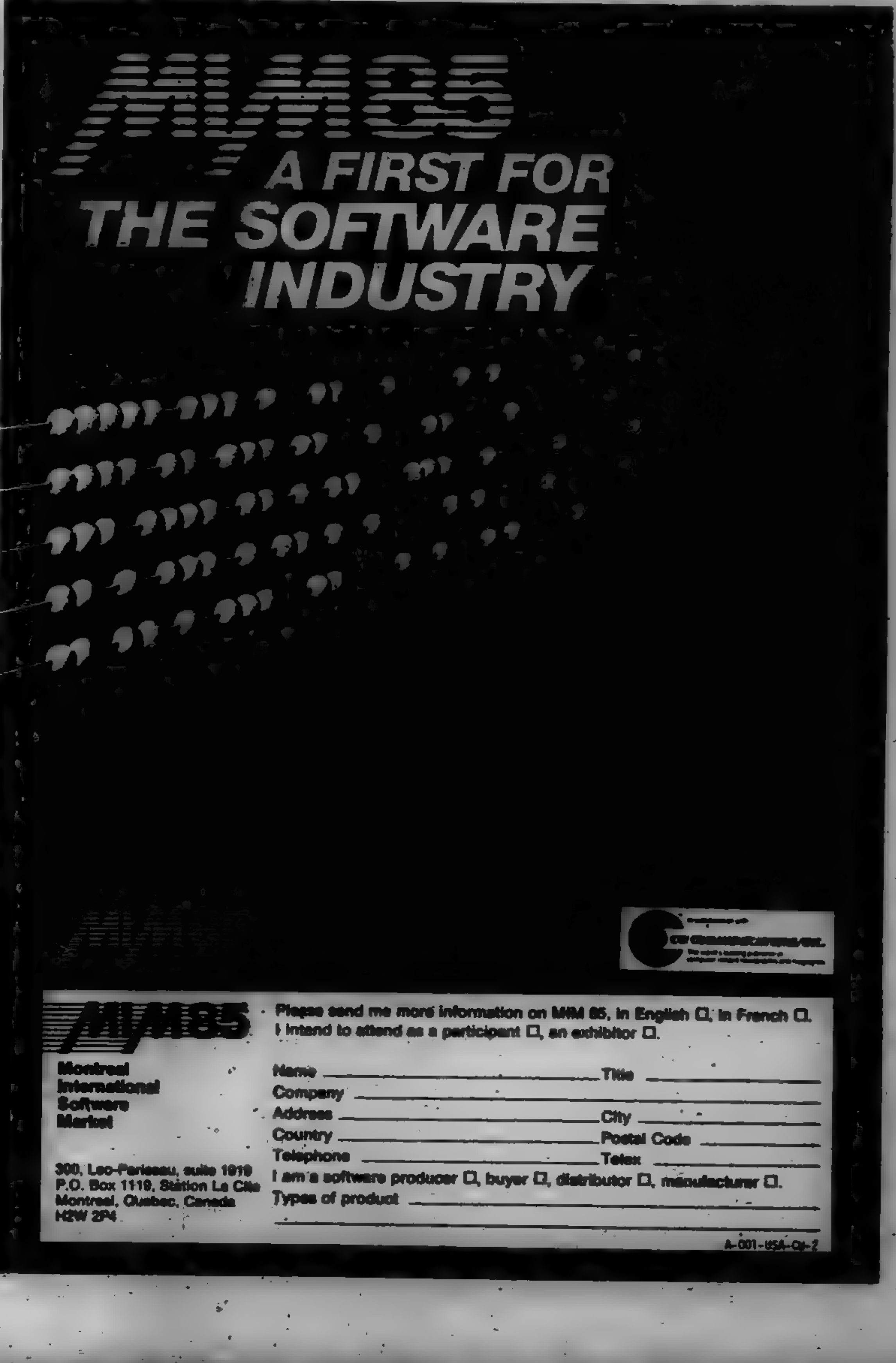
'Little true downloading'

"There is little true downloading taking place," maintained Alan Gross, technical planning specialist at New York-based Smith Barney Harris Upham Co.

"It is just too difficult. What companies do is take summary data from mainframe reports and load it into microcomputer applications. The microcomputer does not complete any ad hoc analysis or determine what data should be extracted from the mainframe."

Advances have been made, however. "The physical connection is there," Gross noted. "What is lacking are better tools for formatting data into and out of a utility like Software Arts, Inc.'s Data Interchange Format."

Goldfarb noted, "A product like [Information Builders, Inc.] Focus works well with PC Focus, but it doesn't work with many other packages. The user does not want a link for each package."



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demand has increased. We just completed a survey of our users and presentation graphics was one item they were very interested in."

For interest to continue to mushroom, hurdles have to be overcome. "Current presentation output is just not high quality," Lefkowitz maintained. "Most systems are good for in-house use. But we are having 300 analysts at a conference and would not think of using a microcomputer package for that presentation."

The chief problem with microcomputers is the lack of powerful output devices. Rather than working with microcomputer devices, many companies turn to dedicated presentation-quality output devices. "We have our graphics work done in-house with our typesetter," stated Steven Machlis, microcomputer consultant in the reasearch and development group at Goldman Sachs & Co. in New York.

A slew of new devices is being introduced to increase microcomputer output quality and flexibility. Some products transform a photograph into computer input and others allow a computer to replace a facsimile machine. The device that user firms seem most interested in transforms a screen or a report into a slide.

These machines may perk interest in presentation-quality output. "I think that demand for packages that produce simple bar and pie charts will remain the same in 1985," Maureen Fleming, manager of software research at market research firm International Resource Development in Norwalk, Conn., predicted. "But I think that [the] new products [that] work with image-processing devices will experience a boom."

With an outline processor, a user constructs a hierararchy of ideas and is able to randomly mov items so that relationships may become clear. The concept of the package is difficult to grasp. Dave Winer, president of Living Videotex, Inc. in Mountain View, Calif., was unable to describe succinctly Videotex' Thinktank and urged potential users to play with it before trying to determine exactly how it worked.

Outline processing is one of the key features that Ashton-Tate has touted for its Framework package. The company has stated that people work in outline rather than spreadsheet fashion.

Therefore, spreadsheet users may not find outline processing helpful. "Our users are number crunchers and need spreadsheet facilities rather than idea processing," Machlis claimed. "Outline processing is just not relevant to financial workers. With a package like Framework, there is not enough memory to store calculations and work with the outline processor."

Rather than forging a new category of software, outline processing may merge with word processing. "There is a huge market for outline processors tied to word processors," Fleming said. "An outline processor can be sold, like a spelling checker, as a utility."

While outline processors can be used to attempt to order one's thoughts, desktop managers unclutter one's desk. Most packages provide notepad, Rolodex, calculator and automatic telephone dailing facilities. Rather than working as a standalone application, they run in background and are available at the touch of a keystroke.

"There is a big market for desktop software," Fleming said.

Strauss disagreed. "Desktop organizers are nice gadgets, but they are not very useful," he said.

Mindware is a loosely defined category of software that sharpens personal skills. "Unlike other packages that allow one to delegate work to a subordinate, mindware cannot be delegated," William Zachmann, vice-president at International Data Corp., a Framingham, Mass., market research firm, said.

The reason that mindware cannot be delegated is that its output depends on the user's input. For example, Human Edge Software Corp.'s The Sales Edge asks a user a number of questions about himself and his perception of a potential client. The software then produces a printout coaching the person on the best approach for the client.

Other packages claim to help sharpen managerial, decision-making and sales skills.

Zachmann predicted that mindware will be one of the most dynamic areas of innovation between now and the end of the 1980s.

Other analysts do not deem mindware capabilities significant. "For a number of reasons, I don't think that these packages will be popular," Strauss suggested. "Usually, these packages have to be approved by a worker's supervisor, and I do not think that most workers are going to ask their boss for a package that teaches them how to do their job. Also, most people do not have the time to learn how to use these packages. Few people believe that a computer can do their job better than they can."

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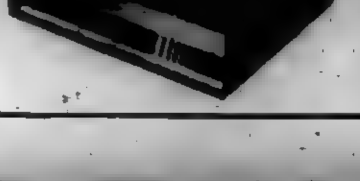

LATE FOR DINNER

By David Olmos

'Japan's prime target today is the DP industry. Domination of the semiconductor market in the U.S. is only a part of an overall strategy that intends to gain control of the computer industry in this country. Clearly, IBM and every other computer manufacturer in the U.S. are under attack.'

— Charles E. Sporck, president of National Semiconductor Corp., in remarks to a Los Angeles gathering of securities analysts, as quoted in *Computerworld*, March 27, 1978.

For years, there have been dire warnings that Japan will one day come to dominate the U.S. computer industry much as it has the steel, automobile and consumer electronics industries. Japan's computer companies, often reaping the benefits of American technology, have, in fact, made great strides in a short time, rapidly narrowing the huge technological lead the U.S. enjoyed in the 1960s.

Although Japanese companies have had considerable success selling semiconductors, storage devices and other peripheral equipment in the

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THE JAPANESE

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U.S, their efforts to crack the microcomputer and large-systems markets have fallen short of many peoples' expectations.

The Japanese share of the $40 billion American computer market, the world's largest, rose to 5% in 1983 from 3% in 1982, according to U.S. Department of Commerce figures. Looked at another way, IBM Japan still does as much business in Japan as all the Japanese companies combined do in the U.S. That modest gain in market share, however, came as Japanese imports of computers, peripherals and subassemblies to the U.S. last year rose 65% to $1.8 billion, creating a bilateral trade deficit of nearly $1 billion.

In general, the Japanese have not done that well in penetrating markets outside the Pacific Basin. Outside that region, they have captured about 10% of the information processing market. American computer firms still control about 75% of the computer market in noncommunist countries, according to International Data Corp. (IDC), a Framingham, Mass., market research firm.

Race for supremacy has just begun

Although the Japanese have definitely made their presence felt in certain segments of the American market, their overall progress has resembled more the slow and steady tortoise than the speedy hare that some experts had expected a few years back. But, then, some would say the race for computer supremacy has just begun.

"The Japanese are here today, but it's not in the way we all thought they'd be," said Matt Meehan, a computer industry analyst with Salomon Brothers, Inc. in New York. "They're here in the sense that they're supplying a lot of the peripherals. When you open up the guts of a computer, you see that a lot of it is Japanese-made."

With some exceptions, Japanese companies have been unsuccessful in marketing computer systems under their own brand names in the U.S. Most of their success has come through relatively less profitable original equipment manufacturing agreements or joint ventures with American firms. One such partnership is that between National Advanced Systems, Inc. (NAS) and Hitachi Ltd., in which NAS markets Hitachi's large-scale computers in the U.S.

If Japanese technology has caught up or surpassed American technology in many areas, then why haven't the Japanese been more of a force in the U.S. market? According to interviews with industry analysts, representatives of U.S. and Japanese computer manufacturers and others, the explanations include weaknesses in Japanese software, lack of American distribution channels, unfavorable market-entry conditions and cultural differences.

The list is long of U.S. manufacturers of IBM plug-compatible mainframes that have fallen by the wayside trying to compete against IBM's technical and marketing muscle: Magnuson Computer Systems, Inc., Storage Technology Corp., Spartacus Computers, Inc. and Trilogy Systems Corp. As their ranks have thinned, some U.S. manufacturers such as Amdahl Corp., NAS and Honeywell, Inc. have looked to the Far East for help in battling Big Blue.

Japan's three largest mainframe producers — NEC Corp., Fujitsu Ltd. and Hitachi — have all formed alliances with U.S. distributors to market their large systems. NEC has teamed up with Honeywell, Inc., Fujitsu with Amdahl and Hitachi with NAS.

'Japanese not copying anymore'

This increase in joint-venture activity is a clear sign of the growing sophistication of Japanese technology, said John Alic, a researcher in the U.S. Congress' Office of Technology Assessment and project director of the agency's 1983 study on international competition in the electronics industry. "The Japanese clearly are not just copying anymore," he said.

The NEC/Honeywell deal helps illustrate how things have changed in the computer industry. More than 20 years ago, NEC started selling Honeywell mainframes in Japan. NEC eventually began building its own hardware; today, its S-1000 mainframe is able to outperform Honeywell's top-of-the line system by some 40%.

The U.S.-Japan partnerships have advantages for both parties. The American companies gain access to Japanese hardware that, according to most accounts, is at least as fast and reliable as IBM's. This allows U.S. firms to stay in the race with IBM and hold on to their large-system customers without incurring huge development costs of their own. The Japanese, on the other hand, are able to expand their worldwide installed base and gain a greater presence and recognition in the U.S.

Ed Shimbo, chief operating officer of NEC Systems Laboratory, Inc., the market research arm of Boxboro, Mass.-based NEC Information Systems, Inc., said the requirements of his company and Honeywell "just fit each other." "NEC has hardware, but we don't have any software in the U.S., and we also don't have any sales or maintenance channels here," he said.

To date, however, these alliances have failed to wrest much market share from IBM. "It's pretty clear they are not a major participant in that area by any stretch of the imagination," noted Jack Hart, director of Pacific operations with IDC.

According to IDC figures for 1983, the total U.S. installed base of Amdahl/Fujitsu and NAS/Hitachi mainframes was 880. That compares with

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9,500 mainframe installations throughout the U.S., 5,700 of which are IBM's.

But the American Electronics Association (AEA), the Palo Alto, Calif., trade association, views the Japanese advances in the mainframe market in another light. Ralph Thompson, the association's executive vice-president, believes the Japanese presence in the mainframe market is significant when cast in terms of bilateral trade, a subject of much concern to the AEA. "I think you'd be shocked to find that we've moved into, if not parity, then a negative" bilateral trade balance in the mainframe area, he said.

Nevertheless, some analysts believe the Japanese companies, helped by the sales and service arms of their U.S. partners, will continue to provide competition for IBM. "[The Japanese] are the only ones who are going to be able to compete against IBM in the IBM mainframe business," Salomon Brothers' Meehan said. "And they'll probably do decently in the supercomputer business; but that's a niche market."

Tiny market or not, the Japanese efforts in supercomputers have been viewed with concern by American computer companies and the American government.

This concern has been prompted largely by the significant military applications of supercomputers. Supercomputers also are being increasingly used for scientific and technical applications.

Japan's national supercomputer program has as its reported goal the development, by 1989, of a machine that would be anywhere from 100 to 1,000 times faster than the fastest American supercomputer that now exists — the Cray Research, Inc. XMP machine. Fujitsu recently became, through an agreement with Amdahl, the first Japanese company to begin marketing its supercomputers in the U.S.

The microcomputer market was one area in which the Japanese were expected to repeat the winning strategies they used to dominate the consumer electronics markets. It was only a matter of time, some predicted, before the legendary ability of Japanese manufacturers to turn out smaller, faster, cheaper and more reliable products would erase U.S. supremacy in this area.

Japanese micro invasion

But the Japanese micro invasion hasn't happened — at least not yet. Japanese vendors have captured only a 5% share of the U.S personal computer market, according to Future Computing, Inc. a Richardson, Texas, market research firm.

However, when Japan's 36% share of the U.S. peripherals market is taken into account, Japan comes in with a 22% share of the total U.S. personal computer and peripherals market.

Much of the Japanese success in this area has been in home computers and portable computers rather than in business systems.

Among the commonly cited explanations for Japan's less-than-glittering performance in personal computers are a lack of software, inadequate avenues of distribution and a general failure to understand the American market.

Asked to compare his company's success in televisions, videocassette recorders and stereo equipment with personal computers, Kazuya Hanazuka, a spokesman for Hitachi Ltd. in New York, said: "In the other areas, it didn't require any software for us to be successful."

But some suggest that software may only be a temporary Achilles' heel for the Japanese. Hanzuka noted, for example, that Hitachi has more than 20 software houses in Japan that are developing programs for personal computers, robotics and other applications.

"It is almost unknown to American companies, but almost every week a new Japanese software house announces that they will export software from Japan to the U.S.," said John Stern, senior representative in the AEA's Tokyo office, which opened this year.

"While [noncustomized] Japanese software is not as deep or broad as U.S. software," Stern added, "in certain areas it's very good and fully competitive."

Some observers suggested that the Japanese companies are taking a cautious approach, waiting for the dust to settle in the micro shakeout.

"Every textbook or Harvard Business School case says this: The Japanese wait until the market matures, until there's stabilization, and they can move in and make things smaller, better, faster, cheaper," said the Salomon Brothers' Meehan. "We haven't gotten to that point yet, and I don't know if we'll ever get to it."

Weak marketing strategy

Marketing is cited as another weakness in Japan's personal computer strategy. "I don't know of any Japanese companies that are starting from a marketing-oriented approach, a customer approach," noted Leslie Latham, a former U.S. marketing executive for microcomputers at a leading Japanese electronics company. "They still have not learned that the reason why companies such as IBM have been successful is not because they have a superior product, but because they have been concerned with the customers' needs."

For that reason, some Japanese companies have again sought out American partners to provide sales and service. Mitsubishi Electric Co., for example, has signed private-label agreements with both Sperry Corp. and Leading Edge Corp. to market its IBM Personal Computer-compatible business computer in the U.S.

One company representative contended, however, that the Japanese have not failed in the personal com-

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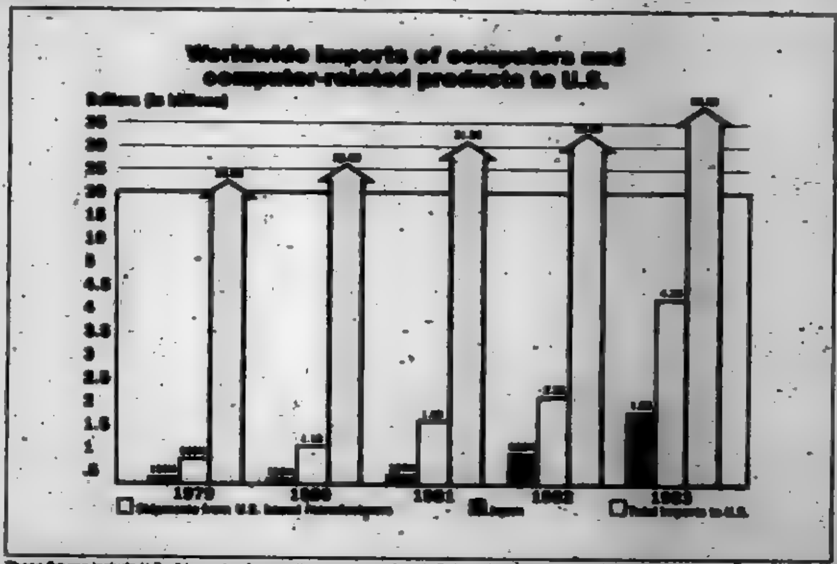

These figures include U.S. shipments of computing equipment from U.S.-based manufacturers. Also included in these figures is equipment shipped by U.S.-based subsidiaries of foreign vendors. (CW chart; U.S. Department of Commerce data)

puter area, but instead have been patiently following a carefully planned business strategy. Ed Schaider, director of marketing for Fujitsu's Professional Microsystems Division, which sells the Micro 16 business computer in the U.S., explained his company's strategy for entering the American market. He said the company waited for the market to mature, identified a specific segment of that market, provided a "very high-quality" product and an "unusually high level of vertical integration.

"Fujitsu will continue to watch the U.S. marketplace," Schaider said, "and as it matures, you'll find Fujitsu."

No one can say for sure when or if the Japanese will make a major move into the microcomputer market — or what niches within that market they will target. But one thing is certain: It's too early for American companies to relax.

"These are huge companies with tremendous resources, and they're going to be around for awhile," noted Peter Teige, a Dataquest analyst. "They don't need to take any drastic measures to move into the U.S. market. . . . In the next several years, they will keep the pressure on and try and make something happen. Their track record in everything else seems to indicate they could successfully do that."

If there is one area in which the warnings of Charles Sporck, National Semiconductor Corp.'s president and chief executive officer, have come to pass, it is in semiconductors.

"The Japanese are doing very well. They are making steady market-share incursions," said Michael Gumport, an analyst with Paine Webber, Inc. in New York.

The Japanese share of the U.S. semiconductor market has been growing steadily. According to the Semiconductor Industry Association, a San Jose, Calif., trade association, the Japanese will have close to 14% of the U.S. market in 1984, up from 13% in 1983 and 10% in 1982. Gumport , however, said his data shows the Japanese market share will hit 16% to 19% in 1984.

Worldwide, the Japanese are said to have captured about half of the 64K-bit random-access memory (RAM) market and most of the emerging 256K-bit dynamic-RAM market so far. Gumport said the Japanese should have about 40% of the world market for 1984, up from 34% two years ago.

The U.S. trade deficit with Japan in integrated circuits ballooned from $327 million in 1982 to $481 million in 1983. Commerce department figures show that the U.S. imported $681 million in integrated circuits from Japan in 1983, compared with $446 million in 1982. U.S. exports to Japan totaled $200 million, up from $119 million the year earlier.

U.S.-Japan tensions cooling

The trade battle between U.S. and Japanese manufacturess has been one of the hottest in the computer industry. Yet despite the U.S.' negative trade balance and continuing complaints from American companies that Japan is not allowing access to its domestic market, tensions overall seem to have cooled.

Sheridan Tatsuno, an analyst with Dataquest, attributed the easing trade tensions to the growing internationalism of the industry. U.S. and Japanese vendors have set up chipmaking plants in each other's countries, in Europe and elsewhere. Moreover, U.S. and Japanese cross-licensing and second-sourcing agreements are on the rise. "It's gotten to the point now that if you don't have a partner, you don't survive."

The change Tatsuno refers to is evident in the 1983 agreement between Oki Electric Industry Co. and National Semiconductor Corp., a company for which such a deal would have been unlikely several years ago. National Semi signed a second-source pact with Oki under which the U.S. firm manufactures 64K-bit RAM chips based on Oki designs.

"It's pretty simple," Tatsuno reasoned. "If you have a [foreign] partner, it's not nice to bash their country."

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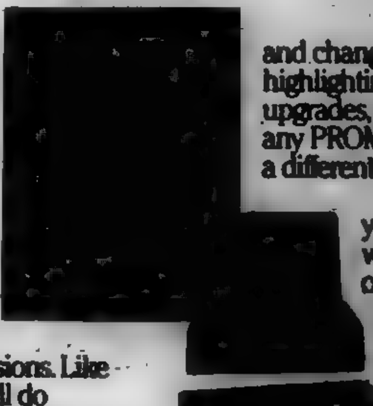

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While mulling over a computer system change a few years back, National Can Corp.'s chairman and chief executive officer raised a question: Should we buy from an American company whose products are partially made by a foreign firm and whose ownership is part foreign?

National Can had already seen one U.S.-Japanese partnership turn sour. The company was using a TRW-Fujitsu Co. TFC-8610 series computer, when Fujitsu Ltd. bought out TRW Corp.'s share of the venture and pulled the series from the market.

Despite some concerns, the Chicago can manufacturer eventually decided to purchase a system from Amdahl Corp., a company in which Fujitsu, Japan's No. 1 computer maker, has nearly a 50% interest. Fujitsu makes almost half of Amdahl's 580-series machine and also markets its own supercomputers through the American company.

Donald Brungard, MIS director at National Can, said he would prefer to buy from a vendor whose products are primarily American-made. But "when push comes to shove," he explained, the company will deal with a foreign vendor if the price/performance criteria are right.

"At our company," Brungard said, "costs are so important that what we say is, 'Let's go look at the market, find the best technology and see what the prices are. If there are no dramatic differences in technology, then it doesn't matter where it comes from.'

"In the Amdahl system, we were buying such additional horsepower that we could demonstrate it would last at least one year longer and . . . would mean a substantial savings above and beyond IBM, for instance," he said.

Other MIS managers, who in recent interviews were asked their thoughts on Japanese equipment, offered views similar to those expressed by National Can.

'We really don't care who it's made by as long as we get a good box that will perform well.'

— Glenn Broom, MIS director, Acme Boot Co.

"We really don't care who it's made by as long as we get a good box that will perform well," said Glenn Broom, MIS director for Acme Boot Co. in Clarkesville, Tenn. Acme Boot has an Amdahl 470V/5-11 system. Broom said some of the components of the Amdahl system are made by Fujitsu.

The computer center at the Federal Bureau of Investigation includes systems from a variety of vendors, including IBM and National Advanced Systems, Inc. (NAS), a Mountain View, Calif., company that markets computers made by Japan's Hitachi Ltd.

"My personal feelings are that it doesn't matter to us whether [the computers] are from an American or foreign company," said Kier T. Boyd, deputy assistant director of the FBI's Technical Services Division. "We're very satisfied with our NAS systems."

Henry Kee, vice-president for personal computing at Chemical Bank in New York, said he has not seriously considered the business computer offerings of Japanese vendors because of what he called their lack of software and inability to integrate with other office system products.

Kee claimed the Japanese have been too late in responding to the rapid changes in the American micro market. "If you look at some of the CP/M [operating system] machines offered today by many of the Japanese manufacturers," he said, "they are very high-quality, excellent for the dollar, but no one cares anymore."

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BORN AGAIN

By James Connolly

The title is manager, as in business executive, administrator or director. Telecom is just that manager's specialty.

Certainly, the telecommunications manager of 1985 needs experience with — and an understanding of — communications. But the successful telecommunications manager will be one who optimizes management skills such as analysis, planning, human relations, marketing and accounting — not the one who sells an ability to reroute a private line.

"This isn't the techie manager anymore," observed Gary R. King, manager of telecommunications for Gillette Co. in Boston. King, other telecommunications managers and consultants spoke of how the role and the makeup of the telecommunications manager are changing in American business.

They spoke of the demands that the breakup of AT&T, the integration of voice and data communications, the emergence of new equipment and service vendors, a population explosion of personal computers and technical breakthroughs have placed on the telecommunications manager.

"In general, the telecommunications manager of the future is going to be a very new type of animal, a very different

Continued on page 88

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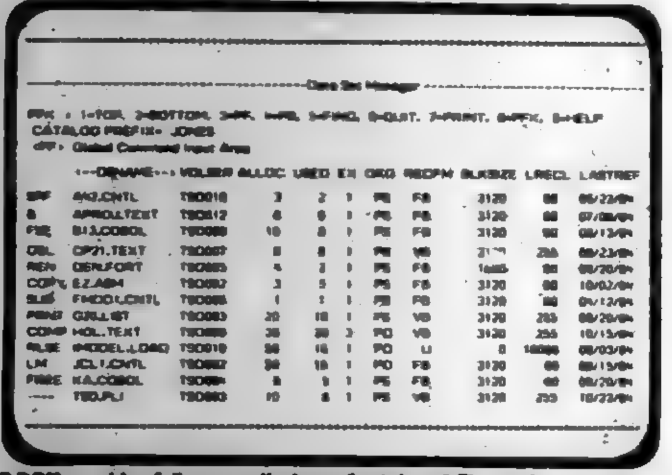

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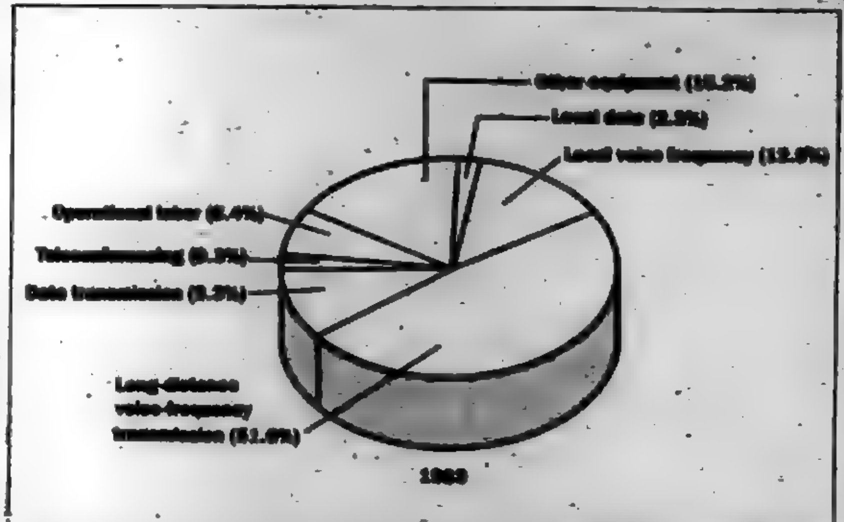

NETWORK EQUIPMENT TECHNOLOGIES CHART

Long-distance voice communications costs still eat up the largest portion (51.6%) of a telecommunications manager's budget, according to a survey of 200 large organizations.

Continued from page 85

person. The [focus] is shifting to a definite business manager emphasis. That should be complemented by a fair amount of technical expertise but at the conceptual level rather than at the bits and bytes level," King noted.

While many organizations do not have someone carrying the title of telecommunications managet, many do have an executive who fits into that general role — a person responsible for buying private branch exchanges and protocol converters, coordinating a nationwide network of private lines, planning for corporate headquarter local-area networks and cutting communications costs.

That person must be able to judge new technology and assess the risks and benefits for a multinational corporation.

That person may have climbed the ladder in telephony or MIS or may have come from the administrative side of the corporate structure.

The titles may vary, but the essential assignment remains the same — to let the terminal access the mainframe, the mainframe talk to the micro and the boss' telephone in Dallas reach out to touch the district manager in Coeur d'Alene, France.

"What I see as really helpful are basic administrative, management skills with experience in design and system analysis and a good mathematical facility. A good number of things that we are doing depend on analysis and statistics. A degree in electrical engineering would be helpful, but I know very few people who have that," said Seth Lewis, project manager for voice communications at Home Insurance Co. of New York.

"There is much more involvement in the data network as it becomes more widespread and more sophisticated. It used to be that if someone wanted a line from New York to Los Angeles, you just called to order it, and a few weeks later it was in. You can't do that any more. Since the AT&T breakup, it isn't that simple. The transmission vendors have proliferated extremely rapidly in the last year or two, and it is tough to keep up-to-date with the tariffs and with what you can or can't do," Lewis added. Lewis' responsibilities include coordinating headquarters voice communications, as well as purchasing and planning field office communications equipment and purchasing data communications equipment for headquarters.

Personal computers mean increasing demand for ports to mainframes and for the ability to communicate with other personal computers, said Frank Haddon, a senior engineer for Southern California Transit in Los Angeles.

"I think everyone is aware that there is a continuing acceleration of the business. Things are happening at a faster rate. I don't see any easing of that, at least not completely, for 10 to 15 years downstream when the technology might start to level off," Haddon said.

"Telecommunications is coming out of the closet," King added. "It is no longer going to be a cost center and an expense to be put up with. In some companies, it is even going to be a strategic asset."

Running a communications department now calls for a proactive approach, observed Chuck Hlavac, telecommunications manager for Crowley Maritime Corp. of San Francisco.

"At some large companies, they have 19 or 20 people doing nothing but planning. They are looking three years ahead. In the past, it was always a reactive situation. You want to be able to get a handle on things so you can control them," Hlavac said. He said that he hopes his planning can save $250,000 in a department with a $4 million budget.

King added, "The next three to five years essentially will be an era of opportunity for the telecommunications managers to make their mark, and I think that those who work for corporations that use telecommunications as an asset will be integrated into the decision-making process and will contribute to the businesses' strategic planning."

But that type of manager may be hard for a company to find, which translates to a comfortable financial position for those who qualify.

Managers and consultants estimated that a telecommunications manager's salary ranges from $40,000 to $100,000, depending on the size and location of the company and its degree of reliance on telecommunications. A Fortune 500 firm that is heavily dependent on communications and located in a costly city such as New York would pay the highest.

There also is room for career growth.

"I think you will see the telecommunications manager moving up the ladder in organizations very consistently now. You will see them having

Continued on page 90

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Self-education a job for communications managers

Vendors, trade journals and seminars are the key means for telecommunications managers to learn about and to stay on top of what is happening in their field.

But each of those sources provides only one more bit of information that goes into the decision-making process when a telecommunications manager is shopping for a product or setting a policy. The information process is largely one of self-education, according to telecommunications managers.

"I was out of data communications for several years, so it was a problem for me when I took this job. You lose track of things. I was forced to grow, to learn more in the data communications area," said Chuck Hlavac, telecommunications manager for Crowley Maritime Corp. in San Francisco.

Hlavac noted that IBM's Systems Network Architecture/Synchronous Data Link Control protocol and AT&T's Digital Data Service had largely developed during the seven years he worked on voice communications for another company. Hlavac recently invited a data communications specialist to address a class that he teaches in Golden Gate University's graduate telecommunications program. "I sat in the back of the room and learned in my own class," he said.

Several managers noted that vendor sales representatives are helpful not only in promoting their own products but in helping managers understand concepts and communications issues.

They also said they and their staffs attend career training seminars, which may be held in their own facilities for a group of employees or at conference centers with staff members from a dozen or more companies in attendence.

One consultant who teaches communications seminars to people entering the field from both the telephony and DP ends of the business said his biggest challenge is making traditional DP workers understand that communications is bringing DP out of the computer room.

"We have to get them thinking in terms of a network, the communications cloud out there, instead of a box," said Ben Chillemi, of Zatyko Associates in Tustin, Calif., which runs seminars for Data-Tech Institute of Nutley, N.J.

Meanwhile, several managers said graduate school-level training is missing, with few colleges offering degrees in telecommunications.

"I'm amazed that the universities seem to have almost totally neglected telecommunications as a field. I think it may be because they see it as too application-specific," said Frank Haddon, senior engineer for Southern California Rapid Transit.

Hlavac noted that even the existing programs, such as those at Golden Gate, New York University, the University of Colorado and George Washington University, tend to approach the field from different angles. He said some schools may take engineering-oriented tracks and others management tracks. Those different approaches lead to sharp inconsistencies in how much potential managers know about the varied aspects of telecommunications.

No consensus on favoring voice vs. data

Who gets ahead in telecommunications? The voice specialist? The data specialist? Neither?

There was no consensus among telecommunications managers and consultants interviewed by *Computerworld*, but all agreed that the telecommunications manager of the future will approach the information exchange process as a single entity — not as voice or data communications — and will think in terms of what is best for the organization, not a single department.

"The guy who was a programmer and is now the MIS manager, just trying to hold his bits and bytes together — he's in trouble," said Ben Chillemi, a Tustin, Calif., consultant. "From the seminars I teach, the guys who have a voice background have a clearer picture of how information is moving around out there."

Stephen J.L. Page, president of Page-Wheatcroft & Co. Ltd., an executive search firm in Dallas, said technicians from both sides will lose out if they do not concentrate on the job's management aspects.

Seth Lewis, project manager for voice communications at Home Insurance Co. of New York, concurred. "Neither has the advantage. If someone has totally stuck to the voice side or the data side, they run the danger of being too limited. The edge goes to the person who has some knowledge of the other side as well. If you had to choose between just those two, then it would be a toss-up on their management skills," Lewis said.

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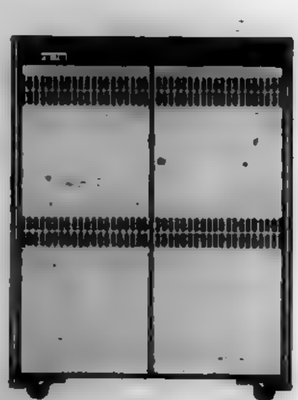

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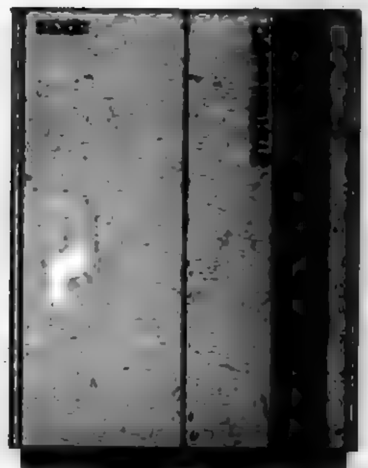

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Price war looms on telecommunications horizon

No major technical breakthroughs are likely in communications during 1985, but watch for a long-distance price war.

That warning came from one of several telecommunications managers and consultants asked for their thoughts on what will happen and what they would like to see happen in the coming year. "In 1985, we will see a long-distance price war really get rolling. AT&T will use predatory pricing as much as it can get away with. I suggest that telecommunications managers keep their powder dry, keep their commitments short-term and exploit the price wars," said one observer, who asked to remain anonymous.

Frank Haddon, senior engineer for Southern California Rapid Transit in Los Angeles, noted, "A magic lantern would help. I don't know of a single thing that would make life that much easier. Protocol conversion is a headache at this time, but I know that five years from now we will have black boxes that will take care of it for us."

Gary King, manager of telecommunications for the Gillette Co. in Boston added, "I want true compatibility among workstations, networks, nodes and all devices. They just aren't as compatible as the vendors promise. I think that would be the single most important thing in helping me to do my job. I also believe that that is unattainable. The major vendors will avoid it. It's just not in their best interest."

King predicted that in 1985 more vendors will keep some of the promises that they have made in recent years about their products' capabilities and said that he hopes the Federal Communications Commission will establish a policy on local bypass. Chuck Hlavac, telecommunications manager for Crowley Maritime Corp. of San Francisco, said he hopes more companies confide in their telecommunications managers when making major corporate decisions.

He noted that a company planning an expansion or relocation should remember that a private branch exchange installation or other major project takes many months of planning and site work and that the telecommunications manager not only needs warning of a move but can help to make the corporate decision.

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Continued from page 86

peer status with the traditional data processing executive, and it won't be unusual to see them reporting to the senior vice-president for operations, two steps below the president," said telecommunications consultant Dixon Doll, president of the DMW Group, Inc. in Ann Arbor, Mich.

Doll said the rewards for making communications an asset could include a promotion to officer of the company and a salary in the $125,000 to $150,000 range.

Telecommunications manager profile

Stephen J.L. Page, president of the Dallas executive search firm Page-Wheatcroft & Co., specializes in finding telecommunications personnel. "Corporate America and the Fortune 1,000 companies are going to be demanding more and more sophistication from their telecommunications managers," he said. "We are seeing a greater trend toward lumping all of the functions relating to office automation into telephone and data communications and integrating them under one corporate manager. These are real [profit-and-loss] managers, and they are going to have to be business people first," Page said.

Page painted the profile of a telecommunications manager as a person in his late 30s or early 40s with a knack for managing a business unit and the ability to develop a peripheral technical knowledge during about 15 years of pragmatic experience. The person may be a "techie" but must show other business-management skills.

"There will be a shortfall of talent for years to come because the technology is changing so rapidly. [Telecommunications managers] have a rosy, dynamic future. The operational savings they can identify by having a well-run communications department can make them very valuable," Page said.

Page said the telecommunications manager can rise to executive vice-president on the strength of an overall knowledge of how the company operates.

Doll, however, warned that telecommunications managers are in danger of being barred from the president's office because they do their jobs too well. He said that once they establish themselves in communications, they may be too hard to replace and too valuable to move laterally into the financial or administrative positions where they need to acquire experience in order to qualify for the top corporate job.

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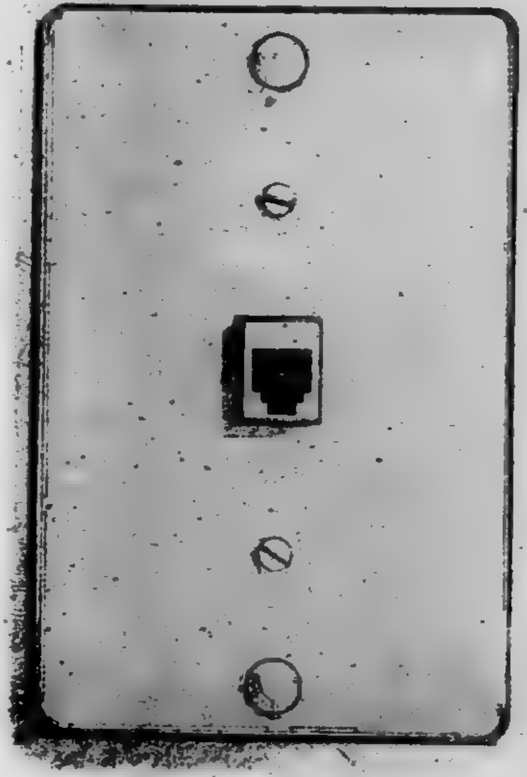

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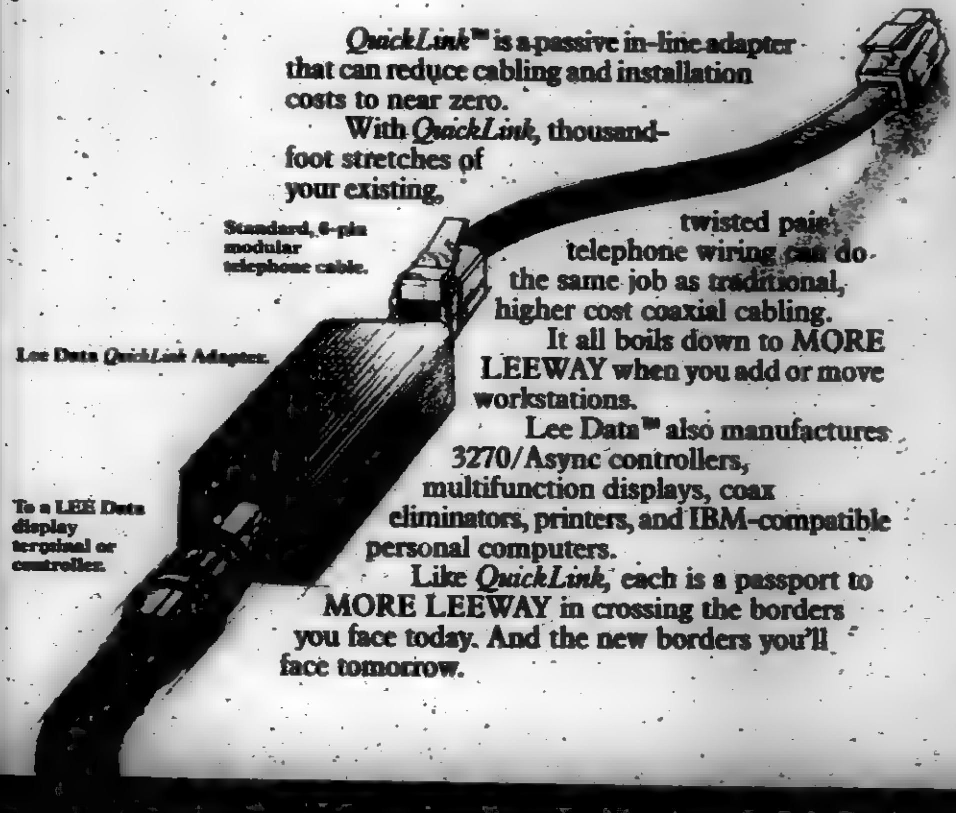
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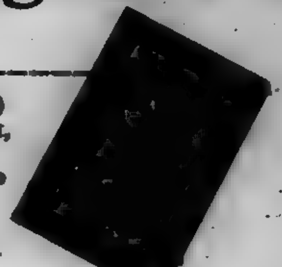

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WHAT'S NOT

By Charles Babcock

In an age when breakthroughs in microcircuitry technology are taken for granted, MIS managers are spending little time worrying about hardware and instead want to know where to find good people or how to set up their own communications systems.

They know processing power will be there when they need it, and chances are, the cost per millions of instructions per second will be less than it was the last time around. So they are talking instead about how to treat their users' "on-line fever" with better micro-to-mainframe connections.

Fourth-generation languages are hot as a watercooler discussion topic, but when it comes to embracing one — a move that threatens upheaval of one kind or another — the conversation cools.

AT&T's Unix operating system doesn't particularly interest MIS managers. Sooner or later, it will probably appear somewhere in their operations, "but we'll wait and see what happens to Unix in the marketplace," said one

WHAT'S HOT/WHAT'S NOT

Richard Sherlund

John J. Davis

Frederick W. Kern

New York investment house MIS director.

Even if Unix is hot in some quarters, relational data base management systems, despite their great flexibility, are not. MIS departments have a heavy investment in their existing data base management systems (DBMS); the relational models are too time-consuming for shops that are involved in daily data collection and information flow.

But without a doubt, the single most important topic to MIS departments is the growing role of microcomputers and the resulting demands on the departments.

"Our hot button right now is promoting end-user computing," said Michael Luciuk, manager of systems and service for Exxon Corp. headquarters in New York.

Micros 'proliferating like rabbits'

"Microcomputers are proliferating like rabbits," said a vice-president for MIS at a New York securities firm.

"We're training over 100 people a month. It's just booming," said a project manager at a Princeton, N.J., firm's information center.

Microcomputers are tied to another pressing topic at many firms — strategic planning. By examining changes in their customer base, analyzing sales data and simulating potential products, banks, brokerage firms and other information-rich businesses can gain a competitive edge.

Another hot topic is the pursuit of people proficient at short-distance data communications or long-distance telecommunications.

With all the demands from microcomputer users for data, MIS managers are having to make the mainframe-to-micro connection and do it in a way that doesn't allow a breach of security. The people in short supply include experts in communications protocols and telephone systems, said John J. Davis, president of Worldwide Computer Services, Inc. in Wayne, N.J., a firm that places temporary engineers and programmers at AT&T and other companies.

Economic recovery drains labor pool

The economic recovery has soaked up the available supply just as many new communications jobs have been created by AT&T's breakup. Exxon's headquarters are in Manhattan, N.Y., but its information systems center is in Florham Park, N.J. It is setting up its own microwave telecommunications link, a task that in the past would have been handled by AT&T.

"You can take on as much of this responsibility as you want today," Exxon's Luciuk said.

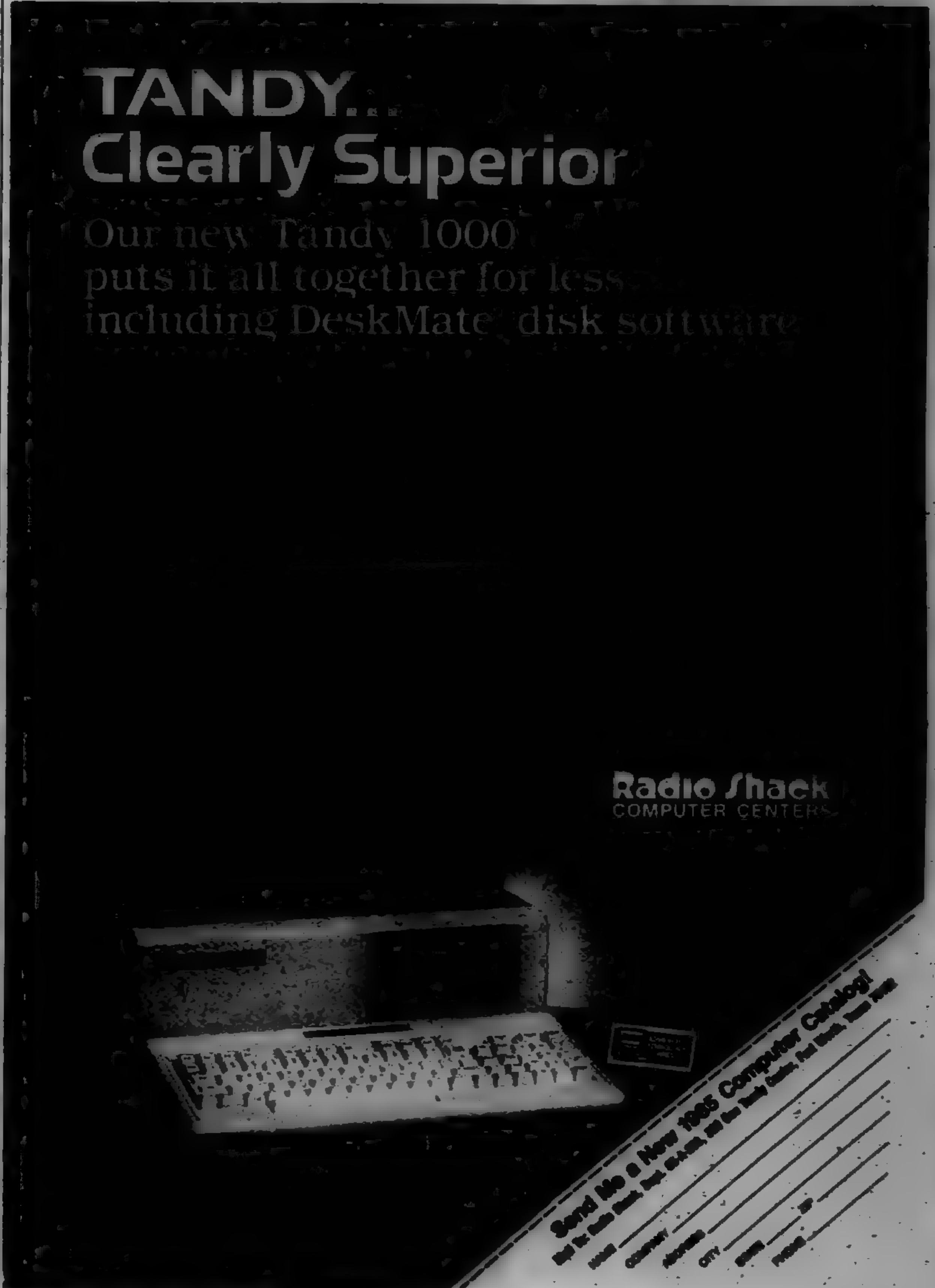
Another shortage of people exists at the systems programmer level.

"There are few good people out there with experience, and you have to pay top dollar to get them. They can practically name their own salary," said Frederick W. Kern, vice-president of information processing at the insurance brokerage firm of Marsh & McLennan, Inc. in New York.

"The demand is greater than the supply and it appears to be growing," Davis said. Even doubling Worldwide's finder's fee to $2,000 hasn't helped, he said.

Fourth-generation languages are being embraced eagerly at a few MIS

Continued on page 96



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WHAT'S HOT/WHAT'S NOT

Robert W. Woodrow

Continued from page 93

shops, but for the most part, the harried MIS manager, with too many demands already on his agenda, wants nothing to do with them. The two phenomena are closely related, industry observers say.

To adopt a fourth-generation language, an MIS manager must find one that fits his needs, retrain programmers to use it and then begin to convert Cobol programs to it. Given a backlog of applications requests, he rarely feels he's got the time to make the switch.

But fourth-generation languages offer one of the few hopes of reducing the applications logjam, industry observers say.

"If people insist on using Cobol, we will continue to have a two-year applications backlog," said Richard K. Sherlund, software analyst at Goldman Sachs & Co. in New York.

A recent Sherlund research report included a James Martin chart showing people costs had outstripped hardware costs in the 1980s.

Adopting fourth-generation languages would permit "a new mind-set," noted David Dell, director of the Diebold Group Research Services. "We don't have to build software to last forever in order for it to have value. We might want to design software to make it easy to adapt and reuse," he said.

Nevertheless, most MIS directors remain unenthusiastic. They say fourth-generation languages are well-suited for end users, who will need less assistance from the MIS department if they have an easy-to-understand syntax.

"End-user computing is more into fourth-generation languages than we are," one MIS director said.

Among end users, the integrated software packages, such as Lotus Development Corp.'s Symphony and Ashton-Tate's Framework, which were hot topics a year ago, are barely warm now. They are "a bit like the Swiss Army knife," Goldman Sachs' Sherlund said. "They combine so many functions that they don't have the utility of a stand-alone."

Meanwhile, Lotus' 1-2-3 still warms the hearts of users; it is outselling Symphony three to one. They like its simplicity compared with the integrated packages, Sherlund said.

In the realm of prediction, several observers said they expect Cmos chip technology to play a more important role in 1985 and beyond. Complementary metal oxide silicon is slower switching than bipolar chips, but it uses less power and has a greater concentration of transistors.

"IBM will come out with Cmos technology in some product in 1985, probably somewhere in their 30 series lineup," predicted Frederic H. Cohen, an analyst with L. F. Rothchild, Unterberg, Towbin in New York.

Many MIS directors are intrigued by the prospect that an optical storage system will soon concentrate their tape libraries onto a few disks. In places like Manhattan, that could be a significant square-footage gain. The one manufacturer prepared to bring out a product, however, Storage Technology Corp., has filed for protection from its creditors under Chapter 11 of the Federal Bankruptcy Act.

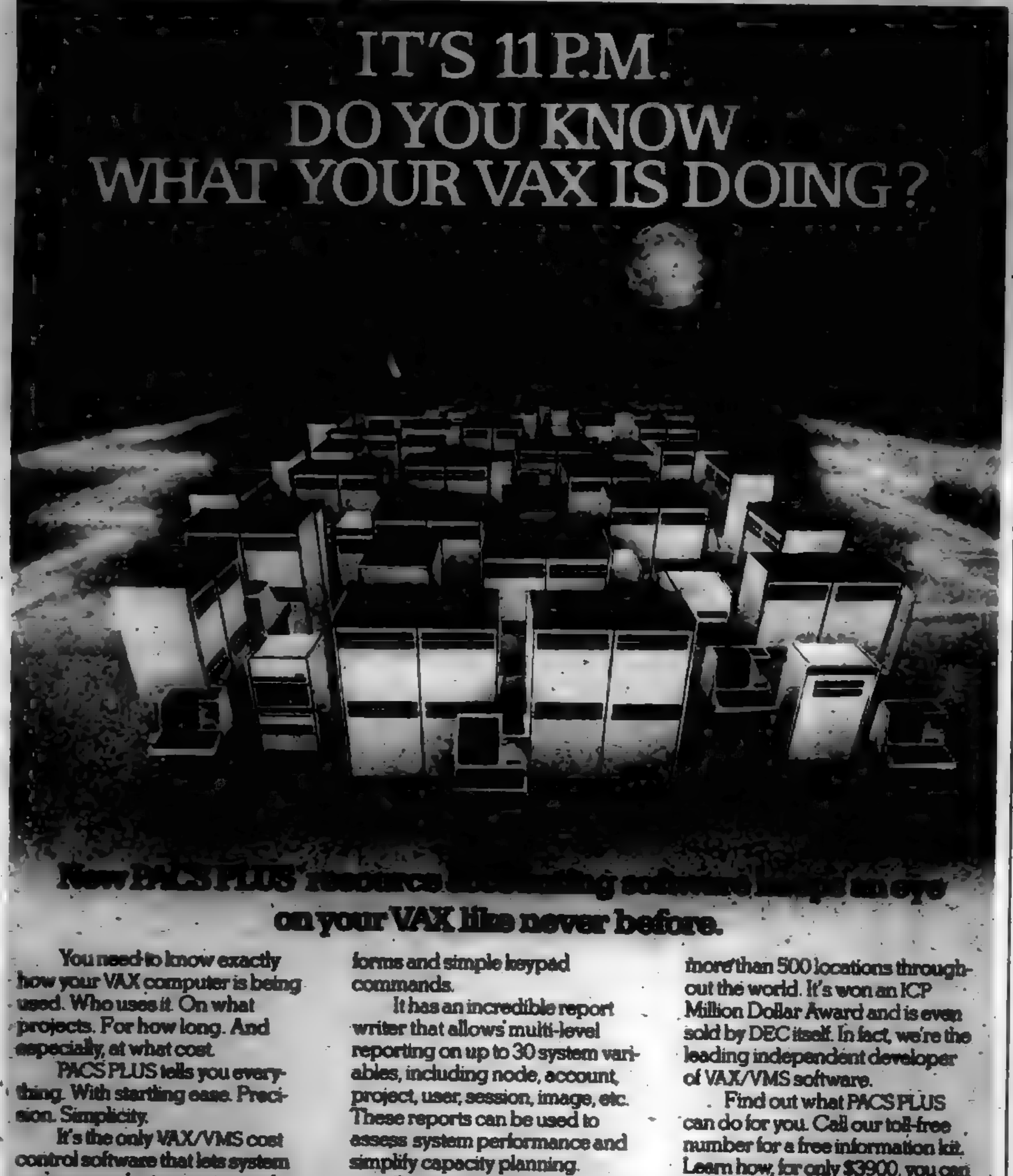
The Louisville, Colo., tape and disk drive manufacturer has designed a 4G-byte, 14-in., write-once videodisk with a 3380-style controller. "It was the only end-user system that we had any hope of [seeing] offered as a product," noted James N. Porter, president of Disk/Trend, a market research firm in Los Altos, Calif. (Japanese manufacturers are offering optical storage drives — both erasable and read- or write-only units — to OEMs.)

'Still too much paper'

A product that MIS managers would like to see brought to market in 1985 is a multifunctional workstation that combines computing with communications and allows a mainframe-to-desktop link. "I would like to see word processing, electronic mail, voice mail, spreadsheet, windowing and standard calculating capability in one unit," said Robert W. Woodrow, senior vice-president at Bank Leumi Trust Co. of New York.

The MIS managers in the securities industry wonder why no one has designed a software package that allows a stockbroker to perform all his functions on a desktop unit. Such a personal computer system would preferably be lightweight and portable, so brokers could demonstrate financial-calculating at clients' offices, said Stephen S. Boguszewicz, systems vice-president, data, at the Pershing Division of Donaldson Lufkin & Jenrette, Inc. in New York.

Although few MIS managers contemplate buying one, they are keeping an eye on the race to build supercomputers. The Japanese are making great strides in this area, but Cray Research, Inc. of Minneapolis will maintain its lead, they say. Cray has said it will launch the Cray 2 early in 1985 and begin work on the Cray 3.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By Susan Blakeney

AROUND THE WORLD IN 16K

What has grown 20 times in size since 1980?

Q: What country is devouring low-end technology faster than any other?

Q: What were the names of four 1984 fiscal casualties of the roller-coaster microcomputer industry?

Q: What key issues will concern the corporate personal computer user in 1985?

A: The personal computer industry.

A: The Netherlands.

A: Franklin Computer Corp.; Victor Technologies, Inc.; Gavilan Computer Corp.; Otrona Corp.

A: Networking, communications capabilities, compatibility, security.

In light of its explosive growth and monstrous sales potential, vendors hardly consider the international personal computer marketplace a trivial pursuit.

At the same time, users around the world are often left guessing over a myriad of choices, compatibility snafus and operating system decisions. The game is complicated further by the relatively recent entries of IBM, AT&T and ITT, which have made their presences felt like that of King Kong at a cricket match.

Continued on page 98

Am
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STICKERS/ARTHUR THOMPSON [illegible]

Continued from page 97

Because most microprocessor-based technology is born in the U.S., international users have traditionally been shackled with more problems than their American counterparts. Obstacles include strict import restrictions, such as those in Mexico and Eastern Europe; heavy tariffs like those in India and the Middle East; home market reservation policies, such as in Brazil; high shipping costs; long-distance support; and language barriers. The personal computer has not invaded foreign offices as deftly as it took American offices, and the foreign marketplace is just lifting off now.

A recent survey *Computerworld* conducted, along with research compiled by International Data Corp. (IDC) of Framingham, Mass., and the Paris-based Intelligent Electronics research firm, all indicate that a voracious vendor community is spurring an eager market, which in turn, is displacing user resistance.

IDC predicted that "the personal computer has the capability to become as important to most individuals as the calculator. This implies that an individual may own more than one [personal computer], and in fact, is quite likely to." Judging from market forecasts, this appears to be a valid claim.

In the Netherlands, for example, the personal computer market is expected to grow by a staggering annual rate of more than 50% in the coming years, which will result in an installed user base of 250,000 micro units by 1989. In Spain, the market is anticipated to expand by 50% in 1985. In Australia, surveys indicate the market is projected to increase by 30% in 1985.

Not only is this exciting for vendors all over the world, but also great news for users, according to the collective research. More than ever before, users can look forward to high availability of systems in their respective countries. They can also expect prices to stabilise or fall as competition grows increasingly ferocious over their personal computer dollars. Likewise, they can count on vendors trying value-added services such as training, installation, special software and so on to sway their purchasing decisions.

Suppliers also appear to be paying more attention to foreign users' individual needs, and studies reveal this emerging trend will gain momentum during 1985 as vendors vie to stay in the microcomputer race. Vendors will distinguish themselves by offering their customers the networking and communications capabilities they've been begging for. In other words, personal computer users can look forward to more responsive vendors. But currently, micro users abroad bear a striking resemblance to users in this country a couple of years ago.

Most countries import almost all of the hardware and about 95% of the software. The most popular applications packages overseas include Lotus Development Corp.'s 1-2-3 and Symphony; Software Arts, Inc.'s Visicalc; Micropro International Corp.'s Wordstar; Ashton Tate's Dbase II and Framework; and Microsoft Corp.'s Multiplan. The remaining 5% of the software is locally produced. This category includes special tax preparation packages to meet individual country requirements and other customized applications, according to the surveys.

At the same time, in Spain and in several other smaller countries, according to the *Computerworld* survey, "professional applications are often carried out with models sometimes considered to be toys in the U.S. . . . such as with the Commodore 64 and the [Apple Computer, Inc.] IIe. This is partly because microcomputers cost almost twice as much in Spain as in the U.S."

The IDC survey also revealed, "The sharing of corporate personal computers will increase, especially as multitasking operating systems continue to remain a fairly small percentage of the market. [Personal Computers] are used primarily for one or possibly two tasks, and the [Personal Computer] is generally used less than eight hours per week. [Therefore], a single system can satisfy the demand of multiple potential customers. This will be a short-term phenomenon."

As in the U.S., purchase decisions for microcomputers are being handled for the most part by data processing managers in large foreign corporations. This is especially true if the user wishes the personal computer to communicate with the corporate mainframe. In small- and medium-size companies, executives and managers often make up their own minds on what to buy and sometimes look to a local consultant or expert for advice.

Unlike in the U.S., the concept of the corporate information center has not caught on very well overseas. Everyone surveyed on this subject tentatively reported that in their country, there were only a few full-grown information centers. At the same time, the research from Europe indicated that "there is a lot of talk going on on this subject."

In several countries, time-sharing services were viewed as a more cost-effective processing solution. In general, though, the research concluded that more than 90% of all personal computers abroad are used in stand-alone environments.

Intelligent Electronics' research revealed, "In the UK, 30% of companies surveyed have connected at least one of their [personal computers] to a data base. A similar percentage is observed in West Germany, although a much larger proportion of these connections are to internal data bases rather than outside. France is very retarded in this field, with only 9% of the companies having data base connections."

Continued on page 99

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European micro sales put Osborne back into the black

One of the most colorful stories in recent microcomputer history is the saga of Osborne Computer Corp., which sank to financial depths, filing under Chapter 11 of the Federal Bankruptcy Act in 1983, but, largely on the coattails of its international sales, rose from the near-dead this year.

Dave Miller, vice-president of sales and marketing, explained how Europe carried the American computer manufacturer out of the red and back into the black: "There were a lot of facets to the recovery, but the cornerstone to our revival was our ability to rely on the strength of our international distribution," Miller said. "In 1984, for example, 80% of our sales were international."

While things were going sour at home, Osborne's international customers remained buffered from the bad news, Miller claimed. "The international dealers remained loyal to Osborne and masked the company's financial problems. And there were financial problems — there was never anything wrong with the product.

"Anyway, dealers stayed with Osborne because they had faith in us. This is partially due to the fact that, unlike U.S. dealers, they can't change product lines quickly. They invest a lot of time and money and people to develop a product line and then stake their reputation behind it. Their reputations are extremely important to maintain."

INTERNATIONAL PERSONAL COMPUTER FORECAST

Year	Shipped	Installed base
1981	103,000	321,000
1982	282,000	603,000
1983	681,000	1,284,000
1984	960,000	2,244,000
1985	1,344,000	3,588,000
1986	1,882,000	5,470,000
1987	2,578,000	8,048,000
1988	3,378,000	11,426,000
1989	4,357,000	15,783,000

Figures courtesy of International Data Corp.'s "Personal Computer Markets 1984."

CW Chart

"In Norway, for example, we are the No. 1 microcomputer vendor. This is because users can get an Osborne with a Norwegian keyboard, a Norwegian character set, Norwegian documentation and Norwegian software. Furthermore, there are not very many domestic personal computer makers in Norway — and certainly none in our price range," he noted.

Miller said the bulk of Osborne's customers overseas are small businessmen who use a single system or sometimes clusters of microcomputers to run their businesses. "The typical users will buy one system for the office, and everybody will share it."

But just what does the future hold for the personal computer user? According to Miller, good things.

"I think we may be entering a new era in which computer suppliers are going to attempt to get very close to users and their needs. The major vehicle is user group activity," Miller theorized.

Security a pressing issue

As for new products to expect, Miller said, "It's obvious that users will see a lot more communications-intensive products . . . and I think security — access availability and data integrity — is among the most pressing issues right now being addressed by communications people. Expect new and exciting breakthroughs in that area."

On the industry in general Miller said, "The world will not be dominated by — at least not the micro industry — a giant or two. New companies such as Osborne will work together to succeed.

"You do not have to become a giant to bring new and innovative products to the market. . . . That is what users can also be happy about. Traditionally it's been the small companies that have brought new things to the world, and I believe that trend will continue . . . more so in the microcomputer industry than anywhere else."

Continued from page 98

All parties surveyed unanimously agreed that IBM's market penetration with its personal computer product line has not met with the vendor's own great expectations. The IBM PCjr has not even made an appearance in most foreign companies surveyed and is not expected to in many countries.

IBM's slice of the world micro market during 1983, in the business and professional sector, hovered slightly above 25%, trailed by Apple Computer, Inc., Tandy Corp. and Osborne Computer Corp. In the European countries, where IBM has yet to win a significant professional user base, many respondents ascribed to the belief that IBM will eventually dominate.

The main conclusion, in fact, of the Intelligent Electronics research was that IBM Personal Computer users all over the world enjoy "a high level of satisfaction" with IBM personal computers and a "high level of confidence" with IBM as a company. They believe that IBM can best serve their immediate needs "in terms of product quality and responsiveness" as well as their future needs "in terms of evolution of their companies and their subsequent computer requirements."

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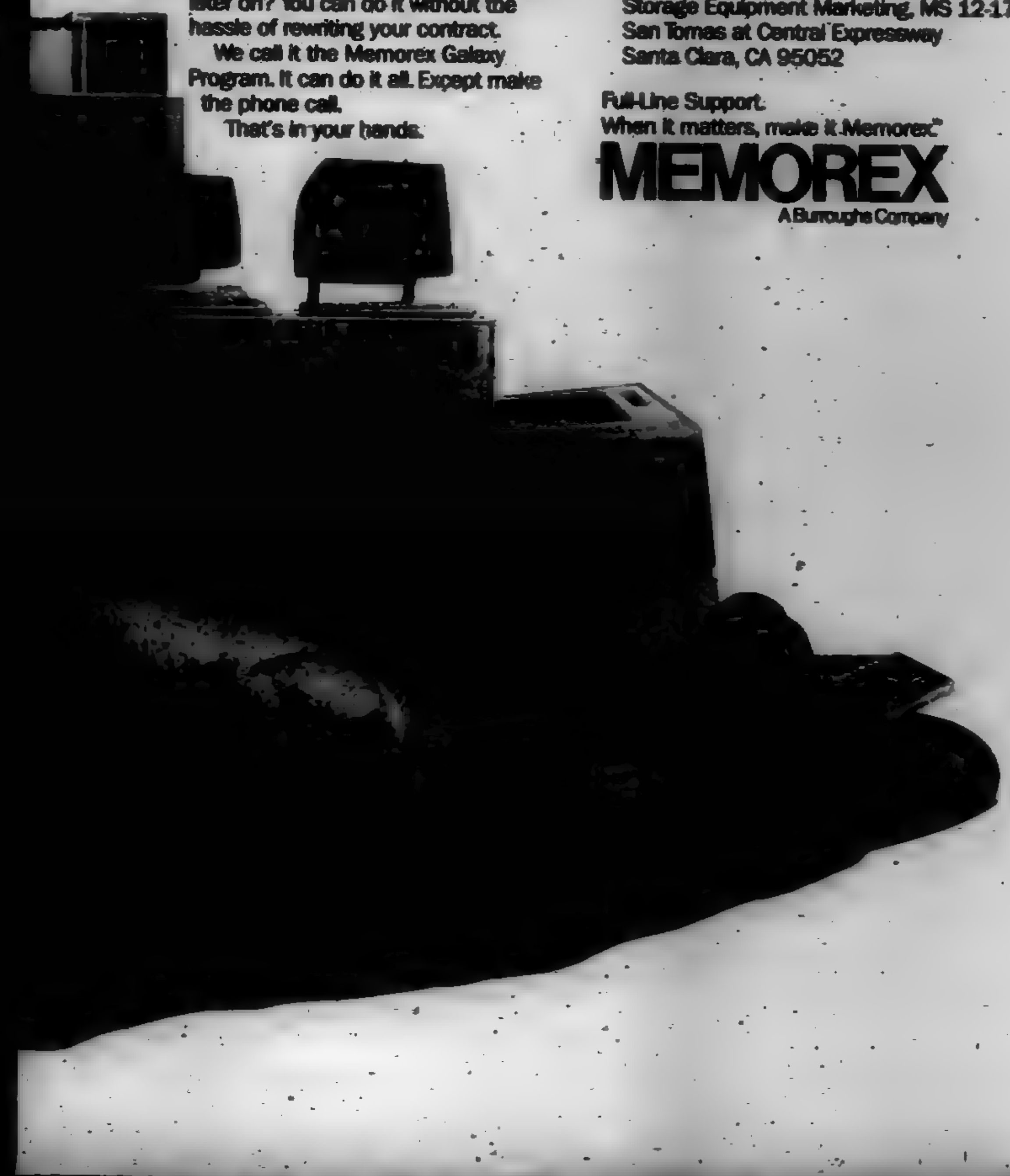

HENRY DANE

DESTINATION UNKNOWN

By Bryan Wilkins

Like the U.N., the world of office automation and data processing users wants to believe that the vendors and companies supplying them are making efforts to make interconnection an easy thing. While most vendors claim to support the International Standards Organization's (ISO) seven-layered Open Systems Reference model for communication between dissimilar devices, the reality of the situation is far from peaceful.

At a Dallas conference earlier this year, a plea from a user, a DP supervisor at a petroleum company, affirmed the confusion users face when trying to link systems where there is no compatibility.

Addressing a panel of vendors at Intech '84, which includ-

Continued on page 102

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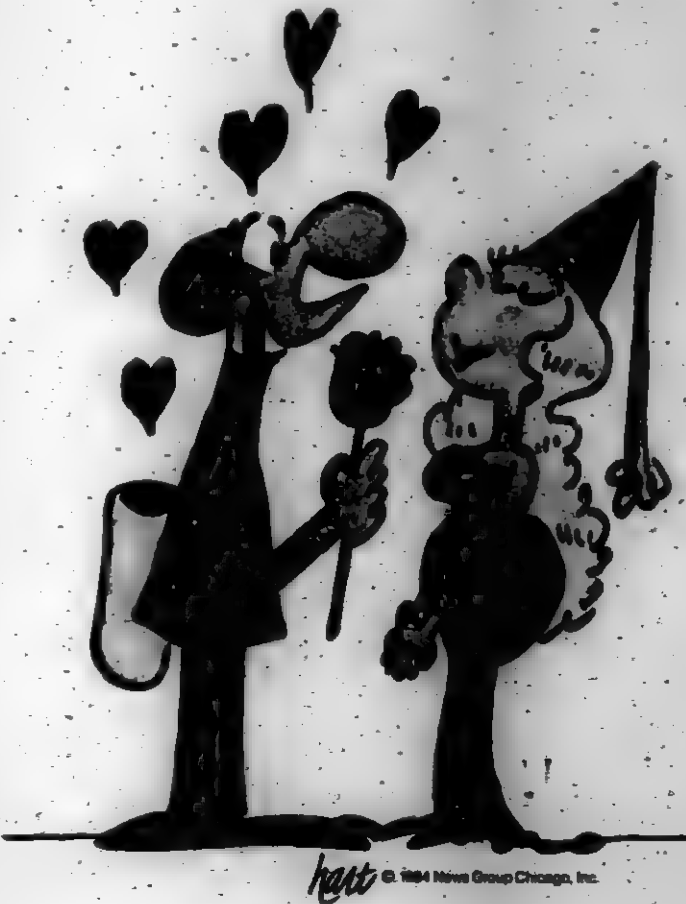

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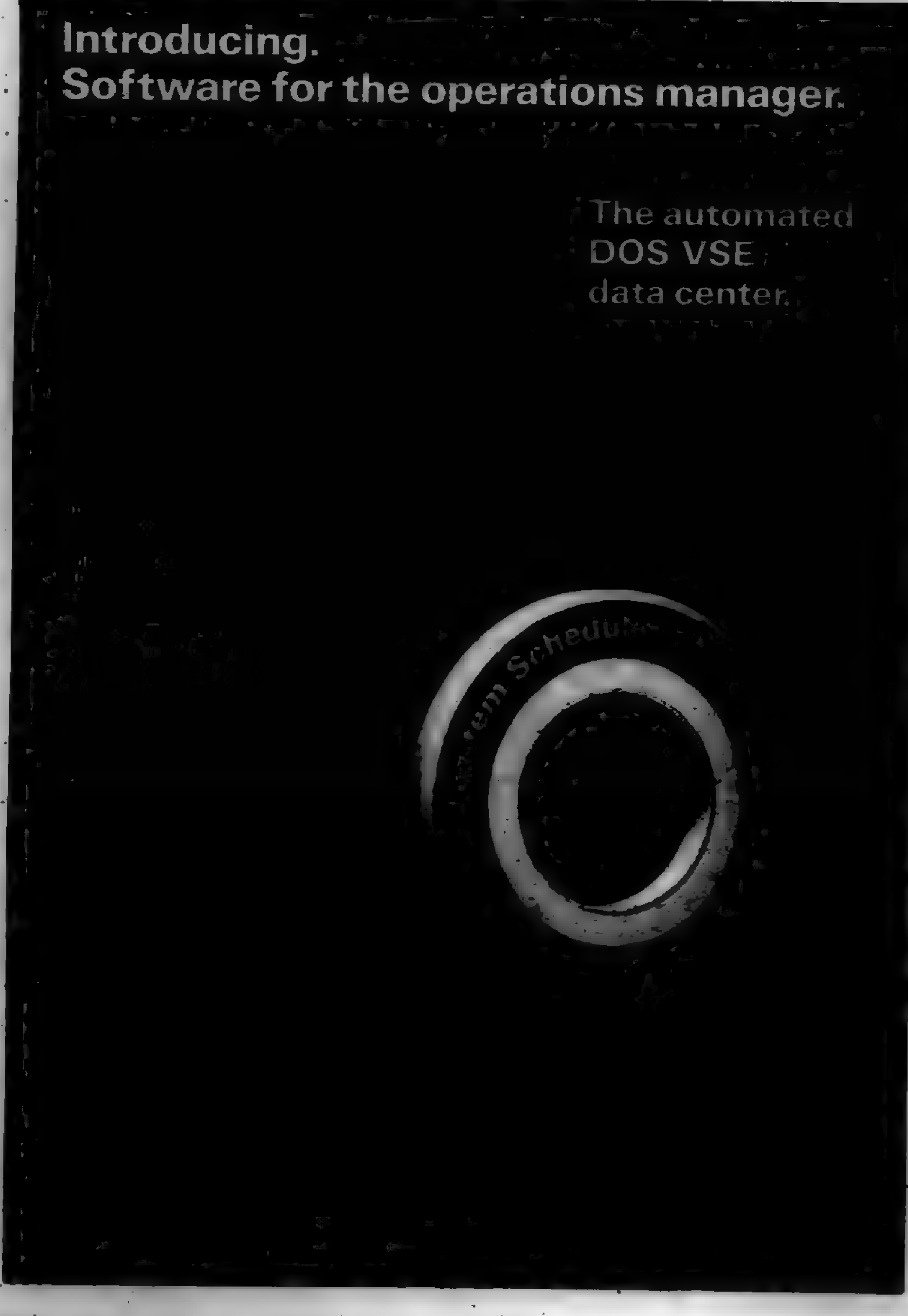
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Continued from page 100

ed Joseph Deblasio, IBM's director of standards, Romeo Matta, a Phillips Petroleum Corp. control supervisor said, "You are asking us to jump on a train you built, run to the front and guide it for you, and we don't even know where you are going."

Other vendor members of the panel tackled Deblasio when he voiced support for the seven-layer open systems integration (OSI) reference model for communications as adopted by the ISO.

"OSI will govern all future developments," Deblasio asserted. "It is a very, very important part of [IBM's] product development efforts."

Al Malinger, director of product strategy for Datapoint Corp., challenged Deblasio's statement, citing IBM's release this year of a link product for the Personal Computer AT that does not follow the OSI model but rather is based on coaxial cable technology.

Standards help compatibility with IBM

Deblasio said that standards such as OSI are making it easier for users who do not have IBM equipment to connect into the Big Blue environment.

The dominance of IBM in the marketplace and the unavailability of usable communications links to the IBM environment have helped solidify customers' conviction that only chaos exists when it comes to standards.

However, standards as formulated in lengthy sessions of working groups under the auspices of the American National Standards Institute (Ansi) and the IEEE, Inc., which recently completed four years of work in its 802 committee on local-area network standards, are much different from the de facto standards that the dominant computer concern — IBM — creates by its ubiquity.

Instincts, not standards, followed

Due to the bloodletting competition in micro markets, the development of micro-mainframe links also is not following standard formats but rather follows the creative instincts of software engineers and increasingly, communications companies.

Progress was made in 1984 on standards for local-area networks. The IEEE 802 committee on local-area networks and its five subcommittees have completed their work, and the draft standards are currently undergoing publication.

The 802.3 committee has completed standards work on the carrier-sense multiple access-collision detection (CSMA-CD) architectures, which reportedly have already been adopted by the U.S. government as federal information processing standards.

The 802.4 committee has completed its work on the token-passing bus architectures for local-area network communications, and the 802.5 committee has completed work on the token-passing ring architecture that has been embraced by IBM as the standard of choice for its future universal communications systems.

In the estimation of Bert Stanley, the IEEE's deputy staff director in charge of standards, the significance to the user of the publication of local-area network standards for the various technologies is this: "After four years, there will be more uniformity in the way the materials [standards] are applied. In the past, people have taken versions of the standards and interpreted them their own way. There should be less of that. Otherwise, not much else will happen outside of the broad availability of the information."

Stanley raised the prospect that, because technology is changing so fast, parts of the work already done by the 802 committees will soon have to be revised to accommodate new applications.

"There will be substantial changes in the requirements as the state of the art matures," he said, adding, "It is rare that standards remain standard."

However, the IEEE 802 standards for CSMA-CD, token bus and token ring have all been submitted to the ISO in Geneva as draft international standards.

Another area of standards promulgation that will affect users in the future concerns the publication this month by the Ansi X12 committee of a draft Business Data Interchange (BDI) standard that will cover an interindustry standard for order forms, purchase invoices, order placement and shipment and receiving information. The Transportation Data Coordinating Committee, based in Washington, D.C., is the administrative secretary for implementation of the BDI standard.

> *'There will be substantial changes in the requirements as the state of the art matures. It is rare that standards remain standard.'*
>
> Bert Stanley, IEEE

A relatively recent addition to the standards arena is the formation, under the auspices of Ansi, of the T1 committee. This committee has as its charter the formal connectivity and interoperability of the public communications network that was necessitated by the divestiture of AT&T a year ago.

Under the chairmanship of Ian Lifchus of Bell Communications Research Corp. in Parsippany, N.J., T1 has "already exceeded by 2½ times the size of Ansi's X3 committee on information processing," according to Lifchus. The committee is working toward universal connectivity to the network.

Under T1, 25 working groups have been formed, dealing with the esoterics of protocols, maintenance issues, ordering standards and building systems.

Equal access standard a main objective

Producing an equal access standard is also a major objective of the committee, as local telephone company exchanges across the country struggle to meet a 1986 legal deadline of treating all long-distance carriers equally in their interconnections.

This work, and the growing emphasis by users on digital-based transmission systems, is accelerating consideration of so-called integrated services digital network (ISDN) standards, where voice, data, facsimile and video are all carried over the same network.

T1 is the U.S. forum for developing a position for submission to world standards bodies such as the ISO and the Consultative Committee for International Telephone and Telegraph, which sets international telecommunications standards.

In Lifchus' estimation, ISDN services, which many believe will not be ready until the 1990s, will be undergoing selected beta testing in the U.S. during 1985 and 1986.

Other concerns of the T1 committee so far have centered on low bit-rate voice coding, where the traditional 64K-byte standard now used to transmit voice is being halved to 32K bytes with the power of silicon technology, so that twice the volume of voice-grade communications can be carried on existing telephone line bandwidths.

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THE MICRO SHAKEOUT

FLASH IN THE PAN

By Kathleen Sullivan

Being in the microcomputer business is like going 55 miles an hour three feet from a cliff. If you make the wrong turn, you're bankrupt so fast you don't know what hit you. But if you make the right turn, you're on a rocket with people throwing money at you.

— George Morrow, chairman and founder of Morrow Design, Inc., from *Quotations From Chairman Morrow.*

By anyone's account, 1985 promises to be the most difficult year yet for personal computer companies. Analysts predict that the year will be dominated by the news of more and more microcomputer firms falling by the wayside, unable to compete in the hotly contested marketplace.

At present, 350 companies around the world produce microcomputers. When the dust clears by the end of 1986, only 75 will remain in the field, predicted Kenneth Lim, an analyst with Dataquest, Inc., a San Jose, Calif.-based market research firm. More than half that number — between 40 and 45 firms — will reside in the U.S.

When asked to explain why the bloom will fade for so many companies, analysts responded with a simple explanation: The market is too crowded. Enraptured by high rates of growth over the past two years — with gains in microcomputer sales revenues of 130% in 1983 over 1982 and 85% in 1984 compared with 1983 — start-up companies

Continued on page 106

ALAN HOPKINS

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THE MICRO SHAKEOUT

Continued from page 104

flooded the market.

But the growth rates will not be as impressive in 1985, Lim warned. He estimated that the industry's expansion rate would only be 35% over 1984's levels.

"Most companies don't have a chance," he said. "They don't have the resources to match up with the major players in the industry. They don't have the money for advertising, marketing, distributing, establishing dealer networks or penetrating niche markets."

Chris Christiansen, an analyst with the Yankee Group, a Boston-based market research company, agreed. "The real question is: Will there be a 1985 for microcomputer companies?" he said. "It's beginning to look all blue to me . . . now that IBM has decided to enter new markets and play the technology game like everybody else, instead of hanging back and waiting for others to make the market."

IBM will become even more firmly entrenched in the personal computer industry in 1985, according to most analysts. They cited the company's recent price reductions and the introduction of the Personal Computer AT, the Topview operating environment and the business software series as evidence of IBM's strength in the industry.

> *In 1985, MS-DOS compatibility will be the 'kiss of death' for personal computer firms.*

Some analysts believe that IBM will change its course of action over the next several years as the market reaches a plateau. According to Christiansen, IBM will be moving away from MS-DOS and Xenix and heading toward the adoption of a proprietary operating system for its personal computers.

Instead of standardizing on operating systems, he indicated, the industry will move toward language standards, which will make it easier to move software from one system to another.

For the IBM-compatible firms, which make up about half of the companies now in business, that spells trouble, Christiansen said that in 1985, MS-DOS-compatibility will be the "kiss of death" for personal computer firms.

'Hitting the moving target'

Why? In 1985, IBM-compatible firms will have a harder time trying to "hit the moving target of IBM-compatibility" because the target is moving in several directions at once: upward toward the Personal Computer AT, downward toward the PCjr and expanding in terms of the soon-to-be-announced Personal Computer II, Christiansen said.

"If you're going to be IBM-compatible, it probably means you're going to be compatible with the older [Personal Computer] architecture, which is out of date and lacks the performance of newer computers," he noted, adding "It's difficult to make the jump in compatibility from the [Personal Computer] to the AT."

According to Andy Seybold, contributing editor of the "Seybold Report on Professional Computing," Topview will be the "tip" of IBM's new operating system by the end of 1985, with MS-DOS and Xenix running under it.

Seybold predicted that IBM will copyright Topview by the end of the year, making it part of a read-only-memory-based system. The IBM-compatible firms will have to scramble once again, because they will be unable to offer Topview on their systems.

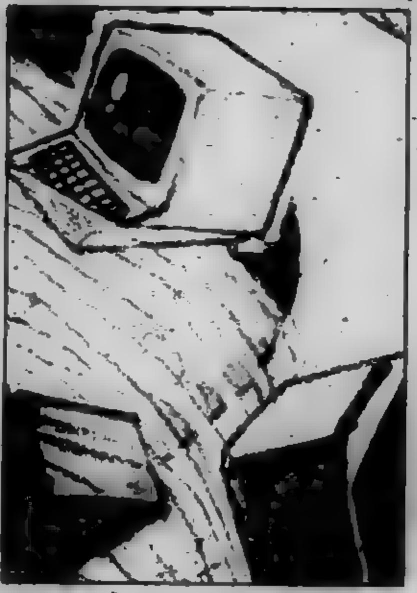
'Year of the integrator'

It will be important for these firms to be able to offer an alternative to Topview, because 1985 will be the "year of the integrator," Seybold said. Unlike last year, when integrated software was the watchword of the industry, 1985's customers will expect total business solutions when they purchase a system.

When they walk into a computer store, he explained, customers will sit down with the sales staff, describe their computing requirements and design a system by mixing and matching various software packages, which will be integrated under an operating environment such as Topview.

The IBM-compatible firms will have to be able to offer an alternative, choosing among the competing environments — such as Microsoft Corp.'s Windows, Digital Research, Inc.'s Gem or Quarterdeck Software's Desq — so they can offer a similar solution to their customers, Seybold said.

The analysts agreed that Apple Computer, Inc., which has eschewed IBM-compatibility, has the best



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chance of surviving the IBM onslaught in 1985. Apple will flourish, they said, because it provides an alternative.

"You can divide the world into two parts: the people who will buy IBM and the people who won't," said Dataquest's Lim. "Whoever is a leader in [the microcomputer] market will survive."

While some observers expect AT&T to offer another alternative to IBM, most analysts questioned AT&T's present course of action. AT&T cannot strike out on its own, as Apple has, because it is already "too locked into PC-DOS," said Aaron Goldberg, an analyst with the Framingham, Mass.-based market research firm International Data Corp. (IDC).

The firm will not find success by pushing Unix as an operating system for single-user systems. "In 1985, Unix will be recognized for the disaster it really is," he noted.

The VAR market

Are there any viable strategies for surviving the shakeout in 1985? While many analysts suggested that the value-added reseller (VAR) market represents a protective niche for personal computer companies in 1985, IDC's Goldberg questioned the wisdom of that strategy.

"The VAR market is not the salvation of troubled microcomputer companies," Goldberg said. "Most VARs are very discriminating buyers. What would make them think that a company that failed when it went up against IBM in the retail market would be appealing in the VAR market?" he asked.

According to Goldberg, selling to the VAR market is a "harder sell than retail." The companies that will be successful in the VAR market will be those with 20 years' experience and a broad product line, not a troubled firm that sells micros, he explained.

Guidelines for surviving the shakeout

While there are no hard and fast rules on how to survive the shakeout in 1985, the analysts offered a variety of guidelines for companies that will try to make it through the year:

- Try to jump ahead in terms of the technology.
- Seek shelter in market niches. Find contentment with .01% market share.
- Grow big enough to maintain independence. Plan on spending at least $10 million to $20 million on advertising and a similar amount on R&D. Develop a strong dealer base by offering dealers proposals they cannot refuse.
- Keep a watchful eye on the corporate financial health. Preserve the financial base. Maintain a good cash position. Spend carefully so that the firm has the money to weather the inevitable dry spells.
- Get production costs down by designing low-cost, efficient manufacturing plants. Consider moving offshore.
- Advertise. It does not matter if you have got a great product if no one has heard about it.
- End eternal product development cycles. Customers have lost their patience with companies that promise products they cannot deliver.
- Sell aggressively. Get down to the nuts-and-bolts work of getting contracts signed.
- Establish a corporate framework that allows the company to bring in a good, solid management team as the firm grows.

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THE MICRO SHAKEOUT

Firms reentering micro fray said to face long odds

Osborne Computer Corp. and Victor Technologies, Inc. — in many ways these companies have come to symbolize the reckless and ruthless nature of the personal computer industry, to which each has fallen victim.

Within the past two years, these two companies filed for protection under Chapter 11 of the Federal Bankruptcy Act, winning at least a temporary reprieve from their troubles: time to devise a plan to pay off creditors and reorganize.

Like the mythological phoenix that consumed itself in fire and then rose again to begin another life, these firms intend to emerge once again and regain market footholds.

Brown

Victor Technologies expects to receive the final seal of approval on its reorganization plan in late 1984, said Roy Wright, president of the Scotts Valley, Calif.-based firm. By the end of January the company will finalize the sale of Victor Technologies to Datatronic AB, a Swedish computer company.

Osborne plans to make a simultaneous announcement in January that will herald the company's exit from bankruptcy court and its inauguration as a publicly held company, said Ronald Brown, the firm's president (see story page 99). The Fremont, Calif.-based firm, which played a pioneering role in the portable computer industry by introducing a machine with bundled applications software, recently unveiled two new portable machines.

But what are their chances of survival in an industry that has become even more competitive in their absence? Some analysts expressed skepticism that the firms could recover a significant share of the market.

Robert T. Cornell, first vice-president of Paine Webber, Inc., a New York-based securities firm, said the companies will fail in their efforts to carve out a new place in the market because their computers are still priced too high. "People don't believe the portable computer market will go anywhere until the systems cost less than $1,000," he said.

Andy Seybold, contributing editor of the "Seybold Report on Professional Computing," said the companies that struggled to survive in 1984 will find 1985 an even more difficult year. "The competition is going to get keener in 1985," he said. When asked to describe the companies' chances of success in the 1985 marketplace, his answer was succinct. "Not good," he said.

But Bob Katzive, vice-president of Gnostic Concepts, Inc., a San Jose, Calif.-based market research firm, took a more philosophical point of view.

Wright

"Osborne is a different company now," he said. It has scaled back, narrowing its focus to niche markets, he explained. Katzive said Victor Technologies' odds on survival were an even call at present, but, like Osborne, it retained some strength as a result of its European distribution network.

Not surprisingly, the current presidents of Osborne and Victor Technologies are bullish on their companies' future.

Osborne's Brown said three factors allowed the company to forge a viable reorganization plan: Osborne's brand-name recognition; its worldwide customer base; and its international distribution network. The company plans to pay off its remaining $5 million in debts out of the firm's assets, he said, adding that Osborne will use the proceeds from its $3 million stock offering to fund product development.

Ironically, the company has emerged from bankruptcy proceedings with a financial advantage. According to Brown, Osborne will not have to pay taxes for the next 15 years, until its profits exceed $18 million, because it inherited a tax-loss carryforward from its troubled parent. "What was bad news for the old Osborne is good news for the new Osborne," he said.

Sights on the vertical mart

Like Osborne, Victor Technologies has set its sights on the vertical market and recently introduced 18 vertical-market software packages. The company will direct its efforts at selling to small business, said Victor Technologies' Wright. No longer will Victor Technologies make the mistake of "trying to be all things to all people," he said.

Victor Technologies plans to introduce enhancements to its computer line, which includes the Victor 9000 as well as the Vicki portable, during the first quarter of 1985, Wright said.

In addition, the firm will unveil its next generation of computers by the end of that year, he added.

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ED BRAVERMAN

ALL PUMPED UP

By Jeffry Beeler

For years, they remained cloistered in their own self-contained, little world far from the hubbub of mainstream information processing. Far and away the computing field's number-crunching speed champs, they quickly entrenched themselves in large research institutions, government agencies and a few giant oil companies. There, they soon made a name for themselves by solving esoteric, stupifyingly complex problems that no other processors could even dent.

But for the vast majority of the world's user organizations, supercomputers lay woefully beyond reach — their towering price tags and proprietary architectures forming seemingly insurmountable barriers to acquisition. Even now, high-speed vector processing remains largely the preserve of a few scientific or engineering heavyweights, the only operators technically adept enough to master its many intricacies.

In a sense, today's supercomputers bear a curious resemblance to the micros of yesteryear. During the mid-1970s,

Continued on page 112

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The IBM PC market is booming in Australia. By the end of 1984, almost 20,000 units will have been sold. **Australian PC World** — the only computer magazine for IBM PC users in Australia — premiered this March in response to the growing demand. Total distribution has already topped 16,000. And newsstand sales are vigorous from Sydney to Perth.

Forecasters predict that the Australian government and businesses will increase their usage of microcomputers by 170% over the next two years. **Australian Micro Computerworld** is the only monthly magazine covering this market. Written for both single-unit and networked users, most of our 12,000 readers are skilled professionals involved in the selection or design of systems and networks.

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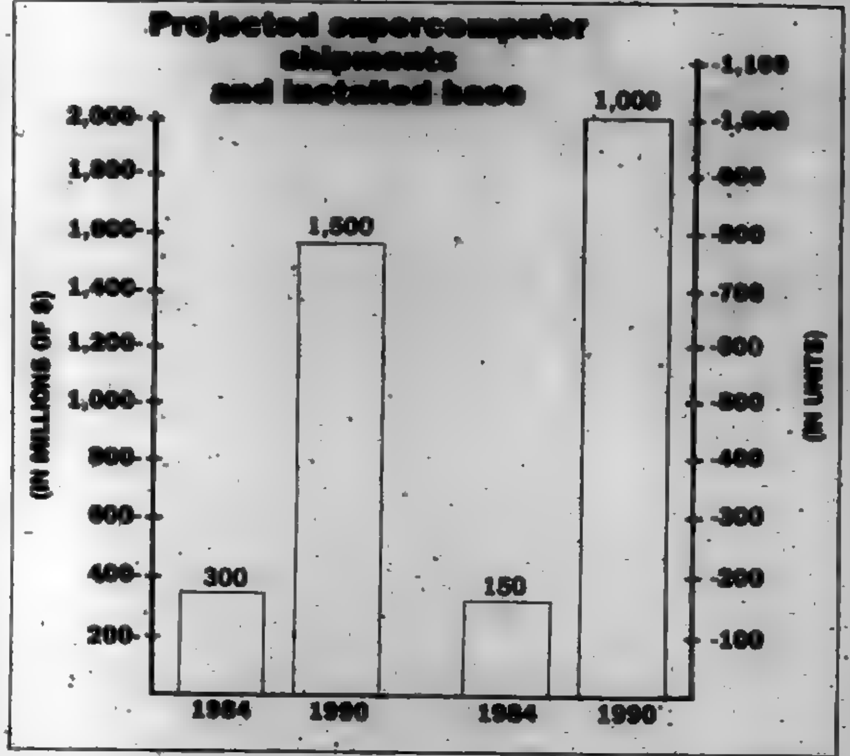


CW CHART

Continued from page 109

personal computers were little more than a gleam in the eye of a small band of high-tech visionaries, a glorified plaything apparently devoid of widespread commercial potential. Only a few years later, the newfangled technology suddenly came into its own, burst free of its cramped confines and took the business world by storm.

Today, industry history seems poised on the brink of repeating itself — only this time on the opposite end of the performance spectrum. Already, supercomputer use is steadily climbing, and during the coming year and beyond, installations are almost certain to increase, according to Kevin Moriarty, a seasoned vector processor user and computer science professor at Canada's Dalhousie University.

Much of the expanded activity, to be sure, will take place among the large defense- and research-oriented users that have formed supercomputing's traditional stronghold. But increasingly, number-crunching machines are expected to expand their limited sphere of influence and find their way into environments from which they have hitherto been largely excluded. One of those new-found user domains will be the world of big business, according to Carl Claunch, National Advanced Systems Corp.'s (NAS) marketing director for technology planning.

Moreover, the influx of vector processors into the commercial realm is expected to come from diverse sources. Part of the increased traffic will undoubtedly consist of high-end machines of the sort that have long been sold by the supercomputer field's two leaders, Cray Research, Inc. and Control Data Corp.

Also contributing to supercomputing's heightened commercial presence will be a flock of comparative newcomers to the number-crunching game. One such recent market entry is likely to be special-purpose vector processors that basically serve as scaled-down versions of full-fledged supercomputers. Priced at less than $1 million, near-supercomputers will specialize in the dedicated scientific and engineering applications where superminicomputers have traditionally been preeminent, according to Eugene Stair, vice-president of the Boston-based Moseley Hallgarten Estabrook & Weeden, Inc. brokerage firm.

Another supercomputer subspecies that seems destined to have a major corporate impact are the emerging IBM-compatible vector processors, which first appeared on the scene earlier this year with introductions from Amdahl Corp. and NAS.

For corporate information systems organizations, the implications of supercomputing's increased business profile are manifold and, in some cases, conflicting. On one hand, the recent advent of IBM compatibility promises to hasten a reconciliation between administrative DP and scientific processing by removing the architectural impediments that have historically kept the two apart. The coming union, in turn, will bring technical computing operations increasingly under MIS control, according to Wayne McIntyre, Amdahl's special-purpose systems director.

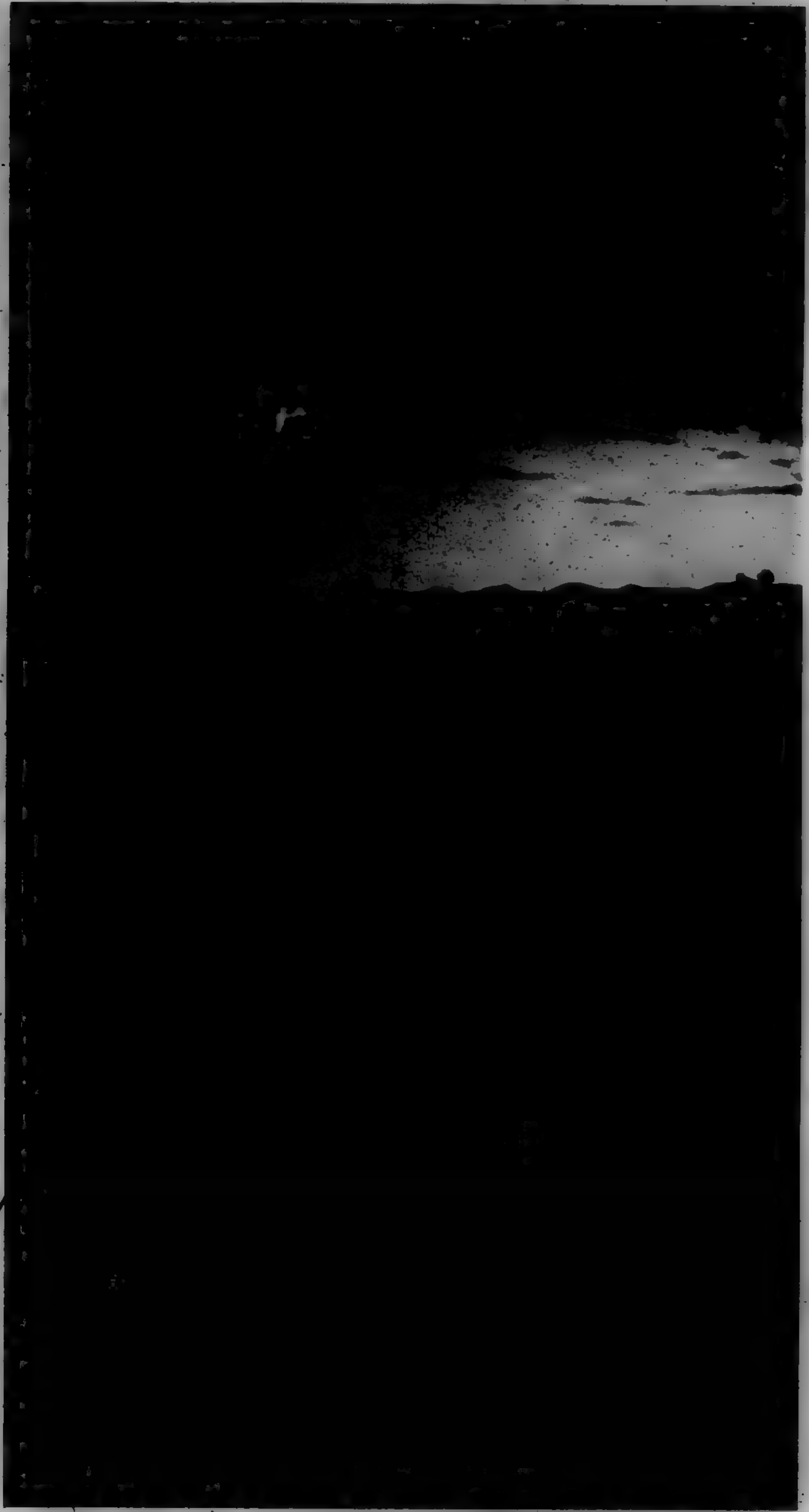
On the other hand, as the supercomputing performance range continues to extend downward, corporate users can expect their vector processing resources, which in the past have been highly centralized, to be gradually dispersed. Thus, the same distributed processing forces that have long been at work in MIS will soon overtake scientific computing as well, according to Bob Paluck, president of Richardson, Texas-based Convex Computer Corp., a near-supercomputer supplier.

Unlike general-purpose scalar mainframes, which are optimized for transaction processing, vector computers are geared for executing scientific programs, which typically require one instruction to operate simultaneously on long streams of elements.

At present, the worldwide base of installed supercomputers still totals only about 100 or so machines. But by the end of the decade, the population will swell to include some 2,000 units, Moriarty predicted.

During the same period, the total market for large-scale number crunchers will expand from $300 million to approximately $1.5 billion, according to Amdahl's official projections.

Continued on page 114



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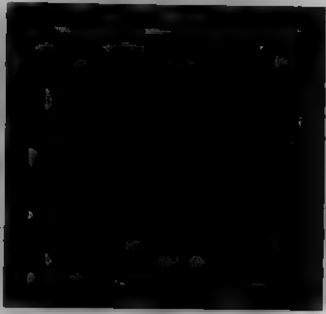

By Jeffry Beeler
CW West Coast Bureau

Virtually all industry pundits agree on at least one point: Sooner or later, IBM is almost certain to announce its long-awaited entry into the vector processing marketplace.

But when will the announcement take place, and what form will it ultimately assume? On these and similar speculative questions the experts quickly part company.

For years, IBM has largely refrained from entering into the insular world of high-speed vector processing. The reason for the company's apparent indifference is simple: For all its potential strategic value and long-term market promise, supercomputing remains comparatively small potatoes in the information processing scheme of things.

Although it already accounts for an estimated $300 million in sales, the number-crunching market is still far too small to draw much more than an occasional sidelong glance from Big Blue.

"For IBM to become seriously interested in a market, it has to exceed $1 billion," Eugene Starr, vice-president of Moseley Hallgarten, a New York-based brokerage firm, said.

Even so, a widespread wariness of IBM's long-term intentions persists — and with good reasons. Already, signs of the company's grow-

Continued from page 112

Although supercomputers will continue to be used heavily for specialized scientific and engineering tasks, they will increasingly find use in applications that have traditionally relied on scalar processing techniques.

An estimated 20% to 40% of all general-purpose MIS programs are written in Fortran and thus lend themselves readily to vectorization. Such applications include certain data base management jobs involving large volumes of information, the various elements of which can be processed independently of each other.

An estimated 20% to 40% of all general-purpose MIS programs are written in Fortran and thus lend themselves readily to vectorization.

"If, for example, you're calculating the salaries for each of a company's employees, you can easily form the raw data into vectors and process it in a pipeline computer," Moriarty said.

Other applications that are likely to migrate someday from scalar to vector processors include financial modeling, commodities forecasting and stock market analysis. In fact, "supercomputers would probably make sense in any commercial application where users have to recognize patterns in lots of data and react swiftly," David Hertz, director of the University of Miami's Intelligent Computer Systems Research Institute said.

In the long run, the way users think about supercomputer applications will fundamentally change. "People will stop asking what supercomputers can be used for," Ken Wilson, the James A. Weeks professor of physical sciences at Cornell University said. "Instead, they'll start thinking about supercomputers in the same way they talk about personal computers. No one asks what the applications for personal computers are anymore."

arena, allowing others to till soil of number crunching

ing interest in vector processing abound.

Not long ago, for example, the industry giant underwent an internal shakeup in which the commercial and scientific sides of its computer business were organizationally separated — a sure indication that a major market assault lies ahead.

Perhaps even more revealing were recent remarks made by IBM chairman John Opel, who publicly acknowledged his firm's supercomputer development efforts before a gathering of Big Blue's stockholders in Los Angeles.

But what makes IBM's future debut as a number-cruncher an all-but-foregone conclusion is the vector processing field's steep projected growth: For the immediate future, though, the company will likely continue to stand casually on the sidelines of the supercomputer field and quietly bide its time. IBM is behaving in accordance with a tried-and-true formula, according to Wayne McIntyre, Amdahl Corp.'s director of special purpose systems. "IBM seldom innovates markets," he said. On the contrary, it allows its competitors to till the soil of new product opportunity and plant the technological seeds. Then, when the crops have ripened and are ready to be picked, it sends a convoy of blue combines out of Armonk and claims the harvest for itself, while the company's rivals sputter in rage.

To see the tactics in action, McIntyre said, one need look no further than Apple Computer, Inc., which pioneered the microcomputer business only later to lose its market leadership to IBM.

The methods that worked with such devastating success in the personal computer arena will likely prove equally effective in the supercomputer sector, where IBM's initial offering will probably be an attached vector processor for the Sierra series, McIntyre predicted.

But when IBM finally does leap into number crunching with both feet, the move will lend respectability to the entire field and greatly promote supercomputer use among otherwise reluctant buyers, according to Dalhousie University computing science professor Kevin Moriarty. Users who wish to influence the future course of IBM supercomputer development efforts should make their views known.

"What's important during the next year is the kind of information that users feed back to IBM for the evaluation of future products," Ken Wilson, the James A. Weeks professor of physical science at Cornell University said.

When IBM finally does leap into number crunching with both feet, the move will lend respectability to the entire field and greatly promote supercomputer use among otherwise reluctant buyers.

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Supercomputers to land corporate resource roles

For Fortune 1,000 companies, success in an increasingly competitive marketplace may soon depend on the ability to use supercomputers effectively.

As their presence in the big business world steadily expands, large-scale number crunchers are destined to be elevated to the level of strategic corporate resources, according to Carl Claunch, National Advanced Systems Corp.'s (NAS) marketing director for technology planning.

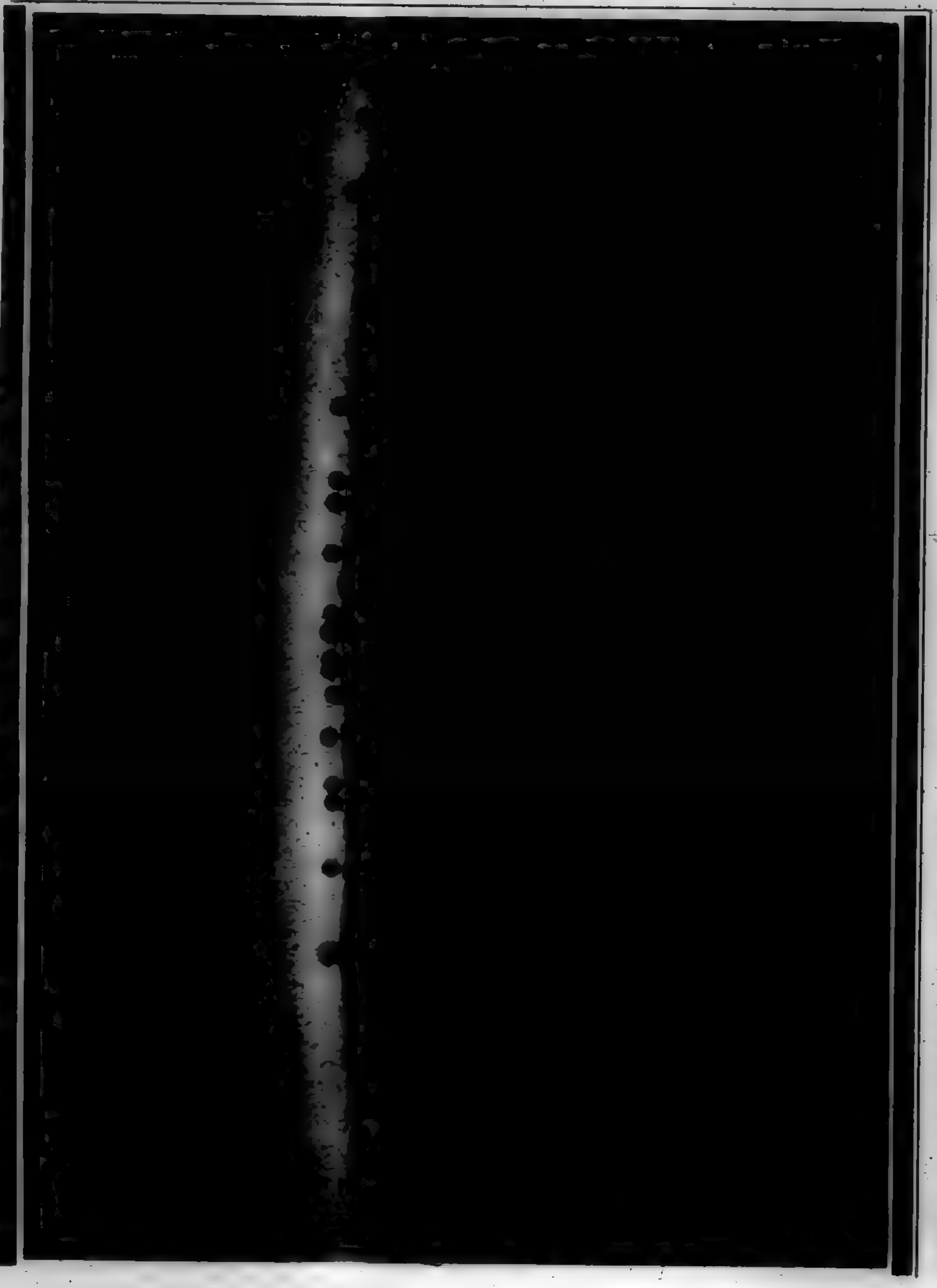
"In a lot of industries during the next 10 years, the competitive edge will belong to companies that can use their processing power to achieve the most accurate results," Claunch said. "An insurance company, for example, that can improve its forecasting abilities will be able to gain an advantage over its rivals by increasing the accuracy of its group policies and lowering its prices."

Stimulating growth

Another influence that will stimulate the growth of commercial supercomputing is decreased hardware prices. Elasticity of demand applies no less to the scientific side of the information processing field than to the mainstream MIS sector, Claunch said.

Probably nowhere is the phenomenon of declining vector processor prices more clearly illustrated than in the recent advent of so-called "near-supercomputers" — scaled-down number crunchers that typically cost a few hundred thousand dollars. Because of their comparatively low prices, near-supercomputers will greatly widen the potential universe of number-cruncher users, according to Bob Paluck, president of Richardson, Texas-based Convex Computer Corp.

Even today, only a handful of the very largest corporations can afford the luxury of installing their own in-house supercomputers, which can easily cost $10 million. "Getting the go-ahead to buy such an expensive piece of equipment is a major event," Paluck said. "It usually requires the approval of the board of directors."



So to satisfy their demand for engineering and scientific processing power, many companies have opted to use supercomputer time-sharing services for their most computing-intensive jobs and in-house superminicomputers for more modest applications. But now, with the appearance of near-supercomputers, those existing vector processing resources seem destined to be replaced or at the very least supplemented, Paluck said.

To illustrate Paluck's point, consider recent developments at United Technologies, Inc.'s Mostek Corp. subsidiary, which uses vector processors for a variety of engineering purposes.

To date, Mostek has used an outside Control Data Corp. Cyber 205 supercomputer to perform its largest and most complex engineering tasks like integrated circuit simulation. "But as the complexity of our VLSI circuitry has increased, our simulation activities have required more and more [computing] horsepower," according to Kwok Wu, manager of the company's CAD development and operations.

> *To satisfy their processing demands, many companies have opted to use supercomputer time-sharing services for their most computing-intensive jobs and in-house superminicomputers for more modest applications.*

Last September, growing demand for vector processing resources finally persuaded Mostek to acquire a Convex C-1 near-supercomputer, which reportedly provides a quarter of the performance of a Cray Research, Inc. machine for one-tenth the price. The in-house C-1 is currently undergoing beta tests.

Another user organization that expects its supercomputer use to grow in the near future is Lockheed-Georgia Co., which needs scientific processors to help it design aircraft parts. Like Mostek, Lockheed-Georgia relies heavily on an outside time-sharing system in the absence of its own in-house supercomputer.

But because of the growing complexity of its design tasks, the company has seen its demand for processing power escalate and its time-sharing costs do likewise. So much, in fact, have its time-sharing bills risen that Lockheed-Georgia plans to order its first in-house supercomputer sometime next year, according to Roy Harris, manager of the firm's scientific computing group.

Until the supercomputer is purchased however, Lockheed-Georgia will use an NAS 9070 with an integrated NAS vector processor to support many of the firm's CAD activities.

HEWLETT-PACKARD

TO MARKET, TO MARKET

By Kathleen Burton

In 1984, Hewlett-Packard Co. shed its technocrat image and pushed aggressively into the mainstream business computer market.

The $6 billion corporation launched its drive last July to join the mainstream computer market by radically restructuring management and introducing personal computer and peripheral products that represented design and marketing breakthroughs for the previously engineering-oriented company.

HP's growth over the past 11 years would be considered more than respectable by most industry standards. Since 1973, company revenues increased at a 21.5% compound annual rate, reaching $6 billion for the year ending Oct. 31. But industry watchers said the mercurial personal computer, minicomputer and computer-aided engineering markets HP hopes to conquer in 1985 and beyond will require an all-out effort by the company to grow even faster and keep pace with industry leaders.

Before the reorganization, HP was a preeminent supplier of analytical and test instruments, minicomputers, medical equipment and scientific calculators.

"The idea behind the reorganization is to make HP as important to mainstream consumers as it's traditionally been to the scientific and engineering communities for the past 45 years," said John Young, HP's chief executive officer.

Under the old organization, HP operated as a loose amalgamation of small, autonomous and often uncooperative fiefdoms, each focused tightly on its own product lines, a viable strategy only as long as HP pursued its traditional niche markets.

Continued on page 118

JOHN OWENS

HEWLETT-PACKARD

John A. Young

Continued from page 117

But by 1983, when customers began demanding integrated systems and as HP's instruments and computer markets began converging, HP's once-viable, separatist structure became a liability.

Now, HP is targeting three distinct markets — instruments, business computers and analytical components — each consolidated under three newly organized product divisions and sales teams, overseen by Dean Morton, newly appointed chief operating officer.

Ross Hunt, marketing manager of HP's Information Systems Group, and overseer of the HP 3000 series minicomputer, said, "The glass-enclosed walls of the computer room are breaking down, and 85% of HP's future business will be integrated products such as microprocessor-driven instruments and distributed data processing products networked to [personal computers]."

HP 3000 series enhancements

According to Hunt, with this in mind, HP plans several product enhancements to the HP 3000 series next year —memory upgrades, tighter integration between the HP 3000 and future personal computer products, more microcomputer-based applications and significantly larger data bases.

The year will also bring more competitive pricing for next-generation HP 3000 series products, Hunt said, and sales efforts that will increasingly focus on previously neglected value-added resellers, original equipment manufacturers and software suppliers.

"We've targeted [value-added resellers], OEMs and software developers next year to supply integrated solutions for largely untapped vertical markets that we never took the time to understand before," Hunt said. There will also be changes in field sales in '85, said Roy Verley, HP's director of corporate public relations.

HP's field sales groups will act as an early warning system for customer needs in '85, bringing complaints and problems back to corporate management, he said.

"Salespeople in the field are in a unique position to spot a customer's incipient toothache long before it becomes a full-blown problem, and we plan to use this resource," Verley said. HP will also adopt a long-time IBM sales strategy next year, Verley said, using floating, on-call technical product specialists to back up HP's traditional sales teams.

Increased support in 1985

Users will also benefit from increased support in 1985, Verley said. The company's recently created National Response Centers, located in three U.S. cities, will offer 24-hour remote diagnostics via satellite for international and domestic customers.

A dark cloud on HP's horizon, however, is last year's abortive attempt to gain a leading position in the lucrative computer-aided engineering (CAE) market, expected to grow to $275 million by the decade's end.

In 1984, the resignation of several key CAE division managers and engineers, the disappointing performance of HP's 9000 series workstation — intended to spearhead HP's entry into the burgeoning market — and a relocation to Colorado decimated the division, according to Rich Edwards, a former HP employee who tracks the company for Robertson Colman Stephens, a San Francisco investment banking firm. "HP's CAE group is now an empty shell, and new product introductions are at least six months away," he said. Even though the division is now back on course, consolidated under a new management team and scrambling to get new products out the door, Edwards said the delay in entering the exponentially growing market (which is expected to double in 1985) will cost HP irretrievable market share next year as competitors like Valid Logic, Inc. and Daisy Systems, Inc. rush new products into the market.

According to some analysts, a customer-driven new products strategy is critical in 1985 if HP intends to gain significant market share in the diverse product areas it has targeted.

Myron Kerstetter, program director for small computer systems at the Gartner Group, Inc. in Stamford, Conn., said, "1985 will have to be a product development phase for the company, as they are two years late in getting a high-end 32-bit HP 3000 product into the market."

Due to this, according to Kerstetter, the competition (led by Digital Equipment Corp. and Data General Corp.) is rapidly closing in, causing HP to drop prices throughout its minicomputer line and seriously impacting margins and profitability throughout the entire company.

Kerstetter said aggressive price discounting of the HP 150 personal

Continued on page 120

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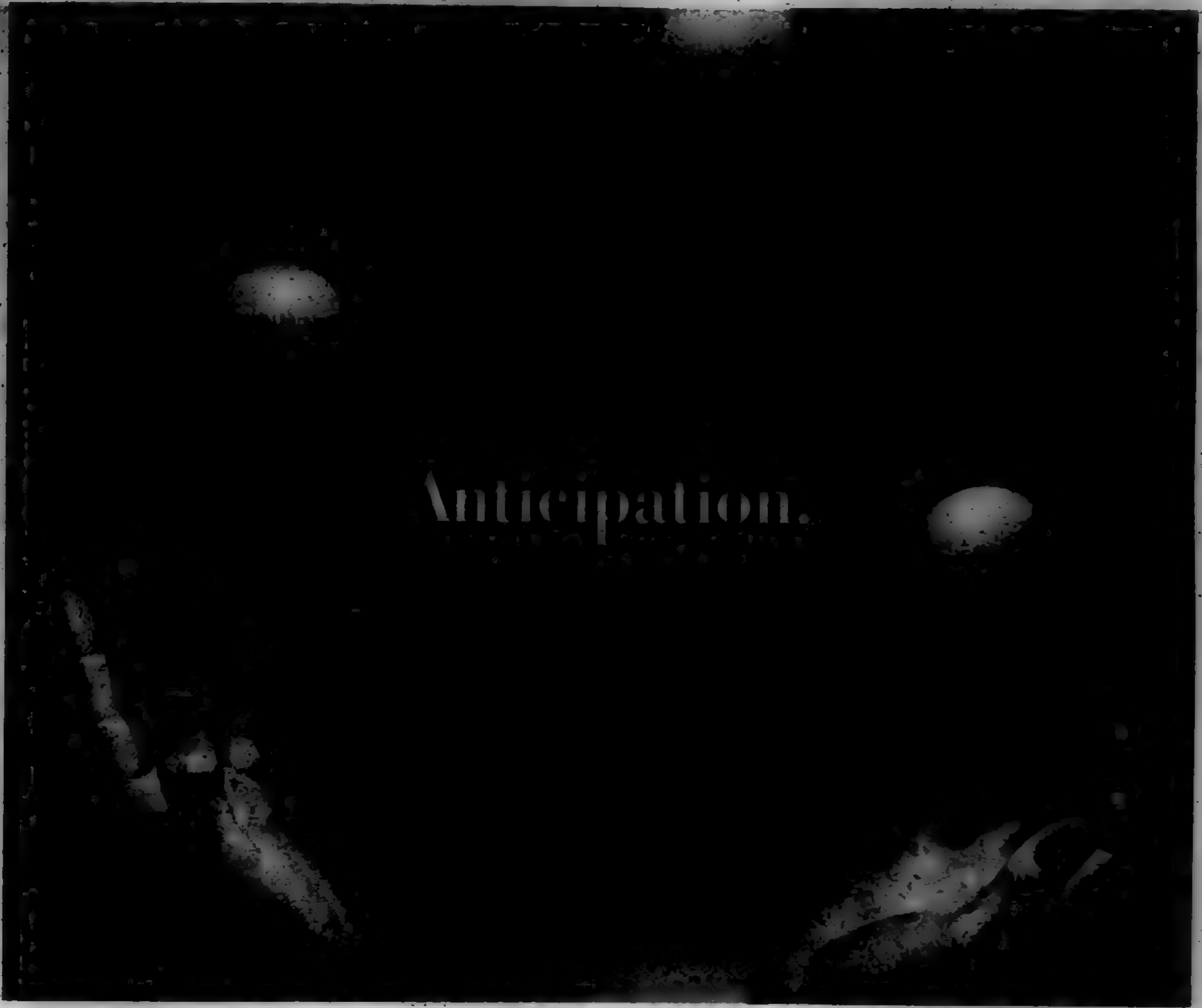

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HEWLETT-PACKARD

Special group spearheads HP's marketing campaign

Hewlett-Packard Co.'s 18-month-old Personal Computer Group (PCG) has dramatically changed the way the rest of the company conceives, develops and sells its products, according to Cyril Yansouni, PCG vice-president.

Although the company did $500 million in personal computer business last year, before the group was formed HP had a disjointed personal computer strategy that targeted only its traditional scientific and engineering customers, Yansouni said.

"Personal computers are a must-win market for us now," Yansouni explained, "and creating the PCG was a good way for the company to learn marketing."

Murphy

The blitzing of the personal computer market by IBM and Apple Computer, Inc. made it apparent that the burgeoning personal computer market, of which HP held only a 2% market share, was driven by average consumers. As a counteraction, HP planned to update its marketing strategy.

Last year, HP began lowering prices aggressively on all its products, from the HP 150 personal computer to the Thinkjet and Laserjet printers, a trend expected to continue next year in its 3000 line.

According to Bill Murphy, marketing manager of the PCG, the division's plans for '85 include focusing on personal workstations in the $1,000 to $6,000 range, with four major computer product introductions scheduled for the year.

Other plans include extending the conceptual planning phase of product development and continuing to use the consumer marketing techniques that proved so successful in products released in 1984 — such as quantitative market research, focus groups, test marketing and closer attention to positioning.

Murphy said his division plans to trim costs and increase dealer productivity through the newly established Dealer Advisory Council, an aggregate of 12 dealers from across the nation who will meet four times with HP officials in '85 to hash out product, promotion and delivery strategies. "We still have a lot to learn with retail," Murphy admitted.

The net effect of PCG's 1984 efforts has been a rapid rise through the second tier personal computer companies, Murphy said. "Our challenge in '85 is to distance ourselves from the second tier companies and cut into the first tier — Apple and IBM," he said.

But according to some industry watchers, HP may still not be pragmatic enough to succeed against IBM in the personal computer business. E. David Crockett, a former HP executive and president of the market research firm Dataquest, Inc. in San Jose, Calif., said. "HP's advertising budget is much too small when you consider Apple is spending $100 million on advertising next year," while HP plans to spend $30 million. "At that rate," he said, "they don't stand a chance against Apple or IBM."

Yansouni

Continued from page 118

computer and HP 3000 lowered product demand (due to the lack of new products) and last year's costly marketing efforts took financial tolls on the company in 1984.

HP's fiscal year figures bear him out, indicating that margins and profits have flattened out (in 1984, fourth-quarter profits were up 14%, compared to primary competitors DEC and DG, who both posted increases in the low 30s) and sales for the quarter showed only a 27% increase, trailing DEC (41%) and DG (53%).

Still reeling from the reorganization, Kerstetter predicted HP would release only minor enhancements to existing 3000 products next year, such as increased networking capability for low-end 3000 series products, several new micro products and networking support for the IBM Personal Computer.

In sum, in 1985, a feisty HP will enter the ring with gloves on, targeting the personal computer, CAE and minicomputer markets, armed with new products and new marketing strategies and ready to roll with the punches from the industry's big boys. "We plan to win big," was Young's optimistic prediction for next year.

But, to do so, HP must overcome several obstacles. Most importantly, the company must introduce new, competitively-priced personal computer and 3000 series products into the market before the year is up to head off a triumverate of serious contendors — IBM, DEC and DG.

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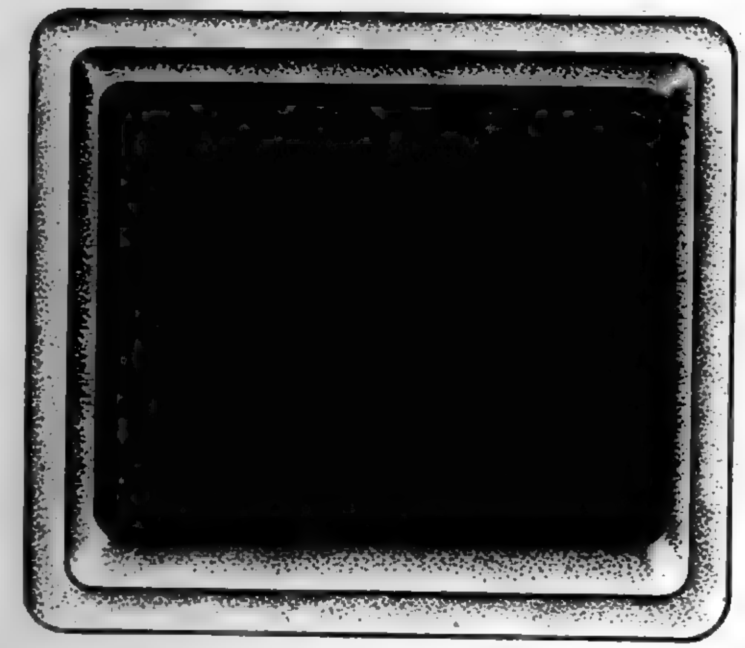

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IBM

THE SPECTER OF ANTITRUST

By Edward Warner

KATHY CROO

Two years ago this month, the U.S. Justice Department dropped its antitrust case against IBM. Some say the giant of Armonk, N.Y., whose 1983 revenues topped $40 billion, walked from the courtroom back into the competitive arena — and came out swinging.

In addition to having pressed the advantages of dominance in most market niches where it competes, the company has also made key minority and total acquisitions, including a 25% stake in Intel Corp. and the recent $1 billion-plus acquisition of Rolm Corp.

"Whether the strategies involve influencing lease vs. buy actions, outside leasing arrangements, volume-discount leveraging or drastic cuts in purchase prices, IBM is dramatically changing its traditional stance and using every means to meet its competition head on," said a 1984 report on IBM strategy produced by the International Data Corp. (IDC), a Framingham, Mass.-based computer-industry market research firm.

IBM's competitive strategies all fall within the limits of the law, according to IBM spokesman Peter Kuhn. And, he argued, they are often based on competitive pricing or advances in technology.

Some IBM competitors are not convinced. At least one, BMC Software, Inc., filed suit late last year in the U.S. District Court for Northern California, claiming IBM had violated antitrust laws by bundling two data communications

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products with the latest release of its IMS data base management system.

"They're saying we're bundling; we're saying we're not," Kuhn responded. A hearing in the case was held in December, but no trial date has been set.

The justice department, meanwhile, is also taking a critical look at IBM. The agency calls it part of a routine investigation of the settlement IBM reached with Hitachi Ltd. in a suit IBM had brought alleging copyright infringement. Parts of that settlement were not made public, and computer industry analyst Robert Djurdjevic, editor of the industry newsletter "Annex Computer Report," claims the settlement requires that IBM be permitted to inspect Hitachi computers prior to their introduction. Kuhn denied this and said that Hitachi would, at its option, be able to permit IBM inspections but only after the product had been unveiled.

> *'[There is] no rule against having a very large market share. The question is how you come by it and how you keep it.'*
>
> — William Baxter, former U.S. Assistant Attorney General

In a letter to Djurdjevic, though, Assistant U.S. Attorney General J. Paul McGrath, head of the agency's antitrust division, said that "The fact that IBM freely can use the courts to pursue its claims does not mean that it can unlawfully extract from its opponents settlement terms that have anticompetitive effects." A Justice Department spokesman said the investigation, begun in June of 1983, is continuing.

Although competitors may be eyeing the courts as an option to curb IBM, the track record of previous efforts has not favored those plaintiffs. During the 1970s, IBM faced at least nine lawsuits from competitors that claimed the firm had violated antitrust laws. Although IBM did make large out-of-court settlements in some of those suits, such as its 1973 settlement with Control Data Corp., IDC data indicates that IBM won all of those cases that went to trial.

Since the settlement of the Justice Department's case, IBM has sued 10 firms for either dealing in its trade secrets or infringing on its copyrights. Some of those suits, such as the ones against Hitachi, National Semiconductor Corp. and its subsidiary National Advanced Systems, lasted months. Others, such as the one against the Gartner Group, Inc., a Stamford, Conn., consulting firm, were settled within days.

The most recent celebrated attempt to prove IBM guilty of antitrust law violations, U.S. v. IBM, was eventually abandoned on Jan. 8, 1982 for what the Justice Department described as a lack of evidence. On the international level, IBM has also prevailed, settling in 1984, on what are said to be favorable terms, an antitrust investigation by the European Economic Community.

Former U.S. Assistant Attorney General William Baxter, the man who announced the government's decision to cease prosecution of IBM, said he believed that IBM is "too well represented by too smart counsel" to fall into antitrust culpability. He added, though, that such charges might well be brought against the company by a future administration. "I would hope that they would have better evidence" next time, said Baxter, who is now a professor of law at Stanford University in California.

Such evidence must do more than point to IBM's

VAX
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AMERICAN

Maybe it's time for Victor

dominance in some computer industry fields, Baxter said. There is, he noted, "no rule against having a very large market share. The question is how you come by it and how you keep it."

In the view of Ray Carlson, a former chief prosecutor in the U.S. v. IBM case, a successful prosecution of IBM would have to show that the firm acted with another organization to fix prices or had priced its products below cost, a practice known as "predatory pricing." But, he added, "It is impossible in my view to prove predatory pricing, [because] it's not a competitive market with a monopolist in it."

Carlson said he is sure that IBM is in no current danger of Justice Department antitrust action because "There is just no more Section Two enforcement [of the Sherman Antitrust Act] in the U.S. government. Section Two of the Sherman Act, the nation's prime antimonopoly law, forbids independent monopolistic practices.

"Not only isn't it being enforced," he added, but "under current views of the law, it probably couldn't be enforced." Only Section One of the Sherman Act, which bans anticompetitive agreements such as price fixing between two or more firms, is receiving enforcement, he claimed.

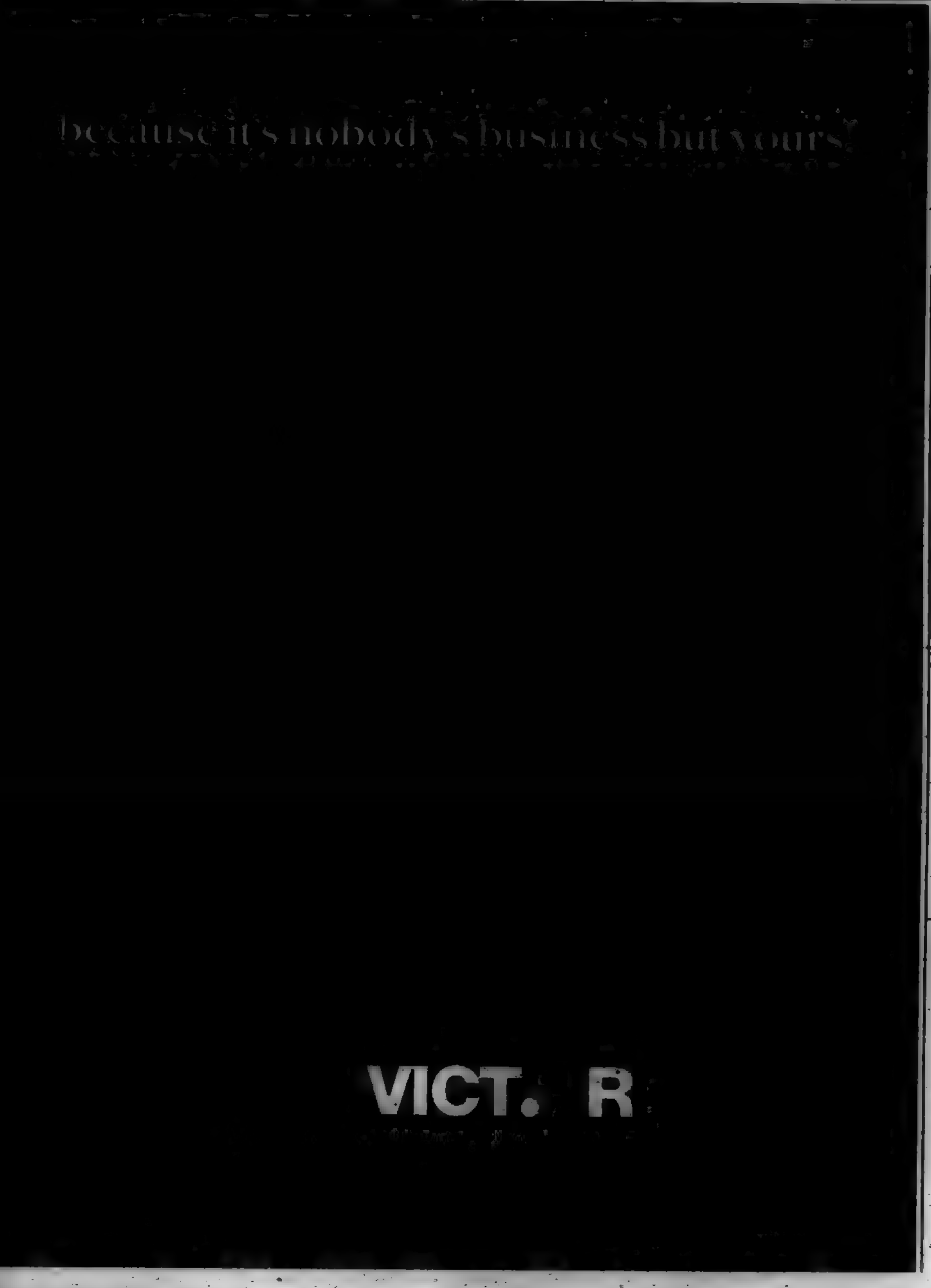
Yale Law School Prof. George Priest, an expert in antitrust law, disagreed. The "Reagan administration has focused on Section One offenses," he said, because the "law makes it difficult to make out Section Two offenses."

While claiming that "IBM is the darling of the Reagan administration," industry observer Frederick Withington, vice-president for information systems with Arthur D. Little, Inc., said the true reason IBM faces less danger of antitrust prosecution is because its "frog-to-puddle ratio is declining." By that, Withington said, he meant that "IBM is smaller, relative to the overall competition," especially in relation to foreign newcomers such as Hitachi, Ltd., Philips Information Systems, Inc. and Matsushita Electric Industrial Co. "If they can prove that," he added, "then there is less chance of being attacked by the regulators."

Withington admitted, though, that there are some parts of the computer industry where IBM casts a long shadow, specifically among mainframe and personal computers. There, he said, IBM's massive size "does represent an economic asset on the government's behalf," especially if the U.S. is to protect its computer industry from falling to Japanese competition. He added, however, that he "wouldn't go as far as saying that everybody wants to cuddle up to [Big Blue] and take them to bed."

Former Assistant Attorney General Baxter said he thinks that "from the standpoint of the national economy, [IBM's size] is just splendid," as does analyst Gideon Gartner — at least at present. While Gartner, president of the Gartner Group, said he believes IBM's size is good today because it is keeping prices down, he speculated that "in 10 years, if IBM sees it has a position of dominance, and if IBM realizes it has won the war, and the pace of innovation slows down . . . then it could be adverse for users."

A spokesman for another IBM competitor, though, said he believes enough independent-minded users will always exist to keep Big Blue's major competitors in the game. According to Memorex Corp. spokesman Bob Fermoyle, competing with IBM "isn't a survival question" for Memorex, even though CDC has exited the storage system market, and STC is now in Chapter 11. "A certain percentage of [data processing] shops will be two-vendor shops forever," he observed. "They want and need that competitor."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1983 IBM Market Share

Market	Rank	Share	1983 Worldwide Shipments All U.S. Manufacturers
Mainframes	1	72%	$22 billion
Small Business/Minicomputers	2	17%	$ 9 billion
Personal Computers	1	28%	$12 billion
Terminals	1	40%	$ 6 billion
Mass Storage	1	70%	$ 8 billion
Word Processors	1	25%	$ 5 billion
Software	1	30%	$ 8 billion
Personal Computer Software	1	10%	$ 1 billion
Private Branch Exchanges (Rolm Corp.)	1	21%	$ 3 billion
Semiconductors (Intel Corp.)	3	18%	$ 6 billion

CHART COURTESY OF TECHNICAL FINANCIAL SERVICES, INC.; IDC DATA

Case settlement raises questions

Did the U.S. government drop its antitrust case against IBM because it believed the judge in the case, David Edelstein, was about to decide the case in the government's favor?

That claim, made by one of the former chief prosecutors of the government's case, Raymond Carlson, is only one of the issues surrounding the unsettled case, which lasted 13 years before the government gave up trying to prove that IBM violated antitrust laws.

In an interview last month, Carlson said "The reason [the case] was dismissed was that the Reagan administration had concluded that the judge was going to find that monopolization had occurred."

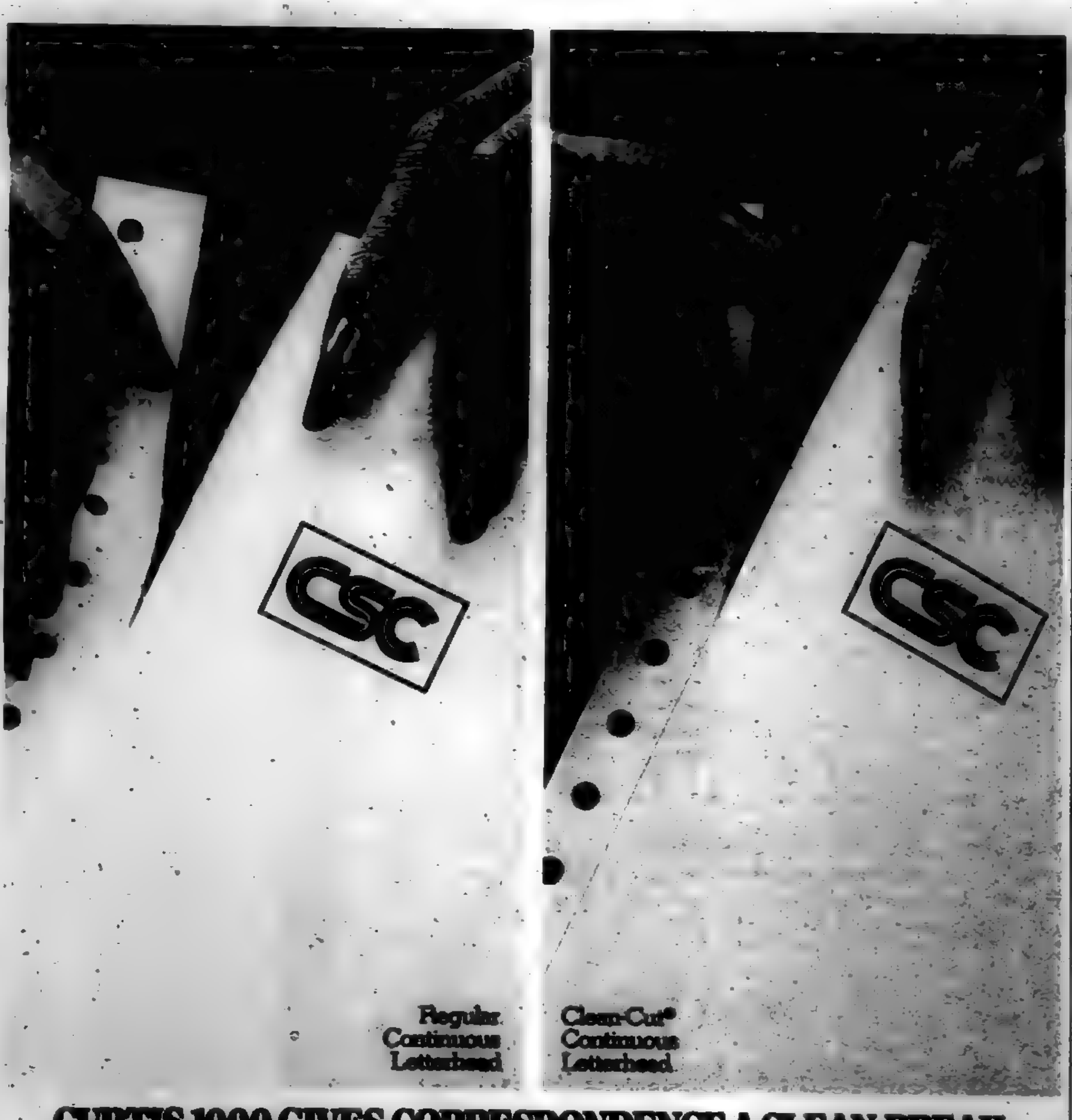
Former Assistant Attorney General William Baxter, however, insisted that the government abandoned the case because of a lack of evidence.

Had Edelstein ruled in the government's favor, the likely penalty is uncertain. Would the firm have been fined or would it have been broken up, as was the case in the suit brought by the government against AT&T, and settled on the day that the IBM prosecution ceased?

One economist who testified on the government's behalf, Lee Preston of the University of Maryland, said he "was sorry that IBM Domestic and IBM World Trade were not separated."

One or both of the two divisions, competing as separate firms, he said, might eventually have become as eager and innovative as Northern Electric after it was separated from Bell Canada to become Northern Telecom, Inc.

Preston said he did not view the U.S. Justice Department's conditional approval of IBM's acquisition of Rolm Corp. as creating the potential for an IBM monopoly in private branch exchange communications. "Rolm is not a terribly large company," he said.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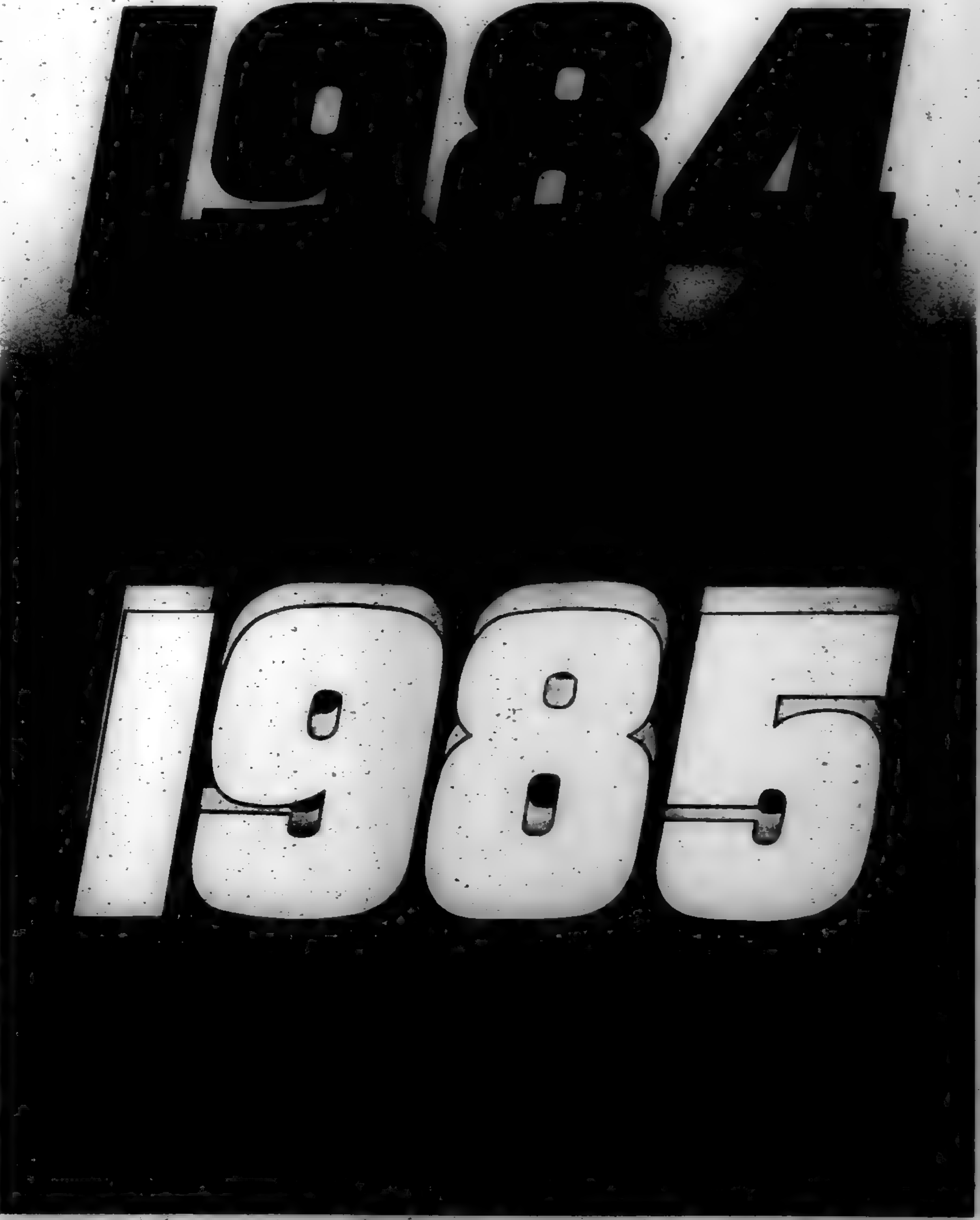


EDITORIAL

New Year's revelations

You hold in your hands *Computerworld*'s fifth annual Forecast issue: the culmination of months of effort by the editorial staff of this newspaper.

As in previous years, our objective has been to suggest the forces and trends data processing management will have to reckon with in 1985. We paint in broad strokes in this issue, leaving the fine detail to professional forecasters and the events themselves to the future. Some key areas to watch are:

■ **DP budgets will be more conservative in 1985.** Yes, corporate DP budgets are growing, but at a slower rate than in any of the past three years. Managers surveyed by *Computerworld* in late November reported an overall budget increase of 9.9% in 1985 vs. 12.4% in 1984, which means there were fewer new hires, deferred software purchases, tighter cost control and a continued applications backlog.

■ **Microcomputer costs will drop, but the user's cost may climb.** Micro users are getting more bang for the buck from their hardware, but the typical configuration cost is rising, not falling. This is because full systems service and support does not come cheap. By one estimate, each fully supported desktop machine in a Fortune 1,000 company costs $8,000.

■ **Capacity planners face increased demand for more horsepower.** The growing number of micro and intelligent terminal users who want access to the mainframe will further strain system resources. Accommodating them will require new and unexplored approaches to a problem that will not go away.

■ **More users will embrace bypass.** A number of Fortune 1,000 companies are not waiting for dust from the AT&T divestiture to settle. They have begun to take control of line rates by practicing some type of local or long-distance bypass. Technologies such as CATV networks and low-cost, two-way satellite systems are expected to mature in 1985, heightening user interest in bypass alternatives.

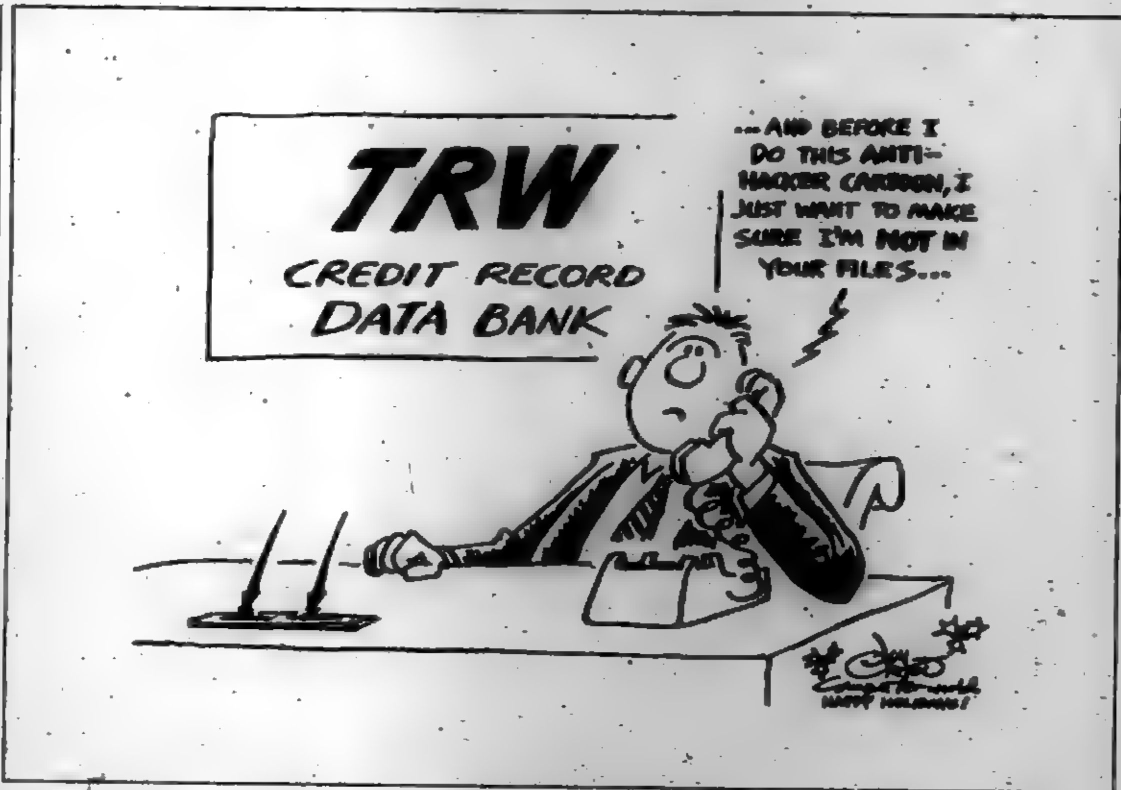
■ **IBM software prices will rise.** One of the fastest growing segments of the company, software is an increasingly important component of IBM's revenue growth. Software products could account for 8% of total revenues in 1985, up from 6.5% in 1982. Users should probably brace themselves for higher price tags — dramatically so, in some cases.

■ **The Japanese still face major hurdles in the U.S. computer market.** Japanese companies have not yet cracked the micro and large-systems markets in the U.S. — nor will they in 1985. This owes to weaknesses in Japanese software, lack of American distribution channels, unfavorable market-entry conditions and cultural differences.

■ **The threat of the "intelligent terrorist" will require DP vigilance.** The intelligent terrorist that recognizes the value of computer centers to the fabric of society fortunately has not yet arrived. But terrorists have launched isolated attacks on data centers, and authorities warn of the threat to fragile computer-based networks.

■ **Supercomputers will find a new market in commercial DP.** High-speed vector processing remains largely the preserve of scientific or engineering heavyweights. But number-crunching machines are moving into corporate environments.

You'll find these and other revelations in the pages of this issue. We'll be watching them as closely as you throughout the new year.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LETTER

Basic DP concepts need rethinking

Hurray for David Hayes in "Integration halves fireplace maker's DP costs" [CW, Dec. 3]. The decisions that he successfully implemented are not easily swallowed, but the underlying problem that he managed to turn around has roots that go very deep.

More and more followers and leaders of DP are being asked to use a product or methodology that never or only partially performs its intended function. Many times the product may even be outdated by the time it is implemented. All of this is forcing a rethinking of the basic DP concepts.

One wonders if corporate expenditure decisions for DP support are being left in the hands of those who have mastered the ability to double-talk. They were probably very good at the hula hoop, wear Calvin Klein jeans at home and rallied to Mel Brooks' cry, "Gentlemen, we've got to protect our phony-baloney jobs." These people love water-cooled, bubble-memoried, cattle-prod-prompted behemoths and closets full of razzmatazz. But then, they don't have to use it.

People who make the decisions must be those who are actively involved with the problems at hand and have to solve the problems using the tools they acquire. It is not enough to allow expenditure decisions to be made based on hyped-up brochures and media blitzes surrounding a product that has been packaged to appeal to the market's sublime pleasure centers.

Hayes seems to have been very fortunate in that he levelheadedly approached the inadequacies of his shop's position, got back to the problem at

See LETTER page 128

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VIEWPOINT

'Know-how' machines on the horizon

LECHT ON SCIENCE
Charles P. Lecht

Part 1 of series

Recent happenings in our industry suggest that 1985 will be the year when practical artificial intelligence applications will leave research laboratories to make their way into our workaday world. The increasing availability of macro systems capable of processing massive information bases is making it possible to create such systems.

The emergence of advanced, integrated service, digital networks and powerful terminals is paving the way for AI systems. Emerging federations of high-technology companies and traditional business institutions — finance, insurance, energy, education and so on — will create the source of their intelligence.

The formation of these federations is an event of staggering beauty. Born in the late 1940s, our computer industry has evolved from a few, small laboratories producing experimental calculating instruments to a massive enterprise spawning an ever-increasing sea of data and information processing devices — some of which seem to possess an intelligence that confounds us. To many, this intelligence appears indistinguishable from that which we thought was found only in human beings.

Evolving partnership

During this evolution, the model of our American computer industry, as it related to other industries, was cloned both inwardly and outwardly. It spread from our largest industrial corporations to our smallest and spilled over into foreign lands. Now, this model, which heretofore presumed the employment of computer technology to be mostly an adjunct to other industries, is changing to become one of partnership. This is likely to create new product development environments that are catalysts for computer system technologies of improved utility.

I believe the appearance of these "know-how" machines confirms that our hopes and aspirations for the creation of computer systems are being realized — more productivity with less toil.

There follows, now, a scenario for how this happens. As if obeying some mysterious and immutable law instituted in its collective consciousness by an otherworldly force, the banking industry's largest members have metamorphosed into massive computer systems/banks. Similarly, our largest computer companies are undergoing a metamorphosis to massive information processing systems that do more than merely provide hardware, software and services; Control Data Corp., IBM, General Electric Co. and many others now offer financial services.

Joint ventures and acquisitions

At the same time, both banks and computer companies are creating federations with the largest corporations in other fields: Communications, automotive, publishing, brokerage, insurance, manufacturing and aerospace companies head the list. These usually start as joint ventures, such as the recent IBM and Merrill Lynch Pierce Fenner and Smith, Inc. venture to market financial data systems and services [CW, March 26]. They can also emerge through acquisitions, such as General Motors Corp.'s takeover of Electronic Data Systems Corp. (EDS) [CW, Oct.1, Oct.22].

However they happen, these new business entities prefigure the form all industries will adopt as computer technology joins with other industries to transform the way we do business.

The products resulting from such federations will provide us with the means to address problems of increasing consequence to us. They will, quite naturally, see first application to problems with the biggest payoff potential. Later, they will be used to spawn systems whose costs will put them within reach of ever-smaller enterprises, providing one of mankind's most precious gifts — automated know-how. The kind of capability, for example, created when IBM and Merrill Lynch work together to address personal financial problems, or when GM and EDS collaborate to address mobility problems.

Replication of all intelligence levels

I call these systems "know-how machines" rather than, say, "expert systems" on purpose. The former may appear to be nothing more than a euphemism for the latter — an AI entity possessed of expertise. I intend for know-how machine to have a broader meaning than that implied by the word "expert." I envision AI embracing the replication, in machine format, of all forms and levels of intelligence that we encounter in the world of human intelligence — and hopefully more.

I cannot conceive of a world devoid of dumb, sometimes fumbling robots, in addition to others that may eventually exceed us. Like old Chevrolets, primitive forms of artificial intelligence will always find a place. I say this because I want to reserve the title of expert system for a special class of know-how machine — those possessing expertise as we have come to accept its meaning. Many know-how machines, in fact most, will possess no more expertise than the mundane skills expected of people in the nonexpert category.

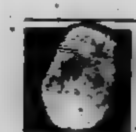
Large or small, possessing expertise or something less, know-how machines will be composed of hardware, software and data and will be packaged in a manner to facilitate their swiftest application. They will be purchased and installed by businesses and individuals alike. Their availability will enable a quantum leap in our industrial efficiency, and the basis of our economic system — competition — will benefit from their appearance. Success will be based less upon what the competition cannot do because it lacks know-how and more on what it can because it has know-how.

You may consider this forecast the

See KNOW-HOW page 128

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Hacking incidents mandate stricter security



HUMAN CONNECTION
Jack Stone

This industry has seen its share of bizarre antics over the years, but I don't recall any as weird — perhaps distressing is a better word — as that concerning Richard Sandza, a reporter for *Newsweek* magazine. The story was splashed all over the news recently, but if you missed it, let me give you a quick summary.

Sandza, in an article he wrote for the magazine Nov. 12, let the public in on a secret that was surely no surprise to DP workers. A ring of hackers, operating an elaborate underground network using personal-computer-based electronic bulletin boards, had been passing around illegally obtained computer access codes, credit card numbers and telephone numbers.

As a consequence of his article, the hackers stuffed Sandza's phone line using autodialing systems; threatened to shut off his home electricity by remote control of the power company computer; and conducted a modern-day version of a medieval inquisition — a "teletrial" — in which they debated his fate — anonymously, of course — over a central bulletin board.

But this was just fun and games for these hackers — a warm-up for the big league. With a little ingenuity, they cracked the TRW, Inc. Information Services Division's credit files, pulled Sandza's credit card codes and passed them around.

> *It is completely mystifying why organizations that provide telephone access to their data bases continue to equate security with little more than password protection and user identification.*

The issue here is not how far out of touch with this society these people are, nor how much sympathy they deserve because their parents didn't give them nickels for Tootsie Rolls when they were kids, causing them to feel unloved ever since. The truth is that they violated the law in numerous ways — wire fraud, conspiracy and threats of bodily harm — and should be sent to prison until they learn their actions will not be tolerated.

Let me turn now to the issue of the security controls on the TRW credit system — or better stated, the lack of controls. This system should be familiar to you as the result of a highly publicized incident earlier this year when hackers reportedly penetrated the TRW division's files [CW, July 2] — an action that be can performed by any high school dropout who can steal a subscriber's telephone number and password and has a thousand dollars or so to invest in a low-grade, modem-based micro.

Delia Fernandez, TRW Information Services' public affairs director, said in the Dec. 6 *Washington Post*, "You can put all the sophisticated bells and whistles on a computer that you can think of to keep it secure. But if someone who has the legitimate right to get into the system . . . releases the password . . . you have lost that security."

This statement provides a shocking example of the naivete associated with system security that penetrates this industry. After years of warnings, it is completely mystifying why organizations that provide telephone access to their data bases continue to equate security with little more than password protection and user identification.

I realize that there would be added costs and inconveniences involved in implementing additional security safeguards. But consider the legal problems presented by the illegal penetration and distribution of data.

Can it happen to your data center? That's for you to judge. ‡

Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C,

LETTERS

AI programs not true to life

As I was reading "Experiments in Artificial Intelligence" [CW, Nov. 12], I found myself disturbed, not so much by the content of the text, but by the content of the examples. I became irritated while reading the divorce scenario, which was analyzed by the Boris AI program. I found the cliche about women being selfish, dishonest and promiscuous irritating. Of course, the man was hard-working, but poor, and had to defend himself from the selfish wife.

As I glanced back over the examples, it became apparent that many others were equally poor. For instance, the example used by the Margie program showed that women could only receive action. At no point did women initiate an action. Women were told, advised, reminded, sold to and assaulted. Men, on the other hand, were able to do things, not just have things done to them. Men told people what to do, hurt other people, gave people things, went places and prevented things from happening.

The Sam, Pam, Frump and IPP programs were not given any better reading material. Women were not worth discussing, apparently.

In the conclusion, the authors pointed out some of the fallacies that the IPP program made as a result of reading these examples. One is forced to wonder what conclusions the program would have made about women and men.

It is not clear whether the fault owes to the selection of examples for the article or whether the examples given to the programs were full of absurd and offensive cliches about women and men. If the former case is true, perhaps the authors should have given as much thought to how the readers would interpret the article as they gave to how computers understand language. If the latter is true, the individuals who wrote the examples should examine their own thinking. Either way, the articles should have been well-balanced and well-written. The articles in *Computerworld* should spark intelligent and creative thought about issues in the computer business, not reinforce outdated social ideas.

Beth Shelly
Cary, N.C.

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KNOW-HOW

from page 127

product of unbridled optimism. There were those who only a few, short years ago pooh-poohed the possibility that tens of millions of computers — more powerful than they had ever seen — would make their ways into our offices and homes. Some doubted that orbital flights would be routine and available for commercial applications and education. Automated bank tellers were inconceivable not too many years ago, yet they are commonplace today.

Now, I don't expect know-how machines to appear everywhere overnight. But in 1985 they will start to appear, and when they do, the rush to acquire them should provide endless opportunity to our computer industry.

Systems that can do the work of bank tellers, typesetters, environmental controllers, mail deliverers, draftsmen, guards and telephone operators all display some measure of intelligence as we define it. The fact that a bank teller had to use his brain to perform transactions and that machines now perform the same duties must lead us to the conclusion that machines have been imbued with some measure of intelligence. To argue that the job of bank teller does not require intelligence is unwarranted and an insult to the people who made — and still make — this a career.

LETTER

from page 128

hand, identified the solution and then was able to sell it to the right people, rather than attempt to prop up bad money with good money.

When we make the decision to spend the money, let's get back to the basics. Is it cost-effective for now and the future? Is the mission accomplished efficiently and correctly? Is the finished product what the user wanted? Designer jeans are too expensive for the use you get out of them. Let's leave fads and cosmetics to the young and let's be realistic and mature in our decisions. I'll take my faded blue jeans, thank-you.

Mike Stonecipher
St. Louis

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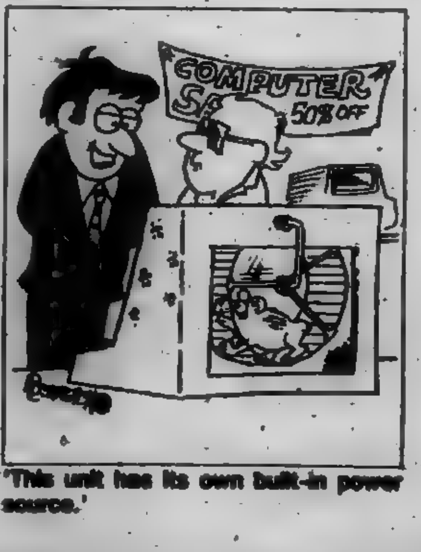

'This unit has its own built-in power source.'

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SOFTALK
John Gallant
CW Senior Writer

Unix may enter 1985 as hot topic

It is customary at this time of the newborn year to reflect on the previous year in terms of important events and major trends. Any number of pundits and observers will begin to speak of 1984 as the year of *this* or the year of *that*.

Undoubtedly, some analysts will say that 1984 was the year of Unix — at least, they will claim, it was the year Unix became a hot issue in the computer industry. They will point to unbridled AT&T's major Unix forays and IBM's introduction of its Personal Computer — PC/IX — version of that operating system and the availability of Microsoft Corp.'s Xenix for the Personal Computer AT. They will also make glowing reference to the increasing stock of software packages introduced for Unix and the growing number of small systems with Unix support announced last year.

But if 1984 was a year in which public attention was turned to Unix, it was also a year in which its detractors became more vocal about that operating system's limitations. Nay-sayers spoke of the basic incompatibilities between the different versions of Unix, the system's lack of security mechanisms and so-called user-friendliness and the absence of advanced features such as windowing.

Unix proponents, however, say those are limitations that can be overcome, and they claim that the system's strengths — its multiuser, multitasking capabilities — outweigh its weaknesses. Much of the leviathan AT&T's new competitive strategy rests on the success of Unix — System V, at least. While AT&T may be new to the open market, it certainly has the resources required to make its presence felt in a big way. Thus, Unix backers say, if 1984 was not the year that Unix won over the majority, 1985 or some subsequent year will be.

Though Unix is AT&T's leading weapon, a key factor in the success of that system is clearly IBM. Considering IBM's dominance in the high- and low-end computer markets, what the blue force does

See UNIX page 138

Policy options aiding software industry released recently

By Peter Bartolik
CW Staff

WASHINGTON, D.C. — A U.S. government agency has urged consideration of several policy options designed to aid the U.S. software industry in maintaining its expected short-term leadership of the world software market over the longer term.

In a comprehensive review of the industry released recently, the agency reviewed the past, present and future of the U.S. software industry in light of technological changes and foreign competition.

"A Competitive Assessment of the United States Software Industry," drafted by a branch of the U.S. Department of Commerce's International Trade Association (ITA), concluded that the worldwide market share of U.S. software vendors should grow from its current 70% to 75% in 1987. Over the longer term, however, the U.S. software industry could be at a disadvantage relative to foreign competition due to U.S. government policies discouraging market growth and policies of foreign governments favoring their own domestic companies.

The ITA's Office of Computers and Business Equipment prepared the report over an eight-month period as part of Commerce Secretary Malcolm Baldridge's plan to draw up competitive assessments analyzing U.S. industries. The study offered the following options for consideration by the U.S. government that could aid the U.S. software industry in maintaining its current leadership.

■ A coordinated program to promote the U.S. position that copyright law is the best overall form of software protection;

■ Bilateral discussions to ensure that signatory nations adhere to international conventions on copyright protection of software;

■ Through diplomatic channels, to strongly protest proposals by nations that seek to establish special legal systems outside of copyright law;

See STUDY page 134

AI field faces crucial barriers to acceptance

By David Olmos
CW Staff

PALM SPRINGS, Calif. — Artificial intelligence promises to have a "profound impact" on the computer industry in creating new products, but a number of barriers will have to be overcome before commericialization blossoms, according to an executive with a leading AI company.

Lee M. Hecht, chairman and chief executive officer of Teknowledge, Inc., a Palo Alto, Calif.-based, artificial intelligence firm, said the next several years will be crucial in determining the commercial development of AI. Hecht's remarks came at the annual Strategic Issues Conference here, sponsored by Infocorp, a Cupertino, Calif.-based market research firm.

One of the principal problems facing the field, Hecht said, is that for many people artificial intelligence means that computers will think like human beings. "There is this unfortunate distraction that has oc-

See AI page 134

Alsys compiler gets validation

Ada implementation runs on DEC VAX line

WALTHAM, Mass.— Alsys, Inc. has announced validation of its first Ada language compiler. The compiler was validated under the Department of Defense's revised Ada Compiler Validatic.. Capability test suite Version 1.5, which became mandatory in December 1984.

Reportedly, the Alsys Ada compiler allows users of Digital Equipment Corp.'s VAX family of computer systems to develop and compile Ada programs and applications on the VAX. The compiler is targeted to systems using the Motorola, Inc. 68000 microprocessor and the AT&T Unix operating system.

A spokesman said Alsys' root compiler technology is 80% transportable to any other system, which means that only 20% of Ada compiler code needs to be custom-written for another host computer. The price of the Alsys Ada compiler is $35,000.

Alsys is located at 400 #1 Totten Pond Road, Waltham, Mass. 02154.

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[illegible] permits multiple terminal sessions to be active concurrently at the same physical 3270 CRT, under DOS or OS VTAM. The user may switch back and forth instantly between the terminal sessions by hitting a PA or PF key. The terminal sessions may be in the same or in different VTAM-connected partitions/regions. For example, one session might be logged on to a CICS partition or to TSO to do program editing, and another session connected to a test CICS to test the application program being developed.

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BIM has 15 system software products for improving productivity and use of DOS/VSE, OS, and CICS, and also performs systems programming consulting. Marketing agents in most countries.

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Direct marketing expert system serves IBM shops

WOBURN, Mass.— Persoft, Inc. has introduced an expert system designed for direct marketing organizations. The system reportedly allows users to determine which names on a mailing list should be mailed to and which names should be excluded from promotions because the recipient will probably not respond. The package is written in Cobol and runs on IBM processors under IBM's OS, MVS and DOS operating systems.

According to a spokesman, the Mail Order Response Enhancer (More) analyzes historical response data or the results of a test mailing and identifies the characteristics of a likely respondent. The package assigns to each name on a list a statistical response value then issues a ranking of a list from most likely to respond to least likely to respond.

The system saves data on when mailings took place to individual names and what was mailed and incorporates the data into its forecasting equation. Individual companies using the system determine other characteristics to be figured into the equation, which may include demographics, psychographics, geographics and others, the spokesman said.

Once raw data is input, the matching of test results against the entire file and the ranking of files occurs automatically. The system reportedly "learns" from one mailing to the next, continually refining its profile of a likely respondent. The More system — using the client's mailing lists — can also target entire groups of people who would be likely to respond to new products.

More is priced at $375,000. Persoft is located at 600 W. Cummings Park, Woburn, Mass. 01801.

SYSTEMS SOFTWARE

UNIPRESS SOFTWARE, INC.
Amsterdam Compiler Kit

Unipress Software, Inc. has introduced the Amsterdam Compiler Kit for AT&T's Unix operating system. The kit is a package of C and Pascal compilers and assemblers for C and Pascal programs on Digital Equipment Corp.'s VAX-11 and PDP-11 computers, and on Motorola, Inc. 68000 and Intel Corp. 8086-based processors under the Unix operating system.

The kit is a collection of programs developed at the Vrije University of Amsterdam to simplify the task of producing portable compilers and interpreters needed for micros and minicomputers.

It contains the complete sources of all programs — Source C compiler or Unix license required from AT&T — plus internal documentation describing how to make the modifications needed to add a new program language or a new target machine. Cross interpreters, used for testing, are also included.

Eight components are included: preprocessor, front end, "peephole" optimizer, global optimizer, back end, target machine optimizer, universal assembler and utility package. The full system in source is priced at $9,950 ($995 for educational institutions), and selected binaries are priced at $4,500.

Unipress Software, Suite 312, 2025 Lincoln Highway, Edison, N.J. 08817.

MCTEL, INC.
P/C Privacy: Personal/ Confidential

Mctel, Inc. has announced that its P/C Privacy: Personal/Confidential antipiracy package, formerly available only for microcomputers, is now also available for IBM 4300 and 3080 series and 370 mainframes under IBM's VM/CMS or OS/TSO operating systems and Digital Equipment Corp.'s VAX-11 computers running under DEC's VMS operating system.

According to a company spokesman, the package en-

Continued on page 131

IT'S 3 A.M. DO
ACCESSING YOUR

Gahan Wilson

PROTOCOL. THE END OF THE

Continued from page 130

crypts any file to provide privacy on the user's disks or over electronic mail. The user controls the encryption process with a key word that can exceed 100 characters and can be changed at any time. Encrypted files can be transmitted between terminals and other computers.

The price of the package ranges between $3,900 and $4,500, depending upon host configuration.

Motel, Suite 505, Three Bala Plaza E., Bala Cynwyd, Pa. 19004.

COMPUTER ASSOCIATES INTERNATIONAL, INC.

Version 3.0 of CA-Raps

Computer Associates International, Inc. (CAI) has annouced Release 3.0 of its CA-Remote Access Power Support (Raps) system for users of IBM's VM/CMS operating system.

According to a spokesman, enhancements to the product allow the user to select, display and manipulate entries in VM/SP spool queues and Power/VSE spool queue entries in IBM's DOS/VSE operating system.

CA-Raps is said to allow Power/VSE or VM/SP spool files to be printed at remote IBM CICS/VS or Remote Spooling Communications Subsystem-controlled printers. The user can initiate the print required independent of the batch system, the vendor said.

A three-year license for CA-Raps on the DOS/VSE operating system is $4,500.

Computer Associates International, 125 Jericho Tnpk., Jericho, N.Y. 11753.

VM SYSTEMS GROUP, INC.

Release 2.0, V/Spell

VM Systems Group, Inc. has announced an enhanced version of V/Spell, its interactive spelling checker for IBM Information Centers and other IBM VM/SP installations. V/Spell adds a Spell subcommand to IBM's Xedit, the primary editor for the IBM CMS component of VM.

According to a spokesman, Release 2.0 of V/Spell increases to eight the number of supplemental dictionaries that can be used at one time, and it can handle words up to 32 characters long. Installations can provide a local dictionary containing words unique to the site. The Spell subcommand allows users to check each word in the file being edited against a series of dictionaries.

Release 2.0 of V/Spell is priced at $2,360.

VM Systems Group, Suite 515, 2300 S. 9th Road, Arlington, Va. 22204.

EMPACT SOFTWARE, INC.

Stop-X37 enhancement

Empact Software, Inc. has enhanced its Stop-X37 package, which was designed to stop abnormal terminations in an IBM MVS or MVS/XA operating system environment.

According to the company, an option has been added that eliminates the condition that occurs when MVS cannot find the primary allocation for a new data set. The product reportedly will intercept the job at the time of abend, find available disk space, allocate the space to the job and continue the job without abending, the company said.

A permanent license for Stop-X37 costs between $7,000 and $15,000, depending on the CPU, the vendor said.

Empact Software, P.O. Box 1297, Stone Mountain, Ga. 30086.

OXFORD SOFTWARE CORP.

Pcmainframe Release 1.2.1

Additional emulator board support has been added to the latest release of Oxford Software Corp.'s micro-to-mainframe link software. The package also supports IBM's PC-DOS Release 3.0 operating system, the company said.

Release 1.2.1 of Pcmainframe is an intelligent data transfer system that is said to allow personal computer users to upload and download generalized files to and from an IBM mainframe in a real-time environment.

According to the company, the emulator board now supports IBM's 3270 Personal Computer and IBM Personal Computers using Microplus, Inc.'s Microplus MP01 3278/79 emulator board. It also supports AST Research, Inc.'s AST bisynchronous and Systems Network Architecture/Synchronous Data Link Control boards and Ideassociates' Ideacomm

Continued on page 132

YOU KNOW WHO'S
MAINFRAME?

This real life nightmare can make any DP manager lose sleep.

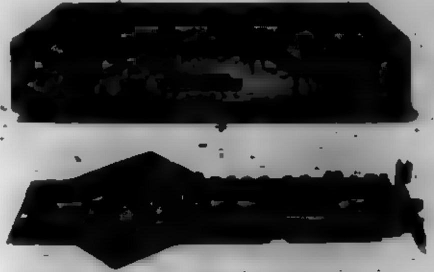
You want to give more people access to your corporate mainframe, so they can get the information they need.

Which is nice.

Except that when you start adding terminals in different locations, how you do control access?

How do you restrict who can upload—and who can download? How do you keep hackers, intruders and other undesirables from invading your mainframe?

DATA COMMUNICATIONS PRODUCTS FROM PROTOCOL COMPUTERS. TECHNOLOGY THAT HELPS DP MANAGERS STAY IN CONTROL.



Only Protocol Computers offers both protocol converter boxes and add-on communications boards with positive security features to help you control who gets access to your mainframe. And who doesn't.

Rest easy.

PCI can show you how to connect virtually any ASCII device to an IBM mainframe. And control mainframe access with positive security.

For example, our PCI protocol converter boxes and PCI-Link add-on communications board both require users to identify themselves with a special password before they can access your host.

That gives you an extra measure of protection.

What's more, PCI protocol converter boxes also offer automatic log-off. So even if your user forgets, your PCI protocol converter will automatically disconnect from the mainframe. Which means unauthorized inquiries are automatically locked out.

FOR MICRO TO MAINFRAME COMMUNICATIONS, NO ONE TALKS TO IBM LIKE PROTOCOL.

There's another reason you know you're secure with PCI. We're the leader in protocol conversion technology.

In 1980, we introduced the first successful protocol converter. And today, more than 9000 PCI boxes are installed worldwide, handling data communications for leading companies in diverse industries. Including aerospace. Oil. Packaged goods. Manufacturing. Banking. And retail.

The fact is, PCI connects more ASCII devices to more IBM mainframes than any other protocol converter manufacturer.

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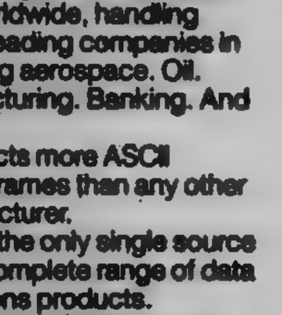

Protocol Computers, Inc.
6150 Canoga Avenue
Woodland Hills, CA 91367

Name ____________ Title ____________
Company ____________
Address ____________
City ____________ State ______ Zip ______
Telephone ____________

CW1/7/85

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DP NIGHTMARE.

SOFTWARE & SERVICES

Continued from page 131

3278/79 emulator board, the vendor said.

The price of the product is $9,000 for eight personal computer licenses on IBM's DOS operating system and $12,000 for eight personal computer licenses on IBM's OS operating system, according to the vendor. The cost for each additional micro is $300.

Oxford Software, 174 Blvd., Hasbrouck Heights, N.J. 07604.

INTERNATIONAL BUSINESS INFORMATION SYSTEMS

Utilities for DOS/VSE

International Business Information Systems has announced a series of utility programs for IBM 370, 4300, 3030 and 3080 series mainframes under IBM's DOS/VSE operating system.

The Dump, KSMT, Stat, Open/Shut and KTST programs operate in IBM's CICS/VS environment; Spacemap is a batch program.

According to a spokesman, Dump provides a hexadecimal dump of a given virtual address, any of 16 specific CICS areas and any of 18 DOS/VSE system areas.

KSMT displays statuses and statistics from terminal, program and file tables.

Stat provides statistical summaries of the items provided in the KSMT individual display. The display also shows system initialization time and provides activity counts by second as well as seconds by activity counts from initialization time.

Open/Shut reportedly allows dynamic opening and closing of files and IBM DL/1 data bases by individual file control table identifiers and/or by preassigned groups.

KTST provides a hexadecimal display of individual (keyed) files defined by the CICS file control table. Functions include hexadecimal/decimal and decimal/hexadecimal conversion and the ability to initiate a task at a specified time interval on a list of terminals.

Spacemap reads a Vsam catalog and produces a condensed listing of the most common file specifications.

Each utility program is priced at $300. Discounts are available for purchases of more than one program.

International Business Information Systems, P.O. Box 15780, 828 Royal St., New Orleans, La. 70175.

BOSTON SYSTEMS OFFICE

BSO/C compiler for 6809 and Z80 processors

Boston Systems Office (BSO) has introduced a C compiler for Motorola, Inc. 6809 and Zilog, Inc. Z80 microprocessors on Digital Equipment Corp.'s VAX line of computers.

The BSO/C is reportedly an enhanced C compiler that is said to permit easier C language programming for embedded microprocessor systems and applications. It includes optimization functions, microprocessor-oriented interrupt and I/O instructions, recursive and reentrant code programming capabilities and symbolic debugging support, the vendor said.

The BSO/C compiler comes with runtime libraries and is priced at $5,000 when bought with BSO's corresponding assemblers and debuggers.

BSO, 469 Moody St., Waltham, Mass. 02254.

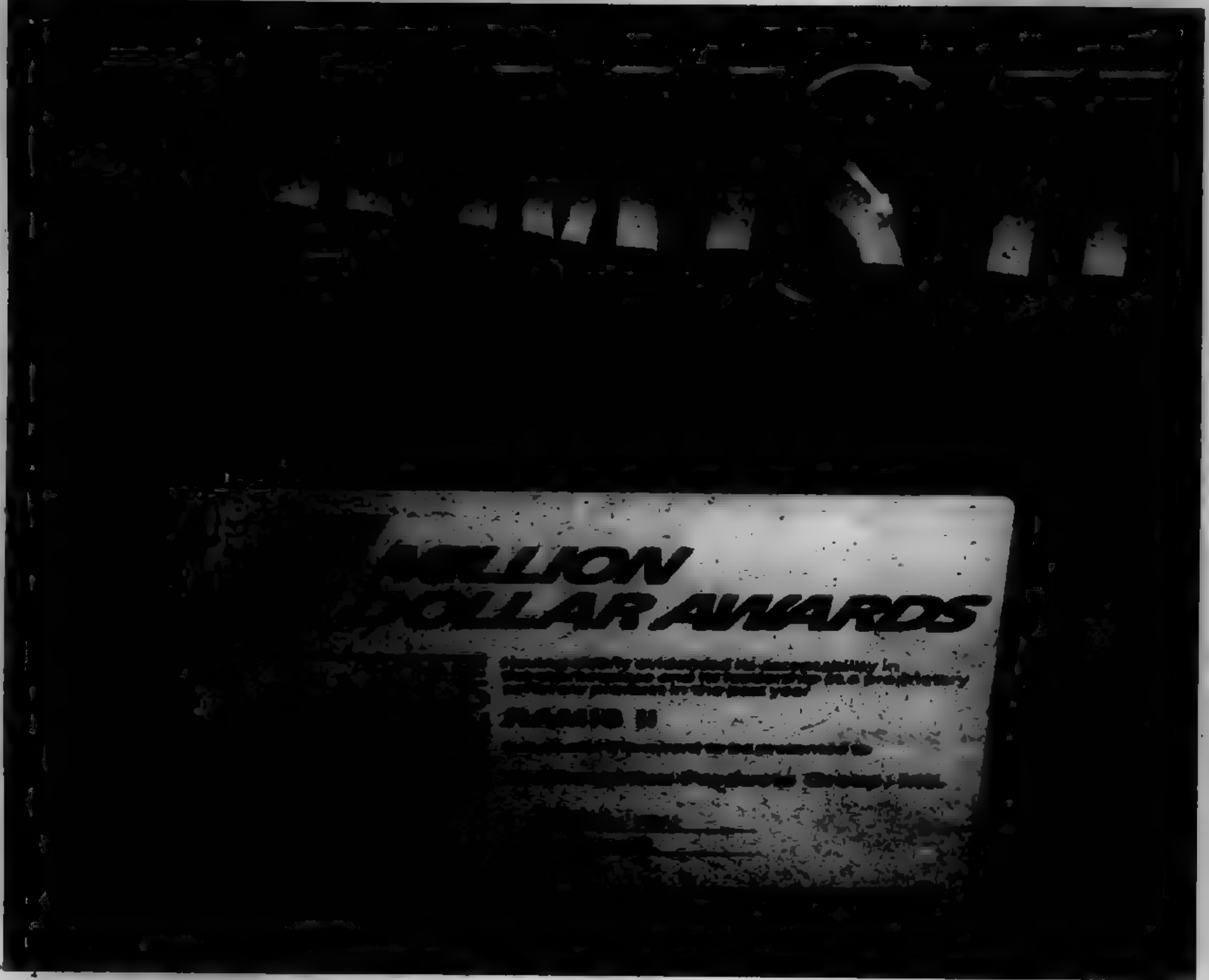
See ADS page 134

SOFTFAIR

"Of the 60 job fairs our organization has attended in the past year, SoftFair has by far been the most successful means of attracting software professionals."

... Bob Corbin, Employment Supervisor,
Digital Equipment Corporation

SoftFair is sponsored by SOFTWARE CAREER LINK, 67 South Bedford Street, Burlington, MA 01803, (617) 229-8818.



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THE 10 MOST IMPORTANT QUESTIONS YOU SHOULD ASK YOUR SOFTWARE VENDOR

"Many questions you would ask prospective application software vendors don't differentiate one vendor from another. The similarities between suppliers are not what's important—it's the differences that count. Here are ten questions you should ask prospective application software vendors before making your selection."

—John C. Gable,
Vice President of
Corporate Systems and Technology
for American Software, Inc.

	AMERICAN SOFTWARE	OTHERS
1. Can the application software you are considering be easily delivered in a variety of data processing environments (operating system, teleprocessing monitor, and data base) to permit easy migration and allow system software environmental independence?	Yes	?
2. Can the application software be delivered for VSAM and all popular data base management systems, rather than being tied to the application vendor's data base system—one which could be outmoded by new data base products developed by another vendor in this rapidly-changing high-technology industry?	Yes	?
3. Is the application software implemented using a "native" or direct approach to the operating system, teleprocessing monitor, and data base manager, without the inefficiency associated with "bridges" or the vendor dependencies of a "black box" approach?	Yes	?
4. Is the application product coded in an efficient, widely-used, and industry-standard language such as COBOL, rather than a vendor-dependent language unknown to the general data processing community?	Yes	?
5. Can the application product be "tailored" or streamlined to meet the specific functional and operational needs of a company through purchase of a basic package and selected optional features, thereby avoiding delivery of useless code?	Yes	?
6. Does the vendor retain a source version of each customer's uniquely tailored application software for emergency backup, problem determination, and client assistance?	Yes	?
7. Does the vendor have a broad, completely integrated line of application software which can be demonstrated on a single system instead of merely described?	Yes	?
8. Have all of the vendor's products been integrated by design and developed by a single organization, thus eliminating the need for inefficient interfaces and unknown "black boxes" to tie together unrelated or acquired applications?	Yes	?
9. Does the vendor clearly demonstrate a full commitment to the complex business of application software, rather than offer an incidental addition to its main product line?	Yes	?
10. Has the vendor been in the application software business a minimum of ten years with a successful track record of sustained profits and a strong financial posture?	Yes	?

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AIDS from page 132

INTERACTIVE SOLUTIONS, INC.
Help

Interactive Solutions, Inc. has announced an on-line documentation package for IBM CICS applications. The Help package reportedly gives immediate access to field-level documentation. When the use of a field is questioned or an entry rejected, users place the cursor under the field and hit a Help key. The original screen is replaced with a display describing that field. The enter key restores the screen to its original format.

Permanent license for Help for IBM's OS and DOS operating systems is $9,995 for one CPU.

Interactive Solutions, 140 Rt. 17 N., Paramus, N.J. 07652.

NEC INFORMATION SYSTEMS, INC.
Remote Workstation Adapter

NEC Information Systems, Inc. has introduced a software package that is said to allow any microcomputer that supports Digital Equipment Corp.'s VT100 terminal emulation to act as a remote workstation on NEC's Astra 32-bit minicomputers.

Workstations at remote sites are linked to Astra systems through modems connected by an adapter to the NEC Remote Workstation Adapter controller, the vendor said. Each controller reportedly can support four remote VT100 terminals or emulators. One controller and one adapter costs $2,000.

NEC Information Systems, 1414 Massachusetts Ave., Boxboro, Mass. 01719.

ADVANCED SYSTEMS CONCEPTS, INC.
Status/38

Advanced Systems Concepts, Inc. has announced Status/38 for IBM's System/38 under the CPF operating system Release 6.0.

Status is said to help users discover how system resources are being used. The product reportedly provides inquiries, reports, graphics and charts of data accumulated by itself and the CPF operating system.

The accounting features of Status reportedly track facets of system use. A charge-back system is also included, so users can be billed for their use of system resources.

The price for Status/38 is $1,500.

Advanced Systems, Suite S, 1350 Remington Road, Schaumburg, Ill. 60195.

AI from page 129

curred because of the use of a human analogy," he said.

Hecht said his company actually tries to avoid the use of words such as artificial intelligence or expert systems. "The idea is that machines will do things that human beings normally use machines to do," he said.

Another barrier to wide commercial use of AI is the popular perception that it has a "soft character" or that the technology is not really vital, Hecht said. "Because it has a broad range of applications, AI is often viewed as a solution in search of a problem." He added that the misperception will be overcome as more concrete applications come into use.

On the other hand, he said, inaccurate media reports "have helped to create a distorted view of what the field is about." Because the commercial market does not understand the technology, companies that participate in the market will have to offer training, products and help in applying the technology, Hecht said.

AI will be increasingly used in vertical applications, in which the technology will not so readily be apparent to the user, he said. "Artificial intelligence will become invisible."

Another prerequisite to the growth of AI is the need for experienced people to apply the technology. Hecht said he believes the shortage of knowledge engineers eventually will be met by people entering the field from other disciplines and by the creation of better development tools for AI specialists.

AI-related technology is expected to be an $11 billion industry — or about 5% of the total computer industry — by 1990, according to Arthur D. Little, Inc.

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- Combat software piracy by requiring that countries seeking access to the U.S. market respect intellectual property rights and, if necessary, consider trade sanctions against countries that do not provide adequate legal protection.
- Continue efforts to lower foreign barriers to free trade.
- In the development of U.S. export control policy, strike a balance between national security and commercial interests so as not to place U.S. suppliers at a disadvantage.
- Lengthen the term of the current research and development tax credit and broaden coverage to include more software.

While the study concluded that the U.S. software industry currently dominates the world market and should continue to do so over the next three years, it noted that foreign governments have promoted development efforts among their domestic companies that have already resulted in success in certain areas.

"The major negative factors affecting the U.S. software industry overseas are likely to be inadequate legal protection of software and restricted access to key foreign markets," the report said. The agency said Japan is likely to become the strongest competitor to the U.S. software industry.

The full report, stock number 003-009-00436-5, is available from the U.S. Government Printing Office, N. Capitol and H St. NW, Washington, D.C. 20401.

Realia COBOL.
Migration without migraines.

Until recently, you had to abandon the business computer language when you developed microcomputer application software. The available micro COBOLs were inadequate—too limited, too slow. The best alternative—the XT/370 or AT/370 using IBM's COBOL—was very expensive and still too slow. To get acceptable performance, you had to retrain your programmers in Pascal or C.

Realia COBOL is the cure for such headaches.

Realia's compiler supports most IBM VS/COBOL and VS/COBOL II features, such as:
- COMP and COMP-3 data
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- Structured programming extensions of VS/COBOL II.

You can download mainframe systems for development, maintenance, and testing. Productivity will soar.

You can compile faster with Realia COBOL than in most mainframe environments, even on floppy-based systems. Compile-time options allow cross-reference, brief and full code listings, and helpful features like subscript and decimal value checks.

Our interactive debugger lets you follow the program source, display and modify data, and set breakpoints using the normal optimized machine code.

The results are startling.

Our users report that their systems run up to 20 times faster when compiled by Realia COBOL. That's compared to our nearest micro competitor. The ratio is up to 100 times faster when compared to any of the others.

On the IBM PC AT, your programs can run at 370/148 to 370/158 speed. Realia's file system really makes your machine deliver, giving it a distinct edge over Pascal or C. Our indexed file system even has full key compression and buffer controls just like VSAM. The generated code is pure MS-DOS, so it can be run on most of the 8088/8086 machine family.

And you can sell your programs without paying us a royalty fee.

Realia COBOL is priced at $995, including one year of maintenance and upgrades. Subsequent maintenance and upgrade contracts are currently priced at $125/year/copy. Available for the IBM PC, PC XT, 3270 PC, PC AT, PC-compatibles, and the TANDY 2000.

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UNIX

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er does not do in the Unix area may have more influence on the future of Unix than all the moves by all the other players.

A significant portion of Unix watchers says that IBM will wage war against AT&T by ignoring Unix, especially on the large systems end of things.

But a study released recently by International Data Corp. (IDC) has some heartening news for Unix supporters.

> *"After experience [with a Unix customer base] IBM will have the specifications to implement a replacement system which bypasses the shortcomings of Unix. IBM might decide on such a bold policy realizing that a replacement [to Unix] would provide the strategic glue to unify its disparate product line."*
>
> — International Data Corp. study

Favorable signs

According to IDC, the favorable signs from IBM regarding Unix include:

- IBM is offering Xenix on its product line. In 1985, Xenix will become System V-compatible, bringing IBM products more closely into line with AT&T's System V standardization efforts.
- The upgrade from System III compatiblity, on which IBM's current Unix product offerings are based, to System V compatibility is easy to do. IBM's positioning with System III puts it in a comfortable position to upgrade to System V compatibility as the System V base becomes more field-proven and as IBM gains experience with Unix. The fact that IBM chose System III rather than a University of California at Berkeley-based version of Unix places IBM more closely in line with AT&T.
- IBM owns 20% of Intel Corp. Intel is heavily committed to Unix and it is expected to complete the port of System V to its 80286 microprocessor in 1985.
- The spread of Unix does not threaten an established IBM market segment. The proprietary IBM time-sharing systems — TSO and CMS — address DP professionals and not distributed end users. So Unix can address a market segment where IBM has no proprietary product. Thus, by adopting Unix, IBM could take advantage of AT&T's experience in building an operating system for a communicating and portable environment. That would give IBM the means to tie together its different processor technologies.
- The portability of Unix can work to IBM's advantage. It can be used to attract customers away from another vendor's equipment.
- Significant market strength could be leveraged against IBM if IBM were not present in the emerging Unix market. AT&T and the scores of hardware and software vendors committed to Unix would be hard to ignore.
- As the industry focus shifts toward applications, IBM will try to distinguish itself to the end user by quality applications based on a standard operating system. Even IBM does not have the resources to do everything well. Why should it not spend its resources on that which will give its hardware greatest appeal, the applications capabilities?

Policy change possible

If those speculations seem logical, IDC says, look for future IBM products to continue to move toward compatibility with the mainstream of Unix standardization. That's heady news for the Unix aficionado. But wait. Despite the signs that IBM is poised to sanction Unix, IDC warns, Big Blue has the wherewithal to switch strategy in midstream.

IDC notes that IBM has made it clear that its actions are governed by the best interests of, you guessed it, IBM. So if upcoming developments in the Unix marketplace point to a course of action better suited for IBM, look for strategic changes to occur. IDC says that there is debate within IBM over whether it should go strictly with proprietary operating systems. Unfortunately for Unix fans, IDC cautions, many of Big Blue's high-level executives hold with the proprietary strategy.

Finally, IDC conjectures, "IBM has little development experience with Unix or any portable operating system. Offering Unix to its customer base will give IBM a laboratory for learning and observation. After experience in this laboratory, IBM will have the specifications to implement a replacement system which bypasses the shortcomings of Unix. IBM might decide on such a bold policy realizing that a replacement [to Unix] would provide the strategic glue to unify its disparate product line."

As with so many other facets of the computer industry, the cards IBM now holds so closely to its chest will probably influence in a big way the outcome of the Unix game. IBM's moves may hold the key to whether 1985, or any other year, will truly be the year of Unix.

The report is available from IDC, which is located at 5 Speen St., Framingham, Mass. 01701.

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COMMUNICATIONS

Users indifferent to office technology wars

DATA STREAM
John Dix
CW Senior Editor

The past year in communications has been dominated by news of AT&T divestiture which has, by its nature, tended to focus concerns on inter-office communications issues. In looking back, however, it is more telling to examine intra-office communications developments to gauge advances in automation.

Here we find that technology continues to outpace the average user. Even in the face of unprecedented shipments of end-user devices, the need to interconnect this equipment has not materialized as rapidly as once expected.

Ironically, the warring proponents of local networks and private branch exchanges (PBX) — battling over which technology should be incorporated as the electronic spine in the future office — have come to terms before most users are even prepared to hear the arguments. Now the conventional wisdom is that the technologies will coexist. But today, few are using either.

Data switches not sexy, but necessary

In fact, while users praise the merits of PBXs that can handle voice and data simultaneously and local networks that can interconnect anything and provide incredible bandwidth, data switches — the real workhorses DP shops rely on to enable users to access multiple devices — go unsung. Data switches are neither new nor sexy. But they do provide a cost-effective and necessary function similar to the baseline functionality of both PBXs and local nets.

What 1984 lacked in user enthusiasm for intra-office communications data communications technology — measured in products purchased — was made up for by vendors. Most notably, this year AT&T and IBM finally entered the fray.

Local network is no longer a banished word within the hallowed halls of Big Blue. In fact, IBM has been running ads in the industry press explaining its stance on, and approach to local networks.

And it did announce PC Net this year, a broadband network for personal computers. The catch here, though, is that the network software won't be released until sometime next year.

In a statement of direction made when the Cabling System was announced — a building wiring scheme on which IBM said it will base its token passing network — the mainframe manufacturer said it would announce an office net-

See USER page 140

■ Ideassociates, Inc. has announced a twinaxial communications card designed to link IBM micros to IBM System/34, 36, and 38 minis/140

Bell exec calls local fiber nets key to ISDN

By James Connolly
CW Staff

CAMBRIDGE, Mass. — The extension of fiber-optic cable into the local telephone loop is an important step toward implementation of an Integrated Services Digital Network (ISDN) by 1990, according to an executive for Southern Bell Telephone Co.

Southern Bell, a subsidiary of the Bell South Corp. regional holding company, is concentrating on building local fiber networks, rather than intercity fiber trunks, which is an area offering limited growth, according to Richard K. Snelling, executive vice-president for Southern Bell. Snelling spoke recently at the MIT Communications Forum here.

Southern Bell installed 62,000 kilometers of fiber between local central office switches in 1984, and changed its specifications repeatedly, increasing typical bandwidths from 90K bit/sec to 405K bit/sec in just five months, according to Snelling.

That fiber will someday be extended to households to carry integrated communications as ISDN develops, noted Snelling, who said three real estate developers are interested in installing fiber in major residential developments in Southern Bell's region.

He said that fiber would carry voice, video and data communications, and would be part of an ISDN that develops over the coming years.

> *'Competition drives it all. Competition in the market was what really caused [AT&T's] divestiture, while technology was a factor.'*
>
> — Richard K. Snelling, executive vice-president for Southern Bell Telephone Co.

One feature of ISDN, if the Federal Communications Commission permits it, would be protocol conversion at the local, central office level.

"Competition drives it all. Competition in the market was what really caused [AT&T's] divestiture, while technology was a factor," said Snelling, adding that it also should be market forces, particularly the rich U.S. market, that drive the establishment of international standards.

With the replacement of copper cable with fiber, a few all-fiber cities will begin to appear in the late 1980s and on a large-scale basis in the 1990s, according to Snelling.

Next millennium networks

He also outlined how communications networks will appear at several stages into the next millennium.

- By 1987: Modular fourth-generation central office switches will handle packet switching, circuit switching, more than one million calls an hour, full digital connectivity and dynamic load balancing.
- By 1990: Intelligent networks with common channel signaling will use more than 400,000 kilometers of fiber in the Southern Bell area, will feature customer

See ISDN page 140

Pactel releases Displayphone for accessing remote data bases

WALNUT CREEK, Calif. — Pactel Communications Systems has announced its Pactel Displayphone, an integrated telephone and data terminal designed to ease access to remote data bases for information such as stock market reports, shop-at-home services, electronic banking and airline schedules.

It reportedly allows the user to exchange data with other Displayphone units and features a speakerphone, automatic redial, speed calling and a directory that can be programmed to display and dial up to 81 20-digit numbers.

The device includes an internal AT&T 103-type modem operating at 300 bit/sec and an 8K metal-oxide semiconductor random-access memory with a three-day battery backup. It also has a 7-in. monochrome screen with an alphamosaic character set and graphics said to be suitable for bar graph applications.

The telephone plugs into standard RJ11 or RJ13 jacks, and power is supplied by a 3-lb external power supply. The Displayphone features two ports, a printer port and an RS-232C serial port.

Pactel Communications Systems is located at 201 N. Civic Drive, Walnut Creek, Calif. 94596.

Enhanced protocol converter from Perle GSD targets IBM

CHICAGO — Perle GSD, Ltd. has announced a redesigned protocol converter based on the Perle GSD PDS 300/525 for the IBM System/34, 36 and 38.

The PDS 350/525 reportedly replaces an 8-in. diskette drive with a 5¼-in. drive and incorporates four, eight, 12 or 16 asynchronous ports as well as ports for the host connection and diagnostics. The PDS 350/525 is said to appear to the host as one or two IBM 5251 Model 12 cluster control units with attached workstations or printers.

The protocol converter reportedly features automatic speed detection, dynamic terminal selection, menu-prompted configuration, printer passthrough and security disconnect. Options include teletypewriter support, file transfer and auto-call printer support.

According to the vendor, the unit has been enhanced by the addition of two direct memory access channels to facilitate buffer management and inter-processor communications.

Shipments are scheduled for this month. Prices range from $4,750 to $12,500.

Perle GSD can be reached at Suite 507, 600 S. Dearborn, Chicago, Ill. 60605.

Ideassociates releases IBM link

BILLERICA, Mass. — Ideassociates, Inc. has announced a coaxial communications card designed to link the IBM Personal Computer, Personal Computer AT, Personal Computer XT and Portable Personal Computer to IBM System/34, System/36 and System/38 minicomputers.

According to the vendor, the Ideacomm 5251 reportedly supports a twisted-pair or coaxial cable connection with the IBM systems through IBM 5250 terminal emulation via either a direct connection or an IBM 5251 Model 12 display controller.

Ideassociates also announced the Ideacomm 5251D card, a companion product that replaces the IBM Monochrome Display Adapter and supports the full 32 attributes of the IBM 5251 screen.

The products will be available in January. The price of Ideacomm 5251 is $895, and the price of Ideacomm 5251D is $495.

Ideassociates is located at 35 Dunham Road, Billerica, Mass. 01821.

ISDN

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control, and will include stored voiceprints for universal credit calling.

■ By 2000: Mobile telephone service will be fully deployed, and there will be interactive computer/voice interfaces, almost no copper wiring and increasing use of light-switch technology.

■ By 2010: With a decentralized society, 35% of workers will have their primary work location in the home, due partly to the decreasing cost of bandwidth. The residential customer will have wideband data links to corporate and public data bases, videophones, holographic meetings and flat wall displays.

■ By 2020: With the optical network fully deployed, telecommunications will replace energy as the leading resource. Fiber running into the home will be at least 45M bit/sec and possibly 135M bit/sec.

USER

from page 139

work within a few years. Until then IBM can stress the data handling capabilities of PBXs from Rolm Corp., the switch vendor that IBM recently acquired.

To complement the data switching capabilities of its PBX equipment, AT&T Information Systems released its first local net this year, the Information Systems Network (ISN). A star topology network that uses twisted-pair wire to support end-user devices and fiber-optic cable between network components, ISN uses what the company calls a short bus to switch packets.

AT&T Information System's ISN was born of the same technology used in AT&T Technologies' Datakit Virtual Circuit Switch. The products were developed separately within AT&T using the same basic theory developed by Bell Laboratories.

The overlap between the products is embarrassing. The separation in the development and marketing of ISN and Datakit was necessitated by the Federal Communications Commission's Computer Inquiry II decision. That ruling specifies that only AT&T Information Systems, a separate subsidiary, can market nonregulated products directly to end users. AT&T's Datakit, not part of the nonregularted part of the company, must be marketed through a third party. This means, however, that AT&T may be competing with itself for some accounts.

Although there may be some validity to the idea that the entrance of IBM and AT&T will stimulate the market for intraoffice local network-like products, the fact remains that most users do not yet need these products.

The need will arise slowly from the personal computer level, where small departmental networks are springing up to provide peripherals sharing. Given that, consider that probably less than 10% of all personal compiuers currently used in business are attached to networks. Commonly accepted, sophisticated intraoffice communications systems are still a while away.

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SYSTEMS & PERIPHERALS

No free gifts seen for PCMs in new year

By John Desmond
CW Staff

David Martin, president of National Advanced Systems, Inc. (NAS), recently noted that his salesmen were spending one hour on sales calls prior to the reorganization and layoffs at Storage Technology Corp. (STC). Now, they spend two. "The first hour is to explain what happened to STC, and the second hour is to sell," Martin said.

Users of IBM-compatible mainframes and peripherals may be running scared as a result of STC's problems and perhaps with good reason. With product cycles ever shortening, the ability of plug-compatible manufacturers (PCM) like STC to compete is being clipped.

The Gartner Group, Inc. recently stated that product life cycles have dropped from an average of 48 months in 1975 to 36 months in 1983. The ability of PCMs to respond, meanwhile, has increased from an average of nine months in 1975 to 18 months in 1983. As a result, the PCMs' "profitability window" (life cycle minus response time) has been reduced from 39 months in 1975 to 18 months in 1983, according to the Stamford, Conn.-based consulting firm.

MVS/XA an example

A specific example is the MVS/XA operating system, which IBM announced three years ago for its high-end systems. The PCMs took 15 to 18 months to respond with XA equivalents, hurting their ability to compete with IBM.

Martin responded that XA is an exception, a technological breakthrough that may happen once every six to eight years. The PCMs take longer to match breakthroughs, but Martin said more routine product announcements can be matched in much less time. He acknowledged that product life cycles are shrinking due to a constant push for new technology, but said the true test for competitiveness should be whether a PCM has the ability to respond.

Perhaps it is true, as Martin suggested, that the successful competitive formula for PCMs has changed. In the 1970s, PCMs tried to achieve vertical integration. Each company sought to have design, manufacturing, sales and service staff. In the 1960s, IBM and its competitors are entering into partnerships with other companies and getting away from integration in order to cut costs. Examples of partnerships include NAS and Hitachi Ltd., Amdahl Corp. and Fujitsu Ltd. and IBM and Rolm Corp.

Product partnership

"The model of the '80s is product partnership," according to Martin. "I don't think STC represents a model for what's happening to the rest of the industry." In his view, STC took on too many vertically integrated projects and became too diversified.

What will 1985 bring for the rest of the IBM-compatible vendors? Of course, the best time to make predictions about 1985 will be next Christmas. But right now, the chances that the PCMs will enjoy any dramatic relief from IBM marketing pressure

See PCMs page 142

Visa expands processing power with addition of IBM 3083 EXs

By Kathleen Sullivan
CW West Coast Bureau

SAN MATEO, Calif. — Almost two years ago, Visa International laid the plans for a three-year, $16 million expansion of its electronic transaction processing and communications services. In mid-October, Visa said it had accomplished a key step in the process by replacing the mainframe computers in its operations centers, which are located here and in McClean, Va.

At present, all the new processors are functioning, said Roger Peirce, Visa's general manager of systems development.

Included within its expansion scheme was a plan to convert the company's bisynchronous communications system to IBM's System Network Architecture (SNA). According to Peirce, Visa has reached the mid-point in its implementation of SNA."

In the process of replacing its IBM 4341 Model Group 12 mainframes with four IBM 3083 EX systems, Visa more than doubled its processing power, Peirce said.

Using the IBM 3083s, Visa will be able to handle about 400,000 transaction authorization inquiries and responses an hour and 10 million settlement items a day, he said. Before the changeover, the firm's capacity was limited to 178,000 messages an hour and 6 million settlement items per day.

Peirce said the 3083s represent a "logical upgrade in terms of current technology and capacity" for Visa. While Peirce said the firm did some evaluation of competing IBM-compatible systems offered by Amdahl Corp. and National Advanced Systems, Inc., Visa did not discover any signif-

See VISA page 142

Image processing system out

ALAMEDA, Calif. — Integrated Automation, Inc. has announced the Series 200 optical laser disk storage and electronic image processing system, for automating the storage, retrieval and distribution of engineering drawings and technical information.

The Series 200 uses central processors from Digital Equipment Corp. in combination with its own optical disk devices. The system uses 12-in. optical disks, each capable of storing 1G byte of data, or approximately 20,000 letter-size pages. The company's Optical Disk Auto Changer stores up to 100 optical disks.

In addition to storing engineering drawings, the Series 200 can store computer-aided design and manufacturing or word processing-generated data, the company said.

The system is available in three configurations. The Series 200A-C is based on the DEC Microvax I and includes an aperture card scanner, image aperture, dual-image processor, an optical disk read/write unit, two terminals and a Versatec, Inc. 7224 24-in. plotter. The price for Series 200A-C is $478,000, according to the company.

The Series 200A-C/E is based on the DEC VAX-11/730 and includes an image retrieval cluster, four terminals, a Versatec 7236 36-in. plotter and a remote cluster communications interface. The price for the Series 200A-C/E is $756,000.

The high-end Series 200B is based on the DEC VAX-11/750 and includes an additional two Versatec 24-in. plotters, a total of 14 terminals and an Optical Disk Auto Changer. The price for Series 200B is $1.2 million, according to the vendor spokesman.

Additional information is available from Integrated Automation, which is located at 1301 Harbor Bay Pkwy., Alameda, Calif. 94501.

Burroughs unveils free-standing ATMs

Targets supermarkets, gas stations, convenience stores

DETROIT — Burroughs Corp. has introduced the CA 7100 Quick Cash, a free-standing, lobby-style automatic teller machine (ATM) for dispensing cash and providing account balances, aimed at supermarkets, gas stations and convenience store markets.

The CA 7100 can complete a withdrawal transaction in 10 seconds, according to a spokesman for the company. The ATM features a 9-in. video screen for displaying messages and instructions, six function keys, a 13-key alphanumeric keyboard and a swipe magnetic card reader.

The CA 7100 uses emulation software to have the system emulate competitors' ATMs. Emulation software is available for Burroughs' RT 600/RT 750; IBM's 3624; Docutel/Olivetti Corp.'s 2380; NCR Corp.'s 1780; and Diebold, Inc.'s 910.

The device can also be connected to surveillance cameras, alarms, monitors and automatic dialers. The product is available with up to three currency feeders, a spokesman said. Each cash cassette reportedly can dispense 1,800 U.S. notes. A backup system is said to maintain memory for 72 hours following a power failure.

In multiple ATM sites, one CA 7100 can coordinate transactions, control data encryption and handle communications with the host processor for the master and up to two CA 7102 slaves.

The receipt printer prints 40 alphanumeric char./line, with up to 16 lines per receipt. The CA 7100 has a capacity of 4,000 receipts. The audit printer provides a 56-char. line and contains enough paper to print 8,000 transactions between replenishment, the company said.

The price for the CA 7100, to be available for delivery in the first quarter of 1985, is $14,700 for the base unit or $12,500 for a slave unit that ties to a host, according to the vendor.

Additional information is available from Burroughs, which is located at 1 Burroughs Place, Detroit, Mich. 48232.

SYSTEMS & PERIPHERALS

VISA

from page 141

icant reasons for changing vendors.

Peirce said Visa purchased the 3083s "with some expectation of upward growth" since the system — announced last February — is in the early stages of its technological life cycle.

In each of the operations centers, Visa now has three computer systems in place: two 3083s and one 4341. One of the 3083s, which is used for real-time processing, is primarily dedicated to processing authorization transactions. The system has 8M bytes of main memory and uses IBM's Transaction Processing Facility.

The other 3083 in each data center is used for clearance and settlement processing, Peirce said. These systems have 16M bytes of main memory and use IBM's OS/VS1 running under VM. Visa plans to convert to MVS in the second quarter of 1985.

Each operations center uses its remaining 4341 to relieve the new systems of several off-line batch processing tasks. In California, the remaining 4341 will be used to handle switching and processing for Interlink, a direct debit, point-of-sale program being developed by the five largest banks in California. The service is scheduled to go into effect this month.

Because of the nature of Visa's applications, Peirce explained, each data center is configured as a duplicate of the other, so that in the event of a natural disaster or systems failure at one location, the second center will be brought up within minutes to take over.

Although Peirce said the changeover was transparent to its members, he said Visa did encounter a problem that resulted in a four-week delay in the installation of the real-time system in its California center. Peirce said IBM had implemented the operator console differently on the 4361 than on the 3083. The software "didn't work properly and was full of bugs," Peirce said. So Visa analyzed and reported the incompatibility to IBM, which eventually resolved the problem.

Visa is also in the process of rewriting all its application programs, Peirce said. By 1986, when the project is scheduled for completion, Visa will be able to expand its settlement system to 15 times its current capacity, the company said. In addition, the firm's settlement and authorization systems will be able to share the same communications network, which will lower costs.

The firm has also undertaken what Peirce called the "expensive, laborious and tedious" task of converting to IBM's SNA. He estimated that the conversion, which entails extensive software changes in all the components of the system, will represent about $3 million of Visa's $16 million outlay. But that figure does not include training or new circuit design that will be required, he said.

So far, Visa has converted its traveler's check service completely to SNA. The firm has completed the software conversion for its clearing and settlement system and is now in the process of converting its Series 1 systems, which serve as the access point to the network, to communicate in SNA. By February, Visa will begin field tests to prepare to convert its authorization system, Peirce said.

PCM

from page 141

appears slim.

Amdahl and NAS, both of which are heavily influenced by their Japanese hardware suppliers Fujitsu and Hitachi, respectively, may face the short-term problem of how to sell supercomputers manufactured by their Japanese suppliers.

But the real challenge to NAS and Amdahl will not come until IBM unveils its much-publicized Sierra line of mainframes. Then the question will be whether both companies are capable of meeting the high R&D costs to match IBM's top-end mainframe. Of course, much depends on how impressive IBM makes the Sierra.

The vendors competing in the mid-range of IBM's mainframe line also face a tough 1985. In the fourth quarter, IBM significantly enhanced the performance of its 4361 and 4381 processors.

Whether companies like IPL Systems, Inc. and Cambex Corp., which are already feeling the bite of increased IBM competition, can match the performance of the 4361 Model Group 3 and 4381 Model Group 3 remains to be seen.

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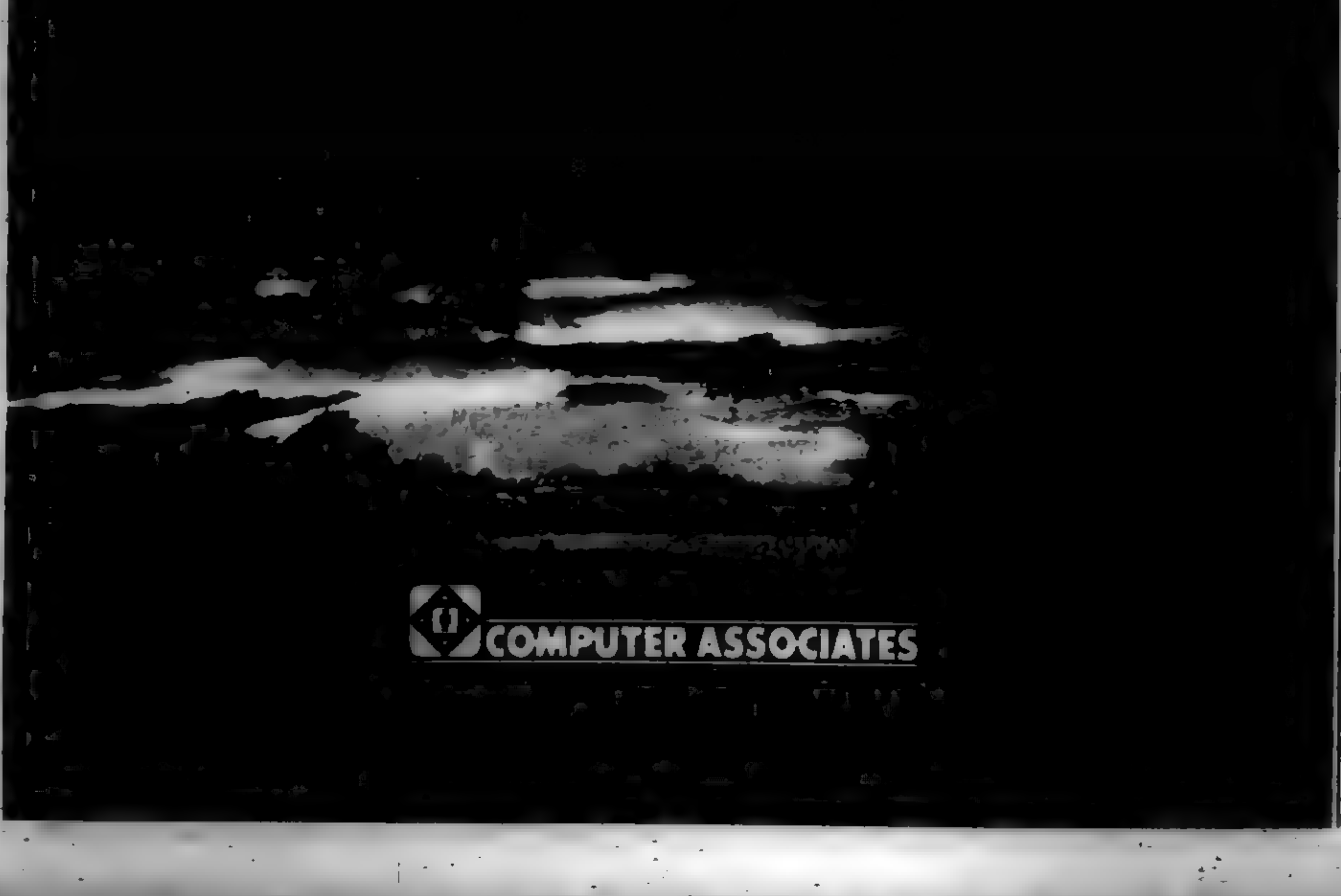

COMPUTER ASSOCIATES

MICROCOMPUTERS

SMALL TALK
Eric Bender
CW Senior Editor

Forecast in '85: Guessing game

Imagine a machine built around Motorola, Inc.'s 68000 chip, with a high-resolution color display and a user interface much like Apple Computer, Inc.'s Macintosh, selling for under $1,000, complete with hard disk drive.

Reports have it that Jack Tramiel's Atari Corp. will unleash a million of these little dynamos on a grateful world in 1985, making this the year in which the high-performance micro really becomes a commodity item.

1985 also is supposed to be the year for laptops, local-area networks, well-tailored micro-to-mainframe links, AT&T's Unix, project management on micros, desktop presentation graphics, the mouse, operating environments and a host of other paraphernalia.

So, of course, was 1984.

As we all take a deep breath and head into 1985, it is a good time to examine why so many predictions for the micro industry have wandered so far afield.

Lack of forecasting ability

One reason is the lack of true forecasting expertise. Market clairvoyance is spread through the industry like the upper Missouri River in flood, a mile wide and an inch deep. This does not prevent a continuing stream of half-baked, scattershot proclamations about the product intentions of IBM or the other big players from "experts" who hail their own occasional triumphs. (As the saying goes, even a broken clock is right twice a day.)

Another stumbling block is that manufacturers still generally do not deliver what they promise on schedule. As one prominent example, Tramiel has built his meteoric career on pioneering both low-cost manufacturing and vaporware.

But a greater factor is general turmoil in the industry, which is slowly settling down but still packs a lot of random noise and motion. A look backwards shows how much has changed during the past year.

One year ago

In early January 1984, the IBM Personal Computer AT was merely a dubious rumor floating around under the Popcorn label. The highest performance desktop machine making a bid for the mainstream was Tandy Corp.'s Model 2000. But like the dozen other machines based on the Intel Corp. 80186 chip that were also making their debuts, the Tandy 2000 never set the market on fire.

Hardware prices were high. A Personal Computer XT with 256K bytes of internal memory went for roughly $6,000 retail, almost twice what you would pay now after a little shopping, and IBM could not roll them out fast enough.

Rumors were flying that IBM would soon put some version of Unix on the Personal Computer. The single-user PC/IX made its debut in mid-January and then vanished from the spot-

See YEAR page 145

Desktop manager debuts

Smartdesk IBM-based turnkey system features word processing, calendar, calculator functions

ATLANTA, Ga. — Jacore Systems has released Smartdesk, a turnkey desktop management system that incorporates an IBM Personal Computer XT or Personal Computer AT.

Smartdesk software reportedly includes word processing, calendar, phone book, clock and calculator functions. The package allows a user to move from an application such as Lotus Development Corp.'s 1-2-3 to Smartdesk software by pressing one function key, the vendor said.

Smartdesk's word processor is said to allow an executive to draft memos and letters, print the documents or save them in a confidential file. Its calendar feature tracks appointments and provides space for notes and reminders concerning specific meetings, the vendor said.

The phone book stores telephone numbers and when coupled with a modem automatically dials a number, according to the vendor. The clock reportedly displays the current time and has an alarm function that beeps when set.

A Smartdesk system includes a monochrome display, IBM's PC-DOS 3.0 operating system, communications software, an internal modem, a phone connector, cable and IBM 5251 terminal emulation capability that allows a user to connect to an IBM System/36 minicomputer.

A Personal Computer AT system with 20M bytes of storage costs $8,373, and a Personal Computer XT system with 10M bytes of storage sells for $6,995.

Jacore Systems is located at 1640 Powers Ferry Road, Marietta, Ga. 30067.

Digital Research announces Cobol compiler for IBM micro

MONTEREY, Calif. — Digital Research, Inc. has announced DR Level II Cobol, a Cobol compiler designed for the IBM Personal Computer.

The compiler reportedly has been certified by the Federal Software Testing Center and meets full American National Standards Institute 1974 specifications for high-level compilers.

According to the vendor, the product includes two utilities: Display Manager and Access Manager. Display Manager allows programmers to create a number of screen displays, Digital Research said. Access Manager reportedly is a file-access method that enhances maintenance of data records.

DR Level II Cobol completes the Sieve of Erastosthenes, an alogorithm for finding prime numbers, in 311 seconds and MS-Sieve, a modified version of the sieve, in 40 seconds, the vendor said.

The compiler has no runtime licensing fee, meaning software developers who develop applications with the compiler do not have to pay a license fee to Digital Research.

DR Level II Cobol is priced at $700.

Digital Research is located at Box DRI, Monterey, Calif. 93942.

Lotus files third suit over copying

DECATUR, Ill. — Lotus Development Corp. has filed suit in the U.S. District Court for the Central District of Illinois against Mueller Co., Inc. for allegedly producing unauthorized copies of Lotus' 1-2-3 integrated package.

The suit asked for compensatory damages of $800,000 for eight illegal copies of the product, punitive damages and statutory damages of $1 million each and any profits made from the activity, according to Bernard J. Bonn, senior litigation partner at the Boston firm of Testa, Hurwitz and Thibeault.

Bonn said that Lotus' special investigative unit, formed in 1984 to monitor illegal copying of its products, uncovered the activity.

Jim Manzi, president of Lotus, maintained, "Lotus actively supports industry efforts to develop new methods of software authorization. However, in instances where individuals intentionally violate our rights for economic gain, we will vigorously defend our rights by using all legal means available."

Mueller, a metal valve and fitting manufacturer, is the third company against which Lotus has filed suit this year. Earlier suits against Rixon, Inc. and the Heath Group were settled out of court.

Need for data backup often ignored

By Richard Gorgens
Special to CW

Corporate computer centers provide mainframe data backup as a standard procedure, regularly copying data onto magnetic tape and storing extra copies in secure, off-site locations. But similar procedures are seldom used with personal computers, for which the need to secure data is just as important.

Catastrophes such as fires, hardware failures, damaged disks and errant commands pose as much potential danger to desktop computers as they do to mainframes.

Most personal computer users realize the fallibility of floppy disks, and they often make backup copies.

But many personal computer users do not back up

See COPY page 148

Gorgens is president and general manager of Alloy Computer Products, Inc., a Framingham, Mass.-based firm that manufactures personal computer peripherals.

■ Research, a package integrating data base management with statistical analysis, is introduced by Economic Software, Inc./146

■ Lifeboat Associates offers a version of Microsoft Corp.'s MS-DOS for S-100 computers/146

■ Gateway Microsystems, Inc. announces terminal emulation products for the IBM Personal Computer AT/146

INSIDE

Software/147

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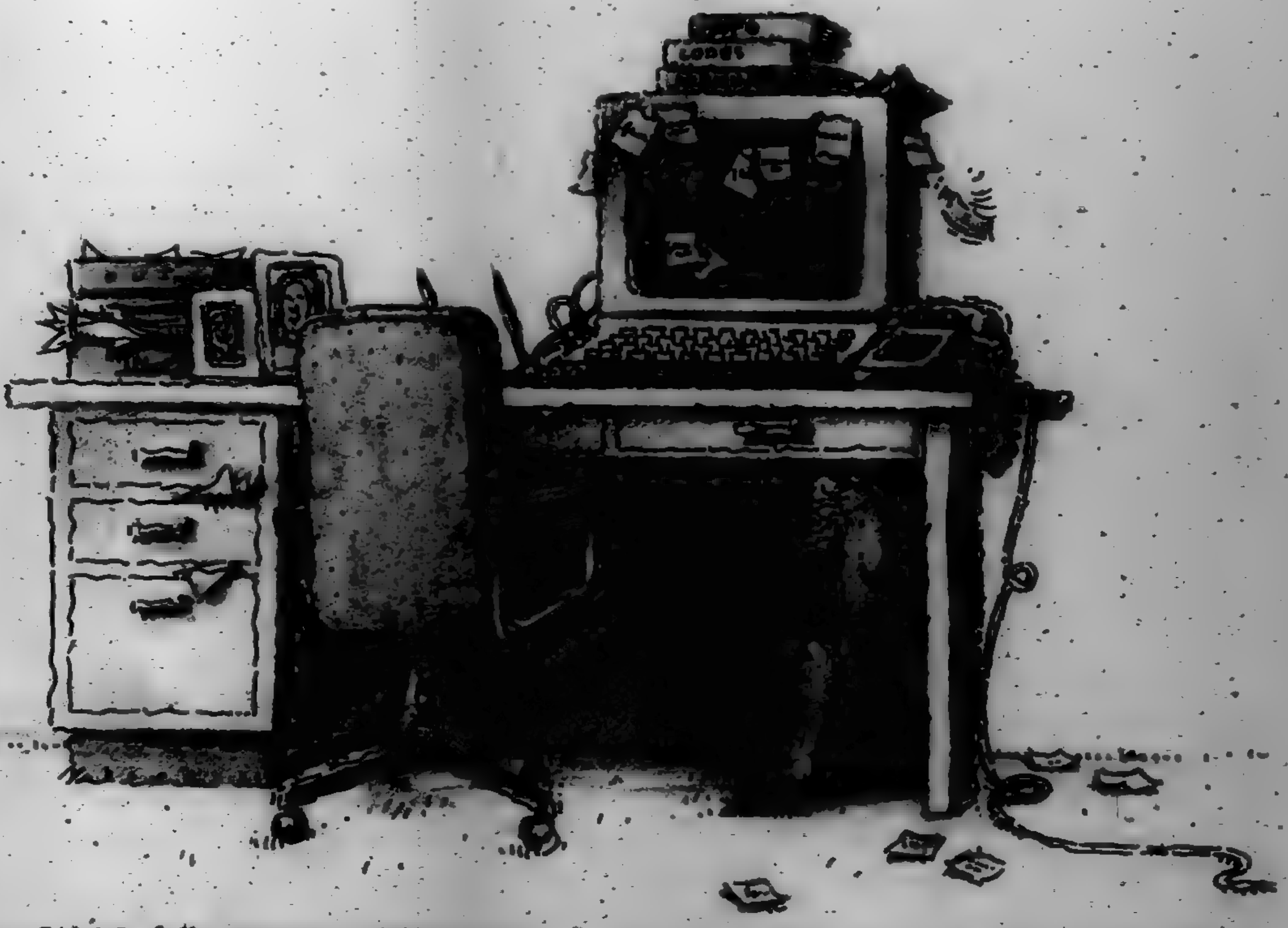

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Microgate emulators available for IBM micro

AUSTIN, Texas — Gateway Microsystems, Inc. has introduced a series of Microgate terminal emulation products for the IBM Personal Computer AT.

The Microgate/WS is said to be an integrated workstation emulating IBM 2780, 3780 and 3270 series terminals. It reportedly provides both batch and interactive micro-to-mainframe communications. Microgate 2780/3780 is an IBM 2780/3780 data communications terminal emulator that uses Binary Synchronous Protocol, according to Gateway.

The Microgate II reportedly is a bisynchronous communications subsystem with a programmable interface to Micro-Focus Cobol and IBM's PC Cobol, compiled Basic and Pascal and assembly languages.

The Microgate 6530 is said to be an enhanced emulator of the Tandem Computers, Inc. Model 6530/20 terminal. The Microgate 940 emulates the Texas Instruments, Inc. Model 940/931 terminal, allowing personal computers to be used on TI's DS990 and Business System series minicomputers, the vendor said.

The Microgate 940 is priced from $250 to $495; Microgate 6530 from $495 to $1,095; Microgate II, $895; Microgate 2780/3780, $895; and Microgate/WS, $995.

Gateway Microsystems is located at Suite 105, 9501 Capital of Texas Highway N., Austin, Texas 78759.

Research software announced

EUGENE, Ore. — Economic Software, Inc. has introduced Research, software that integrates data base management with color graphics and statistical analysis capabilities.

The package reportedly permits users to plot on one screen several different data types, such as correlations between daily interest rates, weekly money supply and monthly inflation rates, Economic Software said.

Research also generates a calendar of days automatically and allows data transfer from various programs, including Lotus Development Corp.'s 1-2-3, the company said.

The software runs on the IBM Personal Computer, Personal Computer XT and Personal Computer AT with 256K bytes of random-access memory.

The program is provided with 325 weeks of data on 40 major economic measures and is priced at $695. A demonstration diskette is priced at $17.95.

Economic Software can be reached at P.O. Box 10925, Eugene, Ore. 97440.

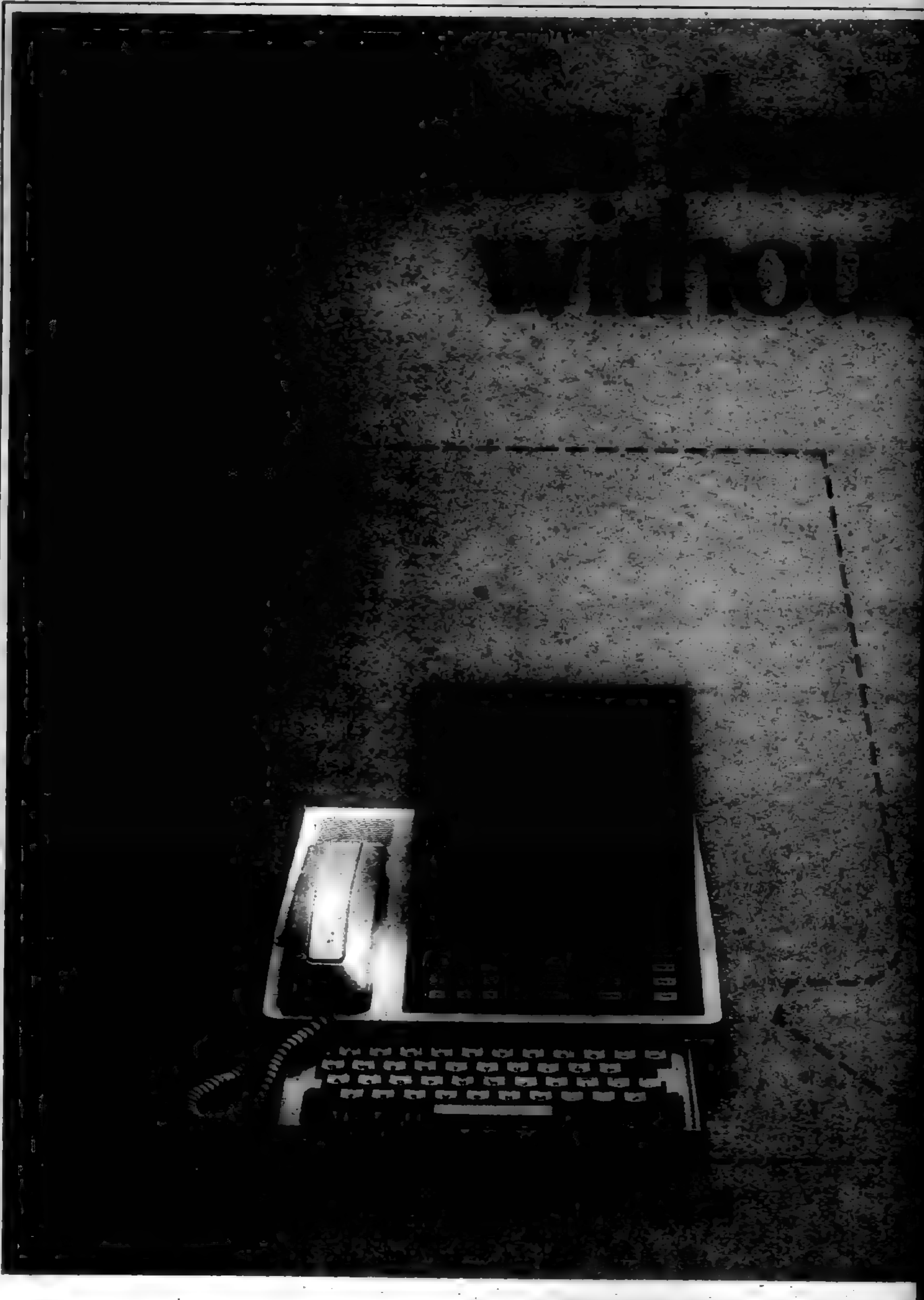
S-100 units gain MS-DOS version

NEW YORK — Lifeboat Associates has introduced SB-86, a version of Microsoft Corp.'s MS-DOS 2.11 operating system for computers based on the S-100 bus architecture. SB-86 reportedly is compatible with IBM's PC-DOS and runs on two CPU boards, the CPU 8085/88 and the CPU 86/87, made by Compupro, Inc. located in Hayward, Calif.

Lifeboat said that its entire line of MS-DOS software — including compilers, assemblers, linkers and business applications such as WP and spreadsheet packages — is available immediately for the new operating system.

The SB-86 requires the CPU card, a Compupro System Support I card, a Disk 1 or 1A controller and disk drive and at least 64K bytes of 24-bit addressable random-access memory, the vendor said. The system is said to support both interrupt-driven and noninterrupt-driven console I/O.

The SB-86 is priced at $275. Lifeboat Associates is located at 1651 Third Ave., New York, N.Y. 10128.



MICROCOMPUTERS

SOFTWARE

POLYGON SOFTWARE CORP.

Easypath 1.0

Polygon Software Corp. has announced a facility that allows users of IBM Personal Computers and compatibles to locate files in subdirectories other than the ones they are working with.

Easypath 1.0 reportedly allows use of the hierarchical subdirectory structure in IBM PC-DOS and Microsoft, Inc. MS-DOS without copying files back and forth. Search paths reportedly can be specified separately for particular files or for groups of files.

The product is said to come with predefined specifications for most major programs and to require PC-DOS or MS-DOS 2.0 or higher.

The list price is $100.

Polygon Software, 363 Seventh Ave., New York, N.Y. 10001.

PRO/TEM SOFTWARE

Notebook II

Pro/Tem Software had introduced its Notebook II data base management system for the IBM Personal Computer line and for the Hewlett-Packard Co. HP 150 and HP 110.

Notebook II reportedly includes a text editor with word wrap, automatic reformatting and screen update. It is said to be able to read files from word processors and public data bases and to accept control and extended characters.

Each Notebook II record is said to be able to include up to 28,000 characters and up to 50 fields.

Field and records sizes are not predefined, the vendor said.

Notebook II is priced at $189, according to a vendor spokesman.

Pro/Tem Software, 2363 Boulevard Circle, Walnut Creek, Calif. 94595.

DURANGO SYSTEMS, INC.

Poppy OS

Durango Systems, Inc. has released Poppy OS, which allows Microsoft Corp.'s MS-DOS programs to run under Microsoft's Xenix operating system.

Poppy OS allows the MS-DOS system calls to speak to the Xenix interpreter, thus enabling MS-DOS-based software to function on the Durango Poppy 286/186 Xenix-based systems. Poppy 286/186 supports up to 12 users with a multitasking operating system.

Poppy OS allows users to run single-user MS-DOS applications programs — such as Micropro International Corp.'s Wordstar, Microsoft's Multi-Plan and Ashton-Tate's Dbase II on a multiuser system.

Poppy OS costs $200.

Durango Systems, 3003 N. First St., San Jose, Calif. 95134.

MCDONNELL DOUGLAS SOFTWARE

Tym/Vsam

McDonnell Douglas Software has introduced Tym/Vsam for the IBM Personal Computer AT/370.

Tym/Vsam reportedly offers users most functions of IBM's Vsam mainframe software, including data storage and retrieval capabilities. It is said to allow the AT/370 to be used as a workstation for the development and testing of programs.

Tym/Vsam also is said to free users from having to return files to the mainframe for testing and to support random or sequential storage and data retrieval.

Tym/Vsam costs $695.

McDonnell Douglas Software, 20705 Valley Green Drive, Cupertino, Calif. 95014.

NEC INFORMATION SYSTEMS, INC.

DR Draw, DR Graph versions

NEC Information Systems, Inc. has announced versions of Digital Research, Inc.'s DR Draw and DR Graph for NEC's Advanced Personal Computer (APC).

The APC's graphics capabilities reportedly allow users to take full advantage of the two products.

DR Graph can be used to create graphs and charts from information in data files, the vendor said. It reportedly also can create line, bar, pie, step, stick and scatter graphs.

DR Draw can be used for creating presentation-quality charts and diagrams, NEC said.

DR Graph is priced at $295. DR Draw is priced at $395, the vendor said.

NEC Information Systems, 1414 Massachusetts Ave., Boxborough, Mass. 01719.

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COPY

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hard disks. Backing up even a small, 10M-byte hard disk can require more than two dozen floppies. The inconvenience deters most users.

Cartridge tape drives that provide adequate backup for micros have been available for several years. They cost about the same as a hard disk drive, and some users consider the price to be high.

Users who keep vital data on hard disks should consider the value or replacement cost of the protected data. When users investigate backup capabilities, they should look for:

- **Data capacity.** The backup medium should hold all data on one or — at most — a few volumes.
- **Data transfer speed.** A backup should not be time-consuming.
- **Cost.** Cost considerations include the cost of both the media and the device.
- **Available software support.** A backup device should provide the capabilities a user needs.

The standard for micro backup devices is the cartridge tape drive. The physical design provides storage capability in a package the size of a paperback novel. Cartridge tapes range in capacity from 10M to 50M bytes and cost $35 to $45 each.

During the past year, several removable cartridge units that use hard or floppy disks have been introduced. The products now available have limited storage capacities and cost two to four times more than higher capacity tape cartridges.

Users interested in cartridge tape backup have several choices. Cartridge tape drives operate in two modes, start-stop and streaming.

Start-stop drives, the older of the two technologies, physically start and stop the tape for each recording. This allows the controlling software to write a series of individual files to the tape. The penalty is a slow transfer rate.

With streaming tape drives, the tape moves continuously, streaming across the tape head. This allows faster data transfer and greater storage capacity.

The newest generation of streaming cartridge tape systems have software to provide complete file-oriented operations while essentially keeping the tape streaming.

The final step toward security lies with the user. Users must develop a set of procedures to ensure that data is backed up, that copies are kept both in the office and off-site and that proper cataloging lets users know where the data is when they need it.

YEAR

from page 143

light, apparently forever.

A year ago Apple was still announcing products for the Apple III. More importantly, it was busily leaking details of the Macintosh, creating tremendous interest and considerable debate about whether the machine would be suitable for the corporate environment.

Also last January, the industry was watching AT&T slowly wheel its guns around toward the computer market. In 1985, we are still waiting for signs of a successful attack by the giant firm, with most interest in the voice/data workstations now poised for entry.

Twelve months ago, there were many more micro companies but no cheap desktop laser printers, no next-generation integrated packages such as Lotus Development Corp.'s Symphony, almost no IBM-developed micro software and less "mindware." Sometimes it seems a long time ago.

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COMPUTER INDUSTRY

Tandem moves to reposition itself

Aims to hold down costs, put low-end system on market

By David Olmos
CW Staff

PALM SPRINGS, Calif. — After broadening its product line and enacting cost-cutting measures and tighter management controls last year, Tandem Computers, Inc. is aiming to recapture the momentum it seemed to be losing.

"We grew our people faster than our revenues last year," James Treybig, Tandem's president and chief executive officer, admitted in a recent interview here. "The fundamental thing we're doing is not hiring people until our revenues catch up."

At the same time, Treybig said, the company, which manufactures fault-tolerant, on-line transaction processing systems, has "moved to reposition ourselves and offer low-end systems as well [as high-end ones], which was something we should always have done." He said the company's strategy now is to offer a broader range of products while striving to maintain its position in larger systems.

Financial performance improving

Tandem's financial performance has been unsteady during the past couple of years. With revenue growth slowing and operating margins down, the company began about a year ago to increase its focus on costs and profitability. The number of employees has been reduced, although the company has increased its sales force.

Industry analysts who follow Tandem said the near-term prospects for the company are good.

"They seem to be determined to get back into the mainstream of major growth and get close to their historical margins," said Fred Cohen, an analyst with L.F. Rothschild, Unterberg, Towbin, a New York brokerage firm. Cohen said the company could have have been faster in improving its hardware and reducing its costs.

Treybig said Tandem had a strong fourth quarter for the period ended Sept. 30, reporting a 30% increase in revenue and a 35% gain in profit over the year-earlier period. "If we have good growth this quarter, then we'll be back to approaching our historical margins," he said.

See TANDEM page 160

Informatics to counter losses with organizational changes

By Kathleen Burton
CW West Coast Bureau

WOODLAND HILLS, Calif. — There is a newly intensified corporate tone in evidence these days at Informatics General Corp., an information processing services and software company attempting to recover from severe financial losses sustained in 1984.

Lemons

To do so, and to meet its goal of becoming a $1 billion company by 1990, Informatics is reshuffling management, revamping its corporate strategy and repositioning several newly announced products to target the microcomputer market, according to executives interviewed here recently.

Other organizational changes include selling ailing divisions and repositioning languishing product lines, such as insurance, to target the micro market. "We're getting back to basics," said Walter F. Bauer, the firm's cofounder, chairman and chief executive officer.

Informatics posted depressed financial figures for 1984. Profits fell, and net income plummeted 87% to $546,000, compared with $4.2 million for the same period in 1983. The reasons, according to company insiders, were losses of $4 million in the company's $30 million life insurance operation, $2 million in the $34 million applications software products group and flattened sales of its flagship Mark V applications development product.

Industry analysts indicated that Informatics' poor financial showing last year was due to a chronic lack of focus. In the past, Informatics has offered a potpourri of services, ranging from customized programming to project management and systems, to a widely diversified array of customers including Fortune 1,000 corporations, the federal government and small businesses.

See RECOVER page 158

ITT consolidates credit divisions to offer expanded finance service

By Peter Bartolik
CW Staff

ST. LOUIS — Through ongoing consolidation of various credit divisions, ITT Corp.'s ITT Commercial Finance group hopes to build its early lead in retail computer financing into a position as the dominant one-stop financing service, including lease underwriting, for business computer equipment sold at the retail level.

The credit group, an operating unit of the $5 billion ITT Financial Corp., over recent months has absorbed four divisions of the former ITT Industrial Credit Co. under the direction of Melvin F. Brown, the Commercial Finance group's president and chief executive officer.

In a recent interview, Brown said the objective of the consolidated operation is to provide full-service commercial financing to leading computer retail operations. Those services currently provide about one-sixth of the

See ITT page 159

■ Kaypro Corp.'s annual financial report showed that a $10 million profit, built up over the first three quarters, had been wiped out/151

■ Digital Equipment Corp. has filed suit against C. Itoh & Co. America, Inc., asking a federal court to halt sales of C. Itoh's display terminal, which DEC alleges copies some of its VT220 terminal traits/153

■ 3Com Corp. has set up an applications software division under the direction of company founder and chairman Bob Metcalf/158

Absence of tax reform may disappoint industry in '85

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

The most significant business-pertinent policy issues raised recently in Washington, D.C., are, first, the federal budget and, second, tax reform.

The Reagan administration cannot seem to get its act together on a comprehensive budget reduction package and therefore is going to have a big problem trying to sell a tax simplification package.

The waffling and wavering that has dampened Cabinet-level budget meetings leaves the impression that the executive branch is running around headless. The inability to develop a comprehensive budget package with a military budget cut significant enough to make it salable in Congress can only detract from the momentum and leadership that should be present in the White House during the beginning of a second presidential term.

Trade groups call for freeze

Recently, the American Electronics Association joined with other major national trade associations to call for a budget freeze, including a freeze in defense spending.

While many people see a budget cutback and tax reform ideally going hand in hand, the folly being played out in the budget process will undoubtedly carry over to the tax-writing process. Where the lack of leadership results in special dispensations in the budget, so surely will special interests smell an opening and flock to influence a new tax act. The end result will more than likely turn into another morass of loophole-ridden amendments, leaving the tax code in even worse shape than at present.

Unless the government gets its house in order, 1985 could turn out to be a very disappointing year for American industries.

■

A fatality earlier this summer stemming from chemicals located at the M/A-Com, Inc. gallium arsenide semiconductor laboratory was in no way job-related, according to a verbal report the company said it has received from the U.S. Department of Labor's Occupational Safety and Health Administration (Osha).

Joseph C. Bothwell, senior vice-president of the Burlington, Mass., company, said he was told by Osha that the death of employee John Zemotel from the inhalation of arsine gas in June was not job-related.

However, as a result of an intensive investigation following the fatality, Osha issued two citations alleging inadequate records of baseline airborne monitoring for inorganic arsenide and for concerns over certain written procedures, eyewash facilities, housekeeping and training programs. "Neither of these citations is related to Mr. Zemotel's tragic death," Bothwell said.

Entered lab without authorization

Zemotel reportedly entered the laboratories June 11 without authorization and inhaled arsine gas that was stored in a cylinder. He went into a coma later in the day and died on June 22.

M/A-Com had initially termed the death a possible suicide but later retracted its statement following complaints from Zemotel's relatives.

The Osha report, which has not yet been received in final written form, followed an earlier, similar report from the Massachusetts Department of Occupational Hygiene.

Intercompany discrepancies yield costly export errors

OUTSIDE LINES
Arthur Bardehagen
and Joseph Colleran

First of a two-part article

Manufacturers of computer hardware and software expend so much effort making and marketing their products that they are not always aware that their work is sometimes unwittingly sabotaged by other units of their companies, thus costing the companies money. This occurs most often, perhaps, when the manufacturers export their products.

How do we know all this? In the first seven months of 1984, Irving Trust Co. made nearly 21,000 payments to a variety of American exporters under letters of credit issued by overseas buyers of their products. In order to obtain payment under these credits, the exporters had to present the bank with various documents showing, among other things, that they had shipped the goods they said they would.

Records of the presentations made by these exporters indicated that 34.2% contained discrepancies of one kind or another. In other words, in more than one case in three the exporters erred in preparing the documents or else did not provide all those that were required. This experience is neither unique nor unusual in the banking industry.

What was the result of these errors? In a few cases the exporters lost their sales altogether. Because of discrepancies in the documents, the overseas buyers canceled their orders.

Usually, however, the discrepancies were corrected, and the sales were consummated. Even so, the exporters were not paid until the discrepancies were rectified and thus lost the use of their money for a day, a week, even two weeks or more. And often they were charged a fee. Over the last few years, banks have routinely levied such fees when presented with documents that contained discrepancies that could not be corrected and on which waivers had to be sought from the goods' importers.

On Oct. 1, the International Chamber of Commerce effected changes in the Uniform Customs and Practice for Documentary Credits, the rules governing the use of letters of credit in international trade. Some casual observers may think that these changes will reduce the discrepancies banks find so often in this area. We think no such thing.

In general, the changes merely streamline the use of letters of credit in international trade and recognize current practices fostered by the use of new technologies. For example, they sanction the use of photocopies, in lieu of original documents, as well as facsimile transmissions and other means of electronic communications.

The fact is a reduction in errors can only be achieved by exporters themselves. Before studying their most common mistakes, let's look briefly at letters of credit and how they are used.

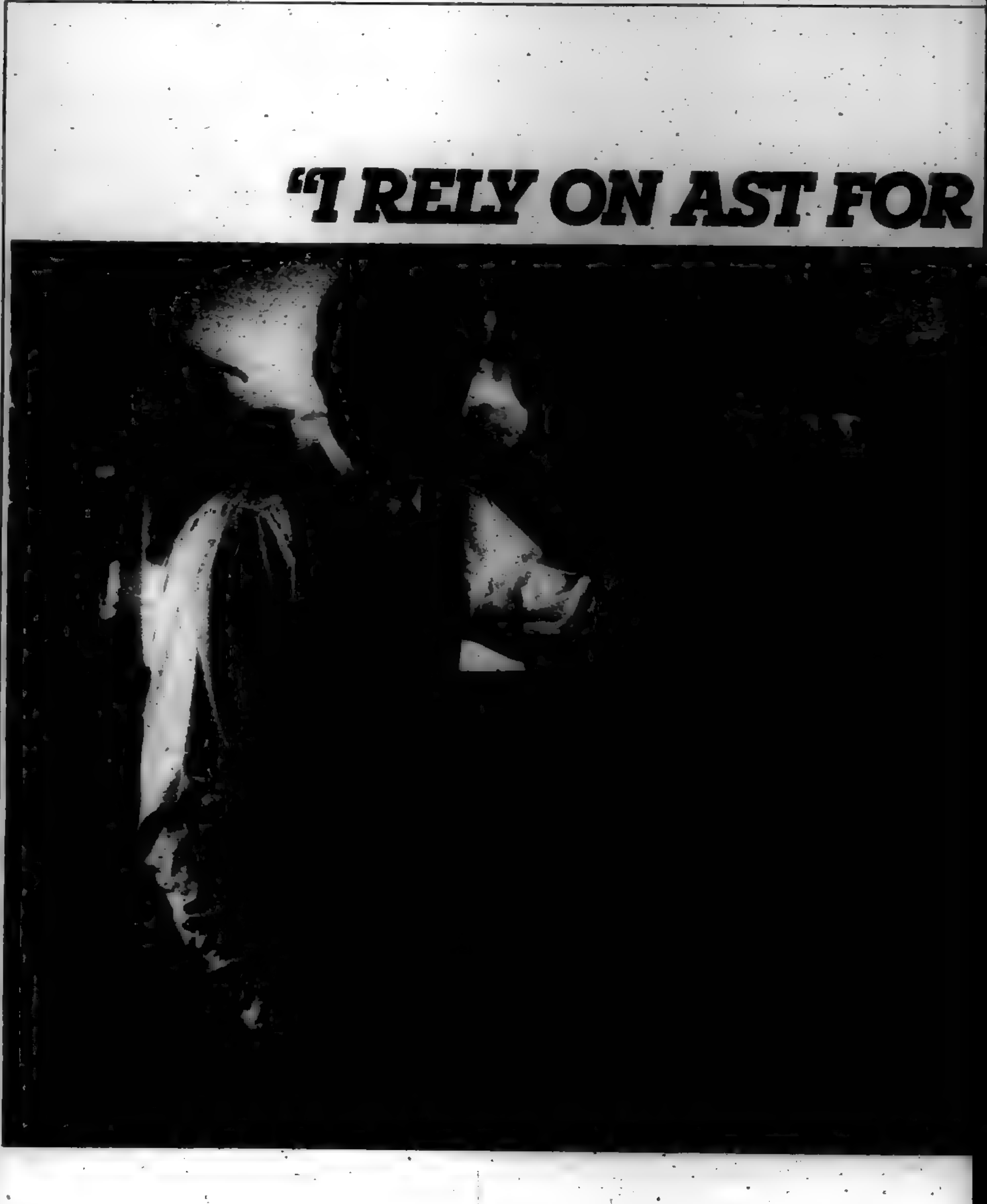
In international trade, an exporter may wish to be paid as soon as he ships his goods, while the importer may not wish to make payment until he has received them. A letter of credit serves to reconcile the interests of both parties.

It is a binding agreement that specifies what the exporter is to ship, what is to be paid for the shipment, when it is to be paid and any other conditions on which the buyer and seller agree. In addition, the letter of credit guarantees that money is available to pay for the shipment.

The letter of credit is is-

See TRADE page 151

Bardehagen is a vice-president in the Trade Finance division and Colleran is a vice-president in the Credit Services division of Irving Trust Co. in New York.


"I RELY ON AST FOR

Earnings adjustments mark Kaypro's fiscal statement

Refusal to reveal fourth-quarter figures could mean problems, analysts say

By Kathleen Burton
CW West Coast Bureau

SOLANO BEACH, Calif. — Portable computer manufacturer Kaypro Corp. recently released its annual financial statement without revealing fourth-quarter results that wiped out a $10 million profit built over the first nine months of the fiscal year.

Kaypro reported a $267,683 loss for the fiscal year ended Aug. 31 after a series of unspecified year-end earnings adjustments. Kaypro officials would not reveal fourth-quarter financial figures or disclose earnings adjustments made to figures in the earlier periods.

Kaypro reported earlier that it expected to break even for the year. For the first three quarters, Kaypro reported net income of $10 million, compared with a 1983 net income of $8.3 million.

A company spokesman said Kaypro is now investigating an unexpected end-of-the-year inventory adjustment. Earlier in the year, David Kay, Kaypro's director of marketing, claimed that several million dollars of inventory parts were missing, possibly because of a theft from a circus tent on Kaypro's grounds, where the parts had been stored.

Management problem?

Bob Katzive, vice-president of Gnostic Concepts, Inc., a market research firm in Palo Alto, Calif., said Kaypro's secretiveness about the details of the write-down, its late Securities and Exchange Commission filing and restatement of profit margins suggest a fundamental management problem.

"It indicates that Kaypro's management is out of control and doesn't want to air out their dirty financial laundry," he said.

According to Katzive, the widely varying financial picture painted by Kaypro between the third and fourth quarters is suspicious. "Finances don't change that radically over one quarter," he said.

A company spokesman said the earnings adjustments were caused by a drop in gross margins from 43.4% in 1983 to 25.7% in 1984, by increases in reserves, by price discounting because of a highly competitive market, by higher than expected advertising and manufacturing costs and by reserves of inventory excesses.

Jan Lewis, an analyst at Infocorp, a Cupertino, Calif.-based market research firm, said Kaypro's 1984 losses were not significant over the long term because of the firm's stable position in the retail channel and its constant market share. Kaypro is "still a solid company," Lewis said.

TRADE

from page 150

sued by the importer's bank, which irrevocably commits itself to pay for the goods if the exporter presents the documents required by the credit.

The exporter's bank examines the documents, determines that they meet the requirements of the credit and so advises the importer's bank, which then forwards payment.

Typically these documents include an invoice, a packing or weight list, a bill of lading and perhaps an insurance form and a customs (or consular) invoice permitting entry of the goods into the importer's country.

Note that neither the exporter's nor the importer's bank actually inspects the goods that are shipped. Only the relevant documents are examined.

It all sounds relatively simple — and should be.

Next week: 10 common errors and ways to avoid them.

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Durango, Molecular Computer plan consolidation

By Kathleen Burton
CW West Coast Bureau

SAN JOSE, Calif. — Merger talks were recently concluded between Molecular Computer, Inc. and Durango Systems, Inc., both based here and both seeking protection in a market rapidly becoming more competitive.

"Consolidation is the only way companies like us can survive against giants like IBM, Hewlett-Packard Co. and Data General Corp.," said Barry Dearborn, Durango's vice-president of sales. "By ourselves," he said, "we can't play on the same section of the playing field as IBM and AT&T." Dearborn predicted the future will hold more such consolidations in lieu of a shakeout for mid-size, entrepreneurially oriented multiuser vendors.

The two privately held companies began merger talks in November after solidifying a one- to two-year OEM agreement for Durango to supply Molecular with 100 to 150 of its Poppy 80286 computers per month. The Poppy 80286, Durango's flagship product, offers limited compatibility with the IBM Personal Computer AT, and can run MS-DOS, CP/M 86 or Zenix 3.0 operating systems.

The proposed merger would create a company with combined revenues of about $50 million and give Durango access to Molecular's well-established direct sales force, aimed at the Fortune 1,000, Dearborn said.

Molecular's newly appointed President and Chief Executive Officer Frank Zurcher, a former executive vice-president at Televideo Systems, Inc., said that before the merger talks began the firm had been looking to expand into the Zenix area.

Jim Renalds, an analyst with Dataquest, a market research firm in San Jose, Calif., said the potential merger will shore up the relatively weak financial positions of Durango and Molecular, which had been relying on a weakened venture capital base. The two companies are reviewing their product strategies now, Renalds said, and focusing on new target markets. "In this business though," he warned, "there's not a lot of time to reposition, so if they plan to refocus product lines, they'd better make their move within the next six months."

But some analysts question whether Durango should tamper with its short-term winning strategy at all. According to Robert Lefkowitz, an Infocorp analyst and former Durango employee, Durango's strength is in the vertically oriented niche occupied by value-added dealers and resellers.

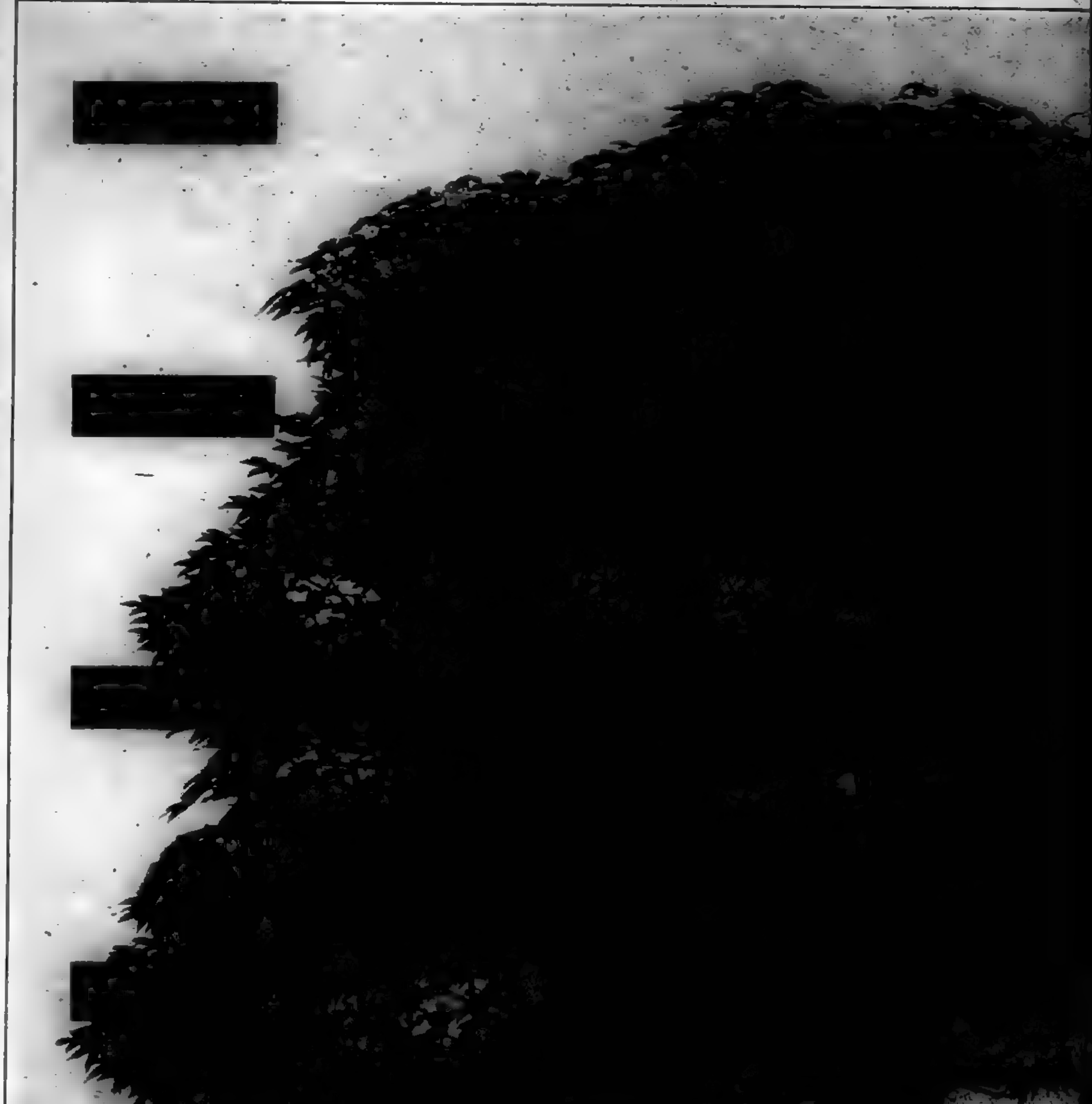
Lefkowitz also said that IBM's recently announced inability to meet first-quarter Personal Computer AT production demands should work in Durango's favor, giving it a substantial lead time in the marketplace.

Second term sees profits

SANTA CLARA, Calif. — National Semiconductor Corp. recently reported a second-quarter profit of $8.5 million, or 10 cents per share, down from the year-earlier profit of $13.2 million, or 15 cents per share.

The company experienced an almost 18% increase in revenues to $435.4 million in the quarter, compared with $369 million one year ago, but capital spending of $120 million was almost triple the year-earlier level. The company also increased spending on research and development.

The spending has positioned the company for strong growth when order rates in the industry strengthen, asserted Charles E. Sporck, president and chief executive officer. But he noted that order rates declined in the second quarter and said, "We feel it will be difficult to maintain the company's financial performance in the near term."



DEC files suit against C. Itoh

NEWARK, N.J. — Digital Equipment Corp. announced late last month that it has filed suit in U.S. District Court here seeking an injunction to prohibit C. Itoh & Co. America, Inc. from further marketing, selling or distribution of the C. Itoh CIT-220+ video display terminal.

DEC charged that the C. Itoh & Co. product is a direct and unauthorized copy of the "distinct external appearance" of DEC's VT220 terminal and that C. Itoh copied DEC's VT220 documentation and set up screen formats in violation of DEC's copyright protection.

The suit seeks treble damages from C. Itoh, based on the gains and profits the company has received through sales of the CIT-220+ products.

Also named in the suit was the company's parent company, C. Itoh & Co. Ltd. of Japan, along with C. Itoh Electronics, Inc. and CIE Terminals, Inc. C. Itoh Electronics, Inc. and CIE Terminals, Inc. are both located in Irvine, Calif.

Booz Allen exec joins Broadview Associates

FORT LEE, N.J. — Harvey L. Poppel, formerly senior vice-president of Booz, Allen & Hamilton and in charge of its information industry practice, recently announced he has joined Broadview Associates, a firm specializing in mergers and acquisitions in the information services industry.

With the addition of Poppel, according to Broadview founder Gil Mintz, "we will be able to specialize in the hardware and telecommunications sectors of the information industry" in addition to Broadview's traditional focus on computer services and software.

Poppel, 46, was with Booz Allen for 18 years and previously held information management and technology positions with Western Union Telegraph Co. and Westinghouse Electric Corp.

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Convergent appoints director

SANTA CLARA, Calif. — Convergent Technologies, Inc. reported recently that William G. Ouchi has been appointed to its board of directors.

The company also announced that David I. Caplan has resigned as president and general manager of the firm's data systems division.

Ouchi is a professor of management and vice-chairman of the Graduate School of Management at the University of California at Los Angeles.

Caplan, who joined Convergent in April, is leaving to take a position as president and chief executive officer at Tolerant Systems Corp.

Intel to sell tools to SAS

AUSTIN, Texas — Intel Corp. said last month that it will sell part of its software operations here to SAS Institute, Inc.

SAS Institute, a Cary, N.C., software company, will acquire the design information, source code, product rights and support responsibilities for Intel's System 2000 data base management system, including the System 2000, Quest, Plex and Report Writer products. Intel's Idis data base information system and the Fast 38xx semiconductor disk products are not included in the agreement.

SAS Institute said the research and development staff for System 2000 will operate as a wholly owned subsidiary and will remain in Austin.

Ztel in leadership change taps execs from investors

WILMINGTON, Mass. — Ztel Corp., a start-up private branch exchange manufacturer, has reported that two of its top executives have been replaced with representatives from two of the firm's four primary investors.

Peter S. Anderson, president and chief executive officer (CEO) of Ztel since April 1983, is said to have resigned from the company on Dec. 14 for personal reasons. Gerald R. Birr, vice-president and chief financial officer, also left the company, a company spokeswoman said.

Ztel's board of directors elected James E. Long as chief operations officer and Harry T. Rein as the company's new chairman of the board. Long, an employee of Adler and Co., a venture capital firm headquartered in New York and one of Ztel's major investors, has reportedly served on Ztel's board since February 1983. Rein will reportedly be working closely with Long until a new CEO can be elected sometime in the near future. Long would neither confirm nor deny whether the so-called "changing of the guard" had anything to do with the company's present financial situation.

AT&T plans megabit chip production by end of year

ALLENTOWN, Pa. — AT&T announced recently it plans to manufacture a megabit memory chip within a year and to be in full production in 1986. The company announced that Bell Laboratories here has produced working chips "that are essentially ready for the production line."

The megabit chip is seen by many as the next big frontier in the production of semiconductors, with varied applications including large storage capacities for 32-bit microprocessors and rapid expansion of portable machine capabilities.

Thomas R. Thomsen, president of AT&T Technology Systems Group said "AT&T intends to continue a leadership position" in the semiconductor area. In combination with 32-bit chips, Thomsen said, megabit chips in the near future could "help put a superminicomputer in business, industrial or other special environments where space is at a premium or for that matter in your lap."

Ian Ross, president of Bell Labs, said his group had successfully simulated the complete production process of the chip "so that there would be no surprises when we put the chip into production."

IBM announced last April that it had produced a megabit chip on an existing production line, indicating it, too, could quickly move into production when a market for the chips develops.

Additionally, at least two Japanese semiconductor companies are believed to have developed prototype megabit chips. AT&T said it will release details on the chip at the International Solid State Circuits Conference in New York this February.

Hitachi said not ready for U.S.

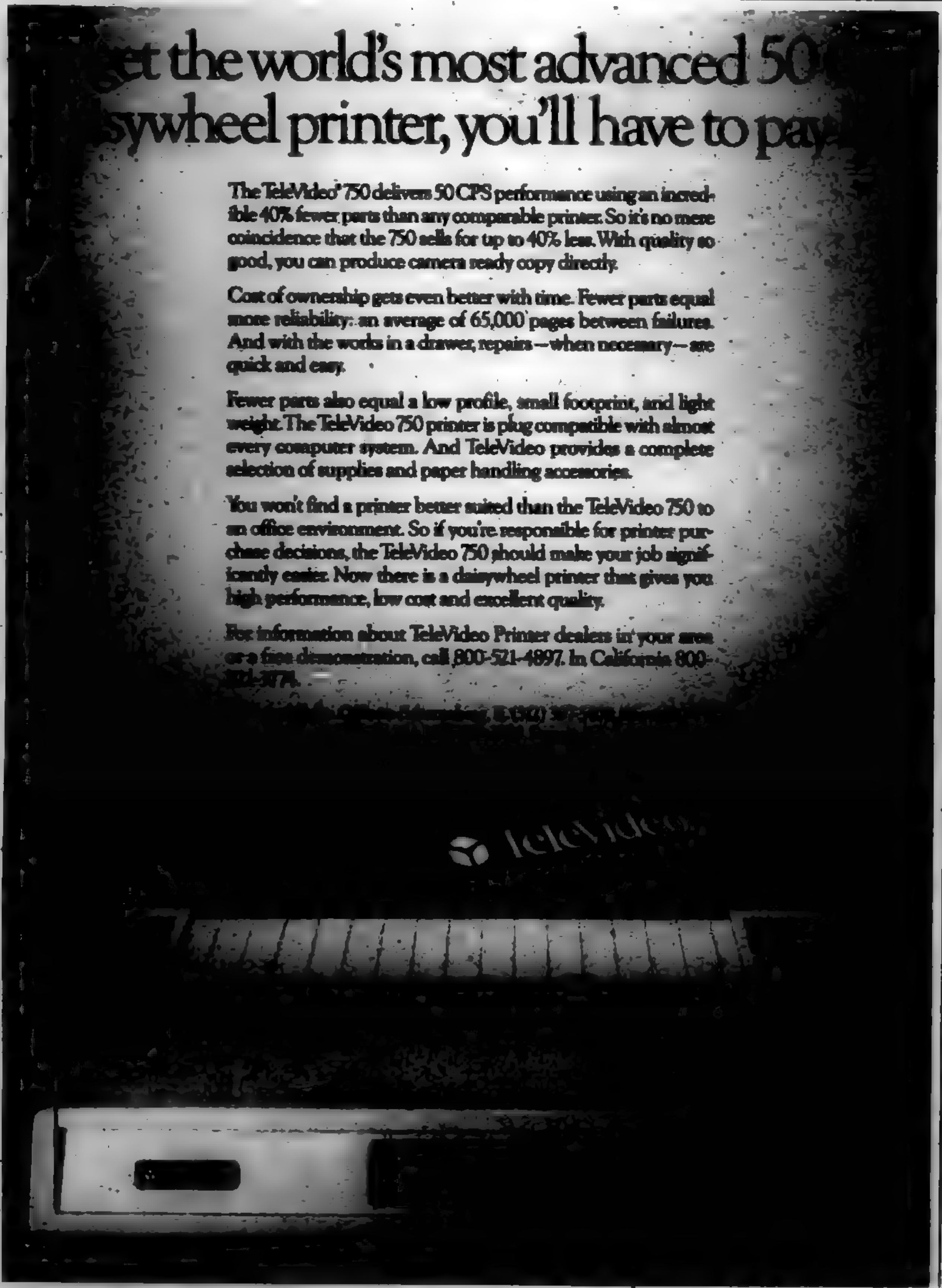
NEW YORK — The marketing director of Hitachi, Ltd. of Japan recently said his company wants "to gain more experience" with its supercomputers before trying to market them in the U. S. or Europe.

When asked for a target date at a recent press conference here, Atsu Kimura said, "We are not considering too much about it right now."

The Hitachi S810-10 is being offered at a lease rate of 50 million yen, or about $200,000, a month in Japan. The S810-20, leases for 70 million yen, or about $285,000, a month. Kimura was unable to say what the computer would sell for in Japan. Few companies have considered buying one, he said.

Three of the Hitachi supercomputers are in use in Japan: one at the University of Tokyo and the other two at Hitachi sites.

Kimura said the S-810 models are superior to the Cray Research, Inc. X-MP but was unable to say whether they matched the multiprocessor versions of the Cray machines.



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3Com software division to target micro net market

By Eric Bender
CW Staff

MOUNTAIN VIEW, Calif. — 3Com Corp. this month formed an Applications Software Division to develop and market software for networked personal computers and announced revenues of $13.2 million for the quarter ended Nov. 30.

The new division, headed by Robert Metcalfe, 3Com's founder and chairman, will offer both application development tools for system integrators and multiuser productivity packages for end users. With the upgrading of the unit, which was formed last June, to division status, 3Com has marked "the establishment of a critical mass" for applications software and taken the first step in a plan to restructure into divisions, Metcalfe said. He noted that 3Com now has about 260 employees.

According to Metcalfe, the new division will work with outside suppliers in offering software development tools. As one example, he said, "we don't plan to do a data base ourselves, but we will make it work on the net."

On the application software side, "we will be focusing on multiuser productivity tools — not spreadsheets or word processors or data bases, but rather productivity tools for more than one user," Metcalfe said. "The prime example is Ethermail." Planned enhancements for Ethermail include greater reach to external environments, boosted memory capability and tighter integration with other applications such as calendars and file managers, according to Metcalfe.

3Com's $13.2 million second-quarter revenues represented a 222% increase from $4.1 million in the same quarter last year, the company reported. Net income for the quarter rose to $1.4 million from $664,000 a year ago. Quarterly earnings per share climbed from 6 cents in 1984 to 10 cents this year.

For the first half of the current fiscal year, 3Com's net revenues were $22.1 million, up from $6.3 million in the first half of last year, the company said. Net income for the first half was $2.6 million, up from $910,000. Earnings per share for the first half climbed to 19 cents, up from 8 cents for the same period last year.

Despite rapid growth in this period, 3Com President L. William Krause commented, "Our incoming order rate was lower than expected" and said that IBM's introduction of its PC Network may have caused some customers to review their network purchasing plans.

Head vendor cuts back business

CHATSWORTH, Calif. — Magnetic Information Technology, Inc., a maker of magnetic heads for floppy disk drives, recently announced that it was curtailing its business and that its president, John Daste, has resigned.

Pete Sidhu, chairman and chief executive officer, said the company plans to continue operation in the U.S. and India on a limited basis. A search has begun for a new president, he said.

Sidhu, noting that 1984 has been a difficult year for the floppy disk business, said the company plans to move into other areas, including Winchester-type magnetic heads.

'And this is our most popular executive model.'

SCIENCE/SCOPE

Military commanders can get a detailed picture of tactical situations and the current status of their resources with a new display terminal. Hughes Aircraft Company's HMD-8000 has two display screens, one of which produces seven-color graphics with about twice the resolution of commercial TV. An innovative touch panel controlled by computer software lets an operator retrieve and display data very quickly. Commands that combine several complicated processes can be made in one touch. The system is built in modular form and is so flexible that it can be reconfigured to meet changing needs immediately. In an air defense command and control system it normally would display tactical air battle data and tactical air force resource data. As a battle grew and more information was needed, additional screens could be used to provide that data. Later the display screens could be returned to regular tasks.

A MIDAS touch will create the factory of the future by introducing computer technology throughout one Hughes manufacturing division. The new Manufacturing Information Distribution and Acquisition System (MIDAS) is a flexible, high-speed data communication network. It will transmit and gather millions of bits of data per day by linking computer terminals, laser printers, bar-code scanners, and other equipment. MIDAS will serve graphic workstations and facilitate paperless planning. Similarly, it will relay numerical-control programs from main computers to machines in the factory, eliminating the need for paper tape. MIDAS will let all users share important peripherals, such as a laser printer, which now is impossible due to the incompatibility of equipment from different manufacturers.

A new TV image processor should find many applications in such fields as electronics, medicine, chemistry, and manufacturing. The Hughes Model 793 processor, which features built-in computer control and a wide range of software options, is a fully integrated system that provides real-time image enhancement. It is intended for use where image retention, enhancement, or comparison is required, and where high image quality is essential. In addition to an image processor, the system has a keyboard, disk drive, joystick, line printer, and optional plotter.

A head-up display (HUD) that provides a wide field of view can be retrofited on fighter aircraft to give pilots critical sensor and steering information, even in low-altitude flights at night and under poor visibility conditions. The display saves pilots from looking down into the cockpit to read instruments because information such as airspeed, heading, and target data is superimposed on a diffraction optics combiner mounted at the pilot's eye level. Compared with conventional, mirrored glass displays, the HUD has a wider field of view, is more transparent, has brighter symbology, and reduces glare and sunballs. Hughes pioneered the technology used in its display, which incorporates diffraction optics made through a process involving holographic techniques and lasers. The Hughes HUD is in production for Sweden's JAS-39 and is undergoing evaluation for several U.S. aircraft.

The Hughes Tucson facility, located in picturesque Southern Arizona, is a large, modern manufacturing complex with capabilities for producing advanced missile systems developed by Hughes. We have openings for experienced and graduating engineers to work on such advanced systems as the electro-optical Maverick, radar-guided Phoenix, TOW, and AMRAAM, the Advanced Medium-Range Air-to-Air Missile. Please send your resume to Professional Employment, Dept. S3, Hughes Aircraft Company, P.O. Box 11337, Tucson, AZ 85734. Equal opportunity employer. U.S. citizenship required.

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HUGHES

Do "Batch Window" Problems Cause Your Online Systems to Come Up Late?

ONLINE SYSTEMS
7AM – 6 PM

When your online system doesn't come up on time, the impact to your online users is the same as if your CPU were down: LOST PRODUCTIVITY

The growth in importance of online systems in recent years has indirectly caused a new concern: there is less and less time each night to complete batch processing – time known as the "Batch Window." And, when the batch schedule is not completed on time, the online system suffers dramatically – often causing a delay in bringing up IMS or CICS. The loss of productivity and revenue to your company can be significant, particularly if this situation occurs frequently or unexpectedly.

Candle's answer to managing the "Batch Window" is EPILOG®/MVS, the Installation Performance Management System. EPILOG/MVS provides analysis on performance data by sampling performance at user specified intervals and writing the data to an EPILOG data base. You can then compare the performance of today's run of a job or group of jobs with their performance when run last week or last month. Once you have determined that a job is now taking abnormally long to complete, EPILOG/MVS can be used to pinpoint the reason why – moreover, this can all be done using TSO or batch reports.

You can also use EPILOG/MVS on an exception basis. When a performance threshold has been exceeded, use EPILOG/MVS to analyze performance for that particular time interval. This allows you to concentrate on *only* the problem areas, thereby achieving your greatest payback.

When system performance is seriously degraded, you need to find out, at once, if anything changed. EPILOG's companion product, DELTAMON™/MVS, automatically tells you what system software, hardware, JES2 operational parameters, data set, and PDS member changes have occurred. All the guesswork about what has changed is eliminated, and valuable systems programmer time is saved, shortening the problem solving cycle.

If you are implementing a planned change, use DELTAMON/MVS to ensure that the change was made and use EPILOG/MVS both before and after the change to measure the impacts the change may have had upon your system.

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NICKELS AND DIMES

Analog Devices, Inc. recently reported that its profits rose 57% to $10.2 million, or 38 cents a share, from $6.5 million, or 25 cents a share, for the fourth quarter ended Nov. 3. Revenues for the latest quarter rose 39% to $84.5 million from $60.8 million during the corresponding year-earlier period.

■

Panasophic Systems, Inc. reported revenues for its second fiscal quarter of $16.6 million, compared with $11.4 million for the same period a year ago. Profits were $3 million, or 35 cents per share, compared with $1.8 million, or 23 cents per share, in the comparable quarter last year.

■

Computer Automation, Inc. announced a net loss of $589,000, or 29 cents per share, on revenues of $14.2 million for the first quarter of 1985, ended Sept. 30. A year earlier, the company reported a first-quarter loss of $2.8 million, or $1.40 per share, and revenues of $12.1 million.

■

Computer Communications, Inc. announced that revenues for the first quarter ended Sept. 30 declined 19% to $2.3 million from $2.9 million reported in the same period one year earlier. The company reported a net loss in the current quarter of $175,656, or 2 cents per share, compared with $246,295, or 5 cents per share, in the same quarter one year earlier.

■

Sterling Software, Inc. reported revenues in 1984 rose 103% to $18.7 million, up from $9.2 million last year. Profits for the quarter amounted to $1.1 million, or 25 cents per share, compared with $1.2 million, or 40 cents per share, last year.

■

Iest Corp. announced revenues for the three months ended Oct. 27 of $5.9 million, compared with $3.6 million in the corresponding period last year. Profits were $67,000, or 1 cent per share, compared with a loss of $986,000, or 11 cents per share, for the comparable period one year earlier.

■

The MacNeal-Schwendler Corp. reported revenues for the nine months ended Oct. 31 of $10.2 million, compared with $8.2 million for the same period last year. Profits were $2.2 million, or 38 cents per share, compared with $1.8 million, or 32 cents per share, for the comparable quarter one year earlier.

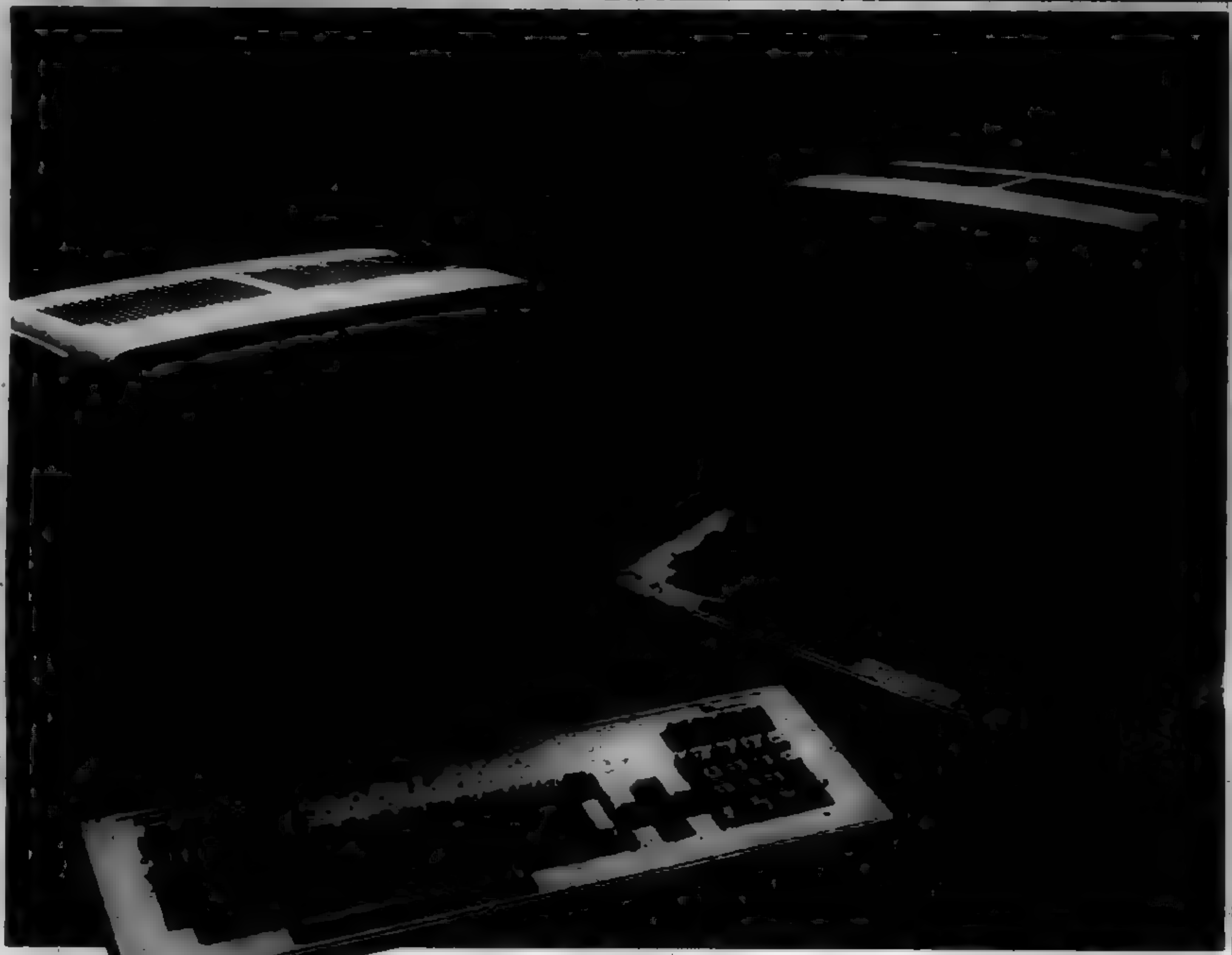
■

Bishop Graphics, Inc. announced revenues for the fourth quarter of fiscal 1984 were $3.2 million, compared with $3.2 million in the same period one year ago. Profits were $243,000, or 12 cents per share, compared with $288,000 or 14 cents per share, in the year-earlier quarter.

■

Floating Point Systems, Inc. reported revenues for the fourth quarter of $32.4 million, compared with $29 million in the same quarter last year. Profits were $4.4 million, or 55 cents per share, compared with $4.4 million, or 60 cents per share, in the corresponding period a year earlier.

■



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RECOVER

from page 149

Bauer said he plans to avoid this diffusion of corporate energies in the future. With this in mind, he recently consolidated the company into eight divisions, all housed under the newly formed Systems and Applications groups. Both groups have distinct purposes, he said.

Bauer

The Applications Group, which accounts for half of Informatics' revenues through its sale of software in corporate vertical markets such as legal, accounting, insurance and distribution, now shares a common sales and marketing team and is aiming to beef up its dealer base to 150 value-added resellers. The newly consolidated Systems Group, Bauer explained, will allow the company to position itself as a prime contractor for its federal clients — a sector of the firm's business that already is worth $35 million a year — and serve as a one-stop shopping center for corporate programming needs.

Informatics plans more acquisitions in the services area, noted Richard Lemons, Informatics' executive vice-president of information. Lemons said that aggressive international expansion is projected for 1985, based on a recently established European major accounts program and an Informatics division in France.

Brian Boyle, an analyst with Gnostic Concepts, Inc., a market research firm in Palo Alto, Calif., said that Informatics' financial problems in 1984 were caused by the company's having "too many eggs in their Mark V basket," a product he called "obsolete before its time." To move out of its financial slump, he said, the company has to move ahead in 1985 with new products. However, Informatics' value-added orientation and high overhead costs make such a move difficult in the micro area, he added.

According to Peter Lowber, a senior market analyst at the Yankee Group in Boston, Informatics lacks the basic foundation software to grow into future vertical markets and address future DP concerns. The key products he sees missing from Informatics' arsenal are fourth-generation language system capabilities, MIS' future alternative to Cobol, and a full relational data base management product, the model for data bases of the future.

COMPUTER INDUSTRY

Systems Associates, Inc. reported revenues for the third quarter ended October 31 of $8.1 million, up 29% from $6.3 million one year ago. Profits were $747,000, or 30 cents per share, compared with $716,000, or 31 cents per share, in the corresponding quarter a year earlier.

■

Gerber Scientific, Inc. announced second-quarter profits of $6.4 million, or 37 cents per share, compared with $3.4 million, or 24 cents per share in the same period one year earlier. Revenues were $52.6 million, compared with $42.7 million in the corresponding quarter one year ago.

■

Tektronix, Inc. announced profits for the second quarter ended Nov. 10 of $22 million, or $1.14 per share, compared with $1.6 million, or 66 cents per share, in the year-earlier quarter. Revenues were $333.4 million, up 17% from $285 million in the comparable quarter one year ago.

■

Denelcor, Inc. announced a third-quarter loss of $2.9 million, or 38 cents per share, compared with a loss of $2.7 million, or 37 cents per share in the same period one year earlier. Revenues for the quarter were $411,000, compared with $191,000 in the corresponding quarter one year ago.

■

Applied Magnetics Corp. a net loss for the fourth quarter of $1.9 million, or 30 cents per share, compared with a profit of $2.6 million, or 39 cents per share for the same quarter last year. Revenues were $35.1 million, compared with $31.8 million in the same quarter one year ago.

■

Cognos reported consolidated revenue for its wholly owned subsidiaries in the UK and the U.S. reached $26.3 million (Canadian) in 1984, a 47% increase from $17.9 million during the previous year. Profits increased 123% to $1.9 million compared with $892,615 in the corresponding period one year earlier.

ITT from page 140

group's total portfolio, he added. Specifically, ITT Commercial Finance has about $200 million worth of computer financing instruments due at any one moment and for the first 11 months of 1984 generated a volume of $960 million.

Brown claimed his company was, in 1980, the first to jump into providing financial services to retail computer dealers. He said it began by offering floor-plan financing — financing of retail dealers' shop floor inventory — for dealers of Apple Computer, Inc. equipment.

Currently, according to John Dobson, the ITT group's senior vice-president, the group provides 75% of the national retail financing market, dealing with almost 2,000 retailers.

In a move to expand beyond its original floor plan financing and related business services, Commercial Finance, as part of the consolidation, created two new divisions.

One, the Equipment Lease and Finance Division, will provide installment loans and leases for new and used computer systems and other capital equipment. The second, the Automated Finance and Lease Division, will provide dealers, distributors and manufacturers with a computer-linked credit check and finance authorization service that reportedly can approve financing within three to four hours.

'Requires steady nerves'

Brown noted that rapid inventory turnover, product volatility in the retail computer market and increasing competition among dealers "requires steady nerves" in signing up dealers. He said his company has developed a profile and product turnover ratios that are used to evaluate good risks.

The company has also developed a specialized staff that is able to differentiate among various products and manufacturers and will only back retail operations selling leading products, he added.

ITT Commercial Finance is intent on capturing an early lead in the leasing of low-end equipment, an area regarded with scepticism by traditional lessors because of the rapid product cycles and price cuts that have accompanied the expansion of the micro market.

Dobson acknowledged that leasing of low-end equipment has not caught on yet. However, he claimed, as competition at the retail level intensifies, dealers looking for an edge "will have to turn to end-user financing."

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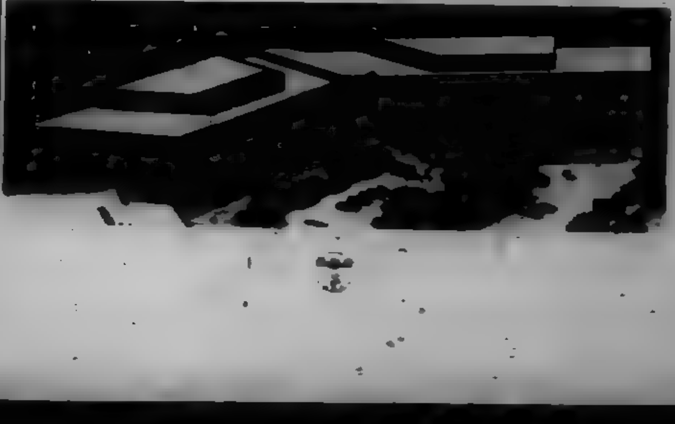

COMPUTER INDUSTRY

SUPERSHORTS

Triumph-Adler AG confirmed **Pertec Computer Corp.** of Irvine, Calif., will remain part of Triumph-Adler North America, Inc., Hartford, Conn., ending plans to sell Pertec.

■

Information Solutions, Inc. (ISI) reported that **Prime Computer, Inc.** and ISI have agreed in principle to enter into a joint venture to market turnkey computer hardware and software systems to the lodging industry.

Under the terms of the tentative agreement, Prime will assume the primary and exclusive responsibility for marketing ISI's hospitality systems to property management companies, hotels and motels as well as resorts.

■

Relational Technology, Inc. has signed two separate joint development and marketing agreements, making Ingres available on Amdahl Corp.'s UTS operating system and on Pyramid Technology Corp.'s computer systems.

■

Tandberg Data, Inc. announced plans to consolidate its Armonk, N.Y.-based terminal division and its data storage division into one central location at the data storage division's new manufacturing facility in Anaheim, Calif.

■

Tandem Computers, Inc. and **On-Line Software International, Inc.** announced they have settled their litigation involving the Guardian trademark used for computer software products.

In accordance with the settlement, the New Jersey lawsuit will be dismissed as well as a related administrative proceeding in the United States Patent and Trademark Office.

Under the terms of the agreement, On-Line Software has agreed to abandon its federal trademark application and not to oppose Tandem's application seeking federal trademark registration of the trademark Guardian.

■

Honeywell, Inc. has formed a marketing support group to improve the availability of application software for DPS 8 and DPS 88 large-scale computers operating under Gcos. The applications marketing group will focus on scientific and commercial cross-industry packages, with initial emphasis on financial, distribution and engineering support applications.

■

The Association of Data Processing Service Organizations has reached an agreement with **National Information Systems** to provide joint purchasing of computer peripherals with **Data Securities International** to provide a new protection service to safeguard software.

■

Control Data Corp. announced that it will donate up to 10 Cyber 180/810 superminicomputer systems totaling $5 million to universities which are selected for the National Science Foundation's (NSF) Engineering Research Center program. NSF applicants had the option of requesting the Cyber 180 systems in their proposals.

TANDEM

from page 149

He declined to discuss specific new products that the company may introduce during the coming year. He said Tandem has not canceled any development projects recently but has "redirected" some of them.

He said the company plans this year to introduce some low-end products aimed at an office-type environment. The company's systems have been used widely for on-line transaction processing by users such as banks, airlines and telephone companies. Conceding that the company "didn't concentrate" on its relationships with software houses in the past, Treybig said Tandem has worked to correct that deficiency. "We made the mistake of not realizing that we had become a big company and that we had a lot of benefit for software houses," he said. The company has established a business alliance program in which it encourages and provides support for software developers.

Software is vital to Tandem's fault-tolerant computers, which rely on parallel processors and sophisticated software to allow the computers to work together, as well as work around a unit that may have failed.

As the company has grown from no revenue in 1976 to more than $500 million for the last fiscal year, Treybig said he has tried to maintain the progressive, people-oriented corporate culture for which the Cupertino, Calif., company is well known.

"There are things we've done well and haven't done well," he said. "I think we went through lots of transitions, but I don't think it affected our goals from a people or management point of view."

On the subject of start-up companies that have tried to challenge Tandem in the fault-tolerant market, Treybig noted that most have failed for a variety of reasons. He believes the availability of venture capital funds for some of the start-ups created a crowded market in which only a few firms could survive.

When Tandem started, he noted, there were no other companies in the fault-tolerant market.

"The start-ups have so much money, and they're all competing against one another, that it's difficult to make a profit. So a situation that appears to be much better, because there's a lot of money, is really a disadvantage, because you're going to have lots of other competitors just like you," he said.

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Secretary of the Association
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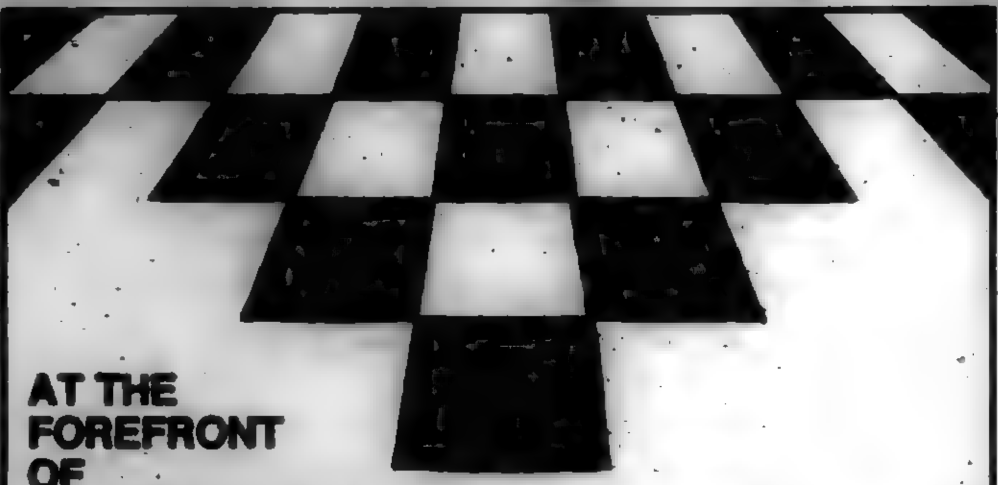

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Data Processing

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- Intensive use of COBOL in writing applications software.
- Communications and/or Networking experience.

If selected, you will have a minimum of 6-8 years experience, a four year degree, previous experience in performing all functions related to complex system design, development, modification, maintenance, and implementation, as well as experience working independently or as a project team leader in business management application. Background in development of a new systems as well as system analysis techniques of existing systems is required.

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If you need further information, please call collect (617) 229-2300. Or contact The CAREER Symposium, 83 Cambridge Street, Suite 2B, Burlington, MA 01803. The Burlington Marriott is located at exit 41N off Route 128.

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January 14th & 15th
12 pm to 9 pm
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NASA

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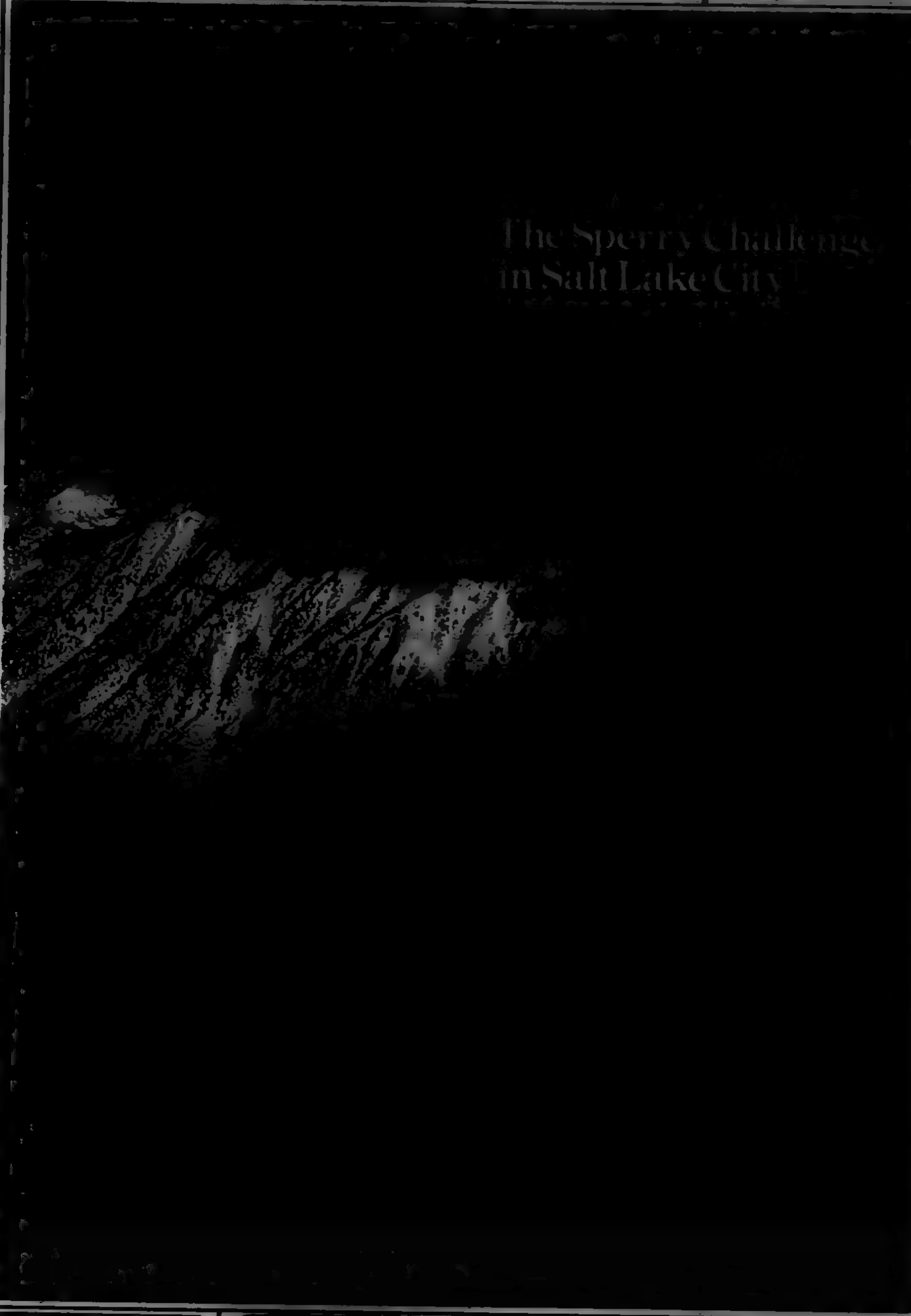
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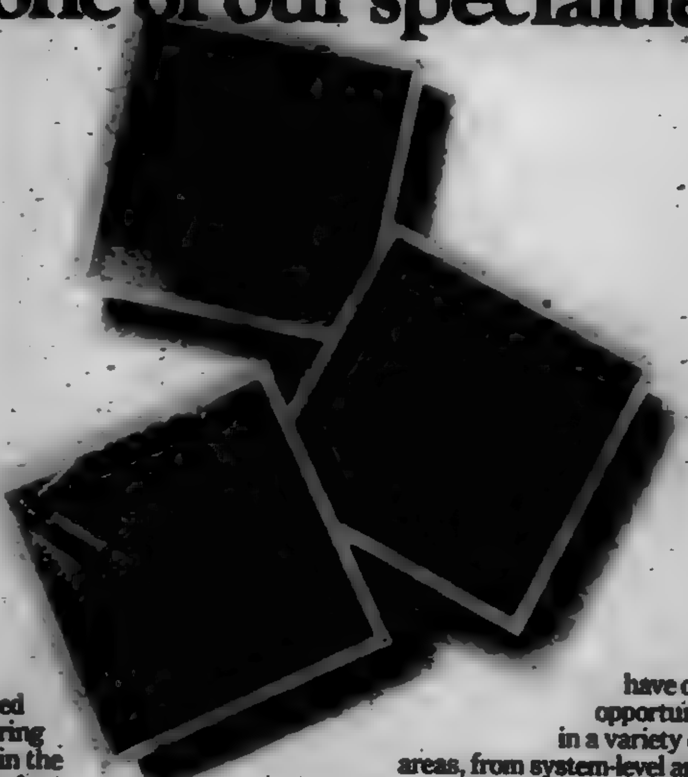

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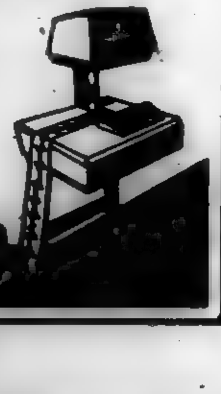

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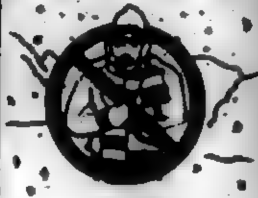

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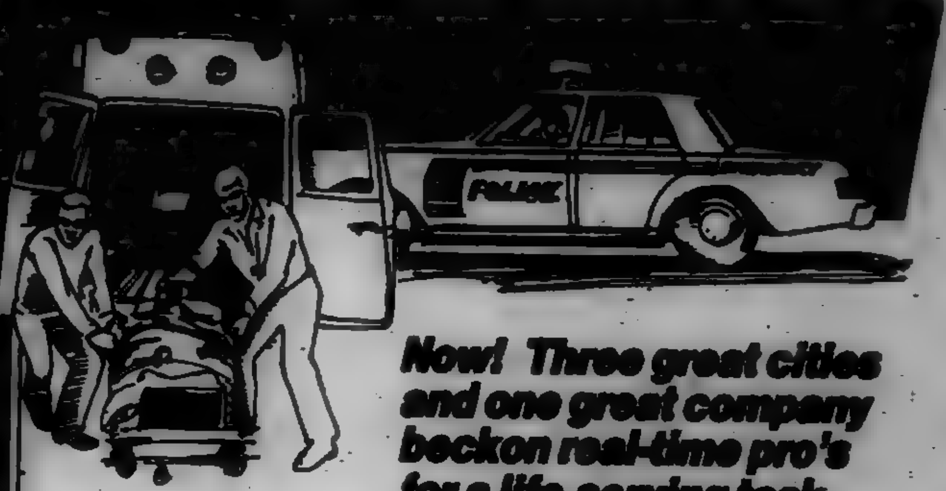

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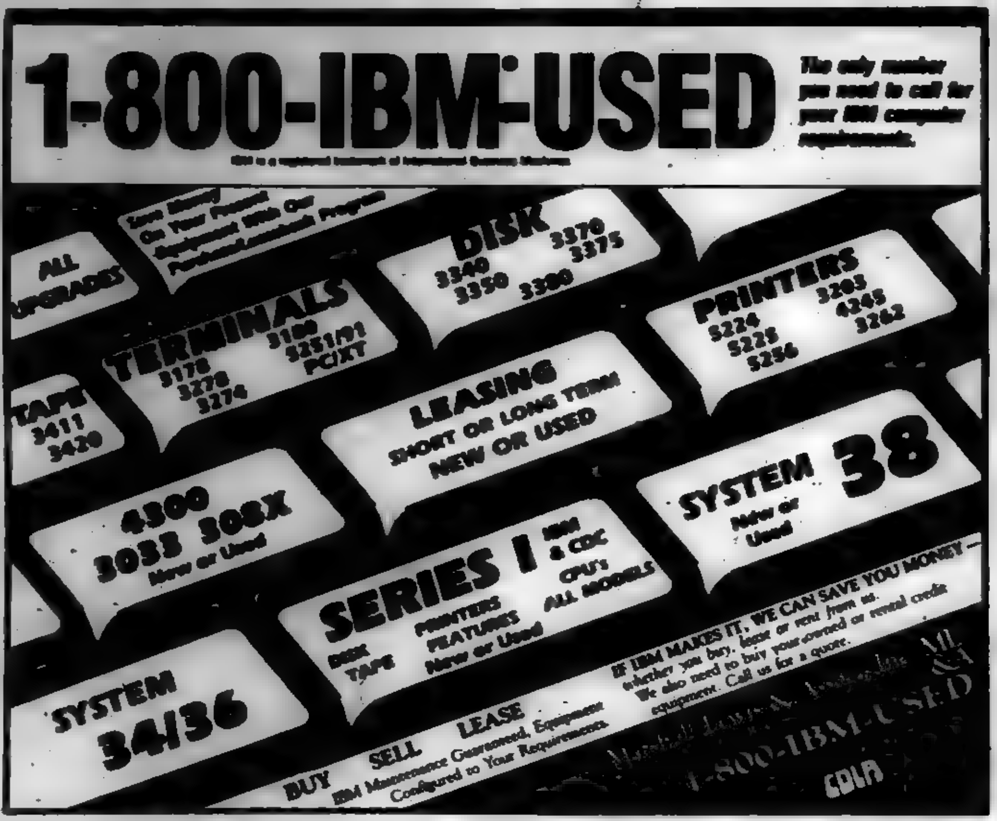

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- The Bulletin Board is designed to advertise only one piece of equipment or software per unit.
- Units are one column wide by one inch deep at a cost of $ 140.00 per column inch. Although several units may be purchased for one advertisement, there will be no quantity discount.
- All ads are standard in format and typeface. No special typeface, borders or logos are allowed. Copy may be up to 25 words per unit.
- The Bulletin Board ads are listed by manufacturer or by product type under appropriate headlines.
- Ads are set on a six-column page in our classified section under "The Bulletin Board"

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- We suggest you prepare your ad before contacting us. Here are some guidelines:
  The first line is set in larger, bold type and should contain standard equipment identification.
  The body copy should describe the equipment and state the price.
  The closing should supply the seller's name and telephone number.
  This is all the information an interested buyer needs for follow up.
- Ads are accepted by mail, phone or by telecopier.
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- The Bulletin Board ads are not agency commissionable nor may they be applied to contract advertisers inch count.
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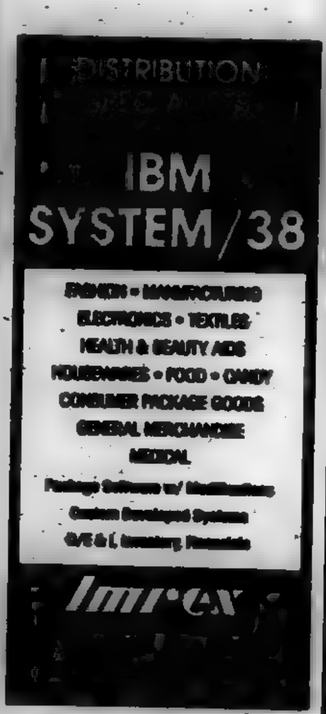

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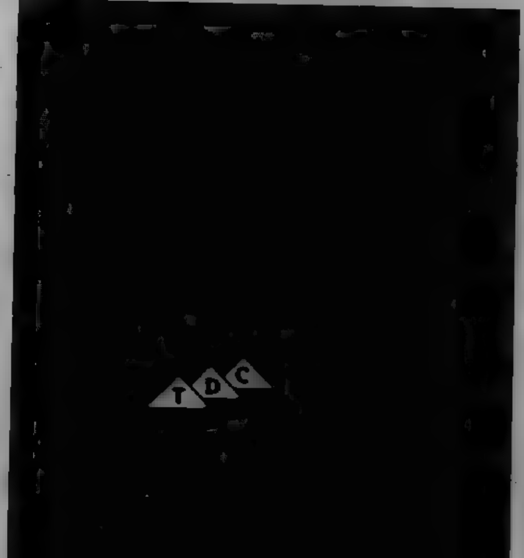

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Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

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Euan Rose, Bill Dunlop, Stephen Thomas, Steere Hobson Assoc., 345 Goswell Rd., Islington, London EC1V FHN. Phone: 01278 3415/6 (reps for all CWCI publications except Computer Management and Computer Business Europe).

France: Axel Leblois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, Paris. Phone: 758.14.14. Telex: 613234 F.

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.l., Via Rosellini 12, 20124 Milano.

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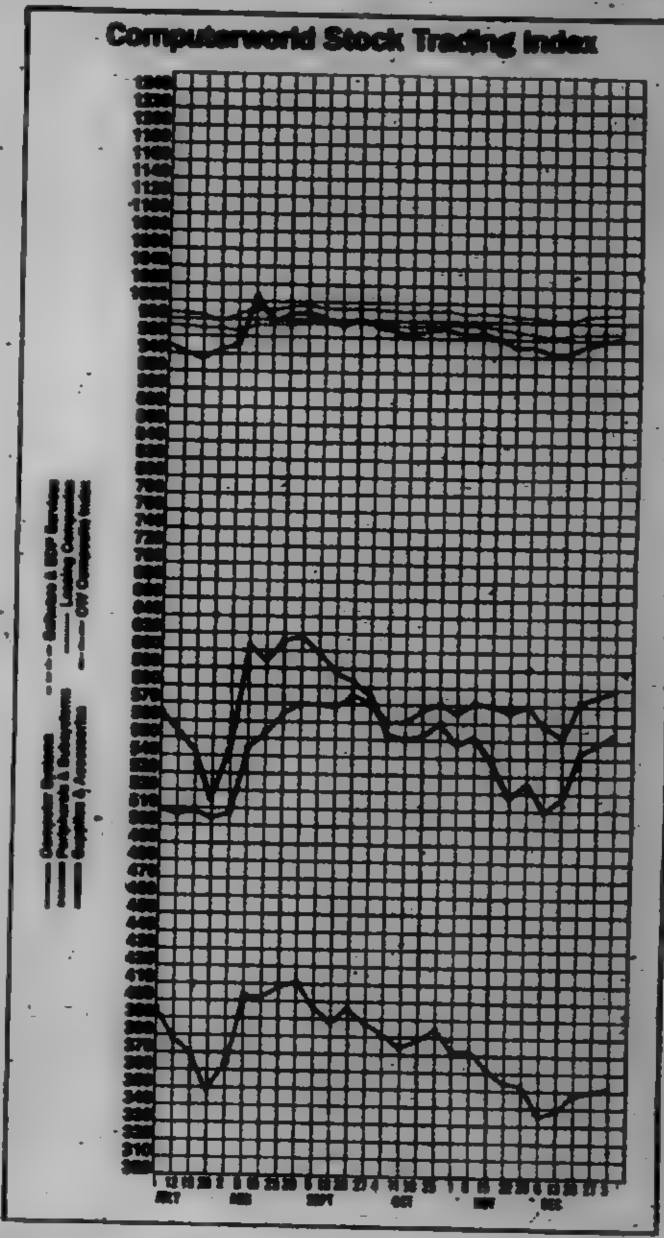

Computerworld Stock Trading Index

Computerworld Stock Trading Summary

CLOSING PRICES MONDAY, DECEMBER 31, 1984

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

E X C H		1984 RANGE (1)	CLOSE DEC 31 1984	WEEK NET CHANGE	WEEK PCT CHANGE
	COMPUTER SYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	LEASING COMPANIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SEMICONDUCTORS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SOFTWARE & DP SERVICES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	PERIPHERALS & SUBSYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SUPPLIES & ACCESSORIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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NEWSPAPER

Accounting firm gives 5,000 Macs thumbs-up

Staff demand outstripping supply

By Kathleen Sullivan
CW West Coast Bureau

PORTLAND, Ore. — When Peat Marwick Mitchell & Co. accountants leave their downtown offices here on their way to an audit appointment, it is likely that some will be gripping the maroon straps of bulky gray carrying cases. Inside is the newest tool of their trade: an Apple Computer, Inc. Macintosh computer.

This scene is being repeated in Peat Marwick offices across the country — from Providence, R.I., where 10 Macintoshes reside, to Atlanta, where more than five dozen systems have been bought, to Los Angeles, where more than 150 Macintoshes are in use.

The accounting firm has purchased close to 5,000 of Apple's newest microcomputer to use in its audit departments. Most of the machines are being used in its 97 offices in the U.S., while about 1,000 systems have been shipped to overseas locations.

In interviews with Peat Marwick staff members in eight offices — Atlanta, Boston, Chicago, Los Angeles, New York, Provi-

See AUDIT page 6

Banks insuring DP

Spread of electronic systems renders fraud, malfunction coverage 'critical'

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The nation's banks are increasingly turning to insurance policies to protect themselves from losses caused by malfunctioning computer systems and computer crime, according to a survey by the American Bankers Association.

"Obtaining adequate yet cost-effective insurance is a critical management problem bankers continue to face, particularly as new banking technology, including the rapidly expanding use of electronic processing and networks, has made banks more vulnerable to fraud and abuse," an association statement said upon release of the survey recently.

The association's "1984 Bank Insurance Survey," based on a sample of 622 banks and covering calendar year 1983, reported the following:

- The number of banks with separate insurance policies to cover data processing increased to 43% in 1983. For large banks (with assets of $1 billion or more), the percentage was more than

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TOP OF THE NEWS

A major government study on VDT safety is turning into a controversy before it begins, as government and labor argue over the study's scope. Page 2.

■

Computerized health care cost management systems are enabling businesses to curb the rate of increases in employee medical costs. Page 36.

■

A programmer is free on bail after surrendering himself to Houston police, who allege he illegally accessed a credit bureau's computerized files and used the pilfered information to obtain 76 credit cards and steal $100,000. Page 7.

■

Apollo Computer, Inc. has chopped up to 38% off the price of its 32-bit workstations and also introduced an enhanced version of its server processor. Page 67.

■

The U.S. Department of Commerce relaxed export rules governing the sale of certain low-end computers to foreign nations, but some manufacturers think the department's regulations are still not liberal enough. Page 89.

■

Something new inside

SOFTWARE BENCHMARK

On page 11, Computerworld begins a monthly feature on [illegible] software benchmarks, conducted by Yates Ventures, Inc.'s Software Evaluation Laboratory Service. The feature will report the results of benchmark tests conducted on software packages used in the corporate environment, with in-depth analyses supported by charts and tables drawn from test results. Today's benchmark pits Access Technology, Inc.'s 20/20 integrated package against Lotus Development Corp.'s 1-2-3.

FYI

If Bud Goode were a betting man, he'd take Miami

But the football forecaster's Sperry says it will be the 49ers by a point

By Bruce Hoard
Special to CW

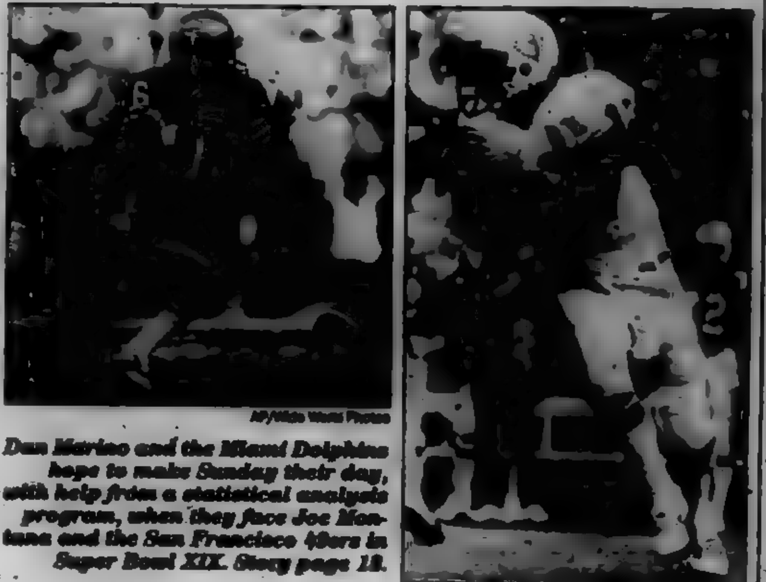
LOS ANGELES — As always, there are the qualifications. Bud Goode never just comes out and predicts an unequivocal Super Bowl victor before the fact — computer or no computer.

"I'm going to hedge because of the home field advantage," declared the man who sells his weekly, 80-page computer analysis to six National Football League teams and CBS, Inc. analyst Dick Vermeil. "I have [the San Francisco 49ers] by one point — 1.85 points actually."

The 49ers have the home field advantage because this Sunday's Super Bowl XIX against the Miami Dolphins is being played at Stanford Stadium in Palo Alto, Calif. And

See BOWL page 8

Hoard is editor of On Communications.



AP/Wide World Photos

Dan Marino and the Miami Dolphins hope to make Sunday their day, with help from a statistical analysis program, when they face Joe Montana and the San Francisco 49ers in Super Bowl XIX. Story page 13.

Focus of Niosh VDT study under fire

Labor groups call proposed pregnancy-related study too narrow

By Mitch Betts
CW Washington Bureau

A major study by the National Institute for Occupational Safety and Health (Niosh) on how intensive use of VDTs affects pregnant women is turning out to be controversial even before it begins.

Niosh is now planning the scope and methodology of the two-year study amid charges from labor organizations that under the agency's draft plan, the study would virtually ignore the issues of radiation and stress. These concerns were raised at a Niosh-sponsored public hearing in Cincinnati last month and in subsequent interviews.

The dispute, all parties agreed, focuses on whether the study, expected to begin late this spring, should be limited to discovering if VDT users statistically have more reproductive problems than nonusers, or whether the study should also test for radiation, stress and problems with ergonomics in the event it shows VDTs are linked to reproductive problems.

Niosh plans to conduct a limited study that compares the pregnancies of women who are full-time VDT users with the pregnancies of women who have the same job but do not use VDTs, according to Niosh officials and others familiar with the plan.

The retroactive study, with a total sample population of about 4,000 married women of reproductive age (2,000 VDT users and 2,000 nonusers), will focus on those women in the population who were pregnant in the last two years. Niosh may also conduct a prospective study, officials said.

The thrust of the study is to determine whether VDT users have more abnormal reproductive outcomes than nonusers.
— Dr. Teresa Schnorr, Niosh epidemiologist

Dr. Teresa Schnorr, the Niosh epidemiologist who will conduct the study, said the study will determine whether VDTs have any effect on pregnancies. "We will measure whether [VDT] users have an excess of abnormal reproductive outcomes compared to [those of] nonusers," she said.

Niosh officials said they will consider the comments made by members of the scientific "peer review" panel as well as labor and corporate officials when making revisions to the study's methodology. However, Schnorr observed, "I don't think there will be any major changes in the protocol."

Study should be 'more expansive'

"I think [the Niosh study] should be much more expansive than it is," said David E. LeGrande, a representative of the Communications Workers of America in Washington, D.C. As now planned, the study will not measure low-level radio-frequency radiation emitted by the VDTs or specifically evaluate the stress of VDT work, he said.

Likewise, Diana Roose, research director of the National Organization of Working Women, 9 to 5, in Cincinnati said: "We think it should be expanded in scope, and it should test all of the potential risk factors at the same time that it's looking at whether there's an increased risk in the first place. The reason is that it will only be a partial answer to the question if they do a very limited risk study."

Schnorr acknowledged that Niosh will not measure radiation from the VDTs and that stress is not a major variable in the study because both the VDT users and nonusers have high-stress jobs. She emphasized that the thrust of the study is to determine whether VDT users have more abnormal reproductive outcomes than nonusers.

If "excess" reproductive problems are not found, then no further research will be undertaken, she said. If such problems are found, then Niosh could investigate the specific causes, she said.

Dr. Robert Arndt of the University of Wisconsin, a member of the Niosh peer review panel, said that his first inclination was to support a comprehensive study that addressed stress and ergonomic factors, but he has begun to reconsider that view. "Is it possible to actually study this many variables in one study of this size, or are we really going to have so many questions that we reduce the power of the study?" he asked. Arndt emphasized that the study must be powerful enough to satisfy unions and other critics. It must "have enough power to detect an effect if it's there," he said. "If you can't satisfy these people on that issue, then you might as well not do the study, because the outcome is going to be worthless."

Dr. James Dunn, associate medical director for AT&T in New York, who has followed the debate, commented, "Keep in mind that 'limited' is not necessarily bad and 'big' is not necessarily good. A limited study may be very good in that it asks a very sharp question and you get an answer [that can be the basis for further research] . . . . A very big study can be very complicated and end up without much of anything."

Roose acknowledged that expanding the study would make the research more complicated but maintained it is feasible.

Unless the potential risk factors are investigated in the same study, Roose said, VDT operators may have to wait for another study for a definitive answer to their questions about VDT health risks.

A budget for the study has not yet been established, according to Schnorr. Niosh, a unit of the U.S. Department of Health and Human Services' Center for Disease Control, will distribute copies of the final report to the participating employers and employees and to the general public, she said.

Cuirle to pen column 'Management Matrix'

Walter F. Cuirle joins *Computerworld* this week as a regular columnist.

His column, "Management Matrix," will examine those items and areas that impact the information processing budget in large corporations.

Topics will run the gamut from how to get the best value for your dollar from a DP consultant to advice on handling key employee resignations so they have the least possible impact on your department's productivity.

Cuirle is currently a consultant associated with Nicholas DeMaio Associates in Bryn Mawr, Pa. The firm provides survey, installation, training and conversion support services for large corporations.

As an independent consultant, Cuirle specializes in designing and producing technical documents and training curricula for major technological firms.

Prior to working in the computer industry, Cuirle was a lecturer in physics for the Rochester Institute of Technology.

He received a B.S. degree in physics from St. Joseph's University in Philadelphia.

You tell us

Hard as we try, some good news and feature stories never reach us.

Is your company involved in an unusual application of DP technology? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes? Heard any hot news about vendors? Are you aware of technology or trends the trade press is overlooking?

If so, we'd like to hear from you. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

We can't be everywhere — but our readers are.

CORRECTIONS

The purchase price for Lattice, Inc.'s C-Sprite debugging tool was incorrectly stated [CW, Dec. 17]. The correct price is $175.

A major new financial function of Version 2.1 of Digital Equipment Corp.'s VAX Decalc [CW, Dec. 3] is internal rate of return, not Interrupt Return Register, as was previously reported.

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Business travelers may want personal computers in their hotel rooms, but the hotels are saying the demand is not great enough/4

A programmer has been charged with the theft of $100,000 in what reportedly was a crime involving the illegal access of a credit bureau's computer/7

The Federal Communications Commission has delayed the implementation of special access tariffs that were due to be placed on private-line rates/8

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Increased quantity and improved quality are just two of the benefits to be found in telecommuting/18

Hewlett-Packard Co. has launched a transportable, AT&T Unix-based micro for technical professionals/22

Computerized health care cost management systems are allowing businesses to slow the growth rate of employee medical expenses/26

A New Zealand forestry firm is the country's first user of a U.S. vendor's general ledger system/32

A local-area network has taken much of the labor out of the labor-intensive task of writing modern weapons systems technical manuals/36

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There's no room at the inn for personal computers

Major hotels have reservations about supplying business travelers with micros

By Charles Babcock
CW New York Bureau

NEW YORK — You reach your hotel after a hard negotiating session with a customer and decide to review the data on his previous contracts. You pull out the floppy disk you have been carrying in your briefcase since you left the office and pop it into the hotel-provided microcomputer. The information instantly appears on the screen.

For most people in business, this scene is likely to remain hypothetical for some time. Businesses may be buying personal computers like paper clips, but few hotels are ready to offer computers to business travelers either in their rooms or on the premises.

In New York, the Plaza, the Ritz-Carlton, Marriott's Essex House and other midtown Manhattan hotels catering to business travelers do not offer or plan to offer computers to their business guests. "Tell me, what do they use them for, these personal computers?" the concierge at New York's prestigious Pierre Hotel asked.

Even Hilton Hotels Corp., the chain that bills itself as "America's business address," said it sees little need for the service. It offered guests an IBM Personal Computer at its Miami hotel, "but I don't think it's gotten much use," said John R. Bennett, vice-president of information systems for the chain, which is headquartered in Beverly Hills, Calif.

Although hotels "desperately want to differentiate themselves from the competition, especially for the frequent business traveler," few are turning to computers as a way of doing so, noted Leo M. Renaghan, professor of marketing at the Cornell University Hotel School in Ithaca, N.Y.

P. [illegible]

Early attempts to make personal computers available in hotels have failed from lack of interest, and now most hotels are reluctant to take the step, he explained.

He related the industry scuttlebutt on offering computers to guests. "Most business travelers don't have the free time to work on a computer. Anyway, there's still a lot of computer illiteracy out there," said Paul K. Manley, assistant director of information services at the Hilton International in New York, which is not a member of the U.S. Hilton chain.

One of the examples most frequently cited is that of the 18-hotel, Scandinavian chain, SAS Hotels of Oslo. It has made IBM Personal Computers available in its facilities in Oslo and Copenhagen and in Gothenburg, Sweden, but so far, demand "has been very spotty," according to Christian Sinding, vice-president for hotel marketing at SAS.

But representatives from two U.S. metropolitan hotels said they think the demand is growing and is just waiting to be tapped. The Hyatt Regency Chicago, the 2,033-room hotel that is the largest of the Hyatt chain, offers eight IBM Personal Computers in its business center on the 32nd floor of its East Tower.

The computers are in use constantly, especially from midmorning to noon and from 5 p.m. to 8 p.m., said Howard J. Weiner, president of Easy Keys, Inc., the private contractor running the center for Hyatt. Business travelers like to review contract information or prepare quotes on the machines, he said.

A hotel considering a similar service is the Vista International in the World Trade Center in New York.

"I think the time has come, and I would like to see the service implemented by the end of the year," said James H. Araki, director of information systems for Vista. The hotel serves as host to travelers visiting nearby Wall Street. Araki said he thinks they will provide a ready clientele for computer services.

'Willing to consider anything'

However, these are the exceptions, according to Cornell's Renaghan.

"Hotels are willing to consider anything" that might attract business travelers, who are among a hotel's highest paying guests, he said. But the figures on computer use, either in rooms or in business centers on hotel premises, are low.

"The Hyatt people will be very polite and tell you there is interest, but the figures aren't there. What's the payback to the hotel?" Renaghan asked.

Many users aren't travelers

Hyatt officials acknowledged that many of the users of the business center in their Chicago hotel "are visitors from the high rises and office complexes in the neighborhood," not hotel business travelers, said Nancy A. Buth, public relations director for the hotel.

Nevertheless, the center's computers satisfy the requests that trickle in to the concierge staff, and the micros help keep Hyatt "one step ahead of the competition," she said.

Hyatt representatives said the company is watching the experiment that began in October to see whether the chain should make computers available at other major downtown venues. So far, it has invested little in the venture. Easy Keys provides the eight computers and three printers, capable of dot-matrix, letter-quality or graphics printing. It also offers popular software packages, such as Lotus Development Corp.'s 1-2-3, and provides the center with a staff. The Hyatt made a suite available for the center at no charge to users.

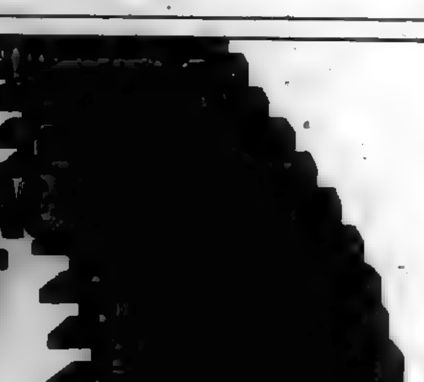
Easy Keys collects the $8 per hour fee for the use of the equipment; many customers simply drop off word processing or quote preparation work to be done by Easy Keys employees, according to Weiner.

Demand by travelers growing

Some hotel observers think the demand for computers by travelers is growing quickly. In 1984, 2.1 million IBM Personal Computers were sold, according to Dean Witter Reynolds, Inc., a New York-based investment research firm.

As microcomputers spread through executive ranks, Dean Witter predicted that more travelers will become dependent on the quick calculations and access to information that they provide.

According to SAS' Sinding, "Perhaps we should have a computer weekend [with guests staying at the hotel at special rates to learn about computers]. I would like to see if we could do something more exciting with computers."



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[illegible] for Peat Marwick users.

Because Peat Marwick's accounting software was written for Apple's original 128K-byte Macintosh, its memory capacity was not cited as a shortcoming in most of the offices. "In 90% of our work, the 128K-byte machine is adequate," one Peat Marwick partner said.

But according to Richard Trueblood, senior manager in Peat Marwick's Boston offices, the limited memory "has been a little bit of a shock" to some accountants who are accustomed to [illegible] the Macintosh, he said.

While Peat Marwick's executive offices are recommending against the immediate purchase of the 512K-byte upgrade for the Macintosh, many staff members said they were considering upgrades for a portion of their machines. "As we get into more and more sophisticated applications, 128K bytes is inadequate," explained Arvin Mark, audit partner in Peat Marwick's Chicago offices.

The Macintosh's speed was [illegible] for some [illegible] program [illegible] ments that are submitted to the [illegible] processing department for final [illegible] could use a faster printer," one Peat Marwick partner said. "But since our software spools to the printer, our accountants can keep working while printing is going on, so it hasn't been a problem."

And because most of the systems are being used in stand-alone applications in the field, Peat Marwick staff members have not been clamoring for a local-area network, they said.

AUDIT

from page 1

dence, San Jose, Calif., and here — *Computerworld* found that, in general, the Macintosh has received an enthusiastic reception.

William Hockensmith, senior manager in Peat Marwick's office here, said that everyone from new employees to senior partners with 20 years experience has been trained to use the Macintosh. Although he noted that there is always some resistance to computer use, the Macintosh's design has helped new users overcome their fear and reluctance. "Our staff learned the system and began using the [Macintoshes] more rapidly than I thought they would," he said.

Arvin Mark, audit partner in the Chicago offices of Peat Marwick, said that some staff members are using the Macintoshes more than others. "Some are still in the process of becoming comfortable with the computer, and some were a little gun-shy at first," he said. "But no one has said, 'I don't want to use it; take it away.' "

In most Peat Marwick offices, each partner and manager has been given a Macintosh. And in general, each in-charge accountant — the person who heads up an audit in the field — has also been assigned one. The accounting firm's corporate goal is to have at least one Macintosh on-site during an audit.

Several offices said demand for Macintoshes was already outstripping supply. Richard Trueblood, senior manager in Peat Marwick's Boston offices, said its 135 Macintoshes are in high demand. "At this point, everyone in the audit department would like to have one," he said.

At present, the typical configuration for a Peat Marwick in-charge accountant includes a 128K-byte Macintosh, an external disk drive, a 1,200 bit/sec modem and a numeric keypad, which fits into a specially designed Macsack that sports a corporate logo. A wide-carriage printer fits into another Macsack.

With each system, Peat Marwick staff receives a variety of software, including Apple's Macwrite, Macpaint and Macterminal and Microsoft Corp.'s Multiplan spreadsheet program and Chart business graphics software. In addition, the accountants use two programs that Peat Marwick's programming staff developed: a financial statement assembly package and a consolidated financial statement program designed for larger firms with subsidiaries.

'The Macintosh frees the accountant to spend more time assisting the clients.'

— William Hockensmith, senior manager in Peat Marwick Mitchell & Co.'s Portland, Ore., office.

According to Trueblood, the system has been well received among the accountants, who recognize the importance of automating some of the repetitive and time-consuming tasks of accounting.

Using Peat Marwick's software, for instance, accountants enter the details of a general ledger account into the system. If any adjustments are made, the computer updates the schedules and financial statements to reflect the change. In the past, those additions or adjustments were made by hand with accountants plowing through a stack of papers and entering changes with a pencil.

"The Macintosh frees the accountant to do what he does best — make judgment calls, evaluate test results and spend more time assisting the clients in improving their businesses," Hockensmith said.

"Our people are well educated and have a great deal of expertise," Trueblood added. "This gives us a way to permit them to apply that knowledge and expertise and focus [on] more qualitative areas."

Peat Marwick has also found a positive response among its clients, who are intrigued and curious when the accountants arrive and unpack their Macintoshes, Mark said. Its clients are encouraged to see computers being applied to audit work, he said. "It brings Peat Marwick into the 20th century," he added.

But the real test of the Macintosh is still to come, noted one audit partner, with the approach of the accountants' busy season, which traditionally falls between January and March. By this spring, the accounting firm will undertake an extensive evaluation of the systems.

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BANKS

from page 1

91%. The DP policies typically cover equipment, media, extra expenses and, in some cases, business interruption.

■ More than half of the large banks obtained a rider on their standard "blanket bond" banking insurance to cover unattended automatic teller machines (ATM). In addition, more than 79% of these large banks had a computer systems rider to cover electronic funds transfers, ATM systems and, in some cases, the bank's proprietary computer systems, software programmers and independent consultants.

■ An average of 7% of all banks elected to have computer crime coverage as a separate policy, an option first offered in 1982.

■ Overall, the banking industry in 1983 paid premiums totaling $11.6 million for DP insurance policies and $4.7 million for separate computer crime policies.

The survey costs $24 ($16 for association members). It has an ordering request catalog number of 215500 and is available from the American Bankers Association, Order Processing, 44-B Industrial Park Drive, Waldorf, Md. 20601.

Theft of $100,000 traced to credit bureau system tap

By John Gallant
CW Staff

HOUSTON — A 24-year-old programmer is free on a $30,000 bond after being charged with the theft of $100,000 in what authorities here said was high-tech fraud involving the illegal tapping of a local credit bureau's computer system.

Late last month, according to Assistant District Attorney Judy Mingledorff, Robert J. Hoxie of Houston surrendered to the Harris County Sheriff's Department after he learned that the agency had issued an arrest warrant charging him with theft.

Mingledorff said authorities believe Hoxie gained illegal access to the data bases of the Greater Houston Credit Bureau and obtained the credit histories of 38 affluent local residents.

Applied for 76 credit cards

He then allegedly used the residents' names and credit information to apply for 76 Mastercard and Visa cards from the First City Bank in Dallas. He supposedly later used the cards to issue himself at least $100,000 in cash from a number of automatic teller machines (ATM).

At his arraignment, Mingledorff said, Hoxie pleaded innocent to the theft charge. His bond was originally set at $100,000 but was later reduced to $30,000. If convicted of theft, a second-degree felony under Texas law, Hoxie could be sentenced to up to 20 years in prison or fined as much as $10,000. No trial date has yet been scheduled.

Mingledorff said investigators have not yet discovered the computer equipment Hoxie allegedly used to access the bureau's systems, and they do not know how the self-employed programmer tapped into the credit histories. Mingledorff said Hoxie allegedly obtained credit information on several bank presidents, board chairmen of local banks, prominent attorneys and oil company officers, among others. Included in the credit data Hoxie allegedly obtained was information on birth dates, names of relatives, current and previous employers, creditors, credit card balances and savings and checking account numbers.

According to Mingledorff, Hoxie had the credit cards he applied for mailed to a variety of post office boxes and other drop-mail addresses that differed from the home addresses of the residents. Wearing a wig and sunglasses so he would not be recognized in photographs taken at the ATMs, he allegedly used the cards to withdraw cash over a period spanning from mid-July to late October.

Mingledorff said Hoxie's scheme came to light when a delinquent credit card account was brought to the attention of a First City Bank officer in Dallas. The officer recognized the cardholder as an officer of a First City Bank branch in Houston. After speaking with the Houston branch officer and discovering that he had not applied for the credit card, the Dallas banker ordered an investigation into all card accounts that had different home and mailing addresses. Authorities discovered 76 applications made out in the same handwriting.

At approximately the same time, according to Mingledorff, Hoxie allegedly rented a truck using one of the bogus cards, and the rental clerk recorded his license and automobile registration numbers and photographed him. Because the credit card Hoxie allegedly used was under investigation, authorities used the rental company's information to trace his identity.

Mingledorff said both police and bank officials are continuing their investigation into the case to prevent similar trespasses into the credit bureau's systems.

National Semi plans two-week production halt

SANTA CLARA, Calif. — Plagued by weak demand for its semiconductors, National Semiconductor Corp. last week announced it will shut down production for two weeks beginning Feb. 11 and postpone merit pay raises for six months.

Company officials said National Semi might also stop production for an additional two weeks in April if the demand for its chips does not improve substantially.

The February shutdown will affect over half of the 9,500 employees at all levels at National Semi's operations here, according to National Semi spokeswoman Linda Baker.

National Semi has not yet decided how many of its 39,000 worldwide employees will be idled, Baker said, but those that continue working during the shutdown will be employees involved in developing new products and in providing customer sales and support.

The shutdown marks the first time since the 1981 recession that National Semi has ceased production aside from holiday closings, according to Baker.

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FCC delays access charges again

IDCMA points out discrepancies in local telephone companies' rates; deadline extended to Feb. 15

WASHINGTON, D.C. — The Federal Communications Commission has extended the Jan. 19 implementation deadline for special access charges that exchange carriers can levy on long-haul carriers. The deadline for the new charges, which are expected to increase private line rates, is Feb. 15.

The FCC has twice postponed the special access charges [CW, Dec. 10] after ruling that the local telephone companies that filed the rates were charging different rates for equivalent services in different parts of the country.

Last week the Independent Data Communications Manufacturers Association (IDCMA), an equipment association, submitted comments on the local telephone companies' revised special access rates, pointing out that proposed termination charges for 1.54M byte/sec data communications links were $77.09 for Oregon and $505.86 for Illinois.

IDCMA also pointed out that current proposed special access channel rates based on distances would make users more inclined to use cheaper, lower capacity links, such as 56K byte/sec, rather than multiplexing, or dividing 1.54M byte/sec links, since rates would vary in different parts of the country.

"Although the carriers have noted that geographic differences affect costs, that does not explain the fact that the total charge for 15 channel miles of 1.54M byte/sec service is $843.33 in Michigan, compared [with] an astounding $1,812.96 in the neighboring and geographically similar state of Illinois," the IDCMA said.

IDCMA said an independent study by an economic consulting firm found a 10:1 variation in the carrier-quoted termination costs for 1.54M byte/sec service across the country. The association urged the FCC to suspend the proposed tariff submissions and investigate the cost basis filed by the telephone companies.

IDCMA said an independent study found a 10:1 variation in the carrier-quoted termination costs for 1.54M byte/sec service across the country.

Corporate Software buys MSA division

By Paul Gillin
CW Staff

SANTA MONICA, Calif. — Management Science America, Inc. (MSA) has sold the first piece of its ailing microcomputer software business.

Earlier this month, Corporate Software, Inc. bought MSA's Microcomputer Distribution Division (MDD) for an undisclosed amount of money. The transaction effectively doubles the size of Corporate Software, which was MSA MDD's largest competitor among vendors who sell micro software exclusively to corporations. Corporate Software Chairman Morton Rosenthal said the revenues of the combined companies are now about $1 million per month.

MSA would not comment on the transaction. Last October, MSA announced that it would sell all four divisions of its packaged microcomputer software operation [CW, Oct. 22]. The three unsold divisions are Educational Operations, Domestic Operations and International Operations.

The deal affects MSA MDD headquarters here. Rosenthal said six MDD sales representatives will be added to the Corporate Software national sales force. He added that the technical support staff from MSA will be offered a transfer to Corporate Software headquarters in Waltham, Mass.

According to Rosenthal, MSA will close down its operations group here and lay off a small number of people. MSA would not comment on Rosenthal's statement.

Rosenthal said MSA MDD customers should see some service improvements as a result of the transaction. "This business is different from MSA's business of selling mainframe software," he explained. "We have more senior management and operations set up, and we expect improvements in service because we have better technical capabilities."

The two firms offered many of the same services, Rosenthal said. Both provided discount sales and software support, special orders, consulting and evaluation copies on loan. He said Corporate Software offered somewhat larger discounts.

BOWL from page 1

Palo Alto is just down the road from the friendly confines of Candlestick Park, where the 49ers normally play their games.

Goode, the former press agent to Groucho Marx and still a gung ho body surfer at 61, is not a betting man, nor does he, in his own words, "incite to bet." This despite the fact that he uses a Sperry Corp. 1106 computer and his 130-variable regression analysis to pick NFL winners against the line for the *New York Post* each week during the season.

Objectively speaking, the 49ers should prevail if they play up to statistical snuff. During the course of the season, their defense allowed a stingy 2% of their opponent's passes to go for touchdowns, while 8% of Dolphin quarterback Dan Marino's passes ended up hitting pay dirt. In Goode's scenario, the immoveable object wins against the irresistable force.

Such is not apparently the case when pitting the 49ers' running attack against the Miami "Killer B" defense, Goode said. The 49ers churned out 4.62 yards per rush, while the Dolphins gave up a league-last 4.7 yards per rush. "However," he added, "when put to the test during the season, the Dolphins have been able to stop a strong running attack."

Looking at the passing game from another perspective, San Francisco quarterback Joe Montana averaged 7.46 yards per pass attempt, while his Miami counterpart Marino led the league at 8.57. "This is a standout offensive passing [statistic]," Goode said of Marino's numbers.

But so much for objectivity. If Goode was a betting man, he'd lay his money on the Dolphins and Marino's golden arm. "Getting down to the bottom line, I'll take the two points and Marino," he stated. You've got to give this much to Goode — one way or the other he's going to be right.

Betting on the Dolphins — or more pointedly, betting against Goode — might make sense, considering the fact that he is zero for four with his computer-based Super Bowl predictions since 1981. But fear not. According to Goode, only one Super Bowl out of every three should be won by the team that stacks up the strongest statistically anyway.

If you're starting to get a little queasy about betting on Goode's numbers, consider this: He had 27 wins and 21 losses against the line on his best bets for the *New York Post*. Of course, he bases his best bets on games featuring the strongest vs. the weakest teams. But that shouldn't matter if you're only betting against the point spread anyway, right?

Goode succinctly summed up the whole idea of wagering in such instances, saying "I don't think you can win gambling on football games."

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Panel says GAO botches system, wasting $13 million

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. General Accounting Office (GAO), the congressional watchdog agency that usually castigates other federal agencies for bad management, is now under fire. A U.S. Senate panel has charged GAO with wasting almost $13 million on a botched computer system.

The Senate Committee on Governmental Affairs, in a recent staff report that reads like a GAO audit, said the failure of the GAO's Consolidated Administrative Management Information System (Camis) was caused by "long-standing deficiencies in GAO's procurement activities.

"It is particularly disturbing that any serious problems in GAO's general procurement practices would be allowed to remain uncorrected since GAO is in the business of auditing and evaluating the procurement activities of government departments and agencies around the world and of providing expert advice to the Congress on procurement policies," the report said.

Charles A. Bowsher, comptroller general and chief of GAO, denied that the failure of the Camis project was GAO's fault. Instead, he blamed the failure on the computer contractor, Boeing Computer Services of Vienna, Va. Sen. William V. Roth Jr. (R-Del.), chairman of the Senate committee, said, "Many of the mistakes made in this procurement occurred early in its history before the arrival of the current comptroller general, Charles Bowsher. While Bowsher did take action to improve the situation, the fact remains that the contractor was paid more than $10 million, and GAO has little to show for it."

In June 1981, GAO awarded Boeing a contract to establish an administrative support system that would consolidate the agency's 18 different personnel, financial and assignment management systems. But internal audits showed that Boeing's cost estimates were too low, and escalating costs and delays became a serious problem, according to the committee report.

Ultimately, the problems forced GAO to permit the Boeing contract to expire in October 1984, at a total cost of $12.8 million. "At that point in time (more than three years into the work), GAO was obligated to pay Boeing approximately $10.6 million (about two-thirds of the amount GAO expected the total Camis procurement would cost), and received a disproportionately smaller portion (perhaps only one-fifth or less) of the work called for in the contract," the report concluded.

One internal audit was titled: "GAO's Procurement of Contract Services — Need to Practice What We Preach."

GAO's Bowsher, in his response to Sen. Roth, said, "We agree that GAO should have done a better job during early stages in the Camis project. But I am concerned that your report does not more fully recognize the extent to which the early deficiencies were recognized and remedied.

"We do not believe the project failed because of the problems identified in your report," Bowsher said. "Instead, we believe it failed because [Boeing] did not properly manage technical issues critical to the success of the project."

Bowsher said Boeing in 1984 repeatedly failed to meet its deadlines and expected substantial cost overruns. "The project was terminated because [Boeing] failed to meet its milestones and could not give us reasonable assurances that they could overcome their technical management problems and deliver the system within agreed-upon time frames and cost," he concluded. A Boeing spokesman said the firm has no comment on the matter at this time.

Draw the line on graphics use

What do users want from graphics systems and software, and how can DP managers best meet their needs? Find some answers in Computerworld's March Special Report on graphics systems.

The Special Report will focus on mainframe, minicomputer and microcomputer graphics and the [illegible] among the three. Contributions to the Special Report should take one of two forms: tutorial articles discussing issues or trends or applications stories pertaining to a particular user [illegible] experience.

Articles may range from four to [illegible] typed, double-spaced pages [illegible]

[illegible]

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SOFTWARE ENGINEERING OF AMERICA SEA

One firm's junked systems become another's treasure

By Maura McEnaney
CW Staff

BROOKLYN PARK, Minn. — Outdated computer systems may be of no value to a growing company, but the discarded units mean business revenue for Jack Umland, president of Di-Core, Inc.

In a 40,000 sq-ft warehouse here, Di-Core uses a chemical refining process to extract value from junked computer systems and industrial materials. These products often contain gold, silver and platinum, Umland said. Once extracted, the precious material is gathered together and sold to refiners.

Umland said that he came up with the idea of establishing a "de-manufacturing" facility while he was a manager of Control Data Corp.'s investment recovery division. It was there, he said, that he realized some firms often do not have the capital to create an in-house program to track and recover discarded materials.

With precious metal specialist Clive Leonard and two other partners, Umland launched Di-Core in October 1983. According to Umland, Di-Core pays other companies for their discarded material on a per-pound basis. Companies can also pay Di-Core a fee to recover precious materials from their discarded products. Di-Core assumes the leasing costs for the semitrailers that transport materials to the Brooklyn Park facility.

Hardware comes from a variety of firms, such as tool and die companies and manufacturers of circuit boards, telephones and electronic parts, Umland noted. "A lot of companies don't know what they've got. They don't know the value of what they're throwing away."

According to Umland, when the materials arrive in-house, they are divided into categories of base metal, resalable and reusable component parts and precious metals. All visible precious metals are recovered through dipping the material into chemical solutions. Encapsulated materials are refined, melted and turned into ingots.

> *'A lot of companies don't know what they've got. They don't know the value of what they're throwing away.'*
> — Jack Umland, Di-Core, Inc.

Since it began operation last May, Di-Core has collected more than one million pounds of surplus material, including systems from Burroughs Corp., Storage Technology Corp., CDC and Memorex Corp. Di-Core has grossed more than $750,000, and Umland expects this year it will gross between $1.5 million and $2.5 million.

Of all the computers salvaged, Umland said he sees "more IBM [machines] than anything." The IBM 370/168, 370/158 and 370/148 are among those that have come through the doors. "Those machines always [contain] precious metals, depending on the serial number of the product," he said. "The lower the serial number, the higher the gold content."

Aside from the precious metals market, Di-Core also dabbles in used parts, selling to third-party maintenance firms. "There is an enormous call for certain parts," ranging from printer heads to circuit boards, Umland said.

Like a detective who gathers clues by perusing a suspect's trash, Umland gets a capsulized view of current business climates by reviewing a company's excess materials. In what Umland termed our "wasteful society," computer systems are being replaced quite rapidly. "Companies are going to much more powerful machines quicker than they really need to in some cases," he observed.

UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK
In re DAV-NA ASSOCIATES, Debtor. Reorganization No. [illegible]
(BRL) — NOTICE OF ENTRY OF AN ORDER REQUIRING CREDITORS TO FILE PROOFS OF CLAIMS
TO ALL PERSONS ASSERTING A CLAIM AGAINST DAV-NA ASSOCIATES ARISING PRIOR TO MAY 25, 1983:
PLEASE TAKE NOTICE, that the United States Bankruptcy Court for the Southern District of New York has entered an order requiring all persons who assert a claim against Dav-Na Associates ("Dav-Na") arising prior to May 25, 1983, whether such claim is fixed, liquidated, unliquidated, contingent or disputed, secured or unsecured, to file a proof of claim in accordance with the instructions set forth below with James P. Hassett, Trustee, on or before January 31, 1985.
Exceptions: Persons who assert claims solely as co-debtors, sureties or guarantors, must file a proof of claim as required herein on or before March 4, 1985. Persons who assert claims solely by reason of the recovery by Dav-Na's estate of money or property or the rejection by the estate of an executory contract or unexpired lease shall file a proof of claim in accordance with the Court's order within thirty (30) days of the recovery of the money or property by the estate or the rejection by the estate of the executory contract or unexpired lease.
ALL PERSONS WHO FAIL TO FILE A PROOF OF CLAIM IN ACCORDANCE WITH THE COURT'S ORDER SHALL BE FOREVER BARRED FROM ASSERTING A CLAIM AGAINST THE ESTATE.
Proofs of claim should be filed in conformity with Official Form No. 19 to the Bankruptcy Rules with: James P. Hassett, Trustee, in care of Zalkin, Rodin & Goodman, 750 Third Avenue, New York, New York 10017 (not with the Clerk of the Court.)
Further information may be had from the Trustee or his attorneys listed below.
Dated: New York, New York
November [illegible], 1984

BY ORDER OF THE COURT
BURTON R. LIFLAND
UNITED STATES BANKRUPTCY JUDGE

JAMES P. HASSETT, Trustee of Dav-Na Associates
35 Mason Street
Greenwich, CT [illegible]
(203) [illegible]
ZALKIN, RODIN & GOODMAN
Attorneys for the Trustee
750 Third Avenue
New York, NY 10017
(212) [illegible]

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Access Technology, Inc.'s 20/20: Is it 1-2-3 for Unix?

IBM PERSONAL COMPUTER SYSTEM REQUIREMENTS

	LOTUS 1-2-3	ATI 20/20
PRICE	$495	$495
VIRTUAL MEMORY		
Minimum Required:	192 K	192 K
Maximum:	640 K	NONE
COMPATIBLES	YES	NO (1)
MONOCHROMATIC MONITOR	YES	YES
COLOR MONITOR	YES	YES
GRAPHIC/COLOR CARD REQUIRED	YES	YES
PRINTERS	Compatible with most printers on the market	IBM Okidata Epson Hewlett-Packard NEC

(1) Under development.

MODULE COMPARISON

LOTUS 1-2-3

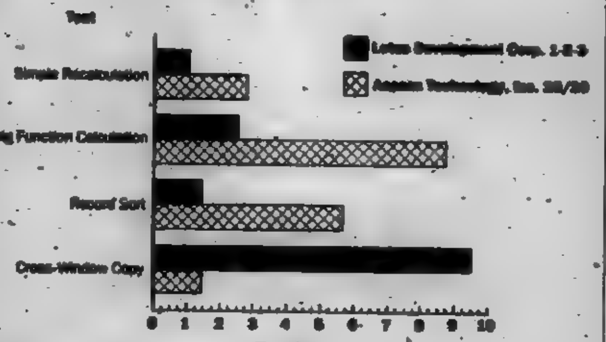
1. SPREADSHEET
   - Maximum Rows: 2,048
   - Maximum Columns: 256
   - Maximum Cells: 524,288
2. BUSINESS GRAPHICS
   - Color Available
   - Graph Types:
     - Line
     - Pie
     - Bar
     - XY Plot
     - Stacked Bar
3. DATABASE MANAGEMENT
   - Sorts:
     - Alphabetic
     - Numeric
     - Ascending Order
     - Descending Order
     - Row
   - Statistical Functions:
     - Sum
     - Average
     - Count
     - Maximum
     - Minimum
     - Variance
     - Standard Deviation

ACCESS TECHNOLOGY INC. 20/20

1. SPREADSHEET
   - Maximum Rows: 1,000
   - Maximum Columns: 1,000
   - Maximum Cells: 1,000,000
2. BUSINESS GRAPHICS
   - Color Available
   - Graph Types:
     - Line
     - Bar
     - Comparison Bar
     - Stacked Bar
3. DATABASE MANAGEMENT
   - Sorts:
     - Alphabetic
     - Numeric
     - Ascending Order
     - Descending Order
     - Row
     - Column
   - Statistical Functions:
     - Sum
     - Average
     - Distribution
     - High
     - Low
4. PROJECT SCHEDULING
   - Data Arithmetic
   - Slack Calculations
   - Critical Path Calculation
   - GANTT (1)

(1) Not currently available.

COMPARATIVE BENCHMARK RESULTS
ATI 20/20 vs. Lotus 1-2-3



All results expressed as the average of 10 executions of the same test.
Both products were tested on the same computer.

MAIN MENU EXAMPLES

(simulated)

ATI 20/20

```
[Col: 0 Row: 0]
Copy Modify Edit Format Default Store Print Window Option Tools Graph Help Quit
Copy a rang of cells into a new range
/......0/......1/......2/......3/......4/......5/......6/......7/......8
```

LOTUS 1-2-3

```
A1
Worksheet  Range  Copy  Move  File  Print  Graph  Data  Quit
Global, Insert, Delete, Column-Width, Erase, Titles, Window, Status
     A        B       C        D        E        F        G        H
```

Access Technology, Inc. (ATI), Company Profile

Founded in 1980 by Allen Kluchman, the current president, ATI markets corporate decision support systems, including Supercomp-Twenty and 20/20. ATI has a direct sales force of seven employees who are marketing 20/20. They have also retained an outside sales group comprised of proven third-party consultants. ATI projects annual revenue for 1984 to be somewhere between $5 million and $7 million. For more information contact : Access Technology, Inc., South Natick, Mass. 01760

Since 1980, Access Technology, Inc. (ATI) has marketed a full-featured, second-generation spreadsheet package known as Supercomp-Twenty. A solid performer, it has an installed base estimated at 10,000 packages.

ATI now markets an integrated package for AT&T's Unix computers based on Supercomp-Twenty that will incorporate graphics capabilities and some data base management system (DBMS) tools.

The new product, 20/20, competes against Lotus Development Corp.'s 1-2-3 on MS-DOS machines — for which it is already available — and is the first such integrated product available for Unix. This prompted a review of 20/20 to see whether it really will be a 1-2-3 for Unix.

ATI's 20/20 should be technically strong enough to compete against 1-2-3 in the personal computer world and will probably become one of the premier business applications packages running under Unix.

A comparison revealed that 20/20 and Lotus 1-2-3 are alike in many respects. The main differences are in 20/20's advanced features: its worksheet consolidation and goal-seeking and time-scheduling capabilities. Also, 20/20 includes a sophisticated data import facility that outstrips 1-2-3's.

> *20/20 will probably become one of the premier business application packages running under UNIX*

The program's documentation is particularly strong, and the package should prove highly versatile. Its spreadsheet capabilities are quite solid, providing a good backbone for the program. Its graphics are integrated well, and graphs can be generated very quickly, although the present version does not provide pie chart capabilities. The program is especially strong in DBMS features.

User interface similar to 1-2-3

The 20/20's user interface is similar to Lotus 1-2-3's in many respects. For example, both packages present the user with similar command lines, which appear at the top of the screen. They each provide a help line directly under the command line.

Both packages can create and save command files or macros. Both sets of documentation include good definitions and examples of command files, but Lotus goes into much greater detail.

In general, 20/20 was quite easy to learn and use, especially with ATI's development of an on-line tutorial that closely resembles 1-2-3's.

The documentation also includes a 70-page section titled "Getting Started," that provides good support for the tutorial.

Written documentation a strong feature

One of the strongest elements of 20/20 is its written documentation, nicely typeset in two colors, including index tab separators. Its appearance is sharp, but its substance is better. It contains complete reference and glossary sections with a complete index. The command and function summaries are superb, including appendices that detail how 20/20 differs from Lotus 1-2-3 and Supercomp-Twenty. The hallmark of integrated packages is their versatility in combining diverse applications, and 20/20 is no exception.

For example, it allows the screen to be divided into four windows, displaying data from the spreadsheet, data base or graphics modules simultaneously. It will be able to interface with a wide variety of applications packages, from word processors to data bases to communications systems. Even more important, the package will be ported across a large number of machines, from micros to minis to mainframes.

ATI's 20/20 has a great advantage of being based on a proven spreadsheet product. It includes virtually all the basic spreadsheet features of Supercomp-Twenty and has several strong, advanced operations, such as depreciation calculation, investment analysis and goal seeking.

It also has solid document- and file-handling capabilities, including a new worksheet-linking feature not available on Supercomp-Twenty. Its column formatting is fairly strong, although it does not include the capability to center text or data in the cell. Its editing features are generally sound as well.

Graphics capabilities strong

The graphics capabilities provided in 20/20 are powerful because of its high-level integration with the spreadsheet module, yet the evaluation copy was limited without a pie chart facility. The program integrates spreadsheet data well enough so that any graph created from this information will be automatically redrawn whenever the data is modified.

Most impressive was the quality and timeliness of the graphs generated. We selected a comparison bar graph for a short test and were presented with a high-quality graph, including a legend, horizontal title and the vertical scale. Starting with the spreadsheet data itself, this graph was finished in well under five minutes.

Good approach to DBMS

ATI took a good approach to DBMS in general with 20/20, choosing to emphasize the data management features within the spreadsheet environment rather than saying a separate DBMS program had been incorporated into the package itself.

However, 20/20 can import data from a separate DBMS package through its Storage Import Data command.

In worksheet consolidation, 20/20 offers much greater flexibility than does 1-2-3, making the interrelation of large amounts of data easier. The program's goal-seeking facilities allow the user to select a desired value for a target cell, then assign the cell, whose value will be varied, until the goal is reached.

Lastly, one of 20/20's selling points is its time-scheduling feature. The Timechart option helps the user manage time-bound projects by calculating time lines for the parts of a project based upon data and dependencies specified by the user. These time lines can then be displayed on a Gantt chart.

Is 20/20 the 1-2-3 for the Unix world? Actually, it may be a little more. With its on-line tutorial and help, 20/20, except for not yet supporting pie charts, is technically equivalent to 1-2-3.

But, with its powerful worksheet-linking and goal-seeking operations, it goes well beyond 1-2-3. Once ATI adds Gantt charts to the time-scheduling feature, 20/20 will be one of the most sophisticated integrated packages anywhere.

ABOUT THE BENCHMARK

Product evaluations, specifications and technical information are provided by Yates Ventures, Inc. Software Evaluation Laboratory Service (Sels), which is solely responsible for their accuracy. For more information about Sels, contact Yates Ventures, Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.

WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

DOD sets computer match to detect agency abuse

WASHINGTON, D.C. — The U.S. Department of Defense recently announced it will conduct a computer match of its personnel records with records from the Veterans Administration to detect any debtors to the federal government or abuse of agency programs.

The computer match is expected to identify people who wrongly obtain veterans' benefits at the same time they are being paid by the military reserves, according to a Defense Department notice.

Other computer matching programs reported by federal agencies included the following:

- The U.S. Department of Labor and the Office of Personnel Management will perform a computer match to identify people who wrongly obtain civil service retirement benefits while receiving workers' compensation payments.
- The U.S. Department of Agriculture (USDA) said it will use computer matching in two programs to reduce its unemployment and workers' compensation costs. One program will share USDA personnel files with state labor officials to identify people ineligible for unemployment benefits; the other will identify USDA employees who are currently receiving workers' compensation and who could be rehabilitated.

Audit finds Indian bureau's DP operations ineffective

WASHINGTON, D.C. — The U.S. Bureau of Indian Affairs has not effectively managed its DP operations, according to a recent audit by Congress' General Accounting Office (GAO), which said the bureau's DP operations are plagued by overlapping information systems and unused equipment.

Bureau officials responding to the report said they have created a new Office of Data Systems to strengthen the bureau's hardware and information systems development management.

The GAO reported that the bureau did not have an inventory of its computer hardware and that many microcomputers, word processors and terminals have not been used since their purchase because local offices had no space, use or software for the equipment. The auditors said 326 of the 1,325 pieces of DP equipment studied by the GAO were unused items and were being leased at a cost of $687,000 a year.

The bureau does not have a centralized means of coordinating systems development efforts, the GAO said, resulting in the development and maintenance of at least nine duplicative or overlapping information systems by the bureau.

Tax reform legislation, industrial policies needed

WASHINGTON, D.C. — Tax reform legislation that eliminates tax credits for businesses should be coupled with industrial policy legislation that provides targeted financial subsidies for preferred industrial investments, U.S. Rep. John J. LaFalce (D-N.Y.) said at a recent press conference.

For example, if the 25% tax credit for research and development expenditures is killed, it should be replaced by direct government payments to stimulate research, according to a staff report he released.

LaFalce said the present corporate tax code is tantamount to an industrial policy because it provides numerous subsidies for particular industries but does so inefficiently and without a coherent strategy.

"It would be far better for our overall economic prosperity to provide such assistance through direct [spending] programs which are better targeted, more flexible and more conditional than tax policies," he noted. "Therefore, I believe that we must try to move toward reform of both the tax code and more explicit industrial policies at the same time."

LaFalce released a study titled "The Tax Code as Industrial Policy" and said his House Subcommittee on Economic Stabilization will hold hearings on the subject in 1985.

Seminars focus on performance

TORRANCE, Calif.— The first of three programs exploring performance measurement systems and contract requirements will be held Jan. 24-25 at the Sheraton Twin Towers in Orlando, Fla.

Sponsored by the Technology Transfer Society, "Advanced Program Control Techniques" is designed for government and private contractors specializing in aerospace, defense, electronics and energy.

The seminar will be conducted by Gregory Maust, director of the financial and management systems division at Doty Associations, Inc., a Washington, D.C., consulting firm.

The program will also be held Jan. 28-29 at Resorts International in Atlantic City, N.J., and Jan. 31-Feb. 1 at Marriott Twin Bridges in Washington, D.C. Program registration costs $525 per registrant, or $495 for government personnel, university staff and teams of three or more. More information is available from TTS Seminars, P.O. Box 3608, Department APCT, Torrance, Calif. 90510.

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On the IBM PC AT, your programs can run at 370/148 to 370/158 speed. Realia's file system really makes your machine deliver, giving it a distinct edge over Pascal or C. Our indexed file system even has full key compression and buffer controls just like VSAM. The generated code is pure MS-DOS, so it can be run on most of the 8088/8086 machine family.

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Miami Dolphins mix might with byte for bowl battle

Micros abbreviate method used in '60s, according to Hall-of-Famer Tittle

By John Desmond
CW Staff

MIAMI — Patty Daley is not a true football fan, but her input will be critical to the Miami Dolphins' game plan in next Sunday's Super Bowl matchup with the San Francisco 49ers in Palo Alto, Calif.

Daley enters the play-by-play data of the Dolphins and their opponents into the Dolphins' computer system from MDS Qantel of Hayward, Calif., and the system generates reports used to devise game strategy.

The Dolphins, the second team (after the Tampa Bay Buccaneers) to use Qantel's Sports Pac program, have run it on a Qantel System 40 minicomputer for five full seasons.

The Miami Dolphins' controller, Howard Rieman, said that Head Coach Don Shula was once asked whether the Qantel system allowed his coaches to get to bed earlier. NFL teams typically view three game films of their upcoming opponents. The previous Sunday's game is usually viewed late into Monday night. "No, it just gave them more time to look at film," Shula reportedly said.

Reports generated for both teams

The coaches fill out a form for every play in the game, listing every relevant fact, including position on the field, downs, yards to go for first down, play called and result of play. The same thing is done for defense and even for the team's own offense to make sure the team is not blind to its own tendencies. In Miami's case, Daley keypunches information from the form into the Qantel system, and reports are generated from the information.

For the Super Bowl, reports will be generated on the opponent's offense and defense based on the game films and and on scouting reports from the coaching staff. "Before, they had to do that by hand. Now, they get the information much faster," Daley said of the system.

The 49ers also use Qantel hardware, but the San Francisco team uses its own software. No one from the 49ers could be reached for comment on the system.

Trick plays a separate factor

One has to wonder whether trick plays such as those in the 49ers' Jan. 6 confrontation with the Chicago Bears, when 49er quarterback Joe Montana lined up at left end or when a 49er guard lined up in the backfield, would confuse the Qantel system. According to Daley, "The computer doesn't know anything about [a trick play]. It'll just be inputted." According to Rieman, "There's a category for stunt plays."

The computer-generated reports are used less and less as game day approaches. Bob Griese, a 14-year football veteran, former Dolphin quarterback and for the past three seasons an NBC-TV football commentator, said, "We would use them during the week, and that's when we formulated a lot of our thinking about what the other team was doing. But we didn't use them during the game."

According to Qantel spokesmen, both teams in the upcoming as well as the previous three Super Bowls have been Qantel users. Does this indicate a relationship? "We'd like like to think so," was the Qantel response from Billy Hicks, customer support manager. In a semicoup for Qantel this year, the Dolphins will have Qantel hardware installed in their headquarters at the Hyatt Regency hotel in Oakland, Calif., to provide instant access to programs.

The high-tech intrusion notwithstanding, professional football is not threatening to become as programmed as a video game. In Rieman's view, "The guy who invented Astroturf did more damage to the game than the guy who introduced computers."

'Almost the same as the '60s'

Despite the application of modern technology to this most physical of sports, Hall of Fame quarterback Y.A. Tittle told *Computerworld* that his New York Giants team in the 1960s was doing almost the same thing computers are doing in football today. According to Tittle, who played from 1948 to 1964 for the Baltimore Colts, the 49ers and the Giants, the Giants were calculating opponents' tendencies in the early '60s. "When I was playing, we had to do it longhand. Now, they do it much better and much faster," he said.

Currently in the insurance business in Palo Alto, Calif., Tittle noted that if a team does something in a game that it has not done in the previous eight games, the opponent may be required to adjust with something equally as unexpected. The coaches may have to go right off the tendency charts. "Computers are a big aid, but they don't make everything foolproof," Tittle noted.

And regardless of her impact on the results on game day, the Dolphins' keypuncher, Daley, said, "I'm not really into football."

"We can't afford to lose data! That's why we bought insurance... Data Check Recovery."

Marv Hampe, Systems Programmer, CADAM Inc., Burbank, CA

"Before we got Data Check Recovery, we more or less threw up our hands in desperation when we had an I/O error – all that pack analyzing, reinitialization, restoring. It all takes time; it's cumbersome.

"Since we installed Data Check Recovery, I've cut down the amount of time I spend on those problems.

"Historically, we've had quite a few problems with data checks on the 3380 packs we use on our MVS system. And as a software R&D firm, being able to get at the latest version of our software is critical to us; having to devote programmer time to correcting DASD errors is wasteful.

"So we bought Data Check Recovery as an insurance policy. And it's paid off.

"For instance, one morning the SYSLOG data set indicated data checks had occurred during the nightly backup of the packs. All I had to do was take the information from the error message and plug those parameters into the DCR procedures – and what could have been a permanent disaster became a very minor inconvenience.

"Data Check Recovery is so easy to run that operations will soon run it themselves, without having to check with the systems group.

"DCR is our first line of defense against disk I/O errors. And it just keeps paying for itself."

Data Check Recovery is a powerful, dependable utility that recovers data that has become unreadable due to permanent I/O errors – hard data checks, track overruns and several types of equipment checks. Data Check Recovery supports all OS operating systems.

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Software Corporation of America

PRODUCT SPOTLIGHT

Realities of data integrity, security, utility confront

By Paul Korzeniowski
CW Staff

In many corporations, a microcomputer data base management package resembles a Pandora's box filled with questions concerning data integrity. The rapid acceptance of microcomputers placed microcomputer data base management systems (DBMS) in corporations before the firms had carefully examined how these packages could best be utilized. Clear guidelines for determining when an employee should use a mainframe data base manager instead of, or in conjunction with, a microcomputer package have yet to be established in most cases.

"Microcomputer data base management packages raise a myriad of questions," said Martin Levin, president of Levin & Associates Corp., a Colorado Springs, Colo., consulting firm. "In some companies, users are downloading data and duplicating a mainframe data base. The user may then copy the data and give it to a manager in another department.

"This scenario raises security and control issues," Levin continued. "Who monitors downloading? What data is stored on a microcomputer? What is kept on a mainframe? Whose responsibility is it to ensure that mainframe updates are downloaded? How will the user track different versions of the data? How reliable is the data? Most corporations are skirting these issues."

Most companies have thus far been able to skirt these issues without opening the proverbial Pandora's box because, in corporations, widespread use of micro data base management packages is the exception rather than the rule. "Out of our 200 microcomputer users, approximately five require a stand-alone microcomputer data base manager," noted Vita Cassese, director at the Pharmaceuticals Systems Division of Pfizer, Inc. in New York.

Ignore data integrity

Other corporate microcomputer administrators' estimates supported Cassese's numbers. With few employees working with these packages, corporations have, for the moment, chosen to ignore data integrity questions.

However, managers added that recently the number of employees requesting these functions has steadily increased. Many companies have reached a crossroad: Address microcomputer data base management issues now or later face the plagues, sorrow and mischief they can unleash.

Cassese and other managers listed three reasons why few employees are currently working with microcomputer data base management packages: Some employees are content with mainframe data base management systems; current microcomputer users do not require data base management capabilities; and until recently, most microcomputer packages were rather limited.

Mainframe data base management packages have been available for years. Consequently, corporate users who required data base management capabilities turned to mainframe or minicomputer packages before microcomputers were conceived. "We have a number of users who are loyal to a mainframe data base management package," maintained Timothy Aston, office system analyst at Bank of New England in Boston. "Yet even they realize that some functions are more suited to a microcomputer than a mainframe."

Also, microcomputers are a relatively recent phenomenon, and few employees have had sufficient time to become expert microcomputer users. "Most of our users have been working with micros for less than a year," said Karen Fredericks, consultant at General Motors Corp. in Detroit.

Because of this inexperience, users are content with the data base facility that an integrated package such as Lotus Development Corp.'s 1-2-3 provides. "Many of our employees have Lotus 1-2-3 and do not even know they are working with a data base," Aston noted.

As time passes, these workers become familiar with data base management capabilities. "Data base managers possess a longer training curve than other applications," Levin noted. "A spread-

SELECTED MICROCOMPUTER DATA BASE MANAGEMENT PACKAGES

Vendor	Ashton-Tate	Ashton-Tate	Dayflo, Inc.	Hayes Microcomputer Products, Inc.	Information Builders, Inc.
Product	*Dbase II*	*Dbase III*	*Dayflo*	*Please*	*PC Focus*
Operating system	MS-DOS 1.1; CP/M 80; CP/M-86	PC-DOS 2.0	PC-DOS 2.0; MS-DOS 2.02	PC-DOS 1.1	PC-DOS 2.0; MS-DOS 2.0
Minimum disk drive requirement	Dual floppy	Dual floppy	Hard disk	Dual floppy	Hard disk
Maximum number of fields/records	32	128	Unlimited	99	255
Maximum number of characters/field	254	254	32,000	999	255
Maximum number of records/file	65,535	1 million	65,000	10 million	Unlimited
Maximum number of characters/records	1,000	4,000	32,000	2,000	4,096
Imports file	Ascii, DIF	Ascii	Ascii, Dbase II, PFS	DIF, Ascii	Ascii
Exports to file format	Ascii	Ascii	Ascii, Dbase II	DIF, Ascii	Ascii, DIF
Split and merge files for reports	Yes	Yes	Yes	Yes	Yes
Maximum number of field sorted in a report	1	7	10	5	32
Encrypts data	No	No	No	No	Yes
Provides password feature	No	No	No	Yes	Yes
Provides activity log	No	No	No	No	No
Provides query language	Yes	Yes	Yes	Yes	Yes
Minimum memory required	48K	256K	256K (512K recommended)	128K	512K (640K recommended)
Price	$495	$695	$495	$349.95	$1,595

SELECTED MICROCOMPUTER DATA BASE MANAGEMENT PACKAGES

Vendor	Micro Data Base Systems, Inc.	Microrim, Inc.	Powerbase Systems, Inc.	Software Solutions, Inc.	[illegible]
Product	*Knowledgeman*	*R:base 4000*	*Powerbase*	*Datease*	*Omnifile*
Operating system	PC-DOS 2.0, MS-DOS 2.0, CP/M 86	PC-DOS 2.0; Ctos 8.0	PC-DOS 1.1	PC-DOS 2.0	PC-DOS 1.1, MS-DOS 1.1
Minimum disk drive requirement	Dual floppy	Dual floppy	Dual floppy	Dual floppy	Dual floppy
Maximum number of fields/records	255	400	64	255	64
Maximum number of characters/field	65,535	1,530	80	256	1,826
Maximum number of records/file	[illegible]	Unlimited	[illegible]	[illegible]	16 million
Maximum number of characters/records	65,535	1,530	1,600	4,000	116,992
Imports file	Ascii, DIF, Basic	Ascii, DIF, Sylk	DIF, Sylk, Ascii, Multimate, WPS, Dbase II, PFS	DIF, Ascii, Multimate, Dbase II	DIF, Ascii
Exports to file format	Ascii, DIF, Basic	Ascii, DIF, Sylk	DIF, Sylk, Ascii, Multimate, WPS, PFS, Dbase II	DIF, Ascii, Multimate, Dbase II	Ascii, DIF
Split and merge files for reports	[illegible]	[illegible]	No	Yes	[illegible]
Maximum number of field sorted in a report	255	10	5	255	10
Encrypts data	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Provides password feature	Yes	Yes	No	Yes	Yes
Provides activity log	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Provides query language	Yes	Yes	No	No	No
Minimum memory required	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price	$500	$495, PC-DOS; $795, Ctos	$395	$600	$425

CW CHARTS

All packages shown run on the IBM Personal Computer and some have versions for other microcomputers. File managers are not included.

Dbase III piques firms' interest

Ashton-Tate's Dbase II has ruled the microcomputer data base management system (DBMS) industry in the same way that Lotus Development Corp's 1-2-3 reigned in the integrated application arena. Ashton-Tate estimates that close to a quarter of a million people purchased the package.

But Dbase II does not seem to have a foothold in many large corporations. "We have only one department that works with Dbase II," noted Timothy Aston, system analyst at Bank of New England in Boston.

Aston's sentiments were echoed by other microcomputer managers who claimed that Dbase II was too difficult to use. The package includes a programming language and requires that end users design their own applications. "I don't think that a user should have to learn how to program to use a data base management package," said Frank P. Chiacchieri, another system analyst at Bank of New England.

George Chetel, manager of data services at Gillette Co. in Boston, added that a DBMS program should be easy to use instead of requiring programmer expertise.

Earlier this year, Ashton-Tate introduced Dbase III, which added a user-friendly interface and other enhancements to Dbase II. "Dbase III has alleviated the ease-of-use problems present in Dbase II," said Dan Spiner, chief operating officer at Management Information Software Co., a New York value-added distributor. "Its Assist function helps novice users design applications."

The Dbase III announcement has spurred interest in the package. "We may recommend Dbase III," said Vita Cassese, director at New York-based Pfizer, Inc.'s Pharmaceuticals Systems Division. "It may be able to combine powerful relational capabilities with ease of use. But we have just begun testing it."

myths regarding data base management packages

sheet is a relatively simple concept to grasp. After working with one for a few hours, users realize the benefits it offers. But it takes much longer for [them] to understand how to manipulate a data base manager."

When employees understand how to manipulate these packages, they notice limitations to a package like 1-2-3. According to Dan Spiner, chief operating officer at Management Information Software Co., a New York-based value-added distributor, integrated packages do not offer comparable features of the stand-alone versions.

DBMS vs. file manager

The integrated packages typically offer a file manager rather than a data base manager. File managers possess limited query capabilities. When a user searches for an item, a file manager examines complete records rather than single fields. For example, if a user was searching for information on an employee with the last name Taylor, a file manager would search the fields First Name, Last Name, Address, City and State. A data base manager would just examine the field Last Name.

File managers are ideal for creating mailing lists and for monitoring a small amount of data, but they are inadequate for other functions, microcomputer administrators claimed. Searching through an entire file by record rather than by field wastes time — especially when the file is large.

Another limitation to file managers is that users can only work with one file at a time. As employees work with a file manager, they will construct a number of different files. Often, data overlaps in various files.

For example, one file may contain a list of the employees with microcomputers. A second file may list employees with software packages. An auditor may want to link the two files. With a file manager, users would have to create a third file from scratch. With a data base manager, the user can typically generate a third file with a join command.

At least 150 micro DBMS packages

As microcomputers became more powerful, the number of packages offering data base management capabilities increased. "A few years ago, the inability to link multiple files was a chief limitation to microcomputer data base management packages," said Spiner of Management Information Software. "But today, that is no longer the case. There are plenty of packages with powerful data base management features."

Today, there are at least 150 micro DBMS packages on the market. To differentiate their products, vendors often tout the number of records a user can place in a data base or the number of fields for each record.

For example, Dayflo, Inc. claims to offer an unlimited number of fields for each record, and Information Builders, Inc.'s PC Focus boasts an infinite number of records for each file in a data base.

Too much storage?

Users question the value of these claims. "Most of our users only need 5K to 10K [bytes] to store their records," said Gregory Chetel, manager of data services at Gillette Co. in Boston.

According to Spiner, "The software capabilities have surpassed those of the hardware. Offering a million or a billion records in a data base is just absurd."

Aston stated that most packages support a data base large enough for the average user. "Whenever there has been a problem, it was usually a hardware limitation — insufficient [random-access memory] or disk space," he said. "Never has a user told us that he needed a new package because his 65,000 record data base was filled."

While most managers downplayed vendors' size claims, a few managers did mention instances where size was a selling point. "We need a package that supports 256 fields for each record," Gillette's Chetel said. "We worked with a package that allowed only 64 fields, and it did not meet our needs."

Rather than the size of fields or number of records, managers re-

See DBMS page 16

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soundingly named ease of use as the key criterion when choosing a package for their companies. "Most end users are not sophisticated microcomputer users; they are principally financial brokers," Bank of New England's Aston stated. "We do not have the staff to provide full-time support to them. So, we look for easy-to-use packages with on-screen documentation and Help keys and screens. The package has to support itself to an extent."

Two packages that Aston's group chose, Powerbase Systems, Inc.'s Powerbase and Software Solutions, Inc.'s Dataease, were cited by other managers. "We chose Dataease because of its ease of use," Chetel said. "Our users can create a production model simply and easily without having to spend a lot of time learning the package."

Packages like Powerbase and Dataease are easy to work with, users said, but they do not possess powerful programming languages. A data base management programming language is similiar to Cobol or Fortran and allows a user to write his own application. Ashton-Tate's Dbase II is the package best known for its programming language.

A powerful programming language is a key purchase consideration in some corporations. "We have been using Dbase II for a few years and are now recommending that users purchase Dbase III," said Neil Cookrish, product manager at Bankers Trust New York Corp. "Dbase II possesses a very powerful programming language that allows us to tailor our applications."

Other managers question whether DBMS packages with programming languages should be given to end users. "I don't think that a user should have to learn how to program to use a data base management package," said Frank P. Chiacchieri, system analyst at Bank of New England.

David Ferris, president of Ferrin Corp., a San Francisco consulting firm, added, "A number of data base management packages are being misused. Most end users are naive and believe that they have the skill to design their own applications. Vendors' claims bolster this belief. Users see products like [Information Builders'] PC Focus and Dbase II as end-user tools. Yet most users lack programming and system analysis skills; they just don't know how to design, test or document system development."

Some corporations attempt to solve this problem by staffing an in-house support team whose responsibilities include writing these types of applications.

Often, this solution creates other problems. "Rather than system development being placed in a mainframe development queue, it is placed in the micro development queue," Levin said. "No matter where it is placed, few companies have the resources to design additional applications. Usually, they have to hire contractors to write the applications."

Allocation of resources is one issue that corporations may soon have to address. Interest in stand-alone micro data base management packages is swelling. "Data base managers represent a rapidly growing area in our company," GM's Fredericks noted. "It is an area where people want more information. Users are not sure how to use a mainframe and are concerned that a mainframe package may be overkill. They are looking for the right mix of microcomputer and mainframe capabilities."

Mixing these capabilities opens Pandora's box. Microcomputer administrators report that micro DBMS security features are relatively

See DBMS page 17

WHAT'S DIFFERENT?

A number of vendors were asked: What feature differentiates your company's data base manager from its competitors? The following are their responses.

Ashton-Tate's Dbase II

[Dbase II] consists of a complete programming language that allows a user to write his own applications.

Ashton-Tate's Dbase III

Dbase III adds a user-friendly Assist function to Dbase II programming language and helps a user construct an application.

Dayflo, Inc.'s Dayflo

Dayflo is a free-form, word-oriented data base that does not require that all records or fields be one length.

Hayes Microcomputer Products, Inc.'s [illegible]

A user is able to use [illegible] with other products, since it contains facilities that allow one to exchange Dbase II and [Data Interchange Format] files.

Information Builders, Inc.'s PC Focus

Because Focus runs on different types of hardware, a user is able to choose what type of machine is suitable for an application and run the application on that machine without learning a new set of commands.

Micro Data Base Systems, Inc.'s Knowledgeman

The product's versatility is its key feature: A user can add spreadsheet, graphics and other modules.

Microrim, Inc.'s Rbase 4000

[Rbase has] special prompts that allow the user to construct an application by responding to fill-in-the-blank questions.

Powerbase Systems, Inc.'s Powerbase

The Zoom function allows a user to [illegible]

[illegible]

[illegible]

CW CHART

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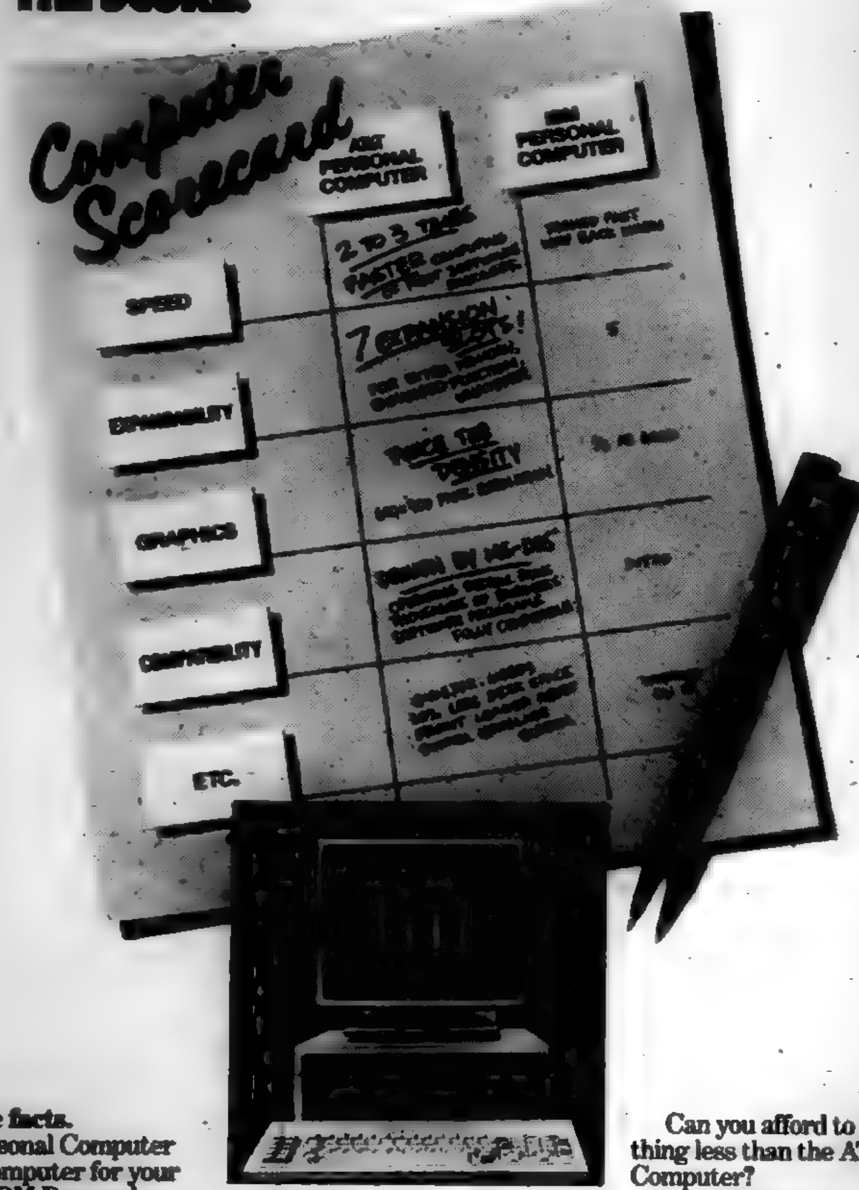

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Retailers' MIS expenses up 18% in 1983, study reports

NEW YORK — MIS costs for retailers jumped to $652 million in 1983 (0.92% of sales) for mass merchandisers, department, specialty and grocery/combination stores participating in a survey conducted by Arthur Young & Co., an accounting and consulting firm here.

This is an 18% increase from 1982 figures and higher than the retailer's 16% increase in sales, the third annual study, "MIS Expenses in Retailing," reported.

The study of 111 retailers reveals a significant drop in the amount they are budgeting for MIS payroll (from 0.52% of sales in 1982 to 0.39% of sales in 1983). Forty-seven percent of the participants reported the recent completion of point-of-sale (POS) systems, and 48% of the retailers reported plans to develop or improve POS and purchase order management systems.

Computers operating in the store — rather than in headquarters — were developed by 47% of the mass merchandisers, and sales reporting/analysis systems were developed by 46% of the department stores, the study said.

Half of the retailers indicated plans to implement inventory control and stock replenishment systems during the next two years, according to the study.

Industry attracted to micros

The retail industry continues to be attracted to microcomputers. On the average, store owners reported that they had 50 microcomputers installed in their organizations. Half of the retailers use microcomputers for financial planning. A third of the grocery and combination stores and a quarter of mass merchandisers use microcomputers for sales reporting and analysis. Three-fourths of all retailers include microcomputers in their overall MIS plan.

Eight out of 10 retailers reported that they have annual written plans for MIS activity, and 71% of the participants have established a data processing steering committee to coordinate MIS with corporate strategy and to disseminate information to other areas of the organization.

The study is available at no cost. More information is available from Arthur Young, 277 Park Ave., New York, N.Y. 10172.

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weak. "It is not only managers who are concerned with security problems; users are becoming aware of these issues," Ferris said.

Micro vendors, aware of the weakness, have recently begun to incorporate security features similar to those on mainframes into their packages. A number of packages offer password protection and data encryption. However, few packages offer an activity log, essential in larger systems.

Until these features are common, Levin recommended that microcomputer data base management packages be used sparingly and carefully.

"One company was running four monthly batch systems to produce reports for four departments," he said. "It altered the system so that a batch run produced a file in Dbase II format. A copy of the file was given to each department that produced its reports. That is a suitable application for a microcomputer data base manager. Unfortunately, there aren't many companies that have put that much thought into the use of these packages."

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Study reports telecommuting boosts work quality

By Donna Raimondi
CW Staff

ITHACA, N.Y. — Rural, suburban and small-city workers are more apt to telecommute than their city counterparts, according to a 1984 study by a Cornell University professor, even though the likelihood for employment without telecommuting is roughly the same for employees in these areas.

Increased quantity and improved quality of work was reported, and turnover and absenteeism problems appear to be reduced under telecommuting arrangements, according to the study titled "Expanding the Boundaries of Work: Research on Telecommuting" by Charles McClintock of Cornell's College of Human Ecology here.

Among respondents who have access to electronic mail and message systems, routine work tasks were handled more efficiently, and it was possible to direct an uninterrupted effort on some of the more complex work tasks, the survey reported.

Telecommuter prototype

The typical telecommuter is a 40-year-old man who is self-employed as a consultant, manager or writer, the study said.

Of men and women who telecommuted, 15% of each was company-employed only, and 22% of the women and 38% of the men were both company- and self-employed, according to the study.

The study was based on 18 interviews and 140 mail questionnaires on self-employed and company-employed individuals who work at home using computer technology. It represents a variety of demographic, household and work situations in the U.S. and Canada.

Among the data processing-related jobs performed by telecommuters in this study were programming, computer staff specialist, software development, custom programming and systems design.

The typical telecommuter is a 40-year-old man who is self-employed as a consultant, manager or writer.

Focus on employer business

Approximately one in 10 respondents spent his telecommuting time exclusively on employer business, the report showed.

While most respondents were employed in professional or managerial jobs, women were three times as likely as men to be in nonprofessional positions (18% vs. 5%), the study said.

On a scale of -2 to +2, showing the influence of telecommuting's affect — -2 being a decreased influence, zero representing no influence and +2 representing increased influence — respondents, by gender, perceived that telecommuting had increased feelings of control over their work (1.14 total), with women claiming an increase of 0.97 and men claiming an increase of 1.21.

All workers said they felt their chances for promotion were greater (0.19), with women feeling more of an increase in chances of promotion (0.28) than men (0.16), the study revealed. Feelings of satisfaction with work were increased (1.18 total), with men feeling more of an increase in satisfaction (1.20) than women (1.13). There was an overall decrease (-0.57) in feelings of work-related stress, with men feeling more of a decrease (-0.64) than women (-0.42).

Respondents' schooling, age range

Forty-four percent of those surveyed held postbachelor's degrees, and the ages ranged from 19 to 67 years.

Telecommuters had worked at home for an average of 2.2 years (with a range of one to 15 years), the study said.

The study is available for $1.60 per copy from Charles McClintock, College of Human Ecology, MVR-N135, Cornell University, Ithaca, N.Y. 14853.

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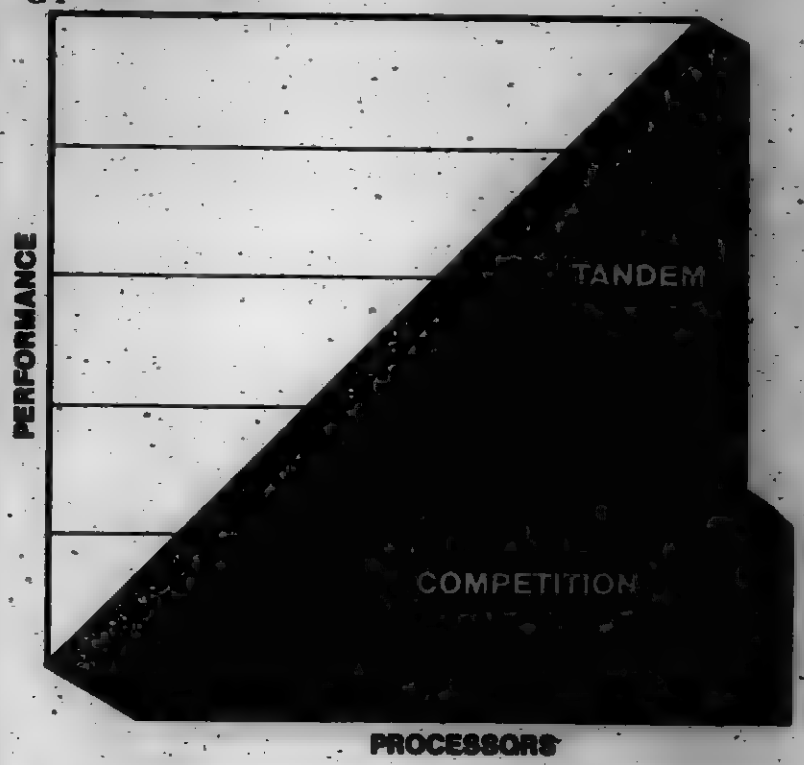

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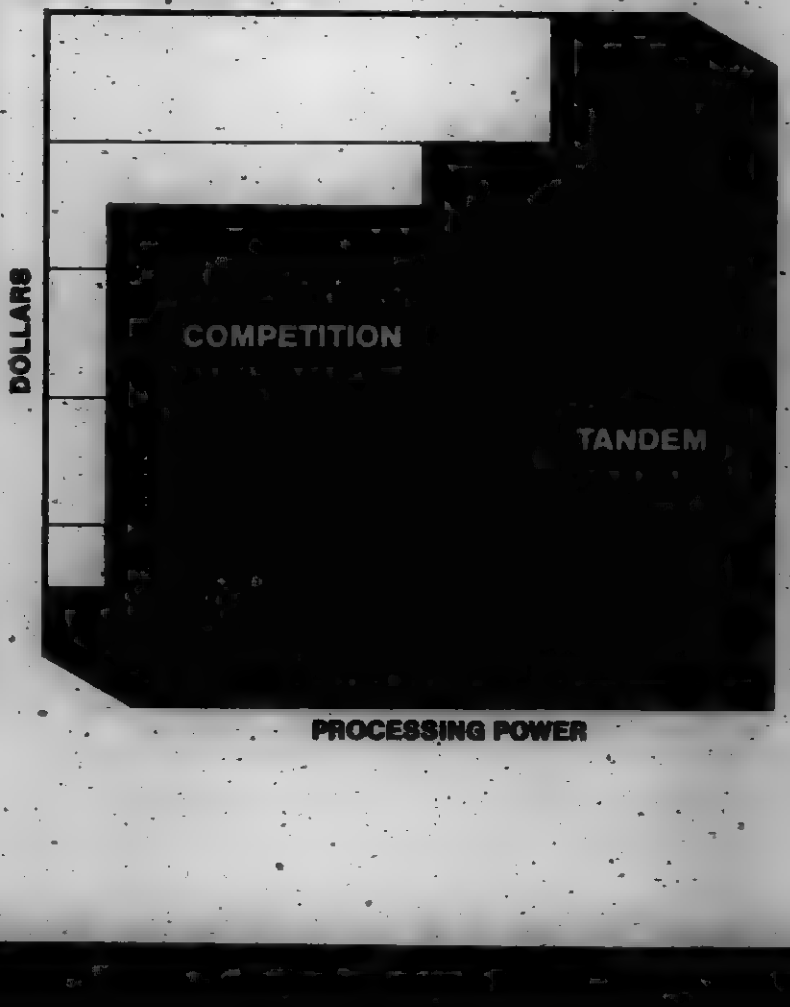

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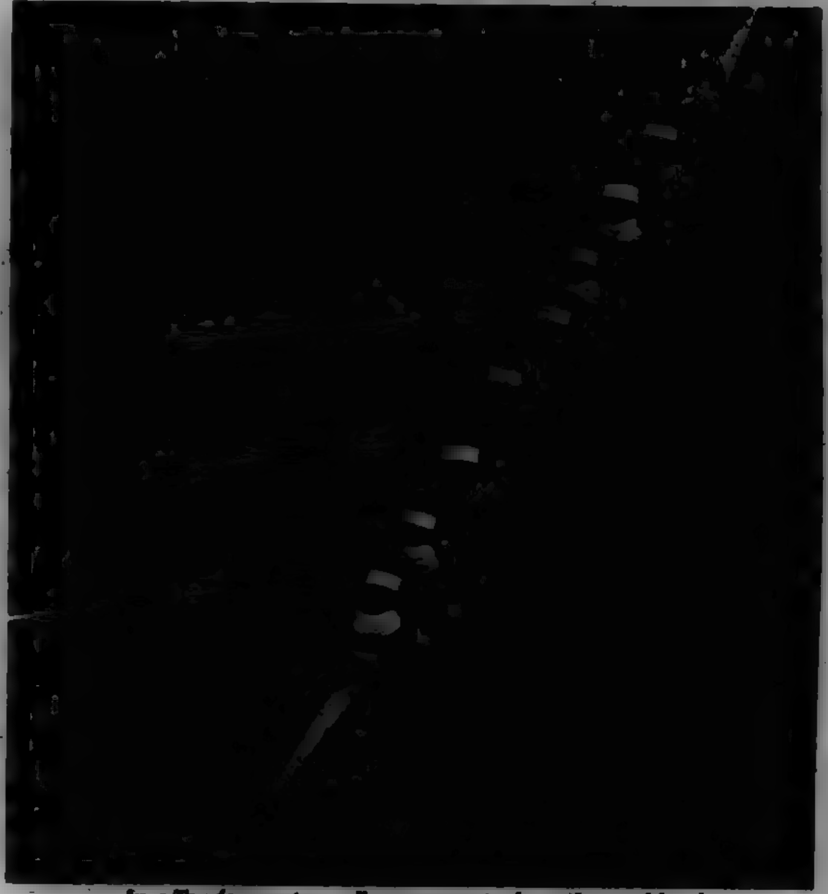

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TANDEMCOMPUTERS

HP launches transportable, Unix-based Integral micro

By Eric Bender
CW Staff

CORVALLIS, Ore. — Hewlett-Packard Co. last week introduced the Integral Personal Computer, a 25-lb, transportable system that runs the company's version of AT&T's Unix.

Priced at $4,995, the system is aimed primarily at technical professionals "who are pushing the limitations of today's 16-bit personal computers," said Cyril Yansouni, vice-president and general manager of HP's Personal Computer Group.

Designing the system in a transportable package, "we tried to make sure that people could operate it as their prime computer," said Bruce Foster, product marketing manager. "Many professionals really do have different sites they work at — they're typically set up at one desk, but they also work at home or at client sites."

HP officials also emphasized the machine's Unix features. Multitasking capabilities will be particularly useful for professionals who typically are interrupted often and "generally work with multiple things at any one time," Foster said. Working on Microsoft Corp. MS-DOS-based micros, these users "spend a lot of time in starting up and shutting down those applications," he said. "On the Integral, you simply have all those things running at once."

HP's Integral Personal Computer

Access to Unix-based software development tools and choices among a growing number of application packages are other important benefits, the officials said.

The Integral, which unlike most Unix systems lacks a hard disk drive, incorporates the kernel of the vendor's HP-UX Unix-based operating system in read-only memory (ROM). The system's 256K bytes of ROM also includes a Personal Applications Manager shell designed to isolate users from Unix commands. In addition, a window manager for handling multiple applications simultaneously is embedded in ROM.

Based on the Motorola, Inc. 68000 microprocessor, the Integral features 512K bytes of user random-access memory (RAM) that can be expanded to 1.5M bytes, 32K bytes of display RAM, a 16-bit graphics processor, a 9-in. amber display with 512- by 255-pixel resolution, a 3½-in., 710K-byte microfloppy disk drive, a built-in HP Thinkjet printer, a full-size keyboard, two I/O slots and the HP-IB expansion interface. Bundled software includes an HP-UX commands disk, a utility disk and a "standard applications" disk.

'Classic HP machine'

"It's a classic HP machine — beautifully designed and elegantly put together," noted Chris Christiansen, senior analyst with the Yankee Group in Boston. He said that while putting the operating system into ROM was not a first, "what is remarkable is HP's job of condensing Unix."

Other analysts also applauded the system design but agreed that the Integral is likely to sell to a relatively limited audience, primarily within HP's currently installed base.

Peter Marvit, manager of laboratory services at Yates Ventures, Inc. in Palo Alto, Calif., noted that HP's sales pitch seems directed toward replacement sales for the HP Series 80.

Marvit called the single microfloppy drive "a significant drawback," saying that users will be forced to swap disks frequently. However, a RAM disk function is built into the Integral, and Foster maintained that running typical applications will require little swapping. He added that HP hard disk drives, offering up to 55M bytes of storage, can be attached via the Integral's HP-IB port.

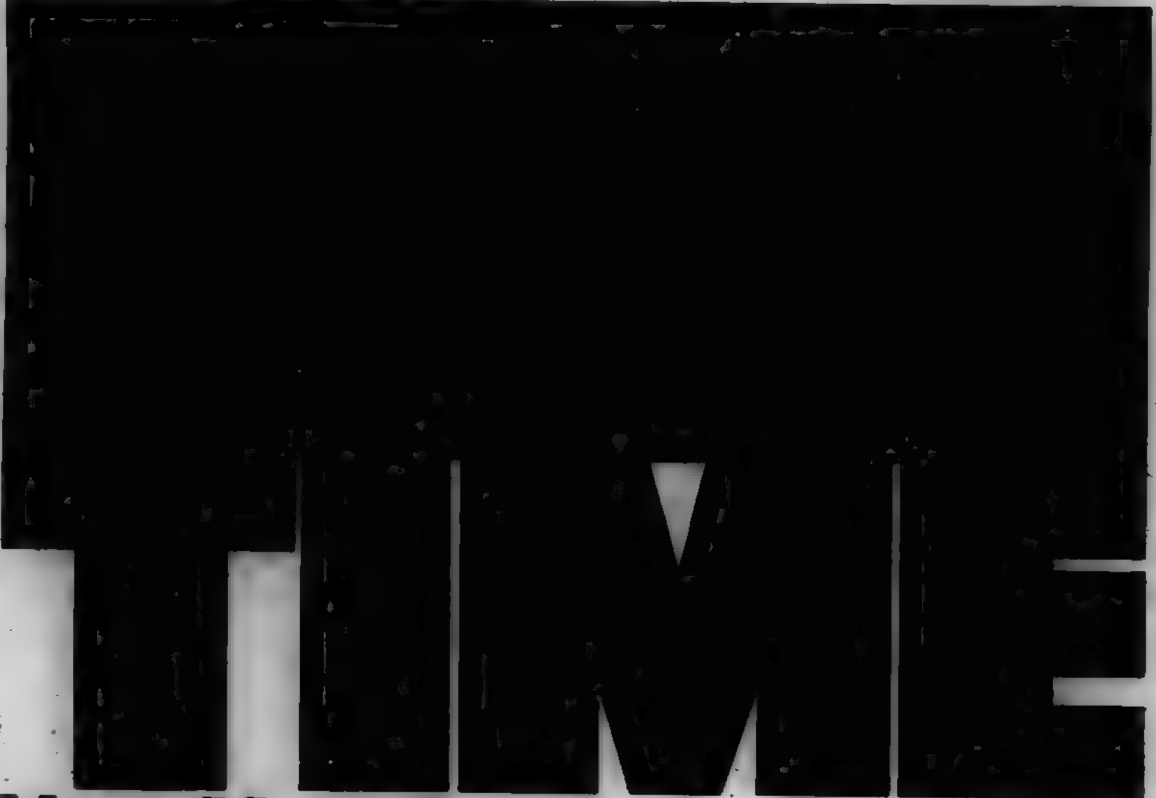
Options offered

Among options for the new system are an additional 512K bytes of RAM for $1,495 or a 256K-byte RAM enhancement, priced at $695. A bus expander providing up to five additional slots will be available by midyear for $1,495; the expanders permit system memory expansion to 5.5M bytes.

I/O cards include an RS-232 interface ($195), a 300 or 1,200 bit/sec modem (available by midyear for $595) and four other interfaces designed primarily for instrumentation control. An HP mouse is available for $195.

Optional software includes HP-UX C language ($295), HP-UX Technical Basic ($295), nine personal productivity applications and a number of computer-aided design packages.

Hewlett-Packard Co.'s Personal Computer Group's Portable Computer Division is located at 1000 N.E. Circle Blvd., Corvallis, Ore. 97330.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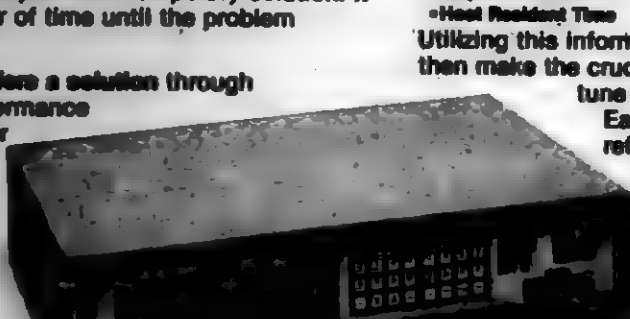

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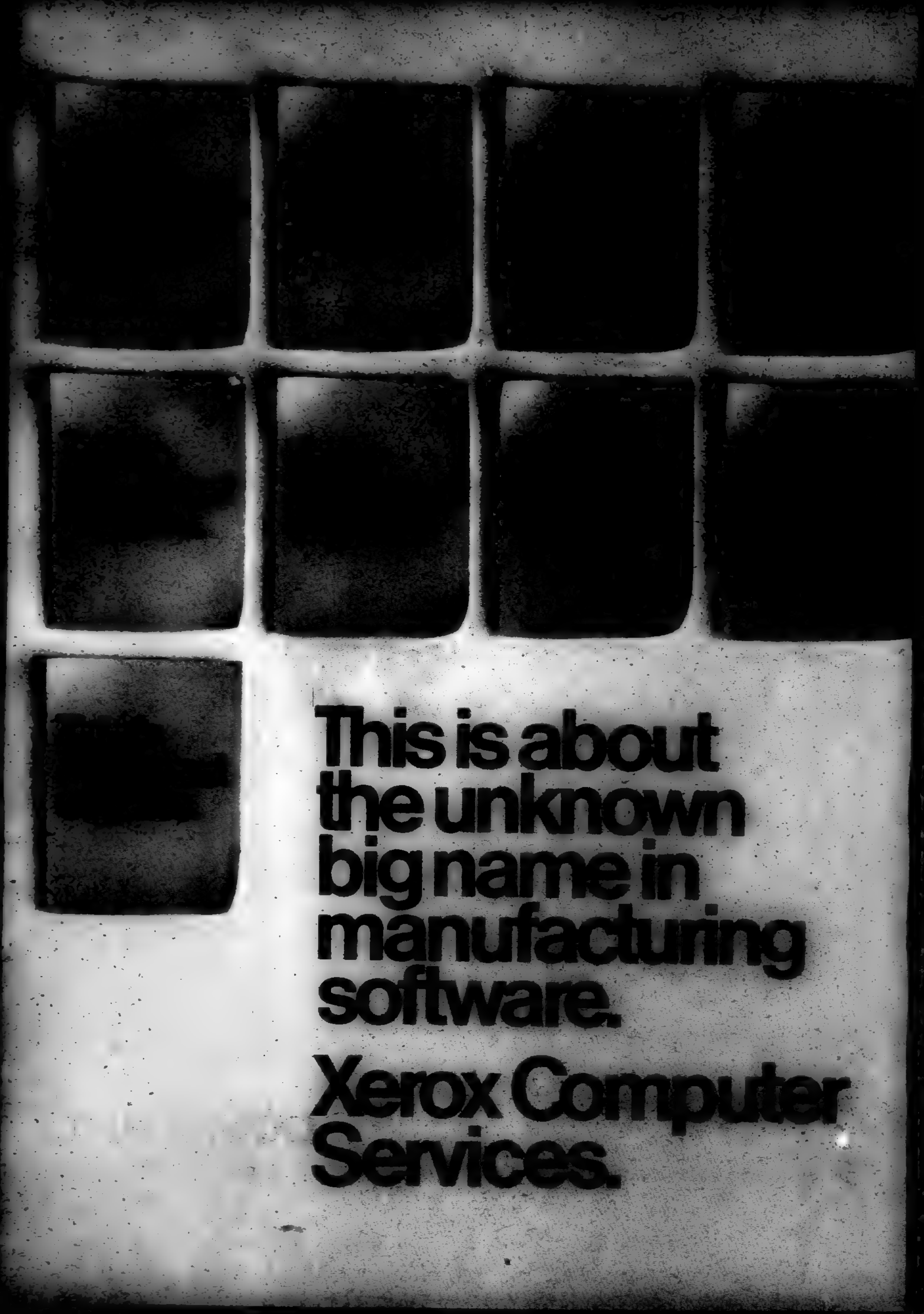
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*Industry report refers to IDC Industry Report

Vendors choose plans to treat rising health care costs

Automaker installs benefits tracking system, timber firm sets up in-house data base

By Donna Raimondi
CW Staff

The skyrocketing health care costs of the past few years prompted Ford Motor Co. to install a computerized medical benefits tracking system in the spring of 1984.

Even to a company the size of Ford, the cost of such a system is not small, but the firm hopes to benefit by modifying its compensation plans to improve the quality of services while slowing the growth of health care costs, Jack Shelton, manager of the employee insurance department at Ford, said.

In 1983, Ford shelled out $742 million in medical benefits for workers employed in its automobile operations, which comes to an average cost of $300 per vehicle produced, Shelton said. In 1980, the average cost per vehicle was $292, and the 1975 cost was only $119 per vehicle, he added.

Ford's rising costs are echoed throughout other large corporations, which are chipping away at employee medical costs using information made available by computerized health care cost management systems. Companies are forcing changes in medical practices that they hope will improve the quality of medical care to their employees and reduce corporate expenses.

Ford installed a health care information system from Medstat Systems, Inc. of Ann Arbor, Mich., in the spring of 1984 with four goals in mind:

- To look at the performance of health care providers.
- To examine the company benefit plans.
- To review how insurance companies administer Ford's programs.
- To study the company's health promotion programs.

"When we tried to analyze the information supplied by our carriers, we found that they hadn't provided good data. It's not timely, and it's in hard-copy form, which makes it not flexible enough to analyze," Shelton said.

The cost of obtaining reports from Ford's insurance carriers was not separated out in the cost for carrier services, Shelton said, so in addition to not getting the quality and frequency of reports that he needed, Shelton said he could not track what the existing reports were costing.

One benefit Shelton has already derived from his Medstat system is an improvement in information that he receives from his carriers — Blue Cross/Blue Shield and John Hancock Mutual Life Insurance Co. of Boston, Mass., he said. The insurers have cooperated with Medstat Systems to furnish the kind of information Ford needed for cost management — as opposed to cost reporting, which they have always provided — he said.

In 1983, Ford shelled out $742 million in medical benefits for workers employed in its automobile operations, which comes to an average cost of $300 per vehicle produced.

In 1980, Boise Cascade Corp. — an Idaho-based timber and paper products company — paid out $53 million in health care costs, a figure that jumped by $10 million in 1981 and that will hit $76 million in 1984, said Richard Strauch, a management consultant for health care cost management.

Strauch said that Boise Cascade figured out that actual medical claims represented about half of its health care expenses, excluding illness pay, dental claims, worker's compensation and other costs.

Boise Cascade called in Health Data Institute of Newton, Mass., two and a half years ago to help set up an in-house data base of health care claims information gleaned from Boise's six major carriers, he said. The data base — developed in SAS Institute, Inc.'s SAS language, is supported by a full-time programmer on Boise Cascade's IBM 3081 Model G under IBM's MVS XA operating system, Strauch said.

From that data base, Boise developed a quarterly health care cost index to determine the average claim amount per covered employee for each of its operating units, Strauch said. The company also set an acceptable annual medical claims growth limit of 7%, he said.

The data base allows corporate management to supply its operating units with information that is directly relevant to them, Strauch said. For instance, if a particular location's data reveals a high incidence of cigarette smoking-related diseases, the

See HEALTH page 28

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INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

SYDNEY — Facom Australia Ltd. announced plans to establish a software development center in Sydney following a similar move in New Zealand, resulting in the creation of Fujitsu New Zealand Ltd. A Facom spokesman said the firm intended to create an umbrella organization centered in Sydney to target the Australian software market with particular emphasis on winning government contracts.

■

NEUTRAL BAY — Memorex Pty. Ltd. here said it was doing everything it could to help users who are facing potential problems with their 3380 disk drives. When original reports spread from the U.S., Australian users learned they were sitting on a time bomb. They discovered that their disk drives may contain faulty disk platters capable of causing a head crash at any time resulting in a complete loss of data. A Memorex spokesman said the company has ceased shipments of the faulty disk drives, and field engineers have been actively rectifying the head crashes caused by the faulty products.

CHINA

NANJING — Several local computer and peripheral makers have been merged here by Zhijin (Venus) Information Industrial Co., to form China's largest computer organization. The company is reportedly equipped to manufacture multilayer printed-circuit boards, microcomputers, printers, VDTs, modems and other communications devices in large volumes.

FRANCE

PARIS — Officials from leading European technology companies met here recently with a number of U.S. vendor executives — excluding IBM — to discuss standardizing their respective product lines to counter IBM's dominance in Europe. The four-day, closed meeting included rep-

HEALTH

from page 26

company makes a smoking cessation program available to it, he added.

Boise looks at comparative data from hospitals in a given area and analyzes hospital utilization for various types of admissions. If the information shows that a hospital's average length of stay for a particular procedure is out of line with other area institutions, the company meets with hospital managers to try to effect changes in that area, he said.

Boise Cascade is in the process of converting its 1983 and 1984 data to run on the Medstat on-line decision support system, which will allow analysis as well as reporting capabilities, Strauch said. This system will give the company three data bases to work from: the Boise Cascade medical claims data base; the National Hospital Discharge Survey — a yearly sample of 250,000 hospital discharges from the U.S. Department of Health and Human Services; and the Data Base Consortium, which contains utilization data and comparative statistics detailing hospital and physician costs of all Medstat's clients, he said.

Strauch figured that it would have cost as much to continue development of his in-house system as it will to use Medstat — which charges a flat rate per covered employee per year — and that it was in his company's best interest to support the development of a large, outside data base that he can capitalize on, he said.

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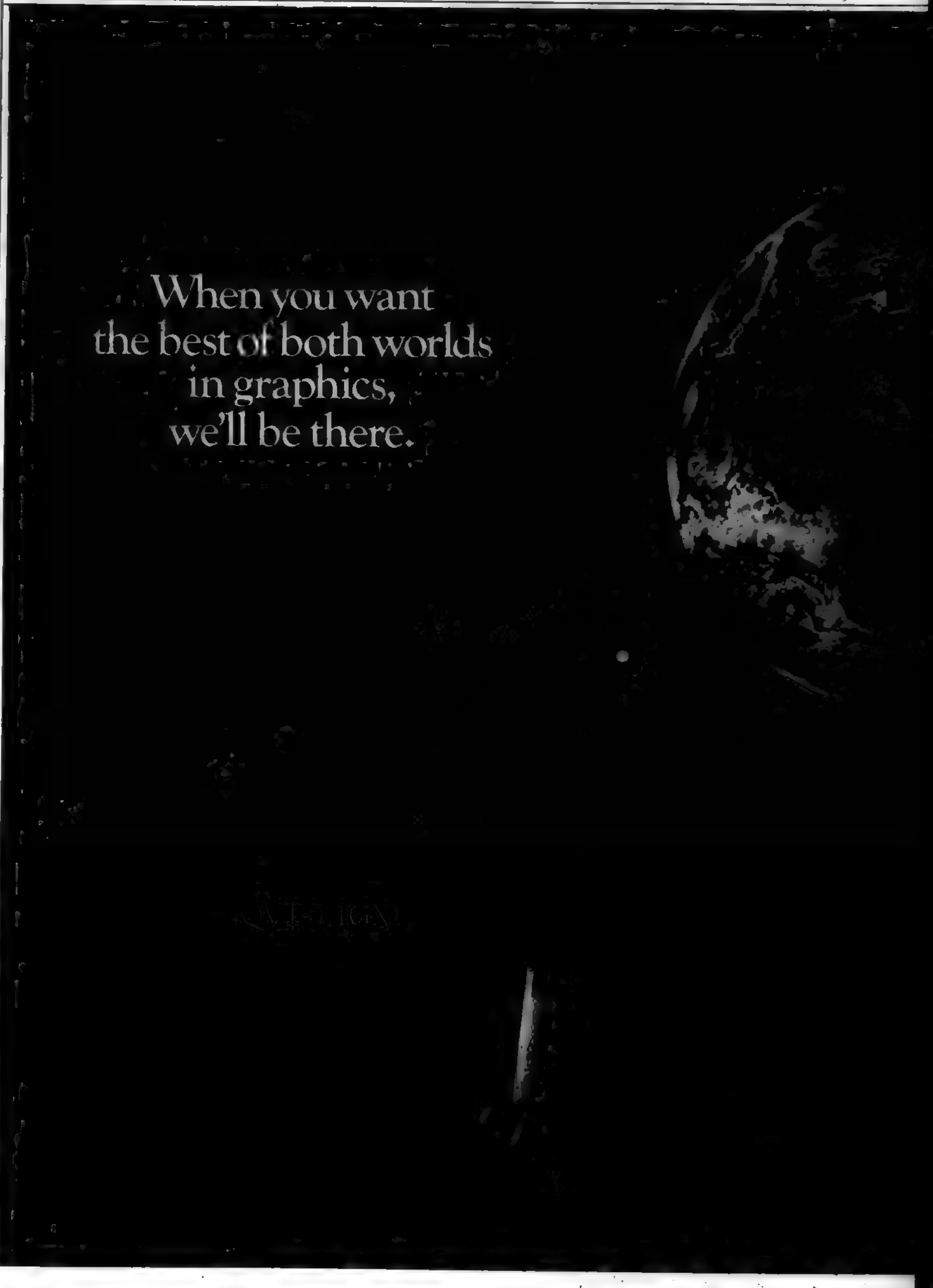

NEWS

resentatives from Sperry Corp., Burroughs Corp., NCR Corp., Digital Equipment Corp. and Hewlett-Packard Co. European firms included Bull, Compagnie Generale d'Electricite, AEG-Telefunken, Inc., GEC, Thomson, Nixdorf Computer AG, Philips, Inc. and Olivetti Corp.

JAPAN

TOKYO — Prime Computer Japan, Inc. will drop prices on its superminicomputer line by an undisclosed percentage, it was learned here. The price cuts are intended to double the sales of Prime machines in Japan, sources said.

■

TOKYO — Fujitsu Ltd.'s video conference system is operational now between its Tokyo headquarters and its five local offices. The facilities are said to be interconnected on a digital network system that can send and receive information over multimedia equipment through dedicated, high-speed circuits.

NETHERLANDS

AMSTERDAM — IBM Netherlands told its customers in a recent letter that it will withdraw its System/34 minicomputer from the market in February. IBM said that users who wish to change the terms of their rental agreements for their installed System/34s should do so. IBM will continue to support the installed systems.

IBM also announced price cuts on three licensed software packages: Systems Support Program, a utility program and a report program generator compiler.

TAIWAN

TAIPEI — Multitech Industrial Corp. of Taiwan has announced the DCS-570, a bilingual English-Chinese computer system. The fourth-generation machine features a hardware character generator for fast display of 17,000 different Chinese characters, the ability to emulate a variety of Chinese terminals, local-area networking capability, an operating system that allows Chinese-language multitasking and windowing and Chinese-language applications software capabilities.

The system is based on the Intel Corp. 8088 microprocessor and comes with 512K bytes of random-access memory, dual 640K-byte floppy disk drives, one RS-232C interface, one parallel Centronics Data Computer Corp. interface, a 121-key keyboard, six IBM Personal Computer-compatible expansion slots and a monitor.

The machine costs $6,250; a hard-disk version is $8,000, the vendor said.

WEST GERMANY

MUNICH — Siemens AG has introduced Hicom, a digital private branch exchange for worldwide distribution. The system is said to handle simultaneous voice, text and images. It is based on the integrated services digital network standard of Europe's Consultative Committee on International Telegraph and Telephone (CCITT).

Bavarian Chief Minister Franz-Josef Strauss called the success of the Siemens project — three years ahead of schedule — an example of European information and communications capacity for innovation. Siemens funded the project, which consists of 1.2 million lines of code written in the CCITT high-level language, Chill. The great volume of code represents roughly half of the space used for operating systems on large mainframes.

The Hicom hardware is based on a specially designed telecommunications integrated circuit that integrates codes and filters onto one chip, featuring 30,000 transistor functions.

Up to 600 Hicom installations are expected to be delivered by year end, Siemens said. The workstation portion of the system, called Multiterminal 3510, will sell for approximately $1,550.

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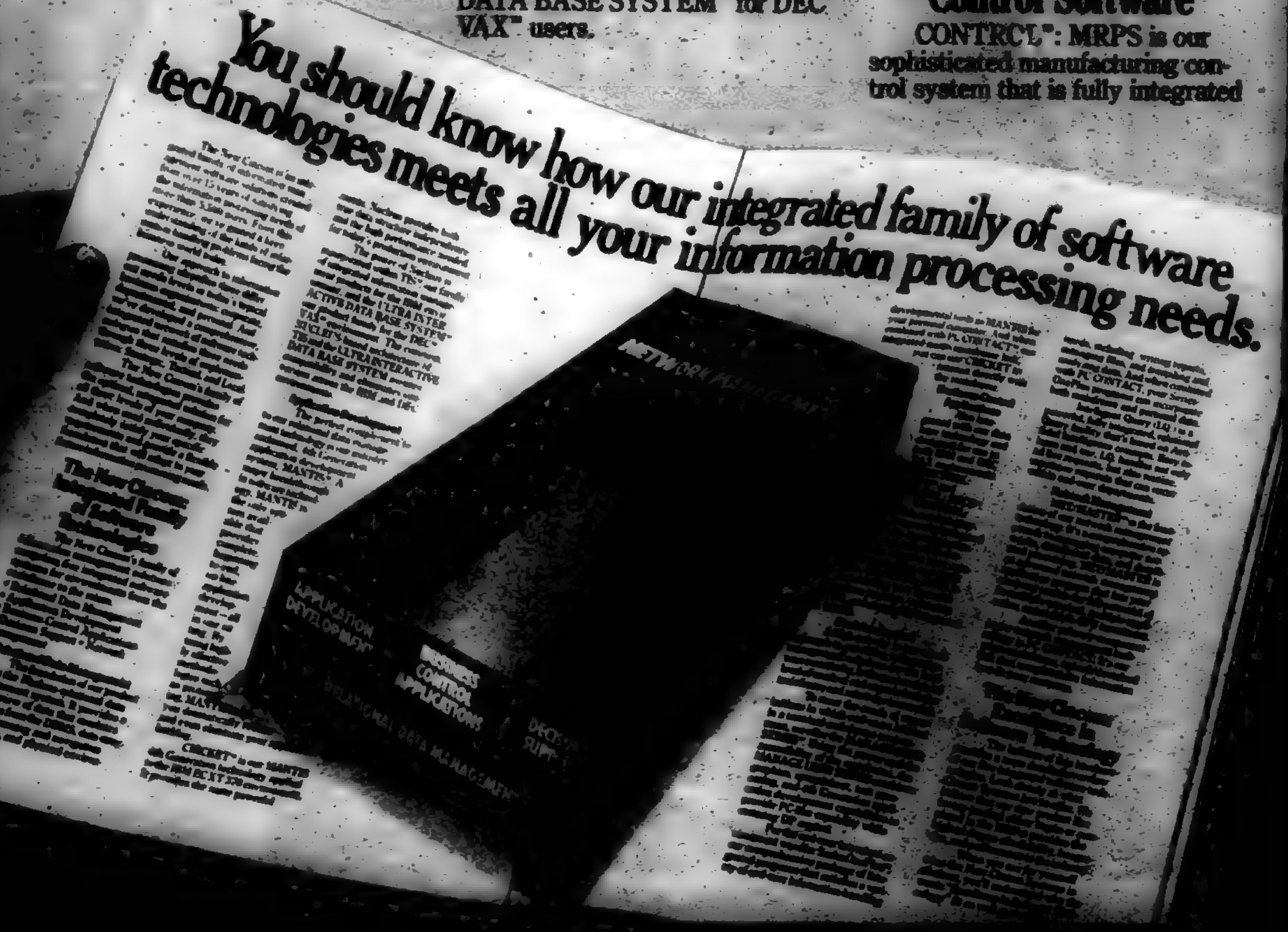

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#8 Mainframe Decision Support Software

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Forestry firm's package tends to trees, manages money

PENROSE, New Zealand — Probably nowhere else in the world are natural resources more crucial to the national economy than in New Zealand, where more than 80% of the country's gross national product comes from fruits of the land and sea. At New Zealand Forest Products (NZFP), the country's largest manufacturing company, managing financial operations is as important as managing the nation's natural resources.

Lumber is a major expert in New Zealand because forestry encompasses all land not suitable for farming, and forest products support other primary industries including farming and packaging. NZFP plants more than 18 million trees annually on 210,000 hectares of forest land to secure sufficient timber to meet future lumber needs.

To track its financial processing, NZFP used financial systems developed in-house in each of its four New Zealand major manufacturing sites in Kinleith, Whakatane, Mataura and here. After NZFP representatives visited McCormack & Dodge Corp. end-user sites in Australia in February 1982, NZFP became the first company in New Zealand to purchase M&D's general ledger information system, G/L Plus.

"We listened to presentations from Software International Corp. and Management Science America, Inc." said Roy Vannini, the firm's DP manager here. "It was important for us to purchase a global financial software package. And since M&D's system is user-defined, there are no massive data processing needs. It is a flat file for processing day to day," he explained.

Effective use of computer resources was also critical to NZFP because the firm depends on its computer for forest planning, Reid added. When land is cleared, the primary consideration is quick tree replacement to keep the growth cycle intact. Silviculturists — people who grow and tend trees — must model on a computer carefully so that each felled section of forest can be replaced immediately.

Ted Reid, NZFP's manager of special projects, noted, "We bought G/L Plus because of the pressure to improve our accounting system, which evolved from a hand-kept system to our in-house system. We also needed the ability to consolidate purchases and maintain a standard chart of accounts."

G/L Plus automated the firm's general ledger accounting and provided the needed information for financial analysis and planning, Reid said. Its data base structure made financial information readily accessible and allowed NZFP users to establish any level or variation of financial data required for reporting and analysis.

"We use the G/L Plus Statement Line File extensively for consolidations," he said. "We also use all three M&D report writers for the preparation of balance sheets, product cost statements and profit and loss statements." NZFP now processes 40,000 master file records amounting to 150,000 transactions per year. The company currently maintains 20 corporations with G/L Plus.

'[McCormack & Dodge Corp.'s G/L Plus] is user-defined; there are no massive [DP] needs.'

— Roy Vannini, New Zealand Forest Products.

Accounting at the major manufacturing sites was transferred from an NCR Corp. 399 system to an IBM environment. Each site now has access to a central data center containing an IBM 4341 with IMS/OS and an IBM 4381 running under TSO and MVS/OS.

For training, NZFP sent a project team led by Reid to Melbourne, Australia. After that, NZFP trained its staff internally. In June 1982, NZFP had G/L Plus up in its first location. "We completely changed the account coding structure to one uniform structure, and we had our first ledger up after a couple of months. . . . All of them were implemented by the end of the year," Reid said.

NZFP first brought up a batch system, and the first ledger was all batch. "We've installed [IBM's] IMS on-line [data base/data communications], and we've continued to provide parallel batch testing," Vannini said. "We run some batch programs now, but front-end users submit batch jobs through the on-line master file maintenance daily. We run our journals overnight, and they're ready first thing in the morning," Reid explained.

NZFP now runs both a production and a test system. In the production system, the facilities on the ledger are fully developed. In the test system, new company divisions are implemented, and new reports and techniques are tested.

The company has recently upgraded the G/L Plus system and is now considering M&D's Millennium:GL environment, a real-time, on-line version of general ledger.

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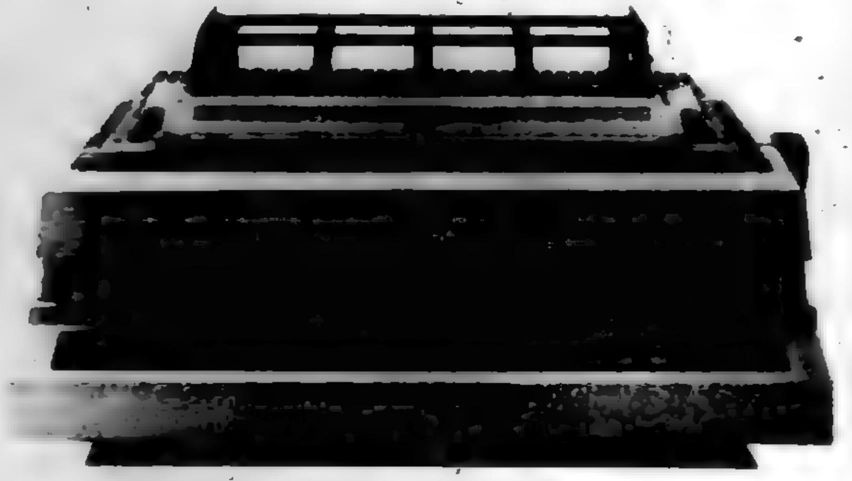

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Albany, New York	February 21, 1985
Albuquerque, New Mexico	March 19, 1985
Atlanta, Georgia	February 14, 1985
Baltimore, Maryland	January 29, 1985
Birmingham, Alabama	January 17, 1985
Boston, Massachusetts	February 6, 1985
Charlotte, North Carolina	January [illegible], 1985
Chicago, Illinois	January [illegible], 1985
Cincinnati, Ohio	February [illegible], 1985
Cleveland, Ohio	January [illegible], 1985
Columbia, South Carolina	March [illegible], 1985
Columbus, Ohio	March 7, 1985
Dallas, Texas	January 15, 1985
Dallas, Texas	February [illegible], 1985
Dallas, Texas	February 12, 1985
Denver, Colorado	February [illegible], 1985
Detroit, Michigan	January [illegible], 1985
Fort Wayne, Indiana	February 6, 1985
Grand Rapids, Michigan	March 13, 1985
Greensboro, North Carolina	March 5, 1985
Greenville, South Carolina	January [illegible], 1985
Hartford, Connecticut	January [illegible], 1985
Houston, Texas	January [illegible], 1985
Houston, Texas	February 5, 1985
Houston, Texas	February [illegible], 1985
Huntsville, Alabama	February 21, 1985
Indianapolis, Indiana	March 14, 1985
Jackson, Mississippi	February [illegible], 1985
Kansas City, Kansas	March [illegible], 1985
Louisville, Kentucky	March 21, 1985
Memphis, Tennessee	February [illegible], 1985
Miami, Florida	March [illegible], 1985
Milwaukee, Wisconsin	February [illegible], 1985
Minneapolis, Minnesota	February [illegible], 1985
Minneapolis, Minnesota	April [illegible], 1985
Mobile, Alabama	February [illegible], 1985
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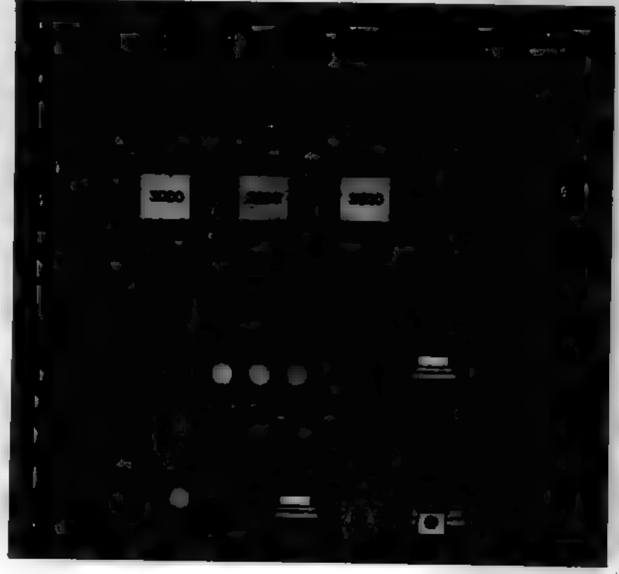
However much you change, you're going to need both office automation *and* distributed data processing. Fortunately, one company gives you both in a single system.

Hewlett-Packard's HP 3000 is a fully compatible family of computers, ranging from a new system that handles as few as two users to a distributed mainframe that connects up to 400. You can run the same software right up the line.



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Local-area network frees writers from manual labor

COLUMBIA, Md. — The annual task of developing 200,000 pages of technical manuals for weapons systems at Westinghouse Electric Corp. was a labor-intensive job involving handwriting and manual editing by 250 writers.

The company's Technical Data and Training Systems department here is responsible for producing 250 technical manuals each year supporting advanced weapons systems and other high-technology products, primarily for the U.S. Department of Defense.

Until last year, writers prepared handwritten manuscripts that were passed on to numerous other employees for typing, editing, illustrating and revising. The work took place concurrently with product development, a situation that meant product engineering changes often forced major revisions in the technical manuals, according to Bob Middleton, manager of technical data operations at the Westinghouse plant.

In late 1983, the department began installation of a Xerox Corp. Ethernet local-area network using 23 Xerox 8010 Star information systems, 10 Xerox 860 information processing systems and three Xerox 8040 laser printers.

"Our old system required that a number of skilled people handle the material. We think the 8010 workstations will reduce the need to involve so many people in so many preparation steps. The units enable us to incorporate engineering changes more easily than in the past. Regardless of the number of changes or when they occur, we are still required to come in on schedule," Middleton said.

He noted that the 8010s function as authoring stations, allowing writers to write and to make text changes on the system itself, rather than on paper.

Middleton said that in addition to eliminating errors and improving response to engineering changes, the network, which moves documents at a rate of 500 pages per minute, lets Westinghouse print out up to 50 copies of a manual on a laser printer. Larger press runs are handled by a government print shop using negatives produced by a Westinghouse reproduction facility.

The laser printers allow editors to specify vertical and horizontal columns, multiple columns, graphics, headings, footnotes, type styles and type sizes from their terminals.

Middleton said the network allows the authors to create line art, charts, block diagrams or graphs on the 8010 and merge them with text. He said the ability to control page design gives the writers more control over production.

"It was essential to us that the screen be able to display more than one page at a time and to display text and graphics simultaneously. This feature is important because the text of a manual often refers to a graph or drawing, and the writer must be able to view the illustration while drafting descriptive text," Middleton said.

Program runs in background

The 860 information processing system, running Westinghouse-developed software, allows editors and authors to check text for readability. That program runs in the background while the editor or writer is working and reports whether the length of words and sentences is too complex or too simple for the target reader.

According to Middleton, Westinghouse, which used stand-alone Xerox 850 and Xerox 820 personal computers and shared-logic Wang Laboratories, Inc. OIS 140 word processors before installing the network, plans to add more Xerox 8010s to the network in the future.

"The time and effort involved in technical data and training materials to support a major weapons system are [great]. We are counting on the automation provided by Xerox 8010 workstations to streamline our research and writing efforts and to improve product quality while satisfying our customers' long-range needs," Middleton said.

EFDPMA hosts AI conference

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (EFDPMA) and its local chapters are sponsoring a seminar on artificial intelligence that will examine AI and expert systems for data fusion. Topics will include system requirements, hardware/software options, development tools and advanced knowledge engineering methodologies.

The Intelligent Data Fusion (IDF) seminar will be held at the Colonial Hilton in Boston on Jan. 24 and 25, at the Sheraton Huntsville in Huntsville, Ala., on Jan. 28 and 29 and at the Marriott Twin Bridges in Washington, D.C. on Jan. 31 and Feb. 1.

The registration fee is $525 ($495 for individual members of EFDPMA). There are reduced rates for multiple registrations or for government or university personnel. More information is available from EFDPMA Seminars, c/o Technology Training Corp., Dept. IDF, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90505.

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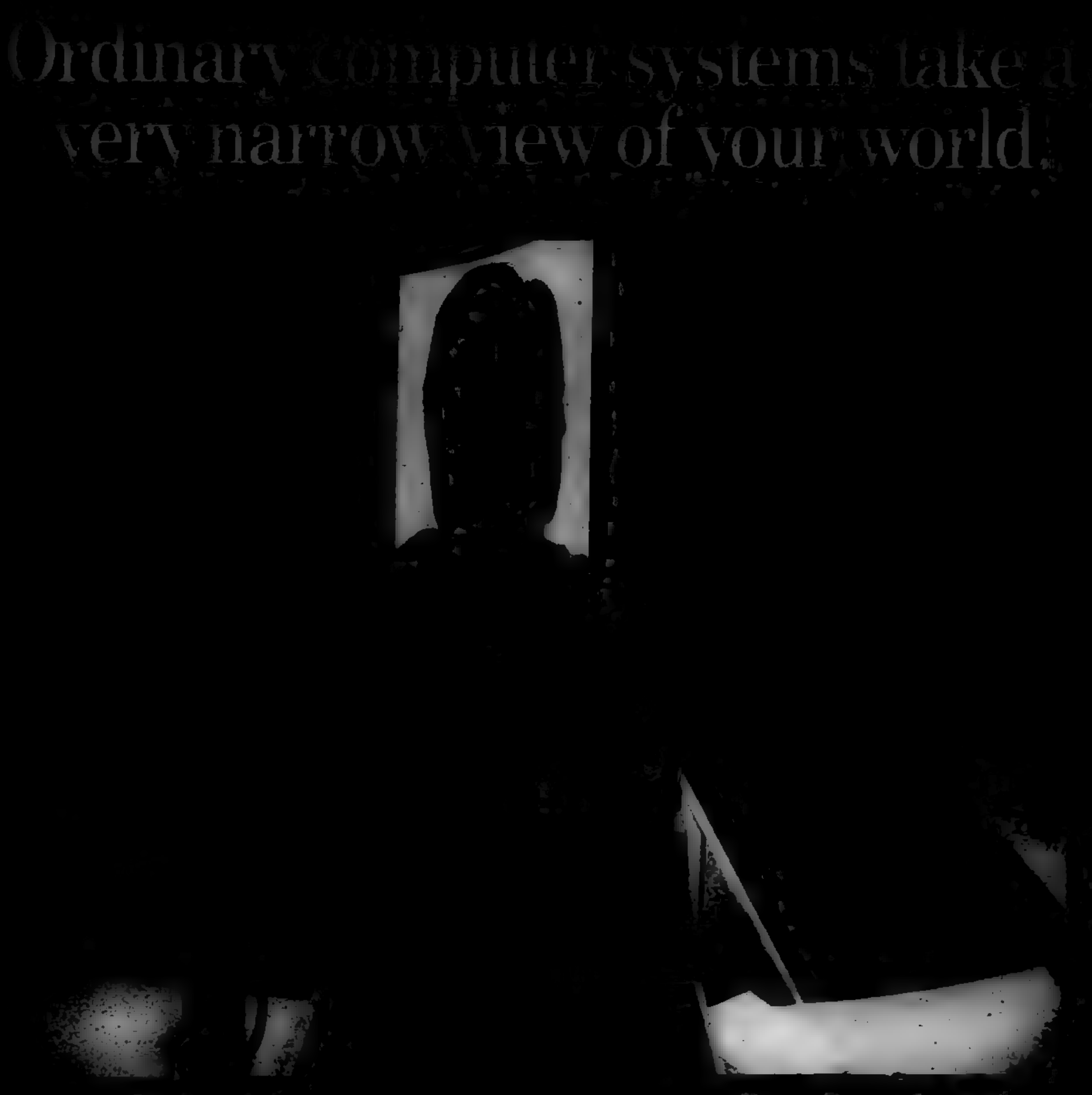
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TURNAROUND TIME

Larry Long

Q In a recent column, you defined "computer literacy" and raised a good point. Your definition was concise and usable as a beginning definition. But is computer literacy a fad or bandwagon upon which people hop without thinking?

The two most visible impacts upon society in this century have been made by the automobile and the computer. I have not, however, found any references to "auto literacy." I can make a few minor adjustments, such as pumping gas and changing tires, but when it really needs attention, I take it to an expert. I know a few buzz words, like "compression ratio," and I even have a vague idea of what they mean. This knowledge neither helps nor hinders me when I drive across town.

Computer literacy is relative. I'm a data processing manager and could professionally stand to be more computer literate, but I know enough to be able to punch the keys on an automatic teller machine.

My definition of computer literacy must have struck a nerve in the computer community. In my definition, computer literate people will be able to do the following:

- Be comfortable in the use and operation of a computer system.
- Be able to make the computer work for them through judicious generation or use of software.
- Be able to generate input from the computer and interpret output from it.
- Understand how computers are affecting society now and how they will affect it in the future.
- Be an intelligent consumer of computer-related products and services.

The analogy to auto literacy does not hold water. Those of us who drive automobiles take full advantage of their potential. When it is cold, we turn on the heater; at night, we turn on the lights; on the interstate, we drive the speed limit. A typical auto will have about 20 user-controled options.

Computing hardware and associated concepts are much more sophisticated. A computer user may have thousands of control options. Computer literate people do not have to understand synchronous communications protocols, but they should have a basic understanding of the devices and appropriate associated concepts, such as data management, systems vs. applications software and so on.

Perhaps the term computer literacy is a fad, but the concept is not. A person achieves computer literacy at a particular point in time. Part of becoming computer literate is learning that there is much more to learn.

Unless a computer literate person retains some exposure to the dynamic field of computers, that knowledge is quickly lost or becomes obsolete.

Over 90% of the population between the ages of 21 and 65 are auto literate, but less than 5% of that same group can drive a computer.

Q My marketing group, which consists of five product managers, myself and three administrative assistants, bought a micro about two years ago. It sat idle for more than six months, and finally, my manager asked me to learn how to use it.

I attended a two-day spreadsheet seminar and returned more confused than informed, but during the next month, I spent just about every waking hour in front of the computer or with a manual. A year and a half later, I am the company's micro "expert." The people in MIS refer all micro questions to me.

I'm still a product manager, but effective use of the computer has cut the time I used to spend on the job in half. Most of my time at work is devoted to assisting people in my group and in other groups with their particular micro needs or problems. I do nearly everything from education to setting up templates, but I don't enter someone else's data.

My unofficial microcomputer activities are actually encouraged by management, but I am evaluated strictly on my performance as a product manager. I find myself enjoying my work with computers much more than my job as a product manager. My current project involves networking the micros in my group.

I'm considering a career change to the computer field, but I don't know where to start. My present employer has been good to me, but I don't think I would enjoy working in our MIS department. My degrees are in business; do I need a computer-related degree? Is there a demand for someone like myself?

There is tremendous demand for people with expertise and home-grown computer talents. In not too many years, the majority of computer professionals will be organizationally attached to user groups, not to a central MIS department. To be sure,

See TIME page 40

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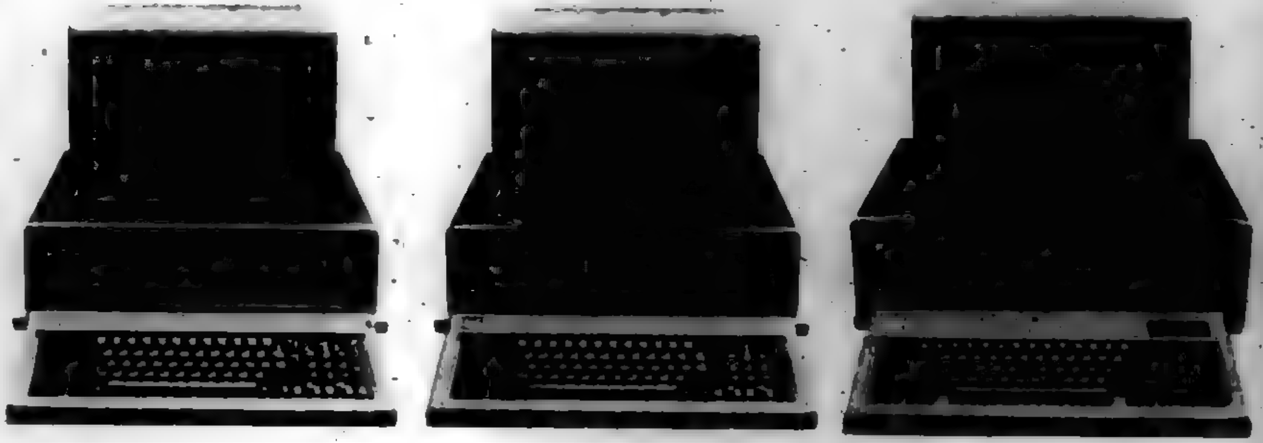

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MANAGERS ON THE MOVE

PAUL A. STELLINE has been named program manager for financial information at GTE Lighting Products in Danvers, Mass.

He is responsible for data processing and information management for four business units within the company.

Stelline joined GTE Lighting Products in 1977 and has held a number of data processing posts there.

In 1980, he was named data processing project supervisor and a year later assumed his most recent position, data processing quality assurance supervisor.

Stelline

He holds an associate's degree from North Shore Community College, a bachelor's degree from Boston University and a master's degree from Rivier College, Nashua, N.H.

■

TIM LUKEN has been appointed vice-president of management and business and information systems for RCA Global Communications, Inc. (RCA Globcom). He will be responsible for RCA Globcom's internal management information systems and office automation.

For the last two years Luken has been director of information systems for the RCA Service Co., including Advanced Systems Development, Operations Research and the company's management information systems and data processing operations.

Before joining RCA in 1982, he held computer management positions with Weyerhaeuser Co. and Caltex Petroleum.

Luken

Luken received a Ph.D in mathematics from the Colorado School of Mines in 1973. He received a master of education in psychology in 1969 and a bachelor's degree in mathematics in 1967 from Xavier University.

■

FREDERICK H. HEMPHILL JR. has joined Lawyers Title Insurance Corp. in Richmond, Va., and has been appointed senior vice-president of management information systems of Continental Financial Services Co., also in Richmond.

Hemphill received his bachelor's degree from Yale University. He is a graduate of the Naval War College and received a master's degree in computer science from the U.S. Naval Postgraduate School.

Sytek meet set

PORTLAND, Ore. — The third annual meeting of the Sytek Network Users Group will take place February 19-21 here.

The sessions will reportedly cover aspects of Sytek, Inc.'s local-area network products, including Localnet/20 and IBM's PC Network, a product developed by Sytek.

More information is available from Greg Scott, Tektronix, Inc., P.O. Box MS 55-156, Beaverton, Ore. 97077.

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CALL FOR PAPERS

CONFERENCE ON SOFTWARE MAINTENANCE-1985

Washington, D.C., Nov. 13

Papers for this conference are being solicited on the topics of controlling software maintenance, case studies including both successes and failures, configuration management, debugging code, developing maintainable systems, software maintenance documentation, maintenance of embedded systems, software maintenance education, end-user software maintenance, software evolution, management of software maintenance, software maintenance metrics, software maintenance error distribution, software maintenance environments, maintenance of software packages, maintenance of hybrid systems, software maintenance practices, software maintenance careers, prototyping and software maintenance, maintenance of real-time systems, maintenance of distributed systems, software retirement/conversion, tools for software maintenance, technology transfer, testing software maintenance changes and understanding the software maintainer.

Five copies of papers and panel-session proposals should be sent to Roger Martin (CSM-85), National Bureau of Standards, Room B266, Building 225, Gaithersburg, Md. 20899.

Proposals for activities other than presentations of papers should be sent to Wilma M. Osborne, Caucus Chair, National Bureau of Standards, Room B266, Building 225, Gaithersburg, Md. 20899. The submission deadline for papers is Feb. 4. Acceptance notification will be April 26.

THE INTERNATIONAL TEST CONFERENCE 1985

Philadelphia, Oct. 1-3

Appropriate topics for paper submission may include, but are not limited to, the following areas: testability measures and fault analysis, computer-aided test generation and design validation, memory test, microprocessor and very large-scale integration test, wafer-scale integrated test, test equipment and methods, design for testability, analog and hybrid test, test software, surface-mounted component and assembly test, built-in self-test, test economics, quality and reliability, systems test, board test, process and test data management, test engineering management, artificial intelligence applications to test and future trends. Deadlines for submission are March 1 in Europe, Asia and India and March 15 in the U.S. and elsewhere.

The outline — defining the purpose of the work, the results obtained, conclusions and how the paper advances the technology — must be submitted in 10 copies to: A.B.M. Elliot, British Telecom Research Laboratory, Martlesham Heath, Ipswich, England IP5 7RE, in Europe; Tsuneta Sudo, Atsugi Elec. Comm. Lab., NT&T, 1839 Ono, Atsugi, Kanagawa 243-01, Japan, in Asia; Nripendra N. Biswas, Dept. of Elec. Comm. Engr., Indian Institute of Science, Bangalore 560-012, India; Rudy Garcia, International Test Conference 1985, P.O. Box 264, Mount Freedom, N.J. 07970, in the U.S. and elsewhere.

Additional information may be obtained from The International Test Conference 1985, P.O. Box 264, Mount Freedom, N.J. 07970.

INFORMATION SYSTEMS EDUCATION CONFERENCE (Isecon '85)

Houston, Oct. 26-27

Papers are now being solicited for the Information Systems Education Conference.

The deadline for submission of papers is Jan. 15. Contact: George Fowler, Program Chairman, College of Business, Texas A&M University, College Station, Texas 77843.

THIRD ANNUAL CONFERENCE OF THE AMERICAN VOICE INPUT/OUTPUT SOCIETY (Avios)

San Francisco, Sept. 10-12

Papers submitted should address one of the following applications: research or technology in categories such as telecommunications, office systems, manufacturing, materials handling, medicine, aid to the disabled, robotics, voice store and forward, education and consumer products.

The deadline for submission of abstracts is March 15.

Abstracts should be sent to Avios, P.O. Box 60940, Palo Alto, Calif. 94306.

TIME

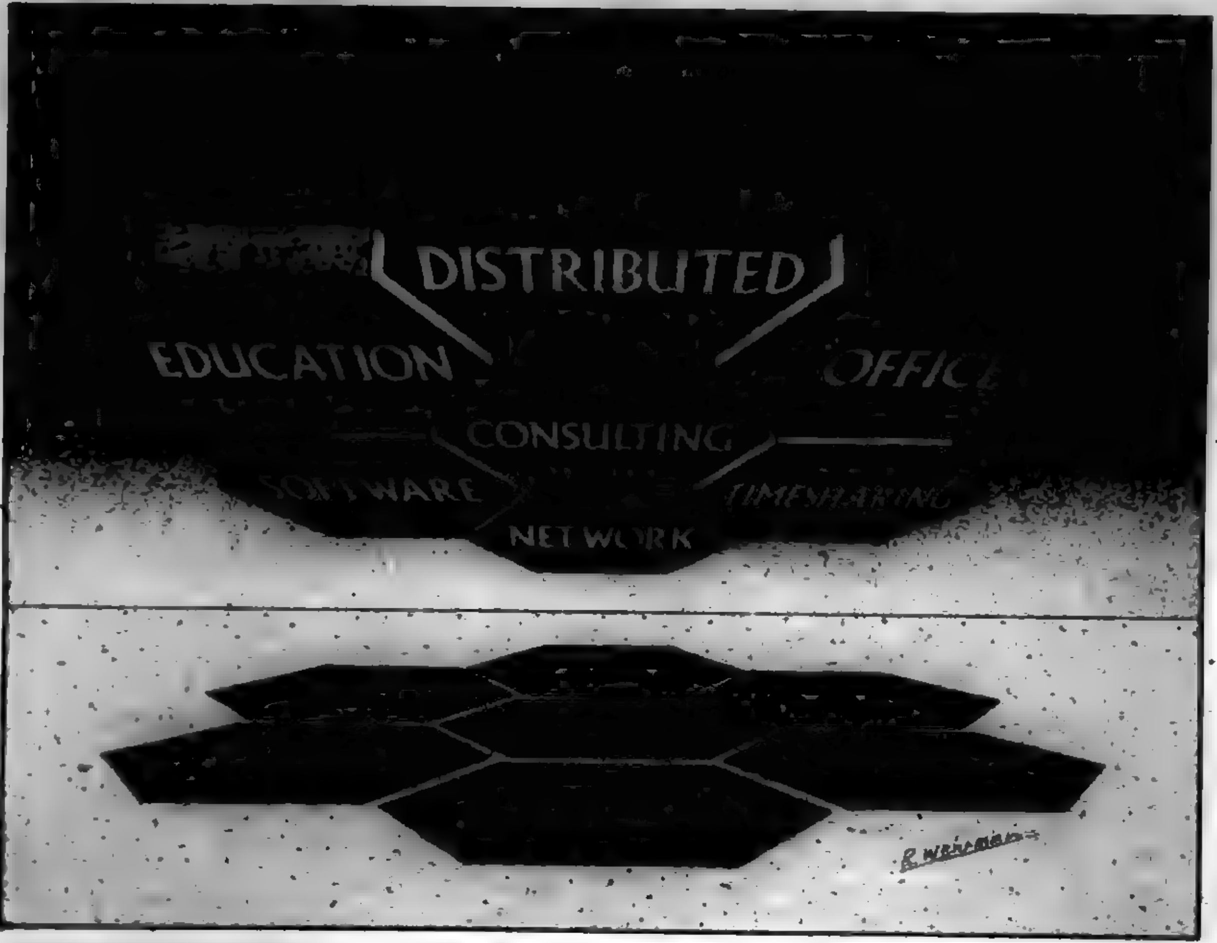
from page 38

there will be centralized control, but just about everything else will be distributed to the user areas, including people. The point is: You don't have to be affiliated with an MIS department to be a computer specialist.

Express your desire to pursue a more computer-oriented career to your manager. I would be surprised if your manager, or perhaps someone higher up, doesn't jump at such an opportunity. If they don't, there are a thousand marketing managers who will. The typical product manager in marketing still spends at least four hours every day laboriously seeking information that, with a little forethought and a micro, could be obtained in an hour.

If you wish to continue full-time with micros in a user area, an occasional continuing education course and plenty of reading will suffice. A degree in computer science will be of marginal value.

Meeting all your information needs requires total systems integration knowledge and experience.



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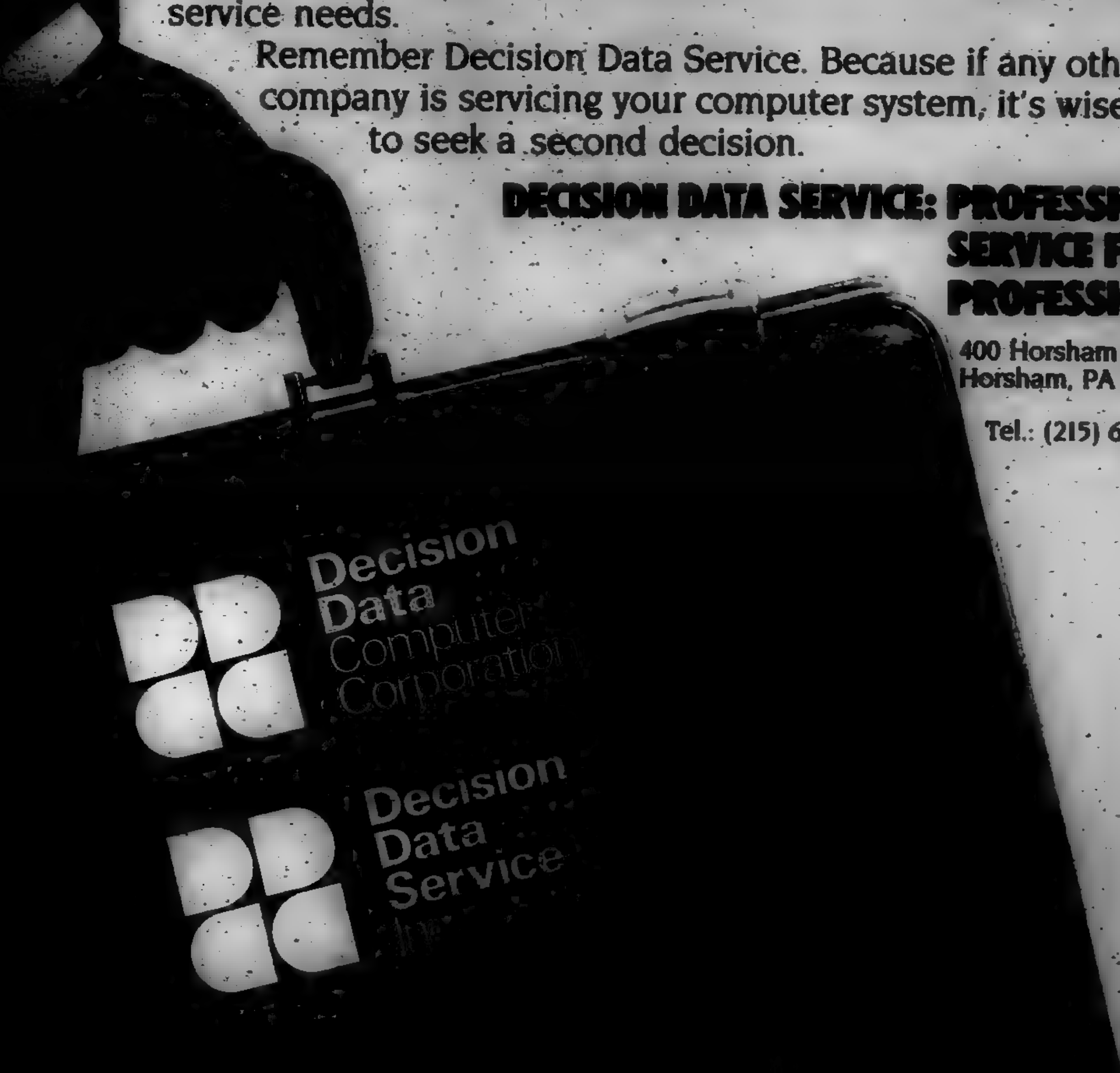

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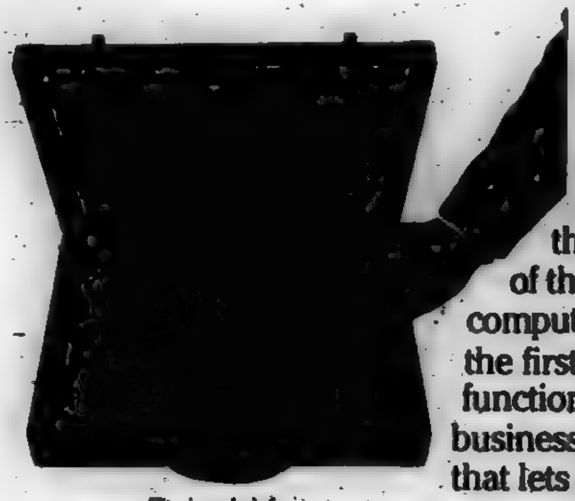
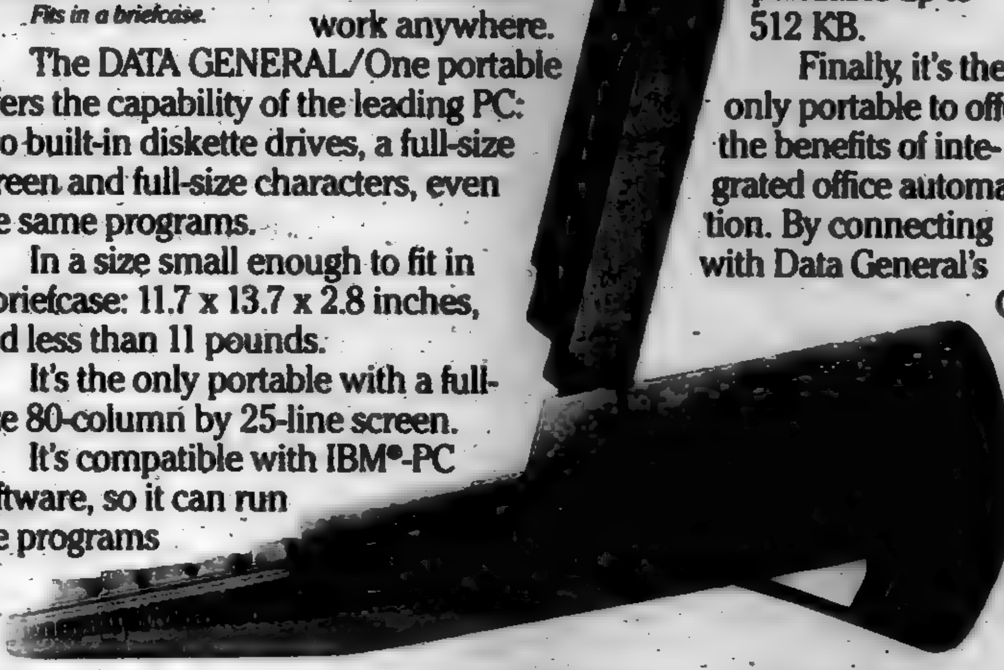


Fits in a briefcase.



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CALENDAR

WEEK OF JAN. 20

JANUARY 21, BOSTON — **How to Document a Computer System.** Contact: Technical Communications Associates, Suite 210, 1250 Oakmead Pkwy., Sunnyvale, Calif. 94086. Also being held Jan. 23 in Hartford, Conn.

JANUARY 21-22, ORLANDO, FLA. — **Vsam OS & DOS Performance & Tuning.** Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JANUARY 21-23, ATLANTA — **EDP Auditing & Controls.** Contact: Laurie Christie, Training Services, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JANUARY 21-23, ATLANTA — **Auditing Advanced Computer Systems.** Contact Laurie Christie, Training Services, MIS Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JANUARY 21-23, FORT LAUDERDALE, FLA. — **Office Information Systems Conference.** Contact: Lynn Bentley, Gartner Group, Inc., P.O. Box 10212, 72 Cummings Point Road, Stamford, Conn. 06904.

JANUARY 21-23, ATLANTA — **Auditors Role in Systems Development.** Contact: Laurie Christie, Training Services, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JANUARY 21-24, LOS ANGELES — **CICS Application Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JANUARY 21-25, DALLAS — **Uniforum: The International Conference of Unix Users.** Contact: Uniforum, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

JANUARY 21-25, HARTFORD, CONN. — **ANS Cobol Programming Workshop 1.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 21-25, RALEIGH, N.C. — **C Programming Workshop.** Contact: Suzanne Battista, Plum Hall, Inc., One Spruce Ave., Cardiff, N.J. 08232.

JANUARY 21-25, DENVER — **Computer Basics for Human Service Managers and Practitioners.** Contact: West Virginia University Research and Training Center, Suite E, One Dunbar Plaza, Dunbar, W.V. 25064.

JANUARY 21-29, HARTFORD, CONN. — **Assembler Language Coding Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St, Hartford, Conn. 06120.

JANUARY 22-23, SAN JOSE, CALIF. — **Technology and Market Forecasting in Electronics.** Contact: Futurecast Learning Center, 40 Birch St., Redwood City, Calif. 94062.

JANUARY 22-23, SAN DIEGO — **Maintenance Management for Productivity.** Contact: Institute of Industrial Engineers, Continuing Education Program Department, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JANUARY 22-24, SAN FRANCISCO — **Microspeak '85.** Contact: Stephen Schneiderman, Micro Communications, 500 Howard St., San Francisco, Calif. 94105.

JANUARY 22-25, LOS ANGELES — **Knowledge-Based Systems.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

JANUARY 23-25, ORLANDO, FLA. — **CICS/VS Internals for Systems Programmers.** Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

JANUARY 23-25, DALLAS — **Usenix Association Technical Conference and Tutorials.** Contact: Usenix Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

JANUARY 23-31, HARTFORD, CONN. — **PL/1 Programming Workshop.** Contact: Don Florek, The Hartford Graduate Center, 275 Windsor St., Hartford, Conn. 06120.

JANUARY 24-25, FORT LAUDERDALE, FLA. — **Local-Area Communications Conference.** Contact: Lynn Bentley, Gartner Group, Inc., P.O. Box 10212, 72 Cummings Point Road, Stamford, Conn. 06904.

JANUARY 24-26, SAN DIEGO — **The 1985 Society for Computer Simulation Multiconference.** Contact: The Society for Computer Simulation, P.O. Box 2228, La Jolla, Calif. 92038.

JANUARY 25, DALLAS — **The Business of Data Communications Using FM Subcarriers.** Contact: Waters Information Services, Inc., Suite 322, Security Mutual Building, Binghamton, N.Y. 13901.

WEEK OF JAN. 27

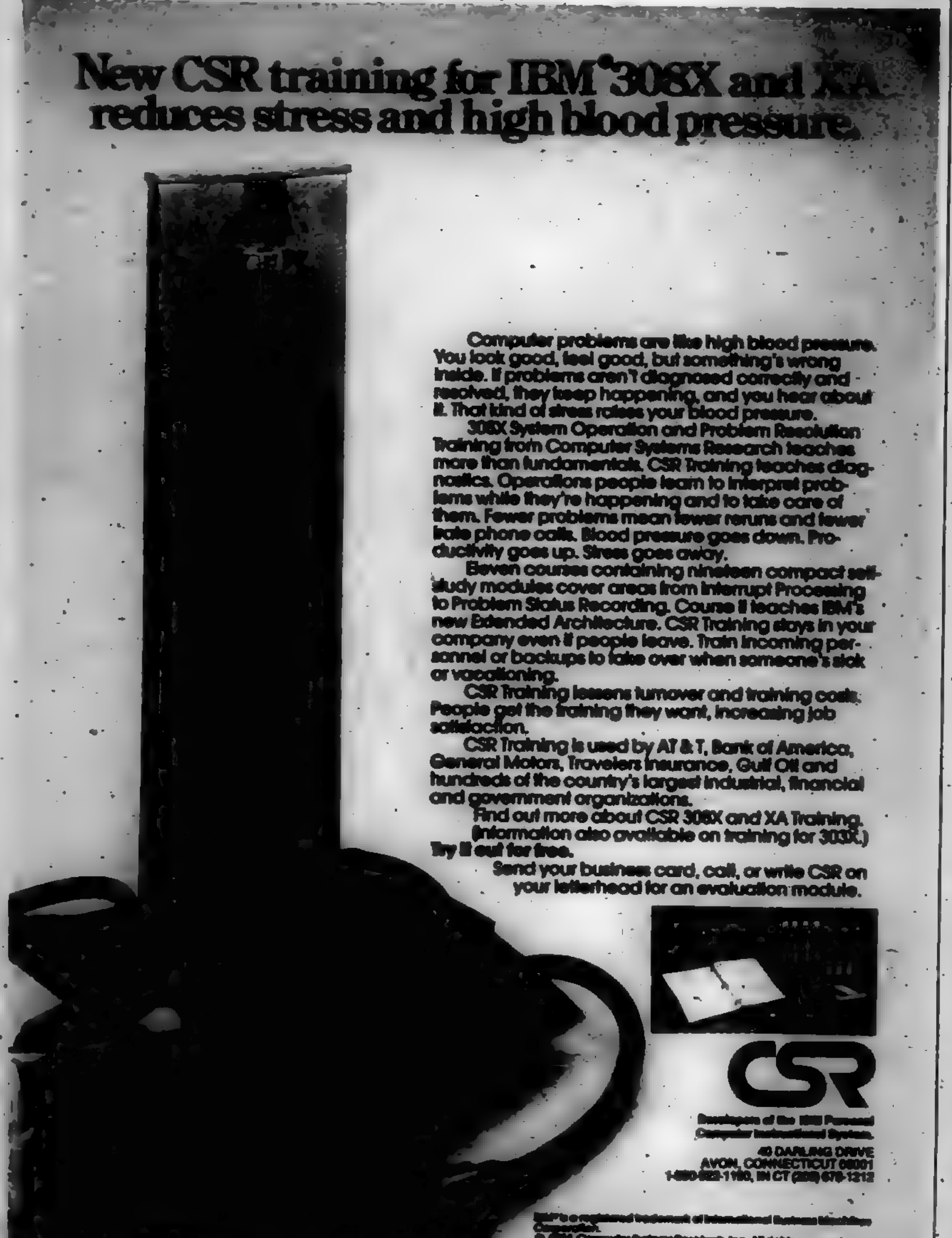
JANUARY 28-29, WASHINGTON, D.C. — **Operating Systems: A Comparative Analysis.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

JANUARY 28-30, DALLAS — **Relational Data Base.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

JANUARY 28-30, NEW YORK — **Job Control Language.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JANUARY 28-FEBRUARY 1, DES MOINES, IOWA — **Basic Systems Analysis.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

JANUARY 31-FEBRUARY 1, NEW YORK — **Utilities/IDCAMS.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.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EDITORIAL

Riding the wave of change

These who survive and prosper in the computer business are the ones who anticipate the waves of change that characterize it, reacting before the waves hit and gaining ever greater advantage over competitors.

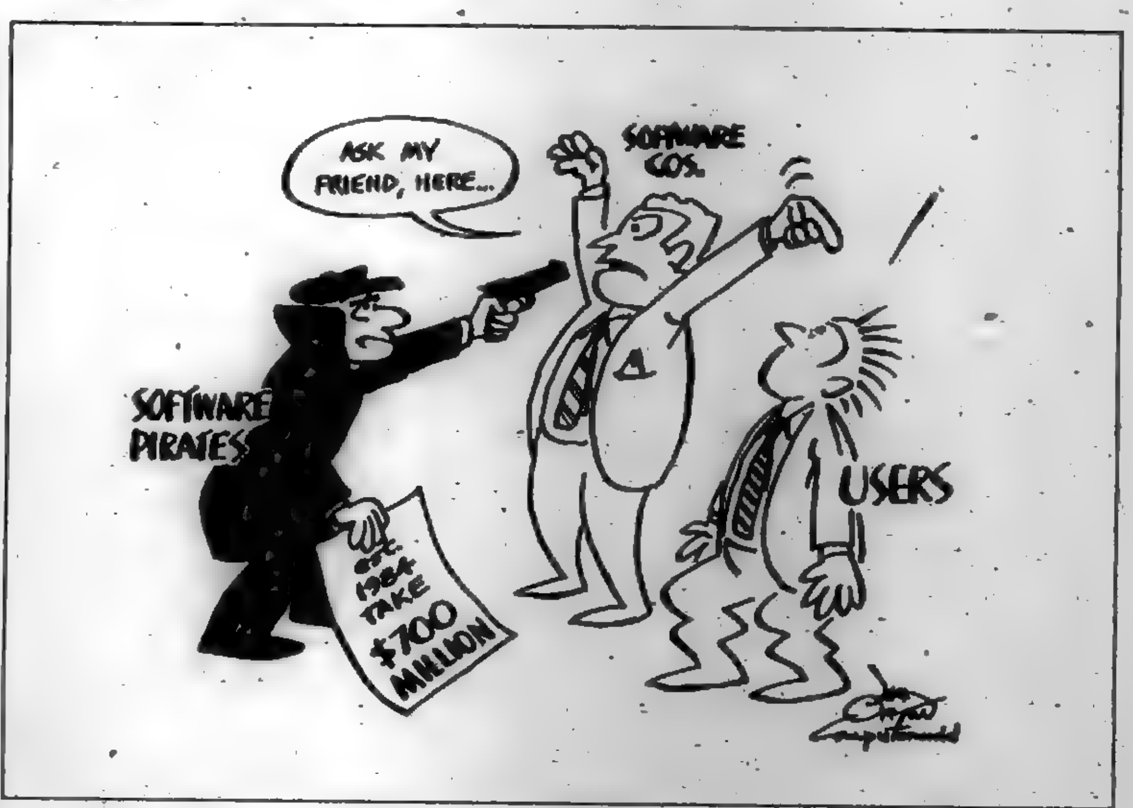
The same is true in the computer journalism business. Over the years, *Computerworld* has committed the resources needed to solidify its position as the No. 1 trade publication in the U.S. We have done this to anticipate change better and to interpret its impact on our readers.

Last year brought several changes to the computer business and, correspondingly, to *Computerworld*. We made key additions to our writing and editing staff, overhauled the design of the paper and added a technical section dedicated to microcomputers in the corporate environment.

This year promises no letup in the frenetic pace of change in the computer business, which again will be reflected in further expansions and additions to *Computerworld*'s coverage. Here's what we're planning:

- **Micro software benchmarks.** Starting in today's issue (page 11) and running once a month thereafter, our micro software benchmarks will attempt to assist managers in sorting through the plethora of vendor offerings before making a buying decision. The benchmarks are conducted by Yates Ventures, Inc. and feature an extensive graphical presentation as well as a detailed analysis of the tests conducted.
- ***Computerworld* Update.** Starting in April, we will present a monthly feature to keep you posted on key management and technology subjects. The purpose of the updates will be to offer the DP manager a critical look at managerial issues, such as recruiting and evaluating career paths, and an overview of emerging technologies, such as the fifth-generation push.
- **Expanded bureau coverage.** Recognizing that the Southeast represents one of the fastest growing areas of the country, *Computerworld* is opening an editorial office with one correspondent in Atlanta. In addition, we will add a second correspondent to our metropolitan New York office, which serves the most densely packed data processing community in the world.
- **Expanded graphics.** We have beefed up our design staff with the intention of providing more informational graphics to accompany our news stories and features. We recognize that our readers' time is precious and that a picture can be worth many words.
- **New columnists.** The op-ed page this year will feature new columnists in addition to those our readers have come to know. Today, for example, Walter F. Cuirle begins his fortnightly Management Matrix column.

We will continue to employ our tried-and-tested formula of printing news, not idle gossip and speculation, as we believe our readers have limited reading time and want their news right the first time. We are here to serve you, the DP manager, and always welcome your suggestions on how to do so better.



LETTER

User rises to defend IBM AT

The article "IBM AT falls short in Personal Computer compatibility" [CW, Dec. 17], was completely unfounded.

The statement regarding the screen update speed is simply not true. Your source may have been actually observing some other characteristic of the computer or program he was using. Also, the monitor limits the speed since IBM always waits for a new horizontal retrace signal before placing any characters into the screen buffer.

Regarding the statement "The AT can be upgraded from 512K bytes to its full 640K-byte random-access memory (RAM) capacity only by addition of a 128K-byte memory add-on board available only from IBM," this is another falsehood. I am using a Persist Time Spectrum multifunction board and it works just fine. I am running with 256K-byte RAM on my motherboard and 384K-byte RAM on my non-IBM multifunction board. This same multifunction board has been running in my Personal Computer since 1982.

The article states, "The AT is not compatible with the popular Iomega Corp. Bernoulli Box storage system for the Personal Computer." The problem here is simply that the software written by Iomega uses the speed of the Intel Corp. 8088 to determine drive integrity. I wrote software for the Iomega that does not rely on the speed of the computer. The Iomega hardware is completely compatible. It is certainly not IBM's fault if people write software that is dependent on machine speed.

Some users were described as dissatisfied with the AT's "inability to access full potential RAM." I

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VIEWPOINT

Enlist allies in campaign for bigger DP budget

THE DATA CENTER
John P. Murray

If you have made a commitment to build a higher level of information processing service for your organization, as you move toward that goal an entire set of new considerations relative to the function will arise. As the environment changes, the factors used to determine the establishment of the service level will also change.

As an example, consider the installation of an effective, successful data base management system (DBMS). After the considerable preliminary work has been accomplished and as a true DBMS environment begins to develop, a number of new opportunities for service to clients will begin to appear.

These opportunities will be found not only in the ability to produce information much more rapidly, but in the ability to manipulate and view that information in an expanding number of ways. An additional benefit will be the ability to do so without any involvement on the part of the information processing department.

As this environment evolves and clients begin to grasp the implications of these expanded capabilities, increased emphasis will be placed upon the continuing requirement for flexibility and responsiveness.

If the function is adequately supported and managed, what occurs is the development of an information utility. Those who desire information can obtain it with relative ease, speed and independence.

It is interesting, given a reasonable degree of success with the data base environment, how rapidly the clients will not only use the facility, but how rapidly they will demand expanded services and functions. This is particularly the case when a good fourth-generation programming language is made available to the clients and when its use is aggressively encouraged by information processing management.

Breach in information 'dam'

Once clients can begin to pose questions and obtain answers on their own, they begin to generate a number of questions they want answered through the facilities of the DBMS. As this develops, the appetites of at least some of the clients will quickly become almost insatiable. It is not an exaggeration to contend that the information "dam" will be breached.

As they gain confidence, the clients will begin to consider and want to try new methods to obtain, analyze and present this newly available information. The questions clients pose will begin to change from "would it be possible to . . . ?" to "why can't I . . . ?" A subtle change perhaps, yet it moves them from the realm of supplicant to practitioner.

In terms of value to the organization, the posing of such questions, coupled with the ability to answer many — perhaps most — without information processing department assistance, should be viewed as a very positive circumstance. However, such an environment does create a new set of concerns for information processing.

As the capabilities of the information utility begin to expand, sooner or later the issue of cost will become a factor. Providing this flexible, responsive environment does involve expense. Because the information processing department budget is often one of the larger expense items in most organizations, it is often the target of criticism.

The reasons for the increases in the budget are often overlooked by senior management. It is simply the case that as more becomes feasible, more is desired by the clients. The delivery of increased information has a cost; most of that cost will, unfortunately, find its way into the information processing department budget.

There is no question that the plethora of increased benefits to be found in the effective use of the new technology more than justifies the additional expense.

Link benefits, costs to improved management

The problem centers around the issue of helping senior management understand the value of that new technology. The goal is to link the increased benefits and costs to the improvement in the management of the entire enterprise.

The most effective means of communicating the value of the new environment is the development of an emperical perspective. The question of where the organization has been, as opposed to where it is now and where it can be taken, can, given a record of accomplishment, be used to build a strong case.

Those in other departments who have benefited from the success of the technology can greatly assist in the effort to convey its merits to management. The use of more advanced technology can drive the organization ahead. Those in areas outside information processing who are the recipients of these benefits should be solicited to help assure senior management of the value of the additional expense required to continue to increase flexibility and responsiveness.

This approach can also move much of the argument about such expenditures from the technical to the business area. The ability to discuss the benefits in the context of business, rather than technical functions, can be helpful. This is particularly the case when that argument is bolstered by members of departments other than information processing.

Despite such an apparently strong position for the continued support of increased funding to help the organization move ahead, a favorable response from senior management is by no means assured. There are situations where, for whatever reason, senior management simply will not provide adequate support for information processing. When that situation is encountered, those in the department who have made a commitment to the development of a quality function face a career decision.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Building on borrowed time

MANAGEMENT MATRIX
Walter F. Cuirle

Don't stop me if you've heard this one. The scene is a project planning meeting in a large corporation. Among the participants are the programming supervisor, let's call him Eric, and a representative of the end user of the proposed software product. The time line is laid out and the critical paths are identified. Since this is a new project, the schedule starts with the long, lonely word "specifications." And Eric's name is on it.

Eric shuffles his boots and says, "Look. That delivery date's pretty tight, and I'm not sure about it. We all have a pretty good idea of what this thing's supposed to do. Let's settle the specs verbally right here, skip the written folderol, and I can save us three weeks. The time my people would spend writing specs they could spend writing code."

The user just wants delivery on time. Nobody else there can really get started with his particular piece of the project until after Eric gets rolling. Everybody agrees to the idea.

I knew you might have heard this one before. Eric goes back to the director of MIS to report his little coup. The director, an otherwise sane individual, listens to Eric's arguments and, in a moment of weakness, agrees. Four months later the project is behind schedule and over budget.

Eliminating specifications is a seductive idea, in part because specifications are like a down payment on a project and leveraging a payment over time is a seductive idea. Ask any credit bureau. But it's not always a good idea. Look at any amortization schedule. Eliminating specifications is like borrowing time at heavy compound interest — always from the future of your own organization and that of the end user. On the other hand, there just might be occasions when you want to do it. What, in fact, is the interest on that borrowed time?

> *Eliminating specifications is like borrowing time at heavy compound interest — always from the future of your own organization and that of the end user.*

Let's start with the 80/20 rule of thumb. That's the old saw, "Eighty percent of the work gets done in 20% of the time allotted." The corollary is, "It takes 80% of the time spent on a job to do the last 20% of the work." You know the feeling, particularly near the end of a project, when practically the whole thing is in place, but it seems to take forever to get the last few loose ends tied up. Suppose the 80/20 rule is true. If so, then productivity is 16 times higher in the early phases of a project than it is near the end.

It's not important how you measure productivity — lines per hour, function points per hour, pages per day, gallons of coffee per week — it's still a factor of 16. Here's why.

Drop in productivity

Take a look at a finished project as a baseline, let's say 100 points worth of code that took 2,000 hours from first meeting to final sign-off. If the 80/20 rule is true, then 80 points were done in the first 400 hours and the remaining 20 points took 1,600 hours. This means that productivity early in the project was one point per five hours, dropping off to one point per 80 hours near the end. The ratio of early to late productivity is 16.

So far, this looks like a good argument for not doing specifications. Maybe Eric's right. With productivity that high, you could get a lot of code done early in the project, and you should have a working system fairly early.

The catch is that, without specifi-

See PROJECT page 48

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

LETTERS

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would hardly expect that the inability to reference more memory than you can put on a Personal Computer or Personal Computer XT would be an incompatibility. An incompatibility is not being able to do at least the same thing.

"Only about 36% of the Personal Computer's software base has been certified as usable on the new machine." Who exactly is the certifying agency? I don't think there is one.

Here is the real story. A quick look at the read-only memory (ROM) listings will show that IBM has gone to a great deal of trouble to give compatibility to even those programmers that were told not to rely on the locations of tables, pointers and entry points in the ROM.

I've dug into schematics, tested direct memory access and interrupt controller programming, checked out keyboard interrupt processing, compared the Intel 8087 and 80287 differences and tested all of our own code; the AT is as compatible as you can get and still have a reasonable upgrade.

Programmers have been informed through Intel publications and magazine articles that there are some differences in the 8088 and the 80286. Those few differences are so minute that the number of programs that would be affected is almost nil. If there appear to be incompatibilities, they are probably due to poor programming practices.

Anyone advertising an Intel 80286-based computer that is more compatible than the AT has probably picked an isolated case and used Personal Computer technology — such as using 360K-byte disk drives — to regain "compatibility."

Edward S. Quicksall
San Antonio, Texas

Modem fits to AT

The article "IBM AT falls short in Personal Computer compatibility" [CW, Dec. 17] states: "Compatibility problems have also arisen when some users tried to insert communications add-on boards for the Personal Computer into one of the eight expansion slots of the Personal Computer AT. Roy Hill, chief programmer in the technical support section of Michigan Blue Cross/Blue Shield, said he found the Hayes Microcomputer Products, Inc. Smartmodem board would not work in any of his firm's four ATs."

I do not know what specific problems Hill encountered, but I know that the Hayes modem can be installed in an AT. I own and use an enhanced IBM Personal Computer AT. When I purchased it, I installed the Hayes 1200B internal modem taken from my previous IBM Personal Computer. The Hayes works like a charm, and I use it extensively for telecommunicating and autodialing.

The AT has eight expansion slots. Two of these use the identical connector that was used in the IBM Personal Computer. The remaining six slots use the new 16-bit connector. Usually the fixed/floppy disk controller is inserted in one of the 16-bit slots, leaving five slots for other uses. A display adapter takes up one of the two 8-bit slots, leaving one remaining.

The Hayes modem will fit snugly into that one and will work without a hitch. The modem must be installed in the remaining 8-bit slot. Mr. Hill is correct in that it will not fit in any of the five 16-bit slots.

Dr. C. Scot Giles
Oak Park, Ill.

Sample DP crime bills

In reference to the article "DP groups begin computer crime law efforts" [CW, Dec. 3], I think the following may be helpful.

In 1979 the National Association for State Information Systems issued guidelines for drafting computer crime legislation which contained a sample bill. This bill and another were published in the 1981 edition of "Suggested State Legislation."

The just-released 1985 edition of "Suggested State Legislation" contains two updated drafts of such bills, one of which contains provisions addressing minors and hackers. The use of these publications may save a lot of research time.

They can be obtained at a cost of $12.00 and $15.00, respectively, from the Council of State Governments, P.O. Box 11910, Lexington, Ky. 40578.

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PROJECT

from page 47

cations, that system isn't likely to be deliverable. You are going to have to make a lot more changes to the system than you normally would, and you'll be making those changes late in the project. So, a feature that might have taken two hours to implement if it had been properly specified up front will take 32 hours later on.

Oh, it probably won't take a full 32 hours of programmer time. It will almost certainly be more than two, but the remainder comes out of other departments. For example — near the end of the cycle, your user documentation is in progress and probably near completion. Now it has to be changed. Maybe a conversion is in progress and needs to be modified, halted or backed up. That takes time — not to mention the time now taken up by an increased number of phone calls from increasingly frosty colleagues.

So there you have it. It will cost you 1,600% interest on the borrowed time if you try to get a product up and running without specifications — which goes to prove another old saying: "If there is time to do it over, there was time to do it right."

SOFTWARE & SERVICES

Information engineering evolving into a science

SOFTLINE
William H. Inmon

As data processing has evolved, approaches to engineering increasingly complex information systems have become more streamlined and globally oriented.

In this first of a two-part Softline, Inmon looks at the new information engineering environment.

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

Information engineering — the discipline of computerizing systems on a platform of stability and manageability — has its origin in the structured movement. The structured approach proclaimed that coding and design practices could lead to systems that could be constructed quicker and maintained more easily. Information engineering has progressed to where the promise of system stability is beginning to be realized.

To date, the focus of information engineering has shifted several times, much like a swinging pendulum. In the early days, structured

See INMON page 58

THREE LEVELS OF DATA MODELING

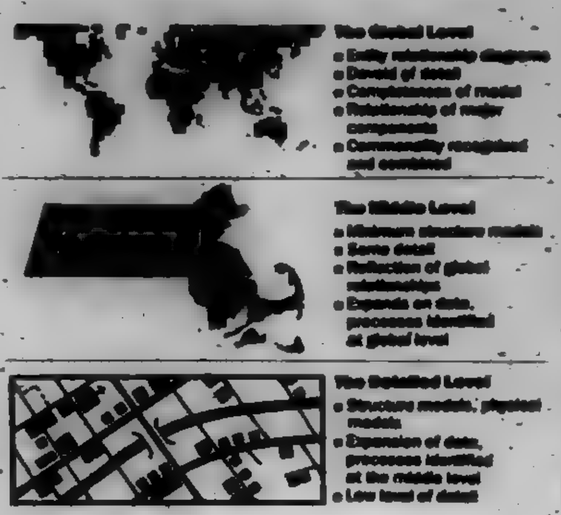
The Global Level
Entity relationship diagrams
Devoid of detail
Completeness of model
Relationship of major components
Commonality recognized and combined
The Middle Level
Midlevel structure models
Some detail
Reflection of global relationships
Expands on data, processes identified at global level
The Detailed Level
Structure models, physical models
Expansion of data, processes identified at the middle level
Low level of detail

Figure 1

■ The U.S. Department of Defense has validated Verdix Corp.'s Ada compiler for Digital Equipment Corp. VAX processors running Unix/56

■ I. P. Sharp Associates Ltd. has released a data management system for IBM mainframe-based information centers/56

INSIDE
Systems Software/56

PC Info micro-mini link out from Henco

WALTHAM, Mass. — Henco Software, Inc. has introduced a micro version of its Info fourth-generation language information management system that allows micro users to tap into Info files and applications on a mini.

PC Info is compatible with the company's mini versions of Info. It features the same functions, screen and report generators, command sets, relational capabilities and interfaces to standard data files as Info. PC Info also provides an upload/download function that allows users to access existing Info applications, reports and files on both the mini and micro.

PC Info also offers a conversational language that allows users to create and maintain data and lets users perform DP functions without conventional programming techniques.

PC Info is available for the IBM Personal Computer-XT and Personal Computer AT. PC Info requires a micro with 512K bytes of memory, IBM's PC-DOS 2.1, a 10M-byte hard disk drive and a 5¼-in. diskette drive. It is priced at $1,200.

Henco Software is located at 100 Fifth Ave., Waltham, Mass. 02154.

SOFTALK/PAUL GILLIN

Firm's inaugural, exec-friendly tool worth a look

This column is rarely used to discuss new products, but there is one product debuting late this month that merits a look from DP managers who are trying to get their executives to use computers.

Command Center is the first product of Pilot Executive Software, Inc., a Boston-based firm founded by David Friend. Friend was the force behind Computer Pictures Corp., which developed the Trend-Spotter executive workstation, and ARP Instruments, Inc., a well-known name in musical synthesizers.

At first glance, Command Center looks a lot like Trend-Spotter. But Pilot's premier product has some interesting and unique twists. Command Center uses an IBM Personal Computer connected to an IBM VM-based mainframe or Digital Equipment Corp. VAX computer. Extracted data is maintained on the mainframe and only downloaded on the microcomputer in very limited doses. Thus, the user can perform some fairly sophisticated manipulations utilizing large-system power and uses the micro only for things like full screen editing, local storage and graphics.

Command Center has a data import facility that allows data to be extracted from any number of external and internal data bases and file structures and loaded into a dedicated data base, according to Pilot. It then has an assortment of embedded routines that can be used for statistical and graphics analysis. In front of all this is a mouse-driven interface and a customi-

See PILOT page 54

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MVS/XA MVS

I.P. Sharp unveils info center data management system

TORONTO — I.P. Sharp Associates Ltd. has announced a large-scale data management system for information centers based on IBM mainframes under IBM's MVS, MVS/XA and DOS/VSE operating systems.

Called Viewpoint, the product provides maintenance, retrieval and data analysis capabilities as well as an electronic mail facility. The electronic mail features make it possible to send reports around the world using I.P. Sharp's Ipsanet international communications network. The IBM Systems Network Architecture and asynchronous networks are also supported. Viewpoint includes a report writer, integrated graphics, multilanguage capability and secure shared data access around the world, a spokesman said.

Management tools include accounting and chargeback statistics and data and user administration tools. An online Help facility is included.

A Viewpoint installation provides a controlled hardware environment with crash recovery, system performance tracking and reporting tools and real-time resource monitoring to the end-user level, the spokesman said. The company provides installation assistance and 24-hour support.

A Viewpoint workstation enables IBM Personal Computer users to access the product in the same way as users with full screen display stations but over an asynchronous network.

A long-term license fee costs $37,500 plus 15% per year for services and enhancements. The monthly license fee is $1,500 including service and enhancements.

I.P. Sharp is located at Suite 1900, 2 First Canadian Place, Toronto, Ont., Canada M5X 1E3.

DOD backs Ada compiler from Verdix

MCLEAN, Va. — Verdix Corp. has announced Department of Defense (DOD) validation of the company's first Ada language compiler.

According to a spokesman, DOD validation of the Verdix Ada compiler was completed in mid-December. The compiler is the base of the company's Verdix Ada Development System (Vads), which is scheduled for delivery in January. Vads is said to be a production-quality system that supports large-scale Ada software development. Vads utilizes the AT&T Unix operating system and is implemented on Digital Equipment Corp. VAX-11 processors. Vads includes runtime support and library management and symbolic debugger utilities designed to facilitate programmer productivity.

The complete Vads system, including the validated compiler, is priced between $7,500 and $30,000 depending on the host machine.

Verdix is located at Westgate Research Park, 7655 Old Springhouse Road, McLean, Va. 22102.

SYSTEMS SOFTWARE

MACRO 4, INC.
Vpac Performance Accounting and Control

Macro 4, Inc. has announced the Vpac Performance Accounting and Control system for IBM mainframes running under IBM's VM operating system.

According to a spokesman, Vpac runs as a virtual machine to monitor events occurring in other virtual machines and in VM's Control Program. The data the system gathers is written to a file on a normal IBM CMS minidisk.

Other Vpac facilities include a real-time monitor and exception condition reporting, resource control and

Continued on page 51

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We believe that anyone who has an IBM product will want to have blue chip service

SOFTWARE & SERVICES

Continued from page 50

long-term planning capabilities.

Vpac is said to display current and historic usage of key resources. Its monitoring capabilities allow the user to detect overcommitment of resources before users are affected.

Vpac is available for an introductory lease price of $195/mo until March 1.

Macro 4, P.O. Box 187, Millbrook Plaza, Mt. Freedom, N.J. 07970.

UNIPRESS SOFTWARE, INC.

Amsterdam Compiler Kit for AT&T Unix

Unipress Software, Inc. has introduced a package of C and Pascal compilers and assemblers for the Unix operating system.

The Amsterdam Compiler Kit reportedly compiles C and Pascal language programs and produces code designed for Unix-based processors using Motorola, Inc.'s 68000 and Intel Corp.'s 8086 microprocessors and Digital Equipment Corp.'s VAX-11 and PDP-11 minicomputers.

The kit consists of a preprocessor, a front end, a peephole optimizer, a global optimizer, a back end, a target machine optimizer, a universal assembler and a utilities package. Complete source code is included. The kit costs $9,950.

Unipress Software, Suite 312, 2025 Lincoln Hwy., Edison, N.J. 08817.

JCA SOFTWARE, INC.

SAR Version 3.0

JCA Software, Inc. has introduced a version of the Sysout Archival and Retrieval System (SAR) designed for use with IBM's MVS and MVS/XA operating systems. The SAR package was developed by Essential Software, Inc and is marketed by JCA Software.

The SAR package reportedly enables an MVS installation to archive and retrieve system output — IBM's Sysout — on-line and to print only the information that is needed. SAR can interface with Essential Software's Express Delivery Report Distribution and Tracking System.

SAR is said to archive job control language (JCL) listings, systems log data and reports to disk and tape. It also scans JCL listings for exceptional conditions.

The price of SAR Version 3.0 is $15,000 for a site license.

JCA Software, Suite 224, 2182 Dupont Drive, Irvine, Calif. 92715.

APPLIED DATA RESEARCH, INC.

Enhancements to Roscoe and Empire

Applied Data Research, Inc. (ADR) has announced that its ADR/Roscoe and ADR/Empire products will support IBM's 3270 Personal Computer, the 3295 Plasma Monitor and the 3290 workstations.

According to a company spokesman, the 3295 workstation includes a gas panel display, provides all 3270-PC base Control Program functions and allows a single full screen display presentation of up to 62 rows by 160 columns. Users of Release 5.4 of Roscoe, ADR's on-line program development system, and Release 3.3 of the Empire decision support system will be able to have up to four concurrent host sessions.

The vendor said Roscoe will support the 3290 in large-screen native mode. Empire supports text and graphics display on all 3270-PC devices supported by IBM's Graphic Data Display Manager.

Release 5.4 of Roscoe and Release 3.3 of Empire will be available during the first quarter of this year. The permanent license price for Roscoe, which operates under IBM's MVS, is $57,500. The permanent license for Empire, which operates under Roscoe, MVS and VM/CMS, is $45,000.

ADR, Rt. 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

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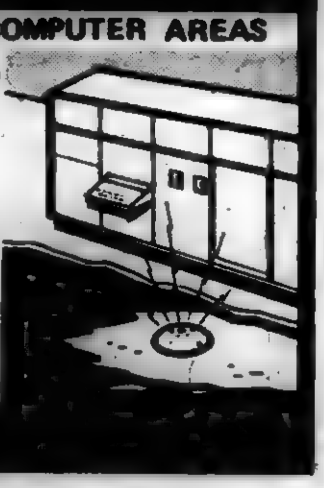

SOFTWARE & SERVICES

AIDS from page 51

M. BRYCE & ASSOCIATES, INC.
IDD and Pride-ASDM Interface

M. Bryce & Associates, Inc. has introduced an interface between Cullinet Software, Inc.'s Integrated Data Dictionary (IDD) and the company's own automated systems design methodology, Pride-ASDM.

Reportedly, Pride-ASDM currently operates on more than 20 different computers, including IBM 370, 4300 and 30 series mainframes and Digital Equipment Corp., Honeywell, Inc. and Sperry Corp. computers. The IDD interface converts the Pride-ASDM information resource management component descriptions and specifications into IDD entity definition transactions for input to the IDD. The IDD interface is priced at $7,000.

M. Bryce & Associates, 1248 Springfield Pike, Cincinatti, Ohio 45215.

BLOSSOM COMPUTING CO.
Soft Recovery Management System

Blossom Computing Co. has announced a utility designed to aid in file recovery of Wang Laboratories, Inc. VS series computer systems that have crashed.

According to a spokesman, the Soft Recovery Management System displays at the workstation all names of disk volumes that are mounted on the VS system. The operator then selects the volumes to be scanned for open files, the software extracts a list of all files on the selected volumes and, for each one of the indexed and alternately indexed files, determines if the file was left open in the I/O or shared mode.

The spokesman said the utility then reports these file names interactively to the operator at the workstation and generates a hard-copy report showing the open files sorted by volume name. The utility then proceeds with the reorganization process. It can display up to 10 such open file names and enables the operator to make a selection of the files that have to be reorganized.

The utility is priced at $495.

Blossom Computing, RFD No. 1, Box 501C, Hubbard Pond Road, New Ipswich, N.H. 03071.

FEL COMPUTING
Mobius

FEL Computing has introduced a software system said to integrate Digital Equipment Corp.'s VAX series, Decsystem-10 and Decsystem-20 host machines with microcomputers using Digital Research, Inc.'s CP/M and Microsoft Corp.'s MS-DOS operating systems.

According to a spokesman; FEL Computing's Mobius allows the micro user to access host data and peripheral devices as if they were resident on the micro. Mobius includes an Instant Terminal Emulation feature that can suspend the program and freeze its context and data. When the user returns from the terminal emulation mode, the applications program will resume operation where it left off, the company said.

Mobius reportedly communicates through the asynchronous communications ports of the micro and a direct cabling link, a standard modem or a network. The product includes security features and an error-checking and correction protocol, the spokesman said.

Price of the product is based on the number of simultaneous users. Minimum price for five users on the host version is $3,500. Users pay $250 per micro version, and license fees decrease depending on the number of users.

FEL Computing, P.O. Box 200, East Dover, Vt. 05341.

ALCYON CORP.
C68

Alcyon Corp. has announced that its C68 compiler now runs on Hewlett-Packard Co.'s HP 9600 series of microcomputers under HP's Hpux operating system.

According to a spokesman, C68 is a full implementation of both the

Continued on page 54

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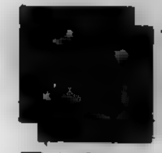
New Technology Update



The impact of Virtual Networking Systems on data communications

There's a new product class emerging in response to an old problem.

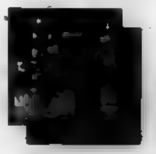
Virtual Networking Systems are being designed to link desktop personal computers into integrated clusters. Clusters that share information, peripherals and other resources on a local and remote basis. And with corporate mainframe host computers.

Right now you're probably saying to yourself, "Hey, wait a minute. What about Local Area Networks; Disk, Print, and File Servers; Protocol Converters; and Mainframe Upgrades?"

Unfortunately, these products and others like them are single point solutions that address only a small part of the problem. None of these choices supply a complete communications solution.

What's worse is that they require users to learn new commands and new procedures. And they don't easily accommodate new devices, new applications or network expansion. Some of these partial solutions even limit the choice of workstations in the network to a specific vendor. And these "solutions" can be very expensive.

There has been a desperate need for integrated architectures. Systems that will provide a uniform and consistent approach to computer communications. There has been a very real need for *Virtual Networking Systems.*

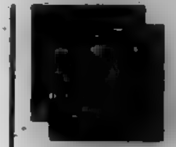


Virtual Networking Systems: a definition

Virtual Networking Systems include both hardware and software. They provide a means of creating a distributed system that incorporates the multi-user functionality of a mainframe host and the ease of use of personal computers.

Virtual Networking Systems are flexible. Flexible enough to link a variety of personal computers, minicomputers and mainframes using a mixture of LANs, protocols, gateways and public networks. A *Virtual Networking System* will also support shared resources such as printers, disks and files.

With a *Virtual Networking System* accessing information can be completely transparent. The information might be on a personal computer, in another cluster, or on a mainframe. It makes no difference. Access to information is as easy as reading a file on a personal computer.

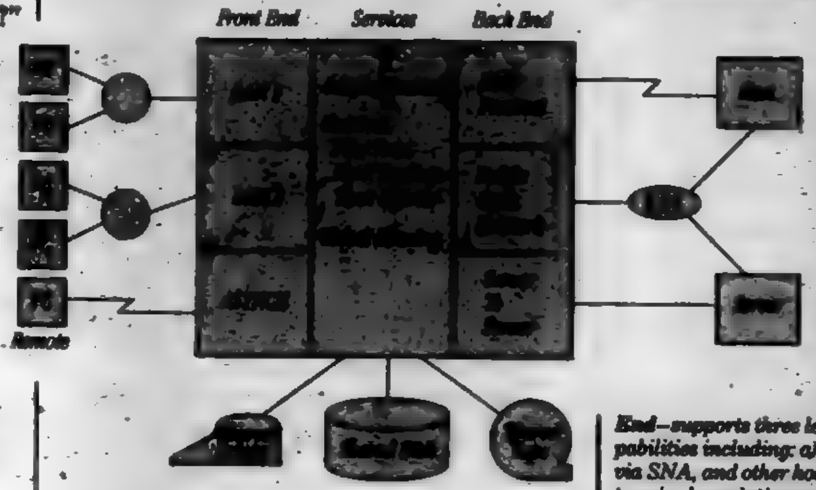


A Virtual Networking System makes it easy to...

- **Find Information**–When there is a large number of users, PCs and a lot of information scattered throughout a work group, division or several corporate locations, it's critical to have a global naming capability. *Virtual Networking Systems* do.
- **Move Information**–*Virtual Networking Systems* provide a powerful and complete set of communications protocols that move only the data you actually need, whether it is a byte, record or complete file.
- **Use Information**–*Virtual Networking Systems* make it possible for computers to share information–whether they are alike or not.
- **Share Information**–*Virtual Networking Systems* hardware and software supply the necessary technology to efficiently and economically share information among personal computers, mainframe hosts and workstations.
- **Control Information**–Multi-level administration and security capabilities are two other characteristics of *Virtual Networking Systems.*

An integrated data communications strategy

Now, for the first time, an integrated communications strategy is possible. By utilizing the unique features of a *Virtual Networking System*, a comprehensive information management system can be designed to enhance individual performance and increase corporate productivity.



Virtual networking system schematic

The ideal Virtual Networking System has three key functional elements... #1. The Front End–supports a range of personal computers connecting them with a variety of LANs, multiple LANs and even remote connect via dial in. Users see the system as a simple, transparent extension of their own PC. #2. The Back End–supports three levels of communications capabilities including: a) connection to an IBM host via SNA, and other hosts with two levels of support, terminal emulation and complete transparent access to host-provided services such as files, databases and mail. b) large systems with hundreds of PCs implemented at multiple locations by interconnecting multiple servers. c) connection to public data networks. #3. Services–supports base level services including a shared file system, printing, mail, network time/date and full backup and recovery.

BANYAN

Banyan Systems Incorporated
Marketing Communications Department
135 Flanders Road
Westboro, MA 01581 Telephone: (617) 366-6681.

For more information on *Virtual Networking Systems* call or write Banyan Systems.

Name____________________
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Street____________________
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CW11485

For the Banyan tree, life begins as a small plant in the limbs of a host tree. A network of vines drops to the ground and takes root. They grow thicker and stronger until each vine is like an individual tree trunk. Where there soon appears to be a virtual grove, there is really only one tree–a single interconnected Banyan.

SOFTWARE & SERVICES

Continued from page 52

Kernighan and Ritchie C language specifications. The package consists of a macroprocessor, a compiler, a relocatable assembler, a linking loader and a support library and utilities. C86 is priced at $1,495, the vendor said.

Alcyon, 8716 Production Ave., San Diego, Calif. 92121.

FORMULA CONSULTANTS, INC.

Shared Library Subsystem

Formula Consultants, Inc. has announced a Shared Library Subsystem (SLS) for users of its System for Tape Administration and Reporting software on Sperry Corp. 1100 series processors.

SLS is a communications interface that is said to allow two or more Sperry 1100 machines to operate as independent systems and share a common tape library. The product reportedly permits separate systems to exchange information.

Price for the SLS software is $4,000 for the first two machines and $1,600 for each additional machine.

Formula Consultants, P.O. Box 544, Anaheim, Calif. 92805.

COMPUTER INFORMATION SYSTEMS

Quantum RS

Computer Information Systems (CIS) has announced Quantum RS, a menu-driven resource management system for Digital Equipment Corp. VAX-11 processors under DEC's VAX/VMS operating system.

Quantum RS reportedly combines departmental and project resource accounting, budgeting and chargeback, performance analysis, capacity planning, cost tracking and both summary and session accounting. It monitors and bills for system resource usage on single VAX systems, VAX clusters and networked VAXs connected via Decnet.

Billable resources are said to include connect time, CPU time, page faults, buffered and direct I/O, volumes mounted, pages printed and disk storage. The package also maintains information on 35 resources and more than 30 statistical measures. System resources are accounted for on several levels: node, account, project, user, and objects — for example, batch and print queues, images, terminals and priorities.

Quantum RS is priced at $4,500 for single VAX systems. A session accounting option costs $1,000, and a networking option costs $2,500.

CIS, 165 Bay State Drive, Braintree, Mass. 02184.

FISCHER-INNIS SYSTEMS CORP.

EMC2 Version 2.1

Fischer-Innis Systems Corp. has announced an enhanced release of its EMC2 electronic mail system for IBM

Continued on page 58

PILOT

from page 49

zable hierarchical menu system.

Perhaps the most interesting feature of the product is its ability to navigate down to greater levels of detail.

For example, if a manager is looking at an income statement and sees that sales commissions are over budget, he can click the mouse over that number and receive a more detailed breakdown by sales region. He can then move the mouse to the total sales figure for a region and click in to get a further breakdown by sales representative.

Command Center also employs a number of routines to compare data with budget, overall economic indicators, previous year's performance and the like. It can also be used for exception reporting to alert the user to a figure that is off-budget by more than a specified percentage.

Divergent approach

Pilot's approach to the micro-mainframe link is also worth noting because it diverges from existing products in two fundamental ways. For one thing, most products assume that the user wants a link only to the production data base. Pilot argues that corporate executives are more interested in comparative historical data — the kind that usually was dumped to tape long ago.

Pilot also attacks the assumption that micro users want data loaded into a spreadsheet or data base on the micro. Rather, it believes that executive users are not interested in learning to use a spreadsheet. They want data available quickly in a consistent format, and they want a few powerful routines to play with it. Command Center has some hooks into Lotus Development Corp.'s 1-2-3, but that certainly is not its strong point.

This should not be taken as an endorsement of Command Center. The product's demonstration is impressive, but demonstrations do not reflect the real world.

For one thing, to use Command Center effectively, users need a clear idea, in advance, of what data they want to use and how they want to use it. In real life, this is rarely the case.

Pilot's demo does not show what happens when the user clicks that total sales number and finds that the data is not available. Building a Command Center data base obviously takes some time.

Pilot also expects that its customers will be willing to devote a VAX or an IBM virtual machine exclusively to Command Center. While Friend said a VAX-11/750 should be able to support at least 30 concurrent users, that is a more expensive option than just giving your executives a Personal Computer.

Nevertheless, Command Center is one of the most interesting and unusual end-user products to come along recently.

IBM
popped the question

McDonnell Douglas
said "Yes"

McDonnell Douglas is proud to announce
another marriage of its Unigraphics II CAD/CAM software.
A value-added-remarketer agreement with IBM provides for fully functional Unigraphics II
on IBM 4361 computers with IBM 5080 workstations.
McDonnell Douglas, with its Unigraphics II software package, now offers
the only turnkey CAD/CAM system available on any combination of three computer choices:
Data General, Digital Equipment Corporation and now IBM.
Think about it…McDonnell Douglas has created a complete
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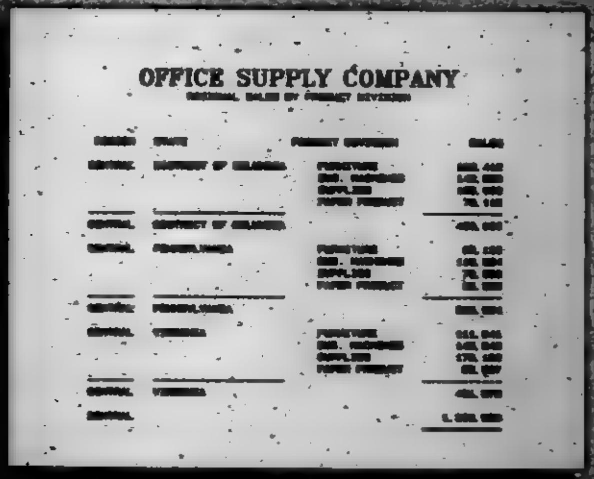

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Take a quick look at sales by state.

Discover…
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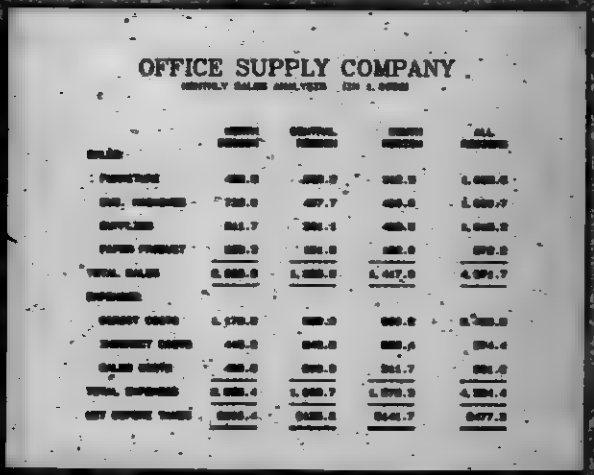
The SAS System is easy to use. [illegible]



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OFFICE SUPPLY COMPANY

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Computers can only perform as well as the people who use them.

The chart below is disturbing.

It shows the kinds of problems computer users are having.

Eye strain	55%
Back pain	43%
Headaches	30%
Shoulder	29%
Hand/wrist	18%
Neck pain	15%

(Source: "Ergonomic Principles in Office Automation" Pub. 1983 by E.I.S. AB, Sweden.)

(Source: "Ergonomic Principles in Office Automation." Pub. 1983 by E.I.S. AB, Sweden.)

Before you dismiss them as trivial, consider two things:

First, more than twenty states are now preparing legislation to protect computer users from problems like these.

Second, it's not just a people problem.

It's a business problem.

Because computers do what they're told.

And if someone with a headache or eyestrain is doing the telling, they're likely to make mistakes.

Quite clearly, it's in everyone's interest to solve the problem.

You are not a machine.

As you would expect, computers are designed by engineers.

They usually know a lot about technology but very little about people.

And even less about ergonomics.

Which is why so many computers are technically impressive yet strangely unnatural to use.

Ericsson, in its very Swedish way, has always believed that excellent ergonomic design isn't a privilege.

It's a right.

That it isn't just a noble gesture.

That it's demonstrably good business.

Because computers can perform only as well as the people who operate them.

It's an attitude that has made Ericsson No. 1 in Europe twice over:

As the giant of European telecommunications.

And as the biggest European workstation company by far.

(You couldn't ask for a better marriage of technology for the future.)

Here is one example of how Ericsson got there.

It's the first of a whole range of computers to be introduced in the U.S.A.

IBM is a trademark of International Business Machines Corp.

The Ericsson PC.
It's Ergo-Intelligent.™

Ericsson has spent $300 million finding ways to make computers more ergonomically intelligent.

Here are some of the results.

Ergo-Screen.™

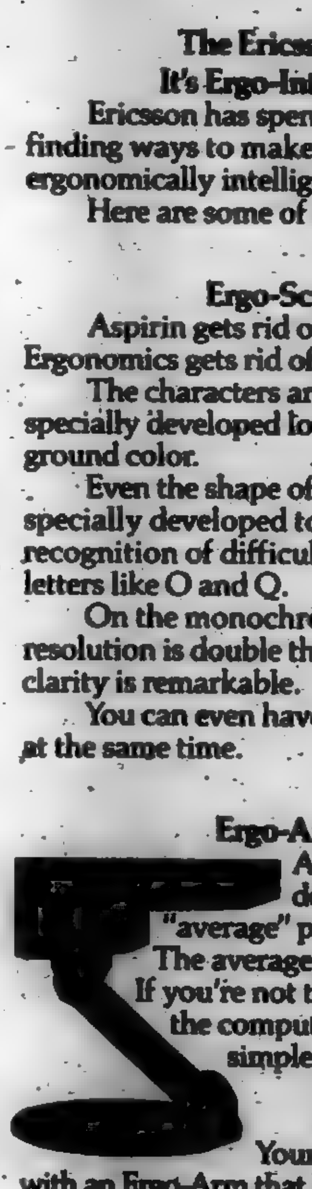
Aspirin gets rid of a headache. Ergonomics gets rid of the cause.

The characters are amber on a specially developed low-fatigue background color.

Even the shape of the characters was specially developed to allow easier recognition of difficult to distinguish letters like O and Q.

On the monochrome monitor, the resolution is double that of IBM's, so clarity is remarkable.

You can even have text and graphics at the same time.



Ergo-Arm.™

A computer is designed for the "average" person.

The average person is 5'9."

If you're not that height, the computer world has a simple answer.

It's your problem.

Ericsson disagrees.

Your monitor comes with an Ergo-Arm that lets you move and angle your screen exactly where it suits you.

Far better than back pain, wouldn't you agree?

Ergo-Touch.™

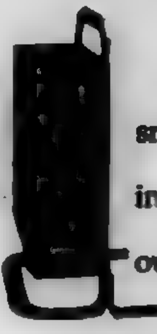
The keys are full-size and the layout is ergonomically planned for greater accuracy and speed.

Yet the keyboard is 20% more compact and less than half the weight of IBM's.

Even the cord is adjustable to suit left- or right-handers.

Ergo-Color.™

Even the color of the case is ergonomically selected to be restful to the eye over many hours.



Ergo-Space.™

The system unit is one-third smaller than IBM's.

It even fits under your desk in a special vertical rack.

So your desktop is your own again.

IBM Compatible.

Many companies claim to be compatible.

Some are. Some are stretching the truth.

The Ericsson PC boasts the highest compatibility rating there is.

It's operationally compatible.

You can take advantage of thousands of PC-compatible programs already available.

In fact, with the best-selling software, program and data disks are interchangeable with those of the IBM PC.

Service. Not Excuses.

Ericsson wouldn't give you anything less than on-site or carry-in service.

The choice is yours.

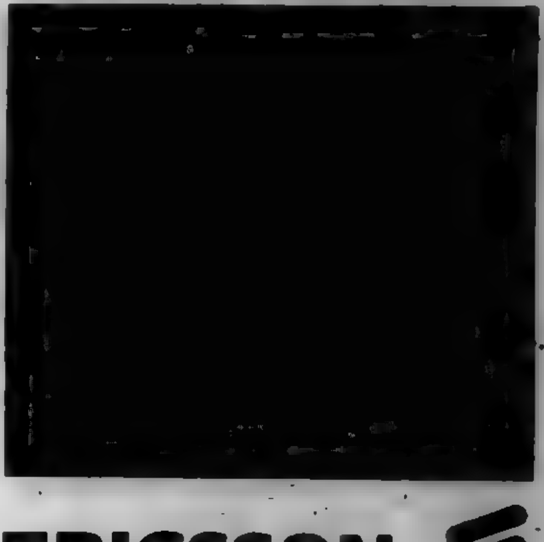
3 Free Offers.

Ericsson will send you revealing literature on ergonomics.

Also a detailed brochure on the Ericsson PC.

And arrange a hands-on test if you ask for it.

Call toll-free 1-800-FOR-ERGO.



ERICSSON

SOFTWARE & SERVICES

Continued from page 54

370 series mainframes. It runs in IBM MVS/TSO; VM/CMS; VS1; and DOS/VSE. It also runs under CICS in the MVS, VSE and VS1 environments. EMC2 may also be used as a separate IBM ACF/Vtam application.

Version 2.1 of EMC2 is said to include priority mail notification for TSO and CMS users, security enhancements, calendar display upon log on, a "surrogate" feature that allows a user to designate up to two other persons who may access and update his calendar and support for fixed block architecture devices.

EMC2 may be leased for between $500 and $800 per month. It may also be purchased for between $20,000 and $30,000, depending on the host environment.

Fischer-Innis Systems, 4175 Merchantile Ave., Naples, Fla. 33942.

MOM CORP.
PC/COM Release 3.5

Mom Corp., a division of National Product Marketing, has announced that its PC/COM software has been adapted to link the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles with IBM mainframes running IBM CICS, CMS and TSO.

PC/COM Release 3.5 reportedly runs with all leading printed-circuit boards that emulate IBM 3270 terminals and IBM Systems Network Architecture/Synchronous Data Link Control and bisynchronous controllers.

The product allows the micro in local or remote locations to become an integrated workstation with access to the mainframe, a company spokesman said.

According to the vendor, PC/COM has file management capabilities that allow the user to manage mainframe and micro files interchangeably and has a facility for creating and deleting files, editing data within a file and renaming, copying, displaying or printing files.

PC/COM originally was designed for Digital Communications Associates, Inc.'s Irma board but is now available for emulation boards produced by Forte Data Systems, CXI, Inc., Quadram Corp., Microplus Systems, Avatar Technologies, Inc. and Intelligent Technologies International Corp.

PC/COM for a mainframe using CMS or TSO costs $400, for a mainframe running CICS $2,000 and for each personal computer $395.

Mom, 2 Northside 75, Atlanta, Ga., 30318.

PROGRAM ACCOUNTABILITY & EVALUATION, INC.
Librarian/38

Program Accountability & Evaluation, Inc. has introduced a tape and diskette inventory system for the IBM System/38 running under IBM's CPF operating system.

According to a spokesman, Librarian/38 provides computer shops with a method of keeping track of tapes and diskettes. The package provides information on tape location, display of entire inventory, hard copy reports and a copy spool file utility that allows a user to save, restore and reprint a spool file without inputting IBM commands.

Librarian/38 costs $300.

Program Accountability & Evaluation, 7 Riverway Road, Salem, Mass. 01970.

ARKANSAS SYSTEMS, INC.
RPG Generator

Arkansas Systems, Inc. has announced a Report Program Generator (RPG) that generates IBM RPG workstation programs to maintain data files on IBM System/34 or System/36 minicomputers.

The RPG Generator reportedly can be used as an alternative to the Data File Utility's Enter/Update facility, a company spokesman said.

The software is priced at $450.

Arkansas Systems, Suite 201, 8901 Kanis Road, Little Rock, Ark. 72205.

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enthusiasts focused on coding practices and analysis of function as the key to success. Function was decomposed, programs were modularized and changes in program flow of control were carefully handled.

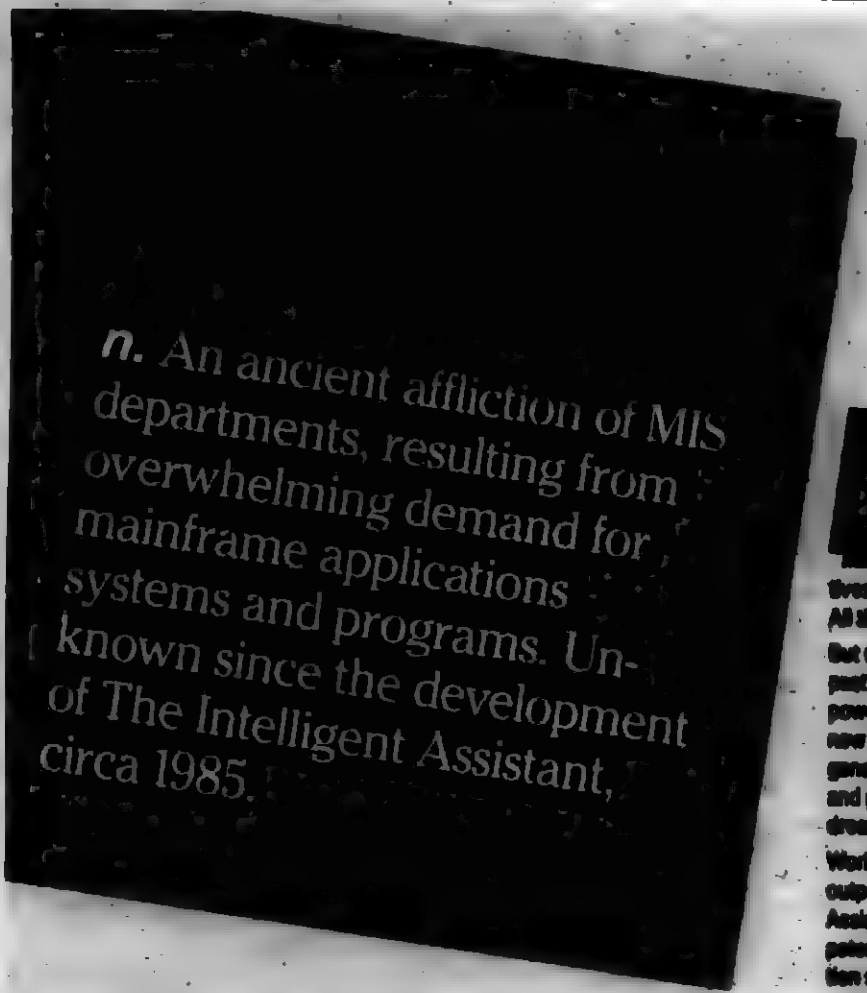
A watchword of the day was "form follows function," which was interpreted to mean that data structures were a by-product of process design and functional analysis. For systems being built at the time — which were almost exclusively tape-bound, sequentially oriented systems — the structured techniques represented an advance over the free-form design and coding that preceded the structured approach. The pendulum had swung firmly to a focus on process design and implementation.

But as shops left the sequential environment for the data base environment where many functions used the same data, the techniques of structured analysis proved to be less than satisfactory. The pendulum rapidly swung to data analysis where data was normalized.

Just as the structured advocates focused on processes at the expense of data, the early data analysts focused on data at the expense of processes. Many felt that if a shop could just get its data structures right, then systems would at last become stable. This second major step in the evolution of information engineering filled in many holes left by the structured way of thinking and represented a significant advance.

But as shops began to build more data base systems, a very low degree of integration among the systems was usually noticed. While data bases solved many of the problems of sequential systems, no discipline required that data bases be integrated. The pendulum then began to swing

See INMON page 60


n. An ancient affliction of MIS departments, resulting from overwhelming demand for mainframe applications systems and programs. Unknown since the development of The Intelligent Assistant, circa 1985.

Inside every MIS department is the same problem. There aren't enough hours to create and maintain all the programs the organization needs to operate at its peak. Result: frustrated executives, weary programmers, low morale. All the problems of backlog.

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Working from a general set of input and output instructions, The Intelligent Assistant stretches the mainframe's potential by delivering an entire production system with the flexibility of a prototype, fully documented, and in stop-watch time. What's more, it greatly reduces the time and effort needed to maintain existing systems. The Intelligent Assistant will regenerate the entire system automatically following the simple entry of a changed input or output specification.

Suddenly, no more backlog. The Intelligent Assistant will automate up to 90% of the process of developing and maintaining business systems. For the end-user, that means accurate on-time data. For the programmer analyst, that means the opportunity to advance to more creative assignments.

Why not remove backlog from your shop, and put it in the pages of history where it belongs?

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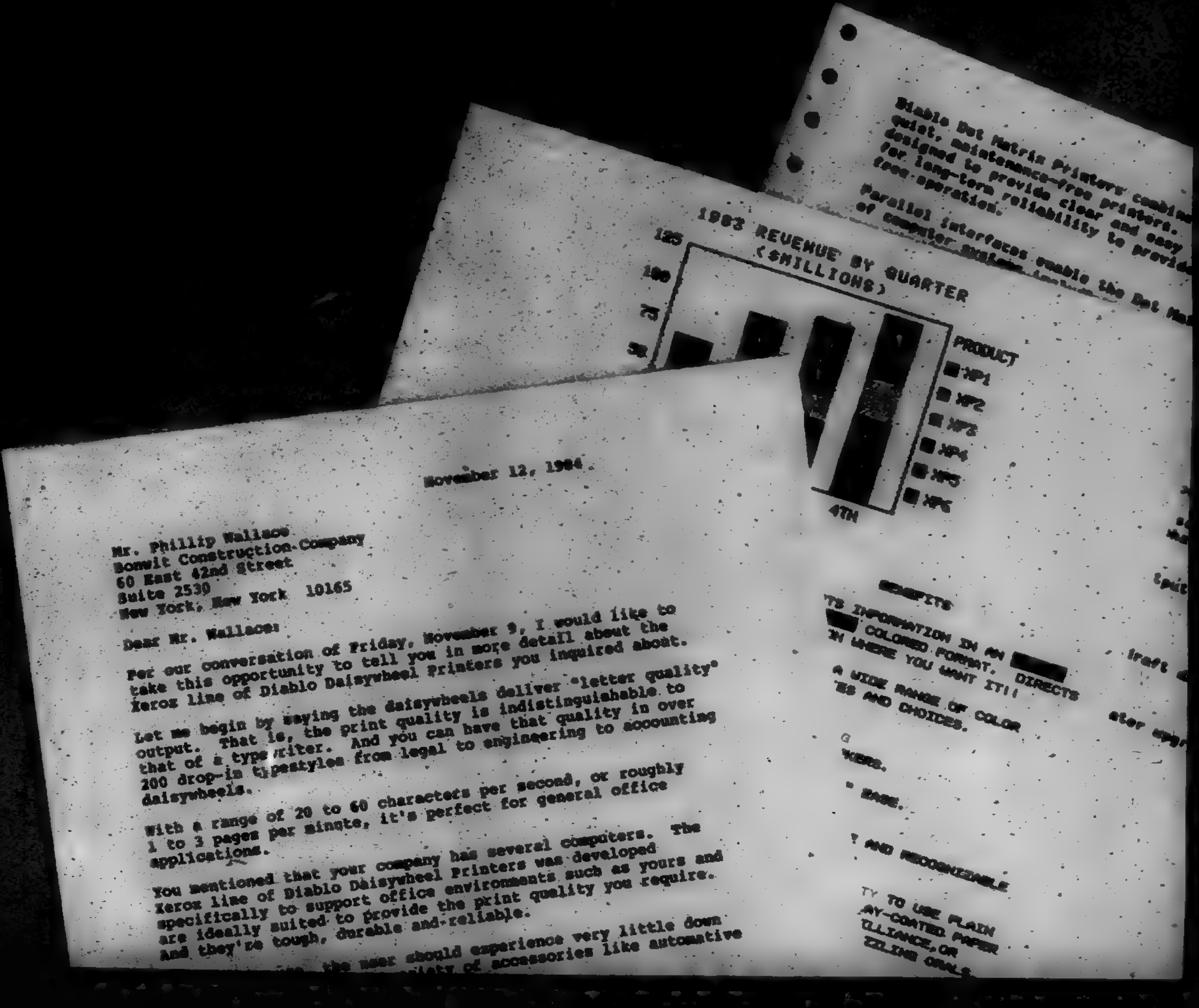
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November 12, 1984

Mr. Phillip Wallace
Bonwit Construction Company
60 East 42nd Street
Suite 2530
New York, New York 10165

Dear Mr. Wallace:

Per our conversation of Friday, November 9, I would like to
take this opportunity to tell you in more detail about the
Xerox line of Diablo Daisywheel Printers you inquired about.

Let me begin by saying the daisywheels deliver "letter quality"
output. That is, the print quality is indistinguishable to
that of a typewriter. And you can have that quality in over
200 drop-in typestyles from legal to engineering to accounting
daisywheels.

With a range of 20 to 60 characters per second, or roughly
1 to 3 pages per minute, it's perfect for general office
applications.

You mentioned that your company has several computers. The
Xerox line of Diablo Daisywheel Printers was developed
specifically to support office environments such as yours and
are ideally suited to provide the print quality you require.
And they're tough, durable and reliable.

the user should experience very little down
variety of accessories like automative

INMON

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away from pure data analysis toward a balanced approach of analyzing data and processes in equal measure. Building an integrated system requires that the same data be perceived in many ways. To achieve multiple perspectives, processes and data are necessarily and equally interrelated.

There is an appropriate analogy that can be made. Sequential systems (and structured approaches) view data linearly. Data base systems and data analysis view data in a two-dimension fashion. Integrated systems and integrated approaches look at data in three dimensions.

Chapter 6 of my book, *Integrating Data Processing Systems In Theory and in Practice* (Prentice-Hall, Inc., 1984) gives a more complete description of this perspective.

What information engineering tools and techniques are being used effectively today? What are people doing today to achieve the integrated environment effectively?

One noticeable advance is the advent of software aids for the information engineer. While flowchart automation has been available for many years, today's software tools deal with the data modeling aspect of the system integration.

While data dictionaries are adequate to hold a repository of data as it is defined at the implementation level, data modeling makes use of different levels of data structures that may or may not be appropriate to a traditional data dictionary.

Another advance has been the realization that several levels of modeling and analysis are necessary to come to grips with today's large, complex systems.

These can be characterized as global level, middle level and local level (see Figure 1 page 49).

The different levels of modeling, which are appropriate to both data and processes, are necessary to deal with the size and complexity of today's information systems. The global level is used to give perspective to all parts of the system — how they relate, how they are positioned and how they interface with each other. This level is devoid of most detail — something many data processors loathe to abandon. Typically found at the global level are entity relationship diagrams and a breakdown of the basic functions of the organization.

At the middle level, the specifics of the model begin to appear. Here is found minimum structure models, data item sets and detailed functional decomposition.

At the lowest level of modeling comes the detail necessary for the actual building of the system. Because of the higher levels of modeling, redundant data and functions are recognized and combined. Found at this level are the familiar record layout and program specification. The integrated, engineered environment arrives at the same implementation level as the nonintegrated, nonengineered environment, but the derivation of the processes, the data at the implementation level and the ensuing capabilities of the systems are drastically different.

Different systems require different numbers of modeling levels. A very large, complex system may require five or six levels, while a simple system may require only one or two.

It is worth noting that different systems require different numbers of modeling levels. A very large, complex system may require five or six levels, while a simple system may require only one or two.

Each level of modeling builds upon the higher, less detailed level. At the higher level, the emphasis is on the structure of data and process — how major parts fit together — while at the more detailed levels, the emphasis is on accuracy of detail and content. The result is a balance between the organization systems and the content of the systems.

The techniques of information engineering have evolved as data processing has evolved. Data flow diagrams, for example, are very appropriate to the tape-oriented sequential environment with many master files and redundant data flows from one file to the next. But in the integrated environment, redundancy should not be a factor. Data does not flow in an integrated environment, thereby making data flow diagrams obsolete.

In its place has risen prerequisite/transformation data that is appropriate to the integrated environment. The only flow that occurs is between different modes of operation — operational to archival, operational to decision support and so on. The flow between modes of operation occurs on a global level.

An important success factor in building engineered, integrated systems is establishing the scope of integration. In developing small, nonintegrated systems, there is either no need to outline the boundaries of development because the system is small or the scope is implicitly defined and understood by all parties.

But in large, complex systems that require information engineering, there is a definite need to outline formally at the outset what will be in and out of the development effort. Without the scope of integration properly defined, an architecture might be developed that later needs major modifications simply because the development effort was misunderstood. A clear identification of the scope of integration allows the developer to build all that belongs in the system in the proper perspective.

Next week, Inmon looks at where information engineering is headed.

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The IBM PC market is booming in Australia. By the end of 1984, almost 20,000 units will have been sold. **Australian PC World** — the only computer magazine for IBM PC users in Australia — premiered this March in response to the growing demand. Total distribution has already topped 16,000. And newsstand sales are vigorous from Sydney to Perth.

Forecasters predict that the Australian government and businesses will increase their usage of microcomputers by 170% over the next two years. **Australian Micro Computerworld** is the only monthly magazine covering this market. Written for both single-unit and networked users, most of our 12,000 readers are skilled professionals involved in the selection or design of systems and networks.

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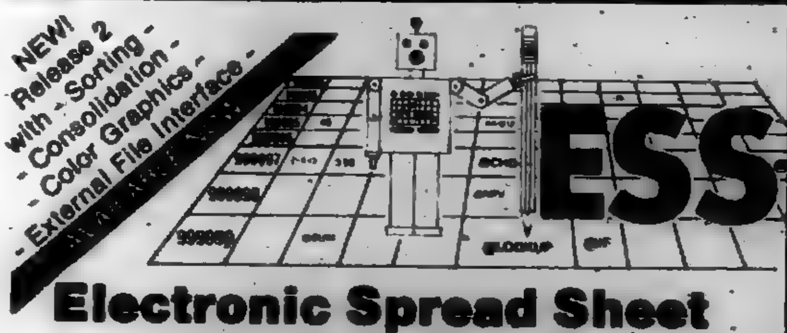

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   - 30 Medicine/Law/Education
   - 40 Wholesale/Retail Trade
   - 50 Business Service (except DP)
   - 60 Government—State/Federal/Local
   - 65 Public Utility/Communication Systems/Transportation
   - 70 Mining/Construction/Petroleum/Refining
   - 75 Other User ____________

   Vendors
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   - 85 Computer Service Bureau/Software/Planning/Consulting
   - 90 Computer/Peripheral Dealer/Distributor/Retailer
   - 95 Other Vendor ____________
2. **OCCUPATION/FUNCTION (Circle One)**
   - 11 President/Owner/Partner/General Manager
   - 12 VP/Assistant VP
   - 13 Treasurer/Controller/Financial Officer
   - 21 Director/Manager/Supervisor DP/MIS Services
   - 22 Director/Manager of Operations/Planning/Administrative Services
   - 23 Systems Manager/Systems Analyst
   - 31 Manager/Supervisor Programming
   - 32 Programmer/Methods Analyst
   - 33 OA/WP Director/Manager/Supervisor
   - 34 Data Comm Network/Systems Mgmt
   - 41 Engr/Scientific/R&D/Tech Mgmt
   - 51 Mfg Sales Reps/Sales/Marketing Mgmt
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   - 70 Medical/Legal/Accounting Mgmt
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   Types of equipment with which you are personally involved either as user, vendor or consultant
   - A. Mainframes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems

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IN DEPTH

An index of 1984 In Depths and Special Reports

In Depth presented 130 stories in 1984, full-length features on topics such as micro Cobol, mindware, the Pick operating system, documentation, optical storage, subsecond response time and models for management. We interviewed the chairman of the Codasyl Cobol committee and the heads of Guide and Share, the IBM user groups. We ran articles by such authorities as J. Daniel Couger, C.J. Date and T. Capers Jones. We excerpted from *Techno-Bandits* and *Technostress*.

And each month, the Special Reports section provided dozens of tutorials and applications stories focusing on a single topic.

This index is intended to help readers locate articles on particular subjects of interest from last year. To order a back issue, write: Back Issues Department, Computerworld, P.O. Box 880, Framingham, MA. 01701. Each issue costs $2, prepaid by check made out to Computerworld. Issues published on Jan. 9, Feb. 27, June 4 and Sept. 24 are not available.

In Depth articles:

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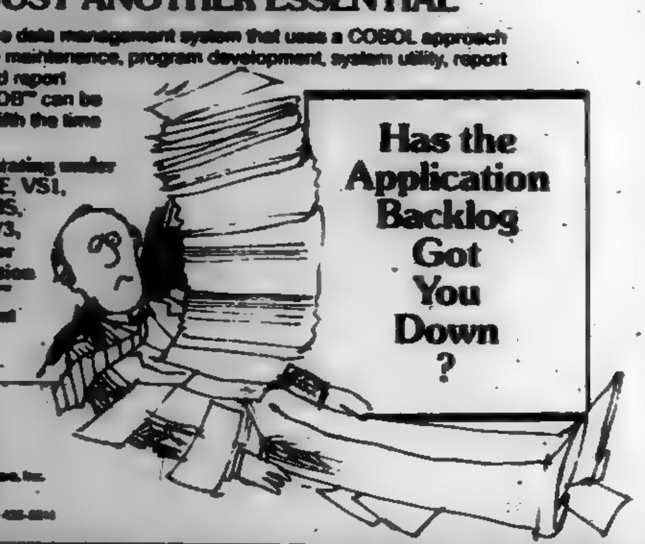
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IN DEPTH

A walk through decision support

with Peter Keen

Peter Keen has been described as a principal mover and shaker in the realm of decision support. He chairs his own firm, Informational Technology, Inc., and serves as managing director of its UK subsidiary, Infoscope, in London. The following is an adaptation of his address last fall to a meeting of FCS-EPS Users Group International, sponsored by Evaluation and Planning Systems, Inc.

Over the last two years, the ideas in the area of decision support systems (DSS) have gotten rather flimsy, to put it politely. If anything, the ability to build systems has gotten ahead of the thinking about which systems to build.

In the next transition for DSS, the question of linking back up with data processing, integrating the organization resource is becoming key. DSS has gotten trapped into small applications without data, and there is an energy crisis. The personal computer partly accentustes it.

As one goes from an [Apple Computer, Inc.] Apple II at 64K bytes to a personal computer at 128K and then up to 512K, one certainly doesn't say, "Good; I'd like to run bigger spreadsheets." One starts looking at data being the key determinant. Powerful models link to data work accessing. And to me, that is no longer a technical question. There are lots of people working on that and the question for technical integration is not if, but when. The question for organizational integration is if.

And the other issue, too, is that the tools we have are being under-exploited. That is, it has been very easy to get trapped into being a DSS builder, taking lots of little applications and then more of the same. Very few DSS groups have managed to build a career path and a mandase. They tend to be doing more of the same. They tend to be good but at the same time trapped into reacting to people's immediate needs.

One thing one has to think of is: What are the decisions that matter in an organization? What are the things that we would really like to affect? What does it mean to have a DSS business plan?.

Who is your target market? Is it middle-level planners in the organization? Is it senior managers? Is it marketing? Putting those all together is essential now because DSS is in danger of getting blurred with just being end-user computing.

And what's different about it? Why do we bother to call it DSS?

The old definition of DSS has always been to take any available and suitable technology and use it to help improve managerial decision making. The definition I would suggest we need to work on now is: "DSS is about using any technologies — intellectual, analytic, financial and computer — to help

I see a natural, lateral development between the fields of DSS and DP. It's certainly true that DSS needs good DP technicians, people who understand data management. It's also clear that DSS has the bridge heads out in the organization that DP needs.

improve creativity in decisions that really matter." It's going to be very important for DSS organizations to exploit the quality of software, to find decisions that matter.

Decision support is more important than DSS. There is no decision support system, per se. There's no particular technology about which you would say, "This is DSS." DP is using the same technologies. The question is: "What do you want to work on?" And here, the main focus is identifying single management tasks.

To a large extent, DSS has been identified with personal decision making, and then when the micro came along, we started talking about personal computing. I'm flagging things that are key, not because we've done them badly, but because they are opportunities we must pick up.

We must get away from personal computing and look at organizational computing and organizational productivity and organizational decision making. One of the questions we have to ask is: What are the applications opened up by access to remote data and first-rate communications links?

DSS was an early warning signal to DP that the world was changing. There's a whole new world class of technologies and a whole new class of applications. And unfortunately, those of us involved in the field very much viewed DP as a sort of inferior form of blue-collar worker, and the snobbery implicit in Scott Morton's and my book is frankly inexcusable.

DSS became a political opposition to DP and that split has taken a long time to fuse. First of all, though, DP was being foolish. It didn't recognize that a free market for computing was emerging, that there were interesting new things to work on. When DP did not pick them up, DSS went in to financial application areas, to the first class of end users who understood data and understood models. Therefore, there has been a split, a political split, between DSS and DP.

Now, surely DP needs DSS as badly as DSS needs DP. One could argue that DSS has been the dry run for office technology. What you learned in DSS is how to build systems for nontechnical users where you don't have functional specifications and how to market systems in such a way that people choose to use them. DSS was the first discretionary system where people could vote with their fingers. If they didn't want to use DSS, they wouldn't. DP was the mandatory system — you must use the payroll system and reporting systems.

At that point, DSS was a very radical view. And even now some of us are still living in the next stage where DSS got way ahead of DP.

DSS is about fast development. It's a service, not a product. And DSS people have always put a premium on being able to handle ad hoc needs very, very quickly. That has a cost. It's very hard to plan next year's activities if you are always going to be available, just picking up odd jobs.

A warning signal for all DSS organizations is when to start thinking about a product portfolio, service portfolio, a business plan and an integrated delivery rather than just picking up whatever management wants them to work on next. But certainly in the period 1975 to 1980, DSS developed a tradition of adaptive design.

DSS was an early warning signal to DP that the world was changing. There's a whole new world class of technologies and a whole new class of applications.

I would suggest now that the next opportunity is to start thinking of DSS being really a new start of corporate thinking, corporate planning.

The real questions are not just doing "what if" extrapolations on the financial side of the organization but the why, where and what around the competitive side of the organization — a natural extension from "what if" to "why if."

But it was DSS that learned that you can build very complex systems out of very simple components. Prototyping is now so old that it's hard to think back to the days when it was never done, which wasn't that long ago. But DSS people have learned that you can, in fact, build full working systems very quickly. One thing we learned, in fact, is that using the fast development language APL or an EPS, you can generally put up an initial version of a model for $5,000 and 10 days of work.

The other rule of thumb was: If the data doesn't exist, it has to be collected and defined; then the simple rule for that $5,000 figure in 10 days is just put zeros on the end until you get bored. We really learned that it's very easy to build DSS if you are model-oriented and the data is either in the manager's head, subjective estimates or small-scale data bases that require infrequent updating.

But in cases where we are talking about data-oriented DSS, there is no question that we did not learn the skills to do it here. I found, to my cost, that DSS people are very good at the front end of a system's invention life cycle. They are good at getting things going. They don't have to have functional status. They can respond, they can experiment. They are good at the innovation on research and development for systems. And DP has always been very bad at that. We now begin to find as data-oriented models and integration become more key that DSS people are very bad at the things DP people are good at.

For example, most people in DSS couldn't spell the word "testing," let alone "documentation," because there is no such thing as a bug in DSS. First of all, you can't anticipate the bugs because you don't have known inputs and known dialogues. But more important, there isn't a bug — there is just a phone call from the guy you've been working with very closely that says, "Hey, there's something wrong with this." Good APL programmers can be recognized by their tilt to one side from five years of being able to hold the telephone while you repair a bug.

Now, we are beginning to put together innovation with discipline. Get going — get things working, experiment with the production side, the traditional systems and development life cycle. In your organization, you are no longer surely talking about building lots of little things. You're trying to consolidate a major organizational resource. And all of a sudden the skills of DP become key. DP is good at handling data, masses and masses of it. It is very good at the operations side and good at the problem of maintenance.

A good system contains its own obsolescence. As users work with a system, they start getting ideas, too. By the third year of a DSS, most of the improvements have been suggested by users. DP people are good at handling large-scale projects. In fact, the good habits of DP are bad habits for DSS. Too much bureaucracy and the good habits of DSS are bad habits of DP.

DSS became very independent from DP and is very model-oriented. One of the problems we have — and let's be honest about it — is that currently, the word DSS has become technobabble. You think of how our field lives on cliches. It's very hard to sort out what is just babble in this field from what really is the top, intellectual idea.

DSS is dangerously close in many organizations to just being sort of another information center. Or is it the same as end-user computing? The identity issue is key. We might ask the question: What would we lose if we just got rid of the term DSS? End-user computing is as good a term, or is it? The thing that makes it different is the D — Decision.

It's not a question of using computers. Whereas DSS was independent from DP, now DP is using exactly the same tools. There is nothing magic about the DSS tool.

Organizational solution

All the aspects of the organizational computing resource are moving more and more to the same tools for the same philosophy. What I find interesting about the information center is that it's an organizational solution masquerading as a technical solution. It allowed the good DP units to break out of the isolation trap and to build a marketing bridgehead instead of being in operations and manufacturing units. Several of them made the mistake of assigning traditional Cobol programmers.

When we start looking at the 1980s, surely there are three things that have to be pulled together. One is DSS being integrated into MIS DP. Every time one generation fails, we rename it. So, operations research became management science, became decision science, whatever. And DP has become information services, information systems, MIS.

But, more important, all three of them have to be merged with office technology — not office automation. Surely we are not naive enough to think that this time we can repeat the awful lessons of data processing in trying inappropriate automation.

You can't have integration without a clear network plan. It's integration of the corporate network with intelligent workstations, which will carry some functions we call DSS, others which are much more traditionally in the office side of things — electronic mail or whatever. And many of them would also be vehicles for information access, which has been the game of DP.

It is extending current DSS activities to the managerial workstation. And I think we can identify what that looks like. I don't think there is anything that office technology needs that hasn't been part of the DSS tradition. Particularly the question of designing usable dialogues, making useful tools usable, the difference between implementation and installation. Installation is easy with modern tools.

You want the office of the future? We can make three telephone calls and it comes in on a truck. On the other hand, do you want to make electronic mail work organizationally? Then you want to make end-user inquiry things work culturally. That's implementation, a much longer activity.

I think the real distinction between traditional developers of systems and DSS people is that traditional people have mainly been concerned about the product, whereas DSS people have mainly been concerned about service. Office technology is in danger of suffering from two things. One is, it's too product-obsessed. It's like being in a candy shop. We never expected to have the quality of software and hardware that's available.

Every time something new comes out, whether it's a Hercules board or another graphics package, you wander in and you just grab. Office technology has been tool-obsessed and product-obsessed. But the other problem is this issue that office technology doesn't have a concept of architectural integration. Architecture is like the city blueprint. How do you get a blueprint that can hold up over changes in technology, volumes,

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users and mix of media? How do you make sure that dreadful word, "incompatibility," doesn't become a growing part of a firm or the vocabulary? Communications architecture, the data architecture and applications architecture have to put this together.

I suggest we're looking for the ability to integrate, not integration. Clearly, integration has been oversold. The new wave of products like [Lotus Development Corp.'s] Symphony are generating a backlash. How many operating systems could we really say are moving toward integration? But we have to go in that direction. Every aspect of this requires "integratability." We used to talk about a migration part of computing. We're now talking about an integration part. Now when you look at integration from the point of view of the data base people and the communications people, you think in terms of standards and operating systems. That's looking from the inside out. What is the infrastructure, and what do we push out onto the workstations?

For DSS, it's the opposite view: Where are we going to put workstations? What do we want to put on them? How do we make short links back in? So when we choose an operating environment, we're concerned about integratability, and when we're choosing software packages now, the key issue is whether they allow us to move along that integration path.

The second problem is more concerned with communications; it's connectability. Can we make sure that, within reason, any of our target customers for the organization, inside or outside, can connect both to our network, and can we interconnect to theirs? The major battleground for industrial activities now is piggybacking. Things like electronic funds transfer or point-of-sale systems link one network into another to create new products. Integration of service is at the workstation. Airline reservations systems piggyback into providing car and hotel reservations.

So the connectability thing is very much a question viewed from the perspective of products and services in the communications environment. There is the assumption of one workstation, the computer equivalent to the telephone. And integratability is about which services can be provided, which devices can access which services. The sorting out of the DSS software market is very much going to be around these issues. Shareability is the micro-mainframe link extended.

Shareability is shareability of processes and data. Ideally, one would like to be able to have a single terminal accessing a whole series of transaction processes as well.

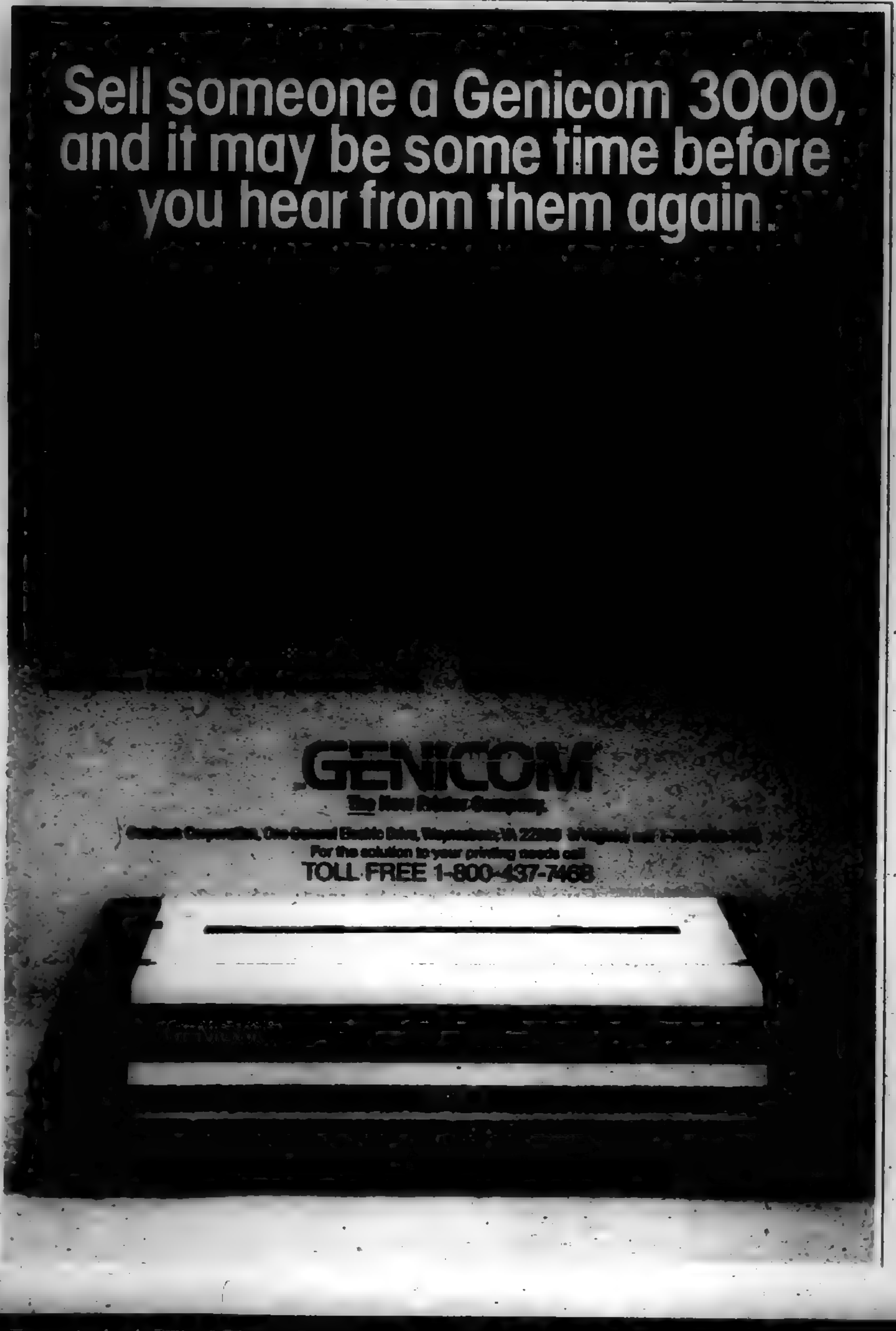
'Outside-in' view

Transportability I find very interesting. Transportability says, "Can we, in fact, move our applications and technology base into new geographies and new operating environments?" Actually, that's why the personal computer is integral to the architecture for DSS and for the organization. It's the outside-in view. Can we, in fact, standardize them, whether it's [Microsoft Corp.'s] MS-DOS or whatever, or can we choose a vendor that will allow us to move into many environments?

The most difficult environments to move into are international, where equipment that may work in one country isn't allowed to work in another country. For example, it's illegal to send a packet of any sort on any network whatsoever in France. Packet switching is a government monopoly.

As you look at that, the question of architecture starts jumping through. The goal of that architecture is, indeed, to allow us to gradually integrate DSS, MIS and office technology, not keep them separate. When we start negotiating with DP or talking with senior management, we spend less time talking about plans and more time talking about architecture. When we choose things like MS-DOS, it is not because it's the best system, it's simply policy choice eliminating design alternatives and eliminating arguments.

Little by little, we are zeroing in on how you set corporate standards so the whole resource has a chance of fitting together. That will be the sorting out of end-user software in the mainframe/micro area. The question you



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> *DSS surely has become the mainstream. It has moved from being sort of a left-wing radical idea to just commonsense notions about how you operate in a user-controlled world.*

must look at when you are evaluating a company now is the architecture and not the functions. Most of the companies selling end-user software are now providing first-rate functions. It used to be five years ago at conferences or trade shows that there would be an ooh and an aah when one company unveiled goal-seeking or double precision or whatever. Now the products are so good you evaluate them and penalize them for the features they haven't got.

There are certain areas where we still need a lot of things. That's in high-performance and end-user data base capability, ones that can handle massive data bases, not the little things we handle now of merely 100,000 records and 15 updates a second. How do we organizationally link these two so that technical integration will occur?

DSS surely has become the mainstream. It has moved from being sort of a left-wing radical idea to just commonsense notions about how you operate in a user-controlled world. That's important.

I'm not a believer in user involvement. It's pseudo participation and it's like being an agnostic. Agnostics are people who, when they get to heaven or hell, want to say, "Well, I haven't really made my mind up."

It's influence and control that matter. We are moving toward DSS being a mainstream because more decisions about the use of the technology are being made by user managers. They're directing it, and our role is to become much more of a staff function, responsible not for the building of systems. Many DSS will be distributed as part of the normal distribution of effort that has taken place with DP. We are in charge of the architectures, the economies of expertise and the planning.

There is no scenario for the 1990s which assumes a reduction in end-user involvement and a reduction of end-user computing and a return to traditional development methods. Now if that's the way we're going, then DP has some very big dilemmas, one of which is around policy. It used to be a monopoly. DP had the advantage of uneducated users and no alternative source of supply. The problem now is that it's a free market. Any one of your organizations could build a complete data processing resource outside in the free market. You want bandwidth? — there are plenty of data networks. You want facilities management? Minis? Micros? A data base? You really can put the whole lot together.

So the question for DP increasingly has become: Who's in charge and how do you regulate the free market? Which things require central direction and which have local autonomy? My own feeling is that you centralize every aspect of the communications architecture and the data architecture.

Then the question is: Are these guidelines with teeth? That's a real question now — which things really require central planning?

The highways issue is the key one — communications architecture. The policy for communications should be that anyone who violates it will be shot.

How much central direction should there be? When you talk about standards for integration with data, what does that mean? Is it a vice? Standards with teeth? And the issue coming from DP is: Who decides?

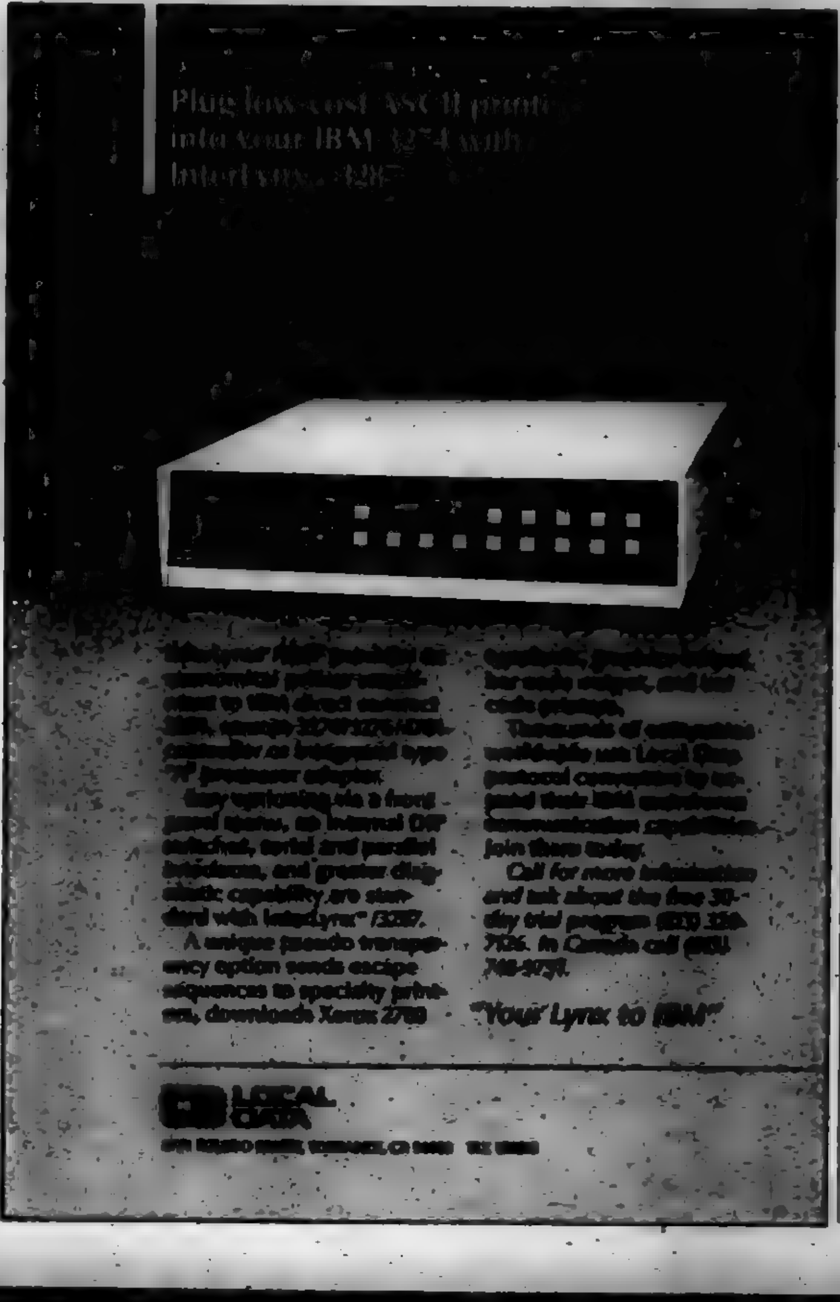
One reason computing is so political in organizations is there's a lot of ambiguity about which things fundamentally belong at the center. The other reason is, of course, that DP is short of development staff — not programmers. End-user development languages have shifted out part of the backlog. But the hybrids — the people who are technically fluent and literal about the business (fluent about the business, literal about the technology) — those are the key people. One can't think of building DSS without somebody who is a hybrid. Where is DP going to get the business-oriented analyst? Where are the people for office technology who understand the business and at the same time are good enough to handle the development issue?

If you look at companies' application plans for three years out, there is nowhere in the world they can get those hybrids.

The toughest area of all is going to be to get the people above the project leader level, the people who are heavily involved in the major application of families, office systems, DSS or whatever. Those people have got to be decent general managers and all the people who would be in those positions for 1988 have to be in the organization now. Because you can go out and buy technical expertise, it's a question of bidding up the market price. If you want CICS experts, how efficient are they when they come into the organization? 90%.

On the other hand, you go out and you want someone to work on building a competitive data base. How efficient are they when they come in — 20%? How long does it take before they understand the organization, the functions, the procedures? That's the crisis for DP. That's why I think the DSS people will be more and more critical to DP, because most people working in DSS surely have a very good understanding of some aspect of the business process. We have to start feeding DSS people back in to DP.

I see a natural lateral development between the fields of DSS and DP. It's certainly true that DSS needs



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really good DP technicians, people who understand data management. It's also clear that DSS has the beach-heads out in the organization that DP needs.

We've built MIS reports around the financials because those are the mule trains across the mountains, the best established pathways. Now even though we have a better technology, we tend just to be automating the same stuff so we may send the information by laser or satellite, which is like mule trains on amphetamines. Before we start exploiting DSS, the question is: What actually do the MIS managers want?

In many cases these decisions are about comfort. What would make your managers feel comfortable at 8 a.m. if they could switch on one screen of information?

That's where DSS and MIS link, and the new generation of executive information systems are around that. Let me give you one hasty example — Donald Reagan's information system, you'd call it DSS, when he was head of Merrill Lynch. He wanted to pull in all the account information and summarize in one graph the aggregate cash position in customers' accounts. If it has gone up for three days, the message is: "You have too much money sitting around; it isn't earning commissions." If, on the other hand, it starts to go down for three days, the message is to start looking at the margin accounts. That's comfort support. And that's really one of the major payoffs of DSS. Surely there is nobody who believes in DSS who doesn't feel it's relevant in the executive office.

And yet in practice, DSS has been trapped in the middle levels of organizations. And in many cases, when we talk about DSS being for managers, they are not for managers; they are for analysts and professionals. But DP has a major dilemma about how to take charge of this strategy.

DP now will purely be judged by its ability to serve. It's no longer a product question. The danger, of course, is that DP is talking about building a utility. Have any of you thought what a terrible job it is to run a utility? No one is ever grateful.

We have a utility operating here — the lights. We don't say, "Gee, isn't it wonderful, the value added that has allowed us to hold a meeting." If the damn lights go off, we will certainly moan, however. And that's the problem with a utility. The only measure of success for utilities is guaranteed 24-hour service, itemized billing, consolidated billing, guaranteed maintenance and, preferably, falling prices.

So any of you who use the word utility, you should polish your resume and move on. It's a thankless job.

But nonetheless, DP is building a utility. And the key value added to that utility benefits DSS. That is, it is the power saw, not the electrical utility, that creates the service. It's the workstation and what you put on the workstation that creates the benefit for that utility. So DP's dilemma is handling these. In many cases, it needs the things that DSS has done fairly well. But let's just take a look at DSS' dilemmas, which I think are more serious.

DSS has spent its time cherry picking. It is taking the little applications and doing them well and getting a lot of gratitude, finding urgent problems that can be solved with a small amount of technology. The trouble with cherry picking is, that is not the way to build an organization mandate and resource. And we do begin to see DSS builders who have terrific early careers and present lots of papers at conferences; three years later, they are a little frustrated because they don't seem to be able to get very far. And five years later, they've left, or they are either doing the same thing elsewhere or have gone to a consulting company.

How many people have built a real DSS career path? That may be impossible because the mandate is with DP.

How many people have built a real DSS career path? That may be impossible because the mandate is with DP. There will not be two mandates for the organizational resource in computing.

The mandate is where the data is, where the big systems are. As long as DSS is seen as an intruder, it will not be sharing in that mandate. One would ask people in DSS: What's your career path? They'd say: What career path? It's an area of extreme ambiguity. And again, it's tough to be a hybrid in any aspect of computing because being a hybrid destroys your career path.

What we are doing is taking people who are on a technical path or a business path and putting them to the middle. We're taking the good applications programmer and saying, "Hey, why don't you work in the information center building financial DSS." What that says is that he certainly doesn't have a technical career path anymore and clearly isn't a finance person. We're looking at DP, or in many cases, finance groups, to take people who had good organizational careers and pulling them in to be not very good programmers. So you don't have a career path until you can sell someone the promotion after next. Where's the promotion after next in DSS?

It means, though, that there are major difficulties for some of our best people in DSS. Where is the career path? DSS people may well

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move back into DP with a service orientation. They will move to create a new style of corporate planner, because that's what DSS really is about.

DSS-DP integration says: What DSS has is an understanding of users. It also has a design base that's very effective and certainly the most opportunistic of all fields. A DSS will use any tools that are available and suitable. I don't think there has been any innovation in computing that we haven't been able to pick up and exploit. Look at micros. There's no question they became a natural aspect of DSS development because they dealt with the problem of cost.

In distributed DSS, we are not just talking about distributing terminals, data, whatever. We're also distributing decisions. How do you build DSS with distributed decisions? It highlights the fact that the whole world converges on the intelligent terminal. That is, if you start with a stand-alone micro, you're going to lack communications. If you start with models, you're going to have an energy crisis and want data. If you start with the word processor, you're going to put in decision support systems only for budgeting.

So the question of building a corporate resource means that you have two choices which we can run in parallel. One has been traditional distributed processing, where we take a corporate resource, the mainframe, the data and start, through communications, distributing the workstations and then literally distributing the processing.

But we work from the inside out. Whereas what we are doing with DSS, or must do, if we have an architecture, is reverse distributing. What you say is, "Here, we'll find an interesting user, give that person financial planning capabilities, build some traditional DSS and then we'll work back to a host and data resource."

And in both cases, you have to have the architecture, and that really to me is what integration means. Now the trap for a lot of DSS people is that too often they think that what this is about is micro/mainframe downloading. It's not. It's really thinking through the questions of an architecture, integratability, transportability, connectability, sharability. It doesn't matter where you start.

Now, what that also says is that DSS is fundamentally concerned with where the workstation is and what it does. We want it to be with decision makers, people who matter, for decisions that matter.

We can begin to say that in reverse distributed processing, we go the opposite way from data processing.

Talking about the multiservice workstation, I think we get a sense of what the components are. There is a basic capability which everybody has. Currently there is one terminal workstation for every 20 workers in the U.S. In the information-intensive industries, such as banking and insurance, or information-intensive departments within manufacturing and customer service, the ratio is not one to 20, but one to two. I don't think there will be a Fortune 100 company in 1986 that isn't in that ratio. That's one workstation for every two workers across the organization. If you believe in productivity, then that's a logical consequence.

That means that in many cases, it's the computer equivalent to the telephone. If one starts using PBX and moves towards the ISDN [integrated services digital network] concept, then in fact it will be a teleset, one workstation on each desk. If we're talking about one workstation for each two workers, then that workstation is a basic delivery vehicle for certain things now done through other media. Everybody surely will be using that as the standard information access capability — end-user information access.

But some people need the same information in aggregate form; some require it at the very detailed levels; some require small amounts; some can live with the recurrent monthly cycle; others need information in between.

We assume the basic capability of the workstation will be to deliver and access information — certainly for electronic mail. For organizations not to be using electronic mail is crazy. There's no system as cheap, as effective on added value and efficiency. Unfortunately, the lack of an architecture to integrate electronic mail is beginning to haunt companies.

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As we move from DSS being for personal analysis and personal productivity to being part of the tools we use in ongoing decision making, then it's not DSS for making decisions but DSS for helping explain decisions.

You can't have separate electronic mail networks. I love the word "incompatibility." It should appear in the dictionary as: "Incompatibility means it doesn't work." It's like that lovely phrase "99% debugged," which also means it doesn't work.

Budgeting and financial control and financial reporting will be done through that workstation. Now, a lot of what we've built in financial planning languages is no longer DSS. It's operational, it's ready to move from the high level we started at, to be pushed down. It's time to put it out into a typical DP environment. It's going to be large-scale use, so whether it's the 1-2-3s or whatever, or models built in any of the standard better end-user languages, they are not special anymore. But they've got to be diffused, because that's part of the basic capability. Now where DSS fits is very much around personal productivity.

DSS will always remain nonstandardized. They may, as with financial planning, get standardized and be pushed down to the basic capability. We have some people who like doing analysis, some don't. Some like graphics, some hate it. Some love lots of data. It's no big deal. One could argue that it's foolish not to be using DSS in certain areas. I think DSS is part of the discretionary aspect of the managerial workstation. And that means there's a distinction.

At the moment, we currently call financial planning and budgeting part of the same thing. One will get pushed down. When we look at personal productivity, we've got to recognize there are large target markets we are not serving as well as we should. When DSS started out, there were probably more marketing applications than there were finance. It moved rapidly into finance. Where do we want to put those workstations, and what do we want to put on them? The discretionary thing is key.

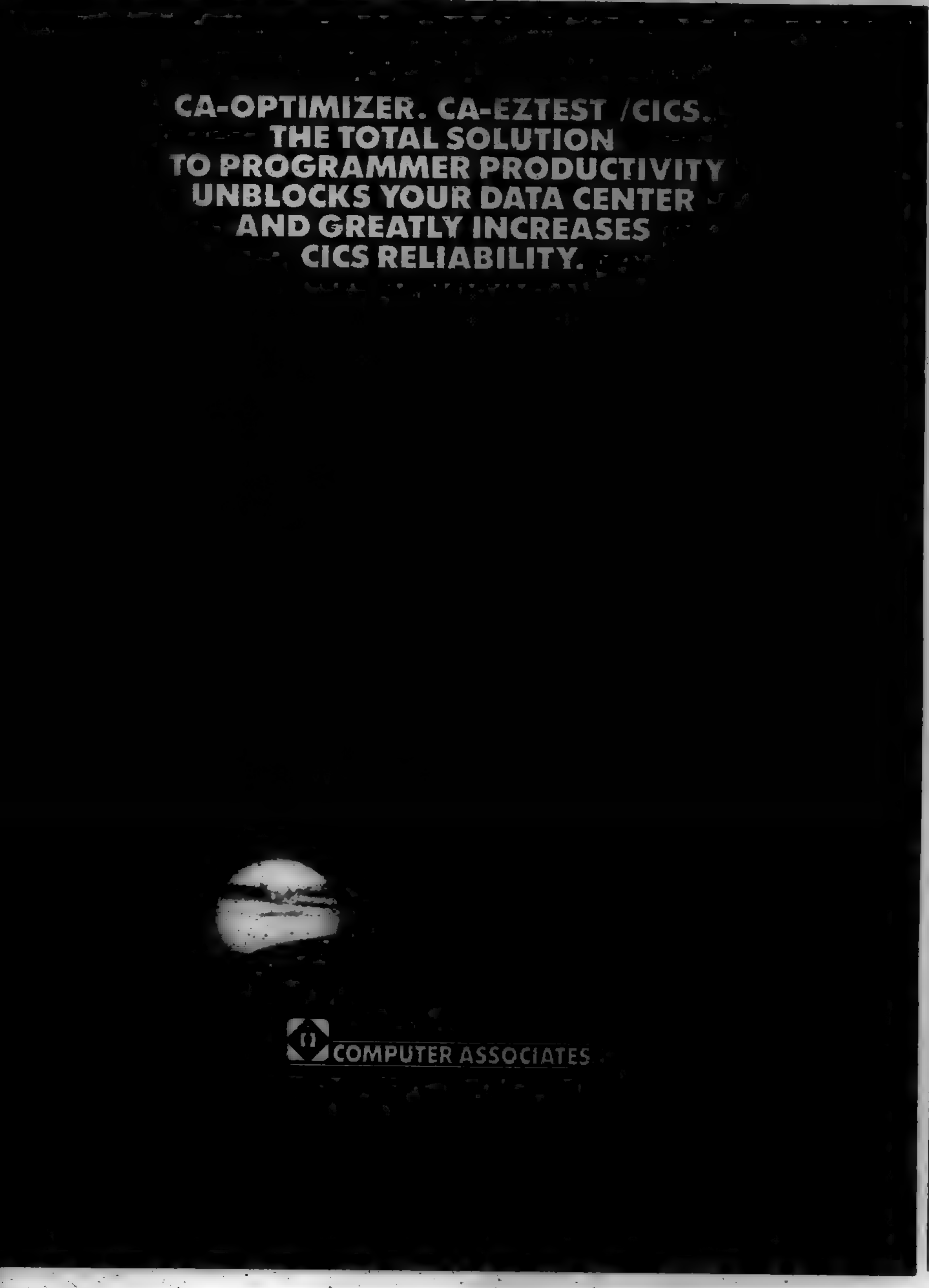
For example, many people don't like calendar management. I certainly don't. It will cause you to lose your last political weapon. To have your calendar known means you lose your autonomy. And surely, there must be people who made a decision which says, "If Fred ever phones, I'm busy." You want to be able to preserve little rules like that.

I'm intrigued by the fact that in many cases we have not recognized that as we move from DSS being for personal analysis and personal productivity to being part of the tools we use in ongoing decision making, then it's not DSS for making decisions but DSS for helping explain decisions.

For example, I don't think many people use graphics to make decisions. They certainly use them to convey decisions. And in certain areas, particularly marketing, graphics are absolutely fundamental. They just transform the ability to get your logic across. Similarly, conferencing is an optional capability. Conferencing is one of those things that is moving out of the learning curve.

What happens with all our technologies is that initially there is overselling. That is, if you look at life as an S curve, how long does it take to do the pilots and build things? When you start up with the pilot for videoconferencing or electronic mail five years ago or DSS, you say the office of the future is now and the cashless society will come in five years.

The learning curve for stand-alone micros was that. And it's over. Surely there's nothing interesting more to say about stand-alone micros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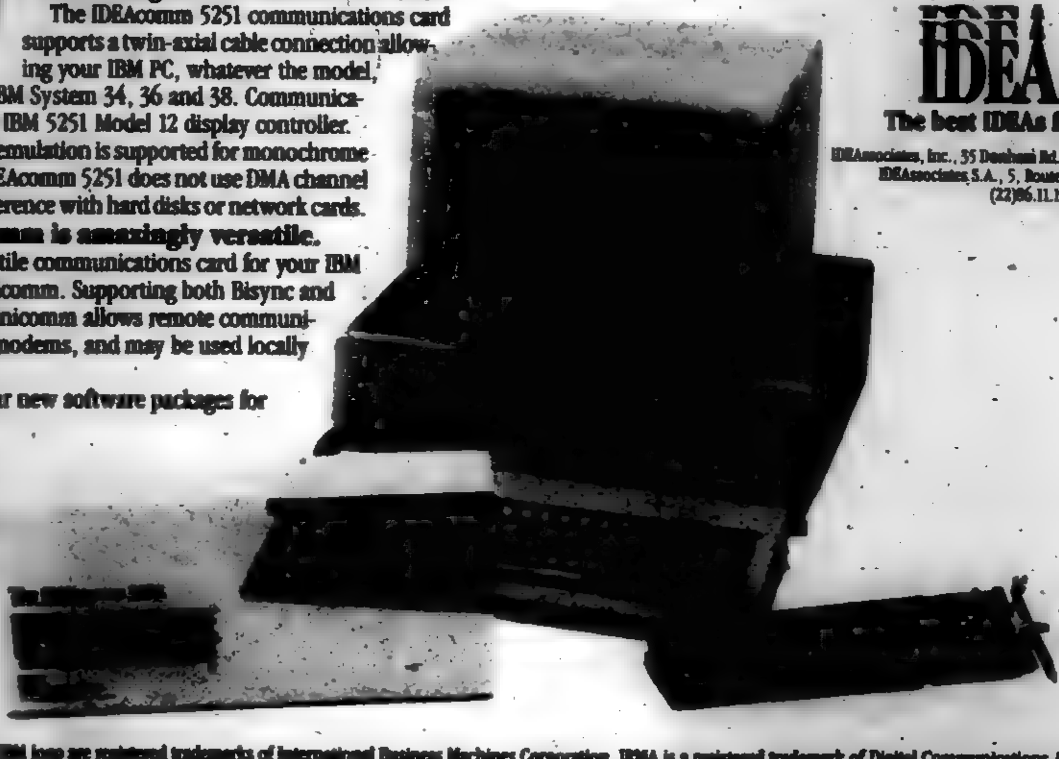

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except what you can do with a 32-bit machine instead of a 16-bit. You can't do anything with a stand-alone 32-bit machine in most cases unless you've got data.

CAD/CAM [computer-aided design and manufacturing], which could still chew up your 32-bit machines, is more interesting when you go to distributed CAD/CAM, the conveyance of designs and so on, the sharing of them. You know we've got a long way to go with integrated data resource management — and it will be slow. Videoconferencing — we've had a long wait, but that's really shaping up.

The point is, we've got to start thinking through in terms of that management workstation, the architecture for DSS. DSS is heavily involved here with special types of applications. The budget and management controls all may be using the same software base.

Decisions that matter

We should pay a little more attention to what decisions we would like to work on. Essentially, we are working on some very boring problems. There are lots of things we could be doing with that technology base.

The priority long-term targets for DSS have got to be decisions that really matter. Major ones are not around "what if," they are really around the fact that most business environments have moved to a level of volatility, partly because of deregulation. But the big question is not extrapolating the business plan and doing financial forecasting. It's really just answering questions like, "Who is our competitor now?"

My favorite example is hotels. There's no question that with deregulation of airlines, the airline reservation system will become the major integrated vehicle for hotel reservations. If you're a hotel, do you compete or do you incorporate with the allies? The area of EFT [electronic funds transfer] or point-of-sale systems is now shooting through the roof, so one of the most profitable banks in Florida is Giant Foods, which has one of the largest ATM networks. Do you compete? Do you incorporate? How do you think about your business?

What does it mean when Sears, American Express, Merrill Lynch and Citibank are fighting for the financial supermarket, and each one of them is in a different business? What does it mean to define a product? Now those are decisions that matter. And with the technologies we have in the training for DSS, we should start going into that.

If you're in the micro component business, surely short-term forecasting of back orders over the next three months and inventory levels is a much more complex problem than the relatively simple one of a one-year forecast.

There's a whole mass of analytic methodologies that somehow we seem to have lost in DSS. We've become too much a subset of a better style of developing systems. We ought to use a better style of thinking about how to help managers solve problems.

There can be no question that companies are haunted by the fact that too many of their decision-making processes assume out-of-date data. The other thing is, how do we help companies start getting a longer term planning horizon? A five-year plan is a short-term plan.

In technology in particular, 18 months is a blink of an eyelash. Can you get anything done with integrated computer technology that takes less than 18 months to think up the idea, get the equipment tested, designed and developed and make it operational. In banking, long-range planning is somewhere between 15 minutes and 24 hours. We say, "My God, we've got to do this quickly." We mean, if we work flat out, it's 18 months.

Simplicity is power

As companies become more dependent on technology and as markets shift, one of the things DSS people should be doing is starting to help people develop better models.

Too many of our models are at too micro a level of detail. We're building overelaborate models to give pinpoint estimates for short-term horizons. They are useful, but they're operational models.

The most powerful models tend to be very simple ones that help you understand your business better. And that's been a recorded statement from users of DSS. That's why they value insight, learning and understanding which variables matter. So we may be trapping ourselves in being a little too good at building operation models. We ought to pull back.

Now fairly obviously, one of the things this says is you better find a

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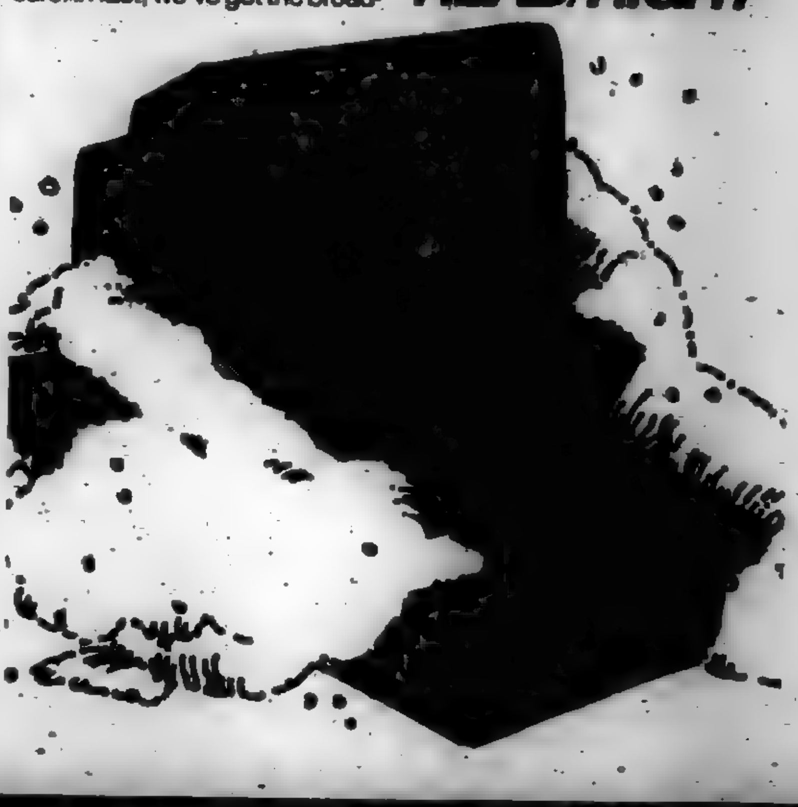

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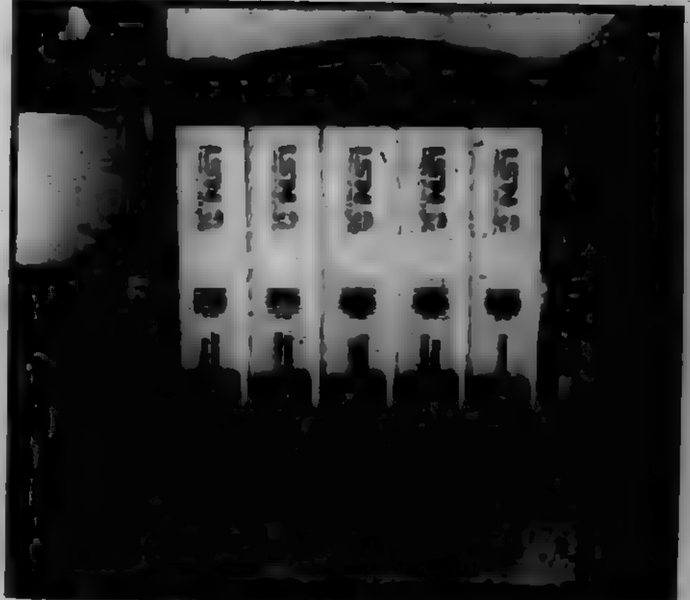

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target market. Who are the people in the organization you would really like to influence? I suspect that means moving up a little higher into the marketing and product planning units. In many organizations, you already have DSS people in there. I think it's fair to say that finance dominates and finance will continue to dominate.

The other area is artificial intelligence. Where does it fit? We all face a big problem there, which is expectations. Senior managers have read *Business Week*. My guess is that if you asked most senior managers whether they expect expert systems to be in their organizations five years from now, you would get a much more optimistic answer than you would from the DSS people and the technicians.

We're all facing the question, "Hey, where do expert systems fit?" We don't want DSS to become the new enemies of change the way that DP was. We don't want DSS saying expert systems have nothing to say.

We are going to see a whole flood of new technologies we are not prepared to handle. I certainly do not in any way feel qualified to deal with logic programming or anything in AI. There's almost a technology gap coming for us.

The opportunity for DSS and decisions that matter is to start looking for semiexpert systems. For example, our interfaces in DSS are very passive. They just do "what if," like a staff assistant. "I want you to go away and calculate the impact of a 6% inflation rate instead of 8%. Come back with the answer." They're not very active.

An active one is a management science model, which tells you what the decisions should be. Moving DSS up to be a little more active, to be run like a good consultant instead of a software system, is very valuable. For instance, you think about what you like out of good advisors — they're devil's advocates; they teach you. In certain areas like auditing and finance, we ought to be able to find DSS where there's a limited semantics. How many words do you need in finance to cover the vocabulary? 100? Maybe 50. There's plenty of knowledge sitting around in textbooks.

Auditing and accounting are ideal, because they fit into the things expert systems do well, which is "if, then, elses." They are very rule-oriented. And it's easy to identify the rules. But how do we start attacking the question of what it means to be an expert manager? How do you even study expertise if you are building an expert marketing system or semiexpert one? How does one even think through the question of where you would work on it? DSS can probably wait a year or two before it deals with that. But it certainly is a huge opportunity to be able to take the decision support methods of development and apply them to expert systems.

> ***It is a huge opportunity to be able to take the decision support methods of development and apply them to expert systems. I would argue that it's going to be the DSS people who build expert systems that work.***

I would argue that it's going to be the DSS people who build expert systems that work. Because the current ones are trapped to certain types of applications like clinical diagnosis, where the task is well defined and you get the rules out of people's heads. A very interesting thing about Mycin is not that it's a super system but how old it is — about 12 years old. And yet, it hasn't infiltrated into the culture.

When people talk about DEC's [Digital Equipment Corp.] VAX configuration, that's not an expert system in the sense of knowledge-based; that's just a series of very fast "if, then, else" rules. That's not a put-down, but it's really saying it may be DSS that helps pull that stuff out of the lab into practicality. What DSS people always do is describe first. You can't improve something you don't understand. You get a descriptive map of how things are done, how managers plan. Then a prescriptive map comes out of "they should or could." We're able to do things that the expert systems guys are going to have to learn, which is let systems evolve rather than build them.

Now consider executive information. Any DSS unit that isn't working on that in a company that has a network is failing to meet its responsibilities to the organization, especially if it's a private network. The nice thing about private networks is there's a time of day when they are free, called midnight. And the cost of transferring large amounts of information to the center is small.

What are the things that really matter in your organization? Is it marketing, new product development, cost displacement — all the things everybody knows are the hot buttons? And then, this strikes me to be a key: Who are the people whose productivity really is worth improving in your organization? That's the target market. Then one can talk about what their critical decisions are, their critical processes.

I really believe that this last 18 months has been an uneasy transition for DSS. There's not much going on in the ideas; the tools are pretty much in place. It has gotten a little boring, with too many easy things to work out.

The issue now is the recognition that the integration question partly stimulated from outside is not about integration of tools. It really is about how you move DSS back to being a key part of the overall computing resource.‡

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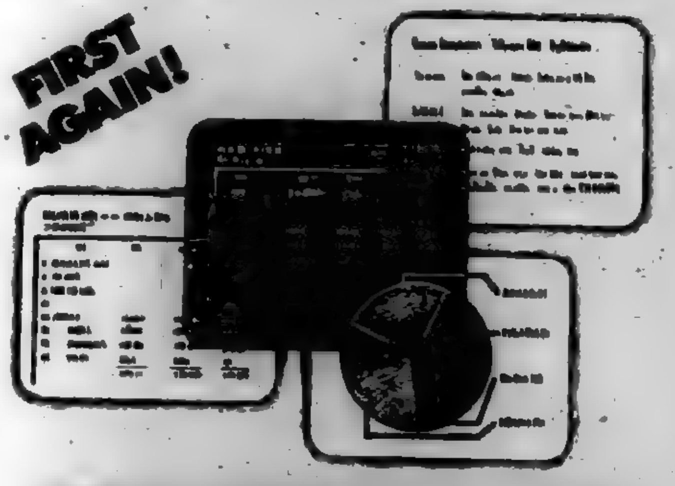
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COMMUNICATIONS

WIRE TAP
Eric H. Killorin

MS-Net holds key to compatibility

Microsoft Corp. recently unveiled its Microsoft Networks (MS-Net), a series of networking protocols that will, when implemented by local network companies, allow IBM and compatible DOS-supported personal computers to exchange information across numerous types of network schemes.

The networking protocols are important not only to personal computer networks, but also — in the larger scheme of things — to IBM network compatibility.

Microsoft's MS-DOS operating system — Version 3.1 — combines the typical DOS operating system with new MS-Net protocols. These protocols conform to the fifth (session) and sixth (presentation) layers of the International Standards Organization's Open Systems Interconnect networking model and include file serving and print serving functions in the seventh (application) layer. Because MS-Net is closely tied to DOS, it provides a clean means of networking, as the network was designed as part of the operating system. This version of DOS also allows applications software to be adapted to operate in a network environment.

An arguable strength of MS-Net is that it allows network "transport" vendors (those providing networking hardware and lower level networking software; for example, 3 Com Corp., Interlan, Inc. and Ungermann-Bass, Inc.) to adopt MS-Net. Although many of these firms already have their own higher level protocols, they must develop a hook into MS-Net and, more pointedly, conform with IBM.

MS-Net is already supported by 23 vendors, including the companies mentioned as well as Digital Equipment

See **PROTOCOL** page 66

Killorin is president of Hyatt Research Corp. in Andover, Mass., and editor of "PC Netline," an industry newsletter covering personal computer networks.

Telenet posts Telemail options

Additions include hard copy, worldwide delivery

VIENNA, Va. — GTE Telenet Communications Corp. has announced four enhancements to its Telemail electronic mail service. The enhancements are said to include hard copy delivery and international connections.

The company said its Telemailxpress will include two delivery options, first-class mail delivery and overnight express delivery.

It reportedly will allow Telemail users to originate messages on office or home terminals for routing to a Telemailxpress processing center and delivery through the U.S. Postal Service.

Available during first quarter

Telemailxpress, scheduled for availability during the first quarter of 1985, will cost $2 to $5, depending upon the desired options.

GTE Telenet also announced an agreement with RCA Global Communications, Inc. that will enable Telemail users to send telex messages.

Users reportedly will be able to receive telex messages on their own terminals and use Telemail features such as message forwarding, electronic filing, customized forms creation, bulletin board capabilities and on-line editing.

Also scheduled for the first quarter, the cost of the telex feature will include the applicable telex charge and Telemail connect time charge.

Telemail is priced at $4 to $14 per hour, depending upon the time of day and 5 cents per 1,000 characters transmitted, the company said.

Global message-handling standards

GTE Telenet also said it will support the international use of global message-handling standards developed by the Consultative Committee on International Telephone and Telegraph (CCITT).

According to the company, Telemailxpress will be the first electronic mail service to have systems connected internationally with software based on CCITT X.400.

The company said the first international connections will be with Canada, beginning in the second quarter of this year. Pricing of the service will be based on the Telemail fees.

GTE Telenet is located at 8229 Boone Blvd., Vienna, Va. 22180.

Microcom offers modem series

NORWOOD, Mass. — Microcom, Inc. has announced a series of error-correcting modems designed for full-duplex communications over dial-up lines.

The products are said to use the Microcom Networking Protocol (MNP), that was designed to correct transmission errors caused by noisy lines by retransmitting lost or incorrectly received data. The 2,400 bit/sec modems are said to be CCITT V.22-compatible with full-featured autodial and autoanswer functions.

The ZX/1200 and ZX/2400 modems are targeted at business minicomputer installations with asynchronous terminals and offer Hayes Microcomputer Products, Inc. compatibility.

The SX/2400 reportedly is a stand-alone upgrade to the Microcom SX/1200. It is said to feature autodial, autoredial, autoanswer, and independent speed and flow control.

The Era 2 2400 reportedly is a 2,400 bit/sec inboard modem for the IBM Personal Computer and allows dissimilar systems supporting MNP to transfer files.

The PC/2400 Modem is said to be a stand-alone modem bundled with software for the IBM Personal Computer and is intended for IBM Personal Computers that have no space for an inboard modem, according to the vendor.

File transfers among dissimilar systems

The Macmodem 2400 is said to be an enhancement to Microcom's Macmodem 1200 and allows file transfers among dissimilar systems such as the Apple Computer, Inc. Macintosh and the IBM Personal Computer.

The 2,400 bit/sec modems also operate at 300 bit/sec and 1,200 bit/sec, according to the vendor.

Scheduled for availability in the first quarter of 1985, they range in price from $799 to $999.

Microcom is located at 1400A Providence Highway, Norwood, Mass. 02062.

- Icot Corp. has announced a family of communications processors designed for use in point-of-sale and automated teller machine networks/64
- Micom Systems, Inc. has introduced its X.25 Network Control System for centralized monitoring and control of Micom Micro 800/X.25 Concentrator PAD networks/64
- Innovative Electronics, Inc. has annouced a concentrator designed to tie NCR Corp. and Burroughs Corp. retail terminals into IBM Systems Network Architecture networks/64
- Genesis Electronics Corp. has announced the Cindi 200 series voice mail system for businesses with 50 to 100 telephones/65

INSIDE

Controllers/64
Voice/Data Communications/64
Protocol Converters/65

Paradyne appends Pix product line with Pixnet-XL

LARGO, Fla. — Paradyne Corp. has added to its Pix/Pixnet product line a new member that can be used to extend the block-multiplexed ports on IBM and compatible hosts.

While previous Pix products applied only to byte-multiplexed channels, Pixnet-XL can be used to extend byte- or block-multiplexed channels of IBM and compatible hosts, making possible the remote location of high-speed printers, computer-aided design and manufacturing (CAD/CAM) systems, local-type terminal controllers and other peripheral equipment usually limited to the 200-ft restriction associated with these ports, the company said.

The Pixnet-XL system hardware and software are contained in control units, or nodes, which can be interconnected in a Pixnet network at speeds up to T1 (1.54M bit/sec). This maximum link speed reportedly can be achieved by using multiple lower speed links. Up to eight 56K bit/sec links can be supported among XL nodes, Paradyne said.

Because use of Pixnet-XL is transparent both to the hosts and peripherals being used, I/O control routines are created and maintained as they would be normally, the vendor said.

Target Pixnet-XL applications include support of a variety of remote devices, including laser printers, line printers, CRT terminals, check sorters and CAD/CAM devices. It uses the High-Level Data Control communications protocol with data compression to optimize transmission efficiency, according to the company.

The illusion of local attachment reportedly relieves the host processor of the burden of polling, error detection and correction normally associated with remote teleprocessing.

The company said the product utilizes a multiprocessor architecture, with each node containing a floppy disk, Winchester disk and 2M bytes of common or global memory that is shared by all processors across a common bus.

The Pixnet-XL operates with satellite, digital and analog lines and microwave media.

It is scheduled for availability during the first quarter of 1985 for $95,000 to $125,000 per link in a point-to-point environment.

Paradyne can be reached at P.O. Box 1347, 8550 Ulmerton Road, Largo, Fla. 33540.

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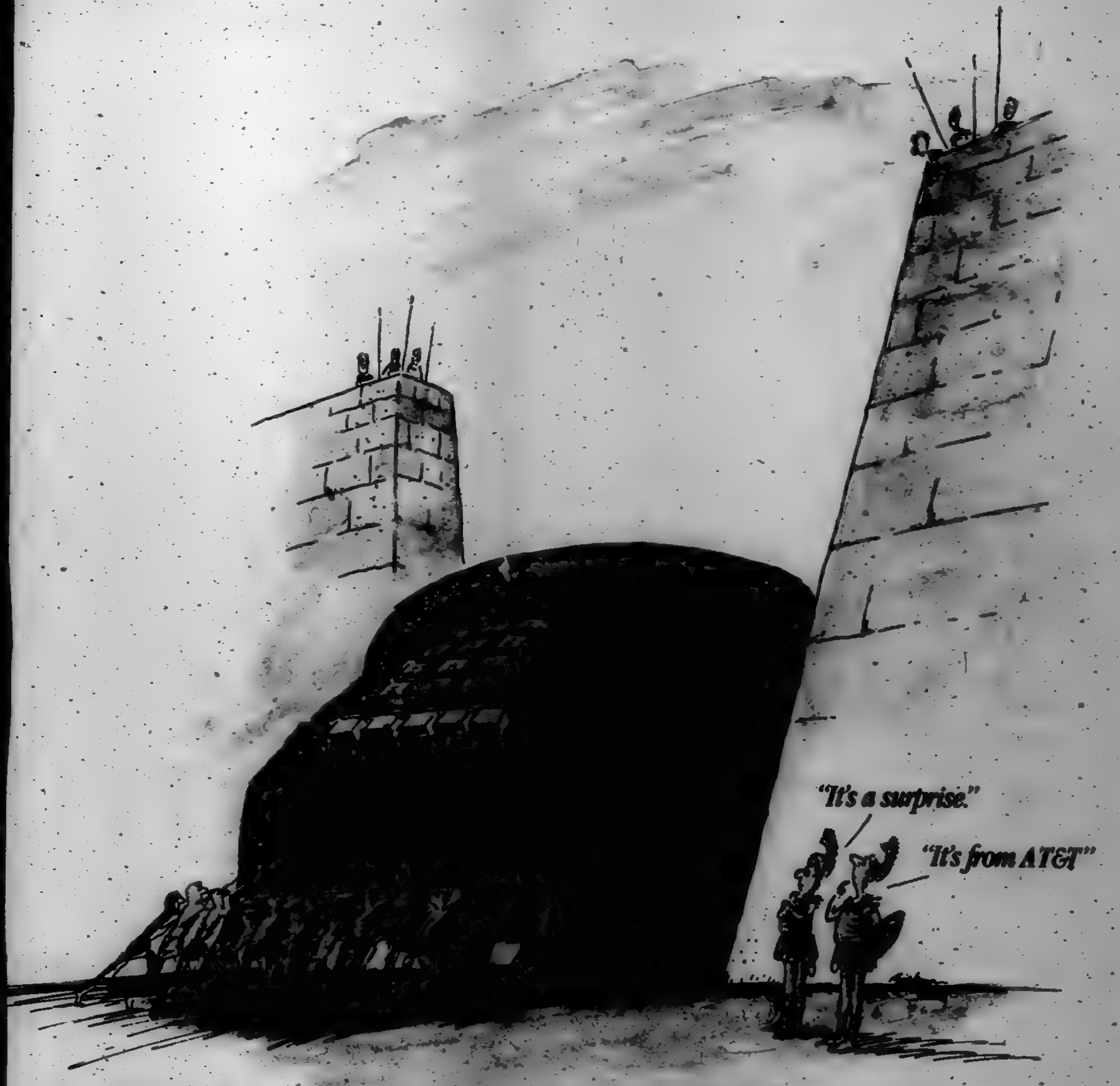

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CONTROLLERS

DOELZ NETWORKS, INC.
Elite One

Doelz Networks, Inc. has announced a multipoint concentrator switch designed as an alternative to multipoint network schemes.

The Elite One reportedly creates a network link by interconnecting up to 60 switches, which set up virtual multipoint circuits providing a single shared path between ports. The product is intended to eliminate line redundancies, protocol adaptations and intervention by a telephone company when drops are added or deleted from the network.

According to the company, the Elite One is useful in asynchronous or synchronous environments that use several terminals tied to a central processor, such as airline reservation, banking and inventory control applications.

Terminals and cluster controllers reportedly can be attached to the Elite One's ports regardless of communications protocols. Polls, acknowledgements and messages are transmitted by the host to all drops, but only those terminals whose addresses are in the transmission may see and respond to the transmission, according to the vendor.

Elite One costs $5,640.

Doelz Networks, 18581 Teller Ave., Irvine, Calif. 92715.

ICOT CORP.
Crystalink 5000 Series

Icot Corp. has announced a family of communications processors designed for use in point-of-sale (POS) and automated teller machine (ATM) networks.

The Crystalink 5000 Series is said to enable a financial institution's mainframe to communicate with multiple ATMs in branch banks and POS devices in retail stores.

The Crystalink 5250 Dial POS Concentrator reportedly enables up to eight simultaneous transactions from standard dial-up credit authorization terminals to be concentrated over a single IBM 3270 bisynchronous link to a remote 5250. A maximum of 24 dial-up ports and two host links can be supported. The Crystalink 5250 is available now and costs $6,300.

The Crystalink 5330 ATM Concentrator reportedly performs similar functions in a direct-connect ATM network, allowing up to 100 ATMs to access a host through IBM Binary Synchronous Communication. It also features traffic balancing in the host link.

Available now, a Crystalink 5330 configured for 50 ATMs costs $8,500.

Icot, P.O. Box 7248, 830 Maude Ave., Mountain View, Calif. 94039.

VOICE/DATA COMMUNICATIONS

MICOM SYSTEMS, INC.
X.25 Network Control System

Micom Systems, Inc. has introduced its X.25 Network Control System (NCS) for centralized monitoring and control of networks of Micom's Micro800/X.25 Concentrator PADs.

The NCS is a turnkey microcomputer system designed to handle remote packet assemble/disassemble (PAD) functions, downline loading of PAD operating software, statistics collecting and reporting, troubleshooting and message broadcasting. The system also is said to keep records covering each PAD, its installation date and service history, its installed options and the person to contact in case of problems.

According to the vendor, NCS uses menu selection and groups packet-switching parameters logically with descriptive names rather than using cryptic numeric descriptors.

The NCS reportedly does not require a dedicated X.25 access link but accesses the network through a PAD supporting other computers and terminals. An NCS supporting up to 50 PADs costs $15,500, and one supporting 150 PADs sells for $16,500.

Micom Systems, 20151 Nordhoff St., Chatsworth, Calif. 91311.

INNOVATIVE ELECTRONICS, INC.
Netmaster

Innovative Electronics, Inc. has announced a microprocessor-based concentrator designed to tie NCR Corp. and Burroughs Corp. retail terminals into an IBM Systems Network Architecture (SNA) network.

Netmaster is said to be a multifunction concentrator that acts as a remote in-store processor in a credit card authorization and data entry point-of-sale system, eliminating the need for large Burroughs or NCR processors in individual stores.

Netmaster is a 16-bit computer that operates in conjunction with the IBM host or compatible host with an IBM 3705/25 front-end processor. It runs with an Innovative application software package under IBM CICS.

Netmaster is said to accumulate point-of-sale transactions and maintain the flow of data to the host. It reportedly preprocesses inbound and outbound data to reduce mainframe processing, translating IBM 3270 virtual screens for transmission to and from the front-end processor and providing mass storage of print data.

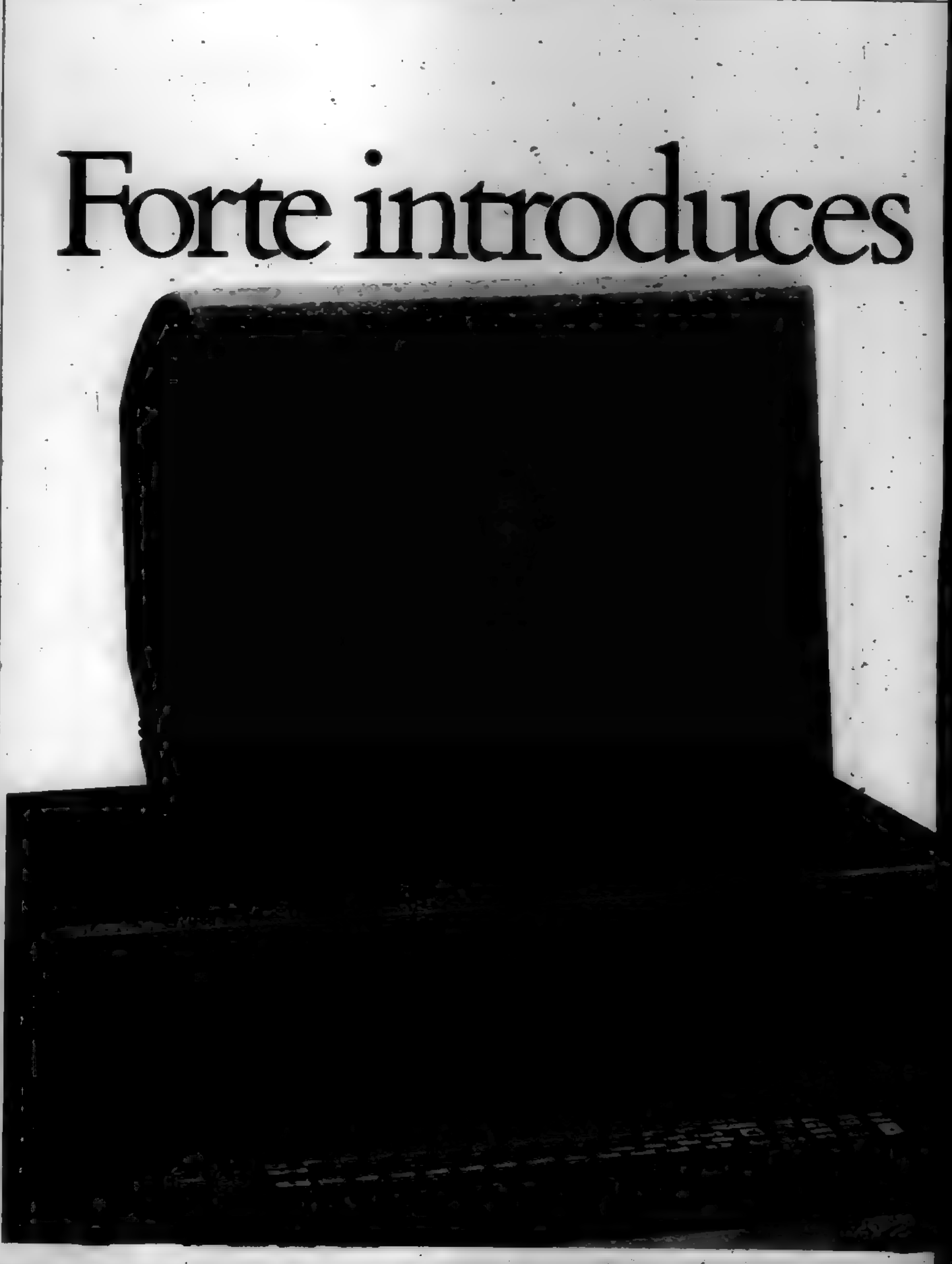
Each Netmaster reportedly can support up to 300 terminals.

The single-unit price is $3,500. Quantity discounts are available.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

HONEYWELL, INC.
Serial link and gateway

Honeywell, Inc. has announced a serial link and gateway for its DPR 1500 digital process reporter to allow its microprocessor-based recorders



and controllers to communicate with host computers.

The interface reportedly allows up to 31 DPR 1500s or UDC 500 universal digital controllers to use a single RS-232C port. It is said to let the DPR 1500 serve as a multiplexer that can acquire, linearize and transmit up to 30 analog input variables.

Users can download data and commands from the host to the DPR 1500 to record alphanumeric characters along with time and trend lines. The host can analyze incoming data and annotate the DPR 1500's data tabulations and trend records using the unit's dot matrix printer.

Communications between Honeywell process instruments and the gateway take place over shielded twisted-pair wires at 19.2K bit/sec for distances up to 2,000 feet.

A user-installed retrofit kit for installed DPR 1500s costs $700 after parts trade-in. For new users, the DPR 1500 costs from $3,800 to $4,800, and the gateway and link cost $780.

Honeywell, Process Control Division, 1100 Virginia Drive, Fort Washington, Pa. 19034.

GENESIS ELECTRONICS CORP.
Cindi 200 series voice mail

Genesis Electronics Corp. has announced the Cindi 200 series voice mail system for businesses with 50 to 100 telephones.

The Cindi 200 is said to provide a range of voice mail features, including message storage and retrieval, message forwarding, call placement, group messages, guest mailboxes, certified messages and password protection.

The system is said to work with a range of private branch exchanges, including Mitel, Inc.'s SX-100 and Harris Corp.'s 110, the company said.

The price for Cindi 200 with two ports and one hour of storage is $9,900, the vendor said.

Genesis Electronics, 103 Woodmere Road, Folsom, Calif. 95630.

HEWLETT-PACKARD CO.
18150JA software for X.25 verification

Hewlett-Packard Co. has introduced a software package for testing X.25 packet-switching problems. HP's 18150JA package works with the HP 4955A protocol analyzer.

Software tools reportedly include an X.25 link-level and an X.25 packet-level certification and an X.25 link-level emulation.

The product sells for $2,500.

HP, 3000 St., Palo Alto, Calif. 94304.

PROTOCOL CONVERTERS

PARADYNE CORP.
9403 protocol converters

Paradyne Corp. has announced two protocol converters that are said to let users add a variety of asynchronous devices to systems using Paradyne's Pixnet communications network.

The 9403 protocol converters reportedly allow asynchronous devices to appear as local IBM 3277 terminals. They communicate in Pixnet's 9476 protocol in point-to-point and multipoint applications. Terminals may be located remotely using leased or dial-up lines and can be used in conjunction with multiplexers, the company reported. Transmission is said to be from 2,400 bit/sec to 9,600 bit/sec.

The Model 9403-01 reportedly connects to a Pixnet through a single line and provides four ports supporting three terminals and a printer. Model 9403-02 is said to have eight ports and support up to seven terminals.

The Model 9403-01 costs $4,900, and the Model 9403-02 costs $5,900.

Paradyne, 8550 Ulmerton Road, Largo, Fla. 33540.

INNOVATIVE ELECTRONICS, INC.
MC 80/700

Innovative Electronics, Inc. has announced the MC 80/700, a compact protocol conversion unit for the IBM 3270 environment.

According to a company spokesman, the MC 80/700 is self-contained and uses a standard Type A coaxial connection into the IBM 3274/76 cluster controllers. The product is said to be compatible with all IBM environments, including Binary Synchronous Communication and Systems Network Architecture (SNA)/Synchronous Data Link Control.

The MC 80/700 supports BSC as well as SNA Logical Unit 1 and 3 IBM data streams. Output can be provided in a formatted mode of 40, 64 or 80 char./line or in an unformatted mode of up to 132 char./line. The unit also supports a "transparent mode" of operation, which allows the attachment of virtually any Ascii output required for specialized host applications, the spokesman said.

The MC 80/700 protocol converter is priced at $1,495, according to the spokesman.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

DIVERSIFIED DATA RESOURCES, INC.
Rack-mount Hydra II

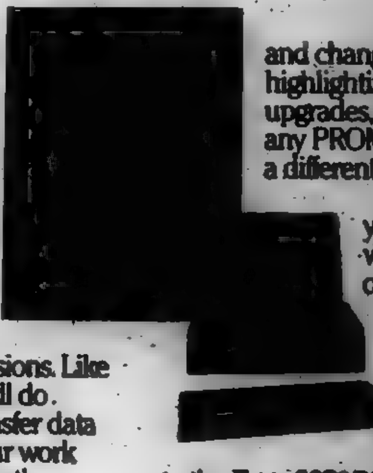
Diversified Data Resources, Inc. has announced a rack-mountable version of its Hydra II direct channel attach protocol converter/controller.

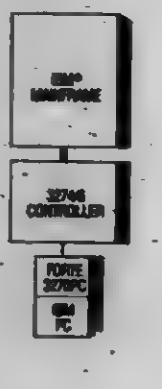
The unit, said to fit into a standard 19-in. electronics rack, has been redesigned with its plugs and cables in the rear, rather than the front.

The Hydra II is a byte multiplexer direct-channel attach device that is said to provide IBM 3278/3279 emulation for personal computers and

Continued on page 96

the smarter ~~desk~~ disk





You've read about the IBM* 3270 PC. Now there's a technology that gives your existing PCs and compatibles IBM 3270 PC emulation. And more.

You can run all this concurrently: an IBM DOS session, mainframe sessions with four different hosts, and two note-pad sessions. Like IBM's machine, your PCs will do windows. You can even transfer data between windows. Save your work on diskettes. Then upload to the mainframe.

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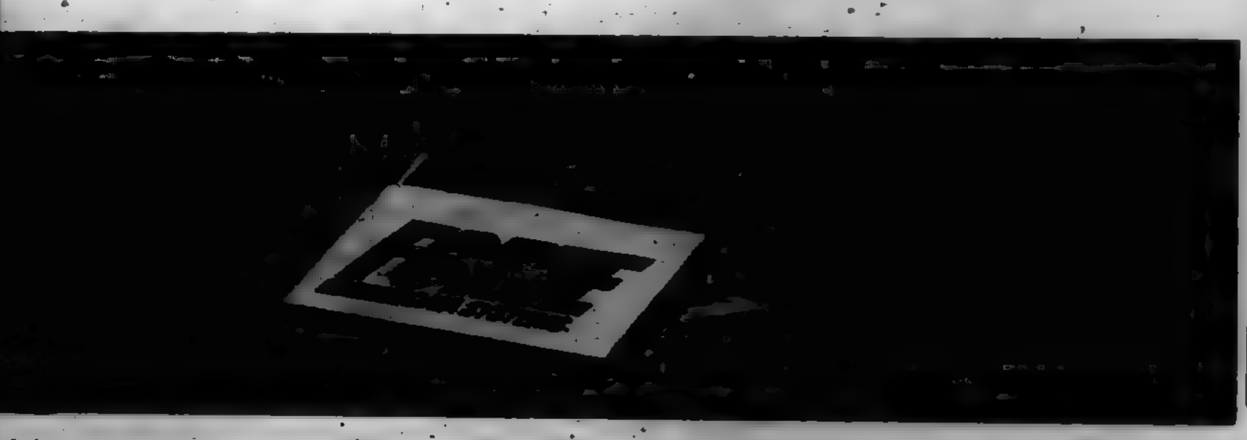

Continued from page 65

Ascii terminals and printers. Devices, whether attached locally or remotely via modems, appear local to the host, according to the vendor.

The rack-mountable versions are priced the same as the stand-alone models — $6,900 for eight ports and $9,900 for 16 ports.

Diversified Data Resources, 25 Mitchell Blvd., San Rafael, Calif. 94903.

INNOVATIVE ELECTRONICS, INC.

MC 80/900

Innovative Electronics, Inc. has introduced a microprocessor-based protocol converter that is said to allow any micro or Ascii terminal to access IBM mainframe environments and Ascii hosts concurrently.

The MC 80/900 reportedly makes the Ascii devices appear to the IBM host as IBM 3278 Model 2 display stations. It supports IBM bisynchronous or Systems Network Architecture/Synchronous Data Link Control communications protocols and connects directly by coaxial cable to an IBM 3274/76 cluster controller or to the display/printer adapter of the IBM 4331 host.

An auxiliary RS-232 port is said to allow an attached personal computer or Ascii terminal to have simultaneous pass-through access to an asynchronous minicomputer or public data base without requiring the user to log on and log off the active IBM host session.

The MC 80/900 costs $1,095, the vendor said.

Innovative Electronics, 4714 N.W. 165 St., Miami, Fla. 33014.

TELEPROCESSING PRODUCTS, INC.

TP-201

Teleprocessing Products, Inc. has announced an asynchronous-to-synchronous converter that is said to allow connection of an asynchronous terminal to a synchronous modem or digital data service link.

The TP-201 reportedly provides an asynchronous data rate that is equal to the synchronous modem or digital data link rate. It was designed to operate at strap-selectable asynchronous rates from 1,200 bit/sec to 9,600 bit/sec, matching asynchronous transmissions to the clock pulses of the synchronous link.

It costs $295.

Teleprocessing Products, Building 7K, 4565 E. Industrial St., Simi Valley, Calif. 93063.

PROTOCOL

from page 61

Corp., Hewlett-Packard Co., Intel Corp. and Texas Instruments, Inc. These companies will resell the MS-Net protocols with their current personal computer network product lines.

Although Microsoft supplies these companies with a target set of upper-level protocols, the file serving portion of MS-Net is inadequate. This an important concern, requiring MS-Net supporters — in order to be IBM network-compatible and competitive in the marketplace — to procure or develop their own file serving software that is at least as capable as the software for IBM's recently announced PC Network.

File server software

It is essential to adopt powerful file server software to ensure IBM compatibility. File serving is rapidly supplanting disk serving as the standard for personal computer networks. In most implementations, file servers enable files to be accessed individually, whereas disk servers require an entire volume to be pulled down to access a single file.

Creating file server software is no trivial task and will likely take most local network vendors a year to develop. Novell, Inc. of Orem, Utah, is one of the few companies that currently supports file serving.

Another key to IBM network compatibility is compliance with IBM's Network Basic I/O System (Netbios) and interface specification for IBM's PC Network. Netbios is central to the evolution of IBM networks, as it will be integrated with other IBM networks over time. A pending release of MS-Net will be compatible with IBM's PC Network program and will be tightly coupled with Netbios.

One advantage users of local net products built around MS-Net will have over IBM's own PC Network program is multivendor support. While the IBM PC Network will link only IBM Personal Computers, MS-Net, when combined with the lower- and middle-level software of local net transport vendors, will link many vendors' Personal Computers.

Sea of uncertainty

So, will MS-Net help part the sea of uncertainty surrounding PC Network buying decisions and help limit choices? Hyatt Research Corp. believes:

- MS-Net is integral to establishing a cohesive set of network options that, if implemented properly, allow mixing and matching of similar physical technologies, such as different Ethernet implementations.
- Microsoft has added an additional and much-needed part of the recipe for the development of applications programs for network environments. This is vital to the acceptance of local nets.
- As IBM's Netbios is carried over to subsequent IBM networks — such as its token ring — the MS-Net interface to Netbios should allow for upgrades from today's IBM networks to future IBM networks.

MS-Net does, indeed, provide consistency and a means to achieve IBM compatibility. Its technological approach, however, is not ground breaking. Further, supporters have the unenviable task of developing file server software equivalent to IBM's, which will not happen overnight.

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SYSTEMS & PERIPHERALS

Westinghouse, DEC link VAX, factory system

PITTSBURGH — Engineers from Westinghouse Electric Corp. here and Digital Equipment Corp. in Maynard, Mass., have merged DEC's 32-bit VAX family of CPUs with a Westinghouse system for factory automation, plant control and plant management.

The development is significant because it allows the Westinghouse WDPF distributed computer system to share one data base with a 32-bit CPU, cutting down translation time and CPU overhead, according to Robert J. Zabielski, manager of marketing communications in the industrial electronics division of Westinghouse.

Previously, translation between two systems was required because the WDPF system's data base communicated with another data base on a separate 16-bit CPU, Zabielski said. The link, with either the VAX-11/780, -11/760 or -11/750 running the VMS operating system, is said to provide the greater processing power needed for factory automation, he added. "Now, there is no gateway to go through. It's just connected to the drop as if it were an operating station," he said. (The drop is an industry term for the point at which individual devices connect to an electronic network. It could be a calculator, console, programmable controller interface or remote diagnostic tool.)

VAX applications software will have access to a plant's data base, allowing updates every second and consisting of up to 16,000 analog values or 256K digitals or combinations, without the mainframe computer overhead of traditional data-linked systems, the Westinghouse spokesman said.

The WDPF system, released in late 1981 and based on the Intel Corp. 16-bit 8086 microprocessor, was originally used for process control in industries such as petrochemicals and food processing. The system was later enhanced with pro-

See **LINK** page 72

Apollo cuts system prices

Enhanced server processor unveiled

CHELMSFORD, Mass. — Apollo Computer, Inc. announced price cuts of up to 38% on its 32-bit DN300 and DN320 workstations and related 34M-byte and 70M-byte disk subsystems.

The low-end DN300 with 1M byte of main memory, the company's Domain local-area network interface, virtual memory and system software was reduced 38% to $9,900, the company said.

The DN320, standard with floating-point hardware, was reduced 21% to $18,900.

Apollo also announced the DSP80A server processor, an enhanced version of the company's DSP80. The DSP80A features a memory expansion from 1M byte to 3M bytes, an enhanced cooling system and improved mechanics for easier maintenance, the company said.

The DSP80A, which has two RS-232 I/O ports and a five-slot Intel Corp. Multibus card cage, is said to allow user nodes to off-load peripheral and communications functions.

The price for the DSP80A with 1M byte of main memory, two RS-232C serial ports, a subset of the Aegis operating system and a five-slot Multibus card cage is $12,000, according to the company. The price with 3M bytes of main memory is $21,000.

Integration processor standard

The DN300 and DN320 come standard with a 32-bit very large-scale integration processor, a virtual memory management unit, an integrated 17-in. 1,024- by 800-pixel resolution graphics display and detachable keyboard and an interface to the Apollo's 12M-bit/sec token-passing ring local-area network called Domain.

Apollo's operating system Aegis is also provided, and the company's version of AT&T's Unix, called AUX, is available as an option.

A 34M-byte Winchester disk drive that previously cost $10,500 now costs $10,000, and the 70M-byte Winchester disk, formerly $12,800, now costs $11,000, the company said.

Other price reductions announced by

See **CUTS** page 72

- International Imaging Systems, Inc. unveiled the Model 6500 and 6700 digital image processors/68
- Megatek Corp. enhanced its Whizzard 1600 line of engineering terminals with an Intel Corp. 80186 microprocessor/68

INSIDE

Turnkey Systems/68
Terminals/68
Printers/Plotters/68

Hitachi's 1M-bit memory chip rounds 'final turn,' enters development stage

By Charles Babcock
CW New York Bureau

NEW YORK — Representatives of Hitachi Ltd. of Japan said they are "entering the final turn before the home stretch" in the race to build a 1M-bit memory chip. Spokesmen for the company also revealed that, unlike IBM and AT&T, Hitachi is continuing to conduct research on Josephson Junctions and other cryogenic research.

Hisashi Horikoshi, Hitachi's director of circuit research, said the firm's Josephson Junction project is still in the basic research stage with no specific applications. Hitachi is conducting the research with an eye toward demands in 1990 for a computer capable of 50-picosec cycle times. A rough Josephson logic gate array built by Hitachi had a cycle time of 5.6 picosec, he said.

Masaharu Kubo, Hitachi's chief researcher, said Hitachi was "entering the final turn" in designing a 1M-bit, dynamic random-access memory chip, capable of storing the text of eight newspaper pages.

Hitachi said it will use a "corrugated trench structure" that provides a large, stored-signal charge capacity in the silicon substrate while taking up little of the chip surface. The project has been transferred from its research phase to development

See **CHIP** page 72

SHOP TALK
William S. Krupka

Computer hygiene vital

Computer hygiene is the regular — daily or weekly — care and preventive maintenance of computer hardware. It includes cleaning CRT screens, keyboards, floppy disk drives, computer casings (known as the skin) and the exposed interior of the printer, its plastic shield or sound cover and platen.

The direct result of good computer hygiene is peak performance of the equipment, along with higher morale on the part of the operator. Without a scheduled cleaning program, users may be leaving equipment vulnerable to costly repairs and downtime.

If you were to ask most computer operators how they

See **CLEAN** page 74

Krupka is president of Computer Care, a vendor of computer cleaning products in Laurel, Md.

HARD TALK/TOM HENKEL

Do IBM rumors breed publicity?

IBM is by far the most secretive company in the computer business. It flatly refuses to discuss details of unannounced products or comment on potential alterations in its business plan. But in spite of that secretiveness, there appears to be no end to the rumors about what IBM will do next.

Clearly, IBM's dominance in the computer business makes it an ideal target for rumors. Almost everyone is interested in hearing predictions of what IBM will do next — even if those predictions sometimes contain painfully few facts.

But since some of the rumors about IBM eventually turn out to be accurate, it is clear that somewhere along the line, some well-informed sources within IBM must be talking out of turn. In fact, some people believe that IBM, through its long-standing policy of not officially commenting on speculative issues, may have stumbled onto one of the best marketing tools ever invented — intrigue.

For example, by intentionally dropping a few well-timed, unofficial hints about its future products and directions, IBM can create an aura of mystery and anticipation about its new products that tends to produce more publicity than any official explanation could ever muster.

Since the trade press is all too willing to listen to — and sometimes publish — the speculations and inside information gathered by industry analysts, IBM can get huge amounts of free publicity before it actually announces a product. Even leaving out of account the purely speculative articles, IBM often benefits from free publicity. For example, asking users how they are planning to deal with an upcoming IBM product indirectly tends to hype the new product. This scenario has happened at least five times in

See **RUMORS** page 74

Image processors unveiled

Models 6500, 6700 aimed at analysis marts

MILPITAS, Calif. — International Imaging Systems, Inc. has announced the Model 6500 and Model 6700 digital image processors for medical, industrial, military and resource analysis markets.

The Model 6500 provides either 1,280- by 1,024-pixel interlaced or 640- by 512-pixel noninterlaced display supporting true color, pseudocolor or up to three simultaneously displayed monochrome images. Three pipelines support radiometric scaling and interactive manipulations in real time at 30 frame/sec. Image array arithmetic and iterative/recursive operations are accomplished at 7.5 frame/sec for 1,280- by 1,024-pixel resolution.

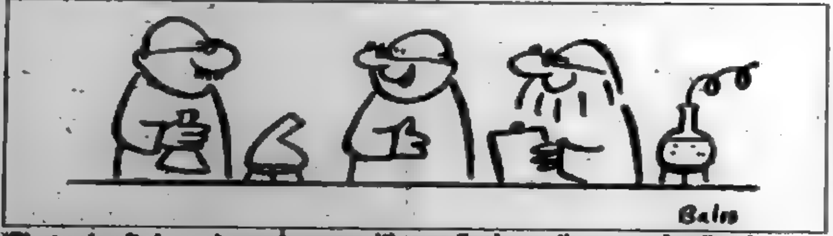
The Model 6500's arithmetic processor is said to provide an architecture that can be used for common image array arithmetic/logical operations and spatial filtering operations. Up to 10 independent graphics planes are provided with independent zoom and scroll capabilities, at up to 16 times magnification.

The 6500 uses a Motorola, Inc. 68000 microprocessor to support device initialization, display control, man-machine interface control and character/vector generation, the company said. The price for the Model 6500 is $39,000, the company said.

The Model 6700 is a monochrome or pseudocolor processor for applications requiring data acquisition and simultaneous real-time processing capabilities. The 6700 features a 1,024- by 1,024-pixel display and performs image array processing on 8-, 12- or 16-bit imagery. It also has a 16-bit, bidirectional port, the vendor said.

Prices for the Model 6700 begin at $49,000, the vendor said. Deliveries of both models are scheduled to begin in the first quarter of 1985.

More information is available from International Imaging Systems at 1500 Buckeye Drive, Milpitas, Calif. 95035.



'Blumenkraft, here, has come up with a radical new theory on funding.'

Megatek VDTs get upgrade

SAN DIEGO — Megatek Corp. has announced that its Whizzard 1600 series of engineering terminals has been enhanced with Intel Corp. 80186 microprocessors, upgraded from the Intel 8086s.

The 1600 series will continue to use an additional 8085 processor for keyboard operations and peripherals functions.

Megatek also announced that it will sell and support Versatec, Inc. V-80 electrostatic printers, featuring 200 dot/in. resolution and 8.5 sec/page output speed. The price for the printer option is $7,200.

Whizzard 1600 terminals in the field can be upgraded at a cost of $1,000 per terminal, the company said.

The 1600 series features two-dimensional or three-dimensional interactive graphics. The color 1650 model features a 19-in. color raster monitor, 640- by 480-pixel resolution and simultaneous display of 16 colors from a palette of 4,096, the company said.

The monochrome 1645 offers the same functions as the 1650, with 1,280- by 960-pixel resolution, the company said.

The price for the 1645 is $8,900, and the price for the 1650 is $9,900, the company said.

More information is available from Megatek at 9645 Scranton Road, San Diego, Calif. 92121.

TURNKEY SYSTEMS

FRANKEL ENGINEERING LABORATORIES, INC.

FEL Mill

Frankel Engineering Laboratories, Inc. has announced FEL Mill for generating milling machine programs.

FEL Mill's software reportedly is an enhanced version of the FEL Milling Machine applications software originally developed for the Hewlett-Packard Co. HP 3000 superminicomputer. The hardware consists of an HP 150 touch-screen microcomputer with a printer, an optional plotter and an optional tape punch. The turnkey system lets programs be generated off-line so milling machinery is not tied up for programming.

Part geometry reportedly can be defined with FEL Mill through simple specifications and then a segment of geometry can be reused. On screen, part geometry can reportedly be scaled, inverted, reflected, rotated, translated or repeated in pattern. FEL Mill displays prompts, menus and messages and has library and editing capabilities, the vendor said.

FEL Mill is priced at $9,950.

Frankel Engineering Laboratories, P.O. Box 501, 125 S. Fifth St., Reading, Pa. 19602.

TERMINALS

THOMAS ENGINEERING CO.

Tempest terminals

Thomas Engineering Co. has announced three Honeywell, Inc.-compatible terminals that conform to government Tempest security standards for protection against radio frequency interference.

The TE-780x is an Ascii terminal with Honeywell 7814 emulation; the TE-780x-S is the Visual Information Projection synchronous version of the 780x; and the TE-780x-V is said to combine the Honeywell 7814, Digital Equipment Corp. VT100 and Ansi standard emulation in one terminal.

Thomas Engineering terminals, based on the Zilog, Inc. Z80 8-bit microprocessor, feature 12 user-programmable function keys, full editing, 11 logical attributes and five visual capabilities.

Each terminal costs $6,495.

Thomas Engineering, 2440 Stanwell Drive, Concord, Calif. 94520.

See UNIT page 69

***Computerworld/Mexico* talks to computer people south of the border.**

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ESPAÑOL

There are currently 15,000 installed computers on 12,000 sites in Mexico. These include mainframes, medium and small computers as well as personal computers. Experts forecast the sale of small, medium and large computers to grow at an average annual increase of 20% during the 1980s, despite Mexico's current economic problems. Minicomputers will be in great demand since they are small, affordable and efficient. U.S. manufacturers have maintained a 80% market share for the past three years with sales of over $182 million. *Computerworld/Mexico* can bring your message to 10,000 key-decision makers in the Mexican computer community. Published on alternate Mondays, *Computerworld/Mexico* covers all the latest developments in hardware, software and terminals in addition to data processing and computer related subjects. Its goal is to provide useful information to data processing professionals throughout Mexico and Central America.

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SYSTEMS & PERIPHERALS

UNIT

from page 68

DECISION DATA COMPUTER CORP.

Amber option for 3761 workstation

Decision Data Computer Corp. has added a no-charge amber screen option to its 3761 CRT workstations.

Intended for use with IBM System/ 34, System/36 and System/88, the workstation had previously been available only with green-phosphor screens. The workstation costs $1,820, the vendor said.

Decision Data, 100 Witmer Road, Horsham, Pa. 19044.

WYSE TECHNOLOGY, INC.

WY-85 terminal

Wyse Technology, Inc. has announced the WY-85 terminal, said to be compatible with Digital Equipment Corp.'s VT220 CRT terminal. The unit offers 132 columns on a 14-in. screen with tilt-and-swivel features.

The WY-85 is also compatible with the DEC VT100 and VT52 terminals and conforms to the Ansi X3.64 standard. Users of DEC PDP-11 and VAX-11 series minicomputers can plug in WY-85 terminals without changes, according to the company.

The product is scheduled to be available in February. The price for the WY-85 is $799, the vendor said.

Wyse Technology, 3040 N. First St., San Jose, Calif. 95134.

PRINTERS/ PLOTTERS/ PERIPHERALS

DECISION DATA COMPUTER CORP.

6706 printer

Decision Data Computer Corp. has introduced a dot matrix printer said to be designed for data processing, correspondence-quality reproduction and graphics.

The 6706 is said to feature color-coded membrane key on the operator control panel, a four-character status display, microprocessor electronics and plug-compatibility with IBM's System/34, System/36 and System/38 small business computers. It is said to provide throughputs of 600 line/min in its data processing mode and 280 line/min for correspondence-quality printing.

Compatibility with System/34, System/36 and System/38 software reportedly enables the 6706 to reproduce graphics using application programs.

The 6706 costs $14,400.

Decision Data, 100 Witmer Road, Horsham, Pa. 19044.

VERSATEC, INC.

7200 series plotter upgrade

Versatec, Inc. has announced an upgrade feature said to increase speed and improve the resolution of the firm's 7200 series plotters from 200 to 400 point/in.

All higher resolution Versatec 7400 series models are said to offer faster maximum-rated paper speed, the company said.

Speed has been increased for Models 7422 and 7424 to 1.0 in./sec, for 7436 to 0.8 in./sec and for 7444 to 0.6 in./sec. Previous rated speed for 400 point/in. models was 0.6 in./sec for 7422 and 7424 and 0.4 in./sec for 7436 and 7444.

The cost to upgrade any 200 point/in. Versatec 7200 plotter to 400 point/in. is $10,000, plus an initial installation cost of $600, the company said.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

See PRINT page 72

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Triangle Software Company
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San Jose, CA 95129

DIGITAL DISPLAYS THE TERMINALS BEST ENGINEERED FOR BUSINESS.

Before you make any investment in business graphics terminals, it really pays to investigate what you'll be using them for.

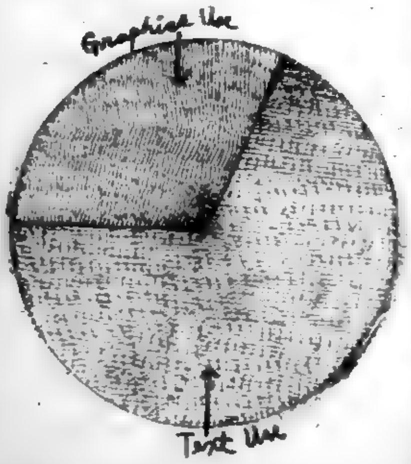
If you're like most businesses, your terminals will be used approximately 70% of the time for generating text and numbers. And only around 30% of the time for strictly graphics purposes. The October 1983 *Infosystems* article, "How to Buy Graphics Displays," coauthored by Jim Warner, CEO of Precision Visuals, Inc.,® states, "While it may be true that one picture (chart, graph) is worth a thousand words, there will always be the need for words, thousands of words, in the day-to-day activity of the office. Special graphics-only devices can have limited value in a general office environment."

At Digital, the first step in engineering every product we make involves a thorough analysis of who will use it, what it will be used for and which features will help make people more productive in their jobs.

That's been true of every terminal we've designed and helps explain their widespread acceptance and popularity.

And you'll find it's equally true of Digital's latest entries, the VT240™ and VT241™ terminals.

ENGINEERED BEST FOR WHAT YOU NEED MOST.



As the newest members of Digital's family of terminals, the VT240, a conversational text and graphics terminal, and the VT241, with the added dimension of color, continue the tradition of engineering excellence for performance. They offer full VT100™ compatibility to take advantage of a host of offerings already developed. And to meet the needs of the business environment, you'll find a set of standard text features that are either unavailable on other terminals or may have to be purchased at an additional cost.

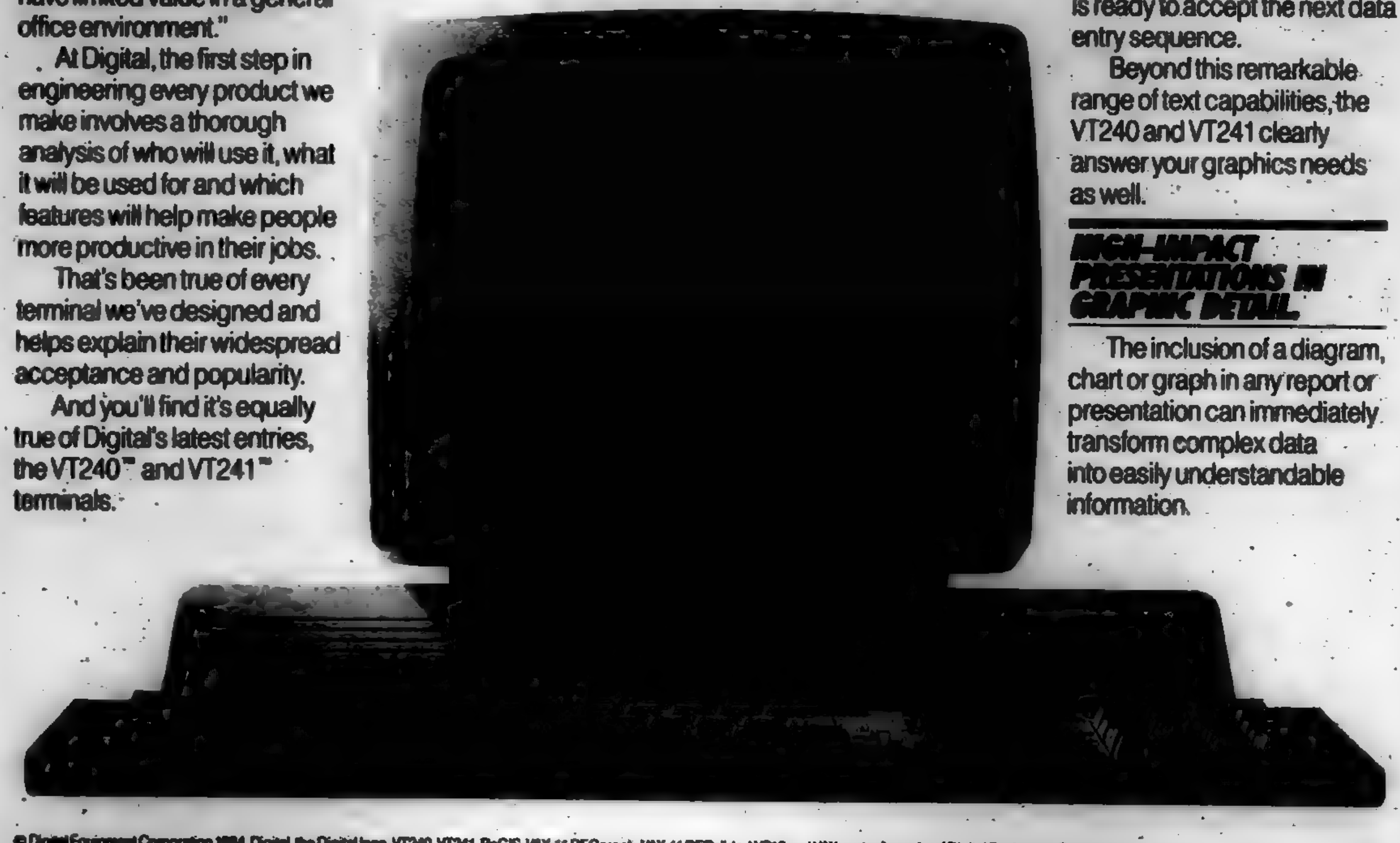
These features include bidirectional smooth scrolling, split screen, a choice of 80 or 132 columns per line and a double width/double height format. A highly legible 8 by 10 dot matrix character font displays true ascenders and descenders for exceptional crispness and legibility. If certain information needs to be highlighted, you can select from a combination of bold print, blinking and underlining in either normal or reverse video. For your added convenience, there's even a built-in printer port for printing hard copy.

Both the VT240 and VT241 terminals give you the option of erasing selected character positions on the screen for more efficient communications and increased productivity. For those applications that require data to be entered by filling in the blanks of a form, once the data has been accepted by the host, the filled-in information—and only that—can be erased by means of a single command. The form itself remains up on the screen and is ready to accept the next data entry sequence.

Beyond this remarkable range of text capabilities, the VT240 and VT241 clearly answer your graphics needs as well.

HIGH-IMPACT PRESENTATIONS IN GRAPHIC DETAIL.

The inclusion of a diagram, chart or graph in any report or presentation can immediately transform complex data into easily understandable information.



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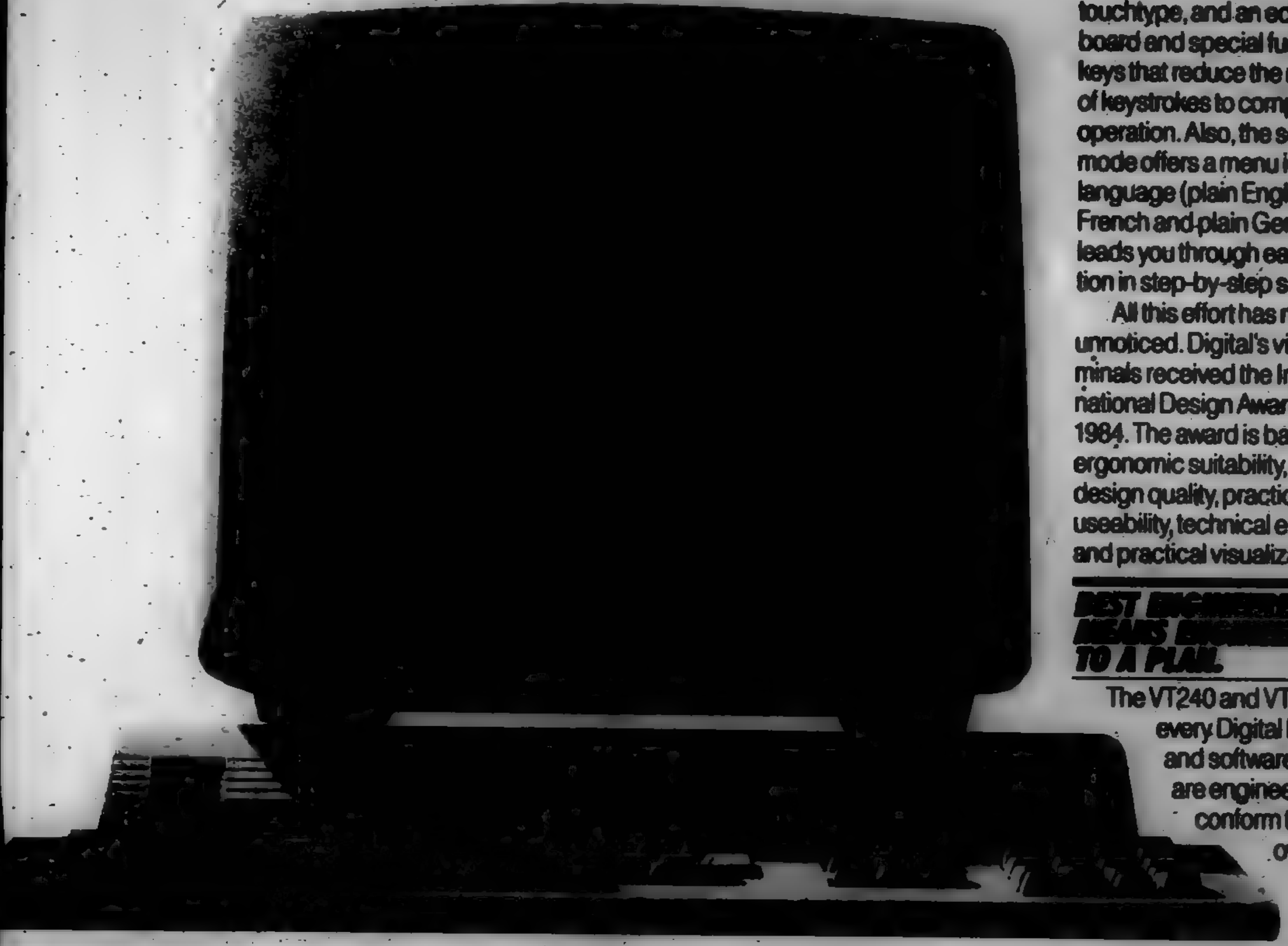

Both the VT240 and VT241 terminals generate bit map graphics in a choice of two protocols – Digital's ReGIS™ (Remote Graphics Instruction Set) and Tektronix 4010/4014.™

SALES
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ReGIS lets you create and store business graphics as simply as producing ASCII text. With VAX-11 DECgraph™ and VAX-11 DECslide™ software, even a novice can prepare graphs and charts and turn them into slides. Self-explanatory icons let you choose a box, circle, line, polygon, triangle or arc.

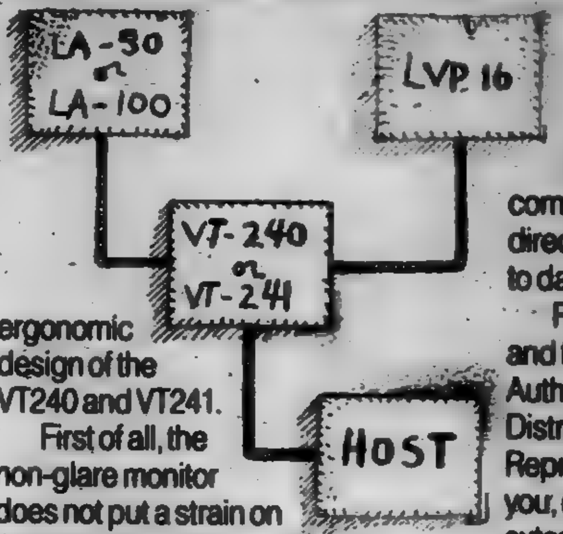
The Tektronix 4010/4014 protocol supports the full array of existing 4010 compatible graphics software. Besides, Tektronix Plot 10,™ TELL-A-GRAF™ and DISSPLA™ from ISSCO® and DI-3000,™ GRAFMAKER™ and GRAFMASTER™ from Precision Visuals are also supported.

When you're using third party software, Digital provides you with the total hardware/software solution: video terminals, hard copy with the LVP16™ Pen Plotter and the VAX™ computer.

THE HIGHEST AWARD FOR ERGONOMIC DESIGN.

Your people have to spend long hours in front of a terminal. It stands to reason the easier they are to use, the more productive the results.

That's why so much time and thought have gone into the ergonomic design of the VT240 and VT241.



First of all, the non-glare monitor does not put a strain on the eyes. Plus, it tilts to adjust to the exact viewing angle that's most comfortable to work with. The detachable keyboard is ruggedly constructed, yet light enough to place on your lap. Even the way the keyboard has been arranged boosts productivity.

There's a standard typewriter keypad so you can touchtype, and an editing keyboard and special function keys that reduce the number of keystrokes to complete an operation. Also, the set-up mode offers a menu in plain language (plain English, plain French and plain German) that leads you through each operation in step-by-step sequence.

All this effort has not gone unnoticed. Digital's video terminals received the International Design Award in 1984. The award is based on ergonomic suitability, safety, design quality, practical useability, technical excellence and practical visualization.

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

The VT240 and VT241, like every Digital hardware and software product, are engineered to conform to an overall computing strategy. This means our products are engineered to work together easily and expand economically. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

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THE BEST ENGINEERED COMPUTERS IN THE WORLD

digital™

PRINT

from page 69

GULTON INSTRUMENTS, INC.
Superplot-80

Gulton Instruments, Inc. has announced an 80-col. thermal printer/plotter that uses a linear array thermal print head.

Superplot-80 is said to be designed for computer and instrumentation graphics hard-copy uses in computer-aided design and manufacturing, scientific laboratory use, structural analysis, medical patient monitoring and other applications in which flatbed X-Y plotters traditionally are used.

Superplot-80 reportedly produces graphics at a speed of 71 line/sec and prints near-letter-quality alphanumeric characters at more than 500 char./sec. It is said to feature a 96-char. Ascii set in a variety of fonts and a 32-char. international set.

The unit reportedly includes page-level vector graphics that enable the user to format a graphics display based on coordinates generated by the host system. It has an 8-in.-wide printable field on 8½- by 11-in. thermal chart paper.

According to the vendor, Superplot-80 will be available in February priced at about $2,000.

Gulton Instruments, Gulton Industrial Park, East Greenwich, R.I. 02818.

LINK

from page 67

grammable controllers and now has factory automation capability. The system currently is in use at 110 sites worldwide, 85% of them in the U.S., including a major application in a General Dynamics Corp. defense plant in the U.S., Zabielski said.

The base price for a Westinghouse WDPF system, including a processor using a 16-bit Intel 8086 microprocessor and an engineering or operating console and keyboard but not including the VAX-11 CPU, is $250,000.

More information is available from Westinghouse, Westinghouse Building, Gateway Center, Pittsburgh, Pa. 15222.

CUTS

from page 67

Apollo were as follows: The DN300 with 1M byte of main memory is reduced from $15,900 to $9,900. The price for a DN320 with 1M byte of main memory and a 34M-byte Winchester disk drive is $19,900, reduced from $26,400. And the price for the DN300 with 3M bytes of main memory is $18,900, reduced from $25,900.

The DN320 with floating-point hardware, configured with a 1.5M-byte main memory, is reduced from $22,900 to $18,900; with a 3M-byte main memory and a 70M-byte Winchester disk drive, the price is $36,650, reduced from $43,200.

The products are used for low-end mechanical and electronic computer-aided design, computer-aided software engineering, technical documentation and illustration and architectural engineering construction.

The price reductions were made possible by decreased component costs and increased efficiencies within Apollo's manufacturing process, the company said.

Apollo Computer is located at 330 Billerica Road, Chelmsford, Mass. 01824.

CHIP

from page 67

phase, Kubo said.

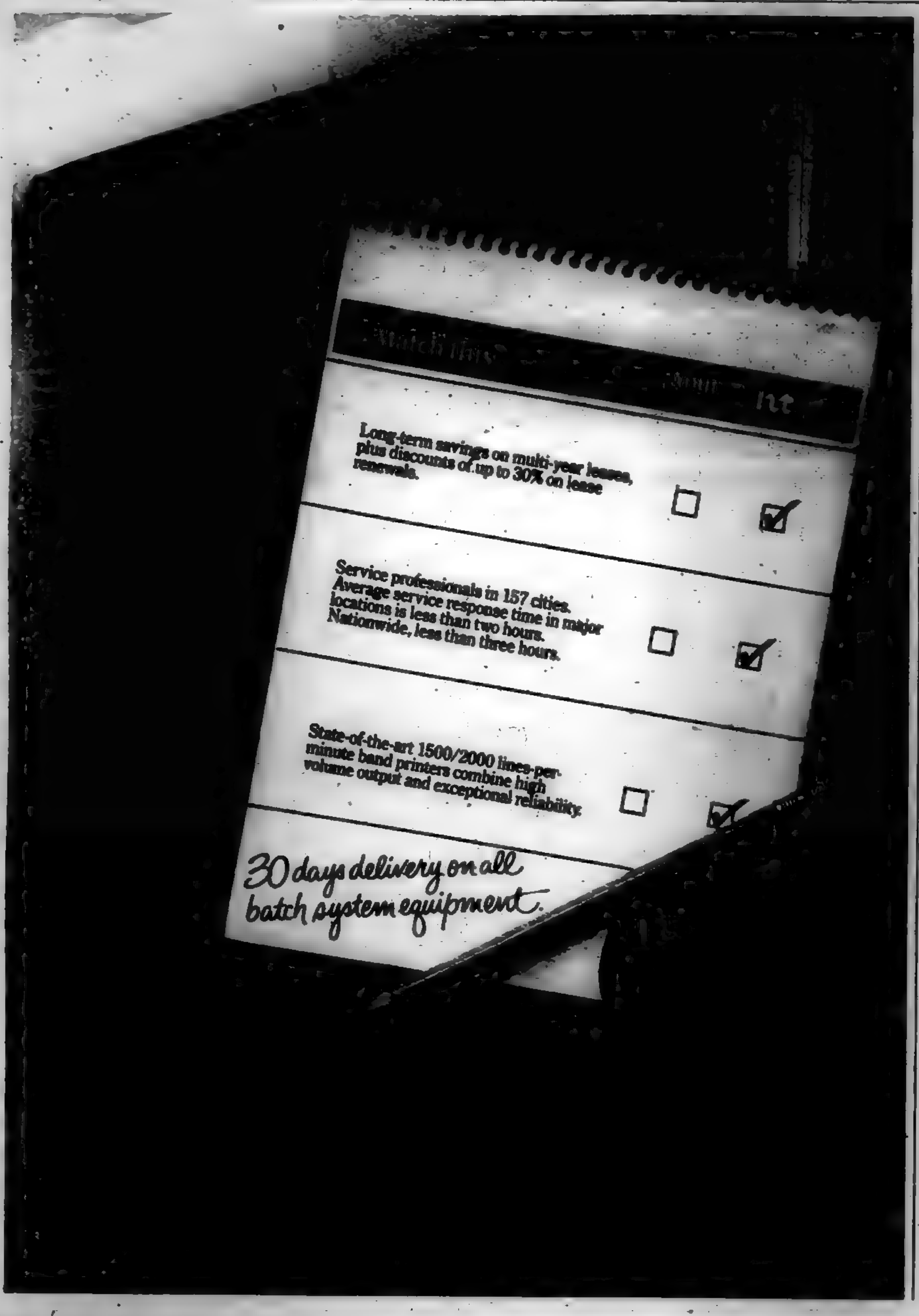
"We still have several problems to work out before bringing it to production," he said, adding that it is expected to be ready for marketing in late 1986 or early 1987.

IBM has announced that it has built a prototype 1M-bit memory chip, and other U.S. chip makers are known to be working on the project.

Hitachi officials commented on the technology projects at the company's recent Technology '85 exhibit at the World Trade Center in New York.

Hitachi officials said they were manufacturing 10 million 64K-byte memory chips a month, even though demand is expected eventually to shift to the 256K-byte chip that Hitachi now has in production. Hitachi spokesmen would not disclose how many 256K-byte chips they were producing but said the company had sold $2 million worth in December.

Company officials said 75% of Hitachi's semiconductor production was slated for factory use rather than consumer use. Fifty percent of its semiconductor production formerly went into the consumer market.



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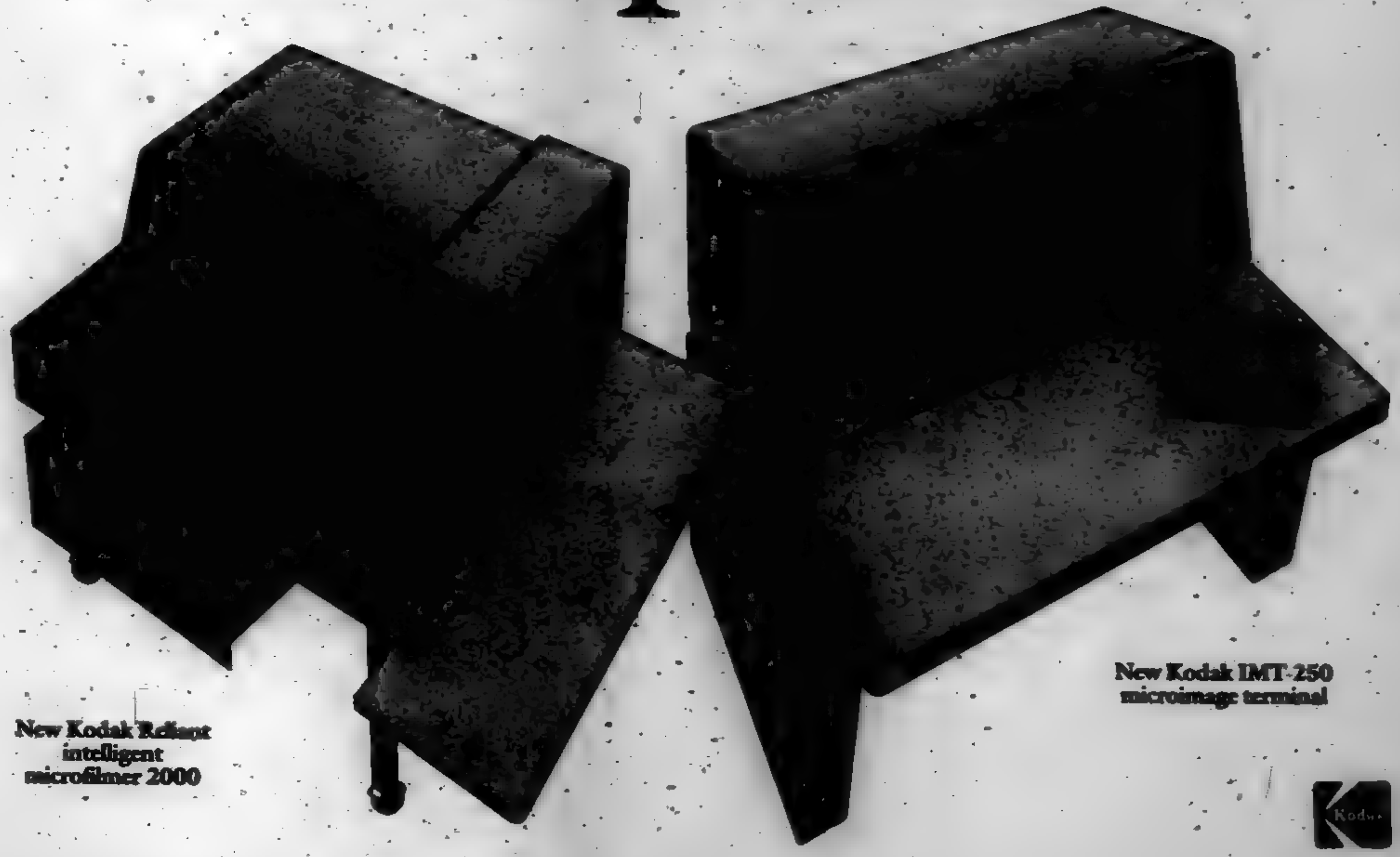

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microfilmer 2000

New Kodak IMT-250
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The Kodak Whiz Kids possess so much built-in microprocessor power, they automate most of the functions once performed manually by the operator.

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Kodak's fastest and smartest.

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CLEAN

from page 67

feel about cleaning their hardware, the standard replies would be: "What's there to clean?" Or, "the service man will do it at the end of the month." Or, "the janitor will do it."

But there are many reasons why it should be the operator who cleans the hardware. For example, the operator is most familiar with the equipment. By following weekly maintenance procedures, the operator can make his job easier and can save his company time and money.

When most people buy a car or a major appliance, the first thing they do is to read the owner's manual. In the case of an automobile, the owner's manual has a section on preventive maintenance, including tire pressure, fluid levels to maintain and specific grades of fluids to be used. Even from an aesthetic point, automobile and appliance manufacturers will recommend specific products to use for cleaning.

Unfortunately, the owner's guides for most computers, printers and related components do not come with procedures for maintaining the equipment, nor do most service technicians take the time to explain to their customers what should be done.

To begin a computer hygiene program, an outline must first be made, listing the components that must be cleaned and the frequency of cleaning, along with the products and procedures that will be used.

After the outline has been designed, it is important to work out a means of communications with all computer operators. Without proper training to convey the purpose and benefits, the program will never succeed.

Communication blitz

Obviously, the larger and more spread-out an organization is, the more difficult it is to communicate with operators the benefits of computer hygiene. To deal with this problem, it is advisable to use as many forms of communications as possible to blitz the users and make them aware that computer hygiene is not only their responsibility, but also company policy.

A monthly newsletter might introduce the program with a feature article, and future newsletters could include a 3-in. by 5-in. section choosing a computer hygiene subject each month, such as, "What would happen if you used water to clean your keyboard?" The explanation would not only give the answer but also take this valuable space to explain what products the company uses to maintain these tools, how and when to use the products and where to procure them.

A company with many satellite offices may use large posters in lunchrooms and rest areas as a form of reminding computer operators to keep the program intact. New-employee orientation is a good time to discuss computer hygiene and its procedures. If a training department is available, computer hygiene can easily be included in the curriculum.

RUMORS

from page 67

the past five years and includes numerous reports of the "E" series (which turned into the 4300 series in 1979), the "H" series (which debuted as the 3081 in 1981), IBM's microcomputer (the Personal Computer that also appeared in 1981), the "Peanut" (which came to be known as the PCjr in late 1983) and now the Sierra, rumored to be IBM's next line of mainframes.

Why does IBM get such treatment? The standard answer goes back to IBM's dominance in the industry. Since IBM has a stranglehold on much of the computer industry and because IBM's actions tend to influence the industry as a whole, it follows that users are more eager to hear about the escapades of IBM than any other company.

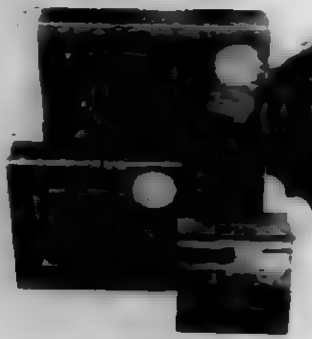
While many companies would kill for the exposure that IBM so regularly receives, the publicity is not without disadvantages. Widespread rumors of pending IBM product announcements tend to stagnate the marketability for current products. A case in point is all the hubbub that preceeded the PCjr announcement. Many faithful IBM users held off on ordering IBM microcomputers for fear that the Peanut would replace the original Personal Computer line.

Currently, IBM seems to be having the same problem with its high-end mainframe line. With so many rumors flying about the Sierra line, many users plan to wait until IBM formally tips its hand on this new line of mainframes before they decide to buy a new system. When you consider how much revenue each mainframe sale generates for IBM, it is clear that a continued trend toward such deferrals could hurt even Big Blue.

So poor IBM, right? It is hard to feel sorry for the most successful corporation in history if it experiences some sagging sales as a result of hype over its own future products. But there may be a truly serious problem brewing here. Since IBM is announcing products at a much faster pace than any time in its history, the firm might wind up being its own toughest competitor.

For example, as soon as the latest IBM product hits the market, the IBM speculators will start talking about how much better its successors will be. This, in turn, could cause some users to delay purchasing hardware in lieu of the next line of products.

Obviously, users cannot wait forever to get the absolutely best product from IBM, but the speculation surrounding new IBM products could wind up having an adverse impact on some IBM sales.



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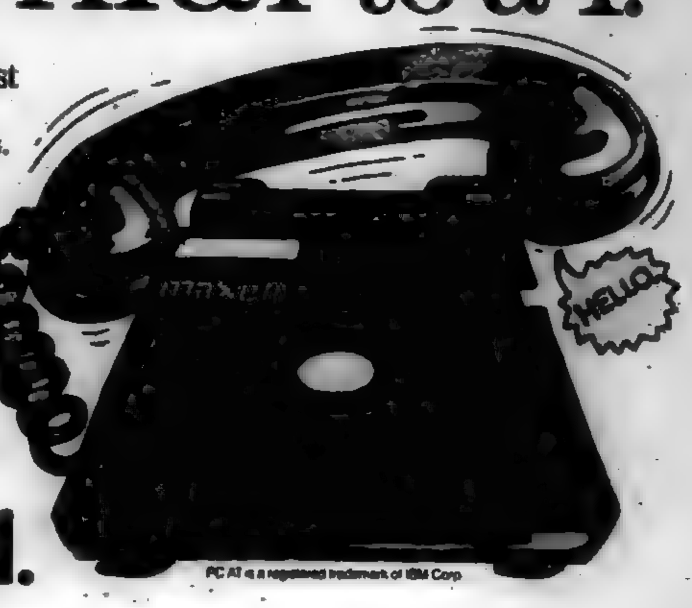

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MICROCOMPUTERS

AT&T desktop coming soon: FCC filings

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — AT&T Technologies plans to introduce a desktop voice and data microcomputer in early 1985, according to filings at the Federal Communications Commission. Manufactured by Convergent Technologies, Inc. of Santa Clara, Calif., the micro, dubbed the Safari 4 or PC 7300, will use AT&T's Unix operating system "in a friendly, easy-to-use environment," the documents said.

The basic specifications of the system, outlined in filings submitted to the FCC for technical approval, reveal a desktop unit built around the Motorola, Inc. 68010 microprocessor that will have 512K bytes of random-access memory, 10M bytes of hard-disk storage capacity (expandable to 20M bytes) and a single 500K-byte, double-sided floppy disk drive.

According to the documents filed at the FCC, the PC 7300 is aimed at the office environment and will be able to link up with a variety of existing proprietary communications systems, including wideband (coaxial cable) premises networks, small local-area networks, IBM's Systems Network Architecture, public packet switching networks and AT&T's Merlin private branch exchange system.

However, the documents indicate that the principal feature of the system will be the combined voice and data communications capacity of the PC 7300, offering standardized dialing services, electronic mail, directory service, automatic calling, redialing, call management, simultaneous data transfer during audio calls and data transfer rates of up to 19.2K bit/sec. Data transfer capabilities will be available between synchronous and asynchronous terminals running under Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M operating systems, as well as Unix hosts, IBM hosts and other asynchronous

See AT&T page 86

Multimate gets additions

Spacing, merging capabilities highlight upgrades of popular word processing program for IBM micro

EAST HARTFORD, Conn. — Multimate International Corp. has enhanced its Multimate word processing program for the IBM Personal Computer. Key enhancements consist of proportional spacing facilities and improved merging capabilities, the vendor said.

Release 3.30 of Multimate reportedly can print documents that incorporate proportional spacing and microjustification. This option was added for the increasing number of printers that support proportional spacing and extended character sets, the vendor said.

The merge facilities incorporate specific pages in list documents and merge lists created by other programs, according to Multimate. The program reportedly works with files from IBM Displaywriter's Document Content Architecture as well as Ascii and Data Interchange Format files.

The new release includes additional document protection options, including one that creates an automatic backup copy of any document that a user edits, the supplier said. The package is said to allow a user to create and edit documents on more than one subdirectory on a disk, which is useful for users with hard-disk storage.

In addition, users with color or graphics monitors are now able to change screen display colors and shadings.

Multimate runs on an IBM Personal Computer with IBM's PC-DOS 1.1 or higher and 256K bytes of random-access memory.

The package costs $495. Current users can upgrade to the new release for $50.

Multimate International is located at 52 Oakland Ave. N., East Hartford, Conn. 06108.

■ Ashton-Tate's Framework and Dunsplus' Dunsplus packages emerged as winners in a comprehensive Software Digest, Inc. study of integrated productivity software/76

■ Information Builders, Inc. offers PC/Focus fourth-generation software for the IBM Personal Computer AT/77

INSIDE

Software/77

Tandy updates laptop system

Model 200 adds memory, 16-line tilting LCD screen

FORT WORTH, Texas — Tandy Corp. has announced the TRS-80 Model 200, an upgraded version of the company's TRS-80 Model 100 portable computer.

The Model 200 features 24K bytes of random-access memory (RAM), which can be expanded to 96K bytes; 72K bytes of read-only memory (ROM), which can be increased to 104K bytes; and a 16-line by 40-char. tilting LCD, the vendor said.

The laptop computer also reportedly includes a 300 bit/sec modem, cassette interface, parallel printer interface, RS-232C interface and eight function keys.

Tandy Corp.'s TRS-80 Model 200

The 72K bytes of ROM include Microsoft Corp.'s Basic language and Multiplan spreadsheet program, a word processing program, a telecommunications program, an appointment and filing program and an address and telephone file program, Tandy said. A calculator is available with each

See LAPTOP page 86

Avoiding bells and whistles

SMALL TALK
Eric Bender
CW Senior Editor

If designers of executive workstations ignored costs and integration difficulties and just grabbed everything from the continuing parade of "new-technology" desktop products, they could make Rube Goldberg proud.

Beginning with a powerful desktop engine with a lot of internal memory and storage, the menu of potential enhancements is almost endless.

The ability to run most popular IBM software probably is a prerequisite this year, so an Intel Corp. processor would be the starting point, but this does not preclude adding a coprocessor to run all those AT&T Unix applications forever lurking just around the corner. Certainly a multitasking operating system running with Microsoft Corp.'s MS-DOS might come in handy on occasion, and sufficient power might be available with the Intel 80286. If not, a Motorola, Inc. 68000 or some true 32-bit processor could be added.

Next is the user interface, and here the horizons really open up: touch screens, graphics tablets, the mouse and other input devices, along with a wealth of pop-up software and operating environments such as IBM's Topview or Digital Research, Inc.'s Graphics Environment Manager. Then there's voice recognition, which surely can do a few odd jobs around the office even

See [illegible] page 84

Dedicated multifunction server to support micro local-area nets

MOUNTAIN VIEW, Calif. — 3Com Corp. today will introduce "the first high-performance system designed exclusively to be a multifunction server for personal computer local-area networks at a microcomputer price," said William Krause, the firm's president.

Running 3Com's Etherseries network software, the $7,495 3Server will reportedly provide disk sharing, printing, communications and backup functions in one system.

The 3Server will support up to 50 network users in personal productivity applications such as spreadsheets and electronic mail and up to 10 users in transaction-intensive multiuser applications such as data base and accounting, said Douglas Pollack, 3Com's server marketing manager.

Built around an Intel Corp. 80186 microprocessor, operating at 8 MHz, and an 82586 Ethernet controller, the 3Server reportedly features a 512K-byte internal memory, expandable to 896K bytes; two built-in Small Computer Systems Interface ports; a parallel port; and a serial port.

A 36M-byte hard disk drive is standard. Users can add up to six external disk drive modules, priced at $3,995 each, extending total disk storage to more than 250M bytes, the company said.

An optional 60M-byte tape unit, able to back up multiple servers on a network, is priced at $2,995.

Supersedes the AP Server

The 3Server will supersede 3Com's current specialized network server, the AP Server, but the company will continue to support the IBM Personal Computer and Personal Computer AT

See SERVER page 82

Framework, Dunsplus top study of integrated packages

WYNNEWOOD, Pa. — Framework and Dunsplus tied for first place in exhaustive tests of integrated productivity programs concluded late last month by Software Digest, Inc.

The two packages, from Ashton-Tate in Culver City, Calif., and Dunsplus in Wilton, Conn., each received an overall score of 7.0 on a scale of 1 to 10, according to a report published last month in "Software Digest Ratings Newsletter."

The study showed that "integrated packages still have a way to go to satisfy the typical user," commented chairman Joseph Segel.

He noted that in earlier tests, Lotus Development Corp.'s 1-2-3 and several word processing packages scored well over 8.0.

"The high rating of Dunsplus, which does not feature common commands for word processing and spreadsheet functions, suggests that the quality of the component parts of the integrated package is more important than standardization of commands, although users would naturally like to have both," the report said. Dunsplus is based on 1-2-3 and Multimate International, Inc.'s Multimate.

Covering 15 packages for the IBM Personal Computer, the study involved six experts and a panel of 12 "typical users," took up more than 5,000 hours of testing and generated more than 40,000 numerical scores, according to Software Digest. Ease of learning, ease of use, error handling, performance and versatility were all examined in depth, according to Segel, who estimated that the firm spent more than $100,000 on the research.

In other results, Enable, from The Software Group in Ballston, N.Y., scored 6.8 overall. Symphony, from Lotus in Cambridge, Mass., and Smart Software System, from Innovative Software, Inc. in Overland Park, Kan., were each rated at 6.6.

Following these programs were, in order, Integrated 7 from Mosaic Software, Inc. of Cambridge, Mass.; Electric Desk from Alpha Software, Inc. of Burlington, Mass.; Goldengate from Cullinet Software, Inc. in Westwood, Mass.; Open Access from Software Products International, Inc. of San Diego; Aura from Softrend, Inc. in Salem, N.H.; Series One Plus from Executec Corp. in Richardson, Texas; Decision Manager from Peachtree Software, Inc. of Atlanta; and Corporate MBA from Context Management Systems, Inc. in Torrance, Calif.

Framework and Integrated 7 tied for first place in ease of learning, and Framework was found easiest to use. Enable was judged best in both performance and versatility. Framework and Dunsplus tied for best error handling, the report found.

Enable and Framework offered the top-rated word processing functionality, according to Software Digest. Symphony and Dunsplus tied for spreadsheet capabilities.

Drawbacks

Among common drawbacks highlighted by the study, none of the programs did well in data base functions, Software Digest said. In addition, "six of the programs don't perform mail merge," the report pointed out.

The report also showed variations in performance on given tasks. Among disk-based data base programs, the time needed to add a 20-char. text field to an existing data base ran from 0.8 sec (Goldengate) to 2,474.1 sec (Decision Manager).

In another example, the time to save an eight-page document ranged from 2.6 seconds (Open Access) to 53 seconds (Aura). One spreadsheet recalculation task took between 6.5 seconds (Dunsplus) and 123.6 seconds (Corporate MBA).

A copy of the "Software Digest Ratings Newsletter" costs $29. More information is available from Software Digest, Wynnewood, Pa. 19096.

Micro-based aid targets disaster recovery plans

WOODBRIDGE, Va. — Advanced Information Management, Inc. has introduced AIM/Plan, a microcomputer-based planning tool for disaster recovery that initially runs on IBM, Wang Laboratories, Inc. and Fortune Systems Corp. personal computers with word processing capability.

The software reportedly provides the framework for a complete set of procedures for backup and recovery of business and data processing operations under emergency conditions.

The modular, formatted tool provides specific instructions that describe the tasks to be accomplished and provides guidelines for tailoring the plan to the client organization, the vendor said.

The multidiskette AIM/Plan is available for a one-time license fee of $3,900 and may be reviewed prior to licensing.

More information is available from Advanced Information Management, located at 1988 Opitz Blvd., Woodbridge, Va. 22191.

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Dataproducts computer printers.

SOFTWARE

HANDLE TECHNOLOGIES
Handle Office Automation series

Handle Technologies has introduced its Handle Office Automation series of software for personal computers based on the Intel Corp. 80286 microprocessor and running Microsoft Corp.'s Xenix 3.0 multiuser operating system.

The software series reportedly consists of Handle Writer/Spell, a word processor with integrated spelling checker; Handle Writer/Spell/Calc, which integrates the Handle Calc spreadsheet; Handle Calc; Handle Writer/Spell/List, which integrates a list processor; and Handle Business Graphics with Handle Calc, a spreadsheet and graphics package.

The Handle applications reportedly all operate in multiuser or networked configurations, with file security. The user is said to be insulated from Xenix via a function key-driven common user interface.

The applications are priced as follows: Handle Writer/Spell, $395; Handle Writer/Spell/Calc, $575; Handle Calc, $395; Handle Writer/Spell/List, $545; and Business Graphics with Handle Calc, $445.

Handle Technologies, 850 N. Lake Blvd., P.O. Box 1913, Tahoe City, Calif. 95730.

ELECTRONIC ARTS
Get Organized! version

Electronic Arts has announced a version of the Get Organized! word processor for the IBM Personal Computer AT and PCjr.

Get Organized! reportedly incorporates a word processor with six other software tools: an address book with mail merge feature, a telecommunications manager with autodial capacity, an index filing system, a calendar, a calculator and a notepad.

The package is also said to include $200 worth of coupons for such telecommunications services as MCI Communications Corp.'s MCI Mail and Dow Jones & Co.'s Dow Jones News & Retrieval Service.

Information entered into Get Organized! can be called up by any of the six applications tools, Electronic Arts said. Menus, with commands in common, reportedly allow users to work with each program in a similar fashion.

The package also offers multiple windowing capability that lets users specify the size, shape, position and color of each window, according to the vendor. Editing tools reportedly permit users to cut and paste between applications.

Get Organized! for the PCjr. and Personal Computer AT is priced at $199.

Electronic Arts, 2755 Campus Drive, San Mateo, Calif. 94403.

FOUR-PHASE SYSTEMS, INC.
RM/Cobol for Series 2000

Four-Phase Systems, Inc. has announced that Ryan-McFarland Corp.'s RM/Cobol compiler is now available for use with the company's Series 2000 family of desktop computers running under a virtual memory version of AT&T's Unix System V operating system.

According to a spokesman, the RM/Cobol compiler can be used to develop software for both single- and multiuser business applications, and it gives Series 2000 users access to more than 750 business applications packages.

An RM/Cobol compiler license for Four-Phase Systems' Series 2000 desktop computers costs $850, and a one-time license for end-user locations costs $250.

Four-Phase Systems, 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

INTERFACE TECHNOLOGIES CORP.
M2SDS

Interface Technologies Corp. has introduced its Modula-2 Software Development System (M2SDS) for the IBM Personal Computer, Personal Computer XT and AT.

Continued on page 78

PC/Focus version introduced for IBM Personal Computer AT

NEW YORK — A version of the PC/Focus fourth-generation language and data base management system (DBMS) for the IBM Personal Computer AT has been introduced by Information Builders, Inc.

The new version of PC/Focus reportedly contains full screen facilities for data base management, transaction processing, reporting and ad hoc requests and other tasks. The Personal Computer AT will run PC/Focus with two to three times the speed of the IBM Personal Computer XT, Information Builders said.

PC/Focus' report writer includes language extensions that permit users to create graphics, the vendor said.

The package also is said to include interfaces to mainframe files stored under such mainframe DBMS as IBM's IMS, Cullinet Software, Inc.'s IDMS, Cincom Systems, Inc.'s Total and Computer Corp. of America's Model 204. Interfaces to files under IBM's Qsam, Vsam and Isam are also provided, as is the capacity to relationally join files.

The program costs $1,500, the vendor said.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

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Continued from page 77

The M2SDS software reportedly permits programmers to use the Modula-2 language to write and compile programs into reliable code. M2SDS reportedly contains a syntax-directed editor that reduces programming statements to a single keystroke. The software also is said to offer background compilation.

The M2SDS software reportedly offers a structured environment for software development, corrects for programming errors and provides online Help functions.

M2SDS is priced at $249.

Interface Technologies, Suite 200, 3336 Richmond, Houston, Texas 77098.

VENTURE SOFTWARE

Bottomline Tax

Venture Software has introduced its Bottomline Tax software for tax planning, preparation, analysis and forecasting on personal computers under Microsoft Corp.'s MS-DOS or Digital Research, Inc.'s CP/M operating systems.

Bottomline Tax reportedly is a menu-driven program consisting of 12 categories that prompt the user through data entry, tax preparation and planning. Users are lead through a complete Internal Revenue Service Form 1040, according to the vendor. The package is said to figure the form's Schedules A through G, SE, W, R and R&P and to print schedules and forms to IRS specifications.

Tax returns reportedly can be developed interactively or in batch mode.

Bottomline Tax is priced at $295.

Venture Software, 16200 Ventura Blvd., Encino, Calif. 91436.

FORTH, INC.

Polyforth II operating system

Forth, Inc. has introduced its Polyforth II operating system for personal computers currently running under Microsoft Corp.'s MS-DOS.

Polyforth II is said to be a multiuser, multitasking operating system designed to support any number of asynchronous processes running concurrently. Under Polyforth II, tasks may have partitions or may execute shared, reentrant routines, Forth said.

Polyforth II also offers the ability to run multiple terminals, unlimited control tasks and concurrent printer operations, according to the vendor.

Polyforth II is priced at two levels. Level 3 includes the operating system, Forth turnkey compiler, assembler, editor, math library, data base support system, utilities and source code for everthing but the nucleus. It is priced at $600. Level 4 includes the Level 3 system, plus full system source code and a compiler for generating read-only memory applications. It is priced at $3,200.

Forth, 2309 Pacific Coast Highway, Hermosa Beach, Calif. 90254.

MANAGEMENT CYBERNETICS, INC.

Proscreen

Management Cybernetics, Inc. has introduced its Proscreen software development tool for the IBM Personal Computer.

The Proscreen, a screen management package, reportedly was designed to facilitate the conversion from Honeywell, Inc. DPS/6 systems to the Personal Computer. It enables a Personal Computer to support functions that resemble the Vforms of the DPS/6, the vendor said.

Proscreen users find interaction with the Personal Computer's screen virtually identical to that on the DPS/6, according to Management Cybernetics.

Proscreen is priced at $795.

Management Cybernetics, P.O. Box 888467, Atlanta, Ga. 30358.

MCTEL, INC.

Post Plus

Mctel, Inc. has introduced its Post Plus software for Tandy Corp. TRS-80 personal computers and personal computers under Digital Research, Inc.'s CP/M 80 operating system. Post Plus reportedly combines word processing with telecommunications capabilities.

Post Plus allows users to retrieve, file and print data, according to the vendor. It is said to include an automatic data capture function that saves messages to the computer's disk, reducing telephone connect charges. Post Plus also reportedly can be programmed to dial an electronic mail service, log on, retrieve mail, send a message and log off, all with one keystroke.

Post Plus is priced at $160.

Mctel, Suite 505, Three Bala Plaza E., Bala Cynwyd, Pa. 19004.

SUNBELT COMPUTER SYSTEMS, INC.

SUNDB86A; SUNDB86M compilers

Sunbelt Computer Systems, Inc. has announced a new release of its Databus compilers for systems running under Microsoft Corp.'s MS-DOS and IBM's PC-DOS operating environments.

The Databus compilers, SUNDB86A and SUNDB86M, according to Sunbelt Computer, are compatible with Datapoint Corp.'s Associative Index Method.

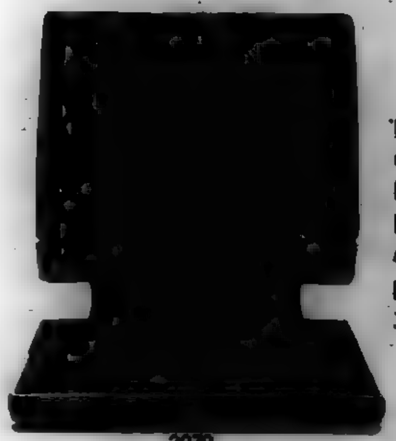
The SUNDB86A is a single-pass Databus compiler; the SUNDB86M is a three-pass Databus compiler, the vendor said.

Both compilers reportedly support the Associative Access Method of the Databus language, which Datapoint developed for use on its minicomputers.

The SUNDB86A is priced at $695, according to the vendor, and the SUNDB86M is priced at $595.

Sunbelt Computer Systems, Suite 111, 5525 E. 51st St., Tulsa, Okla. 74135.

The reasons 3270 us
can be summed
More.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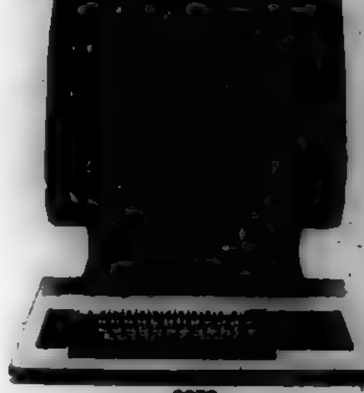
More optional features such as APL/Text, cursor choices, graphics.

More features and benefits in the 3270 world.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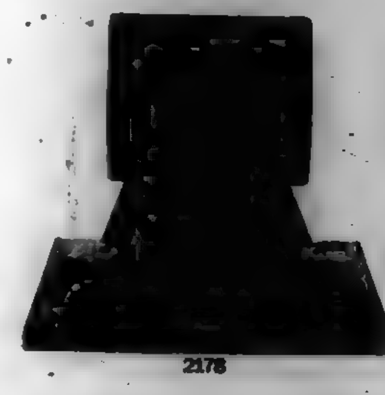
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More for your money: 3270 functionality at a lower price.

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MICROCOMPUTERS

LEXISOFT, INC.
Spellbinder

Lexisoft, Inc. has introduced its Spellbinder Word Processing & Office Management System for the Hewlett-Packard Co. HP 110 portable computer.

Spellbinder reportedly offers mail merge, forms and data handling, columnar manipulation and an on-screen calculator. Files created by Spellbinder on the HP 110 can be read by Spellbinder running on the HP 150 desktop computer, the vendor said. The package also reportedly offers a spelling and grammar checker, automatic hyphenation, footnoting and a mail-label generator and can interface with most printers. Spellbinder is priced at $495.

Lexisoft, Box 1378, Davis, Calif. 95617.

SAMKHYA SOFTWARE CORP.
Pik'r

Samkhya Software Corp. has announced Pik'r, a formatting package that runs on the IBM Personal Computer.

The program reportedly allows users to choose data from any report and reformat the data so it may be used with various data base management, spreadsheet and word processing packages. Pik'r allows Ascii files generated by a mainframe program to be formatted for use by microcomputer applications, according to the vendor.

The product provides editing features that allow a user to reformat rows and columns of data with a single keystroke, the vendor said.

Pik'r is said to support Ascii, Comma Separated Value, Sylk, Data Interchange Format and PRN (used for Lotus Development Corp.'s 1-2-3 and Symphony) files.

Pik'r costs $95.

Samkhya Software, P.O. Box 148, Petaluma, Calif. 94953.

MONTEX MICROSYSTEMS
PA32/20

Montex Microsystems has introduced its PA32/20 logic analyzer for the IBM Personal Computer.

The PA32/20 reportedly features symbolic trigger setup, timing diagram display and a symbolic assembly language display that is organized like an assembly language print listing. The software reportedly permits users to load symbol tables from a symbol table file, link map, print file or a combination of the three.

The PA32/20 also reportedly is compatible with Micropro International Corp.'s Wordstar program, allowing displayed data to be saved and later merged with text.

The PA32/20 is priced at $1,495.

Montex Microsystems, P.O. Box 1845, Huntsville, Ala. 35807.

DBI SOFTWARE PRODUCTS
Trajectories SPC1

DBI Software Products has announced Trajectories SPC1, a statistical package that is said to maximize the use of data for discovery of the most critical variances and the manipulation of a process control data set.

Features of the product include average bar chart, range chart, standard deviation chart, median chart, moving range charts, histograms and up to 100 subgroups per file, the vendor said. The program reportedly also does pattern analysis, process capability and percentage out of specification.

The product requires Microsoft Corp.'s MS-DOS or IBM's PC-DOS operating systems and requires 256K bytes of random-access memory.

Trajectories SPC1 costs $795.

DBI Software, One Energy Place, 5806 E. Pickard Road, Mount Pleasant, Mich. 48858.

XYZT COMPUTER DIMENSIONS, INC.
Integrated Workstation Software for the IBM Personal Computer XT

XYZT Computer Dimensions, Inc. has introduced a version of its Integrated Workstation Software (IWS), an operating system utility, for the IBM Personal Computer XT.

IWS reportedly allows users to install up to 64 application programs as menu selections, allowing them to access programs by highlighting selections rather than entering program names. The product also contains an interface to the disk operating system that is said to allow users to select DOS commands from a menu.

IWS' directory processor reportedly lists files and subdirectories on the hard disk in alphabetical order.

IWS is priced at $195.

XYZT Computer Dimensions, Suite 812, 150 Broadway, New York, N.Y. 10038.

GOLDATA COMPUTER SERVICES, INC.
Goldatabase 5.0

Goldata Computer Services, Inc. has announced an enhancement of its Goldatabase package for the IBM Personal Computer line.

Goldatabase Version 5.0 reportedly includes on-line Help screens, 10 screens for each data base, an increase in record length from 1,022 to 16,000 bytes and an increase in the number of keyed fields to 300.

The software is provided with a user's manual, and user assistance is available from a Goldata support line.

Goldatabase 5.0 is priced at $495.

Goldata Computer Services, 2 Bryn Mawr Ave., Bryn Mawr, Pa. 19010.

EXCALIBUR TECHNOLOGIES CORP.
Savvy Retriever

Excalibur Technologies Corp. has introduced Savvy Retriever, a data

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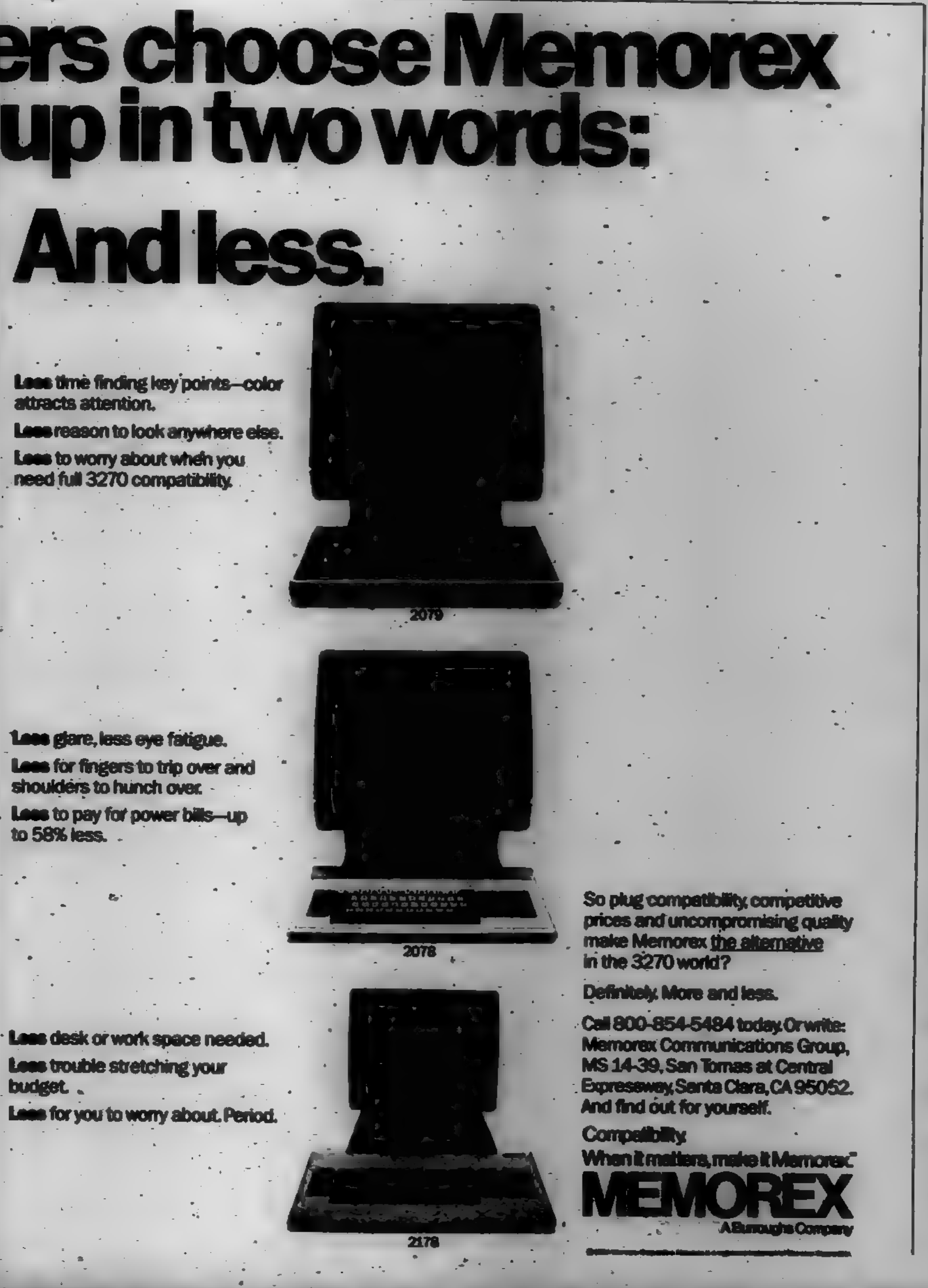
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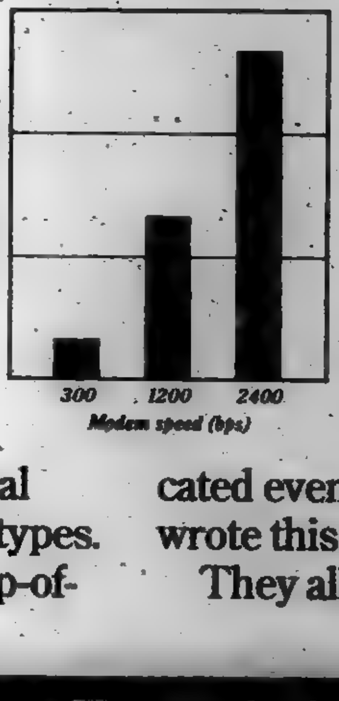

There's even a new internal modem for the IBM® PC that's so uncomplicated even the person who wrote this ad can use it.

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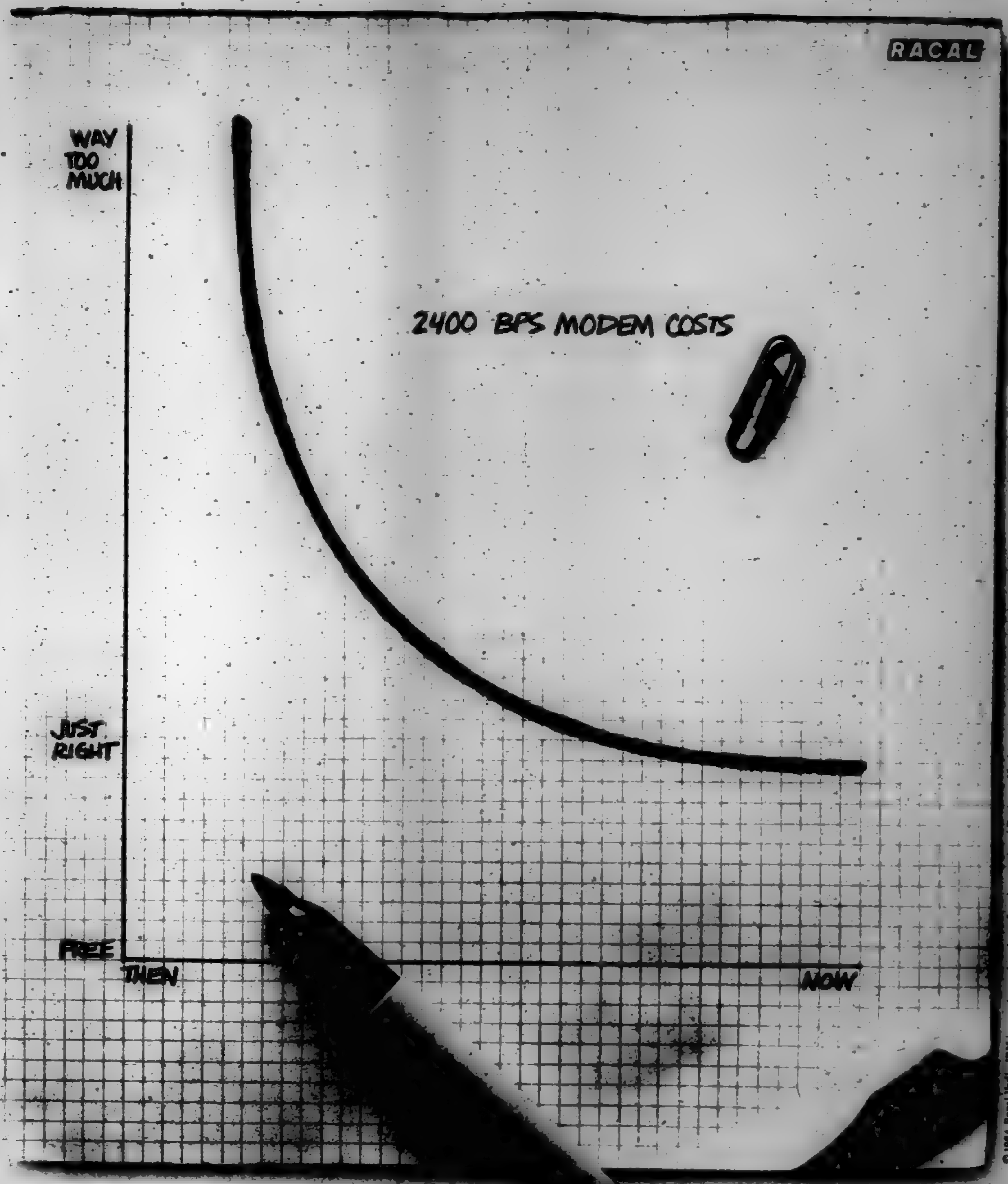

features like remote diagnostics, automatic dialing directories and complete unattended operation.

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Racal-Vadic

Makers of The Maxwell Modem.™

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Continued from page 79

retrieval tool that runs on the firm's Savvy PC personal computer line.

According to the vendor, Savvy Retriever converts plain-language requests for data into formal, structured queries.

The product does not have to parse a query or analyze it according to rules of grammar, since it uses pattern recognition to determine the general meaning of the informal request, the vendor said.

The tool is said to convert any IBM PC-DOS file into a Savvy file, allowing free-form access to most PC-DOS data files created by various applications software.

Savvy Retriever is priced at $200, the vendor said.

Excalibur Technologies, 21 Mercado, 800 Rio Grande Blvd. N.W., Albuquerque, N.M. 87104.

PACESETTER SOFTWARE, INC.
Enhancements to Organization Map Jr.

Pacesetter Software, Inc. has announced an enhancement to its Organization Map Jr. package that allows managers to create traditional organizational box charts.

According to the vendor, Organization Map Jr., which operates on the IBM Personal Computer and Personal Computer XT, consists of two components.

The Human Resources Decision Support System provides a description of an organization's structure, including layers of management, spans of control and staffing levels, Pacesetter said. The system can serve as a human resource information system that allows a user to maintain employee data.

The Organization Analysis and Productivity Improvement Support System provides a detailed view of work activities taking place within an organization, indicates where the activities occur and calculates costs.

Organization Map Jr., with organization chart capability, is priced at $895.

Pacesetter Software, P.O. Box 5270, Princeton, N.J. 08540.

FEROX MICROSYSTEMS, INC.
Encore Version 2.0

Ferox Microsystems, Inc., has announced an enhancement of its Encore decision support system for the IBM Personal Computer.

Encore Version 2.0 is said to feature 75 new Exec commands, enhancing its modeling language; 15 new logic functions for description of calculations; and Quick Report, an automatic report writer. Encore's built-in word processor has been enhanced to include Word Wrap in its editor mode, the vendor said.

The number of Help screens in the enhanced version have been increased from 10 to 50, according to the vendor. In addition, documentation has reportedly been reorganized and a function key template, to fit onto the IBM keyboard, has been included.

Encore Version 2.0 remains priced at $695. According to Ferox, Encore is also available in a runtime version, which offers the same power as the full version minus the logic and Exec compilers, at $180.

Ferox Microsystems, Suite 611, 1701 N. Fort Myer Drive, Arlington, Va. 22209.

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SERVER
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as servers. Krause claimed, however, that the 3Server costs about the same as the AT and offers more than twice the performance in departmental productivity use and up to five times the speed in transactional use.

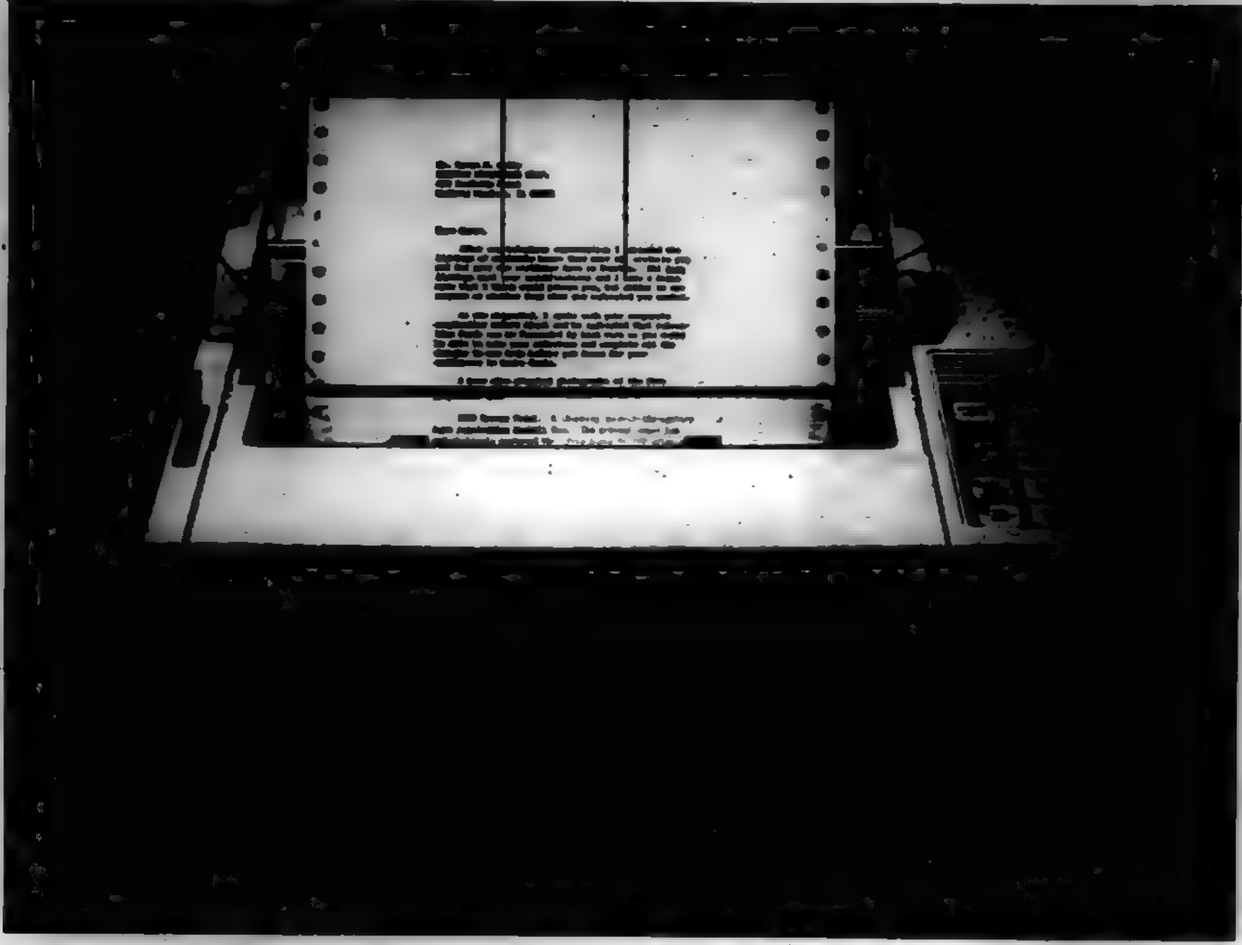
The new system will operate with Release 2.4 of the firm's Etherseries 4 software, including Ethershare, Etherprint and Ethermail, Pollack said. In addition, 3Com reportedly plans to offer two communications packages by July.

Will provide remote access

According to 3Com, Etherterm will provide access to remote computers or services, along with IBM 3270 terminal emulation. Remote Ethermail reportedly will give users dial-in electronic mail retrieval.

Late in the second quarter of 1985, 3Com also will sell port expanders for the 3Server, including ports for IBM Synchronous Data Link Control and Apple Computer, Inc. Applebus communication protocols, according to Pollack.

3Com is located at 1365 Shorebird Way, Mountain View, Calif. 94039.



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Feature for feature, no other microprinter can match the versatility, compatibility, reliability and productivity of the OMNI 800* Model 855 microprinter. Here's why.

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Hardware Compatible. The TI 855 microprinter is compatible with all major PC hardware. And it provides both serial RS232C subset and "Centronics-type" parallel as standard interfaces.

Software Compatible. The TI 855 uses industry standard escape sequences for compatibility with virtually all third-party software. And for those with proprietary software needs, a model is available with ANSI standard escape sequences.

Tough Font Modules For Quick Character Change. Three font modules can be inserted into the front of the printer at one time, and are accessed individually. Each contains both draft- and letter-quality character sets. They're easier to use, more reliable and more durable than traditional metal or plastic daisy wheels.

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DESIGN

from page 75

at this point in time.

Any self-respecting executive workstation comes with a set of more-or-less integrated office automation applications: a word processor, a desk organizer, electronic mail and all the rest. Providing these applications may be relatively straightforward (pick among hundreds of third-party packages and put a proprietary stamp on the collection) or complex (rewrite it all for the operating environment).

Let's throw all of this in, along with more voice functions: a speakerphone, voice store and forward, voice-annotated text; modem and intelligent communications software with "transparent" connection to everything in the outside world moving at 300 bit/sec or faster.

A host of special graphics functions, an image scanner and processor like the Wang Laboratories, Inc. PIC Image Processing System and an interactive videodisk system also might come in handy. Then we could add access to several encyclopedias or other data bases via a few gigabyte-level laser storage systems.

A local-area-network connection, and links to the departmental computer and to the company mainframe (complete with natural-language front ends) would be important. A broadband net for videoconferencing might also have its place. And several laser printers are essential — one bolted to the desk for confidential memos.

Stash laptops under desk

For corporate takeovers and such, our executive should stash a few 16-bit laptop microcomputers (preferably set up with automatic hookups into cellular phone systems) under the desk as well.

However, that desk is starting to look like the bridge of the starship *Enterprise*, so maybe it's time for the executive to buy another one the size of a paddle tennis court.

But this whole daydream, of course, ignores the question of what the executive actually needs, which is more than a plausible sounding and technically robust product. For example, multitasking seems almost basic to effective communications. But if that is true, why haven't hundreds of thousands of users grabbed copies of Digital Research's Concurrent PC-DOS, which really does seem like a useful package? Another example is the touch screen — why hasn't it become a mainstream product?

As we keep hearing, the true selling point is not the jazzy, new feature but the answer to a genuine need, followed through with backbreaking attention to detail. And, for an executive workstation, the right place to start seems to be simply an intelligent phone with excellent connections that truly integrates some microcomputer functions in a comfortable way.

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[illegible] support more than three times as many online interactive COBOL users as HP's top-of-the-line Model 3000/68.

We programmed a "driver" computer system to simulate from 10 to 240 individual users performing representative data processing tasks. This provided us with a controlled and repeatable test of each benchmarked system, operating in a real world multi-user environment. Overall, we timed more than one million responses.

Under the conditions specified for the benchmark tests and simulating 200 busy interactive users (6 data base accesses per minute per user) the BTI 8000's average response time was *one second*.

The benchmark test design, procedures, programs, and results are described in a comprehensive report. It's yours for the asking.

The BTI 8000 system is a modular supermini multiprocessor system that can be sized to fit your needs. The system can use up to eight 32-bit CPUs and 24 megabytes of main memory, but you can start with a single CPU system and build up to larger configurations when your needs grow.

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In Europe: BTI Computer Systems, (UK) LTD., Birmingham B13 8NG, England (021) 449-8000

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It's convenient. And you get the advantage of single-vendor accountability.

[illegible]

For more information [illegible]

[illegible]

TOOLS from page 82

DATAMEDIA CORP.
Fallon compilers

Datamedia Corp. has introduced a family of compilers for Datamedia's 1600 series of AT&T Unix System V-based 932 supermicros.

The family consists of Fast/Cobol, Fast/Basic-C and Fast/Basic-M, which reportedly generate Motorola, Inc. 68000 native code. Most Cobol applications can be ported to the Datamedia 932 using Fast/Cobol's translation capability.

Fast/Basic-C and Fast/Basic-M reportedly allow existing personal computer applications written in Basic to be ported to a shared computing environment.

Fast/Cobol is priced at $2,200. Fast/Basic-C and Fast/Basic-M are priced at $600 each.

Datamedia, 491 Amherst St., Nashua, N.H. 03063.

MINITAB, INC.
Minitab Data Analysis Software

Minitab, Inc. has introduced a version of its Minitab Data Analysis Software for the Digital Equipment Corp. Professional 350 personal computer.

Among the analyses that users will be able to perform using the software are descriptive statistics, multiway cross-tabulations and correlations, the vendor said. The product reportedly has simple, multiple and stepwise regression capabilities.

The Professional 350 version offers the same statistics, data manipulations and graphics capabilities as the DEC VAX-11 superminicomputer series and PDP-11 minicomputer series versions of the program. The software is $500 for each of its three modules.

Minitab, 215 Pond Laboratory, University Park, Pa. 16802.

AT&T from page 75

hosts or data base services.

The software operating system, AT&T Unix System V, will permit direct user access to the Unix shell and will have a task-oriented user interface that includes menus, action keys, a mouse option, screen labels, multiple windows that will permit data and file transfers between applications and a terminal emulation feature.

The monitor, a standard monochrome unit with green-on-black or black-on-white display, will have a high-resolution capacity with a 720- by 340-pixel, bit-mapped display in an 80- by 20-col. format.

The FCC, which has granted type approval to the PC 7300 certifying that it will not harm the regulated telephone network, said Convergent Technologies originally submitted the detailed information, and AT&T Information Systems later assumed responsibility for the filing by placing its name on it.

LAPTOP from page 75

of the programs.

Improvements in the word processing program consist of the ability to set the width, left margin, top margin and page size, according to the vendor. Also, a user can now stop printing or transmitting a file at a specific page or a line on a page. The 4½-lb Model 200 has a battery life of 10 to 16 hours.

The TRS-80 Model 200 costs $999. Price of the 24K-byte RAM expansion kit is $249.95. The machine will be available in March.

Tandy said it does not have plans to stop production of the Model 100, which is priced at $399 for an 8K-byte RAM version and $599 for a 24K-byte RAM model.

Tandy is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

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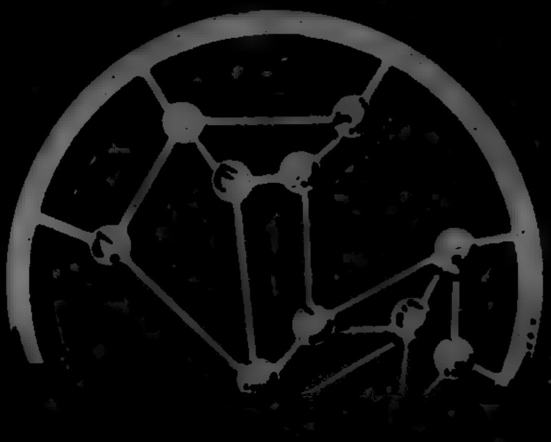

3270 Access

[illegible]

[illegible] pendently access 3270 applications on one or more hosts.

There is no hardware or [illegible]

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Photo: Ron Kimball

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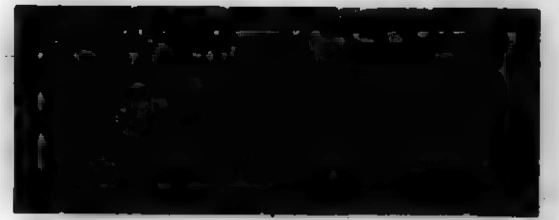

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COMPUTER INDUSTRY

Export rules relaxed for low end only

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — Long-awaited regulations that will govern the export of microcomputers, telecommunications equipment and software were recently published by the U.S. Department of Commerce as part of an effort to inhibit the acquisition of technology by Soviet bloc countries.

The latest regulations — additions to the Commerce Department's Commodity Control List — spell out the performance parameters of equipment and software, stating that they will not be allowed to leave the U.S. before being reviewed by and obtaining individual license approval from the Commerce Department. The regulations govern the export of computers, telecommunications equipment and software destined for other Western countries allied with the U.S. as well as the Eastern bloc countries.

Small computer manufacturers are especially upset about the latest rules because they expected them to be more liberal. "Industry exporters are confused. This will allow subjective interpretations of what an export is for to determine its fate. I bet our country will lose $1 billion in sales a month because of this," said William Chastka, vice-president of Washington Resources International, an export management consulting firm here.

All computers with processing data rates below 2 million bit/sec and 1.1M bytes of internal memory storage have been decontrolled and will not require a Commerce Department license before export. This category would include the Apple Computer, Inc. Apple II, and the Tandy Corp. TRS-80 models.

All computers exceeding this 8-bit computer threshold generally will require an export license, according to new export regulations.

The new rules set forth the parameters of computer systems that will be placed under export controls by determining what their performance capabilities are. For example, computers "embedded" within a piece of equipment that could not run without its presence cannot exceed a processing data rate of 28 million bit/sec, and a computer "incorporated" into equipment where it can be removed cannot exceed a processing data rate of 5 million bit/sec or it will require a validated export license.

The new regulations outlining the additions to the Commodity Control List are the U.S. government's concluding effort to implement the agreements it worked out with its 14 other allies last September at the meeting of the Coordinating Committee on Multilateral Export Controls.

Officials in the Department of Commerce's International Trade Administra-

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■ A systems software company has new owners, changed its name and hopes to revive its fortunes/91

■ Control Data Corp. turned over marketing of its supercomputers to ETA Systems, Inc., a spin-off charged with developing a next-generation machine/96

■ California officials said a tax reform provision that effectively taxes R&D spending was a mistake and will be corrected/96

Northrop faces 18 suits, faults past subsidiary

By Kathleen Burton
CW West Coast Bureau

LOS ANGELES — A diversification into commercial computing in 1972 by the Los Angeles-based Northrop Corp. has resulted in an $18 million arbitration award to users and is expected to become the focal point of a multimillion-dollar legal battle involving medical groups throughout the U.S.

An arbitrator's judgment of an $18.3 million settlement against Northrop, which must still be confirmed by a Superior Court judge in Torrance, Calif., was awarded in a suit against the company by the Richland Medical Group in Racine, Wis., which allegedly purchased a faulty Northrop computer system that snarled its billing system, lost patient records and broke down because of faulty software.

This is the first of 18 similar lawsuits that will be brought by doctors and medical groups across the country which had purchased the Northrop Medical Business Computer Systems for medical office bookkeeping between 1972 and 1980, said Robert Kilborne, an attorney representing the medical groups in Los Angeles Superior Court. Four of the pending suits are expected to come to trial in 1985, Kilborne said.

Kilborne's clients also claim Northrop underfinanced Northrop Data Systems, Inc., the company's commercial computer subsidiary, sold approximately 370 computers over an eight-year period and then let the subsidiary go bankrupt in 1980, leaving the useless computer systems in the marketplace.

Kilborne said Northrop claims that the subsidiary was a separate corporation and that the parent company had no involvement in the design, development or manufacture of the computers.

Northrop discontinued its venture into commercial computing in 1980, selling the division to a small New Jersey firm that

See NORTH page 97

Convergent names new CEO

Veteran HP vice-president takes helm, former company CEO remains as chairman

SANTA CLARA, Calif. — Convergent Technologies, Inc. announced last week that Hewlett-Packard Co. veteran Paul Ely Jr. had been elected president and chief executive officer (CEO) by the board of directors. Former CEO Allen H. Michels remains as chairman of the company.

Ely, as an executive vice-president at HP, built up HP's computer business to a $3 billion operation in 1984. In a reorganization at HP in July, Ely shifted from computer operations to lead a division including medical and analytical products and research laboratories; industry observers said at the time that Ely was shunted in the bid to succeed John A. Young, HP president and chief executive officer.

Michels, 43, said that Ely, 52, had the experience and professional skills to assure profitable growth for Convergent Technologies. "The time had come to bring aboard a truly outstanding professional manager with the experience necessary to help us meet the challenges of the future," Michels said. Convergent said Ely, who was also named to the board of directors, will receive a $300,000 salary along with a $1 million bonus, stock purchase rights and "the right to receive" an additional $1.6 million bonus payable in installments in 1986 and 1987. In a statement, Ely said, "Convergent is an exciting company at a critical stage in its development."

In another move, company cofounder Ben Wegbreit, 39, was named executive vice-president.

NEC takes Intel to court over copyright charges

By Kathleen Burton
CW West Coast Bureau

SAN JOSE, Calif. — NEC Electronics, Inc., a subsidiary of NEC Corp., has filed suit in U.S. District Court here against Santa Clara, Calif.-based Intel Corp., seeking to thwart Intel's alleged copyright infringement threats.

The dispute concerns two NEC Cmos microprocessors, the V20 and V30, announced last April. The NEC products are referred to in semiconductor parlance as "supersets" of Intel's 8086 and 8088 microprocessors, meaning they are fundamentally identical but enhanced versions of the Intel products.

According to Bob Hinkley, legal counselor for NEC Electronics, Intel informed NEC it was considering copyright infringement charges. NEC's suit seeks an injunction that would bar Intel from suing NEC on these charges once U.S. sales of the microcomputers commence, Hinkley said.

To underscore that the V20 and V30 microcodes did not infringe on Intel's copyrights, Hinkley said that in July, NEC voluntarily gave Intel a V30 sample to compare with the 8086 and 8088 chips. Intel is still analyz-

See NEC page 97

INDUSTRY INSIGHT/PETER BARTOLIK

Vendor battles to rev up home computer market

The confusing cabbage patch of the home computer market, relatively quiet since the departure of Texas Instruments, Inc., appears to be building up for yet another loud battle for the lucrative heart and mind of the American consumer.

Although Coleco Industries, Inc. all but abandoned the arena and traded off its innovative but ill-fated Adam computer to concentrate on toys and dolls, the big boys are just starting to play in this ballpark.

IBM has lowered the price and enhanced the configuration of its PCjr. Apple Computer, Inc. is scoring big with its attractive Apple IIc, although the company is seemingly more intent on moving its Macintosh into big business.

Yet, as these two leaders from opposite ends of the spectrum cross paths, the always-entertaining Jack Tramiel pops up yet again to declare that the

See COLUMN page 97

In March's Computerworld Focus, you can make mega-sales in micro software.

There are more micros on more desks than ever before. And there's every indication that the trend will continue.

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Value Software execs set management-oriented course

By Peter Bartolik
CW Staff

FRAMINGHAM, Mass. — Indoctrinating a highly technical product team with a market orientation is the key for future success at Value Software, Inc. of Cherry Hill, N.J., according to the firm's new owners and executive team.

Formerly known as Value Computing, Inc., the vendor of systems software for data center management was recently sold to a group of private investors led by Harvey Kimmel, the new chairman and chief executive officer (CEO) who was formerly a director of Execucom Systems Corp. and instrumental in the sale of that company.

In an interview here recently, Kimmel and Harry S. Gierhart, the company's new president and CEO, said they intend to revive interest in Value Software products by becoming more visible in the market, developing enhancements to meet the needs of existing customers and, over the long term, building a line of integrated utility packages incorporating Cullinet Software, Inc.'s IDMS data base software.

Begun to stall

According to Kimmel, who placed the privately held company's annual revenues at about $7 million, Value Computing in recent years had begun to stall, even though it had posted profits in 14 of its 15 years of operation. Kimmel said the company had not invested greatly in products in recent years, but was attractive because of its more than 1,000 user sites and existing products.

The previous owners were strong on technical knowledge, whereas the new owners believe they are strong in management skills and motivational leadership, Kimmel said. "The company was definitely stalled, numerically and motivationally," he said, adding that its bottled-up potential is almost ready to explode. The company was built on systems software products for use in IBM's MVS and VSI operating environments, offering a production scheduling and control system, a job accounting and billing system, a tape library management system, System Management Facilities data management system and more recently the Data Center Distribution System for on-line report management.

Focus on existing products

According to Gierhart, the former vice-president of marketing and sales with VM Software, Inc., the company will focus heavily on enhancing existing products that have experienced "long-term repeat customer" loyalty. But it also plans to spend $1.5 million over the next 12 to 18 months on developing products incorporating Cullinet's IDMS. "There is a tremendous future for systems software [incorporating] data base management systems," he said. The products are self-contained, and users will not have to license the Cullinet product, he added.

Kimmel insisted that the new owners of the 80-employee company are taking a long-term view and intend to pour money back into the company; the investors have agreed that no dividends will be paid out, he said. Kimmel also said his "personal preference" is not to take the company public if the new team is able to revive revenue growth.

Operational changes, Gierhart said, have focused on increased product training for the sales staff, improved communications between field staff and the technical development team, responsive customer support, installation of a customer advisory board, a shift from departmental management to product-line management and an aggressive outreach program to have executives meet with current customers.

The executives expressed somewhat differing philosophies when asked about the relative values of developing products in-house and acquiring existing products from other companies. Gierhart said the focus for now would be on internal development unless a product was available that met the company's strategic goals. Kimmel said, however, "I will continue to keep my ears to the ground" for possible acquisitions that could boost the company image.

AT&T inks micro distribution pact

MORRISTOWN, N.J. — AT&T Information Systems said recently that it has signed agreements with 44 independent resellers to distribute its PC 6300 personal computers and 3B series of computer systems.

AT&T said it is forming two distribution channels for resellers. Larger value-added resellers will obtain equipment directly from AT&T Information Systems. In addition, a "select group" of value-added system distributers will act as the distribution channel for AT&T computers to smaller resellers, AT&T said.

Last March, AT&T introduced six models in its 3B line, which includes systems ranging from multiuser desktop microcomputers to superminicomputers.

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Miscalculations in documentation, deadlines, details

OUTSIDE LINES
Arthur Bardenhagen
and Joseph Colleran

Second of two parts

As we explained last week, our study of administrative procedures by exporters revealed a number of common documentation errors that serve to delay payments to exporters, or even result in lost overseas sales.

The study pinpointed the 10 most common errors exporters make, which are listed here in order of importance:

■ Exporters present the necessary documents after the letters of credit have expired.

Typically, an exporter is from a few days to a week late. But late is late — even if only one day. The letter of credit is no longer valid and must be reauthorized by the buyer and his bank.

■ Exporters ship their goods later than the credit allows.

Again, late is late, even if it is only a few days. The last date for shipment specified in the credit has passed.

Again, the exporter may not have studied the terms of the credit. Or he may not have checked shipping schedules; when he does, he may find that only two ships a month go to the country of destination.

Usually, we can obtain a waiver from the importer on this matter. But this is not guaranteed. And even when we succeed, the price of the goods may have fallen in the international market. So the importer may offer to pay less for the goods, under threat of not making the purchase at all.

■ Exporters try to draw down more money than their letters of credit allow.

This often happens when a credit permits partial shipments of godds. An exporter has an order for $100,000 worth of his products, so he ships $25,000 worth, then a month later $30,000 worth, then in the third month another $25,000. In the fourth month, he ships a final $25,000 worth, making a grand total of $105,000. In many such cases, the exporter has told the importer he would overdraw on the letter of credit, or the importer has slightly increased his order. Yet the importer fails to tell his own bank of these changes and have the letter of credit amended.

In such cases, we do one of three things: telex the importer's bank for permission to pay the higher amount; forward what documents we have to the importer's bank and request permission to pay; or, if the exporter is our customer, accept his written indemnity that he will hold us blameless if we make payment. Although one of these steps usually works, we know of cases where the exporter has had to find another buyer.

■ Exporters delay presenting documents for an undue period.

A letter of credit sometimes specifies that an exporter must present his documents to his bank within a specific period of time after shipping his goods, even though the credit may not be near expiration. This period may be five, 10, 15 days, whatever. But if no cutoff is specified, the rules of the Uniform Customs and Practice for Documentary Credits (UCP) apply. These stipulate that the exporter must present his documents within 21 business days after the goods are shipped, yet many exporters wait too long to prepare or obtain the necessary documents.

■ Exporters make unallowed partial shipments.

Some letters of credit permit partial shipments, some do not. When they do not, some exporters make such shipments anyway.

There are two reasons why. First, once again, they may not have studied the terms of the credits. Second, they may have one-half of an order ready and decide to forward it in hopes of obtaining early partial payment.

Yet we cannot make such payments unless the full orders are shipped. The letters of credit do not allow it.

■ Exporters make invoices that do not describe the merchandise exactly as it is described in their credits.

A letter of credit may specify that an exporter is to ship a certain number of spare parts for a particular computer. If the exporter's invoice merely says "computer spare parts," this is a discrepancy.

■ Exporters do not supply all the documents required for their letters of credit.

Why not? Pure oversight is one reason. Inability to obtain necessary documents or certification of them is another. A desire to avoid paying fees — say, for weighing the goods — is a third.

Usually, this kind of error is easily correctable. We merely wait until

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Bardenhagen is a vice-president in the Trade Finance Division of Irving Trust Co., New York; Colleran is a vice-president in the Credit Services Division of the same company.

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account for exporting loss of sales, delays in payment

the exporter obtains what is necessary. Yet he does not receive his money until he does what is required. And in the meantime, his letter of credit may expire or its grace period elapse, considering all the risks those contingencies involve.

■ Exporters do not have documents legalized.

Some documents, such as customs invoices, must sometimes be notarized or receive some other kind of legal imprimatur from a third party. If an exporter fails to get the job done, he may not find it easy to rectify his mistake.

It can take time to obtain documents, especially if a consulate of a foreign nation is observing a home-country holiday or wants to see a bill of lading or other documents relevant to the shipment.

Furthermore, circumstances may work against the exporter. During one of the recent Arab-Israeli wars, Arab nations became so irate at the U.S.' attitude that they closed all their consulates in this country. Ethiopia once did the same thing to mourn the death of its former leader Haile Selassie. In both cases, exporters could do nothing but wait — or obtain waivers. Yet they might have avoided the problem altogether by allowing more time to obtain what they needed.

■ Exporters fail to obtain completed onboard bills of lading.

Goods bound overseas are sometimes scheduled to go on one ship, but actually end up on another. The exporters learn of the last-minute switch too late and then present bills of lading that lack an onboard stamp from the appropriate carrying vessel or that contain one that is undated or unsigned.

Obviously, these bills of lading are unacceptable, and the exporters cannot be paid until the problem is corrected.

■ Exporters fail to obtain insurance coverage soon enough.

This discrepancy is the most ironic of the group. That is because many companies that export regularly have an open-ended arrangement with their insurers that allows them to write their own policies for whatever amounts and periods of time they wish. Yet sometimes their shipments leave on, say, Dec. 15, and they do not write the policies and get them approved until Dec. 18. This is in violation of the UCP, which requires that insurance cover the movement of goods from warehouse to warehouse.

Errors can be rectified

As you can see, most of these 10 common errors can be rectified. Even so, there are always drawbacks and risks. The exporters must pay for discrepancies that cannot be corrected. They do not get their money when they could. And they run the risk that their products' prices will suddenly fall or that their buyers will back out of the deals altogether once they learn of the documents' discrepancies. Indeed, in recent years we have experienced refusals to consummate purchases more and more often.

Virtually all of these errors could be prevented. Exporters need only study the terms of their letters of credit, allow themselves time to fulfill these terms, then pay attention to detail.

They will help themselves further if they retain experienced forwarders or customs house brokers because these agents often prepare some of the documents relevant to letters of credit and perform other valuable and timely services.

CDC transfers sales functions

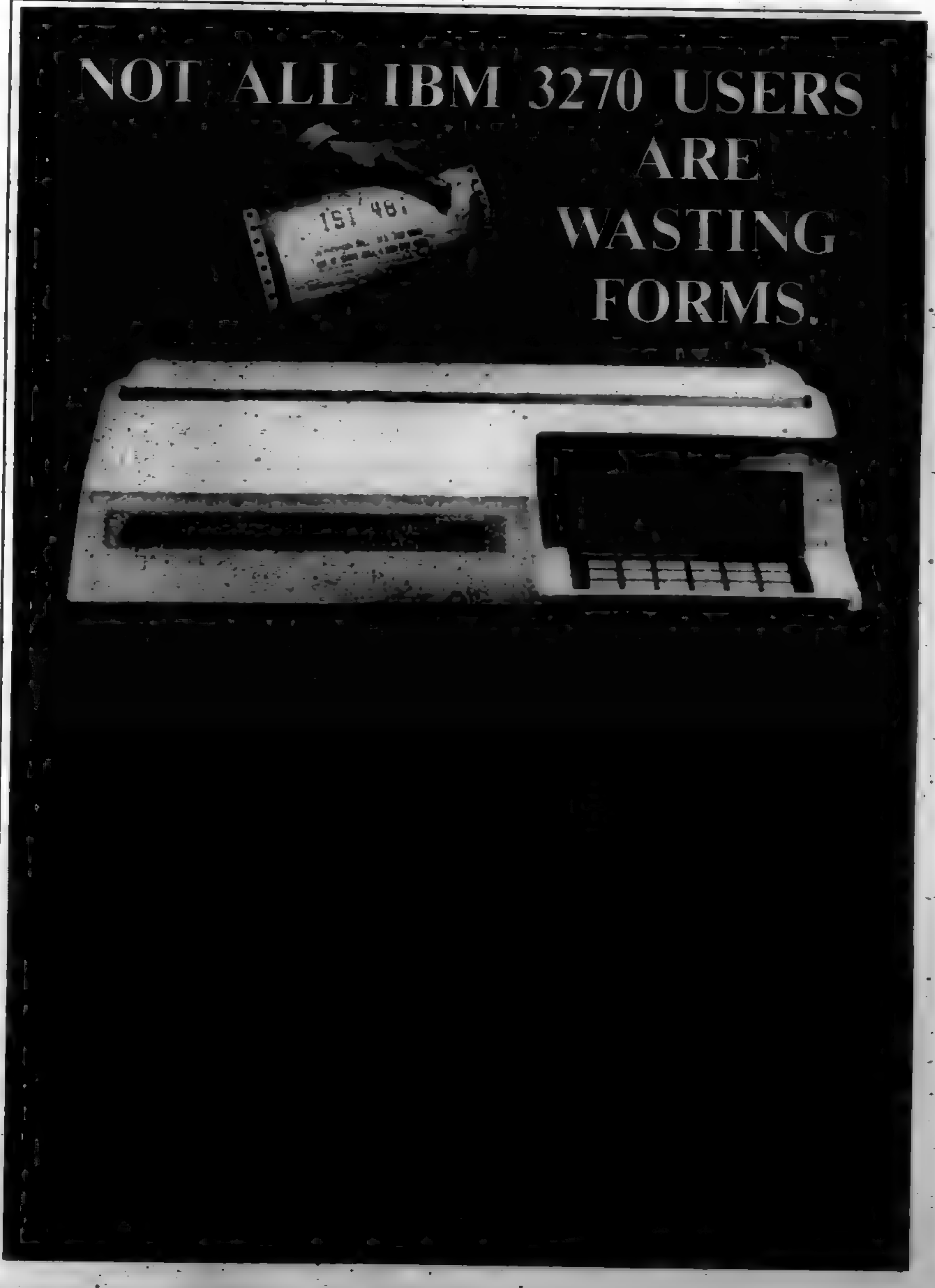
MINNEAPOLIS — Control Data Corp. recently announced the transfer of sales and marketing functions for its Cyber 205 supercomputer to ETA Systems, Inc., the CDC spin-off previously designated as responsible for development of a next-generation supercomputer to succeed the Cyber 205.

ETA, which is 90% owned by CDC, will assume worldwide marketing responsibilities for the Cyber 205, while CDC will continue development, manufacturing and maintenance of the product, including support of the customer base.

Some 50 CDC employees will be affected by the transfer but will have the option of staying with CDC to sell the Cyber 800 series or to obtain other employment within CDC.

ETA was formed in 1983 when CDC spun off the development unit for a Cyber 205 successor and founded an independent company designed to raise equity financing. CDC, however, still holds its 90% interest in the company despite earlier intentions to raise equity funding from outside sources. CDC said it has an installed base of 27 Cyber 205 machines but expects the market for supercomputers to open up.

ETA will sell the CDC machine in addition to its own ETA10 machine that is compatible with the CDC unit and scheduled for shipment next year.



California officials seek to repeal tax reform provision

By Kathleen Burton
CW West Coast Bureau

SACRAMENTO, Calif. — California state officials said legislation was introduced last month to repeal a provision of a tax reform package that would tax corporate research and development spending and could cost Silicon Valley companies millions of dollars in taxes.

Although the tax provision was part of legislation that California Gov. George Deukmejian signed into law in September 1984, the controversial provisions were not discovered until late December, said a spokesman for Deukmejian.

The controversial provision of A.B. 2215, sponsored by California Assemblyman Thomas Hannigan, was signed into law erroneously, said Ellen Worcester, a consultant to the California Assembly Revenue and Taxation Committee. The package was designed to make California tax codes conform to the Internal Revenue Service federal code, but the provision in question failed to duplicate a federal exemption for corporate R&D spending. Such tax snafus are not that unusual, Worcester said, because of the technical language of tax law and occasional drafting oversights.

Legislation repealing the provision will be sent to the governor by March 15. That date is the deadline for changes to be made if companies are to avoid paying the tax for 1984, said a California state franchise tax board official.

Asked if Deukmejian would sign the bill, a spokesman for the governor's office said that it is Deukmejian's policy not to make announcements about the signing of pending bills until they reach his desk.

In the Silicon Valley, many high-technology companies rely heavily on R&D technologies to compete against foreign and domestic firms. Executives of several companies here said the new tax, if not repealed, would have severe consequences and could discourage companies from setting up R&D operations in California.

Although quarterly tax payments were due on Dec. 15, Silicon Valley companies said that with the tax law extensions available for multinational corporations, there is still time to see how the pending legislation develops before making significant payments. Dan Lightman, tax director at Intel Corp., a Santa Clara, Calif., semiconductor manufacturer, said that since California is relatively liberal on tax payment extensions, the company has until October before full payments are due. All multinationals will use these extensions, he said, where it concerns retroactive pending legislation. "We are confident A.B. 2215 was a mistake," Lightman added.

Tax attorneys for two other Silicon Valley firms, Hewlett-Packard Co. and National Semiconductor Corp., said that their firms' fiscal years are structured so they would not have to make estimated earnings payments until Feb. 15.

Clifford Jernigan, director of government affairs at Advanced Micro Devices, Inc., a Sunnyvale, Calif., semiconductor manufacturer, said that his firm would not pay the tax, banking on the passage of an amendment in March to waive possible late payment penalties.

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Memorex aims at new market

SANTA CLARA, Calif. — Memorex Corp. announced last week that it will no longer sell storage products in the OEM market and will instead focus on the IBM plug-compatible market as well as supply storage equipment for its parent company, Burroughs Corp.

The OEM business only accounted for 2% of the company's revenue in 1984, the company said. The decision came as a result of a six-month review by the Memorex management team.

Memorex also announced it will close its Westlake, Calif., manufacturing facility by midyear and assist employees there in finding other jobs. The company will seek a buyer for that facility, subject to the lease terms of Disk Media, Inc., a joint venture of Memorex and Control Data Corp. that also occupies the Westlake facility.

The Memorex/Burroughs plant in Winnipeg, Manitoba, which had been the planned site for the manufacture of OEM high-performance 5¼-in. disk drives, will take on other production and refurbishment activities as a result of cancellation of the disk drive development project.

Memorex said it will seek to sell its OEM business and, in the meantime, will meet all existing commitments to its OEM customers, including replacement of parts. Not affected by the decision is the company's media products operations.

Memorex President Philip S. Dauber said the new focus "enables us to pursue even more aggressively the tremendous opportunity that now exists in the [plug-compatible manufacturer] business to supply peripheral equipment to end users of IBM and Burroughs computer systems."

NEC

from page 89

ing the sample, he said.

Claiming that NEC's microprocessors were independently developed, Hinkley said that of the V20's and V30's 156 machine instructions, 23 differ substantially from Intel's 8086 and 8088 internal instructions. He said the NEC products also have "capabilities that are not found in the 8086 and 8088," including faster execution time.

Tom Dunlap, general counselor for Intel, said that the V30's microcode could have been designed in one of two ways: either totally independent of the 8086 or by illegally copying Intel's 8086 code.

Intel is still analyzing NEC's sample V30 chip to determine whether copyright infringement did occur, Dunlap said, adding that the analysis should be completed by the second quarter. "So far," Dunlap said, "the results are not conclusive but indicate that we should proceed with our investigation." The analysis is taking so long, according to Dunlap, because "Intel is not used to reverse engineering products."

EXPORT

from page 89

tion last week emphasized that the regulations are not cast in stone but will be used to guide license reviews. Export destinations and the uses of equipment and software are important criteria in obtaining license approval, they said.

Peripheral devices such as disk drives that exceed 11M byte/sec transfer rates, magnetic tape drives exceeding 3.2M byte/sec transfer rates and communications control units such as private branch exchanges that exceed 9,600 bit/sec will be required to seek an export license. If a communications channel is not dedicated full-time to a given application, then it cannot exceed a 300 bit/sec transmission speed and must be connected to telex interfaces and a public switched-network service. Local-area network transmission speeds cannot exceed 10M byte/sec.

Software listed for control includes all development system software, software used for high-level programming, disassembler and decompiler software, as well as compiler and interpreter software. Left untouched were applications software programs designed for and limited to accounting, general ledger, inventory control, payroll, accounts receivable, personnel records, wages, calculation and invoice control.

Additionally, data and text manipulation software such as sort/merge, text editing, data entry and word processing were left untouched. Report generators were also left out of software controls.

NORTH

from page 89

has since gone out of business.

The company is believed to have lost money on the computer operations, although the alleged loss has never been mentioned in any of Northrop's annual reports.

In a prepared statement about the recent settlement, William M. Elliott, Northrop's chief counsel, said, "The arbitration award is without jurisdiction, is erroneous, and the company intends to pursue all appropriate legal remedies."

COLUMN

from page 89

home computer market is much removed from the corporate battlefield that IBM all but owns and on which Apple has focused most of its energies lately.

Tramiel, late of Commodore International, Ltd. and now head of a resurgent Atari Corp., pulled off an amazing feat at the recent Consumer Electronics Show by unveiling a Macintosh-type computer only six months after he bought out the company.

Quickly nicknamed the "Jackintosh" by industry wags, Tramiel's microcomputers offer the Motorola Corp. 68000 microprocessor, a 528K-byte memory and Macintosh-like features for $600.

Much doubt has been expressed about Atari's ability to finance production. But Tramiel has many times confounded the computer industry with his ability to turn the market on its ear. He was, after all, the helmsman who steered Commodore to the position of being one of the largest computer vendors in terms of actual units.

Need for software

The other doubt about Atari's future concerns the need for software. IBM is spending big bucks these days to inform the American consumer that thousands of software programs can be operated on the PCjr. This writer, however, cannot picture the average American consumer really wanting to be confronted with thousands of software options — games, maybe, but not a plethora of duplicative application packages that have little use in the home.

If Tramiel can pull it off, he may be able to cut a leg from under both the IBM goliath and the big-booted Apple. With his marketing savvy and bottom-line strategies, Tramiel could clean up in the mass-market arena, particularly if Apple's focus on the corporate arena continues to result in hesitant corrections to its pride-based pricing strategies.

If Tramiel can bring his machine to market, it will present Apple and IBM with a tough moving target. At the very least, his vendetta against Commodore is sure to continue the downward pressure on the prices of home computers as sophisticated machines continue to enter this arena. The reverberations could impact the higher end of the microcomputer market.

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If you have exp with complex IMS apps & a desire for mgmt consider this pos. Environ is IBM MVS IMS-DBDC COBOL. Oppty to assist P/A's in efficient use of IMS design and prog of new systems. $35,000

TECHNICAL WRITER

Challenge your creative writing abilities & use your EDP skills for this exciting software co. If you're currently an EDP tech writer & would like to write on-line DBMS reference guides & user manuals, don't hesitate. Fast-paced co offers real challenge & upward mobility. $30,000

ROBERT HALF
of Boston, Inc.
100 Summer St.
Boston, MA 02110
(617) 423-1200

BUFFALO

S/38 ANAL/PROG

Several of our outstanding Upstate NY clients have selected S/38 as their sys of the future. They have asked us to actively search for RPGIII anal/prog w/min 1 yr exp on the S/38. Any industry OK! Prefer 2 or 4 yr degree. Superb living areas w/ excellent higher education oppty's. To $32,000

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420 Main Street
1310 Liberty Building
Buffalo, NY 14202
(716) 842-0801

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Privately held, rapidly growing apparel mfr seeks sr sys pro w/extensive apparel sys bkgrd. Outstanding oppty to join a dynamic mgmt team. Position rpts to President. Major sys conversion planned. $50,000

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Providence, RI 02903
(401) 274-8700

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PROJECT LEADER

Twin Cities based industry leader seeks Project Leader to supervise 4 to 5 Programmers and Analysts in developing new systems. Requires experience in DOS/VSE or MVS environment. Any additional proven skills in CICS, IMS or MANTIS are pluses. Job #6896. $30-35,000

Mark David or Tim Smith
ROBERT HALF
3636 IDS Center
Minneapolis, MN 55402
(612) 339-9001

HARTFORD

SR-SYS PROGRAMMING

1985 expansion. CT IBM/MVS-XA client seeks strong mgr. Will supv staff of 8-12 sys prog's in state-of-the-art environ. Hi-lvl pos offers excellent benefits, long term growth & full reloc. Min 6-8 yrs lge IBM exp & supvry skills. Salary $48-60,000

PROG/ANALYST

If you have min 2+ yrs in COBOL w/IMS or CICS devel respon our CT client wants to meet you! Reloc expenses paid by this very fast growing multi-div corp w/DP devel staff in multi-CT loc. Salaries to $32,000

SR SYS PROGRAMMER

IBM/MVS client seeking internals indiv to assume all software respon for corp data ctr. Med sized unstructured environ in suburban CT. Will offer very "broad line" tech growth in all IBM products. Salary to $40,000

TELECOMM'S

Sr lvl IBM/VTAM internals indiv to join growing tech support team providing software install & plng for data ctr expansion. Excellent growth potential into tech mgmt.
Salary range $40-50,000

CAD/CAM CONSULTANT

Multi-nat corp seeks indiv w/min 10+ yrs exp as a user/developer of CAD/CAM or CAE sys. Will be sr lvl indiv respon for developing corp strategies & integrating into computer integrated mfg sys. Excellent growth, hi-vis. BS req. Salary $45-55,000

SR CONSULTANT

Exp w/lge IBM & mfg sys (purchasing, fin'l & transportation) req'd for sr lvl corp consulting pos. Will intergrate all sys & be focal pt for future devel for this hi-tech mfr. Suburban loc, excellent potential. BS + min 7-9 yrs exp req. Salary $43-50,000

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111 Pearl Street
Hartford, CT 06103
(203) 278-7170

NEW ORLEANS

SR PROGRAMMER ANALYST

Excellent oppty. IBM, COBOL, CICS professional w/3+ yrs exp needed to get into a project management path. Some data base exposure required. To $33,000

EDP AUDIT MANAGER

3 yrs audit exp with good commun & development skills for this expanding NYSE co. Must have working knldg of COBOL, EDP audit strategies & multi data center auditing. $40,000

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of New Orleans
P.O. Box 57620
New Orleans, LA 70157
(504) 836-4286

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SOFTWARE ENGINEER

Degree required, 2-3 years experience in software design/development in a SCIENTIFIC application. Shirt-sleeve technical design and implementation responsibilities. VAX/VMS or UNIX experience a plus. Must be familiar with PASCAL, FORTRAN, C, and ADA. Experience with assembly level coding desirable. To $40,000

ROBERT HALF
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400 E. Anderson, #334
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(512) 835-0863

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SYSTEMS ANALYSTS

SR PROGRAMMER ANALYSTS

Join in the dynamic growth of one of the fast growing industries on Long Island. Utilize your expertise in order entry/inventory, mfg, acctng/financial. Must have on-line design experience and a solid background in COBOL. Any data base exp a +. Several new positions available in systems analysis.

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Jericho, NY 11753
(516) 333-2121

SEATTLE

TANDEM SYSTEMS PROGRAMMER

Seeking degreed individual with 1+ years Tandem internals experience. Will consider applicants with only Tandem applications programming experience and an interest in moving to systems programming. TAL nice but not necessary. Mid $30's

TECH SUPPORT ANALYST

Seeking systems programmer with 3-4 yrs IBM DOS/VSE internals experience and CICS. Responsibilities include implementing vendor software, modifying operating system, acting as internal technical consultant. High $30's

RPG II PA

Seeking programmer analyst with 4-6 years RPG II and MAPICS or manufacturing industry experience. Project lead experience helpful. Excellent opportunities for advancing in this fast growing high tech organization. To $35,000

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Seeking individual with 5+ years data processing experience in IBM OS environment. Insurance industry experience helpful. To $36,000

Marjie Peterson
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(206) 624-9000

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Fortune 500 firm has seen rapid growth in the applications of micros in their offices, supporting administrative and management functions. They need your experience in the areas of financial systems, micro to mainframes, software evaluation, hardware selection, problem identification & resolution. BS Degree required. This is a highly visible position within the organization with excellent potential for advancement. To $36,000

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Randy Pace or
Warner Coffman
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7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

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Los Angeles, CA 90010
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Join this rapidly expanding group of software technicians doing support of distributive data processing. Work in a wide variety of operating systems, data communications protocol, and investigate a wide variety of software products. Excellent opportunity for a software technician to widen his scope of expertise. Salary to $40,000

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Kansas City, MO 64105
(816) 474-4583

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Opportunity to develop financial systems for banks. You will use your 4+ years IBM systems development experience to direct projects. It's your move. $29-35,000

PROJECT MANAGER

Assume immediate control of high-visibility projects! Requires thorough knowledge of MVS environment. Potential for upper management. To $45,000

Ed Lance or Dick Bird
ROBERT HALF
of Wisconsin
777 E. Wisconsin Ave.
Milwaukee, WI 53202
(414)271-HALF (271-4253)

SAN ANTONIO

DP MANAGER

Degree preferred. Must have Sys 38 - RPG III exposure with good oral/written comm skills. Shop is 5 people strong and position requires scheduling, planning and supv. Visible to owner - shirt-sleeve environment. $33-37,000

PROGRAMMER ANALYST

Degree preferred. Must have 2+ yrs RPG II, Sys 34/36 exp with any appls accepted. Position due to expansion. Above average benefits/potential. $22-26,000

PROJECT LEADER

Degree preferred. Must have 7+ yrs DP experience, Sys 34 RPG II exp with mgmt/supvs ability. Will lead 6 or more P/A's in new development area tied to large mainframe. Excellent upward growth. $30-35,000

All positions above and many more are in Texas where "Long Necks," "Armadillos" and the "Cotton Eyed Joe" call home.

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of San Antonio, Inc.
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San Antonio, TX 78201
1-800-531-5402
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(402) 397-8107

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Experts to prepare long and short range plans for application selection, system development and maintenance. RMF, SMF, MICS, BEST/1, SAS knowledge a plus. Fee Paid. $34,000

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IBM large, medium and small-scale documentation writers needed to fill exciting positions NOW!!! Must be willing to submit a writing sample. Fee Paid. $35,000

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Highly visible position in a MVS shop. Responsible for management and admin of security policies and procedures. Knowledge of CGA's TOP SECRET or IBM's RACF System. An understanding of FDR and DMS/OS a plus. Fee Paid. $30,000

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Excellent problem resolution skills (job abends, JCL errors, telecommunications failures, job flow conflicts, etc.) and user interface experience. 4-6 years with 2 years specializing in either operations, programming, tech support, or systems support. IMS CICS and MVS a must. Fee Paid $35,000

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522 Fifth Avenue
New York, NY 10036
(212) 221-6666

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Dick Stevens
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of New Mexico
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Albuquerque, NM 87190
(505) 884-4557

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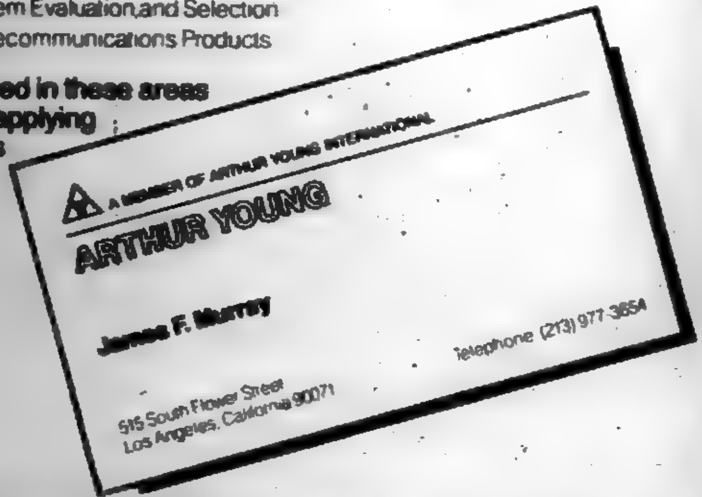

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NASA

COMPUTING SCIENTISTS

The Computer Systems Division of NASA-Ames Research Center, located in the San Francisco Bay Area, invites applications for two senior positions:

Chief, Computational Research and Technology Branch
Provides technical direction and creative leadership for one of NASA's largest computing science research organizations through personal research efforts and by selection of projects which provide significant research opportunities for members of the organization. Current research activities are concentrated in graphics, concurrent processing, and data flow architectures. Branch staff includes approximately 15 computer scientists and engineers. Ph.D in mathematics, physics, engineering, or closely related discipline is strongly desired.

Chief, Program Analysis Office
Responsible for strategic ADP planning, including determination of overall technical requirements, design and integration approaches, identifying needed resources, and budget forecasting and tracking. Defines goals and objectives for integrating the functions of the organization with the computational activities at Ames and NASA Headquarters: Provides technical planning and monitoring of major projects. Manages the Center's master programming contracts. Staff includes approximately 8 members. Undergraduate degree in computer science, mathematics, or related engineering field combined with advanced degrees and broad computer technology management background is desired.

NASA-Ames is a Federal research laboratory pursuing theoretical, computational, experimental, and applied research in aeronautics, astronautics, and human performance in the aerospace environment. Excellent computer facilities include Cray X-MP, Cyber 205, IBM 4381, VAX-11/785 quad, and advanced graphics laboratory. Provision is made for competitive salaries for highly qualified individuals. Anticipated salary range $49,000 to $59,000. Civil service status not required. Must be U.S. citizen. Please send resume or SF 171 Personal Qualifications Statement to: D. E. Schilling, MS 241-6, Ames Research Center, Moffett Field, CA 94035, Attn: Box EC-4. An equal opportunity employer; minority and women applicants are encouraged.

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Application Developers
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If you have a minimum of 4 years experience, our client a Fortune 100 company, has excellent career opportunities for broad systems/applications exposure in these major metropolitan areas. To qualify, you should have strong technical and personal communications skills with the ability to work in customer environments.

The candidates we seek must know COBOL or PL/1 or Assembler and have technical expertise in one or more of the following areas:

- Data Base/Data Communications
  - IMS, CICS, TOTAL
- Systems Programming
  - MVS, DOS/VS, DOS/VSE, VM
- Telecommunications
  - SNA, NCP, VTAM
- Operating Systems
  - Large systems design
  - MVS, DOS, ACP

You'll be involved in varied and interesting applications development and systems programming assignments providing excellent long-term career advancement potential. Relocation assistance provided. Please send resume or call in confidence: Don Kellner, Career Consultants, 107 N. Pennsylvania, Indpls., IN. 46204, 317-639-5601.

COORDINATOR OF INFORMATION SYSTEMS

Applications and nominations are invited for the position of Coordinator of Information Systems at Governors State University. Administrative computing is provided by an off-site cooperative center providing administrative computing services to three universities utilizing the IBM 4300 series. Academic computing depends heavily on use of microcomputers. The University also participates in a state-wide time sharing network utilizing a Cyber 170/730. Duties include coordinating academic and administrative computing and word processing functions, developing and evaluating technical plans for automated support of university information systems, developing policies governing automated system development and equipment/software acquisition, and recommending procurement of software and local hardware as necessary.

Applicant must have a baccalaureate degree (master's degree preferred) in Information or Computer Science, Business or related field with five years data processing experience, a significant portion of which should be in systems analysis and design. Management experience in providing computer services is highly desirable.

SALARY: Competitive
STARTING DATE: Currently Available
APPLICATION DEADLINE: January 31, 1985
Submit application or nomination to:
Dr. [illegible], Chairperson
Search Committee for the Coordinator of Information Systems
Office of the Vice President for Administration and Planning
Governors State University
University Park, IL 60466

Governors State University is located in a suburban area 30 miles south of the Chicago Loop. The University has an enrollment of 5,000 upper division and graduate students in the Colleges of Arts and Sciences, Business and Public Administration, Education, and Health Professions. The University offers curricula in computer science and management information systems.

Governors State University is an Affirmative Action/Equal Employment Opportunity University.

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COM-PRO, a data processing services organization, currently has numerous openings in both of it's CENTRAL FLORIDA OPERATIONS. Qualified candidates should possess a minimum of 3 years of experience and a proven background in one or more of the following technical areas:

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Cobol	IMS DB or DC	IBM
PL/1	IDMS DB or DC	Honeywell
FOCUS	ADABAS	
CICS		

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Chairperson
Information Systems
Management Department
University of Maryland Baltimore County

Applicants should hold the Ph.D. in computer or information systems or a related field and have the scholarly and professional credentials required to manage a complex and expanding undergraduate program and a proposed graduate program.

Interested candidates should submit an up-to-date Curriculum vita to: Professor Joseph F. Mulligan, Chairman IFSM Search Committee, Department of Physics, University of Maryland Baltimore County, 5401 Wilkens Avenue, Catonsville, MD 21228. UMBC is an equal opportunity/affirmative action employer.

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OS COBOL w/CICS	To $35K
SYSTEMS	To $40K
IMS DB/DC	To $40K
ADABAS/NATURAL	To $[illegible]K

[illegible]
of Dallas, Inc.
Two Northpark East, Suite 110
Dallas, TX 75231
(214)[illegible] (agency)

COMPUTER SYSTEMS MANAGER

The University of Illinois at Urbana-Champaign Department of Physics has an immediate opening for a Computer Systems Manager to direct computer operation and develop software programs. Master's degree and computer systems management required. Salary based upon experience. Send Resumes to: Mr. Raymond F. [illegible], 205 Loomis Laboratory of Physics, 1110 West Green Street, Urbana, Illinois, 61801. For technical information contact: Professor Larry Cardman, Nuclear Physics Laboratory, 23 Stadium Drive, Champaign, Illinois, 61820, (217)333-4541. For full consideration, applications should be received by February 1, 1985. The University of Illinois is an affirmative action, equal opportunity employer.

Dallas

Our client companies in the Dallas area have immediate need for the following skills:

- IDMS Data Base Administrators
- IBM System 38 Analysts
- CICS Programmer/Analysts

For immediate consideration please forward your resume in confidence to:

Taylor & Associates
[illegible] E. Airport Freeway-Ste. 210
Irving, TX 75062
214-[illegible]

Subcontractors invited to reply.

S/36 PROGRAMMER ANALYST

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- Mini-Micro Evaluation Technology
- LANs, IBM/SNA
- Tandem Systems Programming: TAL, ENVOY, PATHWAY
- Network Quality Control/Implementation
- Telecom-Eng. & Arch.

IMS Programmer/Analyst Job #4
- IBM MVS/XA, TSO/SPF, VSAM
- IMS DB/DC On-line Development experience
- Structured Analysis & Design
- COBOL
- ADF environment

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- Data Base, Data Communications & Applications
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- IBM Assembler Language Coding & Design experience

Systems Programming Job #6
- Operating System Development: MVS/XA, VM/SP, VM/XA
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- IMS Utility Design
- Assembler Language Programming
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- SW/HW change, review & installation
- Utility development, systems management

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- Hardware capacity planning for IMS, VM, MVS environments
- Critical application tuning
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- IBM PC, WANG, NOMAD II, MARK IV, RAMIS, FOCUS, VP/CSS, VM/CMS
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- Requirements analysis and research, specification design, problem resolution, teaching experience, and client interface skills

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- Provide structure, liaison and direction to all operational activities
- Responsible through the matrixed organization to ensure that the user's service level needs are met
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- Effectively manage a technical support organization responsible for the creation and maintenance of production procedures and associated documentation for all applications executed
- Minimum of 3 years' DP management experience
- Extensive technical experience in computer operations or applications programming

Systems Analyst & Systems Managers Job #12
- Provide written procedures for operations to provide first level problem analysis and recovery
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- Good written and verbal communications skills
- Provide recovery for commonly occurring failures
- Senior position requires above plus 5–10 years' experience

Internal Systems Consultant Job #13
- Major responsibility will be change implementation, planning & tracking
- Strong background in Data Communication, HW/SW Architectures and operations in a large network environment

IMS Systems Programming Job #14
- Systems Development and Support: IMS DB/DC, FASTPATH, MSC
- Systems Software Development: Automated Debugging, Automated Operator Interface, Recovery and Restart Aids
- Application Utility Development, Data Base Reorganizers, Space Management Tools, Application Front Ends

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- Operators, coverage programmers

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We Are Prepared To Move Quickly. So Must You.

Please send your resume including salary history with the mini-application below, indicating the position/job number of your interest to: Bank of America, P.O. 37000, Dept. 3228-CW1/14, San Francisco, CA 94137. Only direct applicant inquiries will be considered at this time. An equal opportunity employer.

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HARDWARE BACKGROUND ______________________

SOFTWARE BACKGROUND ______________________

LANGUAGES: ______ PRIMARY ______ SECONDARY ______ OTHER

CURRENT/LAST POSITION ______________________

COMPANY ______________________

Are you applying for a specific position? If so, please designate the job # and position title you best qualify for with the number of years experience you possess.

Applic. Prog.	______	Project Mgmt.	______
Systems Design	______	Data Base	______
Systems Prog.	______	Telecom/Design	______
Telecom/Ops.	______		

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Systems Engineer — VAX

- Strong VMS and utilities experience required.
- Should be knowledgeable in hardware configuration and system sizing.
- Experience in DecNet implementation desirable.
- Exposure to database management packages an asset.
- Major project experience required.

Systems Engineer — PDP

- Strong RSX and utilities experience required.
- Should be knowledgeable in hardware configuration including special purpose peripherals.
- Experience in system performance tuning desirable.
- MACRO capability.
- Background in real-time projects such as P.L.C. or robot interfaces a plus.

Sr. Systems Analysts

- Must have broad background in factory applications for either assembly or process operations.
- Should have experience with packaged and custom systems.
- Background involving networking of micros, minis and mainframes is a plus.
- Some non-DEC experience desirable.
- Responsible for writing system development proposals and system functional descriptions. Background in structured analysis techniques desirable.
- Project estimating and scheduling ability required.

Database Architect

- Experience with relational or codasyl packages required.
- Will be responsible for immediate selection and implementation of a D/B package for a major manufacturing system.
- Broad applications background desirable.
- Ability to interface with users to define and document system requirements is essential.

Programmers

- Fortran, C or equivalent; MACRO desirable.
- Applications span both interactive and real-time programming; maintenance programming rarely needed.
- Background using database management packages beneficial.
- Exposure to graphics workstations a plus.

Selected candidates will have the opportunity to conceive and implement state-of-the-art factory automation projects using any justifiable hardware or software available. All positions require appropriate education and strong project credentials. DANIEL offers a nationally competitive salary structure, a comprehensive benefit package, and access to the adjacent fitness center.

If you are looking for a new challenge and meet the above requirements, please submit your resume including salary history to: [illegible], DANIEL INTERNATIONAL CORPORATION, Daniel Building, Dept. [illegible], Greenville, SC [illegible]. ([illegible]) [illegible].

DANIEL

UNIVERSITY OF PITTSBURGH OFFICE OF COMPUTING AND INFORMATION SYSTEMS

Associate Director for Academic Computing

The University of Pittsburgh is seeking an Associate Director for Academic Computing to provide leadership in the application of computing systems in research and instruction. [illegible]

[illegible]

Candidates must have at least 5 years experience in positions that demonstrate progressively greater responsibility and expertise in planning, policy making, and management. [illegible] A Masters Degree in Computer Science, Information Science, or a related discipline is required; however, a Doctorate is preferred. Experience in a university environment is very desirable.

Applicants should send a statement of interest, a current resume, and the names and addresses of 3 references as soon as possible to Dr. [illegible], Director of Computing and Information Systems, [illegible] Cathedral of Learning, University of Pittsburgh, Pittsburgh, PA [illegible]. The salary will be competitive and commensurate with qualifications and will be supplemented by a comprehensive fringe benefits program.

Applications will be reviewed beginning on January 31, 1985 with the aim of filling the position as soon as possible thereafter. For further details regarding the position, Doctor [illegible] can be reached at [illegible]. An equal opportunity affirmative action employer.

Director Academic Computing

Applications and nominations are invited for the position of Director of Academic Computing. This individual is responsible for overall University policy regarding the planning, development, implementation, and evaluation of academic computing services.

Reporting directly to the Vice President, the Director is responsible for the management and operation of academic computing facilities which include a staff of [illegible] professionals, a National Advanced Systems (NAS) [illegible] running MVS/SP 1.3 with TSO, two Prime [illegible] minicomputers, associated terminals and telecommunications equipment and over [illegible] microcomputers.

Qualifications: candidates should possess demonstrated management skills in the operation of a large computer center, good communications skills in an academic environment and a thorough knowledge of computer technology and telecommunications systems. Advanced degree or equivalent experience in Computer Science or related field required.

Applications: Submit nominations or letters of application and resumes by March 1, 1985 to:

Dr. [illegible]
Academic Computing
Director Position
THE UNIVERSITY
OF RHODE ISLAND
P.O. Box [illegible]
Kingston, Rhode Island [illegible]

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c. VAX Systems (Systems ranging from VAX 11/725 to 11/785)
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Responsibilities will also include writing technical design documents, software development and contract management. We are looking for a confident and extremely talented individual with complete understanding of Fortran and Macro II and knowledge of the principals and techniques used in interactive computer graphics applications. The ability to analyze user requirements, skill in writing functional and technical specifications, knowledge of software design and the ability to effectively communicate orally and writing must also be demonstrated. If you meet the above requirements, please call Mr. George Williams on (202) 389-2750 for information on application procedures.

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Design, implement, program, test, and maintain major applications project. Four years experience as programmer and/or analyst.

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All positions require experience with an IBM mainframe, preferably an IBM [illegible] series, and CICS/COBOL. Experience with MSA & financial software is desirable.

Applicants interested in this position should submit their personal resumes to the Human Resources Division, P.O. Box [illegible], Fairbanks, AK [illegible].

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#4-104
390 Second Avenue South
Minneapolis, MN 55401

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Position will be responsible for project oriented activities such as software installation, software maintenance, systems performance analysis, and development of procedures for operation, back-up and recovery of the prime computers.

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Personnel Manager
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Employment Office
NC Memorial Hospital
Chapel Hill, NC 27514
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West Virginia University Computing Services is seeking qualified applicant for two computing consultants in the expanding User Services area. We are interested in individuals with extensive technical knowledge of the MVS, CMS, VAX/VMS computing environment, proficiency in one or more programming languages compatible with the local computing environment, excellent oral and written communications skills, ability to successfully work in a stressful environment, a strong commitment to client success and a positive attitude, and a BS degree in Computer Science or related field. Supervisory experience and familiarity with computing in an academic environment are a plus, but not required. Salary negotiable, commensurate with experience. West Virginia University is the center of graduate and professional education and research in West Virginia. Located in the northern part of the state, WVU offers excellent educational, cultural and recreational possibilities. For further information contact the

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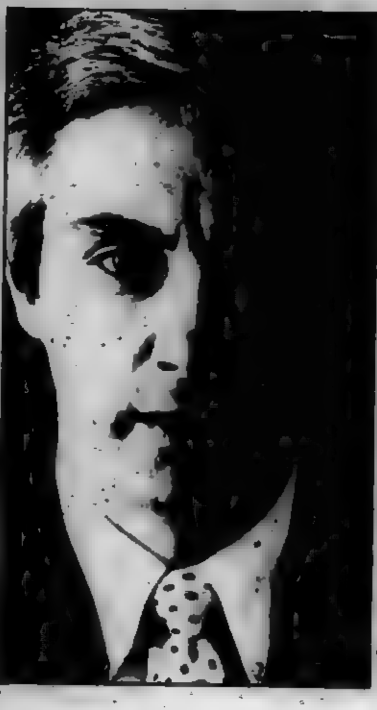

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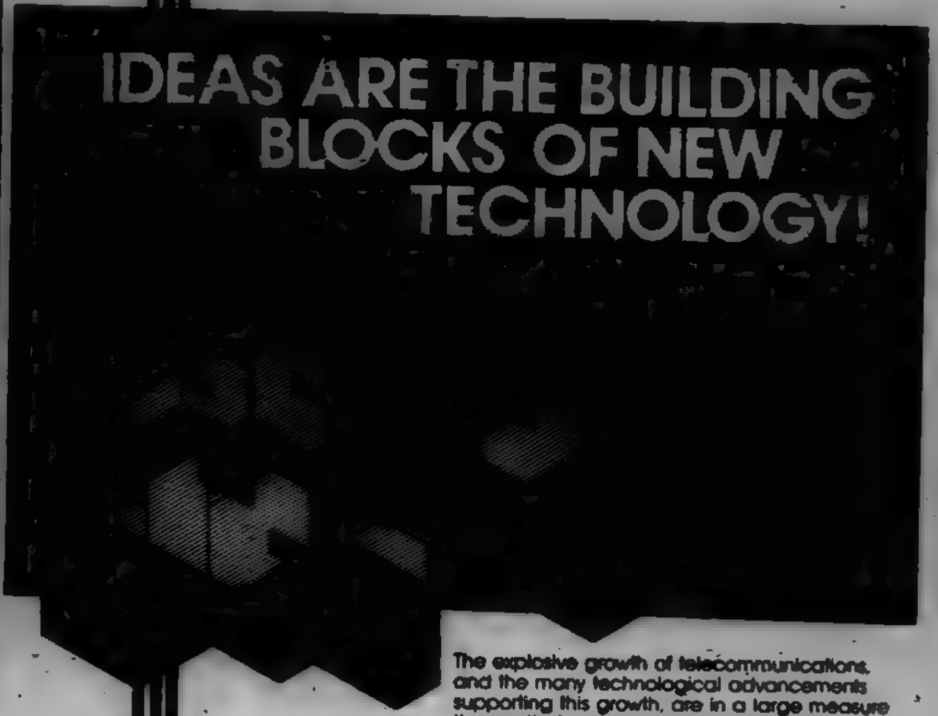

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Personnel Department
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Huntsville, AL 35805

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Position requires working knowledge of IBM mainframe computer systems and/or DEC mini-computers with usual peripherals. Working knowledge of UNIX operating system and C programming language preferred. Demonstrated skill in supervising a technical support, operations and administrative staff. Demonstrated analytical, budgetary, writing and interpersonal skills. Bachelor's degree in an appropriate field and several years of relevant experience desirable. UCLA offers an excellent benefits package. To apply, please send resume, with cover letter indicating qualifications for the position, by January 31, 1985, to: **Dr. Michael Stenstrom, Associate Professor, SEASNET Computer Facility, UCLA, School of Engineering and Applied Science, (Job #R-2957), 4680 Boelter Hall, 405 Hilgard Avenue, Los Angeles, CA 90024.**

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Florida Power & Light Company, one of the largest employers in the State of Florida, has immediate openings for Systems Programmers in its Corporate data center in Miami.

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FLORIDA

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Salaries on these positions range from $25,000 to $45,000, and some relocation assistance is available. If you would like information on any of these career opportunities or have an interest in the Florida marketplace, please call or send resume/letter to:

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- **Knowledge of 4th generation languages and data dictionary**
- **Programming and supervision of programming activities**
- **Communication with users and peers based on excellent literacy and strong interpersonal skills**

Experience using DEC10/20 or large VAX systems and distributed minis/micros in a business environment is highly desirable.

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Contact **Peter J. Haigh of KMG Main Hurdman**, One Oxford Centre, Pittsburgh, PA 15219, phone 412/281-8000, who is directing this recruitment. All inquiries will be held in strictest confidence.

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Send resume, transcripts and three letters of reference by Feb. 15 to: Dr. James M. Olson, Chr., Div. of Science and Mathematics, Rm 217C, University of MN, Morris, Morris, MN 56267. (612) [illegible]-6311. Position will remain open until filled.

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PROJECT LEADER

Requires an individual with strong hands-on management experience with a minimum of three years experience as a first line supervisor. The appropriate candidate will also have four to five years background in coding, design and enhancements of large IMS DB/DC Systems primarily in the areas of Estimating, Bill of Material, Work Tracking and/or General Accounting.

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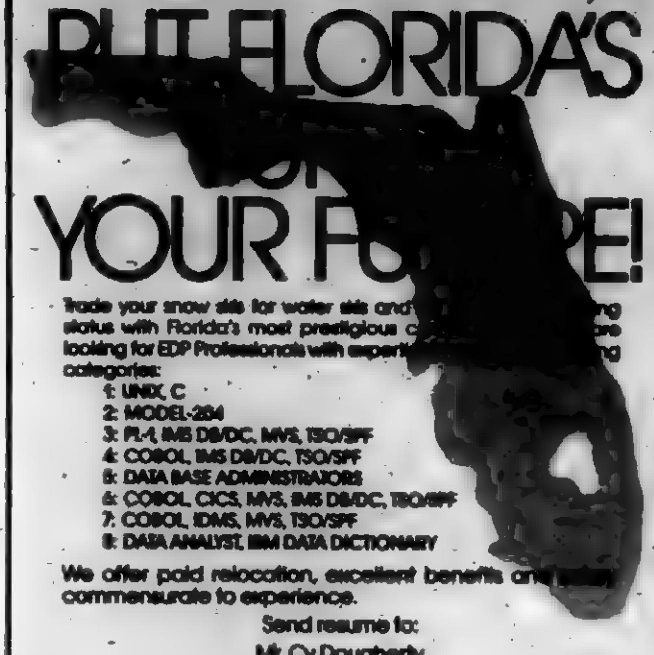

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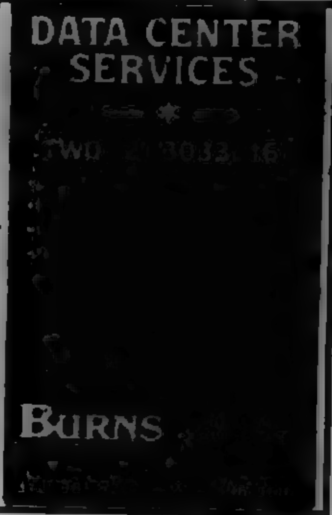

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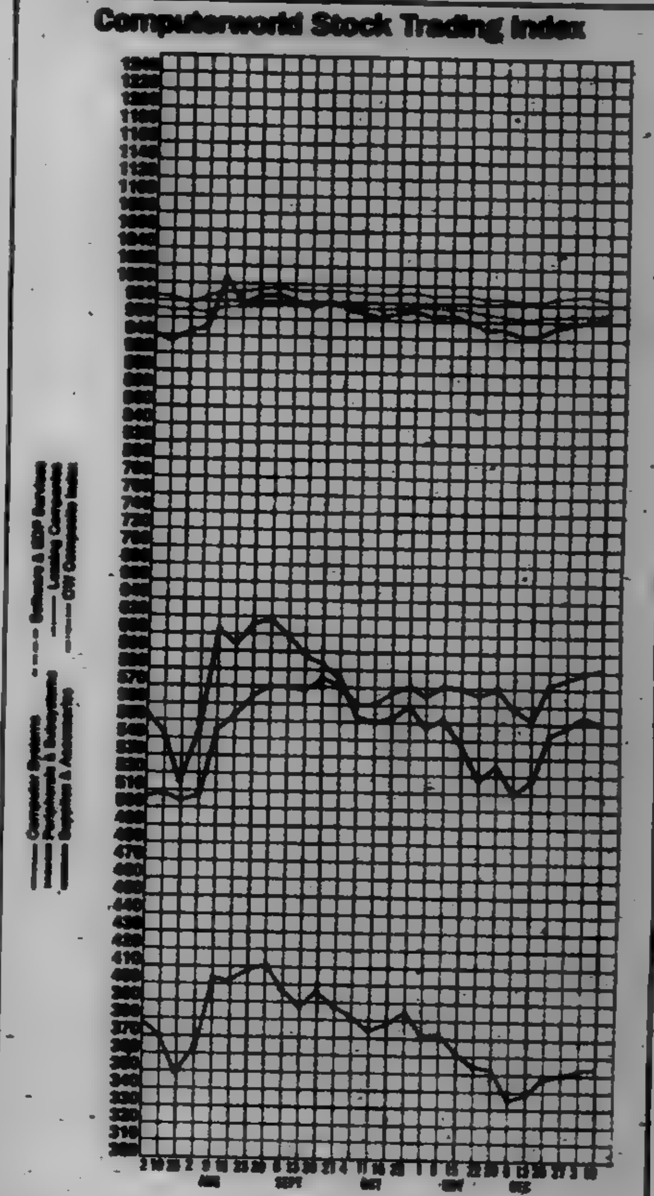

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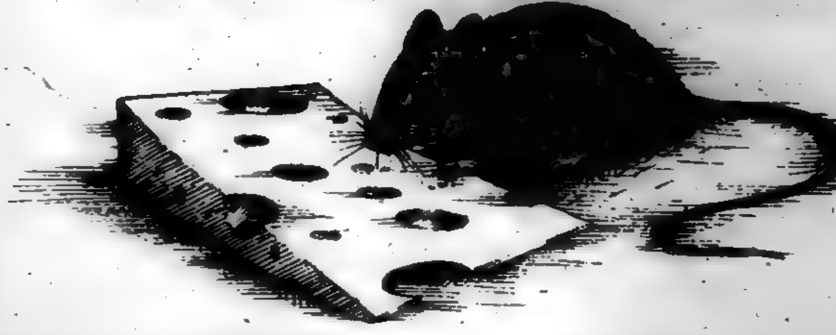

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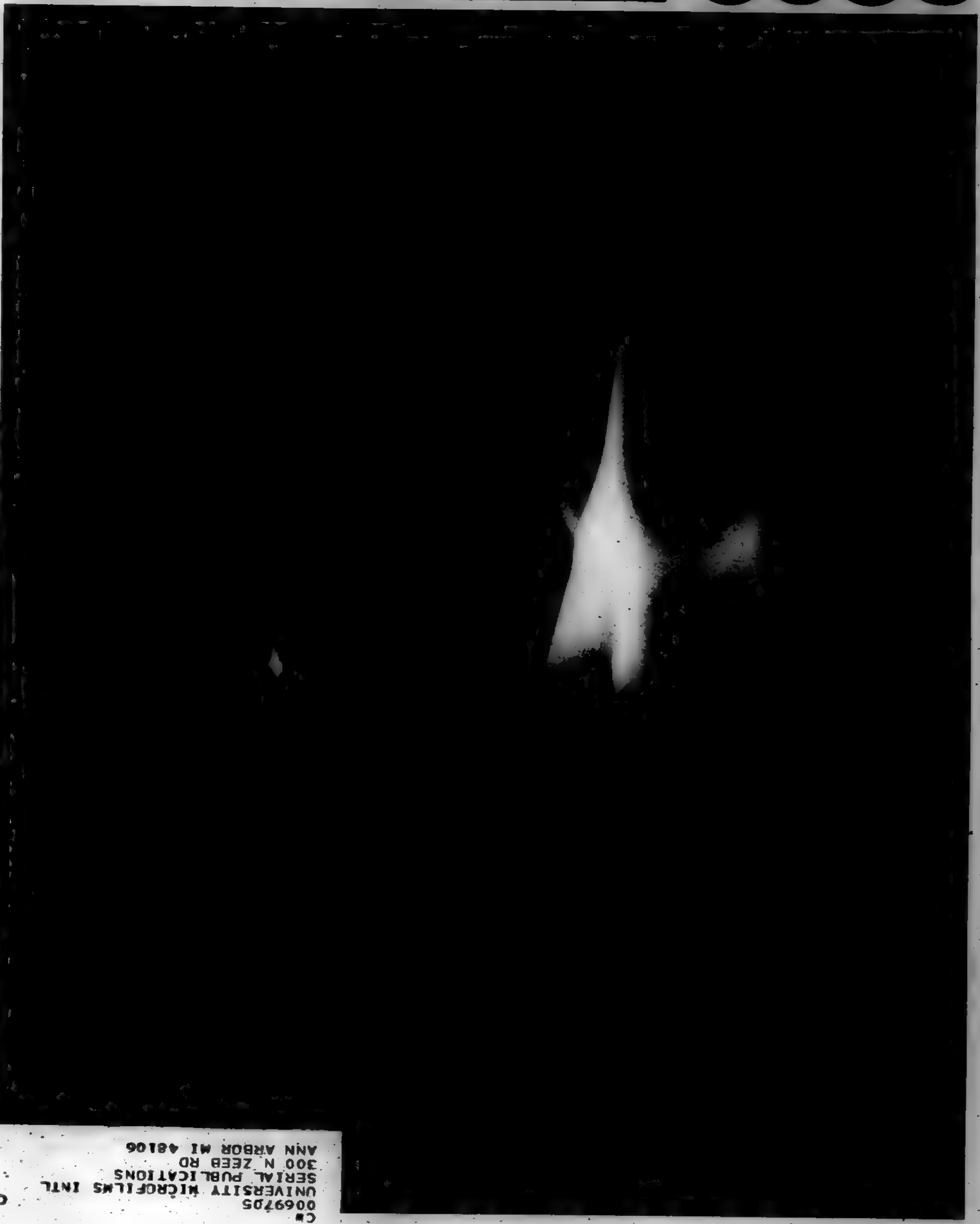

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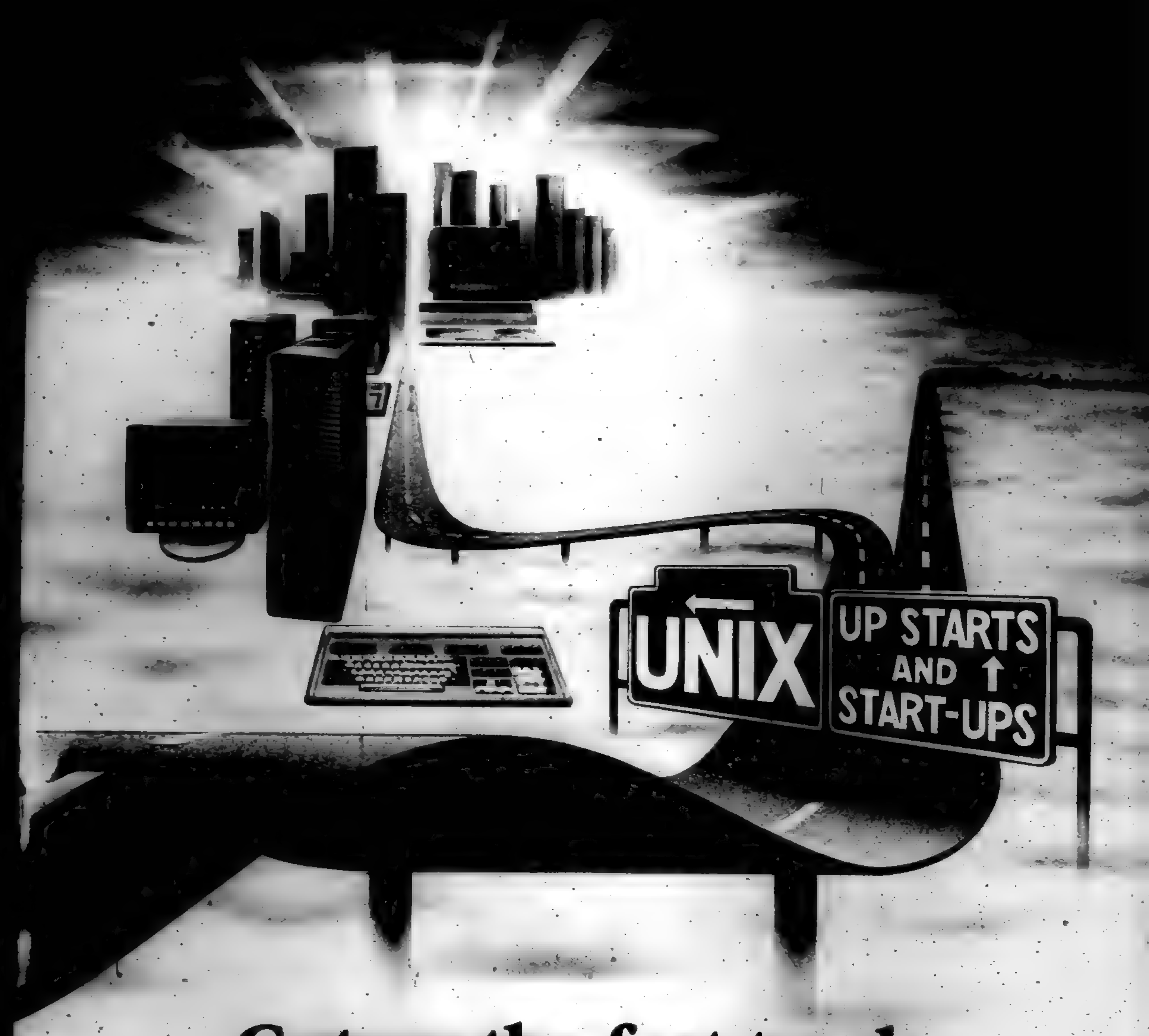

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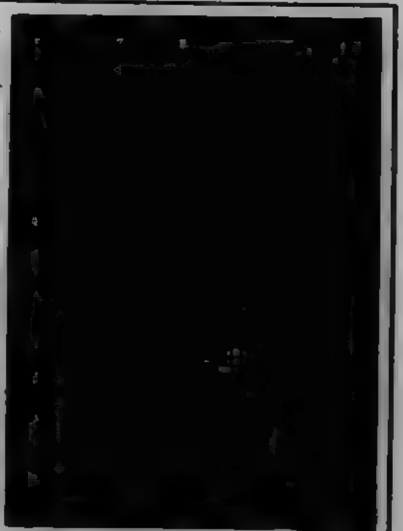

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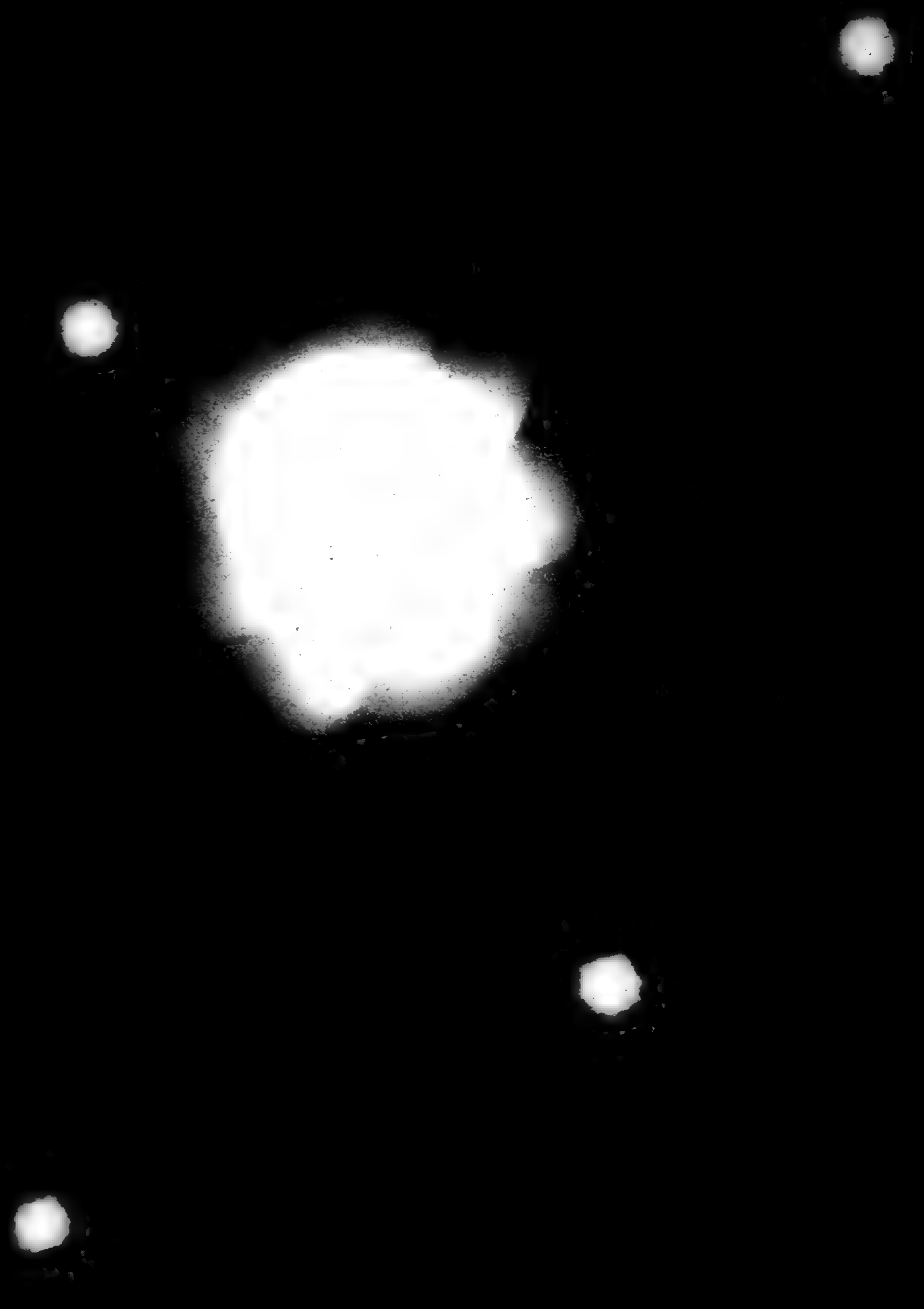

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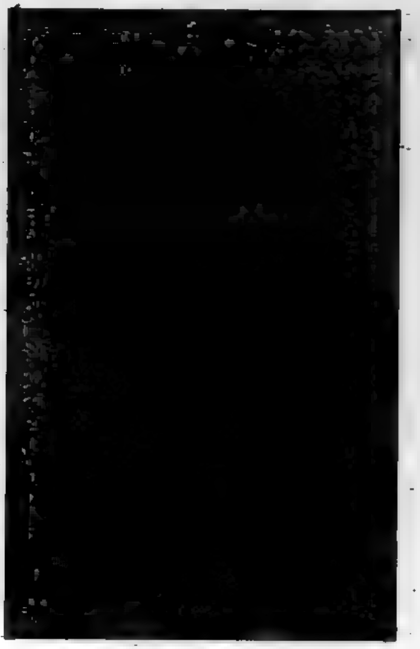

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Editorial

A Clear Focus

Not since the personal computer first swept into organizations has a subject generated such controversy and debate. Will Unix become a standard operating system or won't it? Is it really the long-awaited solution for system portability or will a lack of commercial software make it unfeasible for businesses? And, above all, how is IBM going to react?

Unix has been simmering in the technology pot for some time; now that it has come to a boil, no one is sure whether to turn the heat up or off. A unanimous rally to Unix is probably not going to occur in management information systems (MIS) or end-user installations, at least not until more of the pieces are in place. Nevertheless, the popularity and potential of Unix continue to increase on a dramatic scale. Interest in Unix has escalated, and the time is fast approaching to see if that interest turns into utilization.

In the interim, MIS planners once again face a future without clear-cut answers. At the time when planners are charged with spreading computing power throughout their organizations, the technology is becoming more puzzling in terms of what direction it will take and when and where the products will arrive.

MIS managers are finding it difficult to cope with the technologies, products, directions and organizational changes and they are looking for answers from many areas. Information overload has become a real problem.

Computerworld Focus intends to ease information overload by providing you with tightly integrated packages of information about topics that are important to you. Throughout the year we are going to put the hottest issues of the day in focus for you. We won't give you bulk raw data; rather, we'll provide you with tightly written analyses. We hope to give you a perspective that will raise the right questions and, if it doesn't provide all the answers, will at least guide your thinking along the right paths. Throughout this year we will be devoting entire issues to topics that you deal with daily, such as office automation, microcomputer software, business graphics, application software, manufacturing, networking, systems software and microcomputer hardware. We will be analyzing and assessing products, technologies, issues and future directions to help you sort out the best course for you and your organization.

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Best of luck in the new year and stay in touch.

Insider

Unix Perspectives

By Tom Willmott

Throughout the course of their research subscriptions, clients call International Data Corp. (IDC) to request information on various subjects ranging from microcomputer software to the installed base of Control Data Corp. Cyber series processors, from local-area networks to programmer productivity. Each year, literally thousands of questions are asked and successfully answered. Nevertheless, in 1981 just four of these questions were related to the Unix operating system. In 1982, the number was nine. In 1983, the total jumped to 40. In 1984, more than 120 requests came in for information on Unix, triple the previous year.

Six issues seem to recur among these questions. Each is explored briefly in the following paragraphs.

- The central focus of the year-long surge in Unix' popularity as a discussion topic has been "portability." Unix is designed in such a way that only 30% or 40% of the operating system is hardware dependent. Unlike other operating systems, Unix may be moved from one vendor's machine to another or from micro to mini to mainframe, in most cases by changing less than half of the program.

Make no mistake, changing half an operating system is a nontrivial problem. But if "porting" Unix from machine to machine is at least imaginable, moving IBM MVS to a Honeywell, Inc. architecture or Data General Corp.'s AOS to a Digital Equipment Corp. VAX is unthinkable. Proprietary operating systems have always been inflexibly intertwined with the vendor's proprietary hardware designs.

Some proponents argue that Unix is the ultimate solution for end users facing two serious problems: multivendor hardware environments and applications backlogs. They reason that Unix' portability will eventually solve the problems of having different kinds of computers running the same applications software with a minimum of retrofitting. They also reason that the plethora of utility software available to programmers in a Unix environment will speed applications development.

- In some cases, Unix is already an unqualified success. DP shops across the U.S. and Canada have leveraged Unix strengths into increased productivity. We have seen the development of sophisticated communication gateway programs including menu-driven user interfaces with Unix. This development took place on a DEC VAX 750 in a matter of two months rather than the 10 or 12 months it might have taken using other operating system tools and methodologies.

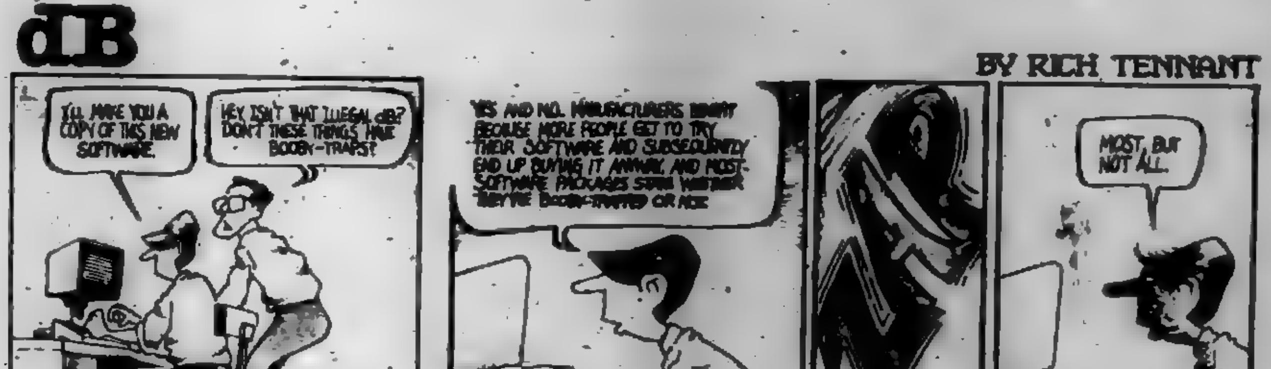
Although we will not contend that Unix is destined to become the operating system standard of the late 1980s, pragmatic supporters will argue that a Unix programming environment decreases development time for particular kinds of applications, especially those which are unique to an organization or for which sections of code may already exist in a Unix library. The fact that Unix also has the potential to be used across different types of equipment makes it attractive to systems people who need a measure of flexibility. The question is not whether Unix will inherit the earth, but whether Unix can be helpful in my data center today.

- For information systems departments searching for an off-the-shelf solution to the applications backlog, the reality of the marketplace has been and continues to be that independent packaged software for the Unix operating system is scarce. Although the trade magazines write each month of an avalanche of business applications packages just ahead, the practical matter is that VM, DOS/VSE, MVS, VMS, AOS, Primos or any other operating system shop will have a choice of a dozen or more accounting or inventory packages. The Unix enthusiast is lucky to select from one or two. Because mainline business data centers have rarely run Unix, financially successful software houses have rarely written for it.

- In the next nine to 18 months, decision-support applications (micro-mini-based) and communications gateways are the most likely applications to be developed by Unix independents. In most large organizations, office automation applications are plagued by multiple vendors. Second-generation integrated office software is already being written in the C language for Unix. Furthermore, AT&T is clearly positioning itself for decision support and gateway communications processing. With AT&T as its primary vendor champion and inherent strength in the development of unique systems, Unix looks like a good bet outside the data center for end-user computing. And with evidence that Amdahl Corp.'s version of Unix supports a powerful time-sharing environment, the data center may not be off limits either.

- Unix has its roots in the development lab and the university computer room — both places where the favorite

(Continued on Page 67)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Q&A

Palantir Corp. of Santa Clara, Calif., is a small Silicon Valley startup company currently developing a compound document processor that extracts both image and text under certain formats and transfers it to a host system. To create the technology, Palantir had to design custom microchips for the software development. The company turned to a Unix-based system to complete the task. Mike Florio, vice-president of marketing, was director and president of the Unix /usr/ group for the past four years. Computerworld Focus *talked to Florio about the role of Unix in the development and work environments at Palantir.*

How does Unix fit into the development of the processor?

The proliferation of tools available with Unix is invaluable. We use Unix tools under the C programming language, but we also use all the other tools available in the Unix system as a way to manage a major software development project.

In addition, some excellent tools for technical development, which run under Unix and are available on a lot of Unix workstations, are coming out of the universities and research areas and are being used for chip design.

Was portability a key issue?

Yes. The ability to move data back and forth between special-purpose machines in a consistent way was instrumental in our being able to get this project done.

What version of Unix are you using?

We're using several versions, including Berkeley 4.2, System V and System III. We've got an IBM Personal Computer running Xenix and an Onyx running System III. We have access to an Arete running System V, and we've got a dozen Sun Microsystems running Berkeley 4.2.

What led you toward Unix?

It was driven from in house. Some in-house people who had had experience with Unix in prior organizations heavily influenced the choice. They insisted that we use it.

You've talked about Unix in the development area. Have you tried to port it into commercial or end-user environments at all?

We are also trying to run a business here, so everybody in the company has at least one terminal here and also at home. Even our secretaries, receptionists and office managers have one at home, and they all use Unix. We had all heard that you can't teach a secretary to use *vi* and *nroff* [Unix features] to create documents. That's malarkey. After about one or two tries on a simple editor, most people figure out how to use *nroff* and insist on using it.

So you've made it user-friendly for the office environment?

We haven't changed a thing. It's just that our people were more willing to jump in and play around with it and find out it wasn't the ogre lots of people thought it was. The first time I showed our office manager *nroff* and *vi*, she said "Come on, you can't really expect me to use that?" Now she's a pro, and it's just been a couple of months.

All of our communications on the terminals, our memo traffic, are on the system using Unix. I don't even know how to use the internal switchboard operation on the phone here. We just mail things to one another — all through Unix.

Was it a problem getting support for Unix?

It would be a problem if we hadn't had the expertise in-house. We're made up of a bunch of computer scientists and physicists, people out of Cal Tech and Stanford. If we were a small company in a small location it would be tough to learn it.

Based on your knowledge of what Unix can do, does it have the potential to spread to commercial environments?

Yes. It's got functions and capabilities that are essential for productivity in those environments. Those capabilities significantly outweigh the perceived drawbacks.

I have a theory. Industry consultants make their money by selling information services to people who don't know what's going on. I think there's been a concerted effort on the part of a lot of industry consultants to inject a lot of confusion in the marketplace about Unix. Then someone will go out and hire them to come in and unconfuse them.

Unix is a partionalist process management, multiuser, multitasking operating system. If you want to run transparently in a network environment, your need those features. If you want windows and all those things, that is all built into Unix. It's always been there.

The problem is that it's much easier to write an application like the blister-pack applications sold in computer stores for single-thread, single-user operating systems. In most cases, those applications violate all the rules of systems programming we've learned over the last 15 years. Consequently, those applications don't port easily to Unix because Unix enforces all those rules.

If people were conscious of the true virtues of Unix would there be a lot more application software out there?

(Continued on Page 63)

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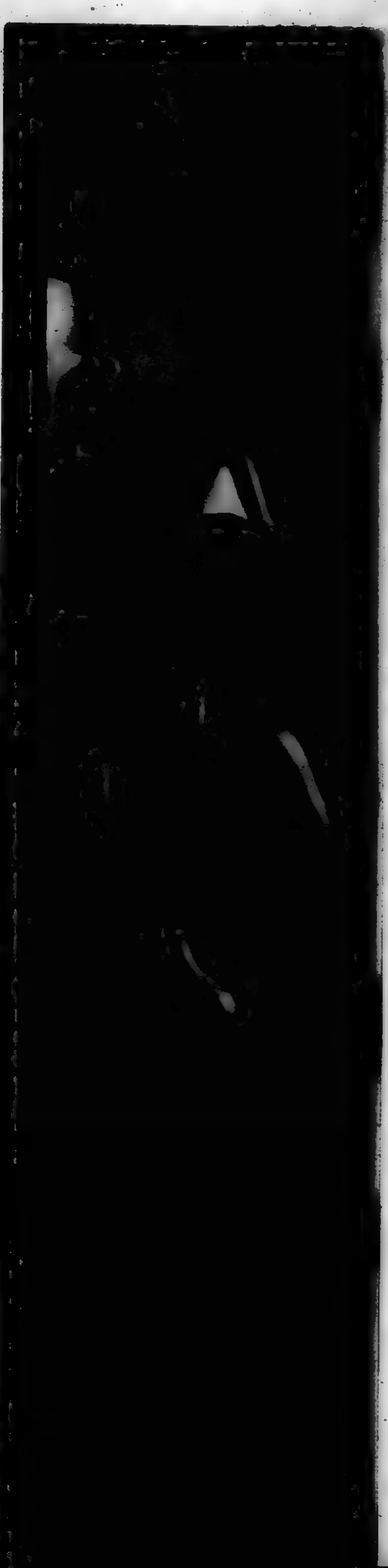

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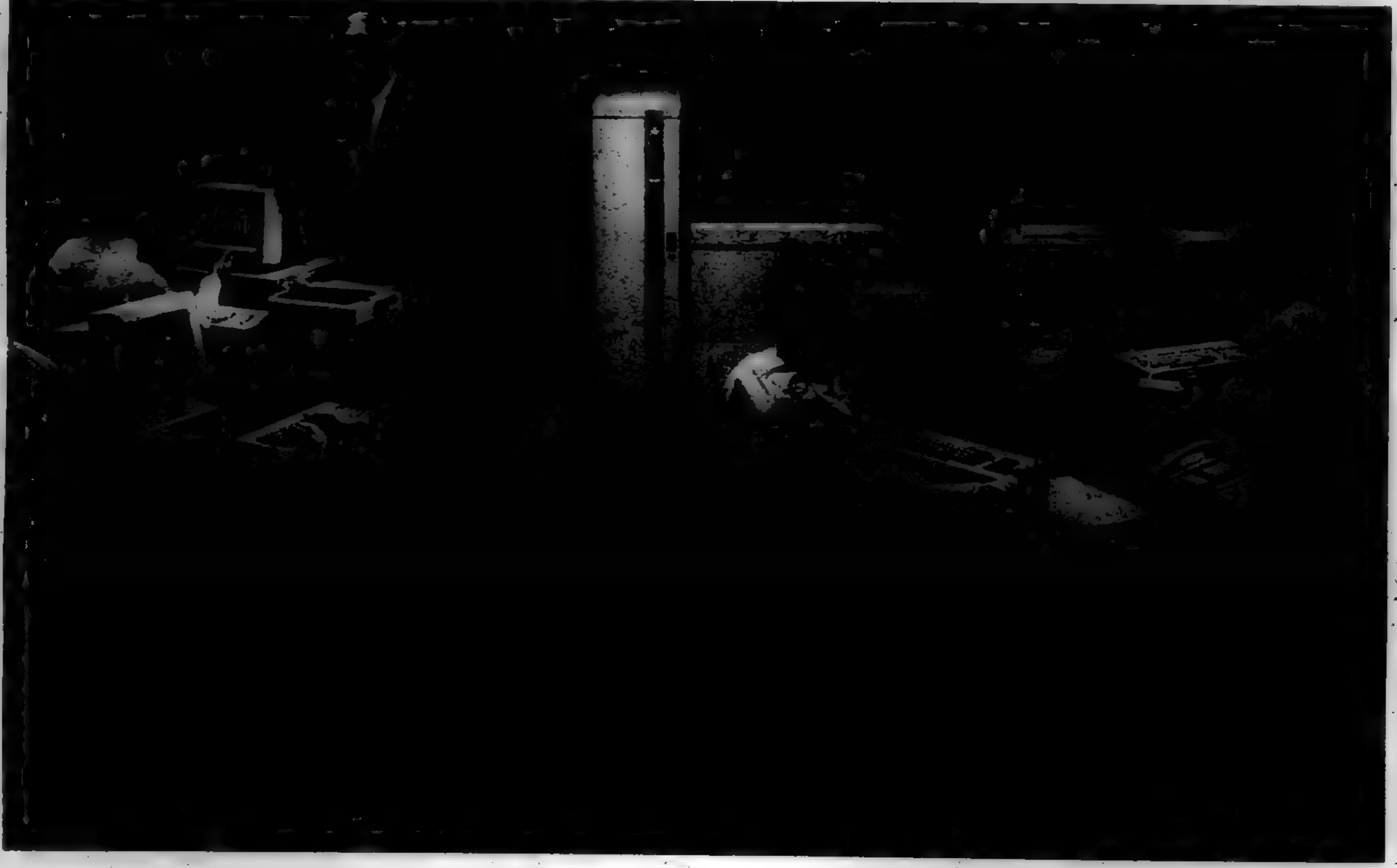

SPERRY

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In the News

Unix For Hire

For those fortunate enough to have Unix experience, the job market for the past two years has been insatiable — a golden egg time. As interest in the Bell Laboratories operating system has soared, the call for Unix expertise has sounded loudly and clearly. Scientific Placement, Inc. (SPI), a 20-year-old employment service for engineering and technical professionals in Houston, Texas, heard the call and has spent two years specializing in Unix placements.

Although the Unix job market has flattened a bit, according to Julia Rich, an associate at SPI, it is still in high gear. Both vendors and users are maintaining a steady need for Unix types. In certain areas of the country, however, the Unix market is saturated, verging on overcrowding.

According to Rich, the beginnings of a shakeout in the computer industry — for example, the crashing of such companies as Storage Technology Corp. and serious problems at others — have caused massive layoffs and a flooding of the market in certain areas. The effects of too many Unix folks are beginning to be felt in the more desirable and livable areas — Silicon Valley; Boston's 128 belt; Austin, Texas; Colorado; the Research Triangle in North Carolina and the Pacific Northwest. Salaries and job opportunities are beginning to reflect that impact: "On the other hand, there is tremendous demand in the Midwest," Rich said, "but people don't want to be cold."

Even with the unevenness of the geographic market, Rich maintained that Unix experience continues to be a marketable commodity. Such large vendors as Gould, Inc., Tandy Corp. and Texas Instruments, Inc. are currently seeking Unix professionals, and giants like IBM, Digital Equipment Corp., Hewlett-Packard Co. and others are constantly seeking Unix help in some part of the company.

Rich pointed out that although the smaller, start-up vendors were seeking basic "porters" for the early stages of Unix development, the larger companies with lengthier commitments to the operating system were now hiring Unix sales and marketing people. "The giants are looking for those with user interface and applications skills, but the others haven't got that far yet," Rich said. "They're still trying to get a product to market."

In the user community, "Help Wanted" signs attempting to lure those with Unix expertise are appearing at a growing number of companies — large, small and mid-size. Rich admitted that her view is "distorted" because she is so close to the market, but said she believes the Unix vacuum tends to scoop up personnel in waves. Currently, she stated, systems programmers and administrators are in demand, and countless requests come in for those with knowledge of both Unix System V and 4.2 BSD.

Ironically, many DP departments don't specify which version of the operating system they have committed to, Rich said, and she has had to learn from experience to ask. "I've set up interviews between people who knew System V and a company that was using System III. And it makes a difference."

Though cautiously optimistic, Rich admitted a shakeout was already under way in the Unix industry. As companies and products are sorted out, as AT&T "cleans up" System V and as moves are made toward standardization, the industry could change significantly.

"The market is maturing," Rich explained. "For the gurus, the market is shrinking. But at the other end — the people doing interfaces, applications, sales, marketing and support — the job demand will mature."

Unix vs. MS-DOS

Despite its overwhelming hold on the current personal computer market, the MS-DOS operating system is destined to be bypassed by Unix in 1990. According to a report in "Software Watch," an International Data Corp. (IDC) newsletter, "In 1990, the combined shipments of licensed and unlicensed Unix PCs will overtake MS-DOS PC shipments."

Among the causes for the role reversal is the appeal of Unix' multitasking, multiuser capabilities. Though the report predicted that MS-DOS "will be tweaked into a multitasking product" and extend its life in the marketplace, its capabilities will be limited to the point that it will serve only a low-end need for such systems. "More powerful multitasking PCs will require different operating systems, most likely Unix and Unix-like products," IDC pointed out.

In that regard, the report predicted that MS-DOS shipments will peak in 1986; the Unix personal computer base will continue to grow slowly until 1985 when unlicensed Unix PCs (referring to IBM and IBM-compatible versions of Unix) will start to take off. IBM, it pointed out, will most likely make a serious commitment to a version of Unix, but not one it will have to license from AT&T. With this in mind, the report predicted that shipments of unlicensed Unix personal computers will overtake shipments of licensed Unix personal computers by yearend 1986 and persist throughout the rest of the decade. "It's arguable that an IBM version of Unix will bury AT&T, which has comparatively little experience in either the personal computer market, or indeed, competitive markets in general," the report said.

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In the News

AT&T will nevertheless be a "major presence" by virtue of its experience in communications. Although Unix penetration of PC shipments will remain lower than declining MS-DOS penetration through the 1980s, strong overall Unix PC shipment growth will continue beyond 1990. "By 1986, 20% of business PC shipments will be Unix PCs and over half of those will be unlicensed versions of Unix," the report said. "By 1990, Unix PCs will account for 28% of worldwide business PC shipments and 56% of those will be of the unlicensed Unix variety."

Speaking of Standards

While the vendors duke it out in an attempt to create a de facto Unix standard, two groups have quietly been making headway toward an officially sanctioned standard for the operating system.

At the fall Comdex gathering in Las Vegas recently, the IEEE-Unix standards committee (officially named the T1003 Working Group on Operating System Kernel [Unix]) made serious inroads toward that goal.

Jim Isaak, director of product planning for Charles River Data Systems, Inc. and chairperson of the IEEE committee, said the meeting produced an agreement between /usr/ group, the four-year-old Unix users organization, and the IEEE committee that a single standard is essential and the IEEE committee should be the conduit for that search.

The two organizations also agreed to promote as a standards document the specifications set out by /usr/ group. Isaak pointed out that agreement on these points was based on pragmatism on both sides. "At this point, the IEEE is viewed as the most effective way to a widespread, highly visible standard," he said. "The /usr/ group is going to put down its effort and join us."

With its established channels for "grinding out" standards, the IEEE simply gives the Unix standards push a strong headstart. In addition, Isaak stated, an IEEE standard will immediately gain American National Standards Institute (Ansi) approval and, more than likely, international approval as a standard.

"When we talk about an IEEE or Ansi standard, we're not talking about just one community; it affects the entire U.S. and the ISO can pick it up for international standards," Isaak declared.

The vendors, of course, are watching carefully, a fact that has not eluded Isaak, who said, "We don't want to standardize a company's product. We want a standard that is industrywide." Though the model for the /usr/ group document is Unix System III, the segments of the operating system they are attempting to standardize are generally outside the areas of differentation between various flavors of Unix, he said. The IEEE document, which will focus on the systems interface and subroutines level, has in fact received solid support from AT&T.

"AT&T has been very active in the /usr/ group effort and has provided good feedback as to how this will relate to the System V environment," he added. "Basically, we'll see a document that is compatible with System V as well as System III. The areas of difference between those two systems tend to be in the extensions, and most of those are outside the scope of the standards."

One major Unix version, 4.2 BSD, has not had much input to date because of a lack of university involvement, which is where 4.2 has found a broad base of support. Isaak expects that to change when the standards document reaches the balloting stage.

"We're dealing with a nucleus, a very basic core of capabilities, and I don't anticipate problems with 4.2, or III or V or Xenix or whatever," he said. "Each of these versions has taken the basic nucleus and extended it in its own direction. But they are all working off the same basic elements, and that's what we tried to put into the standards."

In an effort to speed up the procedure, the committee has decided to follow what it calls a "trial use" route, which allows the document to be put into the standards distribution channel before resolving every final issue. The committee is also forming a balloting group to help prepare the final version of the document for balloting. Isaak predicted that if all goes well, the systems interface and subroutine portions of the standard may be adopted by October and possibly even by July.

The IEEE committee is meeting at Uniforum in Dallas, Jan. 21-22; anyone interested in joining the balloting committee should contact Isaak there or at Charles River Data Systems, 983 Concord St., Framingham, Mass. 01701. A copy of the current standards document is available for $30 from /usr/ group, Suite 200, 4665 Old Ironside Drive, Santa Clara, Calif. 95050.

Workstation Overload

Like the rush-hour subway train, the Unix-based technical workstation market is crowded to overflowing. The leaders, Apollo Computers, Inc. and Sun Microsystems, Inc., are being jostled by heavyweights like IBM, AT&T, Digital Equipment Corp. and Hewlett-Packard Co. and a host of aggressive start-up firms are pushing in the door as well.

The growing popularity of Unix has helped spur the market along and has actually helped change the face of the market considerably. According to

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In the News

Rebecca Hurst of Yates Ventures, Inc., a Unix consulting firm in Palo Alto, Calif., dedicated workstations, such as computer-aided design and manufacturing design machines, are being replaced by general-purpose, multifunction machines, much like what has occurred in the dedicated word processor world. Because of Unix' portability and programming strengths, it has become the operating system of choice on the new wave of workstations and has helped create a clamor for third-party applications software packages.

"The requirement for third-party software is immense," Hurst pointed out. "Access to third-party applications is a determining factor for a vendor's success in this market."

But while software developers are finding a bullish market, the hardware companies may have a tougher time of it. Larger firms such as Sperry Corp., Honeywell, Inc. and others introducing Unix-based workstations will find there is still room in the market "if you go about it in the right way," Hurst said. Rather than jumping into the general multifunction workstation fray, "which people are becoming very tired of," a vendor should pick a specialized niche or vertical market to target, she added.

Hurst gave as an example Daisy Systems Corp., a small Calif. firm that has become a leader in computer-aided engineering (CAE) workstations. "From the beginning, Daisy developed its own software and integrated it with its system specifically for CAE," Hurst said. "So there is really nothing on the market like them, and they'll probably become a dominant force in that market."

For Apollo and Sun Microsystems, the market is tightening, she said. "They will find themselves up against companies — like IBM, AT&T, DEC and HP — with long-standing reputations, larger installed customer bases and the ability to resort to cut-throat pricing," explained Hurst. And the front-runners, by not specifying a market niche, will find competing on that level more and more difficult. "Software companies can't keep supporting people on that level," she stated. "The big thing these days is differentiation. If you can become an expert in a couple of areas and address a vertical market, you are in a nice, strong position."

For the smaller companies, the outlook is not promising. "With Sun, Apollo and the big four in the market, it is becoming more difficult for smaller companies that are already offering or are planning to introduce workstations," Hurst said. "The market window is firmly closed for small firms entering with general-purpose workstations."

Dallas to Host Uniforum

Uniforum '85, The Worlds of Unix, will be held Jan. 21-25 at the Dallas Infomart. Nearly 60 tutorial and conference sessions are scheduled during the five-day period. Plenary speakers are Robert L. Carberry, vice-president, systems architecture and technology, IBM (Jan. 22); R.L. Martin, executive director, computer systems software, AT&T Bell Laboratories (Jan. 23); William N. Joy, vice-president, research and development, Sun Microsystems, Inc. (Jan. 24); and Robert Haley, vice-president, AT&T Information Systems (Jan. 25).

The 40 conference sessions are divided into four tracks of Unix: Office Systems, Personal Computers, Engineering/Programming and Market Trends. Information about free workshops will be posted in the registration area.

On the exhibitor side of the conference, 200 major vendors will set up 850 display booths.

"A comprehensive approach is what Uniforum is all about," Mark Weber, the show coordinator, said. "Everyone will be able to find a Unix product or service of interest on the exhibit floor. And with the variety of conference topics we're offering, everyone will be able to learn something, too."

More information is available from Uniforum, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

Chestnuts and Rumors

Reports of a possible acquisition of all or part of Digital Research, Inc. (DRI) by AT&T are eliciting varied comments. A source at AT&T responded that the possibility of acquiring DRI is an "old chestnut. We're involved in lots of joint ventures, but we're not buying anybody. You ought to look at our cash flow sometime."

On the other hand, Tom Billadeau of the Gartner Group said, "AT&T is certainly shopping. They've definitely been looking around [but] DRI doesn't sound like an appetizing investment." Amy Wohl, of Amy Wohl Associates, noted that at a joint press conference last spring, representatives of AT&T and DRI seemed very friendly and that such a move wouldn't surprise her at all.

Stan McKee, DRI's chief financial officer, said the rumor of acquisition is "totally false. I don't know where the rumor started. There has been no discussion with AT&T. We've been working with them on a Unix library since last March at Uniforum, but that's it."

McKee was told a list was "circulating" of companies that AT&T was interested in acquiring and DRI was on it, but added that "I haven't seen a list and I don't know anybody who has."

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In Brief

BOSTON — A report evaluating the office product offerings of IBM, Wang Laboratories, Inc., Digital Equipment Corp., Datapoint Corp., Hewlett-Packard Co. and Data General Corp. is available from the Seybold Consulting Group. "The Guide to Integrated Office Systems," was designed to help the consumer select an appropriate office system and to assist vendors in their product development.

The report costs $400 and discounts are available for additional copies from Seybold Publications, Inc., Suite 612, 148 State St., Boston, Mass. 02109.

ENGLEWOOD CLIFFS, N.J. — "Unix For People," a hands-on guide to Unix, was published by Prentice-Hall, Inc. The 533-page hard-cover book was designed to introduce programming students and business people to Unix while at the terminal.

The book, authored by three faculty members at the University of California, Berkeley's School of Education, costs $29.95 from Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

RESTON, Va. — Longman Crown, Inc. introduced a series of tutorials on computer-related subjects for executives.

The "Executive Briefings," cover such topics as Unix, Ada, artificial intelligence, data communications, lasers and advanced microprocessors. Topics to be published in 1985 will include the C programming language. Briefings run from 32 pages to 64 pages and each includes summaries, case studies and lists of resources and vendors. Each briefing costs $24.95, the vendor said. More information is available from Longman Crown, Inc., 11800 Sunrise Valley Drive, Reston, Va. 22091.

EDISON, N.J. — Unipress Software, Inc. will hold a two-day course on Unix for marketing professionals Jan. 20-21 at the Loews Anatole in Dallas. Entitled "Unix for Marketeers," the course is designed to prepare marketing professionals with information necessary to understand and sell Unix-related hardware and software.

The course fee is $495. For more information, contact Joyce Bielen, Unipress Software, Inc., 2025 Lincoln Highway, Edison, N.J. 08817.

SAN FRANCISCO — IBM will market a version of Horizon Software System, Inc.'s integrated word processing and spreadsheet software for its Personal Computers running the IBM Personal Computer Interactive Executive (PC/IX) Operating System.

IBM IX Integrated Word/Math runs on the IBM PC XT, PC XT/370, PC AT and Personal Computers with the IBM Personal Computer Expansion Unit. Priced at $600, it will reportedly be available in late January from IBM's National Accounts and National Marketing Divisions.

Calendar

Jan. 17-18, San Diego — **Developing A Unix Market Strategy.** Also, Feb. 14-15, Miami. Contact: Computer Technology Group, Telemedia, Inc., 310 S. Michigan Ave., Chicago, Ill. 60604.

Jan. 22-25, Anaheim, Calif. — **Programming in C: A Hands-On Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45405, Los Angeles, Calif. 90045.

Jan. 22-25, Baltimore — **Unix: A Hands-On Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45405, Los Angeles, Calif. 90045.

Jan. 29-Feb. 1, Boston — **How To Manage Software Projects.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, P.O. Box 45405, Los Angeles, Calif. 90045.

Feb. 4-6, Atlanta — **1985 Office Automation Conference.** Contact: OAC '85, American Federation of Information Processing Societies, Inc., 1899 Preston White Drive, Reston, Va. 22091.

Feb. 4-6, Atlanta — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Feb. 5-6, New York — **The Sovereign Superstate of IBM.** Also, Feb. 12-13, Palo Alto, Calif. Contact: Robert Stearn, The Yankee Group, 89 Broad St., 14th Floor, Boston, Mass. 02110.

Feb. 5-7, Monterey, Calif. — **The Sixth Annual Conference on Automation Technology for Management and Productivity Advancements Through Distributed CAD/CAM and Engineering Data Handling.** Contact: Peter C.C. Wang or D. Tegtmeier, Automation Technology Institute, Inc., Box 242, Pebble Beach, Calif. 93953.

Feb. 6-8, Dallas — **Personal Computers and the Mainframe Connection.** Also, Feb. 13-14, Boston. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

September 18-20, New York — **Unix Expo.** Contact: Robert Birkfeld or Don Berey, National Exposition Co., Inc., 14 W. 40th St., New York, N.Y. 10018.

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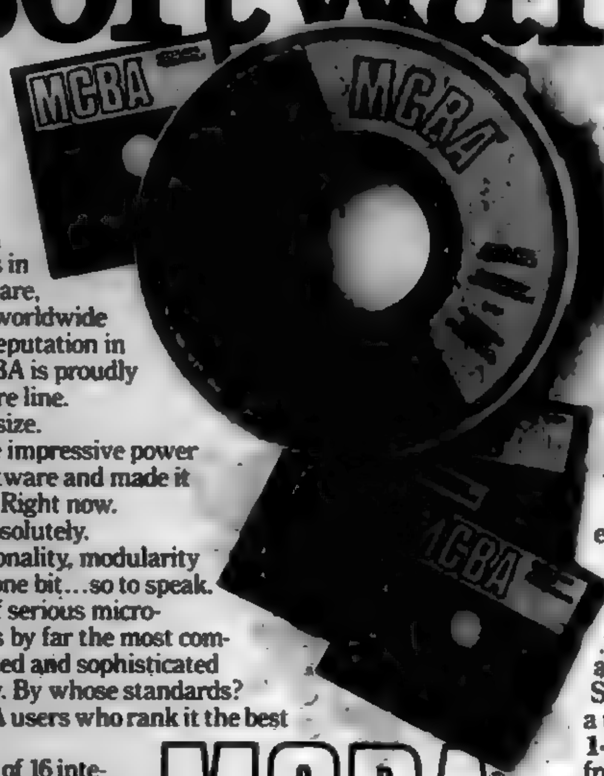

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To Market, To Market

With so much hoopla going on in the marketplace, shopping for a Unix system can be overwhelming. If you plan carefully and assess your needs before you begin looking, that task can be made a lot easier.

By Ray A. Jones

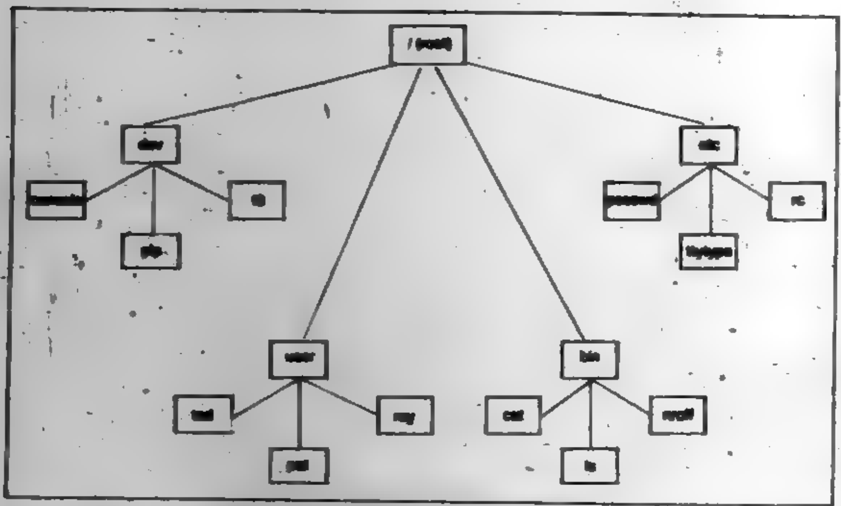


Figure 1. Typical Unix File System

- Storage Requirements: A typical Unix operating system will consume a very large amount of disk space — from 5M bytes to 12M bytes (depending upon the vendor) before you enter any of your applications programs or data.
- Documentation: The documentation currently available is not very good. It is better than it was just a year ago, and it will surely get better as time goes on, but for now it's awful.
- High Cost: This is more of a perceived problem than a real one. A four-user system will cost about $15,000, which seems high compared with the cost of a personal computer. Spread that cost over the number of users and the ability to share both peripherals and files, and the cost argument goes away.

What do you want your computer system to do? Whatever you want it to do, choose the software first. The software selection will influence the hardware requirements a great deal, as we will see later.

Office automation refers to accounting, word processing, text processing (there is a difference), electronic mail and financial modeling. Choose software that fits your business, not software that requires you to change the way your business runs just to fit the software.

Most of the accounting software that has been available up to now was written in Cobol, Dibol, Basic, and Fortran. These are mostly canned packages that are difficult if not impossible to change to fit the needs of a particular business. If you find a package that fits exactly, great. If not, look for a fully integrated accounting package based upon a rational data base that can be easily modified to your specifications.

If software development is your bag, Unix is the place to be. Choose the tools, languages and project control utilities from a long list of those available.

There are a number of sources of information on the software that runs in the Unix environment. Many manufacturers produce directories of the software that runs on their machines. However, in order to find software prior to choosing a machine, you must consult one of the independently published directories or a directory from one of the Unix user groups.

Now that you have determined what the computer is to be used for and have selected the software, it is time to narrow the choices of hardware. We will generate a series of specification sheets, leading to a final specification sheet that will describe the system you need.

System Specifications

Serial I/O Channels: We will start with the requirement for number of I/O channels. How many people, sorted according to the following categories of use, need access to the system?

Constantly _____
Sometimes _____
Seldom _____

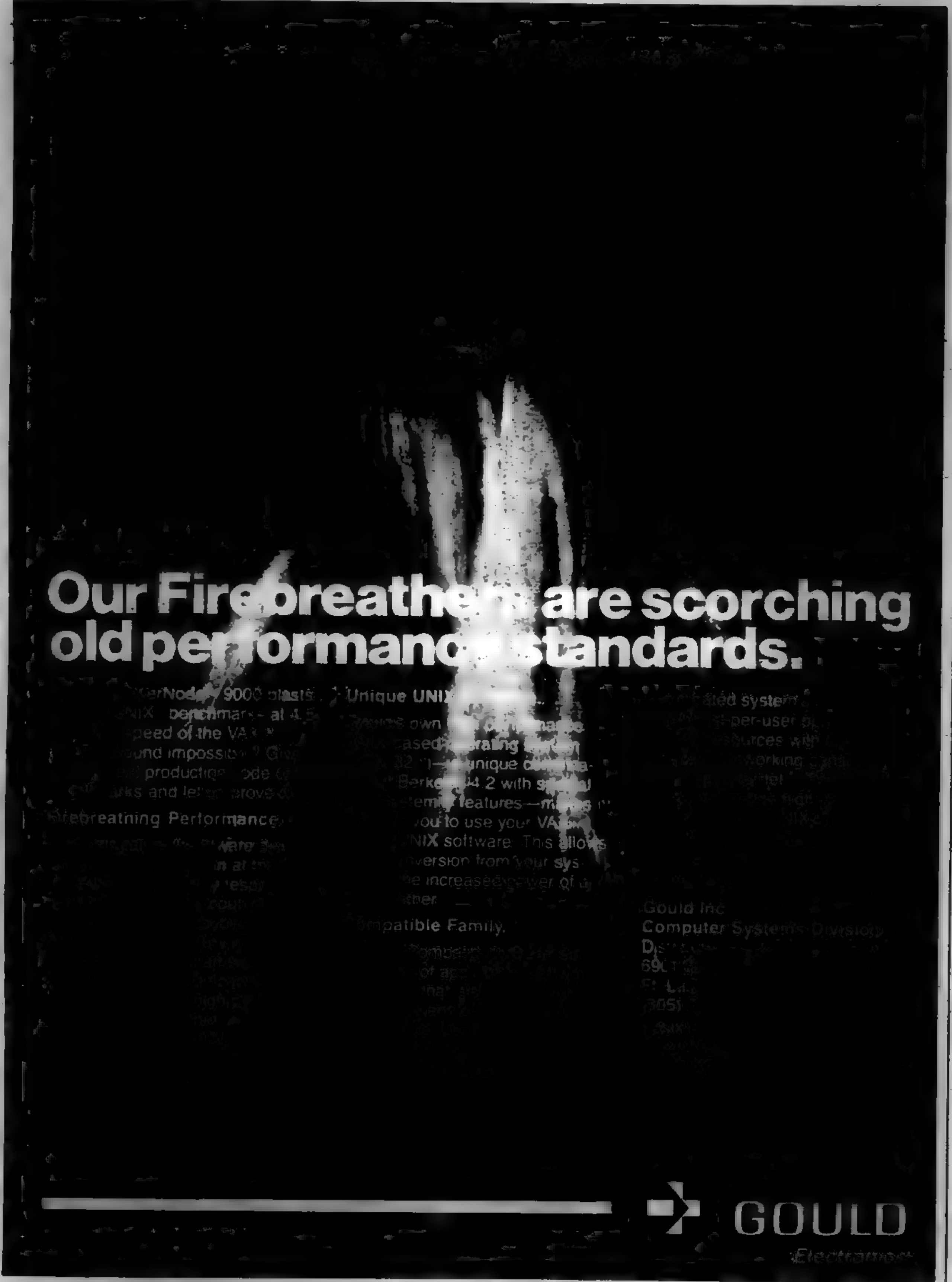
Net number of users _____

Obviously, you will need a port for each constant user, but the "sometimes" and "seldom" user numbers are judgment calls. The "Net number of users" is the number of terminals you will need, not necessarily what the manufacturer refers to as "users." Transfer this number to the following chart.

I/O Port Requirements

	Serial	Parallel
Hardcopy	_____	_____
Printer	_____	_____
Plotter	_____	_____
Typesetter	_____	_____
Terminal/users	_____	
Modem	_____	
Other devices	_____	_____
Total	_____	_____

Insert the numbers for each of the devices you need on your system. Note that hard-copy devices can be either serial or parallel. Serial ports (RS-232) are standard on all systems, and parallel ports are generally extra-cost options. It is recom-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mended that you reserve at least one serial port for a modem because you will need one sooner or later.

The total for serial devices is equivalent to the "number of users" that manufacturers refer to. For instance, many "four-user" systems are fully loaded with one printer, one modem and two terminals (all serial devices).

A word of caution: Most micros that are advertised as being eight-user to 16-user systems will not support more than three or four true "users"! These systems are interrupt-driven, which means that the CPU must service each key stroke as soon as the keyboard is touched, and three fast typists will brigg the system to its knees. An optional "intelligent I/O controller" (which will cost approximately $2,000) will allow the system to serve more than four users.

Memory Requirements

Base requirement (one or two users) **512K bytes**

No. additional users X 128K bytes ______

Total ______

or

Applications software ______ **+ 256K bytes**

Your system should have at least 512K bytes of memory, and you should add 128K bytes for each additional user. Check the memory requirements of the applications software you have chosen and add 256K bytes. Buy enough memory to cover the larger of these two figures. If the application software requires a very large amount of memory, you may want to consider a machine with virtual memory. However, the more memory in a machine, the faster it will run, and memory is cheap. Memory typically comes in 256K-byte, 512K-byte or 1M-byte increments and is least expensive purchased in the largest increment and at the time of system purchase.

Disk Requirements

Total storage for applications ______

No. of users ______ X 0.5M byte = ______

Base requirements of full Unix ______

Swap area ______

Total ______

Again, check the requirements of the application software you have chosen to determine the disk storage space needed (include both program and data). Add 0.5M byte for each user to use a scratch area. Include the amount of disk memory that will be consumed by the Unix operating system. This can be a significant amount depending upon the particular implementation, from 5M bytes to as much as 12M bytes for full System V with Berkeley enhancements and the on-line manual.

The operating system also requires an area on the disk called the "swap area" for swapping processes in and out of main memory. This also can be a large chunk of disk — from 1M to 4M bytes or more. The system I use has 12M bytes of operating system and uses a 4M-byte swap area, therefore consuming 16M bytes of disk space before the first application program or byte of data has been entered.

If all your users will be in close proximity to the paper copy of the manual, you can remove the on-line version and gain several megabytes of usable space.

Beware of salespeople when they quote disk size. Make sure they are giving you formatted disk size. The size difference between formatted and unformatted can be large. For example, a 10M-byte unformatted disk is only 8.4M bytes after formatting.

Also, salespeople tend to round off the disk size, usually up. At various computer shows I have heard one very popular disk described as having 400M, 420M, 450M, 474M or 500M bytes; it actually has 474M bytes unformatted and between 420M and 450M bytes formatted.

Back-Up Device

Murphy's law has not been repealed! Sooner or later, through a power failure, programmer's error, hardware failure or "cockpit error," your system will crash, and you will need that backup. Backups should be done every day to be safe, weekly by the more daring and monthly or less often by those who love pain.

When choosing the backup device, consider the time it will require to actually do the backup. If the time required is more than 30 minutes, the temptation not to do it is great.

Another thing to remember is that your system cannot be used while the backup is taking place.

Use the following equation to approximate the time required:

Disk Size/Media Size = No. of Media Required

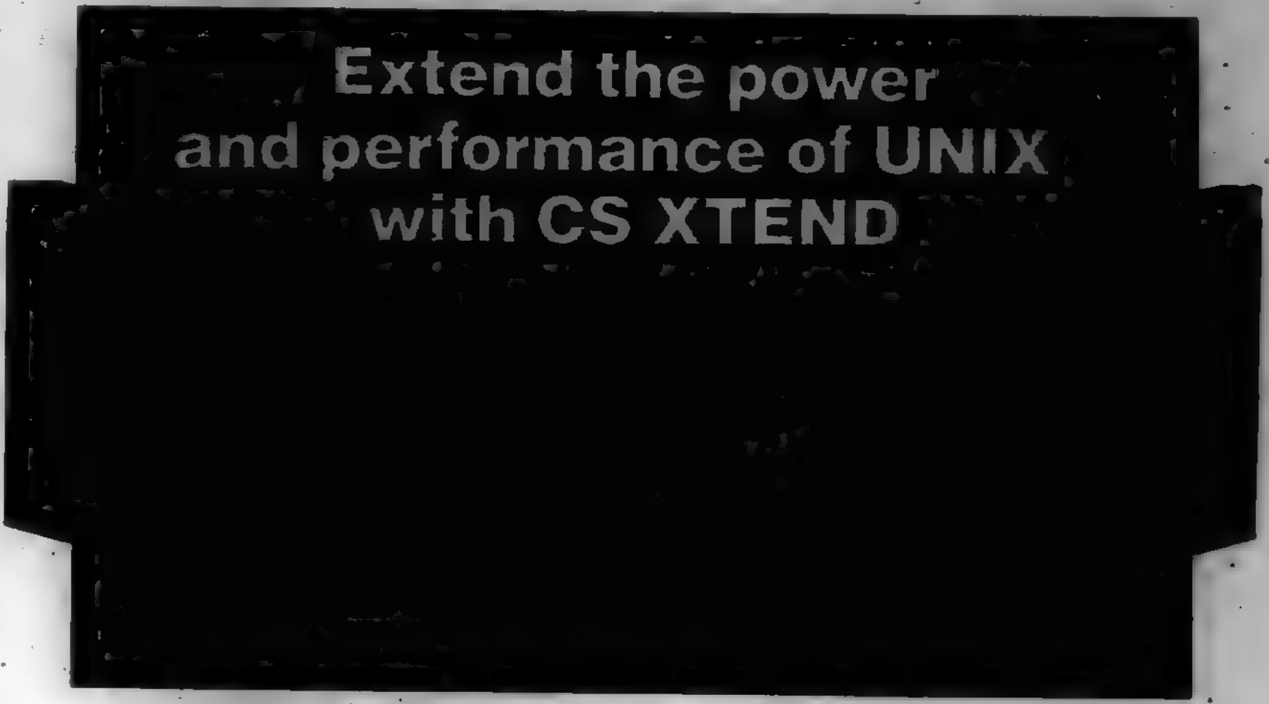
Media Required X Time for Each = Total Time

(Where disk and media sizes are capacity in bytes.)
Some typical backup media sizes:

5.25 in. floppy (single-side) 300K
5.25 in. floppy (double-side) 600K
8 in floppy (double-side) 1.2M
.25 in. streamer 20M to 40M
.5 in. 9-track tape 40M to 80M

The number and time for a full system backup on a relatively small system (such as mine) with a 21M-byte disk and a 5.25 in., 600K-byte floppy are as follows:

21M/600K = 35 floppies
35 floppies X 5 min = 175 min



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Actually, my system requires 36 floppies, but I said the equation was an approximation. The 5 minutes per floppy includes formatting. With preformatted floppies, backup still requires 1.5 hours of sticking diskettes in that slot — a pretty boring process.

Many people argue that a full system backup is not necessary and that incremental backups (dump only those files that have changed since the last backup) can suffice.

True, you will have the data under these conditions, but the restore process is for masochists only. Imagine doing a full system restore from the master backup (36 floppies) plus one or more floppies for each incremental backup — in the order done. Great fun if your crash comes after six months, and you have daily backups!

Recommendation: Buy a system with a tape drive, either a streamer or a 9-track .5-in. drive. Your investment will be recovered in the time saved in doing backups alone.

Most Unix micros have a floppy as a standard item, and many have tape drives as options.

Portable Media Device

If you will need to send or receive large amounts of data between remote systems, you will need portable media. The only portable media today are 8-in. floppies (not very popular) and 9-track .5-in. tape — one more reason to have a tape drive.

Special Requirements

If you have any of the following special requirements, be sure to include them in the final specification sheet: Real-time application (requires major changes to Unix or the hardware. Very few — I know only two — manufacturers have real-time Unix systems); bit-mapped graphics; special languages; special input or output devices; and floating point accelerators or array processors.

Final Hardware Specifications

Now you can complete the system specification form:

Serial I/O ______
Parallel I/O ______
Memory ______ M
Disk ______ M
Backup Device ______*
Portable Media ______*
Special Requirements ______

**should be the same device*

Support and Service

Support and service are the two most important aspects of any computer purchase. Find out who will support the hardware amd how. Also, find out what kind of support you will get for the software and from whom. Don't buy until you feel comfortable with these items.

Go For It

If you still have any money left in the budget, some optional equipment should be considered:

> **If you get twice the disk size you think you will ever need, it will be full in three months instead of in one.**

- High-speed disk drive. Buy the disk with the shortest average access time you can get. Because Unix is a very disk-intensive operating system, the greatest increase in overall performance will come from a shorter access time.
- More memory — both main memory (random-access memory) and disk memory. If you get twice the disk size you think you will ever need, it will be full in three months instead of in just one.

Smoke

Each manufacturer tries to make its own machine appear better than the next company's. They all shout "It's new — it's wonderful," but mostly it's smoke. Sometimes the bells and whistles are useful, sometimes not. For instance, virtual memory is useful if you have very large programs. However, the virtual memory implementation on many of the 16-bit micros actually slows the system down because it causes excessive swapping. If you need virtual memory (for scientific applications), buy it; if you don't need it, avoid it.

One last bit of smoke — benchmarks. All manufacturer-generated benchmark programs were designed to show off the manufacturer's own equipment and make the other company look bad. The only benchmark that makes any sense is the application program that you will use in your business.

Jones is the president of Onager Publishing, San Jose, Calif., publishers of the Unix Applications Software Directory.

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KEN CONDON

Who's Using Unix ?

By Jeffrey Cogen

While the viability of the Unix operating system continues to be at the vortex of countless questions, the real world of computing goes on. For management information systems managers and data processing directors, the decision whether to opt for Unix or to remain with their vendor's proprietary operating system has no simple answer. Many have chosen to be spectators in the Unix controversy and wait until the shape of the market becomes clearer. Others have begun to dabble with one or more of the many Unix alternatives. *Computerworld Focus* recently interviewed decision makers in 35 large organizations to find out what the current status of Unix is in the trenches.

About 15% of the companies surveyed have Unix systems in either production or development environments. The number of companies that used Unix in production environments for office tasks was about equal to the number that used the operating system for program development. In both cases, Unix was generally not used companywide, but in small departments on minicomputers or high-end micros. Unix may be found in large companies, but it was usually considered a nonstandard operating system there — an isolated occurrence in a sea of more common systems software.

A small number of the surveyed companies are using experimental systems to evaluate Unix in the organization. More than 70% of those surveyed said they either have not evaluated Unix yet or are not considering Unix for their organization. None of the nonusers indicated they were seriously considering Unix for their firms, although a few expressed an interest in exploring Unix as a multiuser system for microcomputers in the future. One such organization, National Aeronautics and Space Administration's Jet Propulsion Laboratories in Pasadena, Calif., has recently converted some of its minicomputers to Unix. None of the respondents expressed any interest in implementing Unix on mainframes.

Among the reasons companies cited for not using Unix were the following:

- Cost of converting equipment.
- Time required to learn a new operating system.
- Unwieldly number of versions in the marketplace.
- Lack of applications software.
- Lack of mainframe versions.
- More complicated user interface with Unix.

Perhaps the most telling criticism was that vendors had been unable to convince organizations that Unix is superior to proprietary operating systems. The majority of companies viewed Unix as an option that must be justified. On the other hand, no one has ever been fired for buying IBM with IBM system software.

Unix must be noticeably better in order to attract interest; for the huge majority of those surveyed, it was not. According to Andrew Clifford, systems manager at Millipore Corp. in Bedford, Mass., "The VAX runs equally well under Unix or VMS, and VMS came with it."

Most respondents were not bowled over by the capabilities of Unix in the business arena. "I don't see a system yet that keeps the power of Unix and makes it usable in the general office environments," said James Godwin, chief of the user application office at the Library of Congress in Washington, D.C. Another major concern with Unix is its limited use on mainframes. "We don't think Unix is appropriate for large systems," Mel Ivey, systems officer at the First National Bank of Chicago, said. "It has not been proven on large machines."

The bank, however, has seven microcomputers (including IBM Personal Computer XTs and Unix-based micros from Fortune Systems Corp. of Redwood City, Calif. and Plexus Computers, Inc. of San Jose, Calif.) running Unix for applications such as spreadsheets, WP and electronic mail. According to Ivey, the computers supporting most of the program development in the bank, as well as large-scale production tasks, are IBM mainframes running IBM system software. Ivey added, however, that Unix systems may become stronger in the mainframe market and that firms such as his may then consider getting into Unix in a bigger way.

Other respondents disagreed. "I don't anticipate Unix by itself to be around in the future," said Steven Silva, manager of user information services at Commercial Union Insurance Companies in Boston. "I see Unix being offered under another operating system, such as a suboperating system under IBM's VM," he said. According to Silva, this consolidation would reduce the cost of supporting different mainframe operating systems, while increasing portability.

Commercial Union's eight-year-old Digital Equipment Corp.-based system is used by employees to track attendance, medical records and schedules. Silva said Unix is more flexible for application development but is more complex than other operating systems for office users.

Other obstacles to Unix integration include questions about its portability. "The degree of portability depends on access to source code or vendors porting Unix to the machine," Godwin said. "You usually don't have access to source code in the commercial world."

"There is still not a lot of off-the-shelf software that is compatible between machines," Ivey said. This situation is likely to improve if and when the industry standardizes on one version, a wish near the top of the list of a number of companies.

The survey results reflect the fragmentation of the market. Respondents represented a wide variety of Unix versions, including AT&T's System V, the Berkeley 4.2 and Microsoft Corp.'s Xenix. No one version dominated.

According to Mosher, Bell South Services uses System V on DEC VAX-11/780s and AT&T 3B20s for applications such as electronic mail, WP, spreadsheets and calendaring. Mosher said the firm is committed to Unix for OA, but not as a general development tool. One reason for this direction, according to Mosher, is that Unix systems will never be as powerful data base managers as traditional mainframe systems.

Whatever their commitment, most Unix users are satisfied with Unix itself. "It is a friendly environment to do coding in — fairly efficient and quick," said Glenn Creel of Hughes Aircraft Co. Creel, a member of the technical staff in the company's Space and Communications Group in El Segundo, Calif., said the Unix system, used by employees in his department for developing microprocessor code, was the only option boasting multiuser capabilities.

Another Unix admirer, Chris Sheffield, an OA specialist with Wells Fargo Bank in San Francisco, said, "Unix is very user-friendly and flexible. I can do many things without writing code." The bank has six DEC PDP-11/70s running Unix and supporting about 3,000 users who range from executive vice-presidents to clerks. The system is used for electronic mail and document processing and, Sheffield said, in his view, there are no significant drawbacks to Unix. He added, however, that in order to set up a bankwide network, a bridge from the Unix system to IBM's Professional Office System (Profs) environment is being written.

Many nonusers in the survey reported that Unix does have potential, but that they would wait and see what the rest of the market would do before running out and converting to Unix. This attitude seemed to be the cause of a great deal of inertia. In part, the lack of enthusiasm stems from the major vendors' uninspired commitment to Unix. Danielle Barr, vice-president of office systems at the Bank of New England in Boston, said, "We don't see an IBM direction." A firm step by IBM into the Unix marketplace could make it instantly dynamic.

For now, most respondents that said they would consider Unix in the future also said its potential lies not with large computers, but with micros. An oft-heard comment was, "We keep reading about Unix, but we haven't been able to try it." Others said they are in the midst of developing a microcomputer strategy and have not gotten around to implementing a multiuser Unix environment instead of more standard operating systems.

At Sunbeam Appliance Co. in Oak Brook, Ill., microcomputer networking is a low priority item now, according to technical specialist Greg Heynssens. Heynssens said the company will look into Unix as a networking strategy in the future, possibly in conjunction with IBM Personal Computer ATs. The dearth of applications software for the 15-year-old operating system is an often cited fear with such firms. Whether caused by the numerous versions or by a lack of commitment from third-party software vendors, the scarcity of Unix applications is keeping potential users at bay, and confirmed users may also be growing edgy. "Unix is being marketed as an operating system for the people," said Silva of Commercial Union Insurance. "The user shouldn't care about Unix or any other operating system unless he is going to program. And an operating system doesn't do the user any good if there are no applications for it." ▤

Cogen is a free-lance writer based in Boston.

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3301-01

See How It Runs...

By Dennis Barlow

Unix has come a long way since the early 1970s. It currently runs on microcomputers, minicomputers, mainframes and supercomputers, and each of these categories has its own requirements.

The career of Unix has been a bit like that of a newly discovered recording superstar — an explosion of popularity preceded by years of journeyman obscurity. Once focused mainly on small minicomputers within the confines of academic and research institutions, this multiuser, time-sharing operating system is now available on hundreds of different computer models from micros to mainframes. Proponents claim that Unix has attributes that make it a candidate to become a universal operating environment, in which applications programs and data files can move interchangeably from machine to machine.

Unix is conceptually elegant. Experienced programmers can quickly learn to use its simple file structure, hierarchical directories, common language and multitasking facilities. Unix system functions are well-defined by high-level language programs and are therefore readily implemented in a standard fashion on different computer architectures. Besides being an operating system, Unix is a complete and sophisticated software development environment, including development and configuration management tools, language compilers, and "tool-building tools" such as compiler-compilers and parser generators. The C programming language, in which the bulk of Unix code is written, has become a standard in its own right, even more than Unix itself, facilitating the writing of standard user applications across Unix systems.

Unix was born to be portable. In the early 1970s, the creators of Unix, Ken Thompson and Dennis Ritchie of Bell

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Laboratories, rewrote the system code several times as they moved it from a Digital Equipment Corp. PDP-7 environment to a PDP-11. Finally, Bell Labs moved Unix to an Interdata, Inc. 8/32 and the University of Wollongong moved it to the Interdata 7/32. One attractive feature of the Interdata machine as a guinea pig was its IBM System 370-like instruction set.

In the mid-1970s, Unix became prevalent in the university environment because it was the best time-sharing operating system at the time for the PDP-11 and the price was right. An academic institution could obtain a copy for a nominal fee. The Unix user community grew rapidly, and universities began to matriculate Unix-trained programmers. The Usenix users group was formed, and a small industry grew to serve these otherwise unsupported users.

When researchers at the University of California at Berkeley ported Unix to VAX computers, they changed it irrevocably. By adding performance improvements, virtual memory capability and hundreds of utilities programs, these implementers enhanced Unix greatly, but at the expense of standardization. The lack of a strong force to control Unix evolution has resulted in numerous dialects of Unix, although compatibility remains largely intact at the C program source code and file levels. The Unix families include those based on Bell Labs Version 6 and Version 7; AT&T System III and System V; and Berkeley versions 2.9 (for the PDP-11), 4.1 and 4.2 (both for the VAX). The variety of Unix versions continues to grow, although they are coming to agree on a core of AT&T System V-based features. These many versions are distinguished by the computer environment that hosts the Unix implementation, features and functions needed by the system user and by the heritage of the Unix version used in the port.

Four classes of computer systems produce different requirements for Unix based on their architectural characteristics and intended applications marketplaces: minicomputers; workstations and personal computers; mainframe computers; and supercomputers.

The category of minicomputers is very broad and includes systems that support as few as four users or as many as hundreds of users. Machines in this class tend to directly support a population of more than one user. Their use is dedicated to an application or to an application area, such as a department within an organization. They are architecturally straightforward and typically have a single bus-oriented structure.

Of the four categories of computer machinery, Unix is most numerous in the minicomputer arena. This is because of the historical roots of Unix on minicomputers and the advantages of its strong software development environment in a marketplace where programming tools tend to be weak. Although it has a variety of established scientific, engineering, and typographic applications, Unix trails other operating systems in applications in nonengineering areas. Either through the manufacturer or a third-party source, almost every common mini will accommodate Unix — DEC's PDP-11 and VAX series; Data General Corp.'s Eclipse; the IBM Series/1; and models from Perkin-Elmer Corp., Gould, Inc., Harris Corp., Texas Instruments, Inc., Wang Laboratories, Inc., Four Phase Computer Systems, Inc. and others. The installed base of Unix-based minis is well over a billion dollars.

After its recent divestiture, Western Electric Co. made Unix System III and System V into more of a commercial than a research-oriented product, offering better support, a smoother evolution path over product upgrades and volume discounts on price. Western Electric has entered into joint development agreements with the suppliers of the newest microprocessor chips, the Motorola Semiconductor Products, Inc. 68000, Intel Corp. iX86, National Semiconductor Corp. 16000 and Zilog, Inc's Z8000 series.

This has provided systems integrators, particularly computer manufacturer start-up companies, with a ready-made operating system. Now a vendor can create a computer system hard-

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ware design from standard components without having to worry about also having to build a corresponding software development and applications environment. Indeed, companies such as Convergent Technologies, Inc. and Flexible Computer are creating a new type of computer industry by providing modular minicomputers with Unix to companies that want to offer, but not design, proprietary computer systems. Other companies, such as Plexus Computer, Inc., Pyramid Technologies, NCR Corp. and AT&T, have specifically targeted the Unix marketplace and sell more routinely configured Unix-based minis into it.

Gaps remain in the lineup of Unix capabilities for minicomputers: the lack of high-performance features needed for data base, transaction and real-time processing. Increasingly, minicomputers are being used in communications and departmental integration applications, as file servers playing host to a network of smaller computers or as supervisory controllers of satellite processors in a factory automation environment. Unix lacks a standard means of satisfying these network-control and time-critical requirements. At present, each manufacturer must supply its own approach.

Minicomputers have been very good to Unix. Now Unix may be able to return the favor. New developments in minicomputer technology may come in the form of Reduced Instruction Set Computer (Risc) systems, currently under development at major research labs throughout the country. Risc systems utilize simpler instruction sets, but operate at faster clock rates and over wider data paths of 32 bits to 64 bits than do present-day computers. They also hold out the promise of higher cost performance computing systems than are available today. Because Unix is prevalent in the research environments as a software development environment and because of its other virtues, protptype Risc systems favor the C language and Unix. The Risc approach to computer architecture is available in the marketplace today from Pyramid Technology.

The category including Unix on workstations and personal computers covers stand-alone machines dedicated to a single user but possibly expandable to support one or two additional users on outboard terminals. The recently announced IBM Personal Computer AT is a good example. A popular pastime of computer pundits is to predict a sweeping Unix penetration into the office via personal computers and workstations. Although Unix has attained some penetration into the marketplace for workstations and personal computers, it has several problems in serving this class of processors. The "person productivity" software — for example, business graphics — that dominates the personal computer marketplace has completely passed the Unix world by, and the Apple Computer, Inc. Macintosh is redefining expectations of a user-friendly interface while Unix command processors still suffer from hacker's stutter.

Personal computers and low-priced, low-powered workstations do not have the power to run a multiuser, multitasking time-sharing system. To port Unix to this smaller type of system, designers must be concerned with such technical issues as the time and space overhead of the Unix system, lack of memory in the central processor and disk drives that cannot support the paging rates that Unix demands.

While many vendors rightfully view these drawbacks as opportunities, it will be a long time before some restricted, tamed versions of Unix become viable for personal computer users. Vendors are coping with these problems by adding market-specific features to Unix; by paring Unix down to single-user designs or porting older, more restricted versions of Unix such as Version 6; or by using Unix loosely as a supervisor to initiate smaller, more efficient personal computer guest operating systems such as MS-DQS or CP/M.

This last approach is taken by Digital Research, Inc., which seeks to implement for the leading microprocessors a Unix-compatible operating system that supports both MS-DOS and CP/M as guest environments. Microsoft Corp., the vendor of MS-DOS and the original author of IBM's PC-DOS, takes the first

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approach with Xenix, a product that offers the user a more friendly command language than the standard "shell." This package accounts for over 50% of the installations of smaller Unix-like systems, according to Microsoft announcements. One of the first Unix-like systems on the market was the Version 6 port from Whitesmiths, Ltd known as Idris. Although upgraded since its initial release, Idris retains its smaller, sleeker profile.

Unix is appearing on a class of powerful workstations, exemplified by the Hewlett-Packard Co. 9000 series and the Sun Microsystems, Inc. computers; these machines have the performance characteristics to support Unix and their market targets engineers and systems developers who need Unix' tools. More than 30 companies are preparing for market or offering single-user systems with a 16-bit or 32-bit processor, central storage of up to 4M bytes, local mass storage of up to 100M bytes, a graphics display and, very often, Unix. In future, this will become a commodity market similar to that for personal computers, dominated by a few low-cost producers. Unix will probably become a common operating environment on these machines. In most offices and applications, however, Unix will be confined to a minicomputer acting as a host server to a satellite population of personal computers, each running a standard personal computing operating system such as PC-DOS or PRO-DOS. In this environment, Unix developers must provide communications services, tie-ins to corporate mainframes (IBM), local data base and transaction processing and document archiving capabilities.

Unix is available on mainframes from IBM, Contral Data Corp. and Amdahl Corp., with Honeywell, Inc. and Sperry Corp. possibly to follow, but the prognosis for greater acceptance of Unix on mainframes is uncertain. Unix is not well-suited for applications such as transaction-based, data based or closely coupled network computing, nor can it maintain tight control of computing resources. In addition, the installed base of operating systems such as IBM's MVS or VM (and applications) is so valuable no new system could readily supplant them.

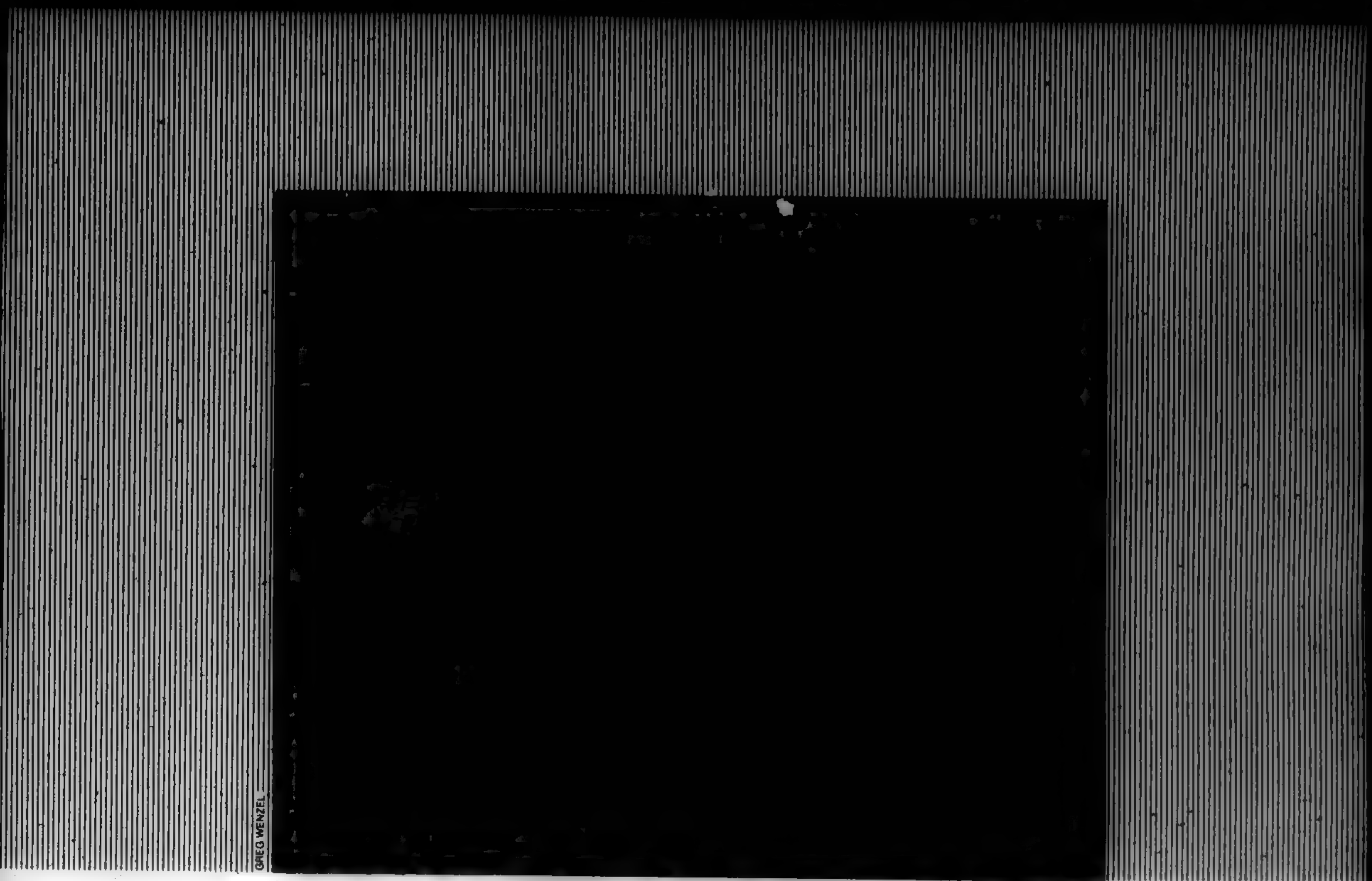
This story may have an unexpected happy ending. There are hints that IBM might choose to take a whole new direction with Unix. IBM has a plethora of incompatible operating systems in its sprawling product lines, and this has actually helped to satisfy all the needs of a widely varied population of IBM users. But it remains difficult for IBM customers to integrate multiple IBM systems because of the insufficient commonality of data interchange and presentation formats, programming protocols and conventions and user interface standards. The problem got worse when IBM introduced new operating systems into its personal computer line — PC-DOS, Topview, Xenix and PC-IX. IBM also wants greater integration of system interfaces among its PC, System 36 and System 370 architectures so that the latter two may serve as hosts for the former. IBM could opt to adopt a Unix-like model for integration. This would probably serve to subsume the entire Unix marketplace under IBM's sway, much to the chagrin of AT&T. IBM isn't likely to accept a competitor's software standard without changing it irreconcilably.

Unix has been ported to supercomputers provided by Cray Research, Inc., CDC, Denelcor and Nippon Electric Co., Inc. These computers most often find their way to the same research environment that spawned Unix. Their buyers are increasingly requesting Unix because of its mature development environment, the availability of university-trained Unix programmers and the availability of some of the existing scientific applications software. Unix may become the universal development environment for this class of computers. However, although it may help supercomputer users in the software development cycle, Unix may have little impact in direct supercomputation management because the applications programs themselves are so highly customized. This is one class of computing where the Unix application software portability may have a minimal effect.

Unix philosophy and features are here to stay, and they will be absorbed into new and existing operating system software products in all levels of computing. This will happen regardless of the eventual penetration of the pure Unix product into the market. After all its development effort, AT&T apparently has no proprietary claim on these ideas, although it has been able to trademark the Unix name. The company might have been able to protect Unix before its concepts entered common computer science discourse. System V will be a core standard among Unix purveyors — unless IBM rewrites the rules — with most adding customized features such as the Berkeley enhancements.

The application-level standardization of data file interchange and the C programming language will continue and will benefit users and providers alike. The level of standardization of Unix facilities will increase, especially in areas like graphics storage and presentation and in data base processing. At the systems kernel level, however, Unix will continue to diverge into many dialects suited to differing applications and needs. This will be especially true across each of the major classes of computer systems — minis; workstations and personal computers; mainframes; and supercomputers. ■

Barlow is a senior consultant with Arthur D. Little, in Cambridge, Mass.



GREG WENZEL

A Princely Transformation: Making Unix More Friendly

By Michael Heffler

The Unix shell, a wonderful tool for programmers, is the standard user interface on Unix systems. Nevertheless, the concern exists that the shell is an inappropriate user interface for those who are not programmers. But because the only people who should use the shell are programmers and system administrators, the concern is not valid. Application programs hide a computer's operating system, just as the operating system hides the underlying computer hardware.

The same concern is not raised regarding the PC-DOS command interpreter on the IBM Personal Computer because the programs most end users interact with on the PC conceal the DOS interpreter.

If the shell is not the user interface for most end users, what is? This question has a wide range of answers.

In the brief history of the computer business, smaller systems have followed larger ones in their growth and development. Mainframes were followed by minicomputers, and minis were followed by microcomputers. Techniques for developing and designing hardware and software migrated from large to small computers. When personal computers hit the mass market, this pattern changed; innovations and development activity focused on these machines.

With the advent of programs such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Framework, the PC user starts up his program and the DOS command interpreter is hidden. The user is in a new environment that covers the underlying PC-DOS system. This new environment was specifically designed to address the needs of the person using the program.

Opportunity follows money as surely as night follows day; thus the main effort to improve the user interface has been in the PC-DOS world, where volume sales opportunities currently exist. Unix, however, runs on computers that can support more than one user, and that capability allows each user to run several programs at once (multitasking). People are discovering the limitations of personal computer operating systems — PC-DOS, for example — and large computer manufacturers are beginning to offer less expensive Unix-based systems as alternatives.

As the sales of Unix systems increase, so will the emphasis on ease of use in Unix programs. Because Unix is superior to PC-DOS as a system for program development, it follows that the commercially available products developed on Unix will have user interfaces that have been at least as well customized.

An appropriate user interface is one that is the appropriate garb for the program and that meets the specific user's needs (at his current level of ability) for the specific task at hand.

A spreadsheet user's set of actions and options differs from the actions and options of a word processor user. The user interface for each of these packages will be tailored to the needs of the user, just as the user interface for a system for travel agents or hotel clerks is tailored to those users.

Users working with programs go through three stages:

- What can I do?
- How can I do it?
- How can I do it quickly?

Programs should have three modes of operation: novice, normal and expert. The novice mode should be equivalent to an operational tutorial. The user should be presented with helpful information whenever it is needed. At first, there's no such thing as too much Help. Later, as the user reads it for the second, third and then the fourth time, the Help text clutters the screen, takes time to display and becomes a hindrance instead of a help.

When the user becomes familiar with the program, the normal mode of operation can be used. This mode makes Help information available upon request, but does not clutter the screen with information not in use or not requested.

In expert mode, the user can also request Help, but other Unix system features are made available to the expert. These features might have overwhelmed the novice or been downright dangerous in inexperienced hands.

The model of three separate operational levels is appropriate for many applications. The basic premise used in designing the user interface to a program should be that the program should not get in the user's way by being either too complex or too tutorial in its usage.

The beauty of Unix, from the programmer's point of view, is that it provides tools that complete tasks quickly and efficiently. These tasks can be tedious and time-consuming to complete on other systems. For example, the command:

```
GREP FRIENDLY *.DOC
```

will find every occurrence of the word "friendly" in every file that ends with the suffix ".doc." It prints each line containing the word "friendly" in each file, prefixed by the file's name. For example:

```
CWORLD.DOC: word
"friendly" in every file that
```

is one line resulting from a GREP command on this article. On PC-DOS you would have to look at each file with your editor or word processor, do a global search for "friendly" in each file and write the file name on a notepad to keep track of occurrences of the word.

The use of GREP and other Unix commands remains outside the realm of most people for two reasons: it takes two sentences to explain a simple usage of the GREP command, and the Unix manuals' documentation is a bit terse in its explanation of Unix commands.

It is the responsibility of the application developer to bring the power of Unix to the application while hiding the details of Unix behind prettier, more appropriate wrappings. For example, inside the program, the capability to look up someone's address for a letter could make use of the GREP command. The user need only know that an address is being located for his use.

When developing a program, one must have a model for the system and for the user. For example, if one is replacing an adding machine, the model for the user is anyone who does basic arithmetic — an accountant, a student and so on. But the model for creating the system does not have to be a machine that solves arithmetic equations in a linear fashion, one equation after the other. The popularity of spreadsheet programs is at least partially a result of their ability to perform arithmetic calculations over several rows and columns of figures in one fell swoop.

The user need not be concerned with the fact that each individual calculation has been performed by the computer. How they were performed is also of no concern, given that they are correct.

Unix also has advantages over PC-DOS in another area: a single request by a user can cause several programs to work together to perform the action initiated by the user. The fact that more than one program is running is hidden from the user. The power of this multitasking environment is far greater than the one-program-at-a-time mode of most personal computers.

Several programming tools and techniques are used on Unix systems for improving the user interface of application programs:

Menus: Menus allow a user to choose from a list of actions the action the computer should perform. Menus are easy to learn, require little or no training and are appropriate for a wide range of users on a wide range of applications.

On the down side, when a large number of choices require a large number of menus, this user interface tends to be cumbersome. Imagine, for example, a library with tens of thousands of books; in order to find one of these books, you must search

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Along with its various technical and commercial advantages, UNIX System V offers something the other systems can't match—

through menus set up by category, subcategory and so on.

When the choices are within reasonable limits, however, and the user does not lose context navigating between menus, menus can be an exceptionally easy to use interface.

Forms: Filling in forms can be simple and straightforward, particularly if Help information is available for each field in the form. A key difference between forms and menus is that menus always present a clear choice; forms, when first displayed, present blanks to be filled in. Blank fields are less intimidating to novice users than a blank screen or a system prompt, but they are blank. Both forms and menus can also validate user input immediately and reduce the most common form of errors: typos.

Forms can also be used for data base or data entry applications. They can be the mechanism used in keyword searches. Once used, forms are an easy and convenient user interface that can be used for data entry as well as data retrieval and display.

Windows: Windows are a tool for programmers who wish to perform more than one task at a time and to monitor the progress of each task over time. A problem with windows is that each window in use takes up some portion of the CRT screen. The screen is a limited resource that provides the only view of the computerized world the user is working with. Although it is a boon when a computer can do many things at once, not many people can efficiently do more than one or two things at a time. Windows have their uses and can be quite helpful, but they must maximize the capabilities of both the screen and the user.

Touchscreens and touchpads: For choosing options on menus, selecting topics from a map and so on, touchscreens and touchpads can be useful. Some users experience arm fatigue when they use touchscreens consistently for more than 20 minutes at a time. People accustomed to using a keyboard to interact with a computer system tend to find touchscreens inconvenient.

Certain applications require only limited interaction between the user and the computer. For these applications, touchscreens can be quite effective.

Touchpads are increasing in sophistication. At a recent trade show, a company demonstrated a touchpad that held up to 22,000 characters per square on the pad. The pad contained over 100 squares. One could place any kind of map or template over the pad for a particular application. When the keyboard is not the method most end users are accustomed to — and even in some cases where it is — this user interface could save an enormous amount of typing.

Mice: The mouse is the user interface tool used on the Macintosh and Smalltalk systems. The mouse is often used with icons that symbolically represent objects that can be manipulated by the application.

Some users encountered problems when using mice. These included knocking things over on their desks or running out of room for manipulating the mouse. It is easier to use a mouse than the arrow keys on a keyboard, as long as adequate room is provided.

Voice recognition: Computers need specific input in order for the input to be accurately recognized. Accents, slurred words and so on cause all kinds of problems. Although voice recognition could save on typing and provide computer access to a large number of nontypists, it is not available at this time at a reasonable price for many users.

Unix systems primarily interact with inexpensive, asynchronous Ascii terminals. The pretty graphics displays seen on many IBM PC and Macintosh applications are not seen on Unix applications. Touchscreens, touchpads and the mouse are also not used on most Unix systems. As the dollars flow toward Unix with the sale of Unix systems, we will be seeing these and other user interface tools in front of applications on Unix.

The key idea in developing a program on Unix is to design the user interface, the part of the program seen by the world, to be suitable for its end users while it makes use of the rich set of tailoring tools that Unix offers. ■

Heller is executive vice-president of Softest, Inc., a firm based in Ridgewood, N.J.

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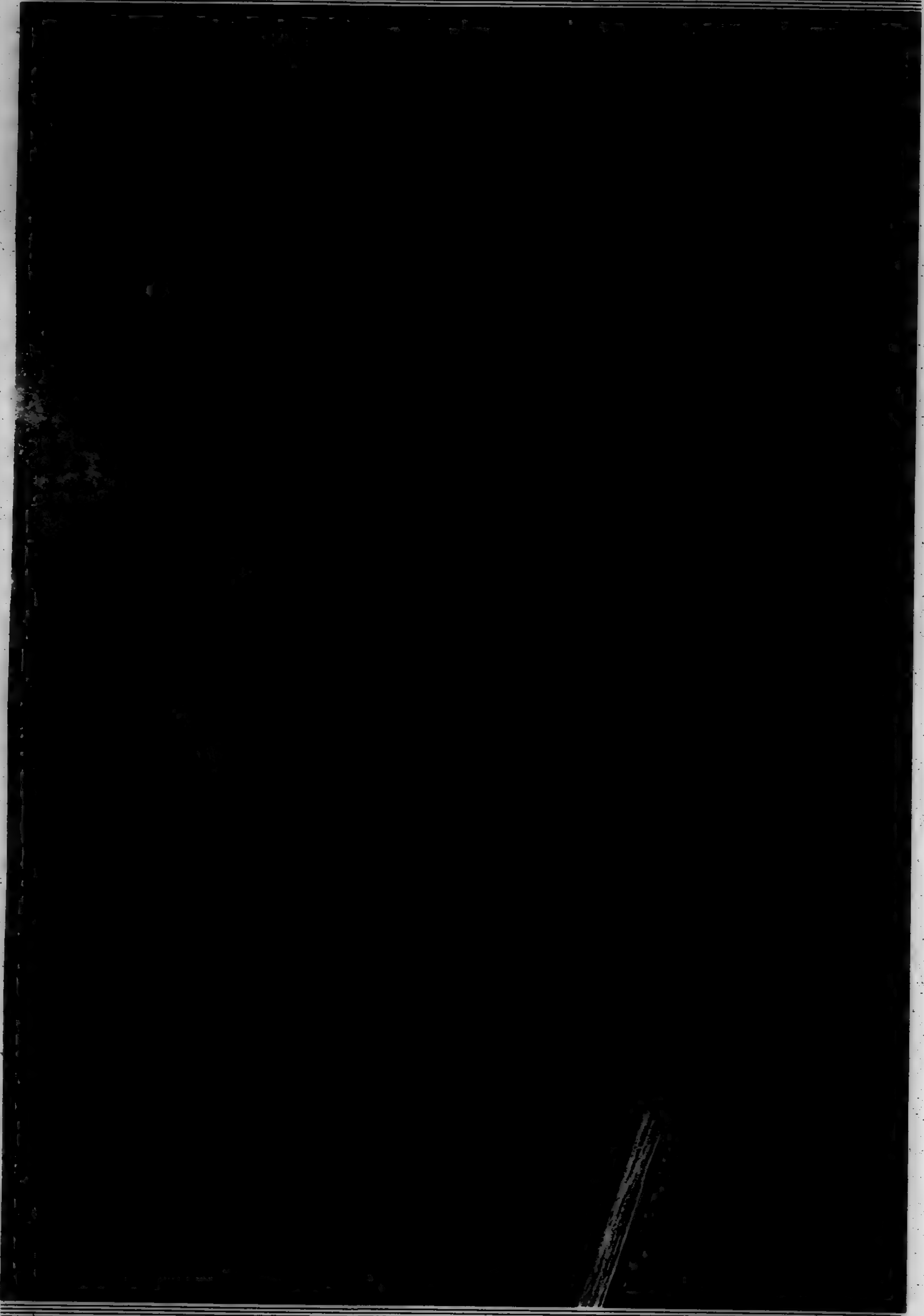

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Unix Heats Up, But Will the Flame Keep Burning?

Unix will grow stronger, especially in some markets, and 1985 will be a shakeout year.

By Jean Yates

The future of Unix has been discussed, defined, projected, poked at, made fun of and lauded to the skies. Everything — you name it — has been written about Unix. To that discussion, this article will now add a projection of the trends in the Unix phenomenon in 1985, including a description of the companies, markets and trends as well as the many needs of the end user. Solutions to some key problems will also be suggested.

Who controls the Unix market? It is now arguable that AT&T has supplanted Microsoft Corp. as the number one influence in the Unix market. AT&T's large advertising campaigns, its introduction of a Unix-based computer family and the beginnings of an extensive distribution network all place the company at the verge of controlling not only its Unix product line, but also the direction of the whole Unix market.

AT&T may be number one, but Microsoft, Sun Microsystems, Inc., Digital Equipment Corp., Hewlett-Packard Co. and IBM also control Unix.

- IBM adapted Xenix for the Personal Computer AT and Microsoft's stated MS-DOS-to-Xenix connection could upset AT&T's future Unix standards.
- Sun's proposed definition of a cross-vendor local-area network standard for Unix is creating confusion about distributed Unix' future.
- DEC, 25% of whose VAXes run Unix, is beginning to recognize the impact of that client base on its future and to react with more Unix products.
- HP is losing sales in engineering (its home territory) to Sun, Apollo Computer, Inc. and other engineering/scientific vendors with Unix-based products.
- IBM's general waffling, wandering, meandering and indecisive smoke generating have slowed down the Unix market, an impact that must not be underestimated.

AT&T has changed dramatically in the last 12 months. After several reorganizations, James Edwards has emerged as president of the AT&T Information Systems (Attis) Computer Division, which is charted to provide third-party distribution of AT&T computer products.

Edwards may have an even wider role in Attis as a guiding light for AT&T's push into the computer market. John Boyd, recently named vice-president of sales for Edwards' division, is another market-savvy choice. Boyd originally ran the distributor and retailer activities for AT&T after divestiture.

AT&T enters 1985 with a widely praised unannounced product, the Safari 4, which may be called

(Continued on Page 30)

Unix has some serious drawbacks, and a cautious manager will make sure they don't harm his company.

By Aaron Goldberg

One of the most amazing stories in the computer industry is the headlong dash to adopt some sort of Unix. A person with my less-than-enthusiastic view of Unix might be tempted to mutter about fools rushing in and so on. Nevertheless, observers who take an objective view of Unix and its implications for user organizations may find themselves having a number of serious misgivings.

Perhaps the only way Unixphoria will end is with shattered dreams, careers and information management plans. However, the thorough and well-informed information processing department may find shelter from the storm. I do not mean to imply that there is absolutely no place for Unix. Rather, like any other product within the industry, it has finite and limited uses.

Probably one of the most important elements of the Unix decision is to examine the weak points of the operating system; the strengths and promises of the environment are well enough known. Among Unix' most critical shortcomings are the following:

- There is no standard version.
- System manufacturers have reinvented much of the basic operation of the system to make it suitable for commercial applications.
- Few and limited compilers exist for major languages like Cobol.
- Speed (or, more precisely, lack of it) is an issue.
- The industry awaits with trepidation a statement on IBM's position.

Each of these factors will be examined to provide details on why those perceiving Unix as the panacea for DP woes will be disappointed.

Much of the advertising related to Unix standards seems to reflect hope rather than fact. At this time, there is no single standard of Unix or its derivatives. At my last count; more than 12 different versions of Unix existed, and there are probably more. This adds up to a very confusing environment for the OEM, end users and even the manufacturers. If Unix were designed from the start to understand the importance of files and records, this situation would be somewhat less aggravated.

The reality of the environment is that the bulk of the low-end vendors (IBM, Altos Computer Systems, Inc. and Tandy Corp.) are adopting Microsoft Corp.'s Xenix. What makes this interesting is that the Xenix implementation is not yet compatible with System V, which AT&T is pushing. This certainly covers the major players in the commercial side, but the question of the technical systems must also be settled. This is the primary

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the 7300 after release. The 7300, according to specifications in the Federal Communications Commission report filed by codesigner Convergent Technologies, Inc., appears to be the first major Unix personal computer product. The 7300 should spur large end users to purchase Unix-based equipment for the first time. In addition, the product's telephony capability should prove extremely popular among medium-size corporations and among office workers in large corporations.

Where are the weak points of AT&T's computer strategy? The first that would have to be pointed out is distribution. The value-added reseller agreements required by AT&T are financially taxing for small system integrators and resellers. AT&T must rapidly develop a two-tiered distribution channel to promote sales of its low-end products to small system integrators and retailers. Otherwise, it will lose a valuable part of the market. Watch for AT&T to sign more retailer and system integrator deals in the near future. Over 30 distributors have been signed, and that number should increase to as many as 1,000 if AT&T is to penetrate the market.

AT&T has made several important moves in 1984. It has done all of the following:

- Conformed to the /usr/group standard for Unix System V.
- Introduced record and file locking.
- Introduced an application software interface standard so that third-party application software vendors can make their products run under System V and know they will remain compatible with future releases of System V.
- Introduced a line of computer products.
- Begun the massive training of a 5,000-person sales force and 22,000-person support team.
- Undergone several massive reorganizations to focus the company more on marketing and clients.

These actions all required a great deal of energy, money and commitment. However, AT&T must make many additional moves in 1985 to maximize its end-user sales and its impact in the computer industry.

Among them are the following:

- Introduce a standard user interface to Unix.
- Communicate much more clearly with application software developers about future releases of computers and software products in order to let them prepare for the product in the market.
- Vastly improve their manuals, training and support materials at least to reflect the standards maintained by their competitors.
- Implement a two-tiered system of distribution that allows small system integrators and value-added resellers to sell AT&T products without a heavy financial burden.
- Eliminate the end fighting that still exists from the Technologies and Information Systems separation.
- Take on less of the "not-invented-here" attitude about improvements and enhancements to Unix, application software, training and support materials and related products.
- Develop and release a distributed version of Unix to offset the Sun "sockets" distributed Unix that threatens to refragment the Unix standard.

Distributed Unix is extremely important to hardware and software vendors and to end users. IBM is anticipated to introduce Personal Computers networked to System 36 and other proprietary IBM computers. Developing a networked Unix — a Unix standard allowing a multivendor solution to networking — is imperative. If AT&T does not define a distributed Unix that allows several vendors' computers to communicate and exchange files, the Sun Microsystems, Inc. network may become a de facto standard, fragmenting the control of Unix again.

The 1985 Unix market may see the fallout of up to half of the Unix-related hardware manufacturers. Many startup companies that offer products today will be out of existence within 18 months as the big vendors such as DEC, HP and AT&T enter the field with bigger budgets

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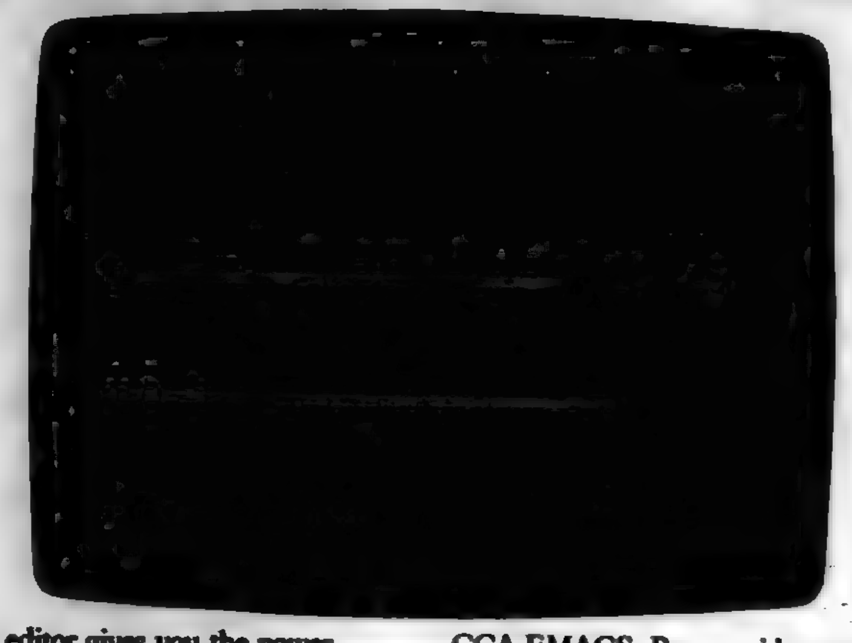

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for advertising, service and support and software. The Unix fallout should be most severe at the supermicro level, where a plethora of 68000/Unix computers compete for the same system integrators, value-added retailers and end users. The high level of government purchases of Unix computers in 1984 will continue in 1985. However, small companies may find themselves locked out of the government contracts they previously won before companies like AT&T and HP entered the competition for these key contracts with unmatchable pricing.

IBM's introduction of personal computer upgrades and networks of personal computers to proprietary IBM file-server products will push the demand for multivendor network solutions that compete with IBM's proprietary products. Although much activity will center on copying IBM's proprietary networking configurations, many vendors will look to Unix to provide cross-vendor compatibility. By offering cross-vendor network ability and application software compatibility, vendors can hope to achieve a large enough installed base to provide strong competition for IBM's proprietary products. As this push for standardization accelerates, the Unix phenomenon will grow stronger. At this point, Unix is probably *the* alternative to copying IBM's proprietary operating systems.

Applications software will grow for the Unix market in 1985, pushed largely by the impact of the PC 7300. Over 100 application software vendors have Unix-based products that exist in some state of completion and are designed to target the high-end personal computer and general business and personal productivity markets. This mainstream Unix application focus, previously nonexistent, will be possible because of the large installed base of 7300s and competitors in 1985 (as many as 80,000 units). Unix application software for vertical markets continues to grow rapidly. The largest and most clearly established Unix vertical market is the engineering and scientific area. Unix-based computer-aided design and manufacturing software, engineering and programming tools and fourth-generation/application artificial intelligence products are all available today, and the Unix trend continues.

The Unix phenomenon has been stronger in some markets than others. It is well established in the engineering and scientific area, in the programming-oriented high-end supermini to low-end mainframe area and in certain vertical areas such as the university, research, government/military and banking areas. In the general personal computer market for small business and office automation, the success of Unix is more speculative. It will, however, grow with AT&T as the driving force in that growth, backed by the MS-DOS-to-Xenix connection and the need for cross-vendor networking. ■

Yates is founder and president of Yates Ventures, Inc., a market research firm based in Los Altos, Calif.

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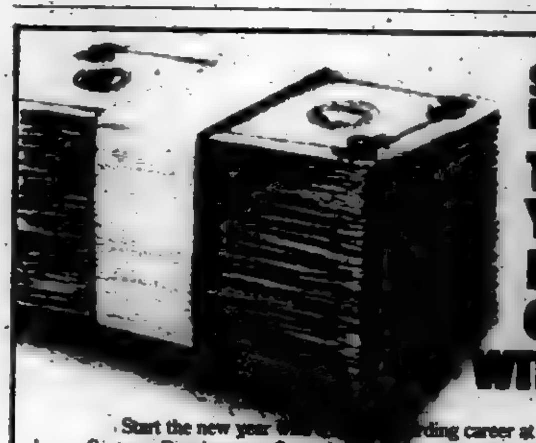

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(Continued from Page 29)

domain of the 4.2 Berkeley version of Unix. Once again, the commercial and technical markets are segregated. To this mix of AT&T vs. Microsoft, add the potpourri of smaller vendors that offer additional versions of Unix. Although converting a C language program among some of these different systems sometimes takes no more than a recompile, many times it takes significantly more.

Those who are taking a wait-and-see attitude and hoping that some standard will emerge in the market should be advised that the odds are long. Today's software developer wants and needs the most advanced capabilities in the basic operating system to allow his product to perform and provide the utmost in utility. To follow the advice of many Unix gurus, the developer is told to use the limited common subset of utilities found between System III, V and 4.2. Berkeley — hardly the state of the art. One of the most interesting aspects of the question "What is a Unix?" is that IBM is in the enviable position of possibly being able to "control" AT&T's "standard."

Nor is the only problem deciding what type of Unix to use. Put yourself in the system manufacturer's shoes. After a couple of years of work and many millions in venture capital, the day arrives when the system works for the first time. After the initial joy and incredulity subside, the next reaction relates to the speed. Again the reaction is surprise. One wonders how a computer can run so slowly. Now the task is to take this system and make it perform better than a Commodore 64 (no offense meant to the 64). Much to their credit, companies like Plexus Computers, Inc. and Fortune Systems Corp. have succeeded by tuning the hardware, adding special-purpose processsors for I/O and other functions and, in some cases, segmenting the operating system to achieve performance. As this tweaking goes on to get real minicomputer class performance, some of the portability is lost.

This also brings up an interesting ancillary point: building Unix systems is not so easy as getting chips from Motorola, Inc. source code from AT&T, disks from Priam Corp. and terminals from Wyse. The two companies mentioned before, Plexus and Fortune, deserve a lot of credit. They actually have working stable systems that run Unix and that don't suffer from monthly hardware stoppages. The fact that companies advertise and even sell a product is no guarantee the system actually works.

Another interesting issue is represented in the language environment. Sure, C and Unix is a better combination than TSO and Cobol. So what? How many of your application systems are written in C? How many in Cobol? The commercial market is a world where Cobol is the major language for applications. Even if you decide that Unix and C form a much better development environment for all new applications, remember you have to run the old ones somewhere. Of course, the user can always buy enough equipment to support an additional Unix environment. Think how much fun adding an entirely new operating environment would be.

Right now, the quality and variety of the compilers for languages that run under Unix is not what it should be, and there is no guarantee things will improve. I think the availability and quality of languages will increase in the future. Think how long it has taken an environment like MVS to get to its relatively workable state *with* IBM's blessing and resources.

For those with an operational perspective on systems, one of the most important requirements surfacing today is the need for additional speed and system capability. And here Unix has some serious drawbacks. Because Unix was designed long before the concept of virtual memory was a given and well before batch became a nasty word, there are some speed limitations. This does vary widely according to vendor.

The final argument against Unix is IBM's position — or lack of it. Even the colossus itself appears unsure. In Austin, IBM markets two products, VM/IX and PC/IX, both derivatives of Unix System V. A trip 1,000 miles to the east brings one to a division with not-so-small impact (Entry Systems Division in Boca Raton); there, Xenix has been named the multiuser operating system. Again, the user is caught between a rock and a hard place: If you bet on a direction now and you're wrong, limitations will be your legacy. If you guess right, there still won't be any parade. There is a third option: Why bet at all? You're looking at serious capital outlay and major impact on information system capability for the future, and this may not, in fact, be a chance you're willing to take. Eventually, IBM will have to take a position on Unix, even if it is a minor part of the market. IBM's stake could, however, be to ignore Unix, leaving it in a sort of limbo. It does appear that the prudent user may decide that now is not the time to get cut on the "leading edge."

Of course, I believe Unix has a place in the market, and it is likely to be significant (meaning between 5% and 20% of the total market for systems). Nevertheless, Unix is not and cannot be the panacea it is proclaimed to be. For those insistent upon moving down the uncharted Unix road, I can offer only one comment: "The nice thing about hitting your head against the wall is that it feels so good when you stop."

Goldberg is director, microsystems services, International Data Corp., Santa Clara, Calif.

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A Bridge to SNA

By Vic Forgetta and Tom Clark

Before Unix can succeed in the corporate market, a Unix-to-SNA gateway is needed.

As decentralized processing becomes more popular, an increasing number of multiuser systems will be found in the distributed end-user environment. The trend toward multiuser processing is occurring because it is highly efficient and cost-effective in situations where many users need access to common and consistent data for various applications.

Unix is on the way to becoming the supermicro operating system standard for the multiuser environment; installations already number up to 95,000 and are expected to increase to 500,000 by 1987. To date, the primary Unix buyers have been the Fortune 1000. Many of these companies conduct distributed processing activities to reduce host overhead while still maintaining a central corporate data base on an IBM host. Regardless of their degree of processing independence, regional offices require some access to the corporate mainframe to update information, share data and maintain consistency throughout the organization.

IBM's System Network Architecture (SNA) is the de facto networking standard in the IBM world, and the need for a Unix-to-SNA gateway is clear. If Unix is to become dominant in the corporate market, it must have the ability to communicate with SNA networks and provide users with access to mainframe applications. The Unix-to-SNA gateway should not restrict normal Unix processing in order to provide this communications capability. Rather, it should provide a transparent and common gateway to the IBM environment.

Protocol converters were one of the first methods used to connect Unix systems to SNA networks. Commonly called black boxes, these devices provide basic asynchronous to synchronous protocol conversion.

Protocol converters can be used in two ways: they can be positioned either locally to the host or remotely with the Unix system.

In the first situation, the protocol converter is an extremely cost-effective solution that allows the converter to be shared by multiple devices by means of dial-up lines. However, when the protocol converter is positioned near the host, most communications between the host and Unix system are asynchronous. Asynchronous communications is a slow process, operating at 1,200 bit/sec or 2,400 bit/sec. It permits screen painting character by character only, rather than in blocks. In addition, because error-correcting facilities are lacking, highly sensitive data may be compromised during transmission.

When the protocol converter is positioned near the Unix system, most of the communications is synchronous; offering increased data accuracy and speed. In this configuration, however, the device is much less cost-effective; the converter typically supports fewer devices than if the converter were positioned locally to the host.

In general, protocol conversion is an extremely restrictive method for establishing the Unix-SNA connection. Converters typically use a single protocol, emulating a 3270- or RJE device. In addition, protocol converters greatly limit the Unix system by reducing it to an unintelligent terminal. By simply emulating a terminal, interactive processing and file transfer capabilities are severely restricted.

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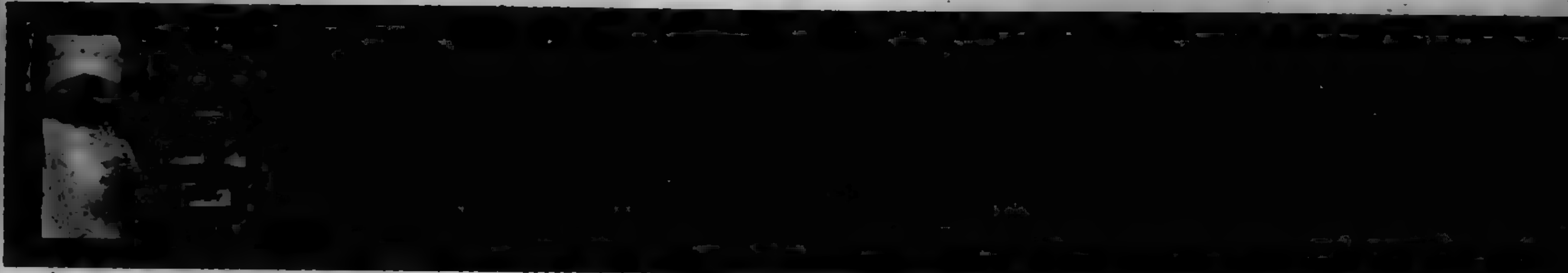

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As the demand for distributed processing increases, the demand for sophisticated communications capabilities will also expand. In light of the protocol converter's limitations, a more intelligent communications solution, such as software emulation, will be required for Unix systems.

Software emulators reside on the Unix system and provide multiple protocol, cluster controller (Physical Unit) and device (Logical Unit) emulation. Users can access many different hosts and choose between interactive and batch file transfer. With software emulators, the host connection is synchronous, and line speeds typically operate from 4,800 to 9,600 bit/sec. Few software emulators currently exist for the Unix environment, but this will change as Unix continues to expand in the commercial market. As these products become more abundant, users may want to consider several important features.

The most important feature in the design and selection of a software emulator is the quality of the SNA implementation. A solid SNA design means the Unix system will be able to emulate multiple control units (Physical Units), multiple display stations and printers (Logical Units) as well as multiple protocols (SDLC and BSC).

With these capabilities, the system can access a variety of hosts, such as the IBM 370, 4300 series, 3800 series and Series 1; host applications — CICS, CMS and TSO/SPF; a variety of operating systems — OS/VS, VM and DOS; and numerous access methods — Vtam, Btam and Tcam.

By emulating an IBM cluster controller, the Unix-SNA software allows the Unix system to support up to 32 concurrent host communication sessions available to any user on the Unix network in any combination of printers or displays. If the Unix system's memory permits, additional controller emulations will be able to run.

A solid SNA implementation should be extremely flexible, permitting simple configuration of physical and logical units to the SNA network. This flexibility includes the ability to store parameters so that reconfiguring is not necessary when multiple hosts are accessed. In addition, a full SNA implementation should supply display handling routines to access the Unix Termcap, a data base that defines, stores and manages all of the Unix system's terminal and printer device parameters. With this capability, the software emulator supports any device attached to the Unix system. If Logical Unit configuring is flexible, printers, for example, can be defined as either local, host-dedicated or shared printers. This is particularly advantageous for decentralized offices that require host printouts on site. Print jobs can be initiated from the host system and printed locally at the same printer used for normal Unix processing. In addition, host print data can be directed to disk or diskette for manipulation at a later time.

With the best software implementation, all host communications activities are transparent, so that the user works only with the desired Unix application. One example of this user transparency is the ability to interface Unix-based application software with communications software. A correctly designed emulation package should include routines for this interfacing.

In light of the protocol converter's limitations, a more intelligent communications solution, such as software emulation, will be required for Unix systems.

For those familiar with the SNA environment, the software also should be user transparent by providing all the capabilities of the IBM equipment. The Unix software product should allow the user the same screen, print and keyboard formats used in the application environment.

In addition, a Unix-SNA gateway that represents a solid SNA implementation will be able to expand quickly to accommodate enhancements made to SNA. A modularly designed software package that is an accurate implementation of SNA is extremely easy to maintain as well as enhance, since blocks of code can be replaced without disturbing other layers.

SNA's latest enhancements permit peer-to-peer communications and for the first time use the processing power of the Unix system. Rather than defining it as an unintelligent terminal, SNA assumes the Unix system is intelligent. This greatly increases throughput as less instructional information is sent with the datastream and a variety of instructional code can be interpreted.

Enhanced Unix-to-SNA communications clearly will affect the growth of distributed multiuser environments in the corporate arena. A gateway that can accommodate current and future communications requirements and make use of future technological advancements will greatly reduce host overhead and contribute to true, intelligent decentralized processing.

Clark is OEM sales manager and Forgetta is product planning manager with Pathway Designs, Inc. in Wellesley, Mass., a hardware/software manufacturing firm.

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AT&T Searches For Standard Status With System V

By Anne Lovett

Rapid change and uncertainty characterized 1984 for newly divested AT&T. The company was free to enter unregulated markets, specifically the data processing sector. AT&T Information Systems (Attis) — its unregulated equipment division — announced its own line of computer products known as the 3B family. With low market share and installed base, AT&T's short-term impact in the computer market will not be significant. However, there is no doubt AT&T is a serious long-term player with strong financial resources to back up its commitment to becoming a strong force in this arena.

The 1982 Consent Decree marked the settlement of the U.S. Justice Department's antitrust suit against AT&T and required the company to divest itself of approximately $100 billion of assets (the Bell Operating Companies). At the time of divestiture, Jan. 1, 1984, the high-tech world exulted that finally there would be a company with enough resources, clout and technology to provide an alternative to Big Blue. Furthermore, the company combined those qualities with another unusual one — a clean slate. On paper, the likely strategy of the giant phone company appeared unbeatable — private branch exchanges, minicomputers, personal computers, terminal phones, networks and so on, all linked neatly together with Unix. In reality, however, the company would make many of the same blunders made by companies that had pioneered in the markets. After all, AT&T was an enormous, slow-moving organization where short-term strategy usually meant the next five years — representing a longer span of time than most of its current competitors' existence.

The strategic importance of Unix to AT&T cannot be overstated. The operating system — always described as highly portable — has been moved quickly from public domain software to part of AT&T's marketing arsenal. As AT&T's best claim to fame in the computer world, Unix also represents AT&T's best chance to penetrate Fortune 1000 accounts.

Developed at Bell Laboratories in 1969 for internal use, Unix was offered to the outside world only after descriptions of the operating system had been leaked to non-AT&T hackers. Distributed through Western Electric Co., Unix was offered cheaply to universities and more expensively to commercial entities. Support was not available for either group.

AT&T has changed its tactics — from years of no advertising, no press releases and no support of Unix to a vigorous advertising compaign for the product.

The former lack of promotion in fact created a "bottom-up" push for Unix, with programmers lobbying heavily in their companies for Unix; current marketing efforts, however, indicate a top-down approach. A typical full page *Wall Street Journal* advertisement has the word Unix covering half a page with the question, "Is it based on Unix System V?" superimposed. AT&T must convey two messages to current and potential users. These messages are as follows:

- The importance of Unix System V as a standard that is here to stay. (This assertion is being supported by many third-party vendors.)
- The importance of buying Unix directly from the company that made it all possible. This second task is more difficult. AT&T will face competition from third parties that have developed enhanced versions of Unix System V. For example, Microsoft Corp. which now sells Xenix, a System III-based operating system, will not sit idly as System V takes over. Instead, Microsoft can be expected to introduce a "Xenix V" product, capitalizing on both Xenix' and System V's notoriety.

Users can expect that AT&T will continue to enhance Unix, but will bring its installed base along, providing free or low-cost upgrades or paths. Users can also count on AT&T's continuing to label its Unix offering "System V," although that umbrella will be shared with many new releases.

> **AT&T sees itself as Unix' custodian and recognizes it must provide a clear statement of direction. It must prove to be an able caretaker of System V without scaring off users by manipulating the system to its own advantage.**

Further supporting the standardization of System V, AT&T recently announced the AT&T System Interface Definition (SID). SID specifies a minimum set of system calls and library routines that should be common to all operating systems based on System V. The announcement is significant not only because it promotes more standardization, but also because AT&T agreed to abide by the guidelines of third parties, most notably /usr/group, in establishing its own interface definition.

The publicized purpose of SID is a high degree of portability of applications, allowing users to protect their software investments even when they change hardware. Clearly, however, AT&T benefits from increasing standardization of Unix, as a means of preventing other companies — most notably IBM — from controlling or establishing standards for Unix or a Unix lookalike.

AT&T considers itself the custodian of Unix and recognizes the necessity of providing a clear and logical statement of direction and commitment to Unix. Intrinsic to its success as the standard operating system provider is the absolute requirement that AT&T prove itself an able caretaker of Unix System V without scaring off users by manipulating the operating system blatantly to its own advantage.

Just as Unix is touted as the glue that can hold a user's disparate machines together, Unix is the cohesive force behind AT&T's own hardware lines. AT&T was in an unusual position at the time of divestiture — a mature, well-financed company possessing incredible technology and research capabilities. The industry expected AT&T to unveil PBXs, minicomputers from the 3B series, personal computers, terminal phones and networks all at once and all running Unix System V. Instead, the company has introduced products in a slower and more confused manner than anticipated. Although a unified systems strategy exists, it is being implemented slowly. At times, the connection between AT&T machines seems more like a footbridge than a freeway.

When AT&T's PBX System 85 was introduced, its applications processor was 8086-based and ran a modified version of Unix, leaving many people questioning why 3B processors had not been used and why anything but pure System V had been offered. Bringing its system strategy into better focus, AT&T finally endowed the System 85 with the 3B5 AP, a mid-range 32-bit computer with an AT&T WE32000 microprocessor, running System V.

For current and potential users, a clear PBX strategy is essential. The PBX products are AT&T's flagship products, to a large degree because of the enormous installed base of the company's older PBX. Just as "no one ever got fired for buying IBM DP equipment," AT&T telecommunications equipment was always a safe bet. Major companies' current moves to coordinate the buying decisions of DP and telecommunications equipment greatly aids AT&T's push to merge voice and data networks and equipment. However, IBM's recent purchase of Rolm Corp. is a setback for AT&T because the company now loses much of its uniqueness.

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An increasing amount of Unix applications software will be available from AT&T, but users will have to proceed cautiously. In its massive software procurement program, AT&T runs the risk of slipping up on quality control.

In June 1984, AT&T joined the multitude of vendors offering a personal computer compatible with IBM's Personal Computer. Initial reaction was one of mild confusion — the originator and now main promoter of Unix offering an MS-DOS machine? With so few applications available for Unix on a personal computer, AT&T needed to take advantage of the prolific application software for MS-DOS. Upon closer scrutiny, the product may be viewed as a strategically positioned bridge, embracing MS-DOS while encouraging occasional or partial use of Unix. Two products form the keystone of this bridge:

- The PC Interface, which costs $100, was actually announced in January 1984 as a 3B product. MS-DOS users can connect to a 3B2 or 3B5 for data transfer or storage or to function as a Unix workstation.
- The Context Switch, which costs $100, allows PC users to move from MS-DOS to Unix by flicking a switch. Because the MS-DOS application is frozen, the user can return directly to the application when he goes back to MS-DOS. Furthermore, certain Unix utilities (such as Spell) can be run on MS-DOS.

AT&T's 7300 PC from Convergent Technologies, Inc. (which has been code-named Safari 4) comes almost as an answer to those who criticized AT&T's introduction of an IBM-compatible personal computer. Scheduled for introduction early in 1985, the 7300 runs System V and has a built-in modem and two separate telephone lines for voice or data. With its rumored above-average integration of computing and telephone, the 7300 will be a good second personal computer product for AT&T; a 3B-based PC is not far behind, as AT&T moves methodically toward its integrated systems strategy.

Ironically — but understandably because of regulatory handcuffs — the company responsible for developing Unix has virtually no applications software of commercial quality. AT&T has worked doggedly to enter into agreements with software companies to develop Unix applications packages.

The decision to sign up Digital Research, Inc. to provide a library of applications software for Unix seemed at first an excellent idea. Unfortunately, the deal has turned into an embarrassment for AT&T management. Although the applications software will eventually appear, the lack of timeliness is damaging to AT&T. Now more than ever, AT&T is encouraging software vendors to join AT&T's Unix Systems V bandwagon — and will continue to do so. The company has taken several tacks, forming:

- AT&T Venture Group — to invest in small business startups.
- AT&T Software Procurement Program — to handle third-party software arrangements. This group is part of Attis' headquarters group in Morristown, N.J. Accepted products are given varying levels of support. The range of this support is quite wide: it may be a listing in an AT&T software catalog (scheduled to be available in hard copy in December 1984 and in an electronic version during the first half of 1985), or distribution without support or the purchase of a license from the software vendor and full support of the product.

In August 1984, Attis formed a Major Accounts Special Systems Group. This organization of software specialists provides technical expertise to major account (Fortune 500) sales teams. When a sale of 3B hardware has been made, this group provides customized applications for the client's particular vertical market. In its early stages, this group will rely on internally developed software programs. Positioned as a "loss leader" service to establish credibility for AT&T on office automation, the offering is reminiscent of IBM's handholding for large accounts in its early days. Unfortunately for users, once established in new markets, companies like IBM and AT&T can no longer afford this initial level of support.

Although an increasing amount of Unix applications software will be available from AT&T, users will have to proceed cautiously. In its massive software procurement program, AT&T runs the risk of slipping up on quality control. At least initially, software programs with the AT&T stamp of approval should be scrutinized carefully for their own merit.

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nology or of technological innovations. It has, however, been plagued by an inability to bring products to market, having cultivated an environment of pure research at Bell Labs — independent of any marketing influence. This technology-driven aspect of the company slowly is changing to meet the challenges of unregulated markets. Hiring experienced computer salespeople has helped. The next, more difficult step is to promote a more coordinated effort between these non-AT&T-trained professionals and the central support staff that has been heavily indoctrinated with the corporate culture of yesteryear. Without improved communications and the sharing of common goals, these two groups will continue to be somewhat at odds with each other, and the users will suffer from it.

> **Queries such as "Why buy Unix from anyone else?" attempt to appeal to users' common sense. AT&T must go one step further and persuade users why they should buy Unix from the company that created it, yet left it orphaned for years.**

Marketing will continue to be AT&T's major focus in the next few years as the company strives not only to learn about marketing, but also to unlearn its past methods of operation. Moving to become more international in scope, AT&T can be expected to set up more offices abroad, as it did in Tokyo, to promote a standard AT&T Unix in Japan.

AT&T will continue to buy hardware and software products where appropriate, seemingly having conquered the "not invented here" complex — or at least having put it into remission. A tremendous number of software companies will be signed up to provide Unix applications and tools. The result may not be completely positive, but could also present difficulties in quality control and product differentiation.

As the gatekeeper of Unix, AT&T will probably try to position its 3B machines as the standard front-end processors to IBM/Unix mainframe systems. It is here that AT&T will square off with IBM. AT&T clearly must leverage its communications expertise, particularly its PBX integration with its DP environment. Emphasizing voice and data integration as a major reason to buy its products, AT&T will focus development efforts in this area and will introduce several important products in the next two years.

The company will seek to capture a larger and larger portion of the Unix "after market," particularly in training, where it already has an excellent reputation. AT&T is already actively promoting its own Unix training, proclaiming that "for 15 years, we've taught our own people to use the Unix System. Now we can teach yours."

AT&T is currently promoting the hardware independence of Unix as the savior of end users; a recent AT&T press release stated, they will be "free from the tyranny imposed by proprietary operating systems." However, the company must push its own hardware vigorously and will be forced to reveal a strategy that in some manner locks users into AT&T machines. Among the possible tie-in strategies are the following:

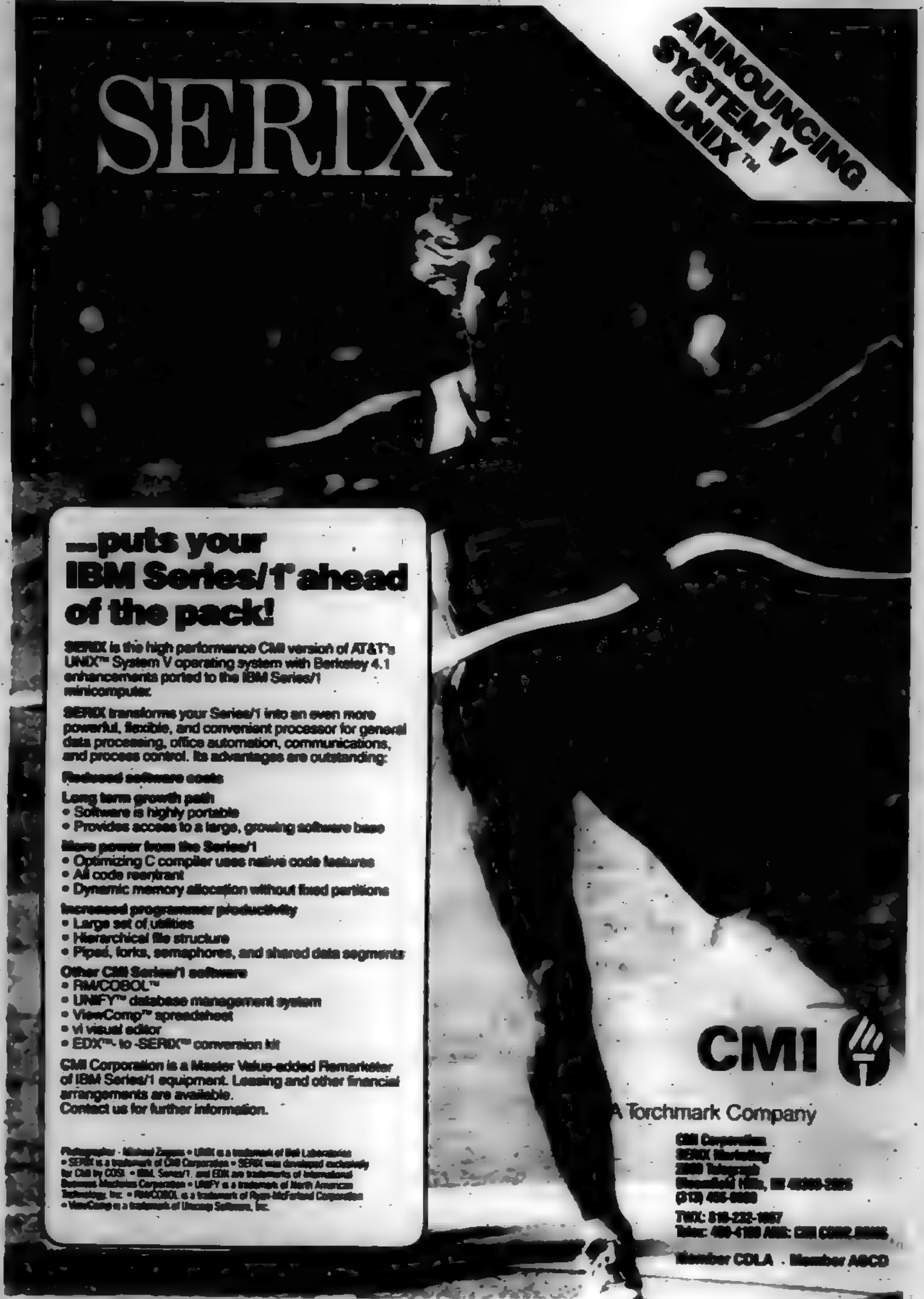
- Free or cheaper updates to System V for 3B Series users.
- Free seminars or training sessions for 3B/Unix users.
- Controlling the user interface by embedding it in 3B firmware.

To soften the blow, AT&T will try to convince users that they always will be able to move around a large AT&T family of hardware without worry — unlike the situation confronting IBM users.

AT&T must guard its role as custodian carefully, not overstepping the bounds and appearing as owner, director or manipulator. The company will continue its efforts to appeal to users' common sense with queries such as, "Why buy Unix from anyone else?" AT&T, because of its short history in DP, must go one step further and persuade users why they should buy Unix from the company that created it, yet left it orphaned for years.

The next few releases of Unix will be important signals from AT&T. Formerly the company had little motivation to improve the commercial version of Unix and left such undertakings to the University of California at Berkeley and others. Now, however, AT&T is a company with a mission. Users can only hope that it is also a company with vision.

Lovett is principal of Avenir Associates, a software consulting company located in Boston.



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IBM Takes a Look at Unix – *Now* What Happens?

By Glenn Rifkin

A technology is introduced. The media takes a look, the analysts analyze. A bold user gives it a try, then another and perhaps another. The technology begins to gain momentum and approach market status. Suddenly, a giant shadow is cast over the new environment: IBM is interested. Big Blue takes a look; its analysts analyze. A roomful of pinstripes murmurs and nods in agreement and the magic wand passes over the technology. IBM has given its approval; legitimacy is bestowed. The scramble begins.

The scenario is a familiar one in the computing industry and seems to be happening once again with Unix. This time, however, IBM's approval has been tepid at best, and its impact on the Unix market remains unclear. Though IBM has made several strategic moves toward various versions of Unix, consultants agreed the world's number one computer maker is still unwilling to pass the approving magic wand over the operating system. IBM's perfunctory offerings of Unix, they said, are merely stopgap solutions that will eventually be played off against IBM proprietary operating systems.

"I view [what IBM is doing] as an interim toe in the water," said Dale Kutnick of the Yankee Group. "IBM wants to pump out iron and get people on its own operating systems, but if the market is going in another direction, IBM wants to be there."

"IBM's commitment to Unix so far has been very slim in comparison to what they could do if they wanted to," added David Fiedler, president of Perchwell Corp., a market research firm specializing in Unix.

For Unix backers, IBM's lukewarm response to Unix has not caused a panic. For one thing, another marketing titan, AT&T, is solidly behind the operating system and pushing hard for its acceptance as a standard. And, more important, Unix is already at the core of a legitimate and thriving market, a business built without IBM's blessing. According to Bob Marsh, president of Plexus Computers, Inc. and a founder of the Unix /usr/ group, the Unix market has had a good, solid underpinning for five years, and it is the media that has been looking for a problem that isn't there.

"In terms of the OEM, multiuser marketplace, there is a solid on-going business built around Unix," Marsh stated. "Some people believe that because it hasn't exploded like the personal computer market, Unix is a market wandering around looking for legitimacy. The truth is that it was a $1 billion market in 1983 and close to $2 billion in 1984. There are 100,000 Unix-based systems out there with eight to 10 users per system — that's the equivalent of a million personal computers being shipped. That's not a wandering-around market."

Nonetheless, an IBM stamp of approval on almost any technology generally creates an insatiable appetite in the marketplace. It not only fills IBM's coffers, but also generates a whirling mass of third-party enterprises that spill off into the far reaches of the computer business. The difference between a tacit IBM push for Unix vs. an all-out major support effort can mean many billions of dollars for the Unix industry.

> **Some consultants believe IBM doesn't want to legitimize the Unix industry for its rival, AT&T, which would certainly benefit from a hearty Big Blue endorsement of Unix. Others say IBM was simply caught by surprise and hasn't decided how to respond.**

It's ironic that IBM is not a neophyte in the Unix world. IBM has also announced several different versions of the operating system for diverse parts of its product line. In early 1983, IBM offered a Unix version for its Series/1 minicomputer (only to a limited customer set); even before that, IBM Instruments had developed a version of Microsoft Corp.'s Xenix for the IBM 9000. The company has also offered Unix for the VM environment — specifically for the 4300 supermini — to customers with "special requirements."

In January 1984, IBM went one step further and unveiled the PC/IX operating system for the Personal Computer XT. The Unix-based system was developed for IBM by Interactive Systems Corp., which reportedly has a VM/IX version ready to be announced.

IBM's most serious Unix offering, however, is PC Xenix for the recently introduced Personal Computer AT. PC Xenix, developed by Microsoft and based on Unix System III with Berkeley enhancements, is scheduled to be shipped this month and, according to consultants, represents the company's strongest commitment yet to Unix.

"The PC AT with Xenix will be a significant product," Fiedler said. "Even so, that won't be the major operating system IBM is putting on the AT."

Nonetheless, some still speculate that IBM's forays into Unix thus far are quite promising. Marsh pointed out that by targeting Unix-type operating systems for so many parts of its product line, IBM may well be "positioning itself to have, for the first time, a single operating system across all its equipment. I wouldn't be surprised if there were elements within IBM who point to [Unix] as an opportunity to tie things together and get some consistency in their products that they've never had."

Most IBM watchers, however, disagree. Though IBM is offering versions of Unix, its primary support continues to be of its proprietary operating systems. According to Kutnick, IBM won't ignore Unix in its larger systems, but instead will "play it off" against its VM operating system. In other words, offer Unix, but push VM.

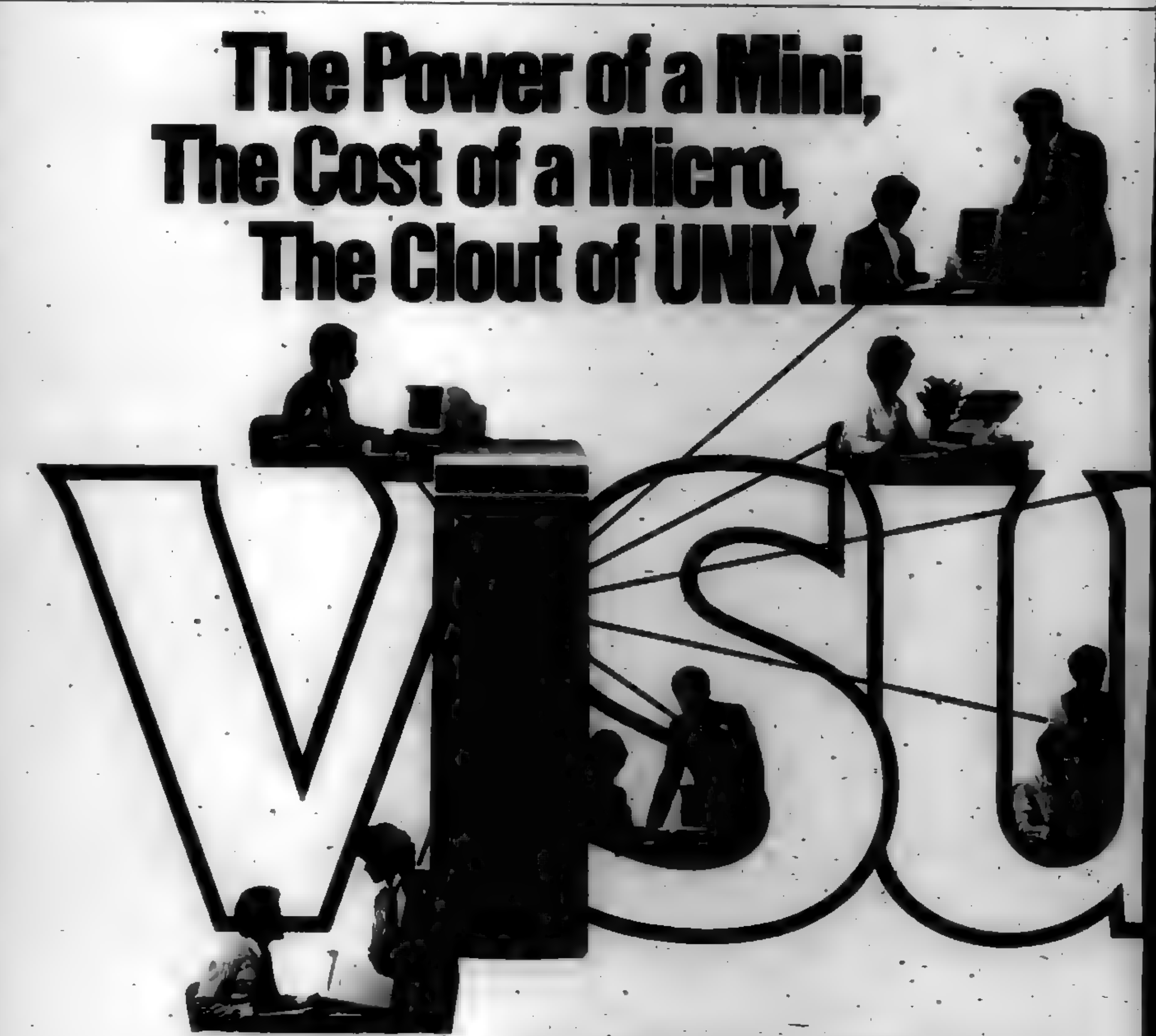
One key reason for this is software. "IBM's software revenue is increasing at 50% a year, and they don't plan on giving that up," Kutnick stated. "If their base demands it, they'll support whatever they need to support. But they'll try to offer alternatives. VM will be the major alternative IBM will offer against Unix."

As usual, speculation about IBM's actions abounds. Industry consultants have attributed the company's less than enthusiastic approach to Unix to many things. Some believe IBM doesn't want to legitimize the Unix industry for its rival, AT&T, which would certainly benefit from a hearty Blue endorsement of Unix. Others comment that IBM was just caught by surprise by the sudden interest in Unix and simply hasn't decided how to respond.

Analysts agreed that IBM's first tentative moves toward Unix have been a response to pressure from segments of its customer base and that the company is taking a "wait and see" stance in relation to a long-term market reaction to Unix.

"I really don't see Unix as being integral to their product strategy," stated Mike Ursino, president of Technology Services Corp., a consulting firm in Bellevue, Wash. "They see it as an opportunistic market — a way to extend applicability of their product offerings to markets where they might not otherwise be considered applicable. Their real strategy is unfolding now, and that is to more and more be able to integrate their PC offerings with their mainframe offerings."

IBM itself does not speculate publicly about future direction, but Pat Kearney, director of programming for IBM's Information Programming Services group, admitted that the company is exploring further avenues with Unix. "We are actively supporting Unix," Kearney stated. "Our customers are asking for it and we see it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as a significant business opportunity." Mike Reisman, an IBM spokesman, echoed those sentiments at IBM's Boca Raton, Fla., Entry Systems Division, where the Personal Computer line is produced: "We have made a sizable continuing commitment to PC Xenix as a multiuser, multitasking operating system for the PC AT."

Though IBM has made this commitment to Xenix on the AT, some consultants don't believe this indicates any great affection for Unix on IBM's part. According to Kutnick, IBM announced Xenix on the AT simply because the latest version of PC-DOS (version 3.1) wasn't ready and when it is, IBM will push 3.1 over Xenix. Xenix, on the other hand, has been operational on Intel Corp.'s 80286 chip for more than a year and was the only commercially available alternative.

> **By adopting Xenix over System V, IBM can keep the many different flavors of Unix flourishing and set up what one consultant called the "FUD syndrome" — fear, uncertainty and doubt. When the market is in that position, it looks to IBM.**

"PC-DOS 3.1 with the network program will get you beyond what Xenix can do for you in the PC environment," Kutnick explained. "Their topograpical philosophy will look like a lot of PC workstations on a network clustered around an IBM host as opposed to going with Unix," Ursino said.

James Sullivan, a senior analyst for Yates Ventures, a consulting firm in Los Altos, Calif., also pointed out that the AT is not truly a Unix machine because it supports only three users. "This is not a true multiuser, multitasking machine. You only get real benefit out of Unix with from four to 16 users."

In addition, Ursino pointed out that IBM looked to Xenix because "it's still not possible to have a normal OEM relationship with AT&T like the one you can with Microsoft." In terms of the kinds of support and services that could be contracted for and the kind of response a customer can expect, that is still not available from AT&T, Ursino said.

He said two other points were also relevant: AT&T has still not announced a firm date when they will introduce a 286 version of System V Unix, and Microsoft has added a substantial amount of value to Xenix to make it more appropriate for the personal computer marketplace.

By opting for Xenix, IBM puts a substantial crimp in AT&T's plans to make Unix System V the industry standard, and that move has not gone unnoticed. "They wanted to slap (AT&T) in the face and scare them a little," Fiedler said, "but the way IBM works, they are less inclined to worry about slapping faces and more likely to think that this is a way to make the most money."

Sullivan added that by adopting Xenix over System V, IBM can keep the many different flavors of Unix flourishing. By adding to the confusion, Sullivan said, Big Blue sets up "what I call the FUD syndrome — fear, uncertainty and doubt. Whenever the market is in that position, it looks one way — to IBM."

Ironically, according to Kutnick, IBM already has Unix System V running internally on its Personal Computer AT as well as other proprietary processors. "They have no intention of offering it commercially yet," Kutnick declared.

Although IBM may not want to tip its hat to AT&T and set up the Unix market, it is more likely that it is simply following a strategy similar to that of other computer makers such as Digital Equipment Corp. and Data General Corp.

"You've invested all this money in proprietary operating systems and that effectively locks users in," Kutnick said. "You don't want a portable operating system — even though Unix is not as portable as people purport it to be — because you don't want people

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migrating processors capriciously. So I don't see any of those vendors supporting Unix actively."

Even if just tacit support, IBM's nod to Xenix has been a welcome opportunity for Microsoft. Beyond stimulating booming sales, that endorsement has helped push Xenix to standard status.

Even with just tacit support, IBM's nod to Xenix has been a welcome opportunity for Microsoft. Jerry Dunietz, senior systems engineer at Microsoft, commented, "Since IBM's announcement, interest has really taken off, largely because a lot of companies that didn't have definite Unix plans now do.".

Xenix, in fact, was already the best-selling version of Unix, with more than 77% of all Unix-based CPUs in the $6,000 to $12,000 price range, according to Yates Ventures. IBM's endorsement of Xenix, beyond stimulating booming sales, has helped push Xenix to standard status, Dunietz pointed out.

"The biggest problem in the so-called Unix market is that there hasn't been a Unix standard by which a vendor can publish packaged software," Dunietz explained. "The reason for that is there is no real binary portability standard and no media compatibility standard. So even though many systems are derived from Unix, every single one of them requires a different physical package and a different disk with different bits on the disk to get the same program running on that system.

"With the 286 microprocessor and IBM's endorsement of Xenix, that problem has been largely eliminated. With 286 Xenix, you get binary portability of applications. I think that, just as we have a media format standard in the DOS world, IBM will set the media standard in the 286 Xenix world. At that point, software vendors can publish one piece of software that will run on IBM hardware and on other vendors as well."

For third-party software developers, the status of Xenix may not be quite that crucial. Jit Saxena, president of Applix, Inc., a Southboro, Mass. software house, admitted that Xenix on the AT will be a strong factor and will attract third-party software developers simply because of IBM's presence.

But the version of Unix is just not that crucial, he said. "Somebody who is playing the hardware add-on game might be a little more sensitive to it, but we are developing applications that fit on top of the operating system. To us, there are minor differences between Unix flavors that we can easily adapt to," said Saxena.

For the management information systems (MIS) director, the interest in Unix should be welcome, Saxena pointed out. "Even though Unix has some minor problems right now, I'm sure [the MIS director] is dealing with systems that are completely different: mainframes, DOS, departmental systems, different vendors. At least with Unix, there is some sense of bringing those systems together. It should be a big help."

And Unix may just be the horse that got out before the barn door was closed, regardless of IBM's intentions. "There are a lot of people early on who expected Unix to go away because they figured the single-user multitasking networked workstation would make the need for Unix evaporate," stated Ursino. "The problem is that it has taken so long for those kinds of workstations to develop — and they are still not here — that Unix has gained critical mass."

Whether IBM can break up that critical mass now seems to be a moot point. Kutnick insisted that Unix will make it or not based on its merits as an operating system.

He warned, however, that as more and more layers of complexity are added onto Unix, people will discover Unix isn't much better than any other operating system.

"I don't see commercial end users jumping up and down on the Unix bandwagon," Kutnick declared. "They are looking for solutions, not operating systems.

"There are still not many solutions in the Unix environment. IBM will not kill Unix, but the presence of its own operating systems will effectively limit Unix' penetration in the commercial marketplace."

Rifkin is senior editor at Computerworld Focus.

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Unix Comes In Many Flavors. It's All a Matter Of Taste.

By Michael Dubrall

To the uninitiated, Unix might be considered a standard. As a matter of fact, AT&T is spending millions of dollars trying to convince U.S. businesses that this is the case. "System V, From Now On Consider It Standard" pops out of advertisements in virtually all computer publications.

However, once past the ads and into a purchase decision, a DP manager is faced with a confusing assortment of "standard" Unix types — all different, some incompatible and all considered standard by some small or not so small segment of the computer market.

This cornucopia of Unix brands came about because of the unique history of Unix as a commercial product. In the mid-1970s, only universities and the Bell system were using Unix to any degree.

By the end of the decade, a demand for the operating system was building from start-up hardware companies looking to capitalize on what they correctly perceived as a growing consumer demand for standard software. Unfortunately, during the same period, AT&T had no idea of the potential popularity of Unix. (For that matter, neither did most of the rest of the world.)

Consequently, when Onyx Systems, Inc., Altos Computer Systems, Wicat Systems, Inc., Fortune Systems Corp. and some of the other frontrunners tried to purchase Unix from AT&T, Ma Bell didn't know what all the fuss was about. So, for $43,000, AT&T granted the hardware companies rights to resell Unix. Unfortunately, the Unix sold by AT&T to hardware vendors was not so much like a product as it was a concept for programmers, and AT&T refused to make any changes or even to support the product.

In order actually to sell Unix to end users, vast changes had to be made by someone — especially in the areas of record locking, file locking, user interfaces and demand paging. Small struggling hardware companies simply did not have the expertise to effect these changes and to support the product.

The vacuum that developed was filled by Unix resellers such as Unisoft Systems Corp., Microsoft Corp., Interactive Systems Corp. Human Computing Resources Corp., The Wollongong Group and so on. These resellers all had one thing in common: They were founded by programming wizards with futuristic views on the way Unix could be used by the computing industry. Most of these companies also had strong ties with Unix-oriented universities.

Now the stage was set for the beginning of this Tower of Babel. Each software house — and some of the hardware houses — made its own changes in Unix to make the operating system more commercial. AT&T, unaccustomed as it was to rapid changes, was horrified by the whole process. It disassociated its Unix from the other Unixes. The pretenders were not allowed to be sold under the Unix label. Thus appeared Xenix (Microsoft), Uniplus + (Unisoft Systems Corp.), Zeus (Zilog, Inc.) and so on and so on. Eventually, there were so many names that the industry began to refer to the whole thing as the "Unix market."

At about the same time, other software houses saw the potential in the Unix market. They decided they didn't need AT&T. They wrote their own operating systems, loosely based on the principles of Unix but without the hassle or expense of dealing directly with AT&T. In this category, brand names like Coherent (Mark Williams Co.), Idris (Whitesmiths Ltd.), Oasis (Phase One Systems, Inc.) and QNX (Quantum Software Systems, Inc.) appeared. All these vendors have had some degree of success in the Unix marketplace.

By the end of 1982, when divestiture was becoming more of a reality than a threat, someone at AT&T woke up to the commercial potential of Unix, both as a pull-through product for hardware and as a source of revenue. The strategic value of controlling an industry standard operating system was also an issue.

AT&T made some effort to standardize the Unix market, but its stubborn refusal to unbundle the product has only strengthened the position of Unix competitors, especially in the microcomputer marketplace. Unix is a large and powerful operating system. If you purchase it on floppies, you could have up to 25 of them to sort through, more than enough to fill the disk capacity of a microcomputer.

Most microcomputer users did not require the more than 200 utility programs that come with standard AT&T Unix. This market demanded something less. Because AT&T wouldn't sell an unbundled version of Unix, microcomputer manufacturers requiring Unix capabilities went to Microsoft for their micro Xenix, turned to one of the unlicensed products available, or adapted Unix to fit their needs. At present, 30 to 35 commercial versions exist in the Unix marketplace.

In a market as segmented as this one, everyone has his own idea about what is real Unix and what is a Unix look-alike. For the purposes of this article, a look-alike will be defined as any operating system that is not AT&T Unix but still advertises that it is Unix-compatible or otherwise tries to score points by claiming similarities between itself and AT&T Unix. It is unfortunate that this eliminates some otherwise interesting companies and operating systems in the multiuser market. The most publicized of these include the S1 and Pick and Associates, Inc.'s Pick System.

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System III	AT&T		
System V	AT&T		
TNIX	Tektronix		
Ultrix	DEC		
Unidos	Unidos		
Uni Plus +	Unisoft		
Unisis	Codata		
Unity	HCR		
UTS	Amdahl		
Venix	Venturecom		
Version VII	AT&T		
VM/IX	IBM/Interactive		
Writers Workbench	AT&T		
Xenix	Microsoft		
Zeus	Zilog		

Figure 1. The Unix Market

The Unix look-alikes described in this article were chosen to illustrate the breadth of the market. A partial list of other Unix look-alikes can be found in Figure 1.

Xenix,
Microsoft Corp.,
Bellevue, Wash.

Xenix is by far the most popular Unix look-alike on the market today. According to Kirsten Sanders, market analyst at Yates Ventures, a Unix-oriented research company, "About 50% to 60% of the Unix installed base in the U.S. is running Xenix, and the actual installed base will grow significantly next year because of the IBM Personal Computer AT and its clones, which will all be available with Xenix."

Xenix was developed out of AT&T's Unix Version 7 and was recently upgraded to System III. Microsoft remains noncommital about the prospect of upgrading Xenix 3.0 to Xenix 5.0 to match AT&T. Its success had been the result of two good marketing decisions by Microsoft and some far-sighted technical planning by Bill Gates and his associates.

The first of Microsoft's two marketing decisions was to sell Xenix only to the few hardware vendors with the potential to ship large numbers of Xenix to minimize support problems. In its second decision, Microsoft unbundled the product to cut down on system overhead and to reduce prices to users that did

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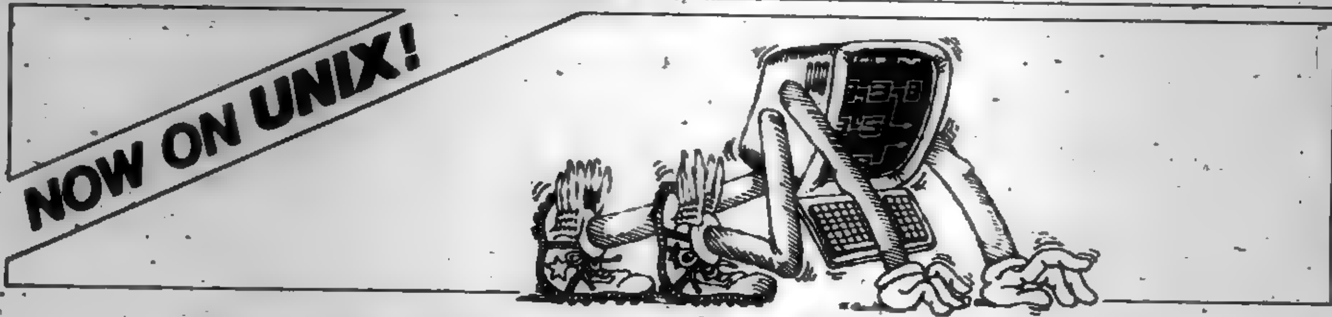

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not require all the Unix utilities. Today, top hardware shippers like Tandy Corp. and Altos Computer Systems offer hardware running Xenix, and IBM soon will.

Technically, Microsoft has been moving Xenix and MS-DOS closer together in anticipation of the networking of the two operating systems. The new MS-DOS 2.00 includes tree-structured directories and device drivers modeled after Xenix, and both operating systems can reside on the same hard disk. Today, it is relatively easy to network several personal computers running MS-DOS with a Xenix file server, a strategy IBM will no doubt exploit with its upcoming PC AT.

4.1, 4.2 BSD
University of California
at Berkeley
Berkeley, Calif.

A great many people will tell you that 4.1 BSD (which stands for Berkeley Software Distribution) is not a look-alike, that it is the Unix standard. To them, AT&T Unix is just a cheap imitation.

Because Unix was developed at Berkeley, the school has always been an influential force in the technical evolution of the operating system. During the 1970s, Berkeley programmers, led by wizard Bill Joy and AT&T techies, enhanced Unix more or less in tandem.

By 1980, however, Berkeley Unix parted company with AT&T System III. Berkeley programmers continued to optimize their Unix for development while AT&T was turning its attention to the commercial arena.

Today, 4.2 BSD has a very fast file system which allows fast processing of large I/O blocks without undue system overhead. It is reputed to have the best C-language compiler available, and 4.2 BSD comes with a great many more utilities than does AT&T Unix.

Many of the utilities written at Berkeley have been picked up by hardware manufacturers, including AT&T, for their own versions of Unix. Prime examples are Berkeley Termcap and vi, which are mostly standard among the different Unix types.

The developing computer-aided design and manufacturing area of the Unix market is dominated by 4.2 BSD. Sun Microsystems, Inc. with technical guidance from Bill Joy, promotes and sells Berkeley Unix. Ultrix, sold by Digital Equipment Corp., is also based on 4.2 BSD.

UTS (Universal Time Share)
Amdahl Corp.
Sunnyvale, Calif.

Many DP professionals don't yet realize it, but Unix is already available for mainframe computers supporting full-duplex Ascii terminals. The product, UTS, is a hybrid of AT&T's System V, largely rewritten to take advantage of the power of the Amdahl 5860 and 5870 computers.

Reportedly, this Unix runs 20 frames faster on Amdahl hardware than on the competing VAX-11/70 sold by DEC. This performance is enough to make AT&T seriously consider the certification of UTS as "the mainframe Unix."

What's more, jobs can be submitted from UTS to IBM's proprietary MVS operating system via high-speed communication lines or channel-to-channel adapters. The resulting information can then be transmitted back to UTS for storage or further processing.

The most interesting point about UTS is not its technical attributes, but rather the effect this product has had on IBM.

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The marketing strategy for UTS has been little short of brilliant. Amdahl made UTS available not only on its own hardware, but also on IBM hardware. Such was the demand for Unix in the IBM environment that dozens of 370s were soon outfitted with UTS.

This gave Amdahl a credible presence at major IBM customer installations. Imagine the surprise of IBM salespeople and service representatives when they encountered an Amdahl support person working on "their" machine in a previously all-IBM shop.

It is this situation, more than anything else, that has forced IBM to acknowledge the importance of Unix. IBM Unix became a foregone conclusion with the introduction of UTS and its acceptance by IBM customers.

> **With the introduction of UTS and its acceptance by IBM customers, IBM Unix became a foregone conclusion.**

Venix
Venturcom, Inc.
Maynard, Mass.

Venix is one of a slew of Version 7 derivatives or compatibles that were modified specifically to run on microcomputers (others include FOR: PRO, Xenix, Coherent and Ultrix). Venix has kept up with Unix evolution, moving first to System III and then System V. Venturcom markets Venix as a full and licensed version of Unix.

Beginning in 1980, Venix has been sold primarily on DEC hardware. It is presently available on the entire 11/70 family, including the new PDP-11/73, and on the DEC Micro 11 and Professional. The Rainbow version of Venix will be available soon. Venix has also been ported to many computers powered by Intel Corp. 8086/8088 microprocessors, including the IBM Personal Computer XT and the AT&T 6300.

Venix is especially attractive for the scientific and research markets because of its real-time data acquisition capabilities. It allows for intensive data input without slowing the speed of the operating system or affecting the background processes.

QNX
Quantum Software Systems, Inc.
Ontario, Canada

Employees of Quantum Software go out of their way to point out that QNX is not a Unix derivative and is not controlled by AT&T. In fact, they even changed the name of the product (from Qunix) and repositioned QNX to create a QNX market, as opposed to a Unix market. Most analysts have yet to accept this concept.

Whatever the analysts think, QNX is successfully carving out a niche for itself as a multiuser, multitasking operating system for personal computers. QNX has been ported to most personal computers, including the IBM PC XT and PC AT.

The major selling features of QNX are its size and its price. The operating requires only 128K bytes of random access memory (RAM) to operate efficiently. A license for 10 users, including about 50 utility programs, costs only $650.

Quantum has recently reached an agreement with the Canadian Board of Education to supply QNX running on Canadian Icon personal computers. With hundreds of Canadian students learning to use QNX, future prospects for Quantum Software seem bright.

Oasis
Oasis Technology/
Phase One Systems, Inc.
Oakland, Calif.

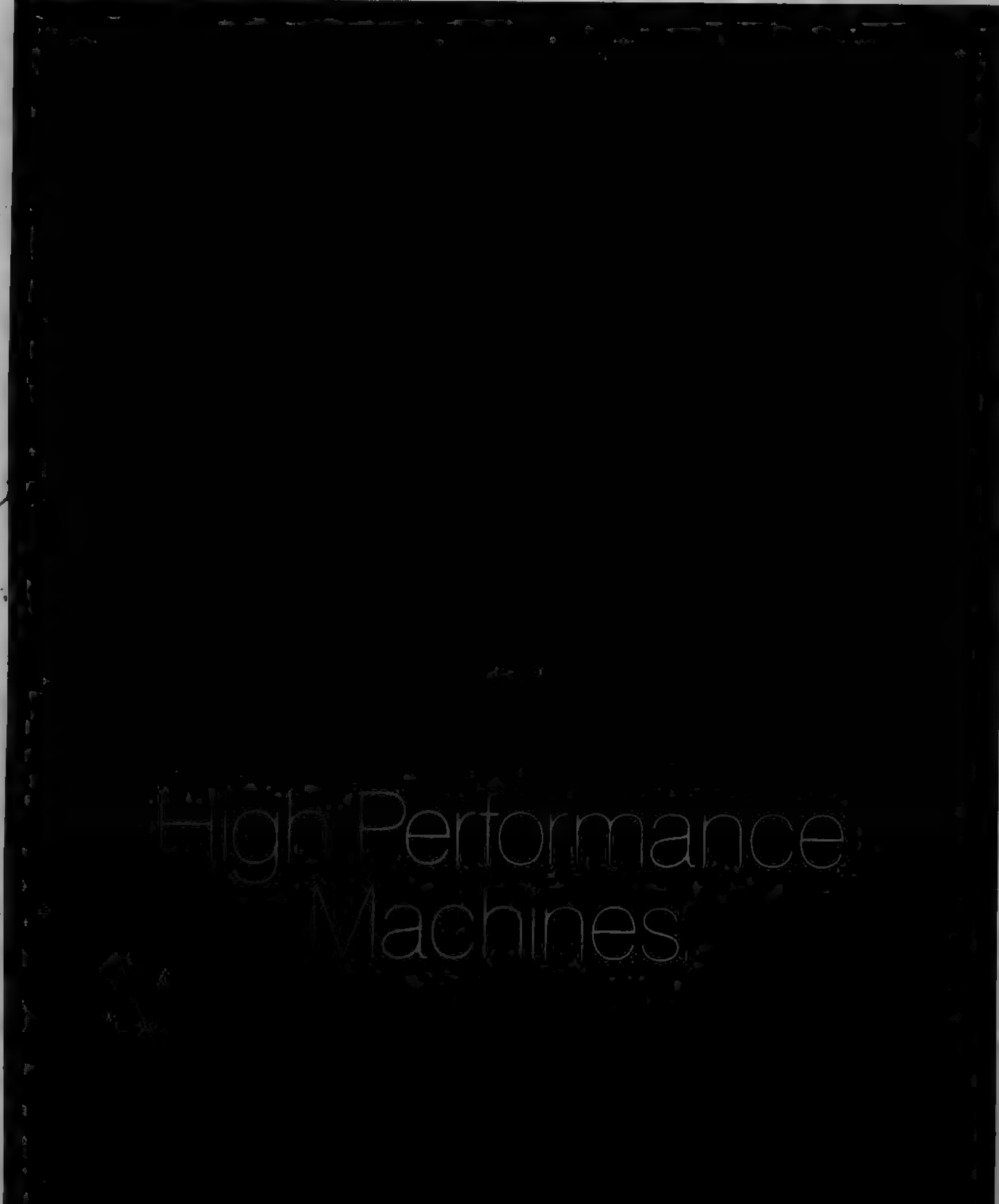
"Oasis is designed for business users using business applications in a business environment," Joel Laffittee of Oasis Technology said. This may sound a bit like an hyperbole, but ease of use is a major characteristic of Oasis.

This usability has attracted more than 200 software houses worldwide to provide applications for Oasis. The product has been adapted to make impressive inroads into the medical, dental, legal and other vertical markets. Almost a third of the installations are outside the U.S., mostly in Europe.

Oasis is not a derivative of Unix and does not generate royalty payments for AT&T. Instead, developer Tim Williams looked to the VM/CMS software offered for the IBM 370 for a model. The first pass was simply a control program, designed to sell the hardware on which it was running. When the customer showed more interest in the software than in the hardware, Williams turned the program into an operating system by 1978.

Oasis features English-like commands and is designed to be user-friendly from login to logoff. It is available for most computers with Intel microprocessors, including Tandy, Altos, Onyx and Seiko Instrument, Inc.

Dubrall is director of independent software marketing, Pacific Group, of NCR International, Inc.



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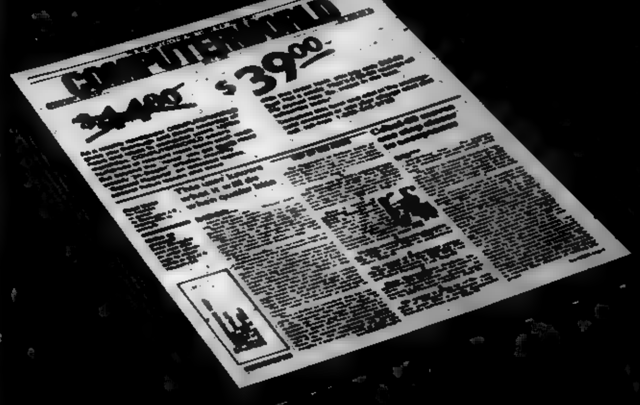
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There Is Software. Here's a Look At Word Processing.

By Joann Jackson

One of the most dynamic parts of the industry is the word processing software market; more WP packages have been sold for general office and home use than any other type of application software.

The growing acceptance of the Unix operating system from AT&T's Bell Laboratories has led to the introduction of new Unix-based systems by leading manufacturers: IBM, Hewlett-Packard Co., Digital Equipment Corp., NCR Corp., Tandy Corp., Burroughs Corp. and Honeywell, Inc. Other 16-bit and 32-bit manufacturers of multiuser systems — such as Altos Computer Systems, Inc., Fortune Systems Corp., Plexus Computer, Inc., Sun Microsystems, Inc. and Pyramid Technology Corp. — standardized on Unix from start-up. The bid by AT&T with its Unix-based processors for a large slice of the office systems market adds another dimension to the competition.

The growing number of existing hardware companies and new computer manufacturers offering Unix systems for general business use has created a high demand for application software.

A recent study, *Unix Word Processing Software: A Market Analysis*, by Yates Ventures, analyzed market growth potential and software suppliers. Vendor revenue from WP was a modest $6.5 million in 1983, representing sales of 12,000 packages in the U.S. The anticipated success of hardware companies selling and supporting Unix in the high-end multiuser business market has resulted in a forecast of 145,000 product sales and $65 million in vendor revenue from Unix WP software by 1987.

As of 1984, 28,500 units had been installed; top leaders were Fortune (29%), Tandy (22%), Quadratron (17%) and Horizon (13%). The three major distribution channels used by Unix software suppliers are hardware companies with independent software vendor programs, system integrators and software publishers.

Annual Unix hardware consumption (units actually installed at end-user sites) is forecasted at 341,000 units by 1987 (see Figure 1 on Page 50). Penetration ratios of Unix installations with WP will grow from 18% of hardware consumed in 1983 to 42% by 1987. The emergence of "all in one" packages with WP and other applications such as graphics, data base management systems (DBMS) and communications will have an impact on stand-alone sales of WP software shipments in the 1986/87 timeframe.

Current suppliers of stand-alone Unix WP packages consist of 13 independent software companies and three hardware manufacturers marketing proprietary packages. Market leaders in both units installed and sales revenue are two hardware companies: Fortune and Tandy. Fortune has achieved the highest penetration rate of hardware shipments with WP of any hardware company interviewed — 97% of its hardware shipments goes out with Fortune: Word or Extended Fortune: Word. Tandy's Scripsit 16 is not considered a viable commercial grade WP product by most competitors, but has achieved a high degree of sales in user installations of the TRS Model 16.

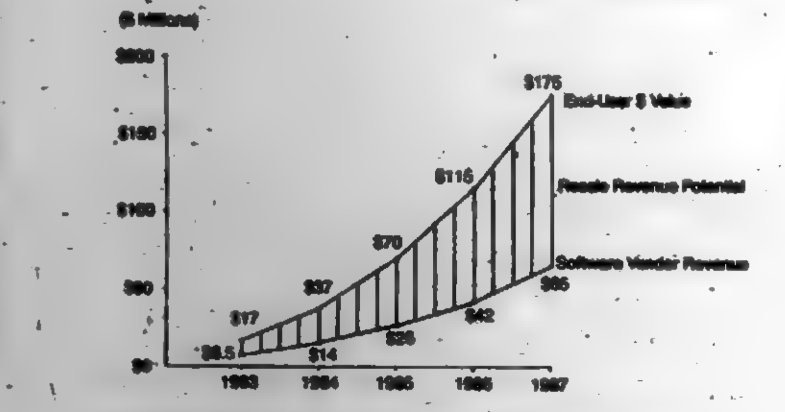


Figure 1. Unix Word Processing Software: U.S. revenue

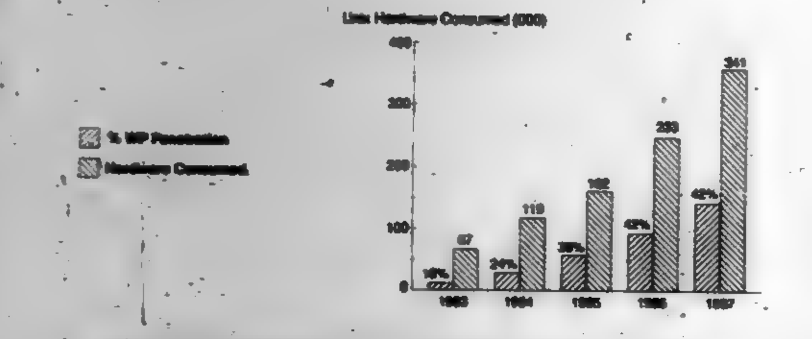
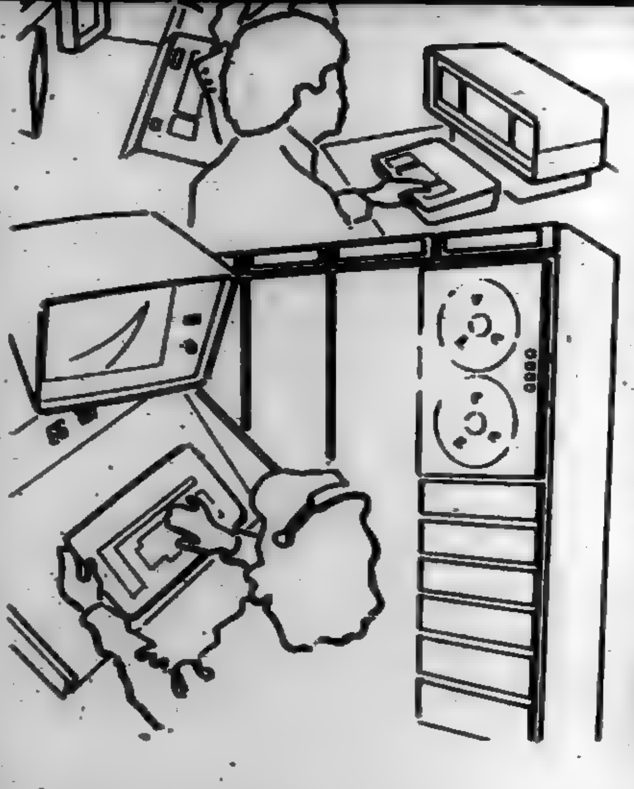


Figure 2. Unix WP Software Penetration Ratios, U.S.

Feature / Software Suppliers	Applied Technology Ventures	Computer Methods Corp.	Convergent Technology, Inc.	EEC Systems	Fortune Systems Corp.	Interactive Systems	Handle Technologies	Mark Software	Quadratron Systems	[illegible]	Santa Cruz Operation	[illegible]	[illegible]	TYX Corp.	Tandy Corp.	Venturcom, Inc.
Spelling Dictionary		●		●	●		●	●	●	●		●	‡	●		
Ability to process WP documents created elsewhere		●	●	●	●				●	●	●	●	●		●	●
Screen-oriented	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Automatic generation of: footnotes	‡	●		●	●	●	●	‡	●	●	‡			●		●
Indexes	‡	●		●	●		‡	‡	●		‡	●	‡	●		●
Table of contents	●	●		●	●		●	‡	●	●	‡	●	‡			
Mail merge	●	●	●	●	●		●	●	●	●	●	●	‡	●	●	
Columnar math	●	●		●	●		●	‡	●	●		●		●	●	
Calculator operations	●			●	●		●		●	●		●		●		
Saved phrase library		●	●	●	●	●	●	●	●	●	●	●	‡	●	●	
Macros		●		●	●	●		‡	●		●	●	●	●	●	
Menu suppression		●		●	●			●	●	●	●		●		●	●
Windows: split screen			●	●	●				●		‡			●		●
Multiple files			●	●	●	●	●		●		‡			●		
Sorting	●	●		●			●	‡	●	●		●	‡	●		
Display Greek symbols		●	●	●				●	●	‡	●	‡		‡		●
Display scientific symbols		●	●	●			●	●	●	‡	●	‡		●		
Foreign language		●	●	●	●			●	●	●	●	‡		●		
Interface with: stand-alone word processors			●	●					●	●			●	●		
Graphic printers		●	●	●			●		●		●			●		●
Multifont capability		●	●	●			●	●			●	●		●	●	●
Multiple printers	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●

● Companies interviewed indicated these features were available. Yates Ventures and *Computerworld Focus* can not, however, guarantee their existence or functional capabilities.
‡ Planned feature

Figure 3. Available Features



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Software Suppliers		AT&T	Altos Computer Systems, Inc.	Apple Computer, Inc. (Lisa)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Zilog, Inc.
Applied Technology Ventures	(Uniword)	‡						●							●	●								
Computer Methods	(XED)	●					●	●							●		●		●	●				●
Convergent Technologies, Inc.	(Ctix WP)						●																	
EEC Systems, Inc.	(LEX)		●					●																
Fortune Systems Corp.	(Fortune:Word)									●														
Handle Corp.	(Handle Writer)	●					‡																	
Interactive Systems	(Inword)							●				●												
Mark Software	(Word Marc)	‡						●			●			●	●			●		●				
Quadratron Software	(Q-One)		●	●		●		●	●	●		●	●		●	●	●	●	●					●
R Systems	(Rword)		●	●									‡		●	●	●							
Santa Cruz Opns.	(Lyrix)	●	●	●				●				●	●		●		●	●			●	●		●
Softest, Inc.	(LEX)	‡	●	●	●	●			●			●	●	●	●	●	●				●	●		
Syntactics	(Crystal Writer)	‡	●		●	●	●	‡	●			‡			●		●							
TYX Corp.	(Tyxword)										●	●			●		●	‡						‡
Tandy Corp.	(Scripsit 16)																				●			
Venturcom Inc.	(Final Word)							●			●		●		●									

● Available ‡ Planned

Computer Manufacturers

Figure 4. Hardware Availability

Computer Methods, the first independent software company to introduce a Unix WP package, achieved early success by selling to the government and international marketplace (it has the only Unix WP package that meets government specifications). Worldwide sales of XED would rank Computer Methods first among the independents in both sales and units installed in 1984. Quadratron, formed in 1983, has been the most successful marketer of the independents. By signing ISV licensing agreements with numerous hardware companies, Quadratron grabbed a 17% market share of unit installations and 8% of vendor revenue during its first year.

Horizon Software, with 13% of unit shipments and 3% of sales in 1984, has dropped its stand-alone WP package and is now concentrating on selling an all-in-one package for WP and spreadsheets. Due to higher pricing of WP products on minis, Mark Software achieved a 6% market share in vendor revenue by selling to DEC VAX and Pyramid installations.

To ensure success and acceptance in a sophisticated buyers market, most developers of Unix WP have incorporated a number of feature enhancements in their products. Spelling dictionaries, macros, menu suppression, saved-phrase libraries, automatic generation of indexes and table of contents and mail/merge capabilities are commonly found. Some of the more advanced features — calculator operations, columnar math, windows, sorting and displaying Greek and scientific symbols — are also found on some products.

Software pricing set by most companies depends more on machine size than on feature availability. End-user prices ranged from $495 on a Motorola/Four-Phase system to $8,900 for a high-end DEC VAX. Considering the products are all sold on multiuser systems, the average cost per workstation was generally under $100.

The availability of WP products on Unix hardware is becoming less of a problem. Most software companies offer versions for several manufacturers' systems or are working on new ports. Users have a choice of a number of products for NCR, DEC, Plexus, Altos, IBM PC XT and Intel systems. Product availability for AT&T's systems will improve by early 1985 as several new products are released.

Paralleling the success of PC products like 1-2-3, several Unix software companies have opted to develop "all-in-one" packages for the general business market. Users wanting WP, spreadsheets, graphics and other integrated applications can choose from several products:

- Alis (Applix): WP, spreadsheet, graphics, list management, calendar management and communications.
- Latitude (Horizon Software): WP and spreadsheet.
- Officeware (Century Business Technologies): WP, DBMS, graphics, spreadsheet, calendar and phone directory.
- Prevail (Inspiration Systems): WP, DBMS, spreadsheet, application development language, report writer and telecommunications.
- Uniplex II (Uniplex Integration Systems): WP, DBMS, forms generator, spreadsheet and phone directory.

Jackson is a senior analyst with Yates Ventures, Inc. in Los Altos, Calif.

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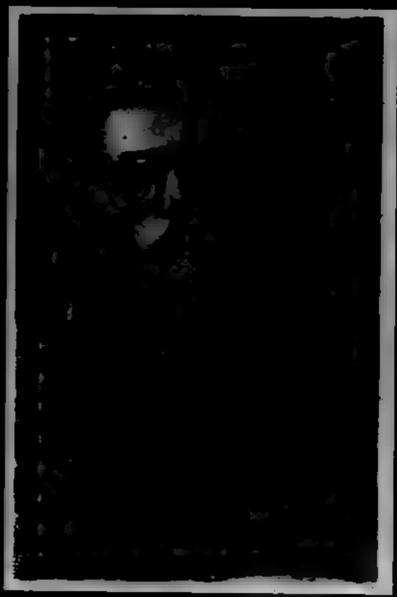
Existing networks aren't going to go away just because we hope for standards.

Unix provides a base on which there is commonality, at least to programmers.

BILL JOY

Bill Joy, 30, has probably had more influence over the current direction of the Unix operating system than anyone not affiliated with AT&T or Microsoft Corp. Joy is credited with creating the 4.2 Berkeley Software Distribution (4.2 BSD) version of Unix, the version used most prevalently on minicomputers in high-tech firms and in universities. His vision has helped bring Unix out from under the programmer's mantle to a more user-oriented focus. Joy helped found Sun Microsystems, Inc., where he is vice-president for research and development and is continuing his work with Unix in Sun's laboratories. Joy recently met with Computerworld Focus Senior Editor Glenn Rifkin to talk about his work.



[illegible] As a result, [illegible] so much focus on the [illegible] system, there's more [illegible] Unix is essentially a platform for [illegible] You [illegible] different systems [illegible] the protocols rather than the operating system. 4.2 was [illegible] designed to operate in that [illegible] communications [illegible] environment.

Are there other Unix enhancements [illegible] for networking?

[illegible] comprehensive [illegible] providing new net[illegible] and a new way of [illegible] networking, with 4.2 we [illegible] to abstract some common [illegible] from the network protocols. We really tried to provide a [illegible]

[illegible] to gateway [illegible] believe [illegible] about [illegible] internationally [illegible] protocols [illegible] the world. But there are [illegible] other [illegible] 4.2 has a framework for dealing with protocols as long as they aren't [illegible] accessible.

Is the operating system [illegible] at all?

Ultimately, the most important things are the protocols and the applications programs. The operating system is important because [illegible]

[illegible] of Unix as [illegible] If you think about the [illegible] It's not the operating system that's important. I think operating systems will become less important, only because other things are becoming more important.

Like user interfaces?

One of the revolutionary things about the Apple Macintosh is not that it can have a mouse and the IBM PC cannot. The revolutionary thing is that the Mac provides a standard way of using the mouse in the menus; you don't have to relearn how to use it each time you sit down and put in a different application program.

Getting to a standard new set of applications is fairly difficult. The trouble is, there's not a high [illegible] common level that everyone can go in and easily add applications to. That's the nice thing Unix provides — a level at which [illegible]

[illegible] you haven't been [illegible]

[illegible]?

That's an open question. The world is making a transition from character-mapped to bit-mapped, and graphics displays and products like the Mac prove you can have bit-mapped on almost every machine. Perhaps the most creative people will go in and work on a bit-mapped sort of environment. The focus is at the application level. I'm not sure those kinds of things will emerge at the Unix command level, not for the problem of document preparation. If you take a view that the procedures and communications in an organization have to be defined in a new way that is appropriate to the office medium, then that gives you more of a chance of using the power of Unix.

What does the Fortune 500 MIS manager need to know about Unix for that environment?

What you're going to see in your environment over the next couple of years is a number of different machines with a range of computing power. In looking at the kind of software IBM has to offer, you notice there are different operating systems running on all the machines. So you don't have a clean migration of programs between machines of different sizes. They can communicate through some fairly complicated protocols, but not in a very convenient way. And with things getting cheaper so quickly and people getting more connected — for example, the MIS department is going to be connected with the engineering department — Unix can be used as vehicle for people to communicate with each other.

The people who know about state-of-the-art stuff coming out of the universities are trained in Unix. I think you'll see Unix boxes running a lot more sophisticated data analysis model programs for corporate management — programs that are too big to run on personal computers.

Some consultants say Unix will be a nonissue in two years, and that it's overrated for the commercial market.

The kinds of applications we see running on microcomputers today are incredibly primitive. They barely scratch the surface in what you can do to make people more productive. They are typically very clumsy and slow. But people tend to not be very critical of them because these applications are so much better than the ones people had before. Take a process that is incredibly inefficient and switch it to a microcomputer. It's already a helluva lot better. But there's so much room for improvement — for making things more productive — that you're going to see new generations of software.

Take some of the office software you see on a Wang or IBM PC. We could show you a document preparation system that runs on a Unix-based Sun and an information management system that runs on a network of Suns. They're so much better that you have to think of them as a different generation.

It's almost indescribable. It's realtime; it's formatted. It's state of the art in document preparation, and it's basically five to 10 years of research ahead of the people who did the word processors.

Unix has been criticized in the micro

Joy in Unixville

Though Unix was created in Bell Laboratories in New Jersey, the University of California at Berkeley became a hotbed for Unix development in the 1970s.

Most influential in Berkeley's Unix effort was a young computer science graduate student named Bill Joy, who came to the campus in 1975 from his native Michigan. Joy and his colleagues got deeply involved with Unix almost immediately, creating enhancements for Version 6 to meet certain educational needs. Joy spearheaded the early releases — BSD and 2 BSD — which were sold for $150 to hundreds of universities and research labs. He also added Pascal and several other capabilities for use of Unix on Digital Equipment Corp.'s PDP-11s.

In late 1978, Berkeley was one of the first to acquire DEC's new and powerful VAX supermini, along with an early release of Unix for the VAX from Bell Labs. For Joy, that signaled the opportunity to get to the heart of Unix.

Among Joy's considerable contributions was his creation of the C shell command interpreter, the vi screen editor and the Berkeley paging kernel.

It was at that time that Darpa, the Defense Department's Advanced Research Projects Agency, was wrestling with the decision of whether to switch to Unix as the base for its research.

Darpa went with Unix and in 1981 gave a contract to Joy's Berkeley group. By mid-1982, a community of research people from such places as Stanford and Carnegie-Mellon universities, University of Southern California as well as Bolt Beranek & Newman, Inc. (BBN) got together at Berkeley, and a new version of Unix — designated 4.2 BSD, emerged.

Joy himself wrote the design documents and created the virtual memory enhancement for 4.2. Kirk McKusick added the high-performance file system, and Sam Leffler added the networking capabilities. The actual code for 4.2 came from BBN. Joy is quick to point out, however, that the design was a joint effort that made use of a lot of varied resources from different installed bases.

After his success with 4.2, Joy left Berkeley, having completed a master's degree in electrical engineering and computer science. Before finishing his Ph.D., Joy was recruited by Scott McNealy to co-found Sun Microsystems, Inc., a manufacturer of Unix-based high-performance workstations for the technical marketplace. He continued to consult with the Berkeley group until July 1984.

Despite his entrance into the business world, Joy has not abandoned his idealistic pursuit of science. As vice-president of research and development, he essentially spends his time getting major development work started, but he is also down in the trenches getting his hands dirty. He has, he feels, created an ideal environment for his inventive and searching psyche. "I don't report to anyone and nobody reports to me," he said, smiling.

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environment as not being friendly enough. Do you agree?

Unix' value is not in its current set of application programs. As a program development environment, it's probably the best. As an end-user tool, you're going to see a little more closed environment. There are already products people have created for doing a specific function where you sit down in front of the machine and that's the environment you're in. They particularize the interface to those application areas.

Are these specific programs based on the 4.2 enhancements?

The applications will probably run on any version of Unix. But a lot of them are taking advantage of facilities in 4.2 to manage bit maps and concurrency and especially to use the network to support them.

Not many commercial installations are using 4.2. Why?

They may not be using the enhancements because they're not using Unix. Until a year or two ago, the primary delivery vehicle for Unix was the VAX. Almost all the universities, labs and engineering companies running Unix on the VAX used the Berkeley release because it was most suitable. System V is important if it can deliver a large range of applications programs across a wide range of machines.

The other thing to notice is that applications are market-oriented, not machine-oriented. You can't really expect all applications to have the same needs; it's not unthinkable that one version of Unix exists for the most advanced environment and another version for an environment where the cost issue prevents using the more expensive micros and a lot more memory.

What is your involvement in any further work on 4.2?

There's not going to be that much change to the system interface in the future. We did a fairly good job of getting it right. Mostly what's being done is implementation; we're running a lot more code to implement things that are already in the design.

But 4.2 is a very stable system; you won't see the amount of change in 4.2 over the next few years that you'll see in System V or in MS-DOS. MS-DOS changes fairly regularly because a lot is missing.

What is your projection for Unix and the marketplace five years down the road?

You can see five years from now what kind of machines will be available. A nicely configured Sun costs $20,000 today. In 1990, it will cost a quarter of that. You'll see well-integrated software working in an environment where machines communicate information with each other. We'll see systems that are more customer-programmable, and languages in that environment for people who aren't experts at programming. We'll also see the integration of a lot of the software used today on research systems. You won't find anything in widespread use that isn't already out there today in a research prototype.

Unix is probably going to be code in read-only memory that glues you into the network environment and just lets you run all these applications programs, whether you run Smalltalk, Prolog or All-In-One. You should be able to run all those things concurrently. The best way to think of Unix is as a sophisticated virtual machine. It'll be around for a long time.' ■

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RON CHIRONNA

What's The Prognosis For Unix In the Office?

By John Butler

Unix has been widely discussed as a potential supporting operating system for tomorrow's office automation systems. Advantages such as transportability, ability to support communications and multitasking capabilities must be weighed against Unix' disadvantages, including its somewhat difficult-to-use interface.

Before the pros and cons of using Unix in the OA environment can be accurately assessed, it is necessary to lay some groundwork. What characteristics should an advanced office system have? What demands will such a system place on an operating system?

Two different classes of software are used in office applications today: integrated personal computer software and integrated office automation systems. Although each calls itself integrated, each lacks the important integration capabilities of the other.

Integrated personal computer software has pioneered in the area of analytical applications for professionals, such as spreadsheet and graphics. High-quality word processing software has also become available for personal computers recently. In addition, the user interfaces to these applications have become fairly well integrated in the better systems.

However, personal computers usually lack facilities for sophisticated communications because these machines were originally aimed at the individual user. Microsoft Corp.'s MS-DOS's lack of multitasking is one prominent example of this situation.

Some form of multitasking is a practical requirement for monitoring a local-area network while also permitting application processing. For this reason, integrated personal computer software does not typically offer application solutions that take advantage of communications. "Every man is an island" is the assumption of most personal computer software; every user has his own data and works as an individual.

A next-generation office system should combine the analytical, problem-solving capabilities of personal computer software and the information-sharing and communications benefits of OA software.

In contrast, studies that have been done of office workers show that most professionals, especially managers, spend the largest portion of their time communicating, coordinating and trying to "work as a team." Personal computers therefore need to be integrated with the fundamental communications systems of the office.

The other class of office application software, integrated OA systems, has excelled in office communications solutions. This software typically arose out of a combination of traditional WP and traditional interactive minicomputer technology.

Convenient electronic mail and messaging applications, group information-sharing capabilities, shared resource and calendar scheduling and shared administrative support applications have been added to a WP base. The multiuser, multitasking facilities of typical minicomputer operating systems have been the basis for these capabilities. Again, the user interface is integrated across applications in the better systems.

In the areas of analytical support applications and user interface technology, however, this class of software has not kept up with integrated personal computer software. Spreadsheets are generally weaker than those available from independent software suppliers for personal computers, and graphics are often poorly integrated with the rest of the applications.

A final point is that much of this office automation software does not make effective, flexible use of the distributed computing capabilities of workstations or personal computers. It frequently requires that a shared minicomputer act as a hub, an architecture derived from the timesharing era of interactive computing.

Both personal computer and OA software meet important needs of the office. Each has strengths where the other has weaknesses; each is integrated where the other is not.

A next-generation office system should combine the strengths of these two classes of software — the analytical, problem-solving capabilities of personal computer software and the information-sharing and communications benefits of OA software.

This office system should be able to exploit the potential of the new generation of workstations, such as the IBM Personal Computer AT. But it should also be able to use departmentally shared machines.

For example, one end-user establishment may be dominated by users at terminals on shared servers with just a few users at workstation nodes; another may be mostly workstation nodes with few or no users of shared servers as application processors.

Furthermore, communicating nodes could be linked by a local-area network, a private branch exchange or a common carrier-based network.

The user, in any case, should perceive exactly the same information sharing and logical communications capabilities.

An advanced office system should also provide a consistent and easy-to-use multiwindow interface. These communications and multiwindow capabilities make multitasking a practical requirement.

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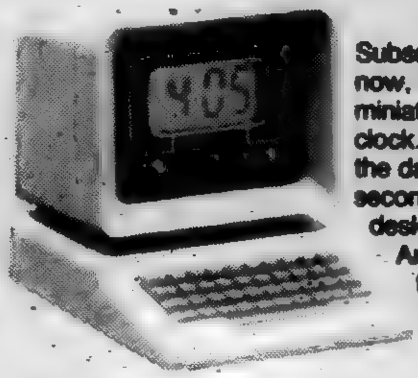

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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business graphics and data base in a single document is desirable. An advanced system should allow users to combine all types of information in a single document and to edit them in their native way.

> **On technical grounds, many proprietary operating systems would be adequate foundations for an advanced office system. Their technical disadvantage is that they have grown too large for use on cost-effective microprocessor-based systems.**

For example, such an advanced system would permit a user to add diagrams to illustrate what is being said in words. This capability would allow the user to see the entire document taking shape at once, knowing it would be easy to come back and edit any part later.

Advanced systems should have an open architecture to support a document-based integration of information types; to provide a consistent, overall information management setting; to support network-based communications; to be modular and facilitate portability and customization; and to support future display requirements of information types such as digitized voice or scanned images.

These are the characteristics an advanced office system should have. What are the available operating system alternatives upon which such an office system might be built?

Operating systems can be divided into two groups — proprietary operating systems and licensed transportable operating systems. Proprietary systems run on only one brand of equipment. This situation exists either through design — for example, because the systems have been written in assembler — or through the business policy of the owners of the systems — for example, VMS for Digital Equipment Corp.'s VAX machines.

In contrast, transportable operating systems are made widely available by their owners. This is facilitated, as in the case of Unix, by their being written entirely in a high-level language. MS-DOS and CPM are other examples of transportable operating systems.

Many proprietary operating systems would on technical grounds be adequate foundations for an advanced office system.

Although all operating systems reflect technical tradeoffs and none is perfect for OA, many of the popular minicomputer operating systems, such as VAX VMS or AOS/VS, are reasonable technical bases. Such systems offer the desired multiuser, multitasking capability. They can respond to terminal I/O on a character-by-character basis and they also lend themselves to easy process creation and peer-to-peer networking capabilities. These characteristics also apply to Unix. In many cases, the technical disadvantage of the proprietary systems is that they have grown too large for use on cost-effective microprocessor-based systems.

Other proprietary operating systems pose technical impediments to OA applications. Typical mainframe operating systems, such as DOS/VSE and MVS, fall into this group. Because of their batch origins, process creation tends to be too costly in terms of computing resources, and terminal I/O is block-mode, oriented toward transaction processing. The former limitation makes it impossible to devote multiple processes to a single user, as is desirable in handling documents that mix graphics, text and voice, for example. The block-type I/O makes visually responsive office applications such as WP very difficult.

Apart from the technical pluses and minuses, however, the single largest deficiency of all proprietary systems is that, by their nature, they are limited to a single brand or type of equipment.

In contrast, end users can realize three distinct benefits through the widespread use of transportable rather than proprietary operating systems for OA.

- The lack of an office system that can run on a wide range of hardware such as IBM Personal Computers, DEC VAX machines and IBM 4300 systems is a major problem today. This situation has spawned attempts to glue the differing office systems together with document format converters of various kinds. At best, this results in a feeble integration that greatly reduces the communications

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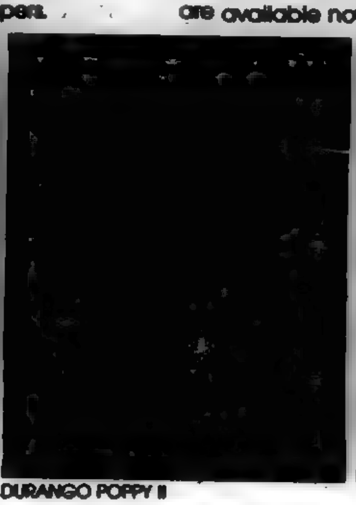

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capabilities for which office systems are bought.

Contrast this with the use of a transportable operating system, which provides a common foundation upon which a unified office automation system can exist. Without that common foundation, the task of porting an office system to all the different proprietary operating systems becomes almost impossible. With a transportable operating system, a single organization can choose from a variety of hardware vendors, yet still be able to run a single operating system and office system.

A common operating system spanning a wide range of office hardware represents a large market base for application software. This large market base in turn stimulates independent software development, resulting in a wider selection and higher quality of software for the end user. An example of this trend can be found in the abundance of software provided for MS-DOS after it emerged as the standard operating system of 16-bit personal computers.

With a standard operating system and an OA system tied to it (and not to the underlying hardware), the end user is free to price-shop for hardware among a variety of vendors. This tends to lower hardware prices, even for those who consistently choose one or a limited number of brands.

The inherent advantages of transportable operating systems would not be sufficient to overcome the desire of many hardware vendors to continue to promote proprietary operating systems, were it not for the powerful pressure applied by high-volume, high-performance microprocessors.

Contemporary chip sets such as the Intel Corp. 80286 family and the Motorola, Inc. 68000 family offer for low- to mid-size processing loads computing economy unmatched by comparatively low-volume proprietary computer architectures. Yet, these chips typically were introduced into the industry without proprietary operating systems.

As a result of this situation, many manufacturers eager to exploit the potential of these chips have turned to transportable operating systems such as MS-DOS and Unix.

Given the end-user advantages and the microprocessor technology pressures, a move toward far greater use of transportable operating systems as a basis for OA is likely, and the serious contenders are MS-DOS and Unix.

Two questions follow: Which, if either, will win? How soon will this happen?

MS-DOS' main advantages are its large installed base among personal computers and its large body of accepted application software. Its major liability is that it is a single-user, single-tasking operating system; this liability is reflected in the general lack of well-integrated office communications capabilities in its applications.

Studies of how office workers use their time show that they spend the largest percentage communicating, particularly among higher paid office professionals and managers.

To increase office efficiency, OA systems must significantly improve communication. Work-group-oriented applications such as electronic mail, electronic shared filing, group-based project management and electronic meeting scheduling are needed in addition to the personal/analytical applications of today's personal computer software.

These work-group applications require effective local communications networks and, when used in conjunction with other types of applications, require a multitasking operating system within each single-user workstation. For example, it must be possible for you to receive mail or for your secretary to check your calendar without interruption to your work on a spreadsheet.

Today, MS-DOS lacks the multitasking capability needed to do this, even though the hardware capability is there with the new IBM Personal Computer AT.

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The potential application performance of the IBM PC AT is clearly underserved by a single-tasking operating system.

This is true in general for a range of 32-bit AT-like workstations we can expect to see from a variety of manufacturers. In this regard, MS-DOS has not kept pace with the hardware. Microsoft Corp. has been promising a multitasking capability for MS-DOS for some time. Even if this capability materializes, this may not be the long-term winner against Unix for two reasons:

1. To retain its leadership position for the new generation of 32-bit workstations, MS-DOS would need IBM's endorsement of its promised multitasking capabilities. By providing a multitasking capability incorporated within its Topview proprietary windowing package, IBM has gone down a separate path for putting multitasking into MS-DOS.

It seems unlikely that, having chosen this route, IBM will subsequently endorse Microsoft's multitasking MS-DOS.

The prospect for a transportable, multitasking MS-DOS supported by IBM seems low. This fact, combined with the lack of graphics support in Topview, may retard acceptance of MS-DOS in advanced office applications requiring multitasking.

2. Even if provided with multitasking capability, MS-DOS will remain unsuitable for use on larger multiuser systems in the departmental server class. Local nets consisting of some workstations and some multiuser systems would have to use different operating systems for the two classes of machines.

By contrast, with Unix on the workstations as well as the multiuser systems, a homogeneous network can be constructed, which greatly simplifies information sharing and communications.

Despite these technical advantages, Unix does have some well-known shortcomings. Among the more serious ones is the unreliability of its file system. Not originally intended for commercial use, its design leaves the user vulnerable to data losses. One would hope for a general solution from AT&T.

Overall, Unix enjoys technical advantages, and MS-DOS has the momentum of the installed base.

Unix' user interface is cryptic and unforgiving, but this is a less-serious problem. An advanced office system would have to provide its own user interface regardless of which of these popular operating system was to be used.

Thirty-two-bit workstations such as the IBM PC AT offer the performance power to support the concurrent application processing and local net communications needed for advanced office applications. Whether Unix or multitasking MS-DOS will become the standard operating system for this class of system remains to be seen.

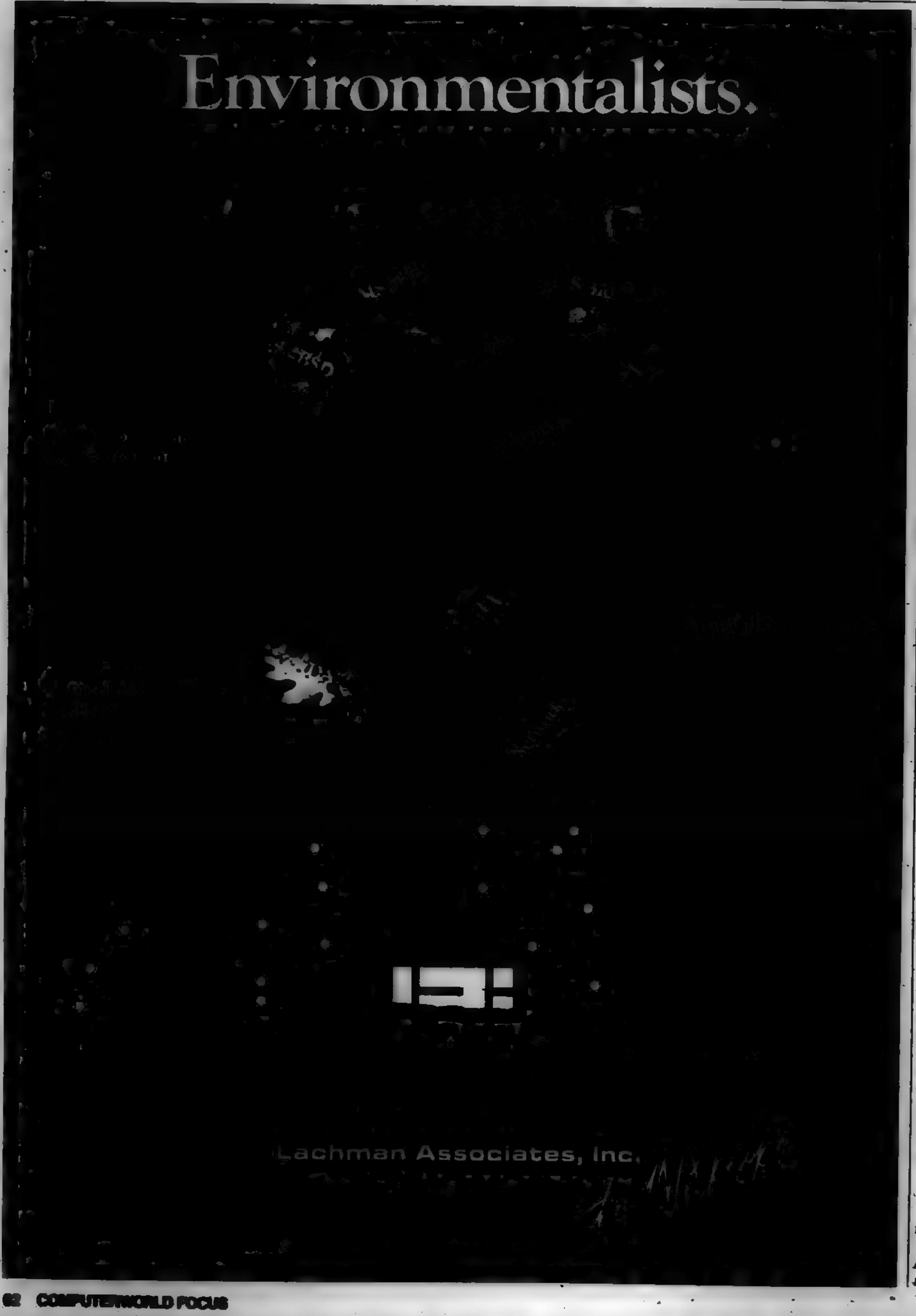
Overall, Unix enjoys technical advantages, and MS-DOS has the momentum of the installed base.

If Topview gains strong support among application developers, Topview/MS-DOS will probably dominate.

If Unix makes early gains in advanced network-based office systems, the world may move toward Unix.

How soon will the answer become clear? Several integrated office systems for Unix were announced in 1984 and are now beginning to ship. Topview is scheduled for first quarter 1985 and Microsoft's multitasking and MS-Windows is now scheduled only for sometime in 1985. By this time next year, the shape of the answer should be clear.

Butler is vice-president of marketing at Applix, Inc. in Westboro, Mass., a supplier of Alis, a Unix-based office software system.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Q&A

(Continued from Page 6)

Yes, I think so. I think price/performance-wise Unix is a helluva bargain. I'm a bit disappointed in the way the market has developed, especially in the personal computer area. It's been developed more to meet the requirements of a couple of vendors than to meet the requirements of the user community.

Hasn't there been some question about the portability of Unix?

As it turns out, you can write programs that are portable across different environments, but you have to follow some rules. You have to recognize that Unix runs in one or another version on 68000s, NS16000s, 8086s, 286s, Z8000s and so on. CP/M runs only on 8080s and 8086s, and MS-DOS runs only on 8088s.

But there isn't anybody running MS-DOS on a 68000. If you happen to have a 68000, you don't have to worry about porting Lotus 1-2-3 to it because there ain't no way it's ever going to go on it.

I'm not being a pitch man for AT&T, but I'd like to get some of the facts out on the table. Unix is a good system, and it's been undersold by those in a position to sell it and denigrated by those in a position to benefit by denigrating it. ■

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Manager's Corner

Who Manages End-User Computing?

By Philip J. Pyburn
and Michael E. Lawson

A recent survey estimated that as much as 80% of the computing in 1990 will be carried out directly by end users, and much of it will be personal computer-based. The personal computer has already changed the way many firms create and deliver computer-based systems. Formerly extensive background and skill were needed to create even the simplest applications, but today most managers and professionals can design, program and operate their own systems using personal computers and a wide range of available software.

Just because managers and professionals can create and operate their own systems, however, does not mean they always should. It is clear to most managers that some applications are inappropriate candidates for user development on the personal computer, either because of their size or because of their importance to the firm. Other applications, though, that perform analyses the user would have carried out manually anyway seem like good targets for personal computer use.

Who decides whether an application should be developed for the personal computer? And, if it is to be developed, when, where and how should it be designed, programmed and used? In many firms, the senior information systems executive is charged with answering these questions, and some are becoming concerned that planning and control for the personal computer are incomplete or inappropriate for the problem. This concern does not mean they view all personal computer use as wrong, but only that they fear serious long-run problems caused by unplanned and uncontrolled use.

But planning and managing end-user computing can be a very difficult undertaking. Beyond the low cost of the personal computer itself, the motivations for purchasing a personal computer include the slow response to development requests by the central information systems department and the control that a standalone unit offers. On the other hand, some recent research indicates that the majority of personal computer users would use a shared machine if it could provide the same level of operational performance and availability. The problem, then, is management's inability to effectively plan and produce required information systems and to control the criteria by which "appropriate" applications are selected.

As a first pass at the problem, it seems reasonable to suspect that the use and management of personal computers will follow an evolutionary path similar to that of other information technologies. Early on, a few personal computers will creep into the organization with little planning or control, in situations where support is mostly users helping users. Next, a substantial increase in the number of micros will be evident. Still, standards will be few, and control will be provided primarily by users. Support will probably be provided by informal organizations operating as an underground. Lack of planning will begin to be noticed.

The third stage can be characterized by the first steps toward integrating the personal computers into the overall computing environment. Planning will take on a short-range, detailed nature especially geared toward system configuration and data requirements. In this transition phase, it is especially important to develop centralized standards and controls if full integration and system compatibility are to occur.

It is also in this stage that the intro-

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Products

BLUE BELL, Pa. — **Sperry Corp.'s Information Systems** unveiled its 5000 series of microcomputers supporting Unix System V and up to 64 users and introduced the 7000/40, a 32-bit minicomputer running Berkeley 4.2.

The 5000 series features the 68000 microprocessor and offers a performance range of 0.7 Mips to 3.2 Mips. The 5000/20 and 5000/40 use 5.25-in. floppy or fixed disks, the 5000/60 uses 8-in. fixed disks and the 5000/80 uses 8-in. or 10.5-in. fixed disks. The products range in memory from 1K bytes to 16K bytes and in price from $15,000 to $150,000. The 7000/40 comes with 4M to 8M bytes of main memory and supports up to 128 users. According to Sperry, the CPU performance of the 7000/40 is 7.7 times than that of Digital Equipment Corp.'s VAX 11/780. It is priced from $160,000 to $300,000 and will be available midyear.

Sperry also announced Q-Office, an integrated office automation software package for the 5000 series priced from $3,500 to $20,000, and the Manufacturing Business Solution software package, an on-line manufacturing control system running on Unix systems. It is priced at $50,000 to $300,000 from Sperry Information Systems, P.O. Box 500, Blue Bell, Pa. 19424.

BELMONT, Calif. — **Fortune Systems Corp.** unveiled an intelligent workstation line that operates in both Unix and PC-DOS environments. The Fortune 1000 family is aimed to work in conjunction with Fortune's 32:16 microcomputer and can be configured to link IBM Personal Computers and Fortune products.

A low-end configuration including monochrome graphics terminal, system unit, MS-DOS software and Fortune terminal emulation software costs $2,995. A system configured with a system unit with 68010 Unix card, one floppy disk, a 10M-byte hard disk and the For-Pro operating system is priced at $7,085 from Fortune Systems Corp., 101 Twin Dolphin Drive, Redwood City, Calif. 94065.

DALLAS — **Lantech Systems, Inc.** announced Unetix 2.0, a multitasking Unix-compatible operating system for the IBM Personal Computer, Personal Computer XT and compatibles.

Designed for stand-alone workstations, the $129 hard-disk software product supports the Lantech Integrated/Office (I/O) office automation software series. The I/O series allows users to mix and match programs such as the $50 Powerlink 100, an asynchronous communications program connecting IBM Personal Computers to any host supporting a VT100 terminal, a $100 integration facility enabling users to transfer data from a mainframe into a local application, a $120 windows facility, a $50 PC-DOS emulator and a $200 C compiler from Lantech Systems, Inc.

More information is available from Lantech, 5501 LBJ Freeway, Suite 500, Dallas, Texas 75240.

Manager's Corner

duction center appears to be most profitable. This third stage is likely to be the most difficult to manage and, perhaps, the stage most sensitive to changing technology.

The fourth stage is characterized by a fully developed end-user computing environment. It would include detailed long-range plans spelling out specific responsibilities for the information systems department, functional managers and users. Maintenance of standards and control would be easier to manage because of the broadly based existing systems and because of the standardizations imposed in the third phase. Finally, support would be very diffused throughout the organization.

These phases will likely be concomitant with the evolution of application programs being developed and used. In the early stages, programs and application will tend to be of a personal nature. Loose control of these programs will be provided by functional managers, and reactive help and training is appropriate. As the application becomes useful to departments, planning and control functions must increase. In particular, questions of the role of micros vs. other technologies, configuration architecture, application architecture and data requirements must be addressed. Also, documentation, security and design standards increase in importance. Finally, proactive consulting and education must be provided centrally. When applications are to be used by the organization as a whole, the full capability of the information systems department must be brought to bear. Full planning cycles, together with very explicit standards, are fundamental requirements. The information systems department must maintain control of these activities and be responsible for providing support.

Pyburn is director of the Information Systems Research Center, and Lawson is director of the Masters Program in Management Information Systems at Boston University's School of Management.

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Products

WESTBORO, Mass. — **Data General Corp.** introduced a range of software for DG/UX, its native Unix operating system, including Documenter's Workbench, a word processing and text formatting system, and Pascal and RM/Cobol programming languages.

Through RM/Cobol, users will have access to more than 1,500 applications packages, DG said. The Pascal programming language for DG/UX is based on Niklaus Wirth's Pascal, which is a high-level structured programming language. DG/UX Pascal has a common code generator and shares the same optimizer as DG/UX C and Fortran 77 for DG/UX. It will cost $4,910. RM/Cobol from Ryan-McFarland Corp. is a GSA-certified version of the Ansi 74 Cobol standard. Prices are expected to start at $1,500.

DG also announced that it is supporting Transmission Control Protocol/Internet Protocol under its AOS/VS operating system for a price of $2,000. This makes DG the first major computer vendor to support this industry-standard network for both a native Unix and a proprietary operating system over an IEEE 802.3 local-area network, the vendor claimed. DG is at 4400 Computer Drive, Westboro, Mass. 01580.

ROCHESTER, N.Y. — **Computer Consoles, Inc.** introduced its first personal computer which is reportedly both hardware- and software-compatible with the IBM Personal Computer and integrated with the firm's Unix-based Officepower system. The CCI PC, running the MS-DOS 2.11 operating system, comes with an Officepower terminal emulation package that allows the micro to operate as a fully supported Officepower terminal, the vendor said.

A base system, configured with a monochrome display, floppy disk drive, 256K-byte random-access memory and Powerterminal software costs $2,500. A high-end configuration including a 10M-byte fixed disk drive and color display is priced at $5,800 from Computer Consoles, Inc., 97 Humboldt St., Rochester, N.Y. 14609.

PALO ALTO, Calif. — **Relational Database Systems, Inc.** unveiled an enhanced version of its relational data base management system, Informix 3.3.

The enhancements will be provided to Informix users being supported by the firm for the cost of shipping and handling, according to the vendor.

For more information, contact Relational Database Systems, Inc., Suite 600, 2471 E. Bayshore Road, Palo Alto, Calif. 94303.

MINNEAPOLIS, Minn. — **CPT Corp.** introduced enhancements to its Unix-based Office Dialog system allowing for the networking of up to 128 workstations. The CPT Open Connection 1 links microcomputers such as the IBM Personal Computer and any system capable of sending and receiving Ascii characters to the Office Dialog system. Open Connection 1 supports such applications as word processing and electronic mail and is priced at $2,000.

The $6,000 Open Connection 2 provides access to calendaring, data base management, Cobol and Basic languages and 3270 emulation in addition to the applications on Open Connection 1.

The CPT Office Network links eight 16-user Office Dialog systems to create a network of up to 128 workstations for sharing resources. It is available for $2,000, from CPT Corp., 8100 Mitchell Road, P.O. Box 295, Minneapolis, Minn. 55440.

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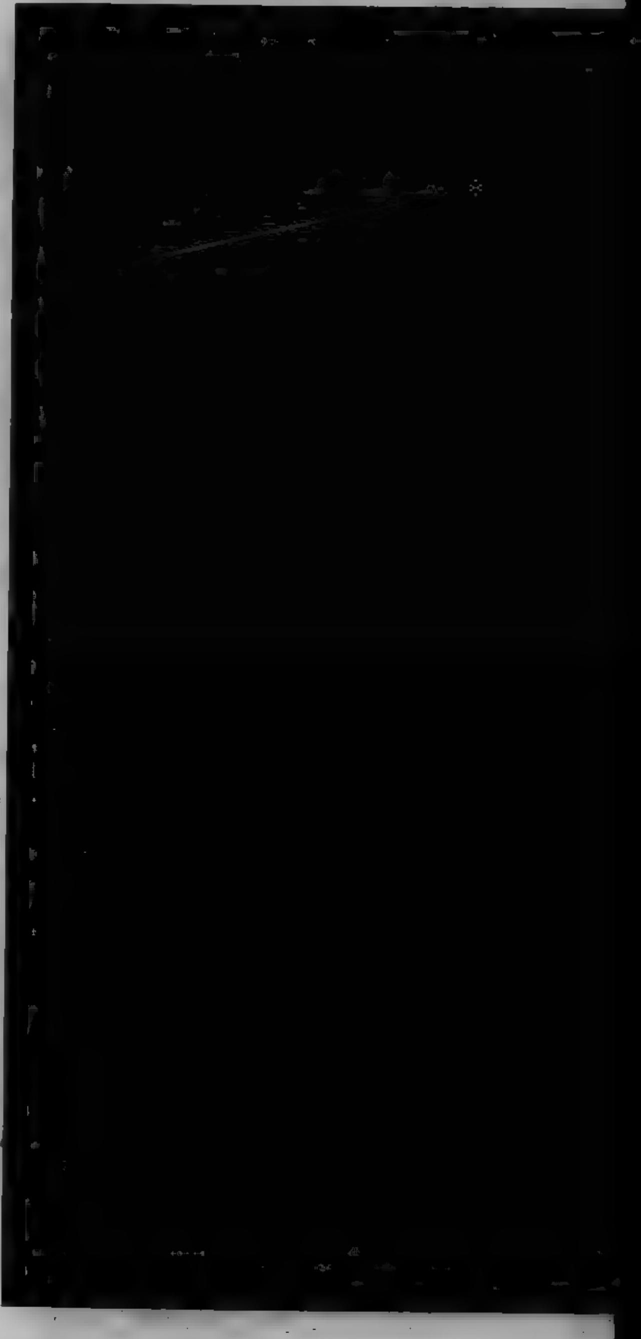

Products

SAN ANTONIO, Texas — A 32-bit stand-alone computer system running a Unix-like operating system and supporting up to 28 users was unveiled by **Datapoint Corp.**

The Datapoint 3200 runs the Unos operating system (from Charles River Data Systems, Inc.) which supports the C programming language, RM/Cobol and Databus — the company's business programming language.

The 3200 features dual 68000 Motorola microprocessors, one with 4K bytes of cache memory performing applications processing, the other dedicated to I/O operations. The 3200 connects to the firm's ARC local-area network via the $2,500 INX-32 adaptor, an internal card and associated software.

An entry level system with 1M byte of memory, 32M bytes of disk storage with 1M byte of diskette storage, 4K bytes of cache memory, and four serial ports is priced at $15,430. The Unos license is priced at $1,000, from Datapoint Corp., 9725 Datapoint Drive, San Antonio, Texas 78284.

MOUNTAIN VIEW, Calif. — A dual-processor 32-bit superminicomputer was unveiled by **Pyramid Technology Corp.** The 90Mx runs the OSx operating system, a dual port version of Unix derived from System V and 4.2 BSD.

The 90Mx features up to 256 user ports and reportedly has a throughput 1.6 to 1.8 times that of the firm's 90x. An entry level 90Mx with a 415M-byte disk drive, 1600 bit/in. magnetic tape drive, 16 user ports and 4M bytes of main memory costs $220,000. For more information, contact Pyramid Technology Corp., 1295 Charleston Road, Mountain View, Calif. 94043.

OCEANPORT, N.J. — **Perkin-Elmer Corp.** introduced a 32-bit supermicrocomputer running Unisoft Systems Corp.'s Uniplus operating system.

The PE 7350A, based on the 68000 microprocessor, supports up to five users. The computer has expansion space for the PE Ethernet Data Link Controller board, which gives users access to the firm's Ethernet local-area network.

The 7350A, with 512K bytes of memory, four ports and 15M bytes of hard disk storage, costs $8,250. A multiuser system with 1M byte of memory and 28M bytes of hard disk storage is priced at $10,900, from Perkin Elmer-Corp., 2 Crescent Place, Oceanport, N.J. 07757.

SANTA CRUZ, Calif. — **The Santa Cruz Operation** (SCO) introduced a full line of Xenix business applications, including the Lyrix word processing system, gateways for 3270 mainframe communications and system support packages for add-on mass storage.

The Lyrix WP package, available for $595, runs on the IBM Personal Computer and Personal Computer XT; Apple Computer, Inc.'s Lisa 2; Tandy Corp.'s 1200 and 2000; and AT&T's 3B line. SCO also introduced the Unipath mainframe communications gateway that allows Xenix and other Unix systems to operate on IBM SNA and BSC networks without changing host software. The company also unveiled a driver software package that reportedly allows the addition of mass storage hard disks from several manufacturers to interface with IBM PCs, PC compatibles and Apple Lisas running Xenix. The drivers are priced from $150 up to $795 from SCO, 500 Chestnut St., P.O. Box 1900, Santa Cruz, Calif. 95061.

IRVINE, Calif. — **Alpha Microsystems, Inc.** has introduced AM-1100E, a desktop microcomputer that runs Alpha's Unimos multiuser operating system, which is capable of supporting 11

Insider

(Continued from Page 5)

pastime is tinkering. Thus a variety of Unix versions and derivatives exist — enough to frustrate any information systems planner. In the early 1980s, Version VII was rather different from versions from Berkeley, Livermore Labs or any of the private label Unix vendors. However, since the acceptance of enhancements such as virtual memory, demand paging and improved editors, as well as reasonable success with standard setting in User Group subcommittees, most fundamental differences in product are eroding. If the user intends to build rather than buy applications, the standards issue is further suppressed.

- IBM and most other major hardware vendors are unwilling participants in the Unix drama. From a competitive perspective, IBM has little to gain from widespread acceptance of Unix vs. PC/DOS, MVS/XA or any future distributed operating system. An operating system that has the potential to ease the pain of multiple vendor environments also has the potential to have an adverse effect on market share, not to mention causing an additional software research and development expense. For these reasons, IBM and hardware vendors in general will be found on the last float in the Unix parade.

Willmott is director of user research and services for International Data Corp. in Framingham, Mass.

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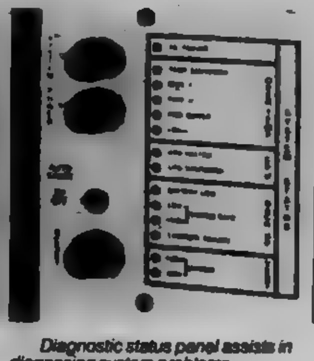

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If you would like more information about the Areté 1000 series systems, please call or write Areté Systems Corporation, 2040 Hartog Drive, San Jose, California 95131. (408) 263-9711.

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Products

users. Unimos is a version of AT&T's Unix System V and supports Unix versions of programming languages like C, Cobol, Fortran and Basic, the vendor said.

The micro features a Motorola, Inc. 68010 microprocessor, 1M byte of random-access memory, a 30M-byte hard disk drive, three serial ports which are expandable to 11 ports and a 40M-byte streaming tape backup, according to the company. The AM-1100E costs $15,585 from Alpha Microsystems, 17332 Von Karman Ave., Irvine, Calif. 92714.

WELLESLEY, Mass. — **Pathway Design, Inc.**, which develops and markets an integrated family of data communications products that provides links between professional microcomputers and communications networks, has announced its Unipath product line.

Unipath is a micro-to-mainframe communications product operating under Unix Systems III and V. Unipath resides on the hard disk of a 32-bit supermicror system and permits concurrent communication for 32 devices with a variety of IBM hosts in SNA/SDLC and BSC network environments. Pricing for Unipath will be based on the number of sessions supported. One user, five sessions is $795; 16-session and 32-session versions cost $1,395 and $1,995, respectively, from Pathway Design, Inc., 177 Worcester St., Wellesley, Mass. 02181.

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If you want to get the most out of your UNIX System, get the single terminal that performs like six—the 5620 Dot-Mapped Display from Teletype Corporation. This terminal is an exceptional value because it offers graphics and capabilities you'd expect to find only in higher-priced workstations.

With its unique capability to divide the display into six windows, the 5620 makes excellent use of UNIX System V resources to greatly improve productivity. You create and control the size and position of each window simply, using the electronic "Mouse." Unmodified host programs then view the windows as separate terminals, making it possible for you to work on several things at once.

Just think how much easier that'd make it for you to prepare documents and graphics, do computer aided engineering or write and debug programs. Imagine, for example, while a program is compiling in one window, you edit the source code in a second window, check output in a third window, and send and receive mail concurrently in a fourth window.

The 15-inch diagonal display boasts 100 dots per inch, which gives you high resolution graphics and font capabilities. Complete with a full 32-bit processor and up to one megabyte of memory, you can also offload the host by running programs in the 5620.

As good as the 5620 makes Teletype Corporation look, it can make you look even better. To find out how, write Teletype Corporation, 5555 Touhy Ave., Dept. 3223-F, Skokie, IL 60077. Or call 1 800 323-1229, ext. 601.

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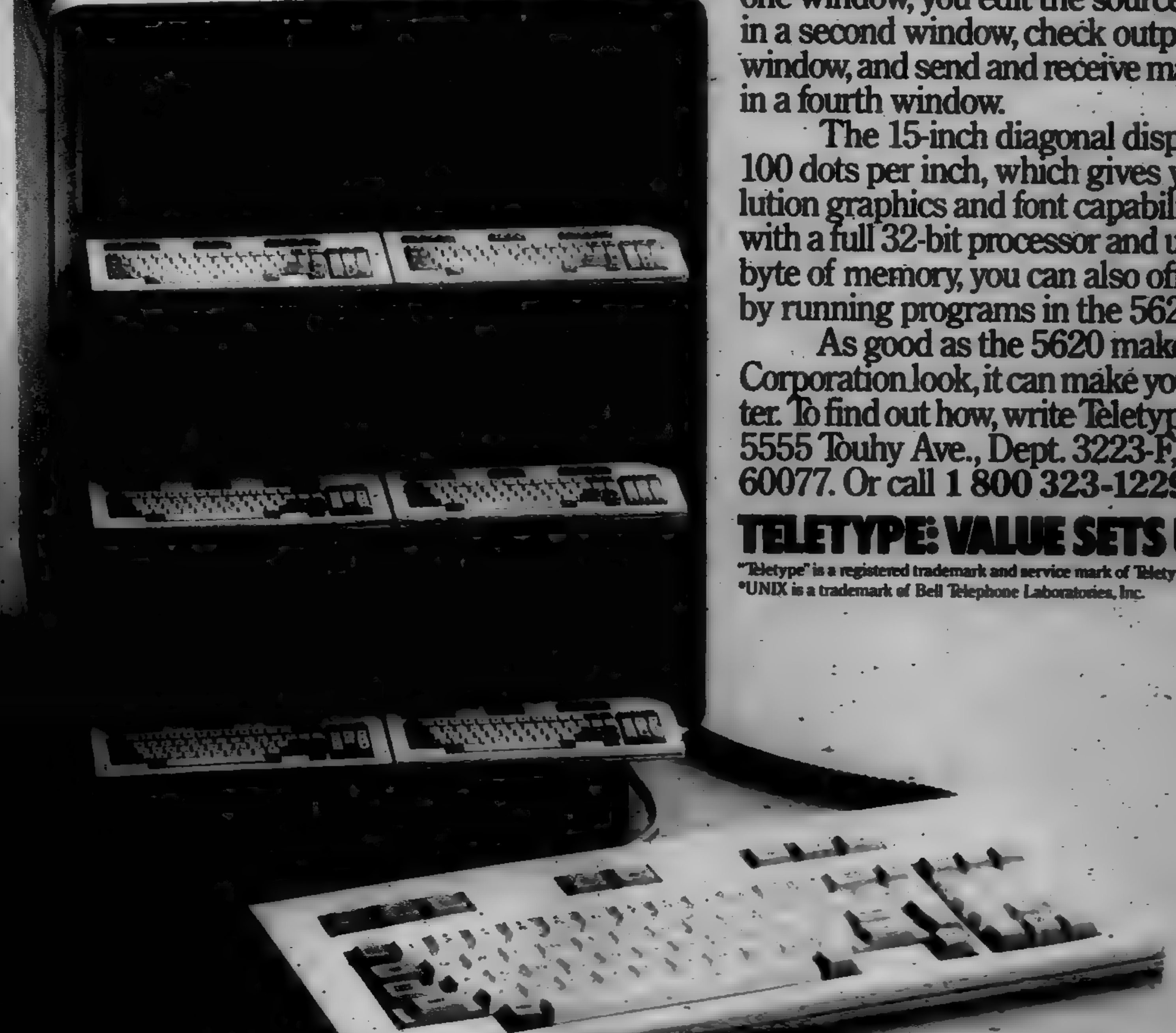

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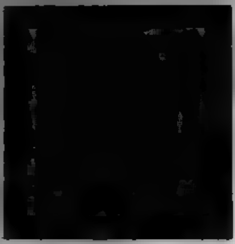

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Adapso suit alleges piracy

Group's campaign against illegal software copying spearheaded by case against American Brands

By Peter Bartolik
CW Staff

NEW YORK — Alleging software piracy, Micropro International Corp. and the Association for Data Processing Service Organizations last week filed a lawsuit against a Fortune 100 company and its subsidiary, which briefly held Adapso membership more than a year ago.

At a news conference held here Jan. 17, Adapso announced that a 20-count complaint was filed that morning in U.S. District Court in Chicago against American Brands, Inc., a conglomerate headquartered here that is the nation's fifth-largest cigarette manufacturer, and its Chicago-based office supplies subsidiary, Wilson Jones Co.

The lawsuit is the spearhead of a vigorous antipiracy campaign formulated by Adapso, an industry association with 750 member companies involved in the computer software and services industry. In addition to the lawsuit, Adapso has embarked on an effort to develop standards for hardware-based software authorization systems (see story page 6) and has begun a corporate awareness campaign involving mailings to corporate executives and leaders of colleges and educational institutes.

American Brands and Wilson Jones are charged in the lawsuit with 20 counts involving copyright and trademark infringement, unfair competition and breach of license agreement arising from the unauthorized reproduction and distribution at Wilson

See LAWSUIT page 6

TOP OF THE NEWS

Management shake-up at AT&T. The company last week tapped Robert Allen, a former Bell Atlantic Corp. official, to head its Information Systems unit, while moving other top-level executives into new roles. **Page 2.**

■

Ivy League link. Dartmouth College is a beta site for an Apple Computer, Inc. local-area network product, although the college is not using the network in the traditional manner. **Page 8.**

■

Amdahl Corp. rolled out a front-end processor said to multiplex data, voice and video lines over a high-speed transmission link. **Page 11.**

■

President Reagan settled a cabinet dispute by giving the U.S. Department of Defense limited review of high-tech export licenses, leaving primary authority with the Department of Commerce. **Page 79.**

Micro-based Cobol tools make debuts

Microsoft Cobol enhanced to support four types of files

The list of microcomputer Cobol wares recently grew with the addition of two products. Microsoft Corp. enhanced its version of Cobol, and Micro Focus, Inc. introduced Professional Cobol, an application development environment.

Microsoft Cobol's features include dynamic call and cancel, built-in sort and merge and an Isam method that supports multiple keys, split keys and duplicate keys, according to the vendor.

Microsoft Cobol is said to support four types of files: sequential, line-sequential, relative and B-tree indexed. An Isam file recovery utility reportedly allows programmers to recover and restore damaged files.

Multiuser environments

The package's screen capabilities, based on Data General Corp.'s Cobol extensions, include cursor positioning, highlighting, automatic format conversion, prompting and automatic field skip, the vendor said.

The product contains record-locking and file-locking capabilities for multiuser environments, according to the vendor.

Microsoft Cobol requires 192K bytes of random-access memory, two

See COBOL page 10

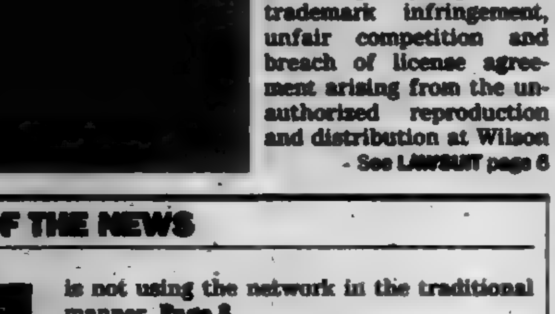
FYI

The death of a library tradition is in the cards

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The main card catalog at the Library of Congress — the rows and rows of massive wooden cabinets that hold 23 million well-thumbed index cards —is gradually becoming obsolete as the library moves toward automation.

Traditionalists worry that they are losing a cherished national institution, a place where scholars can make serendipitous discoveries among the cards and where more than a few romances have started from chance encounters.



CW photo by M. Betts

The Library of Congress will eventually shelve its card catalog in favor of automated records.

Library officials, on the other hand, assert that the evolving computerized catalog is a physical necessity at the world's largest library, which has to add two million index cards each year. The general collection's card catalog, which dates back to 1800, occupies several rooms — about the size of half a city block — and has 22 trays of cards on Shakespeare alone.

Even with increasing automation, the old card catalog will not be abandoned for at least four more years, according to library spokesman Craig D'Ooge, mostly because the cards are being microfilmed. "And it's for certain that as long as there's a need for it, it will be accessible [to] scholars," he said.

But it is becoming obvious that the card catalog's days are numbered. In 1981, the catalog was "frozen" so that books obtained after Jan. 2, 1981, were recorded only in the computerized files. And by the end of 1984, virtually all of the library's English-language books were cataloged in the automated system and available to researchers through 40 terminals in the library's reading rooms, according to John W. Kimball, head of the automation and reference collections section in the general reading rooms.

The automation has proceeded on two fronts. Since 1968, the

See LIBRARY page 10

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NEWSPAPER

AT&T reshuffles deck in management shake-up

By Bryan Wilkins
CW Washington Bureau

NEW YORK — In a major management shake-up, AT&T last week named Robert E. Allen chairman of AT&T Information Systems, replacing Charles Marshall, who had headed the equipment marketing subsidiary since its formation in the year prior to AT&T's divestiture. Marshall was named executive vice-president responsible for personnel and external affairs.

Allen

Continuing the reorganization, AT&T, which has recently reported it would not meet sales and marketing goals for 1984, also announced that Randall Tobias, senior vice-president, will become chairman of AT&T Communications, the regulated long-distance arm that is providing a major source of AT&T's revenue as the company continues to restructure.

Tobias replaces Morris Tannenbaum, who will become an executive vice-president responsible for financial management and strategic planning.

Not a surprise

"The changes really are not unexpected," commented Ken Bosomworth of International Resource Development, Inc., a Norwalk, Conn., consulting firm. "It's part of the ongoing reorganization of AT&T, which has been a continuous and profound process.

"AT&T has publicly said they haven't done that well, in some cases meeting only 50% of their stated goals," he added. "In a sense, these changes show that [it isn't] willing to leave these same guys in charge. It's a form of cosmetic rejiggling."

Allen has been an executive vice-president for corporate administration and finance at AT&T since the divestiture. He originally was named head of Bell Atlantic Corp., one of the seven regional holding companies, but in the months before the breakup, Allen was suddenly transferred to At&T's New York headquarters.

The reorganization will have Marshall, Tannenbaum and Tobias reporting to Brown, while Allen will now report to James E. Olsen, who continues as vice-chairman of the board and chairman of AT&T Technologies, the umbrella unit that provides equipment products, systems and services.

Steven Chrust, an analyst with Sanford C. Bernstein & Co., noted that the personnel shifts "appear to be anticipating the setting of the stage for the successorship to Charles Brown," AT&T's chairman and chief excecutive officer. By naming Marshall and Tannenbaum to these positions, Brown is putting in place a structure that can be used to pick one of them as his successor when he retires, Chrust said. Brown recently announced that he would step down from his position in two years, when he reaches the age of 65.

Vendors post earnings

IBM, NCR report record increases for 1984; Apple, Wang notch first-quarter increases

By Peter Bartolik
CW Staff

IBM last Thursday reported a 1984 revenue of $45.9 billion, a 14.3% increase over 1983. NCR Corp. also reported record 1984 results, and Apple Computer, Inc. reported a 121% increase in sales for the first quarter of fiscal 1985.

Wang Laboratories, Inc., however, fell short of its second-quarter goal, reporting an 18% increase in revenue and profits.

IBM's gross revenue just about met Wall Street expectations, and the 1984 profit was slightly above expectations, rising 20% to $6.58 billion, or $10.77 per share, compared with $5.48 billion, or $9.04 per share, in 1983.

However, fourth-quarter revenue was up just 12.4% to $14.49 billion, compared with $12.89 billion a year earlier, while profits showed a healthier 16% increase to $2.27 billion, or $3.55 per share, compared with $1.86 billion, or $3.06 per share, for the previous year, indicating IBM was able to cut costs to maintain healthy profits.

'The big winner'

Apple declared itself "the big winner" of the holiday selling season with its 121% first-quarter sales increase over the same quarter for the previous year.

Apple announced first-quarter sales of $698.3 million, compared with $316.2 million a year earlier. Profits for the quarter were $46.1 million, or 75 cents per share, compared with $5.6 million, or 10 cents per share, in the comparable quarter of 1984.

Apple President and Chief Executive Officer John Sculley said the company sold approximately 500,000 computers during the last three months of 1984.

NCR reported last Monday that profits and revenue were at record levels in the fourth quarter and for fiscal year 1984. For the year, NCR reported a revenue of $4.07 billion, up 9% from $3.7 billion in 1983; profits for the year were $342.6 million, or $3.30 per share, up 19% from the 1983 level of $287.6 million, or $2.64 per share.

The fourth quarter, according to NCR spokesmen, resulted in a revenue of $1.25 billion, up 10% from year-earlier revenue of $1.13 billion. Profits for the quarter were $123.9 million, or $1.23 per share, up 8% from $114.4 million, or $1.06 per share, a year earlier.

Wang reported a second-quarter revenue of $610 million, up 18% from $515.4 million a year earlier. That increase fell far short of the 30% revenue growth goal set by Wang, which the company attributed to the strong U.S. dollar's negative impact on foreign sales and also to delays in releasing and installing new software products.

Wang's profits for the quarter also climbed 18% to $56.3 million, or 40 cents per share, compared with $47.8 million, or 35 cents per share, for the comparable period a year earlier, according to a company spokesman.

Upcoming Special Report to focus on graphics

What do users want from graphics systems and software, and how can DP managers best meet their needs? Find some answers in *Computerworld*'s March Special Report on graphics systems.

The Special Report will focus on mainframe, minicomputer and microcomputer graphics and the blurred lines among them. It will look at computer-aided design for micros and easy-to-use graphics for mainframes.

Contributions to the Special Report should take one of two forms: tutorial articles discussing issues or applications stories outlining a particular user firm's experience.

Articles may range from four to six typed, double-spaced pages. Artwork is also welcome. Authors should include brief biographies and telephone numbers at which they can be reached. The submission deadline is Jan. 25.

If you have a story you would like to tell, contact Janet Fiderio, Special Report Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Want to [illegible]

NEWS SUMMARY

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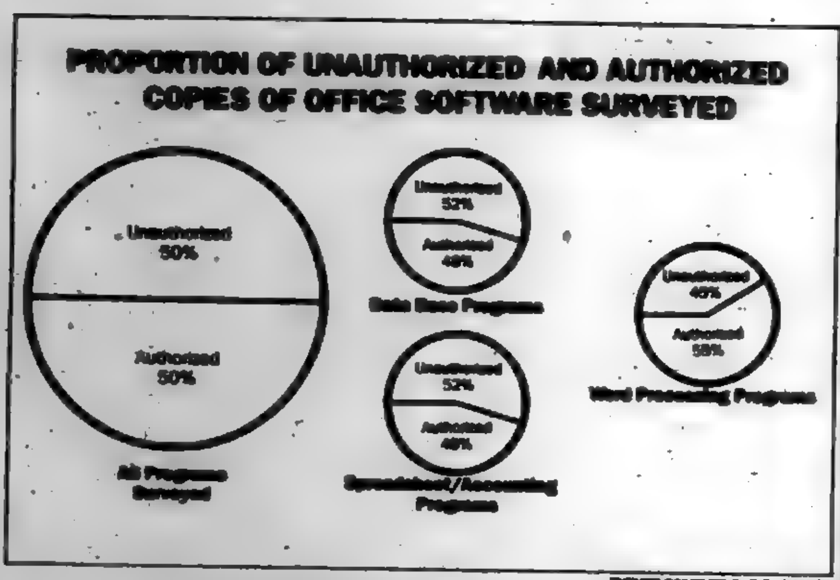

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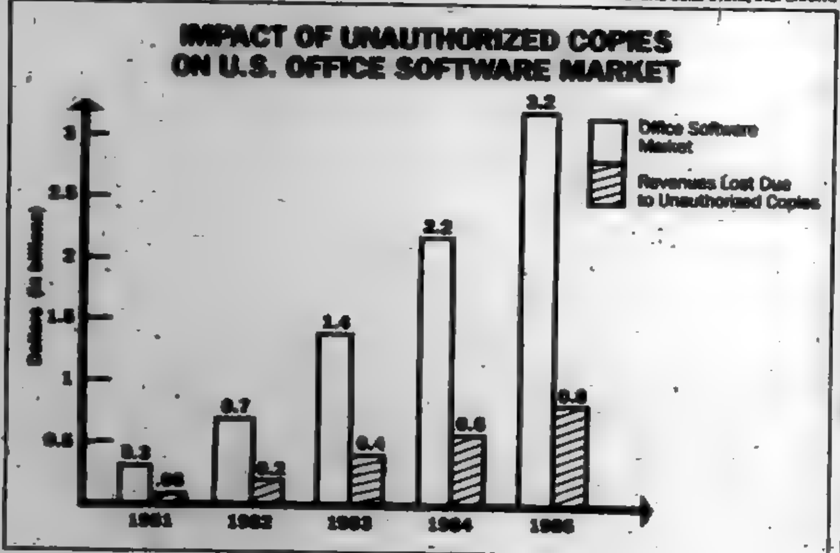

PIRACY

from page 1

During a news conference on software piracy held by the Association of Data Processing Service Organizations, Inc., the Dallas-based market research firm said that micro software piracy cost vendors an estimated $1.3 billion in lost revenues between 1981 and 1984.

Future Computing said unauthorized copying deprives publishers of revenue that could support current products and finance future developments.

The estimates were developed from 45,000 responses to a survey mailed out last July to a representative sample of the U.S. work force.

According to the director of the survey, Joe Curry, Future Computing used data compiled by the U.S. Bureau of Labor Statistics to make an accurate estimate of the number of microcomputer business software packages in use by the entire U.S. work force.

The firm mailed the survey to households that had participated in earlier questionnaires on various products. Follow-up telephone calls were made to 1,400 respondents to account for sharing of packages and use of one package by one person both at home and at work.

Respondents were not asked whether they possessed unauthorized copies, but they were asked to indicate which of 12 packages were in use at home and at work. Although it was not possible to determine whether the unauthorized packages were in use at work or at home, Curry noted, "In some cases, the number of packages in use at home approached the total number of packages that the publishers estimated had been sold."

Curry said the least reliable data was the publishers' estimates, because it was difficult to determine how many packages were still in distribution channels, how many were bundled with hardware and how many were covered by multiple copy licenses.

> ”
> *The least reliable data was the publishers' estimates, because it was difficult to determine how many packages were still in distribution channels, how many were bundled with hardware and how many were covered by multiple copy licenses.*

The projections of copies in use by the entire U.S. work force were statistically accurate, and the research firm was conservative in its estimates, Curry said.

The projected revenue loss of $800 million for 1985 was determined by assuming that approximately 25% of the unauthorized copies would otherwise have been purchased, according to Curry.

Further information on the survey is available from Future Computing, 8111 LBJ Freeway, Dallas, Texas 75251.

[redacted]

Beware the in-house pirate

BOSTON — Software piracy represents one of the most common ways for firms using personal computers to become embroiled in lawsuits, William H. Murray, IBM's program manager for data security, warned in a speech to the New England Computer Law Forum here last week.

Some software vendors are litigious, Murray said, and are gunning for those who pirate their products. He said that IBM has undertaken an in-house educational effort to prevent its employees from pirating other vendors' software and will fire workers who are caught doing it.

During an interview, Murray added that the use of a hardware key is among the options IBM has considered as a means to secure its software from illegal copying. A hardware key plugs into a port or expansion slot on a personal computer and interacts with a program's antipiracy software to allow the program to run only on that machine.

Murray also told the Law Forum, a group of New England lawyers specializing in legal issues related to high technology, there is a misconception that whatever comes out of a computer is accurate. The data that a report or chart is based on, he argued, may itself be in error.

Anyone who uses a personal computer to produce reports and charts should "label data as to its source and authority." They should also identify work that was produced on a personal computer, and those who use the data should make an effort to verify its accuracy, he added.

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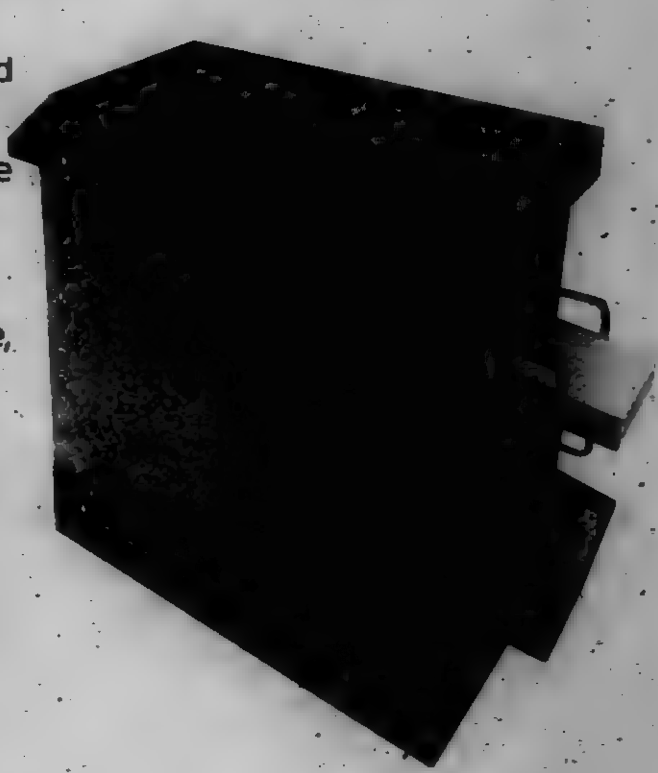

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NEW YORK — The work of the Association of Data Processing Service Organizations (Adapso) to develop a standardized software copy-protection scheme, one of the main thrusts in the software industry association's campaign against piracy (see story, page 1), has drawn mixed initial response.

While applauding the work's intent, some users noted that the scheme would not give bulletproof protection against piracy and might further complicate users' lives. "It's a step in the right direction, but it stops at about 1983," said Brian Boyle, analyst with Gnostic Concepts, Inc. in San Mateo, Calif. "What about networking? What about site licensing?"

Resistance to copy protection in corporate America "is real and sometimes for good reason," said Russell Gee, vice-president at Accent Technology, Inc., a software supplier in South Natick, Mass.

"It's a love-hate thing" for DP managers, Gee suggested. "They're looking for protection to make their jobs easier, and they can lower their maintenance problems and their risk exposure. On the other hand, more overhead is exactly what these guys don't need."

Adapso's Software Authorization Committee began to circulate a working draft of its work toward a standard copy-protection scheme [illegible]

[illegible]

The ring attaches to an RS-232 port via a cable with a pass-through connector, avoiding the need for a dedicated port. In operation, the program lock interacts with the key and key ring to get the authorization that allows the program to run. Many variations on the scheme are possible, providing different levels of protection, the report noted. Hardware standards and communications protocols would be placed in the public domain.

While committee members cautioned that the concept is far from a finished proposal, they point to a number of potential benefits for both vendors and users.

On the vendor side, the scheme would boost technical barriers to copying, although the draft report acknowledged that no method can provide complete protection.

Adapso's approach could provide "a vast array of benefits" for users as well, according to Marv Goldschmitt, committee member and vice-president for business development at Lotus Development Corp.

[illegible] personal computers [illegible]

Other [illegible] include encryption, use of the key ring as an identifier for access restrictions on networks and bundling the key with other peripherals such as modems, according to the committee.

"We're in a unique position," Goldschmitt said. "We're in an industry dealing with intellectual property, and we're in a position to do something technically."

But the committee also noted that the approach raises potential user problems, including failure or loss of the hardware device and loss of data because of data-line collisions. These collisions could occur in multitasking environments if incoming data arrives at the same time the program is interrogating the key ring. However, committee member Michael Strickland, engineering director at Quadram Corp., said the group is confident that a technical solution can be found that will not require a dedicated port.

LAWSUIT

from page 1

Jones of three products from Micropro: Wordstar, Mailmerge and Spellstar.

The suit alleges that copies were made for use or distribution at one or more sales training seminars.

The lawsuit charges that the two companies have "engaged in unauthorized distribution and copying and will continue to do so," and charges willful knowledge of the practice and disregard for Micropro's rights.

Adapso and Micropro, co-filers of the suit, asked for damages of $225,000, the return of any profits the companies earned as a result and sufficient damages to be determined by the court.

No comment

Adapso declined to comment on how many unauthorized copies of the software were allegedly made or the number of authorized licenses granted to Wilson Jones by Micropro; the organization also declined to say how the alleged piracy was discovered.

An official spokesman for Wilson Jones was not available for comment at press time, but an executive of the company's MIS department said he was not aware of the suit.

American Brands spokesman Dan Conforti said Thursday the company could not comment because it had not been served any legal papers pertaining to the suit and had only heard of it indirectly. Asked if the conglomerate had an official policy prohibiting unauthorized copying of trademarked and copyrighted materials, Conforti replied, "Of course we would never [allow unauthorized copying]."

American Brands, listed 79th on the 1984 Fortune 500 list, is most renowned for tobacco products that its American Tobacco Co. division manufactures, but it is a $7 billion conglomerate with interests in insurance, whiskey, records, financial services, home products and, through Wilson Jones, office supplies. Wilson Jones sells equipment and supplies to office equipment dealers and distributors.

Wilson Jones formerly had a business computer division and through that division held membership in Adapso from April 1983 to February 1984, Adapso confirmed. An Adapso spokeswoman said the company dropped its Adapso membership when it disbanded the computer division.

At the press conference last week, Adapso President Jerome L. Dreyer said, "Software piracy can no longer be considered an acceptable crime, with abusers having no fear of being caught" and that Adapso was acting as a representative of the software industry to protect software publishers from infringement of their copyrights and trademarks.

Marv Goldschmitt, vice-president for business development of Lotus Development Corp. and chairman of Adapso's Software Authorization Committee, said the lawsuit is a "last resort" for preventing piracy and is the least desirable tactic. He also said, "A majority of people really don't realize they are doing something wrong."

Adapso executive board member John Imlay, chairman of Management Science America, Inc., said, "Not everyone is a thief; we don't mean to insinuate that; not everyone knows there is such a thing as piracy."

Informational brochure

According to Adapso, 60,000 brochures detailing liabilities of software piracy and urging establishment of formal antipiracy policies will be mailed to chief executive officers and corporate legal counsels around the country, as well as to the heads of colleges and educational institutes.

The intent of the lawsuit and the publicity campaign, according to Adapso, is to prompt U.S. corporations to recognize the legal liabilities of copyright and trademark infringements and to implement formal policies prohibiting employees from such practices.

"The mailing should have quite a positive impact [on top executives] and [should] let them know piracy is a major problem and could have a significant impact on their organization," Imlay said.

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Appletalk links dorm micros to core of Dartmouth net

HANOVER, N.H. — A beta-test version of Apple Computer, Inc.'s Appletalk local-area network has proven to be the solution to Dartmouth College's need for a cost-effective means to link Apple Macintosh computers used by 1,200 students with the college's central computer network.

The Appletalk Personal Network, originally referred to as Applebus, will be officially unveiled at Apple's annual meeting Jan. 23. It will cost $50 per computer and provide synchronous communication at 230.4K bit/sec for as many as 32 Macintoshes, according to Apple literature obtained by *Computerworld.*

At Dartmouth, though, the Appletalk network is not providing the traditional local-area network functions of sharing peripherals or information within an office or even a dormitory. Instead, Appletalk is used as a gateway to the college's own Kiewit Network (see story below), which connects most of the campus's offices and all of its dorm rooms with six Digital Equipment Corp. VAX-11 series minicomputers, two Prime Computer, Inc. minis — a Model 550 and a Model 750 — and two Honeywell, Inc. DPS 8/49 mainframes.

The students use the Kiewit Network for off-line storage, research and for most of their word processing tasks, according to Rich Brown, manager of special projects for Dartmouth's Kiewit Computational Center. They download their writing from the Kiewit Network's mainframe-based word processing system to one of several printer stations located around the campus, he said.

Appletalk's communications software resides within the Macintosh operating system. The network consists solely of a shielded, twisted-pair cable that connects to the Macintosh's serial port at one end and connects to a small junction box that encloses a transformer at the other end. Two output jacks on the junction box allow Appletalk cables to carry communications to the serial ports of other Macintoshes, peripheral devices or, in Dartmouth's case, the four-prong wall socket of the Kiewit Network.

CW Photos by E. [illegible]

Brown demonstrates hardware used in Apple Computer, Inc., Appletalk

Brown said Dartmouth has found Appletalk to be a cost-effective approach to networking the Macintosh. "There are a lot of people with 2M-bit networks [for sale]," he said. "The Macintosh needs one $50 cable to tap into a [personal computer] network; everybody else needs an interface card that starts at $150 and up."

For Dartmouth, Appletalk's arrival was timely; the college had nearly required 1984's freshman class to purchase Macintosh computers, and 750 students, three-quarters of the new class, responded by buying the machines. This action left the school with a need to bring the Macintoshes onto the Kiewit Network in a way that would be inexpensive and that would support broadband communications, Brown said.

Early last year, shortly after Dartmouth decided to support the Macintosh for students, the college began a research effort to develop a link between the Macintosh and the Kiewit Network. When the network staff saw the Macintosh network protocols in March 1984, however, it decided to go with the Apple network, especially because it promised to link a greater number of Macintoshes than they had thought was possible.

Brown said he has since found that Apple "did everything we were planning to do, probably with more foresight." The Appletalk network's minimal hardware was easy to install as well, he said. Because the college had already installed wall sockets for the network in each dorm room, all that was needed was to give the students the Appletalk hardware, a diskette of the college's own Dart Terminal communications software and a demonstration of how to make the Kiewit Network connection.

The students installed the hardware without a hitch, Brown said, using the Dart Terminal software to gain the special terminal emulation needed by the Kiewit Network. Faculty and staff, who own roughly 1,600 Macintoshes among themselves, are not using Applebus and, instead, tie into the Kiewit Network using Apple's Macterm terminal emulation software.

Brown said Dartmouth chose not to provide office-type communications functions for students because of security and for control over access to peripherals. Brown said the college someday is likely to provide high-quality printers to be shared by Appletalk users on each dorm floor.

The Appletalk network communicates using datagrams — messages that are passed from node to node without being slowed by repeated acknowledgements. The datagrams, Brown explained, provide the broadband communications support that Dartmouth needs to utilize eventually the system of buried coaxial cable that currently lies unused throughout the campus. The Kiewit Network is connected with twisted-pair leased lines that presently cost the college $24,000 a year.

A potentially useful feature for the Dartmouth students that Appletalk lacks, Brown said, is electronic mail. Messages sent from one Kiewit Network user to another are now carried by a citizens band (CB) simulator running on one of the Honeywell mainframes. The chatter of the CB simulator users travels across campus to the mainframe and back — even if the users live on separate floors of the same dorm.

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NEWS

Students spell success for firm's program needs

By David [illegible]
CW Staff

JOPLIN, Mo. — Several years ago, a trucking firm needed an applications program that would record information about lost cargos and accident claims. The firm's busy DP shop, however, could not spare the people to write the program, and experienced contract programmers were scarce in southwestern Missouri.

Jim Gray, an assistant professor at nearby Missouri Southern State College and a consultant for the trucking company, Contract Freighters, Inc. (CFI), stepped in with a suggestion: Why not give the job to computer science students at the college?

Gray explained that, while attending a CFI management meeting, he "swallowed real hard" and submitted a proposal stating "Christmas vacation is coming up, and if you'll give us that project, we'll design it."

Pam Green and Carl Duncan review the cargo loss system.

Carl Duncan, vice-president of information systems at CFI, was not sold on the idea at first. "I wasn't so sure it would work, using students who were inexperienced and putting them on a pretty important job," he recalled.

But because the company desperately needed such a program, and because he had confidence in Gray's judgment, Duncan decided to give the students a try. The experiment was a success.

Enthusiasm overrode everything

"The students were so enthusiastic about learning everything they could and [about] doing a superior job, that it really worked out well," he said. "Their enthusiasm just overrode everything else."

Today, the trucking company employs eight students from Missouri Southern and plans to hire more. The accident and cargo loss applications program the students helped write has become an important tool in enabling the firm to manage its fleet of 500 trucks and 800 trailers.

The students have also helped write an inventory program that keeps track of thousands of vehicles' tires. It is used to measure tire wear, to schedule inspections and to prevent theft.

"I have always believed that the student labor force is one of the largest untapped areas in the computer industry," Gray asserted.

Gray is a computer science instructor who, for 10 years, managed the college's computer center using student help exclusively. With the blessing and support of the college, Gray established the internship program with CFI two years ago.

The internship program is popular among computer science students at Missouri Southern. Students are selected as interns based on their grades, personal qualifications and successful completion of a programming course in RPG III — the programming language for CFI's two IBM System/38 minicomputers.

The students must be willing to work at CFI 20 hours a week for two years or until they graduate. The college awards three course credits to each intern.

Although they are paid roughly one-third the going rate for entry-level programmers in the Joplin area, the students agree that the experience is worth it.

"It's an excellent opportunity to get experience that is not available at the college," according to intern Paul Fenstermacher. "It involves programming real applications" rather than merely academic ones, he said. Another intern, LaVerne Stansberry, said she is pleased to have a job while in school and added, "I think this is definitely going to give us an edge" in the job market. Todd Thelen, one of the first two students to work at CFI, has already received a couple of job offers, which he attributes to his experience at the trucking firm. Some of the students have been hired at CFI after graduation.

The software CFI uses to run its trucking operation is all custom-written, Duncan said. The company has also gone into the business of selling applications packages to other trucking firms that then modify them to fit their own needs.

During a recent semester break, several students worked at CFI software client companies helping to modify programs. The students said they valued the chance to work with other clients and gain experience with other computer systems.

"They work with users in designing systems, laying out the files and designing the screens — all the way until the user says, 'That's what I want,' " Gray said.

Duncan acknowledged that, without the students, he would have to pay more to hire experienced programmers — that is, if he could find them. But he asserted that the financial considerations are not as important as the flexibility the students provide, which allows him to respond to changes in his DP shop's work load.

"Most DP shops have a fluctuating requirement for staff," he noted. "They have a heavy load for a while, and then it drops off." Without the students, he said, projects would likely have been delayed.

Gray said he is bothered by the perception of some business people that college students are not worth hiring until they graduate. "They seem to have the idea that the college student can't perform until the day he walks across that stage and gets a diploma. [Additionally] the student faces the problem of the employer who wants [him] to have two years of experience."

He said he has found that it is rewarding to work with students. "These kids are eager, and they'll climb a mountain for you."

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Plus, you'll find out how to create and use a command procedure, or CLIST...a series of TSO commands that are executed in sequence...for jobs you do again and again.

14 chapters; 325 illustrations (most are before-and-after screen images that show how the SPF options and TSO commands work); 464 pages; $22.50

OS JCL

This book takes the pain out of learning OS job-control language. Instead of trying to teach you all there is to know, it concentrates on the JCL you need for everyday applications...the kind that occur most often in an OS shop.

As a result, you'll learn to execute utility, sort/merge, language translator, and link-edit programs. You'll learn to create, maintain, and execute JCL procedures. You'll learn to code JCL for handling sequential, direct, ISAM, and VSAM files.

What's more, you'll quickly put what you learn to work. The first 3 chapters present a complete subset of JCL. So you can start coding the JCL for many jobs right away. The rest of the book is organized by function. So you can go on to any topic you want to know about after chapter 3.

9 chapters; 217 illustrations and JCL listings; 330 pages; $22.50

OS Utilities

OS Utilities, like *OS JCL*, is designed to free you from the IBM manuals and teach you how to use the OS utilities that will help you most in day-to-day programming.

That means you'll learn how to create, rename, reformat, and scratch various types of data sets. You'll learn how to use the sort/merge utility. You'll learn how to list important system information, such as catalog entries or VTOC entries. You'll learn how to generate large volumes of test data with just a few control statements. And you'll learn how to use the IDCAMS utility to process VSAM files.

If you've ever written a program in a high-level language because you couldn't figure out how to use the utility for that function, this is the book for you.

Covers 13 utilities: IEBGENER, IEBPTPCH, IEBISAM, IEBCOPY, IEBUPDTE, IEBDG, IEBCOMPR, IEHLIST, IEHMOVE, IEHPROGM, IEFBR14, Sort/Merge, IDCAMS

14 chapters; 115 illustrations and utility job listings; 185 pages; $15.

OS Debugging for the COBOL Programmer

This book is just what its title implies: a guide to debugging COBOL programs on OS systems using compiler and storage dump output. You'll learn how to:

- recognize different types of debugging output...and tell OS to produce the output you want
- track down the cause of an abend, whether it occurred in a main program, an application subprogram, or a system subprogram
- locate bugs using the JCL and compiler output alone...so you'll only have to go to the dump when you really need to
- use a storage dump (when you really need to!) to find the cause of the problem

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COBOL from page 1

disk drives and Microsoft's MS-DOS 2.0 operating system.

The U.S. government's General Services Administration (GSA) Federal Software Testing Center found that Microsoft's Cobol has a high level of compliance with the Ansi 1974 Level 2 Cobol standard.

Microsoft Cobol costs $700 from Microsoft, Box 97200, 10700 Northrup Way, Bellevue, Wash. 98009.

Micro Focus' Professional Cobol reportedly consists of a GSA-certified High-Level Ansi '74 Cobol syntax checker and an Intel Corp. 8086 microprocessor native-code-generating compiler. It is said to contain a full screen Cobol source code editor that can be used as a documentation development tool and a forms screen painting tool that generates source code that allows a programmer to paint an interactive display as it will appear to an end user.

> ”
>
> *The GSA Federal Software Testing Center found that Microsoft's Cobol has a high level of compliance with the Ansi 1974 Level 2 Cobol standard.*

Animator, a source-level debugging tool, allows a programmer to control the flow of execution, monitor and modify data base values and perform "what-if" program analysis, the vendor said.

Professional Cobol contains other programming tools:

- A library tool that reportedly allows a programmer to group any number of program and data files into one library.
- A run tool with which the programmer, after a syntax check or full compiling, can execute one or more independent programs and view them as an end user would, according to the vendor.
- A build tool that combines programs, library files, application support modules and a runtime system into a stand-alone, executable module.

Professional Cobol costs $3,000 from Micro Focus, located in Suite 235, 1860 Embarcadero Road, Palo Alto, Calif. 94303.

CW photo by [illegible]

Computer catalog terminals in space once reserved for index card cabinets.

LIBRARY from page 1

library has cataloged new acquisitions in its machine-readable cataloging (Marc) computer system and recently the library converted its 1979 list of 5.5 million books into computer format to cover pre-1968 items, in what is called the pre-Marc system.

Consequently, a researcher looking for English-language books on Shakespeare, for example, now could use a computer terminal to find at least 90% of the library books on the subject, Kimball said, conceding that a few very old books and papers do not yet show up in the computer files.

"From now to the time that we dispense with the cards, we will be developing procedures to be sure that everything that's in the card catalog shows up in the computer file," he added.

Automation of all the library's collections will be an arduous and continuing process, Kimball emphasized. "We are making arrangements to continue creating machine-readable records for all of the library's catalogs for all formats, not just monographs," he said. "This will include serials, periodicals, maps, music and photo records, manuscripts — any type of library material."

'A long way to go'

The library has about 71 million items now that could be cataloged. "We're talking now about having only cataloged about 7.5 million books in machine-readable form, so we've got a long way to go," Kimball said.

To handle the huge data base, he added, the library will replace its two IBM 3033 mainframes in the next few months "with whatever is equivalent to IBM's best computer now," because the data files simply require faster and more powerful processors. "The [teleprocessing monitor] is CICS, so in order not to have to redo all of the files and software, the request for new hardware [requires it] to support CICS," he added.

The automation projects will continue as the library undergoes a major renovation, to be completed by 1992. By January 1987, Kimball explained, the number of computer terminals will increase to between 75 and 100. The wood cabinets, with their elaborate and historic carvings, will survive as part of the high-tech catalog, Kimball said, by way of some artful carpentry work.

"We can't afford to lose data! That's why we bought insurance... Data Check Recovery."

Marv Hamp, Systems Programmer, CADAM Inc., Burbank, CA

"Before we got Data Check Recovery, we more or less threw up our hands in desperation when we had an I/O error–all that pack analyzing, reinitialization, restoring. It all takes time; it's cumbersome.

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"So we bought Data Check Recovery as an insurance policy. And it's paid off.

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"Data Check Recovery is so easy to run that operations will soon run it themselves, without having to check with the systems group.

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Software Corporation of America

Amdahl extends communications processor line

By Jeffry Beeler
CW West Coast Bureau

SUNNYVALE, Calif. — Amdahl Corp. last week expanded its communications product family with the introduction of a front-end processor that reportedly helps users exploit their untapped bandwidths by multiplexing data, voice and video signals over one high-speed transmission resource.

Amdahl's 4705T made its debut on the same day as an enhanced version of the company's existing 4705E communications processor. Amdahl claimed the 4705T has more than twice the performance of its IBM counterpart, the 3705 Model 2, and at a 35% price savings.

The enhancements expand by one-third the number of full- and half-duplex lines that can be attached to one 4705E scanner, according to Sam Ezekiel, an Amdahl product marketing manager. The machine's expanded version is also said to support up to six host CPU connections, compared with four for its predecessor. By improving the connectivity of the 4705E's scanners, Amdahl has extended the useful life of the processor's base model, Ezekiel said.

Like the enhanced 4705E, the 4705T starts with a base cabinet and then permits customers to enlarge their transmission capacity through the addition of expansion modules. Packaged with four scanners and four channel adapters, the unit communicates with host processors at up to 64K bit/sec and supports 160 half-duplex lines running as fast as 9.6K bit/sec.

Each of the processor's two expansion cabinets, meanwhile, holds another 96 such links, for a reported total system capacity of 352 half-duplex lines.

Rounding out the 4705T is a high-speed attachment cabinet that is said to hold simultaneously as many as 44 data, video or voice lines ranging in speed from 4.8K to 768K bit/sec. This last hardware module supports simultaneous, two-way communications between distant points and, by allowing the 44 lines to share the same high-speed transmission facility, maximizes the efficiency with which customers can use their bandwidths, Ezekiel said.

Said to outperform rivals

Capable of operating in a Systems Network Architecture environment and compatible with IBM 3705 software, the 4705T reportedly outperforms both its Amdahl predecessors and its IBM rivals. In an Amdahl benchmark test involving 100 bisynchronous 3270 lines operating at 9.6K bit/sec, the 4705T provided 2.4 times greater throughput than the 3705-2 and a 30% performance edge over the 4705, Amdahl sources said.

Included in the processor's features is an assortment of line interfaces to bisynchronous, Synchronous Data Link Control, X.25, X.21 and start/stop communications protocols.

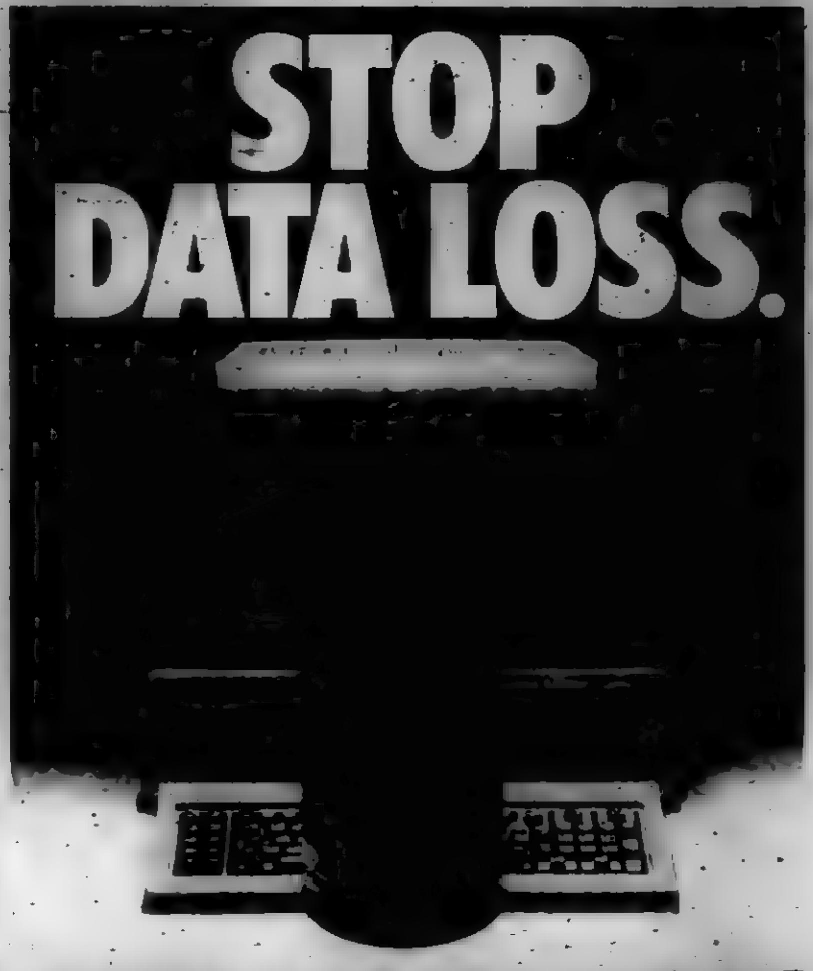
In addition, the 4705T provides as standard equipment a network management console that allows resources in a T1 data switch or other high-speed transmission facility to be allocated dynamically in response to user demands, Ezekiel said.

Increased lines delay expansion

With its high-speed attachment module, the 4705T qualifies as an enhanced version of the 4705E, which now supports 64 half-duplex or 32 full-duplex lines per scanner, he added. Prior to its latest upgrade, the 4705E accepted 48 half-duplex or 24 full-duplex lines per scanner. The purported improvement in scanner capacity is said to increase by 33% the number of lines a 4705E can accommodate before expansion is necessary.

Field-upgradable to a 4705T, the 4705E, price starting at $36,000, will begin shipping in volume during the first quarter. So, too, will the 4705T, whose purchase price starts at $42,000.

Amdahl is located at 1250 E. Arques Ave., Sunnyvale, Calif. 94088.



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GM, large users boosting drive to adopt OSI standards

Seven-layer standard's presence in office DP equipment still lagging

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — A group of 400 users turned out last week to attend the Manufacturing Automation Protocol (MAP) users group meeting, at which adoption of the International Standards Organization's (ISO) seven-layer open systems interconnection (OSI) standard was the principal goal.

Conversely, a parallel effort to promote OSI in the office place appears to be moving along at a slower speed, as evidenced by the fact that no users group is pushing the adoption of the standards for incorporation in vendors' data processing equipment.

This week, however, Boeing Computer Services Co. of Vienna, Va., intends to announce its plans to support the OSI standards for the office place at the opening of the Infomart computer retailing center in Dallas, the company said.

Meanwhile, MAP users, who take their name from a MAP protocol developed for integrating factory automation systems at General Motors Corp., heard officials from the auto manufacturer describe GM's efforts to implement protocol standards that permit sophisticated user manipulation of data over incompatible systems that are interconnected.

> *From a user's point of view, the value of OSI products will not be realized until several significant obstacles are overcome.*

GM said it is pushing for adoption of OSI protocols to integrate factory floor processes because its costs have become inflated by building vendor-specific hardware-software interfaces, which GM said raises its costs by 15% to 35% annually.

The National Bureau of Standards (NBS) last year opened a government-industry push to implement the ISO interface protocols, separating the work into two groups focusing on factory systems and office systems, respectively. A demonstration was held at last year's National Computer Conference in Las Vegas.

NBS has set up a research and test facility to promote the protocols that it hoped would be incorporated into vendor products. Last week, Gary Workman, a GM representative who has been working on the MAP implementation, remarked to the users group that numerous issues — from the third, or network, layer up to the seventh, or application, layer — are still up in the air.

A draft international standard has been formulated for the network layer, which routes information between and within networks. However, addressing schemes and routing algorithms to connect one MAP network to a wide-area network are issues still undecided, Workman said.

At the fourth, or transport, layer, an ISO international standard has been promulgated that specifies a Class IV protocol, but still at issue is the use of other protocols to enable real-time communications, Workman added.

At the fifth, or session, layer, where streams of data are managed, concerns such as the communication of data among applications programs within a MAP network, file transfer and access management in a two-way simultaneous transfer system are still at issue despite the promulgation of an ISO kernel system standard.

The sixth, or presentation, layer and the seventh, or applications, layer are the two areas where vendors are applying their own interpretations to the implementation of the OSI model, according to Workman.

Obstacles to be overcome

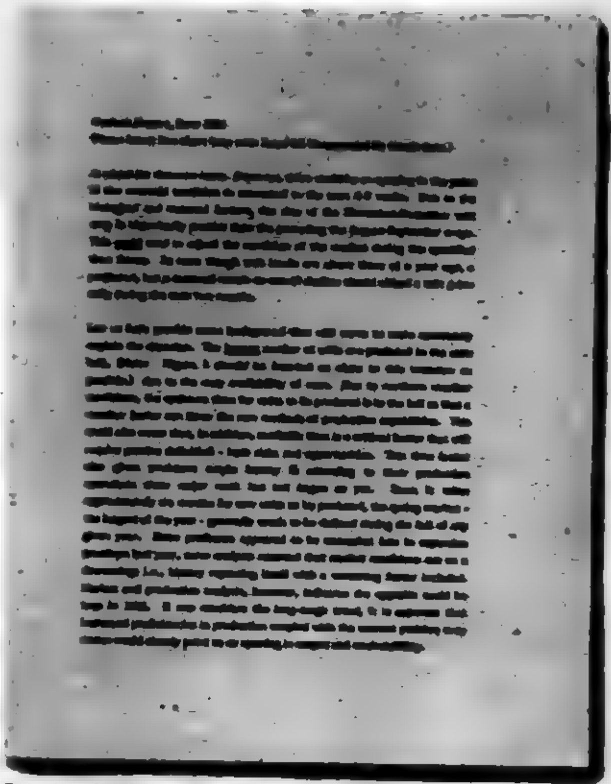
From a user's point of view, the value of OSI products will not be realized until several significant obstacles are overcome, the GM representative said. Among them, he noted, were the development of a language for communicating OSI functions within a network. "We need to work on the components of a message structure — the syntax, semantics and grammar of a message," he said.

Outlining the remaining issues that need to be addressed before OSI becomes a reality, Workman pointed to real-time processing and the connection of MAP nets to wider area networks in order to link, for example, the factory floor to the accounting or the receivables department.

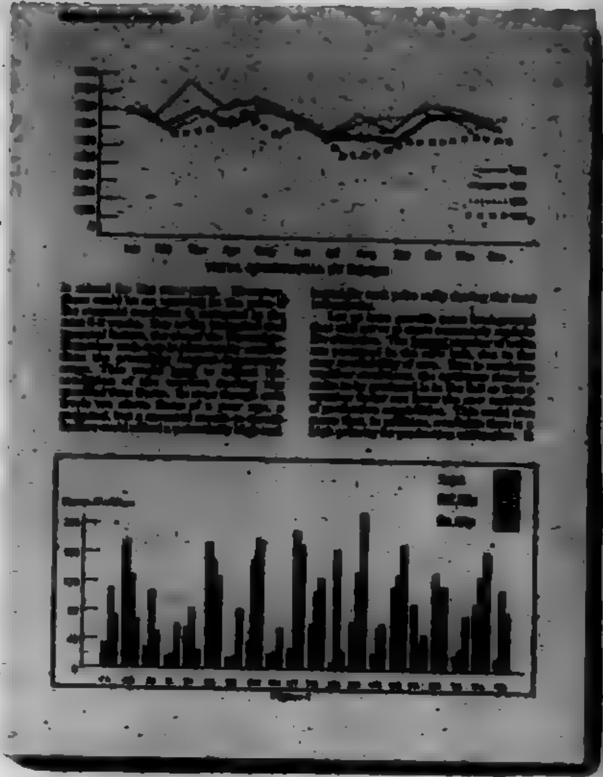
One user asked how users would be able to link OSI-supported products that internally interface between one layer and another in different manners.

In response, Workman demurred, saying, "There is a wealth of interfaces that you [the user] can use."

A day in the life



Los Angeles, Monday, 8:00 A.M. PST. Text of document is created on Xerox 860 Information Processor and communicated on Ethernet network to Chicago.



Chicago, Monday, 11:00 A.M. CST. Graphics created and integrated with received text on Xerox 8010 Professional Workstation and electronically mailed to New York office.

Remarkable, isn't it? The weeks it would have once taken to prepare, translate, print and distribute a complex, illustrated report such as the example above can now be compressed into the span of a single business day.

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Naturally, what you see pictured here is only one example of Star's powers. It's the only workstation that can create and print documents in more than a dozen languages. That includes Russian and Japanese (Kanji, as well as Katakana and Hiragana). This eliminates the need to have separate machines and printers for each language. Which is particu-

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Micro vendors putting users' product queries on hold

By Paul Korzeniowski
CW Staff

"I will have to forward your call to the technical support group," said a customer support representative at Ashton-Tate, a Culver City, Calif., microcomputer software vendor. "You may be put on hold for half an hour."

A wait of such length is common for users with a question that a corporate microcomputer support staff or a computer dealer cannot answer, vendors and microcomputer users told *Computerworld.*

"The only time a company receives prompt answers from a vendor is when it is deciding which package to purchase," noted Mark Tramonte, an analyst at Conn.-based Hartford Casualty Insurance Co. "During the evaluation process, a vendor makes sure that questions are swiftly answered. Once a purchase decision is made, things change, and it takes a longer time to receive an answer."

This disparity arises more out of inexperience than deceit, according to Tramonte. "Vendors are well intentioned and want to provide support, but they just don't seem to know how to do it," he said.

Vendors listed four factors that prevent them from transforming their intentions into reality:

- Users' systems consist of wares from numerous sources, so companies are forced to support other vendors' products as well as their own.
- Users would rather call technical support than read a manual.
- User expertise and needs greatly vary.
- A good support employee must have technical and communication skills, and this combination is hard to find.

During a two-hour period, Alpha Software Corp.'s support staff received as many questions concerning hardware as it did for Alpha's software. "We spend a great deal of time telling users how to configure a system — how to attach a printer or hard disk to a microcomputer," Brad Fenn, manager of customer and technical support at Alpha, located in Burlington, Mass., noted. "Our staff has a thorough knowledge of our products, but locating problems with a certain disk drive or a printer can be time consuming."

User manuals

Often, these questions are answered in a user manual. "Some people are more comfortable picking up a telephone than leafing through a user manual for an answer," noted Bob Gafford, vice-president of documentation and product support at Ashton-Tate.

Usually, it is the first-time user who doesn't consult the manual, vendors noted. "First-time users often need hand-holding, and they ask a range of questions such as 'Which printer should I buy?' and 'How good is XYZ company's spreadsheet?' " Fenn said.

Seldom do these types of calls come from a corporate user. "We know that users may have difficulty reaching a vendor's technical support staff so we try to provide as much suppport as possible," Tramonte maintained. "This situation is good for us and for the vendor."

Despite an in-depth knowledge of a package, a corporate staff often experiences problems that it cannot solve. "There are approximately three or four times a day when we have to call a vendor or a computer dealer for a solution to a problem," Tramonte said.

Technical problems

These problems tend to be technical, and vendors usually are not as well equipped to answer them as they are to answer first-time user questions. "When we hire a support person, we look for communication skills as well as technical skills," Fenn said.

"The person has to be able to guide the person through a problem as well as understand the technology. Our technical support people have programming experience, but they are not programmers. Users should realize that there may be questions that we can't answer."

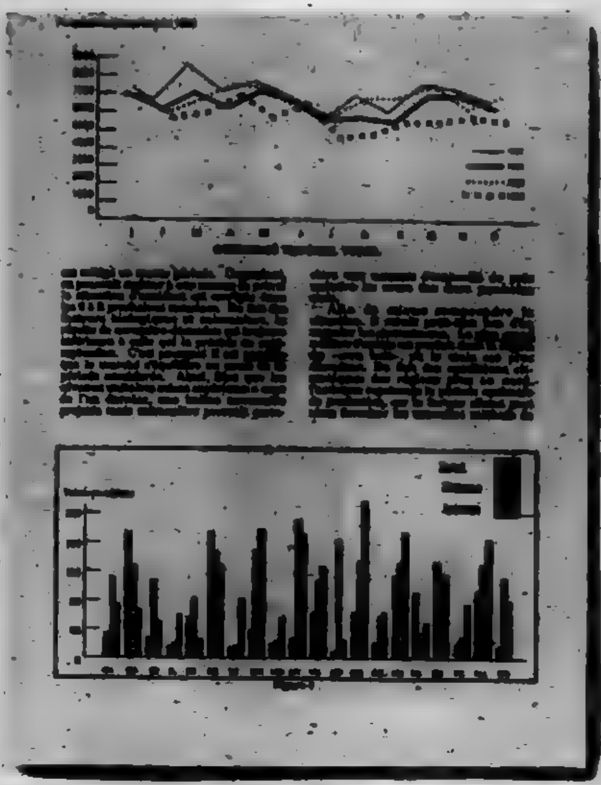
When Fenn's group is unable to answer a question, it consults a programmer who designed the package. "Three or four times a day, we have a problem that we may not be able to solve," the support manager said. Fenn claimed that most technical problems are solved in one day.

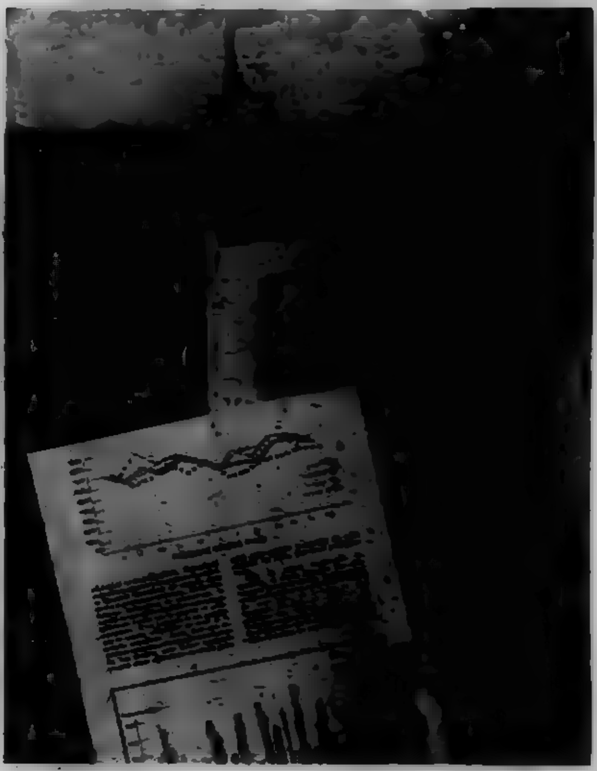
Vendors generally realize the problems this delay may cause a corporate user, and there are signs they are attempting to provide better and faster support. In December, Ashton-Tate hired Gafford as vice-president for support and documentation. His primary responsibility is to improve Ashton-Tate's support response time and quality. Ashton-Tate claimed it is the first microcomputer software company to hire a vice-president of support.

The result may be that Ashton-Tate will divide support into two groups: corporate and single user. "There are two groups of users, and each requires a different type of support," Gafford said. "If we do not divide our group, we may screen telephone calls and route technical questions to those best able to answer them and nontechnical questions to other support personnel."

XEROX

of a document.


New York, Monday, 4:00 P.M. EST. Entire document has been translated into French and entered on the 8010, then sent through Ethernet to Paris.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Patent disputes, hacking major DP law issues in '85

Need seen for lawyers to have better understanding of technology

By James Connolly
CW Staff

There may be those who picture a computer lawyer as a robot standing before a black-robed judge and saying, "Beep! I object!"

But throughout the U.S., almost every major law firm now offers some degree of specialization in computer law, an area that is constantly evolving and yet is little more than corporate, tax, criminal and copyright law with the names changed to confuse the innocent.

More than 1,000 lawyers now belong to regional and national computer law organizations. Some of those attorneys, in a survey eliciting their concerns and observations of trends in computer law, listed hacking, patent disputes, privacy, warranties and product liabilities among their concerns.

But the self-proclaimed inventor of computer law, Boston attorney Roy Freed, tempered all of their comments by noting, "There's no such thing as computer law. Actually, computers are merely the vanguard of advanced technology." Freed added that the first thing a lawyer and a client should realize is that computers impact all fields of law — corporate, copyright, labor, business and criminal — and that lawyers must understand the technology so they can apply the appropriate law.

Freed, who has been involved with computer law for 24 years and is the founder of the Computer Law Association, said key issues include recognizing a computer program as a work of authorship, just like a book, and the idea that "computer equipment is equipment just like any other equipment."

Hacking, whether it involves theft by employees or vandalism by strangers, was one issue cited by Peter Marx, chairman of the New England Law Forum. "People are going to be appalled to see so many people getting off on technicalities. It's going to be a field day for good lawyers. The result will probably be that in 1985 we will see the cases that will generate the anger, so that in 1986, there will be all kinds of new legislation," Marx said.

> *'People are going to be appalled to see so many people getting off on technicalities. It's going to be a field day for lawyers.'*
>
> — **Peter Marx, Chase Econometrics/Interactive Data Corp.**

Marx, who is vice-president and general counsel for Chase Econometrics/Interactive Data Corp., warned that corporations should be prepared for more vandalism, taking such forms as the recent harassment of a *Newsweek* reporter who offended a group of hackers. The hackers, apparently angered by an article the reporter wrote, broke into his credit files, pulled his credit card codes and passed them around.

Marx noted that with so many conflicting theft and computer trespassing laws in individual states, it remains unclear how to prosecute cases, for example, like that of a California company that penetrates its Massachusetts competitor's data base and sends the data to its Michigan branch office. He added that a hot issue that lawyers will be addressing is the question of who owns the knowledge in an employee's head, as in the case of a programmer or designer who uses on-the-job experience to develop a product on his own time, even where no trade secrets are involved.

One result of these and other issues will be the growth of a computer-related insurance business, with vendors and users taking on special insurance for protection against suits for libel, contract disputes and loss of trade secrets.

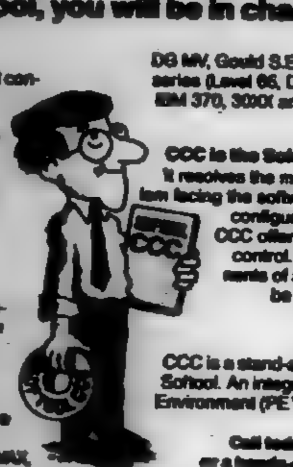
While Marx called for more laws, Michael Scott, director of the Center for Computer Law in Manhattan Beach, Calif., said existing laws are sufficient to protect against hackers. "Most of the activity is going to be taken care of by existing statutes or modified statutes. The problem is that Congress doesn't understand what is going on. They are leaving it up to federal prosecutors to decide who is going to be hit with a federal indictment for a relatively minor offense," Scott said.

He warned that antihacker crackdowns could create disrespect for the law, particularly if the focus is on "victimless crimes."

But an area that is due for more structure is that of warranties, Scott said. "Most of the problems that we've had have been because there are not enough cases to guide us. Everyone is speculating. Until we have more cases, we are not going to know what the boundaries are," he noted. He added that while most states have long had common laws addressing fraud, lawyers representing vendors and users should be careful in drafting warranties, addressing such issues as in what state a suit can be litigated.

Scott and Marx agreed that the

See LAW page 15



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WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

Comprehensive MIS urged for tracking EPA Superfund

WASHINGTON, D.C. — The U.S. Environmental Protection Agency (EPA) should consider developing comprehensive MIS to track enforcement of the Superfund program, which requires companies to help clean up their hazardous chemical dump sites, according to the General Accounting Office (GAO).

In a recent report to the U.S. Congress, GAO maintained that EPA headquarters and regional offices already have individual tracking systems in use for certain types of enforcement cases.

However, GAO reported that if the number of Superfund enforcement cases continues to rise as projected, it will become increasingly beneficial for EPA program managers to maintain more comprehensive tracking information.

GAO said the comprehensive system would help the agency answer questions such as "How long are different steps in the enforcement process taking?" and "Are the time frames that have been set for the process being met?"

The system would track the complex enforcement cases through the court proceedings, which can involve hundreds of participants and documents and take several years to complete.

Proposed U.S. credit agency would use automated system

WASHINGTON, D.C. — The Reagan administration is considering a plan to create a federal credit agency within the U.S. Department of the Treasury that would enlist the help of computers to collect delinquent government loans, a spokesman said last week.

The computer system would be modeled after the one the Internal Revenue Service uses to collect back taxes.

IRS employees use computer terminals to locate priority cases, and the computer dials the telephone number of the delinquent taxpayer. (The IRS system features an IBM 4341 processor, a Galaxy Automatic Call Distributor by Rockwell Collins Co. of Chicago and custom software by Arthur Andersen & Co. of Chicago.)

The Debt Collection Act of 1982 required 20 federal lending agencies to improve their debt collection procedures, but the Office of Management and Budget (OMB) is proposing a more centralized approach to debt collection.

OMB estimates that 20% of government loans are overdue or in default, amounting to approximately $23 billion.

In response to the proposal for a central credit management agency, OMB spokesman Steve Tupper said, "We're currently looking at that as an option for clarifying the federal role in debt collection. Congress and some agencies may have some questions about it, but we think it's the way to go."

LAW

from page 14

ability to copyright software is a dead issue, with the courts in recent years affirming that software should be protected by copyright.

John Lautsch, chairman of the American Bar Association Computer Law Division, added that the next year will see further clarification of patent law as it applies to software, drawing on Apple Computer, Inc.'s victory over Franklin Computers Corp. [CW, Jan. 16, 1984]. "People will begin to realise that protection of software is more realistically achieved through technical protection rather than through the law," Lautsch said.

Lautsch also cited privacy, a "perennial issue," as a hot legal topic for 1985 because the cost of computer storage is plummeting and capacities are rising. He noted that a personal computer 40M-byte hard disk in someone's home or office can hold dossiers on 50,000 people. With no public clamor for action on the privacy issue, Lautsch said he looks for elected officials to take an initiative to protect the individual.

A new area of law is emerging, that of computer-related product liability, according to Lautsch. While past computer law has concentrated on the ownership and performance of the computer, this new focus will be damage and personal injuries caused by computer-driven devices. Lautsch said that with $2 microchips controlling key functions in products ranging from toasters to jetliners, lawyers will sue manufacturers and programmers based on programming flaws that cause tragedies.

But Hampton, N.H., attorney Thomas K. Christo said such product liability cases are three to five years away. "We are really just touching the fringe of real computer-controlled equipment now," he noted.

Christo said a more likely trend for 1985 will be class action suits by users. He observed that personal computer users do not have the resources for a long court battle with a manufacturer, but that groups of users, representing everyone who owns a defective machine, can better wage such a battle. Christo also said that the concept of a computer vendor being responsible for equipment and software is now well entrenched. Because of that, vendors and users are now more careful, he said. That recognition has led to users relying on lawyers from the start of the purchase process.

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Home computing boom encourages zoning law update

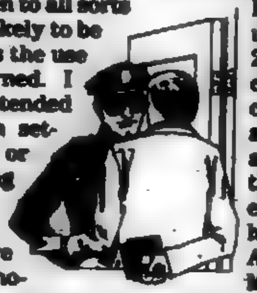
By James Connolly
CW Staff

CHICAGO — The threat of $100-per-day fines apparently has passed for a Chicago couple and other computer users here following a fight that lasted more than a year.

The computer users, including free-lance programmers and writers, and other city residents active in cottage industries such as knitting and sewing have sought to change a 28-year-old zoning ordinance that bars any money-making business in homes in residential neighborhoods.

While the ordinance remains on the books, one of the programmers and the city's acting zoning administrator agreed last week that the law should be changed and that, even as written, it should not prohibit programming in a person's own home.

"The law is vague, open to all sorts of interpretation and is likely to be changed at least as far as the use of computers is concerned. I think it was originally intended to prevent doctors from setting up X-ray equipment or dentists [from] starting their practices in their homes. But it was passed the year before Sputnik 1 went up, and nobody imagined people having computers in their homes at that time," said Leah O'Connor, a former physics teacher who began writing computer games at home five years ago.



O'Connor, who uses a variety of inexpensive home computers, and her husband, Patrick, who uses a Tandy Corp. Model 2000 to write magazine articles, were served with a cease-and-desist order after a city inspector received an anonymous tip last year that the O'Connors were operating a business in their home.

Acting zoning administrator Maurice Parrish, who was not involved with the original complaint, said the O'Connor file indicates that the inspector found a number of people working in the O'Connor's basement, although Leah denies ever having had anyone programming for her.

No employees

Parrish told Leah that as long as she had no employees, she could continue programming.

He also said, "We're working on language to amend the ordinance so it will take into account the new technologies. We have recently gathered background information on other ordinances in other communities that have had amendments to permit these and other operations.

"We're not only talking about high-tech here but all of the new cottage industries, he added."

Parrish said that he has heard unofficial estimates of the number of home-based computer businesses ranging to several million nationwide and that numerous communities, most in the Boston and San Francisco areas, have updated their zoning laws in light of the home computer boom.

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Computer law program to run in 24 cities

NEW YORK — The Practising Law Institute will hold a one-day program titled "Introduction to Computer Law" on Feb. 26, and the program will be broadcast live to 24 cities located in the Eastern and Central time zones.

The program is intended to provide a legal foundation in the acquisition and use of computer goods and services.

The program begins with an introduction to computer terminology for lawyers, incuding definitions of hardware and software.

Other topics to be discussed include contracting for computer hardware, software and services; litigating computer disputes, such as warranty and negligence liability; federal taxation of computer goods and services; and computer software protection, including the developing body of law in copyright and trade secrets.

Daniel T. Brooks of Computer Law Advisers of Springfield, Va., will chair the seminar. The faculty includes Donald I. Baker of Sutherland, Asbill & Brennan of Washington, D.C.; Michael W. Berwind of Gaston Snow & Ely Bartlett of San Francisco; and Morton D. Goldberg of Schwab, Goldberg, Price & Dannay of New York.

The fee for the seminar, including course handbook, is $95. Individual copies of the handbook may be purchased separately for $35. The program is being conducted live at the J. C. Penney Building in New York, but the sponsor discouraged interested persons from attending the live event.

More information on the program as well as viewing site locations are available from Practising Law Institute, located at 810 Seventh Ave., New York, N.Y. 10019.

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Office-based work, micros top preferences in OA poll

BILLERICA, Mass. — Given a $10,000 windfall, office professionals would rather purchase personal computers than hire personal assistants, and given the choice of working at home or in the office, they would elect the office. So said a majority of respondents to a recent national survey.

Forty-one percent of the knowledge workers polled would buy computers if their companies said they could spend up to $10,000 to increase productivity at work, and another 24% would add to their existing computers' capacities in some way. Only 13% would use the money to add a staff member, said respondents to "Office Automation and the Workplace: A National Survey of Knowledge Workers," sponsored by Honeywell Technalysis for Honeywell, Inc.'s Office Management Systems Division.

Fifty-six percent of the surveyed knowledge workers said that, even if telecommunications technology made it possible to work at home, they would continue to go to the office every day. Another 36% said they would like to work part-time at home and part-time in the office; only 7% said they would opt to work exclusively at home, the study found.

Preferences for home-based work vary according to sex, age and income, the survey showed. While 51% of female respondents were willing to divide their time equally between home and office, only 32% of the men surveyed would choose to do so. The preference for working exclusively in a traditional office environment increases with age, the survey showed. While half of the workers between the ages of 18 and 29 would opt for a 50-50 home-office split, only one-third of those between the ages of 40 and 59 would do so. Fifty-seven percent of knowledge workers who earn up to $25,000, 47% of those who earn up to $35,000 and only 27% of those who earn more than $55,000 expressed a preference for working part-time at home, the study found.

Public Attitudes of New York, a research firm, polled approximately 100 professionals and managers of large corporations in each of seven functional categories — design and analysis, finance, legal, marketing, personnel and purchasing and operations management — for a total of 701 respondents.

Three-quarters of the respondents have word processing available to them daily, 68% have a computer terminal with which to work and a little more than half said they have a personal computer to use daily. Of those who have these technologies available to them, 95% use them, the study showed.

Majority interested in technology

Among the one-quarter of polled workers who do not have access to computers, the majority (71%) is either "very" or "somewhat" interested in using the technology, the survey said. Three out of four said they thought office automation technologies were "very" or "somewhat" easy to learn, with less than 1% claiming that learning to do their jobs on computers was "very difficult," the study said.

Approximately seven out of 10 respondents considered word processors and computers "very useful," whereas fewer than four out of 10 people surveyed said they felt that way about technologies like electronic mail and teleconferencing.

Eight out of 10 respondents disagreed with the statement, "Your company is more concerned about adding new machines and new technology than it is about the workers who will have to use the machines," the survey showed. The majority of the respondents (68%) said they felt that their companies had realistic expectations about what can be done with office computer systems, and 75% of those polled said their companies solicited their opinions about what type of equipment to purchase.

Honeywell Technalysis is a research-based program that examines the impact of applied technology on industrial, commercial and residential areas in terms of energy, cost and productivity savings, and it reports on emerging technologies.

The survey is available at no cost from Honeywell, Office Management Systems Division, 300 Concord Road, Billerica, Mass. 01821.

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Shriver wins TCA award

VIENNA, Va. — The manager of telephone services west for Boeing Computer Services has won the Telecommunications Association's (TCA) E.E. Pesavento Award.

George Shriver earned the award, according to TCA President Randine Wilcox, for his work in advancing the group's objectives. The award is given to a TCA member making the most significant contribution to the advancement of the association, according to TCA.

Shriver has worked in the communications industry for 21 years and manages Boeing's Puget Sound area local telephone service in Washington state.

DEC introduces low-end member of PDP-11 family

By Eric Bender
CW Staff

MERRIMACK, N.H. — Digital Equipment Corp. has introduced the MicroPDP-11/SV, a low-end member of the DEC PDP-11 family that supports up to four users.

The new micro's base configuration includes the F-11 CPU, 512K bytes of main memory, a 10M-byte hard disk drive, a 400K-byte floppy disk drive and a four-slot backplane.

The MicroPDP-11/SV is fully compatible with other members of the PDP-11 line, offering an upgrade path extending up to 4M bytes of main memory and 208M bytes of hard disk storage, the company said.

More than 2,000 application packages are currently available for the more than 300,000 systems that make up the PDP-11 family's user base," and most of these packages will run on the new machine, DEC said.

Central role for DEC A-to-Z

Emphasizing a central role for the DEC A-to-Z Integrated System software on the new micro, DEC executives pointed to a growing number of programs written by third-party firms for the A-to-Z environment. DEC will offer the Micro/RSX operating system and the base A-to-Z system software together for $1,000, according to Don Byrne, manager of the A-to-Z marketing group.

Industry analysts generally commented favorably on the introduction. Most important, the new micro represents a logical way to leverage the PDP-11 customer base, commented Michael Geran, vice-president for research at E. F. Hutton & Co. in New York. "Second, there are a lot of add-ons and life extenders," Geran noted. "Third, they know how to build these things."

"DEC continues to try to evolve a strategy at the low end, and the strategy is three steps forward and two steps back," Geran added. "This is a step forward."

Company officials underlined DEC's commitment to the PDP-11 line. "In the foreseeable future, the need for low-cost systems will continue to create a need for 16-bit processors," Byrne said.

The system carries a starting price of $5,995, 39% below the previous entry price for the PDP-11 line. A system with a 31M-byte hard disk drive will cost $1,500 more than the base price. A four-user setup with dot-matrix printer will be priced at about $3,200 per user, officials estimated.

Aimed primarily at small business and OEM sales, the MicroPDP-11/SV is shipping now, DEC officials said.

DEC's Business Computer Group is located in Merrimack, N.H. 03054.

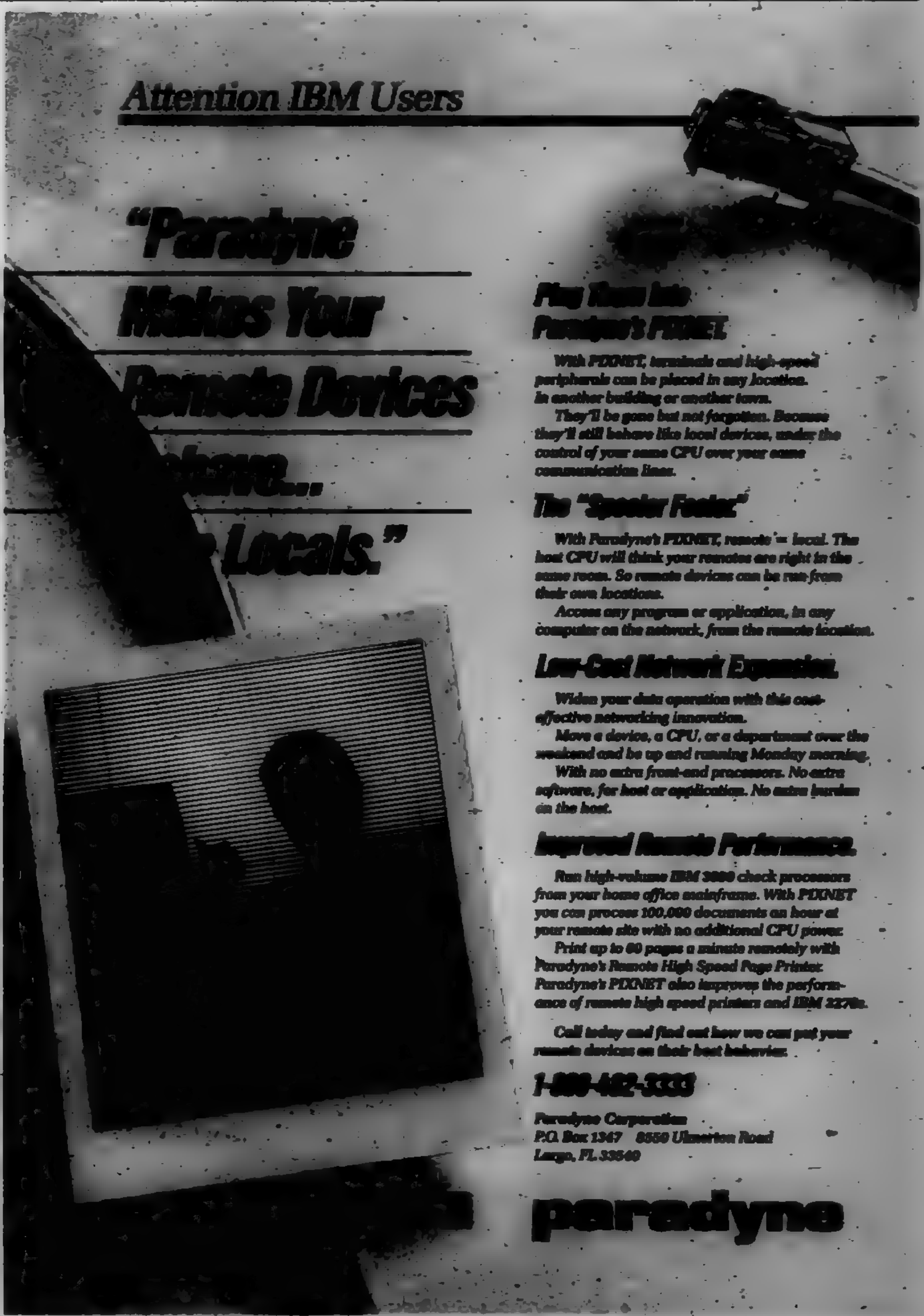
ABA meet scheduled for Feb. 3-6

WASHINGTON, D.C. — The impact of changing telecommunications technologies on banks will be the focus of the American Bankers Association (ABA) 1985 Telecommunications and Financial Networks Conference at the Hyatt Regency Hotel in New Orleans Feb. 3-6.

Speakers will include Charles Brown, chairman of the board of AT&T; William McGowan, chairman at MCI Communications, Inc.; and Henry D. Levine, partner in the law firm of Morrison and Foerster. They will address the state of banking telecommunications technology, plans for the future and business opportunities in the competitive environment.

Three general sessions, 30 concurrent sessions and a product exhibition are scheduled. Registration fees are $480 for ABA members and $600 for nonmembers.

Registration information is available from the ABA at 1120 Connecticut Ave. N.W., Washington, D.C. 20036.



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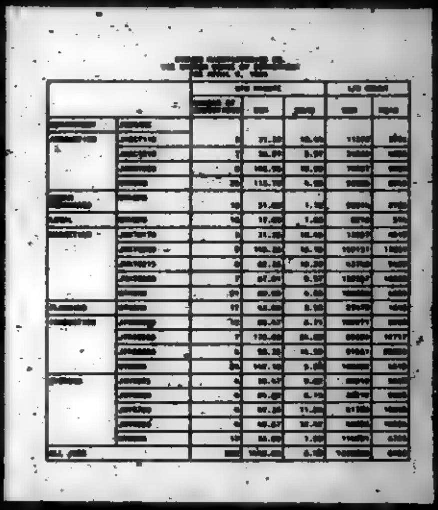

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Exxon Office Systems lays off 300, seeks buyer

By David [illegible]
CW Staff

NEW YORK — Exxon Corp. early this month laid off 300 U.S. employees at its Exxon Office Systems Co. subsidiary and announced plans to spin off the unit's Pennsylvania manufacturing operations into a separate company.

The unprofitable office systems division, which has been up for sale since at least November 1984, has been struggling to compete against other office automation equipment vendors, including IBM, Wang Laboratories, Inc. and Japan's Canon, Inc. and Sony Corp. One hundred and fifty people will be laid off at the division's Lionville, Pa., manufacturing plant, evidently in response to a worsening sales picture as Exxon seeks a buyer.

The new Lionville Manufacturing Corp. has been spun off as a separate business under Exxon Enterprises, the oil giant's unit responsible for diversification efforts, according to Ann Prechette, an Exxon spokeswoman. The Lionville facility has manufactured products for the office systems group but has now suspended production pending the sale of the unit. The plant will continue to manufacture electronics products for other Exxon divisions and do contract work for third-party customers. "We hope to now be able to provide expanded manufacturing capability to third parties," Prechette said.

V.N. Tirendi, formerly vice-president of manufacturing at the Lionville facility, has been named to head the newly formed company. It is not yet known what Tirendi's formal job title will be, Exxon said.

Exxon also announced plans to lay off approximately 150 people this month at its Forrestal Center, a Princeton, N.J., R&D facility for the office systems group. Only a handful of employees will remain at the facility to "pursue some ongoing projects," Exxon said.

The layoffs at the Exxon Office Systems division, based in Stamford, Conn., amounted to 15% of the total worldwide workforce, which now numbers 2,000.

Meanwhile, Exxon said negotiations with potential buyers of the unit are continuing.

The division markets several products, including Qyx, an office electronic typewriter, and Qwip, a digital facsimile unit. Other products include the Exxon 500 word processor and the 965 ink-jet printer. Some of the unit's products were supplied by other manufacturers.

Some facilities set for sale

With its latest move, the company has effectively removed its manufacturing and research facilities from inclusion in any sale of the organization.

Amy D. Wohl, an OA consultant in Bala-Cynwyd, Pa., said the layoffs and Lionville plant spin-off may be signs that the company is preparing to close the division. She said she is doubtful that Exxon will be able to find a buyer.

"The only things Exxon really has to sell are its installed base [of products], which is small, and its distribution" network and staff, Wohl said. The most likely buyer would be a European or Japanese company looking to acquire a U.S. distribution capability, she said.

In a related matter, a group of 27 office equipment dealers have filed a $100 million suit in federal court against Exxon and Exxon Enterprises, claiming that Exxon made misleading statements concerning its intentions to remain in the office systems business.

Information center class set

NEW YORK — The American Management Association (AMA) is sponsoring a three-day course titled, "Implementing and Managing Information Centers," from Feb. 6-8 at AMA headquarters here and at the Miyako Hotel in San Francisco from March 4-6.

The course leader will be Marilyn J. Richardson. Richardson is a consultant, seminar leader and writer on end-user education at McMahon & Richardson of Denver. The company helps companies establish information centers and technical training curricula.

The AMA course is aimed at information center managers and staff, MIS managers, user-liaison staff, personnel managers and data trainers.

Information center concepts covered

The course covers basic information center concepts, a framework for information centers, information center product selection, staff, resource management, guidelines and procedures, education strategies, information center marketing and expansion planning.

Registration for the three-day course costs $750 for AMA members and $860 for nonmembers; group rates are also offered.

More information is available from Beth Ranney, Program Director, AMA, 135 W. 50th St., New York, N.Y. 10020.

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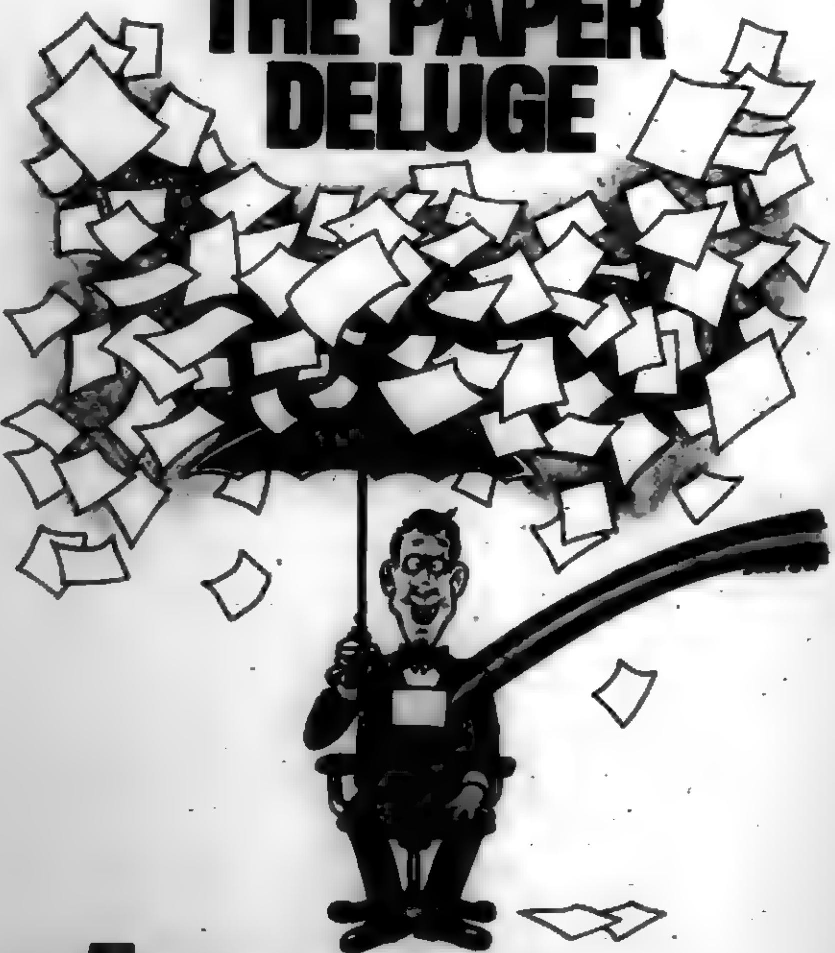

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SEC security system foils break-in

WASHINGTON, D.C. — The Securities and Exchange Commission's (SEC) new computer security system last month successfully foiled an attempted break-in by an unauthorized user, an agency spokeswoman said.

A computer hacker tried to gain unlawful access to data stored in the agency's new computer — the Electronic Data Gathering Analyzing and Retrieval System (Edgar) — through a telephone connection but was repelled by the security system, said Mary McCue, the SEC's public affairs director.

The hacker was unable to read the system's files, but instead saw displayed a warning that the attempt had violated federal law, McCue said. No effort was made to try to identify the unauthorized user.

McCue declined to comment on whether there have been any other attempted break-ins of Edgar since the first incident. She also declined to provide additional details on the security system.

The Edgar system, which began operating on a test basis last September, is built around an IBM 4341 mainframe.

The security features of the system were designed in consultation with the Federal Bureau of Investigation.

Edgar was designed to computerize the SEC's corporate information files for more efficient storage and dissemination to investors and others. McCue said the agency collects six million pages of information a year.

IBM subject of conference

BOSTON — A two-day seminar sponsored by the Yankee Group will discuss how IBM has changed in the last two years.

The seminar will be held Feb. 5-6 at the Plaza Hotel in New York and Feb. 12-13 at the Claremont Resort in Berkeley, Calif.

The conference is called "The Sovereign State of IBM," and will cover such topics as IBM large system processors, storage and operating systems, how users should integrate IBM's new products into corporate information strategies and IBM data base management and application development directions.

The ways in which personal computers have begun to make distributed processing a reality will also be discussed.

The registration fee for the first person in an organization that attends the conference is $875, while other people can attend the conference by paying $775, according to the sponsor.

More information is available from the Yankee Group, located at 14th Floor, 89 Broad St., Boston, Mass. 02110.

Micom, Interlan merge joins technologies

WESTFORD, Mass. — Interlan, Inc., a privately owned manufacturer of cable-based local-area network products here, will be acquired for about $49 million by Micom Systems, Inc., a Simi Valley, Calif.-based manufacturer of a data private automated business exchange (PABX) and other communications products.

Interlan will operate as a wholly owned subsidiary of Micom under the merger, which Micom President William A. Norred said will eventually "offer a local network approach that integrates data PABX and cable-based [local-area network] technology in a single, local network system."

Paul Severino, president of three-year-old Interlan, said the merging of the firms presents an opportunity of "building a leading-edge communications company."

Severino, who will remain as head of Interlan, said the merger moves his company from $18 million in revenues last year to a position with Micom as "the leading [networking] company overnight and provides some significant capabilities for future growth."

Under the terms of the agreement, the acquisition is expected to be completed by March 1, with Interlan shareholders receiving 1.75 million shares of Micom stock as long as the average price of that stock prior to the merger remains above $27 per share.

The sales organizations of the two companies will be combined to add a direct sales and support layer to Micom's existing manufacturer's representative and distributor channels, a Micom spokesman said.

Micom said it posted sales of $170 million during the past 12 months, with its Micro600 PABX accounting for $60 million of that total.

Norred said PABXs have handled the "lion's share" of local-area network connections by linking data terminals to host computers. "But with the rapidly expanding use of personal computers . . . customers are looking for local networks [that] are both inexpensive for interactive terminals and capable of high-speed file transfer," he said.

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System's terrain models aid in landscape preservation

By Donna Raimondi
CW Staff

LAKEWOOD, Colo. — When Colorado's newest winter sports complex was designed, the U.S. Forest Service here used its computer system to ensure that the design's visual impact on the landscape would be as minimal as possible.

The U.S. Forest Service is responsible for the visual integrity of all national forest lands, said Hubertus Mittman, regional landscape architect with the Rocky Mountain region of the service.

People use forest regions mainly in the winter and primarily for downhill skiing, Mittman said. The upper slopes of most areas are on Forest Service land, he added.

Ski area developers have traditionally scarred the land by cutting straight through the forests, leaving wide trails that were ugly to look at in the summertime, Mittman said, but that is all changing.

Model permits views from all angles

A three-dimensional model of any planned changes to the landscape now allows the Forest Service to view such development from all angles and from different locations in order to minimize the visual impact on the area, he said.

The plans for Beaver Creek Complex — developed by the Vail Association and situated seven miles from the Vail, Colo., ski area — were checked out through the Forest Service system from beginning to end, Mittman said.

The planners wanted to know how they could study the design impact from several locations, so they joined with the Forest Service; Devon Nickerson, independent designer of the Perspective Plot software used; and Hewlett-Packard Co., whose system the software runs on, to ensure a correct design, he said.

The computer system is composed of an HP 9020 32-bit desktop workstation with 1M byte of storage, a 16M-byte Winchester disk drive, an HP 2932A graphics printer, an HP 7580A drafting plotter, a California Computer Products, Inc. 9000 digitizer and the Perspective Plot package, Mittman said.

Used primarily for timber harvesting

The system is one of more than 80 similar configurations owned by the Forest Service, said Nickerson, formerly of the Forest Service and now a consultant. Most of the systems are located in the Pacific Northwest and are used primarily for timber harvesting purposes on steep terrain, he added.

The Forest Service buys topographical data that the U.S. Geological Service gathers from satellites, Mittman said. That information is stored on a Sperry Corp. 1100 series mainframe at the Department of Agriculture in Fort Collins, Colo., and extracted as needed, he said. The data — along with information gathered by Forest Service personnel — is digitized into the HP system to obtain a three-dimensional model of the topography, he explained.

Different kinds of trees in different densities can be added to or deleted from the map, Mittman said. Roads, soil manipulation (removal of rocks or dirt) or parking lot plans can be added, changed or moved, and then the area can be viewed from a variety of angles: aerially, from a certain road or from any chosen elevation, he said.

Because Forest Service computer use is decentralized, the software was designed so that field people can come in to the center, learn the system in a few hours and use the equipment on their own, Mittman said.

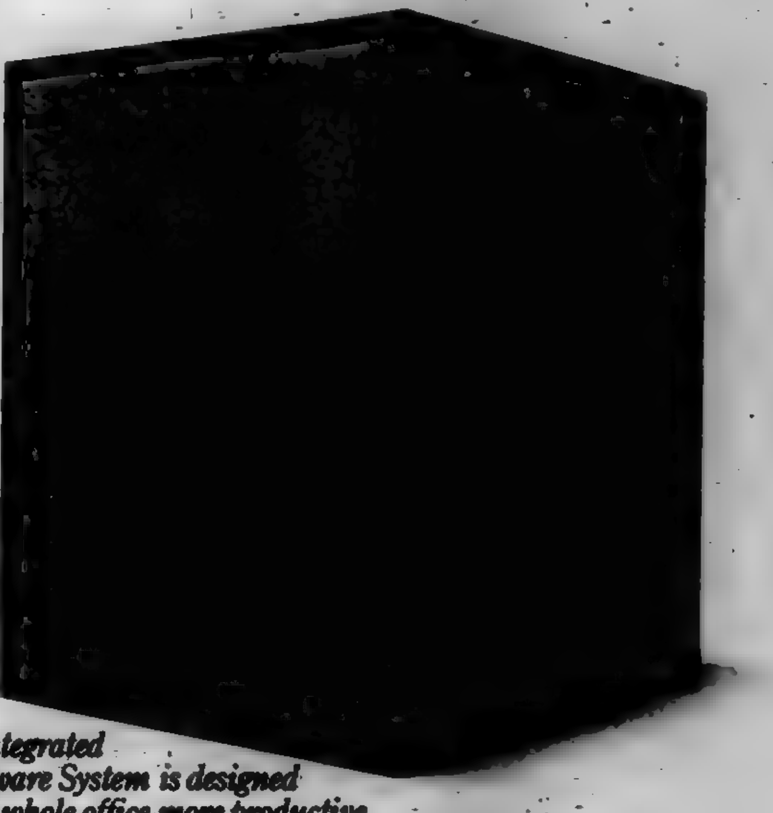
Plots not as good looking as photos

"I did plots of alternative clearing proposals and structures [towers and the ski lodge] for the Beaver Creek project," Nickerson said. "We mixed and matched and had a very accurate preview of the design," he said. The plots are not as good looking as photos or artist renderings, he said, but are impartial and geographically accurate.

The Beaver Creek trails were checked out and changed as needed using the system, Mittman said. Any new trails or trail improvements there or at any ski area involving Forest Service land will have to be run through the system for approval, he added.

Mittman said he hopes to use the plotting system for more than ski area design.

The software is being redesigned to satisfy other needs, such as determining the effects of timber cutting, tree growth and surface mining on the topography, he added.



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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

MELBOURNE — Australian software experts are being courted with lucrative job offers by Ricoh Co., a major Japanese maker of peripherals, cameras and office equipment. Ricoh recently approached the software industry committee of the Australian Computer Society seeking senior researchers who would be available to relocate to a new software development center Ricoh is establishing in Tokyo. Karl Reed, national chairman of the committee, said Ricoh asked for experienced researchers in data base management systems, computer-aided design, pattern recognition and artificial intelligence. Ricoh is said to be interested in one- or two-year signed contracts and claims it has state-of-the-art laboratories. Inquiries are being accepted by Reed at the Royal Melbourne Institute of Technology, 124 Latrobe St., Melbourne 3000, Australia.

CHINA

BEIJING — Wang Laboratories, Inc. has announced that it is establishing three joint ventures to be located here and in Shanghai and Xiamen. The joint ventures will assemble, sell and lease Wang's VS superminis, workstations, network products and micros.

FRANCE

PARIS — Bull has signed two major OEM contracts for the distribution of its Micral 30 microcomputer, which was unveiled in December. The first contract was penned with Jistral, a subsidiary of the Jeumont-Schneider group, which will offer the micro as a workstation in a network setting. The second was signed with Honeywell Information Systems Italia, which will distribute the Micral 30 in Italy under the Honeywell label.

JAPAN

TOKYO — The Sanno Institute of Business Administration here has recently reported its 12th annual survey of 3,896 computer installations in Japan. Fujitsu Ltd. claimed a 30.7% share of these systems, followed by Hitachi Ltd. with a 17.4% market share, narrowly leading IBM with a 17% share of Japanese DP shops and NEC Corp. with 15.8%. Compared with last year's figures, IBM slipped to third and changed places with Hitachi.

WEST GERMANY

WILDBAD KREUTH — During a closed-door meeting of the Christian Social Union party here, guest speaker Heinz Nixdorf, chairman of the board of Nixdorf Computer AG, warned of the precarious position the German computer industry is currently in because of the monopolistic behavior of unnamed market-dominating vendors that determine world standards. He said Japan's intent to dominate the world marketplace presents an added threat to the German electronics economy. Finally, he noted that the disruption of the market economy via state and government intervention, such as practices by the U.S. Department of Defense, is also detrimental to Germany's computer industry. It is thought in Europe that the DOD's high-tech import/export policies favor the U.S. while working against European vendors.

■

HEUSENSTAMM — Beaugrand Datentechnik GmbH has been purchased by the British manufacturer ACT, according to former company Director Lutz-Dieter Beaugrand. ACT plans to take over the Beaugrand stake in the Alphatext distribution organization and also introduce the ACT product line in Germany.

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Specifically, the VAX 8600 system incorporates four-stage pipelined processing that increases throughput by allowing the system to execute one instruction while it simultaneously decodes a second, generates an address for a third and fetches a fourth. There's also a floating point accelerator that speeds floating point operations.

Even with all its power, the VAX 8600 system conserves floor space. The CPU fits into the same size cabinet as the VAX-11/780 CPU. Power consumption and air conditioning requirements are similar, too.

VAX 8600 SYSTEM HIGHLIGHTS

MAXIMUM MAIN MEMORY SIZE	32 Million Bytes
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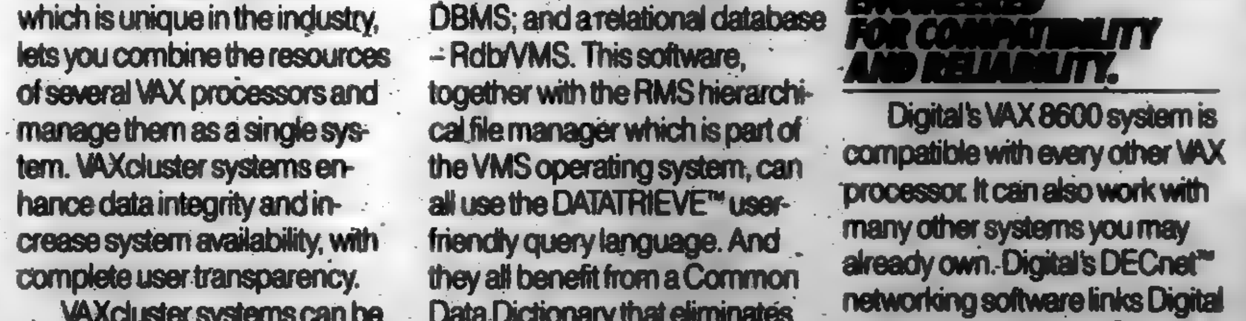

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Telecom system tightens ad agency's client network

TORONTO — Ask people to name a high-pressure, stressful communications-intensive environment and advertising is often among the first few mentioned. The industry is very competitive and fast-paced, and the stakes are always high. Using a fusion of market research, psychology and art, advertising aims at increasing client revenue through persuasive and effective communication.

An advertising agency's telecommunications system is the cornerstone of its daily operations, and the system at Saffer, Cravit & Freedman (SCF) here is no exception. As Canada's largest retail ad agency, in business since 1968, the company boasts a client roster that includes Towers Department Stores, Firestone Tire & Rubber, Peoples Jewelers, Bata Shoes, Home Hardware and Toronto's Eaton Centre. But success did not come without problems. "The agency's growth rate had a serious effect on its telecommunications services," recalled Connie Browne, office administrator at SCF. "This agency began with a staff of eight, and now we have [more than] 160 employees in our Toronto headquarters."

Browne saw the agency outgrow four upgrades in the equipment provided by Bell Canada Telephone Co. in fewer than five years. "We were using [a Bell Canada] SG-1 system and, despite assurances from [Bell Canada], our rate of growth was not taken into consideration. Replacing equipment on an almost yearly basis is very expensive," she continued.

In 1981, SCF selected the Focus digital private branch exchange from American Telecom, Inc. of Anaheim, Calif. The Focus system's reliability and its capacity to expand were the deciding factors for the agency, Browne noted.

Service for the system is provided by interconnect Canadian Telecommunications Groups (CTG) based here.

"In advertising," Browne said, "proper call handling is extremely important. This is a service business, and success means, very simply, providing clients with the best possible service. A reliable communications system was mandatory.

"This business is based on trust. In order for a client to see us as an extension of his own organization, he must be made to feel confident [with] our internal operations [and with] how quickly a message is delivered," she said.

SCF's two-cabinet system, which houses some 161 lines and 24 trunks, routes all incoming calls through two Focus main attendant consoles.

"The system operates very well. We haven't experienced any problems. With Focus, calls are now answered before the fifth ring, which is how business calls should be handled," Browne maintained. "And our clients noticed the difference."

Physical growth

In keeping with its past growth performance, SCF is in the middle of planning a move to a new Toronto location and will grow in office space from 28,000 to 37,000 square feet.

Browne said Focus will make the transition to new offices easier. "The good thing about Focus is that it won't interfere with [our expansion] process," she recounted. "Before, our growth was always a problem. And after the move we'll be looking at some of the more important cost-management features the [Focus] system offers, like station message detail recording and automatic route selection."

Service representatives from CTG have used the Focus system's remote system maintenance feature to make administration changes or software changes to the system from the interconnect's own Toronto office.

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BOOK REVIEWS

OFFICE SYSTEMS
By Samuel Kalow
and Brooks Ross

If, as the authors premise, many businesses convert to the office of the future in the next five to 10 years, then a manager's guide such as this one makes sensible reading. Whatever offices come to look like and however they come to operate, integration of systems figures to be the key. Integration is what this book is about.

Change requires a change agent: "Someone has to say that increasing the lead time with a better office system is possible and important, and it should be done." The change agent can argue for an office system that cuts business overhead or one that increases business productivity. Apparently, the authors from IBM believe these goals are mutually exclusive or at least not compatible.

The key justification for new office systems is the elimination of redundancy. The authors write, "The opportunity of electronic document distribution, because of the declining costs of broadband communications, will become the major reason why people will change office equipment, office systems and office procedures."

Nonimpact printing (laser and ink-jet) will precipitate change, as will bubble memory, which would enable voice recognition and synthesis through the storage of one billion bits of information in a cigarette-pack size device.

But what is needed is a plan, a proposal of how an organization should get to that wonderful-sounding office of the future. The office systems plan launched in Chapter 4 recognizes the need to relate office goals to overall organization objectives.

A systems manager, drawn from word processing, data processing, telecommunications or even general management, must understand which way the information flows, in what amounts and for what reasons. Ideally, this manager chooses a team of individuals from various departments affected by a new system, thus encouraging backing for it after installation. As the authors so aptly note, "People support what they help create."

The book presents more on managing system development and a bit on evaluating alternatives. Ramifications of technology are highlighted. For instance, electronic document distribution (a favorite with the authors) will so speed up mail delivery that a sender (the boss, for example) can expect an answer immediately. No more hiding behind the float-time of the current physical mail system.

Curiously, this work from a major publisher includes instances of sloppy editing as well as typographical errors not normally found, for good reason, in books. These errors make a reader wonder what else escaped the editor's eye.

Paperback, 212 pages, $10.95, ISBN 0-13-633149-1. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

WORK TRANSFORMED: AUTOMATION AND LABOR IN THE COMPUTER AGE
By Harley Shaiken

Now computers are disrupting the life of the working man.

Author Harley Shaiken formerly worked as a skilled machinist and is now a student of the social impact of automation working as a research associate in MIT's Program in Science, Technology and Society.

Using case studies, he captures the forces molding automation of the shop floor, including the die makers' turf and the use of computers to break strikes.

The author requires that the reader accept two premises. First, the potential of computers to enrich life fundamentally contradicts management's goal to achieve more power and control by using computers. Second, detailed descriptions of tool and die shop politics illustrate that contradiction.

Shaiken is convincing that the "us vs. them" paranoia inherent in the labor-management struggle really does relate to automation, which is management's ultimate solution for reducing labor costs and increasing control over manufacturing. In a typical paradox, experienced workers are needed to help debug numerical control programs. But early efforts to automate die-making at General Motors Corp. failed because skilled workers be-

See REVIEW page 34

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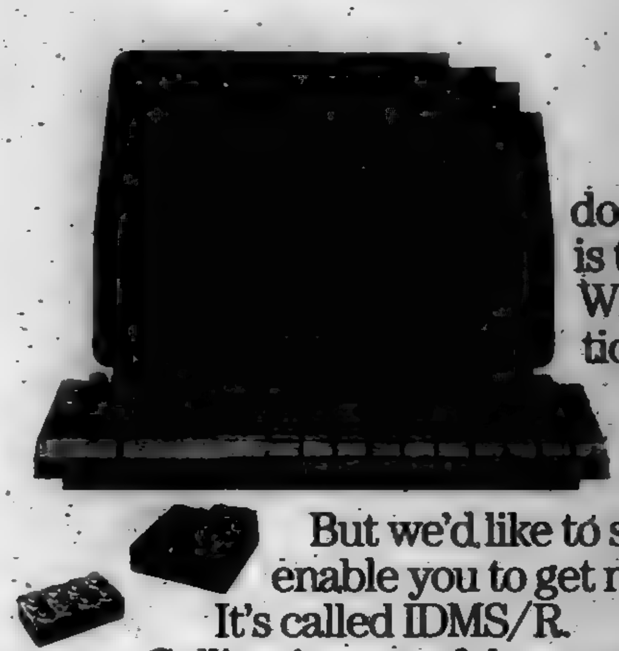

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REVIEW

from page 32

lieved programs they helped perfect would be used to replace them.

Automated systems have eroded the effectiveness of workers' ultimate weapon against their employers — the strike. The now-defunct Patco airline operators union is a case in point. Instead of the Patco strike paralyzing air travel, the government used preplanned computer programs to maintain the air traffic control system with fewer people. Thus, dismissing union members succeeded.

Shaiken does not clarify where labor and automation go from here. He borrows his "Technology Bill of Rights" from an International Association of Machinists 1981 conference and leaves us wanting more about contemporary solutions in response to disruption of the workplace by automation. It is hard to accept his notion that "a more authoritarian workplace would have a corrosive effect on democratic values throughout society," especially since fewer American workers sign up as union members each year.

Hardcover, 306 pages, $17.95, ISBN 0-03-042861-2. Holt, Rinehart and Winston, 383 Madison Ave., New York, N.Y. 10017.

— John Desmond

MANAGING INFORMATION: THE CHALLENGE AND THE OPPORTUNITY

By John Diebold

A reader expects fresh thoughts from one so famous as John Diebold, founder of the international management consulting firm and author so many years ago of a landmark work, *Automation.*

This book compiles speeches dated 1979 and 1980 and suffers as do all such collections. The reader keeps wanting to corner the writer and say, "OK, but what do you believe *now*?"

Some observations were shrewd enough, or general enough, to appear to apply as well today as five or six years ago.

Too often, routine work is automated and that is all — "management without vision," according to Diebold. The real benefits to any office result from linking the various elements of an executive's job "to eliminate the tedious and often error-prone intermediate stages in the collection, processing, transfer and/or storage of information."

The question for the future (and perhaps for the present), Diebold proposed in a 1980 speech, is: Can companies afford not to have computers for all the people who could use them? If that question applied five years ago, how much more valid is it today?

"Today," Diebold wrote, "information technology is the domain of a small 'elite.' " That statement, like others, rang true once but no longer. "The mind boggles when one thinks of prospects for commercial Josephson systems," he said elsewhere, expressing enthusiasm more appropriate to 1980 than now.

The advice in Chapter 2 continues to be well taken. Diebold told senior management: Develop new guidelines for investing in MIS; adjust to the proliferation of micros; take into account the increased importance of telecommunications; define the new role of information professionals; and decide how office automation can change not only the way work is performed, but what that work is and where it is done.

If this advice was not followed in 1979, why give it again in 1985?

Hardcover, 131 pages, $14.95, ISBN 0-8144-5793-2. Amacom, 135 W. 50th St., New York, N.Y. 10020.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, *P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.*

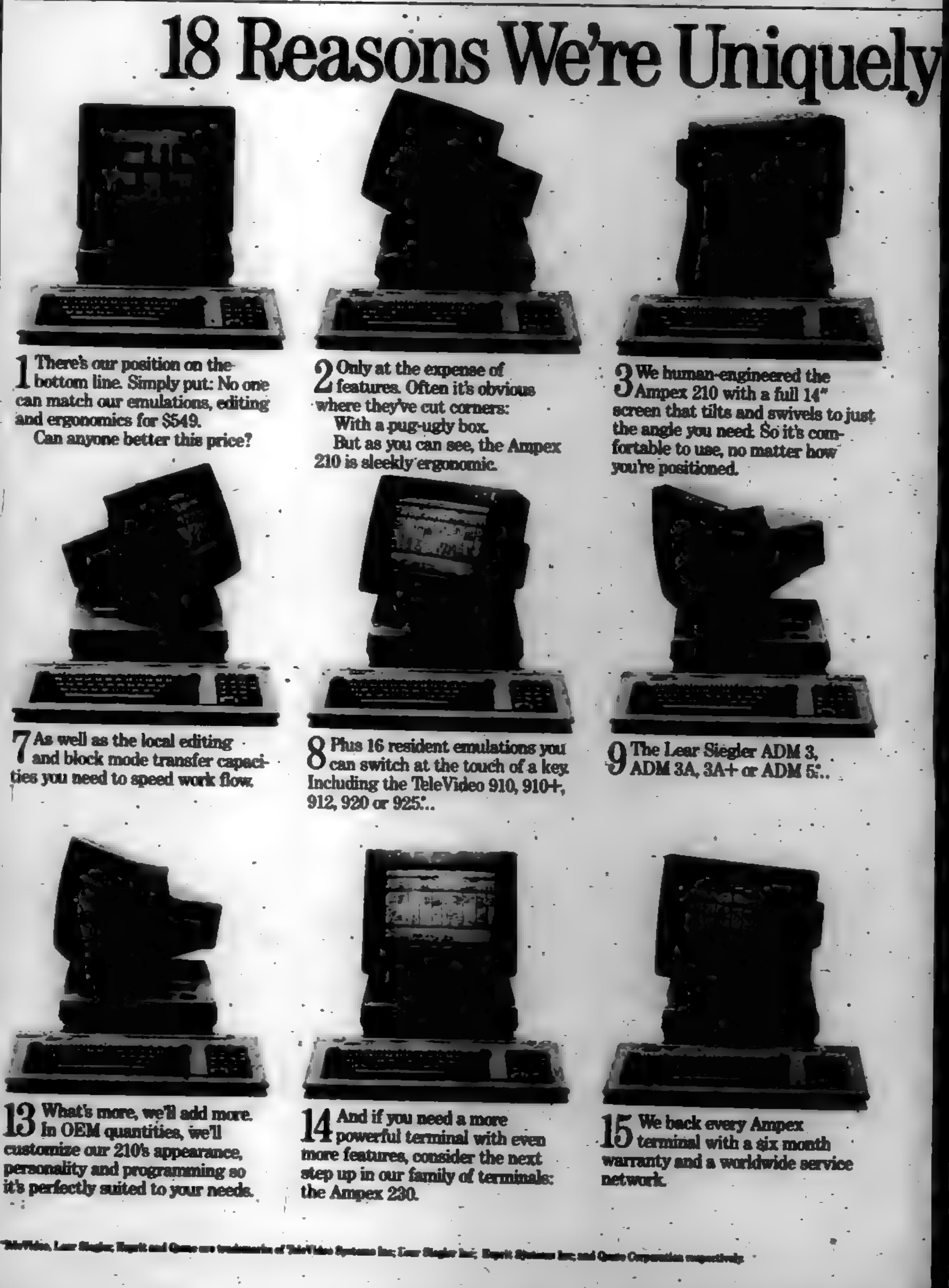
"Consider yourself lucky. I intended to replace you with a computer, but they don't make them that small."

BOOKS OF NOTE

INC. MAGAZINE'S DATABASICS, a guide to on-line business information, by Doran Howitt and Marvin Weinberger. Paperback, 614 pages, $16.95, ISBN 0-8240-7287-1. Garland Publishing, Inc., 136 Madison Ave., New York, N.Y. 10016.

THE OFFICE AUTOMATION REFERENCE & BUYER'S GUIDE, an expanded third edition listing 2,500 manufacturers and suppliers. Paperback, $49.95. Published for the Association of Information Systems Professionals by Butterfield Press, Inc., Brookfield Office Park, 304 Federal Road, Brookfield, Conn. 06804.

THE BROWN BOOK, an industry guide for microcomputer pricing. Paperback, 266 pages, $375 for six quarterly updates. The Brown Book, Inc., P.O. Box 3490, Santa Barbara, Calif., 93130.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Tool speeds insurance firm's application development

ALBUQUERQUE, N.M. — Mountain States Life Insurance Co., an insurance company headquartered here, is using fourth-generation productivity tools to speed up application development in support of more than 30,000 policy holders.

Mountain States Life had been using IBM's DMS for application development, but the data processing staff of 10, working with an IBM 4331 Model I, was frustrated by the delays and the limited calculation power of DMS, said Allan Smith, Mountain States' data processing manager. At one time, the company had to support a mortgage processing work load in addition to the life insurance requirement, he said. Both programmers and management were thwarted by a slow development process and a growing applications backlog, he added.

Under Smith's direction, the staff evaluated a few commercially available fourth-generation productivity products and narrowed down the choices to keeping DMS, changing to command-level Cobol or getting Oxford Software Corp.'s User Files On-line (UFO), an application development software product.

To determine the relative benefits of these three alternatives, Mountain States Life developed identical amortization programs under DMS, command-level Cobol and UFO, Smith said.

"In terms of speed, the clear winner was UFO," Smith maintained. "In DMS, it required four times as much time to develop the same application. In command-level Cobol, a technique with which we were not very experienced, we spent about 10 times as much time."

Smith added that an experienced command-level Cobol staff could have reduced Mountain States Life's experience by two-thirds.

Opportunity to recoup investment

After using UFO for about six months, Mountain States Life had an opportunity to recoup its investment when the company was acquired by Colwell Financial Corp., Smith said. As the acquisition was in progress, Smith and his staff were inundated by scores of requests for specific information. Some of the inquiries were detailed and comprehensive, for example, a listing of all record fields that had more than $5 worth of a specific type of insurance coverage in them, he said.

"We could run an executive inquiry under UFO, and it would take us maybe 15 minutes," Smith said. "Before, we would have had to write a program, which, at a minimum, would have taken half a day." The staff uses the executive inquiry function at least once a day, he said.

The tool also helped reconcile the data processing systems of the two companies, Smith said. It helped determine that what appeared to be errors in the mortgage system were not errors at all. "In about a third of the instances, when the Colwell Financial analysts pointed to an 'error' in our system, we ran an executive program in UFO and demonstrated that they were looking at the wrong data," he said. This capability saved literally hundreds of hours of unnecessary effort, Smith said.

In 1983, Mountain States Life acquired UFO/Cobol, a high-level Ansi Cobol-based application development system, because using UFO alone was proving to be too slow for complicated tasks, Smith said. "It takes more time to write procedures in UFO than it does to write a UFO/Cobol program if you are matching two or more files," he said.

Plans call for Mountain States Life to use UFO/Cobol to develop comprehensive life insurance master updates on-line. These updates require an application incorporating five to seven master files stored in Cobol programs.

"We're going to write a claims system for life insurance that will pull up a person's information on a screen," Smith said. The project will give information such as what benefits the person is entitled to, his history and background, he added.

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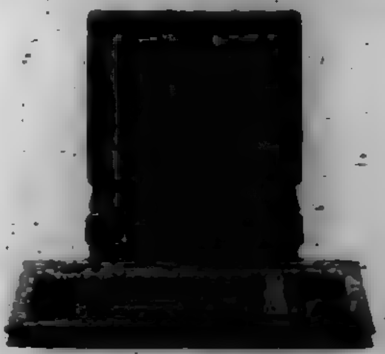

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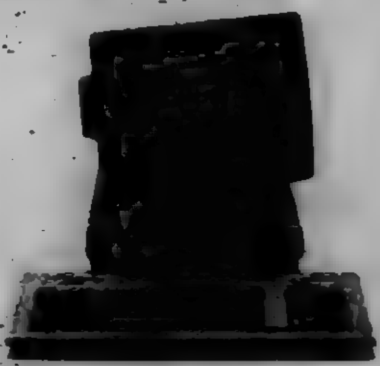

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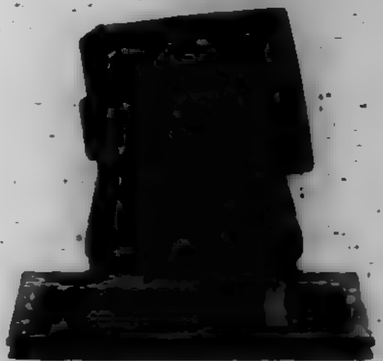
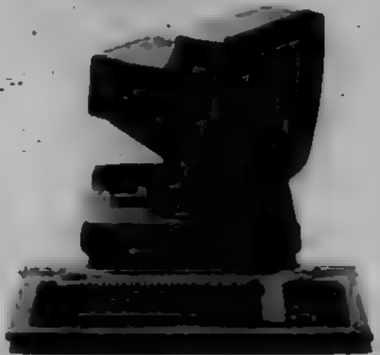


11 ADDS Regent 20, 25 and Viewpoint†...



12 And Qume's QVT 102*

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18 The Ampex 210 is from the Computer Products Division of Ampex Corporation. One of The Signal Companies

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Software buying meet set Feb. 8

MADISON, N.J. — Frank Aiello, a partner in the New York law firm of Contino, Ross & Benedict, will conduct a one-day course on software acquisition Feb. 1 at the Hyatt Regency Hotel in Cambridge, Mass. Aiello will also conduct the seminar Feb. 8 at the Doubletree Plaza in Seattle, Feb. 13 at the Radisson Hotel South in Minneapolis and Feb. 22 at the Houston Oaks in Houston.

"Legal Aspects of the Software Acquisition" is sponsored by the American Institute for Professional Education. It will address the software contract, software product definitions, pricing and payment considerations, protection of the user and vendor, warranties and remedies and licensing considerations.

The course fee is $295. More information is available from the American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

DPMA group sponsoring two-day software seminar

SUNNYVALE, Calif. — The Education Foundation of the Data Processing Management Association (DPMA) is sponsoring "Managing Software Projects II," a two-day seminar featuring Earl Boebert, project manager in advanced systems software and hardware development at Honeywell, Inc.'s Systems and Research Center.

The two-day seminar is being held at the Sunnyvale Hilton here Feb. 7-8 and at the Doubletree Hotel in Anaheim, Calif., Feb. 25-26.

Boebert, who is also an adjunct professor at the University of Minnesota, will cover topics including managing software projects; transition from requirements to design; design, implementation, integration, verification and acceptance; documentation; planning and estimating; and writing the software proposal.

The registration fee is $495 for DPMA members and $525 for nonmembers. Rates for teams of three or more are $455 each. More information is available from DPMA Education Foundation Seminars, c/o Technology Training Corp., Department MSP, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

Ansi requesting feedback on proposed draft standards

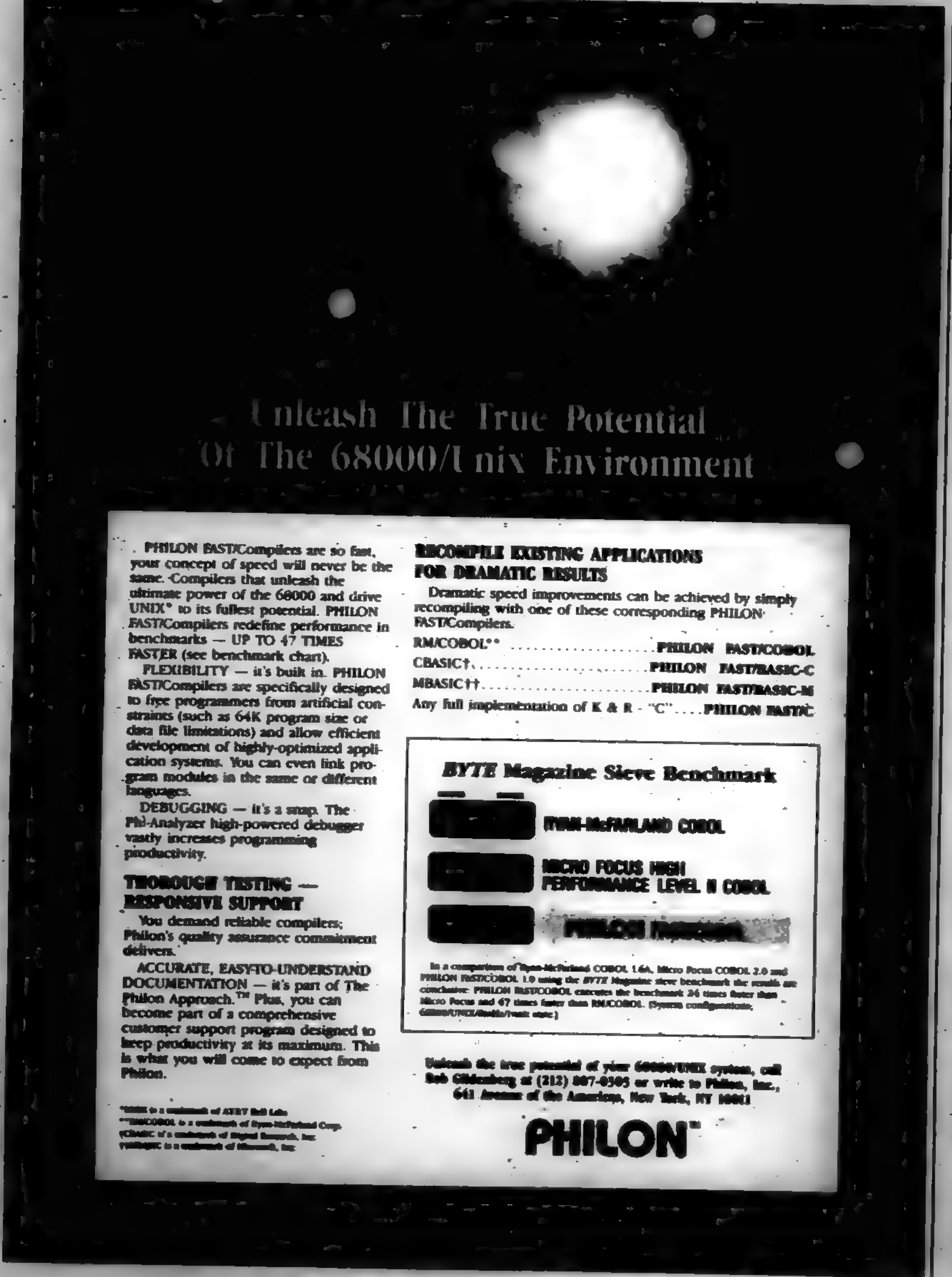
NEW YORK — The American National Standards Institute (Ansi) is seeking comment on the draft international standards (DIS) on information systems that are currently being considered for approval by the International Standards Organization (ISO).

The ISO DIS include the following: ISO/DIS 1001, information processing — file structure and labeling of magnetic tapes for information interchange; draft addendum ISO 7478/DAD 1, information processing systems, data communications, multilink procedures; and ISO/DIS 8342, monochrome test chart for document copying machines — specifications for the chart and its storage envelope.

The standards are priced as follows: ISO/DIS 1001, $44; ISO 7478/DAD 1 draft addendum, $14; ISO/DIS 8342, $20.

They are available from the International Sales Department, Ansi, 1430 Broadway, New York, N.Y. 10018.

Comments on the proposed standards should be forwarded to Ansi's director of operations, Daniel W. Smith.



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††MBASIC is a trademark of Microsoft, Inc.

Henco users set annual meet for Feb. 24-27

NEW ORLEANS — The fourth annual Henco Software, Inc. users conference will be held at the Hyatt Regency here Feb. 24-27.

The conference will feature 20 workshops, 12 tutorial sessions and several special interest group meetings, Henco said. Keynote speaker, W. J. Speigelhalter, manager of industry marketing at AT&T, will reportedly speak on "Intercity, Interdata Networking."

The conference registration fee before Jan. 21 is $275. After that date, the fee is $325.

In addition to the conference, Henco has planned 11 user workshops on Feb. 28 and March 1. Topics include "Application Development Techniques" and "Programming with Info," Henco's data base management package. The workshops are priced from $100 to $400.

Henco Software is located at 100 Fifth Ave., Waltham, Mass. 02154.

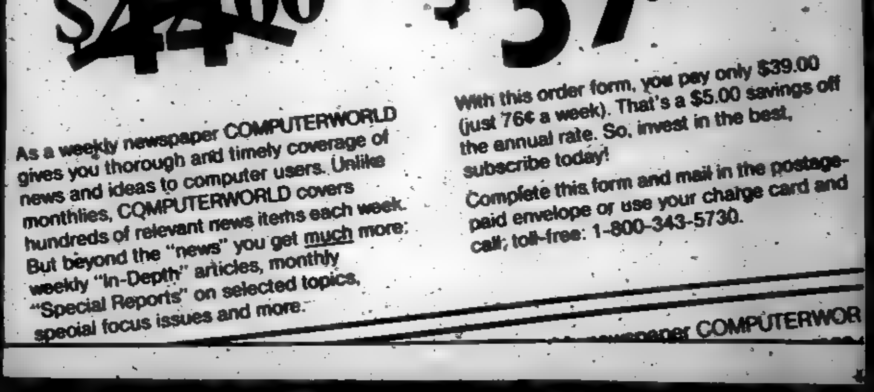
Three-day meet to examine links

DALLAS — A three-day course on connecting personal computers to mainframes will be held here at the Sheraton Dallas Hotel Feb. 6-8. and at the Boston Park Plaza Hotel Feb. 13-15.

Sponsored by Data-Tech Institute, the course will examine the use of distributed data bases and integrated applications for personal computers and mainframes.

Also to be spotlighted will be local-area networks, personal computer data communications and connecting personal computers to either Digital Equipment Corp.'s Decnet or IBM's Systems Network Architecture.

The course will utilize case studies and will provide each participant with a workbook, the sponsor said. The course costs $745 per person. More information is available from Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.



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10 Manufacturer (other than computer)
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30 Medicine/Law/Education
40 Wholesale/Retail Trade
[illegible] Business Service (except DP)
[illegible] Government—State/Federal/Local
65 Public Utility/Communication Systems/Transportation
70 Mining/Construction/Petroleum/Refining
75 Other User ____________

Vendors

[illegible] Manufacturer of Computers, Computer-related Systems or Peripherals
85 Computer Service Bureau/Software/Planning/Consulting
[illegible] Computer/Peripheral Dealer/Distributor/Retailer
95 Other Vendor ____________

2. **OCCUPATION/FUNCTION (Circle One)**

11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Financial Officer
21 Director/Manager/Supervisor DP/MIS Services
22 Director/Manager of Operations/Planning/Administrative Services
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
35 OA/WP Director/Manager/Supervisor
38 Data Comm Network/Systems Mgmt
41 Engr/Scientific/R&D/Tech Mgmt
51 Mfg Sales Reps/Sales/Marketing Mgmt
[illegible] Consulting Mgmt
70 Medical/Legal/Accounting Mgmt
[illegible] Educator/Journalist/Librarian/Student
[illegible] Other ____________

3. **COMPUTER INVOLVEMENT (Circle all that apply)**

Types of equipment with which you are personally involved either as user, vendor or consultant

A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

CALENDAR

WEEK OF JAN. 27

JANUARY 28, BURBANK, CALIF. — **IMS/ADF.** Contact: IMS Consulting, Inc., Suite 305, 16601 Ventura Blvd., Encino, Calif. 91436.

JANUARY 28, NEW YORK — **Word Processing with Multimate.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

JANUARY 28, CONCORD, CALIF. — **Performance Management in the Systems Environment.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

JANUARY 28-29, LOS ANGELES — **Unix Seminar.** Contact: U.S. Professional Development Institute, Unix and C, 1620 Elton Road, Silver Spring, Md. 20903.

JANUARY 28-29, NEW YORK — **Advanced Report Writing in Focus.** Contact: Julie Leonard, Advanced Infostructures, Inc., 475 Fifth Ave., New York, N.Y. 10017.

JANUARY 28-29, WASHINGTON, D.C. — **Operating Systems: A Comparative Analysis.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

JANUARY 28-30, DALLAS — **Relational Data Base.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

JANUARY 28-30, NEW YORK — **Decision Support Systems on Personal Computers.** Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

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EDITORIAL

DOD, DP export: Not a good mix

In appearance, it is a watered-down version of the export review procedure President Reagan proposed six months ago after Congress failed to renew the Export Administration Act.

But the president's recent decision to give the Department of Defense "limited" review authority over high-tech export licenses still is unacceptable and inappropriate.

Reagan's order will give the DOD 15 days to review applications for high-tech export licenses, during which the military can recommend approval or denial. Should the Department of Commerce recommend approval of a license application and the DOD recommend denying it, the dispute will be settled by the National Security Council. It's dollars to doughnuts that, if push came to arbitration, the council would be very likely to side with the military, particularly when advising a president so sympathetic to the Pentagon. Therefore the issue of dispute arbitration is hardly moot.

Why shouldn't the military play an active if not decisive role in determining what computers and other high-tech commodities can be shipped abroad? Wouldn't the Pentagon, which itself annually purchases billions of dollars worth of high-tech strategic goods, be the best judge of what U.S. products should be kept out of the hands of Eastern bloc nations?

The answer is no, as we have said before in this space. The Pentagon has shown an implacable ability in the past to ignore economic and commercial realities in its zeal to out-maneuver the Soviets. Consider the time, early in Reagan's administration, when the Pentagon tried to block the sale of oil pipeline equipment to the Soviets, equipment readily available throughout the world. Remember the time last year when ranking Pentagon officials tried (and failed) to place strict limitations on the export of low-powered micros, pointing to the machines' potential for strategic use on the battlefield — as though 8- and 16-bit microcomputer technology was the sole possession of the U.S.

The broader point is that there already exists an agency, the Department of Commerce, capable of making more reasoned decisions regarding export license review. This department is staffed at the top with Reagan appointees and no doubt shares the president's and the nation's wishes to halt the flow of truly strategic U.S. goods to the Soviets and their allies.

Equally as important, the Commerce Department can more adequately consider the position of small and large businesses in the export control issue, at least as compared with the inherently parochial view of the Pentagon.

The Commerce Department did a good job recently [CW, Jan. 14] in quantifying for small computer manufacturers those product specifications (such as memory capacity and processor speed) that will determine whether a computer shipment need be licensed for export, removing some of the subjectivity from the licensing procedure.

Ultimately, it is Congress' apparent insouciance in the export matter that has given the president the opportunity to implement his own policy. Unfortunately, there are no loud rumblings from Capitol Hill indicating that Congress will seek to regain what it lost through indecision.

VDT
STATION
No. 7

'What do you mean, "Whatever's wrong here, it isn't the equipment"?'

LETTER

IBM's JAD only partial solution

The article, "JAD project aids design," describing IBM's joint application design (JAD) methodology [CW, Dec. 24] correctly praised JAD's virtues but omitted to mention its shortcomings.

Like the older design methodologies it seeks to replace, JAD approaches the design process from the DP point of view rather than from the user point of view. This results in the same sort of insistence on technical needs over business needs that has produced inferior application designs in the past.

While JAD may be a practical methodology for designing transaction processing applications, it needs substantial modification to make it an effective tool for designing decision support systems.

An interactive method for designing computer applications is a necessity if DP is to improve its responsiveness to user computing needs. JAD only takes us part of the way there.

Naomi S. Leventhal
Alexandria, Va.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for clarity and brevity.

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VIEWPOINT

Time is ripe for 'know-how' machines

LECHT ON SCIENCE
Charles P. Lecht

Part 2 of series

Some of us are terrified that new offerings in computer systems will provide increasing artificial intelligence and will, therefore, be capable of performing more and more things that before only people could do. Not me. I, for one, think it's about time.

The "real" stuff — human intelligence — seems as woefully lacking to me as does our vision, hearing and strength. We need artificial intelligence as much as we need artificial vision (for example, the microscope and telescope) to augment our natural endowments. Without it, our capacity to reason would remain dismally poor. The results achieved by the human intellect in avoiding disastrous conflict in the sociopolitical arena provide us with exemplary evidence of its limitations.

That we fear the takeover of our jobs by computing machines more than we do the loss of our lives by nuclear warfare indicates the quality of the reasoning powers we possess. The creation of systems that would enhance our intellectual powers could help to alleviate such conflict and must, therefore, be accepted as cause for celebration.

Putting aside (but not forgetting) such lofty issues for a moment, I believe the appearance of know-how machine technology will improve the day-to-day quality of our lives. These machines will extend and amplify our intellectual powers — enabling us to reduce waste and chance in our lives. The more intelligence the less toil, and that's what we're after.

Given the capabilities of today's know-how machines, the suggestion arises that they may possess an intellect indistinguishable from that of some people. We cannot deny the validity of a machine intellect if we judge it by the same standards we apply to the human sort — the results it achieves.

That what a person achieves may not be, strictly speaking, of his own choosing obscures our measurement of the size of his intellectual powers. Nonetheless, the possession of knowledge and the ability to apply it, is recognized only through results. And if the results of a human and a machine are the same in the application of know-how — defined by *Webster's Ninth New Collegiate Dictionary* to be the "knowledge of how to do something smoothly and efficiently" — concluding the existence of intellect in a machine isn't too hard to do.

> *So what if a machine can possess an intellect? Did the world crumble when earlier theories claiming man's usage of tools to be unique among all living creatures were disproven by a chimpanzee?*

So what if a machine can possess an intellect? Did the world crumble when earlier theories claiming man's usage of tools to be unique among all living creatures were disproven by a chimpanzee?

Arguments about whether machines can know something in the same sense that people do, suffer from chronic semantic difficulties, so I'd like to avoid offering these here. Suffice it to say that I believe they can. And if, at times, this leads me to conclude that certain men may be no more than machines, or that certain machines may be more valuable than some men, I'm not surprised, although I confess to be saddened. Ample proof of this exists; one only need consider the treatment some of us accord our fellow men to put the issue to rest.

We do know that machines can contain knowledge in the same sense that books do. And it doesn't take too great an extension of this to conclude that machines can contain know-how in the same sense that people do.

In its definition, *Webster's Dictionary* avoids the question of who or what possesses know-how. I suspect that the editors may have wanted to leave the question open, thereby avoiding an onslaught of criticism based upon the possible desanctification of man's presumed anointed earthly role.

Even the definition of the word "know" begs the question of who or what can know. Unraveling the mystery of what was thought on this issue is just about impossible. We are sent from one dictionary entry to another for definitions of "knowledge," "know," "know-how" and their relatives, with only the appearance of the word "intellect" to suggest that a human being may be involved.

I offer this to point out the philosophical problem we shall face as machine technology improves. I predict that as this happens, the possession of knowledge and know-how will prove insufficient in establishing humanness as is the description "tool user." This idea confirms a suspicion I've had for a long time: Only creativity distinguishes a human from beast or machine.

Think of all the things machines now do that once only people did. Railway gate attendant, telegraph operator, courier, ticketing agent, pilot; the list is endless. In addition, there are a lot of things that machines now do that people never could; flying heads the list.

While limited to exhibiting know-how with a physical orientation in the past, current machine technology shows increasing intellectual capacity of the kind previously found only in people. It is hard to find a single thing performed by people that cannot be performed by a machine if possession of knowledge and/or know-how is all that is required. But creativity will always be another matter. It is unique to people.

The marriages of our high-technology companies ["Know-how machines on the horizon," CW, Jan. 7] with those of other industries are bringing

See KNOW page 40

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

LETTERS

Computer laws reexamined

I concur with the suggestions put forth in "Don't rely on the law to stop computer crime" [CW, Dec. 17] as to nonlegal remedies for computer abuse.

But the authors cite three cases to show how unsatisfactory the law is now. What they do not report is that convictions were obtained in two of those cases.

In *Ward v. Superior Court* (California, 1972), a motion to dismiss the charge against the employee was denied because probable cause existed to indicate that the program was a trade secret under the California statute prohibiting theft of trade secrets. The jury found the defendant guilty.

In *U.S. v. Seidlitz*, the Court of Appeals for the Fourth Circuit upheld the conviction of the defendant on two counts of wire fraud in violation of 18 U.S.C. Section 1343.

While the judge in *New York v. Weg* (New York Superior Court, 1982), did dismiss the case, the fact remains that many people have been convicted of "computer crime" under statutes enacted before the computer was invented.

I find considerable difficulty with the authors' enthusiasm for the Florida Computer Crime Act of 1981, which they called "the most innovative approach to the computer abuse problem." Innovative perhaps.

However, the authors failed, I believe, to recognize the weaknesses of the statute they praised. Specifically, Section 815.03(3) says, " 'Computer' means an internally programmed, automatic device that performs data processing." This definition includes not only a computer as most people understand it, but also a digital watch, a calculator and a microwave oven.

Consider this farfetched example: If you were on the beach in Miami and knowingly and without my authorization picked up my watch to find out the time while I was swimming, you would, under the Florida computer crime law, have committed a felony (Section 815.06) and could be sent to prison for five years, fined $5,000 or both (Sections 775.082 and 775.083).

Obviously this is a ridiculous example, and no intelligent prosecutor would bring such a case. But if the accused were under suspicion of a serious crime, such an act might be enough to give the police an excuse for arrest.

That computer abuse exists is clear. That some changes in the law may be necessary is also true. Massachusetts took a step in this direction in 1983 when it amended the larceny law to define trade secrets to include electronically stored data (Chapter 266, Section 30 (4)). Congress has, as noted by the Finns, taken a step in this direction that may be helpful, although there appear to be ambiguities in the new law.

The problem with specific computer crime legislation is (as it has been since the first statutes in the field were passed) defining the abuse narrowly enough to solve the problem, broadly enough to encompass developing technology and not so broadly that the law covers things like watches and microwave ovens.

Robert Bigelow
Woburn, Mass.

Case against free software

I am writing to protest the recent article "All software should be free, software developer maintains" [CW, Dec. 24] in which Richard Stallman was given a platform to propound his advocacy of "free software" and the abolition of copyrights.

One need ask Stallman only one question to understand why he endorses such a vague concept as free software. How will software producers live if not by selling the fruits of their labors?

Stallman knows the answer — by government subsidy. You can bet Stallman, spoiled by government-funded academic research programs, longs for the day his kind can dictate the course of the software industry from some ivory tower in Washington D.C.

Stallman claims that the arts and sciences progress "most quickly when people build on each other's work." Yet, how does this work of others come into being in the first place? Does Stallman honestly believe in effects without causes?

No. Stallman's position is an act of moral cowardice to evade the fact that science progresses precisely by the discoveries of independent minds pursuing their own goals and interests. Stallman denies the existence of independent men in order to defend by unspoken implication his own vices — dependence and parasitism.

Allow me to quote the U.S. Constitution on the subject of progress in the arts and sciences: "The Congress shall . . . promote the Progress of Sci-

See LETTERS page 40

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VIEWPOINT

LETTER

from page 39

ence and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writing and Discoveries."

Stallman's assertions that anyone who will not subordinate his life and work to the unearned benefit of others is an "enemy of society" and that trade is an "offense" to the traders are the type of totally fallacious misconceptions one would expect to see editorialized in some third-rate Marxist tabloid.

Stallman's feeling of "shame" when using the products of software companies reveals a fundamental hatred for the pride of the creators of these products, and consequently, a hatred for man's highest faculty, his creative mind. There is no more evil doctrine, and no "golden rule" will ever justify it.

This man brazenly proposes to "interfere as much as [he] can with other people's attempts to interfere with the sharing of software." In other words, he intends to obstruct enforcement of the copyright laws. Obstruction of justice, which Stallman apparently doesn't realize, is a felony.

In closing, I vow to seek every legal remedy from this man should he ever steal any of my company's software products.

Thomas A. Murphy
Roseville, Mich.

User: Mims the word

I would like to introduce Ken Zearfoss (author of "DBMS role in fourth-generation languages" [CW, Dec. 17]) to the Mims fourth-generation language and data base management system.

Mims was first marketed in 1976 and has been in use here at Dictaphone Corp. since 1978. Mims is a product of General Electric Information Services Co. (Geiso).

Mims allows its user to define the logical unit of work which, in Zearfoss' example, would ensure that if the transfer of $1,000 from one account into 10 accounts of $100 each could not be completed in its entirety as one task, then no piece of the transaction would take place.

The dynamic back-out concept is used to make certain that the task is either processed or not processed as a whole, thus ensuring the integrity of the data base.

Since Mims allows for the definition of a logical unit of work, it is also able to lock out all 11 account records in Zearfoss' example from other users until the whole task has been completed. Therefore, other users are assured of a consistent picture of the data base.

I think Zearfoss should investigate the characteristics of Geisco's Mims.

I'm confident he will find that Mims has provided what he feels are the missing DBMS capabilities in a fourth-generation language.

Pamela K. Farley
Melbourne, Florida

KNOW

from page 39

the "know" and the "how" of doing things together. Born of these marriages will be systems products containing know-how — know-how machines. They will join us as decision makers, financial analysts, doctors, inventory managers, farmers and lawyers.

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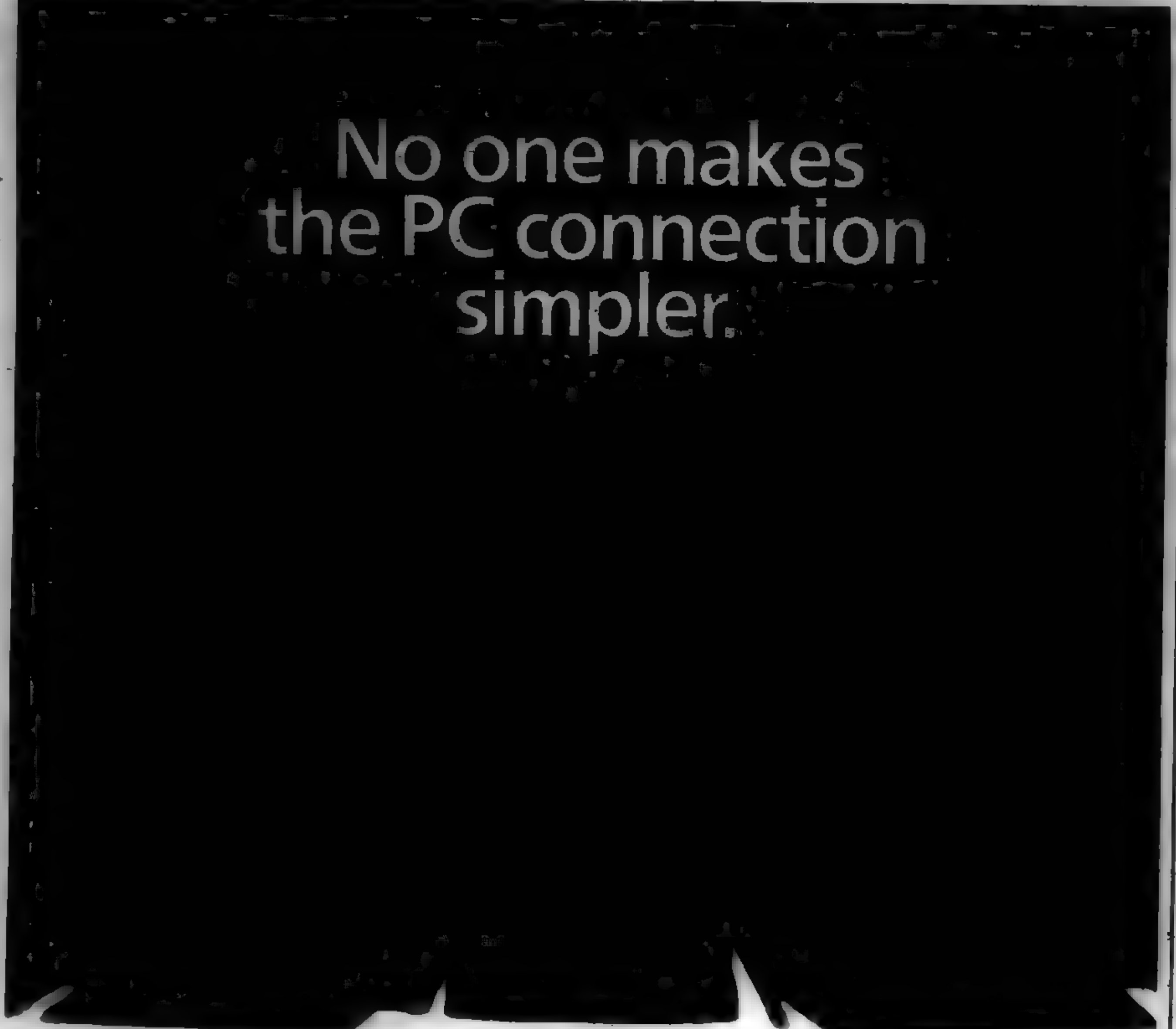

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SOFTWARE & SERVICES

Kodak's Midss zooms in on DSS role

ROCHESTER, N.Y. — Eastman Kodak Co. stopped counting the benefits of a new decision support system (DSS) barely one year after it was implemented two years ago. The project had already saved more than its $1.2 million start-up cost.

What made the Market Intelligence DSS (Midss) so successful was painstaking planning and an approach by the system's implementors that stressed conceptual rather than numeric goals. Kodak's installation of Midss was preceded by months of soul-searching concerning the question of just what the system should do, according to Fred Brachman, DSS director in market intelligence at Kodak.

The key functions that Kodak ultimately defined related little to statistical analysis or multidimensional modeling. Midss was designed to assess information need; measure the marketplace; store, retrieve and display data; analyze market information; and evaluate impact.

Interviewed recently about Midss, Brachman talked largely about the need to view DSS in a different light from traditional information systems. "DSS is about planning based on assumptions and risks based on those assumptions," he said. "The role of DSS is to look at strategies, assumptions and claims and to use DSS to formulate support and rebuttals for them."

Brachman stressed that DSS is different from the input, processing and output function of information systems (IS). "The real challenge is filtering out the necessary information," he said. "That's not an IS task. It's a matter of getting knowledgeable people together to identify [that information]."

Brachman

Kodak has drawn heavily on decision-making techniques to design and maintain Midss. Strategic Assumption Surfacing and Testing methods were used to identify critical functions followed by Kepner-Tregoe decision-making techniques.

What types of information?

Kodak has also used the Critical Success Factor approach to decide what kinds of information the DSS should provide and what software should be used.

Brachman's staff interviewed 30 people from different parts of the company to generate the primary list of needs. The consulting firm of Index Systems, Inc. was later hired to provide information systems consulting services to help organise the procedure, and a data base from Real Decisions Corp. was used to compile an inventory of software suppliers that met the criteria that Kodak identified for its DSS.

Kodak eventually selected Management Decision Systems, Inc.'s (MDS) Express DSS. The key factors in the decision were MDS' performance against a benchmark and the company's consulting experience, Brachman said. There are more than 100 active Express users within the company.

But Brachman believes in offering users a choice. Midss also includes SAS Institute, Inc.'s SAS and SAS/Graph, Execucom Systems Corp.'s IFPS, IBM's APL and APL/DI and programs written in Fortran.

Accommodate different preferences

The variety of software is intended to accommodate the preferences of different user groups, he said. The quantitative methods people, for example, were comfortable with SAS while the finance group had been using IFPS for two years.

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■ Ross Systems, Inc. has introduced a software bridge between IBM Personal Computers and Digital Equipment Corp. processors/48

■ A new package from Virtual Microsystems, Inc. allows Microsoft Corp.'s MS-DOS to run on Data General Corp. minicomputers/48

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Arrival of ISPF version: VM blessing or burden?

SOFTALK
Paul Gillin
CW Senior Editor

IBM's recent announcement of a version of its ISPF dialog manager for the VM operating system [CW, Dec. 10] is a further affirmation of ISPF's importance as a strategic IBM product but a decidedly mixed bag for VM users.

The newest release gives VM users — who are among the most fiercely loyal yet outspoken group of IBM customers — an improved version of IBM's popular dialog manager, but fails to address the stepchild image that VM has come to have within the IBM operating system community.

When taken with similar announcements for MVS/TSO and DOS/VSE over the last couple of years, this means that ISPF applications can now be fully portable across operating system lines. However, the move also indicates that VM users will come under increasing pressure to license ISPF, even though superior products for dialog management are available elsewhere.

"I think the number of products that IBM is going to release that use ISPF interfaces is going to continue to increase to the point that it will almost be a prerequisite for MVS, VM and VSE shops," said Ross Pavlac, lead programmer/analyst in applications support at the First National Bank of Chicago and manager of the ISPF project at the Guide IBM users group.

ISPF Release 2 Version 1 does make better use of some of the unique facilities that are already available in VM. The problem with the previous release of ISPF was that it looked too much like a shoehorned version of the TSO product, users said. Gary Schulz, director of computer services at Northwest Industries, Inc. and a user of both VM and ISPF, said, "A typical example was ISPF's use of libraries. It used to be that all panels, messages and skeletons had to be kept in a Maclib. A VM user would rather use a Syslib."

The release also allows Xedit, the VM editor, to be used instead of the ISPF editor, an option many VM users will embrace. The product now supports CMS sequential files and the CMS Rexx interpreter language, which is on its way to replacing the Exec command processor under VM. "It's a major step in the right direction," Schulz said. "Whether it will get the VM community on the ISPF bandwagon I don't know."

Many VM users may agree with The Adesse Corp.'s Tom Foth.

See ISPF page 51

SOFTLINE/WILLIAM H. INMON

Information engineering to link data, processes

Today's information engineering discipline must encompass a broader audience and proceed from both the top down and bottom up. In this second part of a two-part Softline, Inmon looks at the future of information engineering.

An interesting shift in attitudes has occurred from the earliest attempts at information engineering to the present. The first attempts centered on data processing's understanding of systems. However, because data processing exists to service a user, a fundamental understanding of the user's environment is required to determine just how stable a system will be. This understanding allows the information engineer to recognize where commonalities occur both in data and in processing. User involvement is an essential ingredient in the modeling process.

The final blueprint of the integrated environment must be a communications tool for the information engineer, management, the user, the programmer and the data base designer. Without the users' active and sincere support and understanding, the information blueprint will inevitably become a technical back room exercise and fail.

Another changing attitude addresses how long an information engineering effort should take. In the early days, IBM used its Business Systems Planning Process (BSP) to accomplish much of what today's methodologies do. But a BSP was typically cumbersome, required many resources to execute and took an inordinate amount of time. It was a common phenomenon for a BSP to be abandoned after four or five months, when only a fraction of it had been executed.

To be effective, an information engineering methodology must be executed in a finite amount of time (preferably six months or less) with a finite number of resources. Another success factor is the audience that can execute information engineering. To be applied across a wide audience, the execution of an effective methodology must be appropriate to someone with a reasonable data-processing/user background. If a methodology requires 15 years' experience and a doctorate degree to execute, it will never become popular. For these reasons, information engineering methodologies have become much more streamlined and simplified.

Like the pendulum swinging be-

See INFO page 51

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

The New Cincom: 10
the only software ve

Finally, there's one software vendor offering a single family of integrated products capable of meeting all of your corporate, departmental and personal information software needs—The New Cincom Systems. Our TIS™ family of integrated products is improving performance and productivity in major organizations around the world. Here are just 10 of the many reasons why your organization should be considering TIS:

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Powerful relational data management technology forms the "nucleus" of our integrated software family. Using a unique "Logical View" concept, all applications operate directly with "derived relational tables." As a result, we can provide complete data structure independence, as well as the high performance needed for today's production environments. This relational technology is the nucleus of both our TIS family of information products for IBM users and our ULTRA INTERACTIVE DATA BASE SYSTEM™ for DEC™ VAX™ users.

#2 Fourth Generation Application Development

The perfect complement to our relational data management technology is our industry acclaimed 4th Generation application development system, MANTIS™. In more than 1,500 complex production environments, MANTIS is dramatically reducing the application backlog through its powerful ability to "prototype", refine and commit the application to production in one interactive sitting.

#3 Manufacturing Control Software

CONTROL™: MRPS is our sophisticated manufacturing control system that is fully integrated

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with our relational data management technology. A complete closed-loop system, MRPS is improving the productivity and profitability of over 125 IBM and DEC VAX manufacturing environments around the world.

#4 Financial Control Software

CONTROL: Financial is our sophisticated financial accounting and control system which molds to the way you do business. Integrated directly with MRPS, CONTROL: Financial includes Accounts Receivable and Credit Management systems with Accounts Payable soon to follow.

#5 Advanced Network Management

NET/MASTER™ is one of the most recent additions to the TIS family of integrated products. Very simply, NET/MASTER is an advanced network management system that takes the complexity out of managing a sophisticated IBM computer network and lays the groundwork for distributed data base processing.

#6 The Interactive Mainframe—Micro Link

Further expanding the capabilities of our software information network is PC CONTACT™, our mainframe-micro link which enables users to interactively upload/download data between the mainframe and IBM PC's. PC CONTACT gives the PC user the ability to access multiple file types stored in the corporate data base for Decision Support manipulation.

#7 Micro Decision Support Software

For comprehensive micro-level Decision Support we offer SeriesOnePlus™*. SeriesOnePlus includes file management, spreadsheet, graphics, reporting and word processing components that are all integrated through a unique "BUS" architecture. Because the system is designed exclusively for business situations, SeriesOnePlus complements any mainframe-micro network strategy.

#8 Mainframe Decision Support Software

The recently introduced MANAGE USER SERIES™ provides powerful Decision Support capabilities for the mainframe user. The MANAGE USER SERIES combines graphics, text processing and application development tools to enhance the use and display of corporate data.

#9 Client Support

The one thing that isn't new about Cincom is our unrivaled commitment to service, support and user education. When you choose Cincom you can be assured of the highest caliber of support.

#10 Software Excellence

Why the New Cincom? Well, we like to think of ourselves as the New Cincom because every product in our TIS family of integrated technologies has been released since 1981. And, quite frankly, we believe TIS provides the highest degree of reliability, integration, performance and value in the industry.

But don't take our word for it. We invite you to personally compare TIS with what our competitors are offering. Then you'll understand why the words "Excellence In Software Technology" fit so well under our name.

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SOFTWARE & SERVICES

SYSTEMS SOFTWARE

INTERACTIVE SYSTEMS, INC.
Clone

Interactive Systems, Inc. (ISI) has announced the Clone conversion package, which ISI developed in conjunction with Digital Equipment Corp. The ISI syntax conversion package is said to facilitate conversion of Decsystem-10 and Decsystem-20 Cobol code to VAX-11 Cobol.

According to a spokesman, Clone was designed to aid in the migration of application code from one operating system to another. With Clone, standard parameter files analyze 36-bit Cobol-74 programs within Decsystem-10 and Decsystem-20 files to assist in their migration to a VAX-11 Cobol environment.

Clone provides facilities for application syntax conversion, application library access, translated application code, documentation of all code changes, data name replacement, optional warning messages and application code insertion.

Clone is priced at $750.

Interactive Systems, 600 Suffolk St., Lowell, Mass. 01854.

BOOLE & BABBAGE, INC.
Release 1.1, IMF/SM

Boole & Babbage, Inc. has announced a version of its IMF/System Manager (IMF/SM), which supports IBM's IMS/VS 1.2 or IMS/VS 1.3 environments on IBM CPUs running under IBM's MVS or MVS/XA operating systems.

According to a spokesman, IMF/SM provides a method for controlling IMS/VS resources in an interactive, structured programming facility-like manner. It can automatically start, stop or reassign IMS/VS resources to assure optimal use of resources and the fulfillment of service-level objectives.

All IMS/VS master terminal operator and IMF/SM messages are written to a Dasd log that may be viewed interactively by an IMF/SM user, the vendor said. IMF/SM Release 1.1, which replaces Release 1.0.3, is available to all IMF/SM customers with current maintenance agreements.

The price of IMF/SM is $32,500 for the first site, first CPU.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

BMC SOFTWARE, INC.
Delta IMS

BMC Software, Inc. has announced a software package that allows IBM IMS installations to configure to on-line IMS/VS environments.

Delta IMS provides for the interactive addition and change of all commonly modified IMS resources and allows data bases, application programs, transactions and IBM Vtam terminals to be added and modified, a spokesman said.

The system is said to eliminate the batch-oriented IBM IMS generation procedure, and it includes full screen panels to prompt the user, as well as on-line error detection and help facility. It is priced at $25,000 for a perpetual lease, or $1,250/mo.

BMC Software, P.O. Box 2002, Sugar Land, Texas 77478.

APPLIED DATA RESEARCH, INC.
Micro/mainframe products for IBM 3270

Applied Data Research, Inc. (ADR) has announced that its micro/mainframe software products will operate on the IBM 3270 Personal Computer Workstation.

Continued on page 46

Looking for IMS Productivity Tools?

Take a close look at APS/IMS...
APS/IMS is the application productivity system that for the first time, offers a strategic solution for IMS DB/DC and CICS/DL1 users.

With APS/IMS, you won't have to settle for a development tool that meets just a few of your productivity requirements. APS/IMS incorporates screen and application "painting," prototyping capabilities, and procedural and macro language support into a single, integrated architecture. With APS/IMS, your development staff can design, prototype and implement batch and online applications in a fraction of the traditional time and cost—without sacrificing performance or functionality.

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TIS

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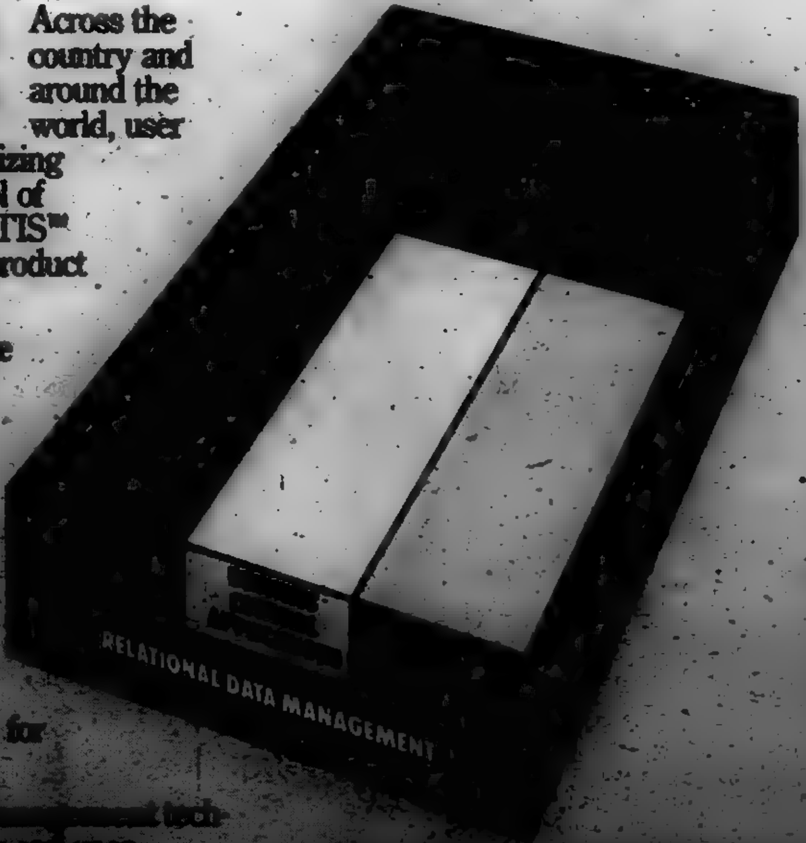
- Relational Data Management technology is designed for end-user [illegible]



TIS Seminar Schedule

In the U.S. call 1-800-543-3010
In Ohio call 513-661-6000

Albany, New York	February 21, 1985
Albuquerque, New Mexico	March 19, 1985
Atlanta, Georgia	February 14, 1985
Baltimore, Maryland	January 29, 1985
Birmingham, Alabama	January 17, 1985
Boston, Massachusetts	February 6, 1985
Charlotte, North Carolina	January 31, 1985
Chicago, Illinois	January 31, 1985
Cincinnati, Ohio	February 19, 1985
Cleveland, Ohio	January 29, 1985
Columbia, South Carolina	March 26, 1985
Columbus, Ohio	March 7, 1985
Dallas, Texas	January 15, 1985
Dallas, Texas	January 22, 1985
Dallas, Texas	February 12, 1985
Denver, Colorado	February 19, 1985
Detroit, Michigan	January 16, 1985
Fort Wayne, Indiana	February 6, 1985
Grand Rapids, Michigan	March 13, 1985
Greensboro, North Carolina	March 5, 1985
Greenville, South Carolina	January 22, 1985
Hartford, Connecticut	January 29, 1985
Houston, Texas	January 17, 1985
Houston, Texas	February 5, 1985
Houston, Texas	February 19, 1985
Huntsville, Alabama	February 21, 1985
Indianapolis, Indiana	March 14, 1985
Jackson, Mississippi	February 26, 1985
Kansas City, Kansas	March [illegible]
Louisville, Kentucky	March 21, [illegible]
Memphis, Tennessee	February [illegible]
Miami, Florida	March 14, [illegible]
Milwaukee, Wisconsin	February [illegible]
Minneapolis, Minnesota	February 27, [illegible]
Minneapolis, Minnesota	April 17, [illegible]
[illegible], Alabama	[illegible]
[illegible], New Hampshire	[illegible]
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1-215-[illegible] 1-617-[illegible]

WESTWOOD
COMPUTER CORPORATION

Setting You Free.
Hewlett-Packard Personal Computers
LaserJet Printer

Continued from page 44

According to a company spokesman, ADR/PC Datacom Version 2.0 permits data sharing between IBM 3270-PC workstations and IBM mainframes. ADR/PC E-Mail reportedly can upload electronic mail messages to the mainframe for distribution. Mail generated on the mainframe or by IBM Personal Computer users can be downloaded for local management.

Both products are priced at $500 and will be available in the first quarter, a spokesman said.

ADR/PC Personal Terminal Environment is said to provide an integrated connection to ADR's Roscoe, Vollie and Librarian products to provide 3270-PC support for both the OS/MVS and DOS/VSE environments.

The product is priced at $500 and will be available in the second quarter, according to the vendor.

ADR, Rt. 206, Orchard Road, Princeton, N.J. 08540.

ROSS SYSTEMS, INC.
Maps/Microlink

Ross Systems, Inc. has introduced a software bridge between IBM Personal Computer-based spreadsheets and Digital Equipment Corp. VAX superminicomputers.

Maps/Microlink reportedly enables Personal Computer-based spreadsheets to share data with the vendor's accounting and decision-support applications on VAX systems.

The program was designed to integrate with the vendor's Maps/Model, a financial modeling package, and Maps/GL, a general ledger program.

Communications modules within Maps/Microlink are said to run independently on the Personal Computer and the VAX, providing error-free, two-way communications between computers.

Maps/Microlink is priced at $10,000.

Ross Systems, 1860 Embarcadero Road, Palo Alto, Calif. 94303.

COMMUNICATIONS CONSULTING CORP.
Lifdos

Communications Consulting Corp. has introduced a package of two utility programs for Hewlett-Packard Co. Model 9000 Series 200 or HP Model 9020 Series 500 computers under HP's Basic 2.0 or 3.0 operating system.

According to a spokesman, the Lifdos package consists of a Copy program and an Editor program. Copy allows for the transfer of Ascii format programs between the HP Logical Interface Format (LIF) disk format and the Microsoft Corp. MS-DOS operating system disk format of the HP 150 microcomputer. The HP 9000 can catalog, erase, purge and transfer Ascii files from the Model 150 to a member of the HP 9000 family and back.

The spokesman said Editor gives the HP 9000 Series 200 or HP 9020 the ability to read Ascii files and store them as a string into memory. The editing features of the HP 9000 may then be used to manipulate the files and to transfer programs and their translation between the HP Series 100 and the HP 9000 computers.

The Lifdos software is priced at $600 for both Copy and Editor.

Communications Consulting, 52 Hillcrest Drive, Upper Saddle River, N.J. 07458.

VIRTUAL MICROSYSTEMS, INC.
The Bridge

Virtual Microsystems, Inc. has announced a Microsoft Corp. MS-DOS option for Data General Corp.'s Eclipse and MV family of minis.

According to a company spokesman, The Bridge sys-

PC to System 34/36/38
Local Communications

PC, AT, XT
System 34/36/38

With AST-5251/11™ and Standard Twinax Connections.

AST-5251/11 is the complete hardware/software solution that uses twinax cable to locally attach your PC/AT/XTs, portables and compatibles to your IBM® System 34/36/38—just like a standard IBM 5251/11 display terminal.

Now you can fully utilize the benefits of your personal computer. With AST-5251/11, you use your PC as always, and emulate a powerful, feature enhanced Model 11 terminal to access your host. In addition to sharing data, you'll improve productivity. By using AST's Hot-Key support you can conduct concurrent DOS and host sessions, offloading work to your PC and freeing up your host.

For configuration flexibility, AST-5251/11 provides host addressable 5256 printer support and can effectively utilize low-cost PC-compatible printers. Options include file transfer and an application program interface for integrating PC and host applications.

This complete package—from the leader in PC enhancement products—is available from your neighborhood computer store. So is our AST-5251/12™ for remote connections. See your dealer today, or call our Customer Information Center (714) 863-1333 Ext. 5249 for more information. For OEM inquiries, contact AST OEM Sales (714) 863-9913. AST Research, Inc.,
2121 Alton Avenue,
Irvine, CA 92714
TWX: 753699AST UR.

FEATURES
- Plugs into PC/XT/AT and compatibles; connects to System 34/36/38 via twinax cable and supports cable thru.
- Emulates 5251/11, or 5291, or 5292/2 display terminal.
- Provides host-addressable 5256 printer support on PC-attached printer.
- Selectable DMA and I/O interrupt channels.
- Application program interface and bidirectional file transfer available.
- Complete package includes hardware, software, twinax cable assembly, and comprehensive user manual.
- Hot-Key assist for concurrent host and PC sessions.

AST RESEARCH INC.

AST-5251/11 and AST-5251/12 trademarks of AST Research, Inc. AST-5251/12 is a development of AST Research, Inc. and Software Systems, Inc., Jefferson City, MO. IBM registered trademark of International Business Machines Corp.

tem is a hardware and software combination that reportedly allows terminals connected to the host minicomputer to appear as a dedicated microcomputer. Distributed processing is facilitated by shared program and data files, according to the vendor.

The price of the The Bridge for a four-user MS-DOS system on a DG AOS operating system is $7,700. Prices vary depending on the operating system and memory capacity, the vendor said.

Virtual Microsystems, 2150 Shattuck Ave., Berkeley, Calif. 94704.

ADVENT ONLINE KNOWLEDGE
ESP, ESP.2 and Personal Calculator

Advent Online Knowledge has introduced three products for Prime Computer, Inc. Series 50 computers under Prime's Primos operating system.

According to a spokesman, Extra-Sensory Perception (ESP) enables a system administrator to monitor the activities of a selected terminal user or scan the activities of all terminal users on a system. ESP.2 enables the system administrator to capture all prelogon activities of selected dial-up and direct-connect lines in a file.

Personal Calculator is a visual calculator that works either in stand-alone mode or as a subroutine call from another application program. It will display a calculator image on the screen and optionally simulate a paper tape. The Personal Calculator program works with many popular video terminals, the vendor said.

The price of ESP and ESP.2 is $395 each or $695 for both packages. Personal Calculator is priced at $295.

Advent Online Knowledge, Suite 133, 1305 Wiley Road, Schaumburg, Ill. 60195.

THE BRIDGE, INC.
Keyplus

The Bridge, Inc. has announced that it has obtained exclusive North American marketing rights to Infolink Australia, Pty. Ltd.'s Keyplus IBM Vtam-based data entry system. The package was designed for use on IBM mainframes running under IBM's OS, DOS and MVS operating systems.

According to a company spokesman, the package works directly with Vtam without the need for any other teleprocessing monitor. Its on-line approach allows data entry applications to be developed and maintained with no programmer intervention. The system works with standard IBM 3270-type terminals.

Keyplus features English commands supplemented by program function keys, menus and Help facilities. Users can design their own informational and Help screens to explain particular data entry standards and requirements.

Pricing for Keyplus begins at $11,500 for DOS and $16,500 for OS and MVS.

The Bridge, 199 California St., Millbrae, Calif. 94030.

PENTA GROUP, INC.
Penta Quik, Penta Key, Penta Time

Penta Group, Inc. has introduced three utilities for Digital Equipment Corp. computers running under DEC's RSTS/E operating system.

According to a spokesman, Penta Quik is a start-up utility that sets runtime systems, libraries, logicals and concise command language commands in about 15 sec. Penta Key, another start-up utility, sets up to 256 terminals, including pseudokeyboards, in about 15 sec.

Penta Time is said to be an on-line, time-limit program that monitors the runtime of jobs and removes any job that exceeds its parameters. It occupies one job slot and runs in 4K bytes of memory.

The utilities are priced at about $350 each.

Penta Group, 127 E. 59th St., New York, N.Y. 10022.

H&A COMPUTER SYSTEMS, INC.
EXB-Backup Utilities;
Exedit

H&A Computer Systems, Inc. has announced that it has reorganized its utilities packages for the IBM Series/1 minicomputer running under IBM's EDX operating system.

H&A's Exdump and Exrestor utilities have been combined with automatic initialization into a package named EXB-Backup Utilities. The utility package allows a single file to span multiple diskettes and can be run from a job stream with no operator intervention. It compresses data, will optionally print a backup log report and provides protection against writing over a hard-disk file.

The company also released an enhanced version of Exedit for the IBM Series/1 that offers added support for IBM 4978, 4980 and 3101 block-mode terminals. The package will restrict the CHANGE and FIND commands to a specified range of positions. COPY and MOVE commands will now hold the screen in place and the cursor can be sent to any position on the current line, the vendor said.

The price of EXB-Backup Utilities is $790, and the price of Exedit is $590.

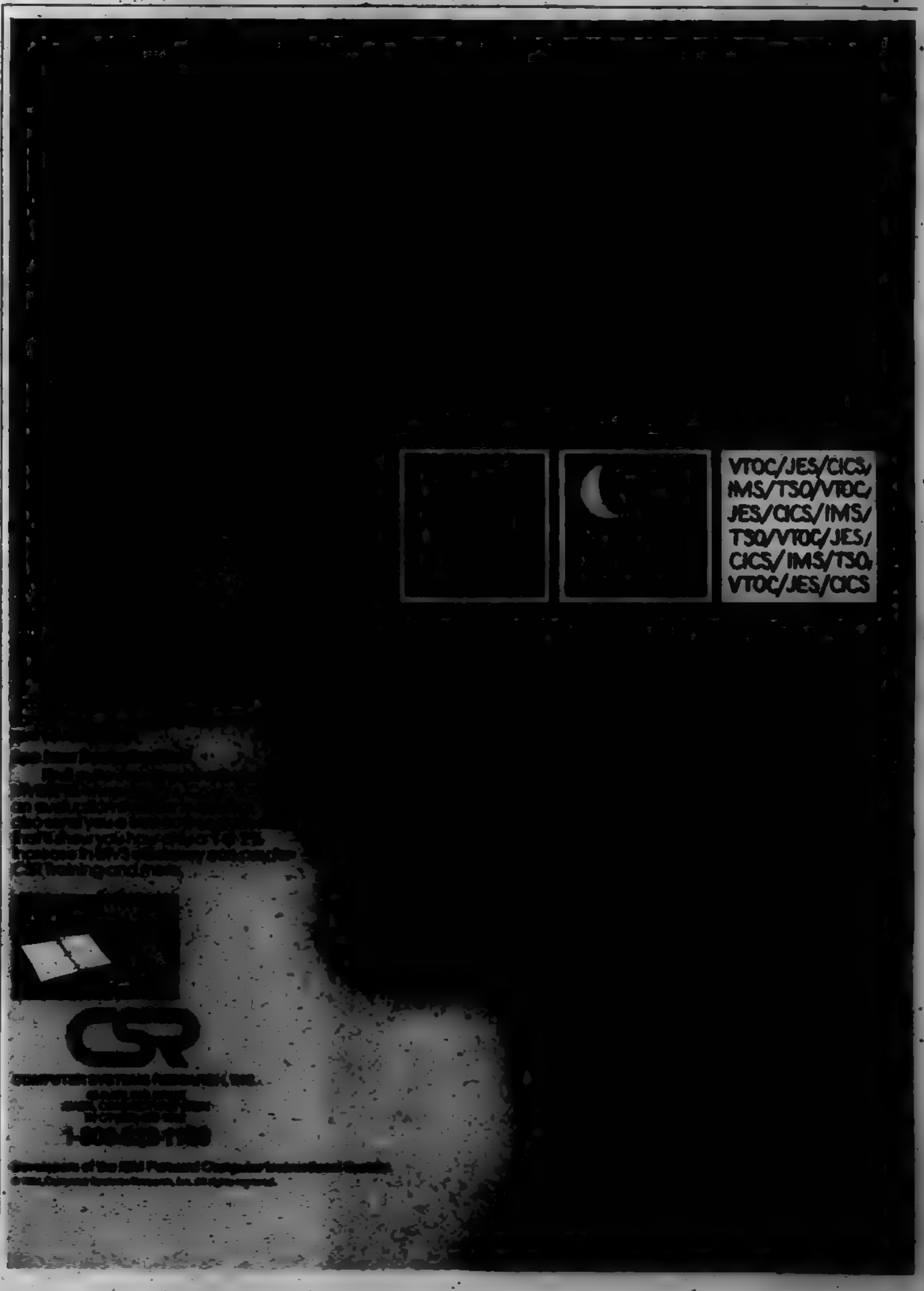
H&A Computer Systems, Suite 204, 30 Hotaling Place, San Francisco, Calif. 94111.

MICHAELS, ROSS & COLE, LTD.
Mrc-Summariser

Michaels, Ross & Cole, Ltd. has introduced a summariser for use with IBM System/38 processors.

The Mrc-Summariser is said to relationally access data base information. It reportedly includes shared access path logic and an automatic Programming Request for Price Quotation interface that allows informa-

Continued on page 54



SOFTWARE & SERVICES

Continued from page 49

tion to be downloaded to a personal computer, the company said.

According to the company, the product allows users to access System/38 data base files and specify the information they would like to extract.

Calculated fields can be defined and included in the summarized files.

Help key documentation, multilevel security and relational file joining are also included, according to the vendor.

The product is licensed for $1,140/module per site, a spokesman said.

Michaels, Ross & Cole, P.O. Box 4538, Oak Brook, Ill. 60521.

MULTIPLICATIONS SOFTWARE, INC.
Imagine 1.2

Data base access has been added in the latest release of Multiplications Software, Inc.'s on-line query and reporting system for IBM's DOS/VSE, DOS/MVT, OS/MVS and OS/VS1 operating systems.

According to the company, Imagine 1.2 provides the ability to create an information data base out of production data files.

The product allows users to define customized access paths to any data base management system file type using a user exit, the company said.

Base price of the product is $25,000 and can range up to $60,000 depending on the processor and operating system.

Multiplications Software, 1050 Massachusetts Ave., Cambridge, Mass. 02138.

PBL ASSOCIATES
Tapmap

PBL Associates has introduced a software package said to create and update system documentation for Tandem Corp. mainframes and superminicomputers.

According to a spokesman, Tapmap can produce consolidated documentation about multiple systems or can report on one part of a single system. The package reads the source code and creates data files used to generate reports on system file users.

The reports also provide references on all program-to-program and program-to-file interactions.

Tapmap is priced at $3,000.

PBL Associates, 10 Cottage Ave., Point Richmond, Calif. 94801.

PYRAMID TECHNOLOGY CORP.
OS Enhancements

Pyramid Technology Corp. has announced that it has incorporated AT&T's Unix System V 2.0 into its OS operating system for Pyramid's 90 series superminicomputers.

Pyramid's OS is a dual port of the two major implementations of the Unix system — System V from AT&T and 4.2BSD from the University of California at Berkeley.

The new version offers system accounting and independent scheduling of jobs by each user.

The system will be available in the first quarter of this year.

There is no fee for upgrading to the enhanced version of OS.

Pyramid Technology, 1295 Charleston Road, Mountain View, Calif. 94043.

GEJAC, INC.
Hasp

Gejac, Inc. has announced a Digital Equipment Corp. VAX-11/VMS version of its Hasp communications software.

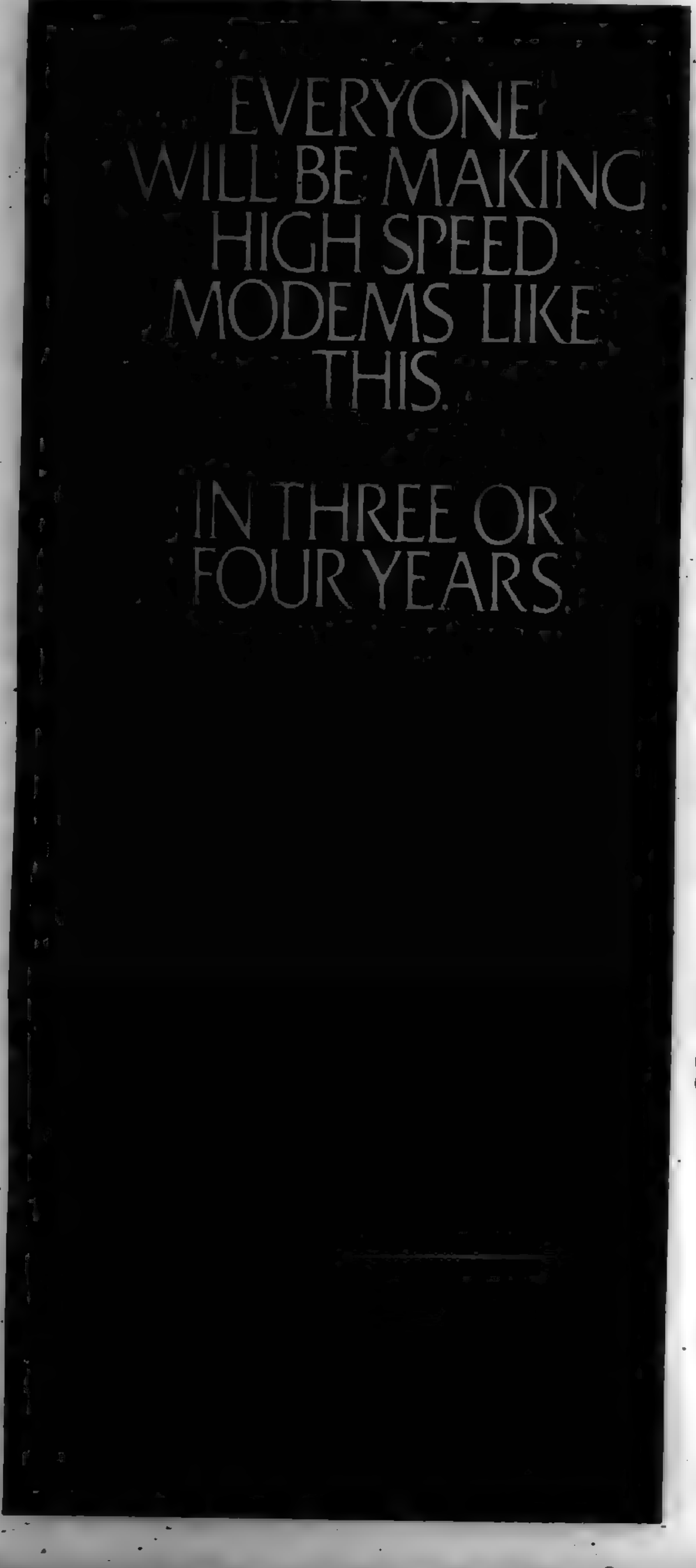
Hasp is a generalized communications package that accommodates connection with mainframes, minicomputers and networks for bulk transfers such as copying files or remote job entry (RJE), the vendor said.

Hasp functions include the RJE Host Functionality Option, support for the DMF-32 multifunction board for VAX/VMS systems and support for automatic dialing.

The price of a VAX/VMS license for Hasp is $5,500, according to the vendor.

Gejac, P.O. Box 188, Riverdale, Md. 20737.

"O.K. Dave, take a break."



How did Codex come up with the 2600 Series, a new generation of modems running at speeds from 4800 to 16,800 bps that's so much more advanced than the competition?

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A design that ensures data reliability with Trellis Code Modulation (TCM)—a significant advancement over uncoded modulation techniques in common use today.

In multipoint applications, the Codex 2640 can even handle mixed 9600, 7200 and 4800 bps inbound rates. So each drop can operate independently at maximum speed and efficiency.

Of course, with the Codex 2600 Series, network control is standard. So you can monitor line and modem performance from the front panel or from a central Codex DNCS system. Plus there's an optional downline-loading feature that lets you conveniently modify or enhance the functionality of remote, unattended modems.

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In three or four years, our competitors will probably have modems just like them.

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codex

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INFO

from page 41

tween processes and data, so the pendulum swings between top-down and bottom-up approaches. Both approaches have their merits. A top-down approach is appealing because the basic organization of the system becomes apparent, all parts of the integrated system are identified and common parts of the systems can be combined. But a pure top-down approach often leaves out much detail that is necessary for implementation.

A bottom-up approach, on the other hand, ensures that all detail is discovered. But there are major drawbacks to a pure bottom-up approach. For one thing, it often becomes so entangled with details that major parts of the system go undefined. A bottom-up approach often deals with users at a level that only addresses today's — not tomorrow's — needs. It often involves collecting and assimilating a tremendous amount of redundant detail.

Loss of perspective

A final and perhaps most significant drawback of the bottom-up approach is the loss of perspective. When building systems from the bottom up, it is usually very difficult to envision how major parts of the system relate.

Effective information engineering methodologies combine both top-down and bottom-up approaches. The initial understanding of the engineered, integrated system is devised in a top-down fashion. Here, the basic structure of the components is identified, as are all of the components. Once the top-down design has given the architecture its basic form, the bottom-up analysis is done to complete the detail of the architecture. Bottom-up analysis is done strategically, avoiding the redundancy and other problems of a pure bottom-up approach.

Today's information engineer must also realize that the designing of the architecture is not a one-time activity. Every user's environment changes over time. And as the environment changes, so the integrated architecture must change.

If the blueprint has been constructed properly from the outset, then users' changes will have a minimum impact. But in every circumstance, the integrated, engineered environment requires periodic refinement. So information engineering becomes an ongoing activity.

An information engineer is not a data processing person, a user or a manager. He is all of these things. While this may be apparent to the information engineer, it usually is not so obvious to the organization. The effective placement of the information engineer in the organization chart is an important task.

Unfortunately, there are few precedents for effective placement. Information engineers are sometimes placed with capacity planners, with data administration — sometimes considered a subfunction of information engineering — and with data processing steering committees and the like. While each position has its advantages, there are distinct disadvantages as well. The information engineer represents a discipline that crosses traditional organizational boundaries and, as such, is usually an organizational misfit.

While information engineering has been evolving for some time, it is in no sense finished. Future improvements will continue in software.

Another area of improvement will be in the further simplification and streamlining of the information engineering process. Today's techniques are unquestionably more direct and efficient than yesterday's, but there is still a ways to go.

The final major direction will be a strengthening of the ties between data and processes. While the pendulum has swung toward a balanced approach, the background of information engineering remains, and that background was fostered in an environment of extremes. One extreme recognized the importance of processes. Unfortunately, the founding fathers of each extreme did little to foster a middle ground, which, in today's environment, is a necessity.

ISPF

from page 41

"This is more of an insult to VM users than anything else," he said. Foth is bothered that new releases of ISPF for VM have failed to track releases of the operating system itself. For example, Rexxs have been available for a year but are only supported in the latest ISPF release.

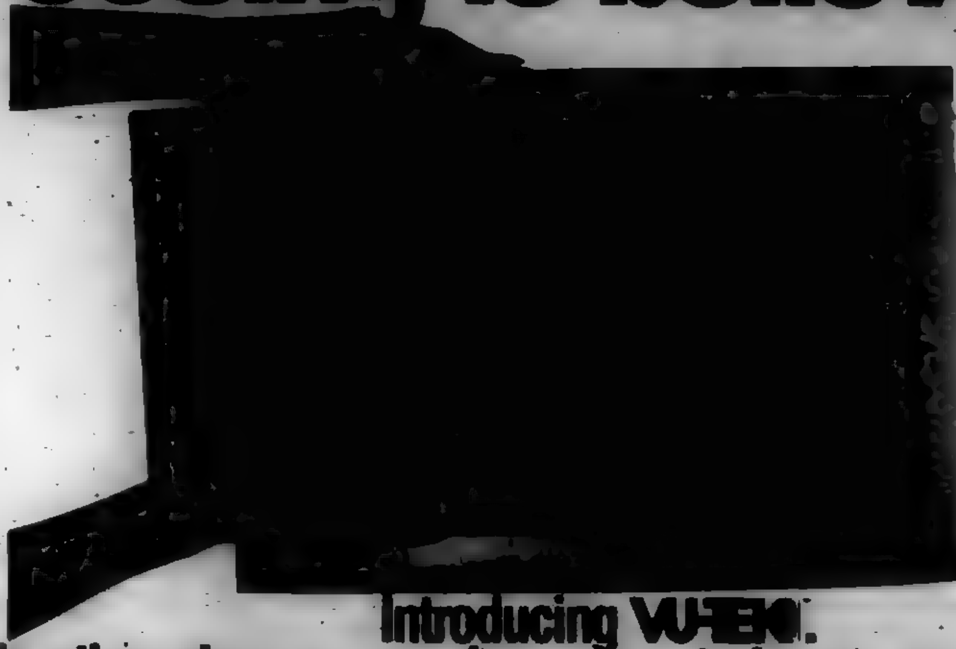
Anyway, many VM users would just as soon do without ISPF. IBM already has better dialog managers in its Display Management System and Interactive Map Definition facility of GDDM. ISPF is generally considered to be the most resource-hungry of the three options.

"It looks to me like [this release] will still be I/O intensive, although IBM has said it reduced many of the CPU pathways," Schulz said. "But our performance problems with ISPF in the past have been I/O problems, not CPU problems."

The use of ISPF could be a benefit if the vendor community starts to respond with ISPF applications that run under both MVS and VM. However, there are no indications that that is happening. In the meantime, VM users are heading for a situation in which they may soon be supporting a dialog manager they do not use simply to be compatible with new program products from IBM.

ISPF still has many fans who praise it for easing dramatically the process of designing and testing input panels. Its validation facilities are good enough to remove a lot of tedious testing procedures and to cut lines of code. Pavlac estimated that ISPF can knock 20% to 30% off the amount of code needed to write an average on-line application.

Seeing is believing.



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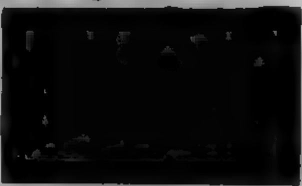

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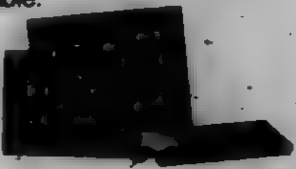

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*National Institute For Occupational Safety and Health Study, August 1981.

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Zip ____
Phone ( ) ____

VU-TEK™ The difference is clear.

© American Hoechst Corporation, 1984.

DSS

from page 41

"If you get into a product push mentality it won't work," he said. "You want to integrate the knowledge of the group, and you need an architecture that allows it."

A key to getting DSS off the ground successfully was selecting target applications. The projects selected had to offer a high payoff and had to address a problem that could not be solved easily with standard data processing methods, Brachman said.

An advertising model was built first. Using demographic information and detailed surveys of consumer buying patterns, the model helps to assess the effectiveness of Kodak's advertising plans. In one case, it saved $5 million in unnecessary advertising costs, he said.

Applications currently in use also cover pricing and product design decisions and perform analyses on target markets. The largest application is a marketing model that tracks consumer buying behavior and relates it to film purchases and processing. Cost savings from the model exceeded the cost of the DSS by 10 times in the first year alone, Brachman said.

Kodak also uses DSS to target products to key markets, identify advertising media, estimate the size of the field sales force and outline sales territory boundaries.

Brachman emphasized that a successful DSS needs the support of both DP and top management. Data base administrators in particular must endorse the system because they will be largely responsible for defining data bases continually, he said.

Critical Success Factors
Kodak Decision Support System (DSS)

1982
- Identify software
- Develop application expertise
- Obtain management sponsorship
- Set up computer-to-computer communications
- Select target applications

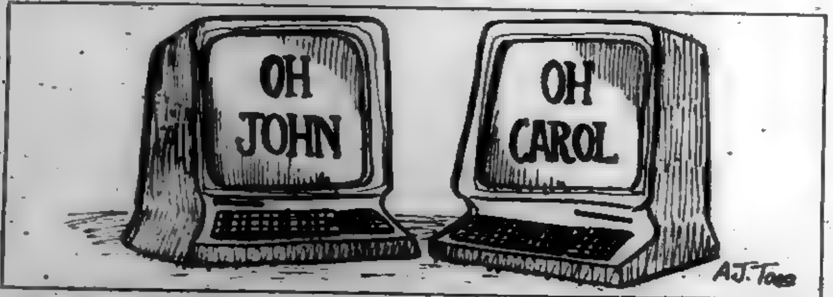
1983
- Training
- Continue developing application expertise
- Continue management sponsorship
- Identify target users
- Position products and services

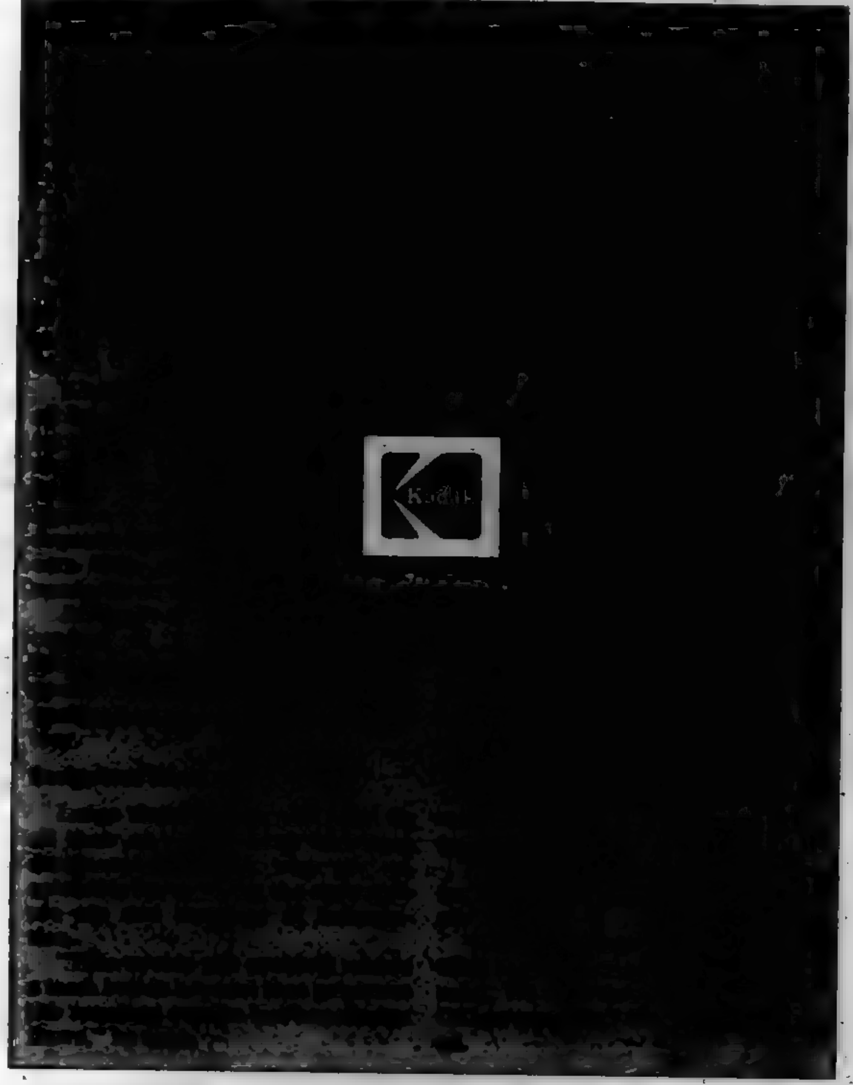
1984
- Develop data bases
- Develop data elements

1985
- Maintain shared data bases
- Micro-based analysis linked to mainframe data bases
- National networking
- Data base administration
- Data base stewards
- Training (micros, demographics)

1986
- Integrated DSS tools and data
- Worldwide networking

CW CHART





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BIMWINDOW — Multiple terminal sessions concurrently at CRT under DOS or OS VTAM.
BIMSWAP — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
BIMCMPRS — CICS 3270 data compression system. Reduces response time for remote terminals significantly. Available for OS/VS1 and MVS also.
BIMECHO — Copies one CRT's output to another or printer for problem determination and demonstration.
BIMP3270 — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer.
BIMSERV — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.
BIMCNSOL — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.
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Forms™ screen painter generates source code for interactive displays. It lets you paint full-size text and input screens, and it generates the code directly into your application. Forms is invoked from the Editor as part of the program coding activity, and it includes *diagram drawing* with return text to Editor and vice versa.

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DOS CALLs allow you to access any DOS or BIOS function from COBOL. In addition, you can enter DOS from the Professional COBOL environment without losing the Professional COBOL context.

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Professional COBOL has all these features and tools to make it the most comprehensive programming offering on the PC today. Professional COBOL also integrates them into a programming support environment that allows you to concentrate on what you really want to build, not the mechanics of getting it done. The energy and time you save can go into making software of a quality you will feel really proud of. That's why Professional COBOL benefits your productivity, and beyond that, your creativity.

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A newly available add-on option, CO-Graphics brings full graphics generation to the COBOL programmer on the PC. Now, your COBOL applications can produce easy-to-understand charts and graphs. Programmers with little graphics knowledge can produce graphics easily through a simple CALL interface from the COBOL program.

CO-Graphics lets you: draw graphics primitives or objects including text, bars, circles, arcs, and pie slices; define attributes such as color fill, line style, and line width; display text in various sizes, fonts, colors, and locations; process input from mouse devices, keyboards, and graphics tablets; and take advantage of the VDI standard for device independence for graphics output on printers or plotters.

The advanced programming aids such as Animator in Professional COBOL can be used in the development and debugging of graphics application programs. CO-Graphics incorporates GSS Drivers™.

And for OEMs

OEMs, for UNIX™, we have an alternative approach. UNIX was conceived as an environment for software developers, and our compilers and development tools integrate well with the UNIX philosophy.

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Micro Focus, Inc.
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FOR PROGRAMMERS

To expand your creativity on the PC, Micro Focus introduces an environment for micro-to-micro software development, Professional COBOL™

An Independent View

"The most significant thing I found, that I found nowhere else, is something I'm going to call the Micro Focus COBOL Environment: Once you have your system loaded and you enter COBOL, you're never looking at the operating system anymore.

"You have your Editor which can go to the Syntax Checker, the Syntax Checker can then go automatically back to the Editor. From the Editor you may then go to the Animator and play around in the Animator and then go to your Build or your Run. But you never have to worry about the operating system anymore. Unless you want [illegible]. And that, I found, was the greatest time saver.

"I didn't constantly have to keep going back to some A prompt or C prompt, entering another program, getting the parameter spelled wrong, having to re-enter the file name I just used, all of that. Maybe individually it isn't significant, but if you're working with a program hour after hour, it becomes extremely significant. That, to me, was very high on the list.

"Second is the whole area of the development tools that you offer people. And those are the different parts of the Professional COBOL system. The Editor, Syntax Checker, Forms, Animator, the Library function, the Build function, and more. In detail, being able to create a help screen just by calling help, being able to change the attributes on the screen by the call for the screen attribute, all of that is very significant. And although in every other COBOL there was a way of doing it, it was very hard. In those systems, it was something you were almost better off not getting involved with.

"The next most significant thing I found was your Forms generator. I looked at several other COBOLs that didn't have any Forms generator at all. Although you can do most of the things you can do through Forms, a conservative estimate is that it takes 10 to 15 times longer doing it that way as compared to using the Forms product. Those which do have some type of Forms equivalent are either very primitive or don't provide color support.

"People who are developing COBOL code for microcomputer use, have to be very conscious of having very nice, easy-to-use screens. It is very hard to generate nice easy screens in a timely fashion on a line by line basis, so Forms has it all over the other packages in that regard.

"However, there are many times when you just want to place the cursor in a certain position or you only want to accept something from a certain part of the screen. You also provide those facilities through your subroutine calls. I can either use the Forms generator, or I have enough control through the calls to move the cursor where I want and set the attributes on or off where I want to. That covers it both ways. Where many of the products didn't cover it in the Forms generation way, you handle it on both sides. And it's absolutely critical: If I'm generating applications to be used on the micro, then odds are the screen handling becomes critical.

"Also important, is the Editor. It is a very friendly editor and far and away the best editor I've seen. When I hit the carriage return in your editor and I'm working in column 12, it assumes I want to go to column 12 again. All the other editors I worked with assumed I wanted to go to either column 1 (which isn't very useful in COBOL), or column 8, so I would constantly have to use the arrow keys or space keys to get to where I wanted to go. That's a small example but it is indicative of the thought that went into building your editor.

"The next thing is the Animator. Again, many of the products don't have Animators. For the one that comes closest to matching yours, if I were to list feature by feature what yours can do and what theirs can do, they may seem the same, but from actual usage it is much easier to use the Micro Focus Animator, and there is much greater functionality with it.

"Another nice thing about Animator goes back to my original comment: I'm within the COBOL environment which means I don't have to compile the program prior to getting the Animator running. You work with Animator for a while, you go back into the Editor, you make changes, you go through the Syntax Checker, then you're back in Animator. The other products that had some type of interactive debugger always required you to go all the way through the compiling step, which takes a long time. And since none of the other COBOLs had any serious syntax checker, one typo means going back through the whole process again. From a productivity point of view, I greatly increased my lines of code produced per minute by having Animator built within the COBOL environment."

Verbatim transcript from an independent consultant programmer sharing his feelings after conducting an in-depth survey of alternatives for COBOL development on the PC.

Act Now

To order Professional COBOL, call Micro Focus at 415/856-4161.

MICRO FOCUS

AIDS

from page 60

OXFORD SOFTWARE CORP.

Maxilink

Oxford Software Corp. has announced a facility for its Maxicalc II that reportedly allows IBM CICS mainframes and IBM Personal Computers to share spreadsheet data.

According to a company spokesman, Maxilink lets users move worksheet data between Maxicalc II data sets and a library file. Maxilink uses Oxford's Pcmainframe micro-to-mainframe data transfer package.

Maxilink is free to Maxicalc II users. Maxicalc II is priced at $9,000 for IBM's DOS operating system and $12,000 for the OS operating system. Pcmainframe for the IBM Personal Computer, Personal Computer XT and compatibles is $9,000 for the DOS license and $12,000 for the OS version. Prices for Pcmainframe include the cost of eight Personal Computer licenses.

Oxford Software, 174 Boulevard, Hasbrouck Heights, N.J. 07604.

PRODUCTIVITY AIDS

MULTIPLICATIONS SOFTWARE, INC.

Accolade 3.1.5

Multiplications Software, Inc. has announced Version 3.1.5 of its Accolade application development system for IBM mainframes under IBM's DOS/VSE, DOS/MVT, OS/MVS and OS/VS1 operating systems in the IBM CICS environment.

According to a spokesman, enhancements to Accolade include a full screen editor, extensions to its data base access support, field mode map support, the ability to transfer control between Accolade and non-Accolade transactions, extended terminal definition support and a user exit within the product's data base access routines.

Perpetual license fees for Version 3.1.5 of Accolade are $28,000 and $39,000 for the DOS and OS environments, respectively.

Multiplications Software, 1050 Massachusetts Ave., Cambridge, Mass. 02138.

DATA RELATIONSHIPS SOFTWARE, INC.

Enhancements to Draft

Data Relationships Software, Inc. has announced an enhanced version of its Draft productivity aid for users of IBM's Data Dictionary on mainframes under IBM's MVS operating system.

According to a spokesman, Draft — a keyword-driven program generator that exhibits the characteristics of a compiler language — uses IBM's Program Access Facility as a lower level access method imbedded within a concept-oriented interface to the Data Dictionary.

Enhancements to Draft include full IBM MVS/XA support, single commands to access standard categories and related information, sort command simplification, a capitalization routine to allow for conversion to mixed case when printing, user-defined headings, an additional sort field for the system's matrix routine, sorting of internal tables and additions to the library of programs.

Draft can be leased at $315 per month and purchased for $13,500.

Data Relationships Software, Suite 600, 1000 RIDC Plaza, Pittsburgh, Pa. 15238.

HAMILTON INNOVATION & TECHNOLOGY CORP.

Micro-Master

Hamilton Innovation & Technology Corp. has announced a software package that can be used to develop data base and records management applications on Digital Equipment Corp. processors.

According to a spokesman, Hamilton's Micro-Master combines data dictionary, windowing and artificial intelligence techniques to eliminate the need for programming. File, form and report layouts are defined by drawing a picture of the desired product on a computer screen or terminal. Calculations, branching between forms and logical control are defined interactively using the vendor's natural language processor.

The product can be used with DEC's PDP-11, Micro-11, VAX and PC 350 systems utilizing DEC operating systems and AT&T's Unix. Prices range from $1,000 to $20,000.

Hamilton Innovation & Technology, Suite 710, 60 Bloor St. W., Toronto, Ont., Canada.

APPLICATION PACKAGES

SYSTEMS ASSOCIATES, INC.

Proc-Secure; MSL

Systems Associates, Inc. has announced a version of its Proc-Secure security system for IBM System/34 and 36 minicomputers running under IBM's SSP operating system.

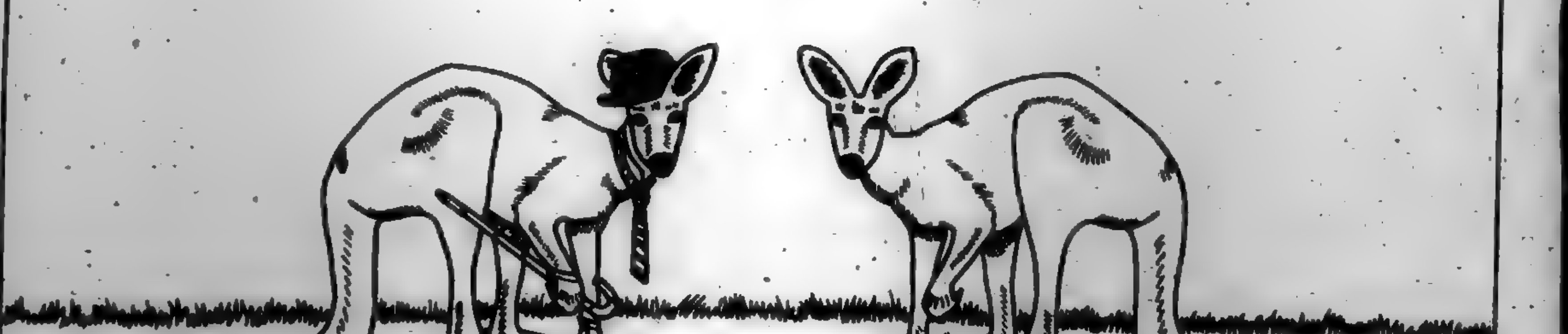
According to a spokesman, the menu-driven Proc-Secure ($150) provides security "block out" at the procedure level. The SSP version contains security listings by procedure and user identification. Uses of the product include placing security on system procedures to restrict their use; placing security on library procedures, allowing modification of libraries but restricting the copying or removing of members; limiting sensitive user procedures to key personnel; and securing periodical procedures.

Systems Associates has also introduced a multiple-stock-location inventory system for IBM's Manufacturing, Accounting and Production Information Control System (Mapics) users on System/34 and 36 under SSP. MSL ($1,295) — used in conjunction with Mapics' Inventory Management module — allows the user to take advantage of Mapics features, such as manufacturing and purchase-order tracking, while maintaining inventory items in multiple locations, the company said.

Systems Associates, P.O. Box 64, Caledonia, N.Y. 14423.

See us at Interface in March, Booth 2510.

WE'RE GETTING LOTS MORE ATTENTION SINCE THE ANNOUNCEMENT OF IBM'S 3710.



Netlink's 3763 Network processor has been around for a while, but it took the introduction of IBM's 3710 for users to recognize the advantages we offer:

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- Gives non-SNA devices SNA equality through NPDA support, dynamic reconfiguration capability.
- Concurrently maps multiple protocols to multiple LU types for most ASCII, BSC and Burroughs devices.
- User macros for personalizing non-SNA devices.
- Versatile host program for downloading configurations.

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COMMUNICATIONS

DG expands product line

Announces processor board, protocol support, intelligent local net controller, remarketing deal

By John Dix
CW Staff

WESTBORO, Mass. — In a spate of communications product announcements, Data General Corp. introduced a communications processor board that can be used to replace three older boards; an intelligent local network controller; support of two de facto standard, high-level local net protocols; a remarketing deal with Ungermann-Bass, Inc.; and a statement of direction regarding the manufacturing network promulgated by General Motors Corp.

The communications processor and local network controller are both board-level products for DG's Eclipse MV series of 32-bit superminicomputers.

Dubbed the MCP1, the communications processor combines the functions of three separate boards — an asynchronous driver, synchronous driver and parallel line printer contoller — on a single circuit board.

This combination decreases costs, lowers power requirements and foreshortens the need to add expansion cabinets, according to Joe Forgione, communications products manager for DG's Information Systems Division.

Previously announced as part of the MV/4000 SC, a low-end, eight-user system, the MCP1 is now available for use with the MV/4000, MV/8000 II and MV/10000. The board, which contains 256K bytes of random-access memory (RAM), supports the following:

- Eight asynchronous ports: six with RS-422 interfaces for direct connection of terminals with twisted-pair wire and two that are selectable between RS-422 and RS-232.
- Two synchronous ports that can run at speeds up to 56K bit/sec and support X.25 and IBM bisynchronous and Synchronous Data Link Control protocols in conjunction with the respective host software, DG/Binary Synchronous Communication, DG/X.25 and DG/System Network Architecture.
- A parallel line printer controller.

Forgione said the combination of capabilities will enable departmental clusters — with terminals, printer and link to other resources — to be supported from this single board. Available now, the MPC1

See DG page 58

AT&T details private-line rates

End-to-end prices to rise, general prices to fall

WASHINGTON, D.C. — On the heels of a Federal Communications Commission decision to delay implementation of special-access charges proposed by local telephone operating companies, AT&T Communications released a statement outlining how the tariffs would affect its private-line rates.

While the company anticipates per-mile private-line prices to decline, it expects overall prices for end-to-end service to increase. AT&T said the rate increases are the result of incorporating higher special-access charges levied on it by local exchange carriers. "The tariff revisions would allow AT&T to pass along to customers the costs of obtaining local access," the company reported.

In the filing, AT&T did not specify new rates but asked the FCC to allow three new tariffs to be put into effect Feb. 15, the same day the local carriers are expected to be allowed to begin charging the higher special-access rates.

In the filing, the long-distance carrier asked the FCC to waive the 45-day period for considering new tariffs and reported that it would file actual tariffs after the FCC's decision.

The company said the three new tariffs would replace six current ones and give customers more configuration options.

DATA STREAM
John Dix
CW Senior Editor

Wang switch purchase hints at service use

Wang Laboratories, Inc. recently agreed to purchase from AT&T a large communications switch that is normally sold only to telephone companies. Considering the capacity of the switch and the other switching equipement the minicomputer manufacturer possesses already, it appears that the new switch will play a role in a forthcoming Wang communications service.

Although many details of the switch sale were not disclosed, including particulars about the device and the value of the contract, AT&T acknowledged that Wang is the first noncarrier to purchase a 5 Electronic Switching System (ESS). The 5 ESS, AT&T's fifth-generation electronic central office switch, is known as a Class 5 local switch. These switches are normally used by local telephone companies to provide basic telephone services and Centrex services, which give business users capabilities similar to private branch exchanges (PBX).

A modular switch, the 5 ESS can support as few as 3,000 to 4,000 subscriber lines and as many as 50,000, according to Jerry Johnson, manager of digital switching product management for AT&T Network Systems. He noted, however, that the economics of the 5 ESS are such that AT&T would not start bidding the switch for private networks under 8,000 to 10,000 lines.

At that size, the 5 ESS overlaps the System 85, AT&T's high-end PBX. With the upgrade announced last November, the System 85 can support up to 30,000

See WANG page 60

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Hardware vendor influence seen boon to videotex systems

Although there are little more than 100 private videotex systems installed today, the active involvement of major computer manufacturers and the new emphasis on integrated systems will encourage further use of videotex, according to Link Resources Corp., a market research company in New York.

In its report, "Private Videotex Systems Survey: 1984," Link defines private vidoetex systems as machines designed for in-house use by companies and institutions or between one of these types of establishments and a distributor or supplier with which they do business. Broadly defined, videotex systems make conventional computer systems easier to use by nontechnical personnel.

A major development in videotex in 1984, according to Link, was the market entrance of major computer hardware manufacturers. Digital Equipment Corp. is reportedly the first manufacturer to offer a videotex software product in North America and is thought to have 30 orders already for the product.

Other companies eyeing the videotex market include IBM, which Link believes is developing videotex software for its mainframe machines, and Honeywell, Inc. Sperry Corp. introduced videotex software late in 1983. Historically, vendors of private videotex systems have been software houses that created stand-alone systems by bundling their software with off-the-shelf hardware.

The market entrance of the computer manufacturers gave rise to another perceptible videotex trend in 1984: an emphasis on integrated videotex systems. Integrated videotex systems are created when users procure software to run on existing processors, enabling users of existing workstations and terminals to access the system.

"The best example of the integrated software approach," Link reported, "is [DEC's] VTX, which runs on any VAX minicomputer, can be accessed by any VT100 or VT100-compatible terminal and can use the Decnet network architecture."

The emergence of integrated systems marketed by computer manufacturers is also influencing the standardization of the presentation protocols. Although Ascii is still not widely used, it is becoming more popular as the computer manufacturers get involved, Link said.

For all of that, broad commercial acceptance of videotex is still a ways off. By Link estimates, 105 private videotex systems are installed to date: 85 stand-alone and 20 integrated systems, reflecting how relatively new the latter is. By 1986, a total of 530 systems will be installed, Link forecast: 355 stand-alone and 175 integrated systems. And by 1989, 3,175 systems will be installed: 1,730 stand-alone and 1,445 integrated systems.

More information about the report is available from Link, 215 Park Ave. S., New York, N.Y. 10003.

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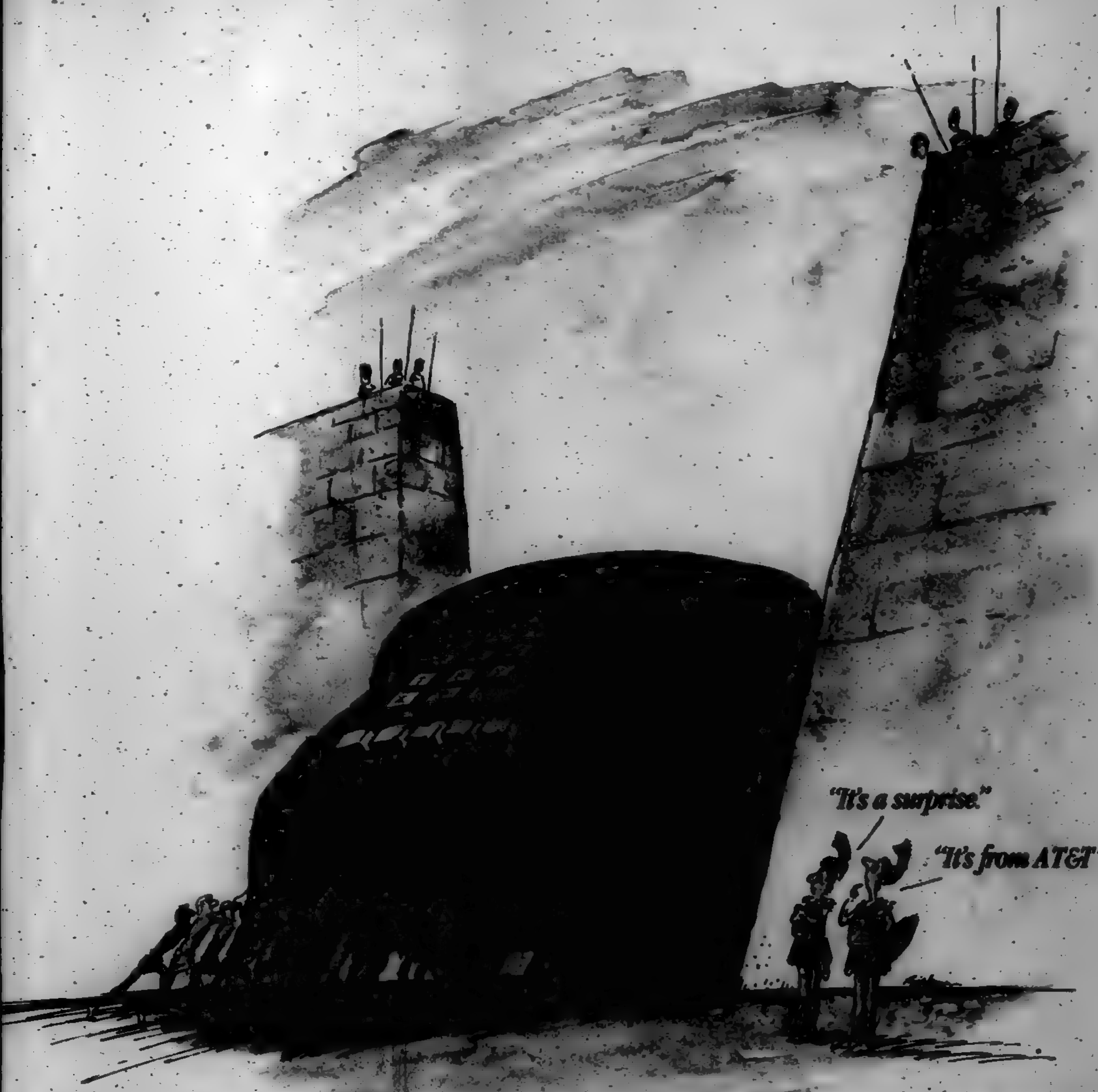

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PROTOCOL CONVERTERS

DATAGRAF, INC.
Series II BPS

Datagraf, Inc. has announced its Series II Burroughs Poll Select (BPS) protocol converter, available in two versions to give Burroughs Corp. terminal features to other manufacturers' terminals and to let Burroughs terminals communicate with a non-Burroughs host mainframe.

The first version is said to permit Digital Equipment Corp. VT100 and VT220 and Wyse Technology, Inc. Wyse 75 terminals to perform full screen editing, supporting all Burroughs TD-830 features while communicating with a Burroughs host mainframe. The mainframe may be local or remote and linked via an RS-232C interface.

The second version is said to allow Burroughs Voltage Loop terminals and asynchronous or synchronous terminals to communicate with a non-Burroughs host in an IBM Systems Network Architecture/Synchronous Data Link Control environment.

It costs $5,600.

Datagraf, 6626 Silvermine Drive, Austin, Texas 78736.

KMW SYSTEMS CORP.
Series II+ 3287 Coax Protocol Converter

KMW Systems Corp. has announced its Series II+ 3287 Coax Protocol Converter, which is said to allow local attachment of non-IBM output devices to IBM 3270 cluster controllers.

The product reportedly enables an Ascii printer to emulate the functionality of an IBM 3287 Model 1 or Model 2 printer. It was designed to accept IBM Systems Network Architecture (SNA) Logical Unit Type 1, SNA Logical Unit Type 3 or IBM bisynchronous data streams, depending upon the application and local controller.

It costs $1,995.

KMW Systems, 8307 Highway 71 W., Austin, Texas 78735.

RENEX CORP.
Bi-Path

Renex Corp. has announced Bi-Path, a product that the company said acts as a reverse protocol converter, allowing IBM 3270-type display stations to emulate Ascii terminals.

Bi-Path reportedly provides the means for IBM 3278 and look-alike display stations to access various minicomputers and mainframes, public data bases, service bureaus, packet-switching networks, electronic mail systems and microcomputers.

An independent unit, Bi-Path was designed for use with IBM 4300 and IBM 3080 series and compatible control units. It is said to operate with IBM Systems Network Architecture, bisynchronous, local channel and other protocols that support IBM 3278 and compatible display stations.

It enables those terminals to emulate Digital Equipment Corp. VT100 or IBM 3101 terminals and will support most serial printers, according to the vendor.

It costs $699.

Renex, 6901 Old Keene Mill Road, Springfield, Va. 22150.

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UCCEL has selected Imagine for use with its application software products. Multiplications has offices in the following locations: Cambridge, MA. Atlanta, GA. New York, NY. Oakland, CA. Rochester, NY. Toronto, CN.

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DG from page 55

costs $5,000.

The board-level Intelligent Local Network Controller enables processors in the DG MV product line to connect to IEEE 802.3, Ethernet-like baseband local-area networks. The controller board is microprocessor based, has 256K bytes of RAM and can be programmed by the user, Forgione said.

The board's intelligence, combined with direct memory access, reportedly enables file transfers to be accomplished with a single CPU interrupt. This is said to provide for higher data throughput because the microprocessor off-loads the CPU by executing all file transfer instructions, Forgione explained. The controller is now available for $4,500.

In recognition of different industry local network needs, DG introduced support of the U.S. Department of Defense's Transmission Control Protocol/Internet Protocol (TCP/IP) and Xerox's Xerox Network Systems (XNS) high-level local network protocols. Both products complement Ethernet-type local networks with higher level protocols to the applications level.

DG claims to be the first vendor to support TCP/IP under native Unix and a proprietary operating system, the company's AOS/VS. This reportedly enables DG's Eclipse MV processors and distributed system workstations running either operating system to coexist on the same local net.

Forgione said TCP/IP is aimed at technical, federal and academic systems, whereas XNS is more broadly used in the commercial marketplace. XNS will be supported only under AOS/VS.

The initial license of TCP/IP costs $2,000 and subsequent licenses are $1,550. XNS costs are the same, and both are now available.

In a joint marketing deal with Ungermann-Bass, DG will market the local net manufacturer's Net/One Ethernet-compatible broadband network, as well as Ungermann-Bass' IEEE 802.3 repeater to interconnect multiple Ethernets. Prices and information are available from Ungermann-Bass.

Finally, in a statement of direction, DG pledged its support to future compatibility with GM's Manufacturing Automation Protocol, a specification the automaker is pushing as a standard for factory automation local networks.

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COMMUNICATIONS

SOFTWARE

SST, INC.
Handshake

SST, Inc. has adapted its asynchronous software package, Handshake, for AT&T 3B2 computers and its Handshake II package for communications between AT&T 3B systems and IBM mainframes. The packages were previously available for Fortune Systems, Inc. 32:16 microcomputers.

Handshake reportedly allows the 3B2 to communicate with other microcomputers, minicomputers and mainframes via cabling or dial-up connections.

Handshake II is said to let 3B computers communicate with IBM mainframes using IBM bisynchronous or Systems Network Architecture/Synchronous Data Link Control protocols via standard cabling or telephones.

Handshake costs $350, and Handshake II costs $1,795.

SST, 9434 N. 107th St., Milwaukee, Wis. 53224.

MULTIPLEXERS/ MODEMS

ASTROCOM CORP.
SH192A modem

Astrocom Corp. has introduced a short-haul modem for transmitting asynchronous data at speeds up to 19.2K bit/sec over distances up to 1¾ miles over standard twisted-pair transmission lines.

The SH192A modem features digital and analog loopback and a status indicator panel. It functions in either point-to-point or multipoint network configurations. The unit is available in stand-alone, rack mount or circuit card versions.

The SH192A stand-alone version is priced at $295 per unit, while the circuit card model is $195.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

MICOM SYSTEMS, INC.
M6212+ Automatic Outdial Modem

Micom Systems, Inc. has announced its M6212+ Automatic Outdial Modem for remote computer access from terminals on a Micom Micro 600 Instanet data switch.

The modem is said to let users request remote systems by name without knowing the telephone number or location of the computer. It reportedly communicates with AT&T 212A-compatible modems at 1,200 bit/sec and with AT&T 103-type modems at up to 300 bit/sec.

The M6212+ is a single-card module that fits into a rack mount chassis, with up to 16 modems per chassis.

A single M6212+ costs $645. The chassis with integral power supply for up to 16 modems costs $750.

Micom Systems, 4100 Los Angeles Ave., Simi Valley, Calif. 93063.

LOCAL-AREA NETWORKS

KEE, INC.
3278 enhancement

Kee, Inc. has introduced an enhancement providing its Kee LAN local-area network with IBM 3278 terminal support.

The enhancement, which involves replacing a board in the Kee LAN product, is said to allow Coax A 3274 and 3278 connections in addition to support for asynchronous protocols.

It reportedly allows IBM 3274 Cluster Controllers to communicate with IBM 3278-type terminals via a local-area network and is said to let IBM 3278-type terminals communicate with non-IBM hosts.

A two-port unit with 3278 support costs $2,995, and in quantities of 100, it costs $2,295, according to the vendor.

Kee, 10739 Tucker St., Beltsville, Md. 20705.

WANG

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lines. The decision of going with one switch over the other would depend on the type of installation — high-rise or campus environment — desired voice- and data-handling features and need for expandability.

The System 85 currently has a richer set of user features than the 5 ESS, Johnson admits, but the 5 ESS can support many more users. In fact, later this year, a second issue of software will be released for the 5 ESS, which when combined with a new piece of hardware for the communications module of the network switch, will enable the 5 ESS to support up to 100,000 lines.

What would Wang want with a 5 ESS? The canned claim is that the switch will be used to meet internal voice and data needs. Consider, however, that the company has roughly 15,000 employees in the Merrimack Valley, which includes the town of Lowell, Mass., where the company is based. While Wang could use a 5 ESS to support all of these employees, that is not likely because it recently purchased a 10,000-line PBX from Intecom, Inc., a switch manufacturer of which Wang owns 21%. The Intecom IBX S/80 will reportedly serve the towers that are part of the company's headquarters.

This would seem to indicate the 5 ESS is destined for another application. Although typically employed today as a local switch, the 5 ESS is used in a few installations as a Class 4 or toll switch. It is possible that Wang will use the 5 ESS, which is expected to be delivered later this year, in a toll application, perhaps as a hub for multiple digital T1 1.54M bit/sec communications facilities.

In this scenario, Wang could use such a T1 network for intracompany voice and high-speed data applications, including communication of computer-aided design and manufacturing data. Additionally, the high-speed data capabilities would potentially enable Wang to offer its customers access to special software development facilities and tools, similar to the way IBM uses its Information Network.

Capable of packet switching, the 5 ESS could also be used in Wang's Wangpac, a 50-city packet-switched network built for Wang and presently operated by Bolt Beranek and Newman, Inc. of Cambridge, Mass. This network, which is supposed to interconnect 120 cities when completed by the end of the year, is already used to support 700 Wang computer systems.

Regardless of implementation, it is clear that Wang, like other office system vendors, intends to offer communications services that complement its products. The 5 ESS will probably play a key role in providing such services.

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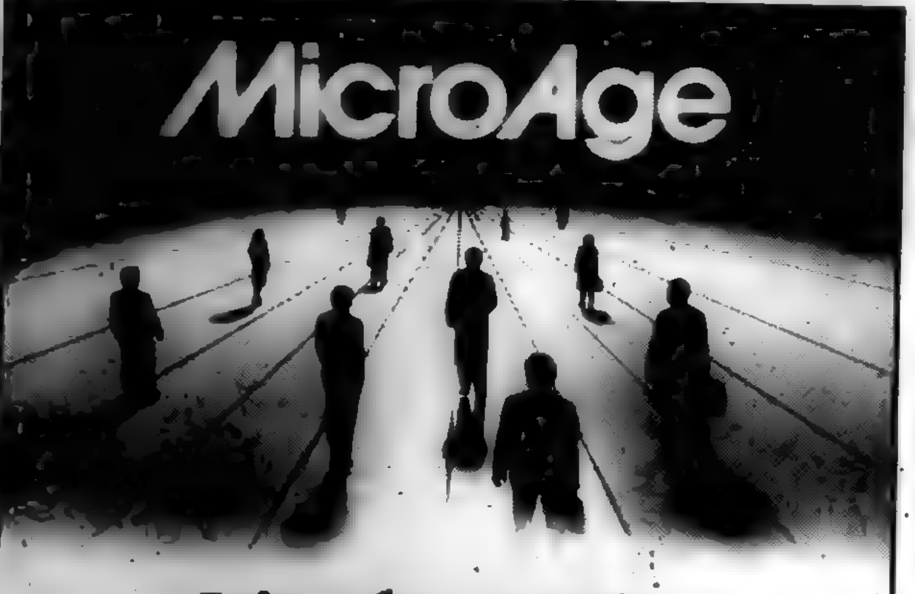

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IN DEPTH

Good fits, bad fits and misfits

Making document interchange work

MIS managers can wait for that perfect world where all systems will sing from the same song sheet (three to five years away), or they can respond today to user needs for connectivity by installing some form of document interchange technology.

By Michael Zisman

While we take for granted the ability to interconnect phone and postal systems, we are just beginning to understand the emerging requirement to interconnect office systems. Today, one expects to pick up a telephone and call anywhere in the world without being concerned about what type of equipment the other party has or what type of networks must be traversed to get to the other party. Likewise, a major requirement for interconnecting office systems will be the ability for one user to send a message or document to another party without concern for the type of equipment or network.

The office systems landscape is complex, ranging from mainframe-based office automation systems to personal computers; consequently, the interconnection requirements are diverse. When considering document interchange technology, the right question is not "why," but "why not."

In a perfect world, all office systems vendors would be standardized on a single document architecture, and documents could be distributed freely among systems from different vendors. Someday this will be the case. However, as we have seen in the past 10 years as vendors have tackled the problem of IBM Systems Network Architecture (SNA) compatibility, we are always charging at a moving target.

Even with respect to IBM's very new office architectures, the situation changed significantly in just the past year. What was Level 3 Document Content Architecture is now Revisable Format Text Document Content Architecture. What was Document Interchange Architecture (DIA) has been relegated to Level 0 DIA and augmented with Level 1 DIA. Function Set 1 of DIA has gone away and been replaced with the SNA Distribution Services (Snads) architecture for interconnecting office systems nodes.

Besides chasing after IBM's evolving architectures, vendors are also confronted with standard-setting efforts by the U.S. Navy (the Document Interchange Format [DIF] standard), the Consultative Committee on International Telephone and Telegraph (X.400) and the National Bureau of Standards.

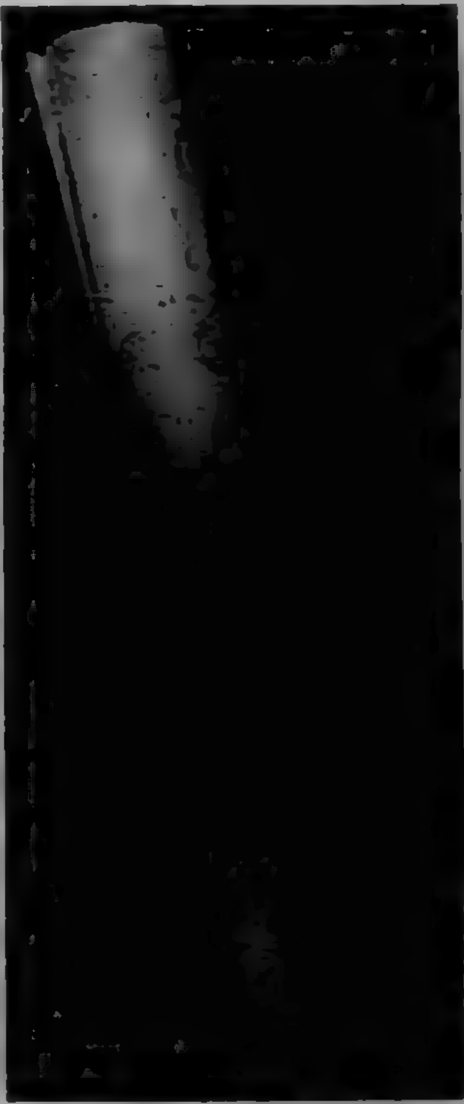
Wait or respond now

MIS managers are confronted with a common dilemma. They can wait for that perfect world when all systems will sing from the same song sheet (probably three to five years), or they can respond to user requirements for connectivity today by installing some form of document interchange technology. Document interchange systems overcome the standardization problem by providing for protocol translation between the different vendors' document structures and

Even if a company can control its own environment, multivendor problems will emerge from intercompany communications.

Some document interchange systems operate point to point, others in a store-and-forward manner much like electronic mail.

Over time we can expect to see document interchange systems on small departmental machines or as local-area network application servers.



interfacing to the various vendors' systems for actual transport of documents among users.

One way to avoid this dilemma is to operate in a single-vendor environment. In point of fact, the trend appears to be heading away from this direction and toward endorsing a controlled number of vendors to meet an organization's needs. This trend is likely to continue for a number of reasons, including the following:

1. As the cost of systems continues to plummet and personal computers become the typical office system workstation, it will become increasingly difficult to control what the end user purchases. Even if standardization occurs at the hardware level, software options will proliferate.

2. Small vendors, particularly word processing vendors, will survive by migrating from general-purpose systems to application niches. Hence, different functional areas in organizations will ultimately look to different vendors for optimal application-oriented solutions.

3. Vendors will continue to rise and fall in capability, and users will respond by migrating to different preferred vendors.

4. A requirement for interorganizational electronic document transfer is emerging. Even if an organization can control its own environment, multivendor issues will emerge for interorganizational communications.

Many companies have already begun to exploit document interchange technology as part of their office automation strategies. Some applications include the following:

■ An organization uses a mainframe-based document interchange system to allow professionals who have drafted documents on personal computers to send these documents to their Wang Laboratories, Inc. word processing center in fully editable form for subsequent editing and printing.

■ A large corporation implemented a document interchange service to allow documents from Wang, IBM, NBI, Inc. and Xerox Corp. word processors to be interchanged and interfaced to their IBM Professional Office Systems mail network.

■ A large agency equipped field agents with portable personal computers and a popular word processing package. These agents prepare reports in the field and transmit them via a public data network to their Wang word processing center for final editing and distribution.

■ A company uses a document interchange system to transmit documents from stand-alone word processors to its mainframe in document composition facility (DCF) format. On the mainframe, the DCF documents are integrated with a graphics package.

■ A large corporation is using a document interchange system to provide a bridge between numerous Wang systems and an IBM Distributed Office Systems network of IBM 5520s and Displaywriters.

There are numerous applications for document interchange systems technology to integrate disparate office systems environments. Like any other technology, there is no panacea. The better users understand the opportunities and potential problems, the better prepared they will be to make good decisions.

There are two significant dimensions to the use of document interchange technology: intrasite vs. intersite usage and intraorganizational vs. interorganizational usage. There are three distinct market segments: intraorganizational, intrasite usage; intraorganizational, intersite usage; and interorganizational, intersite usage.

Generally, users begin with intrasite, intraorganizational usage to gain familiarity with document interchange technology. They then mature to intraorganizational, intersite usage and, finally, look toward adding interorganizational usage. It is important to note that for interorganizational interchange to become a widespread reality, value-added network service offerings will play a major role, just as the U.S. Postal Service and private courier services play a major role in facilitating interorganizational paper communications. Almost all organizations are focusing their energies on intraorganizational document interchange. Interorganizational requirements will probably be more prevalent in the 1986-to-1988 time frame.

Product classes

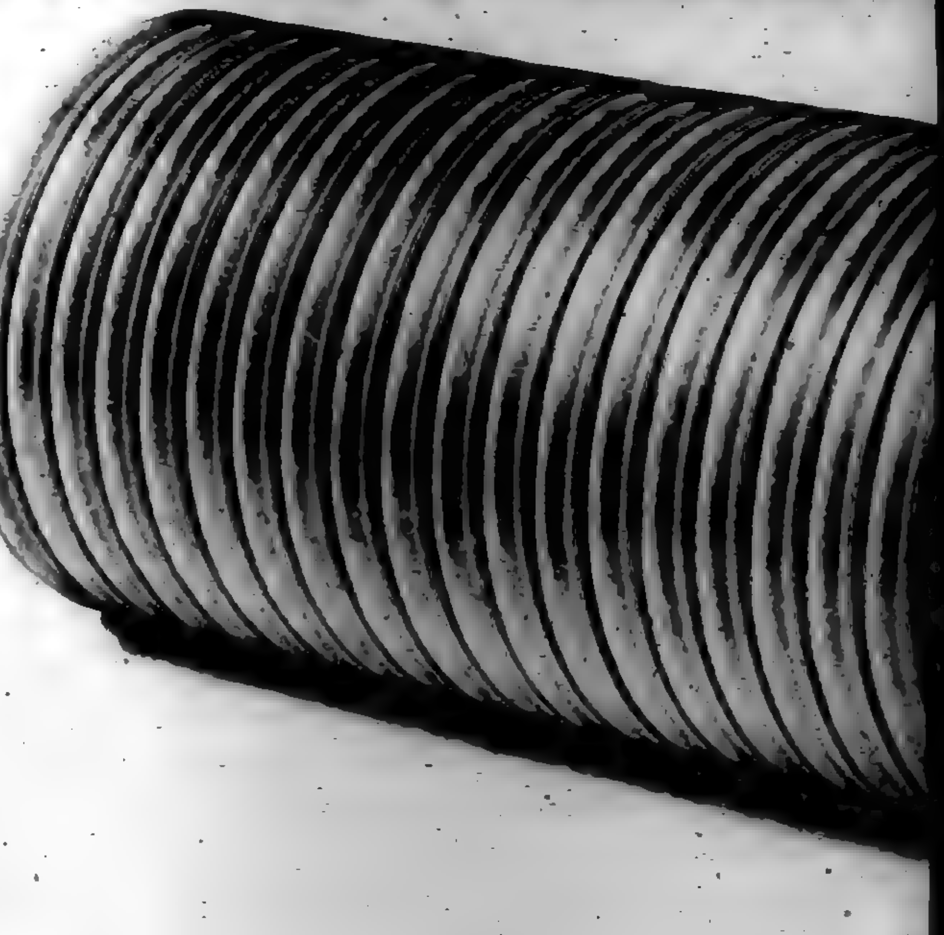
A document interchange system must perform two essential tasks: the document must be distributed from the sender to the recipient, and the document must be translated from the source document structure to the target structure. Broadly defined, there are five classes of systems.

Disk converters. This class of product consists of a hardware device with two or more disk drives. A document from one vendor's disk is copied onto another disk in the target vendor's format. These systems handle not only the different media formats (disk size, track encoding and so on), but they also convert all of the document coding so that the document is fully revisable on the target system. These systems are useful for conversion and for addressing the needs of the intraorganizational, intrasite market segment. Keyword 7000 from Keyword Systems, Inc. is an example of such a system.

Communicating black boxes. This class is similar to the disk converters except that the input and output are communications lines instead of disks. These devices are interconnected between the communicating word processors.

Each word processor is configured to communicate to another of its own

For fast relief



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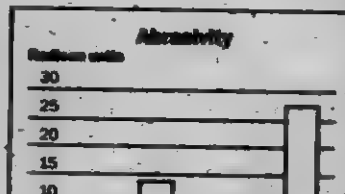

Radiation test measurements above are obtained by running different computer tapes over an irradiated tape drive head. The higher the count of irradiated particles rubbed onto the tape, the more abrasive the tape.

kind; the black box in the middle acts as a similar word processor to each of the two connected word processors. The black box handles all communications necessary to maintain the links and translates the data to the format required on the other side.

> *A Mailway user could access Mailway and send a document to another user with no concern at all that the recipient is actually a Disoss user.*

Because the translation must be done in real time (that is, as a document is passing through the box), maintaining high translation fidelity can be very challenging. Furthermore, the logistics of establishing the communications sessions with the black box can be awkward. The Racal-Telesystems, Inc. Model 404 protocol converter is an example of such a system.

IBM host-based document interchange systems. Because IBM plays such a large role in most big organizations, it is natural to host document interchange on the customer's IBM mainframe systems. Products in this class exhibit some or all of the following attributes:

- Distribution services provides a comprehensive directory so that users of the system need only send documents to the intended recipients and not be concerned with what type of equipment the recipient has. The required information is found in a user directory. When an incompatibility exists, the system transforms the document before forwarding it.
- Library services provides the facility to store documents in host-based libraries and index them for searching and subsequent retrieval. When a document is retrieved to a device type different from that which stored it, the document is automatically transformed before forwarding.
- Translation services are obviously necessary to actually perform the document transformations. As indicated above, translation services are invoked when needed by distribution services and library services.

These systems often interface directly to OA vendors' mail and document distribution systems. Interfaces to Disoss and Profs, Wang's Mailway and Digital Equipment Corp.'s Decmail are examples. For instance, a Mailway user could access Mailway and send a document to another user with no concern at all that the recipient is actually a Disoss user. The Mailway document is first routed to the host-based document interchange system (which is emulating a Mailway node) by Mailway, transformed to IBM format and then passed to Disoss. This attribute will be increasingly important over time.

These systems operate in a store-and-forward mode. A document is sent from user A to user B. The document is first delivered to the host software. There it is transformed into the format required for user B and then forwarded to user B. Because of the store-and-forward nature, translation fidelity can be quite high.

Host-based interchange

Soft-Switch from Soft-Switch, Inc. is an example of a host-based document interchange system. Soft-Switch supports word processors from IBM, Wang, Xerox and NBI. On the IBM Personal Computer, the Multimate word processing program from Multimate International and IBM's Displaywrite II and III programs are supported. On the IBM host, DCF and standard printers are supported.

Through translation services, Soft-Switch can transform the document structure of any of the supported systems to that of any of the other supported systems. Soft-Switch also interfaces directly to IBM's Profs and Disoss products.

Dedicated document interchange systems. Naturally, there is no reason why such functionality should be restricted to an IBM host, and over time we can expect to see document interchange systems on small departmental machines or as local-area network application servers. The emerging generation of high-performance, disk-intensive supermicros will serve as an adequate platform for this technology. Like the IBM host-based systems, the standalone systems will provide translation, distribution and library services. Furthermore, they will interconnect other vendors' mail systems and value-added network service offerings.

Value-added network service offerings. Many of the value-added network vendors are targeting document interchange as a major service to exploit their existing network investments. These systems will service a large portion of the interorganizational market segment and will serve as a gateway for an organization's on-premise systems. Vendors currently providing services are General Electric Information Services Co., with its WPXchange product, and MCI Telecommunications Corp. with the document transfer capability in MCI mail. Very important, both of these systems interconnect revisable form interchange systems with final form messaging systems.

These five classes of products will penetrate the three market segments to varying degrees. The projected

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MEMOREX

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penetration is shown in the figure at right. Disk converters are most appropriate to single-site applications because of the lack of communications. While black boxes provide communications, the lack of store-and-forward capability makes the communication cumbersome. Hence, these devices will be most useful in intrasite applications.

IBM host-based document interchange systems have high penetration in both intraorganizational segments because they exploit the large customer's ubiquitous host-based communications network. The ability of dedicated document interchange systems to gain high penetration in the intrasite segment will depend on the activity of the host-based network.

The value-added network service offerings will play a major role in interorganizational document interchange. As these systems evolve, expect customer's on-premise document interchange systems to interface directly with value-added network service offerings for off-net distribution.

Market segment	Disk converters	Black boxes	IBM host document interchange system	Dedicated document interchange system	Value-added network service
Intraorganizational/ Intrasite	High	High	High	High	Low
Intraorganizational/ Intersite	Low	Low	High	Medium	Medium
Interorganizational/ Intersite	Low	Low	Low	Low	High

Likely market penetration

IBM architectures

IBM has traditionally been the de facto standards-setting body in the data processing industry, and that is clearly the case with respect to office systems architectures. IBM has defined and published architectures for document content, document enveloping and the postal system for moving documents through the network.

Document Content Architecture (DCA) defines with great precision how documents are to be communicated in both a final form and a revisable form. DCA is a data structure; that is, it is simply a definition of how document coding is specified and how it is to be transmitted.

Document Interchange Architecture (DIA) includes both a data structure definition and a program-to-program communications protocol. DIA defines the protocol with which architected office systems nodes communicate with source and recipient nodes (workstations).

The SNA Distribution Services architecture is the newest member of the IBM office systems architecture. Snads defines the architecture of a post office and the protocol by which post offices communicate with each other and with users of the post office. At the moment, the only IBM products that implement the Snads architecture are Disoss at the Version 3.2 level and the IBM 5520 administrative system at the Version 3.1 level.

LU 6.2 is the IBM SNA protocol for program-to-program communications. LU 6.2 is the converging protocol for SNA products.

Disoss is a strategic product from IBM and a cornerstone of the IBM office systems architecture and large account marketing strategy. Disoss is implemented within an IBM CICS transaction processing environment and provides the ability to interconnect all IBM office system products by providing document distribution and document library services capability.

Disoss currently supports interconnection of Displaywriters, IBM 5520 administrative systems, IBM 8100/DOSF systems and the IBM Scanmaster. IBM has announced Personal Services/370, which provides a Disoss interface to a 3270 terminal community, and Personal Services/Personal Computer, which extends Disoss capability to the IBM Personal Computer.

In 1981, IBM made a critically important statement of direction when it indicated that it intended to provide a capability for editable interchange of documents across all IBM office products. With the delivery of Disoss Version 3.2, IBM has essentially completed implementation of the statement of direction. In most cases, any necessary document translation is done at the receiving system.

Profs is the black sheep of the IBM office products family. IBM declares it a "nonarchitected" product, which means it does not use any of the architectures outlined above. Nevertheless, it has been an outstandingly successful product. Profs is essentially an electronic mail system that runs under IBM's VM operating system and supports users of 3270 terminals.

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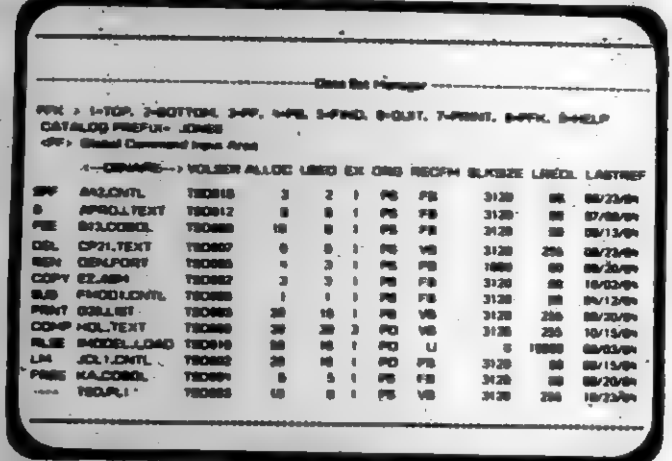

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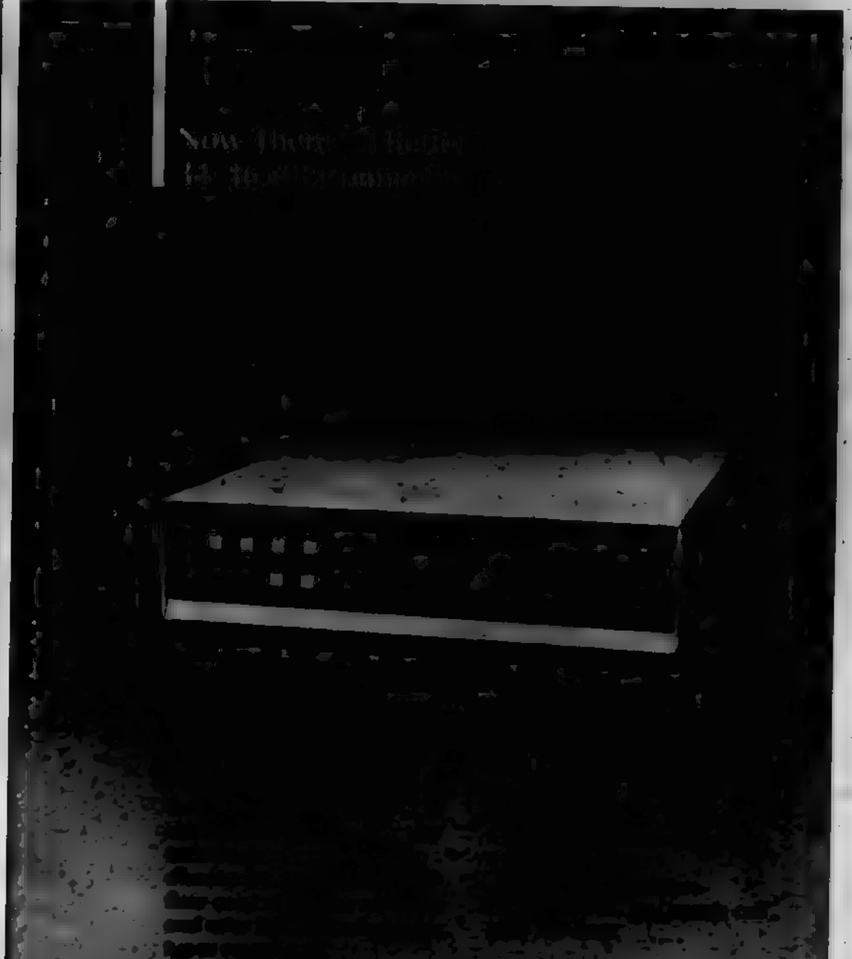

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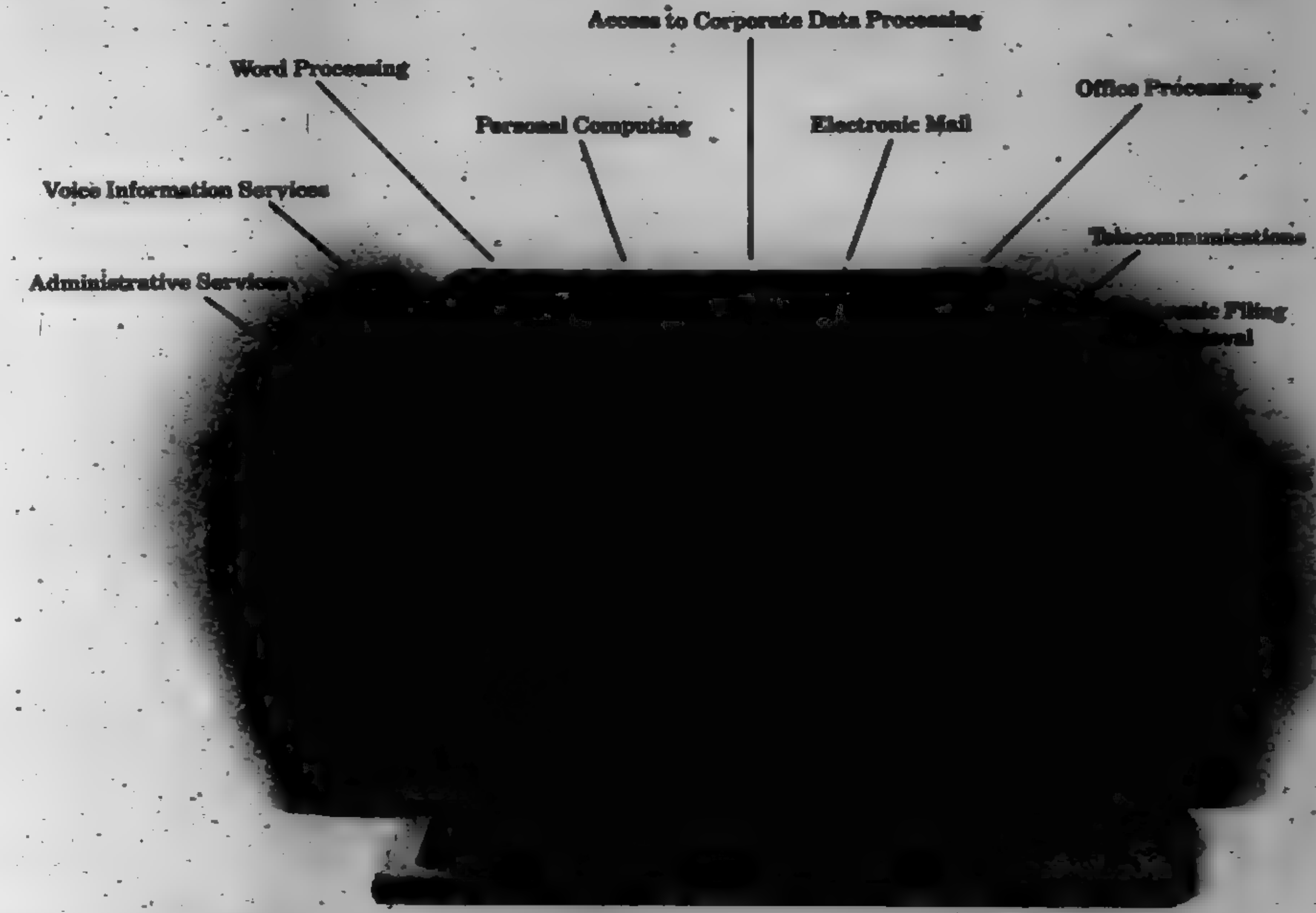
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of office systems products through the use of the above architectures, but there is still much work to be done. DIA, DCA and Snads are quickly becoming de facto standards in the industry. All major office systems vendors have announced the commitment to interface to Disoss and some to Profs.

While there are other standard-setting efforts in progress, it certainly appears that IBM's architectures have gained a tremendous amount of momentum. An alternative to DCA is a recently announced U.S. Navy document standard called Document Interchange Format. While many vendors have announced support of DIF, it is not nearly as comprehensive as DCA. X.400 is a proposed CCITT standard for interconnecting messaging systems that provides a similar level of function as IBM's DIA. It is likely that the relationship between X.400 and IBM architectures will be similar to the current relationship between X.25 and SNA: peaceful coexistence.

DIS technology

Document interchange systems include hardware and/or software to distribute revisable form documents among equipment from multiple office systems vendors. Some document interchange systems operate point to point, and others operate in a store-and-forward manner and look very much like electronic mail systems. A number of key issues must be considered from the user's perspective:

- How is the document physically transported from the sender to the recipient?
- Does the sender need to know the type of equipment the receiver has, or does the document interchange system maintain this information?
- How is translation performed, and how accurate is the translation?
- Does the document interchange system interface directly to the user's office systems equipment or to vendor-specific OA mail systems such as Disoss, Profs or Wang Office?

Document interchange systems must provide two types of service to three types of end-user workstations. The two types of service are translation and distribution. Some document interchange systems also include a library service facility. Although this is a desirable feature, it is not a necessary component of a DIS. The three classes of end-user workstations are personal computers using word processing software, word processing systems and departmental OA systems and mainframe terminals accessing office automation services (for example, Profs and Disoss users).

The basics

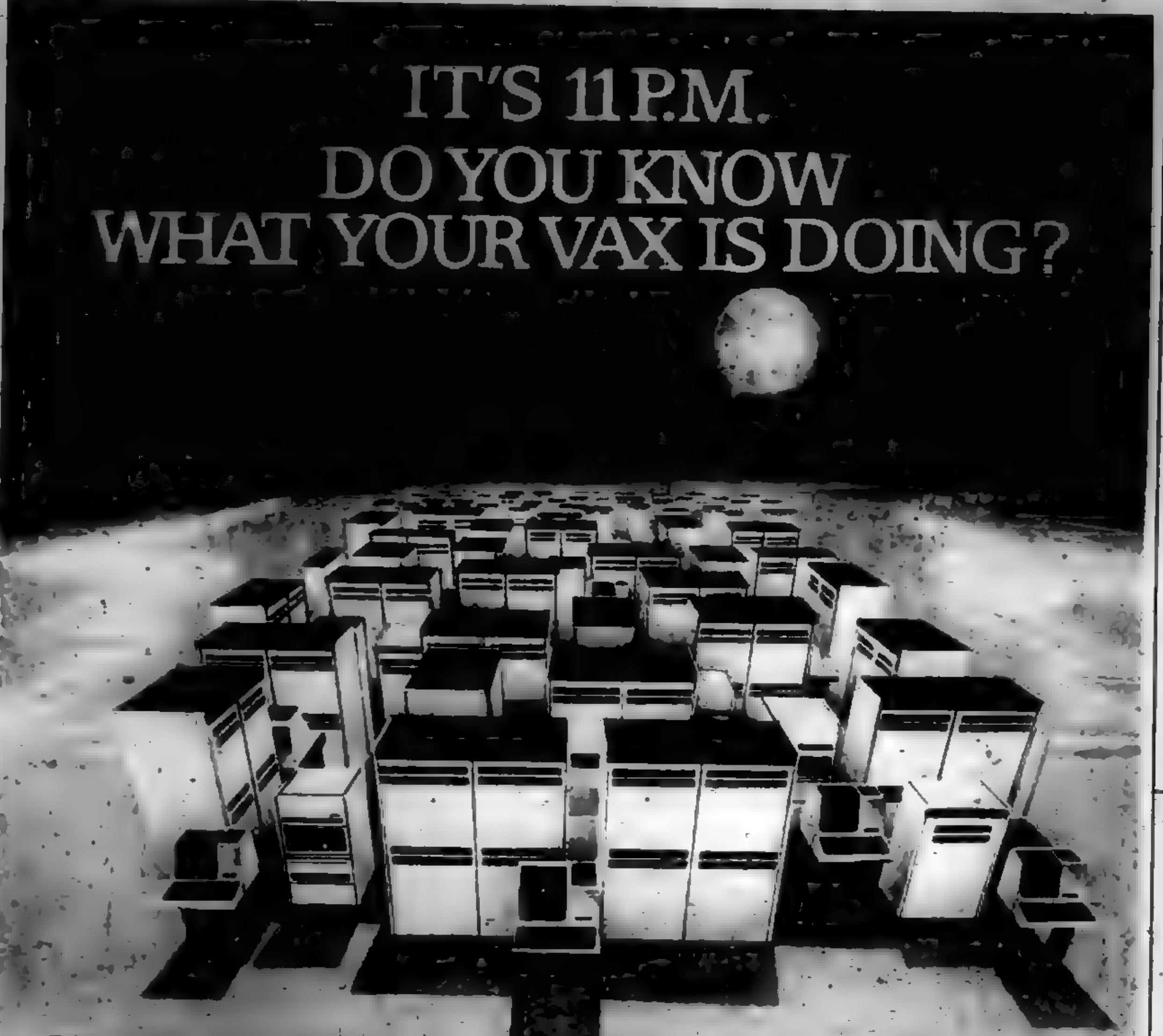
Final form vs. revisable form. A document may be sent from user A to user B in either final or revisable form. Final form is essentially print image. This means that the document can be viewed by the recipient and printed, but it is not intended to be modified by the recipient's word processing system. This is because there is no "coding" in the document to indicate format controls such as underline, indent and center.

Revisable form, on the other hand, means that a document is to arrive at the recipient's system in a form that is completely editable. All of the coding for format controls must be contained within the document.

The handling of center codes is a good example to highlight the difference between final form and revisable form transmission. Let's assume that a document exists on a Wang word processor and that certain lines are centered. This means that on the Wang word processor there is a one-byte control character at the beginning of each line to indicate centering, followed by the text to be centered, followed by a carriage return.

When the text is displayed or printed on the Wang word processor, each line beginning with a "center" code will appear centered. If the margins of the document were changed, the text would still be centered within the new margins. If this document were to be transmitted in final form, the center code would be replaced by the appropriate number of blanks so that the text would appear centered within the given margins. If this text were transmitted in revisable form, the center code itself would be transmitted instead of the blanks.

Herein lies the problem of multivendor document interchange. If we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OAC makes connections

Michael Zisman will chair a session on document interchange at the Office Automation Conference (OAC). The conference, sponsored by the American Federation of Information Processing Societies, Inc., will be held at the Georgia World Congress Center in Atlanta Feb. 4-6.

Participants in the document interchange session on Feb. 5 will discuss user experiences, vendor perspectives and opportunities with value-added network service offerings.

The annual OAC is geared to office automation implementers and vendors. More information is available from Afips, 1899 Preston White Drive, Reston, Va. 22091.

send this document to anything other than a Wang wordprocessor, the center code will be meaningless. This is because there are no standards among vendors for text controls. If the document is being sent to some other kind of equipment, the center code must be translated to the appropriate coding for the target system. This translation can occur at the sending system, at the receiving system or somewhere in between.

Document interchange systems vs. messaging systems. Messaging systems have been with us for a long time. Almost all of us have been exposed to telex systems, and by now most of us have used computer-based message systems — software systems that provide final form store-and-forward transmission of text.

In a typical system, a user prepares a message at a standard terminal and directs the messaging system to send that message to one or more recipients. The message is stored in a message data base until each of the recipients logs onto the message system and requests his messages. At that time, the messages are displayed on the recipient's terminal or printer. The recipient can store the message, forward it to others, reply to it or delete it.

As far as the messaging system software is concerned, in almost all cases it is assumed to be talking to fairly dumb terminals. While some mail systems vendors advertise the ability to support word processors, this is oftentimes a bit misleading. What they are usually referring to is the ability to support a word processor, as long as the word processor is emulating a dumb terminal.

Compared with messaging systems, document interchange systems start with the assumption of operating on revisable form text. Furthermore, most document interchange systems assume that the text is prepared on different vendors' word processing/text processing systems and that the document format must be translated before being delivered to the recipient. The major distinction between document interchange and messaging systems is the translation value-added provided by the former.

Having explained the differences between messaging and document interchange systems, it is important to note that the lines of distinction are rapidly beginning to blur, Some mail systems provide document interchange capabilities as ancillary services. Examples of this include Geisco's WPXchange service, which is linked to its Quikcomm electronic mail system, and MCI's Document Exchange Service, which is linked to the MCI mail system. Likewise, some document interchange systems provide links to final form mail systems and provide the ability to transport final form messages.

Protocol levels. Document interchange systems are one of the very few areas where protocol conversion is being performed at the application level. Most types of protocol converters accept bits in one end and put bits out the other end and, in general, have no idea what the information content of the bits is. When translating from bisync to Synchronous Data Link Control, one is not at all concerned with whether the actual data in the packets is payroll data, word processing text or anything else. At that level, the only concern is with the data enveloping the applications-level data.

Such is not the case with document interchange. At this level of protocol translation, we are very much concerned with every bit in the data stream.

To translate a document from a Wang to an IBM word processor, we must understand precisely what the format of a Wang document is and what the coding is in that document; likewise, we must have the same level of understanding for the IBM document structure. Last, we must have an ability to transform each item of Wang coding to IBM coding.

Canonical form. Many document interchange systems use a canonical form in document translation. A canonical form is simply a standard form that all documents can be translated into and out of. The canonical form used by a vendor can either be that vendor's proprietary form or some other standardized form. Consider for a moment a document interchange system that must handle documents from 10 different vendors. If a distinct translation program were written to translate from each vendor's format to every other vendor's format, we would need 90 different programs. The addition of an 11th vendor's format would require the development of 10 new translation programs.

If a canonical form is used, then two translation programs are

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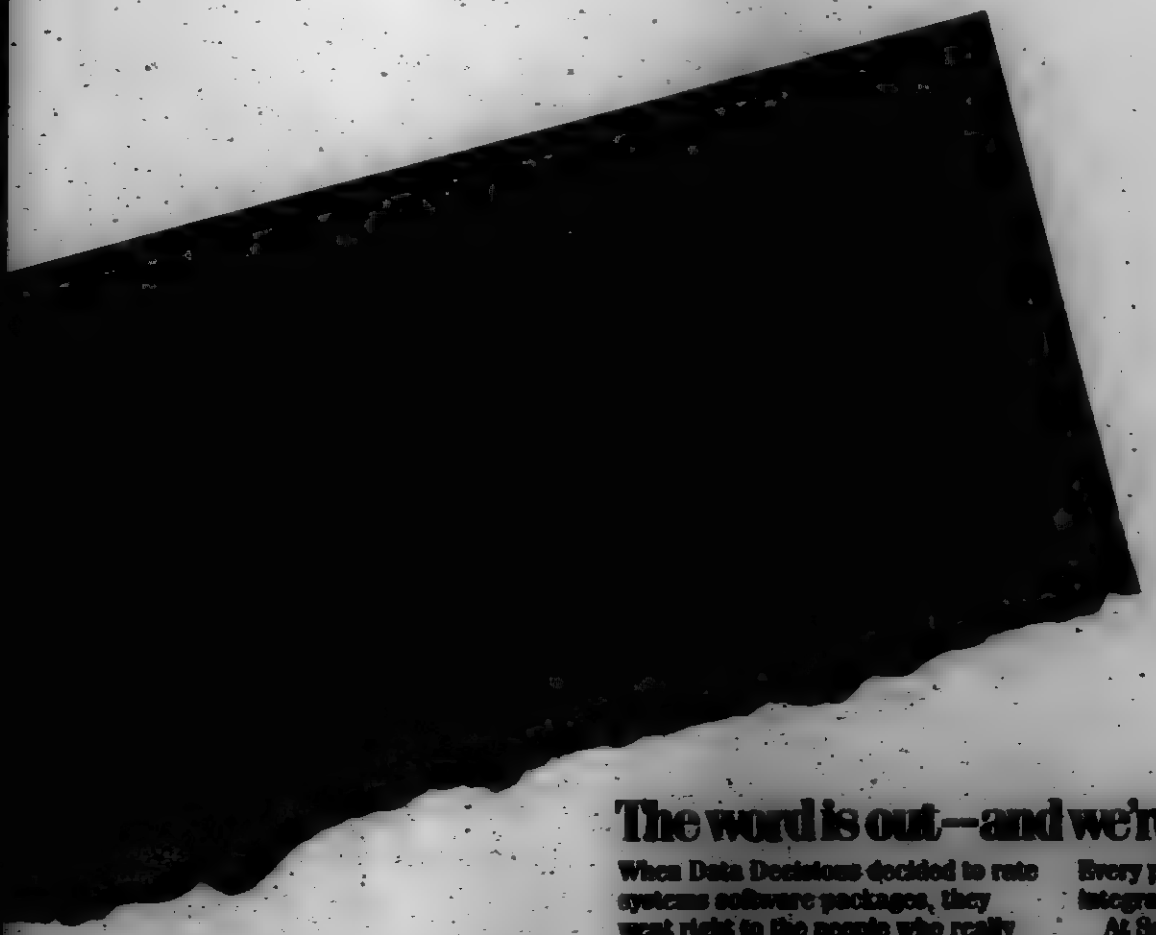

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required for each vendor format supported. One program is required to translate from the vendor's proprietary format to the canonical form, and another program is required to translate from the canonical form to the vendor's proprietary format. When translating from Wang to Xerox, for example, one would first translate the document from Wang's format to the canonical form and then from the canonical form to Xerox's format. Naturally, this is done in a manner that is transparent to the user. In this case, supporting 10 vendor formats requires only 20 translation programs instead of 90.

Even more important, the addition of an 11th vendor requires the writing of only two translation programs instead of 10. Use of the canonical form also provides an anchor point for precisely defining what the various word processing codes mean.

Translation services provides the ability to convert a document format from that required by one vendor's equipment to that required by another vendor's equipment. For example, when a document is sent from a Wang system to an IBM Displaywriter, somewhere in that path the document must be converted from Wang's WPS format to the Displaywriter DCA format.

At first glance, this appears to be a very trivial problem. Obviously, the character set can be translated from Ascii to Ebcdic, and this is, in fact, a trivial part of the problem. As far as translating the document coding is concerned, an initial analysis might lead one to believe that a simple table lookup can be used for converting a center code, for example, from Wang to IBM.

Unfortunately, those building translation systems have learned that high-fidelity document translation is a very challenging problem for a number of reasons. In order to analyze product offerings successfully, users will need to develop some understanding of these challenges.

The following factors make document translation difficult in many circumstances:

- Differences in functionality of systems.
- Differences in basic document structures.
- The syntax vs. semantics of document coding.
- Compromises between edit fidelity and visual fidelity.

Each of these is described below:

Different levels of function. Different word processing systems have different sets of features. When translating a document from a word processor that has a particular feature, such as sophisticated footnoting capability, to a system that does not, the function must be simulated. This sometimes requires the implementation of sophisticated text formatting capability within the translator.

In many word processors, footnoting is handled automatically by the word processor. The user simply keys in the footnote text, indicates that it is a footnote and ties it to the reference in the body of the text. The word processing software automatically keeps track of the footnotes and formats them at the bottom of the proper pages. When a document with this coding is translated to a system that does not support footnoting, all of the footnote tracking and formatting must be implemented in the translator.

In some cases, simulation is not possible. Consider a word processing system that allows the user to change header text anywhere in the document. If this document is sent to a word processor that only allows a single header that appears on every page, there is obviously a problem. Simulation will not help us unless we are willing to do away with the headers on the target system completely and treat the varying headers as text. This obviously impacts the revisability of the document. The most reasonable thing to do is to provide diagnostics to the recipient indicating that the headers cannot be fully converted.

Document structure. Different implementation philosophies often lead to different document structures, which can cause problems in translation. Simple character-by-character translation will be totally inadequate for most users.

Syntax vs. semantics. Because most word processors have the same basic set of document codes (center, tab, indent and so on), it is tempting to jump to the conclusion that each code can simply be

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translated into the code required on the target machine.

To understand why this is more difficult than it first appears, one must appreciate the differences between syntax and semantics. Syntax refers to the structure of the document coding; semantics refers to the meaning of that coding. While the syntax is often similar across different systems, the semantics is often quite different — that is, the very detailed interpretation of a particular code may be very different from machine to machine.

In addition, development of translators requires knowledge of what might be called "undocumented semantics." What happens, for example, when a user of a word processing system depresses the tab key after the last defined tab on the line? This depends on how the word processing software is implemented. On a Wang system, the cursor will move to the first tab position on the next line. On a Displaywriter, the tab operator will be stored in the document, but the cursor will move one position to the right. On the NBI 3000, the attempt is ignored.

While one might argue that an operator should not enter illegal sequences of operations such as the one described above, the fact is that operators quickly learn how a system responds to these sequences and oftentimes use this knowledge to great advantage. Clearly, translators must be able to respond precisely as the machine does. This means that high-fidelity translation requires an investment of very substantial resources in reverse-engineering each of these systems to understand exactly how it operates under a variety of circumstances.

Edit fidelity vs. visual fidelity. When translating a document, there are two potentially conflicting goals. Obviously, the document should be as revisable at the receiving system as it is at the originating station. In fact, this is the essential goal of a document interchange system. However, there is another goal that is also rather obvious. When the document reaches the receiving system, it should look exactly the same as it did at the originating system. This is referred to as visual fidelity. Line endings should be exactly the same, page endings should be the same and so on.

Sometimes there are conflicts between these two goals, and in such cases a compromise solution must be implemented. As an example, consider the case of translating an IBM Displaywriter document with underlined text to a Wang format. On the Displaywriter, underlined text is delineated with a start underline code and end underline code. Spaces within underlined text caused by a tab operator will appear underlined on a Displaywriter. On a Wang system, there is no way to underline the spaces caused by a tab operator.

When translating a Displaywriter document with this coding sequence (that is, a tab within underlined text), the translation program can either translate the Displaywriter tab to a Wang tab, in which case the resulting spaces will not be underlined on the Wang system, or translate the Displaywriter tab into the appropriate number of spaces so that it will be underlined on the Wang system. In the first case, revisability (that is, preservation of the tab operator) is given preference over visual fidelity. In the second case, visual fidelity is given preference over revisability.

Another point of conflict between visual and edit fidelity arises because of differences in word wrap algorithms. Essentially, all word processing programs will perform automatic word wrapping; this means that the program determines where a line should end. The

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only time that the user enters a carriage return (also called a hard carriage return) is when word wrap is to be overridden, as in paragraph end, tables and so on.

Given the same left and right margins and pitch settings, one might think that all word processors would generate the same word wrap. This is not the case.

Some word processors consider all blanks following a word to be part of the word, some consider only the first following blank to be part of the word, and some consider none of the following blanks to be part of the word. In almost all instances, the differences in word wrap algorithms can be adjusted for by changing the right margin.

There are some cases, however, when one system would allow an additional word on a line due to a difference in algorithms. A translator can detect this and insert a hard carriage return to force a proper line ending. Again, we have a trade-off between visual fidelity (maintaining line endings) and edit fidelity. The inserted hard carriage return is undesirable from an editability standpoint.

Typically, users are at first so delighted that they can overcome multivendor incompatibility that the small problems in translation are overlooked. However, within a short time, expectations rise dramatically, and these small problems are no longer overlooked. Such is the nature of progress: It depends on the belief that things can always be improved.

The distribution services component of the document interchange system is responsible for interfacing to the actual communications-level software to accept the document from the sender system. It determines where the recipients are and how they are to be accessed, invokes translation services as necessary to ensure that the recipient gets the document in the format required and interfaces to the appropriate communications-level software to transmit the document to the recipient.

No matter how it is accomplished, some communications links must be established between the document interchange system and supported systems. It is important to note, however, that by supported system we can mean a stand-alone word processor or a vendor-specific document distribution system such as Disoss, Mailway and Decmail.

Interfacing a document interchange system to Disoss, as Soft-Switch does today, is but one of many OA systems for which distribution bridges will be required. As departmental systems such as those offered by Wang, DEC, Data General Corp., Hewlett-Packard Co. and others proliferate, linkage to those vendors' mail systems will become extremely important.

The mail systems provided by each of these vendors will be used as transport services to a document interchange system. In this sense, the document interchange system becomes an intelligent bridge between departmental systems.

How does a document interchange system know that a particular user is a Disoss user or a Profs user or a Wang OIS user? Directory services is a key component of distribution services; through the directory, much of the detail can be hidden from the end user. Document interchange system implementers will obviously take different approaches toward the directory issue.

> ”
>
> *We have a trade-off between visual fidelity (maintaining line endings) and edit fidelity.*

It is important to note that if the end user is interacting with a departmental mail system such as Profs, the user will not interact directly with the document interchange system at all, but rather with the departmental mail system such as Profs, Wang Office and so on. The departmental system will interact with the document interchange system as necessary.

Mail system interaction

As departmental systems proliferate, document interchange systems will interact more with these mail systems and less directly with end users. This means that the user interface will be provided by the departmental system and not by the document interchange system.

This is already the case today with Disoss. Disoss has no user interface whatsoever. The Displaywriter, the 5520 and other IBM office systems implement their own user interface for document distribution and interact with Disoss as necessary.

The increasing number of different departmental/mail systems in an enterprise will lead to a requirement for another type of translation, and that is because of different user naming structures in different mail systems.

Wang Office uses a one-level name space (Mike Zisman). Disoss and Profs use a two-level name space (ADMIN.ZISMAN). Decmail uses an n-level name space (ZISMAN @ SYS1 @ SOFT-SWITCH).

As documents are moved among systems, the names are going to have to be translated to the form required by the receiving system. User addressing in these heterogeneous mail system environments will prove an enormous problem.

About the author

Michael Zisman has been president of Soft-Switch, Inc., located in King of Prussia, Pa., since 1979. Before that, he served on the faculties of MIT and the Wharton School.

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The Micro-Term ERGO 320 is fully compatible with the DEC VT220 and emulates all DEC functions.

Features
Other popular ERGO 320 features not found on a VT220: User-programmable compose key • User-programmable function keys • Function keys in VT100 mode • Flashing LEDs indicating Xoff has been enacted • Superior 132-column clarity • Bi-directional printer port • Erase or save 80/132 screen • Variable-speed smooth scroll • Choice of smooth- or jump-scroll without entering set-up mode • Addressable 25th status line • Low power consumption • Easy access to on/off and brightness controls • A full one-year warranty.

Design
The ERGO 320 is ergonomically designed and housed in an attractive, compact case with an adjustable monitor and smaller footprint than the DEC VT220. The detached, low-profile keyboard, is shorter than the DEC VT220 keyboard, and has an easy-tilt adjustment to provide ease of use for all users.

Graphics
Upgradability. The ERGO 320 can accept an optional graphics board ($595) which will perform all Plot-10 and ReGIS functions. The graphics board, which turns an ERGO 320 into an ERGO 340, can be added to existing ERGO 320s. The small footprint is maintained when adding graphics to an ERGO 320 but must be forfeited when purchasing a VT240. **Fast, too.** In addition, our graphics offers significant speed advantages over a VT240— as much as **seven times** faster. (See an actual comparison above.)

ERGO 340
Elapsed Run Time: 11.0 sec.

DEC VT240
Elapsed Run Time: 11.0 sec.

Price
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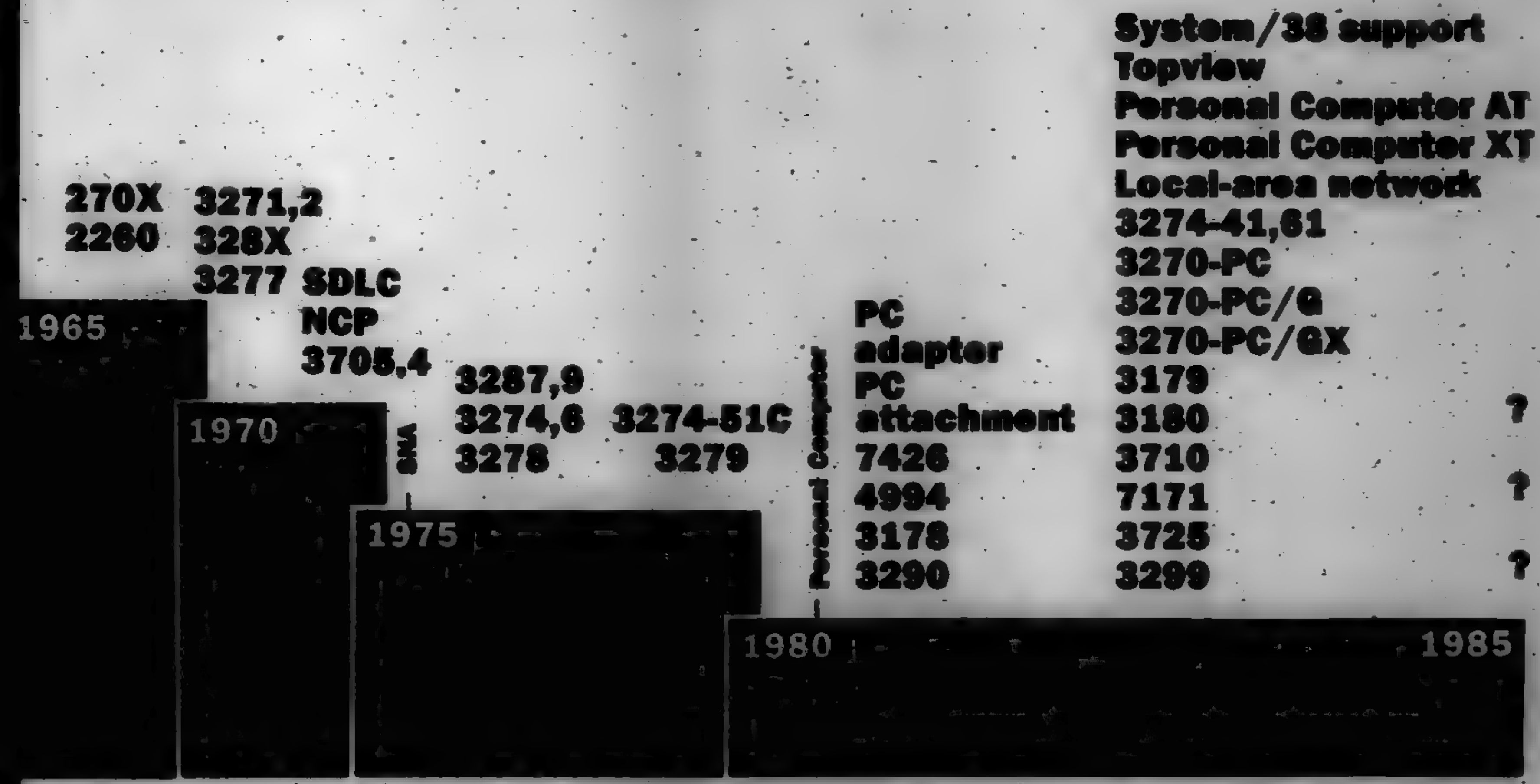
Evolution of the IBM 3270



Cycle of change speeds up

By Scott Brear

The IBM 3270 family has been available in various forms for nearly 15 years — some would even say since the introduction of the IBM 2260 display system in the mid-'60s. The 3270 products generally consist of a cluster of several editing CRTs, such as 3278 display stations, coupled to a polled cluster controller unit — the 3274, for example. Frequently, a printer such as the 3287 is also part of the cluster.

Indeed, IBM cast its lot with the earlier 2260 when it developed this concept of polled clusters over dumb and relatively inexpensive asynchronous Ascii CRTs as the principal means of user interface with IBM hosts. This direction was subsequently reflected in IBM's inattention to both asynchronous terminals and telecommunications support over the next decade — a point not missed by a generation of product planners.

This concept of small clusters of editing CRTs connected by coaxial cable to a synchronous remote or local control unit — around which millions of programmer hours of specific software applications have been written — became popular enough to sell millions of devices worldwide. The 3270 product has become an institution with a longevity matched only by that of the omnipresent IBM 3420 which, until very recently, was the premier tape drive of IBM mainframe users. And, as with the 3420, the 3270 system has been widely emulated by major competitors offering lower prices, earlier delivery and more features than IBM.

As one might expect, the competitive scenario for 3270 products has undergone tremendous changes. No longer can competitors count on IBM's having the highest price, slowest delivery and fewest features. Some major participants have left the business or consolidated with others; some have just entered the battle armed with the skills to interface and compete with IBM, using somewhat nontraditional methods.

As the chart above shows, from 1971, when the first 3270 systems were announced, until about 1981, there was, on the average, only one

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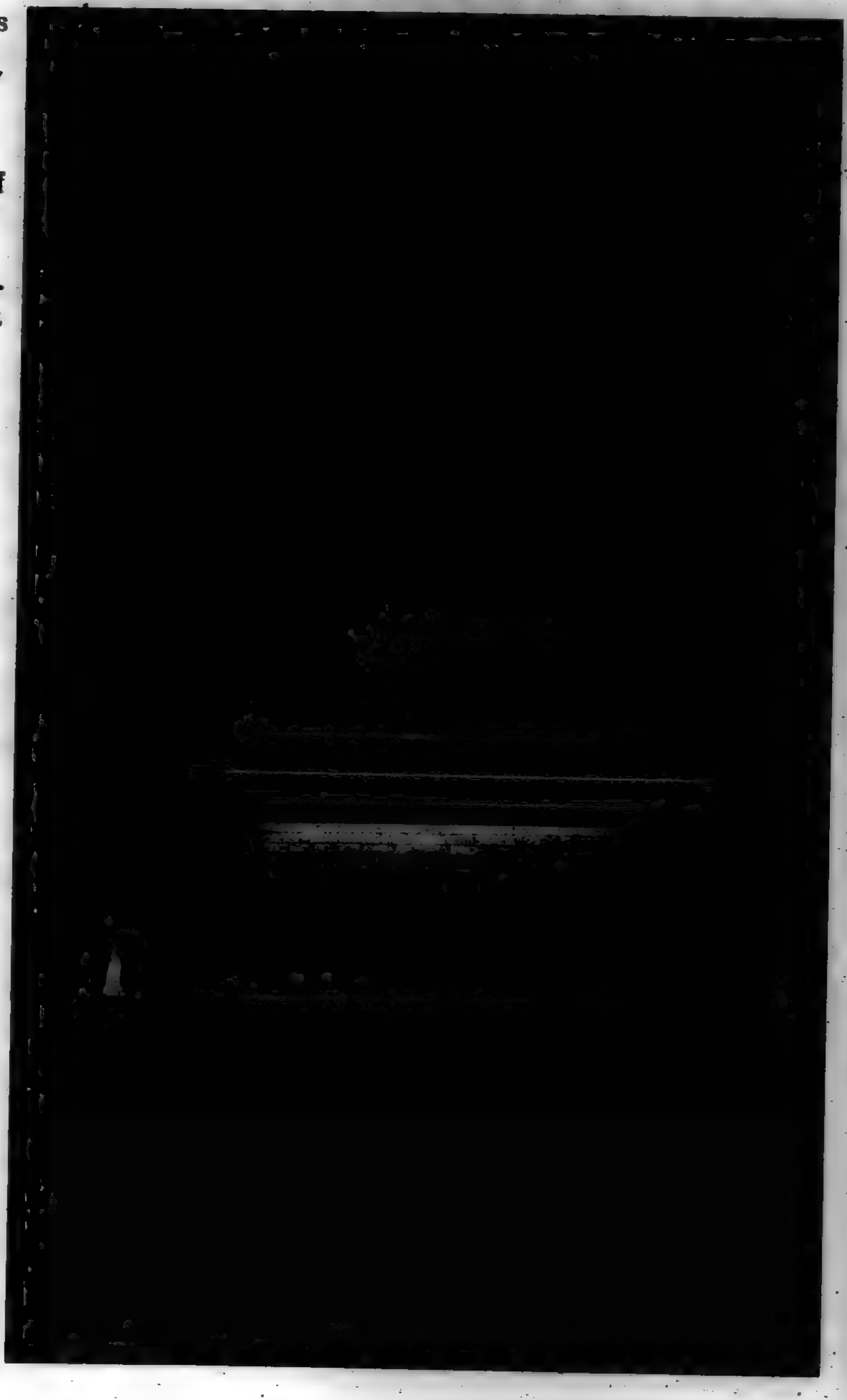

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major product announcement each year. In fact, a full five years separated the announcement of the first-generation 3271- and 3272-based clusters and the release of the second generation, generally represented by the 3274 cluster.

Five years later, just when users were expecting a new product line, they were greeted with several major 3270 enhancements in what became one-year, then six-month and now three-month cycles.

The magnitude of the 3270 system explosion can best be understood when divided into functional segments, such as:

- Basic 3270 components.
- Personal computing.
- Protocol conversion.
- Coaxial cable-based technology.

The basic 3270 cluster components have changed considerably since their introduction in terms of flexibility and features. The explosion first brought a low-cost 3178 12-in. display station. After many years of offering large, inflexible displays, the 3178 was welcomed for its smaller size and ergonomic features, such as a swivel mount for user convenience. In fact, the 3178 closely resembled the IBM 3101 display terminal, an asynchronous CRT device.

The 3178 was also significant for its highly competitive pricing, including volume discounts, and user self-installation and maintenance plans. There is no question that the 3178 stunned the competition, which then rushed their own low-cost displays into the marketplace.

Along with the 3178 came the 3290 information panel, which was able to display as many as four regularly sized CRT images simultaneously, using flat-panel plasma technology. The 3290, which cost more than twice as much as regular 3278 displays, was not about to be a widespread replacement. Rather, it served as a useful computer room or unique applications tool, while at the same time demonstrating IBM's technological prowess to trade show audiences.

The 3270 control unit products were also enhanced to use new products and features, such as the 3290. The 3274 control unit was offered in new Model 41C and 61C versions with more memory, more standard features and a lower cost. For example, the 3274 control unit entry assist function was added as a user convenience, giving some word processing capabilities to on-line data entry operations.

Significantly, the small System/38 now supports the 3274 Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) cluster, providing access to applications that once required a specialized 5251 display station to access. Software in the System/38 converts 3270 data streams for the 5251 applications.

Does this portend a move to a single family of display stations? Perhaps this move is not too far away if one considers some features of the new 3180 display station family. For example, the 3180-1 has been announced as a replacement for the 3278, while the 3180-2 is intended to replace the 5251 for System/34 and System/38 hosts.

The displays are essentially the same in physical terms, but are differentiated by software downloads that can determine keyboard assignment and other operational parameters relevant to their hosts.

The 3180-1 display station and its companion 3179 color display station announcement were significant for other reasons as well. Serious inroads were being made in the 3270 market by several competitors who could offer all of IBM's display sizes — 80 char. by 24 char. through 132 char. by 27 char. — in one device, saving inventory and money and greatly improving user flexibility.

The 3180-1 met this challenge by providing the ability to display any standard screen size on one 15-in. ergonomic terminal. And, if this were not enough, prices came down again. The 3179 was also welcomed by IBM users as it offered a fresh-looking, lower priced alternative to the older, bulky 3279 color product.

Perhaps personal computer users have had the greatest impact on the 3270 system by challenging the preeminence of the existing large host and cluster controller computing environment while urgently seeking access into this same environment. Very soon after the Personal Computer was announced, the industry was speculating as to how and when it would be interfaced with the 3270 product line. It seemed, by many, to be a natural fit.

This speculation ended when the Personal Computer attachment product was announced but was soon followed by disappointment as users realized that this product was a complex "bolt-on" to existing 3278 display stations.

The Personal Computer has been a success, with an installed base approaching two million and expected to reach a possible 15 million units in a few years. Data processing managers were not expecting this potential threat to their domain to become a powerful extension via their 3270 systems and software. But the capability was there. Coaxial cable adapter cards and software, the IBM Personal Computer 3278/79 emulation adapter, became available, which enabled the Personal Computer to emulate directly a 3270 display station.

File transfer became an issue as users realized the usefulness of freely moving files between their hosts and the new little helper; however, users were unhappy to learn about limited file types, relatively slow transfer speed and threats to host data base integrity.

Finally, a completely integrated product, the 3270 Personal Computer, was announced that combined the host-interactive functions of the 3270 information display system and the computing power and versatility

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of the IBM Personal Computer. The 3270 Personal Computer offered single-session operation (the control unit terminal mode) or a unique multisession mode (the distributed function terminal) where one 3270-PC could interface with as many as four 3270 sessions. This feature, also used with the 3290 information panel, was expanded to allow two notepad sessions and one DOS Personal Computer session.

The 3270-PC also had screen windowing, keyboard macro definition, file transfer and many other useful features. Since the original announcement, several powerful graphics versions of the 3270-PC have been introduced and widely promoted for special-purpose applications.

Terminal interfacer unit

IBM offers protocol conversion? Yes, and it has for several years, if protocol conversion means enabling asynchronous terminals to talk to 3270 applications. It seems that the IBM 7426 terminal interfacer unit, released in October 1982, was IBM's first real venture into protocol conversion, providing a remote or loop-connected facility for the connection of a limited number of asynchronous devices, such as its own 3101 asynchronous terminal.

On the other hand, the Yale Package — an IBM Series/1 minicomputer with Yale University-created software, available on a special quote basis — became the IBM 4994, an Ascii device control unit. Apparently, this happened when IBM granted it formal product status. Only IBM knows how successful it was with the 4994, since market figures are buried in Series/1 statistics, but there were some limitations, such as the type of terminals to which the 4994 could interface.

In addition, IBM offers a synchronous communications adapter board and software that converts the Personal Computer into a 3270 display station/control unit running either Binary Synchronous Communications or SNA/SDLC. Of course, running full steam against all of these offerings are the protocol converters of dozens of companies claiming to offer lower price, faster delivery, more features and wider terminal support.

Just when everything looked safe for participants in this small subsegment of the 3270 market, the IBM 7171 Ascii device attachment control unit was announced. The 7171, which adds significant credibility to the concept of the 3270 protocol conversion, replaces and greatly improves on the 4994, in terms of price and features. For example, the 7171 can directly connect to host channels as a pair of 3274 control units offering 3270 emulation to 64 Ascii terminals via direct connection, asynchronous dial modems, line drivers or data private automatic branch exchanges.

Host and software limitations were removed, but the 7171 is still a locally attached product inapplicable to more than three-quarters of all of the 3270 applications that exist in a remote synchronous network environment. However, IBM has placed the burden of dial-in security totally on the host; the 7171 has no password or other types of security common in today's protocol converters.

Furthermore, the 7171 entry size of 16 channels will make it a solution for only very large users. Nevertheless, IBM has turned over one more stone in its efforts to control the 3270 market.

Multiplexer unit

Coaxial cable technology has not stood still either. While not a leader in innovative coaxial cable products, IBM finally offered a 3299 terminal multiplexer unit that allows up to eight devices to share a single 5,000-ft. coaxial cable line. Offered by a few competitors for several years prior to the IBM announcement, the 3299 offered significant savings where coaxial cable runs can cost up to $1 per foot to install or where no room for expansion exists.

There are alternatives from other vendors, such as multipoint coaxial cable attachment, but IBM's local-area network product, when available, should allow the faithful to move in this direction as well.

Users now have an assortment of coaxial cable devices to choose from when configuring their 3270 systems. Not only can the Personal Computer have an expansion board giving it 3278/3279 emulation, but products are available from certain creative competitors that allow virtually any asynchronous Ascii device to emulate 3270 displays or printers.

What's next? Is a new 3274 control unit on the horizon? Only IBM knows — and it is not talking. The product family will not die soon; there are too many software applications written. Remember, it has taken IBM nearly 10 years to withdraw Tcam telecommunications access method support. But it will probably evolve into a much more flexible product with features now available with the more expensive 3270-PC.

A single clustered terminal family will probably apply across all IBM products, making the 5251 product virtually obsolete. The concept of file transfer, which today has been shoehorned into the capabilities of existing hardware and software, will be expanded into a highly functional user tool controlled by mainframe data processing managers.

Finally, networking concepts will change as users become comfortable with the new local-area network technologies and new networking products such as the IBM 3710 network controller.

The 3710 should not go unnoticed by 3270 managers, since this remotely connected device can look like a 3725 communications control unit to 31 Model 3274 control units or protocol converters. And, as IBM indicates in its 3710 product announcement, it "intends to provide . . . full screen protocol conversion capabilities integrated within the 3710."

About the author

Scott Brear is director, protocol conversion products, at Micom Systems, Inc. in Simi Valley, Calif.

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SYSTEMS & PERIPHERALS

Fujitsu's VP-400 supercomputer out; called fastest CPU

TOKYO — Fujitsu, Ltd. recently announced that it has developed the VP-400 supercomputer, which Fujitsu claims is the first supercomputer to perform one billion floating-point operations per second (Gflops), twice as powerful as the fastest Fujitsu supercomputer now available.

The VP-400's speed, measured by the Japanese National Aerospace Laboratory of the Science and Technology Agency, Fujitsu maintains is the world's fastest. However, scientists caution that speed varies with the problem being solved, so the rating varies in practice.

Fujitsu currently offers two supercomputers, the VP-100, rated at 250 million floating-point instructions per second (Mflops), and the VP-200, rated at 500 Mflops.

The corresponding processors from Amdahl Corp., which markets and supports Fujitsu processors in the U.S., are the Amdahl 1100 and the Amdahl 1200.

'No surprise to us'

Wayne McIntyre, director of special-purpose systems for Amdahl, said, "We've known about the product for some time. It was no surprise to us." Expecting that Amdahl will market the VP-400 in the U.S., he said a final agreement has not yet been reached with Fujitsu.

The performance of the VP-400 was achieved by packing more processors in the box, rather than by accomplishing a scientific breakthrough. The VP-400 uses bipolar emitter-coupled logic with 400 gates per chip and has a switching speed of .35 nsec, McIntyre said.

The Amdahl executive predicted that the VP-400, when offered in the U.S., will have an impact on the domestic supercomputer manufacturers, Cray Research, Inc. and Control Data Corp.

The fastest Cray Research, Inc. supercomputer is the X-MP/48 with four processors, rated at 10 times the speed of the Cray 1, according to Cray's manager of corporate communications, Tina Bonetti.

Cray does not issue Mflop ratings for its CPUs, because the rating will vary by application, according to Bonetti.

IBM, DEC fight brews

Report sees increasingly stiff competition for small, mid-range areas of systems mart

By John Desmond
CW Staff

FRAMINGHAM, Mass. — The already heated battle between IBM and Digital Equipment Corp. will intensify in 1985 as both companies attempt to make the transition smoothly from proven, older technology systems to new-generation machines such as DEC's VAX 8600 and IBM's so-called Sierra line of mainframes and Personal Computer AT.

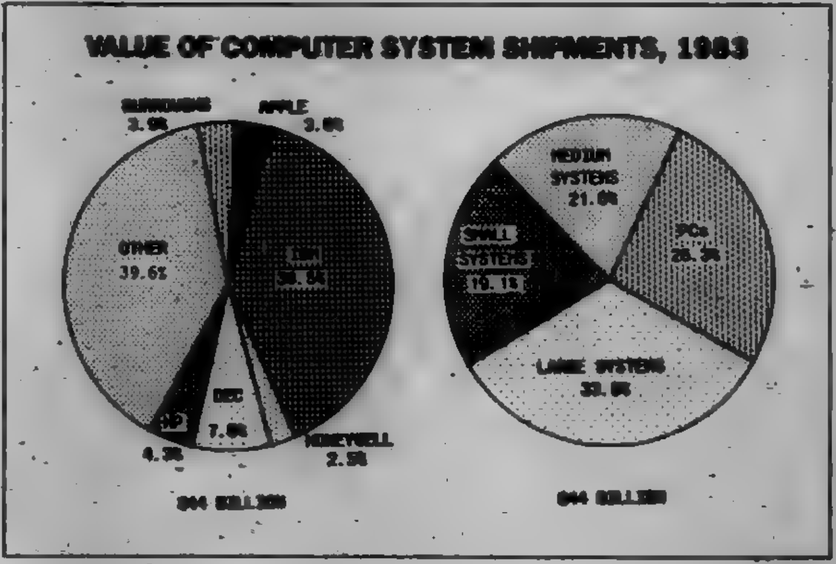
According to "Review and Forecast, Part III," a report published by International Data Corp. (IDC), a market research and consulting firm based here, issues that will affect the DEC-IBM duel during 1985 include the following:

- Because IBM is dominant in the mainframe and personal computer markets, most competition will occur in the small- and medium-systems market, where DEC and IBM were nearly equal in 1983.
- IBM's share of the market fell in 1983 to 38.5% from an estimated 40.5% in 1982.
- Of worldwide processor shipments of $43.9 billion in 1983, personal computers comprised 26.3%; small systems, 19.1%; medium systems, 21.6%; and large systems, 33%. Five-year growths, from 1983-1985, are projected at 32%, 21%, 10% and 9%, respectively. (IDC defines small systems as those having two to 16 users; medium, from 17 to 128 users; and large, more than 128 users.)

IDC is estimating that the value of worldwide 1984 shipments will total some $53.2 billion, up 21.2% over the $43.9 billion shipped in 1983. IDC forecasts that the total value of computer system shipments will grow at

See IDC page 67

VALUE OF COMPUTER SYSTEM SHIPMENTS, 1983



IDC CHART

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Supercomputing requires some study

HARD TALK
Tom Henkel
CW Senior Editor

The latest trend among vendors of large-scale mainframes is to offer users the option to add a scientific processor to boost performance. The idea clearly has merit considering the increasing demands for simulations and other computer-intensive applications that have recently appeared in even the most commercially oriented shops. But a question that has yet to be answered is whether users from traditionally commercial processing environments are ready to learn how to use powerful scientific systems.

Longtime manufacturers of IBM-compatible mainframes, Amdahl Corp. and National Advanced Systems Corp. (NAS), are each currently marketing scientific processors that offer performance similar to the stand-alone supercomputers manufactured by Cray Research, Inc. and Control Data Corp. But in addition to offering the ability to quickly process complex number-crunching applications, the Amdahl and NAS scientific processors, which are manufactured by Fujitsu Ltd. and Hitachi Ltd. respectively, offer compatibility with IBM's 370 instruction set. That compatibility appears to offer a bridge linking the heretofore separate worlds of commercial and scientific processing.

But just giving commercial users the ability to run sophisticated scientific applications is only part of the issue. In order to make expensive scientific processors pay for themselves, users must first clearly understand how they work. For example, supercomputers can run some types of applications much more efficiently than standard mainframes, but there are other applications that will actually run more slowly on a supercomputer. There are software packages, such as precompilers, that help the user decide which applications will run best on a supercomputer, but they are not foolproof and are not replacements for a sound knowledge of supercomputing.

Software is a general sore spot when it comes to supercomputing. Up until now, the traditional supercomputer user has been very sophisticated and very specialized. Consequently, there has not been a mass market for third-party supercom-

See COLUMN page 66

Bell & Howell boosts image storage system

CHICAGO — The Electronic Image Processing Department of Bell & Howell Co. has announced added disk storage capacity for its Data Search System for image retrieval.

The system uses Bell & Howell cameras to record images on microfilm, Digital Equipment Corp. computers for data processing and disk drives to store key words in an index. The Series 10 and 20 use the DEC Micro PDP-11; the Series 30 uses the DEC PDP-11/23+; and the Series 40 uses the DEC PDP-11/24.

The Series 10, 20 and 30 Data Search Systems have been enhanced as follows: Model 3 with a 10M-byte Winchester disk drive; the Model 4 with a 31M-byte Winchester drive; Model 5 with a 52M-byte Winchester drive, of which 26M bytes are fixed and 26M bytes are removable; and Model 6 with a 104M-byte Winchester drive, of which 52M bytes are fixed and 52M bytes are removable, the company said. Models 5 and 6 have been added to the Series 40 line, the company said.

The price for a Series 10 Model 1 with a Micro PDP-11, 800K bytes of disk storage, camera, reader/printer and CRT, is $35,000, the company said.

More information is available from Bell & Howell, Electronic Image Processing Department, 6800 McCormick Road, Chicago, Ill. 60645.

Beehive offers terminals emulating DEC, IBM VDTs

SALT LAKE CITY — Beehive International, Inc. has announced three terminals: the ATL-220, said to emulate Digital Equipment Corp.'s VT220 terminal; the ATL-178, said to emulate IBM's 3178 terminal with an integral controller; and the ATL-3270 MS, which emulates the IBM 3270 terminal with an integral controller.

All three terminals have a 14-in., nonglare, adjustable screen in either green or amber phosphor. Other features include a tilt-and-swivel pedestal and a low-profile, detachable keyboard.

The ATL-220 allows operating features to be selected from a menu and then stored in nonvolatile memory. The terminal can be used to modify communications protocols, interfaces, tab settings, printer controls, function-key definition and keyboard parameters. The ATL-220 has five operating modes: DEC VT200 7-bit control mode, DEC VT200 8-bit control mode, DEC's VT220 version of the VT100 mode, a true VT100 mode and a DEC VT52 mode, the company said.

The ATL-220 features an antiglare filter, enlarged CRT cell and matrix size, optional tilt-and-swivel monitor and optional RS-422 capability.

The price for any ATL-220 terminal is $1,095, the company said.

The ATL-178 workstation is said to include plug-compatible Category A coaxial cable features, which reportedly allow communication at speeds up to 250K bit/sec. Beehive's ATL-178 attaches to IBM's 3274 Category A coaxial cable-based cluster controller and any third-party IBM-compatible Category A coaxial cable controller, the company said.

Features of the ATL-178 include a row and column indicator, an optional keyboard configuration, emulation of keyboards in the terminal, rather than through an external controller, a 14-in. screen with antiglare filter, and tilt-and-swivel control. The price for the ATL-178 is $1,395, the company said.

The ATL-3270 MS is a dual-host, multistation terminal said to emulate the IBM 3276 Model 2 or Model 12. The workstation is said to combine 3270 capabilities with an integral, four-channel version of the Beehive CC74 cluster controller.

Using RS-232 or RS-422 cabling, the ATL-3270 MS can be connected to four Ascii terminal devices, including Beehive's ATL-078 with Ascii emulation of the IBM 3278, the ATL-220 emulating the DEC VT220, the ATL-004 with Ascii emulation of VT100 mode, the Beehive Topper dual-mode microcomputer, as well as IBM Personal Computers, the company said.

The price for the ATL-3270 MS with Binary Synchronous Communications capabilities is $2,795, and the price with IBM's Systems Network Architecture compatibility is $2,995, Beehive said.

More information may be obtained from Beehive International, 4910 Amelia Earhart Drive, Salt Lake City, Utah 84125.

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ZAX 32-bit development system debuts

IRVINE, Calif. — ZAX Corp. has announced a 32-bit microprocessor development system, featuring the ZAX In-Circuit Debugger (ICD) series in-circuit emulators and Digital Equipment Corp.'s Microvax-1 CPU.

Development software for the ZAX/VAX connection includes C, Pascal and Microtec Research, Inc.'s PL/M 86 high-level language support, manufacturer-compatible cross-assemblers and a ZAX interface called Zice. Zice is said to feature symbolic debugging capability, batch file control of the emulators, automatic journaling and Help features.

The combination of Microvax-1 development software and ZAX emulators is said to allow for full software development and hardware/software integration. The Microvax-1 development system package includes: DEC's Microvax-1, 2M bytes of random-access memory, a 31M-byte hard disk, a disk controller, 8-port RS-232 controller, 400K-byte floppy disk and DEC's Micro VMS software and license. The price for the package is $21,435, the vendor said.

The ZAX in-circuit emulators are currently available for Intel Corp.'s 8086, 8088, 8085 and 8048 microprocessors, as well as Motorola, Inc.'s 68000, 68010 and 68008 microprocessors and Zilog Corp.'s Z80 microprocessor.

The ZAX in-circuit emulators come equipped with 2K bytes or 4K bytes of real-time trace buffer, an event trigger that prequalifies breakpoints, emulator overlay memory and breakpoint capabilities.

Prices for the emulators range from $4,995 for the 8-bit version, to $7,995 for the 16-bit version. A typical three-user ZAX/VAX development system, including high-level languages and cross software, 8-bit and 16-bit emulators and terminals costs $56,000, the vendor said.

More information is available from ZAX, 2572 White Road, Irvine, Calif. 92714.

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The key word in that long, drawn-out headline is system.

A system built for PCs.

At Hewlett-Packard, it's a quality system of personal computers, plotters, a truckload of software, and Local Area Network (LAN) capability.

It's all matched and designed to work brilliantly together.

Yet the system is so flexible each part can stand alone. Or even team with an IBM PC.

So you can build just the system your staff needs.

It all starts with two of our Hewlett-Packard personal computers.

We call one the HP Touchscreen and the other (because it can do even more) the HP Touchscreen MAX.

The first comes with two double-sided disc drives that give you 256K bytes of main memory, expandable to 640K bytes.

The HP Touchscreen MAX has even more capacity, with the added power of a 14.8M byte Winchester disc drive.

And both have DSN/Link, to let you set up a direct line of communication between them and your HP 3000 Department Computer.

As the names imply, you can actually change things on either screen just by touching the screen.

That makes the Touchscreen PCs easier to use. And a lot easier to learn.

The system also includes two printers many people think are simply the best around.

Our Hewlett-Packard LaserJet and ThinkJet printers are both breathtakingly fast and refreshingly quiet.

The ThinkJet printer runs at a rapid 150 characters per second.

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and when you get to your hotel, change everything.

Two different plotters are also part of the HP personal computer system.

Both create full-color graphics. One with two pens, the other with six for even more detail.

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It lets a number of HP personal computers link up, talk to each other, share printers, and exchange information.

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1-2-3™ from Lotus™ *WordStar™** MicroPlan™*** And the whole catalogue of software from HP.

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Hewlett-Packard's portable personal computer turns your hotel room (or your den at home, or your customer's desk) into another part of your personal computer system.

The Portable has plenty of capacity; 272K bytes of RAM and 384K bytes of ROM. And with its built-in modem, it can link you with your office printers and plotters. Not bad for a computer that weighs just nine pounds and can fit into a briefcase.

The system is all linked up, all on the same programs, all designed to work together, and all ready to go.

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CDS unveils Linx production data collection system

Features programmable processor and memory, bar and magnetic stripe card readers

SOUTH SHERMAN, Texas — The Corporation for Distributed Systems (CDS) has announced the Linx system for the collection of production data on the shop floor. The unit is said to perform a variety of tasks ranging from collection of work-in-progress data to the control of machines and processes.

Linx accepts data from its integral bar code or magnetic stripe card reader, sealed keypad or external devices. A programmable processor and memory is said to allow Linx to be tailored to each user. The system is based on the 8-bit Zilog, Inc. Z80 microprocessor.

Features include a fault-tolerant network architecture, nonvolatile program storage and rugged construction, the firm said. In addition to the bar code and magnetic stripe readers, Linx can be configured for bar code wands or laser scanners and an RS-232C or RS-422 port for host computer, peripheral or intelligent machine controller communications.

Data may also be entered through the sealed, splash-proof, 20-key keyboard. Operator interface and prompting is accomplished through four function keys, six control keys, a high-intensity LCD and a program-controlled audio feedback.

Each Linx station can be independently programmed and can operate individually in local-area networks or in linked networks, the company said. The Linx network uses High Level Data Link Control data packets transmitted over an RS-485 or industrial-grade RS-422 network.

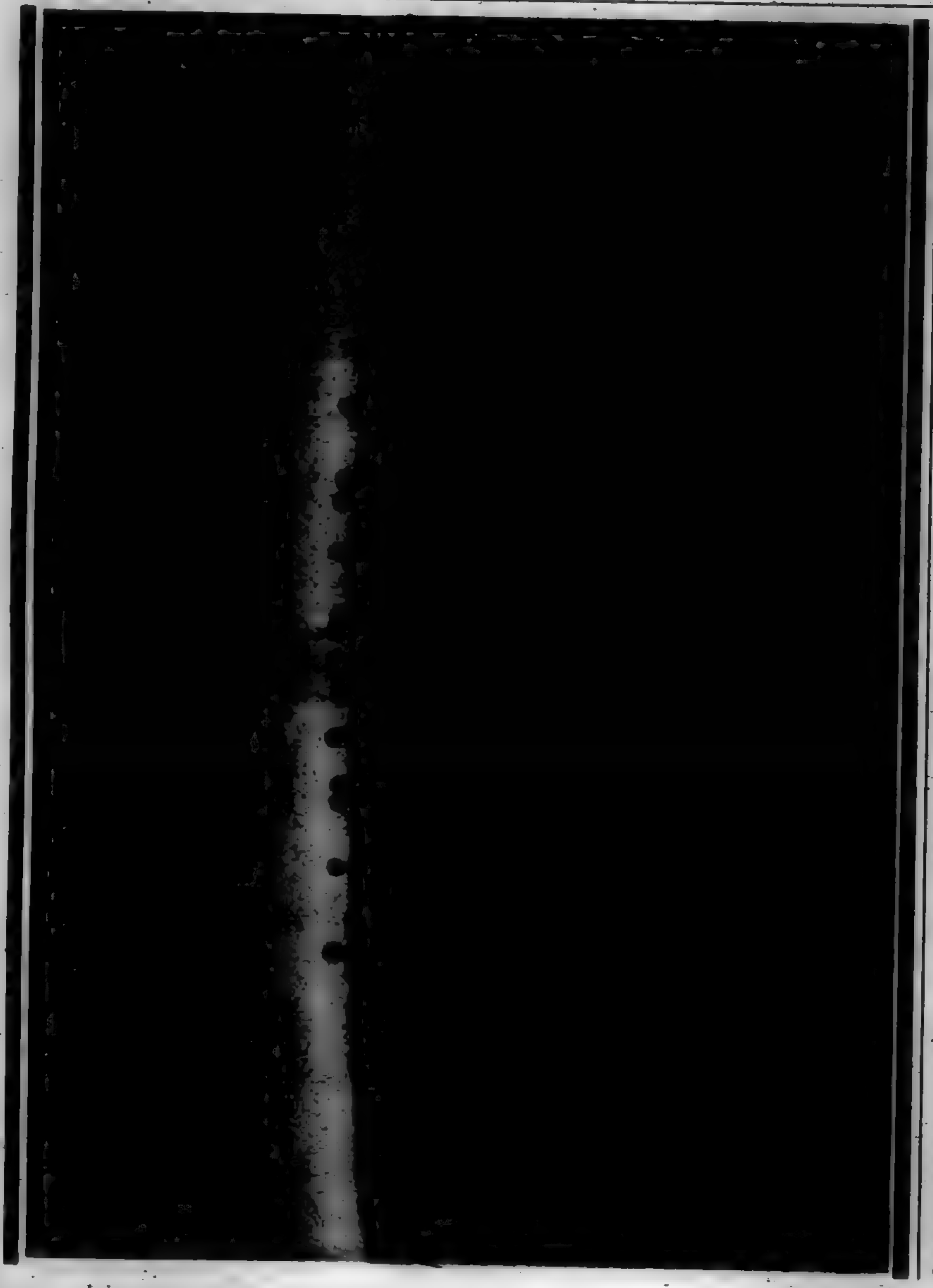
Power distribution

Power is distributed to Linx units through the same cabling as the communications network, eliminating the need for electrical outlets for each station. Power options available include individual unit power supplies, supplies for up to eight network units and uninterruptible supplies.

Optional features for Linx include high- or medium-density infrared or visible wand readers, laser scanner with interface and power supply, up to 16K bytes of memory and real-time clock with battery backup.

The price for a base unit with keypad, 32-char. display, bar code slot reader, 2K-byte internal buffer, 512K-byte double-erasable programmable read-only memory, data collection application generator and network interface is $695.

CDS is located at 750 S. Sherman, Dallas, Texas 75060.



TURNKEY SYSTEMS

DIGITAL TECHNIQUES, INC.
Model 428 Advanced Systems Monitor

Digital Techniques, Inc. has announced the Model 428 Advanced Systems Monitor, said to provide support systems information to data centers. The product is based on the Zilog, Inc. 8-bit Z80 microprocessor. A Remote Signal Module feature collects data on air conditioning, security, fire, safety and electrical power deviations, the company said.

Prices begin at $11,000.

Digital Techniques, P.O. Box 3128, 2510 Professional Drive, Richmond, Va. 23235.

DATA STORAGE

ACKNOWLEDGE, INC.
AN-[illegible]-PC tape file transfer system

Acknowledge, Inc. has announced

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COLUMN

from page 61

puter software. Now that Amdahl and NAS offer scientific processors compatible with IBM's 370 instruction set, more software developers may be willing to develop specialized packages. In fact, many industry observers believe IBM may also soon add some sort of scientific processor to its current mainframe lineup. Such a move would provide a strong incentive for software vendors to develop specialized packages. But for now, many users may find they have to either develop their own scientific software or make fairly significant enhancements to off-the-shelf packages to meet corporate needs.

Clearly, the first users to jump at the opportunity to buy a 370-instruction-set-compatible supercomputer will be shops that are already doing enough scientific processing to realize they could reap a significant gain in productivity by doing so. So, the idea of a complete novice suddenly being thrust into a supercomputing environment is somewhat extreme. But even with a fundamental knowledge of scientific processing, most users used to a primarily commercial processing environment will have a lot to learn before becoming proficient at supercomputing.

SYSTEMS & PERIPHERALS

Continued from page 66

the AN-9000-PC 9-track magnetic tape subsystem for transferring files between mainframes and personal computers from Wang Laboratories, Inc. or IBM.

The AN-9000-PC subsystem includes an intelligent interface card, Alloy Computer Products, Inc.'s Tip/Six utility software and tabletop or rack-mountable 9-track tape drive. The interface card occupies a single slot in the IBM or Wang micro. The 9-track tape drive is compatible with processors from IBM, Digital Equipment Corp., Hewlett-Packard Co. and Data General Corp.

The Tip/Six software is said to allow data records to be converted from Ebcdic to Ascii format. The self-loading and self-threading tape drive reportedly provides disk-to-tape transfer at a rate of 0.7M byte/min, with up to 42M bytes of backup or working storage.

The AN-9000-PC costs $8,995.

Acknowledge, 100 Pennsylvania Ave., Framingham, Mass. 01701.

TERMINALS

PRECISION VISUALS, INC.
Raster terminal driver

Precision Visuals, Inc. has announced a driver for users of the Seiko Instruments U.S.A., Inc.'s GR-1104 color raster terminals with the DI-3000 and GK-2000 graphics tools packages.

The Seiko GR-1104 is a 14-in., 1,024- by 780-pixel resolution terminal capable of displaying 512 colors, the vendor said. The terminal is intended to produce presentation-quality business graphics as well as scientific and engineering applications.

Hardware features supported by the drive include polygon fill, with 10 fill patterns plus solid colors; block and italic fonts in 16-char. sizes, eight colors and line styles; and five marker types.

An escape function in the drive is said to allow printing either graphics or text displayed on the screen. Other escape functions include drawing arcs, circles, sectors, rectangular lattice point patterns and text to be printed in four directions.

The price for the GR-1104 device drive is $650 in the U.S.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

INDUSTRIAL ELECTRONIC ENGINEERS, INC.
Plasma display for Argus Aim family

The Industrial Products Division of Industrial Electronic Engineers, Inc. has announced the addition of a 4-line by 20-char. alphanumeric display module to its Argus Aim family of dc plasma displays.

The Model 3402-05-060 features 5- by 7-dot-matrix characters, a bidirectional Ascii interface and software-controlled dimming.

The Argus Aim family consists of a series of Ascii-interface flat-panel alphanumeric display modules, employing dc plasma technology. The format can display the full 96-char. Ascii set, including uppercase and lowercase letters, numbers and symbols.

The Model 3402-05-060 measures 6.5 in. by 3.6 in. by 1.75 in. The price for the product in quantities of 100 is $457, the vendor said.

Industrial Electronic Engineers, Industrial Products Division, Sales Office, 7740 Lemona Ave., Van Nuys, Calif. 91405.

ELECTRO STANDARDS LABORATORY, INC.
Model 9316 switching system

Electro Standards Laboratory, Inc. has announced the Model 9316 16-channel switching system for IBM 3270-type information display systems.

The Model 9316 is intended to accept inputs from up to 16 IBM 3278-type display stations and switch them either in bulk to controller A or controller B, or to switch them in a preprogrammed mix between controller A and controller B. When in the mix mode, individual channels may be switched.

The price of Model 9316 is $1,050

Continued on page 68

IDC from page 61

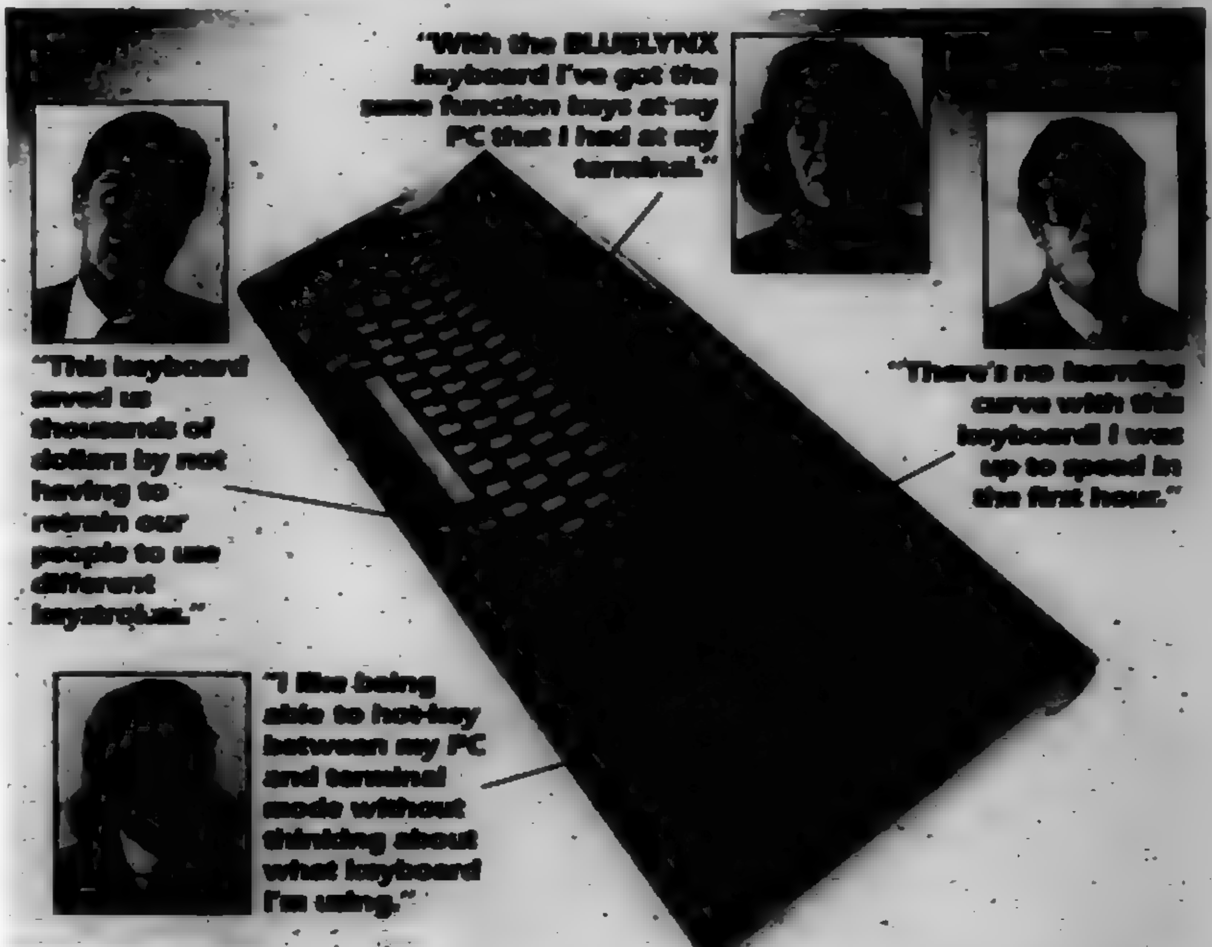
a compound annual rate of 18.1% over the 1983-1988 period, when shipments are projected to reach $122 billion, not including software, service and maintenance.

From a performance point of view, DEC's 8600 cuts the IBM processing power lead. The IBM 3084 mainframe has 30 times the power of DEC's VAX-11/780, but only seven times the power of the 8600, in IDC's estimation. But IBM's awaited top-of-the-line mainframe series is expected to push the lead back to 14 times the power of the 8600, IDC said.

In the medium market, 13 vendors have between 1% and 7% of the market, and in the small-scale market, 14 vendors have between 1% and 7% of the market, according to IDC. The small-scale systems market is projected by IDC to expand 20% per year over the 1983-1989 period, in value of worldwide shipments. In 1983, an estimated 376,000 small-scale systems were shipped worldwide, 62% of them into the U.S. market.

The economies of small systems favor AT&T's Unix operating system because many small-scale customers are new customers and have no need to stay compatible with an installed base, IDC said. Small-scale systems are feeling market pressure from micros, but for many applications, multiuser systems are more cost-effective than getting each user a micro.

The report is available for $375 from IDC, Five Speen St., Framingham, Mass. 01701.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Or write Techland Systems, 25 Waterside Plaza, New York, NY 10010.

TECHLAND SYSTEMS

BLUELYNX. THE PURRRFECT LINK TO YOUR IBM MAINFRAME.

Continued from page 67

as a rack-mount unit and $1,100 as a desktop unit.

Electro Standards Laboratory, P.O. Box 9144, Providence, R.I. 02940.

DATEM LTD.
DDCM100 CRT Display Controller

Datem Ltd. has announced the DDCM100 CRT Display Controller, said to provide OEMs with a programmable, custom, alphanumeric display subsystem compatible with Intel Corp.'s Bitbus distributed control network.

The module is said to provide a serial interface, dual 80-char. by 25-line display memory, CRT timing and refresh circuitry and an integrated display interface task. The unit is also said to allow OEMs to implement custom display systems that may be connected to the Bitbus in a variety of hierarchical control systems.

The price for DDCM100 is $686.

Datem, 148 Colonnade Road, Nepean, Ontario, Canada K2E 7J5.

PRINTERS/PLOTTERS

VERSATEC, INC.
V-80, V-80F enhancements

Versatec, Inc. has enhanced its V-80 and V-80F (film version) printer/plotters with an automatic toner concentrate addition.

According to a spokesman, automatic concentrate addition maintains consistent output image density without operator intervention, a feature especially useful in remote plotting applications. When image density falls below a preset level, toner concentrate is automatically added. If the user desires higher density, a manual override provides for the addition of more concentrate.

The spokesman said the V-80 can plot an A-size drawing in 8.5 sec and a B-size drawing in 17 sec. It prints bills of materials, schedules and listings at up to 1,000 line/min on roll or fan-fold paper. All V-80 models include a self-testing feature initiated from the operator panel.

Interfaces are available for Digital Equipment Corp., Data General Corp., Hewlett-Packard Co., IBM, Perkin-Elmer Co. and other computers. V-80 prices begin at $8,950.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

NICOLET COMPUTER GRAPHICS
Zeta 824CS, Zeta 836CS pen plotters

Nicolet Computer Graphics, a division of Nicolet, has announced two drum-type pen plotters, the Zeta 824CS and Zeta 836CS, said to offer single-sheet media feed and roll feed.

The 824CS handles media up to 24½-in. wide, plotting American National Standards Institute sizes A through D and International Standards Organization sizes A4 through A1, the vendor said. The 836CS has a 34-in. drum, adding Ansi E and ISO A0 to the drawing sizes handled, the company said. Vector speed of 25 in./sec, and resolution of 0.001 in. or 0.0025 in. is available, the vendor said.

Both plotters have all eight pens mounted on the carriage. Standard interfaces are RS-232C and IEEE-488. A P87 option supports interface with an IBM 3274/3276 cluster controller via coaxial cable.

The Zeta 824CS is $11,900, and the Zeta 836CS is $14,900.

Nicolet Computer Graphics, P.O. Box 3030, Martinez, Calif. 94533.

GRAPHICS SYSTEMS

CAECO
Designer III Workstation

Caeco, a division of Chromatics, Inc., has introduced a workstation said to be designed for very large-scale integration design.

The Designer III Workstation is an integrated hardware/software system built around a Sun Microsystems, Inc. Model 2/120 supermicrocomputer utilizing the University of California at Berkeley Unix 4.2 and including Chromatics' Model CX-1400 high-resolution color graphics display system.

Other available options include support for several peripherals, including Xerox Corp.'s Ethernet local-area network, a 9-track tape, ¼-in. streamer tape, Versatec, Inc. plotter, color ink-jet plotter and line printers.

Resident on the Designer III is the editor of the vendor's Caepac I software, which is said to incorporate a specialized form of symbolic representation.

With the program, symbols representing actual geometries only show the critical boundaries of the component. The other geometries, although present in the data base, are normally suppressed but can be viewed by the user if wanted, the vendor noted.

Prices start at about $70,000.

Caeco, Suite 280, 1160 S. State St., Orem, Utah 84058.

CASCADE GRAPHICS DEVELOPMENT
Cascade VII

Cascade Graphics Development has announced the Cascade VII computer-aided drafting system running the company's Speedware software, based on the Motorola, Inc. 68000 microprocessor and the NEC Information Systems, Inc. 7220 graphics processor.

The system's features include dual monitors, one for display of command menus and a color monitor for display of graphics; a 10M-byte hard disk and floppy disk drive; and graphics tablet. Resolution on the 14-in. monitor is 640 by 400 pixels. The CPU has 1M byte of random-access memory.

The price for Cascade VII, with a California Computer Products, Inc. 1043 eight-pen plotter, is $30,000, the vendor said. The price without the plotter is $24,000.

Cascade Graphics Development, 1000 S. Grand Ave., Santa Ana, Calif. 92705.

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France's rapidly growing market for computers and data processing systems is one of the largest in the world. Currently, the installed value of general purpose computer systems is more than $11.1 billion, and a tremendous continuing demand for data processing equipment will cause outside spending on computer-related equipment to increase at an annual rate of 16%, between 1981 and 1985.

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MICROCOMPUTERS

Microsoft: PC-DOS release will solve start-up bugs in AT drive

By Edward Warner
CW Staff

BELLEVUE, Wash. — The new version of IBM's PC-DOS, scheduled for release this quarter, will avoid start-up bugs for the enhanced Personal Computer AT's hard disk drive.

That announcement, from PC-DOS developer Microsoft Corp., is the latest to arise in response to a series of user complaints about the 20M-byte disk drive.

Customers have complained of faulty data sectors cropping up, either during start-up or weeks later, but IBM said the incidents are isolated.

Operating system claimed not at fault

Microsoft vehemently denied that the operating system is to blame, but the company will make an automatic fix in PC-DOS 3.1, according to Chris Larson, MS-DOS product marketing manager.

At present, AT users who get the response of "Format Failure" when they partition their disk drives during start-up must perform a "work-around" made up of several DOS commands. This compensates for a larger than expected number of faulty data sectors on the 20M-byte hard disk, Larson claimed.

He explained that the work-around must be performed manually because the start-up portion of PC-DOS 3.0 remains unchanged from Version 2.0, which he said worked without problems with the 10M-byte hard disk unit of the IBM Personal Computer XT.

Faulty data sectors a general problem

According to an IBM spokesman, faulty data sectors are a problem on any hard disk unit, and the AT's drive is being shipped with at least 21.8M bytes of usable storage space.

Larson maintained that the blame for the hard disk drive failures rests with the hardware. "In no way is DOS causing the problem," he said. "The failure rate appears to be much greater on the 20M-byte drives," than it was on the 10M-byte drives of the Personal Computer-XT.

See DISK page 73

Can Apple pierce IBM mart?

SMALL TALK
Eric Bender

Microcomputer market strategists are now faced with a frightening question: Has IBM locked up the business market?

It is an important question not only for vendors but for users who worry about innovation.

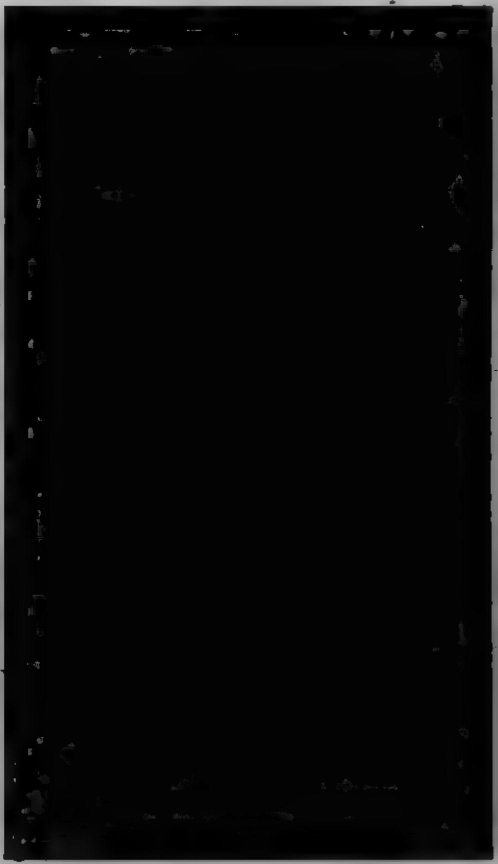
When the micro market first formed in the early 1980s, most strategists envisioned a dynamic, multivendor market that no single company would be able to dominate. The underlying theory was that as technology is diffused throughout a society, it becomes impossible for any single vendor to gain control of the market.

The IBM Personal Computer, however, has now become the dominant force in the business micro market. Virtually every micro hardware vendor, except Apple Computer, Inc., AT&T and a few smaller firms in niche markets, has knuckled under to the requirement that it provide IBM-compatible hardware.

Many firms will have to worry about surviving the IBM onslaught. This article is the first in a series that will

See BATTLE page 76

Caswell is a principal with Trigon Systems Group of Toronto and the editor of the "Electronic Mail & Micro Systems" newsletter.



Utility program gets users' OK

Lets PC-DOS programs run under AT&T Unix

By Edward Warner
CW Staff

LITTLE ROCK, Ark. — Two early users of a personal computer utility program that allows IBM PC-DOS applications to run under AT&T's Unix said they are pleased with the software, although one has doubts about how widespread its use will become.

The Connector, offered by Uniform Software Systems, Inc. of Santa Monica, Calif., reportedly runs PC-DOS as a Unix task and permits Unix tasks to run in the background while a PC-DOS application executes in the

See USERS page 78

- Microsoft Corp. has released an enhancement of its Macro Assembler that supports Intel Corp. 80186, 80286, 80287 instruction sets/76
- Hewlett-Packard Co. has offered Multimate International, Inc.'s Multimate word processing package for the HP Touchscreen Personal Computer/76
- Two graphics tablets and a mouse have been introduced by Summagraphics Corp./76
- Mountain Computer, Inc. has announced hard disk drives for the IBM Personal Computer AT/72

INSIDE

Software/72

Where Giants Fear To Tread

For five years NESTAR has ventured where giants have feared to tread—local area networking. In fact, NESTAR has installed more large local area networks in large institutions than any other manufacturer.

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Microsoft enhances Macro Assembler

Version supports Intel 80186, 80286, 80287 instruction sets

BELLEVUE, Wash. — Microsoft Corp. has released a version of its Macro Assembler that supports Intel Corp. 80186, 80286 and 80287 instruction sets.

Macro Assembler includes an object linker, a library manager, a cross-reference utility, a program maintenance utility and a symbolic debug utility that allows programmers to examine and step through source code as well as object code, the vendor said.

As with previous versions, Macro Assembler reportedly features the ability to define and use macros, the capability to call other routines written in other Microsoft languages and a conditional assembly capability that allows programmers to create and test different versions of a program.

Breakpoints for numbers, symbols

The symbolic debug utility is said to display source code lines in Fortran, Pascal, C and machine language.

It reportedly allows programmers to set breakpoints for numbers and symbols.

Programmers reportedly can single-step through a program following its execution at assembly level or source level.

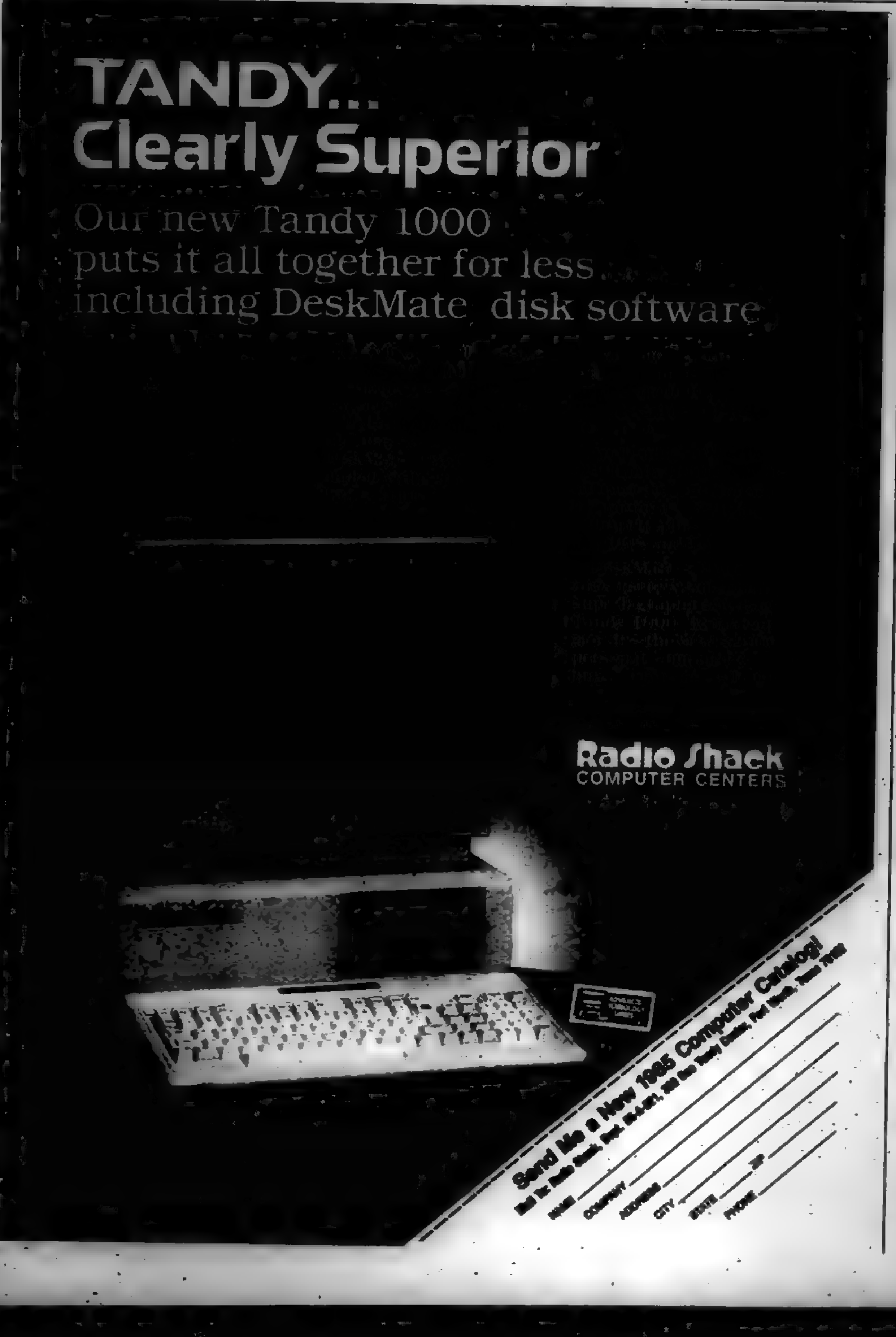
On-line Help is included, the vendor said.

The assembler offers Microsoft's program maintenance utility Make, which automatically updates a program after one or more source files have been changed, according to the vendor.

Macro Assembler runs under Microsoft's MS-DOS 2.0 and requires 128K bytes of random-access memory and a single disk drive.

Macro Assembler costs $150.

Microsoft can be reached through Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.



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Graphics firm offers mouse, two tablets

FAIRFIELD, Conn. — Two graphics tablets and a mouse have been introduced by Summagraphics Corp.

The Mactablet, a 6-in. by 9-in. graphics tablet for the Apple Computer, Inc. Macintosh, reportedly allows users to trace and enter existing drawings. Drawings can be traced from a single sheet of paper or from originals up to ½-in. thick, such as magazines or notebooks, according to the vendor.

Summasketch, a 12-in. by 12-in. tablet, is said to offer the same features as Mactablet but in conjunction with computer graphics programs on the IBM Personal Computer, PCjr and compatibles.

Both tablets can be located alongside the personal computer's keyboard and offer a tilt mechanism for adjustment to user needs, Summagraphics said.

The Summamouse optical mouse is available in two versions. One version reportedly is compatible with IBM's Topview and Digital Research, Inc.'s operating environments. Another version is compatible with several Personal Computer computer-aided design software packages, the vendor said.

Mactablet is priced at $495, Summasketch costs $795 and Summamouse in either version is priced at $199.

Summagraphics is located at 777 State St. Ext., Fairfield, Conn. 06430.

HP releases Multimate tool for its micro

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a version of Multimate International, Inc.'s Multimate word processing program for HP's Touchscreen Personal Computer.

Multimate mimics commands used on Wang Laboratories, Inc. word processors. The word processing software features a spelling checker with an 80,000-word dictionary and room for 5,000 user-defined words, the vendor said.

The software reportedly is able to merge two documents into one document. Page headings and footnotes can automatically be placed on each page, the vendor said.

The package supports addition and subtraction of columns of figures in a document, according to the vendor. In Insert or Delete mode, the product is said to automatically readjust text for proper spacing and positioning.

The package requires 384K bytes of random-access memory and costs $495.

Information about the product can be obtained from Inquiries Manager, HP, 1020 N.E. Circle Blvd., Corvallis, Ore. 97330.

"The computer is down."

It is ironic that when we become dependent on computers, we are at their mercy. As more and more companies go on line, the industry reliability standard of 98.5% becomes unacceptable because it means your computer is liable to go down once every two weeks, on a statistical average.

So, if you are a broker, banker, manufacturer, or businessman who relies on your computer more and more, take note: Stratus Computers are designed not to fail; not once every two weeks, or once every 200 weeks, or once every 2,000 weeks!

Debunking The Myth That All Fault Tolerant Computers Cost More.

It is a common and reasonable assumption that because there is redundancy (extra programming, or extra components) in fault tolerant computers, that makes them cost more. Where the redundancy is in expensive software, this is true. But Stratus has hardware-based fault tolerance that takes advantage of the extraordinary advances in chip technology. The result – price drops. The fact of the matter is, our hardware redundancy adds a mere fraction to our cost, and absolutely nothing to your purchase price. What's more, in overall price/performance comparisons against the top computer names, including IBM, DEC, and Hewlett Packard, Stratus was at the front of the pack, despite the fact that it included fault tolerance, while the others didn't.

	STRATUS XA400	IBM 4381	HP 3000 68	DEC VAX-11/782
RELATIVE PERFORMANCE*	125	100	64	109
PRICE	$446,350	$707,897	$437,754	$656,889
PRICE PERFORMANCE	$ 3,571	$ 7,079	$ 6,840	$ 5,999

Relative Price Performance Index
**Computerworld, August 20, 1984*

All systems are comparably configured with identical amounts of memory, disk space, and communication lines. But, only the Stratus price includes fault tolerance.

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SOFTWARE

WALKER RICHER & QUINN, INC.
PC 2622

Walker Richer & Quinn, Inc. has introduced its PC 2622 workstation management software for the Data General Corp. DG/One personal computer.

PC 2622 reportedly enhances the DG/One's terminal attributes by providing forms cache, type-ahead capability, hundreds of pages of display memory and the ability to scroll horizontally.

PC 2622 also is said to offer a command language and to allow unattended transfer of multiple files, host initiated processes and execution of commands upon expiration of a time period or recognition of a string transmitted from the host.

PC 2622 is priced at $395, the vendor said.

Walker Richer & Quinn, Lake Union Place, Suite 201, 1914 N. 34th St., Seattle, Wash. 98103.

COMMAND SOFTWARE SYSTEMS, INC.
Menucommand

Command Software Systems, Inc. has introduced Menucommand software for the creation and maintenance of menus on IBM Personal Computers and compatibles.

Menucommand provides a series of menus and screen prompts to users, Command Software said. Users reportedly can define each menu selection's title, the program or procedure file that it will run and the device or subdirectory path on which the program resides.

Menucommand also is said to provide system security by returning users to the "calling" Menucommand menu, not the operating system, when they exit a program. Menucommand is priced at $89.50.

Command Software Systems, 5306 Derry Road, No. K, Agoura Hills, Calif. 91301.

BUSINESS MANAGEMENT SYSTEMS, INC.
Mahell

Business Management Systems, Inc. has introduced Mahell, a custom menu, security and user-assistance system for AT&T Unix-based software on the IBM Personal Computer and Personal Computer AT.

Mahell reportedly provides new Unix users with a menu — a selection of the most frequently used Unix operating commands. Commands are said to be fully prompted, eliminating the need to memorize character

Continued on page 73

Disk drives out for IBM micro

SCOTTS VALLEY, Calif. — Mountain Computer, Inc. has introduced three hard disk drives for the IBM Personal Computer AT.

The hard disk drives, offering 20M bytes, 35M bytes or 120M bytes of storage, reportedly can be installed in as little as 10 minutes. The hard disk drives are intended to meet the need for enhanced Personal Computer ATs (with a 20M-byte hard disk), currently said to be in short supply, according to Mountain Computer.

According to the vendor, the disks use the standard Personal Computer AT's disk controller and the Personal Computer AT's power supply.

The disks can be installed in the second diskette drive position, a spokesman for Mountain Computer said.

The hard disk drives are priced as follows: 20M bytes, $1,995; 35M bytes, $2,795; and 120M bytes, $9,590.

More information is available from Mountain Computer, located at 300 El Pueblo Road, Scotts Valley, Calif. 95066.

Getting a group of five or six personal computers networked isn't that big a deal. But it gets complicated when the group gets bigger. And in case you hadn't noticed, the groups are getting bigger. Fast.

Experience may have already taught you that low-end PC networks run out of steam in a hurry once you have more than five or six stations connected. If your plans include several PCs or several hundred, high performance isn't a luxury. It's critical.

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It's a far-sighted solution, even if all you want to do now is hook up a few PCs economically. And it's the *only* solution when PCs need to be mixed cost effectively into a high-speed corporate network with devices from different manufacturers.

In heavy ne
high performan

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Continued from page 72

sequences. It can be used to design a custom menu interface and to control access to applications and system options.

Mshell is priced at $125.

Business Management Systems, 9526-A Lee Highway, Fairfax, Va. 22031.

INTELLUTION, INC.
Fix

Intellution, Inc. has announced Fix, a process control package designed for use with the IBM Personal Computer.

Intellution's Fix interactive graphics display builder features 128 process control symbols. In addition, it offers cut-and-paste capabilities, according to vendor.

According to Intellution, process values and statuses can be displayed as text strings, bar graphs, color changes and flashing.

Fix features multitasking capabilities, allowing it to run in foreground or background with packages such as Micropro International Corp.'s Wordstar, according to a spokesman for the vendor.

Fix costs $4,060, the vendor said.

Intellution, 36 Pervoal St., Westwood, Mass. 02090.

POLYGON SOFTWARE CORP.
Easypath

Polygon Software Corp. has introduced Easypath software for the creation of subdirectories without copying files back and forth. The software is reportedly designed for use with systems in the IBM Personal Computer line.

Easypath reportedly allows programs and commands to find any files on any of the computer's disk drives.

The Easypath software package reportedly permits search paths to be specified separately for particular files or particular groups of files, a spokesman for Polygon said.

Easypath also is said to come with predefined specifications for Ashton-Tate's Dbase II, Micropro International Corp.'s Wordstar and other programs.

Easypath is priced at $100, according to Polygon.

Polygon Software, 363 Seventh Ave., New York, N.Y. 10001.

See TOOLS page 74

HERE'S A CASE WHERE A BIGGER ENGINE IS ACTUALLY MORE ECONOMICAL.

The Net/One Personal Connection system packs the microprocessing power to offload all networking functions, so it doesn't eat up the host CPU's resources. That frees up a work station that other systems require simply to do their network's work.

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twork traffic,
ce isn't a luxury.

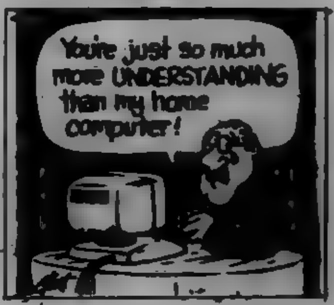
DISK from page 69

Larson admitted that PC-DOS requires from two to three times more error-free space at the start of the 20M-byte disk drive on the AT than it did on the XT, but said that the AT's hard disk drive should meet that requirement without a problem. That error-free space is used to establish the partitions on the hard disk drive for use under each possible operating system, he said.

Setting the partitions can bring up the "Format Failure" response, he said, because too little error-free space is available for the information. To overcome this, users will need to execute DOS commands to repartition the disk and reformat it, a process explained in PC-DOS documentation, he said.

Release 3.1 of PC-DOS will solve only the disk drive reliability problems that are apparent at the time of start-up, Larson pointed out. If a faulty data sector should appear in later use, reformatting the disk drive will be required — along with complete backup to avoid loss of data.

PC-DOS, Larson said, was not designed to recognize faulty data sectors that appear after the disk drive has been put into use. At that point, he said, a utility such as Dfixer, recently introduced by Interactive Data Corp. of Cambridge, Mass., would be useful.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TOOLS from page 73

SOUTHWEST DATA SYSTEMS, INC.

Pluto

Southwest Data Systems, Inc. has introduced Pluto, a Basic language interpreter and programming environment for systems running Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M operating systems.

Pluto reportedly offers portability and runs with MAI/Basic Four Business Basic and Science Management Corp. SMC Basic languages. It permits Basic Four programs to run under either operating system without being rewritten, the vendor said.

Pluto reportedly offers multiple user capabilities as well as record and file locking; indexed, direct, sort and host system serial text files; and math functions.

It is priced at $595.

Southwest Data Systems, 3017 San Fernando Blvd., Burbank, Calif. 91504.

PRACTICORP INTERNATIONAL, INC.

Practibase

Practicorp International, Inc. has announced Practibase, a data base management program for the IBM Personal Computer line.

Practibase can handle up to 254 char./field, 60 fields per record, 2,000 char./record and an unlimited number of records per file, the vendor said.

The program reportedly can access three files at one time and can simultaneously sort or index any number of files.

It reads Ashton-Tate's Dbase II files and runs Dbase II programs, according to the vendor.

Practibase costs $99.95.

Practicorp International, The Silk Mill, 44 Oak St., Newton Upper Falls, Mass. 02164.

GENERAL DATA SECURITY SYSTEMS, INC.

Computer Intelligence Access

General Data Security Systems, Inc. has introduced its Computer Intelligence Access (CIA) software security system for the IBM Personal Computer XT.

CIA reportedly offers multilevel password access, automatic audit capability and an algorithm encryption scheme derived from the U.S. government's Data Encryption Standard.

The product also includes a protection system that prevents users from erasing or deleting files and offers an updated inventory list of all files, according to General Data.

CIA requires 256K of internal memory and a hard disk drive and is priced at $300.

General Data Security Systems, 1127 Loma Ave., Long Beach, Calif. 90804.

STRATEGIC LOCATIONS PLANNING

Atlas AMP

Strategic Locations Planning has introduced its Atlas Advanced Mapping Package (AMP) for the IBM Personal Computer line.

Atlas AMP reportedly can create maps of states, census tracts, counties and other regions. It can shade areas based on user-defined criteria such as sales or population, according to Strategic Locations.

The package also is said to label regions and provide zooms and dot-density mapping.

The software, which resides in 192K bytes of storage, is priced at $449.

Strategic Locations Planning, Suite 123, 4030 Moorpark Ave., San Jose, Calif. 95117.

MICRO BUSINESS APPLICATIONS, INC.

MBA Job Cost

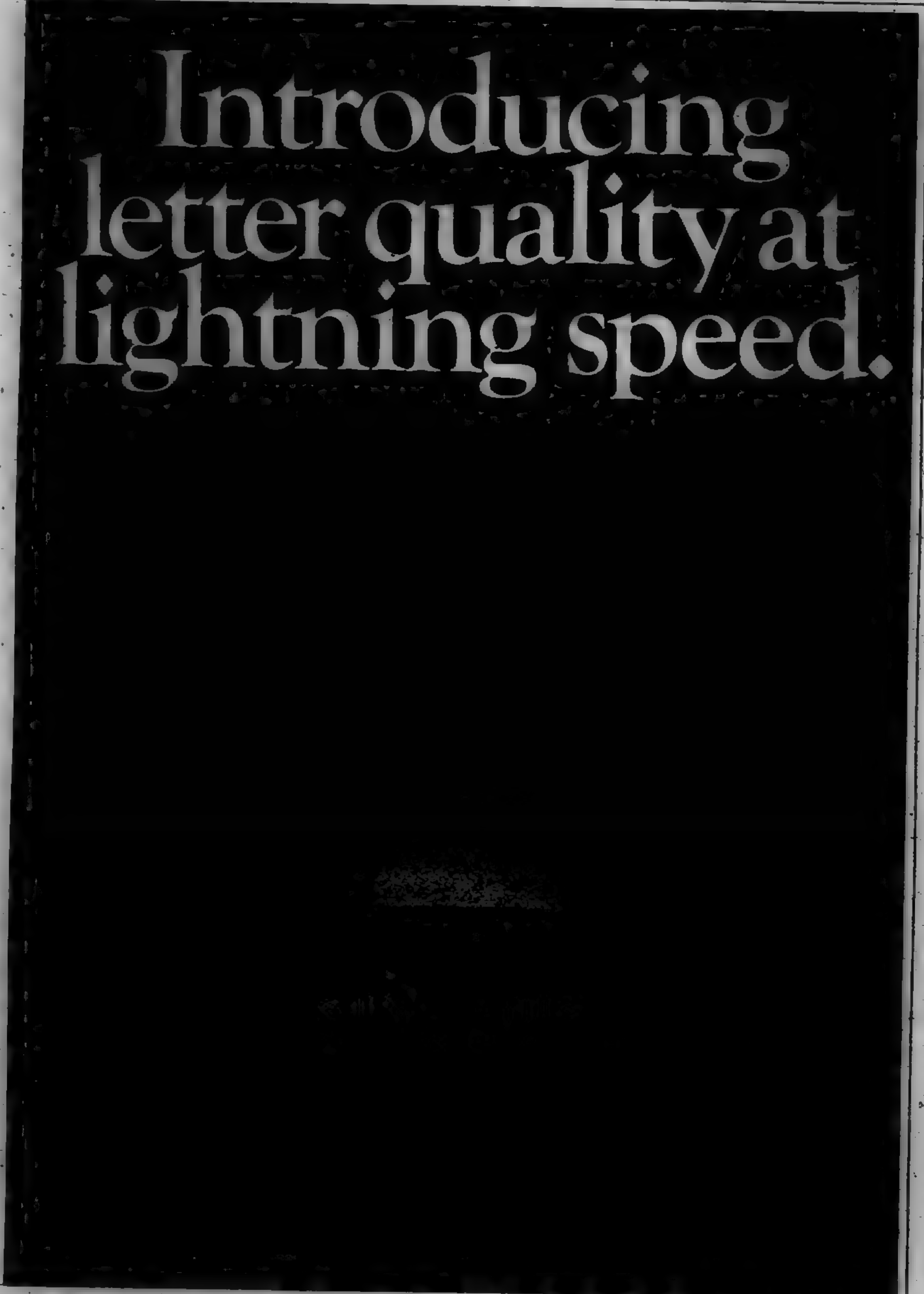
Micro Business Applications, Inc. has introduced MBA Job Cost software for the following operating systems: Digital Research, Inc.'s CP/M 80, CP/M 86, Concurrent CP/M 86 and MP/M II; Musys Corp.'s Turbodos; IBM's PC-DOS; and Microsoft Corp.'s MS-DOS.

The Job Cost system allows job-phase structure with user-definable overhead allocation, according to the vendor.

Job Cost also permits estimated costs in both units and dollars to be maintained by the system, with automated projections of the final cost, the vendor said.

MBA Job Cost software is priced at $595.

Micro Business Applications, 12281 Nicollet Ave. S., Burnsville, Minn. 55337.



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WANG

We put people in front of computers.

BATTLE

from page 69

examine key microcomputer vendors and their strategies.

Apple is the only firm left that has yet to succumb to the market's demand for IBM compatibility. Apple has its highly successful Apple II line that has built up an almost unstoppable momentum at the low end of the market for home, school and light business users but is not now considered a serious business machine.

Instead, Apple is resting its hopes for penetrating the business market on the Macintosh. The Macintosh has sold very well during its first year on the market, coming close to the 250,000 mark. Nevertheless, many users do not consider the Macintosh a serious business machine, citing the lack of software and the memory size of 128K bytes as major limitations.

> ”
> *While the Macintosh may not take over the Personal Computer's place, there is certainly a role for it in the office automation marketplace if Apple Computer makes the right moves.*

Apple already has gone a long way toward opening up the Macintosh to better business software by introducing the "Fat Mac," which uses 256K-bit random-access memory chips to expand memory to 512K bytes. This opens the door to powerful business software that can show off the Macintosh's easy-to-use interface.

In addition, users must remember that the Macintosh is still in its first year. While Apple has caused some difficulties for itself by underestimating the difficulty of writing good Macintosh software and, in concert with the software vendors, preannouncing the availability of many packages, the Macintosh is still far ahead of where the IBM Personal Computer was during its first year.

Users also should keep in mind that good Macintosh software is far easier to use than Personal Computer software, which should lower training and start-up costs. While the Macintosh may not take over the Personal Computer's place, there is certainly a role for it in office automation if Apple makes the right moves.

At its annual meeting this week, Apple plans to announce Mac Office, a series of products designed to turn the Macintosh into a viable business machine. The three key products are a laser printer, a local-area network and a file server.

The printer is based on the Canon LBP-CX engine used by Hewlett-Packard Co. in its Laserjet. The LBP-CX prints at eight page/min and is priced by HP at $3,500.

HP uses cartridges to load a maximum of four fonts into the printer and only produces graphics of moderate quality.

Apple's version of the printer will download the fonts from the Macintosh, so that any font used on the machine can be printed with almost typeset quality. In addition, the graphics will be at least the same quality as those printed on the Macintosh's screen.

The big question about Apple's laser printer is its price. Because the print driver is far more complex than HP's, price estimates have ranged from $5,000 to $7,000. Recent rumblings, however, suggest either that the price has been overestimated or that Apple may lower the price, almost making the printer a loss leader.

So Apple might surprise everyone by pricing its printer to match or even beat the HP Laserjet. This would immediately make the Macintosh the most attractive micro available in terms of output. The Applebus local-area network also will surprise people. Most networks require an interface board priced from $350 to $650 just to interconnect the micro to the network.

The Macintosh, however, has RS-422 serial interfaces already built in, so Apple's network will not require an interface card. Connections, made via a junction box that plugs into a hard-disk-based file server, will be priced at about $50.

Trade-off is speed

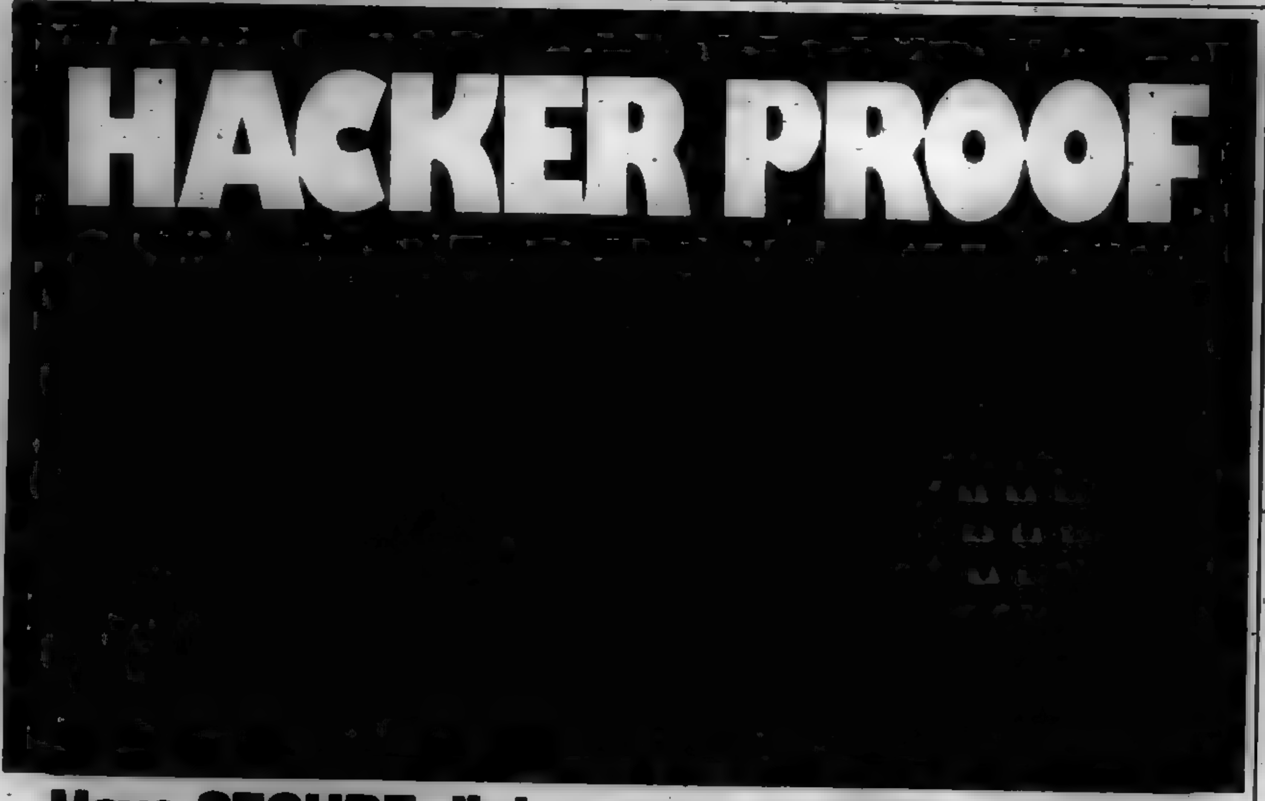
The trade-off is speed. The network will only operate at about 240K bit/sec, which limits the number of users it can support. Apple, however, believes that the typical configuration of Applebus will be in small departments of from five to 15 people. The network's maximum capacity is said to be 32 connections.

The third part of Apple's strategy is a file server. Little is known about this device, but it is likely that the file server could turn out to be the real gem. The server may make Applebus the easiest to use network on the market, if it fully supports the Macintosh's interface.

When users access programs or store documents on the Macintosh, they see a representation of the disk as an icon on the screen. To access a file, the user merely clicks the mouse twice and the files on the disk open up. To run a program or access a file, the user then clicks twice on the file/program icon.

The file server probably will use this convention, so that its operation will be transparent to users. The

See BATTLE page 78



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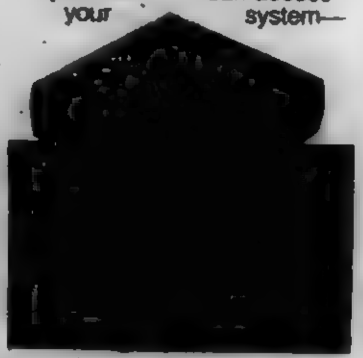

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BATTLE

from page 76

server will be seen as just another disk on the system, accessed as a local disk.

Printing will occur in the same way. Users will see a printer menu on the screen, which probably will be upgraded to offer a choice of the network's laser printer or the local Imagewriter printer. Users will just click to select the printer.

Apple also may make some other moves, including network gateways that allow Macintoshes to emulate Ascii or IBM terminals. In fact, Apple might even allow IBM Personal Computers to be connected to its file server. But these offerings would be icing on the cake.

While Apple is paving the way to a more powerful business environment for the Macintosh, it is likely that the software developers will provide further impetus via a wave of good software designed for the 512K-byte Macintosh that will hit the streets during the next few months. Lotus Development Corp.'s Jazz will be the most heralded product, but word processing, accounting, data base management and desktop products also will be introduced.

The word processing, accounting and data base management packages will provide parity with the IBM Personal Computer. The desktop packages, however, will give the Macintosh an advantage.

The Macintosh has space set aside for desktop accessories that can run concurrently with an application program. With a 512K-byte Macintosh, users will be able to keep a Rolodex, a list of phone numbers, a terminal emulator, a scratch pad and a calendar inside the machine without giving up sufficient memory space for application programs. The accessories can be loaded in the morning, updated throughout the day and then saved at night. The impact will be to turn the Macintosh into an integrated voice/data workstation without requiring an expensive add-on package or card.

> ”
>
> *Apple might surprise everyone by pricing its printer to match or beat the HP Laserjet. This would immediately make the Macintosh the most attractive micro available in terms of output.*

While the Macintosh is presently suspect as a business machine, the technology is fundamentally far ahead of the IBM Personal Computer. If Apple and the software developers deliver, the Macintosh could well be far ahead of today's IBM Personal Computer as an attractive business machine by the middle of 1985.

USERS

from page 69

foreground.

Samuel M. Reynolds, of Savers Federal Savings and Loan Association here, said the utility was easy to install, came with appropriate documentation and operates transparently to users. Savers Federal is using the Connector on an experimental basis for software development for the IBM Personal Computer, he said.

Reynolds, the firm's distributed data processing manager, said he liked the way the program allowed users to toggle back and forth between IBM's PC-IX Unix-derivative operating system and PC-DOS or PC-DOS applications. He also approved of its ability to import data from PC-IX programs to PC-DOS applications.

The product is currently in use only on one IBM Personal Computer XT at Savers Federal, and Reynolds said his firm is unlikely to provide the Connector to its end users. "I don't see the Connector as being a product that has a real long-term use," he said. "Most likely, people will use one operating system." That operating system, he added, is likely to be MS-DOS.

'Low-level' problems

In addition, Reynolds said he found some "relatively low-level" problems in using the Connector with Version 3.0 of PC-DOS. "Some fairly substantial differences in system calls" between PC-DOS 3.0 and the 2.0 and 2.1 versions of PC-DOS have limited his firm's use of the Connector with the earlier releases of that operating system, he said.

Reynolds added that he had no problem running software written for the earlier versions of PC-DOS. Peter Weiner, founder of Uniform Software Systems, said the Connector works with "a long list" of PC-DOS programs.

Another early user expressed no hesitations about the Connector. Sophocles Orfanidis, a professor of electrical engineering at Rutgers University in Piscataway, N.J., said he uses the Connector to gain more efficient use of his Personal Computer XT. While running a statistical analysis program written in the C language that takes half an hour to execute in the background on the Personal Computer, Orfanidis uses the machine's foreground to execute PC-DOS applications.

"While the C programs are running, I go into PC-DOS to plot available data," he explained. "I'm not wasting my time while the computer is running my computations." Orfanidis, though, said he is using the Connector solely for personal use and not as part of a Rutgers' preimplementation test.

Both Reynolds and Orfanidis said they were largely pleased with the Connector. As Reynolds put it, "You can dip your toe into the Unix environment without having to plunge all the way in."

The Connector is priced at $299. Versions for Venturcom, Inc.'s Venix and Microsoft, Corp.'s Xenix operating systems, both Unix derivatives, are under development, said a Uniform Software Systems spokesman.

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COMPUTER INDUSTRY

DOD export review OKed

Reagan approves Pentagon's review of licenses for exports to 15 non-Communist countries

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — President Reagan has settled a dispute over Pentagon review of high-technology export licenses that has been stalemated since last year by giving the U.S. Department of Defense (DOD) a limited role to look at shipments destined for 15 non-Communist countries.

The U.S. Department of Commerce had vigorously fought any role for the Defense Department, citing its power under the Export Control Act, which Congress failed to renew last year but which continues in force by Reagan's order.

Reagan's order, issued Jan. 11, states that the DOD has 15 days to review an export license request and can recommend approval or denial. Unless serious objections are raised by the shipment of high-technology products, the license will be approved.

Three weeks ago, the Commerce Department issued revised guidelines that define the technical parameters of computers, telecommunications equipment and software that will require an export license [CW, Jan. 14]. These rules are generally loosened for lower end, 8-bit computer technology but tighten up considerably on other commercially available products such as 16-bit computers.

Reagan's latest directive creates ground rules to resolve disputes between the DOD and Commerce Department, which have raged in the past year. A year ago a presidential directive to establish guidelines was never implemented because of agency disagreements. Now the National Security Council will have power to settle disputes.

The Reagan order limits the number of

See DOD page 92

Ely cites HP regrouping among factors of move to new company

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — A reorganization last July that removed him from a key position as overseer of Hewlett-Packard Co.'s computer operations was just one factor that led Paul C. Ely Jr. to his new position as president of Convergent Technologies, Inc.

But, despite rumors that being bypassed for HP's chief operating officer post by longtime coworker Dean O. Morton played a major part in his decision to leave HP after 22 years, Ely said Morton was "the right choice" to become chief operating officer of the firm.

Ely had been with HP since 1962 and has been credited with building the company's computer product line over 16 years into a solid business, representing over half of HP's $6 billion revenue, before accepting the job as the new president and chief executive officer of Convergent Technologies [CW, Jan. 14], a Santa Clara-based manufacturer of computer workstations and minicomputers.

In an interview the day after his appointment, Ely said several events contributed to his decision to leave HP. Considered by some to be the heir apparent to John A. Young, HP president and chief executive officer, Ely was passed over for the new post as the company's chief operating officer by Morton, who had been HP's executive vice-president for analyti-

See ELY page 80

Motorola exec: Chip industry 'a drag' in '85

By David Simes
CW Staff

BURLINGTON, Mass. — Echoing the gloomy sentiments heard thoughout the semiconductor industry, a Motorola, Inc. executive said the company is forecasting a "not so aggressive" 1985.

Keith J. Bane, a vice-president and director of strategy for Motorola, said earlier sales forecasts by the company had been more optimistic. However, recent developments in the industry and the U.S. economy have caused the company to revise those estimates downward.

"Whether we have an [economic] recession or not, 1985 will be — as the kids say — a drag," Bane said at a recent meeting here of the Semiconductor Equipment and Materials Institute, a Palo Alto, Calif., industry association.

Describing how the industry has gone from "boom to bust" in the past six months, Bane said Motorola's order backlogs have "fallen dramatically" from their record highs several months ago when the company experienced 10-month backlogs. The company's so-called book-to-bill ratio has hovered around 0.50 in recent months, he said, which means the company took in 50 cents worth of new orders for every $1 of product shipped out.

The Semiconductor Industry Association recently reported that the book-to-bill ratio had reached its lowest point ever — 0.58 — in December.

Motorola is predicting a 10% growth in sales in 1985, which compares with an average growth rate of about 17% during the past five to six years, according to Bane.

Bane said part of the blame for the industry slump must be placed on the chip makers themselves for their failure to understand their customers' inventory needs better. Semiconductor vendors have been hurt in recent months by significant order cancellations and rescheduling of pur-

See SLUMP page 89

- A semiconductor trade association said the industry may have stabilized, but projected a low growth rate for this year. Meanwhile, Intel Corp.'s fourth-quarter profits dropped sharply from the year-earlier level/90
- Storage Technology Corp. announced last week that company founder Jesse Aweida had resigned as chairman of the financially troubled company, which is currently operating under protection of Chapter 11 of the Federal Bankruptcy Act/96
- Martin Marietta Data Systems acquired Oxford Software, Inc. and said it now ranks among the top five independent software vendors/94

Chip mart outlook not so rosy

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Wall Street let out a sigh of relief a couple of weeks ago, apparently convinced that the semiconductor industry has weathered the worst of the storm in the eroding market for semiconductors.

The optimists who bid up the stock on leading semiconductor vendors may have to do some reevaluating when the realities of the situation set in, however.

A recognized facet of the peculiar chip industry is that systems integrators tend to double order in times of scarce availability, only to cancel excess orders later, when the industry enters a downturn, thus creating a crisis-like atmosphere as order rates plummet.

Now the industry and analysts are telling investors that the correction to overbooking has been accomplished. So investors perked up.

Note well, however, that chip vendors themselves have not perked up; National Semiconductor Corp. announced a two-week shutdown for February [CW, Jan. 14] and held out the possibility of a similar shutdown this spring.

Note also that the Semiconductor Industry Association predicted only a 2% to 5% growth in semiconductor sales for this year and pegged that on the assumption that second-half demand will pick up greatly from the

See MART page 92

Franklin aims to stay in business, banks on Apple-compatible micro

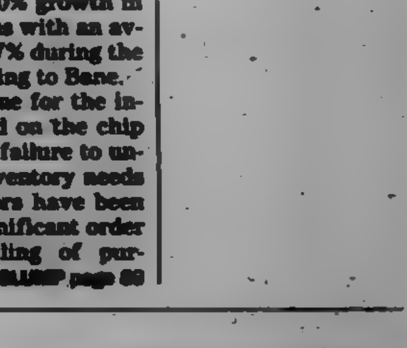
By Peter Bartolik
CW Staff

PENNSAUKEN, N.J. — Franklin Computer Corp., scrapping its former plan to liquidate its assets and go out of business, said recently it will try to emerge from bankruptcy proceedings and continue to manufacture microcomputers that are compatible with Apple Computer, Inc.'s Apple II line.

After agreeing in January 1984 to pay Apple $2.5 million for infringing on Apple operating software copyrights, Franklin suffered a number of setbacks that forced it to file for protection last summer under Chapter 11 of the Federal Bankruptcy Act [CW, July 2]. Later in the year, Franklin said it had decided to liquidate its assets and turn over the proceeds to creditors [CW, Nov. 12]. At that time, it had liabilities of $22.8 million and reported that assets of $33.9 million had been written down to $15 million.

But the company filed an amended reorganization plan earlier this month seeking court approval to pay off creditors with a package offering less than 25 cents for every dollar owed in addition to stock that would give the creditors a 16% stake in the company. The plan has been ap-

See FRANKLIN page 95



Former HP exec expected to revitalize Convergent

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — The day after a new president was appointed to lead the company he founded, Allen H. Michels, chairman of Convergent Technologies, Inc., described himself as an entrepreneurial sprinter who needed a high-quality, long-distance runner to keep his firm on track for the next decade.

"I've made a lot of mistakes running this company in the past, and I'd probably do many of them again," Michels admitted. "I'm basically a risk-taker and always will be; you can only grow if you take risks."

Veteran Hewlett-Packard Co. executive Paul C. Ely Jr. was named president and chief executive officer of Convergent Technologies.

Michels described Ely as "basically very tough, and we value that characteristic here." According to Michels, "a marriage between two executives is like any marriage; two people have to work at it over time to make it successful."

Michels

Michels disputed industry and Wall Street perceptions that the company's poor showing during the last two quarters and its ballooning accounts receivable and inventory have caused severe financial difficulties. Cash flow is not a problem, he asserted, claiming the company can draw on a $70 million line of credit and $1.7 billion in back orders that could carry Convergent Technologies through 1986. Currently, Convergent Technologies plans to balance finances by reducing accounts receivable and inventory and operating with reduced assets, he said.

Michels said new management was needed because "with our phenomenal growth rate, we'd been trying to do too much too fast."

Michels predicted Ely will manage Convergent Technologies to the $1 billion annual revenues level. Convergent Technologies is a five-year-old company that shipped its first system in 1981. Last year, the company posted approximately $400 million in sales.

The problems that plagued the company last year have been corrected, Michels said. In 1984, Ngen, Convergent Technologies' flagship product that accounts for approximately 65% of corporate revenues, was plagued with technical setbacks, higher-than-expected production costs and parts shortages that delayed production and ate into profit margins. Many consider Convergent Technologies' biggest mistake in 1984 was the unsuccessful marketing of its own laptop computer.

Among the company's strengths, Michels said, is the soon-to-be-announced desktop computer produced for AT&T's Information Systems.

ELY

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cal instruments and medical equipment. Ely said, however, that "Morton was the right choice to lead the company; the [chief operating officer] position is not where my talents lie."

At that time, Ely also was reassigned from computer operations to head the medical, components technology and analytical instruments groups and HP's corporate engineering and research and development groups. "It was a dramatic change for me," Ely admitted.

Ely said he began last fall to consider job offers seriously that had flooded in after the reorganization, and that age played a factor. HP has a policy of retiring officers at age 60; Ely is now 52. "I plan my life in 10-year cycles," he said, "and now seemed a good time to consider this issue."

David Crockett, vice-president of Dataquest, Inc. in San Jose, Calif., said that this is a good time for Convergent Technologies to bring in "a heavy hitter like Ely who excels in R&D, manufacturing and contract negotiations." According to Crockett, Convergent Technologies' weak position during the last two quarters was due to manufacturing problems, insufficient margins, high production costs causing cash-flow problems, along with introduction of the Workslate laptop computer that failed in the marketplace.

Ely's Jan. 6 departure triggered HP's second management reorganization since last July. Under the new organization, HP's medical, components, technology and analytical instruments group formerly headed by Ely has been restructured into the manufacturing, medical and analytical systems sector to be headed by Lewis Platt, an HP vice-president and general manager of the Manufacturing Systems Group. Ely's other major divisional responsibility, HP Laboratories, the company's central research arm, now reports directly to HP's Young, as had been the case prior to last July's companywide reorganization.

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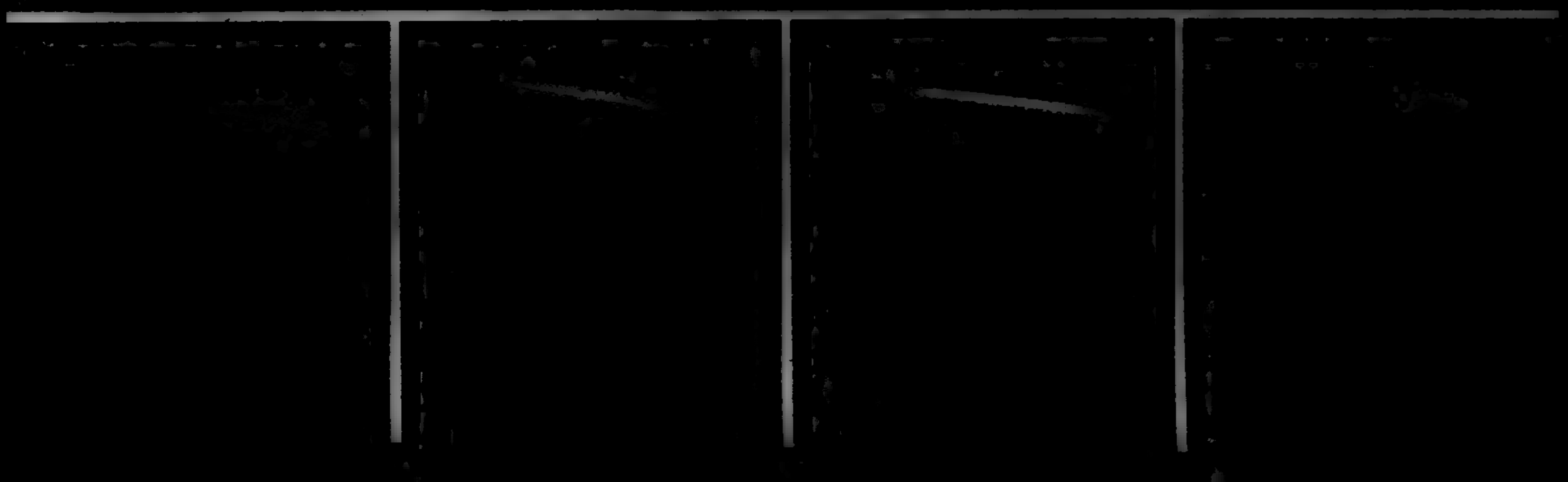

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COMPUTER INDUSTRY

Software remains ineligible to receive benefits of FSCs

OUTSIDE LINES
Alonzo D. Saunders

European and Japanese high-tech companies receive subsidies from their governments for exports. But the fact of the matter is that American companies receive subsidies as well. One source of subsidy is the Foreign Sales Corp. (FSC), which is the legal successor to the Domestic International Sales Corp. (Disc).

Congress replaced the Disc with the FSC because America's European and Japanese trading partners complained about *it*. They charged that the Disc gave American companies an unfair advantage in that it allowed them to sell overseas at a lower cost. Some years ago, the Europeans and the Japanese turned their criticism into a real threat to retaliate in kind — by imposing countervailing import duties on U.S. products exported by Discs.

FSCs differ from Discs in a number of ways. FSCs are now required to be real corporations, not paper ones. This means that FSCs must be incorporated and managed overseas; must keep books and records overseas; hold annual meetings of stockholders and meetings of directors overseas; have at least one director who is not resident in the U.S.; and, of course, they must derive their income from transactions and related advertising, promotion and administration overseas.

Whether this more or less minimal compliance with these treaties will really assuage our trading partners remains to be seen. But the position of the U.S. government is that it did what it had to do and is not going to do any more. The administration also points out that the requirement that FSCs be real corporations puts some money in the pockets of foreign lawyers, accountants, bankers and businessmen and allows foreign governments to tax these corporate entities.

The tax rate of the approved countries is an important factor now because no U.S. tax credit for the payment of foreign taxes is allowed. Countries such as Jamaica, the U.S. Virgin Islands and Ireland all now seem to be popular among the countries where FSCs are to be incorporated, the first two for reasons of climate, the third because of the ex-

See FSC page 85

Saunders is a Boston-based attorney whose practice focuses on international marketing, antitrust and corporate finance.

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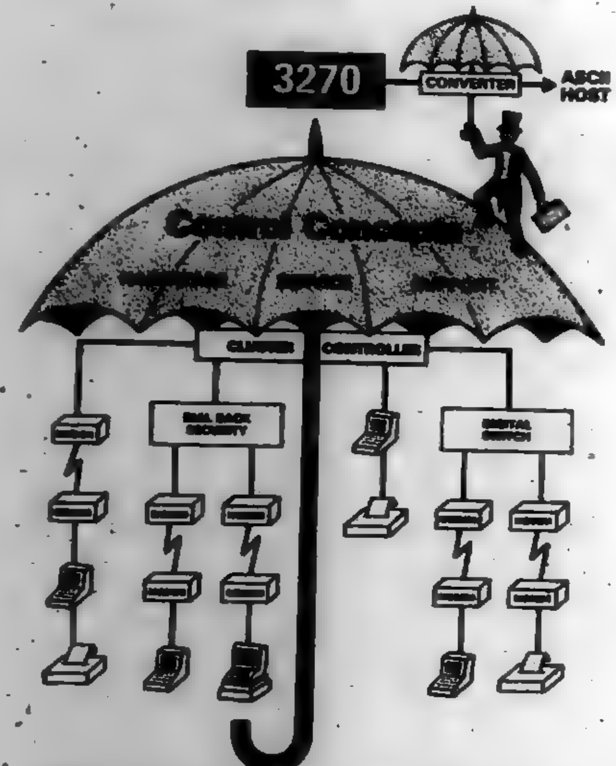

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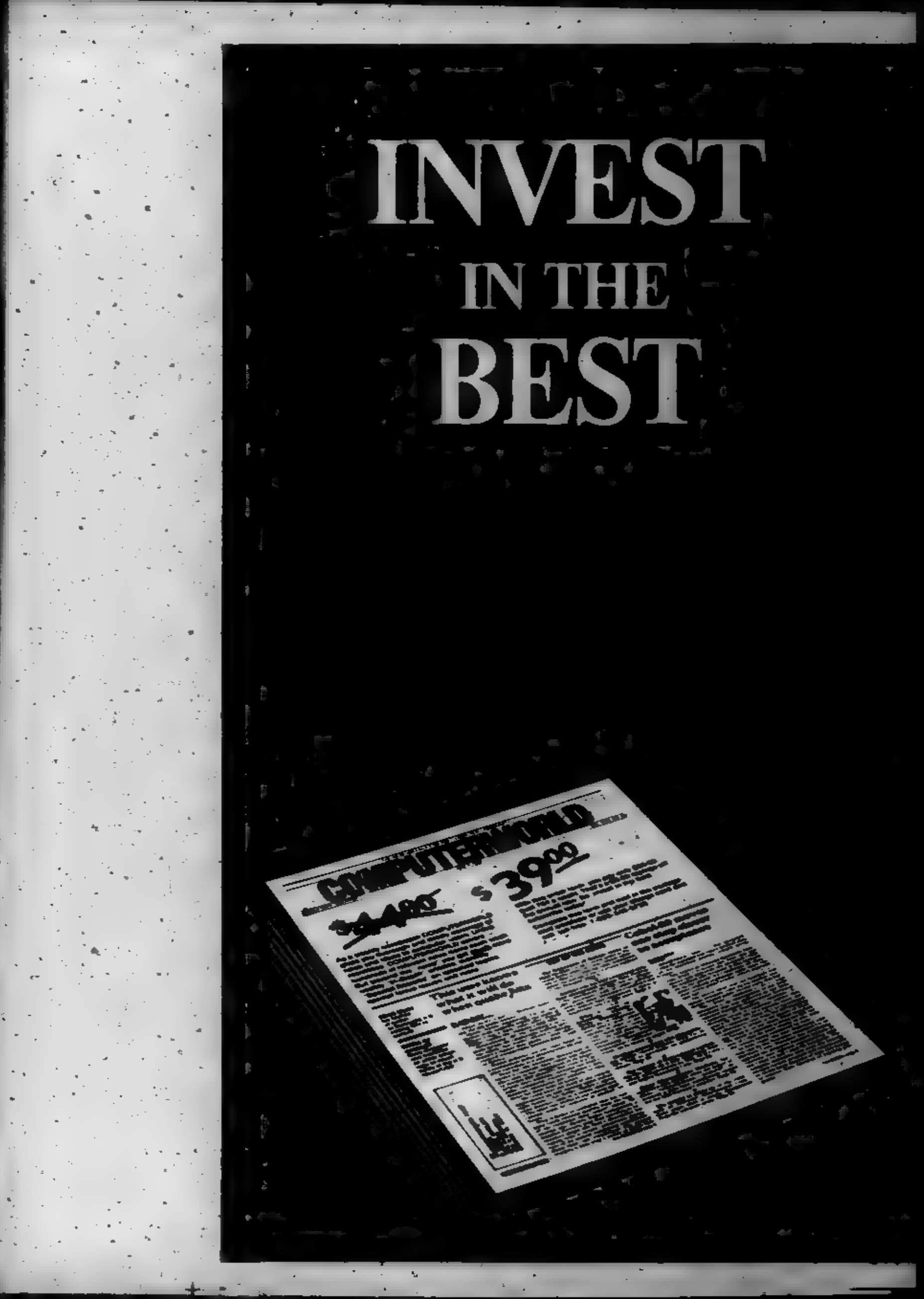
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FSC

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tensive number of additional tax incentives already available to American companies. For companies exporting to the Far East, the Marianas and Guam are on the Treasury-approved list.

The following issue does not foretell good things for the high-tech industry. In the change from the Disc to the FSC, the tax regulations did not make any change to the types of products that were eligible for favored treatment. So-called intangible property, which includes trademarks, copyrights and patents, has never been eligible, and neither has software. They are not eligible now either. The works of Shakespeare, if reduced to a book and exported, receive favored treatment, while those same words, reduced to a disk and exported, are not favored. A strange anomaly indeed.

U.S. lawyers and accountants are considerably vexed by this anomaly. One Big-Eight accounting firm, Coopers & Lybrand, points out in its "Survey of Tax Issues Affecting Software Developers and Users" that software which is sold as well as software which is licensed "should be considered as tangible property and therefore qualify for [FSC] benefits. So long as [a] master tape used to make reproductions is manufactured in the U.S., it should be considered as tangible property [because] a master tape is significantly different from intangible assets [such as patents or copyrights] in that it represents a physical tangible asset." Furthermore, "the value of the computer program [is] dependent upon the existence of the physical asset. That is to say, the data recorded on the tape could not exist unless it was on the physical medium."

Treasury, IRS rules differ

There is another problem. The Treasury regulations state that "a license of a master recording tape for reproduction outside the U.S. is not disqualified from being export property." Yet in reality, the IRS ignores this letter of the law, so there is pressure to force the IRS to adhere to its own regulations.

To complicate matters further, the IRS does treat computer tapes and movies as tangibles for purposes of the investment tax credit, a domestic subsidy if you will, but the IRS did not agree to do so willingly. They had to be taken to court. In *Walt Disney v. U.S.*, Walt Disney claimed that the cost of movie film included the cost of making the film, that is, it included production costs and was not limited to the cost of raw film. And in another case, *Texas Instruments v. U.S.*, TI argued, also successfully, that tapes and films that had certain seismic data on them were tangible property for purposes of the investment tax credit. So, argue the lawyers, why cannot software be considered to be in the same boat and therefore become tangible for export by an FSC.

Some companies are reportedly planning to run the risk and challenge the IRS, using the Walt Disney and TI cases as precedents.

As of this writing, no litigation has surfaced, but it should be only a matter of time until an IRS audit disqualifying software is challenged in court.

Of course, the government is not standing still either. The new Reagan tax proposals have not been fully digested with respect to FSCs, so there are many business leaders, and their lobbyists, who do not know whether the new proposals will render FSCs moot.

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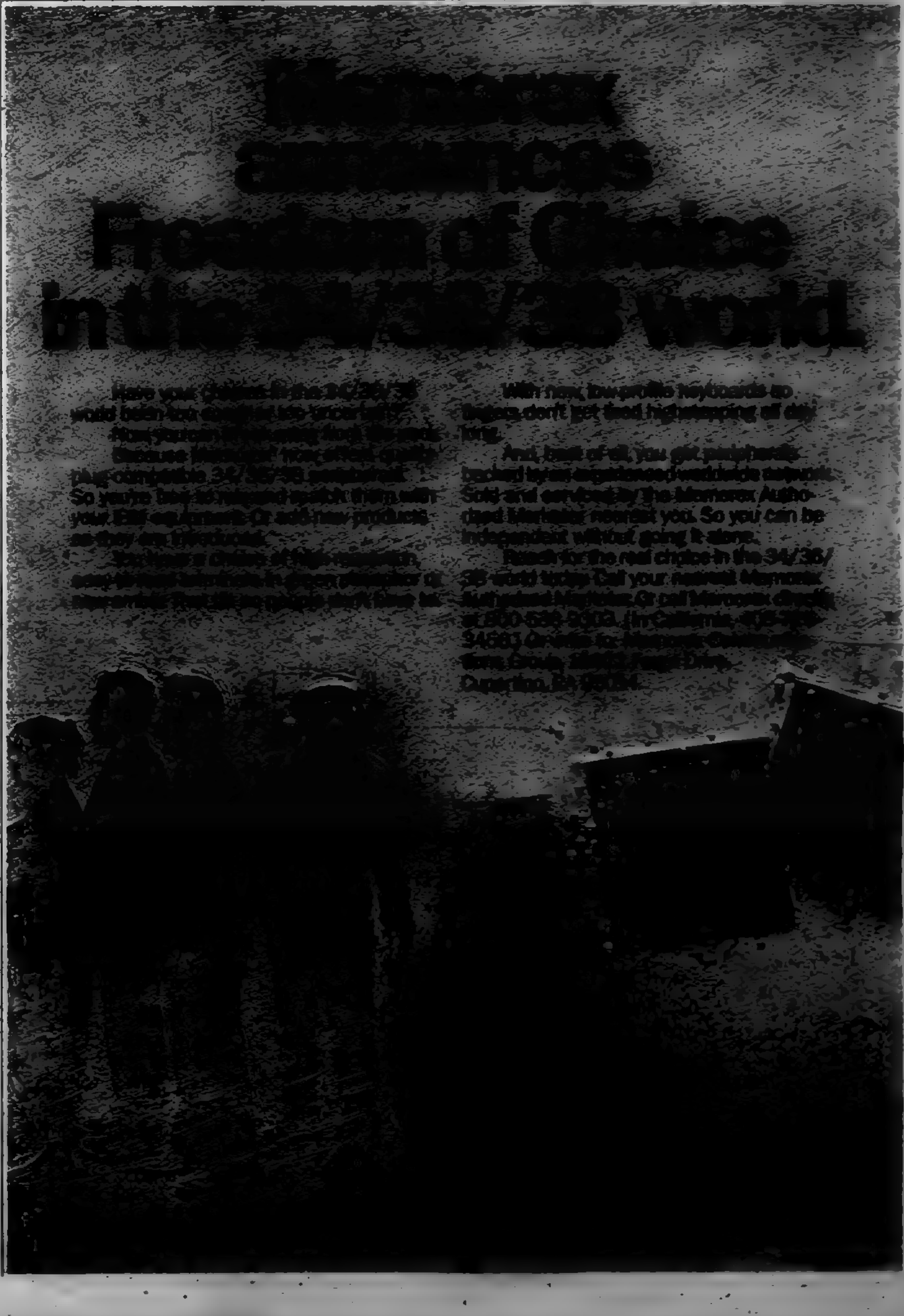

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SIA predicts weak growth for chip mart

SAN JOSE, Calif. — The Semiconductor Industry Association (SIA) said recently the decline in the semiconductor industry appears to have stabilized, but the association projected that the U.S. market will experience only 2% to 5% growth this year.

The SIA said new orders for the three-month period ended in December showed only a 4.3% drop from the September-to-November time frame, reflecting a traditional increase in December shipments. The association's book-to-bill ratio, comparing new orders with shipped orders, was 0.58 in December.

SIA President Thomas D. Hinkelman said the industry situation in December indicated that a period of "massive" order cancellations and reschedules by customers of semiconductor vendors has ended. But he added that the semiconductor business continues to be weak.

"The industry's 1985 performance will be significantly affected by current inventory levels, a slower real rate of growth in semiconductor use and price attrition," Hinkelman said. "We estimate the U.S. market will grow between 2% and 5% in 1985 to not more than $12.2 billion. This scenario assumes a steep rise in demand from the first half to the second half of 1985."

SLUMP

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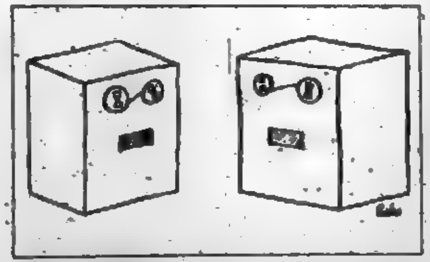
chases by their customers.

Chip manufacturers have "no way of knowing" which orders are legitimate, necessitating increased production capacity, and which ones are simply "security" orders by customers to cover a need for parts that later may not materialize, according to Bane.

"We need to get closer to our customers and to understand more about the security games played by purchasing agents and companies," he said.

Bane said that as the chip industry has grown larger, is has become increasingly affected by the cyclical nature of of the world economy and the fortunes of an ever-broadening base of customers.

"The [semiconductor] industry is more pervasive than it was in the past," Bane said. "In earlier years, we supplied primarily consumer markets or market niches, but the industry now has achieved a level of pervasiveness and is therefore tied closer to the ups and downs of the economy in general."



'But if there's no God, who changes our reels?'

Intel reaps 71% increase in 1984 profits

SANTA CLARA, Calif. — Intel Corp. last week reported fiscal year 1984 revenues increased 45% over 1983 and profits increased 71%. However, fourth-quarter results, reflecting an industrywide slowdown, showed a 50% decrease in profits compared with the year-earlier quarter.

Intel reported revenue of $1.6 billion and profits of $198 million, or $1.70 per share, for the year ended Dec. 31; for 1983, the company had reported revenue of $1.1 billion and profits of $116 million, or $1.05 per share.

In the fourth quarter just ended, Intel revenue was $416 million, up from $332 million for the fourth quarter of 1983. Profits, however, declined to $23 million, or 20 cents per share, from year-earlier profits of $47 million, or 40 cents per share.

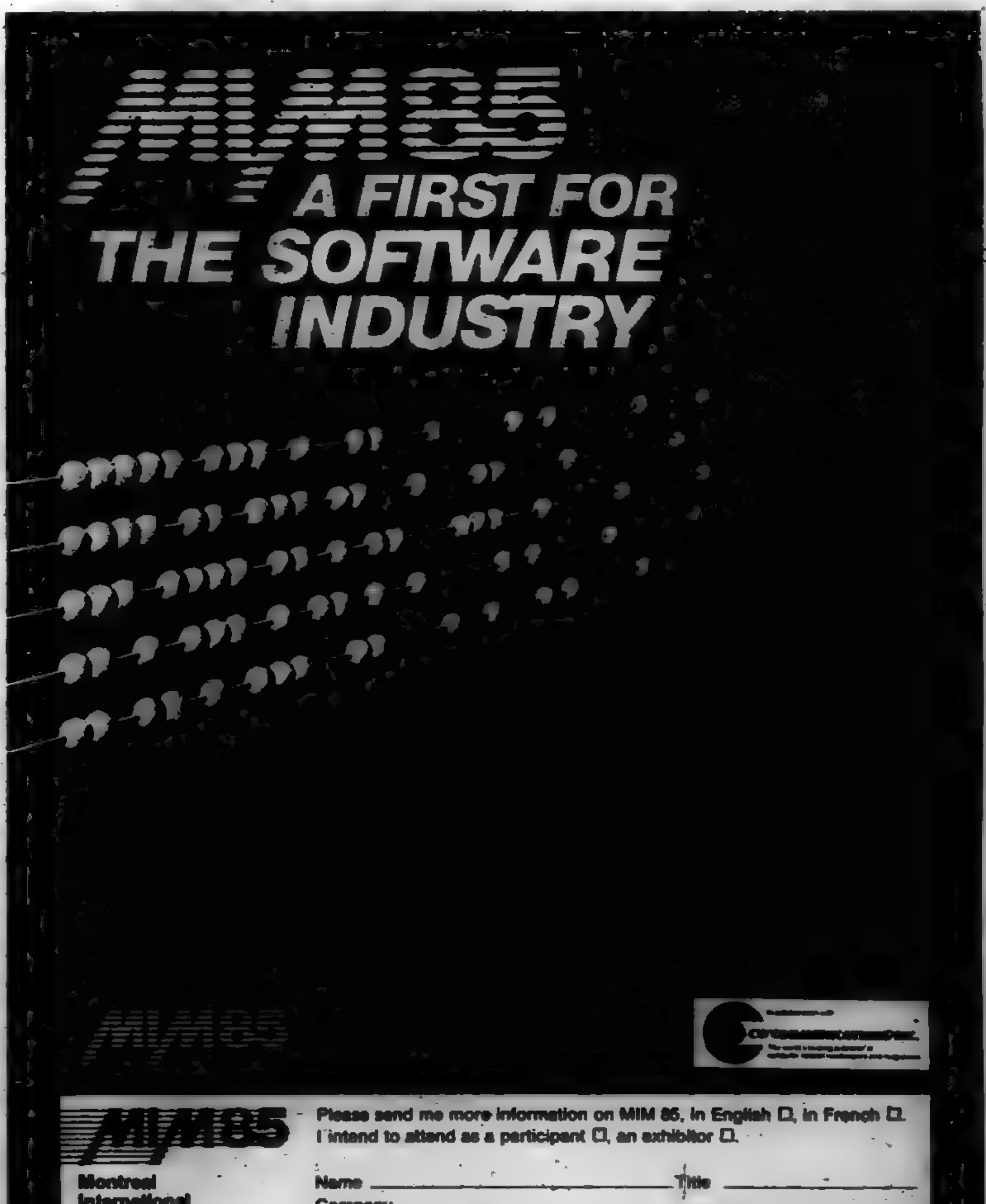
Gordon E. Moore, chairman and chief executive officer (CEO) of Intel, said the strong market enjoyed by the company in the first half of the year "collapsed near year-end" as the rate of new orders dropped below the rate of shipments, and many customers canceled orders.

"As yet, we see no sign of any pickup in demand that we would ordinarily expect in a strong economy," Moore said. "I feel, however, we are well positioned with new products to resume growth with any market recovery."

Another semiconductor company reporting curtailed orders and rescheduling was Advanced Micro Devices, Inc. (AMD) of Sunnyvale, Calif.

AMD reported a third-quarter revenue of $238.6 million, up from $154.6 million a year earlier, and profits of $29.3 million, or 50 cents per share, up from $20.2 million, or 35 cents per share. AMD noted that the third-quarter profits were down considerably from the second-quarter level of $42.1 million and said net orders in the third quarter were less than half of its shipments.

W. J. Sanders III, AMD president and CEO, said the company viewed the third-quarter decline as a "notch in our growth pattern" and not the beginning of a cyclical decline.



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Intel first to register design under chip protection act

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The Semiconductor Chip Protection Act of 1984, signed into law last Nov. 8, got its first customer recently when Intel Corp. registered a chip design at the U.S. Copyright Office to secure legal protection from piracy.

Intel General Counsel Tom Dunlap submitted the circuit design for Intel's 27C256, an erasable programmable read-only chip with 256K bits of memory, to Acting Registrar of Copyrights Donald C. Curran at a ceremony and press conference here Jan. 7.

Intel was followed by representatives of Motorola, Inc. and Harris Corp. in the line to register the topographical designs for integrated circuits, called "mask works."

Though the federal law is administered by the Copyright Office, a unit of the Library of Congress, the statutory protection for chip designs is neither patent nor copyright, but a unique form of legal protection.

The law makes it illegal to reproduce any registered semiconductor pattern for 10 years after the layout is registered or first introduced, whichever occurs first [CW, Oct. 22]. Registration must occur within two years of commercial exploitation.

The Copyright Office opened the doors to registration on Jan. 7, after drafting regulations for implementation.

To register a chip pattern, a company or individual must submit documents such as a set of overlays or photographs that uniquely describe the original layout. Protected chips will carry the symbol "M" for mask work, surrounded by a circle or asterisks.

Industry-supported legislation

The legislation was strongly supported by the industry, led by the Semiconductor Industry Association of San Jose, Calif. "We took an active part in sponsoring the act because unauthorized chip duplication has been an industrywide problem fo. several years, especially since [integrated circuit] development costs have risen dramatically of late," Intel's Dunlap commented.

"Now, semiconductor companies will have protection from pirates copying their complicated designs," he said.

"As a result, the Chip Protection Act will encourage the development of chips that were previously considered economically marginal," Dunlap added.

U.S. Rep. Robert W. Kastenmeier (D-Wis.) and U.S. Sen. Charles McC. Mathias Jr. (R-Md.), chief sponsors of the act, spoke at the ceremony and hailed the chip registration as an historic occasion.

"It's the first significant intellectual property created in [more than] 100 years," remarked Kastenmeier, who is known as "the dean of copyright" in Congress, according to Librarian of Congress Daniel J. Boorstin.

"Passage of the act shows that the modern-day Congress is ready, willing and able to devise rational solutions to thorny technological problems," Kastenmeier said.

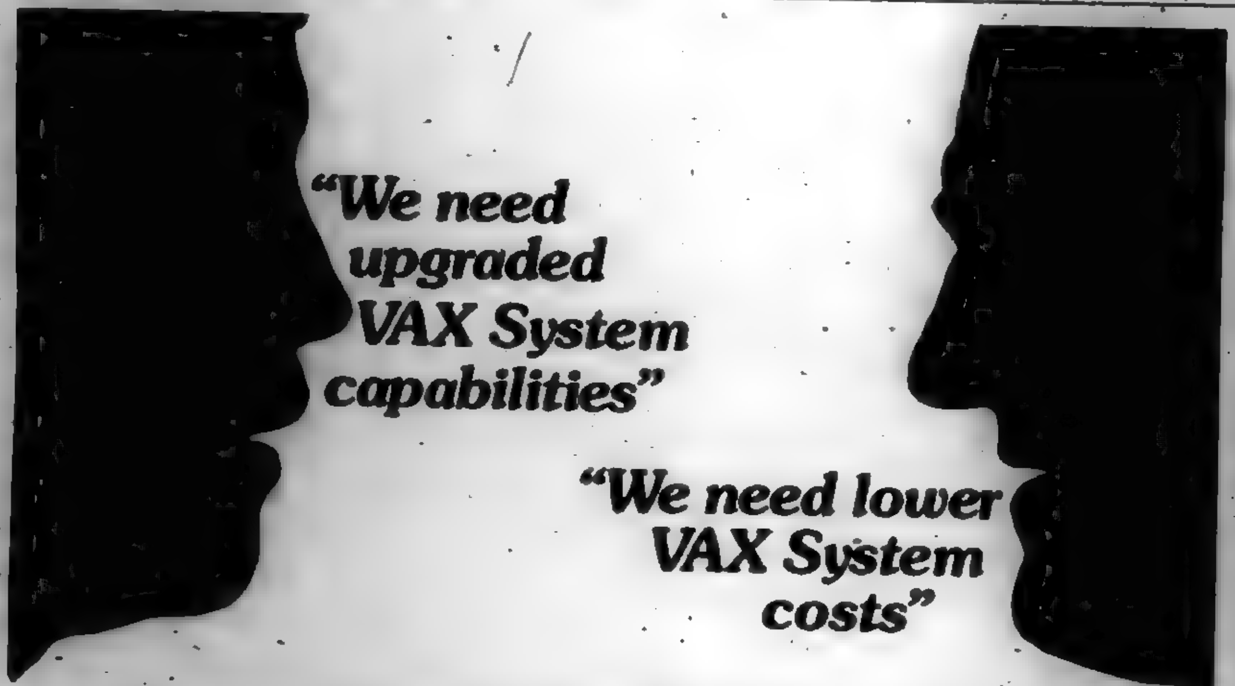
New chapter for Copyright Office

Mathias said the new property right opens a new chapter for the Copyright Office.

"We can be more confident that Americans in the future can continue to enjoy the fruits of technological progress and continue to take advantage of a creativeness ... that has flourished under the shelter of intellectual property laws since the nation's earliest days," he said.

"It's a pleasure to see this fruit of six years of labor," said U.S. Rep. Don Edwards (D-Calif.), who first introduced a chip protection bill in 1978.

"I'm delighted that the Copyright Office, with its usual excellence, has moved so quickly to implement the new law," Edwards added.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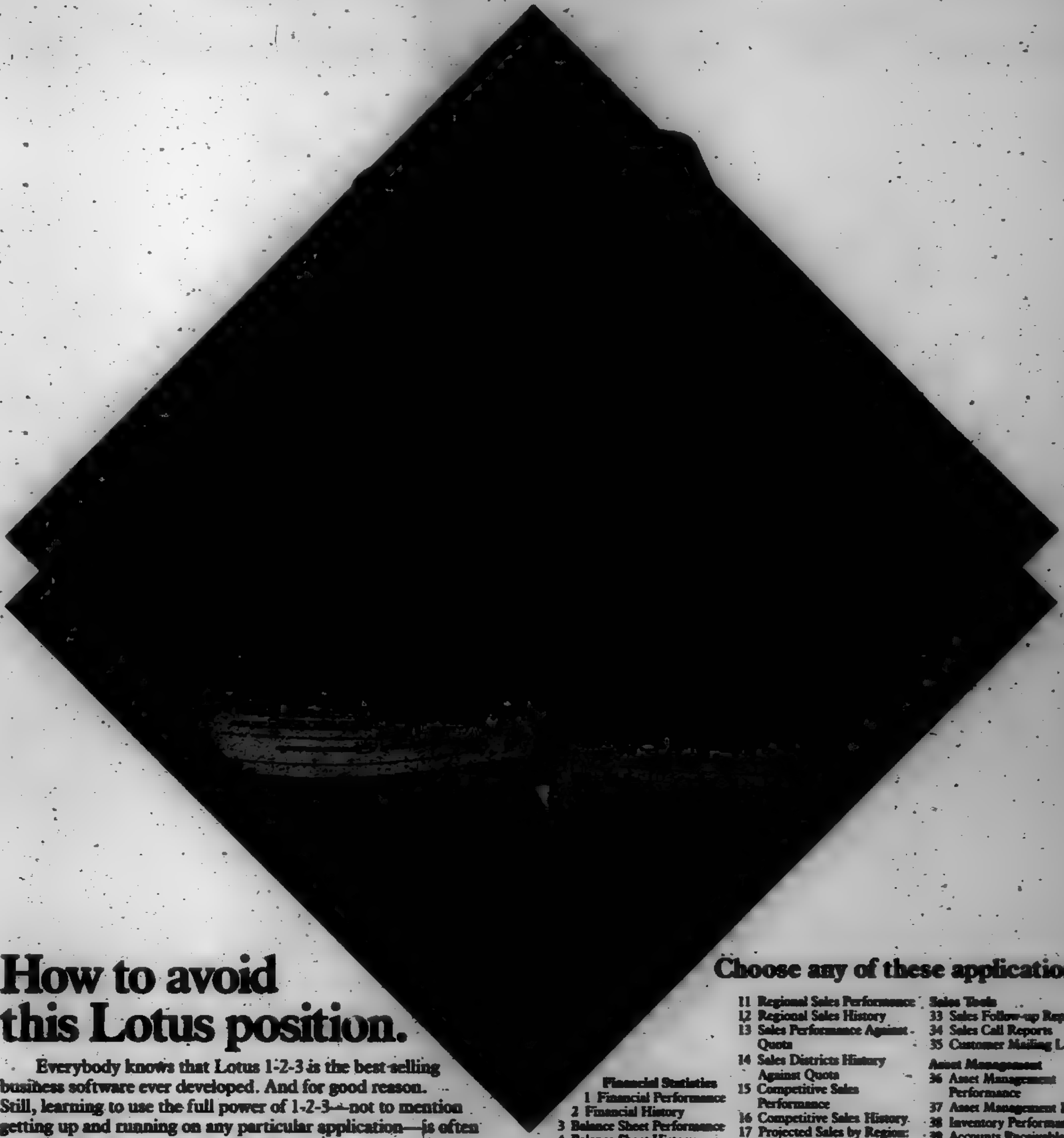
STC founder resigns position

LOUISVILLE, Colo. — Storage Technology Corp. (STC) reported last week that company founder Jesse I. Aweida resigned his position as chairman of the troubled company effective Jan. 19.

Aweida, who is a major shareholder in the company, will remain as a member of the company's board of directors. STC filed for protection under Chapter 11 of the Federal Bankruptcy Act last Oct. 31, hoping to hold off creditors long enough for the company to reorganize.

In mid-November, Aweida relinquished the function of chief executive officer; some analysts had predicted creditors and shareholders would demand he turn over any functional control of the company as a condition of any reorganization plan.

Once a stable vendor of storage tape products, STC mushroomed in size when IBM suffered production delays after announcing thin-film head storage products. STC then poured money into an attempt to develop an IBM-compatible mainframe, only to cancel the project last year.



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MAI reports $12.4 million loss

Revenue up as company moves toward liquidation

NEW YORK — Management Assistance, Inc. (MAI), which has announced agreements to sell its two operating units and to dissolve the company, reported a loss of $12.4 million, or $1.65 a share, for the fourth quarter ended Sept. 30.

The $12.4 million loss reflected an extraordinary tax credit of $300,000, or 4 cents a share.

The company lost $33,000, or less than 1 cent a share, after receiving an extraordinary tax credit of $254,000 in the comparable quarter one year earlier.

Revenue in the fourth quarter rose 16% to $118.3 million from $102.3 million during the year-earlier period.

For the fiscal year 1984, the company lost $8.2 million, or $1.12 a share, reflecting a $1.1 million favorable gain resulting from an accounting change and the credit of $300,000.

Revenue from MAI's Sorbus Service Division rose 15% to $51.1 million from $44.4 million reported during the fourth quarter a year ago.

DOD

from page 79

non-Communist countries facing license review by the Pentagon to 15 at any one time.

Specific categories of products that will come under scrutiny are computers, scientific measuring and testing devices, microchip manufacturing technology, raw materials used in the manufacture of semiconductors and semiconductor manufacturing equipment.

MART

from page 79

first half.

That much growth is not nearly enough to sustain an industry that has been on an ambitious capital spending spree for more than a year. The chip industry is extremely cyclical, and manufacturers have tended to ramp up for further growth when a boom cycle is already far advanced; that results in capital spending plans outliving the life of the boom.

The last boom held in its vises not only U.S. vendors but also vendors throughout the world, including the Japanese, European concerns and a fledgling but optimistic Korean industry.

With everybody ramped up for growth based on the levels of late 1983 and early 1984, it would seem that a 2% to 5% growth rate in the largest market for semiconductors is going to result in vicious competition among the leading companies to capture that growth. That can only lead to price-cutting and reduced revenue growth.

Of course, there are factors that could alleviate the potential problems: the home computer market living up to its full potential and demand for multiuser business micros exceeding expectations. But there are also factors that could worsen the problem, such as an economic downturn that would curb business spending and cut into the sales of semiconductors to automakers and appliance makers.

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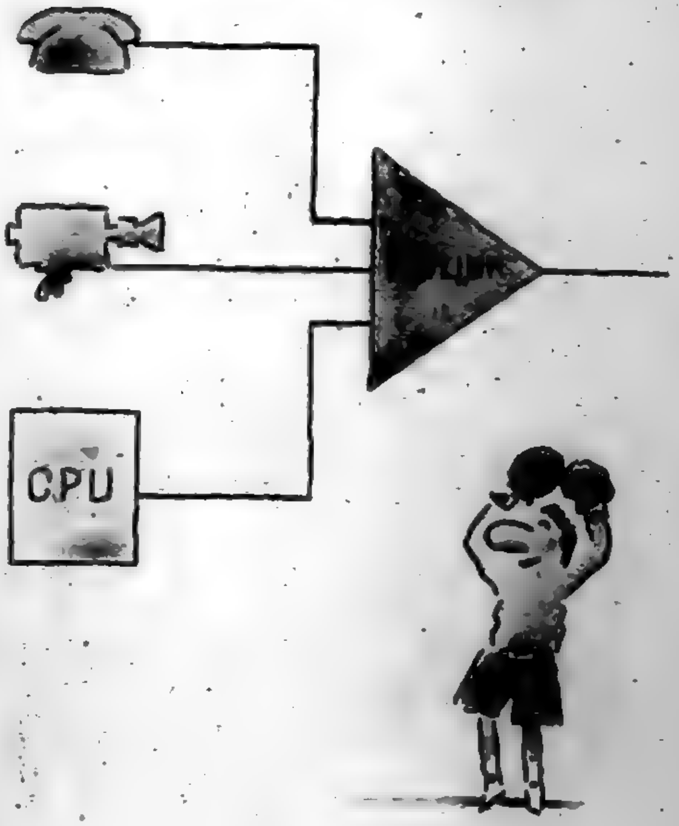

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NBI sets merger with Computer Consoles

Acquisition pending approval, valued at $160 million

BOULDER, Colo. — NBI, Inc., based here, recently announced it will acquire Computer Consoles, Inc. (CCI) of Rochester, N.Y., during this quarter, subject to stockholder and regulatory approvals, in a transaction valued at $160 million.

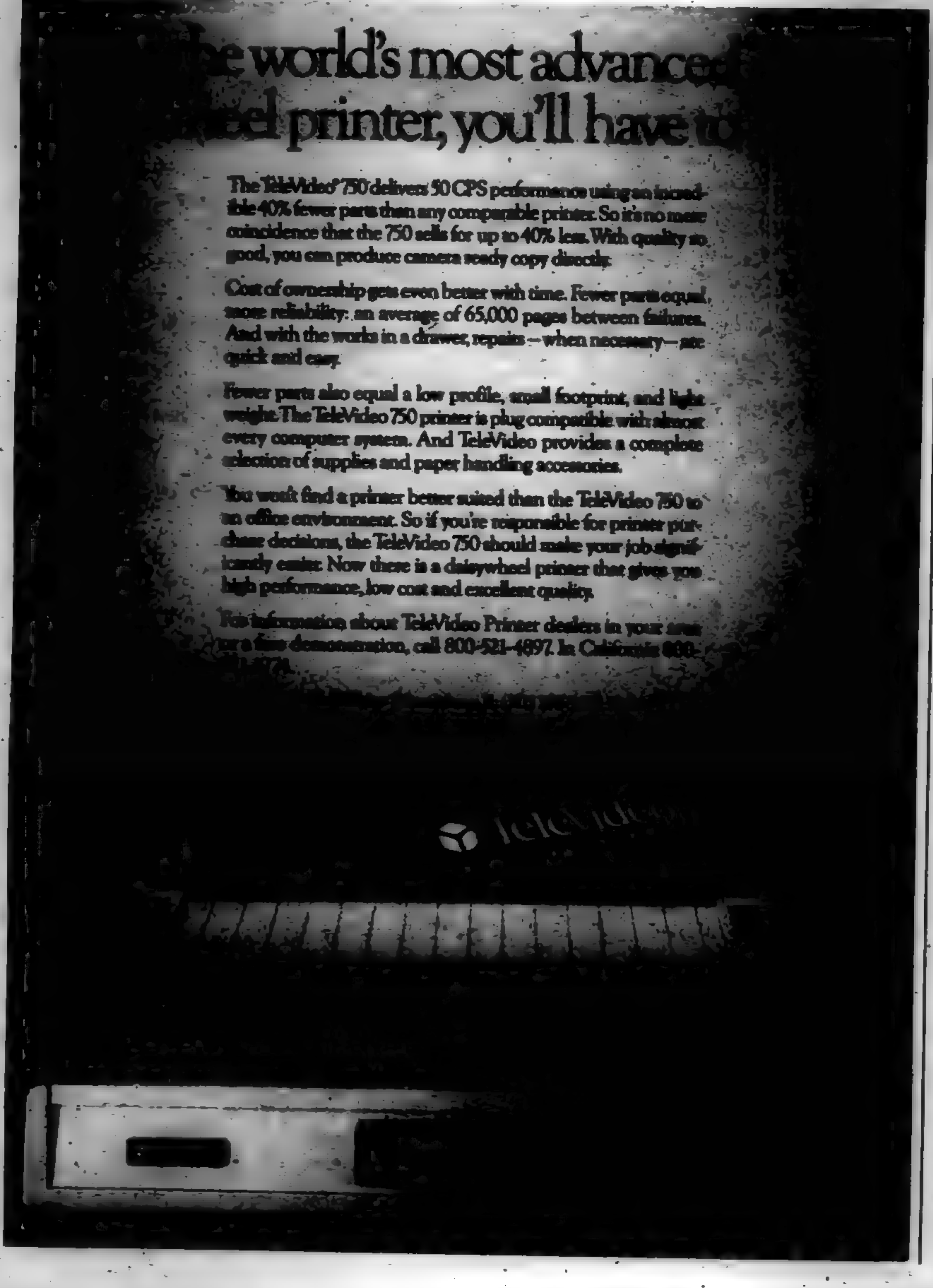
NBI, which manufactures software-based office automation systems, reported revenues of $187 million and profits of $14.9 million for the 12 months ended Sept. 30. CCI, a leading supplier of fault-tolerant computer systems to the telephone industry and also a supplier of advanced computing systems to the office systems market, reported revenues of $135 million and profits of $11.2 million for the 12 months ended Sept. 30.

Under the terms of the proposed merger, Herman A. Affel Jr., chairman of CCI, will become chairman of the board of the company. NBI President Thomas S. Kavanagh will become president and chief executive officer of the company.

If approved by shareholders of both companies and government agencies, the companies would be merged through NBI's issuing approximately 0.8 shares of new stock for each share of CCI's common stock outstanding. Based on the Jan. 10 closing price of NBI, the transaction is valued at $160 million.

Company officials said they expect few changes in employment at the respective locations of the two companies. The two companies together employ more than 4,000 people and operate more than 200 sales and service locations worldwide.

In a joint statement, Affel and Kavanagh said the two companies complement one another. "We believe that the new company will be in a stronger position to compete in the office systems and advanced computing systems markets than either company alone would be," they said.



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Martin Marietta reveals Oxford Software buy

BETHESDA, Md. — Martin Marietta Data Systems, a division of Martin Marietta Corp., has acquired $11 million Oxford Software, Inc. of Hasbrouck Heights, N.J., maker of the UFO application generator and on-line applications development software.

The move is Martin Marietta's second software company acquisition. In August 1983, the firm acquired Mathematica, Inc., maker of the Ramis II fourth-generation language and acquisition system.

According to a Martin Marietta spokesman, the acquisition ranks the company among the country's five largest independent software vendors, increasing its strength against Cincom Systems, Inc., which manufactures the Mantis fourth-generation language application development system, and Pansophic Systems, Inc., developer of the Gener/ol system for IBM's CICS. Martin Marietta software sales alone are $150 million, the spokesman said.

Neither company would reveal the terms of the acquisition, but an Oxford spokesman said the company would remain an independent subsidiary of Martin Marietta and that Oxford President Judd Shanker would retain his position.

Osborne to end Chapter 11, reenter mart

FREMONT, Calif. — Osborne Computer Corp., the first major casualty in the microcomputer industry shakeout, was scheduled to emerge last Friday from Chapter 11 protection of the Federal Bankruptcy Act.

The end of Chapter 11 proceedings coincides with a limited public stock offering of $3 million to California residents and overseas investors. Osborne filed for protection under Chapter 11 on Sept. 13, 1983, after a number of setbacks that shook the industry and set a pattern for failures of microcomputer companies.

Ronald J. Brown, president of the restructured company, noted the unique status of Osborne, remarking that it was the first company to enter the portable computer field, the first micro vendor to go into Chapter 11 proceedings and the first to reenter the market.

"We have been a bellwether of the industry from day one, and we continue to be," Brown said.

Osborne, founded by the often colorful and controversial Adam Osborne, was the first of the micro start-ups to stumble on its own overly aggressive marketing strategy. It announced a follow-up product to the successful Osborne I long before the company was ready to manufacture the machine in quantity, with the result that sales of the original computer dried up and the company experienced negligible revenues.

Gavilan set to liquidate; prospects for sale unlikely

By Kathleen Sullivan
CW West Coast Bureau

CAMPBELL, Calif. — In mid-December, two months after it sought protection under Chapter 11 of the Federal Bankruptcy Act, Gavilan Computer Corp. quietly gave up the ghost. The portable computer firm notified a bankruptcy court here that the prospects for selling the firm were unlikely and that it planned to liquidate any remaining assets.

The court notice closes the books on a company that attracted much attention in the spring of 1983, when it introduced one of the first briefcase-size computers and obtained $31 million in venture capital financing on the promise of delivering a lap-size computer.

Within four months, Gavilan had garnered $100 million in orders for the first machine. But the privately held firm was unable to ship the product for a year because of production delays and technical problems.

In the interim, the competition among vendors of briefcase-size systems intensified as other U.S. and Japanese firms entered the field. Companies such as Hewlett-Packard Co. and Data General Corp. stole the spotlight from the fledgling firm. In addition to increased competitive pressure, Gavilan was plagued with management problems, according to analysts.

Venture investments lost

When Gavilan filed for bankruptcy in early October, it owed $10 million to creditors, including $3.5 million to California-based Bank of the West, its secured creditor. Venture capitalists, who had poured $31 million into the firm during its 2¼-year lifetime, lost their investments.

Like Victor Technologies, Inc. and Osborne Computer Corp. — two computer companies that recently emerged from Chapter 11 proceedings with new funding and new management — Gavilan had hoped to find a buyer. But it was unsuccessful.

In documents dated Dec. 14 and signed by attorneys for Gavilan, the Bank of the West and the committee of unsecured creditors, the company converted from Chapter 11 to Chapter 7 proceedings.

Under Chapter 7, a trustee appointed by the court attempts to collect assets — if any are available — for the benefit of unsecured creditors, according to L. Neil Gendel, a San Francisco lawyer who represented Gavilan.

But, Gendel added, it seems improbable that unsecured creditors will be reimbursed.

FRANKLIN

from page 79

proved by a creditors committee and must be approved through a ballot of all creditors.

Morton E. David, the chairman and chief executive officer appointed one month before the bankruptcy filing last June, explained in a recent interview that the success of a new Apple-compatible operating system and continued dealer loyalty has enabled Franklin to revise its plans.

Market has accepted FDOS2

Regarding the operating system, FDOS2, Morton said, "the marketplace has accepted it with alacrity . . . [and] the feedback from dealers has been excellent."

He claimed that a hard core of 300 dealers has continued to sell Franklin products despite a requirement that dealers pay for equipment in advance or upon delivery.

Last May, Franklin introduced its CX series of computers, but Morton said the company has no intention of manufacturing that series.

Instead, he said, the company will continue to manufacture its Ace 1000 microcomputer until the product has been exhausted, adding, "That will dovetail nicely with a new product line."

Apple suit biggest problem

Franklin suffered from the general downturn in the personal computer market and from a rapid series of management changes that saw the company appoint three chief executives in three months. But the greatest problem was the Apple lawsuit that caused Franklin to stop shipping products while it developed FDOS2.

Morton observed that Apple has no objection to the revised Franklin plan.

"We have a complex agreement with Apple," he explained. "It's not peace, but it's not war."

With the ability to run software developed for the Apple II line without facing copyright battles, he noted, "our future is in the Apple universe for the forseeable future." He added, however, that at some point Franklin's plan is to branch out of that arena.

Eagle to trade stock for debts

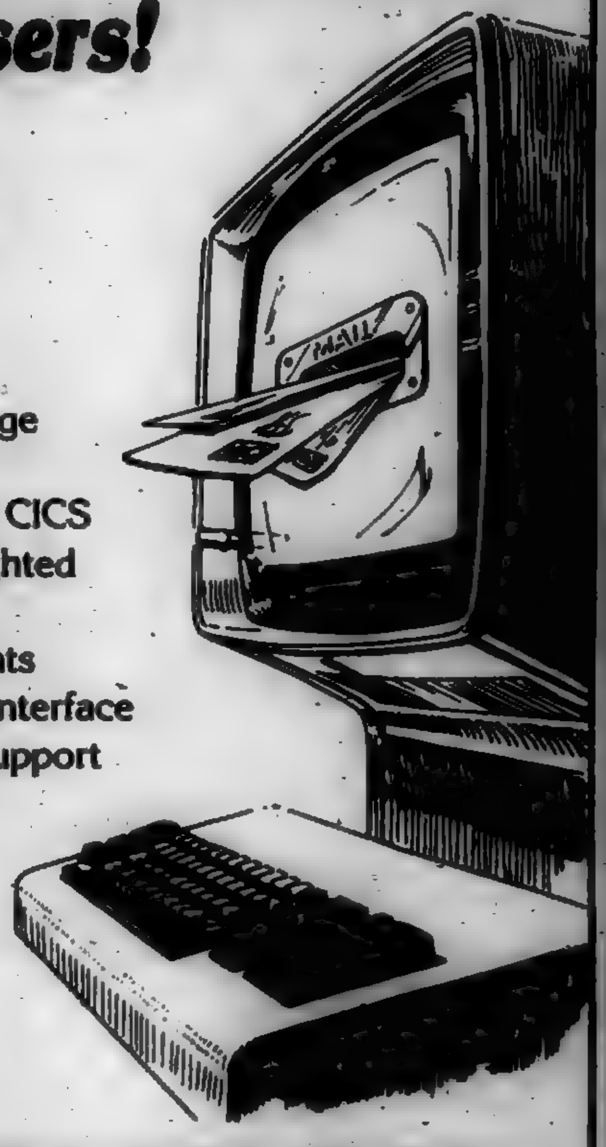
GARDEN GROVE, Calif. — Eagle Computer, Inc. said recently that it has reached agreement with unsecured creditors to exchange stock for about $4.2 million worth of debts, a sum representing about two-thirds of its total trade debt.

Under the terms of the agreement, participating creditors will receive a total of 5.6 million shares of Eagle stock, valued at 75 cents per share.

Gary Kappenheim, Eagle president and chief executive officer, said the agreement "is a major milestone in Eagle's turnaround plan . . . from a balance sheet standpoint, the company is stronger than it has been since mid-1984."

Midway through last year, Eagle stumbled from a highflier among vendors of microcomputers compatible with the IBM Personal Computer to become one of several firms on the verge of extinction.

Eagle's major problem was IBM, which filed a lawsuit alleging copyright infringement of its Basic Input/Output System. Eagle settled the lawsuit by agreeing to develop a noninfringing Bios of its own.



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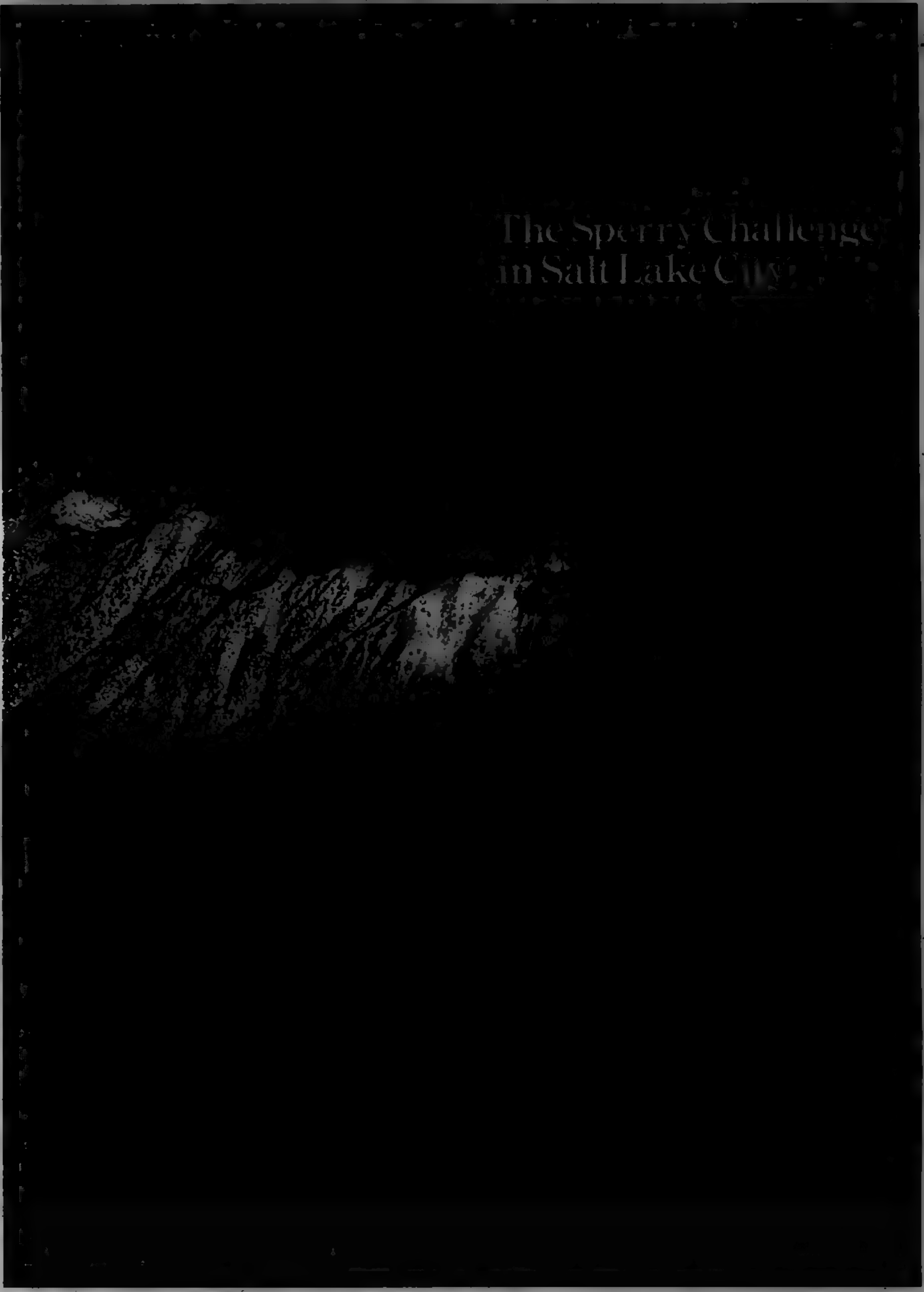

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Our Fortune 100 corporation has immediate career opportunities for MIS Professionals seeking visibility, technical development, and rapid advancement. These positions are available as the result of major expansion and reorganization of the MIS function in response to the corporation's business growth. You will have the opportunity to enjoy working in a dynamic environment utilizing IBM's most current state-of-the-art technology.

Director Systems and Programming	$90K
International Systems Consultant	$55-65K
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Exciting opportunity to work with latest IBM technology, including IBM 38 with 30 terminals and IBM personal computers, plus WANG OIS System. Full range of administrative systems either in place or planning.

IBM 34/38 experience and demonstrated system design work required.

Send resume, including salary requirements, to:

Director of
Administrative Services
Box 40-D
Berklee College of Music
1140 Boylston Street
Boston, MA 02215

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904-725-0667

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Wanted Project Manager to plan and coordinate introduction of new product and to expand market penetration of current products through development, enhancement, current revenue and profitability of individual software products and services. Determines priority and coordinates marketing support activity while maintaining a professional performance level in a high stress environment. Experienced in marketing computer software systems, property and casualty insurance industry, and data processing is necessary. Excellent verbal and written communication skills. Four year college degree in business or insurance. Salary [illegible]. Qualified applicants respond to:

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EOE M/F

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- Programmer Analysts—[illegible]
  COBOL and OS/JCL for IBM 3033 OS/MVS shop with IMS DB/DC
- Systems Programmer—[illegible]
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- Technical Trainers—[illegible]
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For information and immediate response on these and many other positions call or write to:

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Data Processing Division
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If you're looking for career challenge with vast opportunities for growth, SHAPE could be right for you. We're committed to innovative research and development and manufacturing, yet our basic philosophy begins and ends with people...our greatest resource.

Come grow with us.

We have an immediate opening for:

SYSTEMS ANALYST

A position is available for a highly motivated individual to develop and implement a distributed processing network to automate all data acquisition functions for several manufacturing facilities with sales exceeding [illegible]. The work will involve data based management, interfacing to automated production equipment, and implementing a network to best serve SHAPE's rapid growth environment. Applicants should have experience in using and building distributed systems networks.

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Mr. Robert [illegible]
Human Resources Manager
SHAPE Inc.
P.O. Box [illegible]
Biddeford, Maine [illegible]

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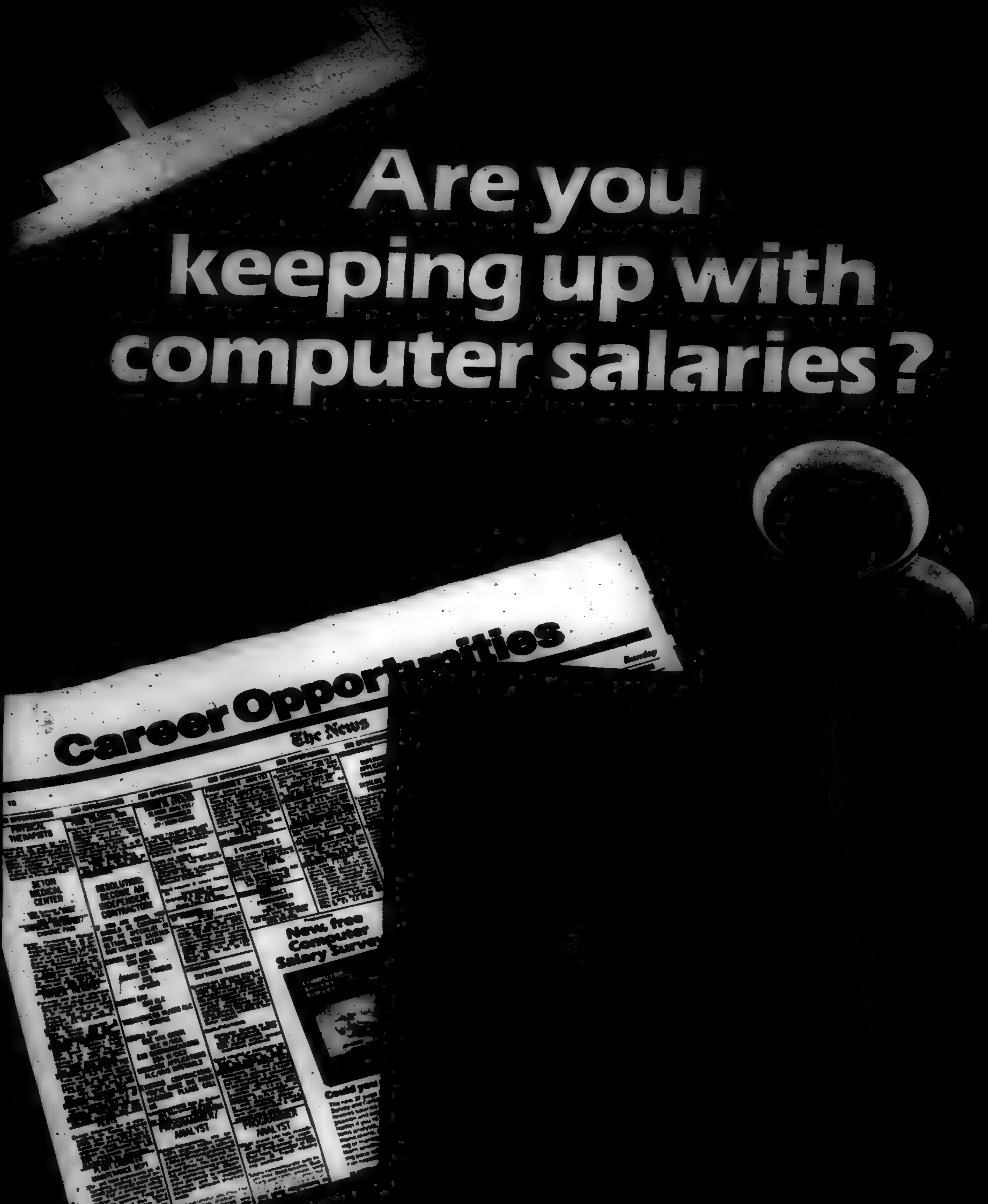
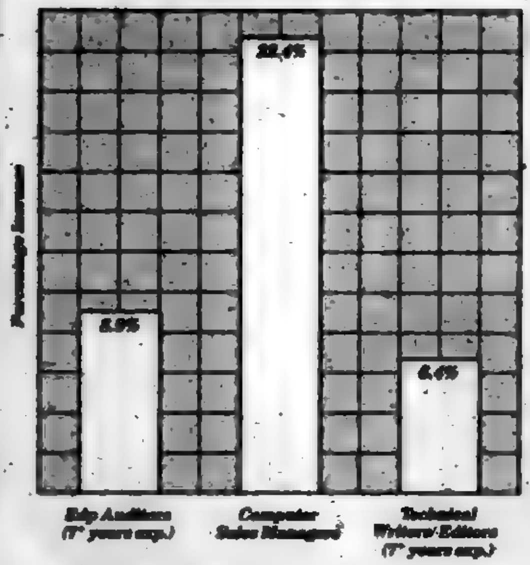
Are you keeping up with computer salaries?


Career Opportunities
The News
New, free Computer Salary Survey
ANALYST
ANALYST

Get the latest data in our new, free 1985 Computer Salary Survey and Career Planning Guide.

With a strong economy and business outlook, salaries for some computer professionals have increased since 1984—by as much as 22%! Are you keeping pace with your peers?

1984 versus 1985
Average Percentage Increases in Compensation
(Selected Experienced Computer Professionals)



Who will get the biggest increases?

- *While our 1985 Computer Salary Survey reviews more than sixty different position and experience levels, there are vast differences in how much some computer professionals earned last year compared to what they can expect to make in 1985.*

Our most comprehensive Survey ever

The new *1985 Computer Salary Survey and Career Planning Guide* is based on contacts with more than 48,000 information processing and computer professionals and 35,000 firms that hire them. Included is a review of salaries at sixty-three different position and experience levels. So no matter if you're in programming, systems analysis, design, software, communications, operations, sales, marketing or management, you'll learn whether or not your salary is keeping pace with your peers—and what you can expect to earn as you advance your career.

A program to help you progress

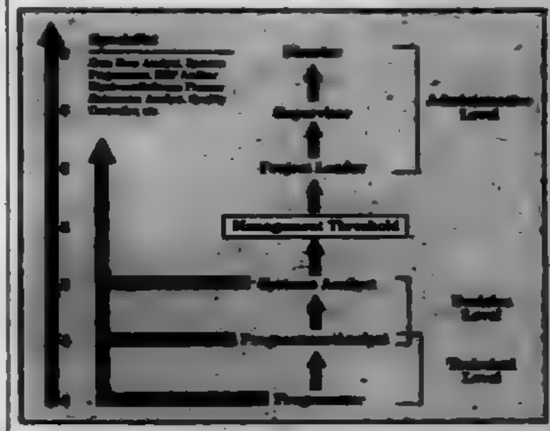
In addition, the new Survey includes a number of comprehensive charts, exhibits and graphs which are designed to help you gain a thorough understanding of emerging industry and career trends and what you could do to capitalize on them. Through documented case studies, you'll also learn why some computer professionals advance while others do not—despite the positive economic outlook.

Included is a seven-step career planning system that can help you assess your current position and take corrective action when and if needed. This is a unique system that Source Edp developed and refined over the last twenty-three years, which has helped thousands of computer professionals advance in their careers.

Free to computer professionals

The new 32-page Survey is available without charge. Since 1966, we have distributed Surveys to more than five hundred thousand computer professionals like you who are determined to realise their fullest career potential.

You owe it to yourself—especially if most of your career lies ahead—to call or write today.



How new trends may affect your career

- *Besides reviewing some of the newer trends in technology—such as CAD/CAM, robotics, communications, networking and more—the new Survey can help you get a clearer picture how to advance both your career and earnings in of computing today. For example, by specialising in narrow areas of expertise, some computer professionals have been able to challenge the traditional salary and career barriers that are normally encountered in many information systems environments, as shown in the chart below. This means they are often able to earn as much or more than those in supervisory or administrative roles.*

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(When writing, please include your title.).

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ACP/TPF SYSTEMS PROGRAMMERS

Responsible for ACP/TPF systems software to include at least 1 or more of the following areas:

- Control program internals (ACP/TPF)
- Communications control program (CCP)
- ACP file support areas
- ACP performance management and tuning
- Utility and test tool program support

Review new ACP/TPF support requirements, design enhancements, and develop necessary modifications. Evaluate new ACP/TPF releases, retrofit TWA developed modifications and install new releases. Programmer to project leader levels will be considered.

ACP/TPF SYSTEMS TRAINER

Responsible for developing new ACP/TPF training courses, refining existing course material, presenting the training course to non ACP/TPF programmers or programmer trainees, and developing assistant instructors for technical training.

TWA has recently implemented a comprehensive program for its data processing department which further demonstrates its commitment to and belief in the computer professional. Some of the key items in the program call for:

- Professional salary grades separate from other employee groups with salary ranges competitive within the industry
- A compensation program which provides for proficiency, merit and promotional increases along with the potential of a salary adjustment based on an annual market salary review
- Formal management and/or technical training
- Emphasis on attendance at industry meetings and professional seminars
- Formal career planning to assist in making education and career decisions
- Work environment conducive to maximum productivity

TWA offers this along with the opportunity to be part of an aggressive software development team which plans to bring TWA's systems software to a high state-of-the-art level. TWA also offers excellent fringe benefits, worldwide travel privileges, and relocation benefits. Qualified and interested candidates are invited to submit their resume to:

TRANS WORLD AIRLINES
Central Employment, Dept. 85001
P.O. Box 20007
Kansas City, Mo. 64195

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TWA

DATA PROCESSING CONTRACT POSITIONS AVAILABLE

PHD Systems, Inc. is a subsidiary of AGS Computers, Inc., a leading national company in the computer services/software industry with annual revenues in excess of $200 million.

For PHD, the future never looked brighter. Because of our present workload and our future assignments, we are currently seeking CONTRACTORS who are experienced PROGRAMMERS, ANALYST/PROGRAMMERS and ANALYSTS with any of the following experience.

IBM MAINFRAMES

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WANG COMPUTERS

COBOL, BASIC, VS, Procedure Language, Utilities

These are "contract assignments" and require a normal working schedule and a commitment of 3 months to 1 year. Locations include Greater Boston, Route 128, Route 495 and New Hampshire areas. Follow on with other challenging assignments very likely. Please call or send resume in confidence to:

PHD

DICK WALSH
PHD SYSTEMS, INC.
12 Lakeside Office Park
Wakefield, Mass. 01880
(617) 245-3013

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P/A's, IDMS, ADS-0	to $40K

Send C. Tillinghast your resume (confidential is ok) or call (305) [illegible].

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Director of Computer Services

Cleveland State University invites applications and nominations for a Director of Computer Services. The Director attends to all the academic, research and administrative computer needs of the University Community and reports directly to the Provost. The Computer Center is responsible for maintaining facilities which include an IBM 3081D, IBM 370/158, a network of several hundred terminals, and a distributed network consisting of Vax based superminicomputers and an assortment of microcomputers. The Director will be expected to communicate and work effectively with administrators and faculty, and manage a staff which presently numbers approximately forty full-time staff plus student part-time employees.

Qualifications: Candidates must have appropriate academic background; sufficient knowledge of the technical aspects of the field to be able to make sensible decisions about the acquisition of equipment and software, and the ability to articulate these clearly to non-technical administrators and faculty; demonstrated managerial experience, preferably within an academic organization; and ability to maintain a harmonious relationship with subordinates. Salary is fully competitive and based upon qualifications.

Cleveland State University has a student body of 19,000 in Colleges of Arts and Sciences, Business, Education, Engineering, Law and Urban Affairs. The University operates on the quarter system.

Please send applications, including curriculum vitae and the names of three references by March 15, 1985, to: Dr. Barbara Green, Vice Provost, CLEVELAND STATE UNIVERSITY, 1983 E. 24th. Street, Cleveland, Ohio 44115. An equal opportunity employer, m/f/h.

CSU Cleveland State University

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This opportunity in Bristol-Myers Pharmaceutical Research & Development offers unique challenges to support statisticians as well as basic and clinical research scientists. You'll develop and maintain programs which generate statistical analyses, tables and/or graphs using SAS or other statistical computing languages. You can qualify if you have a Bachelor's degree which combines courses in computer science with mathematics, chemistry, or biology. SAS and scientific programming experience is desirable.

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This unit of Bristol-Myers is located at Mead Johnson in Evansville, Indiana, a community of beautiful residential areas, outstanding recreational opportunities, exceptional education and cultural facilities, and more. This position will be relocated to a delightful community in the New Haven, Connecticut area in a few years.

To investigate these reasons for joining Bristol-Myers Research is to discover a wealth of others: Excellent salaries, superb benefits including paid relocation, and real growth, both personal and professional. Discover us! When it comes to your career, no one can offer more!

Send resume in confidence to: Employment Department 6L32, Bristol-Myers Research Recruitment, Mead Johnson & Company, 2404 W. Pennsylvania, Evansville, IN 47721-0001.

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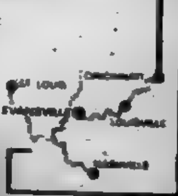

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DRAVO ENGINEERS, INC. is a large technology oriented engineer constructor of process plant facilities. Our market in automated process control consists of industrial process control systems, factory automation systems, communications networks, management information systems, artificial intelligence, expert systems, microprocessor-based workstations and distributed processing.

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As a project manager, you will have overall responsibility for major automated process control systems projects. You will develop project plans for real-time control and plant management systems, manage the efforts of ten to twenty talented systems professionals and direct projects through to completion. These positions require a B.S. in computer science or electrical engineering and six to ten years of experience in the development of real-time control systems including substantial management and client interface experience.

SYSTEMS ANALYSTS

As a systems analyst, you will perform system design, programming and testing for automated process control systems. You will write functional and performance specifications, design systems, develop programs and participate in systems startups. These positions require a B.S. in computer science or electrical engineering and three to five years of real-time control experience.

HARDWARE/SOFTWARE

Previous work with DEC computers using RSX 11M and VAX VMS is important experience for both types of positions.

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Our headquarters, including our state-of-the-art control systems staging area, are located in Pittsburgh's Golden Triangle. This is a renewed river front city with emphasis on family living and excellent elementary, secondary and college educational opportunities.

These positions offer high visibility, a degree of autonomy and competitive salaries. We also provide excellent benefits and a supportive work environment. For immediate confidential consideration, please send your resume and salary history in complete confidence, or call 412/566-4650 for additional information.

Jeff Latterell

DRAVO ENGINEERS, INC.
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An Equal Opportunity Employer M/F/H/V

DATA PROCESSING PROFESSIONALS

UNIVAC 1100

TNT PILOT is a growing subsidiary of Thomas Nationwide Transport, an international billion-dollar transportation company. The MIS Department is a progressive group dedicated to the development and support of state-of-the-art EDP applications. The continuing growth of this department has created the following openings in our Winston-Salem, North Carolina corporate headquarters.

DATA BASE ANALYST

Position requires a minimum of 3 years experience in COBOL, TIP, DMS-1100, Design and support functions. A 4 year degree in Computer Science or related field and exposure to DPS, SSG, QLP and Plus are preferred.

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Positions require a minimum 1 year experience for Programmer and 3 years experience for Programmer Analysts in programming on UNIVAC 1100, COBOL, DMS-1100. A 4 year degree in Computer Science or related field and familiarity with QLP, DPS and MAPPER are preferred.

TECHNICAL WRITER

Position requires a minimum of 3 years experience in the preparation of system documentation, procedure manuals and training aids. A basic understanding of Data Processing concepts is required. A degree in Technical Communications or related field is required.

You will like living in Winston-Salem, a diverse city offering prosperity and quality of life. Culture, recreation, climate and excellent schools are among the many advantages that have won Winston-Salem national recognition.

These outstanding career opportunities offer competitive salaries and comprehensive benefits package. Qualified individuals please submit resume, including salary history and requirements, to:

TNT PILOT
Employment Manager
P.O. Box 27153, Winston-Salem, NC 27153-0000
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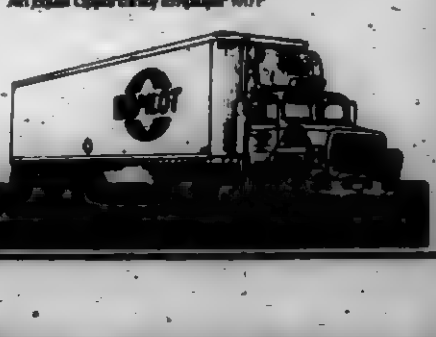

Programming

[illegible]

At **Burroughs System Products Group in Pasadena**, our Software professionals are contributing to the most sophisticated development programs in the industry. Advance your career in a creative environment where your achievements have high visibility and are recognized with progressive compensation. We are looking for experienced professionals with a BS/MS degree in Computer Science to contribute in the following areas:

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Dr. David A. [illegible], Chairman, Department of Computer Science
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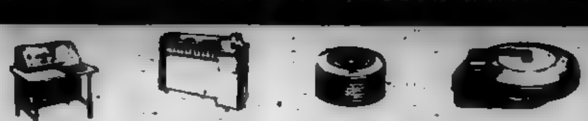

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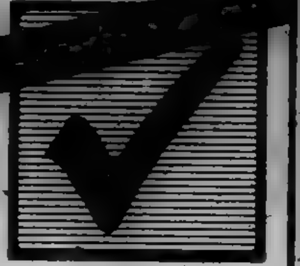

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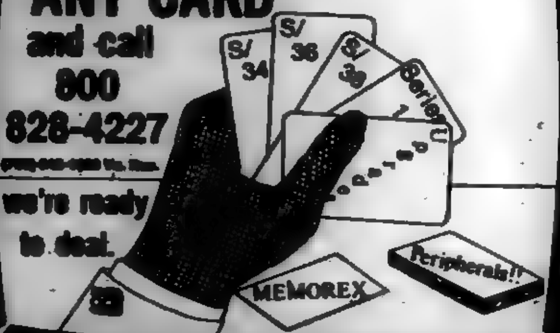

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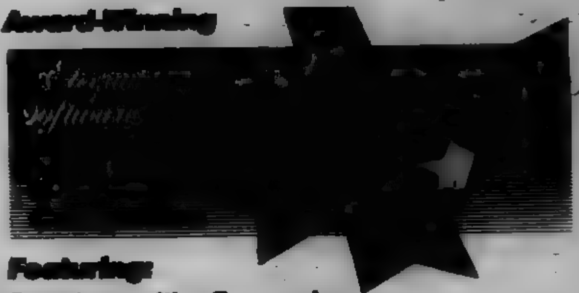

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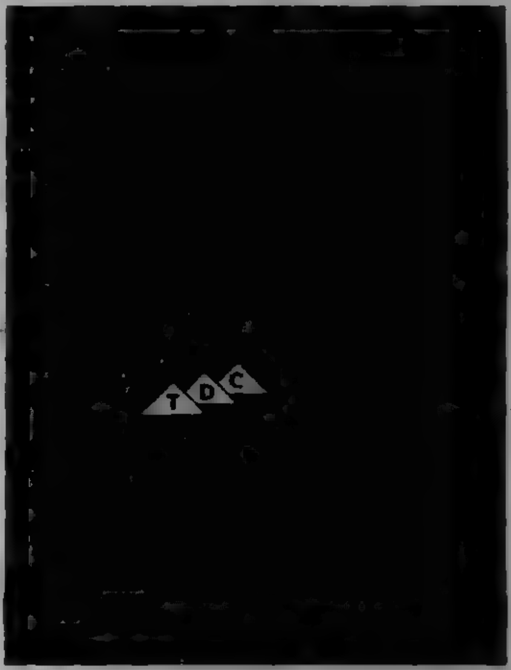

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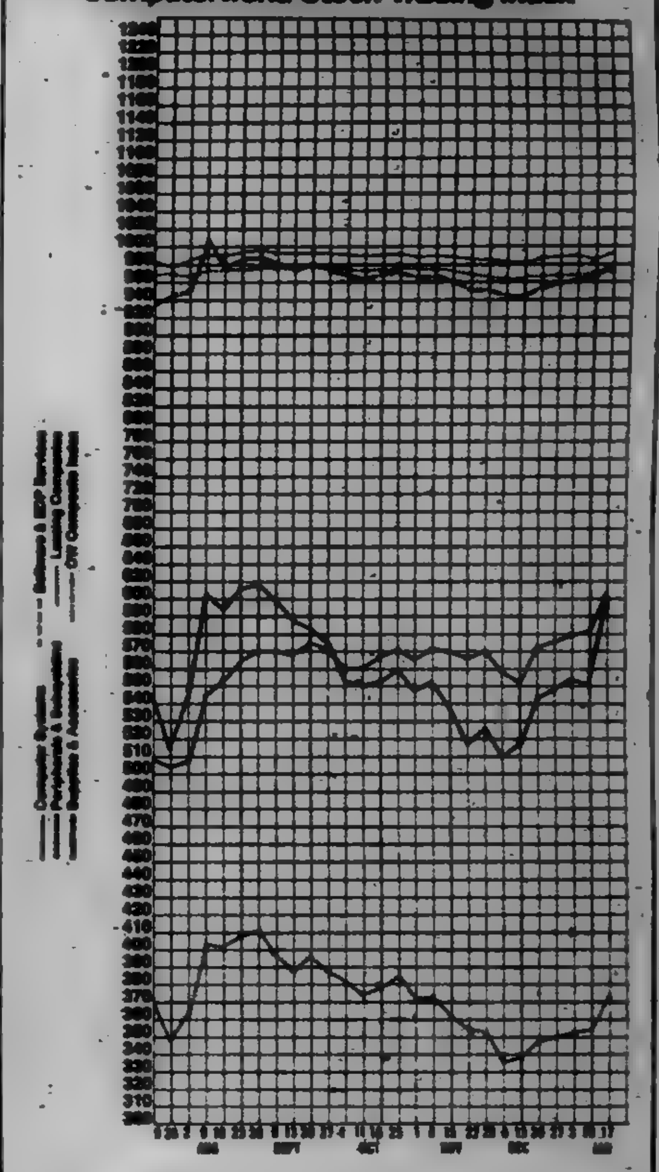

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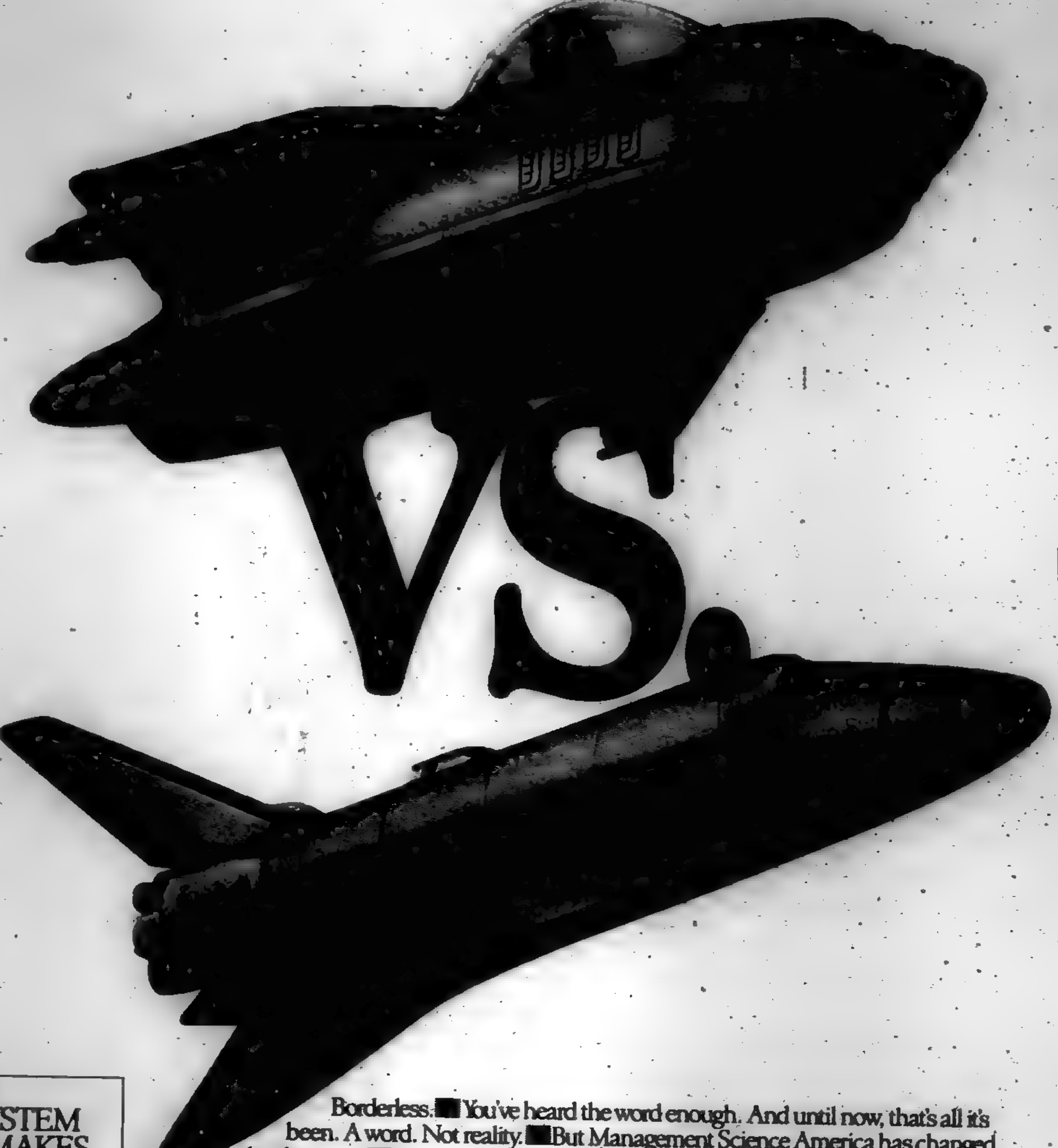

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In Depth
Flat panels: A new face for terminals
ID/11

Strategy helps bank tackle graphics boom

Production, training key to DP division's efforts to deal with user demand

By David Olmos
CW Staff

LOS ANGELES — With users beating down the door for computer-generated graphics, managers at Security Pacific Automation Co. are focusing on two concerns — production and training — in an effort to enhance graphics use within the organization.

"It's almost a chicken-and-egg situation," explained Jan Schwartz, an assistant vice-president of the information center at Security Pacific. "You need to have the facilities to produce graphics, but you also need to know how to do it. You can't have one without the other."

Security Pacific is a division of Security Pacific National Bank, the nation's eighth largest bank, with headquarters here. Last September, the bank's DP group was spun off as a separate division and named Security Pacific Automation. The new division continues to serve the DP needs of the bank but also hopes to market its services to outside financial institutions.

As elsewhere throughout corporate America, the growth of graphics at Security Pacific has closely followed the proliferation of microcomputers.

In a recent interview here, Security Pacific managers said they placed a microcomputer atop the desk of bank President George Moody three years ago, and he has

See **GRAPHICS** page 8

Prime unveils supermini

Unit bests 9950's performance by average of 60%; Series 50 users offered IBM SNA compatibility

By Donna Raimondi
CW Staff

NATICK, Mass. — Prime Computer, Inc. has become the first major superminicomputer vendor to counter Digital Equipment Corp.'s VAX 8600 processor announced in early November. Prime last week unveiled the 9955, which supersedes its older 9950 processor and costs roughly 7% less than the older machine.

The 9955 is said to offer an average of 30% to 60% — and up to 90% in certain applications — more performance than the 9950. Prime claims the new processor yields approximately the same performance as DEC's 8600.

In announcing the 9955, Prime also fulfilled a two-year-old promise to provide users of its Series 50 superminis with IBM Systems Network Architecture compatibility. The firm also announced Prime/SNA, three separately priced communications software packages said to allow Prime users to coexist with SNA environments, and the PT200 CRT terminal, designed to take advantage of the newly announced SNA capabilities and offer optional graphics functions (see story page 7).

The bulk of the 32-bit 9955's added performance comes from a combination of expanded cache memory and faster emitter-coupled logic circuitry. Prime expanded the earlier 16K-byte cache memory capacity on the 9950 to 64K bytes on the 9955.

The newly announced model offers the same main memory capacity as the 9950 — 4M to 16M bytes —, and uses the same 80-nsec CPU cycle time. Available immediately, the 9955 uses Prime's Primos Revision 19.4 operating system, which supports the SNA compatibility and new features of the instruction set. The system is said to be fully compatible with other

See **PRIME** page 6

TOP OF THE NEWS

Going up? AT&T filed for a $260 million annual rate increase that would affect large-volume users first and foremost. **Page 2.**

■

Britton Lee, Inc. rolled out three data base machines capable of handling multi-gigabyte data bases. **Page 4.**

■

Plunging into the crowded office automation market, Apple Computer, Inc. unveiled a series of products based on its Macintosh micro. Analysts, meanwhile, said they feel Apple still has a way to go before it can compete with the OA leaders. **Page 15.**

■

Control Data Corp. expanded its Cyber system's memory with three processor models. CDC also added a streaming tape subsystem to its Certainty family of IBM Series/1-compatible peripherals. **Page 59.**

■

Engineering relief. Users who have endured slow response times from minicomputer-based CAD systems will welcome the expected arrival of low-cost CAD systems based on the IBM Personal Computers XT and AT. **Page 65.**

FYI

'Spaghetti code' glut spawns program restructuring services

By Paul Gillin
CW Staff

Some people call it "spaghetti code."

You might call it your payroll system.

Whatever its name, you are talking about an old, unstructured program, probably written in Cobol between 10 and 20 years ago. Over time, it has been patched to the point that the logic is unintelligible. A single change to the code could add hundreds of new paths to the program. And finding a bug could simply be a lost cause.

There are thousands of programs like this in use today. In many cases, they are the backbone of a firm's operations. As a result, DP shops hesitate to make any substantive changes to or rewrites of the programs, despite the availability of structured techniques that improve program readability and reliability.

But an alternative is now emerging: services that take old, patchwork programs and rewrite them into new structured code. The services do not promise to eliminate bugs that already exist. In fact, the code they produce is intended to perform exactly as the old program performed. But because the programs are struc-

See **CODE** page 10

CW photo by J. Gallant

Big dealings in Big D

Dallas played host to a Texas-size computer industry get-together last week featuring the opening of Infomart, the first permanent high-tech exhibition/market facility, and the 1985 Uniforum International Conference of Unix Users. See stories pages 11-14.

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NEWSPAPER

AT&T asks $260 million, 8.6% rate hike on private lines

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — AT&T is seeking an average 8.6% rate increase for its private-line customers through a rate restructuring that will raise rates for voice-grade service but drop them substantially for T1 facilities and large-volume communications users. The proposed rate increases total about $260 million in additional charges annually.

AT&T filed the proposed tariff changes Jan. 18 with the Federal Communications Commission and asked to have them take effect March 4. AT&T said in the tariff filing the "effect [of the increase] on individual customer groups will vary depending upon the particular mix of services they use." AT&T is seeking to unbundle its rates to reflect both the charges AT&T pays the local phone companies for local interconnect and, separately, the long-distance costs accruing to AT&T. Such an unbundling would give large-volume users more detailed information on the cost of local access that they could use to assess bypass possibilities.

"The tariffs make a distinction between the AT&T interoffice networks and access to that network. . . . The access-based elements are separated from the interoffice elements. The access rates reflect the rates in the [local] exehange carriers access tariffs, while the rates for interoffice components are based on AT&T's costs," the company said in its filing.

The private-line rate restructuring will affect different categories of private-line service such as voice-grade, where costs would rise an average of 11%; Dataphone Digital Service (2.4K to 56K bit/sec), where costs would increase an average of 30%; and Accunet T1.5 service, where costs would be reduced an average of 9% to 13%. Group and Supergroup services, the equivalent of 60 voice-grade channels, would realize an average cut of 7% to 60%, and wideband services would face an average increase of 22%, AT&T said in the filing.

The rate restructuring splits the rate elements of AT&T's private-line service into three tariffs.

- Tariff No. 9 contains the rates and regulations for service provided among AT&T central offices, central office functions, channel options and the type of customer connection to the central office.
- Tariff No. 10 contains the mileage band rates for private-line service between central offices.
- Tariff No. 11 contains the rates and regulations for AT&T-provided private-line local channels for local distribution of traffic.

As an illustration of the new structure, AT&T noted, "The tariffs do not have interconnection restrictions. Customers can obtain end-to-end services from AT&T by ordering local channels from Tariff No. 11 and for connections to interoffice services from Tariff No. 9. When customers choose to order service components that way, they will be able to continue to obtain a total service whereby AT&T assumes full responsibility for all functions and end-to-end service.

"Customers will also be able to secure access independently for use with AT&T services and will have the further flexibility of having AT&T provide either access coordinating functions or only a basic connection," the filing added.

AT&T PROPOSED PRIVATE-LINE SERVICE RATES

	Central Office Connection				
Class	Installation	Monthly	Interoffice Channel	Local Channel	Installation
Voice-Grade					
A	[illegible]	[illegible]	[illegible]	[illegible] to $121.12	[illegible]
B	$ 78	$ 20			
C	$ 76	[illegible]			
DDS* 2.4K to 4.8K bit/sec					
A	$358	$ 62	$75.25 to $300.25	$174.58 to $205.89	$358
B	$148	$ 35			
C	$296	$202			
DDS* 56K bit/sec					
A	[illegible]	$ 77	[illegible]	[illegible]	[illegible]
B	$224	$ 59			
C	[illegible]	[illegible]			
Accunet T1.5					
A	$500	$ 81	$400 to $1,400	[illegible] to $586.21	$800
B	$300	$ 60			
C	$300	$ 60			
Wideband/Group/Supergroup					
A	$140	$ 40	$160 to [illegible]	Local channel costs from local exchange	
B	$100	$ 27			
C	$100	$ 27			

* Dataphone Digital Service

CW CHART

IBM stripped of contract

WASHINGTON, D.C. — The U.S. Immigration and Naturalization Service has transferred a major portion of a $99.5 million computer contract from IBM to Electronic Data Systems Corp. (EDS) as the result of allegations that a secret, late-night meeting between IBM and agency officials gave IBM an edge in its bidding battle with EDS last May.

In an out-of-court settlement, the agency agreed to give EDS, now a subsidiary of General Motors Corp., $91.5 million of the contract that was awarded last summer to IBM, an agency spokesman said last week.

EDS, which won a preliminary court injunction blocking the IBM contract, charged the agency with "bias and favoritism" after it learned that a May 10 "closed-door, after-hours meeting" was held and that IBM subsequently reduced its final bid by $3.3 million, thus undercutting the EDS bid by $2,713 [CW, July 16].

A spokesman for the immigration agency, denying that the meeting was improper, said the agency officials informed IBM that it had mistakenly read the bid solicitation document as requiring 12,000 computer terminals rather than the 8,500 actually needed. The spokesman added that EDS will have to buy the computer hardware from IBM.

Drop a dime

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your firm? Know any unsung heroes? Heard any hot vendor news?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor. We can't be everywhere — but our readers are.

CORRECTIONS

In the Dec. 31/Jan. 7 Forecast issue, "Qualified programmers, analysts difficult to find" incorrectly identified Atlantic Aviation Corp. of Wilmington, Del., as General Aviation Sales and Service.

A Dec. 17 *Computerworld* report on a legal battle in which IBM is charging NCR Comten, Inc. — an NCR Corp. subsidiary — with copyright infringement incorrectly stated the main issue as the disclosure to IBM of an NCR Comten program by Evergreen Consulting, Inc. NCR Comten withdrew in 1983 a breach of agreement suit against Evergreen; currently pending is a separate suit by Evergreen charging NCR Comten with defamation, trade libel and other actions.

NEWS SUMMARY

SPECIAL REPORT
Applications packages
Follows ID/16

Britton Lee, Inc. introduced three turnkey data base machines designed for a variety of applications and capable of handling multigigabyte data bases/**4**

Software AG of North America, Inc. has announced a front end to its Natural applications development language that allows nontechnical users to write Natural programs/**4**

Prime's 9955 superminicomputer was given positive reviews by industry analysts/**6**

A large California bank that has been beta testing a new graphics tool for IBM mainframe users has given the product a favorable review/**8**

CW at Uniforum: AT&T Unix's greatest strengths are also its greatest weaknesses, according to users . . . Enhancements led the parade of small-systems product announcements . . . In the large-systems arena, enhancements were also foremost . . . What does the future hold for Unix? A variety of industry watchers gave their answers/**11-14**

Apple Computer, Inc.'s recent announcement of the Macintosh Office also revealed Apple's plans to discontinue all but one model of the Lisa line/**15**

Industry watchers believe that the Macintosh Office will help Apple establish a beachhead in the IBM-dominated corporate marketplace/**16**

A former DP official at the Social Security Administration was found guilty of bribery/**17**

Corporate information executives will be stalking the rare programmer and systems analyst in 1985, a recent Data Processing Management Association survey indicated/**18**

The University of Colorado has released its annual bibliography of computer-related books/**19**

Next year, incoming foreign banks will strip Australian financial institutions of their DP staff, forcing an increase in salaries, according to an Australian firm's DP salary survey/**26**

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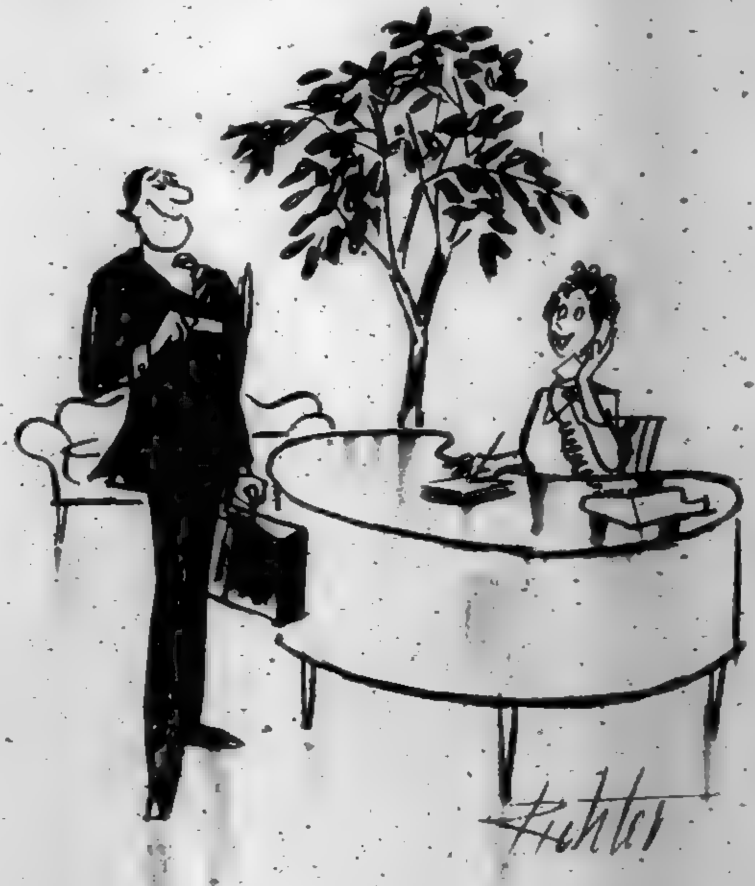

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Britton Lee unwraps trio of data base machines

LOS GATOS, Calif. — Britton Lee, Inc. has broadly extended its line of turnkey data base machines with the addition of three models capable of handling multigigabyte data bases.

Britton Lee's Intelligent Database Machine (IDM) 500 series consists of three systems — the IDM 500E, 500X and 500XL. The systems are based around Britton Lee's IDM 500, a specialized multiprocessor computer designed to execute the relational data base management system (DBMS) model. IDM operates in a multihost environment allowing a variety of host systems to communicate with IDM via host-interface modules.

The most powerful of the three turnkey systems announced by Britton Lee is the 500XL. More than 400 users can access the system's more than 1G byte of Winchester disk capacity. The 500XL comes with 2M bytes of random-access memory (RAM).

The spokeswoman said that an 8 million instructions per pecond (Mips) accelerator is included for applications that require repetitive data base operations. The accelerator is said to improve system performance as much as 10 times. A 500M-byte cartridge tape drive can be used for archiving and for host-independent tape backup and, as with the 500X, the 500XL allows for the flexible configuration of any mix of serial I/O, IEEE-488, parallel, Ethernet local-area network or IBM block multiplexer interfaces. The 500XL costs $154,900.

The IDM 500E is described as an entry-level data base machine. It features a high-speed, eight-channel serial I/O that allows up to eight different hosts and 90 users to access a common data pool simultaneously. Bundled with the 500E is 1M byte of RAM and a dedicated 160M-byte disk drive that allows access to the data base without consuming processing resources from the host computer.

An Ethernet interface option enables additional users to access the data base, and a 300M-byte cartridge tape drive can be used for data backup. An expansion slot allows the 500E to be configured to RS-232, IEEE-488 or Ethernet host interfaces. The 500E is priced at $56,900.

The 500X reportedly allows 250 users to access data bases simultaneously that can be stored in the system's 320M bytes of Winchester disk capacity, capable of being expanded to more than 10G bytes.

The 500X is priced at $98,900.

Britton Lee is located at 14600 Winchester Blvd., Los Gatos, Calif. 95030.

Option simplifies Natural language for nontechnical users

RESTON, Va. — Software AG of North America, Inc. last week announced a front end to its Natural application development language that allows nontechnical users to write Natural programs using a series of menus and prompts.

Super Natural generates Natural code but can be learned in a few hours, a company spokesman said. The product uses a series of screens to prompt users through the process of defining data and processes and designing reports. The menu-driven, prompted interface can be bypassed by more experienced users who would rather develop queries in Natural. In addition, users have access to public or private libraries to retrieve, store and modify transactions.

Super Natural also provides a production reporting capability whereby inquiries can be loaded into a production job stream, the spokesman said. Control and security options are provided, with access defined by the system administrator. Multiple output options let users view information from a terminal or micro in either text or chart/graph format.

User-defined files allow users to create files from existing reports or user-entered data, Software AG said. Data integrity, backup and restart/recovery options are included along with multiple file access. Flexible operations provide users with tailored report formats and creation of data fields for calculations.

Super Natural will be marketed as an extension to the company's Adabas data base management system, Natural and Com-Plete, a teleprocessing monitor. The Super Natural option will be available in April at prices of $15,000 for IBM's DOS/VSE operating system, $20,000 for IBM's VM/CMS or OS/VS1 and $25,000 for IBM's MVS and MVS/XA.

Software AG is located at 11800 Sunrise Valley Drive, Reston, Va. 22091.

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Special Report to target micros

The explosive use of microcomputers in corporate America has not been without its problems. The April Special Report on micros in big business will look at both the benefits of microcomputer use in the corporation and the headaches that can sometimes result.

The Special Report will focus on DP/MIS management strategies for integrating micros into the corporate information system, trends in business-related microcomputer hardware and software and the security risks involved in widespread microcomputer use.

Contributions should be tutorial articles discussing an issue or trend or application stories outlining a particular user firm's data base management system experience.

Articles must be typed, double-spaced and range in length from four to six pages. Artwork, such as charts, graphs and photographs, is welcome. Authors should include brief biographies and telephone numbers.

The deadline for submissions to the Special Report is March 5. Contact Janet Fiderio, Special Report Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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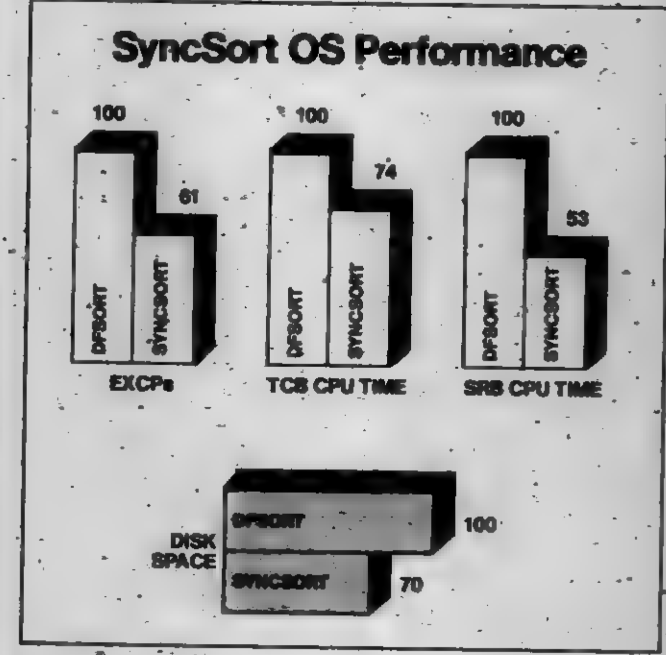

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Prime's 9955 seen direct challenge to DEC's VAX 8600

By Tom Henkel
CW Staff

Prime Computer, Inc. scored several victories last week with its newly announced high-end 9955 superminicomputer. Not only did the company prove it could quickly react to Digital Equipment Corp.'s recently announced high-end VAX 8600 processor, it did so with a competitively priced system that does not require significant technological changes to the existing Prime supermini architecture.

Some industry watchers said they believe the attractive price coupled with the proven technology used in the 9955 may give Prime a slight edge in the developing high-end superminicomputer marketplace.

The 9955 is the most agressively priced system Prime has ever introduced. Peter Lowber, an analyst with the Boston-based Yankee Group market research firm, said Prime's traditional marketing strategy has been to "offer a Cadillac engine and not worry about the price." Now, Lowber said, the 9955, with a purchase price that factors down to roughly $80,000 per millions of instructions per second, may be low enough to entice new users to the Prime fold.

But Lowber was quick to note that by unveiling an attractively priced member of its product line, Prime may have put itself into a catch-22 situation. Lowber explained that Prime will now have to restructure the pricing on the rest of the Series 50 line and may forever give up the relatively high profit margins that have kept the company financially secure in past years. For example, Lowber noted that Prime is not going to turn high profits on the $45,000 upgrade charge to convert older 9950 systems to the 9955 configuration.

By enhancing the performance of its existing processor technology, Prime has been able to get a jump on DEC. The 8600, announced in November [CW, Nov. 5], will not be available until April. Some industry watchers said they believe it will be at least mid-summer before DEC makes volume shipments of the 8600.

"The best thing about [the 9955] is that it is available," noted Dave Moschella, an industry analyst with International Data Corp. in Framingham, Mass. Because it is basically an enhanced version of the 9950, Moschella added, "that means it will probably work." He explained, "The jury is still out on the Venus [the code name for the 8600]" because the system employs a different technology from earlier VAX series systems.

One thing Prime's 9955 does not clear up is the company's strategy in the low-end marketplace. Lowber noted that most companies that compete heavily with Prime in the superminicomputer market, such as DEC and Data General Corp., have unveiled low-end microcomputer products to round out their product lines. So far, Prime has not addressed the low-end market, Lowber said.

While the 9955 fails to clear up all the questions about Prime's future strategy, the announcement clearly sets the stage for what many analysts believe will be a high-end supermini sweepstakes during the next few months. Now, Lowber said, the pressure is on DG to match or to exceed both DEC's and Prime's newly announced products. Other vendors in the supermini marketplace are expected to follow suit.

PRIME

from page 1

members of the 50 series. Current users of the 9950 can field-upgrade to the 9955 configuration for $45,000 after April 1. Users of smaller 50 series processors can also migrate to the 9955 for between $177,000 and $327,000, the vendor said.

The 9955, like the older 9950 and 9750 processors, features a five-stage pipelined architecture that provides overlapped instruction execution and allows five instructions to be in some stage of execution concurrently.

This design reportedly permits overlap of cache access, instruction decode, effective address formation, virtual memory mapping and instruction execution. The system 9955 supports up to 254 directly connected terminals and also supports up to 10G bytes of storage.

Expandable main memory

The new system's main memory is expandable from the basic 4M bytes to 16M bytes in 2M-byte increments. The main memory features high-density, 64K-byte MOS semiconductors. Memory array boards interface to a memory controller — considered part of the CPU — that performs all common timing and error checking and correction functions for the memory. The new system provides soft error recovery, enabling the CPU to detect parity errors in the cache and reload from main memory.

A 64K-byte cache memory is said to have a 40-nsec access time, and by providing the CPU with the required instructions more than 98% of the time, it has a 58-nsec effective main memory access time, the vendor said. The 9955 is also said to feature four times the branch cache capacity of the Prime 9950.

The 9955 instruction set is a compatible superset of the standard Prime 50 series instruction set. User programs written for any Prime system can run on the system 9955 without data conversion or relinking, the vendor said.

According to the vendor, a major feature of the newly announced instruction set is quad-precision floating point in which the mantissa has been expanded to 96 bits from the 48 bits available with double-precision floating point.

Prime's Fortran compiler, F77, has been enhanced to support quad-precision floating point. Any Prime 50 series system can emulate quad-precision floating point by automatic invocation of software routines. The floating-point acceleration hardware enables the 9955 to perform multiplications in less than one-half the time required by the 9950, the vendor said.

Ring network option

For local-area networks, the 9955 can be attached in a high-speed Prime Ringnet network with any other 50 series system. The ring provides intersystem communications via a coaxial cable or fiber optics for systems using Primenet software and a Primenet node controller.

The 9955 supports all Prime communications hardware controllers and most popular communications protocols including IBM's binary synchronous and X.25 packet-switching networks.

The 9955 — which uses the same cabinet as the 9950 — has a five-board CPU, which is said to require less electricity and air conditioning than the 17-board DEC VAX 8600.

The vendor said the price of the Prime 9955 processor and 4M bytes of main memory is $321,000. The price of a typically configured system — including a 9955 processor with a 4M-byte main memory, two 315M-byte fixed media disks with one controller, a streaming magnetic tape subsystem, one peripheral cabinet and a CRT console — is $371,000.

Prime is located at Prime Park, Natick, Mass. 10760.

PRIME COMPUTER, INC.

System	Series 50 9650	Series 50 9750	Series 50 9955
Relative Performance[1]	52	101	229
Mips[2]	.9	1.75	4
Memory size in bytes (Minimum-Maximum)	2M-8M	4M-12M	4M-16M
Purchase Price[3] (Memory Size)	$145,500 (2M)	$250,500 (4M)	$371,000 (4M)
Lease Price (Lease Term)	$3,419 (5 Year)	$5,885 (5 Year)	Not Available
Machine Cycle Time (Nsec)	160	100	80
Channels (Minimum-Maximum)	1-10	1-10	1-14
Cache (Buffer) size	16K	16K	64K
Bus Architecture?	No	No	No
Price per 1M byte[4] of main memory	$10,500	$7,550	$7,550

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers do not constitute a buyer's guide.
2. Vendor claims.
3. Purchase price includes central processor, diagnostic processor, cabinet, chassis, Primos operating system and minimum disk/tape configuration.
4. Purchase price for add-on memory.

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Prime VDT, software give IBM mainframe link via SNA

By Tom Henkel
CW Staff

NATICK, Mass. — In addition to announcing the high-end 9955 superminicomputer last week, Prime Computer, Inc. also unveiled a CRT terminal and communications software that allow users of Prime superminis to communicate with IBM mainframes via IBM's Systems Network Architecture (SNA).

Collectively called Prime/SNA, the communications products can reportedly be run on any Prime Series 50 system and consist of three separately priced parts: the Prime/SNA Interactive Subsystem, the Prime/SNA Remote Job Entry (RJE) Subsystem and the Prime/SNA Server Subsystem. The communications products are said to allow users to communicate with IBM host processors while maintaining compatibility with Prime data communications software.

The Prime/SNA Interactive Subsystem is said to provide a subset of the SNA capabilities offered by IBM's 3274 control unit, 3278 terminal and 3287 and 3289 printers.

The availability of these features, Prime said, means that users of the newly announced Prime PT200 CRT terminal can access IBM host processors and applications as though they were using an IBM 3278 terminal.

SNA, Primos switch

Furthermore, Prime claimed that its software allows users to switch back and forth between IBM SNA applications and those running under Prime's Primos operating system. A session suspension and recovery feature is said to allow the user to temporarily interrupt work on an IBM application, return to the Primos environment to run an application and then resume processing the IBM application. According to Prime, users can suspend work on up to three IBM applications without disconnecting from the IBM host.

The Interactive Subsystem costs $5,500 plus a $65 monthly maintenance fee, the vendor said.

The Prime/SNA RJE Subsystem allows Prime users to emulate an IBM 3776 Model 3 RJE workstation in an SNA network. A multiple logical unit feature allows multiple data streams to flow simultaneously between a Prime system and an SNA host over dedicated or shared lines. When used with Prime's networking product Primenet, multiple systems connected via Primenet can send data to and receive information from an IBM host using the RJE Subsystem, a Prime spokesman said.

The package costs $5,500 plus a monthly $65 maintenance fee, the vendor said.

Prime/SNA Server Subsystem

The Prime/SNA Server Subsystem supports both the interactive and RJE subsystems by providing the capabilities of an SNA Physical Unit Type 2 secondary IBM Synchronous Data Link Control (SDLC) station. The Server Subsystem executes within the Prime host processor as well as within Prime's Intelligent Communications Subsystem Model 2 (ICS2) communications processor, which can be enhanced to support binary synchronous communications for $3,400.

The host-based portion of the package provides the common SNA interface for Prime/SNA Interactive and RJE subsystems. The ICS2-based portion provides the SDLC interface to SNA. The Server Subsystem is capable of supporting multiple simultaneous sessions over multiple SDLC links.

The subsystem costs $6,000 and carries a $105 monthly maintenance fee.

The Server and Interactive subsystems will be available in April; the RJE subsystem will be available in the fourth quarter, a spokeswoman said.

Prime said its communications software currently supports IBM's MVS/SP operating system, ACF/Vtam, ACF/Network Control Program/VS, Network Communications Control Facility, Network Problem Determination Application, CICS/OS/VS and TSO-ISPF/PDF.

Support for Prime/SNA

Also announced was the Performer Terminal 200 (PT200). Said to provide built-in support for the Prime/SNA communications products, the asynchronous terminal reportedly costs 20% less than its predecessor, the PST100.

The PT200 offers users a combination of four display formats, a choice of amber, green or black-and-white screens and a keyboard available in nine language options. An eight-color monitor and a graphics board are available as options.

The PT200 terminal is compatible with Prime's OAS office automation product as well as with all 50 series software. The basic terminal costs $995 and is available immediately, according to the vendor. A terminal equipped with an optional color monitor costs $1,695 and will be available in June. An optional graphics card, which offers a 720- by 300-pixel screen resolution and support for Tektronix, Inc. 4010 and 4014 standards, costs $995 and will be available in April.

Prime is located at Prime Park, Natick, Mass. 01760.

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RECOVERY

Early users give IBM mainframe graphics tool thumbs-up

By David [illegible]
CW Staff

LOS ANGELES — Security Pacific National Bank, a beta-test site for a graphics tool for IBM mainframe users, is mostly pleased with the product, although somewhat skeptical about the vendor's claim that the program is appropriate for top-level executives.

Security Pacific has been beta testing Issco Graphics, Inc.'s Iviss Manager for several months. Introduced last July, the graphics software program is said to make data from IBM mainframes immediately available in chart form with a single keystroke.

According to Issco marketing personnel, the program's ability to call up charts and produce hard copies of paper charts, overhead transparencies and high-resolution 35mm slides — all at the touch of a button — is a feature that would be valuable for a senior executive.

'Not the way we'll use it'

"I think the product is a very useful one," said Jan Schwartz, an assistant vice-president in the information center at Security Pacific Automation Co., a division of the nation's eighth largest bank. "However, I tend to think that in our environment the way [Issco] is marketing Iviss Manager is not the way we'll use it.

"I don't see our senior vice-presidents sitting down at a terminal and generating graphics," he added. The bank has been running Iviss Manager on its Amdahl Corp. 580 Model 5860 mainframe under IBM's VM operating system.

Schwartz pointed out, however, that few of the bank's senior managers have graphics terminals —, an IBM Personal Computer 3270, for example — with the kind of graphics capabilities permitting optimum use of the Issco product. "That's not to say Iviss Manager won't work [for senior executives] at other companies," he said.

Schwartz said he particularly likes the user training features of Iviss Manager. "It has a spreadsheet formula for entering data, which makes it much more user-friendly," he said. "That appeals to us because we can give a tool to our users, and they can very quickly start producing graphs without having to go through an intensive training course."

He said he also likes the program's on-line Help functions and a Make-A-Chart option, which allows "anybody to sit down and generate a chart."

Dick Bertrand, director of IBM products for the San Diego-based software company, said the response from other beta-site users of Iviss Manager has been spectacular.

Aimed at 'highest levels of company'

He said Issco has discussed with other users the issue of whether the program is appropriate for top executives and is standing behind its original marketing claims. "We are definitely aiming at the the very highest levels of the company."

Bertrand asserted that the product will be used by companies whose executives have ready access to graphics terminals.

Deliveries of Iviss Manager are scheduled to begin Jan. 31, Issco said.

GRAPHICS from page 1

shown a special interest in computer-related technologies ever since. "The growth of micros has mushroomed ever since then," said James D. Brandt, vice-president in the interactive computing division.

The number of micros at Security Pacific — predominantly IBM Personal Computers — stands at 1,400 today, with more than 75% of those possessing graphics capabilities. The micro population is expected to grow to more than 2,000 by June.

Security Pacific's information center has more than 80 software packages running on its Amdahl Corp. 580 Model 5860 mainframe employing IBM's VM operating system. Included are graphics packages from such vendors as Evaluation & Planning Systems, Inc.; IBM; Issco Graphics, Inc.; Mathematica Products Group, Inc.; and SAS Institute, Inc.

More than 70% of the company's micros are tied in some fashion to VM. There are about 2,500 users on the time-sharing system, Schwartz said.

One factor that has inhibited wider use of graphics within the bank has been the limited availability of hard-copy devices that could produce high-quality copies quickly.

"I think the biggest problem is not encouraging users to employ graphics but to provide them with the proper tools so that they will use it," noted Judith Koch, an assistant vice-president.

Schwartz added that upper management was supportive of graphics as it became more aware of the tool's benefits. "The executives have been using graphics for a long time," he said, "but they have had to pay to have it done by outside companies at enormous cost."

Last year, Security Pacific surveyed its bank users and found that $10,000 worth of graphics production work was being sent outside the bank each month.

'Continuing explosion' of micros

DuWayne Peterson, chairman of Security Pacific and a long-time MIS professional, said an increasing number of IBM Personal Computer-type workstations are appearing in senior management offices, and "we're seeing a continuing explosion of [personal computers] with graphics going into our branches."

Security Pacific has centralized its graphics production facilities — mainly CRTs and pen plotters — in two areas at its headquarters here and in Glendale, Calif., where users can go to generate graphs without having to purchase costly equipment for their individual departments.

Despite the availability of such equipment, Schwartz said, the main drawback to wider graphics use is related to production. "[Lotus Development Corp.'s 1-2-3 spreadsheet package] is nice to get up a very quick chart on the screen, but what are you going to do with it once it's on the screen?" he asked. "You need a hard copy. You can go to a printer and get a black-and-white, low-resolution copy that's OK to show your neighbor, but it's hard to walk into a management meeting with that."

To get higher quality reproduction, many users have opted for pen plotters selling in the $2,000 to $3,000 range. Pen plotters offer excellent quality but are slow. Schwartz estimated that, on the average, it takes 15 minutes to produce a single hard copy with a plotter. That comes to about $12 a copy when labor and material costs are considered, he noted.

That lengthy process often discourages people from using graphics. As Brandt explained, "If you have a presentation where you have 50 slides, you might just say, 'I'm not going to bother.'"

A recent acquisition that the Security Pacific staff hopes will ease some of the production constraints on graphics is a Xerox Corp. 6500 color copier, which is equipped with a laser graphics interface.

Users 'beating on the door'

"[Users] have been beating on the door to use graphics, and we had no good end-delivery device for them that could create quick, good-quality graphics," Koch said about the decision to purchase the 6500.

Schwartz anticipates that the bank will eventually generate 2,000 to 3,000 charts a month on the 6500 at about $1 a copy.

But good production facilities are useless if users are not properly trained on how to best utilize graphics, Schwartz said.

Security Pacific has tackled the training issue on one front by establishing the in-house Micro Center, which handles personal computer sales, training and consulting for the company.

The Micro Center, located within the bank's headquarters and resembling an average computer retail store, has equipment from a variety of microcomputer manufacturers. There are also two classrooms where regular training sessions are conducted for software and hardware.

"Technology is not the answer to graphics," said Dick Wexelberg, a vice-president in the information center. "There's a whole mind-set that has to be developed on how you present information in graphics form. That requires a great deal of training from a user perspective."

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CODE

from page 1

tured, they are easier to maintain and debug, users agree.

Such services are still scattered and relatively new. However, "they are going to be a whole new subindustry," according to T. Capers Jones III, a consultant at Nolan, Norton & Co. in Lexington, Mass. Jones reasoned that the natural aging process of existing programs will have two out of three programmers working on the maintenance of older systems by the end of the century.

The newest service in this area is from Language Technology, Inc., a Salem, Mass.-based company that — for a fee of 50 cents per source line — automatically restructures programs using a series of algorithms and language heuristics.

Eric Bush, chairman of Language Technology and developer of the company's methodology, said that aging, unstructured programs may have thousands of logic paths, hundreds of lines of "dead" or unused code and scores of hidden bugs. Programmers easily become frustrated trying to maintain the poorly documented systems, leading to turnover problems.

In addition, he added, companies often end up employing a staff of software wizards, each supporting one or two programs, simply because they are the only programmers who understand them.

"Old computers go into computer museums, but old software goes into production," Bush said.

> *'Old computers go into computer museums, but old software goes into production.'*
>
> **— Eric Bush, Language Technology, Inc.**

Language Technology will take any unstructured Cobol program and convert it to an end product that is free from GOTOs, ALTERs, fall-throughs and similar program time bombs, Bush said. The documentation it generates includes a program architecture description and a structured flowchart.

An early user of Language Technology's system, Unionmutual Life Insurance Corp. in Portland, Maine, has been satisfied with the service. Rachel Stamieszkin, a senior programmer/analyst, said Unionmutual submitted programs of 800 and 3,000 lines to Language Technology and got back fully structured versions within a few days.

The structured programs are up to twice as long as the unstructured versions but run almost as quickly, Stamieszkin said. In addition, "Since structured code is modular and easier to understand, finding the location of the code to be changed is easier and testing is easier," she said.

Peat, Marwick, Mitchell & Co. offers a similar service for Cobol-to-Cobol and assembler-to-Cobol translation through its Chicago-based Catalyst Group.

Unlike Language Technology, the Structured Retrofit service involves some manual intervention but similarly produces structured software at a cost ranging from 50 cents to $2 per line, depending upon volume and services requested, explained Mary Kay Kluge, a senior manager at Peat Marwick.

The service reorganizes program logic, reformats code, isolates I/O, raises control logic and builds a mainline program structure with modular paragraphs. Programs are commented, and other reports are provided, Kluge said.

The Peat Marwick service saved ITT Commercial Finance Corp. of Clayton, Mo., "a ton of money," according to Melvin F. Brown, president. He said ITT Commercial Finance ran most of its source library through Structured Retrofit two years ago to obtain the documentation needed for a large-scale upgrade.

A packaged restructuring system is sold by Group Operations, Inc. of Washington, D.C. Superstructure redefines Procedure Division code into independent modules with one entry and exit point; cuts out interparagraph GOTOs and fall-throughs; identifies dead code; and eliminates PERFORM range violations, a spokesman said.

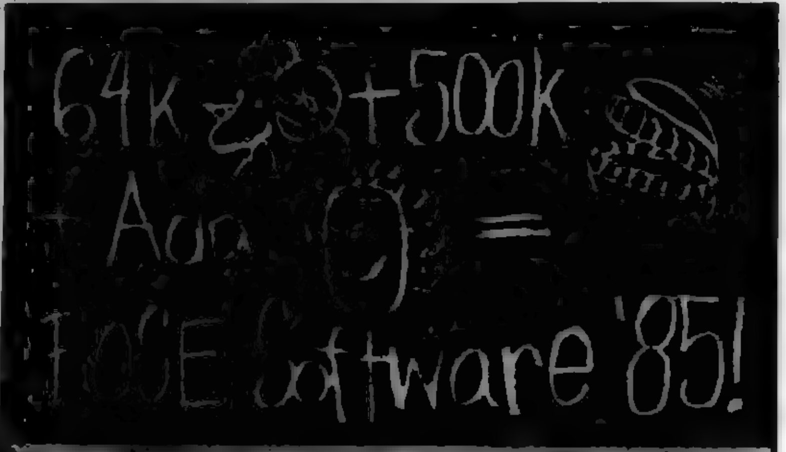
A user of the product, Dayton Hudson Department Store Co. of Minneapolis, has run between 26 and 30 programs of up to 9,000 lines of code through Superstructure and has found no functional differences between the old program and the structured result, according to Don Saul, a senior support analyst.

'A lot easier to find bugs'

"We use it mostly on programs that we're having problems with," Saul said. "We find it's a lot easier to find bugs once you've got a structured program."

He explained that a Superstructure run takes a little longer than an ordinary compile and produces about twice as much source code as the input program. However, runtimes of the new programs are comparable, he said.

Superstructure highlights dead code, adds a descriptive paragraph in the Procedure Division called "Startemup" and includes a comment box in each paragraph showing from where it was performed. Dayton Hudson has had a few problems maintaining procedure calls in the restructured programs but has been able to work around them, Saul said.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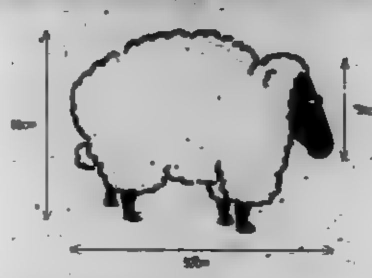

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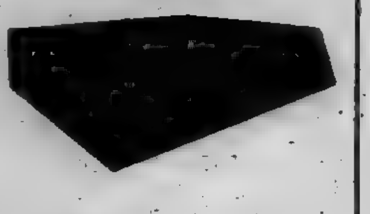

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Users laud Unix portability, call flexibility a weakness

CW AT UNIFORUM

By Paul Korzeniowski
CW Staff

DALLAS — The greatest strength of AT&T's Unix is its portability, and its greatest weakness is its flexibility. That was the consensus of a sample of AT&T Unix users last week at the 1985 Uniforum International Conference of Unix Users here.

"There are so many Unix variations available that a user often feels like [he's buying] a pig in a poke," noted Robert Egent, a pathologist at St. Luke's Episcopal Hospital in Houston. "Finding software that meets one's needs and takes full advantage of one's equipment is difficult. Unix is larger and more flexible than it has to be. Systems with less flexibility can often provide better solutions."

Harry W. Brown at Datagraphics Services, Inc. in Valley Stream, N.Y., added, "Unix provides a number of programming options to solve a problem. Determining which method is best suited to a situation can be frustrating."

AT&T has stated that Unix's portability would encourage applications software vendors to develop Unix software because the developers could easily port their software from one Unix machine to another.

Lack of software

Yet users complained about a lack of software. "There really isn't much applications software available," said Brian McNeely of the Internal Revenue Service agency located in Boonsboro, Md. "Third-party software development is now just beginning."

Datagraphics' Brown said he experienced this purported lack of support. His company recently bought a Unix system, and he cited poor documentation as the primary Unix deficiency. "To solve a problem, a user has to be a computer scientist or wade through two or three reference manuals," he maintained.

Performance issues were also cited as Unix deficiencies. "Generally, Unix response time is slow," Jim Bovers of IBM claimed.

Peter Mikkelson of NCR Corp. noted, "Unix does not function well with real-time processing."

IBM's Bowers added, "Unix does not provide adequate support for data base management systems." Another limitation he mentioned was Unix's lack of a friendly interface for the nontechnical person.

Infomart first of its kind

High-tech boom made exhibit market feasible

By John Gallant
CW Staff

DALLAS — Nearly 20 years ago, when Trammell S. Crow first envisioned a vast marketplace designed to bring the buyers and sellers of high-technology products together within the confines of this booming southwestern city, some people scoffed at his idea.

Critics claimed that there were only a handful of high-tech companies and only a limited number of computer users. But Crow's vision persisted, and his idea was vindicated by the metamorphosis of the computer industry. As computing technology began to pervade everyday life, the number of vendors increased rapidly and the population of users expanded exponentially. Crow's computer mall concept began to win adherents.

Today, Crow's idea graces the Dallas skyline. It is embodied in the gleaming white steel and sparkling glass of Infomart, which was officially christened last week during ceremonies marking the opening of the world's first permanent information processing market/conference facili-

See INFOMART page 12

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Small system utilities premiere at Unix conference

CW AT UNIFORUM

By Paul Korzeniowski
CW Staff

DALLAS — For small Unix systems, operating system enhancements and utilities were plentiful, but productivity packages were few in number among new product offerings at last week's 1985 Uniforum International Conference of Unix Users here.

Unisource Software Corp. introduced The Scheduler productivity package, which serves as an appointment book and interoffice bulletin board, the vendor said. It allows a user to print a daily, weekly or monthly schedule and includes password protection. The Scheduler has on-line Help, runs under Unisource's Venix, Microsoft Corp.'s Xenix and MS-DOS and IBM's PC/IX operating systems and costs $149. Unisource is located at 71 Bent St., Cambridge, Mass. 02141.

Island Graphics Corp. introduced Solar Paint, a painting program that runs on Sun Microsystems, Inc.'s workstations. The package can magnify, mirror, copy, enlage, move, invert, rotate, shrink and erase pictures, according to the vendor. Solar Paint costs $1,895. Island Graphics is located at One Harbor Drive, Sausalito, Calif. 94965.

R Systems, Inc., a Dallas software company, rolled out R Word III, a word processing, office time management and data base management system (DBMS) that runs under both Unix and Xenix.

The product's word processing features include a spelling checker, mail merge capability and three-level file structure, the vendor said. Its DBMS functions reportedly permit a user to select 10 fields and create a 99,000-record file. As an office manager, its features allow multiple card files, daily schedulers and appointment books, according to the vendor. R Word III sells for $1,295. R Systems is located at 11450 Pagemill Road, Dallas, Texas 75243.

Among the operating system software enhancements, Venturcom, Inc. released Venix System V, which is based on Release 2 of Unix System V. This Unix release provides binary compatibility between computers that run System V Release 2. Application software designed for System V Release 2 machines can be compiled under Venix with few changes, the vendor said. It costs $895. Venturcom is located at 215 First St., Cambridge, Mass. 02142.

Uniform Software Systems, Inc. enhanced The Connector so that it supports IBM's Topview operating environment. The Connector reportedly allows a user to run Unix and MS-DOS applications concurrently. But the product does not provide complete file transfer capabilities between the two operating systems, the vendor said. It costs $299. Uniform is based at Suite 514, 225 Santa Monica Blvd., Santa Monica, Calif. 90401.

Viasyn Corp., formerly Compupro Corp., announced that Uniplus System V, a Unix operating system from Unisoft Corp., is available for Compupro's System 816/E multiuser microcomputer line. The System 816/E is suited for Unix because it makes maximum use of its memory management unit, the vendor said. The operating system costs $1,495. Viasyn is located at 3506 Breakwater Court, Hayward, Calif. 94545.

INFOMART

from page 11

ty. In conjunction with the public unveiling of Infomart, officials kicked off the 1985 Uniforum International Conference of Unix Users, the first of 42 major events scheduled at the facility this year alone. The opening ceremonies were capped off with the lighting of a 100-ft Uniforum sign and the switching-on of the crystal fountain in the Infomart atrium.

The building was modeled after London's Crystal Palace, which was built to host the first world's fair in Great Britain in 1851. Like its forerunner, which was designed to highlight the products and services of the burgeoning industrial revolution, Infomart is intended to showcase the wares of the computer revolution.

Infomart's backers say the permanent quasi-trade show gives consumers the opportunity to educate themselves on new products and technologies and gives vendors a chance to shorten the evaluation process and cut marketing costs.

The building itself occupies about six full acres on a 25-acre site. It was developed by the Trammell Crow Co. at a cost of about $97 million.

Infomart offers more than 300,000 square feet of temporary exhibit space and almost 900,000 square feet — the area of 29 football fields — of permanent vendor showrooms.

Companies, including AT&T, Texas Instruments, Inc. and Xerox Corp., that have already moved into the facility have laid out elaborately furnished product information/customer training facilities on the floors above ground level.

Infomart officials expect to draw some 350,000 visitors in 1985 with trade shows, seminars and symposia targeted at specific audiences.

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DG, DEC, Amdahl boost large systems Unix offerings

CW AT UNIFORUM

By John Gallant
CW Staff

DALLAS — Enhancements to Data General Corp. and Digital Equipment Corp. Unix products and the introduction of two Amdahl Corp. Unix packages were among the large systems software debuts made at last week's 1985 Uniforum International Conference of Unix Users.

DG announced that its DG/UX native Unix operating system now supports the Pascal and Ryan-McFarland Corp. RM/Cobol programming languages. A spokesman said DG/UX Pascal is a high-level structured programming language with a common code generator. It also shares the same optimizer as the company's DG/UX C and Fortran 77 products.

DG/UX Pascal is said to conform to Ansi-standard Pascal and provide error-checking capabilities and run-time diagnostics. It is supported by the University of California at Berkeley DBX source language debugger and is priced at $4,910.

RM/Cobol is a version of the Ansi Cobol 74 standard. It features full Level 2 relative and indexed file access methods and multikeyed indexed files with 14 alternate keys and duplicates. Variable names in SELECT and CALL statements are said to allow files and called programs to be specified at execution time. The product licenses for $1,500.

DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

DEC enhancements

DEC unveiled a series of enhancements for two of its Unix-based operating systems — Ultrix-32 and Pro/Venix. A spokesman said Version 1.1 of Ultrix-32 provides greater support for VAX series processors and better compatibility with AT&T's System V Unix. Ultrix-32 is an interactive, virtual-memory, time-sharing Unix system that runs on the VAX line.

Version 1.1 of Ultrix-32 now features the Source Code Control System from AT&T's Unix System III to improve software development productivity. Other System V commands and utilities have also been added to the DEC product to improve compatibility between Ultrix-32, DEC's Ultrix-11 and AT&T's Unix offerings, the spokesman said. Diagnostic testing within Ultrix-32 reportedly has also been enhanced to enable a user to read directly from a distribution tape, locate diagnostic problems and load and execute corrections from an Ultrix-32 file system.

According to the spokesman, the minimum configuration of Ultrix-32, Version 1.1, is a packaged system consisting of a VAX-11/725 with 2M-byte main memory, a one- to 16-user Ultrix-32 license, dual TU58 tape systems, a 52M-byte disk system and a multifunction communications device for $31,950.

Like Ultrix-32, Pro/Venix is a derivative of AT&T's Version 7 Unix and includes Berkeley enhancements. It runs on DEC's Professional 350 and 380 systems.

Version 2.0 of Pro/Venix allows applications designed to run under System V to be ported to Pro/Venix with minor or no modifications, the spokesman said. The product has been enhanced with System V features and a graphics library. It supports the Professional Real-Time Interface and the Professional Ethernet Controller hardware options.

Other enhancements to Pro/Venix reportedly include support for a laboratory interface module on a Professional workstation. The base Pro/Venix, Version 2.0, is priced at $495 from DEC in Maynard, Mass. 01754.

Amdahl software

Also in the way of large systems Unix software, Amdahl announced two Unix-based software packages. One product, (Universal Time-Sharing System/System V (UTS/V), is an implementation of AT&T's Unix System V, Release 2, for use under IBM's VM/SP on Amdahl 580 mainframes and other IBM 370-architecture machines; the other product, UTS/F was described as a companion product to UTS/V for full-duplex Ascii communications support.

An Amdahl spokesman said that because UTS/V operates under VM/SP, it can share the processing resources of the mainframe with other system control programs. In addition to supporting the features of System V, Release 2, the product supports the IBM 3270 family of terminals, systems administration and operations enhancements for the large system environment and tools for communications with Unix and IBM's MVS and VM operating systems.

UTS/F runs on the Amdahl 4705 series communications processors and provides full-duplex Ascii communications support compatible with other Unix systems. UTS/F allows UTS/V to process data from Ascii-compatible terminals one character at a time rather than as large blocks of data.

License fees for UTS/V range from $10,000 to $25,000 per year. The license fee for UTS/F is $2,500 per year. Amdahl can be reached through P.O. Box 470, 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

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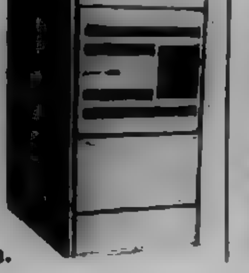

Addressing end-user needs lies in future for Unix

CW AT UNIFORUM

By John Gallant
CW Staff

DALLAS — What role will AT&T's Unix play in the future? The role of a pawn with which IBM will keep AT&T off-balance? A tool for survival for the non-IBM-compatible mainframe vendors? An operating system in search of standardization, one relegated to dwelling in limited market niches?

Those were some of the possibilities about Unix's future posited by a panel of Unix industry watchers during a session at last week's 1985 Uniforum International Conference of Unix Users.

Overall, panelists predicted a bright future for Unix, provided vendors could overcome incompatibility problems between Unix versions — and decide on some industry-wide standards — and begin meeting the real needs of the end-user community.

"Unix is not a cure for cancer," quipped Jean Yates, president of Yates Ventures, Inc., a Palo Alto, Calif.-based market research firm. "I think the Unix marketplace has begun to suffer some consolidation problems. The entrepreneurial phase appears to be over, but some solid opportunities lie ahead."

Current offerings 'dismal'

Yates said that Unix is rapidly establishing itself as a standard operating system for data acquisition tasks and for the scientific and engineering communities. But for end users, she claimed, the current offerings of useful applications software are "still pretty dismal."

Fellow panelist Esther Dyson, president of Edventure Holdings, Inc., a New York-based market research firm agreed with Yates' assessment of the state of Unix applications.

> *'This is the year for the companies that will eventually survive to start serving the end user.'*
>
> — **Jean Yates, Yates Ventures, Inc.**

"In the Unix marketplace, the value added will be in applications. The market has to move toward the end user who does not care what the operating system is," she said.

"For example," Dyson continued, "people talk about a version of [Lotus Development Corp.'s] 1-2-3 for Unix. Users do not care if 1-2-3 runs on Unix as long as it runs.

"For Unix applications to be successful, they cannot be just copies of other products. They must be vertical market applications that take advantage of Unix's strengths and not cheap imitations of popular packages running under an inappropriate operating system."

Reinforcing Dyson's remarks, Yates said Unix hardware and software vendors must begin to address those end-user requirements. "These companies have got to start talking to end users," she said. "We've been selling to each other for years. This is the year for the companies that will eventually survive to start serving the end user. There is not very much of that going on now," Yates said.

Aaron Goldberg, an analyst at International Data Corp., a Framingham, Mass.-based market research firm, said 1985 will see the end-user market for Unix begin to grow — albeit slowly.

Goldberg also said that IBM will continue to add to the confusion that surrounds the different Unix versions.

"It is not in IBM's best interest to clarify the market for Unix," he said. "IBM will wait for the big market pieces to form and then it will jump in and take its share."

Product with a future

Despite that, Goldberg said, AT&T's System V Unix will meet with success. "I predict that System V will do quite well. Users want to build on a product with a future. AT&T is devoting tremendous resources to System V to see it succeed."

Also, he said the Bunch companies (Burroughs Corp., Sperry Corp., NCR Corp., Control Data Corp., Honeywell, Inc.) may be looking at Unix as a survival strategy for the future. Goldberg said Sperry and NCR have already begun to shift their software strategies toward Unix, and others may soon follow.

"Unix has a real place in the market. There are a lot of resources behind it. I think the Bunch is seeing it as a survival strategy. Maybe in 1995 there will only be [IBM's] MVS and Unix players," he said.

Yates echoed Goldberg's sentiments. "The Bunch companies cannot afford the multimillion dollar investment in proprietary operating systems and other software."

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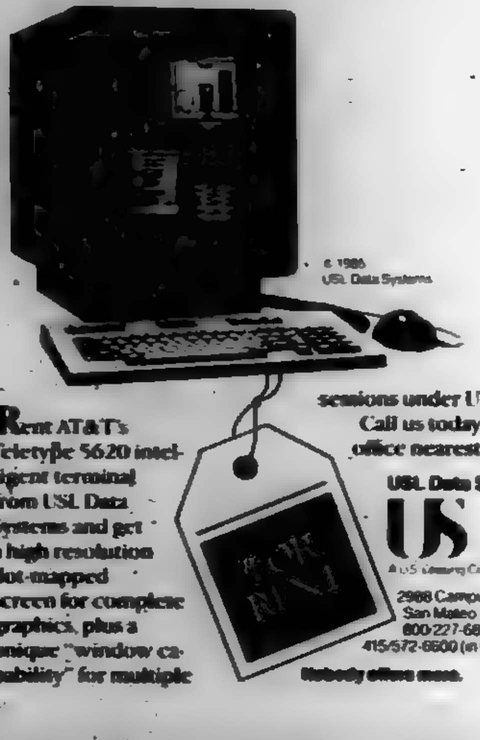

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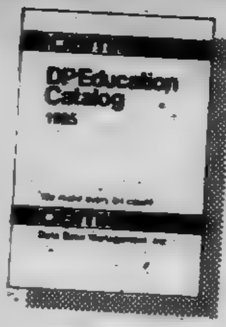

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Apple presents Macintosh Office, drops Lisa line

By Kathleen Sullivan
CW West Coast Bureau

CUPERTINO, Calif. — Apple Computer, Inc. last week answered critics who have questioned the viability of the Macintosh in the corporate world by introducing the Macintosh Office, which includes a laser printer, a network and a file server.

In addition, the firm announced it will rechristen and reposition the Lisa 2/10 as the Macintosh XL and drop the rest of the Lisa line. Also, the price of the Macintosh 512K was cut to $2,795.

Apple used its annual meeting, held here last week, to showcase its new product line, announcing the Laserwriter, Appletalk Personal Network, a file server (currently unnamed) and the renamed Macintosh XL.

Apple's Laserwriter is built around a Canon U.S.A., Inc. engine, which features a resolution of 300 dot/in. Inside the Laserwriter is a built-in computer — a Motorola Corp. 68000 microprocessor running at 12 MHz with 1.5M bytes of random-access memory (RAM) and 0.5M bytes of read-only memory (ROM).

The Laserwriter's printing speed depends on the complexity of the document being printed, the company said. It is said to print text documents at 8 page/min; the throughput of documents that include text and graphics is estimated to be 2-3 page/min.

Font families

Four font families — Times Roman, Helvetica, Courier and Symbol — are stored in ROM. Additional fonts can be downloaded. According to Apple, the Laserwriter can produce font sizes as small as four points, while large point sizes are limited only by the size of a page. The printer is also said to feature Postscript, a page description language developed by Palo Alto, Calif.-based Adobe Systems that was designed specifically for high-resolution printers and typesetting machines.

Apple said the Laserwriter features a built-in interface to its Appletalk network. In addition, the printer is said to include an RS-232 port and a program that emulates a Diablo Systems, Inc, 630 printer. According to Apple, these features will allow users to connect other computers — such as the IBM Personal Computer and its compatibles — to the Laserwriter and print documents without software modification.

The Laserwriter will be available on March 15 at a price of $6,995, the company said.

The Appletalk Personal Network, a baseband network with a bus topology, allows users to connect up to 32 computers at a distance of up to 1,000 feet, the company said. Apple said the network will transmit data at 230.4K bit/sec.

At present, Appletalk only allows users to share the Laserwriter. No file transfer capability is available, so it is not yet a full-function network. Apple officials said they expect third-party developers to fill in this gap by spring.

The Appletalk connector kit includes two meters of twisted-pair cabling, a connector module and an extender for $50 and will be available March 15. No special boards are required to connect Macintosh computers to the Appletalk network, because the circuits are already built into the machines, the company said.

Apple also announced plans to develop an Appletalk card for the IBM Personal Computer that will allow Macintoshes and IBM Personal Computers to share and exchange data over the Appletalk network. An Apple spokesman said the card will be available this fall; no price was available for it.

The company also announced that two Appletalk file servers — a 20M-byte and a 40M-byte server — will be available this fall. Apple has not yet announced prices for the servers. An Apple spokeswoman said the servers will provide software to handle print spooling, file transfer and electronic mail. Appletalk will not offer these until the servers become available.

According to Apple, more than 50 companies are developing products for the Appletalk network. Among the firms are 3Com Corp., a Mountain View, Calif., firm that plans to introduce an Ethernet interface for Appletalk; Sunol Systems, Inc., in Pleasanton, Calif., which has said it will introduce a hard disk drive for Appletalk; and Lutzky-Baird Associates in Los Angeles, which announced an Appletalk/AT&T Unix-based file server and electronic mail software.

The company announced that it was renaming the Lisa 2/10, dubbing it the Macintosh XL and pricing it at $3,995. When introduced a year ago, the 2/10 cost $5,495. Apple said it planned to phase out the Lisa operating system and the Lisa line of workstations, including the Lisa 2, 2/5 and 2/10.

The Macintosh XL features a 12-in. screen (the original Macintosh has a 9-in. screen), a 10M-byte hard disk, a 3.5-in. floppy disk and 512K bytes of RAM that can be expanded up to a full megabyte.

The company said it will encourage Lisa users to switch over to the Macintosh operating system by offering the utilities necessary to convert files generated by the Lisa's integrat-

See APPLE page 16

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Apple eyes corporate market with Macintosh Office

By Kathleen Sullivan
CW West Coast Bureau

CUPERTINO, Calif. — In the eyes of industry watchers, last week's introduction of the Macintosh Office will help Apple Computer, Inc. establish a beachhead in a corporate marketplace clearly dominated by IBM. But there are still hurdles to be cleared before the company can go one-on-one with Big Blue in the Fortune 1,000 market.

The announcement of the Macintosh Office — now consisting of Macintoshes that range from a low-end system to a Macintosh with 1M byte of internal memory and a 10M-byte hard disk, the Laserwriter printer and Appletalk Personal Network (see story page 15) — points Apple in the right direction, the analysts agreed, but it is only one component of a strategy for success.

The Macintosh Office "fills the gaps" in the company's product line," said Mary Ellen Dick, senior analyst with Software Access International, Inc., a California-based market research firm. Esther Dyson, president of Edventure Holdings, Inc., a New York-based market research firm, agreed that Apple's new products would help boost the company's credibility as a corporate office supplier. At the same time, she said, several issues remain to be resolved, including interconnects to the IBM world and the paucity of Macintosh software, when compared to the numerous software titles available for the IBM Personal Computer.

Dyson also challenged the viability of Apple's corporate presence if it tries to enter the market by selling a net that does not support IBM Personal Computers and runs slower than Ethernet.

Joan McKay, an analyst with New York-based Kidder, Peabody & Co., agreed, saying that she was concerned that Apple would not be able to provide IBM communications capability until summer. "I'm still skeptical about the Macintosh," she said. "I still think it's going to be a tough sale into the corporate environment."

Aaron Goldberg, an analyst with Framingham, Mass.-based International Data Corp., had a more positive interpretation of Apple's announcements. Goldberg said the Macintosh Office — along with the IBM communications capabilities that will be provided by Apple and third-party vendors — will "put Apple back into contention for office desktops." Goldberg said the announcement also signals an important change in Apple's corporate philosophy toward what Apple's President John Sculley has referred to as "competitive coexistence" with IBM. Sculley's pragmatic attitude will help put Apple in a much better position in the future, he said.

Kenneth Lim, an analyst with Dataquest, Inc., a San Jose, Calif., market research firm, said Apple now "has a product line that no other company can match." But products alone do not give companies an entry into the Fortune 1,000 market, he noted. Apple lacks the sales force it needs to sell into those companies, he said. In addition, Apple must overcome the skepticism of MIS directors "who don't have any faith or belief in Apple."

Andy Seybold, contributing editor of "The Seybold Report on Professional Computing," agreed that Apple will need more than the Macintosh Office to make an effective sales pitch in the corporate world. The key to success, he said, is an alliance with a company such as Wang Laboratories, Inc.

APPLE

from page 15

ed software package — known as 7/7 — to Macintosh files. Apple said it will offer current 7/7 users a package that will include Lotus Development Corp.'s Jazz; Apple's Macdraw, Macproject and Macworks XL; and the conversion utility during the second quarter of 1985. The Macworks XL is expected to be available in late February. With the utility programs, users will be able to convert Lisawrite files to Macwrite, Lisadraw files to Macdraw and Lisaproject files to Macproject, the company said.

Apple said it will also provide a utility to convert Lisacalc files to Lotus' Jazz integrated software package.

The only hardware change necessary to turn a Lisa 2/10 into a Macintosh XL involves an internal adjustment that alters the Lisa's pixel count to bring it in line with that of the Macintosh, an Apple spokesman said.

Further information is available from Apple Computer, which is located at 20525 Mariani Ave., Cupertino, Calif. 95014.

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Court finds former SSA DP director guilty of bribery

BALTIMORE — Kenneth M. Barry, a former high-level DP official at the Social Security Administration (SSA), was convicted of bribery by a federal court jury here after prosecutors said he solicited and received payments from a California software company that hoped to get an SSA contract.

Barry promised the Los Angeles-based firm, Engineering & Contract Labor International (E&CLI), that he would steer a $4 million subcontract to them in return for payments in excess of $400,000, according to an affidavit by Federal Bureau of Investigation agent Jonathan R. Hersley [CW, March 5].

Barry, 55, was convicted of two bribery charges after a four-day jury trial in U.S. District Court here. Federal law prohibits U.S. government officials from seeking or accepting payments to influence their public duties.

Sentencing by Judge Walter E. Black Jr. is likely to occur next month, according to Assistant U.S. Attorney Michael Schatzow. Barry faces a maximum sentence of 30 years in prison and $1.1 million in fines for the bribery charges, Schatzow said.

At the time of the offenses, Barry was director of the SSA's Office of Data Communications; later he was director of the Office of Systems Engineering and director of the Software Technology Center at SSA's computer center in Woodlawn, Md., according to court documents, which said Barry resigned from his position last April.

Barry denied the charges in court filings. He said he accepted $7,500 from E&CLI as a loan to be repaid later and asserted that he "performed his duties at SSA exercising his best judgment and without regard to the promise, expectation or payment of monies" from E&CLI.

The case involved a controversial $100 million contract the SSA awarded to Paradyne Corp., a Largo, Fla.-based hardware vendor, for a national network of 1,850 computer terminals, called the SSA Data Acquisition and Response System.

In the summer of 1980, according to the FBI agent's affidavit, Barry met in Los Angeles with Robert P. Madariaga and Bill Serrin and informed them he could influence Paradyne to give them the software subcontract, called the SSA Local Intelligence project. Madariaga and Serrin then formed E&CLI and began recruiting programmers from England in anticipation of the contract and agreed to make payments to Barry, court documents said.

Barry also supplied Madariaga and Serrin with confidential documents about SSA application software that helped the E&CLI officials "tailor their proposal to SSA in such a manner that it would be readily acceptable," according to the FBI affidavit.

Last March, Barry was arrested by FBI agents at his Reisterstown, Md., home and indicted on 23 counts of bribery and extortion — later reduced to three counts — in federal court in Los Angeles.

The jury convicted Barry on two counts of bribery: One charge said that from September 1981 to August 1982 Barry sought between $363,000 and $426,000 in payment from E&CLI, with the payments to be funneled through Chesapeake Bay Systems, Inc., a firm partly owned by Barry.

The other charge said that in July 1981 Barry sought and actually received $7,500 — a payment that Madariaga said Barry demanded in cash because he was "financially strapped," the FBI affidavit said.

Barry was acquitted of a third charge that he sought a $4,000 payment in June 1982.

Citing heavy debts and travel expenses, Barry persuaded the California court to move the case to Maryland, and he was assigned a public defender. The former SSA official earned about $58,000 a year at the agency, according to a court document.

Barry's case had been scheduled to go to trial last September, but the defendant failed to appear and forfeited his $50,000 bond. He was arrested again in November in San Antonio and returned to Maryland for the trial this month. Barry faces up to five years in prison and $5,000 in fines for failing to appear for the September trial date.

Megatech show reset for 1986

DALLAS — The Megatech computer industry trade show, previously scheduled for this March, has been rescheduled for March 24-27, 1986, at Infomart here.

The computer industry event, cosponsored by Professional Exposition Management Co. (Pemco) of Des Plaines, Ill., and Infomart, has been rescheduled in order to avoid conflicts with other major industry events, said John Dobbertin Jr., president of Pemco.

More information is available from Pemco, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

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Programmers top execs' hiring list for first part of '85

PARK RIDGE, Ill. — Corporate information executives will be stalking the rare programmer and systems analyst with renewed vigor in the first quarter of 1985.

Sixty-one percent of the 254 corporate information executives who responded to a recent survey plan to increase their staff during the first three months of 1985. Programming positions will account for 48% of all DP/MIS job openings in that time frame, according to a "Comp-U-Fax Computer Trends" newsletter survey of the Data Processing Management Association (DPMA) International's members.

Systems analysis positions will represent 35% of the openings, followed by data base (7%), telecommunications (4%) and data entry/operation positions (4%), the survey revealed.

The executives polled said programmers and systems analysts are the hardest DP/MIS jobs to fill. Most DPMA International members who responded attributed this problem to high turnover rates and an inherent lack of specific applications experience.

Other hard-to-fill positions include telecommunications and data base specialists, the survey said. According to the executives polled, DP/MIS professionals trained in fourth-generation languages are also in short supply.

Surplus of entry-level positions

The members polled said they see a surplus of job applications for entry-level programming and data entry/operation positions.

Large companies account for most of the projected hirings, the survey showed. Sixty-eight percent of the respondents who said they work in large corporations plan to increase their staffs; 34% of those claiming to be from medium-size companies are budgeting for new members and only 19% of the respondents who said they are from small companies plan to expand their staffs.

Comp-U-Fax conducted the survey among 1,000 DP/MIS managers in primarily Fortune 1,000 manufacturing, finance and banking companies and in state and federal government agencies, a DPMA spokesman said.

DPMA, publisher of the bimonthly newsletter, plans to conduct additional DP/MIS hiring trend surveys throughout 1985.

Copies of the survey newsletter are available at no charge. Subscriptions to the newsletter are $18/year.

More information is available from DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

Warnier Prize Foundation seeks nominees

TOPEKA, Kan. — The Warnier Prize Foundation selection committee is accepting nominations until May 1 for the third annual J.D. Warnier Prize for excellence in information science.

The prize — a $3,000 honorarium and a commemorative medal — was established in 1983. It is awarded to a person who has made an outstanding contribution to the theory and practice of information science.

Barry W. Boehm, chief engineer of the software information systems division of TRW Corp.'s Defense Systems Group in Redondo Beach, Calif., won the 1984 prize for his efforts in finding solutions to the problems of software development. Enid Mumford, professor of organizational behavior at the Manchester (England) Business School won the 1983 prize for her research on the design and human consequences of computers.

The 1985 award will be presented at Feedback '85, the 10th annual Data Structures Systems Development users conference, sponsored by Ken Orr & Associates here Oct. 8-10.

Information concerning qualified candidates should be sent to Gerald Weinberg, Chairman, the J.D. Warnier Prize Foundation selection committee, 1725 Gage Blvd., Topeka, Kan. 66604.

Info/Central meeting set

CHICAGO — Info/Central: The Information Management Exposition and Conference will be held at the O'Hare Exposition Center at O'Hare International Airport here Feb. 20-22.

The conference, sponsored by Info/Central, will reportedly focus on telecommunications planning and data security systems.

Conference registration rates are $85 for half-day attendance, $150 for full-day attendance and $295 for the entire three days of the conference.

More information is available from Info/Central, 999 Summer St., Stamford, Conn. 06905.

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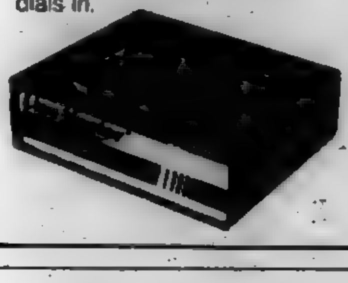

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University's bibliography lists computer-related books

By J. Daniel Couger
Special to CWS

Although relatively new, the artificial intelligence /expert systems field generated some excellent books in 1984. Yet this category accounts for only five of the more than 300 new books in the 18th edition of the "Annual Bibliography of Computer-Oriented Books," released this month by the University of Colorado.

Equally important is the improvement in books on advanced programming (14 new books) and data processing management (11 new books). Hornstein's *Logic as Grammar: Natural Language* is an example of the new high-quality programming books. Cortada's *Strategic Data Processing* and Parikh's *Programmer Productivity* are two examples of the improved books on management of DP. A third is *Handbook of Software Engineering* by Vick and Ramamoorthy.

In the system design area, 18 books were published, including Boar's *Application Prototyping.* The sections on micros and personal computers erupted with 82 titles in the last two years.

The two best additions to the AI/expert systems category are *Rule-Based Expert Systems* by Buchanan and Shortliffe and *AI: Tools, Techniques and Applications* by O'Shea and Eisenstadt. Three of the books in that field are by Winston, including his newest — well written but without a lot of imagination in its title *Artificial Intelligence.*

Advanced programming

The section on advanced programming has grown to 94 entries. Although all the books are serious in tone, some of the titles and styles of presentation are lighthearted, such as Baker's *Scuttle the Computer Pirates.* The subject of personal computer programming was the most popular topic among books published this past year. Thirty-six of those books centered on IBM Personal Computers, with some advanced books now appearing, such as Schwaderer's *Digital Communications Programming on the IBM PC.*

In the programming language section, Basic, the subject of 19 books, continues to dominate. Pascal is making inroads, however, with 11 titles. But those are only the generic books. When we include the books peculiar to specific machines, the list almost doubles. A resurgence in interest in Lisp results from its use in AI. Three books dealing with Lisp were published in the past year. A good one is Touretzky's *Lisp: A Gentle Introduction to Symbolic Computation.* Another AI-related language book is *Micro-Prolog* by Clark and McCabe. Six books were published on Ada and three on the C language. The section of Forth now contains eight books.

The system design category now contains more than 100 books. The new books run the gamut in degree of complexity. For example, the additions to the communications section range in complexity from Stallings' *Local Networks: An Introduction* to Weis' *Elements of Digital Satellite Communication* and Gowar's *Optical Communication Systems.* The additions to the data base design section range in complexity from Townsend's *Using Dbase II* to Merrett's *Relational Information Systems,*

The spreadsheet books outdistanced all applications areas with 15 additions. These were the generic books, however; when machine-specific books are included, the spreadsheet section contains more than 25 entries. After the first surge of hastily written books on the subject, some good ones have emerged, such as Ewing and LeBlond's 701-page *Using Symphony.* Baras' *Guide to Using Lotus 1-2-3* and Tymes and Antoniak's *Multiplan* are examples of other new entries on popular integrated packages.

In all, 41 books were published in the applications area. Other books dealing with applications included Brook's *Investing with a Computer,* Perry's *Improving Audit Productivity* and the 745-page tome, *Manufacturing Planning and Control Systems* by Vollman and others.

In addition to the Cortada and Parikh books mentioned previously, the section on DP management was strengthened with the addition of *Quantitative System Performance* by Lazowska and others and Fisher's *Information Systems Security.* With the addition of 11 books, the management section now contains 94 titles. The project management category is the strongest in the section, although no new titles were added this year.

Need for improvement

There are obvious and disappointing omissions in some subject areas. The personnel area within DP had no additions, despite the fact that personnel costs account for almost half of the typical department budget. The marketing applications section has not had a new entry since 1981. The government section has one new

See BOOKS page 22

Couger is a professor of computer and mangement science at the University of Colorado.

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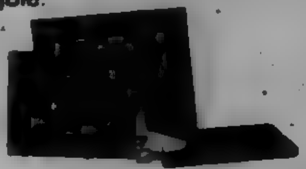

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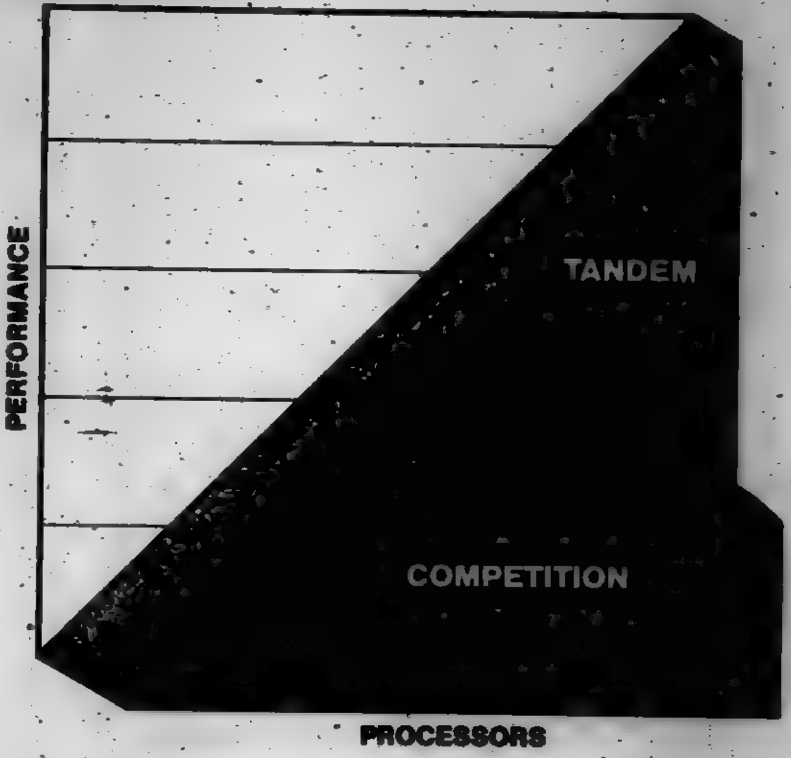

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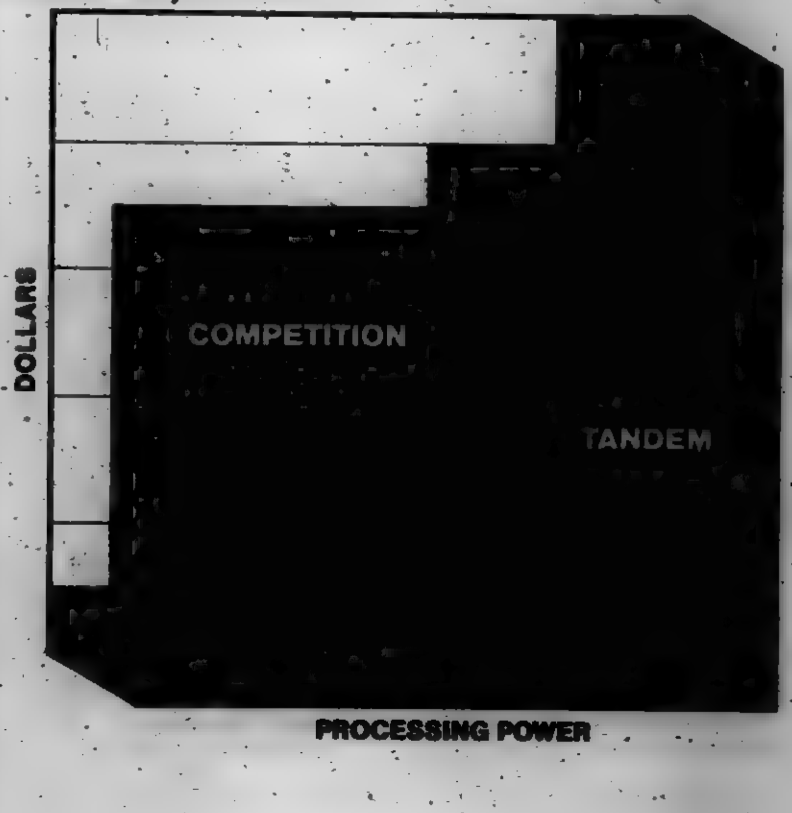

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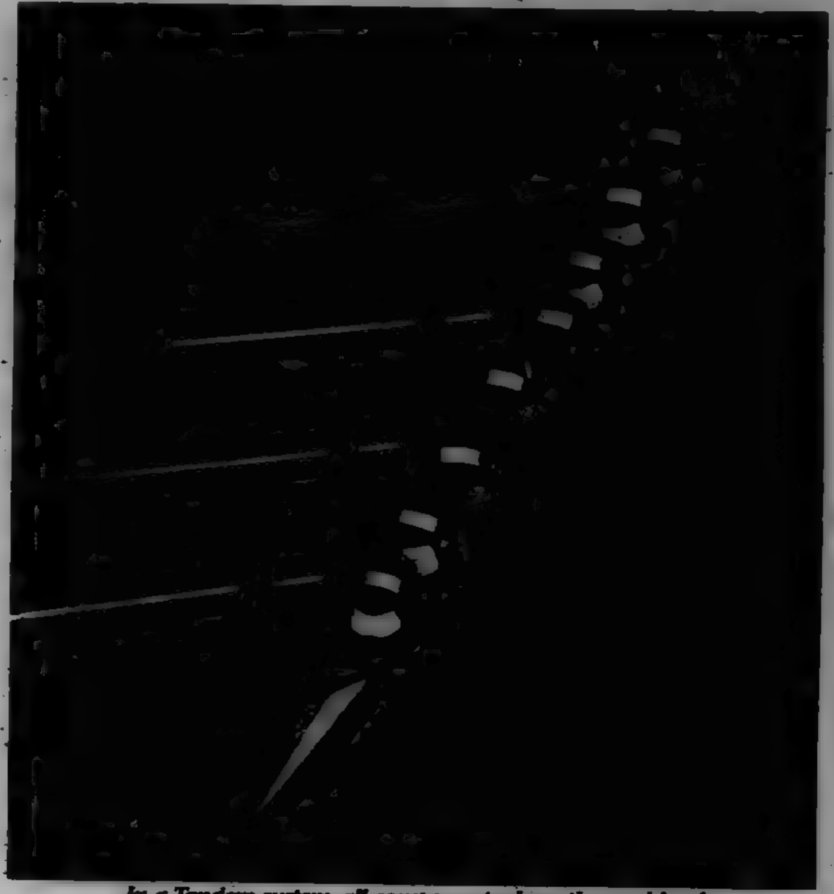

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Cbema workshops to help trainers teach managers correct VDT use

WASHINGTON, D.C. — Corporate trainers will be given the expertise and training materials to educate managers and supervisors in the proper use of VDTs at three workshops. These workshops were scheduled by the Computer and Business Equipment Manufacturers Association (Cbema).

The workshops will be held at Cbema headquarters here Feb. 26-27, April 9-10 and May 7-8.

After the workshop, trainers will be able to conduct management workshops in their organizations. These workshops will use slides, a videotape, an instructor's manual and backup materials, Cbema officials said.

Low-cost solutions to health problems

Charlotte LeGates, Cbema's director of communications, said the workshops were initiated to acquaint management with low-cost solutions to the health problems associated with VDT use, such as eye- and back strain.

The workshop fee is $290.

More information is available from Cheryl Bush, VDT Trainer Workshop Information, Cbema, Suite 500, 311 First St. N.W., Washington, D.C. 20001.

Industrial automation meeting slated for March in Hong Kong

HONG KONG — The International Conference in Industrial Automation Technology will be held here March 7-8. The theme of the conference is "Micros in Affordable Automation — Creating New Industrial Opportunities for All," according to its sponsor, the Hong Kong Productivity Centre.

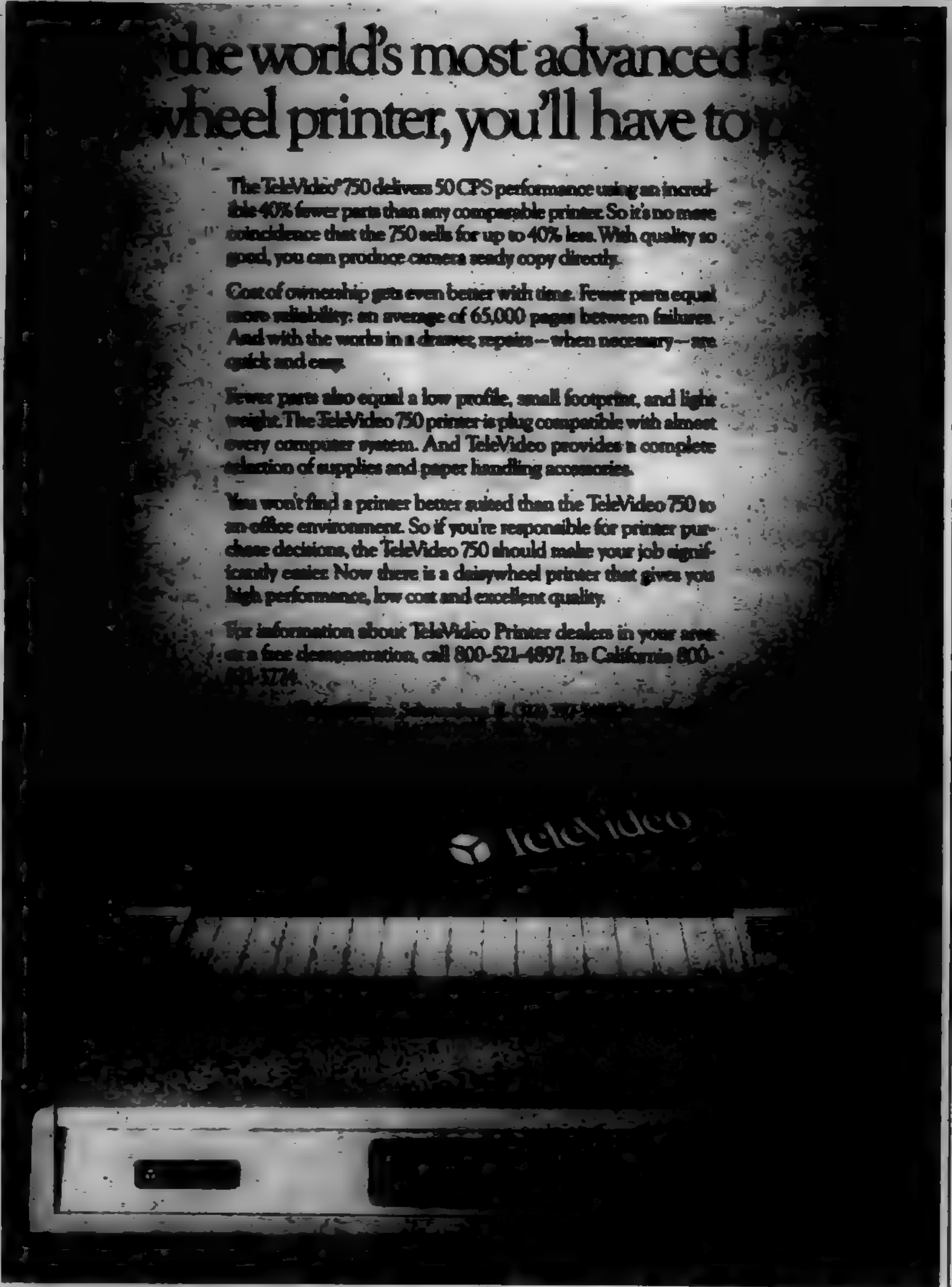
The conference will reportedly bring together experts in automation from the U.S., the UK, West Germany, Italy, Sweden, Japan, Singapore and Hong Kong.

Roughly 200 automation experts are expected to attend the conference.

Running concurrently with the conference will be an international exhibition on automation technology that will reportedly feature a range of hardware and software, including computer-aided design and computer-aided manufacturing systems, automatic integrated circuit bonding machines, manipulators, robots for manufacturing and other products.

Registration for the conference is $200 per person before Jan. 31 and $250 per person thereafter.

The Hong Kong Productivity Centre is located on the 12th Floor, World Commerce Centre, Harbour City, 11 Canton Road, Tsimshatsui, Kowloon, Hong Kong.



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Telecom forum set for Feb. 6-8

CLIFTON, N.J. — A three-day seminar on strategic planning for telecommunications services will be held Feb. 6-8 at the Baltimore Hilton Inn in Baltimore and Feb. 20-22 at the Hyatt Anaheim in Anaheim, Calif.

The conference is designed to provide planners and managers with information on planning, selecting, managing and identifying performance control of telecommunications services. The program instructor will be Raymond Wenig, president of International Management Services consulting and training firm. Registration for the course is $745. More information is available from Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

BOOKS

from page 19

entry since 1980. While there is a proliferation of books in some areas, such as personal computers, there is a shortage of good books in other areas.

The makeup of the bibliography changed this year.

All introductory-type books published prior to 1982 were deleted from the bibliography. Despite the deletions, the bibliography still contains more than 1,200 books from 165 publishers. The bibliography separates the books into 86 categories and catalogs them according to type (reference, textbook, handbook) and style of presentation (programmed instruction, case study or narrative).

Because of space limitations, some of the older programming books were eliminated. However, the bibliography retains classics like Weinberg's *Psychology of Computer Programming* (1971) and Meyer's *Art of Software Testing* (1979).

Copies of the bibliography are available for $4 from Computing Newsletter, Box 7345, Colorado Springs, Colo. 80933. The cost is $6 if an invoice is required.

The 1983 edition of the bibliography contains an additional 455 books — deleted to make room for the new entries. Both bibliographies may be purchased for $7 ($9 if an invoice is required).

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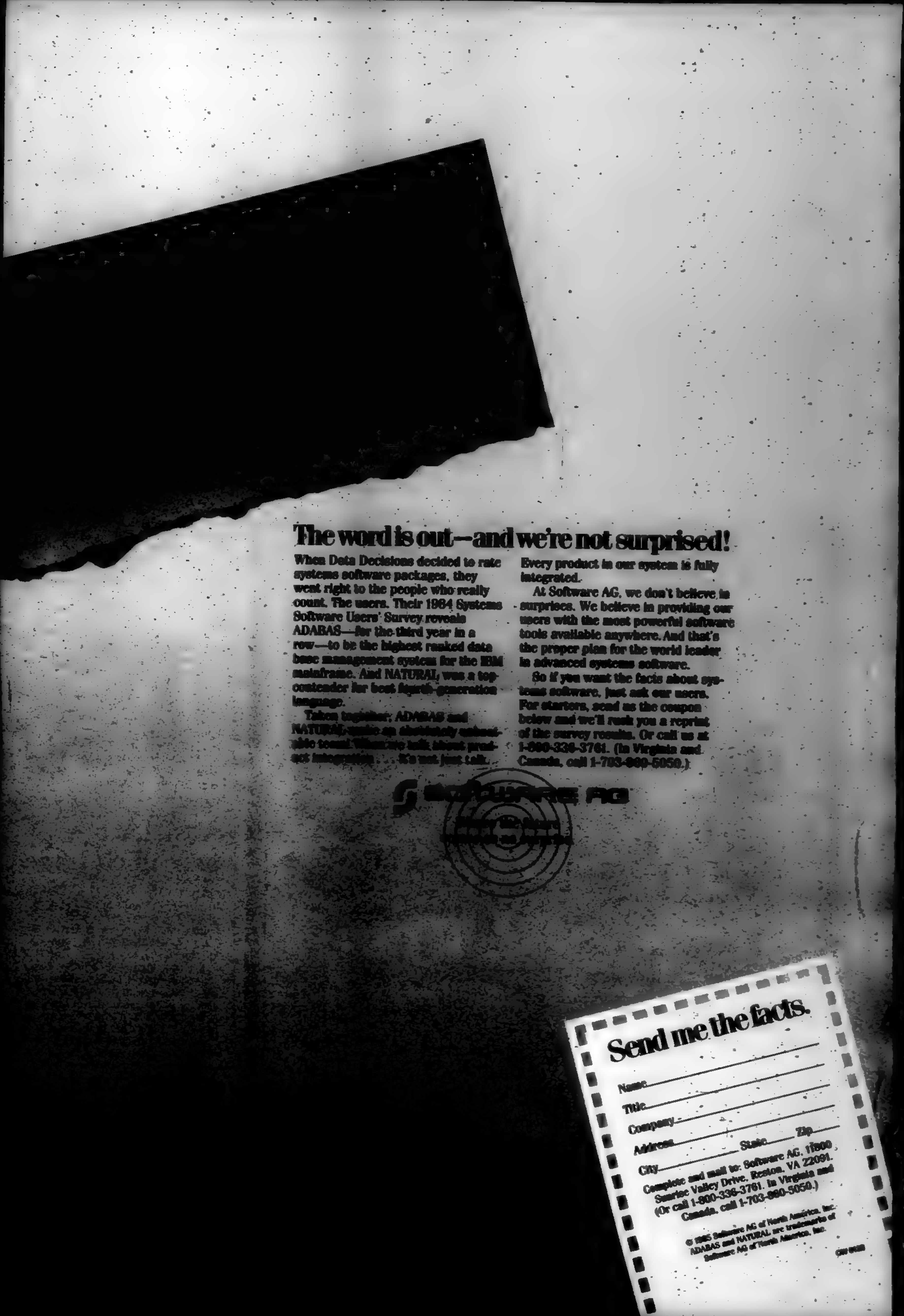

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Aussies banking on rise of data processing wages

By Lauraine Garnett
Special to CW‡

MELBOURNE, Australia — The entry of foreign banks into Australia next year will strip Australian banks of DP staff, forcing up salaries, according to a DP salary survey by Hay and Associates here.

"The days when DP personnel enjoyed lucrative benefits because they possessed skills [that were] in short supply are about to return," the survey stated.

Four or five years ago, DP salaries were 15% above those of the general market, the survey indicated, but today, salaries are only 3.5% above it.

"If it were not for the influx of the banks next year, salaries would drop even further. Instead, we think they will start to increase because most participants are boosting expenditures this year. By next year, [DP salaries] should reach 5% [above those of the general market]," the Hay and Associates survey concluded.

The survey predicted that salary increases in the general market next year will be 6% to 7%, while DP salaries will rise 10%. "The slump this year was the last of the recession," the survey said. "All development work had been curtailed and staff turnover was down dramatically from 25% in 1983 to only 18% in 1984."

Hay and Associates reviewed more than 30 of Australia's large DP installations, including one major service bureau and hardware vendor, for its second annual survey. It revealed that, contrary to popular opinion, hardware vendors did not give DP employees significantly higher paychecks, rather, they augmented salaries with other benefits.

Most companies who responded to the survey had turnovers ranging from approximately $60 million to $800 million and DP operating budgets ranging from $1.6 million to more than $12.2 million. Only two companies had a DP staff of fewer than 10, while most had from 11 to 90 staff members. Approximately one-third had more than 90 DP employees.

The survey noted that only 10% of organizations paid bonuses to DP managers for keeping within budget or for meeting requirements.

By contrast, more than 25% of companies from the general marketplace used bonuses to encourage their managers, and in the U.S., that figure was 50%.

Finally, senior DP managers here were found to be generally underpaid compared with their counterparts in the industry overseas.

Austrian law bans illicit trade

VIENNA — Legislation to prevent illegal shipments of U.S. high technology into Soviet bloc countries has been passed here by the Austrian Parliament.

Foreign Minister Leopold Gratz said the purpose of the amendment was to assure the Austrian industry unfettered access to American technology and also to prove to the Reagan administration that Austria is "prepared to create a legal basis that enables us to prosecute abusers."

The measure met with mixed reviews in Washington, D.C., where senior officials are waiting to see if Austria created the legislation as window dressing to appease the Reagan administration, or whether Austria will, in fact, strictly enforce its new law. The law calls for jail terms of up to two years along with stiff fines for violators of export licenses for the import of goods to Austria.

The issue is a sensitive one for both the U.S. and Austria, the latter positioned next to Soviet bloc countries and not wishing to upset its neighbors by heralding such sanctions.

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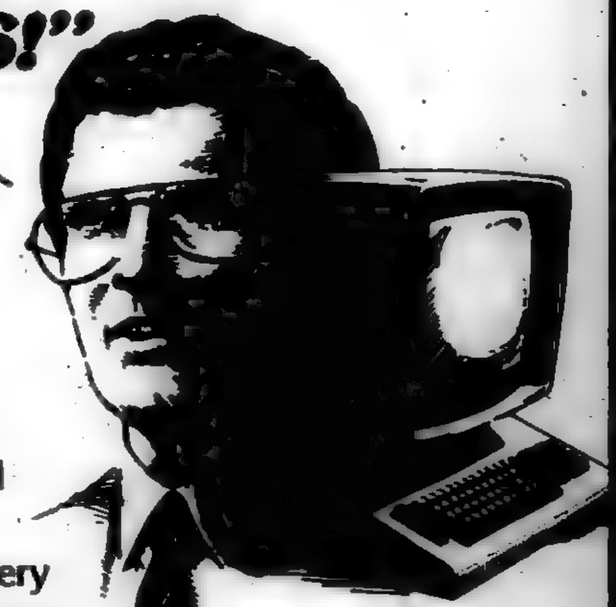

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INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

CROWS NEST — Another version of Cincom Systems, Inc.'s Mantis 4GL, designed to run on Digital Equipment Corp. VAX systems, has been developed here by Cincom's Australian subsidiary. VAX/Mantis will go on sale in the Asia/Pacific region during the second quarter, to be followed shortly by worldwide release.

■

MELBOURNE — Telecom Australia has signed the first agreement for use of its Iterra Satellite Service with Bamboo Management Pty. Ltd. Under terms of the agreement, an earth station is being erected at the Bamboo Creek gold mine in Western Australia. The six-channel earth station will provide telephone, data and text facilities.

■

MELBOURNE — Optimum Software has signed an agreement to distribute Software Technologies and Research, Inc.'s (Star) software products in Australia, New Zealand, Hong Kong and Singapore.

Star's software includes a dynamic allocation/de-allocation subsystem that runs under CICS and Vsam, and a modeling, monitoring and tuning package for Vsam files.

CANADA

WILLOWDALE — The Canadian Business Equipment Manufacturers Association has called for a firm government commitment for economic incentives and other policies conducive to technical innovation. The association warned that without such legislation, Canada will become a has-been in the international trading marketplace. The statement was made in response to a recent economic speech by Finance Minister Michael Wilson.

FINLAND

HELSINKI — Finland has announced plans to be the first Nordic country to erect its own silicon-wafer plant. The $11 million facility is scheduled to be completed in two years and is expected to produce 100,000 wafers per year. The state-owned Outokumpu Oy and Nokia Data will construct and run the plant.

JAPAN

TOKYO — Mitsubishi Electronic Corp. has unveiled a computer-aided engineering system intended for use by designers of buildings, roads, water and sewer pipe construction. The system, called Melcad-CE, will come equipped with a 16-bit CPU, 20M-bit hard disk storage and a printer, all for $27,600, the vendor said.

■

TOKYO — NE Corp. and NEC Home Electronics, Ltd. have jointly announced two microcomputers called PC-8001MK and PC-8801MK. The machines, compatible with the former version of the product line, include improved speed on display and access to the character and pattern telephone access information network videotex system. Prices for the two micros start at $432 and $673, respectively.

SWEDEN

STOCKHOLM — The National Swedish Telecommunications Administration (NSTA) recently proposed to the Swedish government a three-year plan recommending that the government permit manufacture of modems up to 1,200 bit/sec duplex, relinquish its monopoly on telephones and lower videotex prices.

NSTA's present monopoly is scheduled to be disbanded on July 1.

WEST GERMANY

STUTTGART — Bombings and fire attacks on computer centers reached a peak recently. On Jan. 19, a fire was reported on Sydat in Karlsruhe, followed by a bomb blast at Rechenzentrum Bau Gmbhand in Berlin on Jan. 20. On Jan. 21, Stuttgart-Vaihingen was bombed along with a building near an IBM facility in Berlin. The terrorist claimed to have been responsible for the bombing was killed during the last explosion and was identified as Johannes Thimme, 28, a member of the Red Army Faction. The bomb caused $1 million in damages.

Since Dec. 4, more than 40 such attacks have been reported. According to the Federal Criminal Police Office, 17 bombings and 45 fires were committed during the first quarter of 1984 alone. Security expert Reiner von zur Muehlen estimated that 24 bombings were targeted at computer centers last year. A *Computerwoche* survey revealed that more than half of all computer centers have taken no precautions against such bombings.

The Red Army Faction has claimed responsibility for attacks in protest of American business interests and military installations in West Germany.

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But when your needs change, so can the LA210.

Flick a switch and the LA210 shifts to an 18x33 matrix for crisp, near-letter quality copy at up to 40 characters per second.

Or let your host computer change modes for you automatically under program control.

There's more, too. With its standard Courier type face, the LA210 can print 11 languages,

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plus Digital's VT100™ line drawing set. And it gives you a choice of more than 35 optional faces and fonts – Courier, Orator, Gothic, APL, and italics as well as special custom fonts – through plug-in cartridges that let you vary your type face even more. Finally, the LA210 lets you print bold or condensed and change faces or fonts on a dynamic character-by-character basis. So your output is truly customized to suit just about any presentation you have in mind.

Plug-in cartridges also allow the LA210 to emulate three of the most popular IBM compatible printers – the IBM Graphics Printer, the Epson MX80™ with mosaic graphics, and the MX80 with Graftrax™ bit map graphics. So you can produce charts and graphs with all the resolution and professional look of bit map graphics. Yet still retain complete compatability with software that generates mosaics.

All without a hitch. All without compromising a bit of the power of the software you're using.

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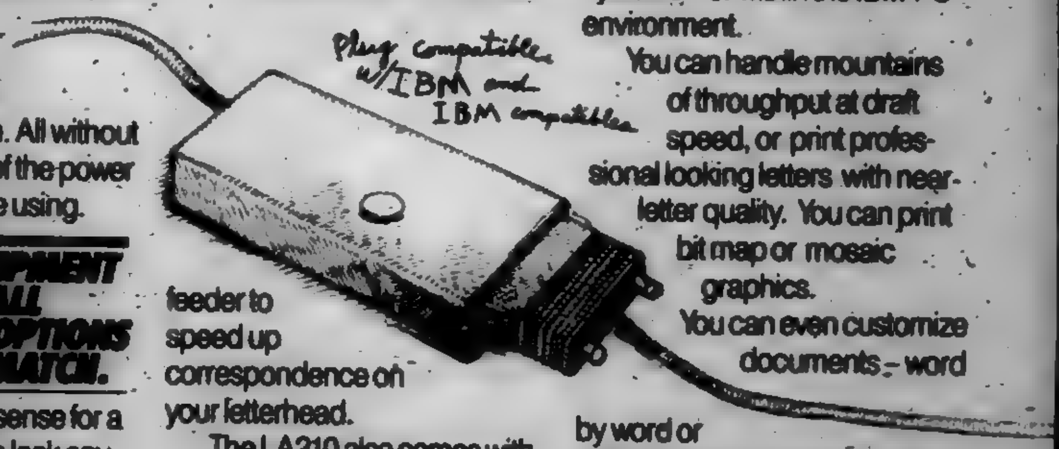
It wouldn't make sense for a printer this versatile to lack any of the features you really need.

So standard equipment includes a 2k buffer and adjustable forms tractor with acoustic cover. Making the LA210 one of the quietest printers in its class as well as one of the fastest.

Add the optional bi-directional tractor, and you can easily handle superscripting and subscripting and full page reverse for multiple column printing.

There's even a cut sheet feeder to speed up correspondence on your letterhead.



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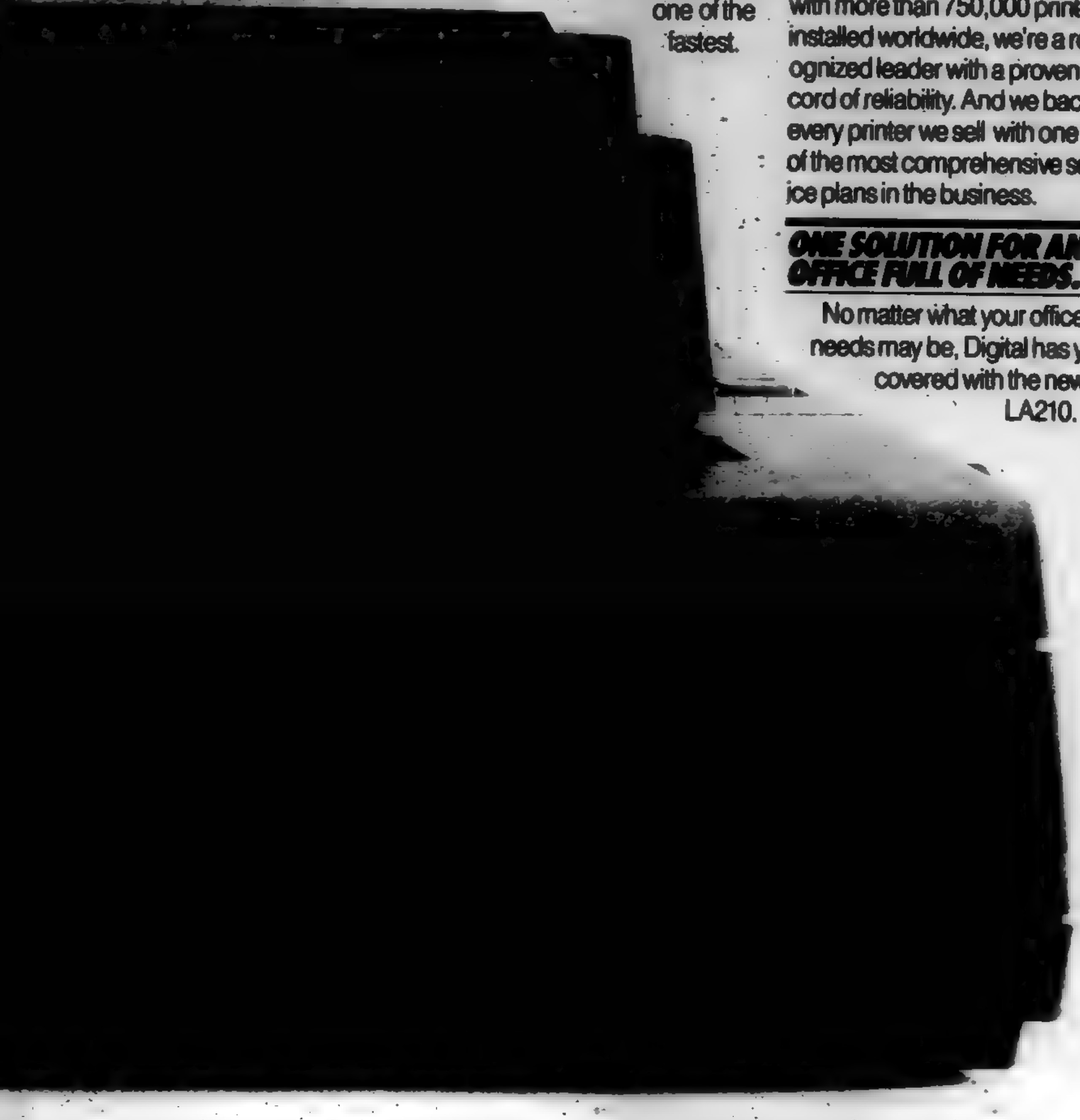

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TURNAROUND TIME

Larry Long

***Q** I used to be with a firm that is an instrumentality of government. Neither state law nor published policy allowed me to see my record of employment.*

They asked me to do work that was not part of my job description. After some time I was told that I was judged lacking in qualification for the applicable job description (in the computer field), and they asked me to find employment elsewhere. It would seem that they changed my job classification in their records, but never allowed me to know or discover that.

In my judgment, that constitutes falsification or fabrication of an employment record. What do you think?

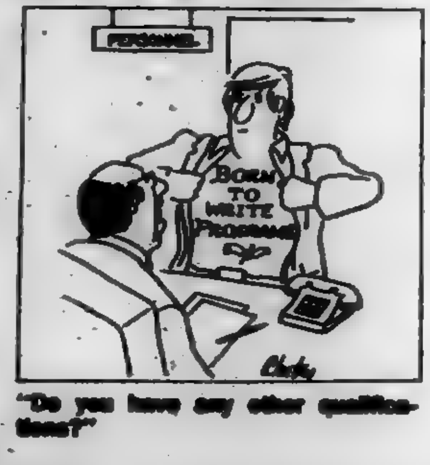
It is a rare individual who would hire a person for one position, then secretly apply the criteria of another position when evaluating that person's performance. Either your managers were attempting to set new standards for unmitigated gall and stupidity, or they were simply crass in the manner in which they released you. I expect the latter.

Many employers hold sacred that portion of an employee's record that deals with performance evaluations, but, I cannot imagine an employer not releasing such basic information as an employee's job classification.

***Q** I am now a junior and will graduate with a degree in computer science. Most of my courses during my senior year will be electives in my major. My college has a large computer science department with a good selection of courses. Which specialty areas would give employers added incentive to interview me?*

Generally speaking, I would recommend that you select courses that will broaden your perspective on the field of computers. That is, if you have had Pascal I and II, avoid Pascal III and IV. See if there is a special projects course that will permit you to address a single multifaceted problem over the duration of a term. Ideally, the emphasis of such a course will be on logic and design and not on syntax and mechanics.

Besides the degree itself, an employer might be favorably impressed if you had at least a one-course exposure to each of the following areas: graphics, C programming, artificial intelligence and data communications and networking. I mention these because they are not required in many undergraduate computer science curricula.



"Do you have any other qualifications?"

***Q** My boss handed me your definition of computer literacy [CW, Jan. 14] and asked me to put together a program that would result in our middle and upper division management people becoming computer literate. I run an information center with a staff of three, and about half of our intended audience has used our facilities at one time or another. However, I doubt if more than a couple would call themselves computer literates.*

I am concerned about our managers' willingness to devote time to attaining computer literacy. Before we get the program off the ground, we need to request a certain amount of time from our managers. Could you give us some guidelines as to how much time will be needed?

A willing manager, starting from scratch, can expect to achieve computer literacy after about 120 hours of study and practice. I would suggest that approximately 40 hours of that time be devoted to reading and study, interaction with pedagogical software and perhaps some classroom (or small group) instruction. Another 40 hours could be devoted to developing skills in specific software, such as financial planning, and generalized software, such as query languages, that is specific to your organization and to their job function. The remaining 40 hours could be devoted to drill and practice in the use of this software. I want to emphasize the importance of the last 40-hour segment. Any training on concepts and software that is not put to use is soon forgotten and never really appreciated.

Relatively few managers are willing to pull themselves away from their routine activities for 120 hours. As a compromise, why not propose that a 40-hour program be conducted during work hours over a two-week period. Then make computing resources and expert assistance available to them during both work and after-work hours so that they can complete the program. You will need to structure the latter two segments of the program with specific work challenges and deadlines, otherwise participation will die off quickly. The time spent on the self-paced portion of the program will, of course, vary considerably depending upon the managers' interest and willingness to learn.

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CALENDAR

WEEK OF JAN. 27

JANUARY 30-31, SAN JUAN, PUERTO RICO — **Pan-American Conference and Exposition on Document-Based Information Systems.** Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

FEBRUARY 1, NEW YORK — **Advanced PC-DOS.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 1, PITTSBURGH — **Finite Element Modeling and Analysis.** Contact: Valerie Broadal, Ridge Computers, 3451 Mission College Blvd., Santa Clara, Calif. 95054.

FEBRUARY 2, NEW YORK — **IDMS CV Generation.** Contact: International Computers & Communication Systems, Inc., 10 E. 21st St., New York, N.Y. 10010.

FEBRUARY 2-3, SAN FRANCISCO — **Softeach Seminars.** Contact: Softsel News Bureau, Suite 210, 160 Newport Center Drive, Newport Beach, Calif. 92660.

WEEK OF FEB. 3

FEBRUARY 3-6, NEW ORLEANS — **1985 Telecommunications and Financial Networks Conference.** Contact: Kit Stevenson, American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

FEBRUARY 4, NEW YORK — **Vsam for Application Programmers.** Contact: International Computers & Communication Systems, Inc., 10 E. 21st St., New York, N.Y. 10010. Also being held Feb. 11-15 in New York.

FEBRUARY 4, NEW YORK — **Displaywrite 2.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 4, NEW YORK — **Introduction to the IBM Personal Computer.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 4, COLUMBIA, MD. — **How to Write Better Technical Reports, Proposals and Papers.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742. Also being held Feb. 5 in Rockville, Md., and Feb. 6 in Reston, Va.

FEBRUARY 4-5, NEW ORLEANS — **Unix Seminar.** Contact: U.S. Professional Development Institute, Unix and C, 1620 Elton Road, Silver Spring, Md. 20903.

FEBRUARY 4-5, WASHINGTON, D.C. — **Managing the Data Center.** Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.

FEBRUARY 4-5, ST. PETERSBURG, FLA. — **The Second Annual Frost & Sullivan Automated Manufacturing Conference.** Contact: Wendy Engelberg, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

FEBRUARY 4-6, SAN FRANCISCO — **Culprit/EDP Auditor: Concepts and Practice.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 4-6, SAN FRANCISCO — **Auditing in a Data Base Environment.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 4-6, SAN FRANCISCO — **Controlling & Auditing On-Line & Distributed Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 4-6, ATLANTA — **1985 Office Automation Conference.** Contact: American Federation of Information Processing Societies, Inc., 1899 Preston White Drive, Reston, Va. 22091.

FEBRUARY 4-6, DALLAS — **Automating the Office: A Tactical Guide for Success.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

FEBRUARY 4-6, ATLANTA — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

FEBRUARY 4-6, WASHINGTON, D.C. — **Introduction to Data Communications.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

FEBRUARY 4-6, WASHINGTON, D.C. — **X.25 and Packet-Switching Networks.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

FEBRUARY 4-6, SAN FRANCISCO — **Networking Personal Computers.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

FEBRUARY 4-6, SAN FRANCISCO — **IBM's Systems Network Architecture: Audit & Security Concerns.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 4-6, SAN FRANCISCO — **Computer Security for the Security Professional.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701,

FEBRUARY 4-6, PARSIPPANY, N.J. — **Vsam in Cobol.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

FEBRUARY 4-6, WASHINGTON, D.C. — **Digital Private Branch Exchanges.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

FEBRUARY 4-6, DALLAS — **Systems Project Management.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio. 44138.

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EDITORIAL

Software piracy: courting danger

There will be at least two lasting and significant effects of the antipiracy suit filed this month [CW, Jan. 21] by the Association of Data Processing Service Organizations. The first is a heightened awareness of the illegality of duplicating copyrighted software and the second, a heightened fear of the consequences.

While the suit, filed against American Brands, Inc., will likely travel a long path through the courts before concluding, it is abundantly clear that Adapso is playing hardball regarding the piracy issue.

But neither heightened awareness nor fear of retribution will do much to stop a crime that is so difficult to detect as long as DP management is willing to look the other way.

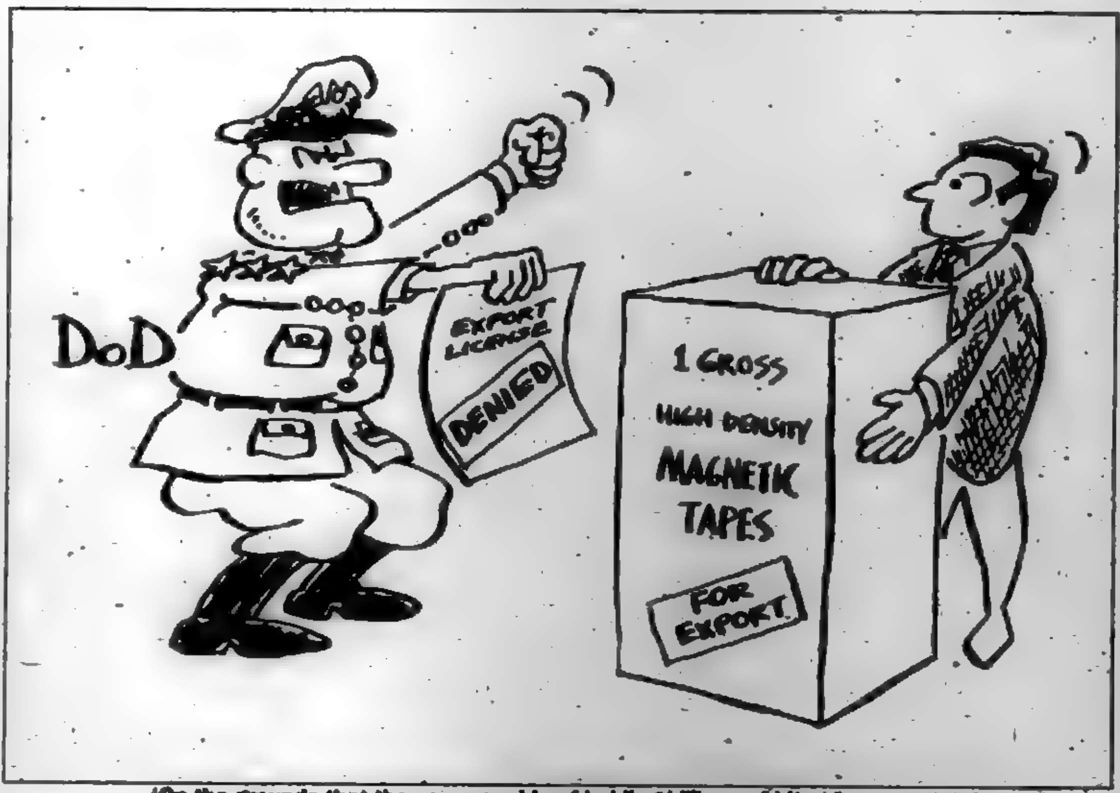
Let's face it, there are few managers who could not be aware of the rabbit-like multiplication of the two or three spreadsheet packages purchased at the start of the fiscal year. These same managers must now know that, if the piracy issue is raised in court, it is the managers — not the users — who will be on the witness stand, and the managers who will likely find themselves without a job if piracy charges are made to stick.

So, what's a manager to do? In the first place, every DP shop where micros are blossoming (which is virtually every large shop) should develop and implement an antipiracy policy.

Drafting such a policy is no big problem. The main thrust of the policy statement should be simple: Duplicating copyrighted software is illegal, regardless of whether the copies are sold, and duplicating these packages at work will be dealt with accordingly, as an illegal act.

And what of the managers' original problem — insufficient funds to meet the booming demand for micro software packages — that drove them to a life of piracy in the first place? That is a poor excuse to steal.

One of the realities of corporate life is that an effective manager must learn to live within a budget. Besides, it might be easier to get caught than you think. What if a disgruntled employee turns you in?



'On the grounds that they are capable of holding billions of bits of enemy data!'

LETTER

In praise of software benchmark

I want to comment on *Computerworld*'s new monthly feature on micro software benchmarks [CW, Jan.14].

I've been using Lotus Development Corp.'s 1-2-3 for several months now on my IBM Personal Computer XT with great results. It's a fine package and fills the spreadsheet requirements I have very well.

I have not used the Access Technology, Inc. 20/20 package and am therefore not qualified to comment on it, which is exactly the point.

I applaud *Computerworld*'s venture into this monthly benchmark series; it is certain to become a very popular feature because there are so many users like myself who operate relatively small systems in an isolated environment.

We are small business people who are required to perform many tasks each day and have little time to spend deciding which is the best of a variety of software packages available for a given application.

Certainly there are other publications that produce articles such as this, but I have always believed they were written more for the knowledgeable enthusiast than the small business user with a limited data processing background.

I shall greatly look forward to future installments of the software benchmark series.

This is the kind of relevant writing we've all come to expect from *Computerworld*. Congratulations.

Dave Dother
Killington, Vt.

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DATA PAST

Five years ago

ORLANDO, Fla. — Harris Corp. filed a lawsuit for more than $9.3 million here against the government of Iran, charging it breached a contract that called for the company to manage the installation of a sophisticated electronic intelligence-gathering and data processing system.

WASHINGTON, D.C. — Delivery of AT&T's Dataphone II system was to be delayed up to four months, the company told the Federal Communications Commission.

Ten years ago

NEW YORK — In its pretial brief filed with the U.S. District Court here, IBM charged the antitrust suit brought by the U.S. government was "at bottom an attack on IBM's success through competition" and "a repudiation of sound antitrust precedent and policy."

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3301-01

VIEWPOINT

Contract programmers: a fitting compromise

MANAGEMENT MATRIX
Walter F. Cuirle

Sooner or later, usually sooner than you'd like, you run into a situation where there is more work than people to do it. Normally, this isn't a problem. The best of schedules will always have temporary overloads followed by short slack periods. But for relief from the discomforts of the occasional scheduling headache, there are always contract programmers.

Some DP shops swear by contract programmers; in some cases, a majority of the staff may be long-term contractors. Other shops swear at them. In those latter shops, managers often claim that they can't find people with exactly the skills they want and have to pay too much for what they can find.

The ideal contractor has exactly the skills and experience you want. Let's say you want someone with three years of experience in Cobol — no more than six months out-of-date — with at least one of those years in an environment the same as yours. That's quite specific, but such a person shouldn't be too hard to come by.

You pick up the phone and call your favorite neighborhood broker. When one of the job shops on your list finds somebody with the qualifications you have specified, you have every right to expect the contractor to pick up the specifications and start right in on coding.

Unfortunately, it is not always that simple. Every manager who deals with job shops should expect to review candidates that have almost but not quite all the qualifications required.

This is normal, and a good shop will offer candidates who come close to meeting your requirements while continuing to look for the perfect match.

The problems begin when the parties involved try to decide how close a match is close enough. Some managers insist on a perfect match or none at all. That could be a mistake.

> ”
>
> *Some DP shops swear by contract programmers; in some cases, a majority of the staff may be long-term contractors. Other shops swear at them.*

Gray hair and a nervous twitch

Look at it from the broker's point of view. Did you ever wonder why so many of them have gray hair and a nervous twitch? It's a hard life. On the one side, they have a stable of programmers, half of whom answer the phone with "sixty an hour" instead of "hello." On the other side, they have an array of beady-eyed DP managers. Certainly, a broker's job is to match up a client's needs with a programmer's skills, but a good broker's most important asset is his reputation.

Given half a chance, and some room to maneuver, a knowledgeable broker really won't waste your time.

Now look at it from the contractor's point of view. A contract programmer's strength is depth of experience in a specific skill. This means that you, the client, can expect and get immediate production. That same programmer's weakness is usually lack of breadth. It's hard to get the opportunity to pick up new skills as a contractor, and good ones know the value of continuing education. You can make a living out of knowing CICS, for example, but you can't make a career out of it.

Next time, try making up three skills lists for your broker instead of just one. The first list should contain your requirements for immediate productivity. Assume no learning time, but offer — and expect to pay — the highest rate for any contractor that fills these specifications. For the second list, you can specify the same depth of experience but in areas that are related, rather than identical, to the skills you need.

Finally, specify your absolute minimum requirements. This list should be looser than the second, allowing for less experience in a larger variety of areas related to your final needs. Naturally, you offer lower rates for the second two lists.

Rate vs. skills scale

What you've done here is set up three points on a rate vs. skills scale. The brokers should like this system because they will have a larger number of programmers they can fit on the broader scale. At the same time, your variable rate still motivates them to find a match as close as possible to the top of your scale.

The contractors should like it because you are offering them the relatively rare opportunity to broaden their skills.

You should like it because your needs will get more attention, you will have a broader field to pick from, and you are therefore likely to find someone to fill the position sooner than you would with a single, fixed list.

If you are astute at picking candidates who appear to be quick studies, you'll still meet your schedule, and you are likely to do so for less money.

This method works best on your longer term projects. Keep your sense of humor. Sure, you may get a Logo hobbyist presented as qualified to pull down $45/hour in your operation, but look at the bright side. Those resumes can really brighten up an otherwise dull, afternoon staff meeting.

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

Infusing quality in the corporate culture

QUALITY
Wayne Smith

In the last installment of this column [CW, July 30], I stated that the quality of MIS products was more a function of the management culture in an MIS organization than a result of the effectiveness of any of the individual tools and methods. In this article, I would like to discuss several examples of what I mean.

An important principle in any quality program is the principle of coverage. Coverage is a testing or validation term that represents the degree to which a particular product has been fully exercised by a given set of test cases. For programs and other software products, the expression "fully exercised" is stated in lines of code, decisions, branches and so forth. For example, the ratio of statements that were executed by a given set of test cases compared with the total statements in the program becomes the coverage (in this case statement coverage) for that set of test cases.

The principle of coverage states that the greater the coverage, the greater the likelihood of discovering the next defect in that product. In general, high coverage means fewer latent flaws; conversely, low coverage means more latent flaws.

If you believe that defects are exceedingly expensive, and further, cost you exponentially more as the development cycle advances, then the principle of coverage becomes a very important weapon in your overall campaign to reduce your development and maintenance costs.

Vital part of MIS culture

Coverage is a quality principle. The central issue is how to translate this principle, desirable as it may be, into an actionable element of your quality program. For software products, this coverage principle can be implemented relatively easily by several products on the market today. But, the key to making the principle of coverage a truly valuable component of your quality program is to make it a vital part of the vocabulary, thought processes and culture of your MIS organization.

Let's start with a fairly simple example. Assume an organization wants to adopt the coverage principle as a part of its overall program development quality program. This means that whenever a program is to be developed, specifications are written that define the functions, rules, inputs and outputs for that program together with a test plan. This test plan defines the test cases and expected results that were developed by the system architect or analyst. It also serves as the basis for the acceptance of that program by the programmer and the analyst.

This approach implies that for a program to be considered complete and acceptable, the programmer must not only develop a source program from the attached specifications, but the program must be validated by demonstrating that it meets the expected results in the associated test plan. In addition, since the coverage principle is being implemented, a coverage report must also be part of the turnover documentation.

A coverage report will typically indicate which portions of the program were executed and which were not. This coverage report must show that the programmer, via the test plan that was included in the specifications together with any test cases the programmer has added, has achieved some predefined level of coverage (greater than 85% is not unreasonable for statement coverage).

Fallen by the roadside

The coverage principle has now been integrated into the program development process at the unit test level. But, is it yet part of the culture? Clearly, more is required. We all know of many good techniques that have fallen by the roadside because they weren't picked up by management and thereby perpetuated.

Accordingly, we can now take this principle and apply it to different levels of testing. But more important, we must include coverage measures as part of our routine status reporting and management reporting.

An effective technique is to include, with each program's status, a summary of the corresponding coverage for that program. This step is vital to the cultural change.

The goal here is to slowly redefine the nature of

See COVERAGE page 34

Smith is vice-president, specializing in quality, at Applied Information Development, Inc. in Oak Brook, Ill.

VIEWPOINT

LETTERS

Language not DBMS double

This is in response to the article "DBMS role in fourth-generation languages" by Ken Zearfoss [CW, Dec. 17].

Zearfoss's overall point is well taken: Let the buyer be wary of fourth-generation language products that falsely claim to offer data base management system (DBMS) capabilities. However, permeating the article is the assumption that these high-level languages somehow could or should double as DBMS. Therein lies a problem of definition.

A fourth-generation language is simply a high-level programming language, a means of writing programs with less procedural code. A DBMS manages access to and relationships among stored data. The DBMS is responsible for the four functions Zearfoss names: logical access, logical units of work, data sharing and recoverability.

A good fourth-generation language is a shorthand method of giving instructions to either a full-fledged DBMS or a simple file manager. If a fourth-generation language is coupled only with a file manager, then it clearly should not be used in applications requiring a DBMS.

Thus, the question is not "Does a given fourth-generation language provide all necessary DBMS functionality?" but rather "Is a given fourth-generation language sufficiently integrated with a good DBMS?" In other words, can you write applications programs, including updates, in a fourth-generation language and, through high-level instructions or logical defaults, have the DBMS perform its work of ensuring data integrity and consistency?

Unfortunately, Zearfoss's experience has not included any fourth-generation language that is closely coupled with a full DBMS. Such products do exist, and they have been used to build multiuser systems, even in complex applications like order service and manufacturing control.

These applications run in production with full data integrity, concurrency and recovery facilities and without any of the laborious code (for example, code to handle data contention) that the article describes. Fourth-generation languages are even serving as source languages for full-function applications software packages.

Your readers should keep in mind both the distinction between fourth-generation languages and DBMS and the value of having them work together.

Bob Morison
Burlington, Mass.

COVERAGE

from page 33

the dialogue between developer and manager so that terms such as coverage are important and recurring elements of that discussion. Managers should begin to realize that coverage is important to them and is a more precise way of defining testing effectiveness than the traditional technique of testing until time runs out. Low coverage is very expensive and unnecessarily risky.

Incorporating this principle into the management culture is actually quite straightforward. The coverage principle is first translated into a set of techniques that can be properly utilized by the staff in a usable, practical manner. These techniques are then integrated into the development methodology in order to discipline their usage.

Incorporate into training program

Finally, the principle is incorporated into the status and management reporting mechanisms so that it becomes part of the vocabulary and thought process of senior management. This principle must also be reflected in the organization's training program.

A further incorporation of the coverage principle can be achieved by adapting the concept for use in user acceptance testing. The idea here is to apply coverage not to lines of code, or other software constructs but rather to business requirements. If one considers that a system must meet a set of user-oriented business requirements before it can be considered acceptable, then it is reasonable to design an acceptance test plan that has a high level of coverage with regard to these requirements.

As in the earlier example, simply define a threshold (here, 100% of requirements might be the target) and incorporate this technique into the acceptance process. First specify the requirements in detail. This involves training the users in this new process so that they can assist in the requirements specification. Then, define a set of test cases and expected results in such a way that each requirement is covered by at least one such test case.

Here coverage involves a more subjective assessment, but such an approach nonetheless yields a substantial improvement in ensuring that the system or package meets the users' requirements.

Actual vs. expected results

Acceptance testing can proceed on this basis and requirements are considered covered when all their associated test cases have been successfully executed. That is, when the actual results are found to be equivalent to the expected results.

Again, as in the earlier example, this principle is further incorporated into the culture by including requirements coverage levels in the periodic status and management reports. In this case, requirements coverage reports that show which requirements have been covered and which are yet to be covered provide a simple but very effective means of evaluating the true progress of acceptance testing.

Developers, managers and users are now talking in terms of coverage, and as it becomes a legitimate element of their status reviews, management reviews and steering committee minutes, it becomes more completely integrated into the management culture of the MIS organization.

Cultural changes, even relatively minor ones, are often slow and painful. They require legitimation by the staff. They must make sense. They must be practical and clearly beneficial. But most of all, they must become a routine part of the way management thinks and acts.

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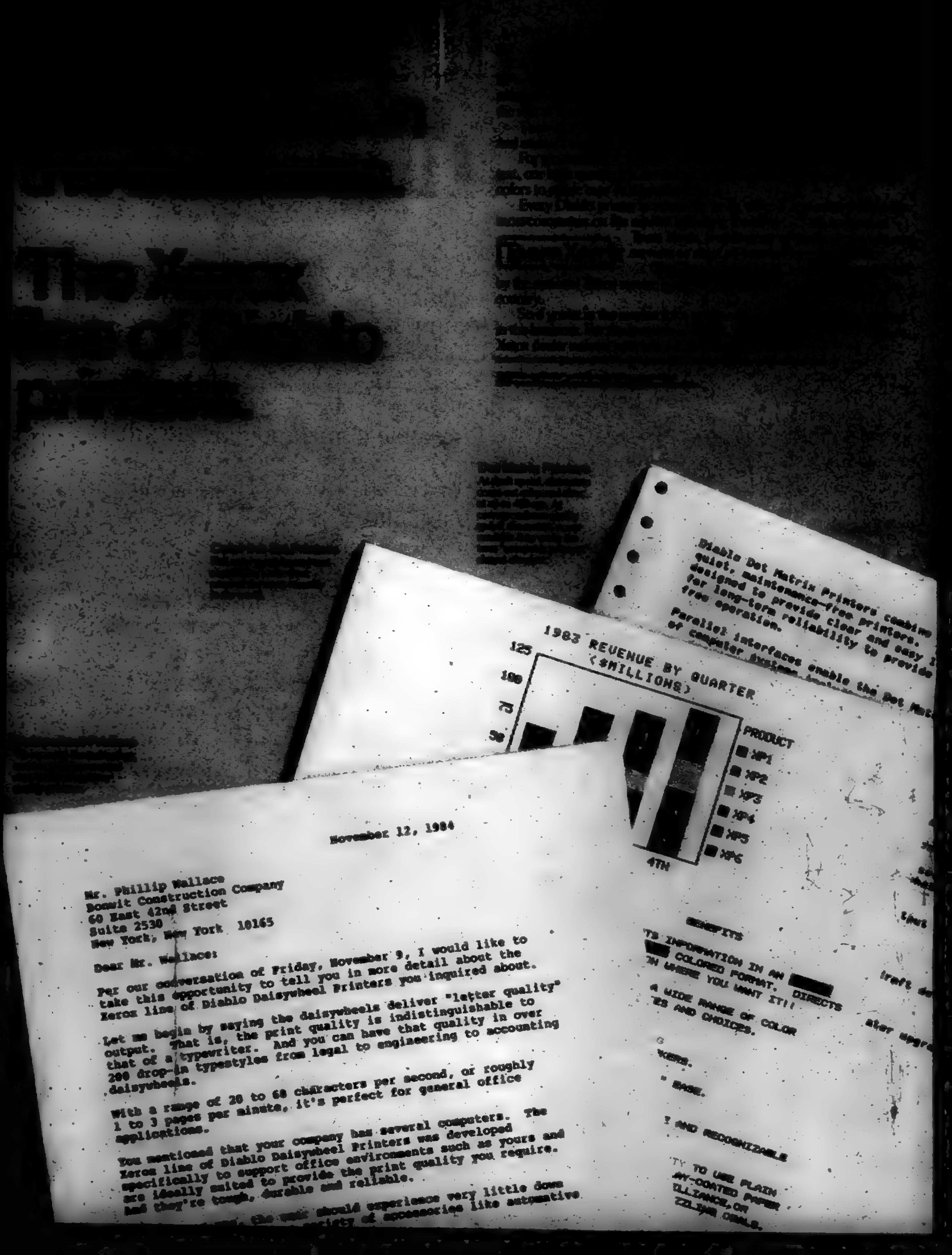

November 12, 1984

Mr. Phillip Wallace
Bonwit Construction Company
60 East 42nd Street
Suite 2530
New York, New York 10165

Dear Mr. Wallace:

Per our conversation of Friday, November 9, I would like to take this opportunity to tell you in more detail about the Xerox line of Diablo Daisywheel Printers you inquired about.

Let me begin by saying the daisywheels deliver "letter quality" output. That is, the print quality is indistinguishable to that of a typewriter. And you can have that quality in over 200 drop-in typestyles from legal to engineering to accounting daisywheels.

With a range of 20 to 60 characters per second, or roughly 1 to 3 pages per minute, it's perfect for general office applications.

You mentioned that your company has several computers. The Xerox line of Diablo Daisywheel Printers was developed specifically to support office environments such as yours and are ideally suited to provide the print quality you require. And they're tough, durable and reliable.

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SOFTLINE
Gerald W. Lanning

Simplifying documentation

Writing and modifying documentation for the user can be very time-consuming and expensive. Often it has information the user seldom reads or it does not have enough definition to be understood.

Documentation must be on a level everybody can understand. And the simplest documentation needed is the one that describes the data that is to be captured — a method that is cost-effective and provides a communication tool for management and one that will eliminate extensive documentation costs.

The method is called a user dictionary. It is so simple that it is surprising it was not thought of before. The user dictionary describes the data and code requirements of each field of a file. Just as you refer to the English dictionary for a word you do not understand, the same concept applies to the user dictionary. When a user is unfamiliar with a term or phrase, the dictionary can provide the answer. In addition, the dictionary provides a tool for management to communicate its needs to the programmer.

Using such a documentation method requires the cooperation of both the DP staff and the user responsible for the information. It is up to both to provide the criteria of each field. When new data fields are discovered, they must be fully defined and then arranged in the appropriate files.

For example, if the user needs to store an invoice number for future use, he would describe this field as invoice num-

See DOCUMENT page 38

Lanning is a senior programmer/analyst at Nebraska Western College in Scottsbluff, Neb.

PDSMAN capability stretches memory for bank programmers

By Sharon Stahlheber
Special to CW

HARTFORD, Conn. — The data processing division of Connecticut National Bank here is graded by management according to disk storage availability and response time in the IBM TSO environment. The goals are 100% availability and subsecond response.

In March 1983, however, the company was having a difficult time achieving its goals. "We needed a way to eliminate the number of compresses we were performing on Dasd [direct-access storage device] libraries," said Assistant Vice-President Richard Schaefer. "We simply needed to control our overhead."

> *'We simply needed to control our overhead.'*
>
> — **Richard Schaefer**
> **Connecticut National Bank**

The bank decided that the Free Space Reuse capability of PDSMAN from Goal Systems International, Inc. would provide the most control with the least impact on the computing environment. Free Space Reuse watches for any blank disk space, reorganizes stored material in real time and aggregates any unused disk portions.

"Installing PDSMAN was done simply and without fanfare," Schaefer said. "The first realization our programmers had of the new software was that they weren't running out of space anymore. We no longer needed to do compresses four times a day and response time remained acceptable."

Schaefer explained that in order to maintain efficient storage under TSO prior to installing PDSMAN, the library needed to be compressed regularly. If compresses were scheduled and performed on time, problems rarely occurred, he said. However, each compress burdened the operations

See BANK page 47

Stahlheber is a partner with Corporate Communications Associates in Annapolis, Md.

IBM link hooks micros to CPU

PC/VM Bond allows Personal Computer users to enter mainframe for VM system capabilities

WHITE PLAINS, N.Y. — IBM has introduced a microcomputer-to-mainframe link that allows users of its Personal Computer to make use of IBM VM operating system services on the mainframe.

According to a company representative, PC/VM Bond consists of two programs — VM Bond on the micro side and PC Bond on the mainframe — that enable a Personal Computer user to access VM capabilities. The link allows the Personal Computer to use large system disk storage, provides for data sharing among Personal Computer users, facilitates message services and features a command interpreter for the micro and full screen IBM 3278/79 terminal emulation capabilities.

The representative said that VM Bond provides the Personal Computer user with virtual disks that reside on the VM host system, although they appear to exist on the micro. There is no limit to the number of disks that the user may define and share with other users. Up to eight virtual disks may be actively accessed by IBM's PC-DOS operating system at one time, and the disks may range in size from a minimum of 2K bytes to a maximum of 32.7M bytes. The disks can be accessed through normal PC-DOS commands. In addition, services are provided to allow text or bina-

See LINK page 50

- Cap Gemini DASD has announced a translator that converts Fortran code to run on other Fortran compilers/40
- Inspiration Systems, Inc. has introduced a series of applications and development products for the AT&T Unix operating system/40
- Software International Corp.'s Smart Link now supports IBM's IMS/DC environment/41
- Oracle Corp.'s Oracle data base management system will soon be available under Amdahl Corp.'s UTS operating system/41

INSIDE

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SAMPLE USER DICTIONARY ENTRIES

User Definition [illegible]
30 Character Alpha (Mandatory)
Purpose: Describes the field in general terms.
Responsibility: User
Supplier: End user
Values: None

Programmer Definition [illegible]
10 Character Alpha (Mandatory)
Purpose: Describes the field name used for coding programs.
Responsibility: Data center
Supplier: Data center
Values: None

User Description Array [illegible]
350 Character Alpha (Mandatory)
Purpose: This is a five-element array of 70 characters each describing in detail the information to be captured.
Responsibility: Data center
Supplier: End user
Values: None

Length of Field [illegible]
3 Character Alpha (Mandatory)
Purpose: To describe the length of the data field used.
Responsibility: Data center
Supplier: User/DP
Values: None

Character Type [illegible]
1 Character Alpha (Mandatory)
Purpose: To describe the type and use of the data field.
Responsibility: Data center
Supplier: User/DP
Values: A — Alphanumeric $ — Dollar Amount
N — Numeric % — Percentage Figure
D — Date T — Yes/No

Responsible [illegible]
2 Character Alpha (Mandatory)
Purpose: To describe the person or persons responsible for the data field criteria.
Responsibility: Data center
Supplier: Any user
Values: DP — Data Center US — User Department
AU — Any User EU — End User
UD — User/Data Center JD — John Doe

Supplier [illegible]
2 Character Alpha (Mandatory)
Purpose: To describe the person or persons responsible for supplying the data.
Responsibility: Data center
Supplier: Any user
Values: DP — Data Center US — User Department
AU — Any User EU — End User
UD — User/Data Center JD — John Doe

Figure 2 CW CHART

DOCUMENT

from page 37

ber and give a description of its use and intent. The programmer or analyst responsible for design would be required to provide the size and character type along with a field name used in files and programs.

For example, a six-character alphanumeric field named INVNUM could be used. At this point, the data field links the user with the programmer. So when the user needs a report using the invoice number, the programmer can cross-reference and find the name used in the file.

Implementing such a system requires three basic files: the data field description file, data codes file and the program description file. Each file contributes to the user dictionary system supplying data field definitions, codes and purpose of programs written by programmers.

The data field description file is used as the master or driver. It retains the use and intent of the field, plus any extra information needed. The data codes file provides the codes of each field. This file consolidates all the table files currently on the system. The program description file just keeps track of all programs, job control programs or files created by the programmer.

Program description file

The program description file in Figure 1 gives a better understanding of the user dictionary. The file name FDATA is used to identify a file layout or program entered in the computer system. FDATA is entered into the field name PGMNAM. The data field description file found after the file name is an extended description of the file or programs. The information is then stored in the PGMDES field. The information relating to the purpose and intent of files, programs and job control routines is found in the PURPOS field.

[illegible]
[illegible]

SAMPLE DATA CODES

[illegible]
FDATA — Data Field Description File
Purpose: The data field file describes each data field of all input and/or output files for capture of company information. This file will handle all existing storage fields as well.

Created date: 01/01/80 Created by: [illegible]
Modified date: 03/05/81 Modified by: John

[illegible] — Data Code File
Purpose: The data code file retains all code requirements of a designated data field. This file describes codes in the same manner as a table file.

Created date: 01/01/80 Created by: [illegible]
Modified date: Modified by:

[illegible] — Program Description File
Purpose: The program description file describes each program, sort, job routine and input or output file created by programmers.

Created date: 01/01/80 Created by: [illegible]
Modified date: 10/08/82 Modified by: [illegible]

Figure 1 CW CHART

The CREATED DATE and CREATED BY fields indicate the date and programmer who created the first source code. The information is entered in the CRTBY and CRTDTE, respectively. Finally, the MODIFIED DATE and MODIFIED BY fields keep track of the dates and programmers modifying the source codes, and entry is in the field names MODDTE and MODBY, respectively.

Figure 2 provides further information about the elements of the data field description file and data code file.

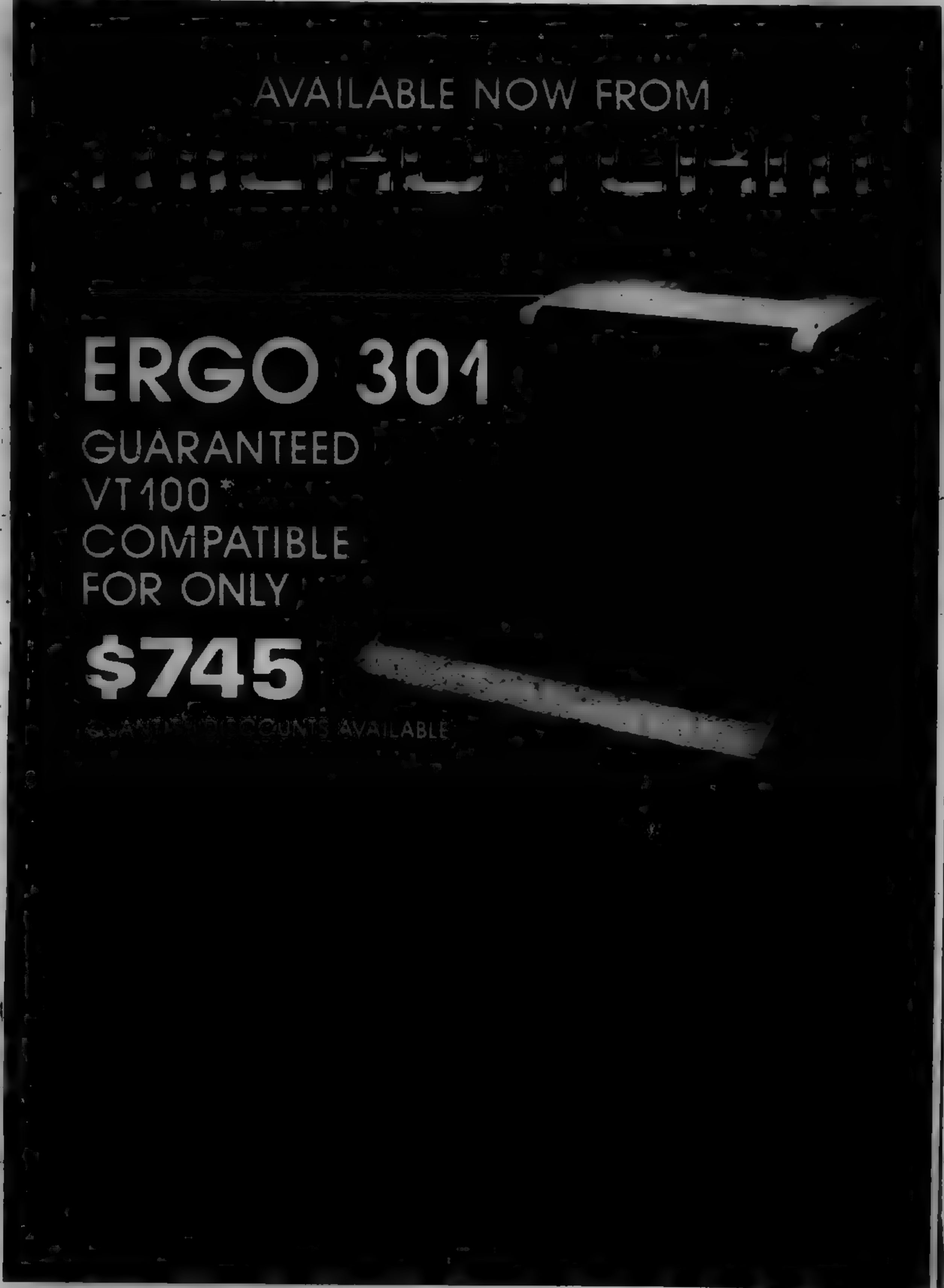
DP staff can control files

This should offer an idea of each file's use. Imagine the control the DP staff has on the files and programs written. The file also has potential Help instructions that can be implemented in all menu-driven programs.

With the ability to provide the necessary information of each data field, entry for unfamiliar input needs can be referenced in the same manner the English dictionary is referenced.

The computer was designed to store data about the company and the user dictionary is about that data. With this method, you can eliminate the time your personnel needs to read extensive documentation.

As a tool for management, the user dictionary provides a communications link between what is needed on a report and how the programmer can find the code. By selecting from the user dictionary the necessary criteria needed, management is in control of its data.



Fourth-generation tools do not replace Cobol: IDC study

By Maura McEnaney
CW Staff

FRAMINGHAM, Mass. — Fourth-generation languages are not a replacement for Cobol and when used as such can cause the loss of a competitive advantage, poor response times and unnecessary hardware additions for MIS directors, according to International Data Corp. (IDC).

In a recent report entitled "Fourth-Generation Languages: Information Generators to Meet Information Needs," the consulting company's Information Systems Planning Service expressed what it called "restrained enthusiasm" about the impact that fourth-generation languages have on programmer and MIS productivity.

"Fourth-generation languages will not replace Cobol or lead to Cobol's obsolescence," the report asserted, but are most effective when used as a "prototyping-only aid for mainstream Cobol programs or full implementation of seldom-run Cobol-type applications."

Summaries of information

Used as the basis for a decision support system (DSS), fourth-generation languages can help non-MIS and mid-level managers plan and model their business growth by providing timely summaries of business information, IDC said.

Because they significantly reduce coding requirements, fourth-generation languages save MIS programmers "enormous development energies," when they are used as a prototyping tool for large Cobol-oriented applications, IDC said. The languages can reduce MIS software maintenance and work to decentralize MIS by making area managers more accountable for their MIS requirements.

However, Cobol and fourth-generation languages are designed for two types of users, according to IDC. Cobol's hierarchical data base best handles the high-volume applications used by operations and accounting groups, while the relational data base structure and decision support strengths of fourth-generation languages make them appropriate for managerial planners.

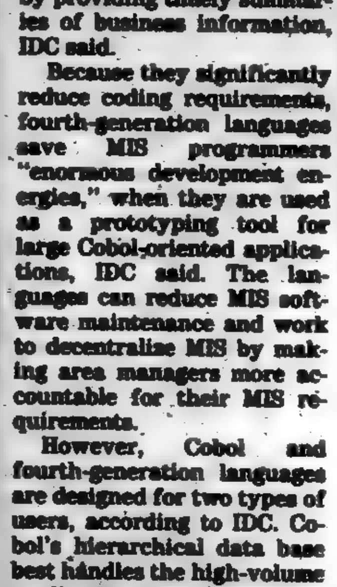
IDC reported that the use of fourth-generation languages will not help decrease the backlog of traditional Cobol needs. According to the report, however, they can be used to reduce the backlog of any DSS-related applications.

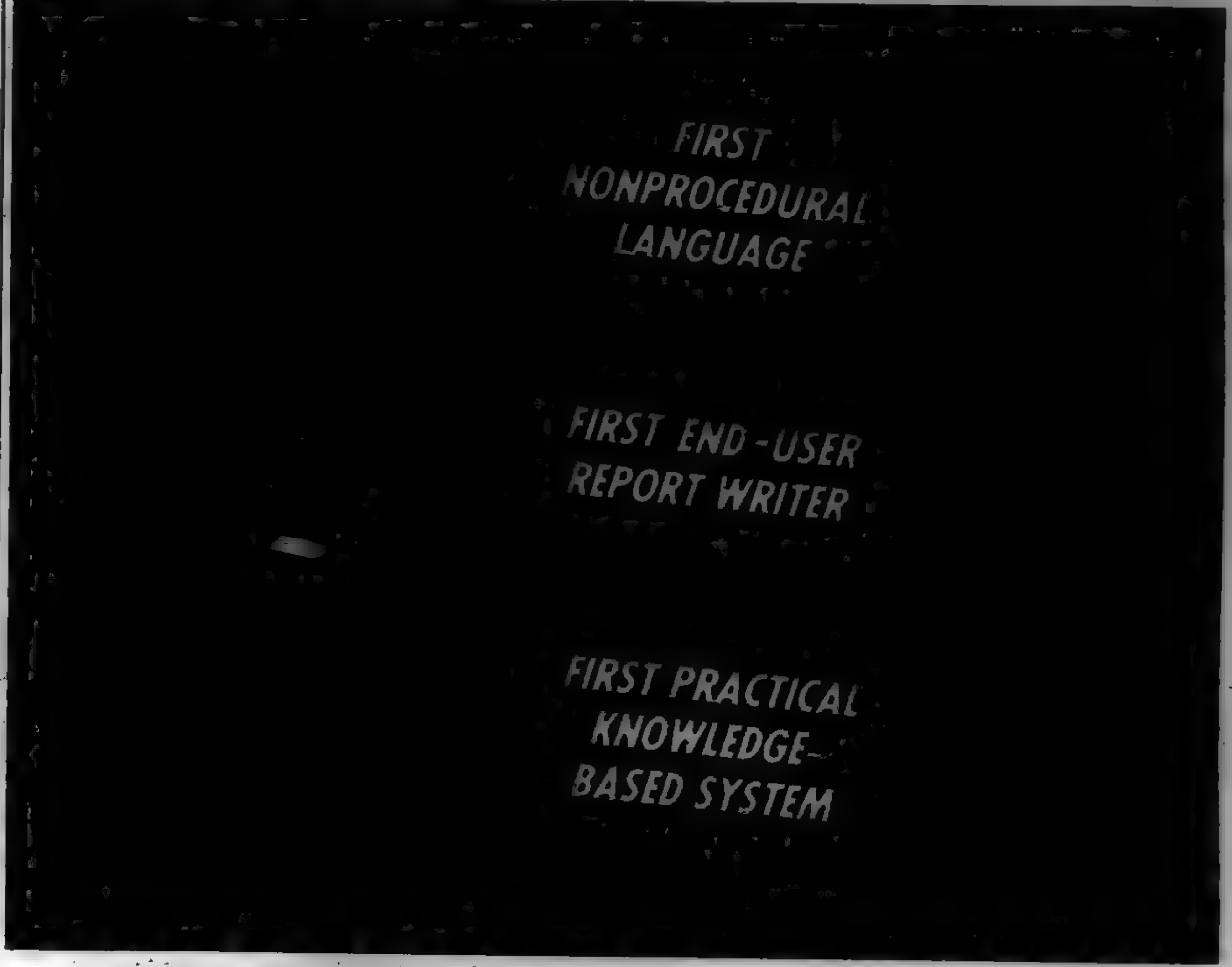
While the IDC report maintained that it is "very positive" about the benefits of fourth-generation languages as productivity tools, it alerted managers to several problem areas. These include lack of language standards, limited portability, the need to implement new releases, data security, poor product documentation, data transportation problems, storage issues, vendor support and shortage of fourth-generation experts.

Despite those problems, an IDC survey found that most fourth-generation language installations are used in companies employing IBM's VM or MVS operating systems, suggesting that "bigger shops are acquiring most of the fourth-generation languages software. In addition, fourth-generation languages are being used in nearly all industrial groups."

The report said the largest users are the durable manufacturing industry, which absorbs 22.4% of the language sales; financial services (17.4%); and nondurable manufacturing (17.4%).

The report is available for $650 from IDC Information Systems Planning Service, 5 Speen St., Framingham, Mass. 01701.





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CGD adds Fortran translator in free-form, formatted code

MILWAUKEE — Cap Gemini DASD (CGD) has introduced a version of its Fortran-to-Fortran translator that is capable of handling the translation of formatted and free-form Fortran to any other Fortran. The translator is available in an IBM OS/MVS environment, and CGD will act as a service bureau for users without that environment.

The translator produces a listing of translated programs and line-by-line diagnostic messages and comments, the vendor said. If variable names need to be truncated, the translator produces an old name/new name cross-reference table at the beginning of each program.

When the code is reformatted, all statements can begin in column seven, or "do" loops and "if" blocks can be indented, according to the vendor. All labels and label references are optionally resequenced in increments of 10.

The license fee ranges from $19,000 to $24,000. Translation is also available on a per-program, per-line basis.

CGD can be reached at P.O. Box 23676, 9045 N. Deerwood Drive, Milwaukee, Wis. 53223.

Inspiration Systems offers Unix-based DBMS package

SEWICKLEY, Pa. — Inspiration Systems, Inc. has announced a family of software products, based on AT&T's Unix, that is built around a common user interface and that combines applications with a relational data base management system (DBMS) and applications development facilities.

According to a spokesman, the Prevail series is built around a relational DBMS core and integrates an end-user interface with word processing, spreadsheet, communications and report writing modules and applications development tools. The user interface is described as a user-access shell that incorporates windowing capabilities, adaptive and permanent function keys, menus, a common command set with a spelling checker, a full screen editor, Help screens and a data integration facility that allows for sharing of information between Prevail components.

Prevail's components reportedly can be configured in any combination and are designed to operate across a variety of machine types. Hardware currently supported includes Digital Equipment Corp.'s VAX series, NCR Corp.'s Tower minicomputers, AT&T's 3B series and Masscomp Co., Parallel Computers, Inc. and Sun Microsystems, Inc. processors.

Prevail's office products offerings include menu-driven word processing software that features insert, replace and cut-and-paste capabilities. It allows for multiple column layouts, automatic titles, footings and pagination and document merging. The Prevail spreadsheet offers unlimited row, column and cell capacities, arbitrary cell list referencing, natural recalculation ordering and automatic command recall. Prevail's communications software provides access to electronic mail and other network services and facilitates interactive dialogue with other Unix- and non-Unix-based processors.

The core of the Prevail series is a relational DBMS that features an integrated, active data dictionary and is designed to accommodate large data bases and multiple interactive users. The Prevail report writer/data base definition facility offers interactive Help and continuous error-checking capabilities. As users define fields and records in response to screen prompts and as new information is compiled, the system automatically checks spelling, syntax and data dictionary capacity.

System based on ADL

According to the spokesman, Prevail's application development facilities are centered around the company's Pascal-based Application Development Language (ADL). ADL is described as a full-function, procedural, high-level language. All programs generated by the Prevail report writer are internally translated to ADL source code so programmers can change or add to source code generated via the ADL. ADL handles date, arithmetic and string operations and contains structured programming control statements and I/O facilities.

The Prevail software series is scheduled for shipment in May. Pricing for modules purchased separately for use on a supermicro such as AT&T's 3B2 are as follows: user interface, $375; DBMS and report writer, $1,350; telecommunications, $450; word processing, $750; spreadsheet, $750; ADL, $450. If purchased as a package, the entire Prevail system is priced at $4,125. Prices for modules or the entire system for minis, superminis and mainframes are 50%, 100% and 150% higher, respectively, than supermicro prices.

Inspiration Systems is located at Production Plaza, Sewickley, Pa. 15143.

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Smart Link out for IBM IMS monitor

ANDOVER, Mass. — Software International Corp. has introduced a version of its micro-to-mainframe link for users of IBM's IMS/DC teleprocessing monitor.

The IMS/DC Smart Link is said to be an intelligent micro-mainframe link integrated with Software International's General Ledger and Financial Reporting System. It reportedly enables IBM Personal Computer users to download data from the General Ledger and Financial Reporting System, manipulate the data using microcomputer spreadsheet products and upload the results to the mainframe.

According to a spokesman, the link provides options that allow the same naming convention to be used when accessing amount information from the mainframe. Information is downloaded in Software Arts, Inc.'s Data Interchange Format.

Smart Link reportedly incorporates audit trails and other security features used in the General Ledger mainframe system.

The single-unit price for the IMS/DC Smart Link is $4,000.

More information is available from Software International, One Tech Drive, Andover, Mass. 01810.

SYSTEMS SOFTWARE

PANSOPHIC SYSTEMS, INC.
Panexec Version 5.1.A.

Pansophic Systems, Inc. announced a release of its management control system software for IBM mainframe users.

Panexec Version 5.1.A. is said to include such features as complete support for IBM's MVS/XA operating system; an extended architecture Linklist Look Aside Facility support for Panexec libraries; an Authorized Program Facility support of individually authorized Linklist libraries for Panexec libraries; support for 31-bit programs; and a Fetch command.

Other features are said to include a dynamic Build Directory List that allows a directory preload of Linklist libraries and the ability to display the addressing mode and residency mode attributes of Exec elements.

A product enhancement is available free of charge for users of Duquesne Systems, Inc.'s PVO and Quickfetch software products that pro-

Continued on page 42

Oracle DBMS available for Amdahl UTS users

SUNNYVALE, Calif. — Amdahl Corp. has announced that it has entered into an agreement with Oracle Corp. that will make the Oracle relational data base management system (DBMS) available under UTS, Amdahl's mainframe version of the AT&T Unix operating system.

Under the agreement, a spokesman said, Oracle will license the system directly to UTS users. Oracle's applications tools allow users to develop and maintain their own applications.

The product's applications generator allows the user to build multiuser screens for on-line data entry, query and update procedures. The Oracle relational DBMS also features an interactive report writer and integrated data dictionary.

The spokesman said the interactive report writer operates through six basic commands and allows for the output of any query to be automatically formatted into a report.

The integrated data dictionary is automatically updated and stored as part of the data base and can be accessed by all Oracle facilities.

The price of a fully supported Oracle license under Amdahl's UTS ranges from $72,000 to $120,000, depending on the Amdahl unit and processor.

Amdahl is located at 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

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Continued from page 41

vides compatibility with Panexec, the vendor said.

A source/load cross-reference facility, %Write, provides support for Panvalet 11.0.

Users of this facility who are running prior versions of Panvalet must upgrade to Version 11.0, the vendor said.

The vendor said that because IBM has announced it will reduce support for OS/VS1, the latest release of Panexec will be the last to include guaranteed support of VS1.

Panexec is priced at $35,000 for IBM's OS operating system.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

PANSOPHIC SYSTEMS, INC.
VMLIB 2.0

Pansophic Systems, Inc. has announced enhancements to VMLIB, a source library system for IBM's CMS that operates in a native or guest system control program environment.

According to a spokesman, VMLIB 2.0 provides controls for source code accessed by multiple users and tracks changes to source code. One facility manages the development process from initial coding to testing to production and creates an audit file of all activities.

The enhanced version is said to store all changes in the form of delta files, and production-level programs are stored at their current level of maintenance.

VMLIB reportedly supports CMS/ISPF and makes use of CMS/ISPF editor features.

VMLIB 2.0 is priced at $19,500 for IBM's OS operating system or native VM with no guest operating system and $17,500 for IBM's DOS environment.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

TSI INTERNATIONAL
Docu/master enhancements

TSI International has announced enhancements to Docu/master, a storage and retrieval system for text and structured data that runs under IBM's OS or DOS operating systems.

According to a spokesman, enhancements include a columnar reporting option that offers users a paint-the-screen procedure to format any combination of structured data and text.

In addition, Docu/master now supports up to 400 users, and there is no longer a limit to the types of terminals defined in a system. The enhanced release also supports Spanish, Swedish, Dutch, English, French and German.

Docu/master is priced at $58,000 for the OS version and $45,000 for DOS. Current Docu/master users can upgrade to the latest release for $5,000.

TSI International, 187 Danbury Road, Wilton, Conn. 06897.

EMERGE SYSTEMS, INC.
Rtux Executive

Emerge Systems, Inc. has introduced a real-time support package for use on computers running under AT&T's Unix System V.

According to a spokesman, the capabilities provided by the Rtux Executive package include shared memory management, loading of resident programs, interprogram and interprocessor message-queuing services, direct sharing of memory between resident programs and scheduled processes and resident program control of scheduled process execution priorities.

The package reportedly

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provides support for resident systems mode exception handlers and scheduled real-time processes in single or distributed real-time systems.

Rtux Executive costs $2,000 for an initial license and $200 for each additional license.

Emerge Systems, P.O. Box 3175, 114 Sixth Ave., Indialantic, Fla. 32903.

INFORMATION PROCESSING TECHNIQUES CORP.
DG'C' Revision 2.25

Information Processing Techniques Corp. (IPT) has announced an enhanced version of its C compiler for Data General Corp. computers running under any mapped DG operating system.

According to an IPT spokesman, enhancements to Revision 2.25 of DG'C' include the addition of a Motorola, Inc. 68000 microprocessor cross-compiler, support of unpended I/O, I/O packet support for 32-bit DG machines running under the AOS/VS operating system, greater optimization in generated code size and speed, added debugging features and additional preprocessor facilities.

DG'C' ranges in price from $5,000 to $26,000, depending upon the configuration of the host system and the cross-compilers selected.

IPT, 1096 E. Meadow Circle, Palo Alto, Calif. 94303.

INFORMATION PROCESSING TECHNIQUES CORP.
Tracer

Information Processing Techniques Corp. (IPT) has introduced a C language development tool for Data General Corp.'s Nova, Eclipse and MV machines running under DG's Rdos, AOS and AOS/VS; for IPT's Eclix operating system; and for Digital Equipment Corp. VAX series computers running under DEC's VMS or Ultrix-32.

According to an IPT spokesman, Tracer is a C source analysis/debugging tool that operates in three modes. Tracer's source analysis mode highlights nonportable or wasteful code segments, variable-type usage conflicts and unused variables and functions.

The package's runtime analysis mode indicates the names of new variables, the names and values of functions and arguments upon entry and the name of the caller, labels of statements and execution of IF/ELSE, DO and CASE statements. The product's interactive mode allows a programmer to set break points and run through a program interactively.

A one-time license fee for Tracer is $3,950.

IPT, 1096 E. Meadow Circle, Palo Alto, Calif. 94304.

LATTICE, INC.
IAPX86 compiler for VAX/VMS

Lattice, Inc. has announced that its IAPX86 compiler can now be used as a cross-compiler for Digital Equipment Corp. VAX-11 superminicomputers running under DEC's VMS operating system.

The Lattice VAX/VMS cross-compiler is said to have the same functions and generate the same code as native compilers. It reportedly corresponds to Microsoft Corp. MS-DOS V.2.14 compilers and can generate code for the Intel Corp. 80186 chip, a Lattice spokesman said.

The cross-compiler is available on nine-track magnetic tape in the VMS backup format. It is said to contain a hierarchical directory that mirrors the native compiler structure. Directories for the memory models contain run-time libraries and start-up routine object modules, the spokesman said. An object module disassembler and a function-extract utility are included. The cross-compiler is priced at $3,250.

Lattice, P.O. Box 3072, Glen Ellyn, Ill. 60138.

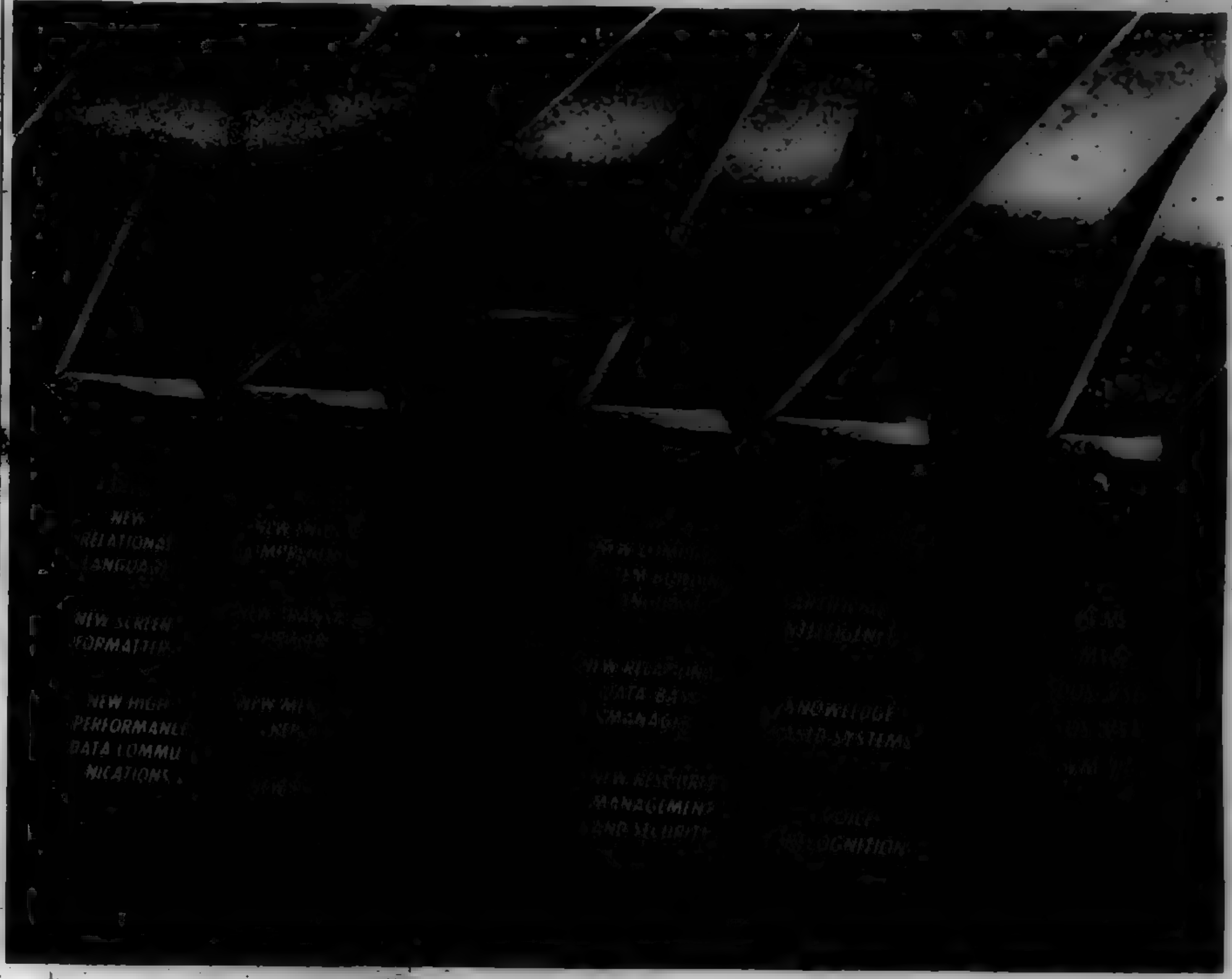
LISP MACHINE, INC.
Rtime

Lisp Machine, Inc. has introduced a software package for its Lambda family of Lisp processors that is designed to enable Lisp programs or expert systems to handle real-time processes.

According to a spokesman, the Rtime package uses the parallel processing capabilities of the Lambda/Plus series of Lisp machines.

The product reportedly allows the Motorola Corp. MC68010 microprocessor of the Lambda/Plus to monitor and screen incoming information on a real-time basis, and it allows the Lisp processor to concentrate on expert

Continued on page 44



. . . And the one with the most innovation yet to come.

Continued from page 43

systems decisions.

Written in C, Rtime operates in parallel with the Lisp processor and communicates with it via a Lisp-based serial interface or by maintaining data values in arrays in shared memory, the spokesman said. The product handles tasks such as data acquisition, calculations, process-related algorithms and low-level inferences.

Rtime is priced at $20,000.

Lisp Machine, 6033 W. Century Blvd., Los Angeles, Calif. 90045.

PRODUCTIVITY AIDS

FOUR-PHASE SYSTEMS, INC.

Maestro+

Four-Phase Systems, Inc. has announced that Softlab Systems, Inc.'s Maestro+, a project management package for use with the Maestro software development computer system from Softlab Systems, Inc. of Munich, Germany, is now available for the Four-Phase Series 4000 running under Four-Phase's MFE/IV operating system.

According to a spokesman, Maestro+ consists of two programs: a project library service for administering development material and for supporting project standards, methodologies and information flow; and a project management service for task distribution, cost control, automated entry, generation and evaluation of reports, tables, charts and trends.

Maestro+ costs $17,000.

Four-Phase Systems, 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

APPLICATION PACKAGES

JCA SOFTWARE, INC.

Express Delivery

JCA Software, Inc. has announced Express Delivery, a report distribution and tracking system that runs under IBM's MVS and MVS/XA operating systems.

According to a spokesman, the product enables data centers to implement banner page support and destination information required to distribute daily reports. Express Delivery allows a user to customize distribution information to suit individual data center requirements without requiring operating system modifications.

Report information is generated by production history, late production, user cross-reference and report cross-reference. Express Delivery is priced at $20,000.

JCA Software, Suite 224, 3188 Dupont Drive, Irvine, Calif. 92715.

S&H COMPUTER SYSTEMS, INC.

Indas-Graphics; Indas-Screen

S&H Computer Systems, Inc. has added a full-color, presentation-quality graphics facility and a screen-oriented data entry and editing facility to its Indas statistical analysis system for Digital Equipment Corp. VAX computers running under DEC's VMS operating system.

According to a spokesman, Indas-Graphics produces graphs and charts on a variety of plotters and display devices and provides 12 character fonts for labeling. The plotting facility produces scatter and line plots with optimal polynomial line fitting and confidence intervals.

Indas-Screen allows a nonprogrammer to generate a data entry screen for entering and editing data used with the Indas system, according to the vendor. The facility is said to support multipage screens and provide file maintenance facilities.

Initial license fees for Indas-Graphics range from $1,500 to $4,900. Indas-Screen is priced from $1,200 to $4,400, depending on machine size. Annual license renewal fees for all products are 50% of the initial license fee, according to the company.

S&H Computer Systems, 1027 17th Ave. S., Nashville, Tenn. 37212.

COMPUTER DATA CORP.

Project Cost

Computer Data Corp., has announced that its line of financial applications software now includes a Project Cost module for Hewlett-Packard Co.'s HP 3000 and Digital Equipment Corp.'s VAX series of computers.

Project Cost reportedly can be integrated with the company's Computer Data Information Systems software to provide financial,

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For Applications Development, today's RAMIS II combines 4th-generation flexibility with the efficiency of a compiled architecture to deliver the highest levels of productivity.

SOFTWARE & SERVICES

distribution and human resource software packages for manufacturers and distributors.

According to the company, Project Cost is an on-line, real-time, menu-driven application said to accommodate the posting and distribution of hours and labor expenses to the company's general ledger module of books, accounts and cost centers. Other features of the product include billing rate, cost code and task definition, as well as customer maintenance and start and completion date maintenance.

The Project Cost with the general ledger module costs $20,000, The general ledger module alone costs $15,000.

Computer Data, 31344 Via Colinas, Westlake Village, Calif. 91362.

MOBIUS MANAGEMENT SYSTEMS, INC.
Infopac 2.0

Mobius Management Systems, Inc. has released Version 2.0 of its output management software system for IBM's DOS/VSE and MVS operating systems.

Designed for nontechnical personnel, Infopac 2.0 is used in distributing computer-generated reports. According to the company, it automatically groups each end user's pages from multiple reports into addressed and indexed packets. Report recipients can designate the number of reports or segments of reports they want to receive.

Infopac 2.0 is said to feature general and selective distribution schemes. The enhanced system also offers expanded default options and can handle reports of up to 255 columns in width, requiring one production job to execute. Optional add-on modules include Job Entry System and Power Spool interfaces, Laser Printer Interface, a Microfiche Module and a Remote Job Output Module, the company said.

Infopac Version 2.0 is priced at $12,500 for DOS and $15,000 for MVS.

Mobius Management Systems, 271 North Ave., New Rochelle, N.Y. 10801,

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ISDOS, INC.
PSL/PSA; PSA-SA for AT&T Unix

Isdos, Inc. has announced that its software engineering tool, the Problem Statement Language/Problem Statement Analyzer (PSL/PSA), and its Problem Statement Analyzer-Support Environment for Structured Analysis (PSA-SA) are now available for use with Apollo Computer, Inc. and Pixel Computer, Inc. workstations and Digital Equipment Corp.'s VAX series, Hewlett-Packard Co.'s HP 9000 and Gould, Inc.'s 3287 minicomputers running under AT&T's Unix operating system.

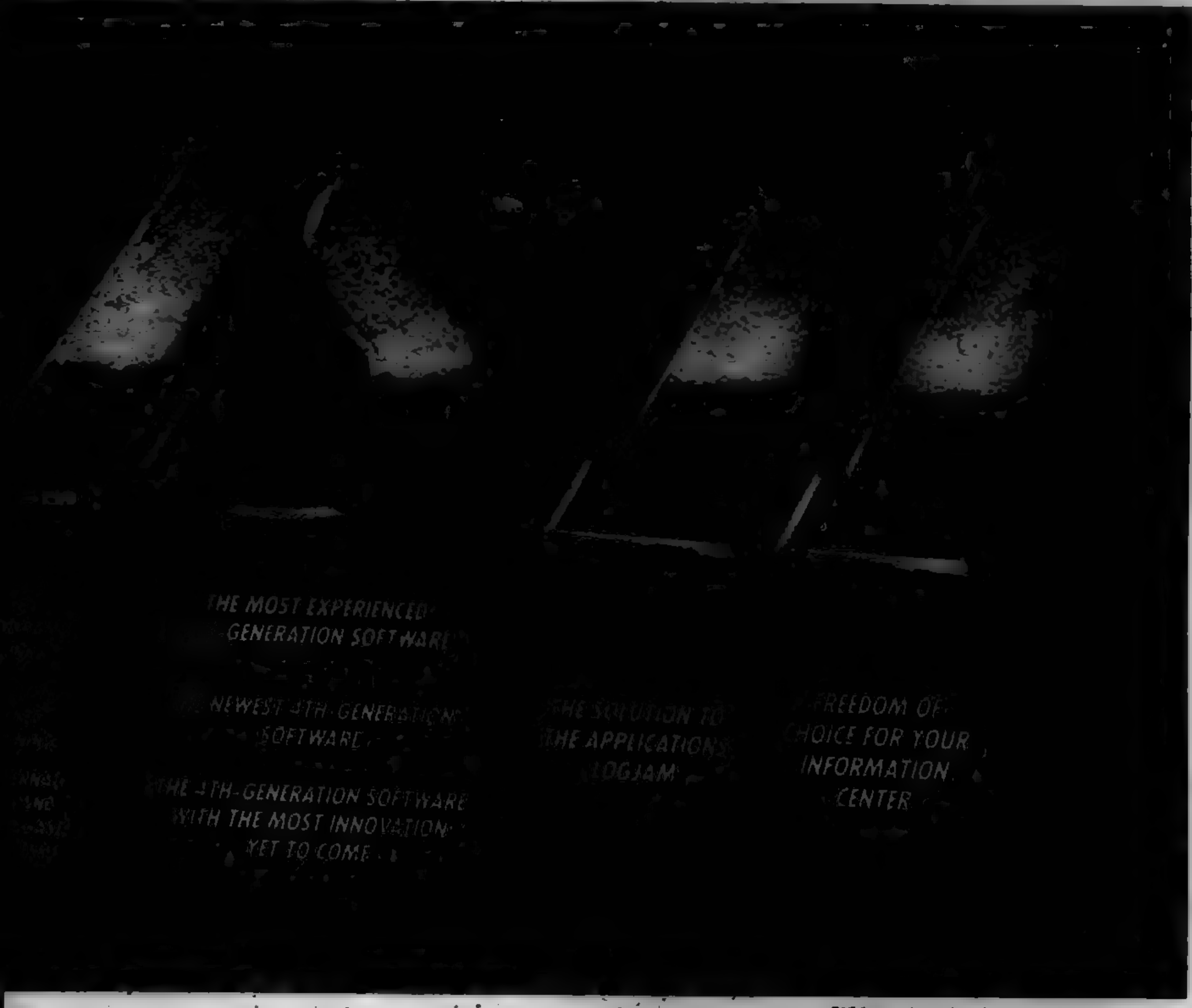
According to a vendor spokesman, PSL/PSA is a computer-aided tool that automates the development of requirements and the analysis and design of an information system. It reportedly allows developers to describe an information system, provides quality assurance through completeness and consistency analysis, allows "what-if" analysis and automates the production of deliverable system documentation.

The menu-driven PSA-SA environment works in conjunction with PSL/PSA to automate the analysis process in structured methodologies. It includes predefined quality assurance analyses appropriate to the methodology and generates a deliverable, structured specification document as a by-product, the vendor said.

Superminicomputer and mainframe versions of PSL/PSA are priced at $45,000, with an additional $3,000 to add the PSA-SA environment. The workstation versions of PSL/PSA range from $15,000 to $22,500, with an additional $1,500 for PSA-SA.

Isdos, P.O. Box 4179, 325 E. Eisenhower Pkwy., Ann Arbor, Mich. 48106.

See AIDS page 50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BANK

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department with additional job submissions and management of overall processing. And if compresses were not scheduled, programmers would likely run out of space, Schaefer said. TSO would stop, and the 70 to 90 programmers using it at Connecticut National would be idle.

The bank uses two IBM 32M-byte 3081 processors running under the MVS/XA operating system: one for production processing and one for program development.

Since installing PDSMAN, Connecticut National has begun to rely on the Dynamic Build Directory List (BLDL) facility in the system to create a list of all programs and their addresses in storage. Program requests cause the storage device to seek out addresses each time they are requested. "Simply using BLDL for high-traffic load libraries creates enormous amounts of Dasd contention and very high overhead," Schaefer explained. "PDSMAN remembers the addresses of the most-used programs. It records them the first time the program is loaded. The next time the program is loaded, PDSMAN remembers and goes right to the program without consulting the directory."

Accessing PDSMAN statistics from a terminal at his desk one morning, Schaefer reported that approximately 35,000 program requests had been processed from the system link list so far that day. Of those, 31,000 were fulfilled by PDSMAN; 3,500 required an actual library search. Thus, more than 90% of requested programs were found faster with virtually no excessive overhead by the PDSMAN BLDL, he said.

Except for some minor contact with Goal Systems developers to smooth out PDSMAN interfaces with MVS/XA, Connecticut National has had little need to use the vendor's technical support, Schaefer said.

'System works with us'

"The system works with us to pinpoint problem areas," he explained. "When something goes wrong, we can just shut PDSMAN off until we find the problem. If it's within PDSMAN, we find out right away. Usually it's elsewhere. We isolate the problem, fix it and then turn PDSMAN back on. Since PDSMAN requires no initial program load to activate, we can turn it on and off at will.

"We have bought Dasd hardware in the last 18 months to handle additional capacity from businesses that have joined the bank, but we haven't added PDS," Schaefer said. "Today, library compresses that were formerly required on a daily basis are done weekly. The ones that were weekly are now monthly.

Conversion to PDS

"Our technical people are talking about converting entirely from source library software files to PDS. Right now, we have one large source library for 110 programmers. . . . The proposal from my technical staff is to break up the huge source library into multiple PDS.

"We could maintain far better control of programs and let PDSMAN worry about the storage. PDSMAN maintains its control at the programmer level, never allowing a program to be filed without creating a backup for its archives."

Has the bank's data processing division made its grade? Schaefer reports yes, more often than not. Space is rarely unavailable to users, and since TSO is no longer overburdened, response time remains acceptable.

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12:00 - 1:00	Lunch
1:00 - 3:30	Breaking the Applications Logjam

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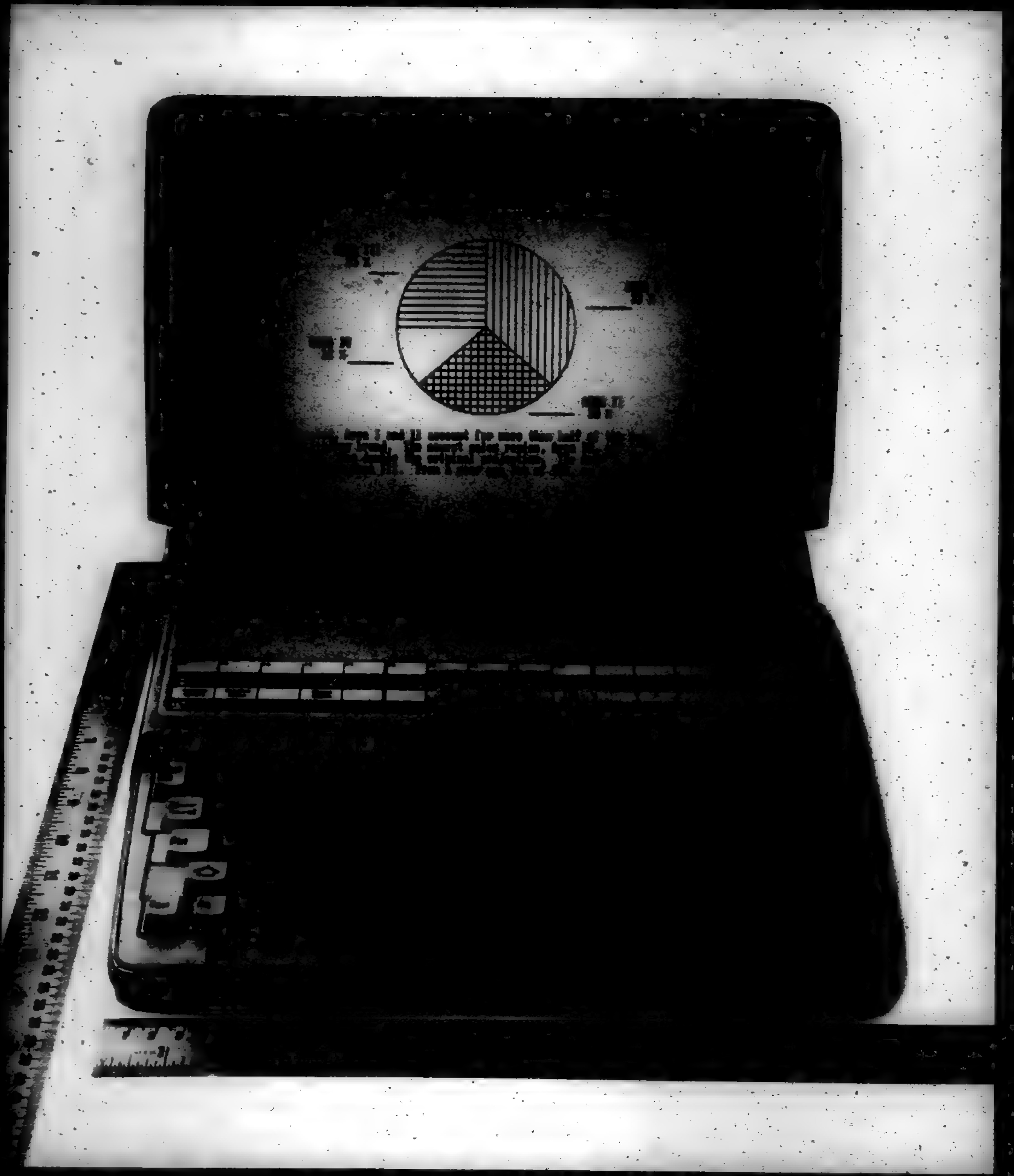

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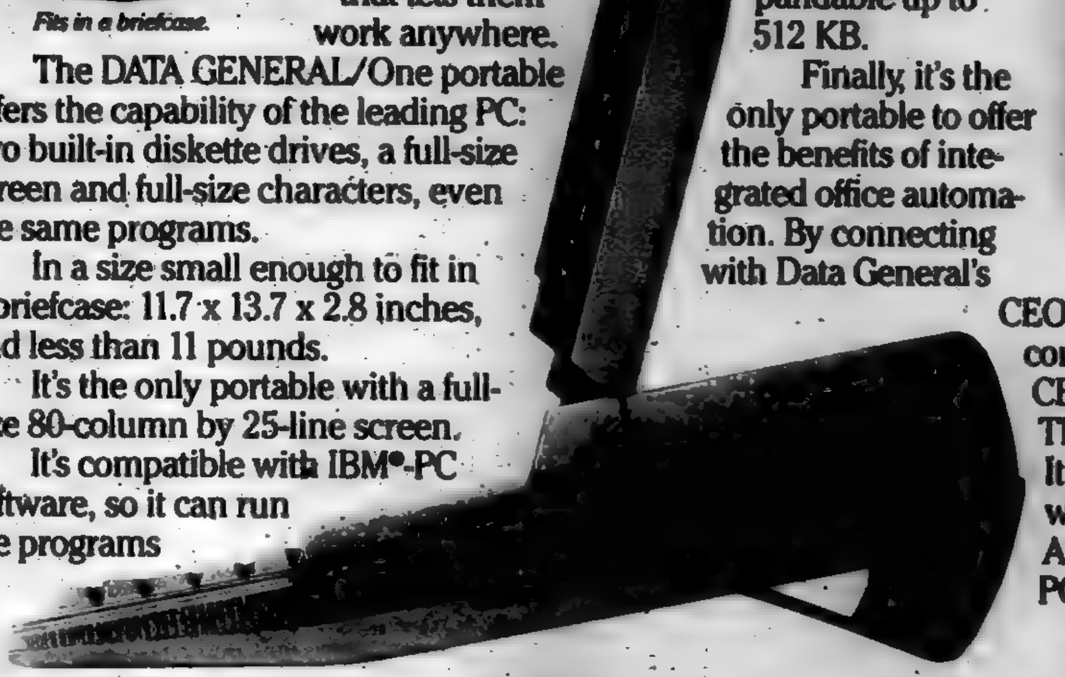

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SOFTWARE & SERVICES

AIDS

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KURZWEIL COMPUTER PRODUCTS, INC.

Interfaces for Kurzweil 4000 Scanning System

Kurzweil Computer Products, Inc. has introduced custom interfaces for its Kurzweil 4000 intelligent scanning system to the IBM Personal Computer Displaywrite and the Wang Laboratories, Inc. VS series.

According to the company, the interfaces insert format codes specific to PC Displaywrite and Wang's Word Processing Software (WPS) into scanned text during the communication process from the Kurzweil 4000.

The PC Displaywrite interface inserts codes for PC Displaywrite products. It is said to communicate synchronously in the IBM Revisable Form-Text Document Content Architecture.

The Wang VS series interface reportedly communicates synchronously in Wang's WPS mode and is said to insert code to the WPS document format.

The interfaces are available for $3,500 each.

Kurzweil Computer Products, 185 Albany St., Cambridge, Mass. 02139.

COMPUTER SOLUTIONS, INC.

Growthpower Release 4.0

Computer Solutions, Inc. has announced Release 4.0 of its Growthpower package, an integrated manufacturing, financial and marketing software system for assembly manufacturers.

Reportedly, the package was designed for the Hewlett-Packard Co. HP 3000 minicomputer running under HP's MPE operating system and interfaces with the IBM Personal Computer and the HP 150 micro. More than 200 enhancements are said to be included in the modules of Release 4.0. An on-line, horizontal, vertical and action-planning MRP inquiry function suggests quantities of parts to be ordered so that production schedules are met on time. Another improvement in the MRP module allows users to get daily status reports, both hard copy and on-line, that reflect up-to-date changes in inventory quantities and orders.

The price of Growthpower 4.0 ranges from $30,000 to $60,000.

Computer Solutions, One Burlington Woods, Burlington, Mass. 01803.

BEDFORD RESEARCH

I*S*P 1.2

Bedford Research has announced the release of Version 1.2 of Interactive Signal Processor (I*S*P), a research and design software system for Digital Equipment Corp. VAX-11 and PDP-11 minicomputers.

Multichannel processing, enhanced graphics, signal editing, audit trail, coherence analysis and structured programming features have been added to the product, a spokesman said. The product is priced at $9,500.

Bedford Research, 4 De Angelo Drive, Bedford, Mass. 01730.

LINK

from page 37

ry files to be moved to or from host VM disks to virtual disks.

Through the use of virtual disks and VM facilities, users can access data that resides on a host VM system, share data among other Personal Computer users running VM Bond, send files to other users connected to the same VM host, store data in a VM host system and provide for the backup of data through VM host backup procedures.

The representative said the link includes a command interpreter language extension similar to the Rexx/370 command interpreter available with VM/SP Release 3 to provide a common control language between the two environments.

Rexx/PC operates completely on the micro and can control the sequence of commands and program execution based on real-time interpretation of the environment.

The VM Bond portion of the micro-mainframe link is available for a one-time charge of $125. A single license for the PC Bond portion supports all VM Bond users on the same machine. It is available for a one-time charge of $2,000 and a monthly license charge of $100.

For more information, the National Accounts Division of IBM is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

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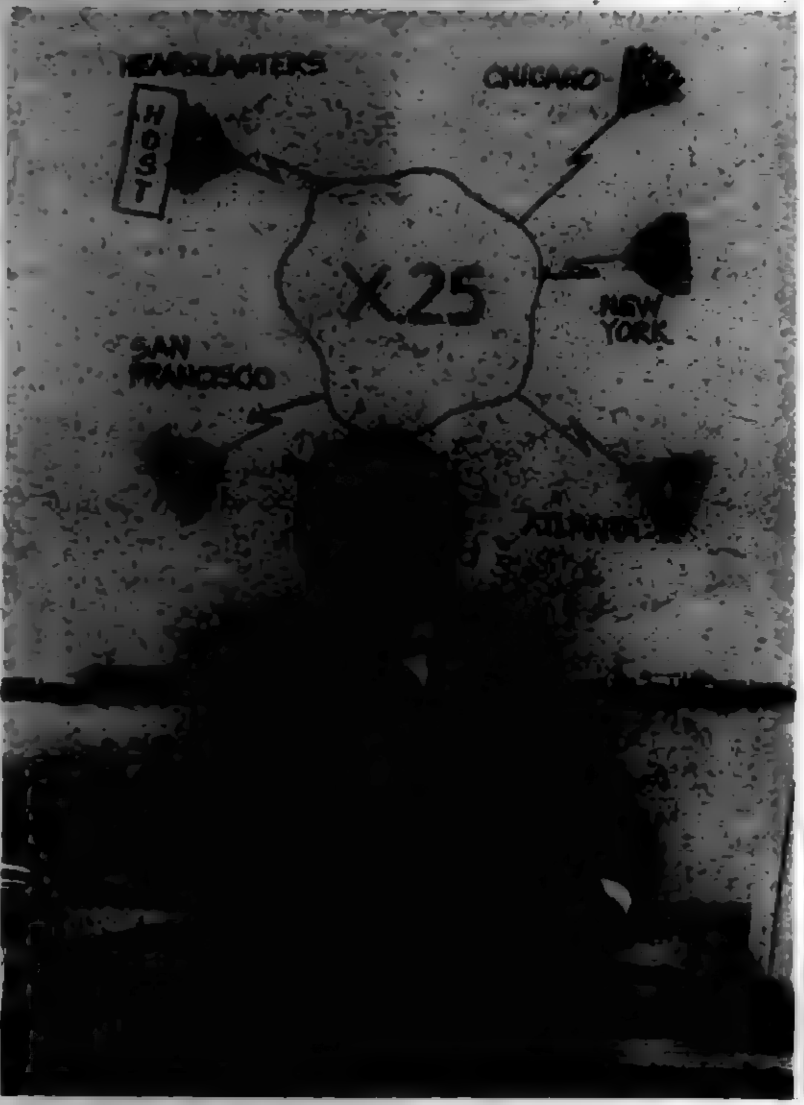

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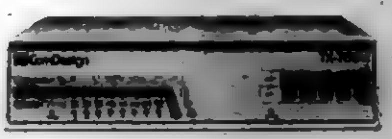

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IN DEPTH

Thou Shalt Not Dupe

So says a vendor of software — is anyone listening?

By Marv Goldschmitt

For certain leading products, the ratio of illegal copies in use to legal copies licensed is greater than one to one, according to a recent study. Virtually all of these packages came with some sort of diskette-based copy protection and written prohibitions against copying.

The microcomputer software industry has entered into an arms race with consumers in an attempt to stem the tide of illegal copying. From a business standpoint, this escalating cold war is tremendously counterproductive, frustrating legitimate users of micro software products and generating ill will toward the publishers.

The roots of the problem are certainly complex. First, in the last 25 years, society has become desensitized to the rights of the developers of intellectual property. Paper copy machines began the process by providing people with the opportunity to make quick and inexpensive exact reproductions of others' copyrighted printed work.

High-quality consumer audio recording equipment has certainly hurt the record and prerecorded tape industries. The advent of the videocassette recorder and videodisk industries has allowed people to make unauthorized copies of motion pictures.

Finally, the very technology and proliferation of microcomputers, which spurred the micro software industry's meteoric rise, are also enabling users to make thousands, if not millions, of illegal copies of software.

In many respects, the copying of micro software is much more insidious than the other instances. The cost differential between buying a legitimate copy or making an illegal copy of a written work, movie for personal use or record is almost incidental. After all, who is going to stand over a copy machine and run off *War and Peace?* The cost differential between buying *Thriller* in the store and copying a friend's record on a blank tape is less than $10.

The cost of renting a movie for a video cassette recorder may be a few

dollars a day — less than purchasing a blank tape.

Yet the price difference between buying a legitimate copy of an integrated software product or making an illegal copy on a $5 blank disk is frequently hundreds of dollars. In addition, the software is a tool that is normally used repetitively and thus has a value that increases. *Gone With the Wind*, with the exception of a few movie buffs, loses it value after being viewed by the same person a few times.

Second, the infant micro software industry is not as well positioned as the more established record, motion picture and print publishers to withstand substantial revenue losses to piracy.

Third, unlike other industries affected by illegal copying, software publishers are called upon for significant after-sale support. With the tremendous number of illegal copies in use, this demand places a greater cost and strain on the software publishers' support system without compensating revenues.

Finally, the micro software industry is arguably stuck with the largest copying problem in any industry. A recent Future Computing, Inc. study indicates that for a number of leading business computer software products, the ratio of illegal copies in use to legal copies licensed is greater than 1:1. For every legitimate copy purchased, there is at least one illegal copy in use. Interestingly, virtually all the products studied had some sort of diskette-based copy protection as well as written prohibitions against copying included in the package.

It is obvious that each illegal copy in use would not translate into a sale. However, if only one in four of the illegal copies had been purchased instead, the micro software industry's revenues would increase more than 25% annually, or an additional $300 million during 1984.

What can the industry do?

Diskette-based protection schemes have not been very effective in stopping software piracy. It is equally clear that diskette-based protection has created many difficulties for legitimate users of software products. Many diskette-based protection implementations require a disk to remain in the drive while the product is running, limiting the use of the computer system to that single product. Copy protection also makes it difficult for users to make what seem to be reasonable backup copies for archival and security purposes.

While the basic technology employed for disk protection has remained essentially the same over the last five years, other microcomputer-related technologies have continued to move ahead. As a result, users find it difficult to run protected products on hard disks and in multiuser environments, such as local-area networks. People have resorted to a variety of patches, bit copiers and snapshot programs that are available commercially and on dial-up bulletin boards to circumvent software protection so they can use the software on a local-area network.

Many users are aware that they are breaking U.S. copyright law when they make copies. Illegal disks often proliferate quietly through an organization or user network as one person makes a copy for a co-worker or friend, who makes an additional copy for someone else. While these activities seem harmless from many users' points of view, they are not only creating serious problems for the micro software industry but can create serious legal problems for organizations that allow copying.

Any solution to the software piracy problem must satisfy the customer so that the publishers can remain in business. Some illegal software copying results from user dissatisfaction with roadblocks for effective use put in place to protect software from illegal copying. Software vendors must make the business decision to alleviate the problems that motivate users to copy software while creating public awareness of the copying problem. At the same time, software publishers must protect their legitimate rights to fair compensation.

Software publishers must find a way to stop the arms race with end users. All software protection thus far can be broken by software modification. Unfortunately, current diskette-based protection may have done as much to encourage software piracy as to discourage it. The need for new technologies of software use authorization is glaringly obvious.

Why should DP care?

Whereas virtually all data processing departments have grown up with license agreements and contracts with mainframe and minicomputer software products companies, most end users have very little idea of the rights or responsibilities of software use. In fact, many never see the license agreement and are simply given the disks and documentation.

It is therefore incumbent upon data processing managers to inform end users of the potential consequences of illegal software copying. As more software is reproduced unlawfully, software developers are being compelled to sue to protect their rights. Most companies that have been caught have settled out of court to avoid embarrassment and unfavorable publicity. Under the U.S. Copyright Law, civil damages for illegal software copying can be $50,000 or more, depending on the amount of loss to the publisher.

The Association of Data Processing Service Organizations (Adapso), the trade association representing the computer software and services industry, has begun a public awareness campaign to deal with this issue. The organization, representing more than 750 companies in the

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business, developed the brochure titled "Thou Shalt Not Dupe," which deals with the issues of software piracy and "softlifting."

The brochure deflates the myths of software piracy, explains the U.S. Copyright Law and its penalties, tells why users should take steps to curb software piracy in their organizations and urges all companies to adopt a policy statement against software piracy, circulate it to all end users in the organization for their signature and enforce it.

The following language taken from the brochure represents a guide for the development of such a policy statement:

I recognize that:

1. (Company, organization) licenses the use of its computer software from a variety of outside companies. (Company, organization) does not own this software or its related documentation and, unless authorized by the software developer, does not have the right to reproduce it.

2. With regard to use on local-area networks or on multiple machines, (company, organization) employees shall use the software only in accordance with the license agreement.

3. (Company, organization) employees learning of any misuse of software or related documentation within the company shall notify their department manager or (company's, organization's) legal counsel.

4. (Company, organization) employees caught making, acquiring or using unauthorized copies of computer software will be disciplined as appropriate under the circumstances.

5. According to the U.S. Copyright Law, illegal reproduction of software can be subject to civil damages of $50,000 or more and criminal penalties including fines and imprisonment.

I am aware of the software protection policies of (company, organization).

Employee signature

Date

Adapso will circulate more than 60,000 of these brochures to end users, DP professionals, corporate legal counsel, superintendents of schools, college presidents and U.S. corporate presidents, urging them to adopt a software protection policy statement, circulate it to all employees and inform Adapso of their decision to adopt a policy.

Because of the lack of understanding and involvement of corporate presidents and most end users in the software licensing process, the association is urging data processing professionals to bring this issue to the attention of company presidents to encourage them to adopt such policies.

If users clean their own house, not only will the organization be safeguarded from potentially costly litigation, but also the health of the software industry will improve so that better products and support can be delivered to end users. Free copies of the "Thou Shalt Not Dupe" brochure are available by writing to: Thou Shalt Not Dupe, Adapso, Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

> ”
>
> ***If users clean their own house, not only will the organization be safeguarded from potentially costly litigation, but also the health of the software industry will improve so that better products and support can be delivered.***

Adapso's Software Protection Committee is working to develop a proposed set of standards for software authorization systems so that the user and the industry will have a consistent set of guidelines for any hardware-based solution developed in the future. In order to have a formalized standards process, Adapso must make the user community, software protection vendors, hardware manufacturers and software developers aware of the process, as well as

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provide the opportunity for input and comment. As a result, the committee has developed a software authorization overview paper that covers the preliminary work of the committee. Anyone interested in receiving a copy of the paper or serving on the technical review subcommittee should write to the Adapso office.

The remainder of this article is excerpted from the committee's paper.

Statement of goals. The goal of a technical solution to the problem of unauthorized software use should address the needs of both users and software vendors. At this time, we can identify six basic goals for a successful technical solution:

1. Provide a new and significant level of protection.
2. Provide tangible benefits to users.
3. Be inexpensive.
4. Be convenient for the user and provide transparent operation.
5. Be uniformly and generally implemented (to the extent possible).
6. Allow voluntary and flexible implementation by software vendors.

Hardware-based protection. Hardware-based protection attempts to separate authorization to use software from the software itself. By isolating authorization within a hardware device, the vendor increases the level of technical sophistication required to break the protection scheme.

At least two microcomputer software vendors have implemented hardware-based protection devices: BPI Systems, Inc. and Sensor-Based Systems. In 1980, BPI required a device to allow operation of its accounting package on the Apple Computer, Inc. Apple II Plus. To use the software, the user had to open the computer and place the device in the game paddle port of the Apple.

While this scheme was apparently successful in protecting BPI's software, it represented a major inconvenience for the user. Because the device was not transparent, it monopolized the computer's game paddle port. This meant that the user had to remove and replace the device often to gain use of this port. The device was fragile, and pins bent after several insertions. Realizing the difficulties with this system, BPI discontinued its use early in 1982 and eventually adopted a diskette-based protection scheme.

Trial and error

Sensor-Based Systems has used hardware-based protection with its Metafile products since 1979. Initially, Metafile required installation of a programmable read-only memory (Prom) chip in a Vector Graphic, Inc. computer. The system worked well for protection, but as with the BPI scheme, users found it inconvenient to install the Prom.

The initial implementation of Metafile for the IBM Personal Computer required a Zilog, Inc. Z80 microprocessor to operate. Sensor-Based Systems bundled Metafile and the Prom with Xedex Corp.'s Baby Blue Card to provide both the needed microprocessor and the protection. This method, while effective, lacked portability.

In August 1982, Sensor-Based Systems released an Intel Corp. 8086 version of Metafile for the Personal Computer. This release incorporated a specially designed hardware-based protection device. The device attached to the RS-232 port. This method was well received by users and is currently in its fourth generation of refinement.

While Sensor-Based Systems' experience suggests a direction for hardware-based software authorization, it does not meet the needs of all users and vendors.

Features of a software authorization system to meet our goals.

1. Provides a new, significant level of protection.

No method can provide complete protection against individuals who are determined to defeat it. The experience of BPI and Sensor-Based Systems shows that a properly designed hardware device can significantly raise the cost of breaking the protection scheme.

The eventual proposal will specify standards for hardware-based software authorization systems that generally have the following features:

- A level of technical sophistication that raises the level of difficulty required to defeat the system while it decreases the motivation.
- An environment that

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facilitates vendor implementation of various authorization methods with increased security and decreased vulnerability.

- A software/hardware interface that allows periodic testing for authorization to defeat patches and snapshot programs and to prevent removal of the system and simultaneously run software on a second computer.

2. Provides tangible benefits for the user.

Hardware-based software authorization is a radical departure from diskette-based protection. Implementation of this approach separates the software product from authorization to use the product and offers potential benefits to the user:

- Allows reasonable and legal copying for archival and security purposes because copies can only be used with a specific hardware key.
- Enables vendors to provide customers with software for trial use before they buy and makes legitimate lending libraries possible.
- Allows software to run directly from a hard disk because diskette-based authorization is no longer required.
- Allows (when appropriately licensed) software to be run from a local-area network. Authorization takes place at the individual workstations.
- Provides a way for large-scale users to control personal computer operations within their organizations by controlling devices rather than diskettes.

3. Is inexpensive.

Making the systems inexpensive to implement will allow acceptance by both vendors and users. This goal should be accomplished by keeping the technical standards as simple and easy to implement as possible. In addition, maintaining the standards in the public domain will encourage entry of third-party vendors to help bring market forces to bear on the cost of implementation.

4. Is convenient for the user and provides transparent operation.

For the user, a major shortcoming of current software protection schemes is their inconvenience. To be attractive to both software vendors and users, an authorization system must be easy to install and use and must not interfere with the normal operation of the computer. The eventual standards proposal will therefore envision devices that:

- Are effectively engineered to be small, lightweight and durable, allowing users to move the device easily from one machine to another.
- Provide a standard configuration with removable hardware "keys."
- Use a standard RS-232 port for easy installation on most computers.
- Allow pass-through connection and provide transparency at a speed of at least 19.2K bit/sec so that the RS-232 port can be used for other devices:
- Allow for simultaneous use of multiple software products.

5. Likely to be uniformly and generally implemented.

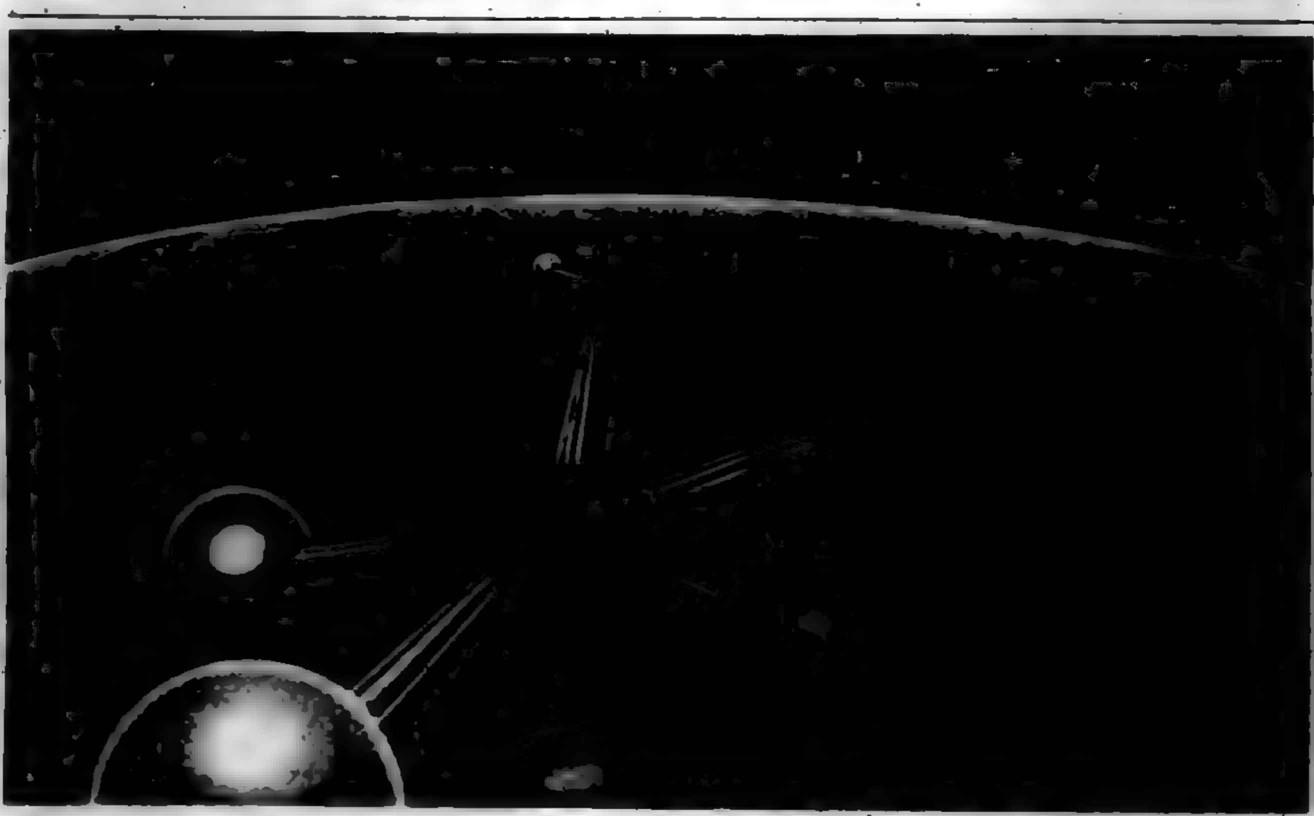
To avoid confusion in the marketplace, the general features of software authorization systems should be as standardized as possible. This standardization will provide consistency for software vendors and users so that both will be able to rely on a single type of system.

In addition, the system should be machine-independent and allow implementation for current hardware and operating systems and adapt to future technologies. The standards should therefore be established so that:

- Physical specifications and protocols are maintained in the public domain to provide adequate information and equal access for all concerned parties.
- Opportunities are created for third parties to design and develop specific systems and authorization methods.
- Communications are allowed on either status or data lines to enable implementation for single-user, multiuser and multitasking systems.
- Device drivers are allowed to enable implementation with operating systems that do not provide direct addressing of the status and data lines.

6. Allows voluntary and flexible implementation by software vendors.

All proposed standards must allow software vendors to use the system as they see fit and should not exclude any other form of software authorization. The proposed



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standards should therefore:

- Provide a facility for implementing vendor-designed authorization schemes rather than prescribing a specific method.
- Allow vendors to continue using diskette-based protection or not protect software at all.
- Allow for a variety of levels of protection, from simple serial number checking to sophisticated encryption algorithms.

The proposed standards may also provide additional benefits for users and after-market potential for entrepreneurs. A number of custom and generic options appear possible at this time. These include:

- Encryption for securing sensitive data.
- Use of a software authorization system as a terminal identifier to allow hierarchical access restriction on networks and corporate mainframes.
- Bundling the software authorization system with other peripherals such as modems or print spoolers.

Adapso believes that the proposed standards will open up other possibilities for after-market applications. These will be limited only by the creativity of the innovative third-party hardware and software vendors.

Implementation issues

Illegal software copying is an industrywide problem. Therefore, Adapso's Software Protection Committee recommends development of a set of standards for software authorization systems. The standardization process is described in the box above. The proposed standards will not specify a particular device (key ring) or authorization method. Rather, they will describe the physical connections and protocols for software authorization systems generally. Specific implementation will be left to software vendors and third-party hardware vendors, which will provide flexibility and allow market forces to reduce the costs of implementation.

Implementation of a software authorization system will proceed along three avenues:

- Development of an Adapso standards process.
- Introduction to the marketplace.
- Specific implementations by software vendors.

In addition, a method must be developed for identifying and dealing with potential problems that users may encounter in using the system.

Implementation of a software authorization system can only succeed if the economic impact on both software vendors and users is minimal. The combination of low cost and potential benefits should facilitate its introduction into the marketplace. In

How the process will work

The standardization process suggested by Adapso includes three phases: proposal development; proposal presentation, review and comment; and action on the proposal by the Adapso board of directors.

Proposal development formally begins with the publication of this document. The aims of this phase are to open the discussion to all interested parties and to assess the overall technical feasibility of the proposed solution.

During this phase, the committee will develop monthly reports and technical papers that describe work to date and progress toward developing proposed standards. These documents will be available to all interested parties to allow them to respond with comments and to begin thinking about possible implementation issues.

As the proposal of standards is being developed, Adapso will also do the following:

- Actively recruit interested and potentially interested parties.
- Inform the Department of Justice of its intent to develop a set of standards and request a business review letter.
- Determine voting requirements and procedures for the proposed standard.

At the end of the proposal development phase, Adapso will distribute the proposed standard, supporting materials and ballots to all interested parties for review and comment.

The public review period will last for a minimum of three months. One month before the end of the review period, Adapso will contact reviewers who have not yet responded by returning their ballots and comments. Adapso will seriously consider and respond in writing to all substantive reviewer comments. Any substantive changes in the proposed standards will be subject to additional review and balloting.

At the end of the review period, Adapso will count the ballots and review comments. It will respond to all substantive comments and consider incorporating them into the set of standards. The final, revised standards proposal will then be presented to the Adapso board of directors for adoption.

Introduction of a software authorization system to the marketplace will require acceptance by vendors and users. In addition, implementation will require an independent body to manage general issues, such as serial numbers and standards maintenance.

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addition, increased public awareness of the negative economic impact of software theft on software vendors and users will aid in this effort.

Software clearinghouse

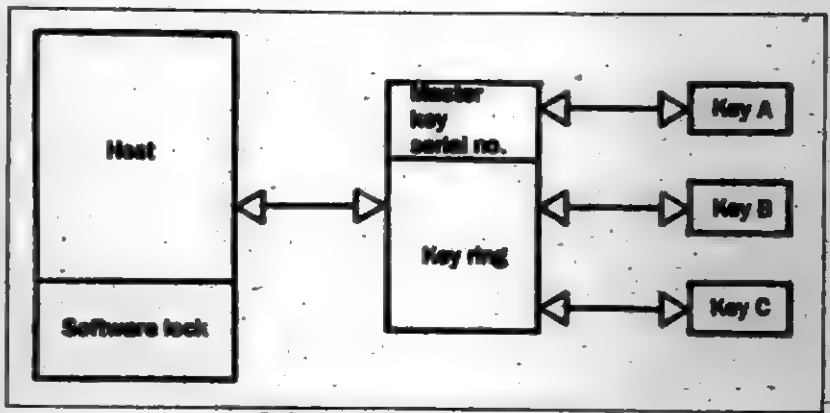
Implementation will require an independent body with administrative responsibilities. While the specific structure of the body remains to be worked out, one possible model is a clearinghouse similar to that developed for administering Universal Product Codes.

A clearinghouse would be responsible for the following:

- Controlling and distributing hardware and software serial numbers to vendors. The hardware vendor serial number will allow vendors to create unique identifiers for each key ring. The software vendor serial number will allow vendors to create an address to facilitate software/hardware communications.
- Certifying that key rings comply with the standard. This will ensure that key rings manufactured by different vendors will be compatible.
- Maintaining the standards in the public domain. The clearinghouse will evaluate and incorporate any revisions to the standards that result from technological advances.

The standards will provide a facility for implementing software authorization rather than a specific method. Software vendors will be able to design their own implementations within a wide range of possibilities, depending on their specific needs. Some possibilities include:

- Using the unique serial number provided with the key ring with no hardware additions by the software vendor.
- Using a third-party-designed hardware device (key).
- Using a specific vendor-designed hardware device (key).



Software authorization system

Potential user problems

At this time, several potential user problems seem possible. These include failure of the hardware device, loss of the hardware device and loss of data because of data line collisions.

Vendors should consider replacing broken or lost devices through their established dealer networks and direct-support channels. Because devices will have unique identification numbers, it is also possible that market forces will generate independent replacement services. These could be similar to services that handle credit card replacement.

If vendors choose implementations that rely on data line communications, loss of data may occur in multitasking environments if incoming data arrives at the same moment the program is interrogating the key ring. If vendors do choose this option, they should warn users of the possible implications.

This section contains information that represents work in progress. It is neither complete nor stable. It is a snapshot of the current state of the project. As comments come in and research and development proceeds, the technical information will continue to evolve and become more complete.

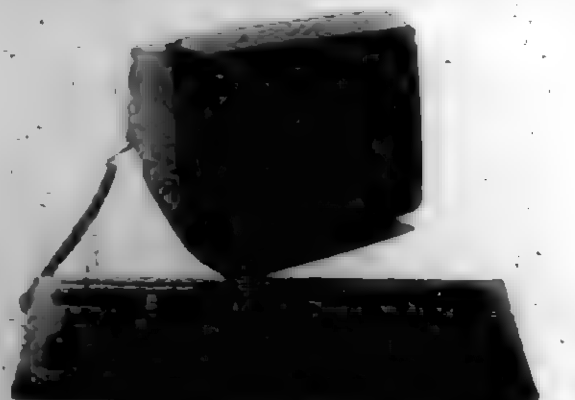
This technical information is presented in the context of a model system called the Software Authorization System. This model system should not be construed as a proposed standard but as merely a vehicle that aids in discussing the difficult concepts associated with hardware-based software authorization systems.

The Software Authorization System has three parts — one part software and two parts hardware. The software part of the system is analogous to a lock. The software lock is typically a program module embedded in the code of the software product that prevents the program from executing without authorization. The first of the hardware parts is analogous to a key ring and the second to a key.

The three parts of the system (lock, key ring and key) work in conjunction with one another to authorize the use of a software product that has been protected. The software lock prevents unauthorized use of a software product, the key ring holds the user's set of keys and the key unlocks the product and authorizes use (see figure).

The lock is typically a program module (or modules) that checks the key ring serial number and/or the key that authorizes use of the product. In the latter case, the program module can have a dialogue with the key if the key is present. This dialogue would consist of an algorithm (of the software vendor's design) that interrogates the product's unique key. If the key supplies the correct answer, the module unlocks the software product and authorizes its use.

The key ring is a hardware device that can vary in size. It holds a user's collection of keys to various software products. The key ring is the



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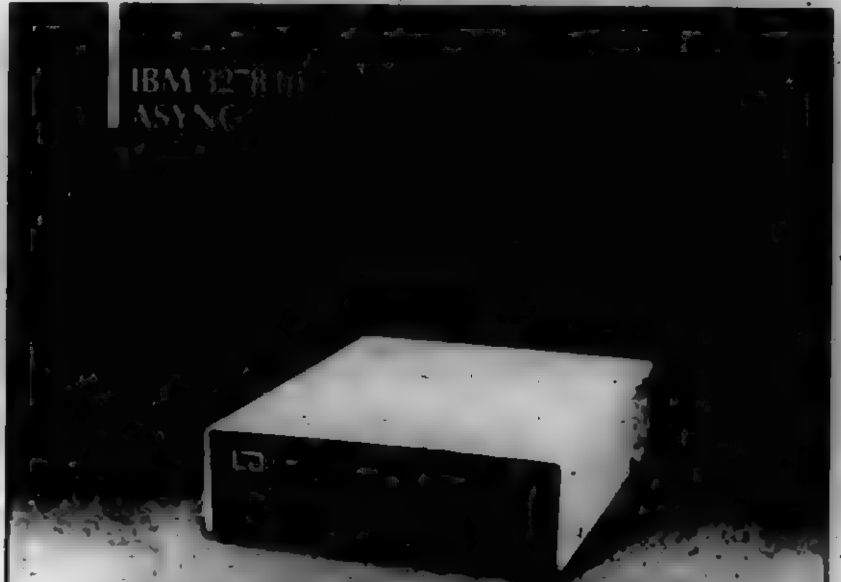

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traffic manager for the communications that take place between the host and individual keys.

The key ring connects to a computer's RS-232 or equivalent port via a cable that has a pass-through connector. The pass-through connector allows another device (for example, a printer or modem) to be connected to the computer through it.

The key ring is transparent to the communications between the computer and an attached peripheral device and avoids the need for a dedicated port for the Software Authorization System. The degree of transparency varies depending upon the communications method used. When a software product (on the host) is looking for authorization, it communicates with the key ring (and ultimately the key).

The key is a small device (generally about the size of an office key, although the size may vary) that plugs into the key ring. Software vendors can design custom keys for their products or use off-the-shelf and semicustom versions that are expected to be produced by third-party vendors. Using current technology, each key would contain (at a minimum) a single-chip microcomputer to control communications with the key ring. The physical design of the key enables easy insertion, uses minimal space and guarantees the proper orientation of the key. There are two types of keys: a master key and standard software key.

The master key comes with the key ring and contains a unique serial number that is assigned by a clearinghouse. The master key may be polarized differently from standard software keys. Some software vendors will use the unique serial number on the master key to marry a copy of the software product with a specific key ring. In the event the key ring fails, the master key, with the identifying serial number, can be moved to a new key ring.

Standard software keys can provide for several levels of authorization, depending upon the inclination and needs of a particular software vendor. At a minimum, a standard key must contain a unique software vendor ID and a product ID, which would serve as a "telephone number" for the software product to call its specific key. To avoid duplication and confusion in the marketplace, the unique software vendor ID would also be assigned by the clearinghouse. The product ID is chosen by the software vendor.

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> *Some software vendors will use the unique serial number on the master key to marry a copy of the software product with a specific key ring. In the event the key ring fails, the master key, with the identifying serial number, can be moved to a new key ring.*

In an elementary authorization scheme, the module in the software product would call the key ring to see if the appropriate key is present and authorize use of the product on this basis alone. A more sophisticated scheme would do this and then have a two-way conversation with the key in which both the question the software lock is asking and the answer the key is providing are based upon a complex algorithm that is deeply buried in the product's code.

Some software keys could be more sophisticated than standard keys and, therefore, more expensive to produce. As an example, a more sophisticated key or engine key that incorporates a public key encryption processor might be produced by a third-party key manufacturer. A software vendor could use these third-party-produced engine keys in conjunction with its own standard key for its product's authorization scheme.

Two examples

The possible implementations of the Software Authorization System are extremely flexible and subject only to the imagination and ingenuity of software vendors, key ring and key manufacturers and third-party software protection (authorization) vendors. Depending on a software vendor's needs, implementations can range from simple to highly complex. In each case, the sophistication of the software lock and its interrogation of the key ring and key(s) play a major role in determining the degree of security of an authorization

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scheme. Possible implementations include the following:

- Uses key ring serial number only (no key involved).
  - Program self-installs the serial number.
  - A phone call to the vendor installs the serial number.
- Uses a key that contains the vendor ID only.
- Uses a key that both asks questions and provides answers (bidirectional communications).
- Uses two keys (standard and engine key) to provide authorization.

This appendix presents two sample implementations of the Software Authorization System. The two examples include a very simple (and inexpensive) implementation and a somewhat more complex implementation that uses a custom-designed key.

Consider the following relatively simple implementation of the Software Authorization Code.

ABC Software is a start-up software vendor that is introducing its first product. It is trying to keep its costs down but still wants to release its product with some degree of piracy protection.

To discourage anyone from making copies of its product prior to installation, ABC ships its product on a copy-protected disk. The installation process for the ABC product removes the disk protection and marries the user's particular copy of the software product with his key ring serial number. This combination of a unique copy of the program and a unique key ring serial number authorizes the user's copy (and subsequent backups) of the program to run only with his specific key ring.

Periodically, while the program is running, it queries the key ring to see if the serial number it remembered and the serial number on the key ring still match. If the numbers do not match, the program aborts. Although this particular scheme might be fairly trivial to find and patch, it affords the start-up software vendor some degree of piracy protection for very little cost.

Using a custom-designed key

The following briefly illustrates a more extensive implementation of the Software Authorization System.

Acme Software has produced several successful products and wants to implement a fairly sophisticated authorization scheme on its new product. For the new product, Acme would design (or have designed by a third-party key manufacturer) a software key with the following capabilities:

1. The ability to avoid redirection of more than one copy of the program to the key. This feature might use an incrementing number that is returned to the program each time the key is accessed. Each time the program is loaded, a base number is established between the lock and the key. During a particular session, each access of the key would increment the base number by one. If the number of the key returns does not match what the lock expects, the lock decides that the key is being simultaneously accessed by more than one copy of the program. This would cause the program to abort.

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> ***The installation process for the ABC product removes the disk protection and marries the user's particular copy of the software product with his key ring serial number.***

2. The ability to make it difficult to patch the program code that checks the key. This would involve placing some essential part of the program code or structure on the key itself. Each time the key is called, it would return an essential part of the program. With the essential part missing, the program would not execute properly or would simply abort.

3. An algorithm, parts of which are in the program code and parts of which are on the key, that unlocks the software lock. For example, a simple algorithm would do the following: The lock would generate a 64-bit random number and send it to the key. The key would receive the 64-bit random number and "hash" (compress) it into a 12-bit number. The key would use this 12-bit number as an index to a 4K-byte number table and return a number to the lock. In the meantime, the lock would also have done the same thing to the 64-bit number. When it got the answer back from the key, the lock would compare its answer with the key's answer. If the two matched, it would authorize use of the product.

In addition to Adapso's Technical Protection and Public Awareness Program, the association is also pursuing legislative and litigative remedies as appropriate. During the 1985 session of Congress, the association will support legislation to increase federal penalties for willful copyright infringement to $250,000. In addition, it will back a bill expected to be reintroduced by Sen. Charles Mathias (R-Md.) to stop short-term rental of computer software without the agreement of the software publisher.

Adapso also will file lawsuits on behalf of the industry against organizations that have established patterns of software copyright abuses.

About the author

Marv Goldschmitt is vice-president of Lotus Development Corp. in Cambridge, Mass.

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A new face for terminals

By Charles Apt
and John Ketchum

Flat panel displays may soon change the way users look at their terminals. Demand for the three most promising technologies (liquid crystal, electroluminescent and plasma displays) skyrocketed from $4.8 million in 1982 to $54.9 million in 1983 (see Table 1 on ID/12). According to an Arthur D. Little, Inc. market study, this trend will continue, pushing demand to almost $4.3 billion by 1992. At that rate, in another eight years, more than one out of three office video displays will be flat panels.

In part, this rise in demand is riding the office automation boom. In the area of business personal computers alone, more than 2.4 million units were sold in 1983. According to our market study, this number will increase by 50% this year and reach 28 million by 1992.

Thus the major commercial market for flat panels will be office/business applications, including word processors, data entry terminals and personal computers.

Flat panels are ideal for portable computers because they are rugged, compact and use less power than CRTs; so portable computers will constitute the most important part of this market. A number of products are already available (see Table 2 on ID/14). However, at the current state of the art, flat panels are expensive and cannot offer the same brightness, contrast and resolution as a monochrome CRT. In addition, full-color flat panels are some way off. Therefore, CRTs will continue to dominate where low cost, color or high resolution is critical.

Secondary commercial markets for flat panels include: automotive applications, such as displays for navigation; industrial applications, such as computer-aided design and manufacturing (CAD/CAM), image processing and process control; financial applications, such as automated teller machines; and telecommunications applications, such as data display phones. Again, these are areas where a sturdy, compact display that uses little power is desirable.

Type	1982	1985	1987	1992
LCD	2.3	505.3	1,281.9	3,038.7
ELD	0	22.1	179.6	716.7
Plasma	2.5	68.9	179.7	526.7
Total	4.8	596.3	1,636.3	4,282.1

Source: Arthur D. Little, Inc.

Table 1. World demand for flat-panel video displays (in millions of dollars)

However, before these displays can fulfill their promise, certain issues must be resolved. Liquid crystal, electroluminescent and plasma displays all suffer technical problems that must be solved to improve viewing. In addition, because they are new, the performance and life span of these displays are not certain. Techniques for manufacturing flat panels in commercial quantities (more than 10,000 units per month) have not been developed fully. This delay keeps prices high, but costs will drop once the learning curve takes effect.

Of the three reigning types of flat panel, liquid crystal displays (LCD) hold a commanding lead. RCA Corp. began developing LCD technology in the early 1960s. The technology was first used in watches and calculators in the early 1970s, and since then it has been applied to increasingly larger displays. Today, LCD penetration of the office electronics market is well under way. Recently, Apple Computer, Inc., Hewlett-Packard Co.and Data General Corp. introduced kneetop computers featuring LCDs. Currently, the largest of these displays has 25 lines of 80 characters each. Sanyo Electric Co. Ltd., Seiko Instruments, Inc. and Sharp Electronics Corp. are, or shortly will be, supplying half-page versions in commercial quantities.

LCDs differ from other displays in that they reflect light instead of emitting it. As a result, they use very little power. However, larger LCDs tend to have limited viewing angles and low contrast ratios. For example, the Sharp, Sanyo and Seiko displays reportedly have viewing angles of about 25 degrees and contrast ratios of less than 5:1 — about that of a newspaper. CRTs have contrast ratios of about 25:1.

> ”
>
> *Liquid crystal, electroluminescent and plasma displays all suffer technical problems that must be solved to improve viewing.*

Nevertheless, LCDs remain an attractive alternative to CRTs for applications requiring a display that is rugged and compact and uses little power. Further, all of the Japanese suppliers, as well as Panelvision Corp. in the U.S., are hard at work on improving performance. Conceivably, improved technology could be available by 1987 or 1988.

Liquid crystals

As the name suggests, LCDs are based on the use of liquid crystal materials. Liquid crystals are structured liquids with rod-like molecules that have many of the light-bending characteristics of solid crystals. There are three types of liquid crystals: nematic, smectic and cholesteric. The molecules in nematic liquid crystals line up to produce ordered layers stacked one upon the other (see Figure 1a on ID/14). The ordering in smectic material is similar, but the material is denser (Figure 1b). Molecules in cholesteric material also stack in layers, but these layers have the relative twist and tilt shown in Figure 1c.

The type of large LCD most commonly used commercially, the twisted nematic (TN) display (see Figure 2 on ID/15), makes nematic material take on the same spiral configuration as cholesteric material. A TN display consists of a layer of nematic liquid crystal material sandwiched between two plates of glass. A cross polarizer is placed on the outside of each plate; the orientation of the front polarizer is perpendicular to the back one. A reflector is placed on the back of the display.

Each cell (or pixel) of a TN display is designed so that when the pixel is in the bright state, the rod-like molecules are twisted into a spiral configuration (see Figure 3 on ID/15). This spiral twists light coming in through the front polarizer, orienting it so it can pass through the back polarizer to the reflector. Then the spiral twists the reflected light,

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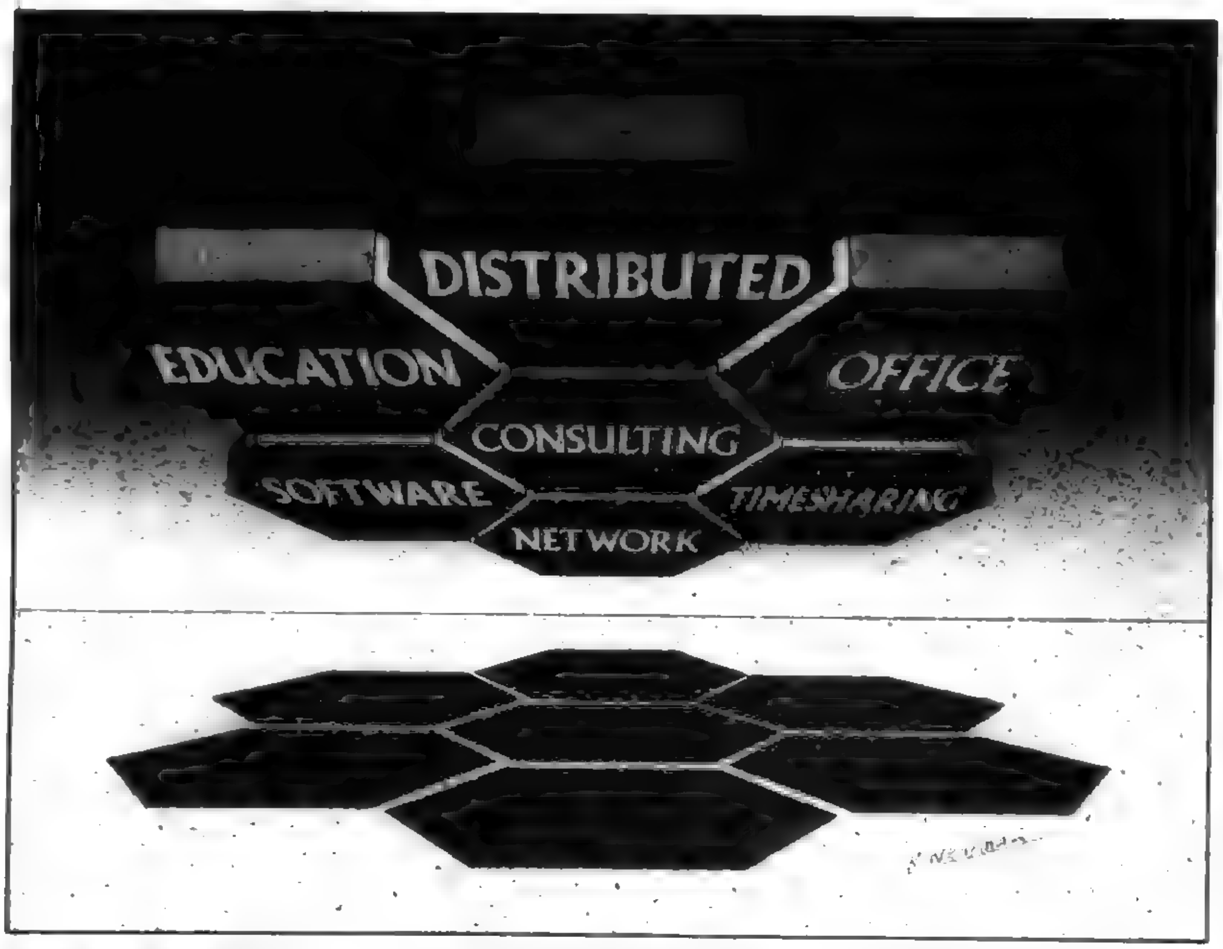

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s display
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Type of system	Type of display	Company/product	Weight (lb)	Size of display	System price
Kneetop (briefcase)	Liquid crystal	Apple Computer, Inc. Model IIC	7.5	24 lines, 80 char.	$1,300
	Liquid crystal	Hewlett-Packard Co. Portable, Model 110	9	16 lines, 80 char.	$3,000
	Liquid crystal	Data General Corp. One	9	25 lines, 80 char.	$3,000-$4,000
	Electroluminescent	Grid Systems Corp. Compass	10	25 lines	$3,450-$8,000
	Liquid crystal	Sharp Electronics Corp. Personal Computer 5000	11	8 lines, 80 char.	$2,000
	Liquid crystal	Tandy Corp. Model 100	4	8 lines, 40 char.	$399
Transportable	CRT	Compaq Computer Corp.	26	25 lines, 80 char.	$2,700
	CRT	IBM Portable Personal Computer	30	25 lines, 80 char.	$2,800
	CRT	Kaypro Corp. Model II	26	25 lines, 80 char.	$1,300
	Electroluminescent	HP Integral Personal Computer	25	24 lines, 80 char.	$4,995

Source: Arthur D. Little, Inc.

Table 2. Sampling of portable personal computers

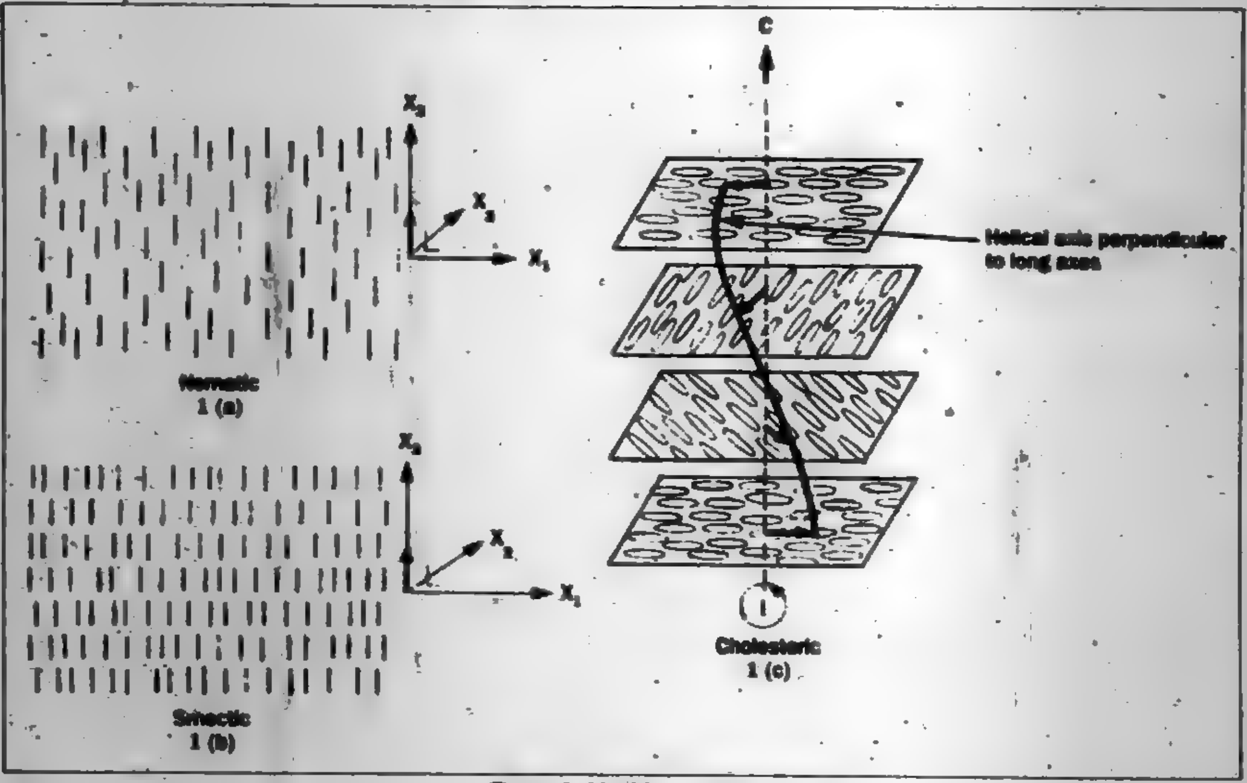


Figure 1. Liquid crystal structures

orienting it so it can pass back out through the front polarizer.

To place the pixel in the dark state, it is exposed to an applied electric field. At a certain applied voltage, called the threshold voltage, the spiral straightens out and the molecules align themselves parallel to one another and perpendicular to the front and back plates (Figure 3). Without the spiral to guide it, the light is blocked by the back polarizer and the pixel appears dark.

In small LCDs, like those in watches and calculators, each pixel is addressed directly by the voltage source. However, a half-page display requires 130,000 pixels, which makes direct addressing impractical. In TN displays, pixels are addressed via an x-y grid. Each intersection of the grid forms a pixel. When the combined voltages in intersecting x and y electrodes equal the threshold voltage, the pixel goes dark.

Today's TN displays have two major drawbacks. First, the cross polarizers block a certain amount of light, even when the pixel is in the bright state. This reduces contrast, brightness and viewing angle. Second, the larger the display, the less effective standard matrix addressing becomes. In part, this is because liquid crystal material does not respond to the peak of the applied voltage but to the root mean square voltage (Vrms). The greater the number of electrodes to be addressed, the smaller the gap between Vrms on and Vrms off. This lowers effective voltage across the pixel, which degrades contrast.

In addition, LCDs do not have a sharp threshold. Therefore, voltage applied to a single x and a single y electrode affects not only the intended pixel but also the other pixels that lie along the energized electrodes. Worse still, since all the pixels in the matrix are interconnected, even pixels quite remote from the one addressed "see" some of the applied voltage and respond. Thus, these sneak paths also degrade contrast.

Companies around the world are investigating a number of approaches to solve these problems. One avenue is the search for new and better liquid crystal mixtures, which is being vigorously pursued by universities worldwide and by the major liquid crystal suppliers: BDH Chemicals Ltd. in England; Merck and Co., Inc. in Germany; Hoffmann-LaRoche and Co. in Switzerland; and Sharp, Sanyo, Seiko and Hitachi Ltd. in Japan.

Perhaps the most promising approach being investigated is active matrixing. This involves placing an active device, such as a thin-film transistor, at each intersection of the matrix. The active device serves as a switch; it maintains the pixel in the on or off state. This eliminates sneak paths and improves contrast and response time. However, such displays are difficult to fabricate because an active device must be manufactured and installed at each pixel. In addition, the transistor yields necessary to ensure that the display does not appear flawed are around 98% — a severe constraint in a panel containing 130,000 pixels.

Another approach is the guest-host display, which eliminates the need for polarizers by introducing a special dye (the guest) into the liquid crystal material (the host). Molecules of this dye absorb light when they are at a certain orientation to it. If cholesteric material is used, the spiral order of the host/guest prevents incoming light from reaching the reflector. The pixel appears dark.

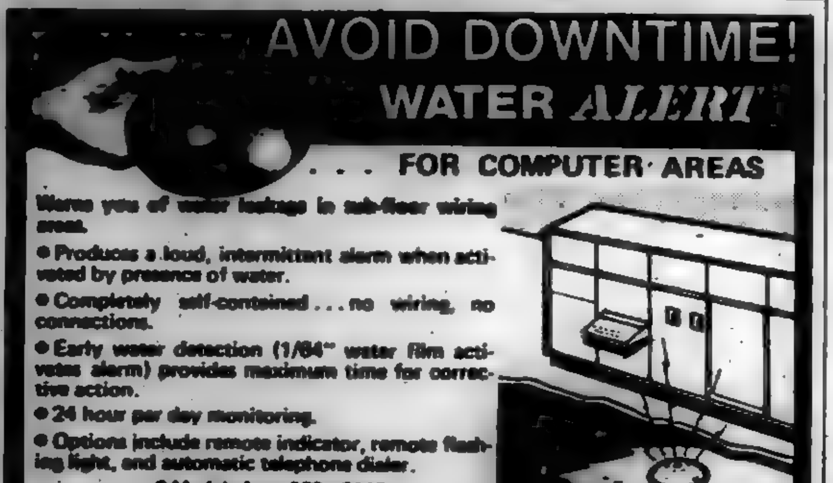
When an electric current is applied to the pixel, the spiral order is destroyed, light reaches the reflector and the pixel appears bright. Since guest-host displays operate without polarizers, they are brighter and have a better contrast ratio and a wider viewing angle than standard TN displays. However, some problems remain. The dyes used are unstable, and it has proved difficult to keep them attached to the host crystals. In addition, these displays are very difficult to multiplex.

Electroluminescent displays

Although electroluminescent displays have not made a strong showing yet, they have excited widespread interest. Sylvania made the first electroluminescent panel a quarter century ago, but practical application dates from 1974, when Sharp announced it had developed an electroluminescent display (ELD) with a long operating life. In 1980, Sharp introduced a 240- by 320-pixel display with resolution of 69 lines to the inch. These achievements convinced many that the ELD will prove a major contender in the display market.

Currently, Sharp, Planar Systems and Lohja Oy AV (a Finnish company) are beginning to manufacture large-area electroluminescent panels; Grid Systems Corp. and HP produce personal computers with ELDs; and Fujitsu Ltd., GTE and Matsushita Electric Industrial Co. are developing displays.

The type of ELD in commercial use today is called an ac thin-film electroluminescent (Actfel) display. That is, the display employs a thin-film phosphor that glows in response to an ac voltage of a certain magnitude (the threshold voltage). The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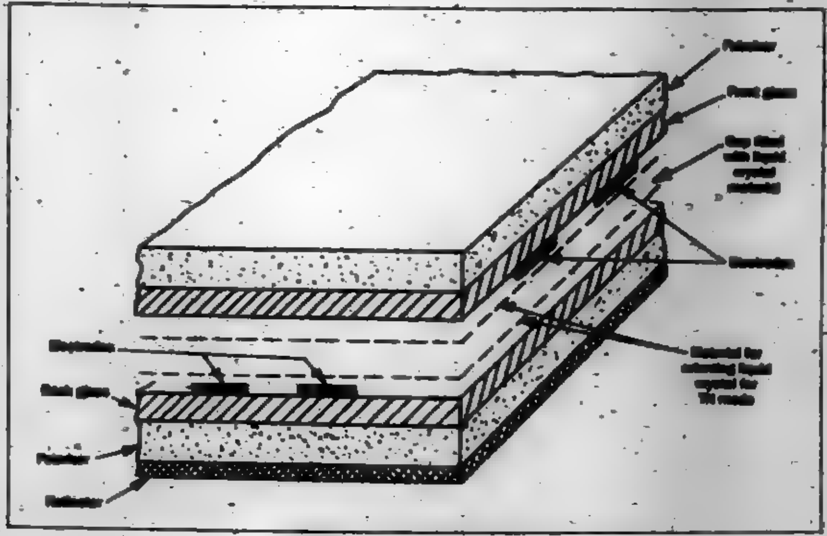
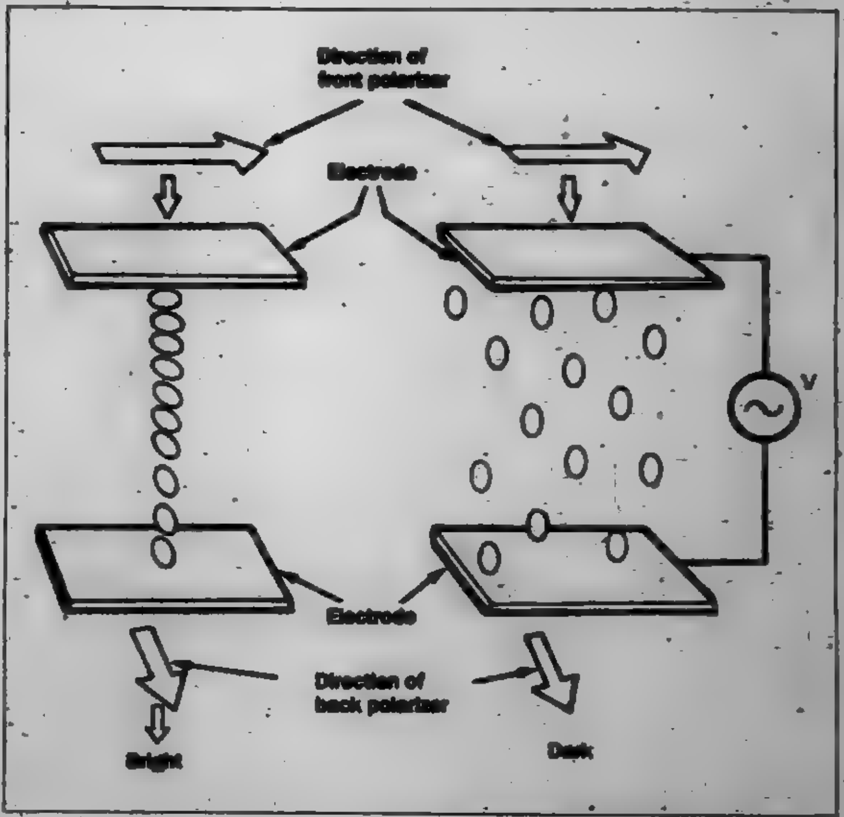


Figure 2. A TN display.



Source: D. Bosman in Agard Advisory Report No. 169, p. 94.

Figure 3. TN cell (pixel) in bright and dark states

basic panel consists of a glass front plate with transparent electrodes, a layer of insulation, a layer of thin-film phosphor, another layer of insulation and a set of metal electrodes placed perpendicular to the transparent ones (see Figure 4 on ID/16). These panels are matrix addressed in a manner similar to the way LCDs are addressed.

Actfel displays have many characteristics that make them desirable for such new products as kneetop personal computers:

- They weigh less than 2¼ lb.
- They are less than 1 in. thick.
- The monitor face is only 6 in. by 10 in.
- They have a good pixel brightness and reasonably good resolution (about 66 lines per inch) and their contrast ratio is an acceptable 10:1.

However, full-color displays are some way off. Planar Systems recently developed a blue display, and red and green are also available, but these operate at much lower efficiency than the traditional yellow.

The greatest barrier to commercial acceptance of the electroluminescent panel is the high cost of the solid-state driver circuitry. In addition, the manufacturing processes and equipment are still not established, so yields fluctuate and manufacturing costs are high. These problems will be resolved, at least to some extent, as the learning curve takes effect.

Although commercial plasma displays have been available since the early '70s, they have not managed to penetrate mass markets. The first plasma panel was developed at the University of Illinois in 1964. Two years later, Owens-Illinois entered the field, and by 1971 it was producing an ac plasma display called Digivue in limited quantities.

Control Data Corp., Bell Laboratories, Fujitsu, NCR Corp. and IBM also began to develop plasma panels in the mid-'60s. In 1981, IBM announced the commercial availability of a 750,000-pixel display, the 581 plasma display subassembly, which

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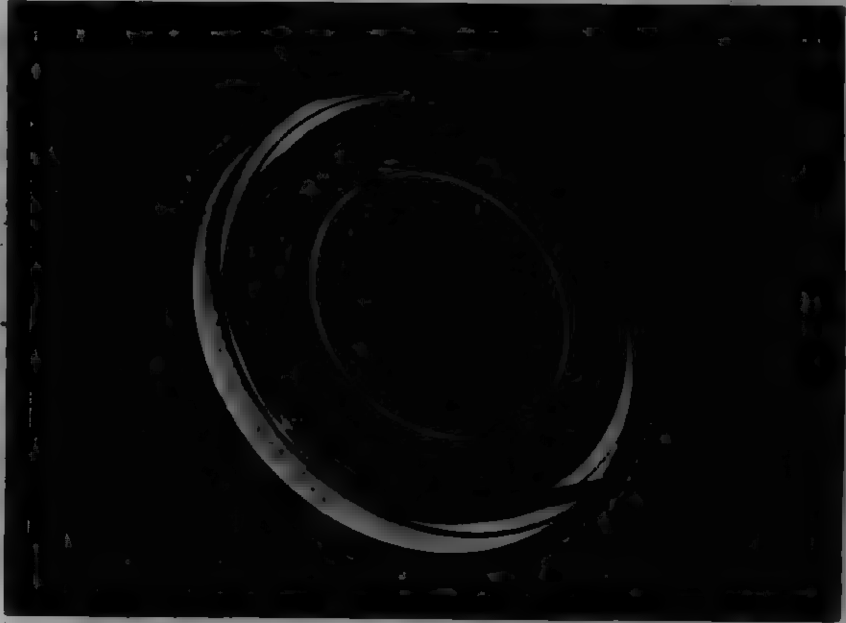

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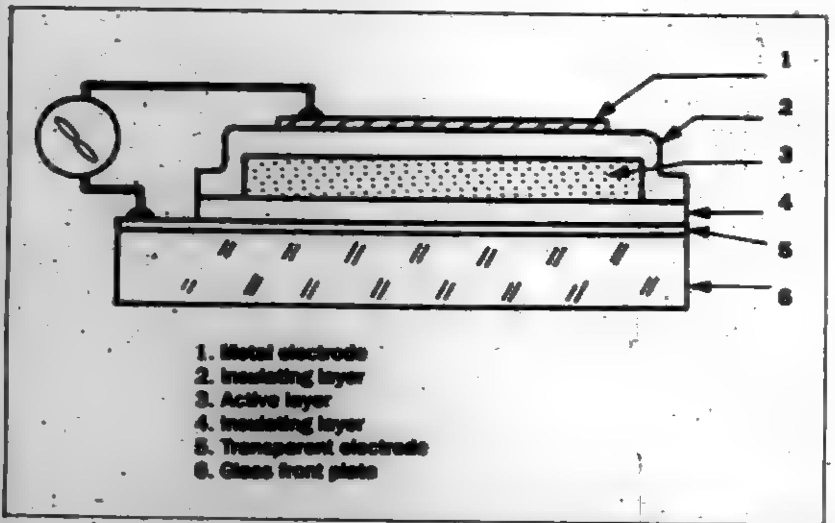
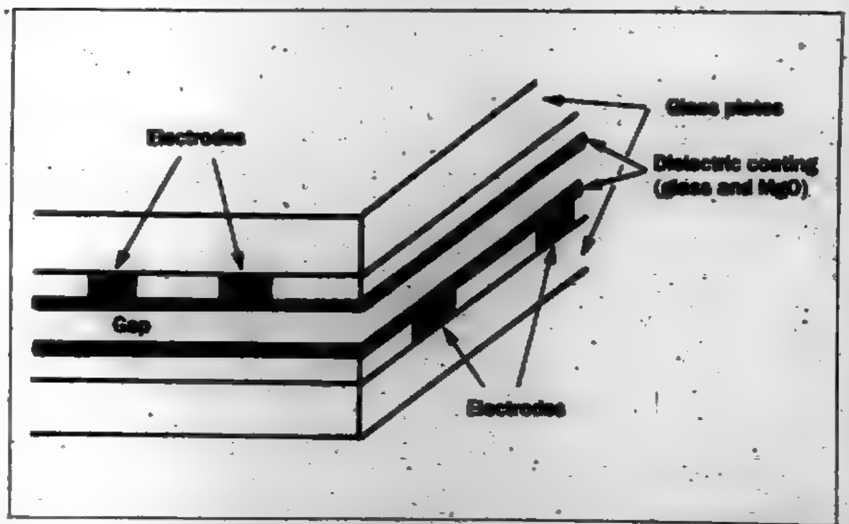


Source: Inoguchi, T., et al., Symposium Digest of Technical Papers, Vol. X, 84, 1974

Figure 4. Schematic structure of an actfel display



Source: Arthur D. Little, Inc.

Figure 5. Schematic structure of AC plasma display

is currently used in the 3179 computer display terminal. Last month, IBM announced that its 3295 plasma monitor, introduced in 1983 as a mainframe terminal, is now available for use in the IBM Personal Computer and the Personal Computer XT. This 960- by 768-line display provides 64 160-char. lines.

Today, panels are also available from Photonics Technology, Electro Plasma and Fujitsu.

Commercial plasma displays consist of a mixture of neon and argon sealed between two glass plates (see Figure 5).

As with LCDs and ELDs, plasma displays are matrix-addressable. When the neon/argon mixture is exposed to an ac current, it glows an attractive orange. The term "plasma" refers to the glowing gas.

One of the greatest advantages of plasma displays is that they can be made quite large. Ac plasma displays have been made up to one meter in diagonal and with more than four million pixels. Most commercial displays have a resolution of about 70 line/in., but some have been made with a resolution of 125 line/in. In addition, these displays have good brightness and contrast ratios up to 20:1.

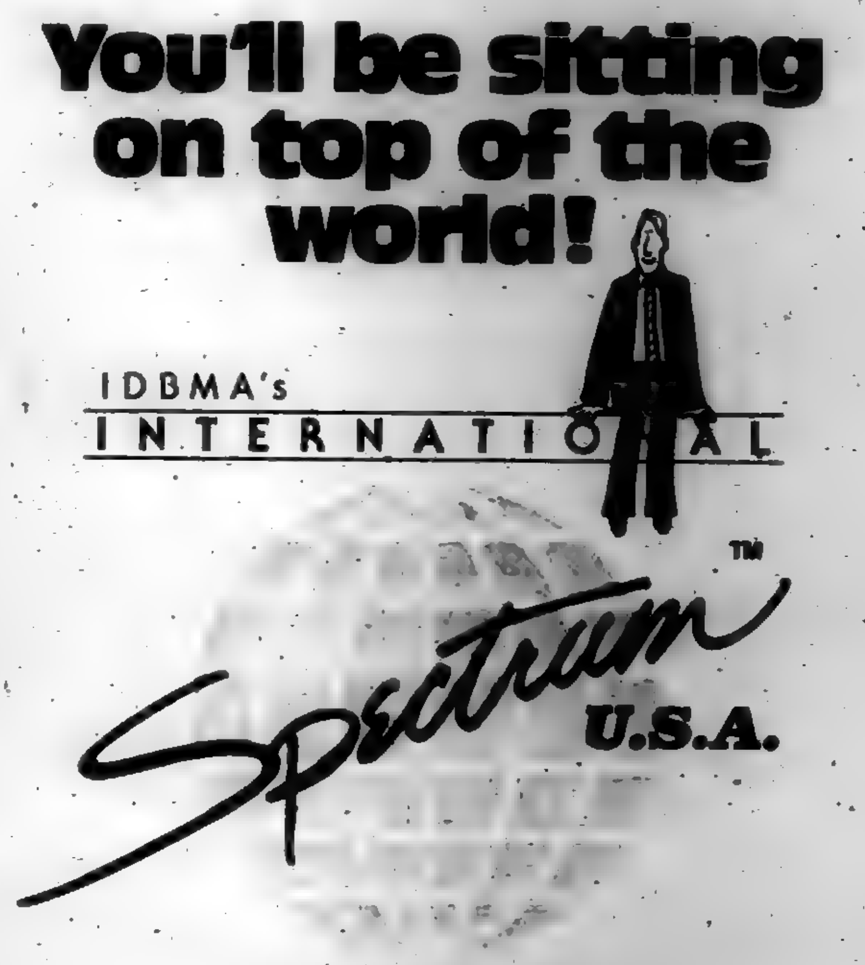
However, plasma displays also have some significant disadvantages. They are expensive; the price of a half-page display varies between $600 and $800, depending on the size of the purchase order. They also operate at higher voltage than other displays and consume considerable power (about 200 microwatts per pixel). Finally, they are heavy. Because the panels contain a gaseous mixture at less than one atmosphere, thick glass must be used to maintain the proper gap between the plates.

For these reasons, plasma displays have not penetrated mass markets, in spite of their high level of commercial development. In the near future, however, plasma displays will probably find a market niche in applications where brightness and small footprint are important.

About the authors

Charles Apt is a senior member of the Electronics Systems Section at Arthur D. Little, Inc., a multinational management and technology consulting firm. Among other responsibilities, Apt conducts acquisition studies and company evaluations, performs technical audits of R&D activities and finds applications for emerging technologies.

John Ketchum is a writer/editor at Arthur D. Little.



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COMPUTERWORLD

Special Report

January 28, 1985

Applications Packages

Software comes of age

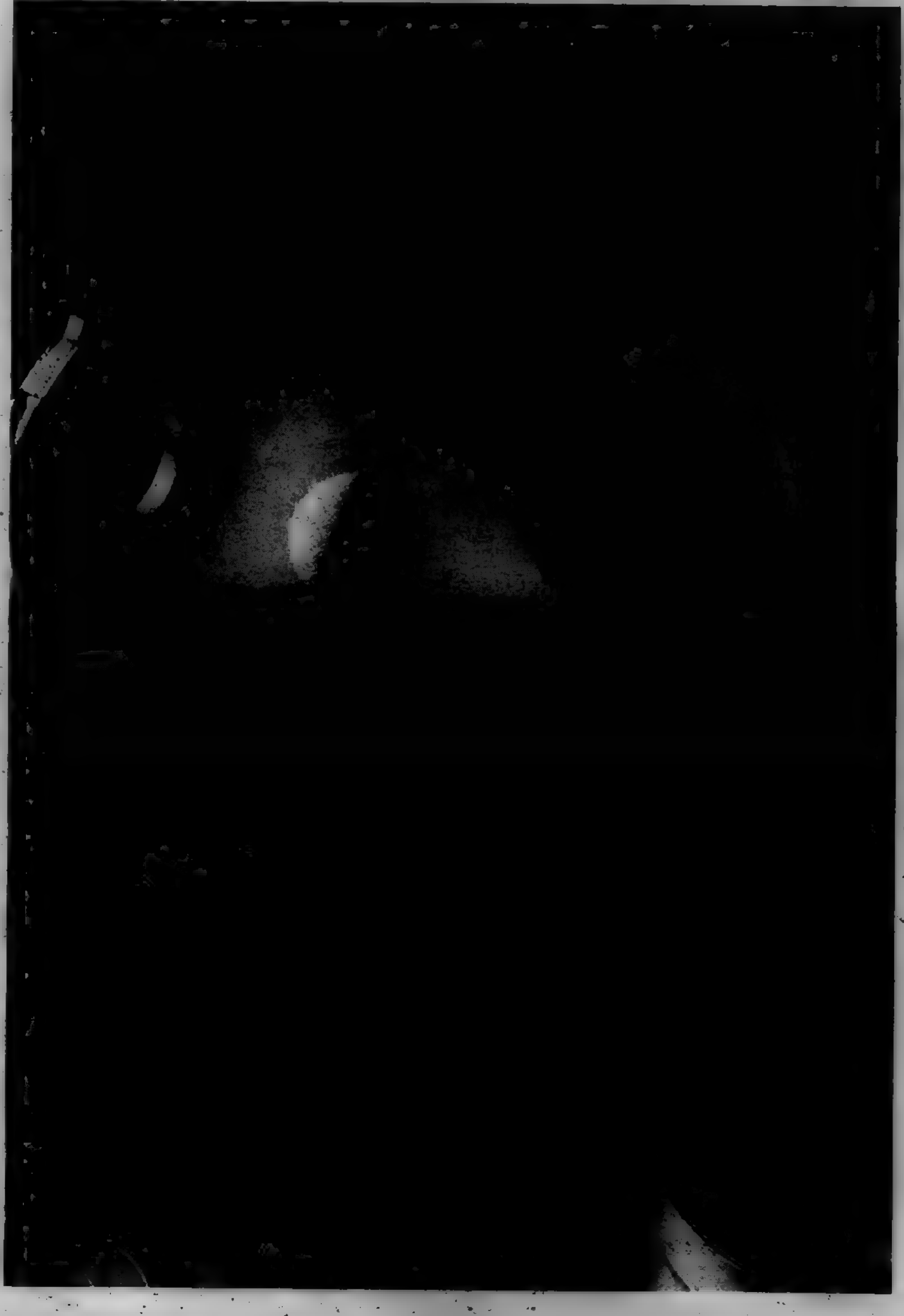

Photo by Mort Rabinow

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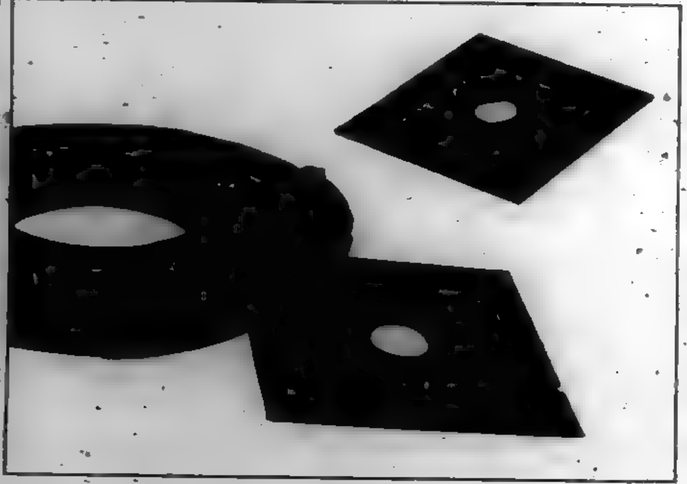

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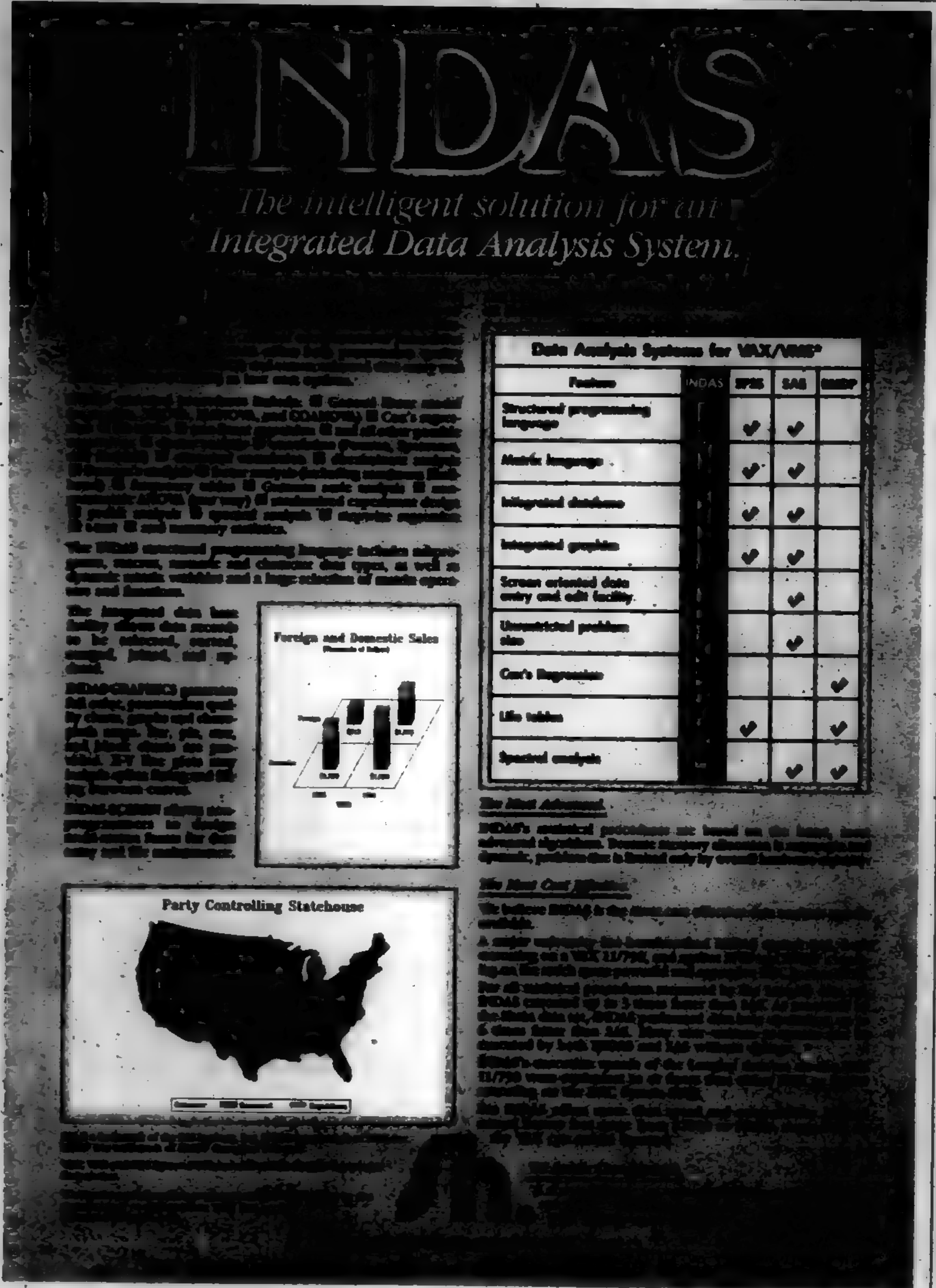

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Integration

Putting the pieces together

By Paul Gillin
CW Staff

Just as "automate" was the application developer's bugle call for many years, today the watchword is "integrate."

Although integration is loosely defined and widely misused, it is clear that large computer users are increasingly demanding new ways to look at and manipulate data. "It's no longer enough to build an application for one purpose and expect it to continue to perform that," said David Dell, director of research at the Diebold Group, Inc., a management consulting firm based in New York. "We have to anticipate that information will be wanted for purposes for which it was not originally designed."

But just what constitutes integration and how much integration a user needs are two thorny issues. Rudimentary forms of integration have been available for several years, but many experts agree that the technology is still immature. One of the barriers to achieving true integration has been the roots that many applications systems still have in batch processes of the past.

"When I first started building systems, the computer people sent somebody they called a systems analyst out to the user community to, in effect, automate what they did," said Naomi Lee Bloom, senior principal in the consulting division of American Management Systems, Inc. "We didn't have to think about the data. What we usually ended up with was a bunch of automated systems that had the same basic flow as manual systems."

Dell added, "Originally applications were designed to do a single job well. Now much more attention is being focused on the advantages of integration in terms of lowering the costs of design coding, improving productivity and being able to move information efficiently from one application to the next."

Unfortunately, the process of retooling batch systems to include integrated features has been slow and difficult. And because technologies are changing so quickly, a standard for integration has not yet emerged, Dell noted. "The [application] software houses are not the only ones in the integration business," he said. "The data base people set some [standards], the major hardware vendors set some and everybody wants to integrate with [Lotus Development Corp.'s 1-2-3].

"People want to integrate between various functions and also [between the mainframe and the personal computer]," he noted. "Add to that the complexity of different vendors coming up with approaches to integration in their product lines and the question becomes: How do you integrate different kinds of integration?"

The topic of integration has gained importance in recent years due to two major factors: the need for improved programmer productivity and end users' desire to apply some of the imaginative techniques to corporate data that have been developed for micros.

"The market now understands that the Tower of Babel is very costly," Bloom said. "The user community is very involved, and they don't want to learn 13 different command structures for 13 different applications. The users are forcing integration."

> *'[Users] don't want to learn 13 different command structures for 13 different applications. The users are forcing integration.'*
>
> **— Naomi Lee Bloom**
> **American Management Systems, Inc.**

Software vendors have reacted with several new approaches, each of them claiming to be fully integrated. However, Bloom, whose firm also sells integrated applications software, admitted, "Vendor marketing far outstrips delivery. Vendors are better articulators than we are deliverers. We are our own worst enemies."

Wayne Pierce, manager of software intelligence at Arthur Andersen & Co. in Chicago, agreed. "Vendors have created an environment that confuses the issue for purchasers in order to differentiate their own products," he said. "By saying they're integrated, [the vendors] imply that things work very closely between one another, that data is shared. But in most cases it is still simply passed. Each application still possesses its own files, and that's a very significant difference between integrated and interfaced applications."

The approaches being taken to horizontal integration today can roughly be split into two types: data base integration and data access integration.

Integrated access is the most popular approach on the market, with adherents like McCormack & Dodge Corp. (M&D), Walker Interactive Systems, Inc., Data Design Associates, American Management Systems, Inc. and Hogan Systems, Inc. The approach is not based on a specific data base management system (DBMS) but rather provides for consistent operations across files.

With M&D's Millennium technology, for example, "The user's ability to converse with the system is identical," said Owen Boyd, M&D marketing manager for tools. "You can pull data from multiple files, cross-edit and cross-check, update and write back to files, and the files are always updated in sync. The processes define the relations, and this can change as the processes change."

Most vendors who have taken this approach have changed the on-line portions of their software to reflect this consistency but have not fully rewritten the batch modules. "Batch now does not do true processing between programs," Boyd said.

Tighter integration can be achieved if applications are designed around a common DBMS using a single development system, an approach that is advocated by data base vendors like Cullinet Software, Inc. Cullinet's manufacturing modules, for example, share one common IDMS data base, a structure that offers improved functionality and performance by minimizing the transfer of data. "Cullinet is trying to control the tools that control data and also the tools to create on-line and batch applications," Pierce said. "That is a more all-encompassing approach to integration."

On the other hand, a data base approach is more expensive because it requires a commitment to a single vendor and the purchase and maintenance of a DBMS and related systems software. Critics also claim that outside of high-volume processing, data base integration does not offer much more function for the far higher cost.

A third but increasingly rare option involves building interfaces between existing application modules to perform some rudimentary data passing. The option is by far the cheapest and requires the least commitment to a specific vendor. However, it is a far cry from integration.

Although much talk has revolved around various approaches to integration, many observers agree that a basic issue has been ignored; namely, how

See INTEGRATE SR/10

Integration option: Add to existing software

[illegible]

Special Report

Users spending more on applications software yearly,

By Jack Keen
Special to CW

Applications software is the growth leader of the information services marketplace. More users will spend more dollars on these packages than on any other type of information service during the next five years.

As shown in Figure 1, $6 billion was spent on applications software in 1984 in the U.S. alone. By 1989, annual user expenditures will almost quadruple to more than $23 billion, a 31% average annual growth rate.

But, in spite of this healthy market expansion, all is not well. Many organizations are underestimating the short- and long-range implications of acquiring the proper packages.

> ”
> *Any applications software purchased locks an organization into procedures for doing business for at least three years — the typical life of an application. In essence, the company becomes married to the way of doing business that is built into the code itself.*

Applications packages' impact

Information systems are rapidly becoming a critical competitive weapon as businesses battle for marketplace supremacy. Packaged applications software, with its alluring price and faster implementation potential (as compared with custom-developed software), is a natural response to the need for a cost-effective arsenal.

Unfortunately, too often overlooked is the fact that any applications software purchased locks an organization into package-induced methods, policies and procedures for doing business for at least three years — the typical life of an application — following product selection. In essence, the company becomes married to the way of doing business that is built into the code itself.

Rather than discovering applications software inadequacies later that could result in premature abandonment of the package or costly revisions, applications software product buyers are urged to do the following:

- Take a closer look at current trends and developments likely to shape information systems needs and opportunities during the next five years.
- Incorporate the implications of such findings into today's selection criteria for applications software.

Outlined below are several important characteristics of the information systems environment that those acquiring applications software should take into account.

- **More applications integration.** Applications are becoming integrated faster than many people realize. Applications software integrated with data base management systems (DBMS) will increase to where it will comprise one out of seven applications software expenditures by 1989. Also by the end of the decade, more than one-third of all software products will require micro-mainframe link capabilities.

Most systems will eventually interconnect in a corporate-to-department-to-individual hierarchy. As a result, functions that an applications software package can perform by itself will often be less important in the future than how well the package can support and be supported by systems with which it must coexist. Today's buying criteria should reflect this trend.

- **New looks from old vendors.** Many vendors, in a quest for expanded market penetration, are broadening their product lines beyond their traditional roots. This expansion assumes many forms. For example, both Cullinet Software, Inc. and Cincom Systems, Inc. (leading DBMS systems software vendors), as well as Management Science America, Inc. (a leading financial systems vendor), are aggressively selling industry-specific applications to the manufacturing industry.

Numerous professional services vendors are now marketing software products that are derivatives of their custom software development contracts. Auxton Computer Enterprises, for example, is offering as applications software an industry-specific system developed for New England Telephone Co.

Many well-established vendors in remote computing services and turnkey systems markets will also be-

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Keen is vice-president and director of vendor and user research programs for Input, Inc., a market research and consulting firm specializing in the computer software and services industry.

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but planning essential before buying

come vendors of software products. These vendors will carve out market and applications specialities and then offer customers a variety of delivery modes for providing solutions to common problems.

This "market migration" tendency represents both an opportunity and a challenge for applications software buyers. On the positive side, additional sources are providing new product alternatives. Conversely, vendors run the risk of stretching themselves too thin resource-wise if they are not realistic about their competitive potential. Criteria for applications software buying must make judgments regarding these issues.

■ **The role of IBM.** IBM's overall software strategy should be an important portion of any criteria for buying applications software. By the year 2000, Big Blue is projected to be a $400 billion firm, with no less than $100 billion coming from software- and information-related services.

However, for the next five years, IBM will focus primarily on systems rather than applications software. Although it will have many applications software offerings, it will put the most emphasis upon and fight the hardest to win those competitive battles involving operating systems, Systems Network Architecture and DBMS-related products. These products form the heart of the centrally controlled distributed processing systems world upon which IBM depends for maximum account control.

Not until the beginning of the 1990s will the computer giant shift its primary business focus to the electronic office and to the applications-related software that supports it.

As a result of IBM's strategic thrusts, independent applications software vendors are more likely to gain the support of IBM than incur its competitive wrath. IBM is more comfortable coexisting with applications software vendors because more applications software begets more IBM hardware. In addition, these vendors are less of a threat to account control than are systems software firms. Because IBM's attitude contributes to the well-being of applications software vendors, users should factor this aspect of vendor viability into their buying equation.

■ **Expect more big vendors.** More deep-pocket firms will be competing for software and services sales during the rest of the decade. Whereas independent vendors currently comprise more than two-thirds of the information services market, they will account for less than 60% by 1989. Computer communications firms will boost their share from 10% to 16% during the next five years. The greatest growth, however, will come from subsidiaries of larger companies. This type of vendor will expand from 10% of the current market to 19% by the end of the decade.

However, vendor size and product brand-name familiarity do not necessarily bring applications software happiness. Whereas these large firms have the potential to bring such positive benefits as more heavily funded product-enhancement efforts and longer term commitments to a given market, there are disadvantages.

For example, the entrepreneurial zeal that has produced many unusually innovative products may be missing. In addition, the organization, because of its size, may be slow to react to marketplace changes, thus resulting in a too-slow product enhancement policy.

Buying applications software is a strategic business decision. To avoid disappointments caused by systems that look good today but are ill-fitted to tomorrow's needs, monitor the big picture when establishing the buying criteria. Especially important questions to ask include:

■ Does the vendor have a viable, realistic long-term product plan?

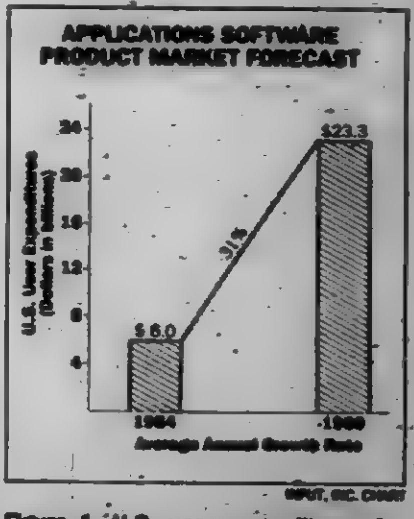
■ Does it satisfactorily take into account micro-mainframe links and other integration issues?

■ How much is the vendor really committed to the market represented by the software offered? What evidence exists that the vendor truly understands this application area?

■ How large is the staff (not how large is the company) that develops and supports this software under consideration? Is it experienced in this area or is it just learning?

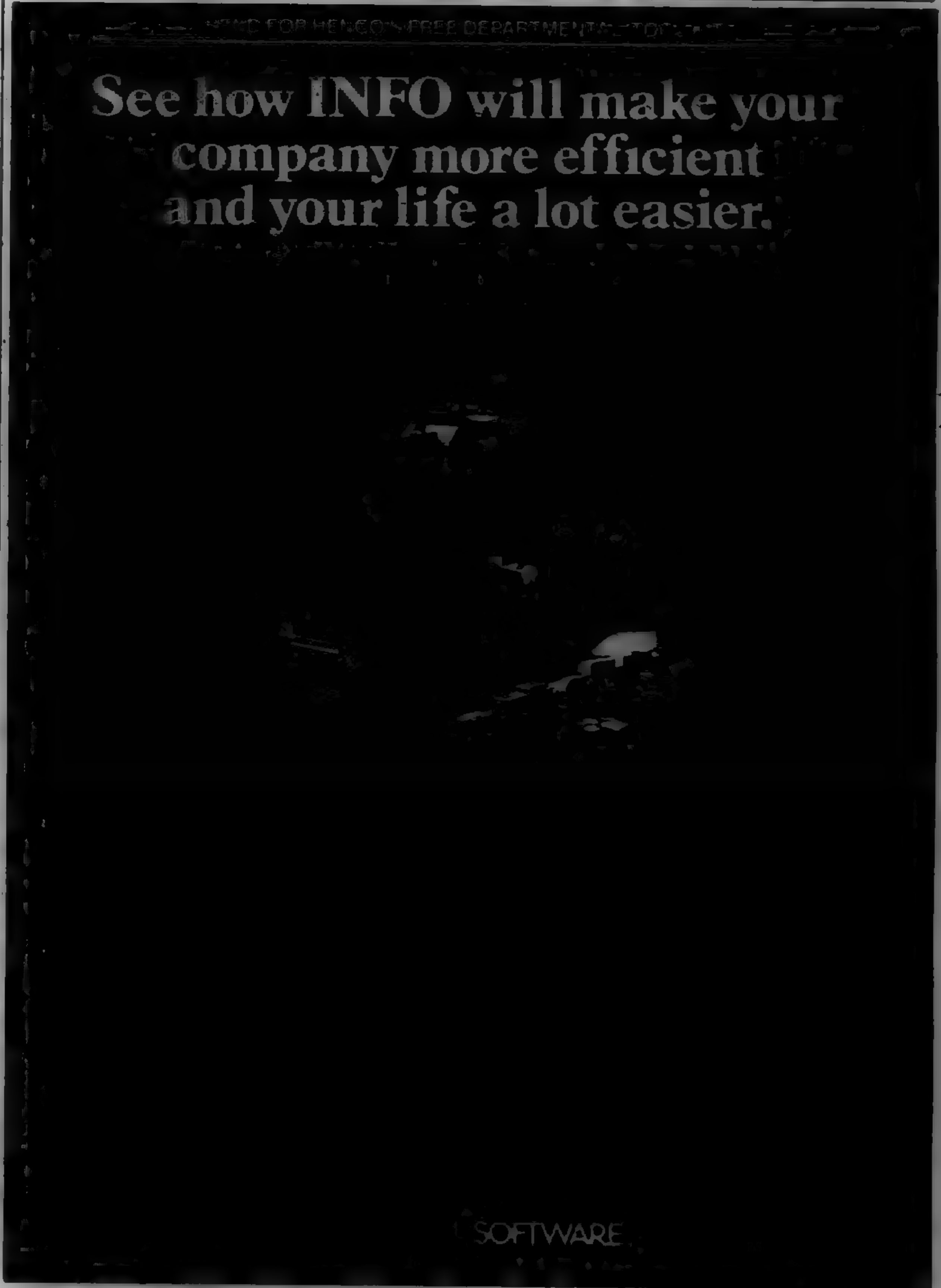
■ Who is the vendor's main competition? Is that competition a threat to the vendor's long-term survival? If so, what must it do to prosper? Will it do it? When?

In a nutshell, buying applications software is a multibillion-dollar undertaking that will affect the destinies of businesses of all sizes.



INPUT, INC. CHART

Figure 1. U.S. user expenditures for applications software products are expected to quadruple by 1989.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SOFTWARE

Spiraling personnel costs a factor when determining

By Gary Layton
Special to CW

Cost analyses from a recent Dun & Bradstreet Corp. study showed that building a program in-house costs approximately $8 per instruction vs. the $1 per instruction it costs for an off-the-shelf applications program.

In addition, the analysis revealed that the maintenance costs of custom-built packages run 50% to 55% of the program's cost per year, while packaged software maintenance is 20% to 25% of the package cost per year.

Often, companies attempt to please end users and battle the backlog by hiring more programmers. But there are project management studies indicating that what requires 100 hours for one person to complete will not necessarily be accomplished by 100 people in one hour.

Skyrocketing personnel costs

The fact is that qualified staff is hard to recruit and costly to pay. Processing power costs have decreased 700% in less than 20 years, whereas personnel costs have skyrocketed the opposite way.

Packaged software is a necessary and useful tool in meeting the expanding demand for new applications programs, especially when cost and resources are an important consideration.

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> *A Dun & Bradstreet Corp. study revealed that maintenance costs of custom-built packages run 50% to 55% of the program's cost per year, while packaged software maintenance is 20% to 25% of the package cost per year.*

In addition, many business processes, such as financial applications, are uniform, which makes packaged software products an acceptable solution.

When considering what type of packaged software tools to provide for end users, the DP executive should keep several things in mind. First of all, how easy to use is the product from an end-user perspective? Is it menu-driven? Cursor controlled? Does the software allow the end user to do some simple programming or forms generation to alleviate some of the data center's programming burden? Is the product on-line and interactive? Does the end user feel it answers all of his applications needs?

Quite aside from the end-user prerequisites of the product are stringent expectations of the product from the data center staff.

Unnecessary strain on system

Do the packages generate a lot of I/O? If they do, they will put unnecessary strain on the entire system and slow it down to unacceptable levels. How many CPU resources will be needed? If the product is integrated with others — for instance, a general ledger, accounts payable and accounts receivable — do they share common routines and common code?

Scheduling is a very complicated

Layton is product manager for Computer Associates International, Inc.'s application division, based in Jericho, N.Y.

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whether to buy or build applications software

process in the data center. If the package is not on-line, how much batch processing time does it require?

And what are the recommended cycles for the jobs? Does the product have its own security controls? How much disk space will the product require? What is the estimated growth rate of the data base? How much maintenance does the product require? How much modification? Are the products user-defined or parameter-driven to allow for easy modification?

Special nature of certain applications

Due to the special nature of certain business applications, it is often necessary for a corporation to develop many of its own applications programs.

In-house development produces a 100% match to specific needs. If resources and time are not a factor, this is the ideal solution. Unfortunately, the reality in most companies is that there is a shortage of good programmers and severe budgetary constraints.

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> *In-house development produces a 100% match to specific needs. If resources and time are not a factor, this is the ideal solution. Unfortunately, the reality in most companies is that there is a shortage of good programmers and severe budgetary constraints.*

One way to maximize the in-house development effort is to provide productivity tools to aid in the performance of programmers. There are productivity tools to aid in all phases of the programming cycle: definition phase, design phase, prototyping stage, coding storage, testing and debugging and finally the maintenance phase.

Whether the DP executive's decision involves buying or building the program, he should first develop a request for proposal outlining all the needs of both the end user and the data center.

Preliminary paper analysis

He can then make a preliminary paper analysis of products on the market, their features, facilities and costs.

He should determine if the percentage match of a purchased program to his needs is acceptable. If unacceptable, he can assume he will either have to modify the program, modify his needs or custom-build the solutions.

To help make that determination, a quick reference guide is useful, see figures A and B.

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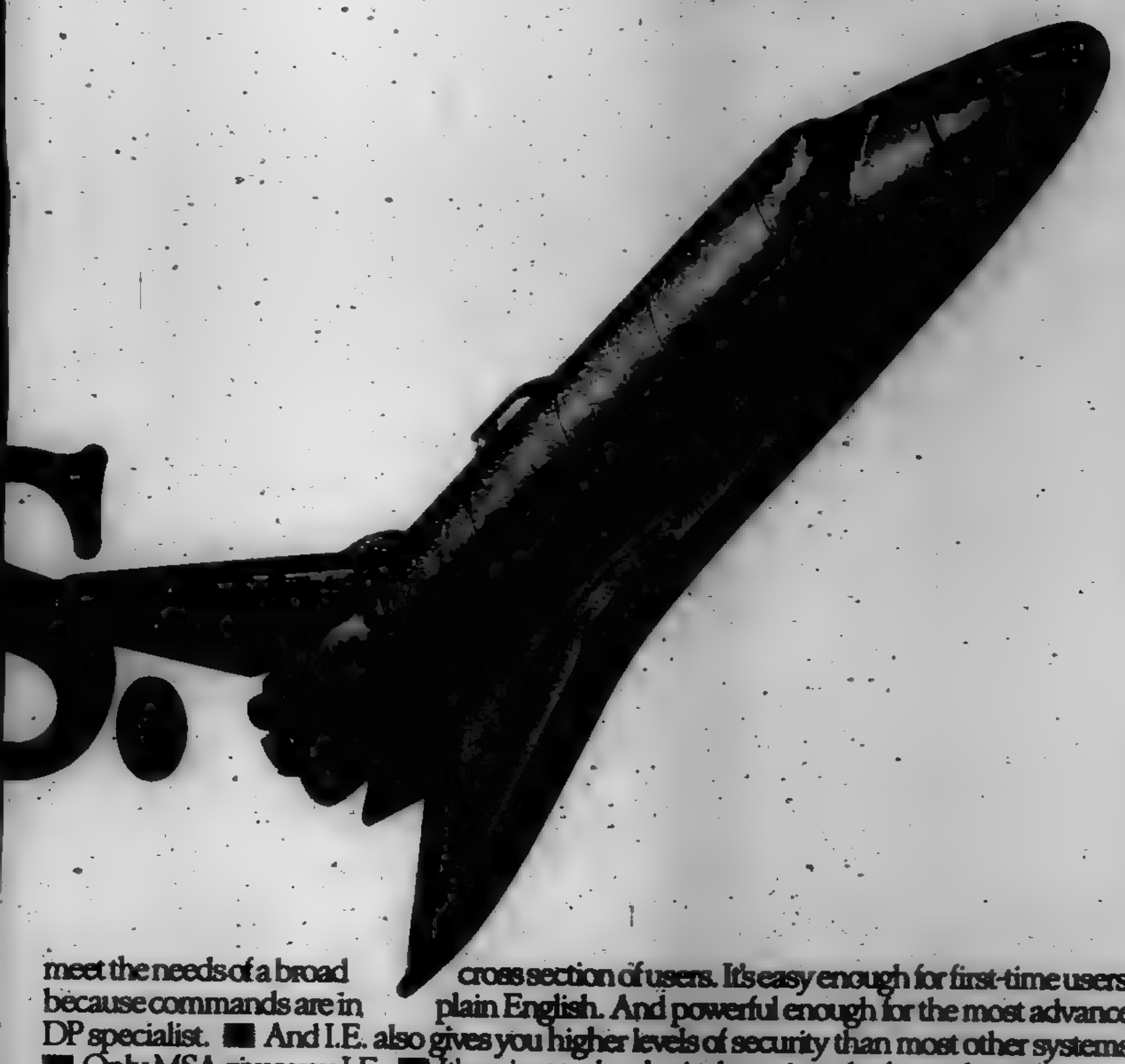

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Integrated software key to firm's system upgrade

Racal-Vadic

MILPITAS, Calif. — When modem maker Racal-Vadic, Inc. here outgrew its batch processing system three years ago and set out to put together a replacement system, it centered its plans around obtaining integrated, data-base-oriented software.

The firm had purchased a Sperry Corp. 9030 mainframe and installed financial and manufacturing software in 1979, when it was a $19 million/year company with a rather simple, centralized manufacturing organization. Since then, Racal-Vadic has expanded its revenue to $100 million annually, added manufacturing plants and distribution centers and opened regional offices throughout the country.

Early in 1982, Racal-Vadic's top management committed itself to a five-year MIS plan to bring up an on-line system that could keep up with the company's expansion.

The plan dictated that software applications for separate departments run off a centralized data base, according to Robert Swetavage, the firm's MIS manager. "In a high-growth, multiplant environment like ours, we believe that maximum integration of our applications across the company is crucial to our future success," Swetavage said.

With such a setup, managers in financial and manufacturing departments can access at will current data from all divisions of the company. Having current information from throughout the firm allows them to respond quickly to changes in the marketplace, to evaluate immediately the effects of business decisions and to stay competitive in general, Swetavage said.

Racal-Vadic issued a request for proposals to software vendors and, after considering the replies it got, purchased Cullinet Software, Inc.'s IDMS data base and modules of the vendor's financial and manufacturing systems.

The firm chose Cullinet because it offered integrated data base and applications software, Swetavage said. "Everyone else used the [data base management system] as a vehicle for implementing applications, with little or no integration involved."

Modular design appealing

Cullinet also offered an integrated data dictionary, a fourth-generation language and some other tools Racal-Vadic wanted, along with a modular design that appealed to the firm, he said. "I didn't have to bring everything in at one time."

Racal-Vadic signed a contract for the software in July 1982. In September, it ordered a 4M-byte IBM 4341 for delivery in February 1983.

Even before the mainframe was on order, the firm began sending staff members to Cullinet's training centers to prepare for the data base and the firm's initial software application, general ledger, both slated for installation in March 1983.

The firm then linked two terminals in its headquarters here to a mainframe at a Cullinet data center in Westwood, Mass., that was running a copy of the general ledger software. Racal-Vadic established the link because it had to make changes to the software's chart of accounts but did not have a mainframe on which to do the work. Over the same communications link, DP staff members received additional training on the software and ran some tests.

As planned, Racal-Vadic installed the 4341 in its headquarters in February and brought up the data base and general ledger software in test mode during February and March. On April 1, the software was in use, recording finances for Racal-Vadic's new fiscal year, which began that day.

Swetavage said the firm brought up its general ledger before other financial and manufacturing modules partly because it needed the software running at the start of the fiscal year. If it had come up later during the

See UPGRADE SR/10

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INTEGRATE

from SR/3

much integration users really need.

"In some ways, I would try to dissuade people from integrating right away because I think there may be a tendency to overintegrate where it's really not valuable," said Daniel Pfau, of Index Systems, Inc. in Cambridge, Mass.

Boyd added, "I've found that customer wants are usually totally unrealistic compared to what they can really get."

Large-scale integration in most cases requires a near-total redesign of existing software and may entail even greater expense if a DBMS is involved.

For that reason, experts agreed, companies should be questioning seriously just how much integration they need.

Deciding how much integration is needed "is the biggest question right now, and there isn't any right or wrong answer," Pierce said. He added that users often "overestimate their ability to implement the kind of integration that they would like. And it's more expensive than they expect it to be," he said. "Rarely do you see people able to spend the amount of time and resources to achieve it."

Integration cannot be effectively achieved through simply purchasing software, Bloom pointed out. In the perfect world, a company would be able to close down for a while, analyse its business strategy and create an information architecture and systems strategy based on that analysis. Then the software would be designed by one superanalyst taking into account possible future uses of information as well as current uses. The scenario is implausible, Bloom said, "But it does help to go through the mental exercise of shutting the business down and thinking through what you would put in place in the ideal situation."

Thinking about integration has to begin with the realization that different groups use the same information in different ways. "In a product data base, integration is conceptually thinking about the product; determining what the corporation needs to know about it and coming up with a data model that allows different users to look at the product as though they were the only ones looking at it," Bloom said.

Dell added, "There are major benefits to determining what can be integrated and what doesn't need to be integrated, especially as more people and functions are involved."

UPGRADE

from SR/8

year, Racal-Vadic would have to maintain financial data for one year on two systems.

In addition, general ledger set the stage for future financial and manufacturing applications the firm planned to bring up. "We viewed [it] as a reference that would create system disciplines for other integrated applications to comply with as we brought them on," he said.

Last summer, the firm installed the central modules of its manufacturing system — Cullinet's bill of materials, inventory control and material requirements planning. The modules went into use in September, and the firm has since begun to realize the benefits of the integrated system, according to Swetavage.

"The advantages of the integrated approach include more timely and consistent data, greatly reduced data redundancy and one set of parts master information for all departments in the company," he said.

The only programs still running on the Sperry Univac are order entry and accounts receivable. Racal-Vadic plans to install Cullinet's order entry software on the IBM system this spring and to bring up accounts receivable sometime afterward. A service bureau processes the firm's accounts payable, and a bank does its payroll.

Throughout the implementation to date, Racal-Vadic has evaluated its business practices in relation to the way its software is set up, Swetavage said. "In some cases, we've found it best to modify our procedures to conform to the package."

Finer level of detail

Cullinet's general ledger, for example, provided several more positions for data in its chart of accounts than the software that ran on the Univac did. Racal-Vadic modified its procedures to take advantage of the software, bringing a finer level of detail to its reporting.

The firm also introduced strict data entry procedures and distributed comprehensive documentation to its users. Swetavage said the integrated software requires that users enter data correctly and conscientiously, because if they enter garbage, the data base spreads that garbage to data files throughout the company.

Users have responded well to the system but have had trouble with Culprit, the IDMS report writer. Culprit is not easy for end users to learn, Swetavage said. "My programmers can use it better than my users." In turn, the programmers do all report formatting, a task the MIS department would like to relegate to end users.

Cullinet offers On-Line English, an easier to use report-writing utility, but Racal-Vadic has shied away from it because it takes up too many system resources.

As users mature on the IDMS system in the coming years, the firm will look for report writers they can operate, Swetavage said.

Racal-Vadic's other plans include installing Cullinet's master production scheduling and shop-floor control software this fall and bringing up a purchasing module when Cullinet releases it. Further in the future, the firm wants to obtain accounts payable and cost control modules.

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Multivendor approach an option in product search

By Michael J. Green
Special to CW

Companies searching for application software in the mid-1980s face a formidable challenge. The proliferation of application packages offered by different software companies is making the selection process increasingly difficult.

Faced with this situation, many companies are attracted to total-solution software vendors that offer one-stop shopping and integrated packages. But the single-source software vendor may not be the panacea for which many companies are looking.

Many total-solution vendors broadened their product selection more in response to pressure from existing customers than as part of their original development plans. Software companies that built their success and reputations on a particular application, such as an inventory control system, often discovered that they had a ready-made market in their existing customer base, eager to buy any add-on module the vendor could produce.

These software developers rushed to deliver to their customers the add-on application packages they wanted, such as general ledger and accounts payable. However, the expertise that made the vendor successful with its original application system was often of little or no use when applied to radically different applications.

Many total-solution vendors created what is known as the "Snow White" effect. The temptation is there to be all things to all people. The vendor makes the sale to the prospective customer, based on the virtues of the lead product — the Snow White. The customer sees security in a single-vendor solution and winds up buying all the other add-on products. Only after all the application packages are installed does the customer discover that the seven extra modules he bought were really the seven dwarfs.

Often the benefits customers anticipate by going with a single software vendor are outweighed by the lack of functionality and capability that characterize some vendors' secondary add-on products.

However, even the strong supporters of the multivendor approach do not advocate a different vendor for each application. Companies should evaluate the add-on modules on their own merits when buying application software.

There is no doubt that some inherent problems still exist in mixing and matching application software from different vendors. But the interface and connection problems are often much less formidable than first feared. Most of the efforts in integrating packages from different vendors take place during the initial conversion and installation.

Companies searching for packaged software should consider the following points:

■ Purchase packages from the same vendor where necessary, but not in every case. Where close interaction and integration of functions is critical, it often makes sense to purchase more than one package produced by the same vendor, such as order entry and billing systems; general ledger and accounts payable packages.

On the other hand, there is often no significant reason why a general ledger from one vendor cannot work effectively with the manufacturing or payroll system produced by another vendor. In this type of situation, you should choose the best packages for your needs rather than be ruled by fears of multivendor problems.

■ A discounted price is the wrong reason for selecting a vendor's add-on product. Good software is expensive to develop. When an add-on package is heavily discounted it may be a sign that the vendor does not consider it in the same class as the firm's premier product.

The biggest cost to an organization acquiring any package is not the license fee but the start-up, internal training and ongoing operating expenses. The real financial benefits from a software purchase are the time and money you save with a good product once it is in operation.

■ Good hardware does not necessarily mean good software. The commonly held belief that good hardware vendors must also make good software is a myth.

■ Big isn't always better but too small may be worse. Although the size and reputation of prospective software vendors are important (you would like to know that they will be in business next year), much of the best software historically has been produced by young, innovative firms.

However, you should be concerned if a small firm offers too wide a range of homegrown application packages. Does it really have the resources to develop and support a large number of products? Some of them may be secondary, low-function add-on modules.

One signal is whether any of the add-ons stand up to competition on

See SOFTWARE SR/19

Green is product manager for Multiview financial software from Cognos, Inc., an independent supplier of software for minicomputers.

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Firm pulls off software switch in three months

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Accounts Payable		Develop account numbers Enter vendor information Conduct user training Perform trial check runs	Process current accounts Phase out service bureau
General Ledger		Develop account numbers	Develop relationships between account and department numbers Design and format reports for financial statements

CW CHART

Businessland, Inc.'s software implementation began in April and continued into August, but May, June and July were the critical months during which the firm had to establish three financial systems.

SAN JOSE, Calif. — When a retail computer chain decided to bring up three major accounting packages in three months, even the project's directors questioned the sanity of the move.

"To tell you the truth, I never thought we could do it," said Brian Bundy, assistant controller for Businessland, Inc. and day-to-day manager of the software implementation. But with some detailed planning and more than a few all-nighters, the project team brought up the three modules on schedule. "There were extensive hours put in by a number of individuals," Bundy said.

Businessland, which operates a national chain of retail centers that sell and service microcomputers and related office equipment, realized last February that its growing business volume was straining the capacity of the service bureau that processed its financial data, Bundy said. "We were using a fairly small service bureau, [and] we had basically outgrown it."

Between June 1983 and June 1984, Businessland opened 36 retail centers, expanding from six centers to 42. The increase in business slowed the service bureau's processing time. Businessland's financial closings took about 16 business days, leaving little time for the firm to review data before beginning a new period.

Businessland had an 8M-byte IBM System/38 in-house running inventory tracking software, so it decided to look for financial programs to run on the machine. In March, the firm bought a package of financial software modules from Software International Corp.

The timing of the purchase prompted the need for a speedy implementation. "The optimum time to bring up that financial package would be at year's end," Bundy said, and Businessland's fiscal year ended June 30 — just three months away.

Because Businessland had a small DP staff — an MIS director, one programmer and one operator — it hired two outsiders from the consulting firm Myers Holum & Co. to help with the implementation. The two consultants, along with Bundy and Businessland's accounts receivable supervisor, Edna Kincaid, worked as a team throughout the project, reporting weekly to the firm's controller and its vice-president of finance.

Core segments brought up

The team aimed to bring up core segments of accounts receivable, accounts payable and general ledger software by June 30 so that it could enter into the new system all financial data for the fiscal year that would begin July 1. The team decided to start with accounts receivable because, Bundy said, "it was, by far, the toughest to bring up."

Businessland maintains separate accounts receivable agings for each of its retail centers, and the firm needed to modify the software to accommodate this practice. It also needed to enhance the software so that it could generate reports that broke down accounts receivable information into different categories of retail sales.

The consultants on the project team used the System/38's query facility to generate specialized daily sales and cash receipts reports, customer lists and exception reports. Because the Software International accounts receivable system makes use of System/38 native-mode data base facilities, query reports were easy to produce, according to Mark Myers, one of the consultants.

During April, some members of Businessland's accounts receivable staff took classes from Software International. The same month, the project team obtained from the service bureau a list of all open invoices so that Businessland could enter these into its in-house system.

In May, operators spent three weeks manually entering about 2,000 customer account numbers and 13,000 open items into the system. The consultants felt manual entry would acquaint users with the software, and, Bundy said, Businessland did not have enough time to write a conversion program. Throughout the month, the firm entered its current accounts receivable records manually on the service bureau system and on its System/38. At the end of the month, the project team ran trial accounts receivable balances on the new system.

During June, Businessland continued to run its accounts receivable in parallel on the two systems. An interface that Myers wrote allowed the firm automatically to transfer to the accounts receivable system data on sales and inventory that was collected from point-of-sale (POS) microcomputer systems in the retail centers. The project team checked this information against data entered manually into the service bureau system and reconciled the two weekly. By the end of June, Businessland cut over from the service bureau.

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> *The team aimed to bring up the three modules by June 30 so it could enter into the new system data for the fiscal year beginning July 1.*

While the firm was finishing work on the accounts receivable package, it was also beginning to implement its accounts payable and general ledger software. In June, the project team developed account numbers and department numbers for its chart of accounts and entered the names and addresses of its approximately 1,500 vendors into the system. During June, the team also used dummy invoices to test the system's ability to generate checks. At the end of the month, users received training on the accounts payable software.

Goals met in July

Beginning July 1, Businessland entered its current accounts payable invoices on the Software International system. With accounts receivable and accounts payable data from all its July activities going to the new system, Businessland had met its goal of establishing its in-house financial framework by the beginning of the fiscal year.

The firm kept its outstanding accounts payable on the service bureau system, allowing them to drop off after they had been paid. Otherwise, Bundy said, "We would have had to have someone sit down and revoucher all those invoices." The redrawn invoices would then have to be entered into the in-house system, opening the firm to data entry errors and taking up crucial time. "By the end of July, they would have run out anyway," he added. About a dozen accounts remained on the service bureau at the end of July. Businessland reentered these into its system early in August.

With the input programs for accounts payable, accounts receivable and general ledger established in time for the opening of the fiscal year, Businessland's project team devoted the month of July to defining relationships between account and department numbers and to formatting reports. Like the project as a whole, the month's work was under a strict deadline, Bundy said: It needed to be finished by month's end so that the firm could produce financial statements in time for its July financial closing.

Statements recreated

The project team recreated some statements that had run on the service bureau system — mainly detailed profit-and-loss statements for individual Businessland stores — and created some new reports. The most notable of the new reports, according to Bundy, was a one-page summary profit-and-loss statement that provided corporate management with one profit figure for each of several business categories.

In re-creating the detailed reports, Businessland added some refinements to allow individual store managers to break down their revenues and costs of sales by specific products and services: hardware, software, training and the like. These and other reports represent what Bundy called one of the two main benefits of the firm's new financial system: increased control over finances. "Our center managers are just elated that they're able to get financial statements that are helping them manage their centers," he said.

The other major benefit was reduced costs, according to Bundy. Businessland had paid its service bureau about $30,000 per month to process its financial data. "That [figure] has gone virtually to zero," he said. Monthly savings from doing financial processing in-house should allow Businessland to recover its system expenditures within two years, according to Bundy. The firm still keeps its fixed-assets accounting on the service bureau, but plans to bring up a Software International fixed-assets module in-house next month.

Businessland closed its July financial books 10 working days after the end of the month and has maintained 10-day closes as its norm.

Phased out dependence on consultants

Near the end of the installation project, the firm hired an in-house programmer to assume responsibility for the financial system and phased out, over a month, its dependence on the consultants. Businessland has since hired one more programmer who is dedicated to maintaining and upgrading the Software International package.

The two programmers have produced some financial reports, including an historical report generated from accounts receivable data, to supplement the reports formatted during the installation. These, Bundy said, "were more niceties than anything else." The programmers have targeted about 60 additional enhancements they would like to make to the system.

Businessland plans to upgrade its System/38 to an 8M-byte IBM System/40 within the next month. The firm recently installed a System/36 to collect data sent from the retail centers' POS systems.

Swift setup key in guitar manufacturer's ledger pick

MERIDIAN, Miss. — For a fast-growing guitar manufacturer here, swift installation and implementation of a mainframe software system were more important than any attribute of the software itself.

"When you're trying to move along at 80 miles per hour, it's hard to stop and change a flat tire," said Jim Clark, accounting manager for Peavey Electronics Corp. here. The firm, a manufacturer of guitars, amplifiers and sound reinforcement equipment, is growing at an annual rate of about 20%.

Peavey wanted to switch from a batch to an on-line general ledger but could not afford to bring its system down or disturb account processing for any amount of time to do so. The accounting department balances cash, accounts receivable and checks every day.

By last spring, Peavey had outgrown a general ledger system that had been written in-house and was running on the firm's 4M-byte IBM 4300. The software was designed for a 56K-byte IBM System/3 and upgraded bit by bit over 10 years. It could not support the firm in the firm's present state.

Peavey runs six manufacturing plants — each divided into subplants for woodworking, electronics, metal working and assembly. The corporation is composed of four separate companies — R&D, finance, distribution and an overseas firm. A new general ledger system had to meet the needs of these many divisions, Clark said. "We wanted a general ledger system that could handle multiple companies and multilevel plants online. . . . We're international, so we also needed currency conversion, and we needed to be able to transfer funds between companies."

Clark said Peavey chose software from Global Software, Inc., partially because Global had a general ledger package that offered these functions but mainly because the firm offered a method for converting from the old software to the new without interrupting accounts processing.

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> *'The Swat program is very intensified, like getting four weeks of in-house training in five days.'*
>
> — Jim Clark
> Peavey Electronics Corp.

Under the vendor's Software Walkthrough (Swat) implementation program, representatives from Global visited Peavey for two days.

During these two days, the representatives reviewed Peavey's chart of accounts and asked what the firm expected from a new general ledger, Clark said. They then obtained a taped copy of Peavey's general ledger and took it to Swat headquarters in Raleigh, N.C., where they developed conversion programs.

During the week of the actual conversion, Clark and three other accounting staff members traveled to Raleigh to study the new general ledger system and practice using it on Global's IBM 4300. By the time they arrived, Global had loaded one month of Peavey's accounts into the system. The accountants from Peavey loaded another month's work during the week they spent at Global.

Clark and his coworkers practiced and studied for most of that week, and their hard work paid off, he said. "The Swat program is very intensified, like getting four weeks of in-house training in five days."

The team left Swat headquarters on Friday and loaded the new general ledger software into Peavey's 4300 that Sunday, Clark said. The system went on-line Monday.

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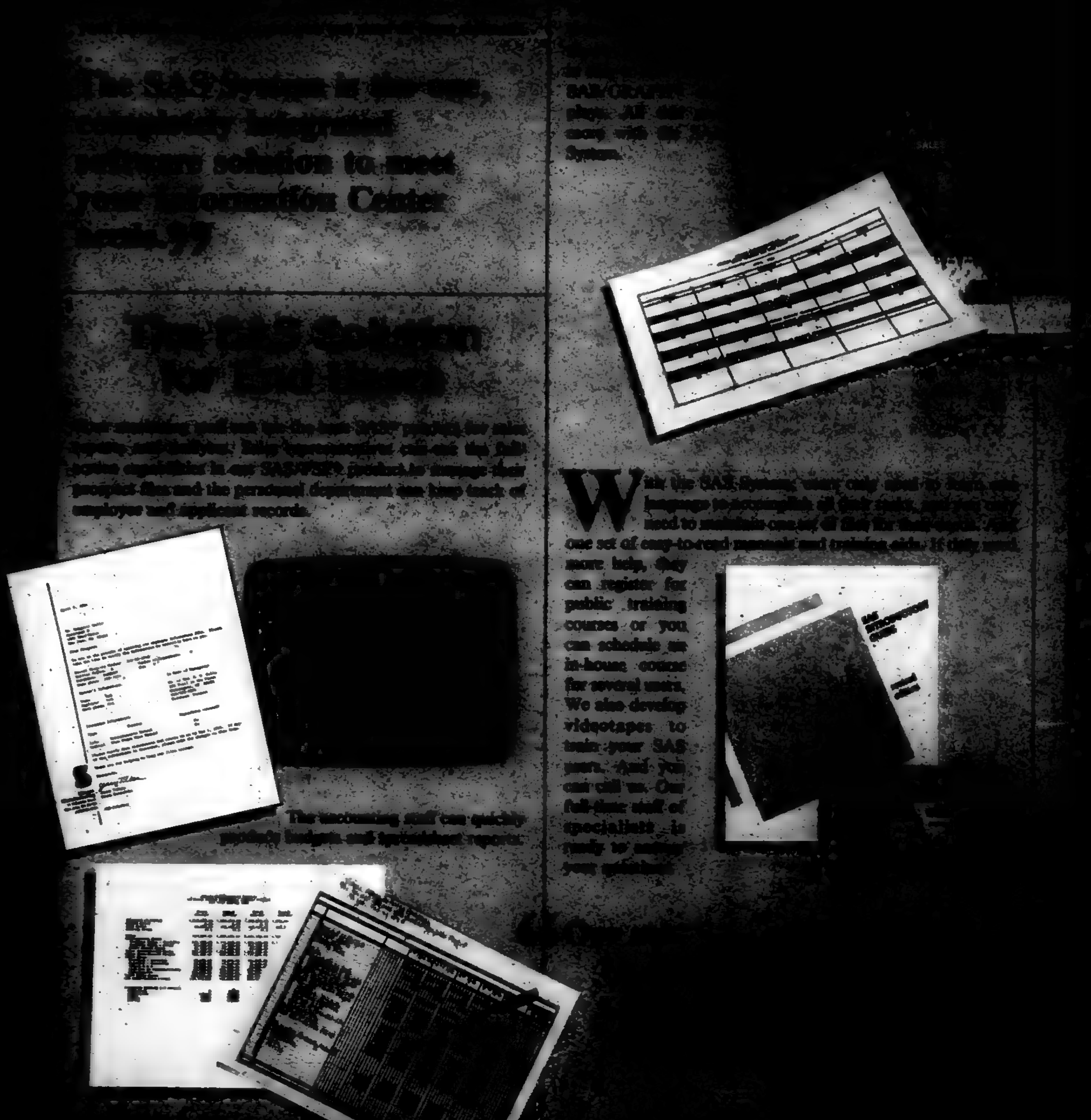

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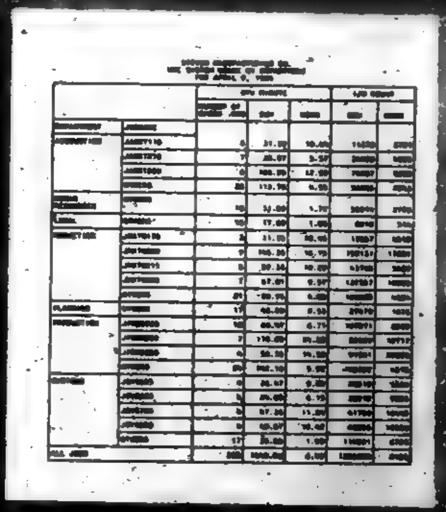

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Special Report

Shortcomings of escrow arrangements require that

By Tom Mylott
Special to CW

The lack of source code lurks in the background as a serious danger in acquisition of off-the-shelf software. For many reasons, vendors resist providing source code to their users. Yet, what will happen to a user if the vendor goes out of business or terminates the application's maintenance?

As a common technique of self-defense, purchasers of these packages often convince vendors to place the source code in software escrow. Software escrow can be an effective protection, but many users build escrow arrangements on foundations of sand.

The concept of software escrow lacks structure — only a vague definition of it exists. Basically, it consists of the depositing of materials, usually source code, in a location other than the vendor's in order to give a user access to the material under certain conditions. It is the vagueness of this definition that can be confusing.

While the concept of software escrow is alien to many people, some have participated in an escrow agreement when they purchased their homes.

Few software escrow arrangements, however, are established as carefully as the ones used in the buying and selling of real estate, even though the financial stakes often exceed the average price of a house.

Before determining how well a particular escrow agreement will meet your needs, some basic questions must be answered:

■ Why a software escrow arrangement? Not all users who acquire off-the-shelf packages have the same needs. Most software escrow accounts are arranged as a compromise between the user's desire to have source code and the vendor's determination not to release the code.

Users overwhelmingly prefer to have application source code in their possession, primarily so they can maintain their software. Vendors prefer not to release source code because they fear both their competitive edge and proprietary interests in the software will be jeopardized.

■ How unique is your package? If you can easily switch from one vendor's package to a competing vendor's package, the need for escrow is less than if your acquisition is unique or there is no easy conversion path to a different package. The more important your application's maintainability is to you, the more you need a strategy and procedures to make the source code accessible.

With all escrow agreements, ask these questions and make sure the answers are in your escrow contract. To succeed, all escrow agreements must meet these requirements:

■ An escrow agreement must be a written agreement — that is, a contract.

Oral promises are difficult if not impossible to enforce.

■ The escrow agent must be an independent third-party. Once you have a written agreement, determine the identity of the escrow agent.

Beware of a vendor that states you will be sent a copy of the source code if the company goes out of business. Nearly as bad is the vendor that promises the company is guarding a copy of the source code in its safety deposit box. In both situations, the vendor plays the parts of escrow agent and vendor. Both of these arrangements stretch the concept of software escrow beyond the breaking point.

Situations in which the escrow agent is the vendor's bank, accountant or some other organization doing business with the vendor are also not recommended. If you have a dispute with the vendor over your getting the material out of escrow, whom do you think this type of escrow agent will favor? The company with which it does business and earns money, or some user of whom it may never have heard?

Of course, the best escrow agent might be someone who favors you, such as your own bank. Because that arrangement leans in your favor, the vendor will likely object. Nevertheless, even an independent local escrow agent could still work to your advantage if you, the vendor and the agent come to blows.

■ Determine what should go into escrow. If the escrow agent is satisfactory, the next step is to determine what should go into escrow. Of course, the source code goes, but in what format? A copy on machine-readable media as well as a printed copy lines up as the best combination. Note, however, that possession of the source code alone can be insufficient protection. What if the vendor wrote the software in a proprietary or unusual programming language? You might need the compiler, too.

To make the source code useful, the vendor needs to hand over other materials to escrow, such as documentation, any system and program specifications that are needed for software maintenance.

■ Usually a vendor that offers sufficient answers to the "who" and "what" of an escrow agreement will answer the question of when-materi-

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Mylott is an attorney with the Dallas firm of Peter S. Vogel who specializes in computer law.

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software buyers look carefully before they leap

als go into escrow satisfactorily as well, but not always. The escrow agent should embrace the source code and documentation before or as you acquire the package.

Several variations of answers exist as to the "when" of escrow. Some vendors promise that they will place the material in escrow when a crisis looms. In the present, software escrow should console you as being an in-force insurance policy rather than something that might rescue you if you need it in the future.

Escrow of obsolete software

When the vendor will deposit material in escrow is not only a threshold issue in the escrow relationship, but also a continuing concern. Unless the deposited materials adequately reflect the application you are running, an otherwise successful escrow plan can crumble into an escrow of obsolete software. Therefore, require the vendor to update its materials.

- How will you monitor the escrow arrangement? Another consideration is that of verifying what the vendor places in escrow. You cannot always afford to take the vendor's word concerning what it has placed there. Frequently though, the inconvenience of actually inspecting the deposited material will outweigh the advantages. A compromise is to require the escrow agent to notify you regarding all deposits.

- When will the source code be released? Most escrow arrangements provide for release if the vendor goes bankrupt or otherwise ceases to do business. A few escrow arrangements mention some kind of software maintenance failure as another condition for release of the materials in escrow. Both approaches disguise latent problems. One approach may be illegal, the other ineffective.

- Bankruptcy. The problem with releasing source code upon bankruptcy is that the bankruptcy laws may build a brick wall in the escrow agent's path. When a company tumbles into bankruptcy, the federal court takes over the business while seizing complete legal control of any assets that remain.

A bankruptcy court has broad powers, including the power to rip up ongoing contracts. Software escrow has yet to be baptized by the fire of a lawsuit during bankruptcy proceedings.

If the court determines the source code is a valuable asset of the bankrupt company, the judge will not let you walk away with it. Even if the court overlooks the ownership and value issues, the judge may still decide that honoring your escrow agreement is not in the best interest of the bankruptcy proceedings.

Moreover, if the bankruptcy is a corporate reorganization that causes minor maintenance problems, the court may ignore your pleas that the lack of source code jeopardizes your software support.

- Some escrow agreements include a failure of software maintenance as a condition for release of what is in escrow. This contingency has the best opportunity to be enforceable and effective. However, it can be a worthless strategy unless your escrow contract has nailed down the components of a maintenance failure or defined inadequate maintenance.

Assuming you have lined up a neutral escrow agent, that agent wants to minimize the chances of being sued. In the face of uncertainty, the agent is unlikely to go along with your definition of satisfactory software maintenance. One way to help the escrow agent is to establish a contractual standard of software maintenance that the agent can ascertain with some objectivity, and at the same time, provide a procedure for you to spur the agent into action, particularly if the vendor fails to respond to inadequate maintenance.

A vendor that claims to have a software escrow arrangement and stands unwilling to alter that escrow should be confronted. As with any vendor claim, examine this one closely. In addition, your attorney should examine the vendor's contract with the escrow agent.

SOFTWARE

from SR/12

their own right or whether they are sold only in conjunction with a Snow White product.

- A multivendor solution requires both the right software and the right users.

Not all software packages are suitable for integration with other vendors' products. The ability to pass files to and from outside systems is essential.

Access to the data dictionary of the other vendor's product may also be necessary to allow files to be shared by several packages.

The successful multivendor integration also requires the skills of a knowledgeable systems analyst who can help resolve the technical issues that may arise during the process of integrating products from different vendors.

The multivendor solution is a viable alternative to the single-source software vendor.

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Integration glues shattered system

A Pfaudler employee applies a glass lining to a vessel.

ROCHESTER, N.Y. — The buzzword "integration" took on significant meaning for a manufacturer here that had to construct — from scratch — a financial system to process its own data and that of an operating group with which it merged.

After the Pfaudler Co. was acquired in December 1982 by Standard Oil, Co. of Ohio (Sohio), it could not choose a package or two to supplement its system, according to Jeffrey Spink, manager of financial planning and analysis for the firm. "We had nothing that we were going to keep from our old system," he said.

Pfaudler, which manufactures 100- to 10,000-gallon glass-lined vessels that chemical and pharmaceutical firms use for mixing formulas, was merged with the process equipment division of Sohio, which makes similar vessels with plastic and metallic linings. Administrative and financial responsibility for the division rested with Pfaudler.

The firm wanted to phase out its financial system — homegrown software running on an IBM 370/158 — and tie its records with those from the process equipment division. The division tapped into an IBM 3033-based system running under MVS that Sohio ran for its operating companies. "It was a very good system," Spink said.

But Sohio announced shortly after the Pfaudler acquisition that it wanted to decentralize its DP operations and that operating companies should have their own setups by the end of 1983. Pfaudler then began looking for hardware and software to meet its needs. Because the firm was building the system from the ground up, integration was the most important criterion, Spink said. "We wanted a fully integrated financial system [with modules] that could talk back and forth to one another."

Pfaudler purchased a 12M-byte IBM 4341, then looked for software to run on it. The firm narrowed its search to two vendors, McCormack & Dodge Corp. (M&D) and Management Science America, Inc. (MSA), and chose M&D over MSA mainly because of support services, Spink said.

Financial software purchases

In June 1983, Pfaudler purchased M&D's G/L Plus general ledger, F/A Plus fixed assets and A/P Plus accounts payable software. A team of financial and technical staff members from Pfaudler attended training sessions on the general ledger package at M&D and returned to put together a chart of accounts that would serve both Pfaudler and the process equipment division.

Spink said the software allowed Pfaudler to combine the two groups' finances into one system, even though the two used different length account numbers, different types of accounts and different accounting structures.

The firm ran the general ledger system in parallel with the two old systems during January, February and March 1984 and went live with it April 1.

After the firm had its general ledger in place, it ran tests on the fixed-assets software and brought it up in September. The accounts payable software is slated to come up later.

Because the system is still in start-up mode, Spink said, Pfaudler has yet to realize all the benefits it expects from integrated financial software — mainly reduced data entry time and financial savings. The most wide-ranging benefit to date is that the system provides a "20th-century type of technology vs. something I think was really ancient," he said.

Pfaudler is currently using the software's analysis and reporting features, for example, to help plan its budget. The firm monitors financial activity for a given period and extrapolates it to a full year. It compares its forecasts with its actual performance, its budgets with its actual performance and its budgets with its forecasts. "We certainly wanted a lot more than a system that could add up debits and credits," Spink explained.

Pfaudler keeps 40,000 master file records on the general ledger for 24 operating entities within the firm, Spink said, and the system can generate separate profit and loss statements and balance sheets for each. Such reports are generated on demand by accountants.

Both the general ledger and the fixed assets software are Millenium series products, which provide an online, real-time environment, Spink said.

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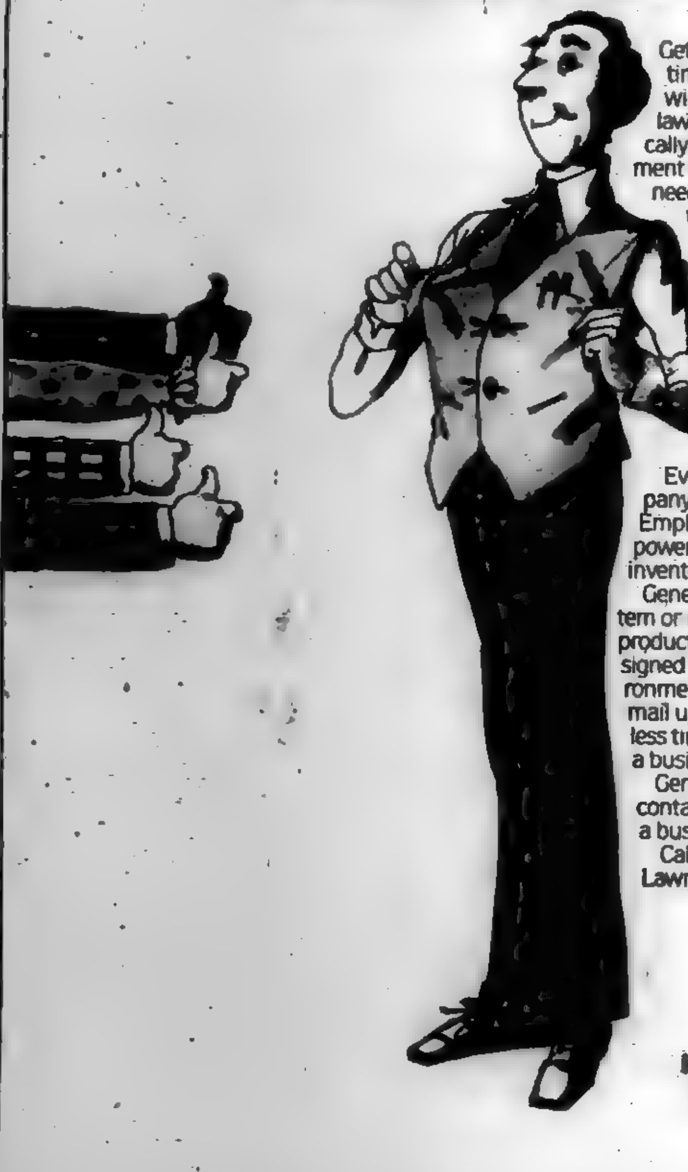

Options exist to deal with aging applications system

Choosing to replace or redevelop may provide cost-effective solution for firms

By Girish Parikh
Special to CW

The cost of maintaining aging applications systems is a nightmare for many companies. Such systems often predate the introduction of structured programming techniques and are often poorly documented. It is estimated that companies spend as much as half of their DP budgets, and from 50% to 75% of their programmers' time, on the maintenance of existing systems.

One approach to reducing the high cost of maintenance is to replace an old system with an off-the-shelf package. Another is to redevelop it. First, let us see why we should consider replacing an old system.

In addition to reducing maintenance costs, replacement of an old system can ease the migration to state-of-the-art hardware configurations and software technologies, such as fourth-generation languages and data base management systems, and produce a more responsive and modifiable system.

Cost-effective replacement

When can the replacement be cost-effective? There is no simple, generalized answer, but there are some suggestions.

To get an idea of how much software is involved, prepare an inventory of in-house applications systems. The list should include the name of the system; the name, brief description, programming language used and length of each program in the system.

If you are not already collecting program and system maintenance data, a simple maintenance log can be set up. It should include the name of the program, a change control number, a brief description of the change, the name of the programmer who worked on it and the estimated and actual time and other resources spent for the change.

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> *Do not forget to keep in mind the intangible benefits of new systems, such as increased user satisfaction and better response to customers. New systems will also help reduce programmer turnover.*

The cost of proposed changes can be determined based on prior changes. The costing function can even be automated. Such data may help identify what programs cost the most to maintain. System maintenance costs can also be worked out by determining the total cost of program maintenance within a system.

Select the systems with high maintenance and project costs over five years. How much would they cost to replace with packages or to redevelop and maintain thereafter? If you outline the requirements of the new systems, you can find out if suitable off-the-shelf packages are available or if the systems will have to be redeveloped and then project the costs and benefits.

Any experience with installed packages and in-house development of similar systems can help in a preliminary cost/benefit study. Do not forget to keep in mind the intangible benefits of new systems, such as increased user satisfaction and better response to customers. New systems will also help reduce programmer turnover.

What issues should you consider when replacing an old system? First, search for packages that will meet most of your requirements and will run on your hardware configuration. In selecting a package, consider the ease and cost of installation and conversion, the vendor's reputation and support, the need for customizing the package and the documentation and maintenance costs. Also talk with some users.

If you decide to redevelop an existing system, estimate the costs, resources and time needed for this work.

Redevelopment usually involves high risk. If appropriate, you may consider redeveloping the system in phases.

Fortunately, there are some alternatives available to defer total replacement and reduce maintenance costs.

Identify worst code

One alternative is the so-called 80/20 rule first observed by Gerald M. Weinbert. He found that 80% of maintenance problems were found in 20% of the code. The percentages may vary, but the majority of problems are found in the minority of code. By identifying the worst code and redesigning or documenting it, you can substantially reduce maintenance costs.

Program maintenance logs described earlier can help identify the worst code.

Also consider improvements in the system such as converting front-end data entry from batch to on-line. The code can also be improved. Automated packages or services are available for renovating old systems. Several preprocessors are available for reformatting Cobol code to improve readability.

Automated documentation packages for Cobol, such as Scan/370 from Group Operations, Inc., are also available for documenting programs. Study a good software tools directory for other packages.

Automated restructuring

Another option is automated restructuring of programs. One vendor is the Catalyst Group of Peat, Marwick, Mitchell & Co., which provides service for automated restructuring of Cobol programs.

Superstructure from Group Operations is an example of a package that automatically restructures Cobol programs.

Prepare short-, medium- and long-term plans to deal with the high costs of software maintenance. Get management support for implementing the plans.

Involve users and DP staff in preparing and implementing the plans. And review the plans and progress periodically.

Parikh is a Chicago-based consultant, lecturer and writer. His books include Techniques of Program and System Maintenance *and* Tutorial on Software Maintenance *(with Nicholas Zvegintsov, published by the Institute of Electrical and Electronics Engineers, Inc. Computer Society).*

Forming rapport with vendor key to units' maintenance

By Linda Lancaster
Special to CW

What user of electronic equipment would not agree that service is essential to the proper maintenance and upkeep of electronic hardware? But how many would agree that the same holds true for their software? With the cost of servicing and maintaining the average software package approaching a hefty 85% of its total cost over time, today's wise user should be thoroughly educated in the ins and outs of available service programs and options.

Admittedly, there is an array of services available, and each user's needs are unique, but a general rule of thumb when purchasing any software package is to look for vendors that offer a full range of services and support.

This is true even if you have no intention of ever using every program or service they offer.

Only vendors who maintain a fully developed support staff and good resources will be committed to providing the kind of service you may need. Software manufacturers should offer all of the following services:

- Phone support. A toll-free number attended during business hours by specialists who can respond quickly and effectively to users' questions.
- Update service. An automatic distribution service that appears at regular intervals and keeps the user abreast of all modifications and revisions to the software package.
- On-site service. An important feature provided by manufacturers who support a broad range of services. This option allows trained specialists to isolate and identify software problems on-site. Although most difficulties can be resolved through phone assistance, on-site service provides additional backup in unusual situations.

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> *Because software is in constant development, form an ongoing relationship with your software vendor. Assess that relationship at purchase and determine if it will wear well with time.*

- On-line service. Essentially an on-line library maintained and frequently updated by the software vendor, on-line service should provide software enhancements, trouble-shooting tips and new products.

On-line services also allow fellow users to share information about the software they are using. By keeping the software user up-to-date on new developments, a properly maintained on-line service can maximize the productivity of a package.

- Remote assistance. The newest development in software service and maintenance, remote assistance lets your software vendor access and correct software problems via a communications device.

Before choosing such a service option, however, the user should analyze his security requirements very carefully. Because remote assistance allows the software vendor to access your computer system and possibly your data as well, be certain that you retain absolute control over how and when the service party gains access for maintenance.

The customer should have the option to observe and terminate the service operation. By minimizing downtime for your software vendor to service your software, remote assistance keeps your software operating at its highest level of efficiency.

Because software is not static but rather a product in constant development, you will need to develop an ongoing relationship with your software vendor. The wary software buyer should assess that relationship at the time of purchase and determine if it will wear well with time.

If a software manufacturer is willing to sit down with you and draw up a service plan that fits your needs, you are on your way to developing the kind of relationship that will maintain your software at peak productivity over its lifetime.

Lancaster is manager of software services for Data General Field Engineering, a designer and developer of computers and software based in Westboro, Mass.

Lessen the trauma of software selection — plan ahead

By Constance A. Knapp
Special to CW

Some simple planning can make the application software selection process easier and more effective. First of all, a project leader must be selected. This person can either be from systems or the user department; technical expertise is unimportant. The project leader must be able to manage both the project and the project team.

Once a leader is chosen, an interdepartmental, two- to 10-person task force should be established, including a representative from every department affected by the new system. This group must meet regularly, establish a schedule and work together to complete the tasks.

Once this has been done, these steps can be followed:

■ Determine exactly what the system must do. Separate the need-to-have features from the ones that would be nice to have. Feature by feature, be as specific as possible.

If there isn't time and/or staff to write a formal requirements document, then at least create a chart with the features you must have down the side, leaving room for the vendors you will be considering along the top. Agreement on what the system must do to satisfy minimum requirements must be reached now, along with whether or not modifications will be made.

As much as possible, systems should be installed without modifications. Not only will the system take longer to install, but any maintenance agreement and warranty will not cover modifications unless the vendor does them for you. Most vendors aren't interested in custom-coding system changes. A plain vanilla system is to everyone's advantage.

■ Select a vendor with a proven track record and an active users group. The users group is your forum for enhancements, changes and so on, as well as a resource of system expertise. Use published materials listing software vendors by application. Next, choose three or four companies for your initial calls. Each one should be willing to spend half a day with the project team, explaining the system features.

At the end of this first visit, the vendor should leave a list of user contacts, a contract and a full set of documentation (you may have to sign a nondisclosure agreement). The contract should go to your legal department when and if you decide to purchase from this vendor.

This allows lead time for legal review and revisions, ensuring that the contract will be ready when you are. The documentation should be reviewed by both systems and the user department. Unreadable documentation is unacceptable, no matter how good the system seems to be.

Following each presentation, the project team should determine if the vendor's product should be considered further. The result of this review may be the realization that prepackaged software is not for you. If no system can satisfy at least 80% of your requirements, you should reconsider. Either change the way you will use the system or develop a customized system.

This weeding out should leave one or two vendors. The sales representatives should now come back for a full day to explain how this system will work using your data. All remaining project team questions should be answered on this day.

■ Make a user visit without the sales representative. Users of the product not only can show you how features work but also can alert you to problems the sales representatives will gloss over. Ask how satisfied people are. If they are not satisfied, ask why.

The users you visit should be as much like you as possible in terms of volume, activity and even industry. In addition, telephone four or five users. Design a form for all visits and calls so that the same information is gathered. Questions regarding support, training and system reliability cannot be overlooked.

The project team is now ready to recommend a vendor, sign a contract and order a system. For those nonbelievers who complain that this is a time-consuming job, remember: There's never time to do it right; there's always time to do it over.

Knapp is a New York-based computer consultant specializing in the selection and installation of financial software.

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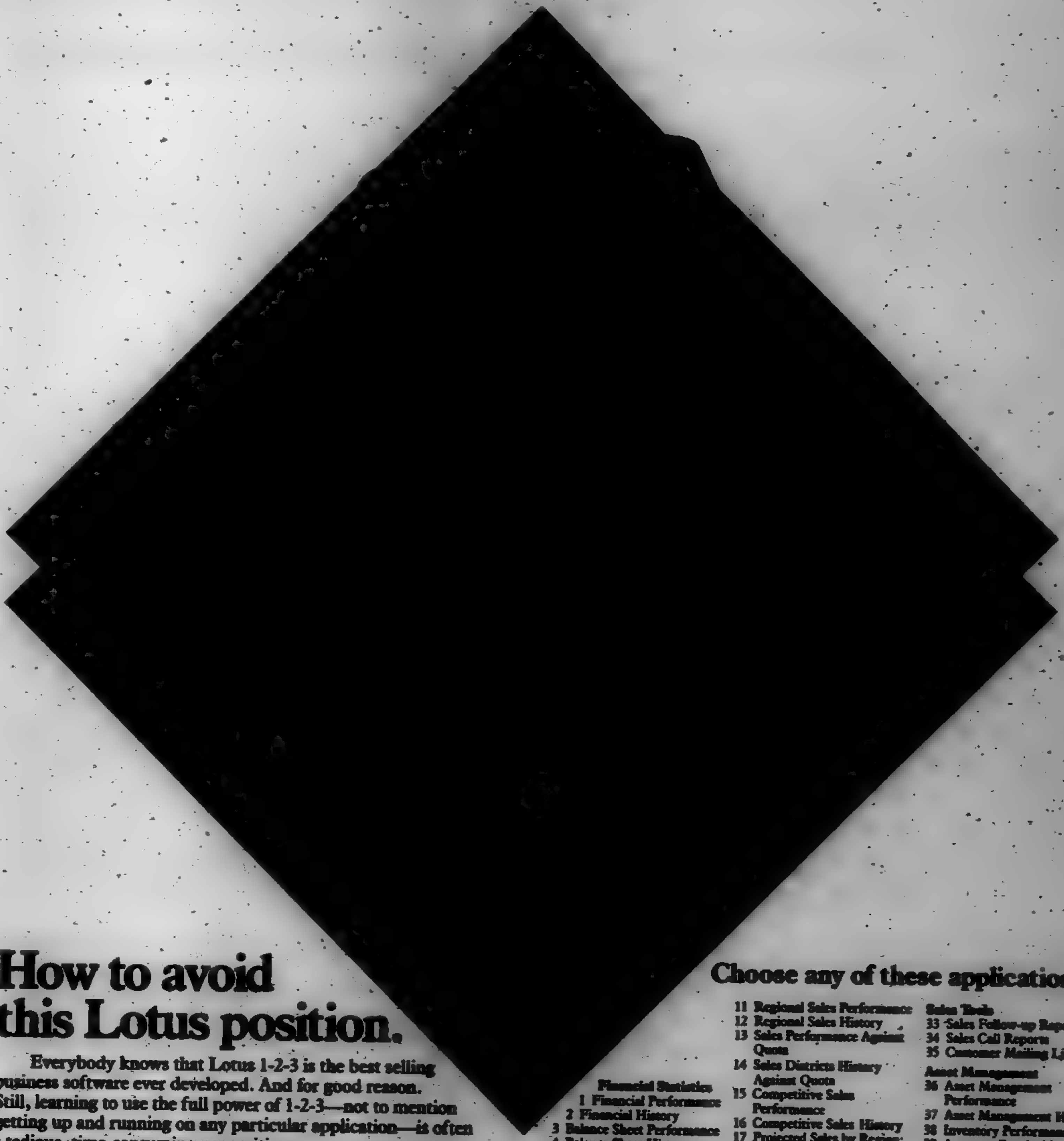

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15 Competitive Sales Performance
16 Competitive Sales History
17 Projected Sales by Region: Qtrly. & 5 Year
18 Price List
19 Competitive Sales Projections
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22 Department Budgets History
23 Breakdown of SG&A Expenses
24 History of SG&A Expenses
25 Consolidated Manpower & Expenses
26 Consolidated Manpower & Expense History
27 Projected SG&A Expenses
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33 Sales Follow-up Reports
34 Sales Call Reports
35 Customer Mailing List

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37 Asset Management History
38 Inventory Performance
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42 Cash Flow Projections
43 Capital Expenditures Analysis
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55 Personal Income Tax (Form 1040)
56 Asset Records for Insurance

Good impressions lead to addition of two packages

CLEVELAND — Familiarity with a software vendor and its system architecture was a driving force behind a Fortune 500 manufacturer's recent purchase of two accounting software packages.

MIDLAND ROSS

Midland-Ross Corp., an $850 million-per-year manufacturer of aerospace, electronic and electrical products, thermal systems and steel castings, decided early last year to buy general ledger and accounts payable systems from the same firm that supplied its fixed assets accounting software.

The firm's decision to buy two new packages from Data Design Associates, Inc., whose fixed assets system Midland-Ross has used since 1980, was based heavily on two criteria, according to Jeffrey Kenney, a corporate accountant for Midland-Ross.

"From our experience with the fixed asset system, we knew that Data Design's support was excellent," he said. "Also, we were impressed with that supplier's advanced system architecture, which facilitates flexibility within the system and permits us to custom-tailor the system to suit our needs."

Kenney served as project leader for the selection and installation of the general ledger and accounts payable systems. He said he took advantage of the vendor's support during the installation and continues to rely on Data Design's help. "There have been a few minor snags from time to time," he said, "but when they occur, I get on the phone, and the developer fixes the problem or tells us what to do."

Bandy Rhea, supervisor of systems and programming for the firm's corporate office, explained why the software's architecture was a second factor in the firm's choice of vendors. The software includes a data mapping file on which on-line screens are maintained, he said, and the setup allows the firm to customize screens without the need for program changes.

"As a result of data mapping," he said, "you don't have to change many lines of code to change the configuration or information on a screen. All you have to do is make minor changes to information kept on a card-image disk file."

Rhea said the decision to install three systems from the same software house was an additional advantage for Midland-Ross' data processing department. The architecture on which the packages are based uses common functional modules with similar commands for standard routines such as edit/update. Because of this, he said, "It will be relatively easy for our staff to make the transition from one package to another."

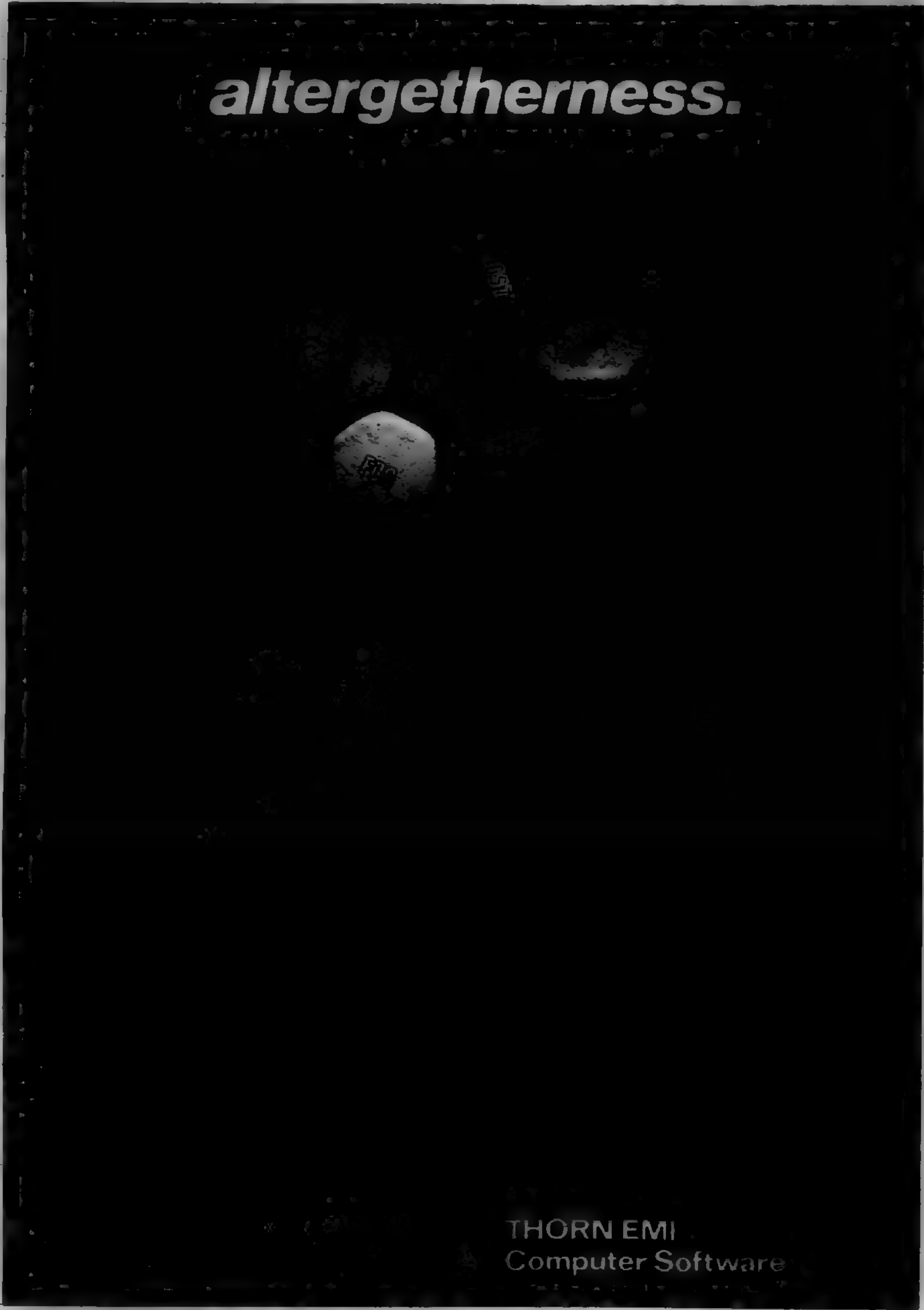
Midland-Ross installed the fixed assets accounting system in 1980 to handle the requirements of the federal government's accelerated cost recovery system, which was introduced that year.

According to Mike Atamanec, Midland-Ross' supervisor of property accounting, the system currently keeps track of approximately 38,000 assets. Those assets have a net book value of about $150 million, he said. The system gives the present depreciated value of each asset for accounting purposes. Depreciation is accrued for monthly statements.

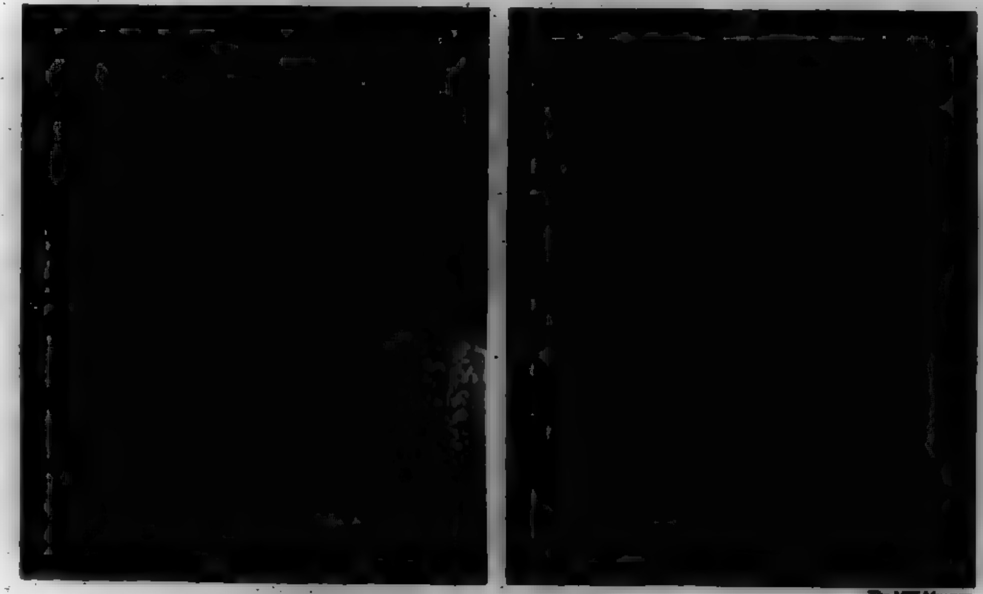
The general ledger system, installed this summer, is being used for corporate office statements and reporting, according to Kenney. He said applications may be expanded later and eventually may include preparation of consolidated financial statements for the entire company.

Midland-Ross installed the accounts payables package in the fall and has been running tests on it. Kenney said that after it goes live this month, it will be used to pay and keep track of payables incurred by the corporate of-

See ROSS SR/32



Oddly enough, most offices are better equipped for the future than the people who will create it.



The MIT Museum

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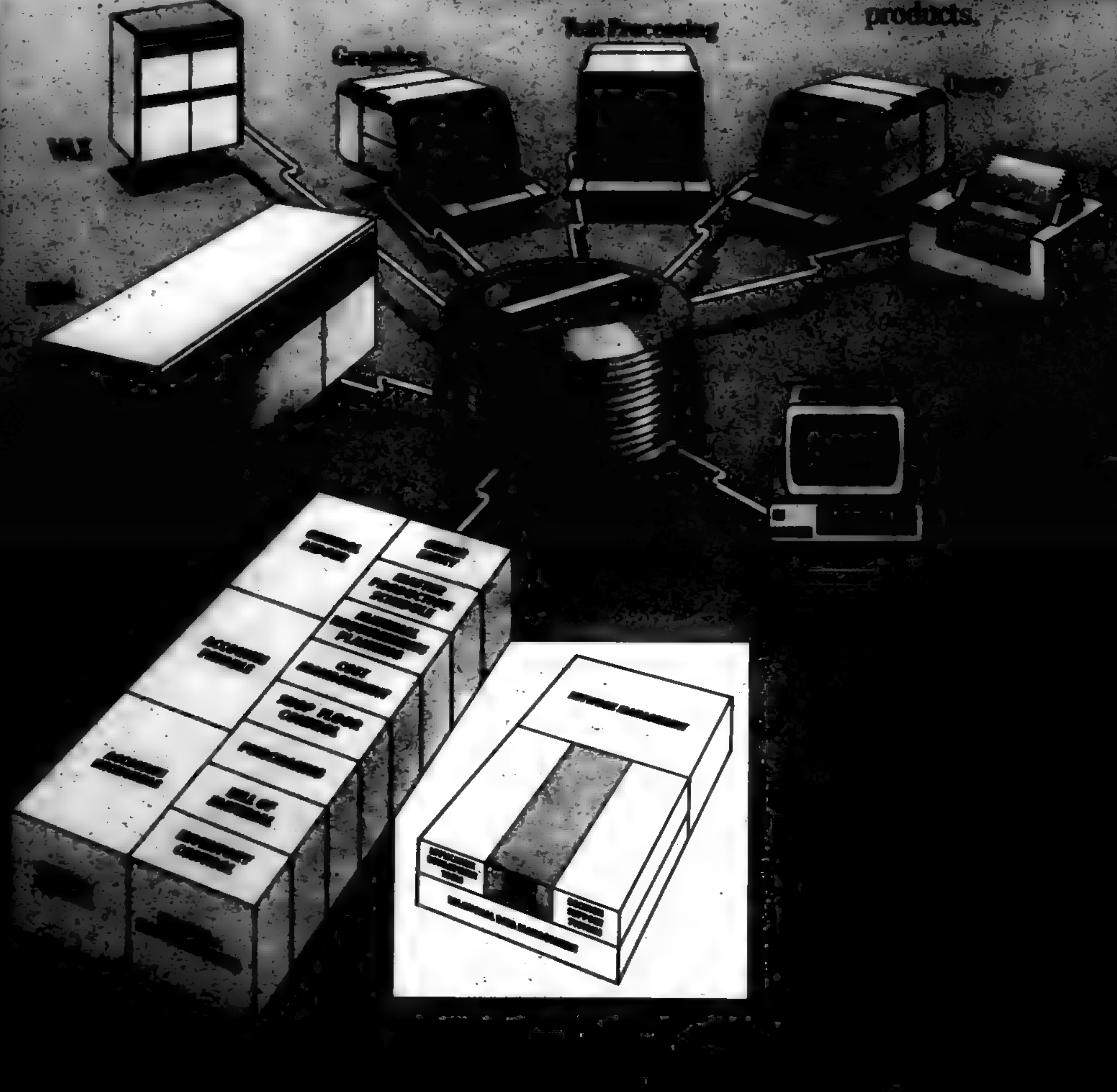

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Special Report

Cost-management software criteria key to federal bids

By Jim Maher
Special to CW

> *Cost-management applications software must help a manager structure projects with an emphasis on the most up-to-date form of status reporting.*

With the growing number of U.S. Department of Defense and Department of Energy (DOE) projects, more companies are bidding for government contracts. To be successful in the competition for government-funded work, companies have had to implement quickly cost-management applications software and systems that meet government requirements and standards for reporting project progress and spending patterns.

Because the U.S. government is currently funding so many large projects and programs, companies have had to change the way that they perform cost management. Now more than ever, companies are bound by the strict requirements contained in the Cost Schedule Control System Criteria (CSCSC) issued by both the DOD and the DOE.

The CSCSC is a set of government specifications for cost reporting standards and requirements to which contractors and subcontractors working on DOD or DOE projects must strictly adhere. Although there are many government requirements for cost and schedule reporting, the CSCSC is considered to be the most comprehensive and stringent of them all.

Current cost-management applications software must help a manager structure projects with an emphasis on the most up-to-date form of status reporting. Benefits of this software include:

- Improved communications and closer client-contractor relationships.
- Increased ability to define, trace and understand problems by objective variance reporting.
- Measurable and more visible project performance.

See COST SR/32

Maher is manager of applications development for Metier Management Systems, a Houston developer of project management systems.

Which system should be used for software?

Much confusion exists among prospective buyers of cost applications software relating to the most appropriate hardware processing environment. In most cases, the determinant for running on micro, mini or mainframe is simply volume. However, there are other factors that do come into play.

■ Mainframe. Mainframes can handle the largest volumes of data within the shortest processing time. Storage of information can be centralized providing the [illegible]

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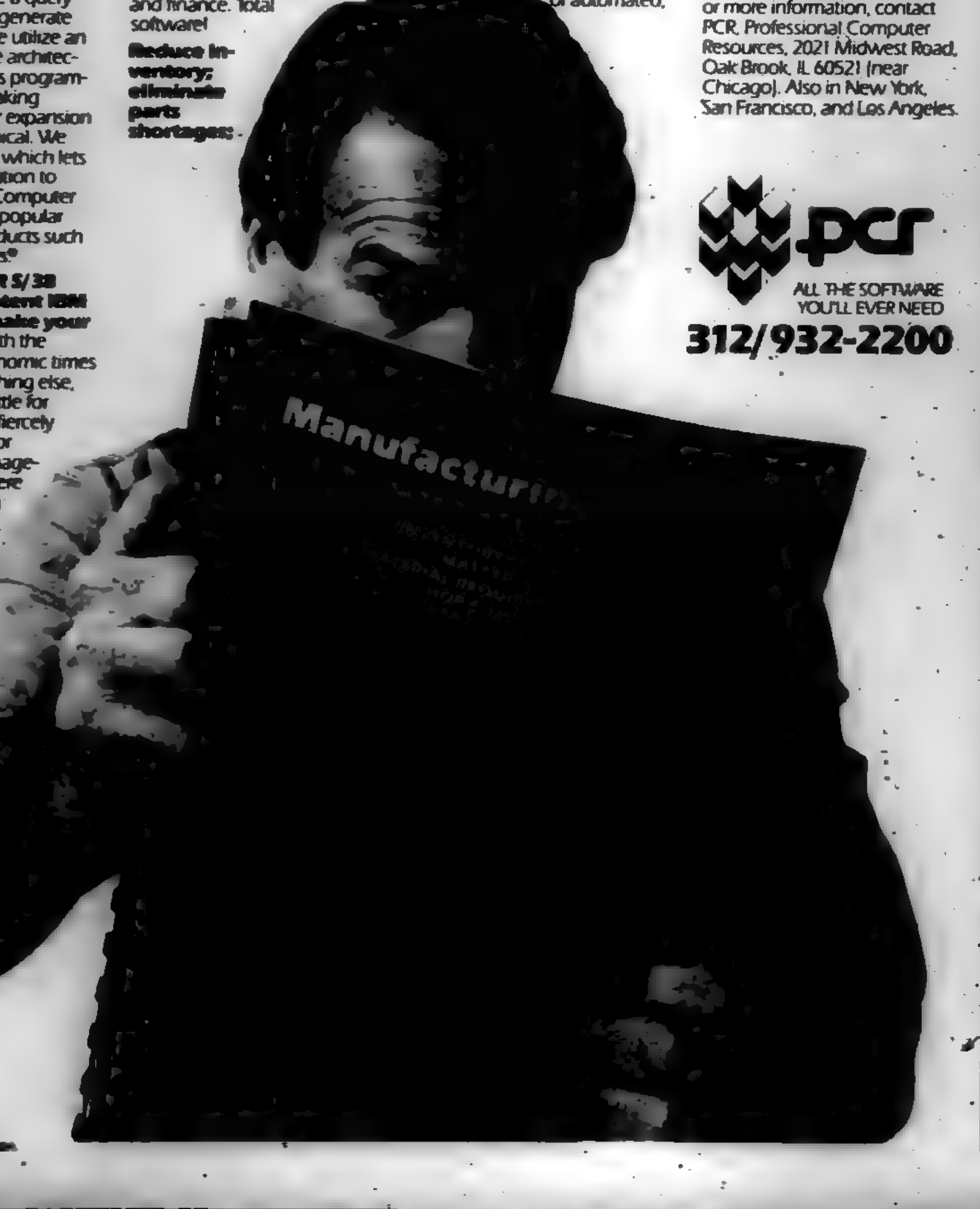

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Special Report

Applications package halves processing time for truck

TULSA, Okla. — A firm here that builds trucks and containers to haul anything from garbage to cows got a lift from a mainframe software package that cuts the time the company spends preparing its payroll in half.

Crane Carrier Co. builds garbage trucks with cylindrical rather than square backs because they can carry more trash; it recently designed a cattle car that stores food and water so that cows en route to slaughter houses do not lose weight when they get laid over at freight yards.

The company also owns and operates a nationwide network of 23 parts depots, which sell engines, transmissions and other parts to companies like Mack Trucks, Inc.

> ”
>
> *'We projected significant growth, so it was a good time to make the change.'*
>
> — Ken Martin
> Crane Carrier Co.

In the mid-1970s, Crane decided to produce specialized vehicles in addition to its customary stock — cement mixers and other trucks for construction jobs. Besides sanitation trucks and cattle cars, the firm manufactures vehicles that function as mobile oil and gas rigs, which customers can drive on-site to service their wells.

Diversification brought success, and by 1982 the company's growth prompted a system upgrade and a search for some application packages. "We projected significant growth, so it was a good time to make the change," said Ken Martin, Crane's MIS director.

Crane installed an 8M-byte IBM 4341 to supplement and eventually replace a Sperry Corp. 9080. The firm also purchased accounts payable, general ledger and payroll software packages from Management Science America, Inc. (MSA) to run on the IBM machine. It brought up those packages one at a time, finishing with the payroll, which went on-line in November 1983. MSA's Payroll System replaced a home-grown batch processing system that ran on the Sperry Univac.

For its 1,000 employees in its manufacturing plant here and depots throughout the country, Crane runs five separate payrolls:

- An executive payroll, run twice a month.
- A payroll for other salaried employees, run twice a month.
- A payroll for office workers, who are paid hourly wages, which is run every week.
- A payroll for workers in the plant, who are paid hourly, which is run every week.
- A payroll for drivers, who deliver parts and equipment where they are needed, which is run twice a week.

With the MSA software, Crane wraps up its payroll cycle, which includes entering data and producing and distributing checks, in 2½ days, according to Barbara Brannan, the firm's payroll supervisor. Under the batch system, she said, the cycle consumed about four days' work.

Payroll keys in data

Employees in the payroll department key information from workers' time cards and other documents into the system using an IBM 3278 terminal. When they are finished, they run a program that flags unusual entries with error or warning messages and shows whether the payroll information is in balance. "If there's an error, we stop running the program and get a validate listing that identifies the problem," Brannan said.

Before she authorizes the firm's data processing department to process the payroll and print employees' paychecks, Brannan corrects all the errors, checks the warnings, correcting information if necessary, and makes sure everything is in balance.

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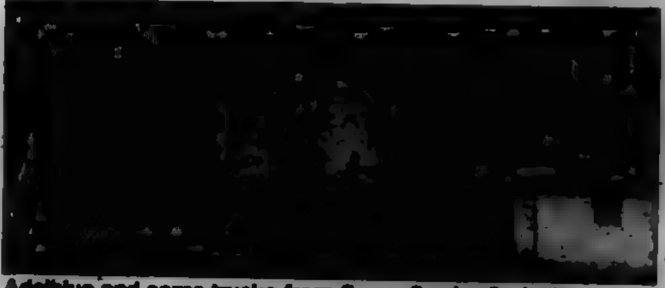
firm's five-part payroll system



Adelblue and some trucks from Crane Carrier Co.'s line.

Brannan explained that the checks and balances provide accuracy, which is essential to payroll processing. "You're dealing with people's income, so it better be right," she said. Employees from the manufacturing plant, for example, have called the payroll department to complain when their paychecks have been off by as little as one cent.

MSA also provides Crane with tax bulletins, which keep the payroll department abreast of tax changes as they occur.

According to Jim Adelblue, a systems analyst at the firm, the updates replace a sometimes lax system that depended on local parts depots to report state tax changes to the company's central office. Local tax agencies provided the depots with information on tax changes, he said. But "the depot might or might not make the necessary changes, occassionally resulting in a lack of compliance."

The payroll department now receives information on any tax changes directly from MSA. If the updates take up less than 50 lines of code, they are sent on paper and keyed into the system, Adelblue said. If they are larger than that, MSA sends a tape that Crane runs to update its system.

The software package also provides Crane with automatic and on-demand payroll reports. Whenever a payroll is processed, the system generates reports that list deductions that are made for state unemployment and other programs, summaries that show total state and federal tax deductions, registers that record the entire payroll and other reports.

> 'You're dealing with people's income, so it better be right.'
>
> — Barbara Brannan
> Crane Carrier Co.

End of fiscal period

At the end of each month or quarter, Brannan keys in a code that signals the end of a fiscal period, and the system produces reports that Crane sends to state and federal tax authorities.

The payroll department also uses a feature called the Special Report Generator to put together reports by different variables, Brannan said. If the firm's managers request a list of all employees in chronological order by the date they were hired, Brannan's staff requests the variables, and the system generates the list.

Adelblue said the reporting tool and other features of the payroll system are easy to use. Any employee from the payroll department can do his own work without help from DP, he said. "All you have to teach him to do is use the terminal."

Planned additions

Crane plans to install an IBM Personal Computer in the payroll department this year to supplement the 3278 terminal, Adelblue said.

The firm plans to give the Personal Computer access to the mainframe through a Digital Communications Associates, Inc. Irma board and MSA's Peachlink software.

An interface to tie the payroll software with Crane's general ledger package and an on-line real-time module for the payroll software will be installed in the first quarter of this year.

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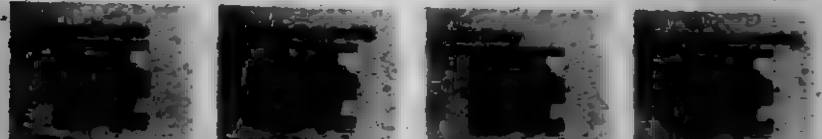

like the PC/XT. It lets you store them, permanently, inside your machine. Very handy. Here's another tip. IBM's new Personal Decision Series (for spreadsheets, writing, graphing, etc.) can take information directly from BMS. Very, very handy. And ask about IBM Extended Support, a way to get software updates and telephone assistance, direct from IBM.

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COST from SR/28

■ Increased management confidence in project information.

■ The ability to show the impact of problems such as cost and schedule deviations in dollars.

■ Accurate historical data for future project proposals.

■ The ability to forecast future cost performance based on current trends.

Wide array of packages

The company needing cost-application software must choose from a wide array of packages. Many cost-management systems use a series of interrelated application modules, and the buyer's choice becomes even more difficult when the various modules of each package are evaluated.

A recent survey distributed to users of project-management systems determined which application modules were considered to be most essential to their corporate needs. They are as follows:

■ **Organization.** This module should define the project in terms of cost accounts and cost elements using work breakdown structures and the organization breakdown structures.

■ **Budget.** The budget module must establish a time spread for the resource expenditure plan for each work increment and maintain the project performance measurement baseline.

■ **Schedule status and earned value.** This module should provide true cost/schedule integration with earned-value calculations generated from the network schedule status. In addition it must provide stand-alone milestones at the task level for automatic calculations of earned value based on milestone completions.

■ **Cost collection.** Here the application must collect direct and indirect costs from the user's system or by the direct input of actual cost.

■ **Forecast.** The forecast module should update the current project status and future performance.

■ **Estimate to complete.** This module must update the current project status and estimate future performance requirements.

■ **Analysis.** This module analyzes the data in each of the modules and performs all the summaries necessary for production of the monthly or periodic reports.

Standard reports, cost graphics and documentation modules also ranked high on management's list of module preferences.

Cost-management application systems should be flexible enough to implement a variety of modules with minimal system adjustments. Application modules should be self-contained in nature and relate to specific areas of the whole system.

User gets what he pays for

The system on which a cost-management application operates is an extremely important consideration and the user usually gets what he pays for.

This feature should enable a system to hold all applications and information in one data base, thereby allowing direct access instead of interfaces to other applications, such as planning and scheduling, which are essential to project control. These applications should also be completely menu-driven to allow the user to begin entering data immediately.

Although menu-driven applications are desirable, the chance that the user would never want to restructure a format or create a specialized cost report are remote. To allow for such flexibility, a company would be well advised to choose a cost-management system written in a user-oriented project language, which also provides application source code for development of internal cost report formats.

Don't overlook training, documentation

Two additional elements that cannot be overlooked even with off-the-shelf software are training and documentation.

The reputable supplier will provide information on how to use an application and how the application should be applied to the individual organization.

There are perhaps 50 to 75 firms in the U.S. selling systems and off-the-shelf software applications for cost management. There are many firms that can provide you with a product in your specialization, but remember that a narrow scope may not fit into your organization's overall environment. Also, remember that the cost-management system chosen should be open-ended enough to accommodate the needs of a growing project.

The prospective buyer must know and understand the present and future needs of the company as a whole.

Choose three or four vendor firms that meet the organization's requirements. Investigate the vendor's history and client base thoroughly and request demonstrations. Feel comfortable that the vendor has knowledgeable people to support your acquisition after the sale.

ROSS from SR/24

fice and to maintain detailed accounts payable and vendor histories.

The three packages run on the firm's 2M-byte IBM 4331. Each includes Data Design's spreadsheet report writer component called DD-Star that Rhea said users find particularly helpful. "You can make any kind of report you want, utilizing different formats for income statements and balance sheets for various divisions or business units of the company," he said.

According to Kenney, the firm's users needed such a report writer for their work, and its inclusion in the Data Design software was a factor in Midland-Ross' choice of vendors.

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COMMUNICATIONS

Products extend IBM cable length

Channelnet's Channelmax, Syslink boost channel length from 400 feet to 3.4 miles

NORWALK, Conn. — Channelnet Corp., a subsidiary of Data Switch Corp., recently announced two products that can be used to extend the reach of the block-multiplexed channels of IBM processors.

IBM's Bus and Tag cables, used to interface processors, disk controllers and other peripherals to one of typically 16 channels on a mainframe, cannot exceed 200 feet in length, Channelnet reported. When IBM's 3088 Multisystem Channel Communications (MCC) unit is used, that distance can be extended to 400 feet.

With Channelnet's Syslink and Channelmax products, IBM's Bus and Tag cables are replaced with fiber optics, extending the reach of IBM's block-multiplexed channels to 3.4 miles at full channel speeds. This enables processors and disk systems to be located where best suited — instead of within the previously mandated 400-ft range — and provides for applications such as high-speed file transfers that would otherwise tie up front-end communications processors.

Syslink components

Syslink is said to comprise an IBM channel interface, a microprocessor that executes and controls channel commands and diagnostic functions and a fiber-optic interface that serializes IBM parallel data, encodes it for transmission and transmits it onto the optical fiber.

Channelmax Model 1400 integrates the basic Syslink functions into an intelligent switch that is said to provide backup, recovery and data path monitoring and enables control of local and remote computers through a central command console. The smallest Channelmax switch has two input mainframe channels and four output channels, and the largest has 16 input channels and 24 output channels.

The operation of both products is said to be transparent to IBM applications that support IBM's Channel-to-Channel Adapter or the IBM 3088 MCC. Their use does not require extra memory, extra processor cycles or special applications software modifications, the company reported.

Syslink speed key to transparency

The key to this transparency is said to be the speed of the Syslink. It maintains IBM processor channel throughput speeds of 1.5M or 3M byte/sec, the equivalent of up to 27M bit/sec. To achieve these speeds, the fiber-optic link is driven at 44.74M bit/sec, which is the T3/DS North American digital telephony standard.

An integrated systems controller is said to provide both products with centralized channel management, control that can be extended to up to 16 channels on a CPU. The systems controller monitors the channels, logs disk storage errors and displays critical status alerts. An optional channel analyzer and trace unit can be added that will sample Bus and Tag signals at 10 million times per second. These events are time-stamped and stored on the disk of an IBM Personal Computer for analysis.

Robert G. Gilbertson, president and chief executive officer of Channelnet, said that if IBM increases the maximum speed of its Bus and Tag channels to 6M byte/sec, a rumored development, the Syslink and Channelmax products would be upgraded.

Available now, Syslink costs $50,000 for a pair of adapters and a controller. The two-by-four Channelmax with one Syslink pair starts at $115,000 and goes up to $475,000 for a 16- by 24-port model.

Channelnet is located at 3530 Boston Post Road, Southport, Conn., 06490.

Rolm releases four-channel Phonemail voice message unit

SANTA CLARA, Calif. — Rolm Corp. last week announced a four-channel version of its Phonemail voice messaging system aimed at small organizations with 40 to 80 users.

The entry-level system, offering seven hours of voice storage on an internal 164M-byte Winchester disk drive, can be upgraded to Rolm's eight-channel, 300-user Phonemail system or to the top-of-the-line, 16-channel, 1,000-user system, both of which are being marketed to large organizations.

According to Rolm, the minicomputer-based Phonemail system was designed for integration with its line of private branch exchanges (PBX), connected to Rolm's CBX over a direct digital link through a line card set in the switch. This provides features not available with nonintegrated systems, such as automatic call forwarding to the user's mailbox after a predetermined number of station rings.

Rolm claims this feature encourages the use of voice messaging systems by a factor of three because, among other things, the user is not required to know the mailbox number of the person he is trying to reach.

Voice messages

The system stores and forwards voice messages and is said to feature telephone answering with a personal greeting, the ability for callers to return to the operator by pushing "0," and integration with the CBX telephony features. System users reportedly can retrieve messages through any touch-type telephone, save or delete messages, hear and annotate messages during a single telephone call and skip ahead to other waiting messages.

Message waiting notification is achieved with standard analog phones by giving the user a broken dial tone when he places a call. Rolm's proprietary phones have a visual message identification light.

The four-channel messaging system was designed for use with Rolm's smallest PBX, the CBX VS. It cannot be "cleanly" integrated with other Rolm Phonemail systems, a Rolm spokesman

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■ Dataflow Systems of California, Inc. has introduced an implementation of the XModem file transfer protocol for Hewlett-Packard Co.'s HP 3000/56

■ Pathway Design, Inc. has introduced a series of IBM Systems Network Architecture and bisynchronous gateways/57

INSIDE

Software/56
Multiplexers/Modems/56
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IBM mini-based net out from Systar

SAN JOSE, Calif. — Systar Corp. has announced a networking scheme based on IBM Series/1 minicomputers that are used as X.25 packet-switching network nodes, each capable of supporting up to 15 host computers and 100 virtual circuits.

The Sonnet-Series/1 Nodal Network targets companies desiring to build their own corporate backbone networks. Each Series/1 node is designed to provide packet assembly/disassembly functions, translating data from incompatible sources into a common X.25 transmission protocol and back into a receiving protocol following transmission.

The nodes are also said to perform routing and transport functions and dynamic alternate routing in the event of line or node failure or in network reconfiguration.

Systar said that a network can include up to 945 nodes, with each node having up to four trunks for internodal packet switching.

For local network ring configurations Sonnet reportedly supports speeds of 2M bit/sec. Communications between hosts to the network nodes can be up to 19.2K bit/sec, and internodal communications can be at speeds up to 56K bit/sec. Nodal reconfiguration can be accomplished on-line without system interruption, and network control and diagnostics processes are resident in each node, according to the vendor.

Sonnet is said to allow other Systar software products to coreside in the Series/1.

Systar is selling the hardware and software package as an IBM value-added remarketer.

The starting price for a basic node is $50,000.

Systar is located at 1762 Technology Drive, San Jose, Calif. 95110.

3Com releases multifunction server

MOUNTAIN VIEW, Calif. — The 3Com Corp. has introduced a network server designed to allow personal computers connected to 3Com's Etherseries local-area network to run multiuser network applications, share peripherals and go off the network.

The 3Server contains a 36M-byte hard disk that can be shared by up to 50 network users in non-disk-intensive applications such as electronic mail. It also enables the sharing of certain network applications, such as spreadsheets and access to networked data base and accounting systems.

Additionally, the 3Server can support up to six other disks, provide a gateway to wide-area networks and double as a print server and tape backup server.

Network-based applications supported include transaction-intensive multiuser data base and accounting systems, such as Aston-Tate's multiuser Dbase II, Software Connections, Inc.'s LAN:Datastore and Business Library Corp. and Open Systems, Inc. accounting packages. About five users can be supported in these types of applications, 3Com said.

Peripherals that can be shared through 3Server include the Hewlett-Packard Co. HP Laserjet laser printer, a 60M-byte tape backup unit and up to 250M bytes of external disk storage.

Other than the 36M-byte fixed disk, the server includes an Intel Corp. 80186 chip, an 82586 Ethernet controller and 512K-byte disk cache memory.

The suggested retail price for 3Server is $7,495. Add-on 36M-byte disk drives cost $3,995. A 60M-byte tape backup costs $2,995, and an add-on 384M-byte memory option costs $995. Also, Ethershare software for shared-disk capability costs $695.

Etherprint software for sharing printing resources costs $395, and the Ethermail electronic mail software costs $995.

More information is available from 3Com through P.O. Box 7390, 1365 Shorebird Way, Mountain View, Calif. 94039.

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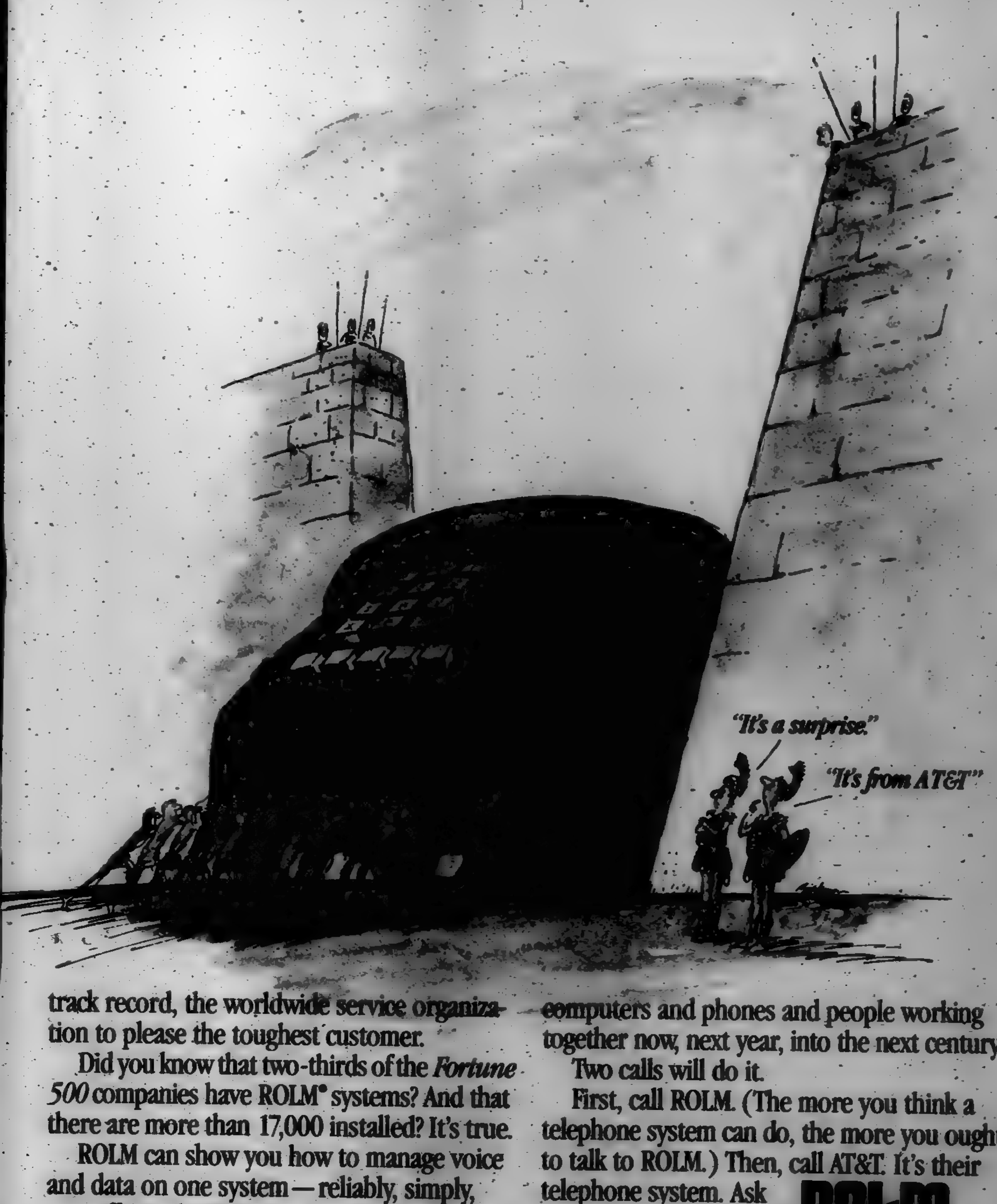

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4900 Old Ironsides Drive, M/S 626, Santa Clara, CA 95054 • 800-538-8154. (In Alaska, California and Hawaii, call 408-986-3025.)

Local Data unwraps Datalynx 3274 enhancement

TORRANCE, Calif. — Local Data, Inc. has announced a version of its Datalynx 3274 protocol converter software that features IBM Systems Network Architecture (SNA) 25th status line using IBM 3278 symbols, large-screen IBM 3278 Model 5 emulation and base or four-color terminals.

The Datalynx 3274 3.31A software is said to allow use of IBM 3278-type symbols on terminals such as the Applied Digital Data Systems, Inc. (Adds) Viewpoint/78; Lear Siegler, Inc. 1178; Esprit Systems, Inc. 10/78; and Beehive International, Inc. DM78.

The SNA 25th status line reportedly offers alpha substitution characters on other terminals. The vendor said three-digit error and status codes of an IBM 3274 controller are emulated to assist in network management.

The product supports large-screen 3278 Model 5 emulation on Digital Equipment Corp. VT100 and Data General Corp. 450 terminals and IBM 3278 Model 3 and 3278 Model 4 emulation on most terminals with 24-line by 80-char. screens, Local Data said.

The new version of Datalynx 3274 reportedly features optional echo suppression for computer-to-computer and X.25 applications. It also supports base or four-color terminals such as the Adds Viewpoint/79 and Viewpoint/60 and the IBM Personal Computer, Personal Computer AT, Personal Computer XT and PCjr, according to the vendor.

Datalynx 3274 is available in three-, five-, seven- and nine-port configurations and costs from $3,000 to $6,000, depending on the model and number of ports.

Local Data is located at 2771 Toledo St., Torrance, Calif. 90503.

AT&T offers T1.5 users circuit boost

BASKING RIDGE, N.J. — AT&T Communications has announced a service function that will enable its Accunet T1.5 Service customers to increase the capacity of their circuits from 24 channels to 44 voice-grade channels.

M-44 Multiplexing uses a technique called bit compression. The service compresses the 64K bit/sec data stream normally required for voice channels into 32K bit/sec voice channel streams without any substantial loss of quality.

M-44 Multiplexing comes in two configurations — between two AT&T central offices or between an AT&T central office and a customer's location. In the latter configuration, the customer must provide a compatible device called a low bit-rate voice unit at his location. This unit must meet the technical specifications of AT&T Communications Technical Publication 54070 (February 1984).

The price of M-44 Multiplexing is $500/mo for each use of the service function.

AT&T Communications is located in Basking Ridge, N.J. 07920.

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How to be in 16 places

COMMUNICATIONS

SOFTWARE

DATAFLOW SYSTEMS OF CALIFORNIA, INC.
XLink/3000

Dataflow Systems of California, Inc. has introduced an implementation of the XModem file transfer protocol for Hewlett-Packard Co.'s HP 3000 superminis and minis.

XLink/3000 is said to allow users to exchange text, data and files among HP 3000s and most personal computers. It costs $250 per single system license.

Dataflow Systems of California, 2465 E. Bayshore, Palo Alto, Calif. 94303.

MULTIPLEXERS/ MODEMS

CARROLL TOUCH CORP.
BI-Link and Q-Link

Carroll Touch Corp. has announced two statistical multiplexers supporting asynchronous/synchronous protocols on the same line and supporting 7- or 8-bit protocols.

The two-port BI-Link and four-port Q-Link reportedly allow either two or four terminals, respectively, to share one telephone line and a pair of modems. They were designed for full-duplex applications with leased or dial-modems and reportedly support the X.21 interface standard.

They are said to feature intelligent flow control that is switch-selectable on the terminal ports and can be set to X-on/X-off or CTS/Busy with busy high or low.

BI-Link features an aggregate data rate of up to 19.2K bit/sec, and Q-Link has a rate of up to 28.8K bit/sec.

BI-Link costs $750, and Q-Link costs $1,195.

Carroll Touch, P.O. Box 1309, Round Rock, Texas 78680.

TYMSHARE
Tymnet Models 931 and 932

Tymshare, now part of McDonnell Douglas Corp.'s Information Systems Group, has announced two modems designed for 2,400 bit/sec and 1,200 bit/sec asynchronous dial-up transmissions.

The Tymnet Models 931 and 932 reportedly can be used to implement Tymnet's 2,400 bit/sec out-dial service. The 932 is said to be auto-dial, enabling a host computer to connect to the Tymnet public data network and download data without an operator present.

Both modems are said to be V.22bis-compatible and to operate over ordinary dial-up lines at 2,400 bit/sec full-duplex in synchronous and asynchronous modes. They also have an automatic 1,200 bit/sec AT&T 212A-compatible fallback mode to accept data from 1,200 bit/sec or 2,400 bit/sec modems. The 931 costs $845 and the 932 costs $995.

Tymshare, 20705 Valley Green Drive, Cupertino, Calif. 95014.

BACKUS DATA SYSTEMS, INC.
Linemux

Backus Data Systems, Inc. has introduced a five-channel, switching statistical multiplexer system that is said to concentrate up to five asynchronous Ascii terminal devices over a single synchronous data link.

Linemux reportedly features channel switching, identification and password security with automatic call-back, network control and management, error control and retransmission.

The switching capability permits terminal users to communicate with multiple computers or other resources to reduce the number of leased lines, computer ports and modems, according to the vendor. Linemux costs $1,545 per multiplexer, with one Linemux required at each end of the leased line.

Backus Data Systems, 1440 Koll Circle, San Jose, Calif. 95112.

See MODEMS page 57

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COMMUNICATIONS

MODEM

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E + E DATACOMM
Modems

E + E Datacomm has released modems that are compatible with most Hayes Microcomputer Products, Inc. communications software.

The 300 bit/sec Avatex offers manual originate and manual answer modes, EIA RS-232 interface and is fully AT&T 103-compatible. The 600 bit/sec modem has low-speed and high-speed modes, is AT&T 103/113-compatible and has autoanswer and autodisconnect features. The 1,200 bit/sec modem is said to be AT&T 212A-compatible in high-speed mode and AT&T 103-compatible in low-speed mode. The modems cost $64.49 for 300 bit/sec; $99.99 for 600 bit/sec; and $299.99 for 1,200 bit/sec, the vendor said.

E + E Datacomm, 70 N. Second St., San Jose, Calif. 95112.

LOCAL-AREA NETWORKS

MICOM SYSTEMS, INC.
Instalink

Micom Systems, Inc. has announced a version of its Instalink voice/data multiplexing system, which allows users to piggyback data signals over telephone conversations.

The system includes desktop units that attach to a telephone and support a terminal at speeds up to 9,600 bit/sec and a Micom Model 4648T Central Chassis for separating voice and data signals. The Central Chassis can be connected to a computer with two copper twisted-pair wires supporting up to 128 full-duplex channels.

Instalink can be attached to Micom's Micro 600 Data private automatic branch exchange with a Micom Instatrunk480i T1 multiplexer.

A Model 4648T Central Chassis configured for 48 channels costs $3,500; the desktop Instalink multiplexers cost $250, $212.50 in quantities of 50; and Instatrunk480i sells for $1,500.

Micom Systems, 4100 Los Angeles Ave., Simi Valley, Calif. 93063.

ROLM

from page 51

said, meaning that some functions would be sacrificed in the attempt to tie two or more Phonemail systems together.

The spokesman would not comment on any future plans to integrate the voice messaging system with text or other messaging systems, a promised capability of AT&T's yet-to-be-shipped voice messaging system.

The cost of Phonemail is $45,000.

Rolm is located at 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.

PATHWAY DESIGN, INC.
Netpath

Pathway Design, Inc. has introduced a series of IBM Systems Network Architecture and bisynchronous gateways designed to provide multiple personal computers with communications to IBM hosts.

Netpath reportedly resides on a local-area network gateway, permitting 32 concurrent host communication sessions through value-added emulation of IBM 3270, 3770 and 2780/3780 controllers and attached devices.

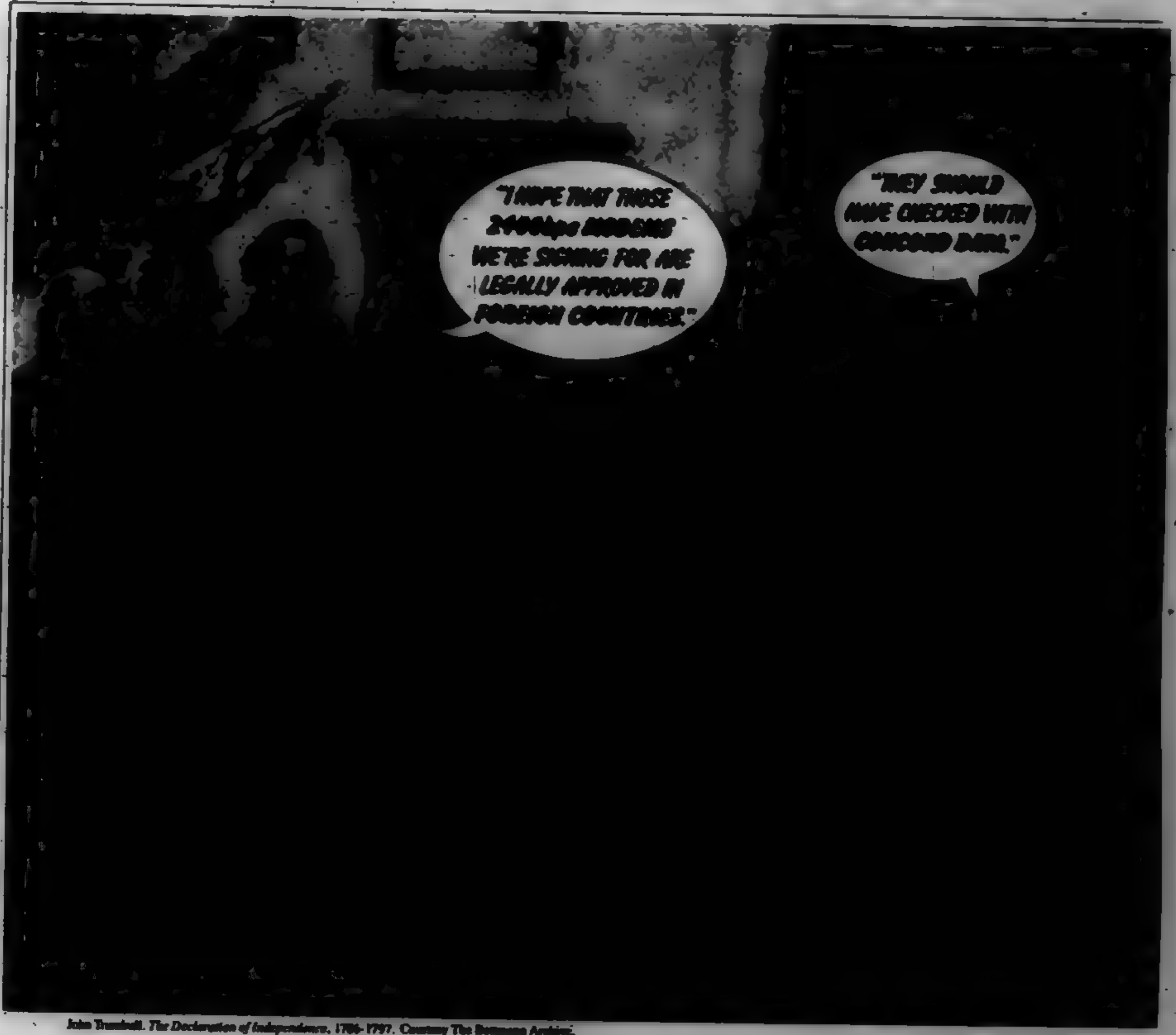
Reportedly, a single Netpath gateway can support multiple users sharing a modem and common telephone lines to access different host data in remote job entry and interactive modes. Meanwhile, network users can take advantage of the local network's features.

It is said to operate with various local-area networks, including Corvus Systems, Inc. Omninet, the 3Com Corp. Etherlink, Orchid Technology, Inc. PC net, Davong Systems, Inc. Multilink and Televideo Systems, Inc. Personal Mini using Novell, Inc. Netware/S.

It is said to permit a variety of IBM Personal Computers and compatibles to communicate with IBM hosts over dial-up, leased, point-to-point and multidrop lines. The hosts include IBM 370, 3080 series, 4300, 8100 and Series 1 systems. A single keystroke reportedly allows users to shift back and forth between a personal computer application and a host communication session.

Netpath is available for $1,995.

Pathway Designs, 177 Worcester St., Wellesley, Mass. 02181.


"I HOPE THAT THOSE 2400bps MODEMS WE'RE SIGNING FOR ARE LEGALLY APPROVED IN FOREIGN COUNTRIES."
"THEY SHOULD HAVE CHECKED WITH CONCORD DATA."

John Trumbull. *The Declaration of Independence, 1786-1797.* Courtesy The Bettmann Archive.

Installing a worldwide 2400bps dial line data network can save you thousands of dollars in international data communications costs. But before you put your John Hancock on a purchase order, check the facts. To be legally used in most foreign countries, today's 2400bps modems must not only comply with the V.22bis Recommendation, but must also meet dozens of additional design and performance requirements as outlined by each country. And the truth is, most don't. In fact, there is only one company whose family of V.22bis modems has been approved and accepted by *over thirty-five* foreign nations – Concord Data Systems. Concord was the first company to install a V.22bis-compliant 2400bps modem. And, with over 20,000 units in place today, Concord Data is not only the most popular name in 2400bps modems, but is the benchmark for 2400bps modem performance. For complete details on our full line of domestic and international 2400bps full duplex dial line modems, call us at (617) 890-1394 or write 303 Bear Hill Road, Waltham, MA 02154, telex 951793.

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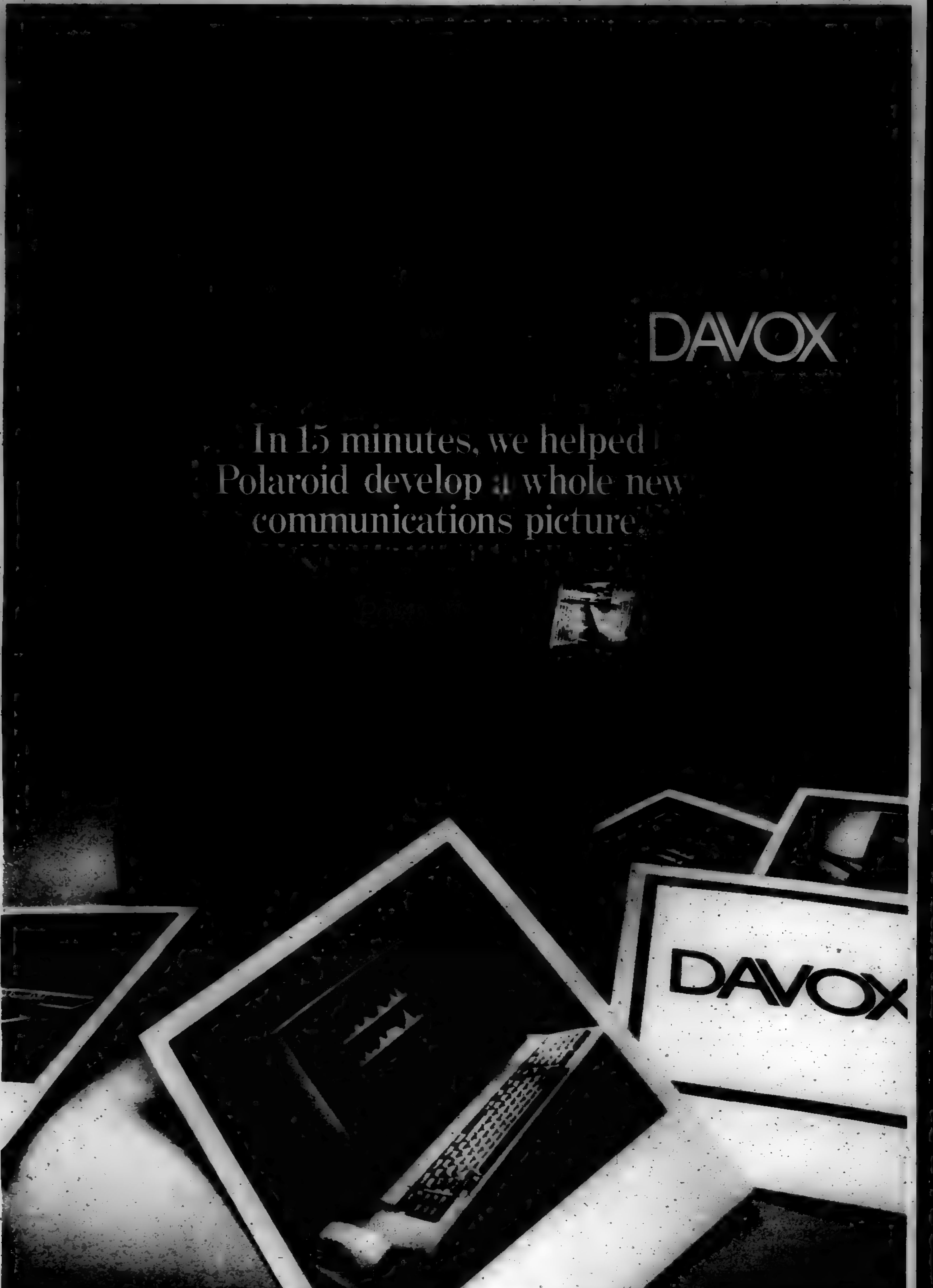

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SYSTEMS & PERIPHERALS

CDC expands Cyber systems' memory

By Tom Henkel
CW Staff

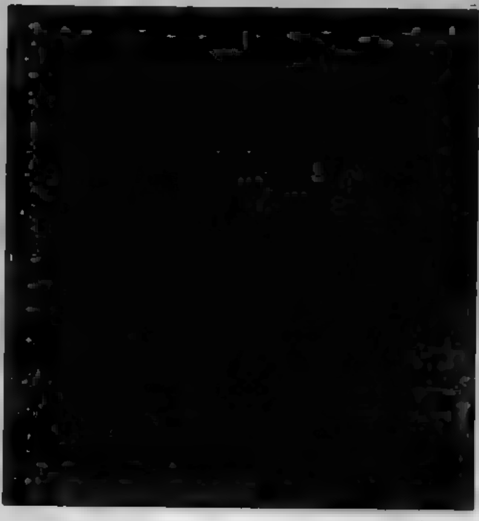
MINNEAPOLIS — Control Data Corp. has replaced its year-old Cyber 180/835, 845 and 855 processors with the Cyber 180/840, 850 and 860 models. The recently announced systems are said to offer eight times the main memory capacity and occupy 20% less floor space than the earlier models.

Using 256K-bit memory chips, the 840, 850 and 860 models offer 16M bytes to 128M bytes of main memory. Current users of the 835, 845 and 855 systems can also take advantage of the 256K-bit memory chips to expand the capacity of their systems from the previous maximum of 16M bytes to 128M bytes. A CDC spokesman said the purchase price for main memory enhancements has been decreased from $25,000 for 1M byte to $12,500 for 1M byte.

The Cyber 180/850 and 860 models offer the same internal performance as the 180/845 and 855 models they replace. The 180/840 is said to offer roughly 30% more internal performance than the 180/835 model it replaces. A dual-processor version of the 860 is also available to replace the dual-processor configuration of the Model 855, the vendor said.

Like the other members of the 180 line, the Cyber 840, 850 and 860 support both CDC's older NOS operating system and the firm's NOS/VE operating system that was announced with the Cyber 180 line last year [CW, April 30]. Users can concurrently run NOS and NOS/VE in the same processor and main memory, the company

See CYBER page 64



■ Pyramid Technology Corp. unveiled a dual processor version of its 90X supermini-computer/[illegible]

INSIDE

Terminals/[illegible]

Graphics Systems/[illegible]

Board-Level Devices/64

Tandem adds storage facility

4120-V8 houses eight disk drives in one cabinet

By John Desmond
CW Staff

CUPERTINO, Calif. — Tandem Computers, Inc. has announced the 4120-V8 Disk Storage Facility, said to store up to 1.3G bytes by housing eight 168M-byte Winchester drives in one cabinet and compatible with Tandem Nonstop 1+, Nonstop II and TXP systems.

The multiple drives are said to allow eight users to make eight I/O requests to the same file, and the requests will be processed concurrently. Average seek time is 20 Msec, and average time to data is 28 Msec with latency added.

The 4120-V8 is aimed at users with large data bases who are processing high transaction volumes, said Jerry Peterson, Tandem's vice-president of product management.

The 4120-V8 Disk Storage Facility

The eight disk drives are packaged in six sq ft of floor space. The 4120-V8 features a modular design to simplify servicing, with disk drive modules said to slide in and out without disturbing cables. Each Winchester drive is sealed and has a dedicated power supply.

The cabinet has two power cords, each supplying up to four drives, allowing data to be mirrored on disks in the same cabinet to ensure data availability in the event of drive failure, the company said.

The 4120-V8 is compatible with Tandem's 4110/4111 disk drives, and no changes to application software or operating system software are required to use the V8 in place of other Tandem drives, the company said. Each cabinet measures 36¼-in. high, by 24-in. wide by 36-in. long. The empty cabinet weighs 260 lbs. and each drive weighs 37 lbs.

The minimum V8 Disk Storage Facility configuration includes the cabinet and four drives, each with a capacity of 168M bytes unformatted, 128M bytes formatted. The price for the minimum configuration V8 is $50,000, the vendor said.

Additional Winchester modules can be added in pairs, to a maximum of eight per cabinet. Each additional pair costs $20,000, the company said. The maximum V8 configuration of eight drives and cabinet costs $88,000, the company said.

Tandem Computers is located at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

HARD TALK
John Desmond
CW Staff

Like Mips, Mflops measure imperfect

Millions of instructions per second (Mips) has long been assailed by vendors and users alike as being a meaningless measure of how computer systems perform. But in spite of those protests, Mips has remained popular — possibly because many users and industry followers have been unable to find a better way of easily expressing how one processor performs relative to another.

Now that scientific processors with supercomputer or near-supercomputer speeds are becoming more prominent in the industry, complaints similar to those lodged against Mips are being voiced about the technique of counting millions of floating-point operations per second (Mflops).

In theory, Mflops measures the relative speed of a scientific processor by counting the number of straight calculations — such as additions or multiplications — a CPU can carry out in a second. Typically, these calculations do not use

See MIPS page 61

UNITRONIX distributes DIGITAL terminals

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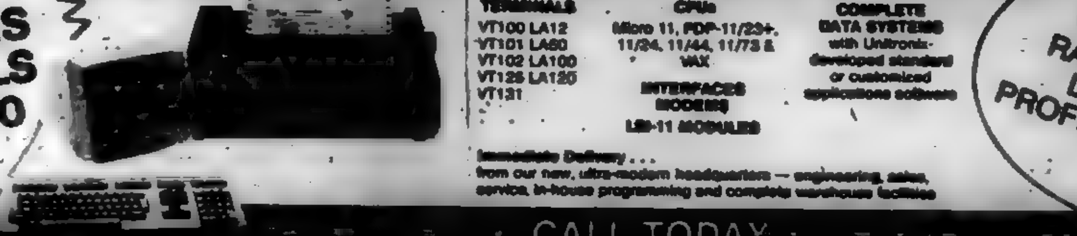
241



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Pyramid unwraps 90MX

MOUNTAIN VIEW, Calif. — Pyramid Technology Corp. has unveiled a dual-processor version of its 90X superminicomputer called the 90MX.

The unit is said to be an asymmetrical implementation of the 90 series architecture that offers dual-processor support transparent to user programs. According to the vendor, the 90MX can offer between 1.6 and 1.8 times the performance of a single-processor 90X.

Like the 90X, the 90MX uses the firm's OSX operating system, a version of AT&T's Unix operating system that incorporates AT&T's System V and the University of California at Berkeley's 4.2.

The 90MX configuration may include 16 intelligent terminal processor ports for a maximum of 256 user connections. Also included are slots for eight memory boards that can hold a maximum of 32M bytes of main memory. Two 32K-byte data cache units, one in each CPU, are standard, the vendor said.

The 90MX ranges in price from $220,000 to $420,000. The $220,000 configuration consists of the OSX operating system, a 415M-byte disk drive, a 1,600 bit/in. magnetic tape drive, a black-and-white console, 16 user ports and 4M bytes of main memory.

The vendor is located at 1295 Charleston Road, Mountain View, Calif. 94043.

TERMINALS

TELERAY, INC.
Model 7-7305

Teleray, Inc. has announced the Model 7-7305 terminal, emulating the Honeywell, Inc. VIP7305 terminal and featuring a keyboard-selectable Ansi X3.64 Digital Equipment Corp. VT102 operating mode.

Other features include two bidirectional communications of attributes and field qualifiers, which are Honeywell VIP7200-, VIP7300- and VIP7800-compatible, on each display line.

The Model 7-7305 contains four displayable character sets for a total of 255 characters, including standard Honeywell graphics and 64 mosaics, all of which can be displayed on its 14-in. CRT. For spreadsheet applications, display memory that is normally 24 lines by 80 columns can be programmed to accept line lengths up to 255 columns long.

In addition to 113 standard Honeywell keys, the Model 7-7305 accepts up to 32 nonvolatile, programmed function sequences or control strings from the keyboard on either of its I/O ports.

The price for the Model 7-7305 is $1,695, the vendor said.

Teleray, P.O. Box 24064, Minneapolis, Minn. 55424.

GRAPHICS SYSTEMS

DATA INNOVATIONS, INC.
Expert Designer

Data Innovations, Inc. has announced the Expert Designer for producing presentation graphics from any Digital Equipment Corp. VT100 terminal connected to a DEC VAX series CPU.

The system software is said to automatically design the slide with text style, size, color and placement. Features of the Expert Designer include 864- by 576-pixel resolution, ability to produce color slides on a black-and-white monitor and correct format for 35mm slides.

The Expert Designer package includes a graphics processor board, system software, color film computer image recorder, 35mm camera back and 3¼-in. by 3¼-in. instant print-back, the company said.

The company's graphics board includes an NEC Information Systems, Inc. 82720 8-bit graphics display controller and an Intel Corp. 8051 8-bit microcontroller, a spokesman said.

The price for Expert Designer 100 for use with VT100 terminals is $8,000, and the price for Expert Designer 200 for use with any RS-232 port is $8,600, the vendor said.

The products are scheduled for shipment in March.

Data Innovations, 660 Suffolk St., Lowell, Mass. 01854.

See GRAPHICS page 64

Memorex adds 3380 emulation

SANTA CLARA, Calif. — Memorex Corp. announced that its 3864 storage subsystem now emulates the IBM 3380 disk drive and is said to off-load paging and swapping functions from the CPU.

The 3864 was formerly compatible only with IBM's MVS/SP, VM/SP and MVS/XA operating systems. Because it can now appear to the operating system as an IBM 3880/3380 disk subsystem, the 3864 is compatible with IBM's DOS/VSE as well, the vendor said.

The 3864 can work with IBM's 3030, 3080 and 4300 series processors and compatible processors. Installed units can add the 3380 emulation feature in the field, according to the vendor.

The price for 3380 emulation is $6,000 per basic storage module, the vendor said.

Memorex is located at San Tomas Central Expwy., Santa Clara, Calif. 95052.

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MIPS

from page 59

multiple operations such as division, nor do they involve program branching or checking. The answer is expressed in a format in which the decimal point floats.

But the hardware processing speed is only one factor in measuring performance. Software sophistication is another. Logical processing, such as IF statements or other conditional instructions, will degrade performance.

Mflops a form of hype

Mflops ratings are a form of hype. "It's my brochure vs. your brochure," said Wayne McIntyre, Amdahl Corp.'s director of special-purpose systems. "It doesn't take into account any of the things you would find in a real-world program."

While Mips and Mflops ratings are not interchangeable, they are related. Because supercomputers process multiple instructions simultaneously and not sequentially, and because they work on a tight kernel of instructions, Mips ratings would not be useful in describing their speed.

But Mips ratings on a general-purpose machine, divided by two or three, will yield Mflop potential; therefore, a 14-Mips general-purpose system may translate to a 6- or 7-Mflop supercomputer. The reason is that all general-purpose machines require multiple cycles to perform one instruction for floating-point arithmetic, McIntyre said.

"The only real way to measure box No. 1 against box No. 2 is to take a real-world job representing real-world kind of work, put it to the machines, hold things as constant as you're capable of doing and look at it in that fashion," McIntyre said.

McIntyre compares Mflop ratings to horsepower ratings in a car. "I can tell how fast a car can go by how much horsepower it has. That doesn't take into account transmission gearing, differential gearing, one seat or six seats. Horsepower is an indicator but not an all-encompassing one," he said.

Rating a 'theoretical maximum'

Art Leiz, a senior long-range planner with Grumman Data Systems, whose data centers uses Cray Research, Inc. array processors, emphasized that a supercomputer's speed depends on its instructions. He described the Mflops rating as "the theoretical maximum you can go if you have the optimum instruction."

One source said some benchmark numbers from the Los Alamos, N.M., national laboratories were 5 or 6 Mflops on a processor with a published rating of 80 Mflops. If Los Alamos scientists are not doing work close to the optimal for the machine, who is?

In fact, probably no one currently using a supercomputer is actually getting the top Mflops speed rated by the vendor. And many industry experts believe it is virtually impossible to operate a supercomputer consistently at the vendor's top-rated speeds.

Is there a better way to rate performance than Mflops? The approach of Floating Point Systems, Inc. is to use benchmark tests, performed in Fortran code by the Argonne National Laboratory in Argonne, Ill., to compare their processors with those of competitors.

The use of a proven benchmark is clearly a better indicator of performance than a nebulous rating system like Mflops or Mips. But getting vendors to agree on a standard benchmark is often difficult. Too often, vendors insist on using the benchmark that puts their systems in the best light.

Speed only 5% to 10% rating

Leiz suggested the optimum speed most supercomputer users actually receive is really 5% to 10% of the rated speed — quite a spread. Veteran supercomputer users may be familiar with these potential spreads, but new users may be confused.

Of course, just as users are getting comfortable with Mflops, Fujitsu Ltd. in Tokyo announced the VP-400, with a reported performance of 1.066 billions of flops — or Gflops. And the goal of the fifth-generation project of Hitachi Ltd. is to produce a supercomputer that processes at speeds thousands of times faster than Mflops, yielding teraflops.

"Tera" comes from the Greek word for "monster," so we may finally be using a description appropriate for the processing power involved — monsterflops.

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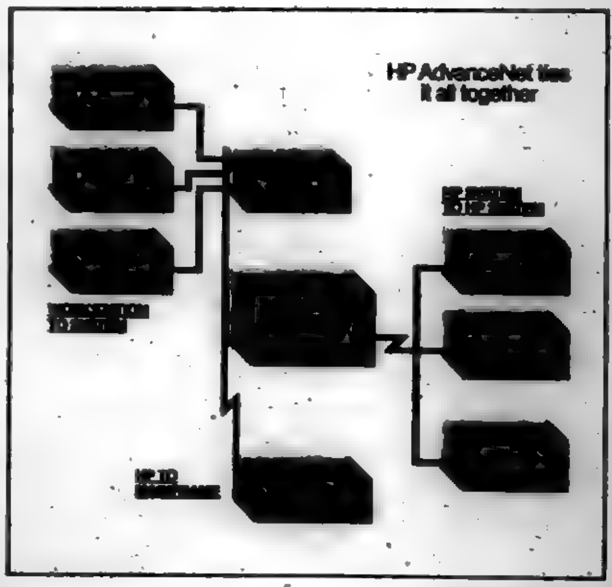

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GRAPHICS from page 60

APPLICON, INC.
Aria 19-in. color workstation

Applicon, Inc. has announced a 19-in. color-engineering workstation for its Bravo! family of computer-aided design and manufacturing systems, which previously offered only a 13-in. workstation.

Based on the 32-bit Digital Equipment Corp. VAX-11/730, Aria workstations feature virtual memory architecture and color graphics display. They include software for two- and three-dimensional design and drafting tasks, as well as Conference on Data System Languages-compliant data base management capabilities, the vendor said.

Options include an Ethernet local-area communications link, cartridge tape drive, the Performance Enhancement Package for additional memory and remote Decnet communications capability.

A system configuration including the 19-in. workstation costs $90,000, and the 13-in. workstation configuration costs $80,000.

Applicon, 32 Second Ave., Burlington, Mass. 01803.

BOARD-LEVEL DEVICES

PARALLAX GRAPHICS, INC.
600 Series Video/Graphics Controller

Parallax Graphics, Inc. has announced the 600 Series Video/Graphics Controller board set, said to combine video with color graphics for a variety of applications.

The Video/Graphics Controller board is currently available for processors with Intel Corp.'s Multibus or Digital Equipment Corp.'s Q-bus or VME-bus.

The controller's video features include the National Television Standard Code I/O function, said to allow a computer to be used with a video disk player or connected to a camera or videocassette recorder.

Graphics features include a drawing processor with a 12 million pixel/sec drawing speed and a choice of 256 colors from a 16-million-color palette. The double-buffered memory displays 640 by 480 pixels out of a 512- by 1,024-pixel memory.

The controller is priced at approximately $10,000.

Parallax Graphics, 1095 E. Duane Ave., Sunnyvale, Calif. 94086.

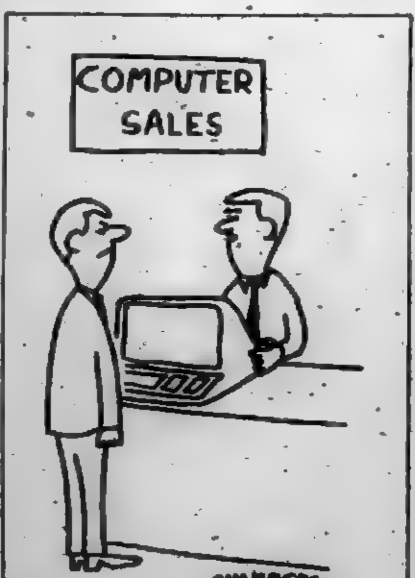
CYBER from page 59

said. Dual processor configurations of the Model 860 require that NOS/VE be used on the second processor, the vendor said.

The models each employ emitter-coupled logic circuitry and large-scale integration packaging. The systems offer an I/O unit consisting of 12 data channels and 10 peripheral processors that can operate independently and simultaneously as stored-program systems. Options can be selected to expand the I/O unit to 15 or 20 peripheral processors and 12 additional data channels.

The Model 840 is field-upgradable to the Model 850 and the Model 850 can be upgraded to the 860, according to the vendor.

The 840, 850 and 860 models including CPU, I/O units and 16M bytes of main memory cost $760,000, $1,115,000 and $1,575,000, respectively They will be available in March, the vendor said. More information is available from CDC, Computer Systems Marketing Group, HQW09G, P.O. Box 0, Minneapolis, Minn. 55440.



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MICROCOMPUTERS

Relief for sluggish CAD

Microcomputer-based systems expected to save time, cost for computer-aided design engineers

By Edward Warner
CW Staff

Corporate engineers who have endured slow response times on their firm's minicomputer-based computer-aided design (CAD) systems may find relief this year with the arrival of several CAD systems based on the IBM Personal Computer XT and AT.

The systems, one industry analyst predicted, could do for CAD-based engineering what stand-alone word processors did for office automation. "Graphics are the 'words' of engineers," pointed out Charles Foundyller, president of Daratech, Inc. in Cambridge, Mass.

The advent of low-cost CAD systems based on personal computers has been several years in coming, Foundyller noted. The pioneer system, Autodesk, Inc.'s Autocad, designed for use with the IBM Personal Computer, was introduced a little over two years ago.

But the arrival last year of the Personal Computer AT and an increase in the number of people who know how to write CAD software has brought forth microcomputer-based CAD systems that offer "the performance of systems costing as much as $50,000," Foundyller said.

Foremost among those personal computer-based CAD systems, he claimed, is Anvil 1000, developed by Manufacturer's Consulting Service, Inc. (MCS) of Irvine, Calif., which is scheduled to ship this

See CAD page 73

SMALL TALK
Eric Bender
CW Senior Editor

Adapso scheme for lock and key to benefit users?

Nobody is happy with current copy protection methods for microcomputer software because the methods typically inconvenience users and do not withstand a determined attack, but some see major flaws in the effort by the Association of Data Processing Service Organizations, Inc. (Adapso) to develop a technical answer.

Adapso's Software Authorization Committee is working on a potential solution combining a lock in the software program with hardware keys held in a key ring that would attach to each personal computer's RS-232 port [CW, Jan. 21].

Once installed, the scheme would be transparent to users and very difficult to crack, proponents claim. The scheme also could ease making backup copies, simplify operations on hard-disk machines, allow a user to move from machine to machine and permit encryption and other features.

But others in the industry point to potential drawbacks. The scheme is likely to involve additional complication for the user and definitely requires new equipment (the keys and ring) that may fail or be lost. It may conflict with other technology and market trends, such as the move to distribute applications from a local-area network's file server.

And, of course, the scheme is not foolproof. In it, "there exists a ROM [read-only memory] that would run all copies of [Lotus Development Corp. software]," noted Brian Boyle, an analyst with Gnostic Concepts, Inc. "All somebody would have to do would be to duplicate that ROM, and somebody's going to sell the

See PIRACY page 74

■ Opus Systems has introduced a coprocessor that converts IBM Personal Computers into Unix workstations/66

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Communications/70

Company sprouts for introduction of MS-DOS DBMS

NEW YORK — System Automation Corp. has formed System Automation Software, Inc. to launch the Microsoft Corp. MS-DOS version of its relational data base management system (DBMS).

The system, known as Request, has produced $800,000 in sales since its release a year ago for use on Convergent Technology, Inc.-produced microcomputers, according to Alfred Rubin, president of the Silver Spring, Md., software house. The package was designed in the early 1970s as a mainframe DBMS.

The MS-DOS version of Request, demonstrated here recently, reportedly includes the following:

- Uses menu-driven rather than procedural language commands.
- Files can be used with Lotus Development Corp.'s 1-2-3, Micropro International Corp.'s Wordstar or Microsoft's Multiplan

See REQUEST page 74

Lisa conversion gets mixed reviews

Apple to phase out Lisa operating system

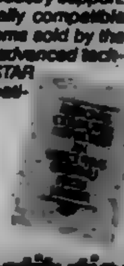
By Kathleen Sullivan
CW West Coast Bureau

CUPERTINO, Calif. — Managers at four companies that currently use Apple Computer, Inc.'s Lisa workstations had mixed reactions to the firm's recent announcement that it will phase out the Lisa operating system and transform the Lisa 2/10 into the Macintosh XL.

Rick Richardson, national director of microcomputer technology at Arthur Young & Co. in New York, welcomed the company's decision.

"Since Apple has provided a way that people can take advantage of the plethora of software [available for the Macintosh] and convert the Lisa documents they've been working on for a year to Macintosh files, about the only thing current users have sacrificed is a lead-in price to get into

See LISA page 73



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MICROCOMPUTERS

Opus coprocessor converts IBM micro to 32-bit Unix workstation

LOS ALTOS, Calif. — A coprocessor designed to convert an IBM Personal Computer into a 32-bit Unix workstation has been introduced by Opus Systems.

The Opus516 Personal Mainframe reportedly offers a complete port of AT&T's Unix System V along with a 32-bit coprocessor for the Personal Computer. It allows people running software programs on larger machines to bring them to the desktop level, Opus said, adding that Personal Computer applications can still be used with the product in place.

A single keyboard command allows users to toggle between Unix and IBM's PC-DOS, according to the vendor.

Opus516 reportedly uses the National Semiconductor Corp. 32016 CPU, with both memory management and floating-point options. The on-board memory of the Opus516 is said to be expandable to 2M bytes.

Also included with Unix System V and its utilities are C language and Fortran 77 compilers, an assembler and a debugger.

A 1M-byte system with all utilities is priced at $5,230.

Opus Systems is located in Suite 120, 960 San Antonio Road, Los Altos, Calif. 94022.

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SOFTWARE

GENERAL PHYSICS CORP.
J/T PAK

General Physics Corp. has introduced J/T PAK, a job/task analysis package for the IBM Personal Computer.

J/T PAK is a menu-driven data base that reportedly guides a user through the job/task analysis process. The product is said to enable users to develop a list of elements for each task, maintain a data base of up to 320,000 statements and store lists of terminal and enabling objectives, a company spokesman said.

J/T PAK runs on the IBM Personal Computer with 192K bytes of random-access memory, a floppy disk drive, 80-col. color or monochrome monitor and printer. J/T PAK is priced at $6,000; the Job Analysis Software program can be purchased separately for $2,500.

General Physics, 10650 Hickory Ridge Road, Columbia, Md. 21044.

LATTICE, INC.
LMK

Lattice, Inc. has announced LMK, an automated production generation utility that works under Microsoft Corp.'s MS-DOS operating system.

With the product, once a user specifies relationships of system pieces (source modules, object modules or chapters of a document) in a dependency file, a single LMK command initiates automatic rebuilding of the system, the vendor said. LMK reportedly can perform any executable command, such as invoke a batch text editor to make replacements in a number of files, update a data base or run a utility.

The product requires an Intel Corp. 8088, 8086, 80186 or 80286 microprocessor, MS-DOS 2.0, 128K bytes of random-access memory and a 320K-byte disk drive.

LMK costs $195.

Lattice, P.O. Box 3072, Glen Ellyn, Ill. 60138.

SCIENCE RESEARCH ASSOCIATES, INC.
Using IBM Displaywrite 2

Science Research Associates, Inc. (SRA) has announced Using IBM Displaywrite 2, an interactive tutorial for secretaries.

The 20-hour, two-volume course

Continued on page 68

INTRODUCING DECISION DATA'S DUAL-PURPOSE COMPUTING WORK STATION

THE NEWEST CRT TERMINAL FOR THE IBM/34/36/38 IS A PERSONAL COMPUTER, TOO.

One machine. Two separate functions. A multi-feature work station for easy access to your System/34/36 or /38. And your own personal computer which runs programs from the IBM Personal Computer software library.

The Decision Data Computing Work Station combines the power of on-line computing with the freedom of independent processing. For less cost. And in less space.

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A special "hot key" lets you switch back and forth between terminal emulation and personal computing.

Operating as a terminal, the CWS permits computer output to be printed on your personal printer or stored on diskettes. Six memory keys let you enter or retrieve up to 78 characters each —with a single key stroke, cutting down on repetitive typing.

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With the Computing Work Station, Decision Data can help you get more from your System/3X and more from personal computing than ever before.

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DECIDEDLY BETTER

Continued from page [illegible]

provides hands-on training for a Displaywrite 2 user with an IBM Personal Computer, the vendor said. The first volume reportedly teaches how to create, print, revise, format and paginate simple documents. The second volume explains how to merge text, use a spelling checker and format diskettes, according to the vendor.

The course is divided into 40-minute lessons and includes two handbooks, an administrative guide and four training diskettes.

The course costs $250.

SRA, 155 N. Wacker Drive, Chicago, Ill. 60606.

LANGUAGE RESOURCES, INC.
PC-68K

Language Resources, Inc. has introduced its PC-68K plug-in CPU board for use by the IBM Personal Computer in development and debugging of code for the Motorola, Inc. 68000 CPU.

The PC-68K reportedly provides a symbolic debugger, a linker/locator, a Motorola-compatible macro assembler and an Institute of Electrical and Electronics Engineers floating-point package. It is said to offer host communications utilities, emulator communication and Pascal and C compilers.

The PC-68K costs $2,995 with 256K bytes of random-access memory (RAM), $3,595 with 512K bytes of RAM and $4,195 with 1.2M bytes of RAM.

Language Resources, 4885 Riverbend Road, Boulder, Colo. 80301.

MICRO-SYSTEMS SOFTWARE, INC.
M-Edit

Micro-Systems Software, Inc. has introduced its M-Edit tool for full screen editing on the IBM Personal Computer.

M-Edit reportedly offers display of up to eight windows, data transfer between windows and block copy/block move functions. It is said to be useful for creating batch files and working with Ascii data files.

Each of its windows reportedly has a 64K-byte text buffer, depending on system memory. Text lines may be up to 240 characters long, the vendor said. The tool also is said to offer global search and string-change functions and to support hanging indents. Its edit-mode functions reportedly include line and block operations and line-only operations.

M-Edit is priced at $199.

Micro-Systems Software, 4301-18 Oak Circle, Boca Raton, Fla. 33431.

STRUCTSOFT, INC.
PCSA

Structsoft, Inc. has introduced PCSA, a structured analysis tool for the IBM Personal Computer.

PCSA reportedly is an intelligent graphics editor that permits the production of leveled data flow diagrams of structured specifications. It also reportedly can draw data flow diagrams and check capabilities to assure consistency of specifications.

PCSA also runs with a high-resolution, bit-mapped display and will work in conjunction with a mouse, the vendor said. The software is said to offer an object-oriented, pop-up menu and to move objects around by dragging.

PCSA costs $895.

Structsoft, 24 Homer St., Parsippany, N.J. 07054.

BRADFORD INFORMATION SYSTEMS
Interactive Distribution Planning System

Bradford Information Systems has announced that its Interactive Distribution Planning System (IDPS) is available for the IBM Personal Computer XT.

The package reportedly allows a user to solve truck or vehicle routing problems on a daily or a weekly basis. It is said to provide the best locations for distribution centers, assigns distribution centers to customer locations and calculates the distance between any two points in a data base.

The product requires 512K bytes of random-access memory, IBM's PC-DOS operating system and an Intel Corp. 8087 microprocessor.

IDPS costs $10,000, the vendor said.

Bradford Information Systems, P.O. Box 73111, Houston, Texas 77090.

ZYLAB CORP.
Zyindex Plus

Zylab Corp. has introduced Zyindex Plus and enhanced its other Zyindex software for the IBM Person-

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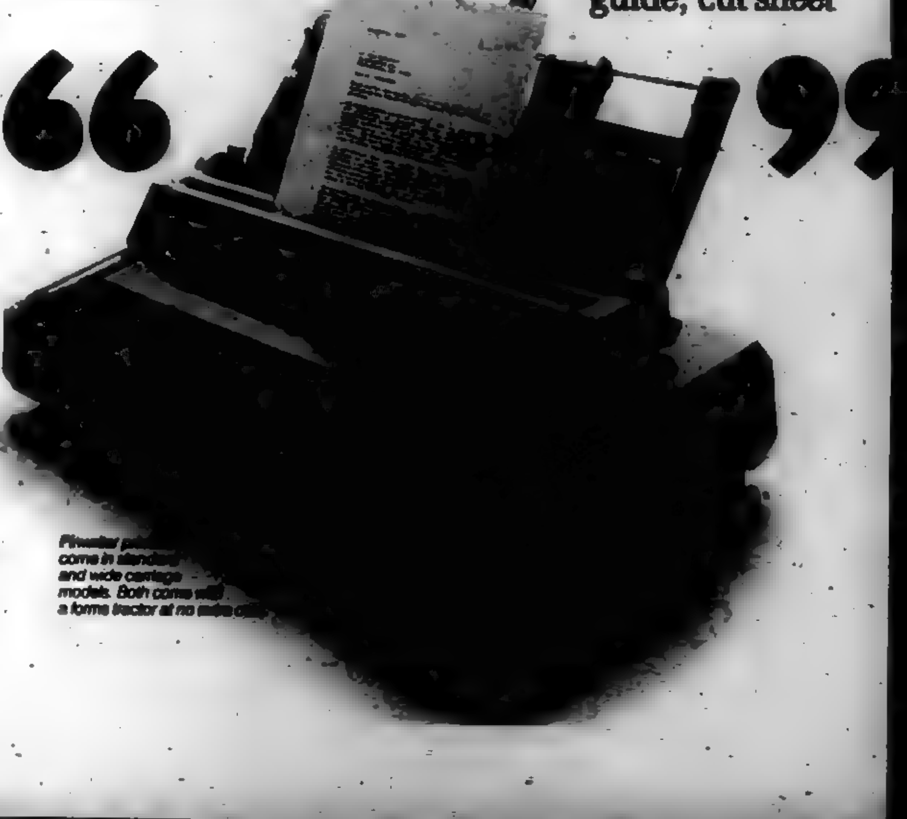
...word ...processing, ...00 wpm for ...orrespondence and memos, or 1800 wpm for drafts and spreadsheets.

You can create unbelievably clear graphics, too. Because Pinwriter printers produce an amazing 240 x 240 dots per inch in black and white. Or in seven crisp colors.

But that's not all. You can print in 8 different type styles. You can also feed forms automatically. Because NEC makes a wide range of easy-to-use forms handlers. Including a cut sheet guide, cut sheet



Pinwriter p... come in standard and wide carriage models. Both come with a forms tractor at no extra c...

al Computer.

Zyindex Plus, also for the Personal Computer, reportedly was designed for heavy users of textual information and provides full text search in up to 15,000 files. It is not copy protected and is licensed for up to five networked or multiuser workstations, Zylab said.

Zyindex Professional, Release 1.3, now offers the ability to handle 5,000 files. Zyindex Standard, also at Release 1.3, can now handle 500 files, the vendor said.

Zyindex Professional is priced at $295, Zyindex Standard at $145 and Zyindex Plus at $695.

Zylab, 233 E. Erie St., Chicago, Ill. 60611.

SUPERIOR SOFTWARE CORP.

Superior Mod/Com

Superior Software Corp. has announced Superior Mod/Com, a communications package that runs under AT&T's Unix or Microsoft Corp.'s Xenix.

The package features error checking and recovery and is compatible with Xmodem protocol, the vendor said. When sending or receiving files, the user reportedly can choose to send one file, several files or all files in batch mode.

In terminal emulation mode, a user can save a conversation in a file, send predefined strings by pressing one key and display user notes, according to the vendor.

The product is available for $495 for a perpetual license or for $150 for the first year and $99 for each additional year.

Superior Software, Suite 206, 202 13th St., Augusta, Ga. 30901.

LOGICAL SOFTWARE, INC.

Softshell

Logical Software, Inc. has introduced versions of its Softshell, a user interface to the AT&T Unix operating system, for the IBM Personal Computer XT under IBM's PC/IX, the IBM Personal Computer AT under PC Xenix, the Digital Equipment Corp. Professional 350 under Venturcom, Inc.'s Venix and the NEC Information Systems, Inc. APC-II under NEC's PC-UX.

Softshell reportedly consists of three programs. Yelp provides structured help information and templates for Unix commands while LSLS, a directory walk program, clarifies the Unix file system, Logical Software said. Lshell, a full screen scroll handler, permits reviews of terminal sessions and other functions, the vendor added.

Softshell is priced from $295 to $995, depending on the CPU in use.

Logical Software, 17 Mount Auburn St., Cambridge, Mass. 02138.

STOK SOFTWARE, INC.

Backrest; Stok Pilot

Stok Software, Inc. has introduced a feature for its Backrest hard-disk backup program and an enhanced version of its Stok Pilot software. Both programs are available for the IBM Personal Computer and computers running under Digital Research, Inc.'s CP/M operating system.

Backrest now features the ability to allow users to upgrade Microsoft Corp.'s MS-DOS 1.0 to MS-DOS 2.0 hard-disk formats. Backrest is said to split and merge files while they are being copied back to a disk that has undergone a reformatting.

Backrest reportedly runs on machines under Microsoft's MS-DOS; IBM's PC-DOS; Digital Research's Concurrent CP/M, CP/M 2.2, CP/M Plus, MP/M, MP/M 86 and CP/M 86; and Software 2000, Inc.'s Turbo-DOS.

Stok Pilot reportedly allows existing programs to be tied into a menu-driven structure, and systems designers may use it to add tutorials to their applications. It runs on the MS-DOS, CP/M 86, PC-DOS and Concurrent CP/M operating systems.

Backrest costs $180. Stok Pilot is priced at $290, the vendor said.

Stok Software, 17 W. 17th St., New York, N.Y. 10011.

See TOOLS page 70

DOT MATRIX
SAY ALL THIS.

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All the controls at your fingertips.
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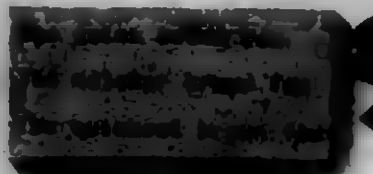

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And find out why more and more PC owners are saying, “NEC and me.”

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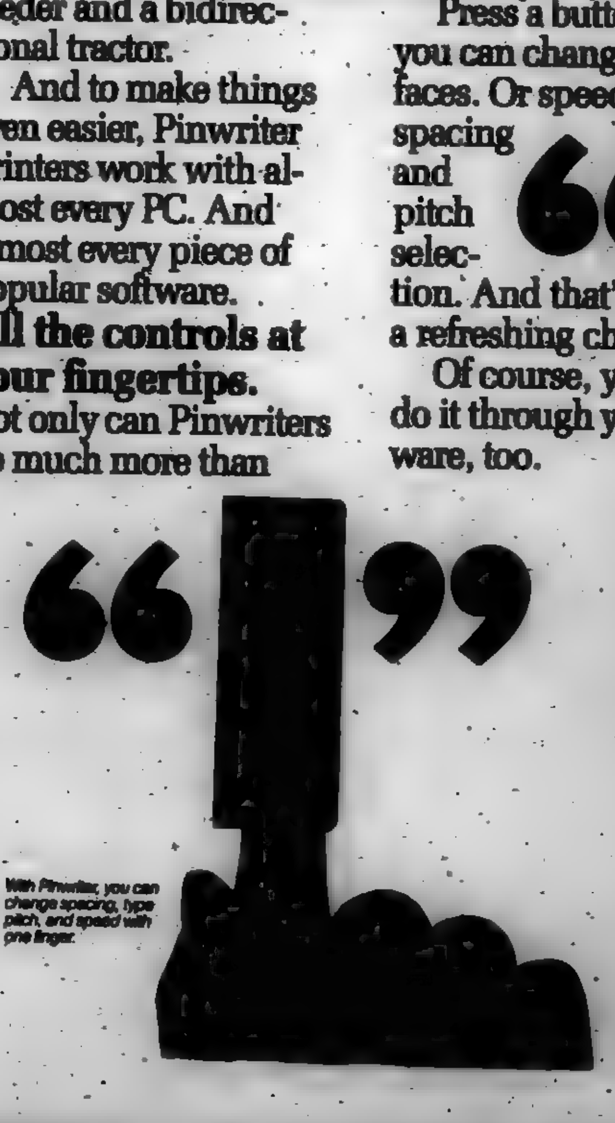

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With Pinwriter, you can change spacing, type pitch, and speed with one finger.

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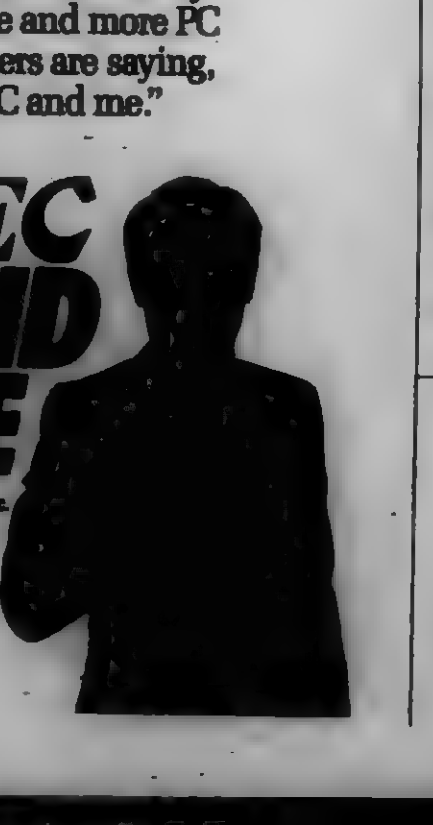

NEC Information Systems, Inc.
1414 Massachusetts Ave.
Department 1670
Boxborough, MA 01719

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TOOLS

from page 69

VANCE INFO SYSTEMS
CD Tracker

Vance Info Systems has introduced a certificate of deposit (CD) tracking and marketing system designed for savings and loan associations, banks and money brokers. The package runs on IBM's Personal Computer and Personal Computer AT under IBM's PC-DOS or Microsoft Corp.'s MS-DOS and requires Ashton-Tate's Dbase III software.

The system is said to feature document preparation, management production reports, cash flow management aids, CD tracking and analysis tools, investor analysis and marketing tools.

The package is priced at $6,000.

Vance Info Systems, 2818 Clay St., San Francisco, Calif. 94115.

VERSATILE BUSINESS SYSTEMS
Job Cost, Billing and Summary Programs

Versatile Business Systems has introduced its package of Billing, Job Cost and Summary Programs for the Apple Computer, Inc. Apple II, Apple IIe and Apple IIc personal computers.

The billing portion of the software accumulates charges for invoicing at any time, while the job cost portion will accumulate costs by job or operation, Versatile Business Systems said. According to the vendor, the job cost program will accumulate time or charges by client for professional services performed.

The package is priced at $295.

Versatile Business Systems, P.O. Box 270, Sioux Narrows, Ont., Canada P0X 1N0.

SYSTEMS

MANUFACTURING AND CONSULTING SERVICES, INC.
Anvil-1000MD

Manufacturing and Consulting Services, Inc. has announced that the Anvil-1000MD computer-aided design and drafting system for the IBM Personal Computer AT and Personal Computer XT now has interfaces for use with eight plotters from four manufacturers. The Anvil-1000MD system is said to feature 640- by 480-pixel resolution, 32 colors and support for points, lines, ellipses, conics, splines and arcs.

The product now supports Hewlett-Packard Co.'s 7470A two-pen A-size, 7475A six-pen B-size, 7580B eight-pen D-size, and 7585 eight-pen E-size plotters; Houston Instrument, Inc.'s DMP-41 and DMP-42 one-pen, D-size plotters; and Nicolet Zeta Corp.'s eight-pen, B-size plotter, the company said.

The complete Anvil-1000MD system, including the IBM Personal Computer AT and Professional Graphics Controller and Display, sells for $15,885. The Anvil-1000MD software alone costs $2,995.

Manufacturing and Consulting Services, 9500 Toledo Way, Irvine, Calif. 92718.

COMMUNICATIONS

NORTON-LAMBERT CO.
Lync telecommunications software

Norton-Lambert Co. has introduced its Lync telecommunications software for the Data General Corp. DG/One portable personal computer.

Working with the DG/One's internal modem, the Lync software is said to allow users to send and receive telexes and electronic mail and to access and exchange information with data base services. Users also can transfer data between two computers with different operating systems and disk formats, the vendor said.

The Lync program is said to contain logon modules for telex and electronic mail services. It offers macro modules that users may customize.

Lync is priced at $195.

Norton-Lambert, P.O. Box 4085, Santa Barbara, Calif. 93140.

AST RESEARCH, INC.
AST-5251/11

AST Research, Inc. has introduced a hardware/software communications package said to enable an IBM Personal Computer, Personal Computer XT, Personal Computer AT or compatible system to emulate an IBM 5251 Model 11 display station for local interactive communications with IBM System/34, System/36 or System/38 minicomputers.

The AST-5251/11 also is said to enable an inexpensive printer linked to the Personal Computer to emulate an IBM 5256 printer without changes in the host's operating system. The package consists of a microprocessor-based connection board and Model 11 emulation program.

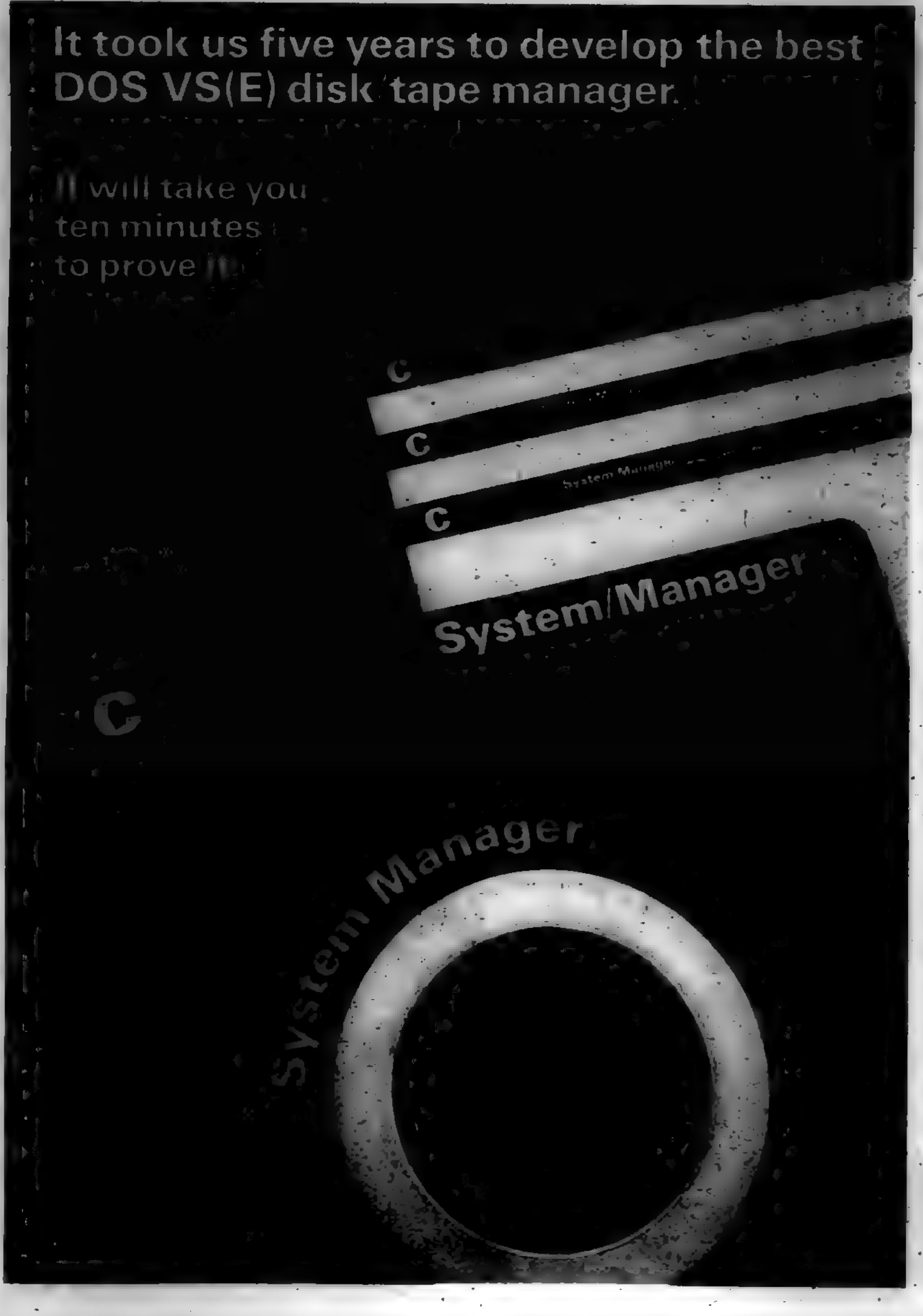
The AST-5251/11 features as standard hardware an Intel Corp. 80305 microprocessor to provide control of the line protocol, buffer management and interface with IBM personal computers; one user-selectable direct memory access channel for Personal Computer XT and Personal Computer AT compatibility; one selectable I/O interrupt channel; and a Twinax cable assembly supplied by the vendor.

The package is designed to run on IBM PC-DOS 2.0 or above, the company said. Other system requirements include 128K bytes of random-access memory, one standard IBM Personal Computer expansion slot, diskette adapter and one disk drive, a monochrome or color/graphics display adapter and a color or monochrome monitor.

The price for the package is $995.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

See TALK page 72


It took us five years to develop the best DOS VS(E) disk tape manager.
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C
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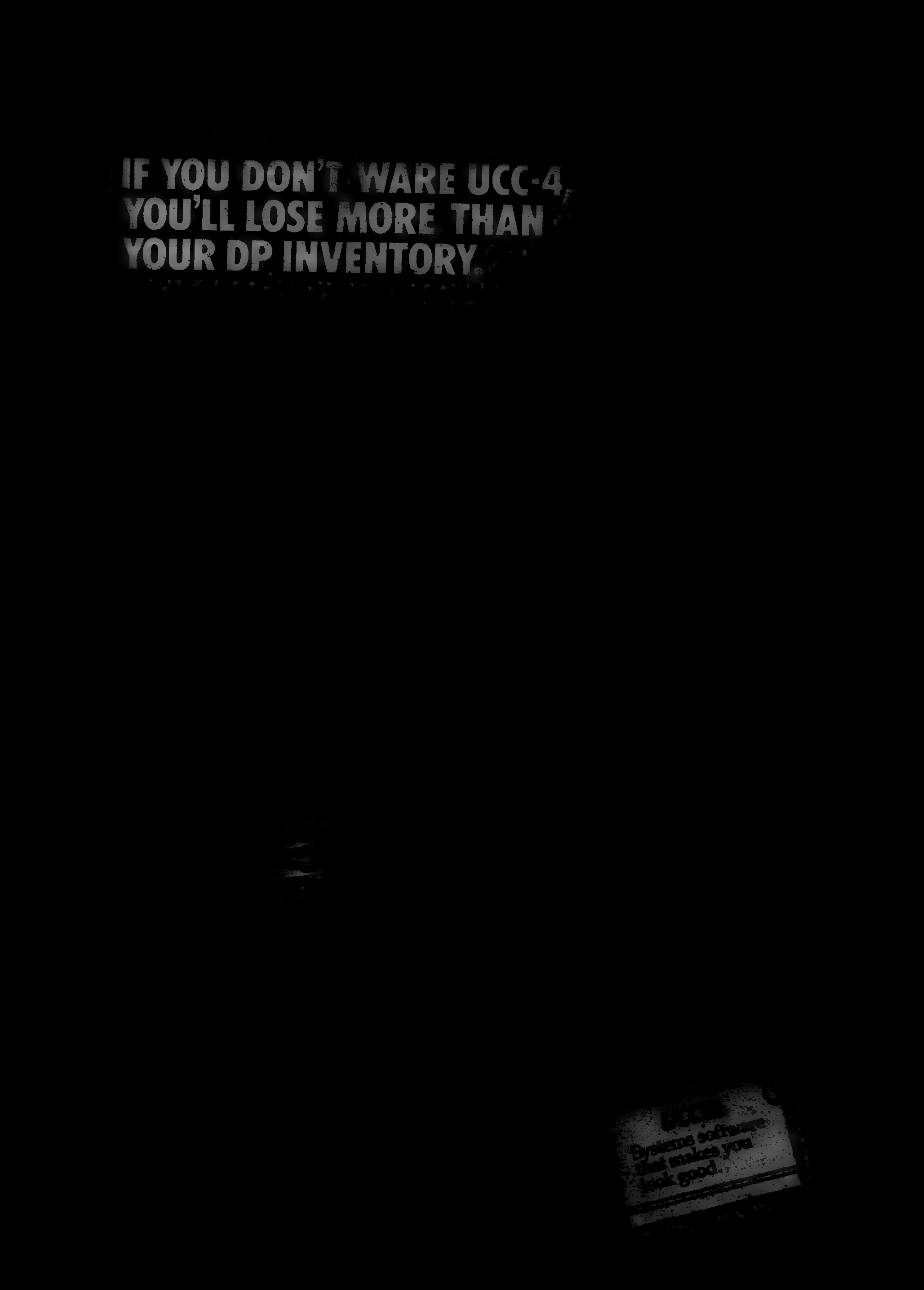

IF YOU DON'T WARE UCC-4 YOU'LL LOSE MORE THAN YOUR DP INVENTORY.
UCC
Systems software that makes you look good.

TALK

from page 70

INNOVATIVE ELECTRONICS, INC.
PC-80

Innovative Electronics, Inc. has announced a plug-in expansion board designed to link the IBM Personal Computer to an IBM mainframe.

The PC-80 reportedly attaches a Personal Computer or Personal Computer XT to an IBM 3274/3276 cluster controller or an IBM 4331 Display/Printer Adapter using standard Type A connections. It is said to support IBM Systems Network Architecture/Synchronous Data Link Control and Binary Synchronous Communications.

The PC-80 lets the Personal Computer or Personal Computer XT appear to the cluster controller as an IBM 3278 Model 2, 3 or 4 monochrome display station, the vendor said. With a color screen, the Personal Computer XT reportedly appears as an IBM 3279 Model 2A, 2B, 3A or 3B.

The PC-80 cost $895.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

EMULEX CORP.
Persyst DCP-88/VM

Emulex Corp. has announced a distributed communications processor board with expanded memory for the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles.

The Persyst DCP-88/VM is an expanded-memory version of Emulex's DCP-88, a single-board, front-end processor for Personal Computers and compatibles. The DCP-88/VM can be used with a variety of software packages to emulate both Systems Network Architecture and Bisynchronous 3270, 2780/3780 and Hasp protocols, the vendor said.

Based on Intel Corp.'s 8088, the board reportedly can support up to four multiprotocol communications lines and a high-speed parallel printer port.

The board is available in dual-ported, random-access memory configurations of 64K, 128K, 256K and 512K bytes. It operates with the vendor's Persyst PC/3270SC SNA cluster and PC/3270BC bisynchronous cluster applications software for IBM 3270 terminal emulation as well as Emulex's Persyst PC/Hasp and PC3780 software.

Persyst DCP-88/VM is priced at $695.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

INTELLUTION, INC.
ICM-4

Intellution, Inc. has announced ICM-4, an industrial communications processor for the IBM Personal Computer.

The product fits into a single-slot communications board and provides serial communications between an IBM Personal Computer and data acquisition subsystems, data loggers, programmable controllers and distributed controllers, the vendor said.

ICM-4 features 8K bytes of memory, a Zilog, Inc. Z80 microprocessor, 32K bytes of erasable programmable read-only memory and support for transmission rates between 300 and 19.2K bit/sec. It is priced at $1,595.

Intellution, 35 Forvest St., Westwood, Mass. 02090.

OSM COMPUTER CORP.
Zeusmate

OSM Computer Corp. has announced Zeusmate, an intelligent, diskless workstation for local-area networking applications.

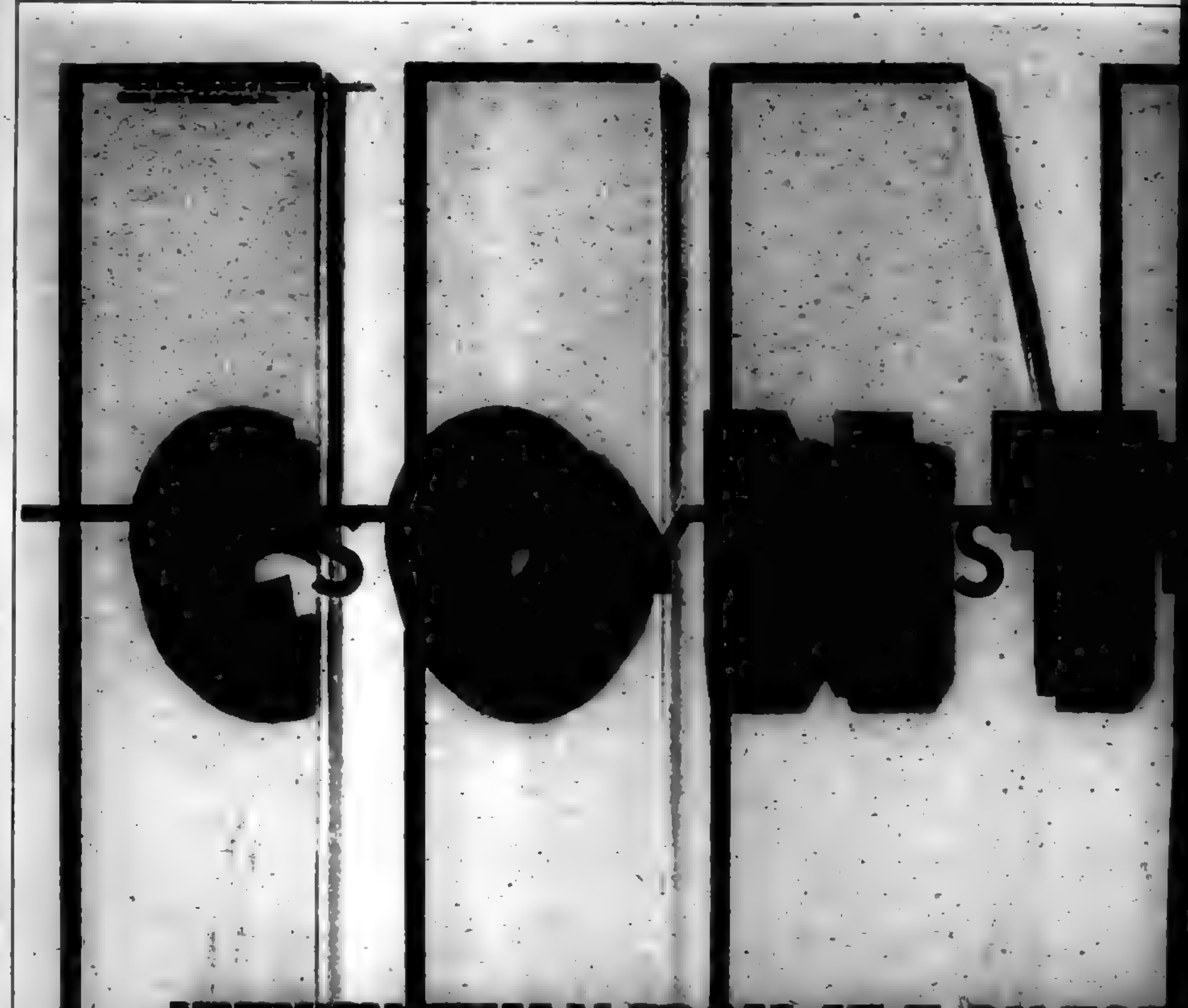
According to a spokesman, Zeusmate was designed for network interfacing with OSM Computer's Zeus microcomputers and is IBM Personal Computer-compatible.

It is equipped with an Intel Corp. 8088-2 microprocessor and an optional Intel 8087 coprocessor. Zeusmate also features an optional 5¼-in. floppy disk drive for local storage.

Zeusmate comes standard with 256K bytes of random-access memory, an 8K-byte erasable programmable read-only memory, one Personal Computer-compatible parallel interface, three expansion slots, 80-char. by 25-line monochrome video logic with graphics capability, a 12-in. monochrome monitor, a Personal Computer-compatible keyboard and Microsoft Corp.'s MS-DOS 2.11 operating system.

Zeusmate is priced at $1,495.

OSM Computer, 665 Clyde Ave., Mountain View, Calif. 94043.



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Is your company's computing system an unmanageable muddle of isolated workstations and departmental computers?

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UNIX System V is virtually hardware independent. It gives you the freedom to combine equipment from a variety of vendors. Even if the machines are of different generations.

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Don't worry about your standalone personal computers running on MS-DOS.* AT&T's PC Interface allows you to integrate your current machine into your system without costly disruptive change.

And, our COMMKIT™ Software links UNIX System V to the major networking protocols for data communications between computers based on UNIX System V and those that are not.

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LISA

from page 65

the market.

"Apple has tailored the Lisa hardware to what's happening in the real world of software development," he said.

Mario Alarcon, manager of planning integration and systems development at Los Angeles-based Northrop Corp., which designs and manufactures aircraft, said that although he expected a smooth transition to the Macintosh operating system, some users might experience problems.

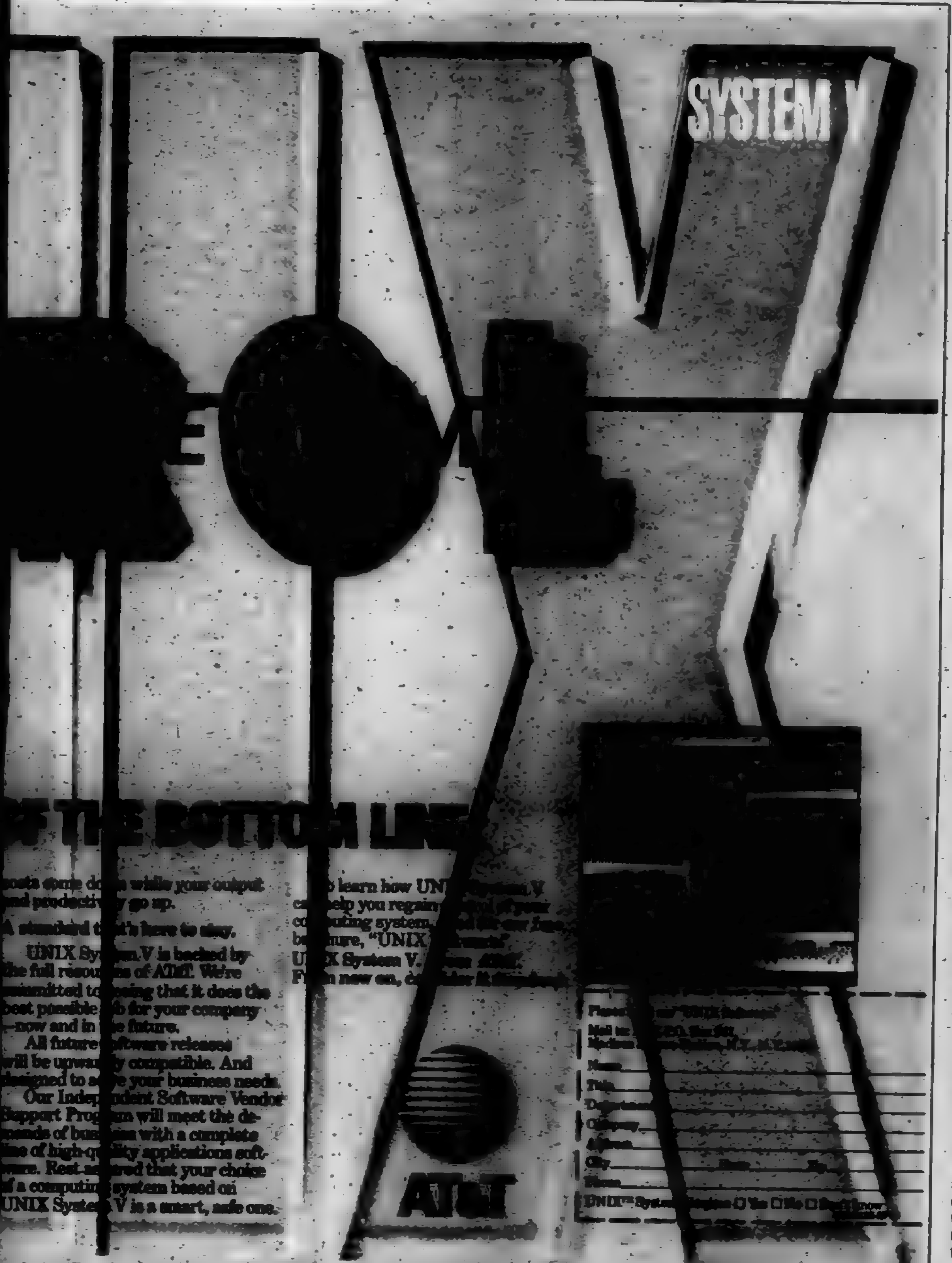
"I'm still a little concerned that the way you work in Macintosh is different enough from the integrated packages [7/7] on the Lisa side that it will cause culture shock with our users," he said. Additional training may be needed to help users make the transition, he added.

Rick Wohleberg, manager of systems development at Rockwell International Corp.'s Collins Transmission Systems Division in Richardson, Texas, said Rockwell's users were satisfied with the Lisa's integrated software programs. He said he was worried that Lisa users might be asked to give up functionality when they change to the Macintosh operating systems.

He said the Lisaproject program was a "bit stronger" than Macproject and that Lisacalc was "much easier to use" than Microsoft Corp.'s Multiplan for the Macintosh.

"I would hate to see a situation develop where the level of software on the Lisa had to be downgraded in any way to satisfy Apple's phaseout of the Lisa operating system," he said.

Joel Eide, micro specialist at Winnebago Industries, Inc. in Forest City, Iowa, also said the Lisa's 7/7 package met his firm's needs. "So the ability to switch from Lisa documents to Macintosh documents might not be that important for us," he said.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To learn how UNIX System V can help you regain control of your computing system, send for our free brochure, "UNIX [illegible]" UNIX System V. From AT&T. From now on, consider it standard.
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Name
Title
Department
Company
Address
City State Zip
Phone
UNIX™ System [illegible] ☐ Yes ☐ No ☐ Don't know

CAD

from page 65

month. Anvil 1000 is priced at $2,995 and reportedly offers side and rotational viewing of images, two-dimensional drawing, a library of stock CAD images and the ability to store images consisting of up to 20,000 components. It can store 300 drawings on a 20M-byte hard disk and runs on the Personal Computer XT and the enhanced version of the Personal Computer AT, both with the optional IBM Professional Graphics Display and math coprocessor, the vendor said.

Anvil 1000 uses a similar menu and offers many of the same features as Anvil 4000, the minicomputer-based CAD software for which MCS is best known, said Ross Stoutenborough, MCS's director of marketing. For that reason, he added, many large CAD users are looking at Anvil 1000 as a training system for their Anvil 4000 CAD systems.

Drawing Processor II

Another entry on the list of CAD systems for micros is the $995 Drawing Processor II, developed by BG Graphics Systems, Inc. of Kent, Wash. Version 2.0 of the Drawing Processor II, which debuted last month, is designed for computer-aided drafting and is available with an optional $275 mouse interface, according to Candy Lane, BG Graphics' marketing director.

Rick Bousley, a former Boeing Co. manager and now president of BG Graphics, said he produced the software after recalling the difficulties he faced in getting access time on the aerospace manufacturer's centralized CAD system. His department at Boeing exceeded its budget by 200% in his last year there because of continual changes that had to be made in its drawings, he said.

"I was paying [under a chargeback system] to have the same job done over and over," Bousley said. "With a $7,500 micro-based workstation, I would never have gone over budget."

Drawing Processor II, designed for the Personal Computer XT and AT, reportedly offers layering under which users can treat drawings as a series of separate layers; component menu extension, under which users can create their own menus for symbols or components used in their line of work; and dimensioning, under which the software generates witness or dimension lines between any two points on a drawing.

Foundyller said that the award for the most popular of all micro-based CAD systems, though, must go to Autodesk's Autocad, a product that now rivals IBM's Cadam software in number of instal-

See CAD page 74

CAD

from page 73

lations. Foundyller claimed that Cadam has 15,000 installations, while Autodesk will have 12,500 by year's end.

Maryanne Zadfar, Autodesk's director of marketing, agreed with Foundyller's estimate of Autocad's installed base and claimed the product has met such success because "We offer 90% of what you get in a mini- or mainframe-CAD system."

Autocad 2, the latest version, was introduced in October at a cost of $1,000 and reportedly offers full dimensioning, which enables a user to dimension angularly or from a center mark or radius; full hatching display, which enables a user to fill an image with cross-hatched lines; and addition of user-defined drawing entities such as fonts and symbols.

This quarter, Autodesk will begin shipments of two Autocad options, Zadfar said. Its Level 1 three-dimensional drawing add-on will be priced at $600 and provide 360-degree image rotation. Its CAD Camera software option reportedly will work with an image digitizer, such as the Wang Laboratories, Inc. Professional Image Computer (PIC) image processing system, to translate paper drawings into CAD images. With a Wang PIC, CAD Camera will cost between $7,500 and $8,200. The software alone will cost $3,000.

> ”
>
> *Some clients now specify that designs be done with CAD systems because CAD offers greater precision than hand-drawn designs.*

If the demand for low-cost CAD systems booms, Autodesk's Zadfar suggested, it will not just be because engineers want faster response times and architects want to step into the CAD world. Some clients, such as the U.S. government, now specify that designs be done with CAD systems because CAD offers greater precision than hand-drawn designs, she said.

Foundyller forecast that IBM soon will introduce a product based on AT&T's Unix that he called "Personal Cadam" for the next version of its Personal Computer or the IBM 5080 graphics workstation.

IBM will not be the first of the major vendors known primarily for mini-based CAD systems to venture into the micro-CAD world. Computervision Corp. of Bedford, Mass., is already marketing Microcad software, which uses a command structure structure similar to Computervision's Cads 4X mini-based CAD system.

Priced at $5,800, Microcad runs on the IBM Personal Computer XT and requires a minimum of 500K bytes of memory and the Intel Corp. 8087 math coprocessor. According to the Steve Ford, president of 4-D Graphics, Inc. of Reton, Wash., which developed Microcad, the software offers a "full set of three-dimensional wire frame [design system] tools."

REQUEST

from page 65

because Request automatically converts them into the syntax the program uses once the user selects it from a menu.

- When records are entered in the data dictionary, those with common fields are linked by an indicator, allowing the user to retrieve related information with a pointer.
- Question-mark processing allows users who have forgotten a field name to type in a question mark and get a display of field names to prompt their memories.
- It can manage up to 65,000 records and find one record among the 65,000 in three seconds.

The MS-DOS version will sell for $695 for a single-user micro and $1,500 for multiuser machines.

System Automation Software is located at 8555 Sixteenth St., Silver Spring, Md. 20910.

PIRACY

from page 65

chip to do it."

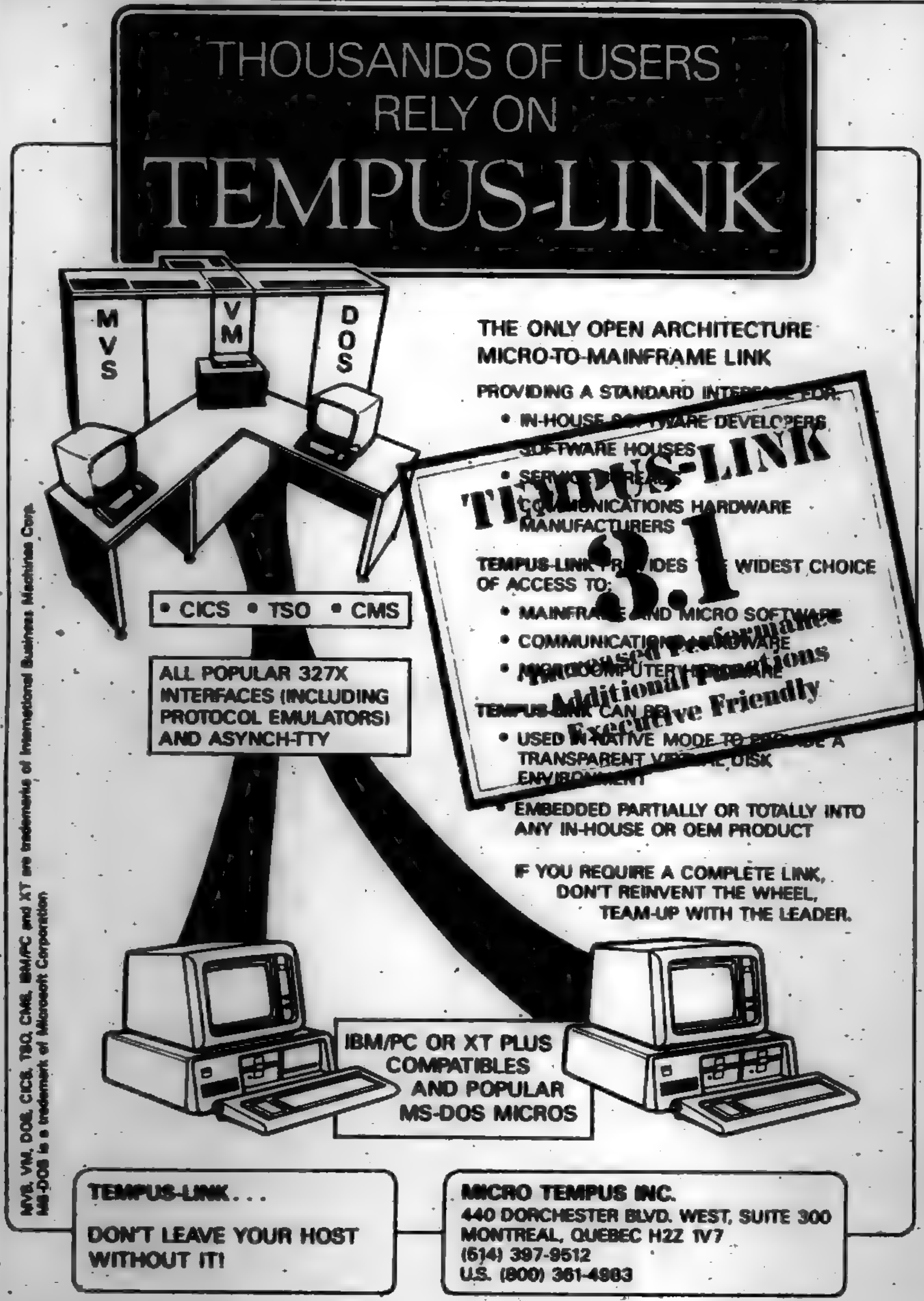
Then there is the question of whether software vendors intend to swallow all the expenses and write them off against the loss of revenue from pirated copies.

So there is not unanimous agreement on this approach. Among doubters, Digital Research, Inc. President John Rowley said it seems a clumsy solution to a problem that may be overblown.

Many others feel that litigation is a more promising deterrent to software piracy. Russell Gee, vice-president of Access Technology, Inc., offered another alternative: "I'd like to see everyone take the software creed — raise your right hand and swear that you're going to be good boys and girls," he joked.

In any case, users may end up with a hardware/software remedy regardless of whether they want it, as major vendors, including Lotus, Microsoft Corp. and Ashton-Tate are backing the move. IBM is waiting on the sidelines at the moment.

Many in the industry view Lotus as the main force behind the effort, although the Adapso committee has been scrupulous about requesting comment from any concerned. But the work "is not just for the software industry," emphasized committee member Marv Goldschmitt, vice-president for business development at Lotus. "We're a service industry, and we must keep that in mind."



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COMPUTER INDUSTRY

Views vary on cause of HP exec exodus

By Kathleen Burton
CW West Coast Bureau

Paul Ely Jr., the recently named president of Convergent Technologies, Inc., is not the first high-powered Hewlett-Packard Co. executive to heed the siren call to pilot an entrepreneurial company into uncharted waters.

Besides Ely, other senior-level executives who have left HP's fold since July are Edward McCracken, a 17-year HP veteran who is now chief executive officer (CEO) of Silicon Graphics, Inc. in San Jose, Calif.; Edward Hayes, who left HP last fall to become marketing vice-president at Plexus Computers, Inc. in San Jose but who has since returned to HP; and Richard Moore, former general manager of HP's engineering division and now CEO of Valid Logic Systems, Inc. in Santa Clara, Calif.

Company insiders said the reasons for the executives' departure are varied, but opinions are divided about whether this exodus was caused by the recent ferment and change within HP.

McCracken, who left HP last July to head Silicon Graphics, a small start-up firm that designs very large-scale integration chips for engineering workstations, said he left primarily for the challenge of leading a fledgling company into a new marketplace. Predicting the HP exodus will pick up steam in the months ahead, McCracken said: "Recruiters know that HP, with its small-group-oriented entrepreneurial atmosphere, is a good breeding ground for developing top managers with the necessary skills to turn around troubled start-ups."

Hayes, another HP veteran who served as general manager for HP's business computers group from 1980 to 1984, left the company in September for a post at Plexus, a more freewheeling start-up, but has since returned to HP. According to an HP insider, Hayes missed HP's support structure where "everything clicked organizationally."

But analysts and HP insiders said Moore's abrupt departure from the company last year was the result of the reorganization of the computer-aided engineering department he had headed.

Roy Verley, HP's public relations director, denied that HP is the culprit in the recent talent outflow. Verley said the July reorganization, which shuffled divisions and personnel within the company, may have caused dissatisfaction among some senior executives, but, more importantly, a severe shortage of seasoned managers is causing "headhunter fever" in the Silicon Valley. That has caused start-ups to offer attractive benefits and salary packages to lure top-level executives.

See HP page 90

- A strategy of helping MIS and DP gain control over microcomputer proliferation has produced a 770% revenue growth for a California-based distributor/78
- The tightly held Computerland Corp. is the subject of a bitter lawsuit under way in California; at the heart of the issue is an old IOU that may be convertible for 20% of Computerland's stock/82
- The planned $16 million acquisition of Visual Technology Corp. by Lee Data Corp. was called off recently; Visual Technology reported a large loss for the quarter and restated earlier results/89

No quick recovery for chips

Analysts adjust growth forecasts to slack mart

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — Semiconductor manufacturers are facing pressures from a slack semiconductor market, and analysts said no substantial recovery is expected until the middle of the year.

Surprised by the weakened demand for semiconductors, chip industry analysts are cutting their growth projections. Dataquest, Inc., a San Jose, Calif.-based market research firm that last year projected the chip industry would grow 22% in 1985, now estimates about a 6% growth for the year, according to a company spokesman.

Semiconductor demand soared six months ago, and most companies added staff and ramped up capacity, adding new plants and equipment. Now the situation is reversed, and customer demand is down, but the staff and equipment remains, causing high overhead, according to Sheilah Sandow, a spokeswoman for the Semiconductor Industry Association (SIA) in Cupertino, Calif.

SIA President Tom Hinkelman predicted a 2% to 5% growth rate for the U.S. market this year, down from an earlier 21% prediction. In November, chip makers received new orders at an average monthly rate of $589.9 million for the U.S. market, a decline of about half from the booking rate six months before, and in December, the book-to-bill ratio — a comparison of semiconductor shipments to orders — fell to 0.58, an industry low, Hinkelman said.

> *Surprised by the weakened demand for chips, industry analysts are cutting their growth projections.*

Industry watchers said the somber atmosphere in the industry is reminiscent of

See CHIP page 90

Xerox declares Shugart unload

By Kathleen Burton
CW West Coast Bureau

SUNNYVALE, Calif. — Xerox Corp. recently announced it will phase out Shugart Associates, Inc., the disk drive manufacturer it purchased in 1978, and said it expects to lose $85 billion from the decision to close or sell Shugart's various divisions.

Xerox, based in Stamford, Conn., purchased the hard- and floppy-disk manufacturer nine years ago for $41 million in Xerox stock. Since then, industry watchers say, Shugart has been poorly managed, new products have not kept pace with the competition and key management talent has left the company for more lucrative start-up ventures.

James R. Lamb Jr., a Xerox spokesman, said Shugart was being phased out because competition within the industry eroded prices and caused substantial losses and because Shugart's products "are not strategically important to Xerox's long-range plans." Xerox will reallocate Shugart re-

See SHUGART page 89

Will export review work?

INDUSTRY INSIGHT
Bryan Wilkins
CW Staff

Four years of tense jurisdictional fighting between the U.S. Department of Commerce and the Department of Defense over computer exports recently concluded when President Reagan ordered a resolution. Simply put, the U.S. will be as strict as it can in preventing any technology with a potential military application from reaching the Soviet Union and its allies. The DOD will make sure of it.

The International Trade Administration, a subagency of the Commerce Department whose job it is to promote U.S. goods overseas as well as approve export licenses, has somewhat successfully fought to limit the DOD's role in reviewing export licenses. Reagan's decision, however, allows the DOD to look at export licenses that contain equipment capable of military applications bound for countries thought of as U.S. allies, such as Sweden, Austria, Switzerland and Taiwan.

There will be a limit of 15 non-Communist countries on the DOD agenda at any one time, in addition to the Eastern bloc countries already restricted for the export of

See EXPORT page 89

Walker scales back operations, lays off a third of work force

SAN FRANCISCO — In a move described as an "adjustment" following a three-year period of rapid growth, Walker Interactive Products, Inc. last month laid off about a third of its work force and scaled back its applications software operations.

Layoffs were rumored to number about 100 employees, a figure which was described as "fairly accurate" by a Walker employee. Walker now employs about 180 people worldwide, a company spokesman said.

Walker President Richard Currier said the actions were prompted by increased competitive pressure and a need to slow Walker's growth rate. "We've had [a] 25-to-one growth in the last three years, and we're rethinking whether it's possible to continue to grow at that rate," he said.

Currier noted that price-cutting competition in the applications software market became so intense in 1984 that Walker was not meeting sales projections.

He said cuts have been made across the board throughout the company, with the exception of the recently formed systems software division. "They are now experiencing the kind of growth that Walker as a company experienced two years ago."

The changes were also prompted by high-level management changes that recently brought in Craig Carlson, formerly of Electronic Data Sys-

See WALKER page 89

China looks to West to meet industrial computer

OUTSIDE LINES
Bohdan Szuprowicz

The formation of IBM China, sales of shares in Chinese companies to the public, talk of establishing a stock exchange and a recent Sino-Soviet detente in the commercial area are radically changing the rules of the game in the China market.

Companies that have been rushing headlong to supply China with the latest high-technology products may now have second thoughts, and most of these companies are bound to refocus their marketing policies.

Energy, transportation and electronics are now the three top development priorities in China. This should not surprise anyone who is aware that more people in China than in the entire U.S. still have to make do without electricity.

Electric power generation and its distribution are an immediate necessity before almost a quarter of China's population of one billion can switch on an electric bulb at night, let alone plug in a personal computer.

Nevertheless, China's work force is estimated at almost 450 million in a centrally planned economy that gives rise to an unmatched gargantuan bureaucracy.

Key to modernization

Slowly but surely the Chinese are beginning to realize that the key to modernization is the computerization of massive central files in numerous industries. These industries require powerful high-speed mainframes with huge storage capacities, reliable telecommunications and local-area networks and large numbers of personal computers, workstations or terminals. With a massive training effort of a standardized nature required, only organizations of IBM caliber are up to that task.

Until a few years ago, China pursued domestic manufacturing of large, medium, mini- and microcomputers based on some licenses and reverse engineering programs. In 1984, it even announced the development of its first supercomputer, known as the Galaxy 100, which reportedly has a top speed of more than 100 million operations per second.

But as years went by, China became very much aware that, like its previous large-scale computers, only a few units will be built before these are rapidly made obsolete by Western hardware developments. In fact, since 1958, China has developed approximately 200 different computer models, but only 10 of those have reached serial production of a few hundred units at best.

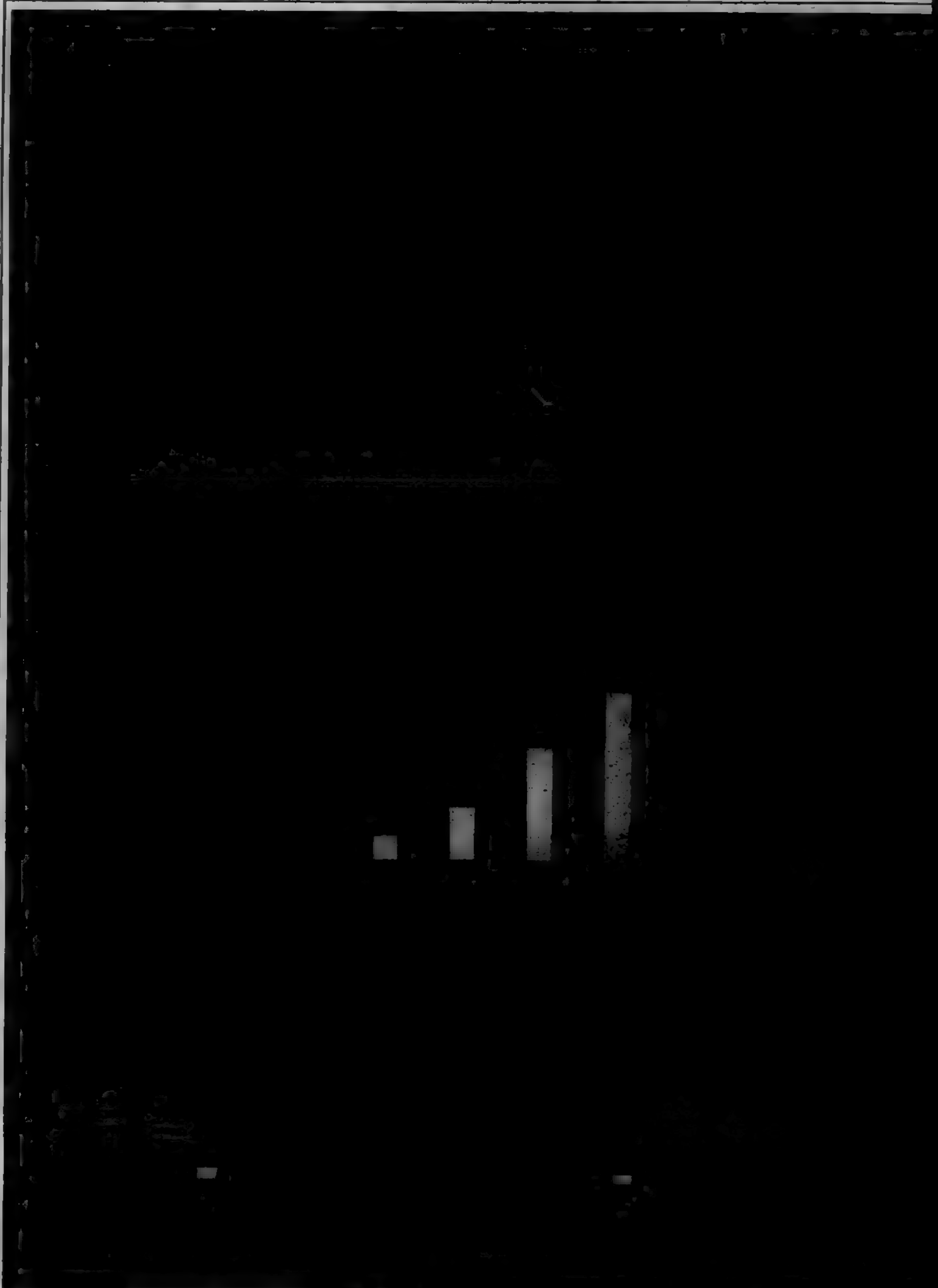
As a result, at the outset of the current 1981-85 five-year plan, China drastically changed its policies pertaining to the development of electronics in general and the computer industry in particular.

Current plans

Current plans call for a concentrated effort to develop significant manufacturing capabilities in micros , an effort expected to reach 10,000 units manufactured in 1985 and four times that level by 1990. Recent imports of large quantities of microcomputers from various vendors appear to be a temporary measure to meet immediate demand and acquire manufacturing know-how for domestic production.

Although China also expects to increase its production of medium systems, mainframes and minicomputers to about 1,000 units in 1985 and almost double that by 1990, its new policy calls for continuing imports of large and medium systems.

The huge potential of that market does not become ap-



Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

needs, but less reliance seen on micro imports

parent until one considers the overall computerization objectives of the country. The import of modern mainframe systems is critical to China because its immature data processing industry is now becoming a bottleneck to modernization of its large industrial plants in all sectors of the economy.

More specifically, Chinese ambitions for 1990 are to achieve a computerization level per million of population comparable with that of Spain in 1975; this could mean an almost tenfold increase in the number of mainframes and minicomputers.

But China cannot come anywhere close to that goal without a massive import program of mainframe systems from the West. This apparently is one of the reasons why IBM moved so swiftly into China. The company is expected to install 60 mainframes in China during 1985, twice the number of all IBM machines installed since 1979.

During the last few years, China has accumulated almost $20 billion in hard currencies, which is more than enough to pay for a massive mainframe import program to meet the 1990 computerization objectives. At the same time, any production of IBM 5550 desktop machines in China could offset some of the cost through exports to the rest of the world. IBM already purchases Chinese-made transformers and computer covers, and the potential for offset trade in this area is huge.

The proposed trade escalation with the Soviet bloc will also save China more hard currency because it can obtain Soviet power generation equipment, trucks, rolling stock or even aircraft in exchange for Chinese textiles and agricultural products, for which there are limited markets in the West.

On the other hand, this new Sino-Soviet detente may increase Western pressures for stricter export controls of computers and telecommunications equipment to China.

Soviet access to West

It is conceivable that advanced Western mainframes could end up in plants originally built by the Soviets; under a new arrangement, the Soviet Union is going to modernize these plants, thus gaining access to Western technologies.

There are also some political analysts who maintain that there is a significant group of Chinese communist and military leaders who are not happy with the quasi-capitalist innovations of recent years. Since Deng Xiaoping is already 80 years old, the analysts fear that after his death, China may once again be in the throes of a domestic upheaval.

The current Chinese play of the "Soviet Card" is an indication of the direction in which things may move in the future.

Whatever happens, however, it appears certain that China intends to establish itself as a low-cost manufacturer of microcomputers and other electronic products and may be eyeing Eastern and Western markets simultaneously.

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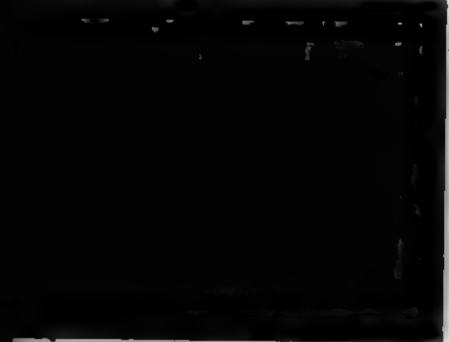

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Firm raises revenues 770% with on-line guide to micros

By Peter Bartolik
CW Staff

FRAMINGHAM, Mass. — Helping MIS/DP managers gain control of microcomputer hardware and software proliferation resulted in a 770% revenue growth last year for a California-based distribution and service company.

One Point of Walnut Creek, Calif., was formed in early 1982, a year in which it sold $10,000 worth of microcomputer products. In 1983, the company experienced total sales of $1.5 million and in 1984, skyrocketed to sales of $11.4 million, according to company founder and President Stevan Cloudtree. With plans to open five regional offices this year, the company is anticipating sales of more than $30 million, Cloudtree said in a recent interview here.

Cloudtree said the creative spark behind the founding of One Point occurred when he was general manager of a company and was caught up in the acquisition of microcomputers and selection of software. "The kind of information I wanted and was used to getting for minicomputers and mainframes was just not available for micros," he said.

Seed money funds on-line data base

With seed money provided by company cofounder and Executive Vice-President Jonathan Hathaway, who spent 20 years in sales positions with IBM, One Point developed proprietary software to operate an on-line data base for dissemination of product information and order processing.

Backed by venture capitalists, the company made the One Point Information Network available over Tymnet, Inc.'s Tymshare service, providing daily updated information on available products.

According to Cloudtree, MIS/DP executives at large companies are "besieged [and] under lots of stress" as microcomputers proliferate and end-user demands multiply. MIS/DP departments, he said, are under pressure both from management to improve productivity and from users for improved service and support.

Users are beginning to ask for diversified software products that offer job-specific functions, and micro support groups within corporate organizations are beginning to buy stripped-down micros and adding on equipment features that best serve their needs, Cloudtree asserted.

Complicating those facts of life is the tendency of small microcomputer software suppliers to compete solely on price and minimize service and support functions.

Prepurchase consulting available

Cloudtree said One Point eases the pressures by providing MIS/DP departments with prepurchase consulting that can include information on likely vendor support, comments on particular packages by previous users and evaluation packages.

The key component of the company's various offerings, which include educational seminars, is the information network that Cloudtree said can be customized for use on the user's local-area network. "Our job is to help MIS/DP manage the micro explosion," Cloudtree said.

While cost is always an important consideration, MIS/DP is most concerned about what can be expected from both vendor and product after a purchase is made, he said. Another concern is scheduling delivery of products to fit in with the MIS/DP implementation schedule, he added.

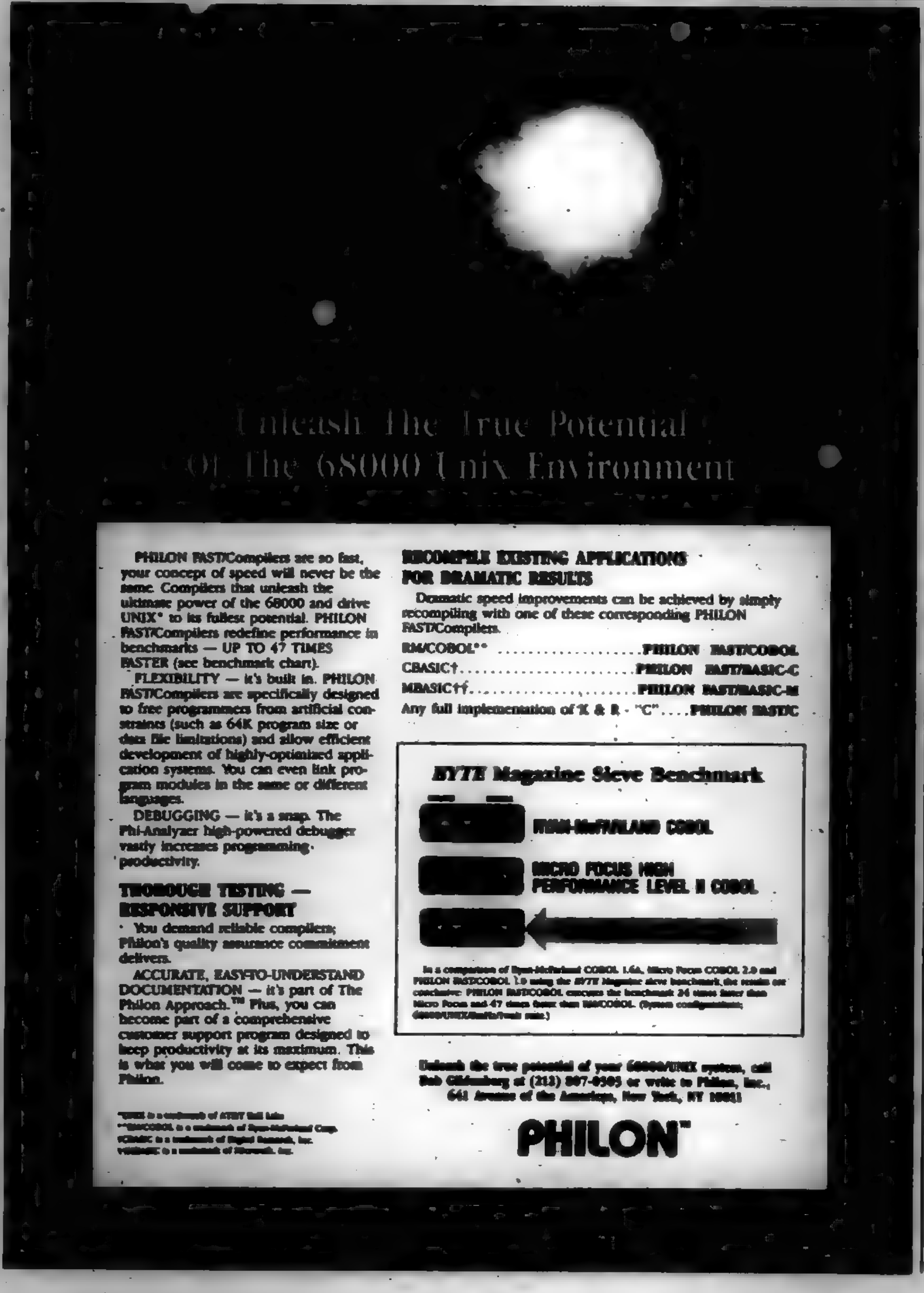
> ***'The kind of information I wanted and was used to getting for minicomputers and mainframes was just not available for micros.'***
>
> **—Steven Cloudtree**
> ***One Point***

One Point's solution, according to Cloudtree, has earned it 500 customers among the Fortune 2,000 ranking.

Actual distribution of products "is a low-margin, very competitive business," Cloudtree said. The key to funding the company's expansion plans is the proprietary, higher margin information network. In its effort to build value into that service, the company developed a software package that automatically will connect an IBM Personal Computer-compatible microcomputer into the data base via a Hayes Microcomputer Products, Inc. Smartmodem.

Providing ease of use in a communications service, according to Cloudtree, "allows any user within a corporation to have access" to it without having to learn complicated dial-up routines and without having to undergo rigorous training to use the service.

Branching out, One Point recently reached an agreement with First Software Corp. of Lawrence, Mass., to make a version of the One Point network available for retail stores. First Software will underwrite the cost and plans to place the service in 1,000 retail stores.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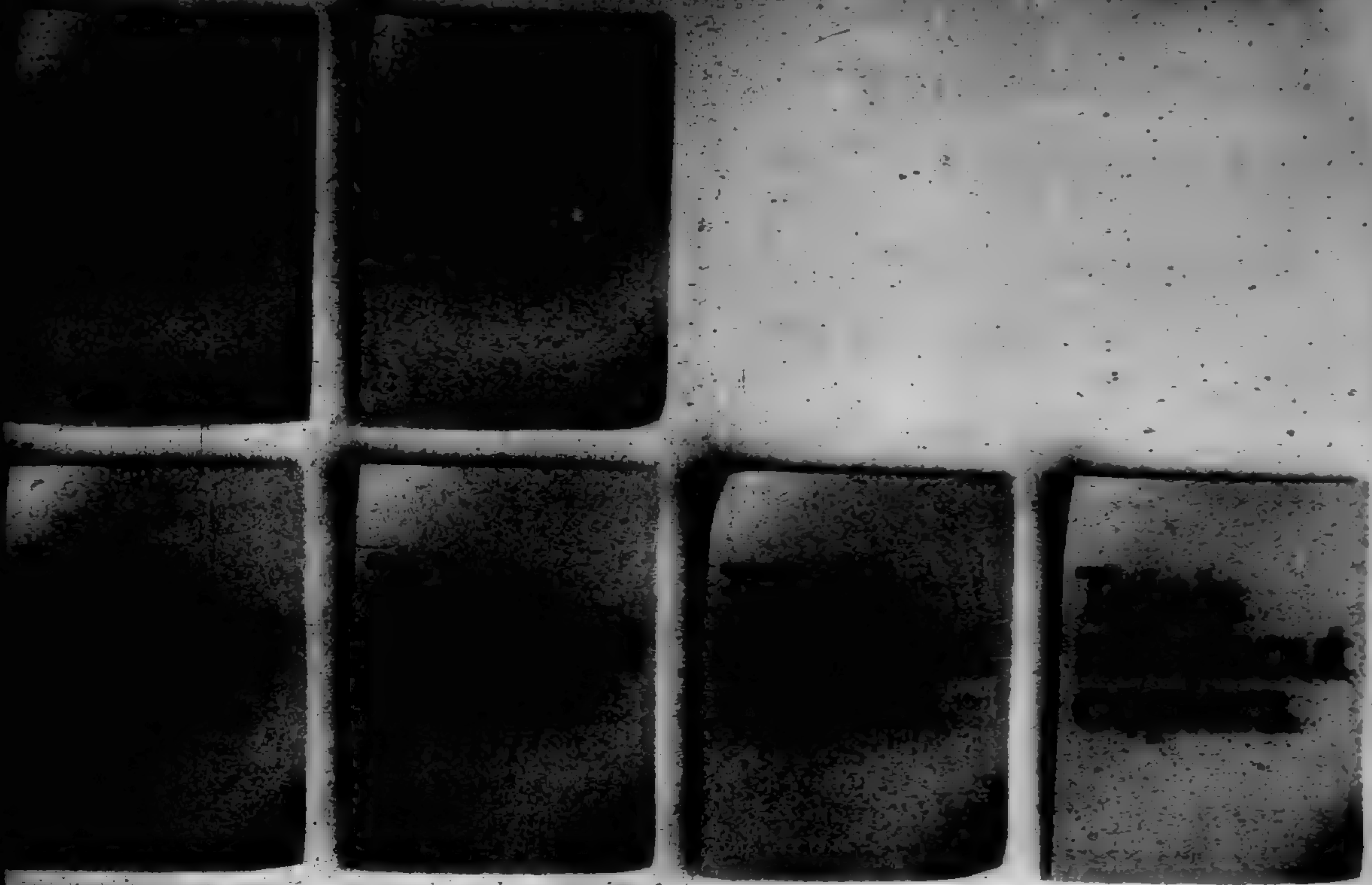

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*Industry report refers to IDC Industry Report

Court rules in Apple's favor in dealers' antitrust suit

LOS ANGELES — A U.S. judge recently awarded a summary judgment in favor of Apple Computer, Inc. in an antitrust suit lodged by six retail computer distributors concerning Apple's policy prohibiting mail-order sales.

U.S. District Judge Pamela Ann Rymer ruled that the six distributors had failed to show sufficient evidence to support a reasonable finding in favor of their claims that Apple was restraining trade when in November 1981 it modified its dealer agreements with retail stores and chains to prohibit mail-order sales.

An earlier attempt by Apple to have a summary judgment entered was denied in 1983, even though the judge hearing the case at that point had declined to issue a preliminary injunction against Apple and expressed doubts about the merits of the claims by the dealers. According to case law cited by Rymer, summary judgments should be used sparingly in complex antitrust cases. In the Apple case, however, there was no evidence for a finding in favor of the dealers based on a recent court case that required more stringent evidence in cases of distribution agreements.

No after-sales support

Apple had argued that it was necessary to prevent mail-order sales because dealers engaging in mail-order practices did not provide the after-sales support Apple determined was necessary to promote a favorable business climate in a highly competitive market. Apple said dealers that provided after-sales support were placed at a competitive disadvantage.

The antitrust suit was filed in December 1981 by six computer dealers: OSC Corp. (also known as Olympic Sales Co.); Computer Consoles, Inc.; Advanced Computer Products, Inc.; Custom Computers; Computer Specialists; and Micro Business World, Inc. The dealers argued that the mail-order policy was designed by Apple in conjunction with several of its larger dealer accounts as an attempt to cut discounting practices. The court held there was no evidence of such a conspiracy, noting that discounting occurred after the mail-order policy was established and that agreements with Apple allow dealers to set prices.

Gary L. Reback, a Palo Alto, Calif., attorney with the firm of Fenwick, Stone, Davis and West representing Apple, said the case provided vendors "with greater leeway over controlling distribution."

The ruling, according to Reback, allows manufacturers to exert controls over distribution channels to ensure that products are marketed in a manner that promotes the manufacturers' competitiveness.

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Computerland fights investors

By Kathleen Burton
CW West Coast Bureau

OAKLAND, Calif. — In a major legal battle begun earlier this month in Alameda Superior Court here, Computerland Corp., the country's largest personal computer retailer, is attempting to stave off outside investors who are pressing a claim for 20% of the company's stock.

At stake are Computerland assets valued at between $300 million and $600 million, dividends and interest up to $12 million and punitive damage claims that could total $300 million, said Herbert Hafif, attorney for plaintiff John Martin-Musumeci, a former Computerland executive. Hafif said a settlement could threaten Computerland founder William Millard's hold on the closely held firm.

Millard and his family currently hold 94% of Computerland's outstanding stock. The Hayward, Calif.-based company has 776 franchises and stores in 25 countries and had a 1984 sales goal of $1.5 billion.

Dispute deals with IOU

The dispute centers around an IOU based on a $250,000 venture capital investment made in Computerland in 1976 by a Massachusetts-based venture capital firm, Marriner & Co. The IOU, which Martin-Musumeci claims is convertible into a 20% share of any one of several Millard-owned companies, was bought from Marriner in 1981 by Micro/Vest, a company started by Martin-Musumeci.

Micro/Vest, based in Morago, Calif., filed suit in April 1981 when Computerland disputed its claim for the note.

Hafif said the case is centered around the fact that the Computerland assets are both assignable and convertible to another purchaser.

Oral agreement crucial

Millard's attorneys claimed that an oral agreement with Marriner's principals specified that the stock conversion option could not be transferred to outside investors and that the stock conversion rights applied only to several other small Millard businesses.

Opening arguments began Jan. 14.

The trial could last for up to two months, attorneys said.

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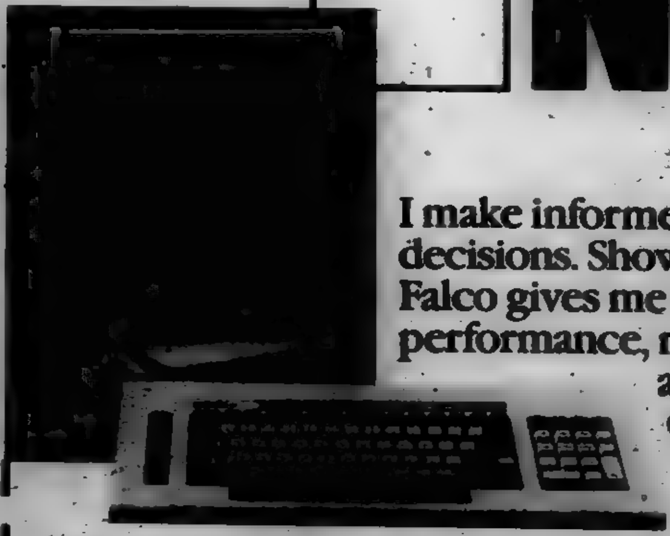

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Studies relate birth defects to high-tech toxins in water

By Kathleen Burton
CW West Coast Bureau

SAN JOSE, Calif. — Miscarriages and birth defects occurred at two to three times the average rates in areas where water supplies were contaminated by chemicals used in high-technology manufacturing, according to two related studies recently released by state and county health agencies.

The two-year studies were conducted by the California Department of Health Services and the Santa Clara County Health Department. Both agencies studied infants born between 1980 and 1981 in a San Jose suburb that had been contaminated by toxic leaks from a nearby Fairchild Camera and Instrument Corp. semiconductor plant.

Study results indicated that the rate of miscarriages in the test group was 2.4 times greater than in the control group, the birth defect rate was 2.5 times greater than the national rate, and the rate of major heart abnormalities in the infants was three times greater than the control group, according to public health officials. The control group was a nearby community with no known water contamination, the health officials said.

The water in the San Jose neighborhood of Los Paseos was contaminated with TCA (also called methyl chloroform), a chemical solvent used to clean grease from semiconductors, health officials said. While the study did not directly link the birth abnormalities to the contaminated water, conventional causes of birth defects, such as smoking and the medical histories of the mothers, were ruled out, according to health officials.

The Fairchild leak was discovered in December 1981 in an underground storage tank near a well that provided drinking water to part of Santa Clara's Great Oaks Water District, said Kenneth Kiser, deputy director of the California Health Services Department. After the leak was discovered and the well shut down, subsequent tests found that toxins in the water were sometimes up to 800 times higher than the state's recommended levels, Kiser said.

Although contaminated drinking water cannot be ruled out as a contributing cause, there are still incongruities relating the Fairchild spill to birth defects, Kiser said. According to Kiser, a major uncertainty remains as to whether the seepage began before 1981. Additionally, Kiser said, the faulty tank contained a variety of solvents, and it is uncertain which toxins were involved. To clarify these matters, Fairchild will provide additional documentation and data about the chemicals, Kiser said.

Francine Plaza, communications manager for Fairchild, said that the report substantiated Fairchild's position that several factors besides the leaks may have contributed to the defects. "The study raised more questions than it answered," Plaza claimed, and said it focused on "random samples of people in the wrong place at the wrong time."

There are currently more than 400 lawsuits pending against Fairchild from Las Paseos residents who claim that the contaminated water caused cancer, brain damage and birth defects, according to Gerson Smoger, a lawyer for the residents.

Cliff Bowen, district engineer for the California Public Health office in Berkeley, said approximately 100 toxic leak sites affecting local water supplies have occurred in the Silicon Valley over the past two years. Most major electronics firms in the area are involved, he said, including IBM, National Semiconductor Corp. and Teledyne, Inc. Fairchild and IBM have each spent more than $20 million to remedy the leaks, he added.

Bernice Giansiracusa, County Director of Public Health for Santa Clara, said air pollution could not be ruled out as a possible cause of health abnormalities. Giansiracusa said the U.S. Environmental Protection Agency will examine air quality in the area as part of a larger project.

California Gov. George Deukmejian has earmarked $625,000 in his proposed 1985-86 budget to continue the investigation, health officials said.

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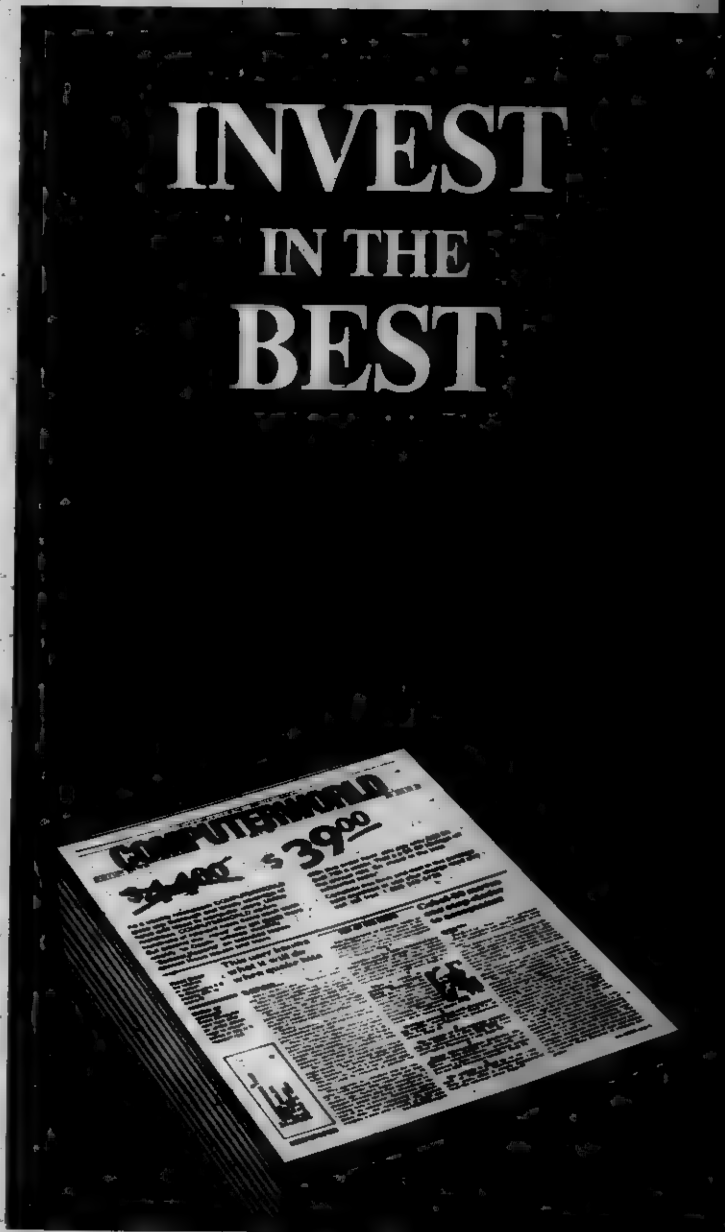
Poppa takes over as STC chairman

LOUISVILLE, Colo. — Ryal R. Poppa, formerly chairman and president of BMC Industries, Inc., was recently named chairman and chief executive officer of Storage Technology Corp (STC). Poppa, named to succeed STC founder Jesse I. Aweida, was charged with the task of bringing STC through a reorganization under Chapter 11 of the Federal Bankruptcy Act — a task that most analysts now believe will be based on selling off some of STC's divisions.

Before taking over as head of St. Paul, Minn.-based BMC, an electronics parts manufacturer, Poppa headed Pertec Computer Corp., which was acquired by Triumph-Adler AG.

Poppa was given a court-approved salary package that included a $300,000 annual salary, bonus and stock provisions and termination compensation of $900,000 in the event STC is sold or liquidated.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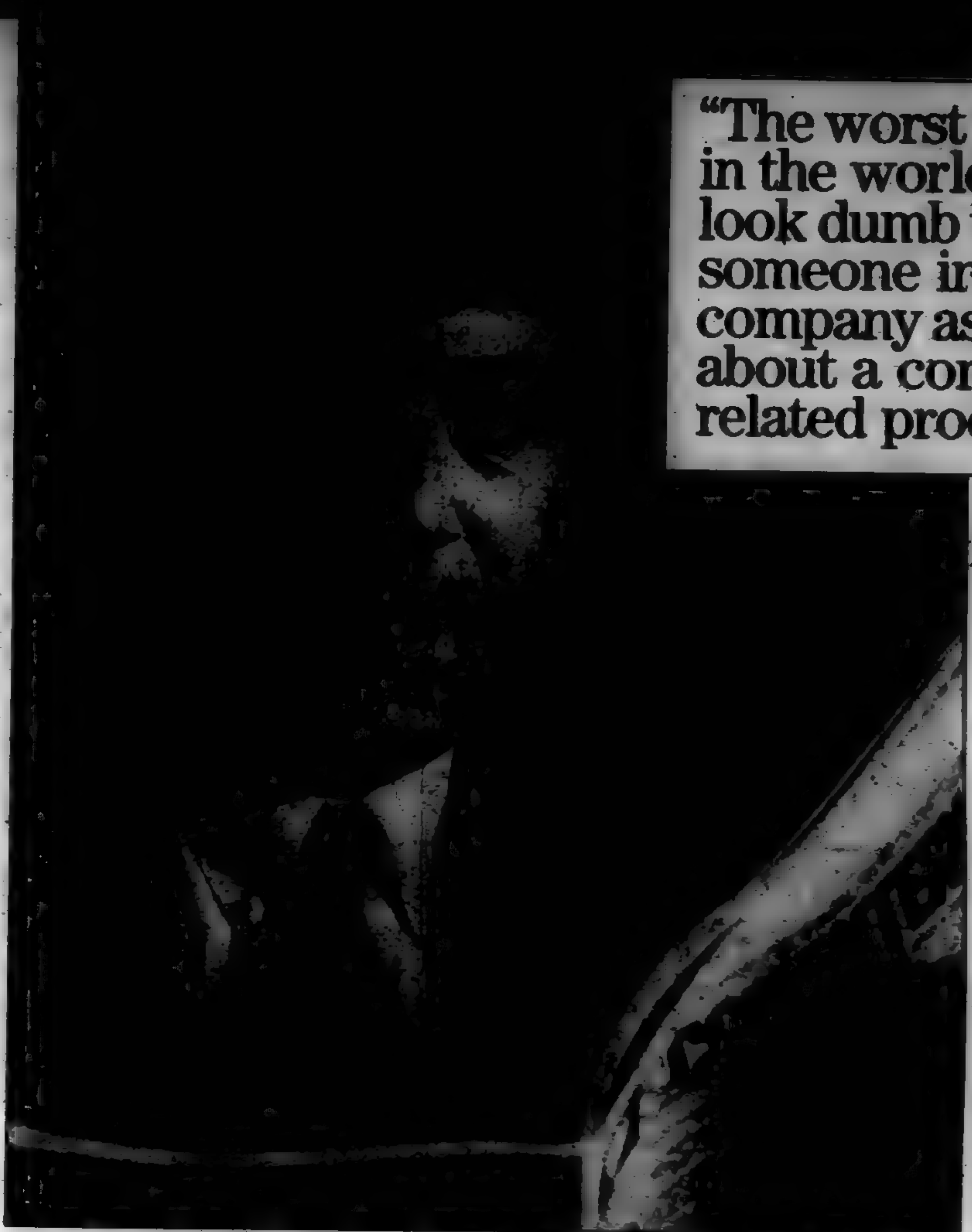

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Sperry's third-quarter profits down despite revenue increase

NEW YORK — Sperry Corp. reported last week that third-quarter profits from continuing operations were down 10% compared with one year earlier, while revenue increased 23%.

Profits for the third quarter were $61.2 million, or $1.09 per share, compared with year-earlier profits of $68.1 million, or $1.32 per share. Revenue for the quarter was $1.45 billion, compared with $1.18 billion a year earlier.

Sperry pointed out that it took an after-tax charge of $12.7 million, or 23 cents per share, against earnings as a result of an arbitration proceeding with the government of Israel. In the third quarter a year ago, the company also experienced a nonrecurring after-tax gain of $10.1 million, or 20 cents per share, from the sale of a facility.

Disregarding the after-tax charge and last year's extraordinary gain, "Income from continuing operations in the current quarter rose 27% over last year," a spokesman said.

The company's Information Systems segment, under a reorganized structure announced in September, experienced revenue growth of 43% and operating profit growth of 30% over the year-earlier period.

Honeywell cites Synertek loss in fourth-quarter profit slump

MINNEAPOLIS — Posting a $70.6 million write-off related to its decision to dispose of its semiconductor subsidiary, Honeywell, Inc. recently announced that its fourth-quarter profits slumped to $31.8 million, or 68 cents per share, compared with year-earlier profits of $91.9 million, or $1.96 per share.

For fiscal year 1984, Honeywell reported profits from continuing operations were up 33% to $334.8 million, or $7.14 per share, compared with 1983 profits of $250.7 million, or $5.46 per share. Those results included an extraordinary gain of $40 million, or 85 cents per share, reported in the third quarter as a result of tax law changes affecting domestic international sales corporations.

Total net income for the year, reflecting the decision to sell the Synertek, Inc. semiconductor subsidiary, was $239 million, or $5.10 per share, compared with $231.2 million, or $5.03 per share, in 1983. That included losses from the Synertek division of $25.2 million, or 54 cents per share. Fourth-quarter profits from continuing operations were $110.4 million, or $2.35 per share, compared with year-earlier profits of $102.9 million, or $2.22 per share. But total fourth-quarter results, including the Synertek write-off and a fourth-quarter loss by Synertek of $8 million, or 17 cents per share, reduced the net profits to $31.8 million.

On the bright side, Honeywell reported that operating profits from its Information Systems division increased to $180 million in 1984 from $130 million in 1983. Operating profits from its Control Products division rose sharply to $141 million in 1984, compared with $83 million in 1983.

ADP reports revenue boost

ROSELAND, N.J. — Automatic Data Processing, Inc. (ADP) recently announced revenue of $253.6 million for the second quarter ended Dec. 31, up 16% from $218.4 million one year earlier.

ADP reported that profits for the quarter were up 15% to $20.1 million, or 57 cents per share, compared with profits of $17.5 million, or 50 cents per share for the year-earlier period.

Josh S. Weston, president and chief executive officer of ADP, said, "Stronger than anticipated new account revenue growth in Employer Services offset continuing low trading volume in Brokerage Services."

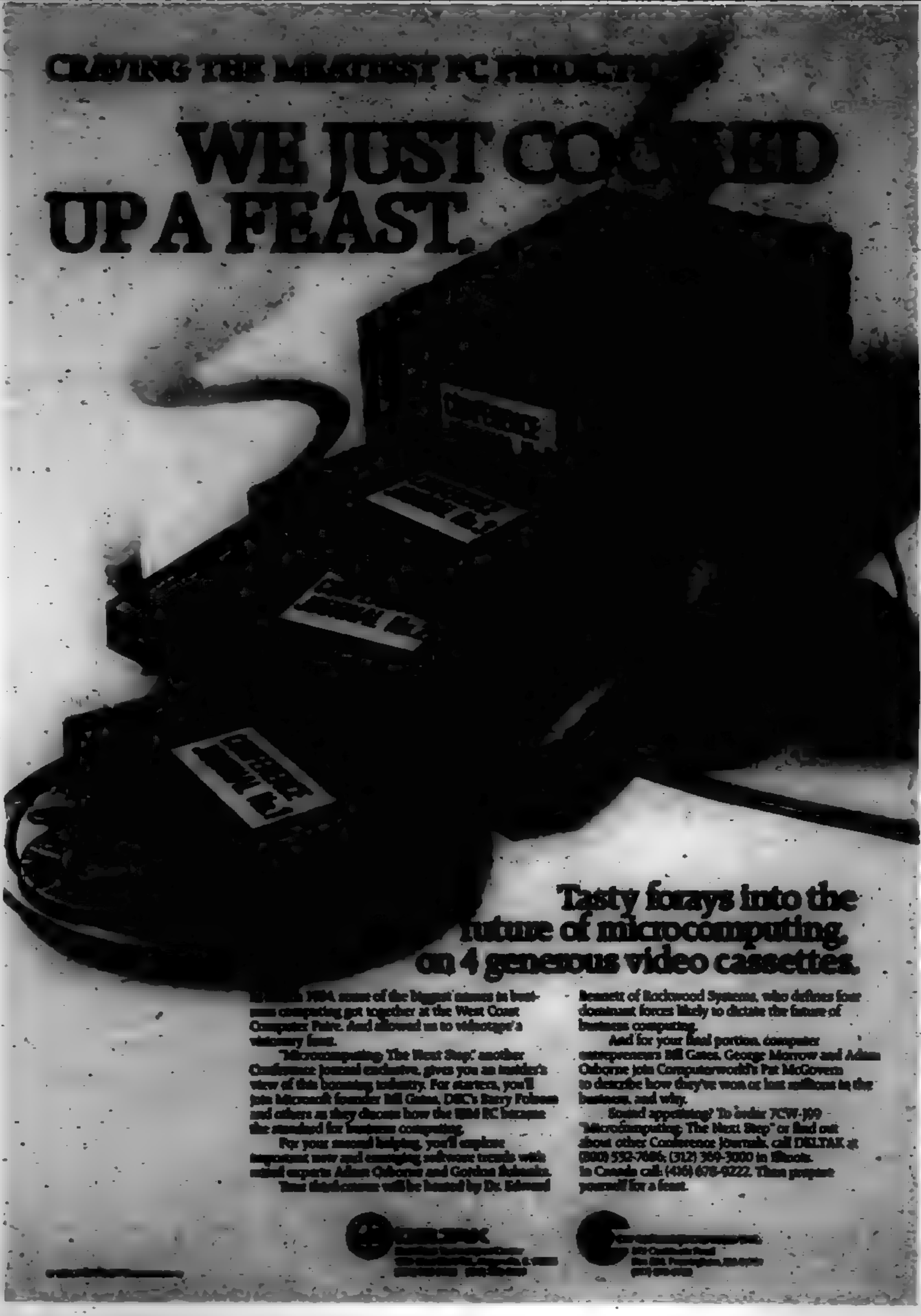
Weston said the results were consistent with earlier estimates of 15% or better growth in revenue and profits for the year.

Tektronix set to acquire CAE

BEAVERTON, Ore. — Tektronix, Inc., a manufacturer of electronic test and computer graphics equipment, recently said it has reached preliminary agreement to acquire CAE Systems, Inc. in a $75 million transaction.

Tektronix said that, subject to negotiation of a formal agreement and approval by both Tektronix and CAE Systems, it will acquire CAE Systems through an exchange of stock and it will operate the firm as a separate subsidiary.

CAE Systems is a privately held company based in Sunnyvale, Calif., and is the producer of CAE 2000, a software package for design capture and design verification.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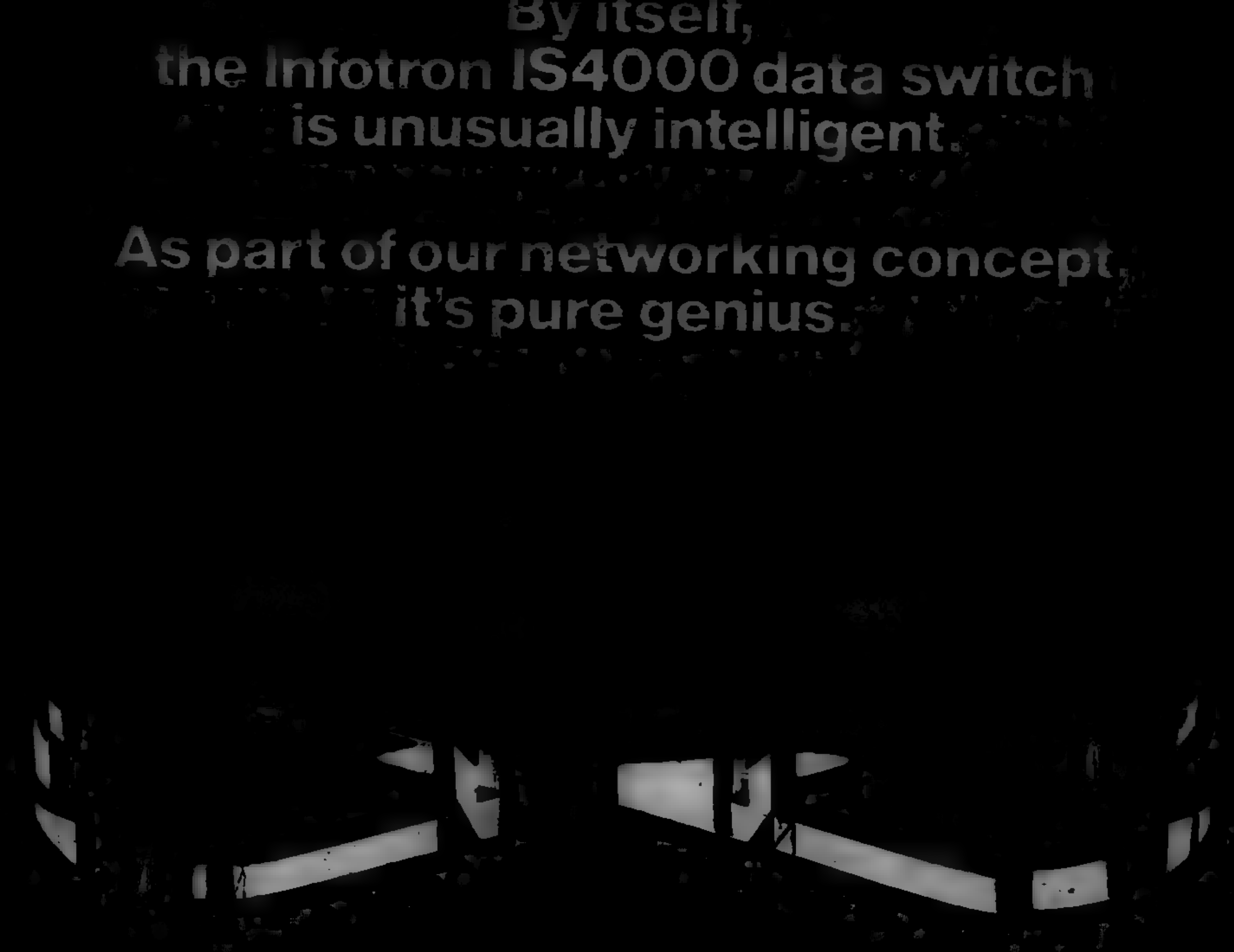
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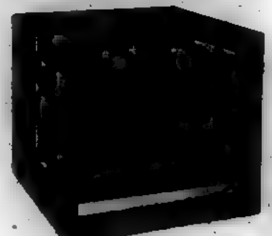

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SUPERSHORTS

Alcatel Thomson Gigadisc of Redondo Beach, Calif., announced the signing of an exclusive distribution agreement with **Gene Computer Corp.**, Markham, Ontario, for the sale and distribution of Alcatel Thomson Gigadisc Optical Disk Storage Systems in Canada.

■

Advanced Micro Devices, Inc. (AMD) reported an agreement to sell certain assets of its microcomputer systems directorate. The agreement provides for assets related to AMD's line of multibus board-level products to be acquired by Central Data Corp. of Champaign, Ill.

■

Computer & Communications Technology Corp. (CCT), Santa Barbara, Calif., announced that it has entered a letter of intent with **International Signal & Control Group PLC** (ISC) providing for the sale of **Zeta Laboratories, Inc.** to ISC. Zeta is a wholly owned subsidiary of CCT that supplies microwave components and subsystems to the communications industry.

■

Intel Corp. said it plans to sell part of its Austin, Texas, operation to **SAS Institute, Inc.** under terms of an agreement in principle by the two companies.

SAS will acquire the design information, source code, product rights and support responsibilities of Intel's System 2000 data base management system, including the System 2000, Quest, Plex and Report Writer.

The terms of the sales agreement have not been disclosed.

■

Gould, Inc., Rolling Meadows, Ill., announced that its computer systems division in Fort Lauderdale, Fla., has received a $15 million contract for 17 computer systems from the Boeing Military Airplane Co., headquartered in Wichita, Kan. As part of the contract, Gould will provide Boeing with its 3297 and 3227 computers for use in aircraft simulation. Delivery of the systems began in November and will continue through June 1987.

■

Comsat General Integrated Systems, Inc. announced that it has terminated its negotiations with **Prudential Insurance Co. of America** and **Douglas Ruhe** to establish partnership for direct broadcasting satellite services. Comsat said it has significantly restructured its approach to this business area.

■

Silicon Compilers, Inc. and **VLSI Technology, Inc.** (VTI), both headquartered in San Jose, Calif., announced that they have signed a licensing agreement under which VTI will manufacture and market a chip from Silicon Compiler. Undir the agreement, VTI will have exclusive marketing and sublicensing rights for the chip.

■

Wicat Systems, Inc., Orem, Utah, and Minneapolis-based **Control Data Corp.**, through its wholly owned subsidiary USSA, signed a letter of intent to form a joint venture that will provide products and services to kindergarten through 12th grade public and private schools in the U.S.

■

Spectragraphics Corp., a manufacturer of computer-aided design and manufacturing and computer-aided engineering workstations, announced the expansion of its foreign distribution to include Australia and Israel.

■

Westinghouse Electric Corp. announced it has formed an advanced production technology systems organization to design, sell and service intelligent automated work cells and systems.

■

Control Data Corp. and **AT&T Communications** announced they have signed a marketing agreement to offer businesses a quick and efficient way of using telecommunications to exchange purchase orders and inventory information between computers. Terms of the agreement were not available.

Lee Data nixes pact to acquire new subsidiary

MINNEAPOLIS — Lee Data Corp. and Visual Technology, Inc. recently announced they agreed to terminate a preliminary agreement under which Visual Technology would have become a wholly owned subsidiary of Lee Data.

Late last year [CW, Nov. 19], the companies announced Lee Data would acquire Tewksbury, Mass.-based Visual Technology through an exchange of common stock valued at about $16.8 million.

In terminating the agreement, the two companies announced that they are exploring alternative arrangements, including Visual Technology providing Lee Data with products through an OEM or licensing arrangement.

Lee Data said it will fulfill its previous agreement to provide Visual Technology with $3 million of additional financing; $1.5 million was provided in November through a purchase of Visual Technology products, the company said.

Visual Technology recently reported a third-quarter loss of $15.6 million and restated second-quarter results to show a loss of $457,000, compared with its earlier report of a $119,000 profit.

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EXPORT

from page 75

high-tech goods.

The question that arises from the turf war is whether the structure now in place for which both sides claim credit, will work. To date, the evidence is mixed. It is true that the DOD has been able to increase the efficiency of its review time. The Commerce Department has instituted a "fast-track" process that has earned plaudits from exporters.

Yet the government machinery is still impeding U.S. companies' freedom to respond to the pressure of overseas competitors, even when they know they have superior products that all but sell themselves.

Cease-fire not good for small firms

According to an estimate by an official in a Washington, D.C.-based export consulting firm, the U.S. is losing at least $1 billion a month in export sales as result of export restrictions on high-tech goods. The official asserted that the Commerce and Defense departments' cease-fire is not good for small exporters who have leading-edge products that overseas buyers are actively seeking.

Horror stories abound: export license applications that are never resolved, or an international distributor being told that the earliest his product can reach its destination is six to nine months, even though he knows a Japanese firm can get a similar one in three weeks.

Large U.S. manufacturers have it a bit easier. They can hire lobbyists at $75 an hour to follow the torturous path of an application. But the small exporter has no friends to help — he cannot afford them.

WALKER

from page 75

tems, Inc., to run Walker's technology operations and Donald France, formerly of Software AG of North America, Inc., to manage financial applications.

"We did some restructuring, as typically happens when you have two new senior executives," Carrier said. "It's certainly true that there are some people who are no longer with us, but that's nothing out of the ordinary. Walker's board of directors believed that the management that takes you from $1 million to $25 million may not be the management that can take you from $25 million to $100 million."

He added that Walker is continuing plans to make a public offering in the near future, although he would not specify a date.

SHUGART

from page 75

sources to the company's existing systems and copier/duplicator businesses, he said.

Shugart — which until recently employed almost 1,650, compared with a high of 3,900 employees in 1983 — manufactured disk drives for other vendors' microcomputers. The company is currently contacting customers to assess their needs, a Shugart spokesman said.

Letter of intent

Shugart has signed a letter of intent with Matsushita Communications Industrial Co., effective Feb. 15, to turn over most of Shugart's 5¼-in. floppy disk drive business to Matsushita, which currently manufactures the products for Shugart offshore. Matsushita will make the 5¼-in. disk drives available in the U.S. through its affiliate, Panasonic Industrial Co., the spokesman said.

Xerox officials are now negotiating with several unnamed companies for the sale of other Shugart product lines, including its 5¼- and 8-in. rigid disk drives. Depending on these negotiations and on Shugart's assessment of customer requirements, Xerox will begin to phase out its remaining unsold product lines, beginning with Shugart's 3½-in. disk drives, Lamb said. Xerox will continue manufacturing and distributing Shugart's 8-in. drives for a limited time and will continue to meet Shugart's warranty and service obligations to customers, according to a Xerox spokesman.

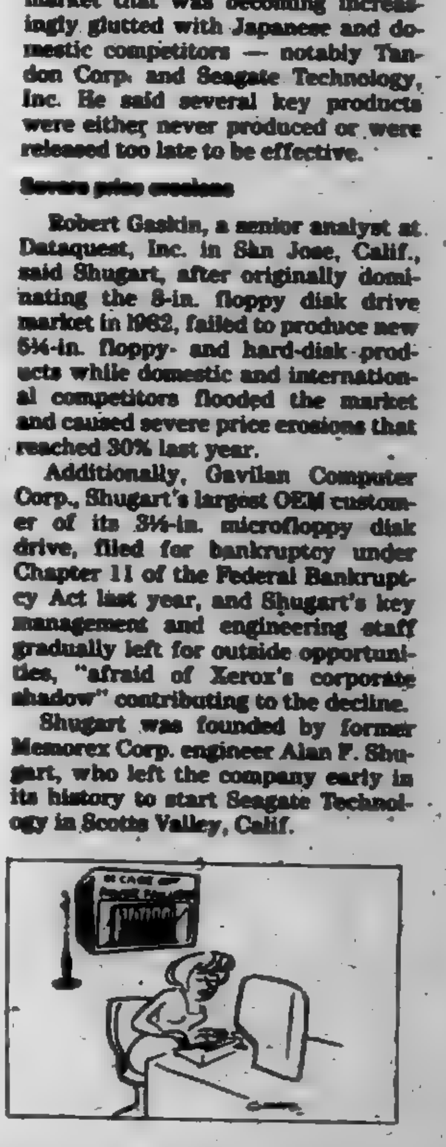
According to James N. Porter, president of Disk/Trend, Inc., a statistical market study firm based in Los Altos, Calif., Shugart's problems began three years ago when it failed to ship significant new products in a market that was becoming increasingly glutted with Japanese and domestic competitors — notably Tandon Corp. and Seagate Technology, Inc. He said several key products were either never produced or were released too late to be effective.

Severe price erosions

Robert Gaskin, a senior analyst at Dataquest, Inc. in San Jose, Calif., said Shugart, after originally dominating the 8-in. floppy disk drive market in 1982, failed to produce new 5¼-in. floppy- and hard-disk products while domestic and international competitors flooded the market and caused severe price erosions that reached 30% last year.

Additionally, Gavilan Computer Corp., Shugart's largest OEM customer of its 3½-in. microfloppy disk drive, filed for bankruptcy under Chapter 11 of the Federal Bankruptcy Act last year, and Shugart's key management and engineering staff gradually left for outside opportunities, "afraid of Xerox's corporate shadow" contributing to the decline.

Shugart was founded by former Memorex Corp. engineer Alan F. Shugart, who left the company early in its history to start Seagate Technology in Scotts Valley, Calif.



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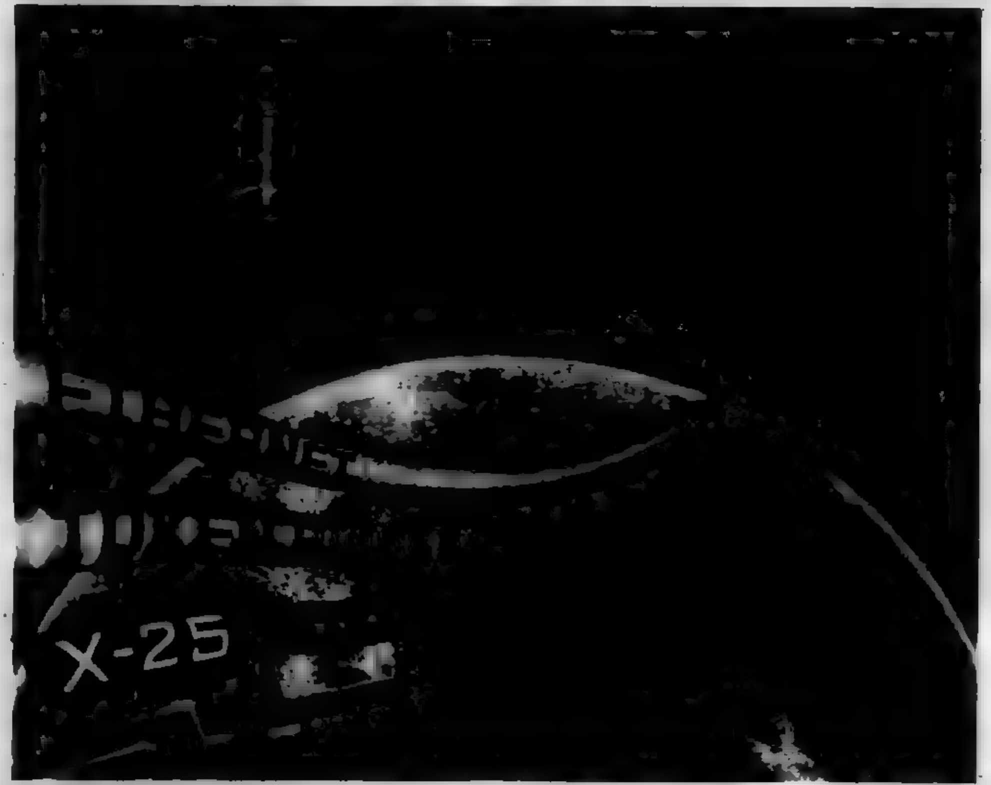
The LAN's IBM Mainframe Connection



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CHIP from page 75

the 1981 recession, when chip makers struggled to avoid massive employee layoffs and capital expenditure cutbacks, a policy that paid off later when companies had to meet the explosive demand for semiconductors in 1983. This demand, however, created today's problems. Because of the chip shortage, customers "double-ordered" huge amounts of chips in "a panic buying situation" to boost inventories, resulting in a glut of chips in the warehouses of chip users and causing demand to drop, Sandow said.

Most analysts agree that recovery is based on how quickly OEMs work down their inventories. "It'll take them six months to work through their excess inventory," noted Mary Wu, a semiconductor analyst at Gnostic Concepts, Inc. in Palo Alto, Calif.

Wu noted that most chip makers feel that no long-term recession is developing for the industry because the nation's key economic indicators — usually a sign of the industry's health — are stable.

HP from page 75

Verley said start-ups avidly seek seasoned HP managers for their staffs to improve a sometimes shaky Wall Street image, to strengthen a position with investors and to lay the groundwork for future top-level recruitment from the same company.

He noted that no major changes are planned for HP's corporate benefits package, nor is the company unduly concerned about the defections. "A few defections will always happen," he explained. "We've always felt our compensation and benefits package, and the opportunities for growth and self-expression we offer here are equal to anybody's." HP's senior management turnover rate was 5.1% for 1984, lower than average for the Silicon Valley, he said.

Targeted as one of the best-managed companies in the country in two recent best-selling books, HP is a premier candidate for hungry recruiters, according to Tony Price, a recruiter with Russ Reynolds Associates in San Francisco. Price, who helped convince Ely to leave HP for Convergent Technologies, called HP "the Procter & Gamble of business executive training," with an entrepreneurially oriented, small-group milieu that yields executives capable of producing immediate results for a start-up's financial or administrative problems.

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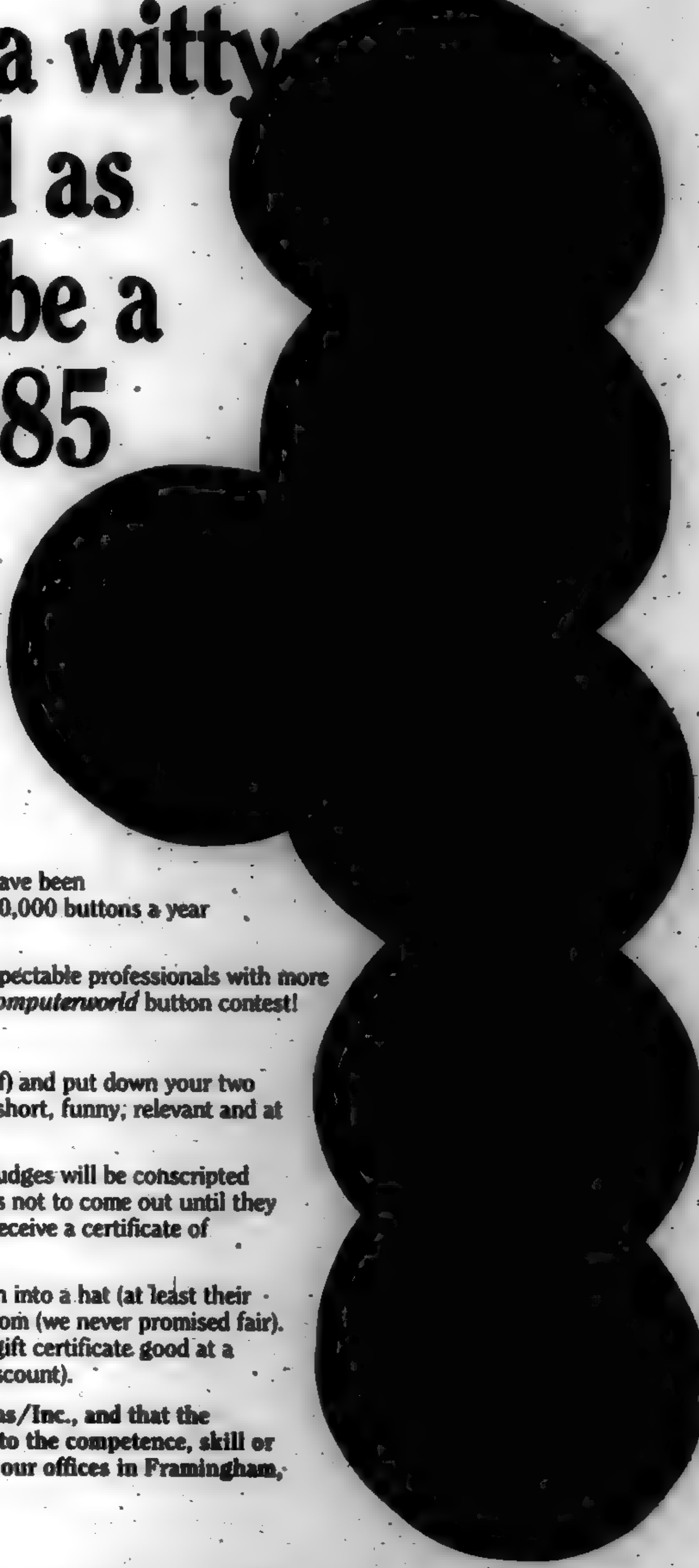

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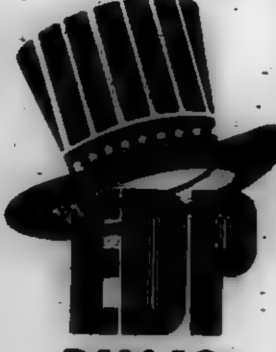

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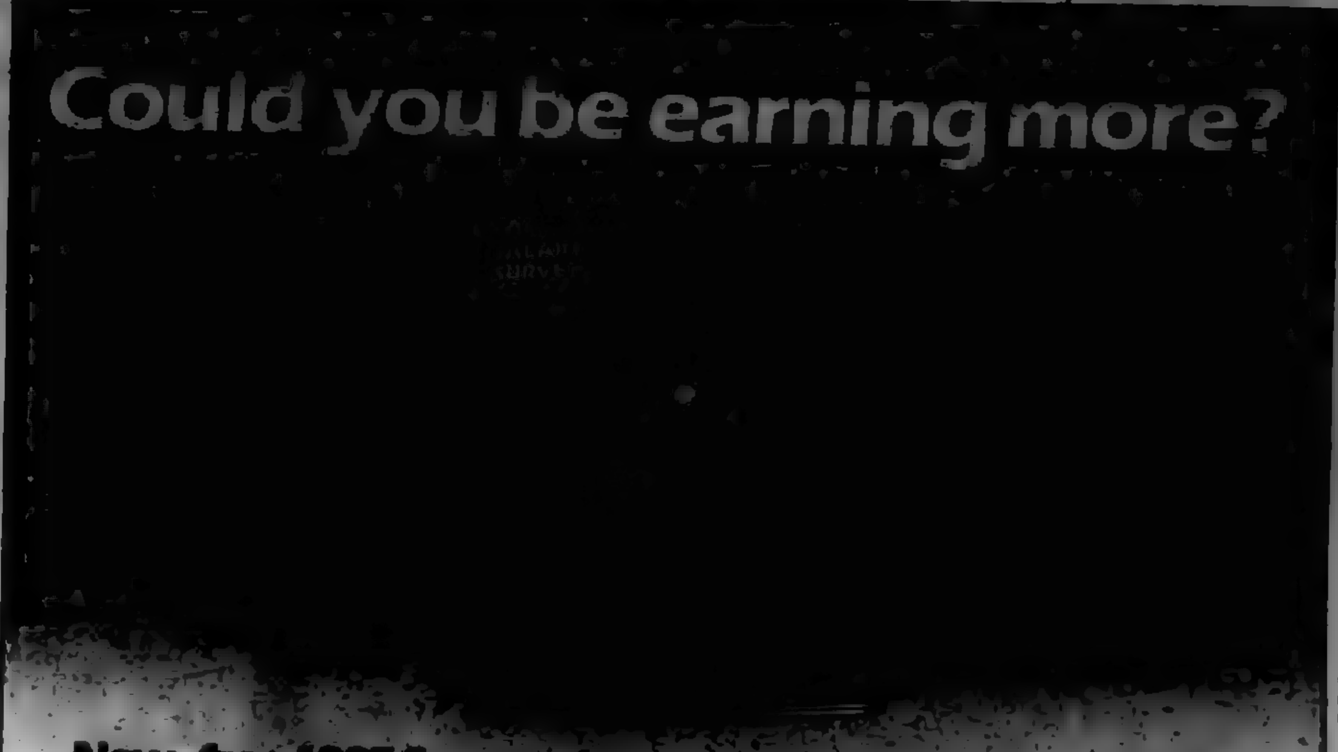

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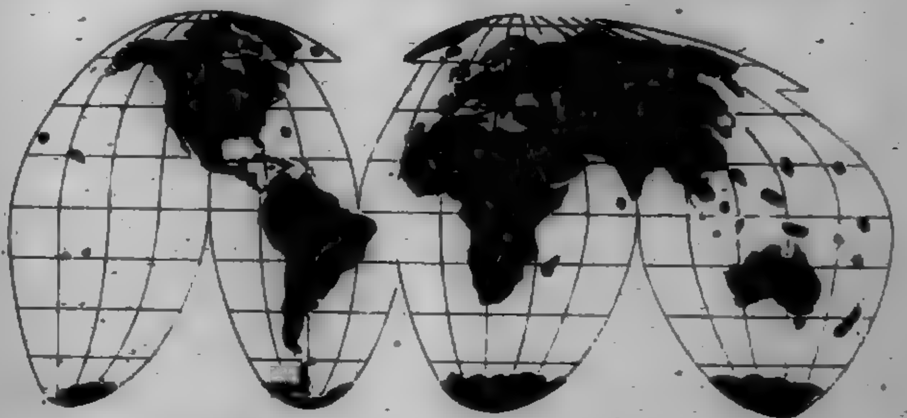

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The University Of New Mexico Computing Center is seeking qualified IBM, DEC, and Communications System Programming personnel. Experience required in at least one of the following: MVS, SNA, UNIX*, C, VMS, DECNET, TCP/IP, LANs, Systems Management. Benefits include four weeks vacation annually. Application deadline is February 28th, 1985. Reply with resume, or for further information contact:

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Computing Center
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Min 5 yrs. solid systems programming exp. with IBM MVS/SP, TSO, CICS with working knowledge of VS/1, NCP/VTAM, RCAF or ACF2 or Top-Secret and some database experience. Degree required.

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3-6 yrs. experience including: preparation of manuals used within a DP installation, preparation of user manuals and maintenance of system or programming standards and procedures manuals. Ability to gather information from diverse sources and arrange it in a logical and readily understandable manner. Knowledge of the terminology associated with structured techniques highly desirable. Programming and systems analysis experience desirable in an IBM VS-1 or MVS installation.

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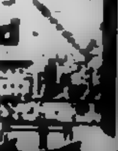

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data processing

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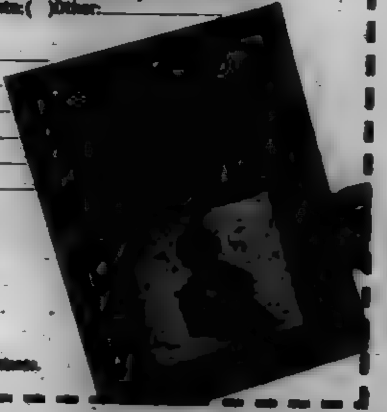

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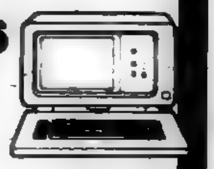
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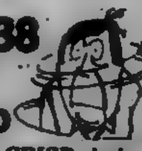

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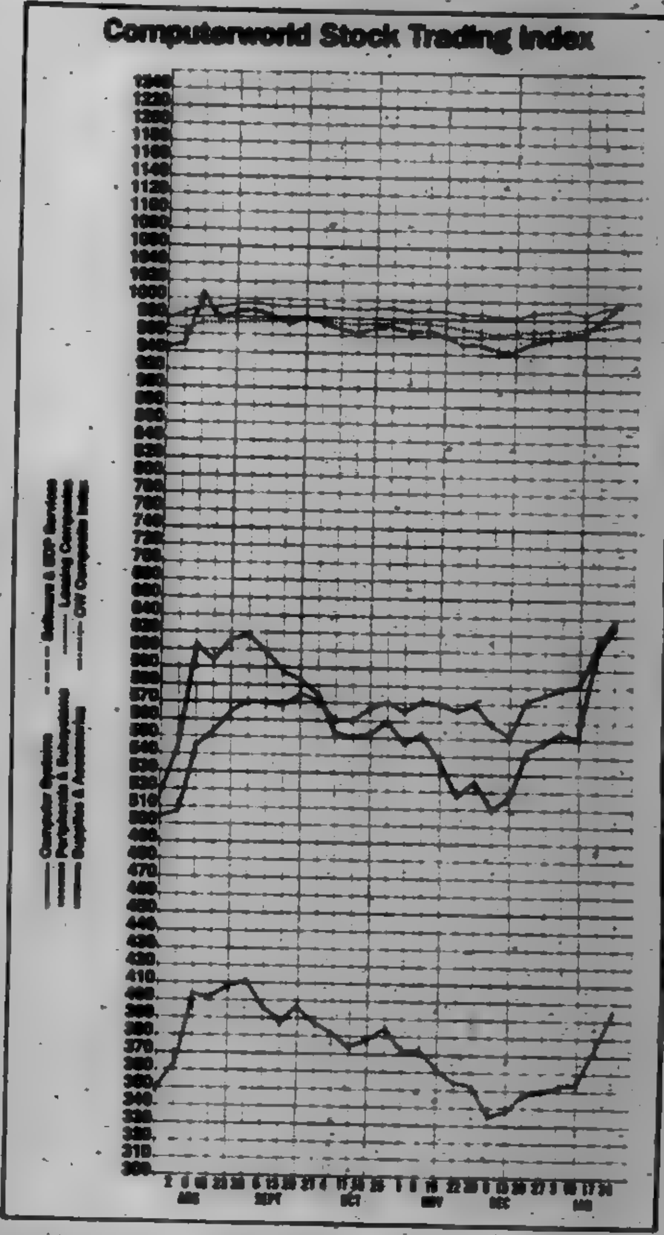
Computerworld Stock Trading Index



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CLOSING PRICES THURSDAY, JANUARY 23, 1985

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LEASING COMPANIES

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COMPONENTS

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SOFTWARE & EDP SERVICES

[illegible]

PERIPHERALS & SUBSYSTEMS

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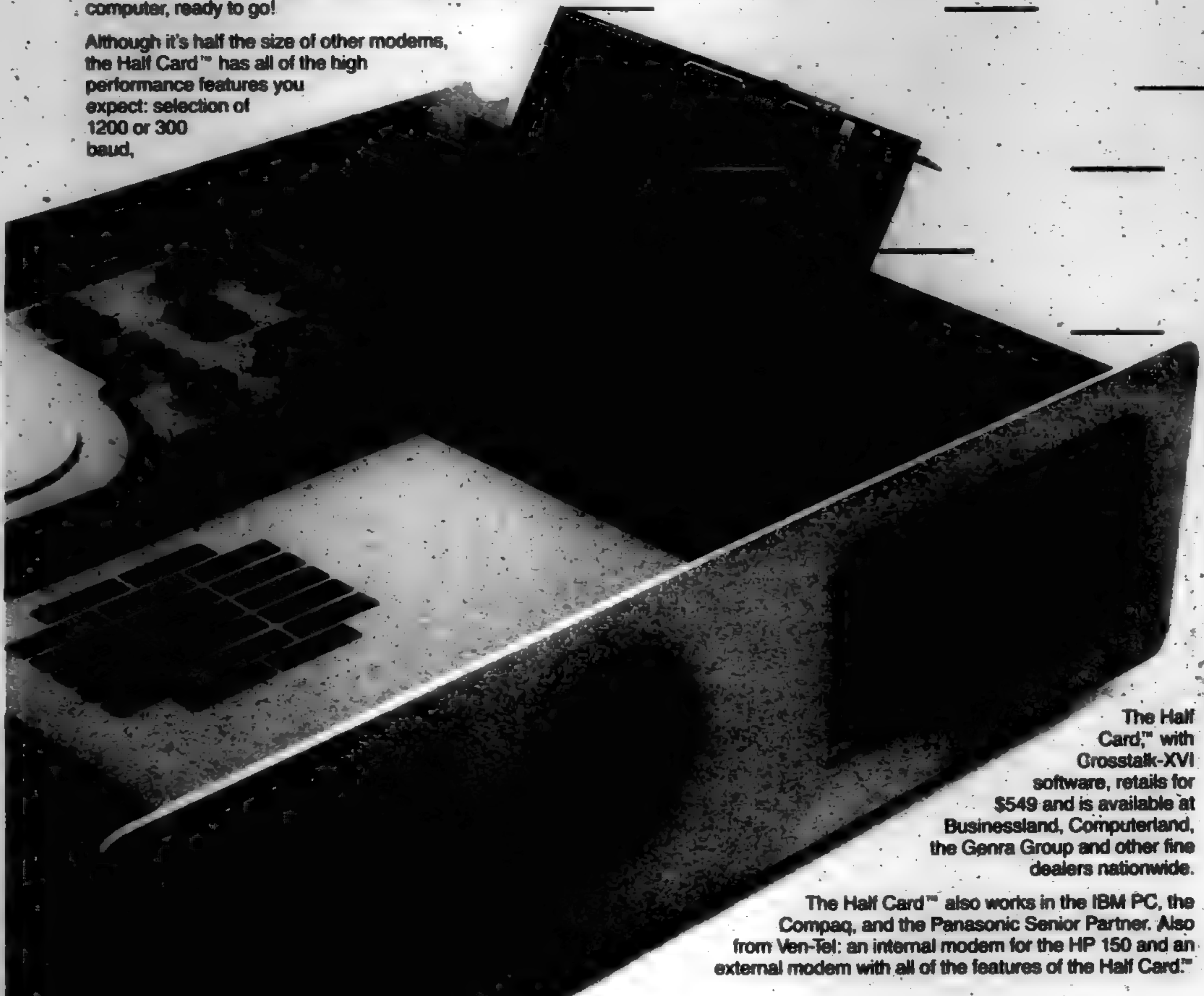

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VOL 19

ISSUE 5

FE 4 1985

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$2.00 A COPY; $44/YEAR FEBRUARY 4, 1985 VOL. XIX, NO. 5

From the road
Communications Networks 1985
12-14

Short of the mark?
AT&T makes $1.37 billion/**81**

In Depth
Why wait for new productivity tools?/**29**

Disk problems nag IBM

U.S. users report continued glitches; task force finds no 3380 damage at sites in Europe

By Tom Henkel
CW Staff

IBM's recent problems with head disk assembly units on some 3380 disk drives [CW, Dec. 17] still appear to be causing headaches and confusion for some users. The nagging problems also have prompted IBM to expand its efforts to identify troubled sites.

IBM recently formed a task force to investigate incidents of 3380 contamination in Europe. The special IBM group is said to have investigated 50 European sites but reportedly did not discover any damaged 3380 disk drives. Domestically, however, several large-volume IBM customers are still having head disk assembly problems attributable to the tin oxide biocide used to kill bacteria in computer room air-conditioning systems.

Late last year, IBM warned 3380 users to stop using the biocide because tin oxide, in a gaseous form, can contaminate 3380 head disk assemblies, causing data loss and possible head crashes. In December, IBM said approximately 2% of its 3380 user sites had already experienced trouble with the chemical.

One user experiencing disk assembly contamination is FMC Corp. in Dallas. The company is working with IBM to resolve problems with some of its older 3380 drives. George Danforth, the firm's manager of development and operations, noted that the company has been using the tin oxide biocide for some time, and it recently appears to have had an effect on some 3380s. Like other users who have experienced chemical contamination of 3380 head disk assemblies, Danforth said the glitches have been more of a nui-

See DISK page 11

Software firm sues broker

Rosesoft suit alleges copyright infringement

By Peter Bartolik
CW Staff

NEW YORK — A Seattle-based software publisher last week charged a leading brokerage firm with incorporating a literal copy of the Seattle firm's program in an electronic investment software product.

Rosesoft, Inc. filed papers in federal court here alleging that Dean Witter Reynolds, Inc., a subsidiary of Sears, Roebuck & Co., incorporated within its Fast investment program a "character-by-character copy" of Rosesoft's Prokey Version 2.13.

Prokey is a utility program that enables users of IBM Personal Computers and compatible machines to set up character or command sequences to be performed with one keystroke. It has generated $1.8 million in revenues since it was introduced in mid-1982.

The papers were filed in answer to a Jan. 2 petition by attorneys for Dean Witter seeking a declaratory judgment that the Fast program does not infringe upon a copyright and that Rosesoft is not entitled to any monetary relief from Dean Witter.

See SUIT page 6

Hundreds pick GM's buy-out for DP workers

By John Desmond
CW Staff

DETROIT — In response to growing concerns voiced by DP workers at General Motors Corp., the automotive giant has offered buy-out options that an estimated 600 of those employees have embraced as a means of avoiding transfer to GM's new subsidiary, Electronic Data Systems Corp.

GM offered the buy-out options in the wake of attempts by the United Auto Workers union to organize DP workers and a month after the DP workers first learned that they would get EDS and not GM benefits. The early retirement option allowed employees with 28 years of service to take a two-year furlough with pay and then retire with GM benefits. DP workers not eligible to retire within two years could have elected the separation option, which provided a lump-sum payment of up to a year's salary for workers with 10 to 27 years of service.

Estimates of the number of GM DP employees who have accepted the company's buy-out options range from an early company projection of 9%, or 600 of the 7,000 affected employees, to estimates of up to 28% that DP workers in specific divisions gave to *Computerworld*.

The transferred employees had to choose by Jan. 21 whether to accept the options. Disgruntled DP workers in transition have protested a perceived loss of benefits through a variety of actions, including filing suit, forming an organization to raise legal fees and signing petitions to hold union elections [CW, Dec. 17] (see story page 10).

EDS Chairman H. Ross Perot said at a recent news conference that 600 GM salaried employees accepted the buy-out offers. But a spokesman in the office of Kenneth Riedlinger, senior vice-president of EDS, said Perot's figure came from a conversation "two or

See GM page 10

FYI

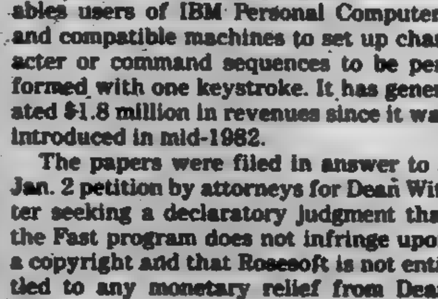
No shortage of ATs here

By Edward Warner
CW Staff

NEW YORK — Just call Tony Graffeo the king of the IBM Personal Computer AT.

While other corporations must tolerate what could be as long as a nine-month wait for the delivery of the high-speed machines, Graffeo's employer, Home Insurance Co., is almost awash in them.

Home Insurance received 360 ATs before the delays cropped up, and boxes of CPUs and keyboards now are stacked four and five high in every available space of Home Insurance's MIS department.



CW photo by E. Warner

Theodore Oswald (l), Technical Support Group, and Graffeo

Why is Graffeo, the MIS vice-president, working in a department that

See [illegible] page 5

TOP OF THE NEWS

Data General Corp. and Perkin-Elmer Corp. unwrapped top-of-the-line superminis as competition at the high end stiffened. **Page 4.**

■

Copycat policy. An informal poll of DP managers found that most shops have policies guarding against illegal software copying. **Page 6.**

■

Five billion dollars: That is the expected cost of the five-year DP make-over planned at Bankamerica Corp. **Page 6.**

■

More than pie in the sky. Despite high start-up costs, private nets built around satellites can be cost-effective. **Page 12.**

■

Going up? DP management salaries are outpacing inflation but not by much in some categories. **Page 17.**

■

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NEWSPAPER

FCC sparks AT&T subsidiary debate

WASHINGTON, D.C. — The Federal Communications Commission last week reopened debate on its requirement of a separate subsidiary for AT&T's telephone equipment sales and indicated that enhanced services obtained through the subsidiary, AT&T Information Systems, will also be reviewed.

The action signaled the FCC's plan to review completely the Second Computer Inquiry decision policies set five years ago before the divestiture of AT&T in 1984.

The FCC cited increased competition from other providers as justification for the move to drop the need to sell customer premises equipment (CPE) through AT&T Information Systems.

FCC Chairman Mark Fowler, citing AT&T-supplied statistics, said AT&T Information Systems had seen its market share drop from 80% of sales of new business CPE in 1980 to 30% in 1984.

An FCC spokesman said an emergency petition filed by AT&T seeking removal of the subsidiary marketing requirement will take at least six months to complete. He said the action would permit joint marketing of CPE with services such as long-distance private lines from AT&T Communications.

No effect on operating company requirement

Last week's action does not affect the current requirement that the regional Bell operating companies still must sell CPE through a separate subsidiary.

In other action, the FCC spokesman refused comment on reported AT&T Communications plans to sell a software-supported service combined with long-distance communications, a service that has raised questions in the FCC. This proposed service, called Docuform, would provide word processing and editing facilities for lawyers preparing standardized legal documents. This type of service is now required to be marketed through a separate subsidiary. That issue will be addressed in the enhanced service notice that the FCC is scheduled to issue shortly.

FCC Commissioner Mimi Weyforth Dawson said the Computer Decision II policy is currently in "intensive care, and the plug should be pulled on it."

Wang, CDC join forces in development pact

NEW YORK — Wang Laboratories, Inc. and Control Data Corp. last week unveiled a joint development agreement and announced a product to link Wang's office automation products to CDC's Business Information Services time-sharing network.

The Control Data Distributed Service for Wang Virtual Storage is an integrated information system that links Wang VS 100 minicomputers to Management Application Systems and data bases available on the CDC network, according to officials of the two companies.

The distributed service was previously available on IBM minicomputers, according to Robert Sanford of the Business Information Services group. Under the agreement, CDC will resell Wang VS 100 machines with CDC Call software and also will sell the software to existing Wang VS 100 users.

From its Cleveland operations center, CDC will provide Wang mini users with on-line diagnostic and support services, which it said will reduce the need for customers to hire skilled DP employees.

Users will be able to access the in-house host and the Cleveland IBM-based center through locally attached terminals or in-house networks, CDC said.

Paul Colantuono of Wang's Independent Sales Organization Marketing Division said the product will provide Wang users with expanded DP resources and will provide an integrated processing environment to use Wang's current office automation capabilities with CDC's decision support applications. CDC said the agreement will enable users to configure networks connecting in-house IBM mainframes, Wang minicomputers and microcomputer workstations, all capable of accessing CDC applications and proprietary and public data bases.

The price of the service will range from $15,000 to $50,000 per month and will be marketed by Control Data Business Information Services, located at 500 W. Putnam Ave., Greenwich, Conn. 06830.

Wang unwraps PC/VS Data Exchange tool

LOWELL, Mass. — Wang Laboratories, Inc. has announced the Wang PC/VS Data Exchange Utility, a data integration tool that converts and transfers files between Wang Professional Computers and VS systems and between applications on the Professional Computer.

Data Exchange, which will be available this month, will permit Professional Computer users to benefit from the processing power, file sharing, printing and office automation functions of VS systems. Previously, Professional Computers basically were limited to emulating a VS terminal or transferring word processing documents to the larger system, a Wang official said.

On stand-alone Professional Computers, the utility is said to transfer data among various spreadsheets such as Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Multiplan, using various industry-standard file formats.

Costs are $250 for the Professional software and $1,000 for the VS Access software required on the VS.

The utility requires 256K bytes of memory on the Professional. File transfers between Professional Computers and a VS require the Wang Local Communications Option on the Professional, along with VS Multi-Station, VS Access and Version 6.20 or later of the VS operating system on the host.

Wang Laboratories is located at One Industrial Ave., Lowell, Mass. 01851.

We can use your news

[illegible] as we try to give our readers the most complete information available, some good stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes? Heard any hot news about vendors? Are you aware of technology or management trends the trade press is overlooking?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for information regarding items of interest in the computing community. Call us toll-free at [illegible]. Ask for [illegible], [illegible] editor.

CORRECTIONS

A chart accompanying the microcomputer data base Product Spotlight [CW, Jan. 14] should have stated that Software Solutions, Inc.'s Dataease did provide a query language.

The "Small Talk" column published in the Jan. 21 issue of *Computerworld* was written by Stephen Caswell, a principal with Trigon Systems Group in Toronto and the editor of the *Electronic Mail and Micro Systems* newsletter.

The Seagate Technology, Inc. company profile in the Computer Industry section [CW, Dec. 17] incorrectly related comments by James N. Porter, president of Disk/Trend, Inc., based in Los Altos, Calif.

Porter said IBM will produce most 3½-in. and high-capacity 5¼-in. disk products in-house but will still purchase from outside vendors; additionally, Seagate Technology has produced half-height disk drives throughout 1984.

NEWS SUMMARY

Data General Corp. enhanced its high-end Eclipse MV/10000 supermini with a scientific-oriented coprocessor/4

Perkin-Elmer Corp. has unveiled an enhanced model of its tightly coupled multiprocessor superminicomputer/4

U.S. companies, seeking to protect their software from piracy, are pursuing different methods to safeguard against copying/6

Burroughs Corp. unveiled a disk subsystem for its high-end mainframes that incorporates a version of Memorex Corp.'s 3680 disk drive/8

The Bank of America National Trust & Savings Association and its parent company, Bankamerica Corp., took the first step to ensure that their systems resources further both firms' long-range strategies/8

General Motors Corp. DP workers, concerned about a perceived loss of benefits through their transfer to Electronic Data Systems Corp., have so far raised only half of the $50,000 needed for a legal challenge/10

CW at Comnet '85: Private corporate networks can still succeed when built around satellites, according to a variety of speakers . . . Integrated voice/data private branch exchanges fit the long-range plans of telecommunications managers interviewed here . . . Telecommunications industry leaders are pressing for changes in regulations and divestiture conditions/12-14

A New Jersey senator has introduced legislation to encourage U.S. retaliation should Japan reduce or eliminate software copyright protection/15

Salaries for computer professionals grew at varying rates at or above last year's 4% rate of inflation, according to the annual survey by Source EDP/17

The Federal Bureau of Investigation is employing leading-edge expert systems software to assist agents in solving crimes/18

The U.S. National Institute for Occupational Safety and Health has proposed a study that will focus on the mental stress of computer-related work/22

The president of Britain's Northern Telecom Ltd. said government restriction of high technology to save jobs will backfire and cause unemployment/23

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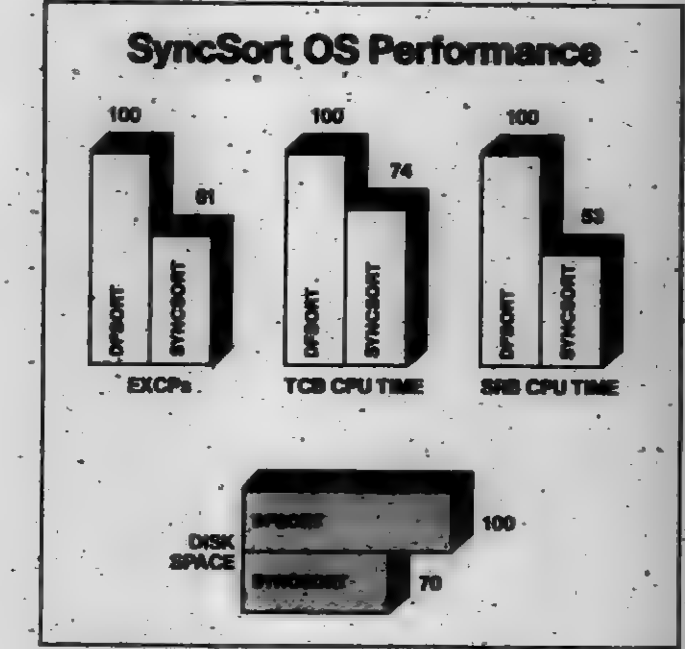

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PE hikes supermini's I/O, adds entry-level 32-bit unit

By Tom Henkel
CW Staff

OCEANPORT, N.J. — Perkin-Elmer Corp. today increased the I/O capabilities of its tightly coupled multiprocessor Series 3200 superminicomputer line with an enhanced version of its 3200MPS system. The 3260MPS configuration can accommodate multiple I/O processors (IOP) in addition to the previously available auxiliary processing units (APU).

Available in April, the 3260MPS employs the same basic architecture offered in the earlier 3200MPS system. Based on the company's 3250XP CPU, the configuration can accommodate a CPU and up to nine asymmetrically connected processors that are built around the company's 3250XP global memory bus. The 3260MPS system was designed to use PE's OS/32 operating system, the vendor said.

The 3260MPS employs a tightly coupled architecture, meaning each processor has equal access to all memory. This, the vendor said, eliminates the need to transfer data from one processor to another via special communications links. The 3260MPS design is also asymmetrical, meaning each processor type performs a unique primary function. For example, the CPU's major function is to control the multiprocessing environment. The APUs execute user computational tasks and the IOPs do physical I/O processing. The optional, dual-function APU/IOP has the capability of performing either user computations or I/O processing. However, when operating, the units will perform exclusively one role or another, depending on the operating system environment.

The 3260MPS can accommodate any combination of APUs or IOPs. Furthermore, current users of the 3200MPS configuration can upgrade to the 3260MPS configuration and convert currently used APUs to units with the characteristics of both APUs and IOPs. This, the vendor said, allows users to use attached processors as either APUs or IOPs, depending on system requirements.

There are 55 possible hardware configurations available with the 3260MPS, the vendor said, and there are four basic configurations.

The Model 3262-01 consists of a 2M-byte, two-bank main memory, a CPU with a writable control store feature and a floating-point processor, an I/O processor with writable control storage, bus switches and two direct memory access channels. The configuration costs $185,000. The same configuration with an APU instead of an IOP is called the 3262-10 and costs $185,000, the vendor said.

The Model 3264-01, which consists of 4M-byte, four-bank memory, a CPU with writable control storage and floating-point processor, bus switches and four direct memory access channels, costs $219,000. The same configuration with an APU instead of an IOP is called the 3264-10 and costs $219,000.

Additional IOP and APU units cost $42,000 each. A unit that offers the combined functionality of an APU and an IOP costs $47,000. The 3260MPS is compatible with currently installed 3200MPS systems. Field upgrade kits to convert APUs to combination APU/IOP units cost from $8,000 to $11,000, depending on the functional level of the installed equipment, the vendor said.

PE is located at 2 Crescent Place, Oceanport, N.J. 07757.

DG gives mid-life kicker to high-end supermini

MV/10000 gets scientific coprocessor, memory boards, 30% performance boost

By Donna Raimondi
CW Staff

WESTBORO, Mass. — Data General Corp. last week gave its Eclipse MV/10000 supermini a mid-life kicker, boosting the machine's performance over previous models by 30%.

DG's announcement came less than a week after Prime Computer, Inc. rolled out its top-of-the-line supermini [CW, Jan. 28] and the same week that Perkin-Elmer Corp. unveiled its high-end supermini (see story this page).

DG also announced the following:

- Two memory boards designed to double the maximum capacity of its MV/10000 machines.
- A high-end, dual-speed magnetic tape drive.

The enhanced version of the Eclipse MV/10000, called the MV/10000 SX, uses emitter-coupled logic 2,800-gate array components, developed by Motorola, Inc., in a coprocessor in the system. With the coprocessor, the system is said to perform calculations on two instructions simultaneously in computationally intense applications.

The coprocessor board communicates asynchronously and executes in parallel with the 140-nsec cycle time on the main central processor. This, the vendor said, allows the coprocessor to operate at faster cycle times. For example, the divider operates at 35 nsec, so the divider chip is said to be able to produce four quotients in one 140-nsec cycle.

The system is geared to computer-aided design and signal analysis in scientific/technical markets and high-volume transaction processing and economic forecasting in commercial markets, the vendor claimed.

The SX enhancement is not designed to replace the Eclipse MV/10000, a spokeswoman said. The added coprocessor makes this model suitable for applications that require high computational performance, she said.

The price of the MV/10000 SX starts at $223,000 including the CPU, 4M bytes of memory and system software. Customer shipments will begin in May. The smallest configuration of the system is said to include 1M byte of memory. Installed Eclipse MV/10000 systems can be upgraded to the SX configuration for $55,900. The upgrade packages will be available in June.

The company has also announced 4M-byte and 8M-byte memory boards that reportedly can double the maximum memory of MV/10000 models to 32M bytes. Both the MV/10000 and the MV/10000 SX come with 64K-bit MOS memory chips. The add-on boards use 256K-bit MOS chips.

The increased memory capacity of the boards enables larger amounts of information to be kept resident within main memory, thereby reducing the paging and swapping of memory-intensive operations. The denser boards also allow more physically compact main memory storage and offer commercial users more configuration flexibility, the vendor said.

Prices are $20,000 for the Model 8870 4M-byte board and $40,000 for the Model 8871 8M-byte board.

In addition, DG announced a dual-density, dual-speed (1,600 or 6,250 bit/in.) magnetic tape drive subsystem. The DG Model 6299 can be mounted vertically in a tall-bay peripheral cabinet and is comparable to the horizontally mounted Model 6300 for meter-high cabinets. It contains a 50 in./sec streaming tape drive with start-stop capabilities and is reportedly designed to provide mass storage backup for large disk configurations. The Model 6299 has a tape capacity of 180M bytes (unformatted), a transfer rate of 312.5K byte/sec and is supported by DG's AOS/VS, AOS/RT32, AOS, MV/UX and DG/UX operating systems for compatibility with DG's 16-bit and 32-bit Eclipse systems.

The price of the Model 6299 (without cabinet) is $29,690. It is available 60 days after receipt of order. The cabinet costs $1,820. More information is available from DG at 4400 Computer Drive, Westboro, Mass. 01581.

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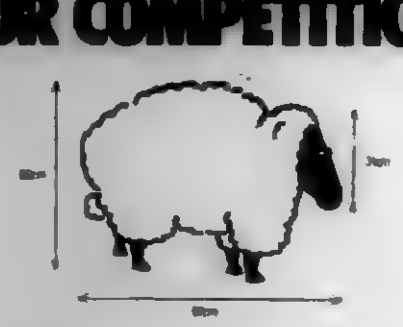

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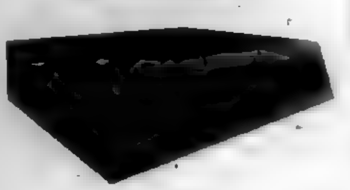

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looks like it is partially a computer store when most Manhattan IBM dealers — let alone corporate users — are without ATs?

It is just a tribute to quick action, he said. "The first day they announced the AT," he said, "we realized that was the machine to go with." The AT, introduced last August, "looked like the machine of the future," Graffeo observed. He said he liked the speed of the AT's processor heart, the Intel Corp. 80286 microprocessor. In addition, the enhanced AT was attractive because of its built-in 20M-byte hard disk storage unit, he said.

While other corporations were ordering ATs to test, Graffeo told IBM that he did not want just one or two — he wanted a full 400, half of them enhanced models. Home Insurance held an Extended Enterprise Remarketer Agreement with IBM to buy 1,000 Personal Computers in 1984, and 400 Personal Computers remained to be ordered under the agreement. Graffeo said the contract allowed him to specify the model of Personal Computer he could order.

When IBM heard of his plan, Graffeo said, the firm was shocked and tried to dissuade him. IBM was not available for comment at press time. Graffeo would not budge. He said he would cancel the agreement unless the ATs were provided.

"I said, 'I don't want to see another XT come through the door,' " he recalled. "There was no way I was going to buy obsolete machines." In its time, Graffeo observed, "the XT was fantastic," but the greater speed and storage capacity of the AT, coupled with a price near that of the XT, meant that the latter machine "was a dead product," he said.

Home Insurance eventually took delivery of 405 ATs but returned 45 of them to IBM. The 45, Graffeo noted, were standard-version ATs that IBM had provided in place of enhanced models in the order.

Home Insurance placed its AT order roughly two days after the machine was announced. In doing so, Graffeo said it avoided the order backlog and also "got them early on before the problems [with the enhanced AT] started." Those problems, Graffeo explained, are hard-disk failures that have reportedly occurred with enough frequency to cause IBM to cut back shipments of the enhanced AT until manufacturing difficulties can be solved by the disk's supplier [CW, Dec. 17].

Graffeo said that Home Insurance's ATs have been relatively trouble-free. They will be used for spreadsheets, financial analysis and WP and to access client policy information on Home Insurance's mainframe data base (see story above).

IBM spokesman Rick Scott, meanwhile, confirmed a nine-month wait on orders for the enhanced AT placed with IBM's direct sales force today. The enhanced machines are in short supply with retailers as well, he acknowledged.

Computer stores looking for ATs have heard of Graffeo's supply and have called him, offering to buy some of the ATs. Under the terms of his contract with IBM, however, Graffeo can only resell the machines to Home Insurance's offices, its independent agents and the subsidiaries of City Investing Co., Home Insurance's parent firm.

Insurer takes personal computer plunge

By Edward Warner
CW Staff

NEW YORK — Home Insurance Co., a firm that was something of a latecomer to the use of personal computers, last year vaulted aboard the micro bandwagon. Starting last year with 500 micros, Home Insurance acquired 1,000 IBM Personal Computers. Roughly two-thirds of the machines were Personal Computer ATs, the high-speed micro introduced by IBM late last year (see related story at left) and the one on which Home Insurance expects to eventually standardize.

The Personal Computer was introduced in 1981, but Home Insurance, with 300 independent agents and 90 company offices nationwide, moved slowly toward personal computing until it felt its mainframe files were secure from possible unauthorized access by micro users, said Tony Graffeo, Home Insurance's vice-president for MIS.

All told, the firm spent a year developing a system to secure the mainframe's data that requires, among other things, that personal computer users insert a special diskette into their computers before logging on to the mainframe data base. The security system was unveiled last year.

Home Insurance sells Personal Computers at 25% below the list price to its independent agents, who, in turn, communicate with the firm's host, an IBM 3084 Model Q64 via a dial-up network and IBM 5250 terminal emulation cards. From the mainframe's 160 spindles of IBM 3380 and 3350 hard-disk storage, the agents can get either current policy information or a claims history on their client's policy going back seven years.

A pilot project, in use by 13 independent agents, allows them to quote auto insurance policy rates and even write the policy on their Personal Computers while connected to the mainframe. If approved, that project could come into use for other Home Insurance independent agents. The pilot system has so far prevented errors in rekeying data and saved time and paper use, Graffeo said.

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RECOVERY

Firms take different routes to curtail software piracy

This article was prepared by CW staff members Peter Bartolik, Maura McEnaney and Donna Raimondi.

Piracy of copyrighted microcomputer software has been an issue for some time among U.S. companies, and several approaches have been taken to discourage unauthorized copying, a number of MIS executives said last week.

A campaign to prod U.S. companies to institute formal antipiracy policies was recently launched by the Association of Data Processing Service Organizations, Inc. (Adapso) [CW, Jan. 21]. That campaign was dramatized by a lawsuit that Adapso and Micropro International Corp. filed against American Brands, Inc., a Fortune 100 company, over alleged software piracy.

In phone interviews conducted recently, only three MIS executives out of 15 contacted by *Computerworld* said their companies have no formal policies prohibiting unauthorized copying. Among those whose companies do have formal policies, though, several indicated that the availability of microcomputers and apparent ease of copying programs makes such policies difficult to enforce outside their own departments.

IBM, which is very active in protecting its own proprietary assets, is also active in protecting material that other vendors copyright. According to an IBM spokeswoman, brochures outlining guidelines for software use have been given to all Personal Computer users, and employees are required to sign business conduct guidelines that classify software as intellectual property that must be treated with care.

The manager of corporate DP for a diversified food products company based in Chicago said his firm implemented a policy about six months ago. The policy has been distributed to employees in both domestic and international operations, he said. The executive, who like many of those surveyed, asked not to be identified by name or company, said the company is very sensitive about protecting its well-known name and takes strong action at the slightest hint of unauthorized copying. "We never compromise anything that would bring our company to the forefront of negative publicity," he said.

> **"**
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> *Only three MIS executives out of 15 said their companies have no formal policies prohibiting unauthorized copying.*

Eleanor Luce, corporate director of MIS at Stamford, Conn.-based Olin Corp., said the company has had a policy in effect for three years and disseminates written copies to employees. Like several other executives, Luce said employees are required to sign a statement indicating they have read all existing company policies. "Every corporation has a responsibility to make it clear that employees are not to copy copyrighted materials," she said. Luce added that unauthorized copies should be destroyed upon discovery and that all employees should be notified of disciplinary action taken against those engaging in such practices.

The Singer Co. in Stamford, Conn., implemented a policy about one year ago for both domestic and international operations, according to Lou Valente, director of corporate systems planning. In addition to disseminating written copies of the policy, "the policy is restated on nonremovable stickers placed on every mini, micro and mainframe; but we are most concerned about personal computers," Valente said. "We didn't want [pirating] to catch on in our corporation; we wanted to take a proactive stance," he said.

At a West Coast aircraft manufacturing company, a draft version of a management directive addressing software protection has been included in a users' guide published by the company's information center, according to the manager of information technology. "We've had the antipiracy policy since the personal computers were brought in two years ago, and we've made attempts to make sure it's enforced," he said.

At Travelers Insurance Co. in Hartford, Conn., Thomas Ottman, vice-president for DP, said one person was fired about two years ago for making an unauthorized copy. All members of Travelers' DP department, which has some 1,000 microcomputers, receive a letter from the senior vice-president of the department every six months detailing the illegality of piracy, Ottman said.

Additionally, the DP department works with personnel administration to inform other departments of the policy, which is also periodically printed in the company newspaper and handed out at the company computer store, he said. Software packages are assigned specific microcomputer serial numbers, and users are informed that sharing packages is grounds for dismissal, Ottman said.

A California aerospace company disseminates a written policy, an information center executive there said. "When we configure systems, we ensure that there is a sufficient number of copies at that time," he said.

An executive for microcomputer support at a Texas-based oil company said a policy exists and that when software is acquired, users are sent a letter informing them of the licensing agreement provision. "Basically, we say, 'no copying, and if you have questions about whether you are free to copy, contact the legal department for advice,'" the executive said.

Two Chicago-area executives said no formal policy exists at their firms. One said he was not aware of any copying, "but then if somebody did, he wouldn't tell me." The other said, "We have no idea what they are doing with [software]," but added that his department controls acquisition of packages. A third Chicago executive said a written policy exists but is not widely disseminated.

An executive at Manufacturers Hanover Trust Co. in New York said the banking company has data security policies in effect governing the use of various computing environments. The company is also working on a specific policy to cover use of off-the-shelf microcomputer packages, he said.

All of the executives at firms with existing policies said they have not witnessed any unauthorized copying and expressed confidence that employees under their direct supervision do not pirate software.

SUIT

from page 1

Dean Witter's petition did not directly deny Prokey was copied in Fast but, rather, disputed Rosesoft's copyright claims. Since hearing of Rosesoft's claims, Dean Witter has taken steps to modify Fast "to avoid any claim of copyright infringement," according to the petition.

Dean Witter attorneys would not comment.

Alleging unfair competition and copyright violation, Rosesoft's filing named Jon R. Millen of New York and five "John Doe" employees of Dean Witter.

Rosesoft's New York counsel, Robert J. Bernstein of the firm of Cowan, Liebowitz and Latman, said Millen was involved with Dean Witter in the development of the Fast program, but Rosesoft was unsure whether Millen was an independent contractor or an employee of Dean Witter.

Rosesoft claimed that Initfast, a portion of the Fast package, is a copy of Prokey. Specifically, Rosesoft alleged that Dean Witter copied the program and altered it so that references to Prokey and its copyright notice would not appear on the user's screen.

Rosesoft said a license was sought in 1983 to make multiple copies of Prokey for use in connection with a program Dean Witter was developing, but the license was not granted. However, Rosesoft said, Millen acquired a copy of Prokey in April 1983, and returned to Rosesoft a "Prokey Registration and License Acknowledgement Card."

No actual damages

The Dean Witter petition noted that as of Dec. 15, a copyright certificate had not been obtained for Prokey from the Register of Copyrights. Even if Fast is an infringement on a Rosesoft copyright, the petition asserted, financial liability would be limited to Rosesoft's actual damages; Dean Witter claimed there were no actual damages.

Bernstein said a copyright certificate was obtained Jan. 8 of this year. The certificate date limits claimable damages prior to that date but does not eliminate Rosesoft's claim, Bernstein said last week.

Even if Fast has been modified, Bernstein said, earlier copies may still be in use, and Rosesoft is seeking identification of all Fast users. The charges of unfair competition resulting from the alleged removal of trademarks are not dependent upon a copyright certificate and could result in triple damages, he added.

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[illegible]

Bankamerica inaugurates $5 billion overhaul of MIS

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — The holding company for Bank of America National Trust & Savings Association last week launched a $5 billion effort to bring the management of its internal systems resources into line with its long-range, strategic business objectives.

Using a transcontinental teleconference hookup as a showcase, Bankamerica Corp. officials last week outlined a five-year plan to combat growing competition by expanding the company's mainframe arsenal more than twofold, integrating its data bases and otherwise enhancing its technology.

In preparation for the contemplated improvements, Bankamerica has already restructured its existing MIS organization to form the Bankamerica Systems Engineering (Base) division, a technology management unit that selectively applies both centralized and decentralized processing techniques. Through 1989, Base will reportedly receive $1 billion per year to ensure that Bankamerica manages its information systems technology to support its critical business needs.

Heading the just-created management unit is Bankamerica Executive Vice-President Max Hopper, who spearheaded development of the automated reservation system credited with fundamentally transforming the airline industry. Hopper served as American Airlines, Inc.'s vice-president of DP and communications until August 1982, when he left the company to join Bank of America as executive vice-president of retail information and processing services.

At the outset, more than half of Base's planned yearly investment will go solely toward operations and maintenance of Bankamerica's existing processing resources. But as the five-year plan progresses, the emphasis in the corporation's internal MIS spending will shift increasingly to new systems development, Hopper predicted during the teleconference marking Base's debut.

In particular, Base's systems development efforts will focus on strengthening Bankamerica's branch-office support, adding convenience features to its customer services and expanding its automated teller machine and point-of-sale networks worldwide, Hopper said.

To support the proposed systems and their greatly increased transaction volumes, Bankamerica plans to enlarge its pool of mainframe processing power by at least 150% during the next five years, he added. In northern and southern California alone, the company's Bank of America subsidiary is already using approximately 20 IBM 3033, 3083, 3081 and 3084 processors or their Amdahl Corp. equivalents.

"The kind of growth we foresee in our internal processing capabilities isn't at all exceptional," Hopper said in an interview after the teleconference. "A lot of other banks will experience comparable increases."

Word of Bankamerica's vastly expanded investment in information systems resources comes at a time when nearly all major financial institutions are struggling to adapt to their industry's recent deregulation and the resulting surge in competition. Deregulation has spawned a raft of so-called "nonbanks," a new breed of financial services suppliers that are increasingly challenging the banking establishment's preserve.

Using a heavy dose of high technology, the industry newcomers "are delivering their financial services through means other than brick and mortar and are offering a convenience that conventional branch banks can't match," Hopper said.

One of Base's objectives reportedly is to integrate many of the financial products Bankamerica has maintained independently. Integration of Bankamerica's customer data bases would also benefit the company by enabling it to minimize service costs.

Technology group [illegible] MIS operations under one umbrella

SAN FRANCISCO — Bankamerica Corp. will depend on its recently created technology management group for strategic guidance as the company steadily evolves into a full-fledged financial-services institution.

With the formation of its Bankamerica Systems Engineering (Base) division, Bankamerica for the first time has brought together all of its disparate MIS operations under the same organizational umbrella, according to Base chief Max Hopper.

Despite the consolidation, each of Base's individual operating units will retain a high degree of autonomy.

"Our intent is not to smother them in centralization," Hopper said. Instead, "we're trying to strike a balance between centralized and decentralized processing."

Earmarked for probable centralization is any Bankamerica technology or function that benefits from economies of scale. Typical examples of activities that lend themselves well to centralized management include telecommunications and systems planning.

On the other side of the MIS [illegible] functions that call for close alignment with applications development units or other line groups and, thus, are strong candidates for decentralization, Hopper said.

If a question involving technology management ends in an unresolved dispute, Base will refer the matter to a Strategic Information Resource Committee, which will set automation policy for the entire company.

As Bankamerica's [illegible] of last resort for issues concerning broad technology strategy, the Committee is charged with ensuring that the firm's investments in information systems resources dovetail with its long-range business goals, Hopper said.

Burroughs offers disk subsystem for A9, B7900 series processors

DETROIT — Burroughs Corp. last week announced its plans to market a disk subsystem for its A9 and B7900 series processors that incorporates a thin-film read/write head disk drive previously available only to users of IBM-compatible mainframes.

Called the B9494-12 Disk Subsystem, the unit consists of three products and was developed by Burroughs' Memorex Corp. subsidiary. The unit includes the B9399 dual-storage control unit ($53,600), the B9399 dual-string control unit ($26,000) and the B9494-12 disk drive (32,220), according to Burroughs.

The B9494-12 is the same unit Memorex sells to users of IBM and compatible mainframes as the 3680 disk drive. The 3680 drive is system-compatible with IBM's 3380 disk drive, a Burroughs spokesman said.

The B9494-12 subsystem reportedly has an unformatted capacity of 1.3G bytes and a 868M-byte formatted capacity per disk spindle, an average seek time of 16 msec and a data transfer rate of 3M bit/sec.

According to the spokesman, users must buy all three components of the subsystem for it to operate.

He added that only Memorex B9494-12 (or 3680) disk drives can be used. Other IBM-compatible, 3380-type drives cannot be used in the subsystem.

More information is available from the vendor at Burroughs Place, Detroit, Mich. 48232.

April Special Report to look at micro boom's ups and downs

The explosion of microcomputers in corporate America has not been without its problems. The April Special Report on microcomputers in big business will look at both the benefits of micro use in the corporation and the headaches that their use may cause.

The Special Report will focus on DP/MIS management strategies for integrating micros into the corporate information system, trends in business-related micro hardware and software and the security risks involved in widespread microcomputer use. In addition, the report will cover how large DP/MIS organizations are networking micros.

Contributions to the Special Report should take one of two forms: a tutorial article discussing an issue or trend or an application story outlining a particular user firm's experience with a microcomputer.

Articles must be typed, double-spaced and range in length from four to six pages. Artwork, such as charts, graphs and photographs, is welcome.

Authors should include brief biographies and telephone numbers at which they can be reached.

The deadline for submissions to the Special Report is March 8.

If you have a story you would like to tell or any questions to ask, send them to Janet Fiderio, Special Report Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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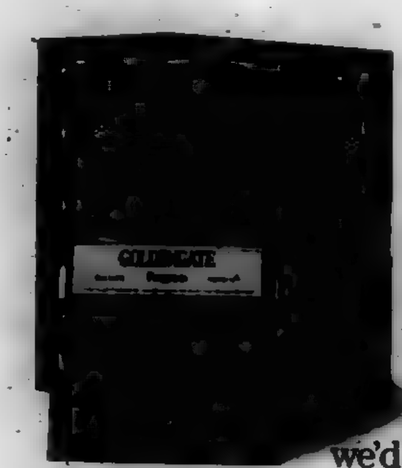

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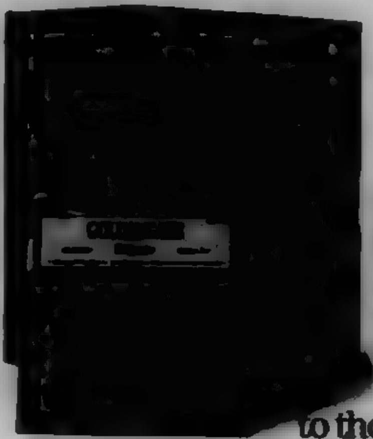

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[illegible]

GM from page 1

three weeks" earlier with Riedlinger. At that time, the deadline for DP workers to accept the offers had not yet passed.

At the former GM Information Systems and Communications Activity (GMISCA) in the GM Technical Center in Warren, Mich., 179 of some 1,000 DP workers accepted the buy-out offers, according to a source there. In GMISCA's data base administration department, six of seven employees accepted the buy-out, according to Henry Merker, one of the departing employees.

Several employees at GM's Detroit Diesel Allison Division said 19 of 70 DP employees accepted the buy-out offers. According to an employee at GM's Rochester Products Division of Grand Rapids, Mich., which manufactures components, eight of 28 DP professionals are leaving the site. A systems analyst at GM's Buick Motor Division in Flint, Mich., said 22 of some 120 DP professionals have left the company. And a programmer in the Saginaw (Mich.) Steering Gear Division data center, said 13 of 100 DP employees have left.

DP workers claimed that those accepting the buy-out offers were required to sign a release, a copy of which was obtained by *Computerworld*, stating that the employee agreed "not to institute any proceedings against [GM] . . . based on any matter relating to the cessation of [his] employment."

One DP worker, who has since begun working at Chrysler Corp., said he was not aware of the release when he agreed to the buy out. "It came out after Jan. 1 that in order to get your money, you had to sign it," he said. The GM Rochester Products employee said all eight workers there who accepted the buy-out offers signed the release.

Company officials said they would not comment on the buy-out offers and release until they have totaled the number of workers accepting the buy out.

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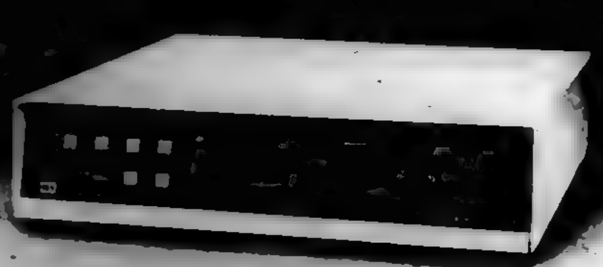

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DISK

from page 1

sance than a debilitation. He added that FMC is currently working with IBM to resolve the problems.

In the wake of IBM's biocide warning, some users now believe that tin oxide may be only one chemical that can cause head disk assembly contamination.

In spite of the fact that IBM has been able to identify only 3380 users with bona fide head disk assembly contamination problems, two users of IBM's smaller 3370 disk drives are pointing to the 3380 contamination problems as a possible explanation for the higher than normal levels of head disk assembly failures they have been having.

Don Sanginario, DP manager at Mikasa China Co. in Secaucus, N.J., said four of the five 3370 disk drives connected to his company's System/38 Model 8 processor have developed head disk assembly problems since December 1983.

"The only [3370 drive] that did not fail was less than two years old," Sanginario said, noting that the oldest of the disk drives installed at his shop failed.

He added that a fifth 3370 drive, which had been installed at the Secaucus facility until 1983, also developed head disk assembly problems when it was moved to the company's Los Angeles facility.

IBM replaced the head disk assemblies in Mikasa's 3370s free of charge, although Mikasa had to pay for the labor. But so far, IBM has not been able to determine specifically what caused the units to fail.

Sanginario said he now plans to have his computer room tested to determine whether there are any unusually high concentrations of chemicals in the air. "Contaminants are all over this area," Sanginario said, noting that there are several chemical refineries located near the Mikasa data center.

He also explained that since Secaucus is fairly close to New York, unusually high concentrations of air pollution caused by automobiles may also be present.

In New York, Art Carved, Inc., a division of Lenox China, Inc. that manufactures jewelry, has had two 3370 head disk assembly failures since last September. During the same period, the company also experienced a failure in the internal disk unit in its System/38 Model 7 processor.

According to Bob Lee, the firm's corporate MIS director, the problems started during Labor Day weekend, when one 3370 failed. The entire 3370 disk drive was replaced by the firm's third-party maintenance contractor.

After the failure, Art Carved decided to stop using third-party maintenance and go back to using IBM.

A few weeks after IBM resumed maintenance on the Art Carved system, the unit's internal disk failed. Two months later, the 3370 that was replaced in September failed again.

"Each of the failures occurred after a weekend," Lee said, noting that at one point the company thought someone might have been sabotaging the system. But after eliminating that possibility, Lee said he decided that chemical contamination may have caused the problems.

Currently, the disk drive problems at Art Carved appear to have subsided, Lee said, adding that, at this time, the company does not plan to test the computer room air for contamination.

One organization that experienced head disk assembly problems with IBM's 3380 disk drives has not experienced the same problem with 3370s, even though both drives have been subject to the same environment.

According to James Wilson, chief deputy director of Teale Data Center, a state-run computer services center in Sacramento, Calif., the center's 3370 disk drives have thus far remained relatively trouble free.

The center's director, David Lema, said the center experienced a rash of 3380 head disk assembly failures until the center reduced its fresh air intake from a 100% refresh rate each hour to a 15% refresh rate.

Since the Teale center did not use a tin-oxide-based biocide, Lema theorized that the 3380 head disk assembly failures may have been caused by contamination from pesticides used in the area.

Most industry analysts agree that IBM's 3370 has been a reliable unit, and IBM said it has not received unusually high reports of head disk assembly problems on the 3370.

Graphics meet to cover CADD

DALLAS — The emergence of personal-computer-based computer-aided design and drafting (CADD) systems will be a key topic at Computer Graphics '85 to be held April 14-18 at the Dallas Convention Center here.

The use of personal computers for architectural and engineering computing will be the topic of five tutorials and seven technical sessions. This topic and others will be addressed at a total of 40 tutorials and 80 technical sessions during the five-day graphics conference.

The conference is sponsored by the National Computer Graphics Association.

Fees for the tutorials are $295 for association members and $355 for nonmembers. The technical sessions cost $395 for members and $460 for nonmembers.

Additional information is available from the National Computer Graphics Association, Department HN, 8401 Arlington Blvd., Fairfax, Va. 22031.

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A-4

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Satellite-based private networks prove successful

CW AT COMNET '85

By James Connolly
CW Staff

WASHINGTON, D.C. — Despite high start-up costs and uncertain future benefits, private corporate networks can still succeed when built around satellites, speakers told telecommunications managers at Communications Networks 1985 (Comnet '85) here last week.

In a series of user case studies, three telecommunications managers profiled their networks, which ranged from a newspaper's nationwide full-page facsimile transmissions to integrated voice and data networks with multipoint videoconferencing.

The networks, three of which have been in operation for three years, have not run without flaws, the speakers conceded — even in one case being shut down because of poor response times. But three of the four managers said the satellite links are now integral parts of their networks.

"We came into this knowing it was a 10-year project because that was the life span of the transponders. We came in thinking in terms of a five-year payback period, which will probably turn out to be six years," reported David T. Smith, vice-president for corporate telecommunications for New York's Citibank.

The case studies focused on the following:

- Citibank's Satcom, a corporate network tying together eight bank facilities in the New York area and facilities in cities such as Los Angeles, St. Louis, Sioux Falls, S.D., and Denver. That network is based on a C-band transponder and backup C-band transponder on Western Union, Inc.'s Westar 5 satellite and handles voice, data and videoconferencing.
- A nationwide network of 10 earth stations run by Hercules, Inc., a Wilmington, Del., chemical company, and using Ku-band frequencies. That network carries corporate data and voice communications, with most of the intelligence imbedded in the network itself, and is bearing an increasing videoconference load.
- A facsimile and voice network that each day transmits the page proofs for the *USA Today* newspaper to printing plants across the U.S. Also initiated in 1982, that service is at the heart of the newspaper's existence, according to William O. Hider, *USA Today* vice-president for telecommunications.

William G. Phile, manager of network services for Hercules, reported that a key decision in designing his company network depended on whether or not to integrate voice, data, video and electronic mail or to leave them on a stand-alone basis.

'Why go to satellite?'

"We decided to integrate and chose Satellite Business Systems. Why go to satellite? Being a chemical company, we're not located in your backyard. We're largely out in the boondocks," Phile noted. He said that most of the 10 earth stations, including several 5-meter dishes, are located well away from large cities and could be placed directly on Hercules' property, avoiding the need for local telephone company tie-ins.

Phile reported that in 1984 Hercules' network handled 3.82 million calls and that in the first seven months of last year alone the videoconferencing capability saved the company 478 trips and $594,000.

Phile and Smith noted that proposed AT&T rate structures and the decreasing cost of fiber-optic media will require continuing attention and reevaluation of the cost benefits of new satellite systems.

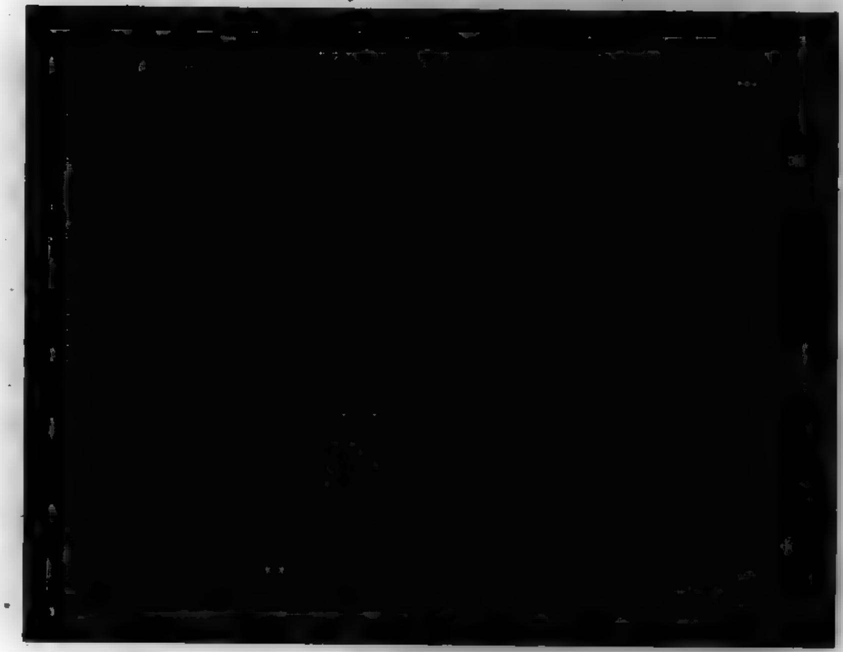
Smith said his goals in developing a satellite network were the ability to deal with new and changing requirements; the provision of high-quality voice, data and video transmissions; and reliable and secure communications.

He said the fully digital network is operating now in six cities and scheduled for expansion into several more cities. Unlike Hercules, which uses smaller Ku-band antennae on the user sites, the 15-meter C-band antennae must be located off-site, raising the problem of the last-mile connection to Citibank facilities. That last mile is covered by a combination of microwave links and dedicated lines.

Smith warned other telecommunications managers of several potential problems in a satellite network, including interference from other video sources on the C-band transponders, problems in locating antennae, a ¼-sec propogation delay, poor performance of channel bank equipment and the difficulty in locating qualified staff.

Smith noted that his company's videoconferencing has been underutilized but not because of technical problems. "The problem has been getting people to try it. Once they try it and get used to it, they like it," he said. Smith said of the network as a whole: "It used to take months, maybe a year, to get a data line. Now we can respond in a week with new services. Also, the quality has been phenomenal, with a bit error-rate of one times [10 to the seventh]."

Dumb.



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*[illegible]

Voice/data PBXs find market niche but slow demand

CW AT COMNET '85

By James Connolly
CW Staff

WASHINGTON, D.C. — The integrated voice/data private branch exchange (PBX) is somewhere between a pipe dream and the real thing — available on the market but not yet justifiable — according to attendees at Communications Networks 1985 (Comnet '85) here.

Interviewed at the conference last week, communications specialists generally said that their organizations are not yet ready for an integrated switch but added that such a system would be justified by continued company growth and further proof of the product's reliability.

"I think a lot of people are very interested in it, but doing it is another thing," said Willis Miller, director of telecommunications for the state of Minnesota's Department of Administration. Miller noted that moving large amounts of data from IBM mainframes through a PBX is a complex task.

CW Photo by J. Connolly
Hight

"We're not using a PBX now. We're using Centrex, but we're looking at ways that voice/data integration can be done, even if it is through Centrex, perhaps with some software changes. I think the need is there, but you're not going to justify a PBX with just voice or with just data," he added.

Terry D. Goddard, a telecom manager for IBM in Gaithersburg, Md., observed, "I don't think there is a demand for [integration] right now. Nobody is jumping up and down, saying, 'My data switch is overloaded, you've got to take some of my data on the PBX.' "

Goddard predicted that it will be the personal computer that drives the PBX market, as 3270 Personal Computer-type connections and dedicated local-area networks may prove less able than switched systems to cope with the proliferation of micros. He said it will be applications such as personal computer connections that convince organizations to install PBXs.

Looking forward to integration

Owen Reese, network systems manager for Policy Management Systems Corp., an insurance software developer and service bureau, is looking forward to voice/data integration as his company grows.

He said Policy Management has the voice traffic to justify a PBX now and that he expects to have sufficient data traffic between his Columbia, S.C., headquarters and several regional data centers "two or three years down the road."

"I think people should be looking for that growth pattern, especially with a large switch that may take four years to buy and install. We found it best to lay out that little extra money up front and look two or three years ahead," Reese explained.

He said his company recently installed a Northern Telecom, Inc. SL-1 switch but that data transmissions will, at least temporarily, continue to be handled through dedicated 9.6K bit/sec and 56K bit/sec lines because the remote data centers have insufficient data traffic.

CW Photo by J. Connolly
Duvall

Another manager observed that his company will wait for the integrated PBX to prove itself before making a commitment.

'We would rather wait'

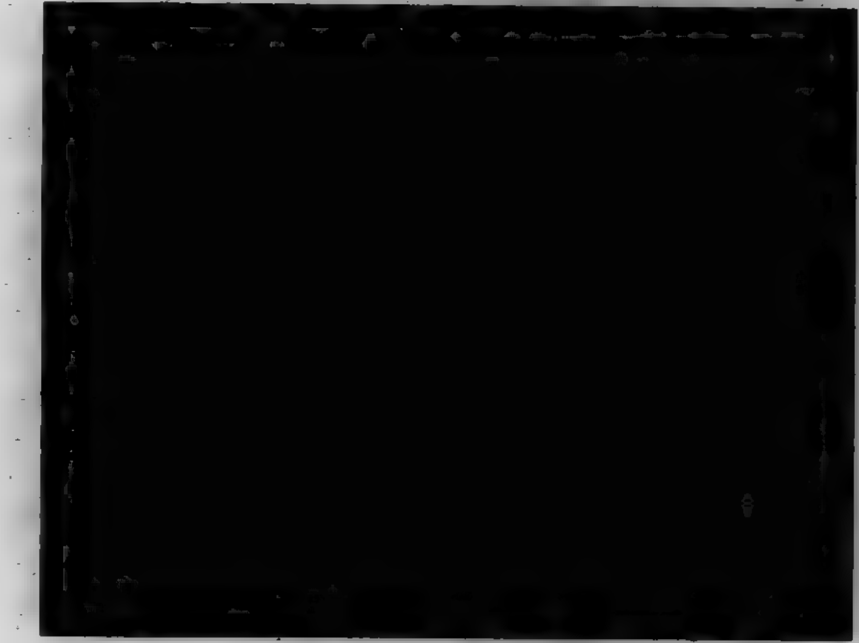
"We're still a little nervous as far as what the vendors will do. We're not a state-of-the-art company. We would rather wait and be two years behind the technology and be sure that a product is good," explained Ted Hight, operations manager for Best Products, Inc. in Minnetonka, Minn.

"I don't know of any companies that are really discussing [voice/data integration through a PBX] yet, but that is probably because it is so new," he said.

Among the managers who have already made a move to voice/data integration is William G. Duvall Jr., vice-president for network operations at Compuserve, Inc. in Columbus, Ohio. "I don't see a mass changeover to integration. The increasing data-traffic [is] our prime interest. If we can tie voice into data at a relatively low cost we will do it."

He reported that six months ago his company installed a T1-speed multiplexer between data centers 10 miles apart and, while the voice quality is imperfect and the up-front costs of an integrated switch are higher, the savings can be significant.

Smart.



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FCC commissioner: Overhaul Computer Decision II

CW AT COMNET '85

By James Connolly
CW Staff

WASHINGTON, D.C. — The Second Computer Inquiry decision, which set many of the guidelines for the divested AT&T and its former operating companies, must be changed to address the dynamics of telecommunications, according to a Federal Communications Commission official.

Dennis R. Patrick, a keynote speaker at Communications Networks 1985 (Comnet '85), last week said the FCC failed to envision the rapid changes in technology in its Computer Decision II limiting AT&T's role — and that of its now-divested operating companies — in the computer industry.

Computer Decision II was based on a "snapshot of the market," Patrick noted. "That works well in a static, but not in a dynamic market."

> ***The FCC failed to envision the rapid changes in technology in its 1981 Computer Decision II,***

Patrick, appointed an FCC commissioner by President Reagan in 1983, said the dichotomy between basic communications services, which the regulated telephone companies can offer under Computer Decision II, and enhanced services, where the telephone companies are restricted, has blurred since 1980.

Patrick called for a new or amended Computer Decision II — one not based on fixed models, as the 1980 version was, but rather on guidelines that can be applied to new technologies as communications and computers become more closely interwoven.

He cited as one typical problem the fact that in 1981 the FCC denied AT&T's request to provide voice store and forward. He noted that AT&T's competitors now offer similar functions, but while the FCC's mandate is to protect the general public, those functions are available only to large businesses, not to residential or small-business customers. AT&T's competitors are able to offer "one-stop shopping," which AT&T cannot do, he added.

"The world is too complicated for those neat little boxes that we regulators love so much," Patrick said. Regulators must be flexible in the "gray areas" of drafting a new Computer Decision II-type decision, he said.

One area that must be approached with an eye toward that kind of rapid change is that of cross-subsidization of new services, Patrick said.

He said an FCC decision to allow carriers to cross-subsidize services must consider, on a case-by-case basis, issues such as whether the market will be competitive or a natural monopoly and whether the applicant can provide services without significantly impacting other services.

Telecom firms cite regulatory burden at meet

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The telecommunications industry, ranging from the divested Bell operating companies to AT&T to MCI Communications Corp., last week asserted that the Federal Communications Commission's regulatory policies are hampering their business and called for changes. A top official of the Reagan administration also said that changes may be in order.

At a special "town meeting" of the Communications Network 1985 conference here, Randall Tobias, recently named chairman of AT&T Communications, asserted that uneven regulation from the FCC "has outlived its usefulness."

"Divestiture removed the need for separate subsidiaries [required by the Second Computer Inquiry decision], but they still remain," said Tobias, who claimed that communications users are being forced to shoulder the expenses of "costly duplication." His view was echoed by David Markey, assistant secretary for telecommunications and information in the U.S. Department of Commerce, who said Computer Decision II "must be reexamined."

However, William McGowan, president and chief executive officer of MCI Communications, maintained that in the year since the divestiture it has become apparent that the "changes we had hoped would work are working but not as we had hoped . . . we thought equal access meant equal access. But we have underestimated the costs . . . and find the pro-

See CHANGES page 15

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U.S. brandishes bill to stop Japan's copyright alteration

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — U.S. Sen. Frank R. Lautenburg (D-N.J.), in a strong warning to the government of Japan, last week introduced legislation allowing the U.S. to retaliate if Japan reduces or eliminates conventional copyright protection for computer software.

The legislation, supported by the Association of Data Processing Service Organizations, is another step in the U.S. government's efforts to pressure Japan into dropping its plan to abandon copyright protection for software.

Lautenburg's proposed International Computer Software Protection Act of 1985 states that if another country reduces copyright protection for software, the U.S. will in turn reduce copyright protection for that country's software products in the U.S. This reciprocity is called the "rule of the shorter term" in copyright law.

Lautenburg's bill was provoked by Japan's active consideration of legislation that would replace its present software copyright law with a 15-year, patent-like coverage that gives programmers and software vendors less protection from piracy, an aide said. U.S. copyright law covers software for 50 to 100 years after the author's death, and Japanese copyright covers software for 50 years following the author's death.

Development despite U.S. pressure

According to U.S. officials, Japan's Ministry of International Trade and Industry (Miti) has continued to develop the legislation despite U.S. pressure, which succeeded last year in striking the measure from the Japanese legislature's agenda only temporarily.

The U.S. strongly opposes the Miti legislation on the grounds that it undermines the fragile international consensus that copyright is the proper protection for software, reduces the term of protection, jeopardizes the confidentiality of the registered computer programs and gives the Japanese government too much control over sales of software licenses.

Lautenburg's bill specifically states that if a country provides less than 25 years of copyright protection or no copyright protection for software, then the U.S will not provide any copyright for software first published in that country or by its citizens.

Additionally, the bill says that if the country provides a software copyright term exceeding 25 years but less than that provided by the U.S., the U.S. will provide a term of no greater length for software first published in that country or by its citizens.

CHANGES

from page 14

cess heavily biased in AT&T's favor."

Among the concerns cited by McGowan was the automatic assignment of long-distance customers to AT&T Communications if a carrier is not selected. Seventy percent of customers are not picking one carrier over another, he said.

In addition, AT&T Communications has obtained divested Bell operating companies' customer lists and can selectively hit target markets, while other long-distance providers are forced to spend heavily in expensive advertising campaigns. And the most lucrative markets will not have been converted to equal access by the September 1986 deadline under the divestiture order, McGowan said.

> *'Changes we had hoped would work are working, but not as we had hoped . . . we thought equal access meant equal access.'*
>
> — **William McGowan**
> **MCI Communications Corp.**

A major impact being felt by MCI, McGowan said, is the refusal by several states to authorize long-distance competition within their state boundaries, which comprises a substantial part of long-distance traffic. He called on the FCC to assert authority over the states in this matter.

Thomas Bolger, chairman and chief executive officer of Bell Atlantic, also criticized the separate subsidiary restriction imposed by the FCC's Computer Decision II policy. He said Bell Atlantic and other regional operating companies are becoming unintended victims, while the FCC tries to "create competition for AT&T."

Bolger accused AT&T of gearing up to offer by-pass services to large-volume customers with the recently filed private-line tariffs [CW, Jan. 28].

Bolger said that Bell Atlantic is spending millions to implement equal access to long-distance customers and that there is a chance that, once available, it will not be used.

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WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

State, local prosecutors may receive MIS grants

WASHINGTON, D.C. — MIS systems that help state and local prosecutors manage their criminal cases would be eligible for federal grants from the U.S. Department of Justice under the terms of a proposal recently published by the department.

Prosecution Management Support Systems would help local prosecutors to notify witnesses, prepare subpoenas, identify priority cases (such as cases involving violent and career criminals), reduce case processing time and generally improve the effectiveness of the prosecutor's office, the department said.

The Justice Assistance Act of 1984 reportedly authorizes the department to provide block grants to states, which then issues subgrants to state and local governments for innovative programs that will improve the functioning of the criminal justice system.

Public comments on the rules, made before March 25, will be considered before the regulations become final.

Senators working to affix 25% R&D tax credit in code

WASHINGTON, D.C. — Two members of the U.S. Senate Finance Committee have introduced legislation on behalf of the computer industry to make the 25% tax credit for R&D expenditures a permanent part of the federal tax code, rather than let it expire at the end of this year.

Sens. John C. Danforth (R-Mo.) and Lloyd Bentsen (D-Texas) recently introduced the bill (S. 58) that was passed by the Senate last year but failed to gain approval in the House of Representatives [CW, July 9]. Danforth said the bill is supported by the U.S. Department of the Treasury — in one of the few exceptions to that department's proposal to eliminate most business tax credits — and the Coalition for the Advancement of Industrial Technology, a coalition of eight high-tech trade associations, 15 universities and 49 companies involved in R&D.

The credit applies to R&D expenditures that exceed a firm's average R&D expenditures for the previous three years. In addition to making the credit permanent, S. 58 also narrows the definition of R&D activities that qualify so the credit is targeted toward innovative, technological research, Danforth explained.

Research ventures seeking federal antitrust protection

WASHINGTON, D.C.— Three computer industry joint research ventures recently registered with the U.S. Department of Justice and the Federal Trade Commission to invoke the antitrust protection provided by the National Cooperative Research Act of 1984, the Justice Department said.

Under the law, registration with the government limits the ventures' liability in antitrust litigation to the actual damages, not triple damages as in other antitrust suits. The purpose of the law is to encourage the formation of research ventures by high-technology firms [CW, Oct. 15].

So far, the three registrants from the computer industry have been existing ventures:

- Microelectronics and Computer Technology Corp., a 21-firm corporation engaged in R&D on advanced computer architectures, artificial intelligence, semiconductor chip design and software productivity.
- Software Productivity Consortium, a 13-firm consortium that is exploring a possible joint venture to conduct R&D on advanced software tools and techniques.
- Computer Aided Manufacturing International, Inc., incorporated in 1972 to sponsor joint R&D on the use of computers to improve the productivity of industry, through research in areas such as robotics, quality assurance and factory management. The members include corporations, government agencies and educational institutions in the U.S., Europe and Japan.

Info technology topic of seminar

TARPON SPRINGS, Fla. — The Society for Information Management will hold its 1985 Institutional Member Seminar "Forming the Partnership: Exploiting Information Technology for Competitive Advantage" at the the Innisbrook Resort here March 6-8.

Aimed at senior information systems and business managers, the seminar will feature presentations on the use of information technology.

Speakers will include F. Warren McFarlan, professor, and James I. Cash Jr., associate professor, at Harvard Business School; and David G. Robinson, vice-president of Index Systems, Inc.

Registration for members is $595 for the first attendee and $495 for each additional one; for nonmembers, $1,395 for the first attendee and $495 for each additional one. More information is available from the Society for Information Management, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

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DP salary increases vary at or above 4% inflation

By John Desmond
CW Staff

MOUNTAIN VIEW, Calif. — Despite the flat 4% rate of inflation in 1984, salaries for computer professionals grew at varying rates at or above the inflation rate, according to an annual survey released recently by Source EDP here.

The recruiting firm's "1985 Computer Salary Survey and Career Planning Guide" was reportedly based on an analysis of surveys of approximately 48,000 computer professionals. The survey reported median compensation levels, as well as high and low ranges.

Salary ranges in certain individual cases "may not have kept pace with the rising cost of living," although salaries increased across the board in 1984, the report stated.

For example, the median salary for an entry-level commercial programmer was $20,800 in 1983 and $25,600 in 1984, an increase of 23%. Experienced data base specialists, who topped the salary list for nonmanagers, saw a 4% median rise to $43,900.

In the management ranks, operations managers at small installations saw their median income rise 9% from $29,000 to $31,700, the survey showed. Directors of large installations saw their median salaries increase 7% from $66,800 to $71,500.

Characterizing 1984, Wayne D. Emigh, vice-president and general manager of Source EDP, said, "Demand for computer professionals definitely accelerated in relation to 1983 and 1982, which [were] truly recession years."

Continuing a two-year trend, demand was heaviest in 1984 in the areas of systems software, microcomputer and minicomputer applications programming, data communications programming and software development, software engineers and qualified systems designers, according to Emigh. New areas of expansion in 1984 included office automation and artificial intelligence, which Emigh said is still in its infancy.

Responding opportunities for next year, Source EDP recommended that professionals in user environments gain exposure in areas including distributed processing, end-user information center products, networking and communications. New opportunities within firms marketing minis and micros will include software development, commercial and scientific systems development, programming, marketing and marketing support, the survey predicted.

The survey called computer-aided design and manufacturing (CAD/CAM) the most exciting area for career advancement, especially for designers, programmers and automation specialists. Source EDP's 1983 and 1984 reports said much the same thing about CAD/CAM.

Other positions showing significant median salary increases from 1983 to 1984 included the following: sales and technical support representatives, from $25,000 to $28,200, a 13% increase; sales managers, from $55,300 to $67,700, a 22% increase; and software engineers, from $25,300 to $30,300, a 20% increase.

Of all nonmanagement positions, computer operators earn the least, the survey showed. Their median salary ranges from $17,800 for less than two years of experience to $25,800 for more than five years of experience.

In management positions, operations managers were the lowest paid, with median salaries of $31,700 at small installations to $46,100 at large installations.

Source EDP's survey is available at no cost from Source EDP, Department DX-400, Box 7100, Mountain View, Calif. 94039.

MANAGEMENT POSITIONS*

	Annual Compensation ($ in thousands)		
	15th Percentile	Median	85th Percentile
[illegible]			
Small	33.2	43.7	56.6
Medium	39.5	49.3	62.1
Large	44.0	57.2	69.0
[illegible]			
Small	33.6	43.7	51.6
Medium	41.2	50.0	59.9
Large	45.6	55.7	67.0
[illegible]			
Small	24.2	31.7	37.2
Medium	28.1	39.3	46.5
Large	34.7	46.1	53.2
[illegible]			
Small	35.6	44.1	54.6
Medium	43.5	56.9	65.4
Large	55.6	71.5	97.2

*Salary according to size of computer system or staff managed

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FBI moving to employ AI software as crime fighter

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — When the boss of the Federal Bureau of Investigation expresses his support for the development of a new crime-fighting weapon, the chances of its successful adoption improve considerably.

The FBI is moving quickly to implement a new crime-fighting weapon that does not involve increased firepower or more agents. The weapon is artificial intelligence and expert systems software. When applied to the crowded FBI data bases, the expert systems are supposed to help crime solvers find patterns, clues and, ultimately, make inferences based on the data about the likely source of the crime.

"Artificial intelligence will be pervasive. It is integral to our automation strategy," explained William A. Bayse, assistant director of the FBI's technical services division.

Bayse and his deputy, Kier T. Boyd, are not required to convince a stubborn bureaucracy of the worth of their mission. They are following the expressed interest of FBI Director William Webster, who is pushing for the introduction of technology into the FBI toolbox of investigative techniques. "The director has given us the strongest support. He is interested in implementing this technology in our work," Bayse added.

Last week, one of the first steps of this strategy was realized as the FBI accepted a commercially available software package, modified for its specific task, that uses AI mechanisms for case management and development of prototype cases by rapid pattern analysis. It will be used to "underpin and support" the investigations of FBI agents in narcotics intelligence and organized crime work, Bayse said.

Bayse and his staff, which includes systems programmers and data base administrators, are excited about taking the overflowing FBI files already entered in computerized data bases and making cross-references from one file to another. The marriage of data base administration with expert systems software to draw out previously unlinked facts and inferences is what the bureau is undertaking, Bayse said.

"We have a potential richness of [links] that can be derived from a multiplicity of activities that are contained in our data bases. We've already got a lot of experts in various fields — bank fraud and computer crime, for example. They can and will be able to use these new systems to help them," Bayse said.

The division director would not disclose on which areas the bureau will concentrate initially with the new expert systems software. He did reveal, however, that the agency is not concentrating on one particular technology, but rather, is using different programming languages, such as Prolog and Lisp, to build simple rule-defined algorithms that will swiftly access the FBI data bases and pull together seemingly unrelated facts. "The thing we see about this [use of artificial intelligence] is that we will be able to capture the institutional knowledge of the bureau and codify it," he added. This is increasingly important because of rapid turnover in the ranks of agents and the movement of agents from one division to another, resulting in lost expertise.

Germane to the task of introducing AI into the daily use of the FBI is the planned "rebuilding from scratch" of the National Crime Information Center (NCIC), the massive centralized federal-state crime index used extensively by law enforcement authorities. The NCIC processes 400,000 transaction requests daily.

Although the FBI currently audits the requests coming into the NCIC, Bayse said, the planned rebuilding will generally change the system from its current single-thread case processing to a multithread system where dispersed host computers, instead of a central system, will contain stored data. Expert systems software will be used to monitor patterns of access to the NCIC files, Bayse said. This would enable the FBI to see, for example, if similar types of requests for information to the NCIC were coming from one particular region of the country and moving to another, which might indicate a trend or direction of criminal activity.

In specific cases, this ability to detect patterns in criminal behavior has already been put to use by the FBI, but the work has been done by agents with expertise in the cases, not by AI software-searching data bases.

Ultimately, Bayse predicted the utilization of expert systems software in the field by agents with lap-top computers to investigate crime. The software would perhaps prompt agents to enter data that might otherwise be overlooked. "The deterioration of evidence is a fact, and these systems could help the field agent to obtain the evidence that is needed to break the case. The case of the Atlanta serial murders involving Wayne Williams was made more difficult because of poor evidence collection in the first cases, when there was no link established yet," Bayse said. All FBI recruits are now receiving computer training in expert systems software, Bayse cited, as proof of the FBI's new direction.

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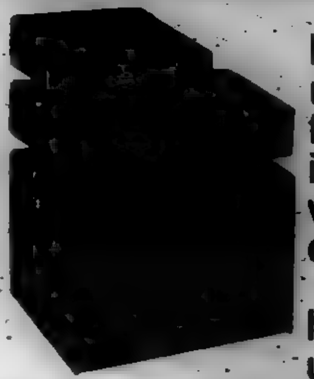

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Niosh to study mental stress related to computer work

By Mitch Betts
CW Washington Bureau

CINCINNATI — Taking the first step toward understanding the "mental overload" and stress experienced by workers in automated offices, the National Institute for Occupational Safety and Health (Niosh) plans to study methods of measuring the mental demands of fast-paced information processing jobs.

Ultimately, the research may help managers of office automation projects design jobs that avoid mental stress, according to Niosh researchers interviewed by *Computerworld*.

Niosh officials said the study was prompted by the fact that more than 50% of the current U.S. work force performs work that is information processing as opposed to physical in nature, and the work increasingly is automated with computer-based technology.

"We know a considerable amount about how physical tasks and equipment affect individuals, but we know comparatively little about how mental tasks might affect people," said Joseph J. Hurrell Jr., a research psychologist at Niosh here.

"Cognitive tasks may ultimately affect not only psychological health but also physical health," he said.

Affect heart rate

For example, Hurrell noted that there is preliminary evidence that high-speed information processing jobs such as air traffic control affect an individual's heart rate.

The purpose of the one-year study "Health Risks in Information Processing" is to develop an index for measuring the mental demands of a particular job.

Once the measures are validated, they can be used in future studies of the relationship between cognitive demand and stress in information processing jobs, Niosh officials said.

Demanding job vs. heart rate

The study will involve a questionnaire that asks 330 workers about the mental demands of their jobs, and researchers will place small heart-rate monitoring devices on 30 of the workers to test the correlation between mentally demanding jobs and heart rate.

> ”
>
> *More than 50% of the current U.S. work force performs work that is information processing as opposed to physical in nature.*

Hurrell said the subjects will be in the telecommunications industry, which he said is at the forefront of office automation. Specifically, the workers will be telephone operators, telephone customer service representatives and data entry clerks.

Trying to gauge the mental demands of the job, the questionnaire will ask about office distractions, the amount of decision making and memorization required on the job and whether the worker must switch between visual and oral information.

Finite mental capacity

The current theory in cognitive psychology is that an individual has only a finite mental capacity to devote to a task, according to Raymond White, a psychology professor at Miami University in Oxford, Ohio, who is working on the Niosh study.

"We know that if there are distractions [in the office], that will use up some of that [mental] capacity, thereby leaving less mental capacity to deal with one's work," he said.

The study will begin once the White House Office of Management and Budget approves the Niosh questionnaire as required by the Paperwork Reduction Act of 1980.

SCIENCE/SCOPE

A future generation of infrared "eyes" for space surveillance systems will be far more capable as the result of technology advances at Hughes Aircraft Company. These systems will be able to see distant targets in space, in the air, or on the ground—and relay data instantly to ground stations. Advances are being made in focal plane design, signal processing architecture, and in the design of a unique sensor with very steady telescoping optics. By building modularity and programmability into the new technologies, researchers are making it possible for systems to use tailored combinations from a single family of hardware and software. For its advances, Hughes received an Award for Technical Achievement from the Strategic Technology Office of the Defense Advanced Research Projects Agency. This effort was sponsored by DARPA and monitored by the U.S. Air Force Space Technology Center.

A series of semicustom, high-performance HCMOS gate arrays, featuring flip-flop toggle rates of 75 MHz, has been introduced by Hughes. The new Quad Logic® arrays use a basic four-gate equivalent cell arranged as two 2-input and two 3-input gates. This architecture minimizes the number of gates needed to implement macro functions and ensures efficient interconnection and routing. High-density circuit layout and high performance are achieved through the use of double-layer metal interconnections and 3-micron processing technology. Electrical channel lengths are under 2 microns. Arrays vary in complexity from 2,000 to 8,000 gates.

An RF-excited waveguide carbon-dioxide laser has been introduced for use in medicine and industry. The compact 20-watt laser, designated the Series 3900, is the first RF-excited laser to be commercially available from Hughes. It features stable output and a clean mode for excellent control of the beam's cutting edge. "Hardseal" construction and advanced metal-ceramic processing techniques insure long life. The tube has a hardseal gas valve to permit factory refill. The laser is available in three configurations—air-cooled, water-cooled, and a bare tube that measures 1.75 inches in diameter, about the size of a conventional helium-neon laser.

A klystron amplifier tube designed to operate 10 years—three times the current design life—is improving reliability and reducing life-cycle costs in Hughes' AML terrestrial microwave signal distribution systems. Key to its longevity is a coating layer of osmium ruthenium alloy for the tube's cathode, which allows the amplifying electrons to be emitted at lower temperatures. The resulting tenfold reduction in evaporation of barium from the cathode extends operating life. The technique, an outgrowth of work done for satellite communications amplifiers, is finding application with cable television companies.

Hughes is seeking experienced engineers and scientists to further develop advanced spacecraft systems and components for communications satellites—successors to the 20 that will have been launched from the space shuttle by 1986. Openings are in the fields of: software, computers, and data processing systems; components and component survivability; microwave communications; space electronics; control electronics; spacecraft design and integration; engineering mechanics; propulsion and electrical power; guidance and control; spacecraft manufacturing; and systems test and development. Send your resume to Dan Frownfelter, Hughes Space & Communications Group, Dept. S3, S4/A300, P.O. Box 92919, Los Angeles, CA 90009. Equal opportunity employer. U.S. citizenship required.

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HUGHES

Regulated high-tech growth limits economic potential

LONDON — Attempts to preserve jobs by restricting access to the latest high-technology products through regulation will create unemployment and inhibit economic growth, according to Edmund B. Fitzgerald, president and chief executive officer of Northern Telecom Ltd.

In a recent address to the World Telecommunications Conference, sponsored by London's *Financial Times*, Fitzgerald said, "The technologies of information management do not consume wealth. They produce wealth, and thus have a significant impact on all areas of national life.

"Because information management products are productivity tools," Fitzgerald continued, "any attempt to restrict their dispersion within a given political jurisdiction is probably doomed to failure."

Fitzgerald maintained that a national telecommunications network must incorporate the latest technology available, or else its users will be forced to find other sources. " [The users] will have no choice, because their international competitiveness will be at risk if they accept the inflated costs and reduced efficiencies inherent in using outmoded technologies.

"The continuing integration of voice and data networks internationally means that every one of the half-billion telephones in service around the world can be converted into a sophisticated information processor."

Fitzgerald suggested that this new capability, combined with recent advances in computer-aided design and manufacturing, "suggests that our traditional practice of identifying economic activity with national boundaries may already be obsolete.

"Ultimately, the information component of all goods and services will flow so freely through the global telecommunications network that effective regulation may be impossible," he continued.

Fitzgerald argued that the new information technologies, which are creating unemployment and lowering wages, are based on static analysis. The assumption that the application of new technologies will mean only the same goods and services produced in the same quantities at the same relative prices but with less labor is "not supported by history or logic," he added.

Union regulations that restrict the use of technology "ultimately impose hardships" he said. "By seeking to combat the basic economic principles of the marketplace, [regulation] discourages investment because wise investors are well aware that changes in public policy can instantly eliminate any competitive advantage created by regulation."

Fitzgerald also claimed that protected industries are often incapable of exporting their products because of high costs. At the same time, their domestic markets are generally too small to provide the economies of scale required to sustain competitive pricing. "Protection in such cases does not mean sustained life for a company or industry but a slow and painful death," he said.

"Universal accessibility to the latest in high technology will ensure that every nation will be able to use its particular competitive advantages — whether they are natural resources, such as timber and oil, or human resources, such as a hardworking, skilled work force — to their full potential," he concluded.

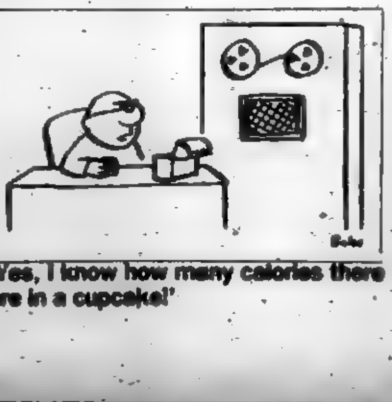
Expert systems event to be held in France in May

AVIGNON, France — The French Agence de l'Informatique will be holding its Fifth International Workshop and Exhibition on expert systems and their applications May 13-15 at the Palais des Congres here.

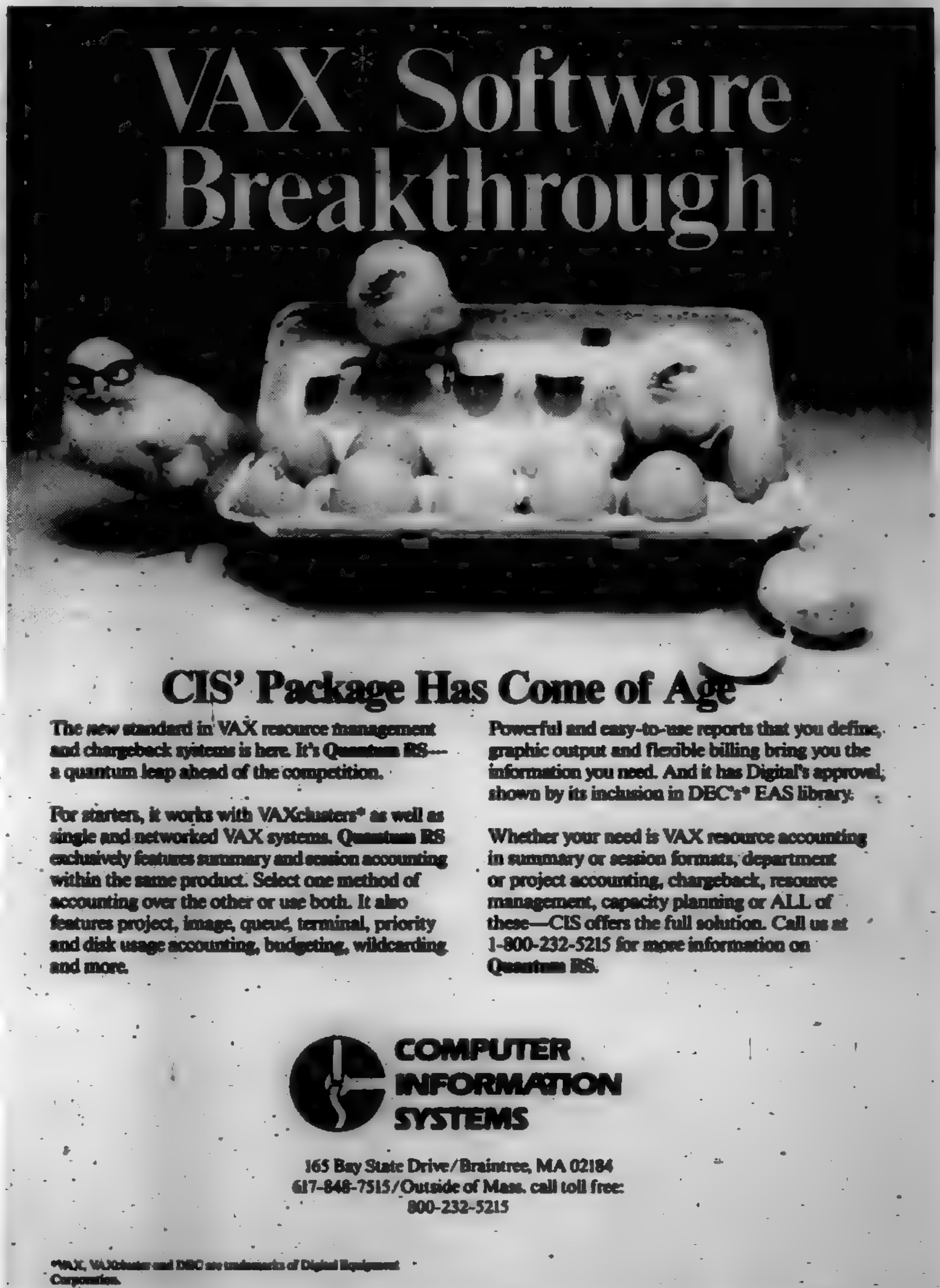
The workshop and exhibitions will include a conference dedicated to the basic tools and techniques for building expert systems and to expert systems implementations concerning real-life applications. Theoretical issues underlying knowledge engineering also will be discussed. The exhibition will feature operational or experimental tools and applications, according to the show's sponsor.

The event is designed for developers and users of expert systems. The conference will be conducted in both English and French.

The Agence de l'Informatique is also calling for papers for the conference in research or applications areas. Additional information is available from Jean-Claude Rault, Agence de l'Informatique, Tour Fiat-Cedex 16, 92084 Paris-La Defense, France.



'Yes, I know how many calories there are in a cupcake!'



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INTERNATIONAL REPORT
CW International News Network

CHINA

BEIJING — The year 1984 was a good one for China's computer industry, with overall revenue doubling that of the previous year. According to the administrative director of the computer industry sector, under China's Ministry of Electronics Industry, the country produced six times as many microcomputers in 1984 as in 1983.

■

HUNAN — Hunan Research Institute of Electronics has announced an English-Chinese-Japanese dot matrix printer that reportedly contains an entire set of standard Chinese characters. The printer is based on Intel Corp.'s 8085 controller and prints at speeds up to 80 char./sec.

It features English, Chinese and Japanese characters, symbols and images, according to a representative from the institute.

■

BEIJING — For the first time, the international computer and telecommunications trade fair, called China Comm, will open its doors to European exhibitors this year. The conference is slated here Nov. 5-13.

JAPAN

TOKYO — IBM Japan, unhappy with its declining position in the Japanese market, is beefing up its Asia/Pacific regional staff by adding approximately 50 people.

In addition, it will announce an aggressive volume-sales incentive plan promoting the use of its JX Japanese personal computer, insiders reported.

IBM is also expected to unveil a stable of new software packages to spur sales of the personal computers.

■

TOKYO — Mitsubishi Electronic Corp. has announced a line of mid-range mainframes called the Melcom EX series.

The three additional machines are said to be high-end versions of the company's existing Cosmo mainframe series.

The Melcom EX series reportedly allows users to get the same functional level as in large-scale machines, boasting capabilities of 1.65 million to 3.92 million instructions per second.

ENGLAND

LONDON — The European Strategic Program for Research and Development in Information Technology (Esprit) got a big shot in the arm last week when the European Economic Community officially made a $1 billion commitment hoping to catch up with the U.S. and Japan in developing advanced information technology.

The program is funded 50% by the 10 Common Market countries and 50% by industry participants.

The European Economic Community has selected 270 companies, research institutes and universities to collaborate on research dealing with microelectronics, advanced computer design, computer-aided design and manufacturing and office automation. Critics of the 10-year Esprit plan said they feel the money might be too little too late, but Brian Alvey of the UK's Alvey research consortium said he feels the European Economic Community's move at least signals a start.

Of 441 proposed research projects, 104 have won approval by the European Economic Community. Of that number, only nine projects call for the participation of multinational companies. IBM Deutschland, for example, will be involved in two of the projects, and the West German subsidiary of Digital Equipment Corp. will participate in one. Prototypes of the proposals are expected within two years, according to sources.

■

LONDON — IBM is destined to lose the battle for the dominant data communications architecture, according to standards expert Hal Folts, a member of European and U.S. standard groups. During a recent address at the Organizational Standards Institute's Open Systems Interconnect (OSI) Conference, Folts said, "[IBM's Systems Network Architecture] will converge with OSI. It will never be the other way around."

WEST GERMANY

MUNICH — Unity reigns among the plug-compatible manufacturers (PCM) here, but only in terms of a common enemy: IBM. With that exception, stiff competition exists among the various PCMs.

Siemens AG has recently gained ground in the battle for large-mainframe business in Europe, mainly at the expense of Amdahl Corp.'s West German subsidiary.

Ironically, Siemens' PCM partner, Fujitsu Ltd., holds a 49% stake in Amdahl Corp. Meanwhile, Amdahl GmbH has recently found itself out in the cold with the General German Automobile Club when that organization replaced its Amdahl V7 system with a Siemens 7890.

In addition, Bavarian Motor Works is reportedly considering swapping two Amdahl 5860 mainframes for Siemens machines.

According to insiders, Amdahl had over 40 installed mainframes in West Germany in 1982. That number slipped to 38 by the beginning of 1984 and dropped to 30 in October.

ISWU plans three meets

SAN FRANCISCO — The International Society of Wang Users (ISWU) will hold a regional conference with the theme "Rediscovering Enterprise: Managing Change in the Age of Information," at the Fairmont Hotel here March 3-6.

The conference will additionally be held at the Shoreham Hotel in Washington, D.C., April 9-12 and at the Downtown Marriott Hotel in Chicago May 28-31. The conferences are named Enterprise West, Enterprise East and Enterprise Central, respectively.

Each conference will include more than 50 sessions on subjects including the following: Wang Laboratories, Inc. systems and applications encompassing technical information on Wang products, user applications and question-and-answer sessions; integrated information processing exploring the state of the art; and executive management encompassing economics, social and organizational structure.

The fee for ISWU members is $490, and the fee for nonmembers is $540.

More information is available from Wang Laboratories, One Industrial Ave., Mail Stop 5413 B, Lowell, Mass. 01851.

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NOMAD2's single-command environment, unmatched report writer, statistical and interactive decision support capabilities and, most importantly, its richness of language have made it the hallmark 4-GL against which all others are measured. And it is through these attributes that the sheer power of SQL/DS can be fully realized.

The NOMAD2-SQL/DS interface represents the latest innovation from D&B Computing Services. In making NOMAD2 available for use on in-house mainframes, we have continued the evolutionary process we began in 1975 when NOMAD was first introduced. And it is this evolutionary process that has catapulted NOMAD2 to the leadership position it holds in the marketplace.

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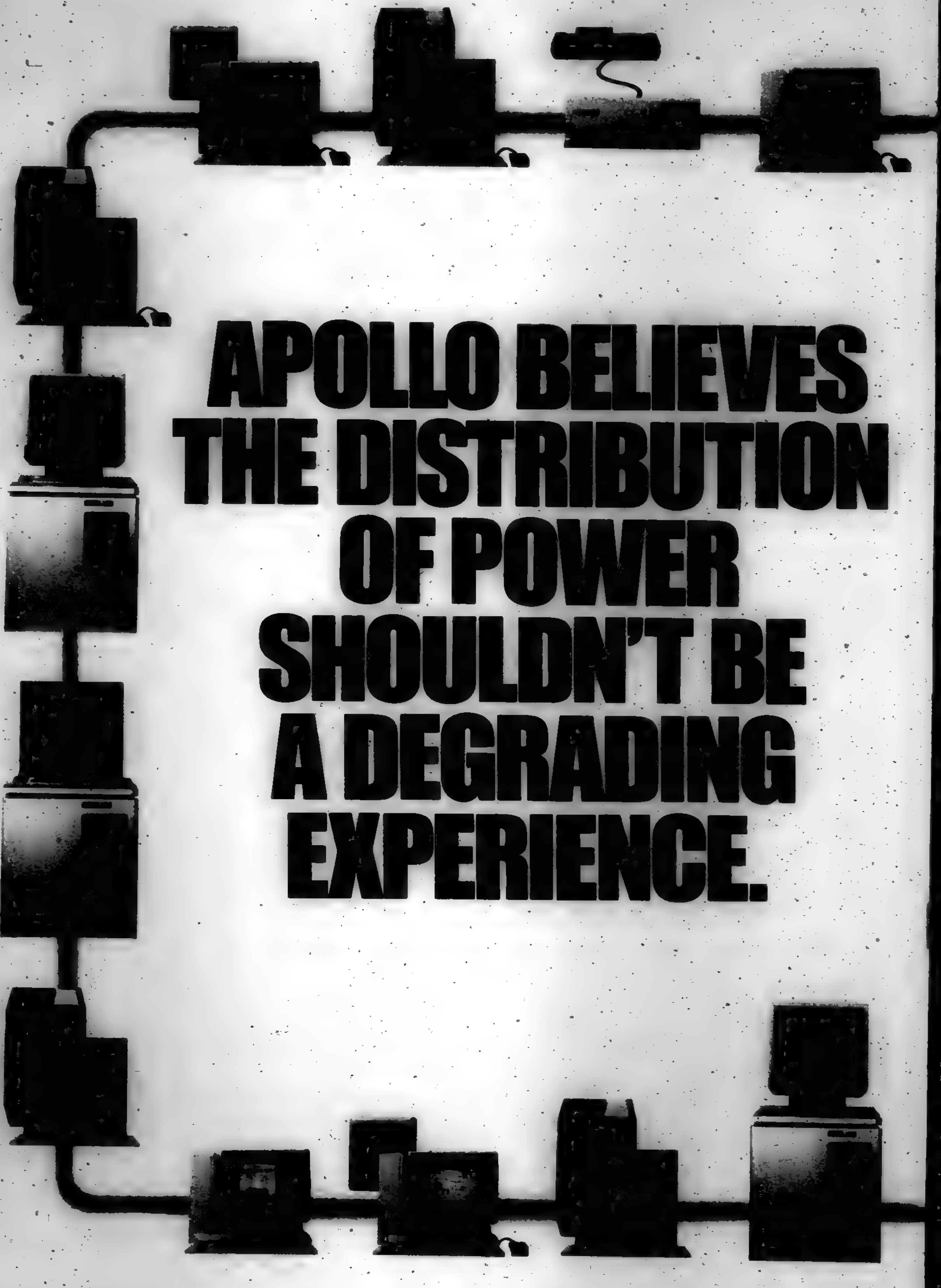
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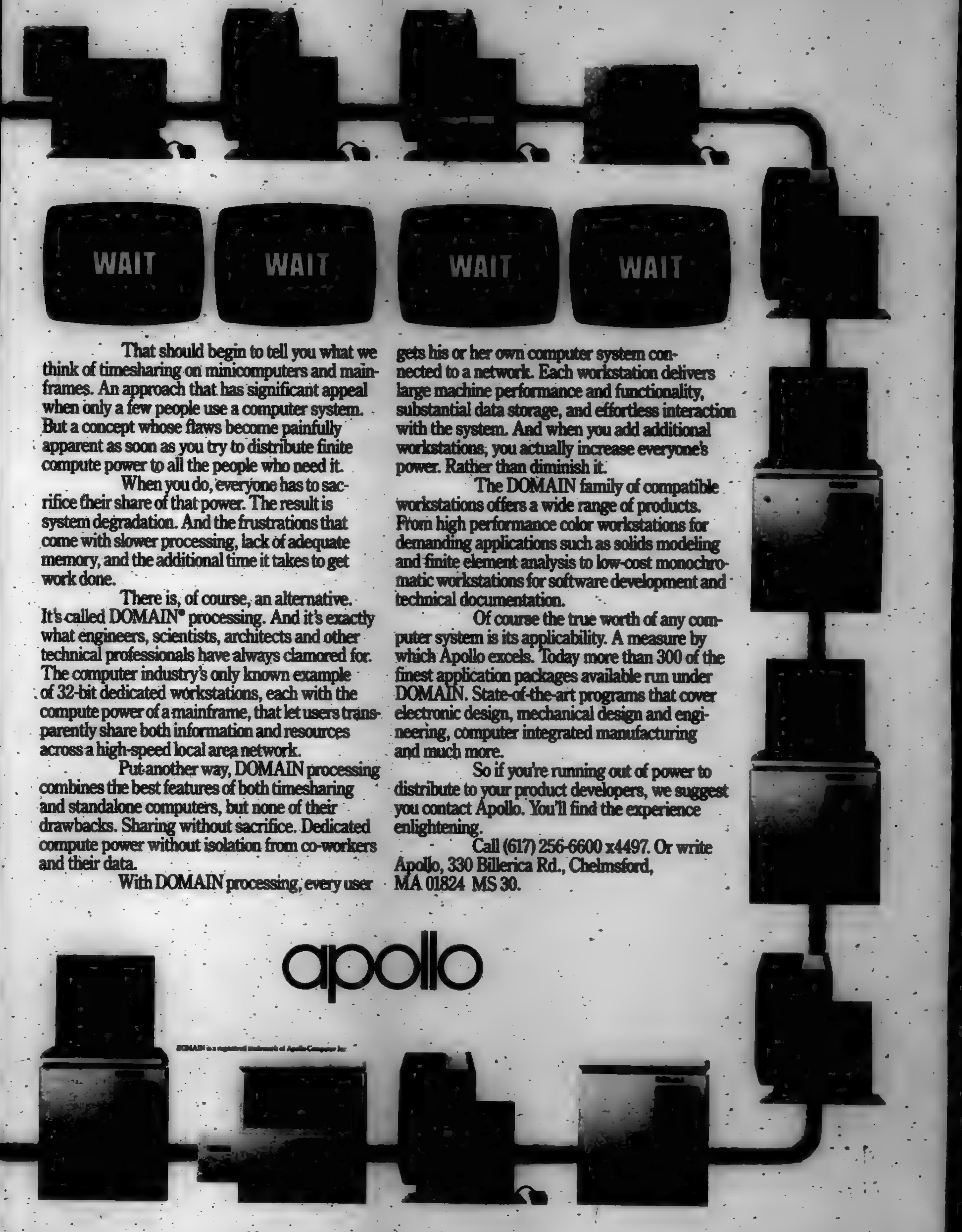

That should begin to tell you what we think of timesharing on minicomputers and mainframes. An approach that has significant appeal when only a few people use a computer system. But a concept whose flaws become painfully apparent as soon as you try to distribute finite compute power to all the people who need it.

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CALENDAR

WEEK OF FEB. 10

FEBRUARY 10-13, PALM SPRINGS, FLA. — **Small Computer Systems Interface (SCSI) Forum.** Contact: SCSI Forum, Suite 312, 8929 Sepulveda Blvd., Los Angeles, Calif. 90045.

FEBRUARY 11, NEW YORK — **Introduction to the IBM Personal Computer.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 11, LANSING, MICH. — **Performance Management in the Systems Environment.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Feb. 12 in Chicago.

FEBRUARY 11, NEW YORK — **Personal Computer Communications Overview.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 11-12, FREDRICK, MD. — **Computer Literacy for Executive Secretaries and Administrative Assistants.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742.

FEBRUARY 11-12, PRINCETON, N.J. — **Lotus 1-2-3.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

FEBRUARY 11-13, BOSTON — **Data Base Management Systems and Fourth-Generation Languages for Personal Computers.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

FEBRUARY 11-13, LOS ANGELES — **Relational Data Bases.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

FEBRUARY 11-13, SAN FRANCISCO — **Introduction to Data Communications.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

FEBRUARY 11-13, INDIANAPOLIS — **Systems Project Management.** Contact: Thomas J. Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held Feb. 11-13 in Lincoln, Neb.

FEBRUARY 11-13, HOUSTON — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

FEBRUARY 11-13, SAN DIEGO — **Telecommunications Alternatives in the '80s.** Contact: Continuing Engineering Education Program, George Washington University, Washington, D.C. 20052.

FEBRUARY 11-13, SAN DIEGO — **Configuration Management of Software Programs.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

FEBRUARY 11-13, PARSIPPANY, N.J. — **Data Processing for the Non-DP Manager.** Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07054.

FEBRUARY 11-14, LOS ANGELES — **State of the Art Conference.** Contact: Sherry Lewis, The Institute of Internal Auditors, Inc., P.O. Box 1119, 249 Maitland Ave., Altamonte Springs, Fla. 32701.

FEBRUARY 11-14, NEW ORLEANS — **Computer Micrographics Technology's (Comtec) 15th Annual Conference.** Contact: Comtec, Suite 200, 100 N. Winchester Blvd., San Jose, Calif. 95128.

FEBRUARY 11-15, SAN FRANCISCO — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Suite 405, 2800 N. Loop W., Houston, Texas 77092.

FEBRUARY 11-15, PORTLAND, MAINE — **Basic Systems Analysis.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

FEBRUARY 11-15, NEW YORK — **IMS/DB Application Programming.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

FEBRUARY 11-15, HOUSTON — **Analysts' Skills Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Suite 405, 2800 N. Loop W., Houston, Texas 77092.

FEBRUARY 11-15, WASHINGTON, D.C. — **Microcomputers and Auditing.** Contact: Sherry Lewis, The Institute of Internal Auditors, Inc., P.O. Box 1119, 249 Maitland Ave., Altamonte Springs, Fla. 32701.

FEBRUARY 12, BOSTON — **T1 Carrier Strategies: The New Networking Imperative.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

FEBRUARY 12, NEW YORK — **Spreadsheets Using Lotus 1-2-3.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 12-13, CHICAGO — **Data Communications in the Factory.** Contact: The Yankee Group, 89 Broad St., Boston, Mass. 02110.

FEBRUARY 12-14, NEW ORLEANS — **United States Telephone Association/United States Telecommunications Suppliers Association (USTA/USTSA) Southern Telecommunications Showcase '85.** Contact: USTSA, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

FEBRUARY 12-15, DALLAS — **Vsam.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

FEBRUARY 13, NEW YORK — **Word Processing with Wordstar.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

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Productivity now! (Why wait?)

Why not develop programs the same way software houses do? Their existence depends on the efficient development of new systems. Is productivity any less important to your business?

By George Proudfoot

Emerging software tools such as fourth-generation languages, sophisticated data bases and powerful query programs can improve programmer productivity by making it easier to translate the needs of computer users into instructions for data processing machines. It will take time, however, for these tools to evolve to the point of real usefulness and general acceptance.

In the meantime, there are several simple but much-neglected steps that most data processing departments can take to improve programmer productivity without waiting for the new software tools to come on-stream. The average company can benefit from using software development principles devised and used by software houses themselves.

Following are a few aids for creating systems more efficiently using only those programming tools commonly available in most companies:

- Comprehensive standards.
- Generalized building blocks.
- Externalized variables.
- Automated documentation generation.
- Easier linkages.

Developing standards

Good programming standards are the structural foundation for building enhanced programmer productivity. Standards ensure that systems are developed uniformly, thereby enabling programmers working on related programs to understand each other's work quickly and easily. Ideally, standards should be so thorough that to an outside observer, all programs appear written by the same person.

Standards should be established for each element of a system. Data names, for example, should have a predefined structure so that by looking at the program, anyone familiar with the standards can identify data items and recognize how each piece of data is likely to be used.

The overall architecture of a program should be standardized so that similar functions are located in the same place in all programs. Seemingly unimportant details such as indentation settings and the structure of program statements should also be uniform throughout all programs.

Benefits of standardization

Standardization along these lines yields many benefits. Because standardized code can be read and understood easily, new employees quickly become familiar with the programs. Additionally, the productivity of programmers charged with maintaining programs or creating program interfaces will improve markedly as a result of the shortened learning curve.

With thorough standardization, it is possible to develop systems

Programming standards should be so thorough that to an outside observer, all programs appear written by the same person.

Program writers will begin thinking in building-block terms: "Is this something I can use an existing building block to do?"

By removing from programs items that are commonly subject to change, it is possible to avoid rewriting programs after they are developed — the essence of "externalizing variables."

that can automatically generate skeletal programs as well as large sections of code with very little programmer input.

Furthermore, comprehensive standards make it possible to design "filter" programs for making generalized changes that will enable a system to work in different hardware or operating system environments. A filter program knows exactly where to look for statements or elements that must be changed. Standardization makes this possible. Without standards, such changes must be made manually on a piecemeal basis for each program.

Although standards are generally easy to devise and their benefits widely acknowledged, it is rare to find a programming department that strictly adheres to universal standardization. In the rush to meet deadlines, programming shortcuts that violate standards are commonly tried.

Managerial self-discipline is required in order to maintain adherence to standards in the face of such pressure. Even though adherence might cause an initial project to be delayed, the long-term benefits of strict standardization for ongoing projects should far outweigh any short-term costs.

Creating building blocks

The building-block concept ranks with standardization as a fundamental element in improving programmer productivity. Generalized building blocks are routines, sections or entire programs that can be used by more than one system. Without strict standardization it is not possible to create building blocks because building blocks and new program codes must follow the same standards in order to mesh smoothly.

It has been estimated that more than 80% of the code in any system is written to perform functions common to other systems, such as input editing, screen creation and report generation. The code that performs these functions can be written in a generalized manner so that when a new system or program is developed, existing building blocks can be used to perform common tasks. Only the new portions of code need to be written, tested and documented.

Building blocks can be as simple as a routine to add or subtract dates, which can be copied or called into a program requiring that function, or as complex as a generalized report writer that can produce reports for any system if files and report formats are properly defined.

Once standards have been established and some building blocks have been coded, programmers begin to realize the enormous productivity gains provided by this approach. As the library of available routines and programs grows, program writers find themselves thinking in building-block terms: "Is this something I can use an existing building block to do?" or "Is this a function that could be written as a generalized building block?" It is possible for an organization to reach the point where most of the code in most of its systems consists of building blocks.

Code maintenance. Obviously, the cataloging and maintenance of standard code must be carefully controlled. Within every organization an individual or centralized group should be assigned the responsibility for maintaining the generalized code. That individual or group should ensure that the code conforms to standards, that it operates properly with the current version of each system and that suitable improvements are incorporated into the code.

Externalizing variables

In the dynamic world of systems design there is one constant — sooner or later, all systems change. Therefore, it is not sufficient to develop productivity tools that make it easy to build new systems; there must also be tools that make it easy to change systems as the need arises. The externalization of variables is such a tool.

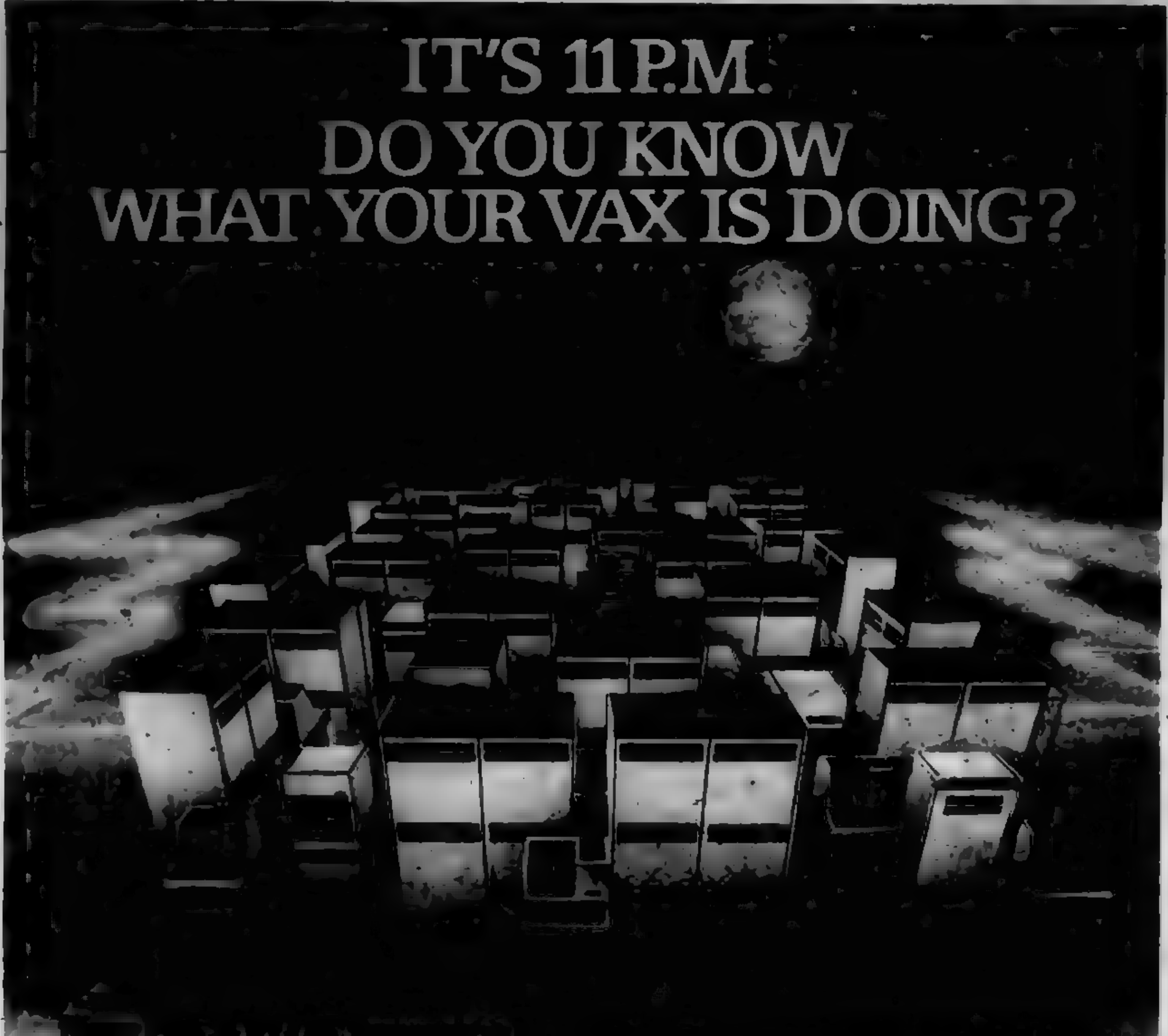
By removing from programs those items that are commonly subject to change, it is possible to avoid having to rewrite programs after they are developed. This is the essence of the concept of externalizing variables.

One of the earliest uses of this concept was the report writer program. Before the advent of report writers, reports were hard-coded in programs. If you wanted to change a report, you had to change the program, recompile it and perform tests to make sure no mistakes were made. If you wanted a new report, you usually had to write a new program.

Report writers, however, made it possible to change existing reports and develop new reports without having to alter a system's reporting program or write a new one. The report writer did this by externalizing the variable that was most likely to change — the appearance and content of the report. Some report writers even went a step further and also externalized the definitions of the file from which reports were produced. That made it possible to generate a variety of reports from different files without changing the report writer program itself.

The principle of externalization of variables is most fully manifested in a system that externally defines not only reports, but on-line screens, edit rules, files and access keys as well. An assortment of important revisions — including the addition of new fields, the defining of new access keys, development of new inquiry or entry screens and production of new reports — can be incorporated into such a system without having to alter programs. To effect such changes, new controls would simply be entered into the system's external tables.

If a company has adopted comprehensive standards, then programs driven by external variables can be



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developed into the kind of generalized building blocks that can add exponentially to programmer productivity.

Automating documentation

The need to maintain up-to-date documentation on a system's capabilities is a key consideration in system design. Documentation produced when a system was initially developed can rapidly become obsolete if the system is changed. Since systems that externalize variables were designed to be easily changed, it is especially important to be sure that documentation for such systems is kept current with whatever changes are made to screens, edits or other elements of the system.

The best way to keep documentation current is to produce it automatically whenever changes are made to the external tables that define the system. This requires a program that can access the external variable tables, interpret what is meant by each table entry and produce a document that will describe to a user how the system operates.

Such a documentation generator program should produce literature showing what the system's screens look like and describing the functions they perform, discussing the edits performed on various fields and outlining the information contained in each master file.

The automatic generation of new documentation from system definitions not only solves the problem of keeping documentation up-to-date as a system is changed, it also greatly boosts programmer productivity by eliminating the time-consuming task of documenting new systems. Designing systems to write their own documentation frees programmers for tasks requiring more creativity and analytical skills.

Making linkages easier

Systems and families of systems — no matter how comprehensive they may be — do not operate in a vacuum. For proper processing, systems inevitably must interchange data. If systems cannot be linked together, then the data they need to share must be printed out of the sending system and manually keyed into the receiving system.

By making it easy to link systems together, programmer productivity — as well as end-user productivity — can be greatly increased. Three types of linkages may be established to accommodate three different circumstances: linkages between programs in the same system family, linkages within a company between different types of systems and linkages to systems outside a company.

Easiest to provide for are intracompany linkages between programs of the same system family, such as a fixed asset system and a general ledger system developed using identical standards. When each application within a system family is developed, the requirements of other programs and applications within that family can be taken into consideration by the system's designers. Integration can thus be built into the application from the ground up.

It is more difficult to plan for integration involving different types of systems. People developing financial systems, for example, may not be familiar with current or future requirements for manufacturing systems in the same company. Adherence to standards in systems design makes it easier to establish linkages between different types of systems. If file formats, data names and I/O routines, for example, are designed in accordance with comprehensive, companywide standards, it is much easier for programs to interface with each other.

The possibility of linkage to systems in other companies is often overlooked when linkages are being considered by system designers. Such an oversight might prove costly. However, if external linkages can be readily established, significant productivity gains can be realized when information is automatically passed between computers without the need for printouts and reentry of data by hand.

One way to achieve this kind of external integration is to develop a program that makes it easy to interface systems. Such a program must embody sophisticated translation capabilities so it can receive information in the format produced by the sending system and translate it into the format required by the receiving system.

If the principle of externalizing variables is followed, one generalized program can be used to perform many linkages. Definitions of the sending system's data and the format of the receiving system's data can be provided in external tables. New interfaces can be developed by simply making new table entries. The same program can be used for all interfaces, eliminating the need to develop a series of interface programs from scratch. An automated interface program can be used to develop interfaces between in-house systems that were not initially written to be integrated. It can also be used to develop interfaces to transmit automatically information to other companies (such as purchase orders to vendors or payment data to banks) and to receive information from other companies (such as invoices from vendors or cash receipt data from clearinghouses).

The standards and methods described have been implemented without using fourth-generation languages or data base tools. Taking full advantage of the tools that are currently available for improving programmer productivity is often far less disruptive and costly than buying new tools. With planning, commitment and discipline, you can implement these guidelines to enhance the productivity of your data processing department.

About the author

George Proudfoot is vice-president of Data Design Associates in Sunnyvale, Calif. His firm develops financial applications software for mainframes and minicomputers. Prior to joining Data Design, Proudfoot was financial applications manager for Electronic Data Systems Corp.

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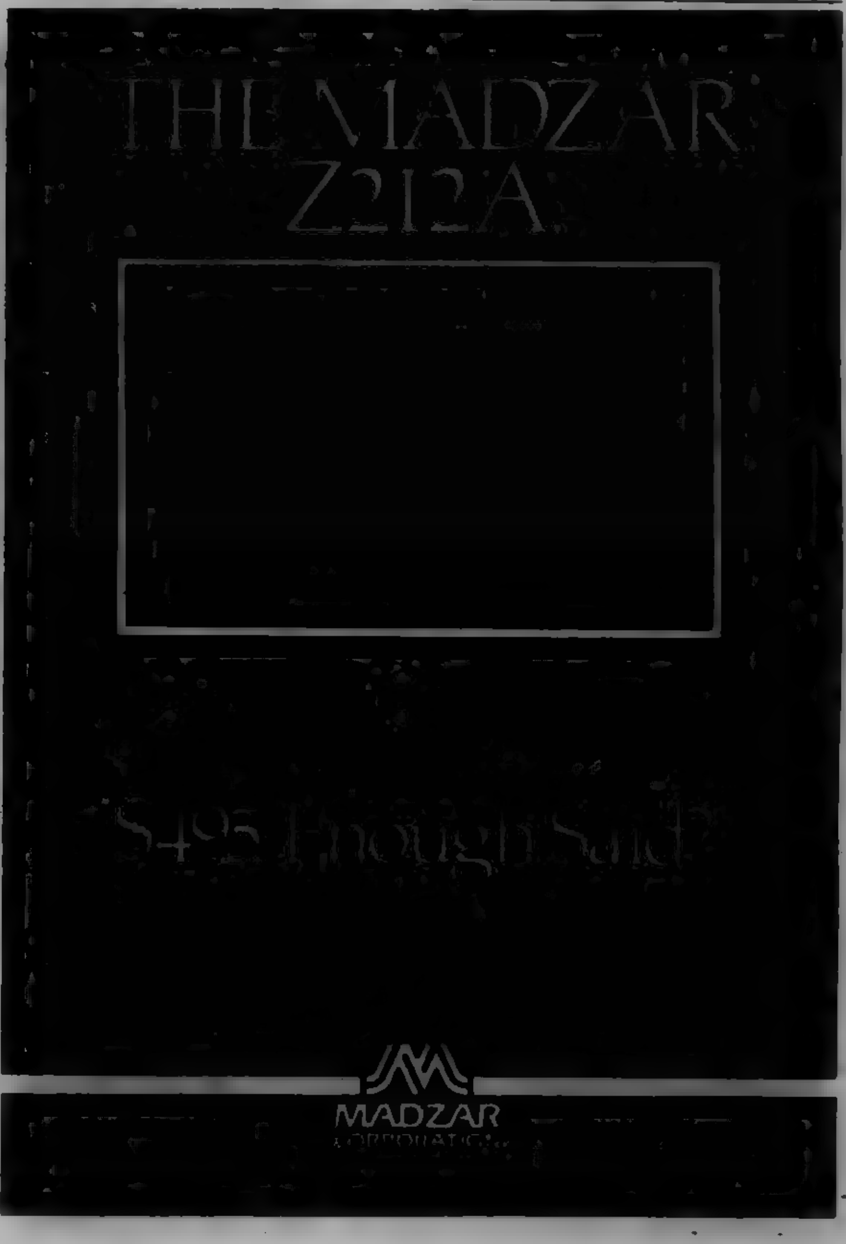

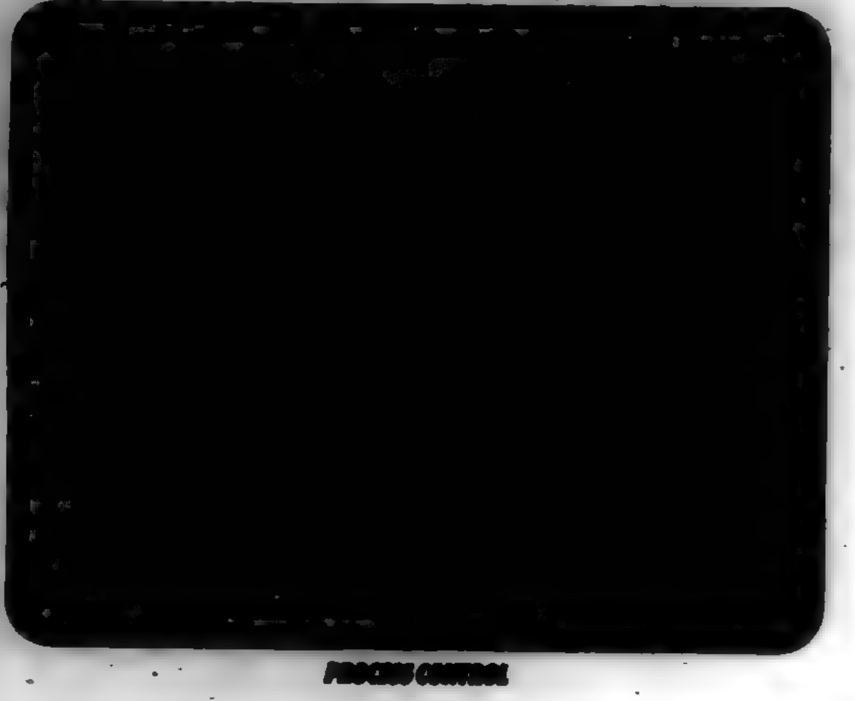

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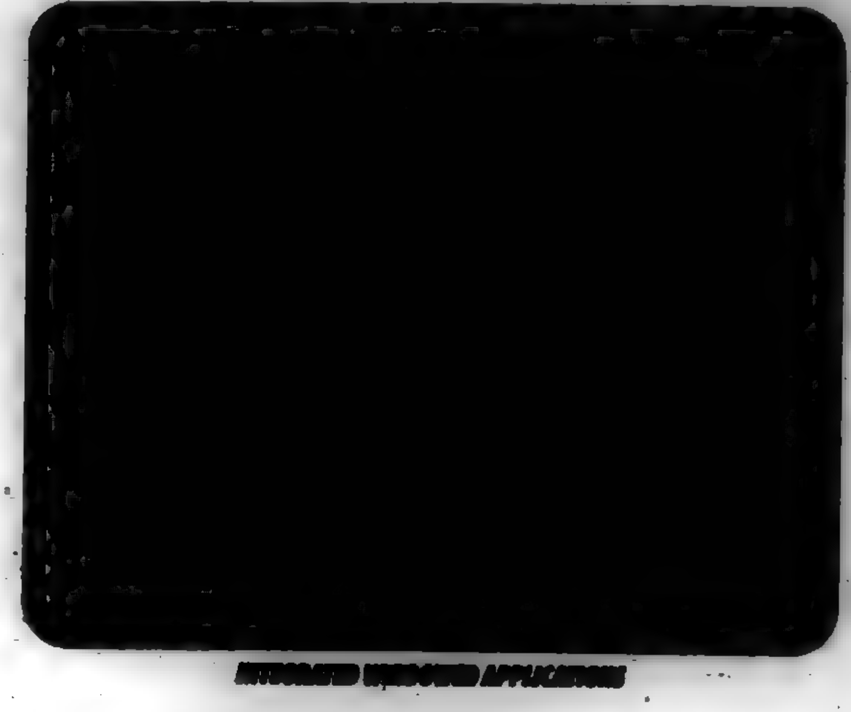

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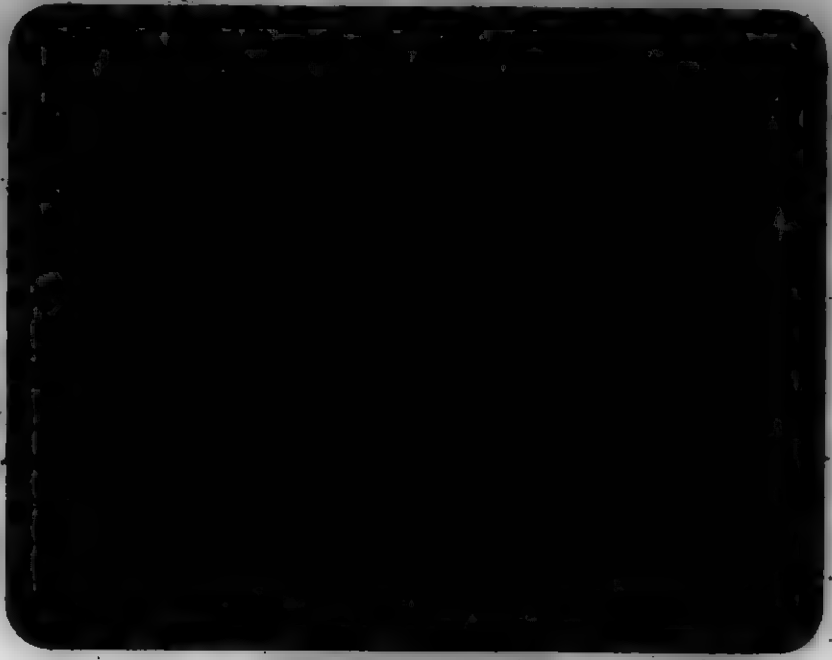

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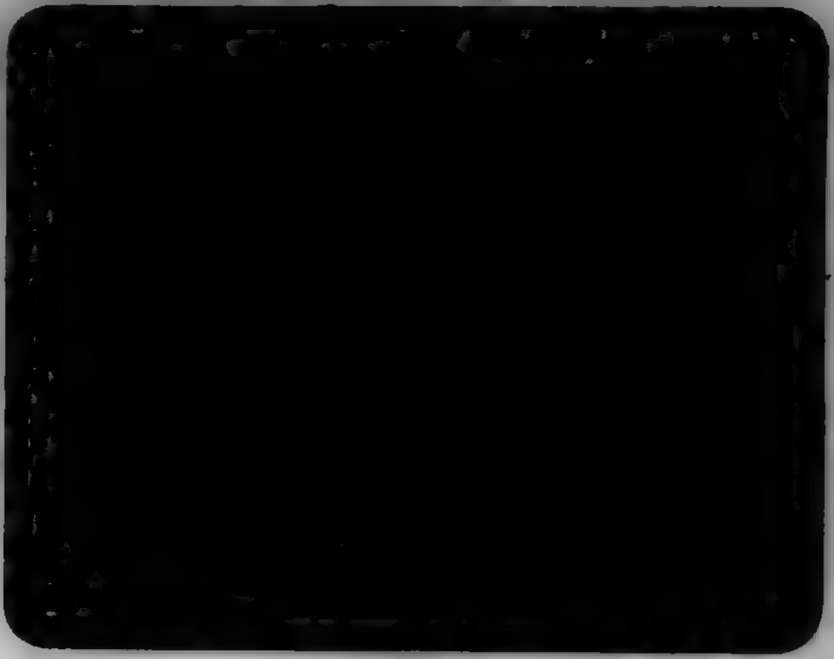

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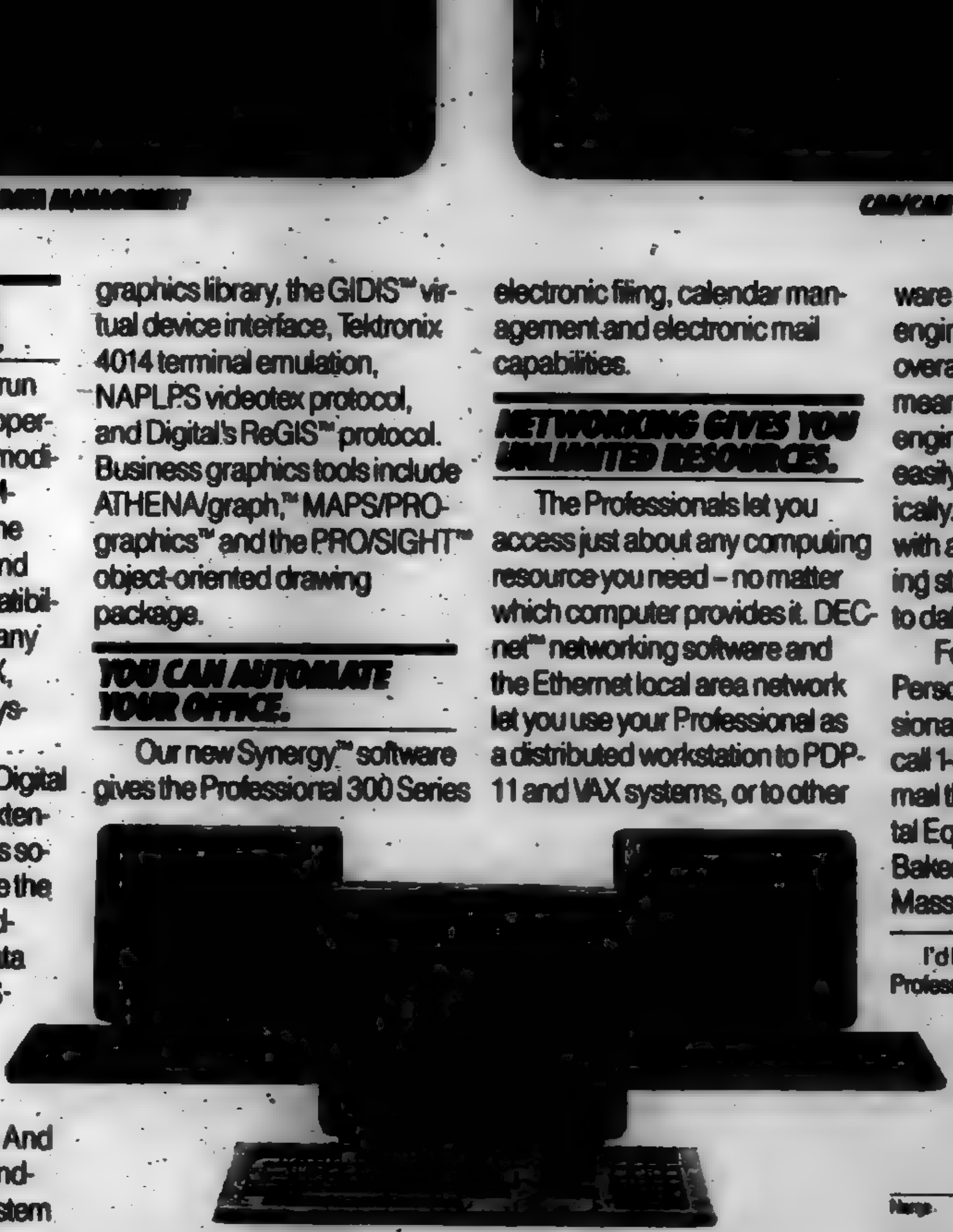

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EDITORIAL

Common sense eases the choice

At Digital Equipment Corp.'s 1983 annual meeting, a shareholder asked company President Kenneth Olsen if DEC's then-sagging performance was due to increasing competition, particularly at the high end of the minicomputer market. Olsen said DEC had always dealt in crowded markets, but hinted that competition was perhaps waxing fierce at the superminicomputer end.

A year-and-a-half later, the supermini arena is the most bitterly contested and dynamic market niche this side of the IBM-compatible microcomputer market. In a spate of one-upmanships — an unprecedented event for products of the size and cost of today's superminis — vendors are tripping over one another in the rush to bring machines — or promises thereof — to market.

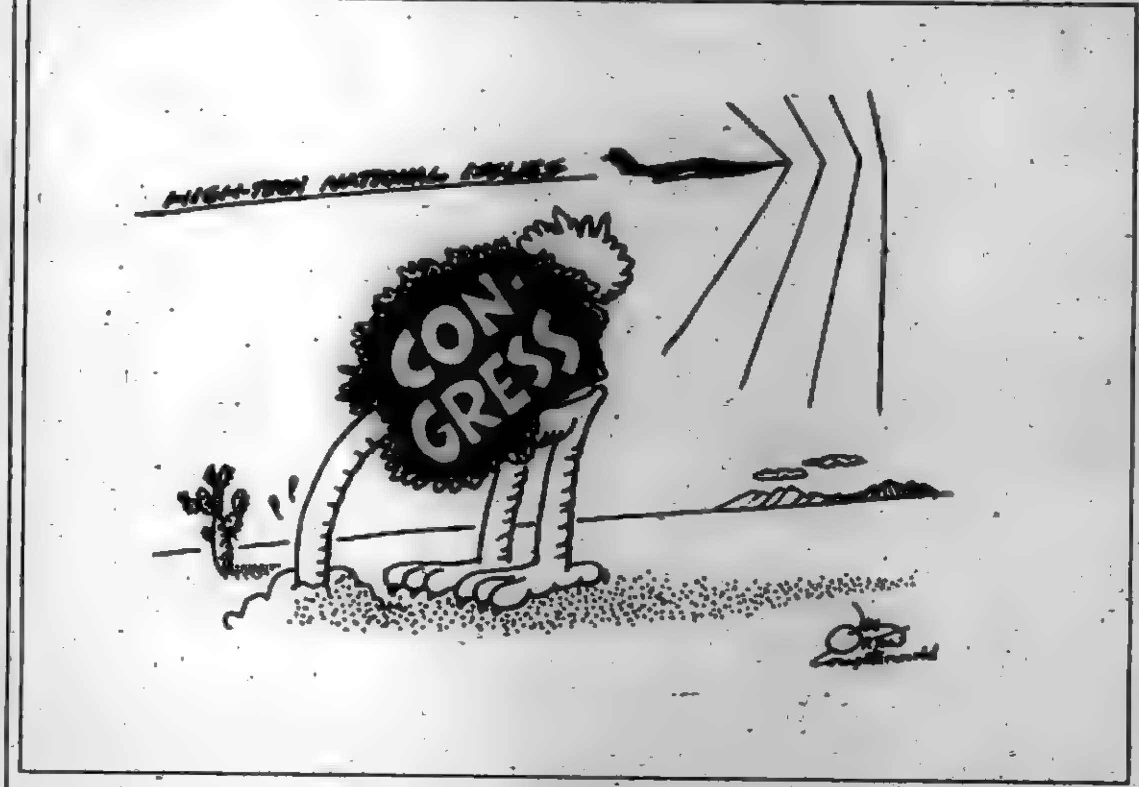
Consider these developments of the past two weeks:

- Prime Computer, Inc. unveiled a supermini that mirrors the 8600 machine DEC announced in November, which will not ship until two months after Prime's new entry does.
- Data General Corp. introduced an enhanced MV/10000 that looks an awful lot like Prime's 9950 and DEC's 8600, while rumors abound of an MV/12000 announcement later this year that will top all competitors in its class.
- Perkin-Elmer Corp. unwrapped a supermini configuration aimed at scientific and commercial applications that rivals and, in some cases, exceeds the performance of the aforementioned machines.

Add to these announcements IBM's 4381-Group 3 announcement in October and Wang Laboratories, Inc.'s VS 300 unveiling inApril (made nearly a year before the machines would actually ship), spike the mixture with a shot of heavy marketing efforts and you've got the makings of a lot of confusion for the user community. What to buy? When? From whom?

While each of the high-end superminis has its attributes and weaknesses, they all target the exploding scientific and engineering market, which includes applications intensive in software development. And each makes various price-performance claims based on data that may not be very useful in making comparisons. Thus, some good old-fashioned common sense must prevail over the hype and confusion of making a purchase desicion.

- **Make compatibility a cornerstone.** What good is the world's fastest supermini if it can't talk to and share data with your other processors?
- **Beware of Mips** (millions of instructions per second). Mips ratings are but one narrow measure by which to judge a machine's performance and are very applications-specific. To see how fast a machine will process *your* applications, take one of your applications tapes to the vendor and run your own tests.
- **What sort of growth path does the vendor offer?** In the usual case, you buy a machine with enough power to last you five years, but the machine's features pull new users and new applications out of the closet. As a result, you're thinking of an upgrade in six months. Consider which vendor can meet both present and future needs.
- **Like users, no two machines are created equal.** A VAX is not an MV/10000, which is not a Power Node 9000. They each have special features that make them better at some things but not so good at others. Make the machine fit your application, not vice versa.



LETTER

Cobol-80 standardization needed

The article "To anyone moving Cobol applications to micros" raised points that illustrate the importance of Cobol-80's speedy adoption. The article correctly identifies two causes of portability problems. First, the current American National Standards Institute (Ansi) standard contains many elements that can be defined by the implementor. Several of these will be rectified when Cobol-80 becomes the standard. Second, many implementors extend the Ansi standard language, although report writer and sort are Ansi features, not IBM extensions as stated in the article. If the standardization process could move faster, extensions to add functions would be needed less. Implementors only would need to extend the language for compatibility with existing programs supported by specific earlier versions of their own compilers.

The article "IBM's VS Cobol not Cobol-80-based" [CW, Dec. 17] provides an example of this extension problem. Programs written in Cobol II will be incompatible with prior and future implementations of IBM's VS Cobol II. The problems have nothing to do with Ansi standardization because there is no mechanism to guide an implementor to be compatible with its own extensions. I wonder if VS Cobol II would have been introduced as a Cobol-80 compiler if the standardization process moved faster. It is quite unfortunate that the delay of Cobol-80 has owed largely to the many comments concerned with incompatibility. That delay may only have brought a much greater compatibility problem to IBM customers.

Lemuel Skidmore
Kensington, Conn.

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VIEWPOINT

Machine bias impedes progress, payoffs

LECHT ON SCIENCE
Charles P. Lecht

Part 3 of series

Is there any doubt that investment portfolio analysis is performed better by a machine than by a person? In reaching conclusions — such as street value — on any portfolio of substance, machines will always perform faster and more accurately than any person I know.

But the real payoff is in the use of machines for investment decision making. Imbued with the capability to run programs that contain the collective reasoning powers of our most successful statisticians and economists, these machines are slowly but surely proving the case for increased employment of artificial intelligence in our day-to-day financial affairs.

Wall Street brokers who still eschew the use of machines to aid in making investment decisions are a vanishing breed. Their reluctance to employ technology is rapidly eroding their financial performance. Their dogged insistence that the computational and intuitional capabilities of humans could never be replaced by those created artificially confirms their need for increased intelligence of whatever origin — artificial or natural.

We cannot help but admire the love of human nature characteristic of those in the investment community who still resist the idea that artificial intelligence may be better than their own in solving a specific problem. Like old chicken-hawk pilots, they prefer to fly by the seat of their pants in carrying out their duties, winging a landing in the roughest weather to the cheers of their clients, who may admire individualism more than success.

Murky atmosphere of investment decision making

But we need only a smidgen of the intelligence to conclude that no financial analyst can hope to wing it in the murky atmosphere of today's investment decision making without some sort of instrumentation — know-how machine support, for one.

A review of the massive investments successful financial organizations are making in know-how machine technology shows how essential they consider it to their futures. Each has embarked on creating in a machine what they could not find in people — namely, extensive knowledge, reliability and the power to use that knowledge.

Today medical diagnoses and the treatment of many diseases involve know-how machine support. Their use is now commonplace in minor surgery like the removal of bone spurs and in some not-so-minor surgery like curing myopia in older people. Machines are on the brink of performing operations — even those performed only by the most accomplished physicians — such as brain surgeons. Such machines are capable of "seeing," reporting on and responding to what a physician cannot. Without know-how machine support, even the best physicians are forced to rely upon circumstantial evidence and must resort to dangerous exploratory surgery to treat their patients.

Use in demanding fields

Considering their use in such demanding fields as finance and medicine, know-how machines without a doubt will enter just about every field where the deepest knowledge and most adroit performance skills are needed for success. Such machines possess the kind of artificial intelligence that we think is needed. The bottom line is that we're better off acknowledging the possibility of such intelligence in a machine; the alternative is to view people as little more than machines — an unacceptable idea by anyone's standard.

Yet, we have but to review the man vs. machine concerns that emanate from artificial intelligence experts to see how vigorous is their struggle to avoid acknowledging a true machine intelligence like their own. Most offer little more than metaphysical claptrap that — contrary to what we may think — betrays their worship of machines. Patronizing at best and demeaning at worst, many scientists in today's artificial intelligence community endlessly seek to reassure people that machines cannot "think" in the same way they do — as though this were a good thing and supportive of our own unquestionable superiorty.

By citing examples where a machine is proven less competent than a person, they invariably retreat to arguments based upon exceptions rather than the rule: a nihilistic technique that may be used to prove a moron superior to a genius by virtue of what the latter cannot do.

Devoid of capacity to daydream

However we may endow a machine to do the work of a person, someone will always be around to note that a person can do more, even though there may be no logical reason to do so. For example, the decision-making process in air traffic control is best performed by a machine, devoid of the capacity to daydream.

If we use the capacity not to do things to differentiate men from machines, we lose again. There are many things a man would do that a machine would not. For example, having made a bad investment, a securities analyst might go out drinking at a local pub; a machine wouldn't dream of doing so.

We may be consigning already-proven valuable knowledge and know-how to dispassionately and fairly thinking machines in the nick of time. These machines may ultimately help us eliminate the paradoxes we face in a world where natural intelligence tells us that it is as inane to arm as it is to disarm. They can give us time to understand why these paradoxes arise in the first place and to avoid them in the future.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Break down problems into simple subtasks

READER'S PLATFORM
Robert J. Carrico

We have a tendency to emphasize the technical knowledge demands of computer programming and systems design, often ignoring the demand for strategic skills. There is no question that technical knowledge is required. However, it is general problem-solving skills that often determine the total effectiveness of a programmer or systems analyst.

Programmer training seldom includes general problem-solving strategies, but it should. The importance of these skills owes, in part, to the limitations that we all have in our ability to process problem information. Problem-solving strategies can compensate for these limitations.

Researchers have found that cognitive limitations in our capacity for processing information largely owes to the nature of the human working memory. Unlike that of computer, human working memory is severly limited by both space and time constraints.

Seven items at a time

The human space limitation is about seven units. This means that we can work with about seven items, or facts, of a problem at any given time. The time limitation is about 15 seconds. We lose problem information in about 15 seconds unless we rehearse it by repetition, either silently to ourselves or aloud. These limits play a major role in human problem-solving.

For the tasks of computer programming and design, the cognitive demand is considerable. The programmer must grapple with problem facts, objectives and constraints, as well as language and machine requirements. The aggregate of this information can shackle the brain work of even a brillant mind, causing an information overload. For these complex problems we need powerful problem-solving strategies.

The reduction of a problem into a series of smaller problems is a general compensating strategy for our cognitive limitations. We call these smaller problems "subgoals." Subgoals keep information at a manageable level.

Partition problem into subtasks

When programmers write structured programs, they are using subgoals. Structured programming, then, is really a special case of a more general form of thought, one that has application well beyond the scope of program design and composition. The method of subgoals applies equally well to requirements analysis, system design, testing, debugging and documentation. In all of these tasks, it is essential to be able to partition the problem domain into manageable subtasks.

An effective strategy for identifying problem subgoals is lateral thinking. It is particularly useful during requirements analysis and design. With lateral thinking we think through the problem across rather than down by traveling only a short distance along several paths before going very far down any one particular path.

We soon find that lateral thinking is serviceable in many programming-related functions. For example, it helps us cover a broad range of requirements during systems design and span the entire latitude of the system during testing; it is an invaluable aid for writing documentation that answers most users' questions.

Because we are limited by the amount of problem information that we can process concurrently, lateral thinking helps keep our thought processes on one level at a time. We deal with the tasks of requirements analysis, testing and documentation with the same "layered" approach that is so characteristic of structured programming. The subgoals are the layers of the problem: each layer more detailed than the previous.

Organize confusing jumble of data

To compensate further for our cognitive limits, we all use hypotheses, theories about problems that help us organize what would otherwise be a confusing jumble of data, such as a "hunch" about the cause of a program bug.

Hypotheses give direction to behavior and, consequently, may indicate the particular strategies that we use to wade through the labyrinth of problem. When an hypothesis proves to be unproductive, however, we must have the means to switch

See PROBLEMS page 36

Carrico is director of the Problem-Solving Institute of Franklin, Mich., and has worked as an independent systems designer and consultant.

LETTERS

User tools free resources

After reading the article "Do tools help find DP gold?" [CW, Dec. 10], I felt the urge to write about the New Mexico Taxation and Revenue Department's experience with some of these tools and their impact.

As a state government agency whose primary responsibilities are the collection of taxes and revenue projections, we generally think in terms of receivables much like the private sector. The process of collecting receivables from our customer base involves large volumes of transactions that are best processed in the Cobol batch mode, which consumes large amounts of machine resources, although the resources for program development/maintenance effort are minimal.

The real resource users of program development/maintenance efforts are one-time or ad-hoc reporting and analysis jobs. We have found one answer to this by giving users a combination of tools to use for the data messaging they require. We provide them with access to regularly produced extract data files.

While the users are doing their thing, our professional analysts and programmers concentrate on the design and development of the systems that will produce even more extract files for the users. Our attitude at the outset was "capture it all," so whatever the individual user eventually wants is there for his use. We have found that the most time-consuming efforts in the design and programming phases are analytic formulas development and report format design. Once we unloaded those efforts onto the user where it belongs, our professionals were free to deal with the real information processing duties for which they were hired.

These professionals are provided tools for use in their environments, which give them a technological edge and also a way to communicate with the users in a way they both understand.

We have found, in essence, that in an environment where change is the name of the game, there is no single cure-all for the job of providing all users with an information processing service they deserve and expect.

Lynn P. Bower
Santa Fe, N.M.

PROBLEM

from page 35

expediently to a more productive one. We must make a mental shift.

Just as computers must occasionally get back on course by reinitializing the operating system, human problem solvers get back on course with a mental shift. One effective mental shift is simply setting the problem aside for awhile and picking it up later. Other mental shifts might include viewing the problem as another person would view it, or possibly exposing an idea that is dominating our thinking.

The need for such mental shifts is most evident in the tasks of program testing and debugging. Because we use hypotheses to organize information and give direction to our behavior, we are likely to develop the hypothesis that our program "is correct." We then set out to prove it. Because of this bias, we may not consider tests that could dispel this hypothesis. However, by looking at the problem from the point of view of another person, we are better able to diffuse this biasing influence and construct more objective test data.

In diagnosing the cause of computer problems, the mental shift of exposing a dominating idea can help prevent our quest from becoming an endless adventure. All too often we contrive hypotheses that are convenient. For example, we may limit our search for a bug to those parts of the system with which we are most familiar. But such an approach may not be sound by any objective standard.

Potent diagnostic approach

We may further prolong problem diagnosis by failing to use all available symptom information. Efficient problem resolution usually requires strategies that are specifically designed for cause analysis. Attending to symptoms by considering both what the problem is and what it is not, is a potent diagnostic approach.

Recognizing that the problem does not occur with the payroll application may be as important as recognizing that it does occur with accounts payable. We then look for explanations that are consistent with this distinction.

Another useful problem-solving strategy is pattern matching. When we pattern match, we use some or all of the solution of one problem to solve another; we combine old parts into new wholes. This is particularly useful during the composition of programs and documentation, where the matched solution is usually a section of a similar program or document. Pattern matching is a constructive use of hypotheses. We use information that is already organized in the form of a proven solution.

Pattern matching also may be effective in diagnosing problems. A pattern of symptoms is matched with that of a problem having a known cause.

These general problem-solving strategies will pay generous dividends to programmers and analysts who practice their use. They are robust techniques, effective in reducing programming and design tasks to simpler and more manageable subtasks.

Lateral thinking, mental shifts, cause analysis and pattern matching are not technical skills: They are tactical skills and valuable resources for living and working in a problematic world.

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SOFTWARE & SERVICES

AT&T renews Unix push

Product debuts extend processing range to plug System V as industry-standard operating system

By Paul Korzeniowski
CW Staff

DALLAS — AT&T's quest to transform Unix System V into the standard operating system for the computer industry continues. At the 1985 Uniforum International Conference of Unix Users, held here recently, the communications giant made a series of announcements that extend the range of processors that run System V.

Some announcements centered on a pledge AT&T made in May 1983 to provide certified variations of Unix System V for Intel Corp. 80286, National Semiconductor Corp. 32000 series and Motorola, Inc. 68000 microprocessors. AT&T had said these variations would be compatible with Unix implementations running on Digital Equipment Corp. VAX series and AT&T 3B superminicomputers and would provide advisory record and file locking and file system reliability features.

At Uniforum, AT&T announced that an Intel 80286 version of Unix System V was completed and would be available in April at a cost of $43,000 per CPU.

As part of a contract with Intel, Digital Research, Inc. completed the port. The porting reportedly took Digital Research more time than Intel and AT&T desired. In addition, Digital Research reportedly was unhappy with the terms of its Unix licensing agreement.

Start-up to support Unix port

As a result of these problems, Digital Research has sold the marketing rights for the port to Microport Systems, Inc., a 10-person start-up company headed by Chuck Hickey, who managed the porting project for Digital Research. Microport said it is responsible for enhancing and supporting the product and tailoring it to specific hardware.

"Digital Research was looking for a sweetheart deal with AT&T," asserted Rod Turner, Microport chairman. "An AT&T Unix license is very expensive and does not provide the healthy margin that a

See **UNIX** page 50

Keeping maintenance minimal

SOFTALK

Maintenance.

Ugh.

You don't want to think about it; you certainly don't like to do it, and nobody is about to offer you any magic ways to avoid it.

But maintenance may be shaping up to be the major programming problem of the rest of this century. And if you do your own programming, it is your problem as well.

The percentage of time that programmers spend on maintenance has been steadily increasing for the last several years. *Computerworld*'s annual DP budget survey [CW, Dec. 31, 1984/Jan. 7, 1985] found that the percentage of an average programmer's time spent on maintenance now stands at about 55%, compared with 45% last year. There are no indications that this figure will go anywhere but up.

But maintenance issues rarely show up on lists of concerns voiced by DP managers. This is curious, considering that those same managers are very much concerned about the problems and costs of hiring and keeping good programmers. Since programmers are increasingly spending their time on maintenance and since salaries are one of the fastest growing areas of many DP budgets, maintenance would seem to be a high-priority concern.

Bottom-line perspective

Take a look at maintenance from the bottom-line perspective. A fundamental shift is taking place in the function of data processing operations. Once a cost reduction center, DP is now seen as a strategic asset, a provider of valuable information. Companies that are spurting ahead of their competition these days are very often those that are using

See **MAINTAIN** page 50

SOFTLINE
Thomas O'Flaherty

Multiuser age raises issues

With the advent of the IBM Personal Computer AT, the multiuser micro has come of age. But the real question is: Into what age has it come?

Previous multiuser micros have usually been used for special, generally dedicated applications such as turnkey accounting or order entry. These multiuser micros have been used, in essence, as slimmed-down minis. So far, the multiuser micro's cousin, the networked single-user micro, has been viewed mostly as a curiosity and used experimentally.

Consequently, the past is not much of a guide to what, if any, differences we will see in general-purpose multiuser micros. Somewhat surprisingly, there has not been a great deal of public discussion about how multiuser micros might be used in the future. Potential users seem to assume that multiuser micros will be used for the following:

- As a more potent single-user micro.
- As a "mini" mini or even "micro" mainframe, able to run conventional applications in a tiny terminal network.
- For sharing data and mass storage, even though local-area networks have made slow headway in performing similar functions.

These advantages have a common characteristic: supplying personal computing hardware capabilities in a more cost-effective manner. But, important as these advantages may be, they do not really make use of attributes uniquely related to a multiuser micro in the way, for example, that spreadsheets took advantage of single-user micros.

The lack of an obvious breakthrough makes it clear why one industry figure said recently that he did not see multiuser micros ever having a significant role in a large corporation. Ignoring the

See **MICROS** page 52

O'Flaherty, a principal at Information Service Strategies in Hackensack, N.J., is a regular contributor to Softline.

- Boeing Computer Services Co. unveiled enhancements to its Document Transfer System software, including a link to IBM's Disoss/40
- An innovative meeting technique is helping systems developers improve the process of defining user requirements/40

INSIDE

Systems Software/42

Application Packages/44

light

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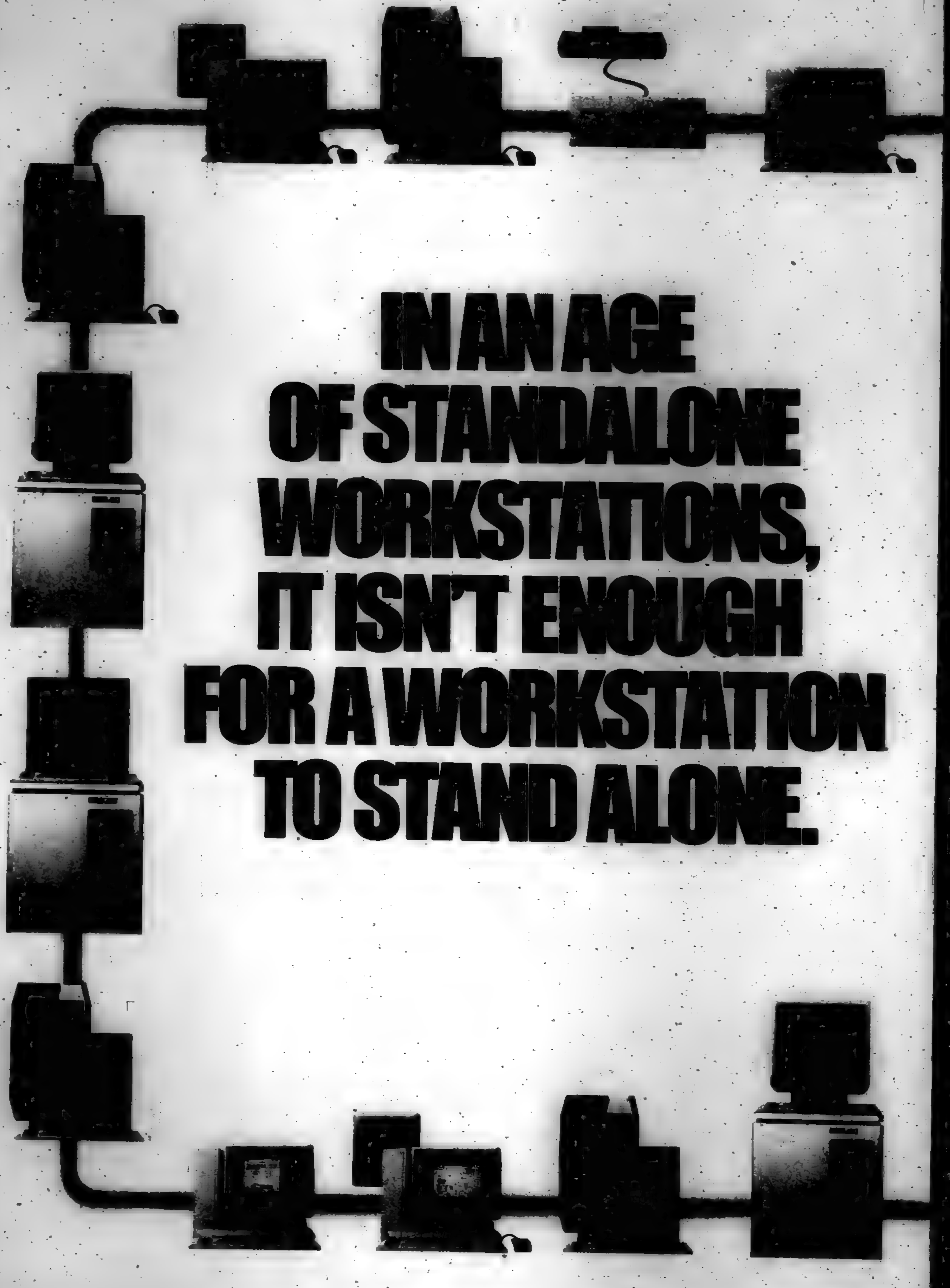
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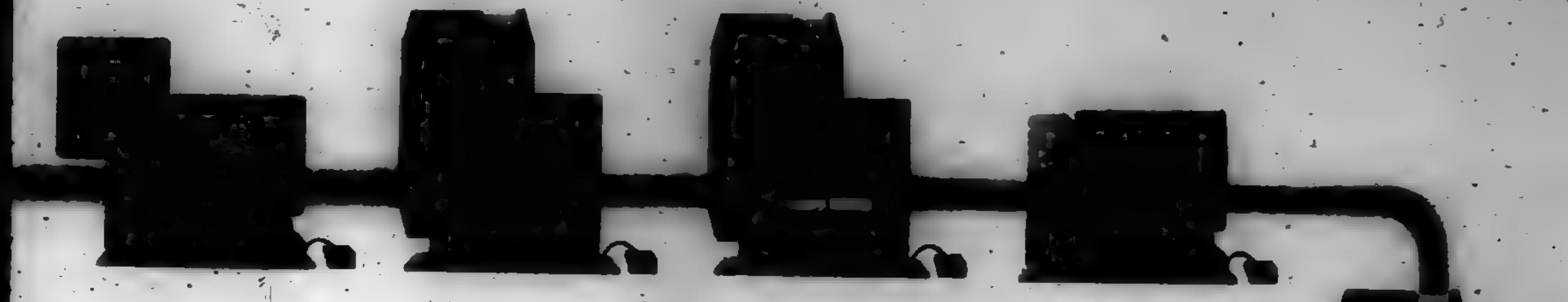

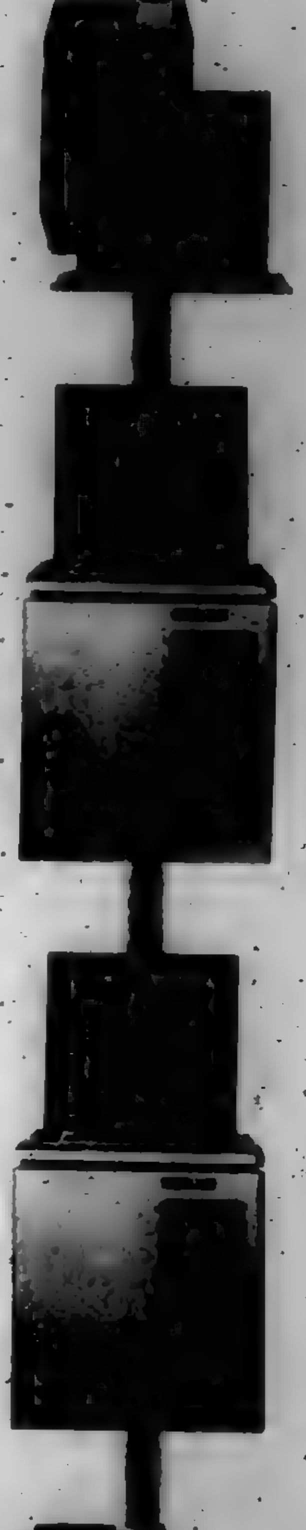

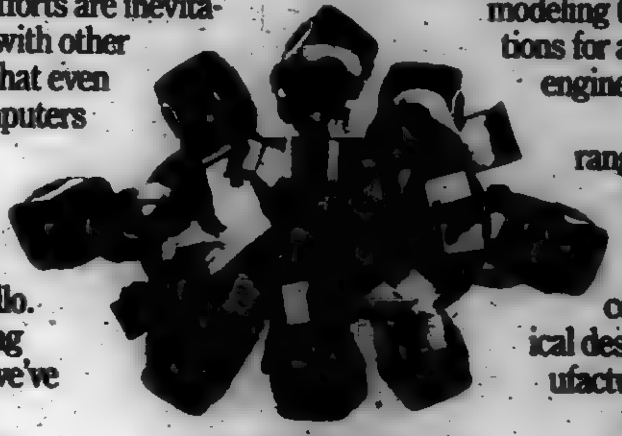

It's a well-accepted dictum that the bigger the technical problem, the more compute power needed to solve it. A valid reason for engineers and scientists to demand their own standalone computers and the processing power that comes with them.

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Meeting method brings in users for faster systems design

By Mitch Betts
CW Washington Bureau

The hardest part of systems design often is getting users to agree on their requirements. When Cathy Oliva, a project leader in the systems and programming department at New York's Chase Manhattan Bank, began a systems design project recently, she could foresee that reaching a consensus among five major bank departments would be a time-consuming chore.

To speed up the process, Oliva called in an outside consultant to coordinate the effort of defining user requirements and act as a referee in the office politics, she said. The consultant, Performance Resources, Inc. (PRI) of Arlington, Va., uses a highly structured meeting technique that is designed to forge user agreements faster than the traditional approach of interviewing each user.

This interactive design technique is a modified version of IBM's Joint Application Design (JAD) method, in which an impartial meeting leader uses a structured agenda to help users and systems designers hammer out a business requirements document [CW, Dec. 24].

Jim Snyder, development center manager at CNA Insurance Cos. in Chicago, said that he used IBM's JAD method in 1983 and found it satisfactory for defining the work flows of processes, such as the movement of insurance forms from station to station.

But Snyder said he discovered that JAD is not compatible with the development of a decision support system and called in PRI to provide a custom version of its interactive design technique.

PRI calls its systems design technique The Method and has just introduced it as a distinct product of the consulting firm after testing it on clients such as Chase Manhattan, CNA Insurance and AT&T Communications.

The Method has six basic steps, beginning with steps to prepare the key players for the big workshop and ending with the design workshop and follow-up to produce the document.

Dorine C. Andrews, PRI's president, explained that The Method is designed to reduce systems design costs, force the early resolution of issues and produce a complete set of user requirements without excessive documentation.

PRI provides the workshop leader with an instruction guide; a diskette that runs on the IBM Personal Computer for managing and customizing the design process and a four-day training and certification program. This package, offered on an individual basis, costs $5,000. PRI will lead The Method program as a pilot program for $15,000.

PRI is located at 3606 Forest Drive, Alexandria, Va. 22302.

Boeing offers enhancements for office line

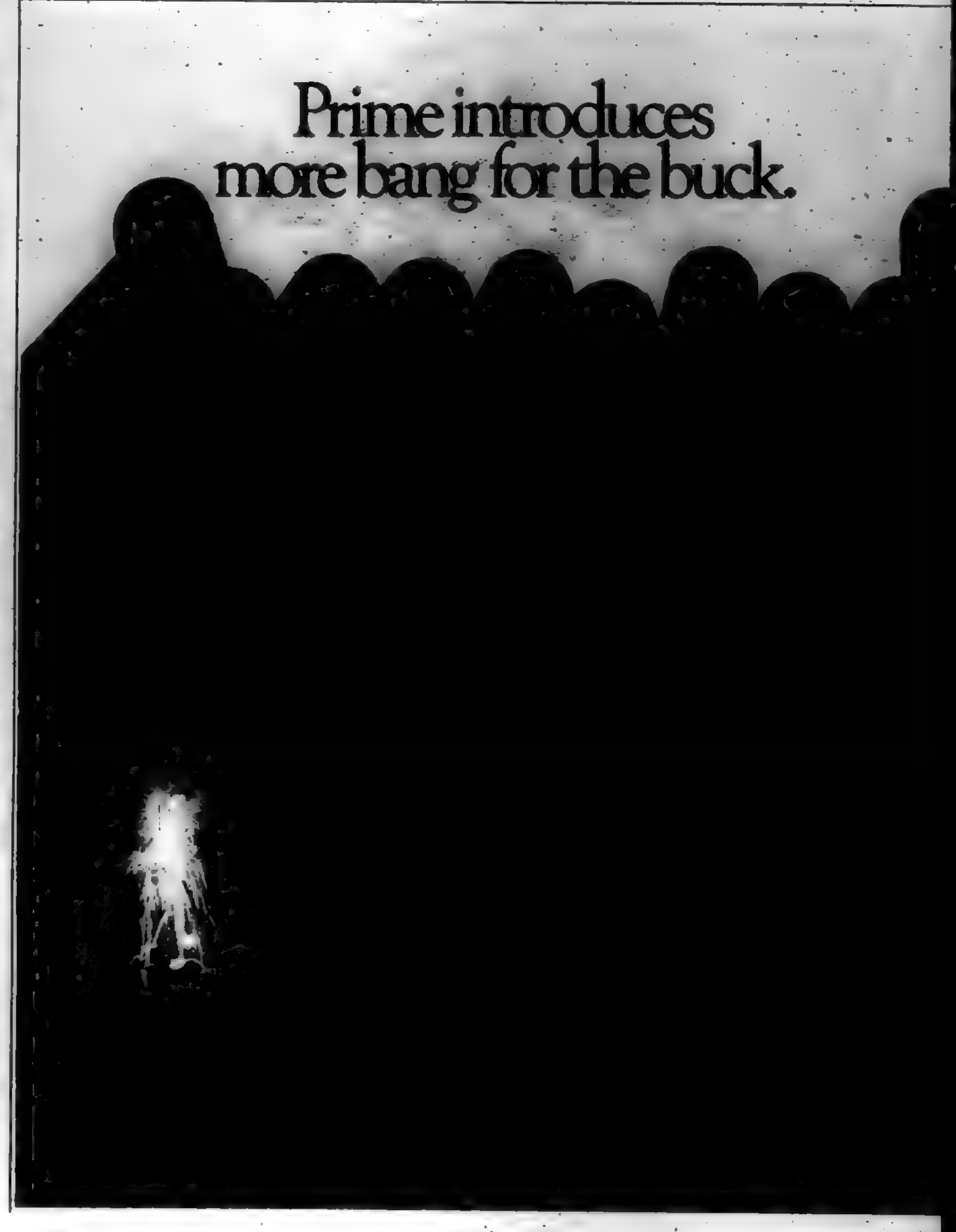
VIENNA, Va. — Boeing Computer Services Co. has unveiled enhancements to its Boeing Office Solutions software. The company's Document Transfer System, which runs in IBM's MVS operating system environment, now supports the IBM Personal Computer running Multimate Corp.'s Multimate, IBM's Displaywrite II and Microsoft Corp.'s Wordstar word processing software. Users can use the Document Transfer System, which offers document translation capabilities, to exchange documents between Displaywriter, Wang Laboratories, Inc. VS and OIS and Xerox Corp. 860 word processors, as well as the IBM Personal Computer.

Boeing also announced that it has developed an interface between the Document Transfer System and IBM's Distributed Office Support System (Disoss) and will market the product in the second quarter. By bridging the two products, a company representative said, users can create a communications link between Document Transfer System-supported equipment running on binary synchronous lines and IBM Systems Network Architecture devices supported by Disoss software.

The representative said the average price for a Document Transfer System software license is $50,000.

Boeing Computer Services is located at 7980 Gallows Court, Vienna, Va. 22180.

"You know, I nearly tripped on this silly thing."



SOFTWARE & SERVICES

SYSTEMS SOFTWARE

■ Communications Research Group has released a version of its Blast communications software that runs under AT&T's Unix.

Unix Blast products provide file transfer and terminal access capabilities to link Unix-based systems to computers running Blast software, a spokeswoman said. Other versions of Blast are available for more than 100 different computer types.

The spokeswoman said no add-on hardware or communications boards are required to use Blast via standard RS-232 ports. Any computer with Blast can transfer files to any other processor with the product. Blast is priced at $250 for micros, between $595 and $895 for minis and $2,495 and higher for mainframes.

Communications Research Group, 8939 Jefferson Highway, Baton Rouge, La. 70809.

■ Cincom Systems, Inc. has announced Release 1.4 of Net/Master, the company's network management software.

It features performance improvements, network control language enhancements, support of IBM's Vsam files and improvements to the Network Error Warning System.

Net/Master's Network Control Language (NCL) now includes facilities to access standard Vsam files, which can be created or accessed by applications that are external to Net/Master.

Current users of Net/Master may upgrade to Release 1.4 at no cost, the company said. The price for the basic component of Net/Master, Network Management, is as follows: for users of IBM 3080 series CPUs, $20,000; for users of IBM 4341, 4381, 3031 and 370 series CPUs, $15,000; and for users of IBM's 4331 and 4361 CPUs, $10,000.

Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio 45211.

■ Orion Software, Inc. has announced a communications software module to connect its Network Orion electronic mail system to domestic and international telex networks.

The system runs on IBM System/34 or System/36 computers under IBM's SSP operating system.

The Telex 34/36 communications module allows users to create, transmit, receive, file and redistribute telex messages and provides users with an electronic mail facility as well as a connection to the telex network, the vendor said.

The price of the Telex 34/36 communications module ranges from $3,400 to $5,000, depending upon user requirements for spool file transmission or connection to other sites.

Orion Software, 222 Third St., Cambridge, Mass. 02142.

■ Excelan, Inc. has announced two Exos 8000 series protocol software packages.

The packages reportedly link supermicrocomputers running AT&T's Unix operating system with Digital Equipment Corp.'s VAX-11s, PDP-11s and LSI-11 systems.

The package is said to eliminate the performance bottleneck common to networking systems while maximizing throughput and reliability.

The Exos 8030 package is said to support DEC's PDP-11 and LSI-11 CPUs running DEC's RSX-11M operating system. The Exos 8040 package is said to support DEC's VAX-11/730, 750 and 780 running DEC's VMS operating system.

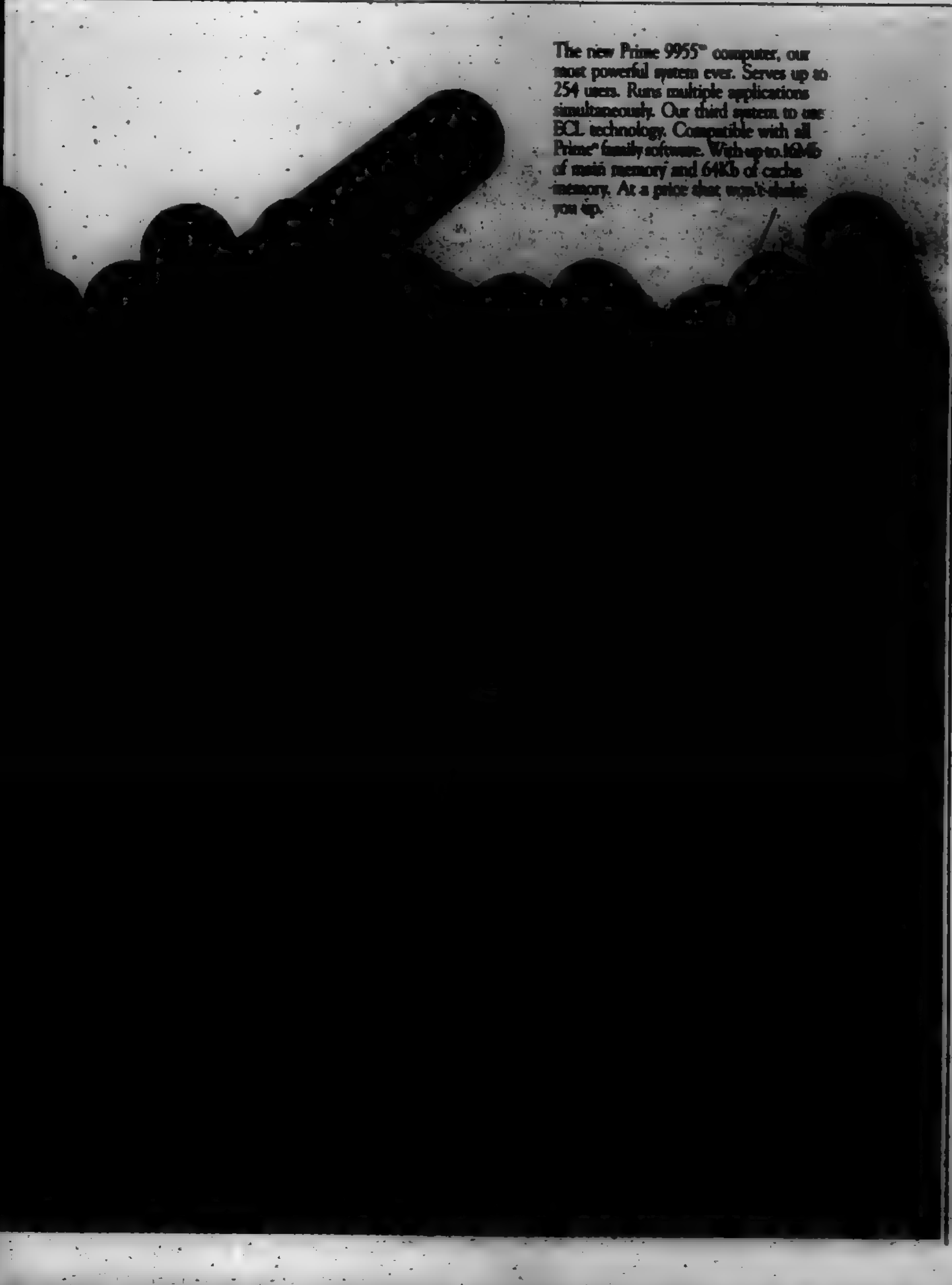
The Exos 8000 series protocol packages are based on the standard Department of Defense Arpanet protocols, including TCP/IP. The products are scheduled to be available in the second quarter.

License fees are $10,000 for the 8030 and $20,000 for the 8040; development kits cost $2,000 for the 8030 and $4,000 for the 8040, the vendor said.

Excelan, 2180 Fortune Drive, San Jose, Calif. 95131.

■ Venturcom, Inc. has announced System V Venix, derived from AT&T's Unix System V, Release 2, for Intel Corp. 8088, 8086, 80186 and 80286 microprocessors and for the Digital Equipment Corp. J11, LSI-11 and PDP-11 processor families.

Continued on page 42



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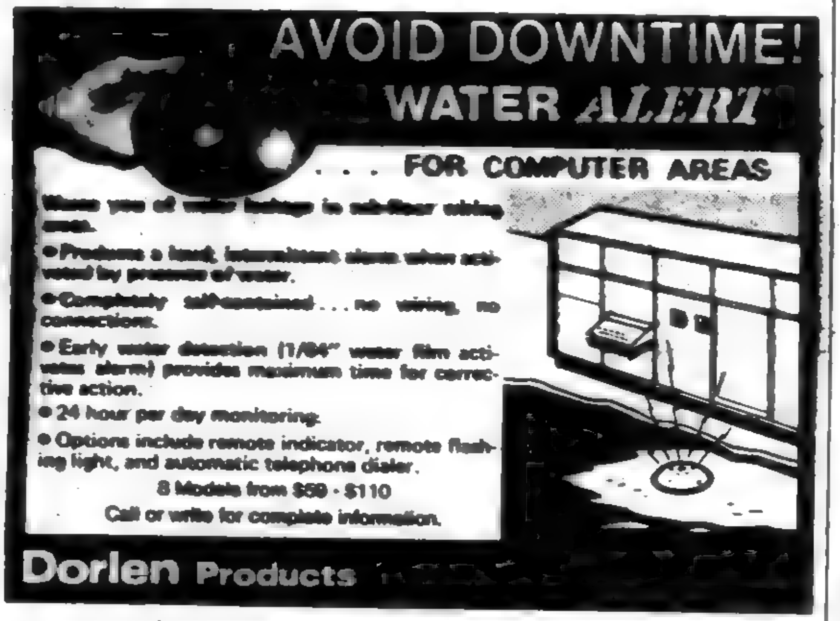
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SOFTWARE & SERVICES

Continued from page 41

Application software developed for other versions of the Unix operating system, such as for the AT&T 3B family and for Motorola Corp.'s 68000-based system, can now be compiled under Venix with little modification to the source code, the company said.

In addition, software compiled under System V Venix will execute without modification on the following: IBM Personal Computer XT or AT, DEC's Rainbow, AT&T's 6300 and Mad Computer, Inc.'s MAD 1, the firm said. In addition, software compiled for the DEC LSI-11 will run without modification on a DEC Professional 380 or a J11 Micro PDP-11, the company said.

The single-unit price for System V Venix is $875, the vendor said. The product is scheduled to be available in April.

Venturcom, 215 First St., Cambridge, Mass. 02142.

■ Creare, Inc. has announced that its Ultralink communications software has been extended to 18 additional AT&T Unix machines. Ultralink permits error-free file transfers between Unix systems and Digital Equipment Corp. VAX machines under DEC's VMS operating system, according to a representative.

The added product implementations are AT&T's 3B computers; Apollo Computer, Inc. processors; Burroughs Corp. XE series; Cadmus Systems Co. processors; Callan Data Systems, Inc. Unistar series; Charles River Data Systems, Inc. Universe 68 series; Convergent Technologies, Inc. Megaframe and Miniframe; DEC Microvax; Gould, Inc. Powerseries and Powernodes; Harris Corp. Station 10 and 20; Hewlett-Packard Co. HP 9000 series; NCR Corp. Tower; Plexus Computer, Inc. processors; Perkin-Elmer Corp. 3200 series; and Zilog, Inc. System 8000 computers.

Ultralink costs $1,800, according to the vendor.

Creare, P.O. Box 71, Etna Road, Hanover, N.H. 03755.

■ Process Software Corp. has introduced software that allows production personnel to program programmable read-only memory (prom) and erasable prom chips supporting Intel Corp.'s HEX format.

Hex Output Program (HOP) reportedly operates on Digital Equipment Corp. computers running DEC's RT-11, VMS, RSX-11, M-Plus or Micro/RSX operating systems, the vendor said.

According to a spokesman, the program will create Intel HEX formatted files from input files of different formats. The program contains support for standard files using 22-bit addressing, the spokesman said.

Cost of the product ranges from $450 to $650, depending on the operating system.

Process Software, P.O. Box 746, Amherst, Mass. 01004.

■ RAC Consulting has announced Espul Version 5.0, the Extended Spool Utility for the Hewlett-Packard Co. 3000 minicomputer, said to offer users more flexibility and functions in managing output spool files.

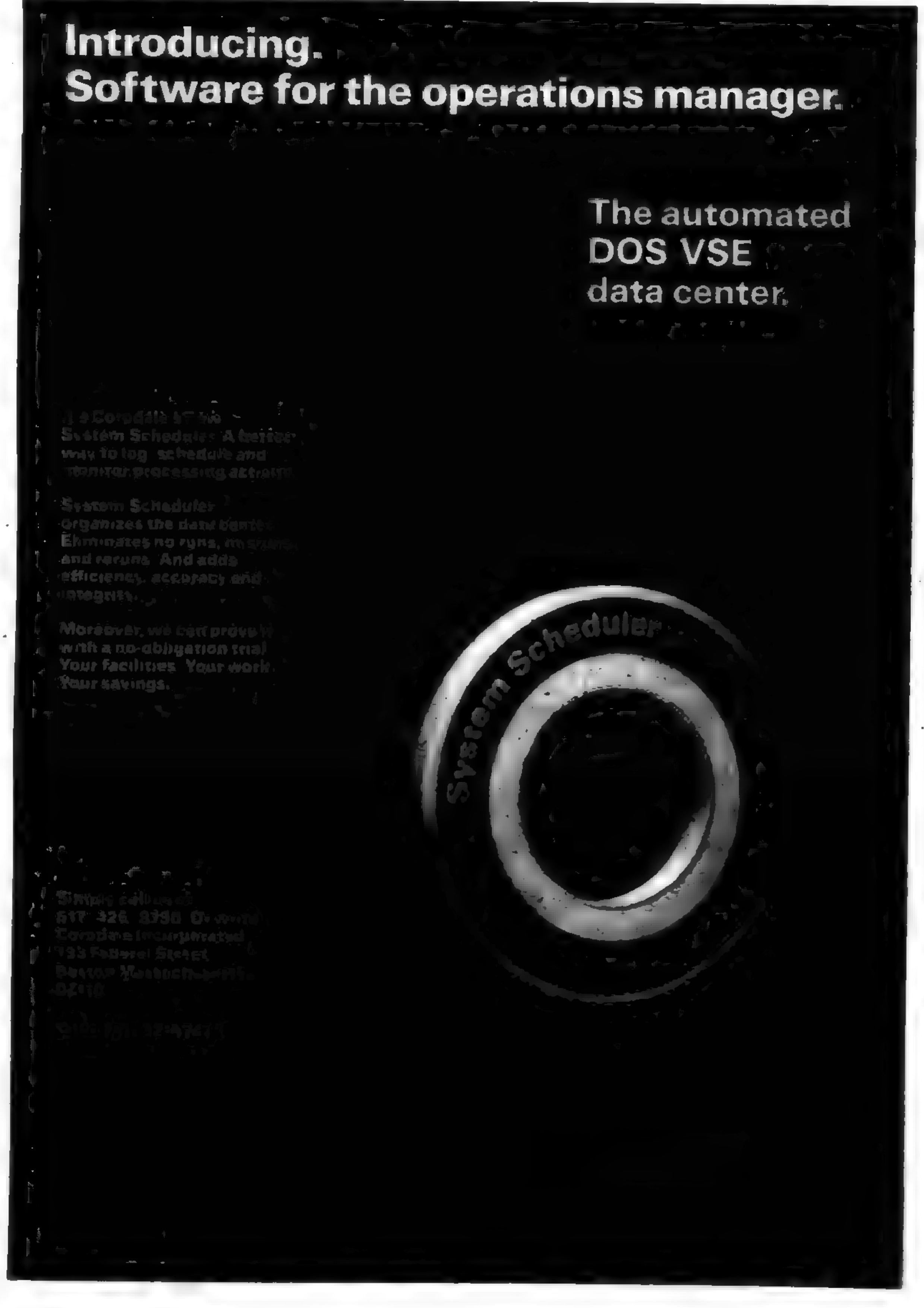
Espul is said to allow spool files to be altered, purged or copied by device file identification, user name, job and session number, file name or priority. Espul is said to alter or purge special forms spool files as a group and display the forms messages in such files before printing. The Espul spool queue display lists spools in priority order with the number of lines in the file.

Espul is also said to copy spool files to new spool files, tape or disk. The copy can add or remove laser environments or forms messages. Espul also enables the user to alter or abort jobs waiting in the job queue by number, user name, job name or priority.

The price for Espul Version 5.0 is $750, the vendor said.

RAC Consulting, 4309-B Quail Run Loop, Olympia, Wash. 98502.

See [illegible] page 44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INFO SOFTWARE, Chicago, Booth 405, February 20-22, 1985.

SIR/DBMS
The Intelligent Relational System.

AIDS from page 42

■ Precision Systems & Programming, Ltd. has announced an expansion path called Swinger for the family of Singer Business Machines' Single System 10 users, intended to let those users run their programs on a Wang Laboratories, Inc. VS without modification.

Using Swinger, users will not be limited by the number of partitions running simultaneously, the company said.

Swinger is said to emulate all hardware functions of the Single System 10 at the object code level.

The one-time licensing fee for Swinger is $9,500, the vendor said.

Precision Systems & Programming, Box 119, Route 2, Deepwood Road, Barrington Hills, Ill. 60010.

APPLICATION PACKAGES

■ Data Processing Services, Inc. has announced an enhanced release of its Distribution Processing System (DPS) for the IBM System/36 minicomputer.

Added to the DPS/36 is a standard interface to the company's FIN/36 Financial Processing System, consisting of accounts payable, general ledger and payroll, a spokesman said. DPS/36 consists of fully integrated order processing/invoicing, accounts receivable, inventory control, purchasing and sales analysis.

DPS/36 includes source code and is priced at $27,000.

Data Processing Services, 8604 Allisonville Road, Indianapolis, Ind. 46250.

■ Data Processing Design, Inc. has introduced file transfer and conversion software that allows users to maintain file formatting capabilities while transferring word processing files between an IBM Personal Computer and a Digital Equipment Corp. VAX-11 minicomputer.

Wordlink reportedly includes software for either an IBM Personal Computer or a Personal Computer XT and the DEC VAX. According to a spokesman, the product allows micro users to convert documents to the company's Word-11 word processing software system format or to transfer word processing files between different micro software packages using the DEC mini for file storage.

The product will be available in March. Wordlink is priced at $1,300 for a VAX license and one Personal Computer diskette, with additional Personal Computer copies priced at $200 each. One VAX license and diskette is priced at $2,300 for sites without a Word-11 license.

Data Processing Design, 1400 N. Brasher, Anaheim, Calif. 92807.

■ Harris Data Service of Virginia, Inc. has released its Distribution and Job Cost systems for IBM System/34 and 36 machines running under IBM's SSP operating system.

The on-line, interactive systems contain multicompany, multifacility control, screen-prompted processing and complete data edit checks and messages.

The HDS Distribution system consists of order entry, inventory and purchasing modules. It provides for open order entry, back order control, invoicing, recurring invoicing, cash sales and customer quote processing. The system includes a multiple level pricing structure as well as multiple methods of inventory costing.

The Job Costing system operates as a collection base for the detail breakdown of costs from accounts payable, payroll and inventory modules. Information from the accounts receivable and purchase order modules can also be fed to the Job Costing system.

Modules in the Distribution system are priced from $3,000 to $4,000, depending upon the module and system. The price of modules in the Job Cost system range from $3,500 to $4,500, depending upon the module and system.

Harris Data Service of Virginia, 108 S. Leadbetter Road, Ashland, Va. 23005.

■ Integrated Planning, Inc. has announced that its Stratagem decision support system will run on Prime Computer, Inc.'s superminicomputers using the Primos operating system.

According to a company spokesman, Stratagem includes financial modeling capabilities, statistics, graphics, report writing and an application development language. It is designed for strategic and financial planning and market research analysis.

Prices for the Prime version of Stratagem range from $30,000 to $75,000 depending on system configuration.

Integrated Planning, 338 Newbury St., Boston, Mass. 02115.

■ Increased processing efficiency and capacity for handling large cartographic data bases are among the revisions announced for Environmental Systems Research Institute's ARC/Info software management system for geographic data.

ARC/Info 3.0 runs on Digital Equipment Corp. VAX-11, Data General Corp. MV series and Prime Computer, Inc. superminicomputers. The product also runs on IBM's VM/CMS operating system, a spokesman said.

The version includes Library, which is said to manage multilayered geographic data bases. Manipulation commands and a partial processing system have also been added.

ARC/Info 3.0 is priced at $75,000.

Environmental Systems Research Institute, 380 New York St., Redlands, Calif. 92373.

See TOOLS page 46

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[illegible] you, you need the [illegible] Call us at 1-800-[illegible] for information on the entire 6097 line.

TOOLS

from page 44

■ **Computer Cognition has introduced the Acuity financial and business application software system for AT&T Unix-based systems.**

According to a spokesman, the Acuity system is a modification of MCBA, Inc. software with added integrated modules. The products reportedly can be integrated to share data between modules. Applications range from accounts payable, general ledger and payroll to fixed assets and depreciation, inventory management and purchase order processing and receiving. Project management, project scheduling and materials requirements planning are also included, the spokesman said.

Acuity has also been ported to other operating systems, including Digital Equipment Corp.'s VMS and Prime Computer, Inc.'s Primos.

Modules range in price from $1,000 to $9,000, depending on hardware requirements and system modules.

Computer Cognition, 225 W. 30th St., National City, Calif. 95020.

■ **Armor Systems, Inc. has introduced a 12-module accounting package for hard-disk microcomputers and minicomputers running under AT&T Unix and other operating systems.**

Business application modules in the Excalibur Plus package include general ledger; accounts receivable; accounts payable; payroll; inventory control; billing; order entry; job cost/work-in-progress; point-of-sale; fixed assets; customer information data base management; and purchase orders.

According to a company spokesman, the Excalibur Plus software includes a built-in command language and the ability to interact with spreadsheet, data base and networking programs.

The Excalibur Plus fixed assets and data base management modules are priced at $395 each. All other modules are priced at $695 each.

Armor Systems, 324 N. Orlando Ave., Maitland, Fla. 32751.

■ **Nicolet Computer Graphics has announced four versions of ZDDM, a package that converts IBM Graphic Data Display Manager (GDDM) code into the graphic machine language that drives Nicolet's line of pen plotters.**

According to a spokesman, versions of ZDDM are available for Release 2 and 3 of GDDM for IBM's VM and MVS operating systems. ZDDM converts GDDM graphics data files and data and format files generated by IBM's Interactive Chart Utility software.

Nicolet's plotter line consists of three eight-pen, drum-type digital plotters that connect to IBM 3274 or 3276 series controllers.

The four versions of ZDDM are priced at $1,795 each, the vendor said.

Nicolet Computer Graphics, P.O. Box 3020, Martinez, Calif. 94553.

■ **Info Tech has introduced the Bid Information Management System (Bims) for Digital Equipment Corp. VAX series processors running under DEC's VMS operating system.**

According to a spokesman, Bims is designed for monitoring sealed bids for state, county, and city governments.

It automates the preparation of bid proposals, and it includes a decision support system that is said to assist managers in evaluating bid preparation productivity, market competition, award coverage success rates, bid patterns, sales activity, effectiveness and product analysis.

Bims is customized for each site and provides end users with menus, windows

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Net/One brings
connections out wh

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and color graphics, according to the spokesman.

The product is reportedly available either on a software-only basis or as a turnkey system.

Software only for the DEC VAX-11/750 is $30,000, including installation, training and data interfaces with existing systems.

Prices increase depending on customization and enhancements, the vendor said.

Info Tech, 5700 S.W. 34th St., Gainesville, Fla. 32604.

■ **Kolinar Corp. has announced an enhancement to Xmenu/E, its IBM VM/CMS screen management system.**

Xmenu/E is an information display management facility that reportedly uses programming languages to create and display full screen menus on display terminals.

According to a company spokesman, the product supports all features of IBM's 3270 family of display terminals and IBM 3290 and 3180 terminals for creating menus up to 256 rows by 256 columns.

The product is said to allow interactive design of menus with a screen painter/editor.

Program function keys define fields on the 3270 with full control of attributes, including color and extended highlighting.

Fields can be assigned alphanumeric names for reference by programs, a spokesman said.

Xmenu/E, including source code, is available for a $2,000 annual license fee, with an initial license charge of $1,000.

Kolinar, 3064 Scott Blvd., Santa Clara, Calif. 95054.

■ **GMD Systems International, Inc. has announced that its Customer Order Servicing (COS) software, previously available for the IBM System/38, is now available for the IBM System/34 and System/36.**

The COS software is an enhancement to IBM's Mapics order entry and invoicing application and is said to provide improved functions and operating simplicity.

COS is intended to improve customer communications, support multiple types of order and shipping functions, adapt to many pricing and discounting structures and offer order and management controls in domestic and international environments.

For the IBM System/34 and System/36, the price for COS is $8,100; for IBM System/38, the price is $10,800, the vendor said.

GMD Systems International, Suite 420, 8601 Dunwoody Place, Atlanta, Ga. 30338.

■ **Computer Data Corp. has released Version 4.0 of its Computer Data Information Systems (CDIS) for all models of Hewlett-Packard Co. HP 3000 processors under HP's MPE operating system and Digital Equipment Corp.'s VAX series computers under DEC's VMS operating system.**

According to a spokesman, Version 4.0 of CDIS accommodates accounting by book, multiple levels of consolidations handled in two separate but integrated structures and statistical accounting. Other features include posting by project, automatic invoice matching and comprehensive bank reconciliation.

Available CDIS modules include general ledger, accounts payable, accounts receivable, fixed assets, payroll, inventory, sales orders, sales analysis, purchasing, material requisitioning, project costing and modeling and forecasting.

CDIS prices range from $50,000 to $80,000 for the complete system, depending on CPU size. Modules are also available individually, the vendor said.

Computer Data, 31344 Via Colinas, Westlake Village, Calif. 91362.

See TOOLS page 50

THE NIU-130 LOWERS COST-PER-LOCATION.

Announcing the NIU-130: a two-port NIU that can follow you anywhere at a cost-per-location so reasonable that network connection is feasible where it hasn't been before—particularly in broadband applications.
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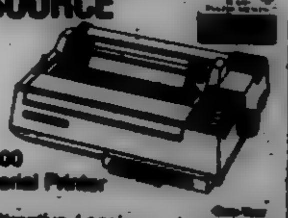

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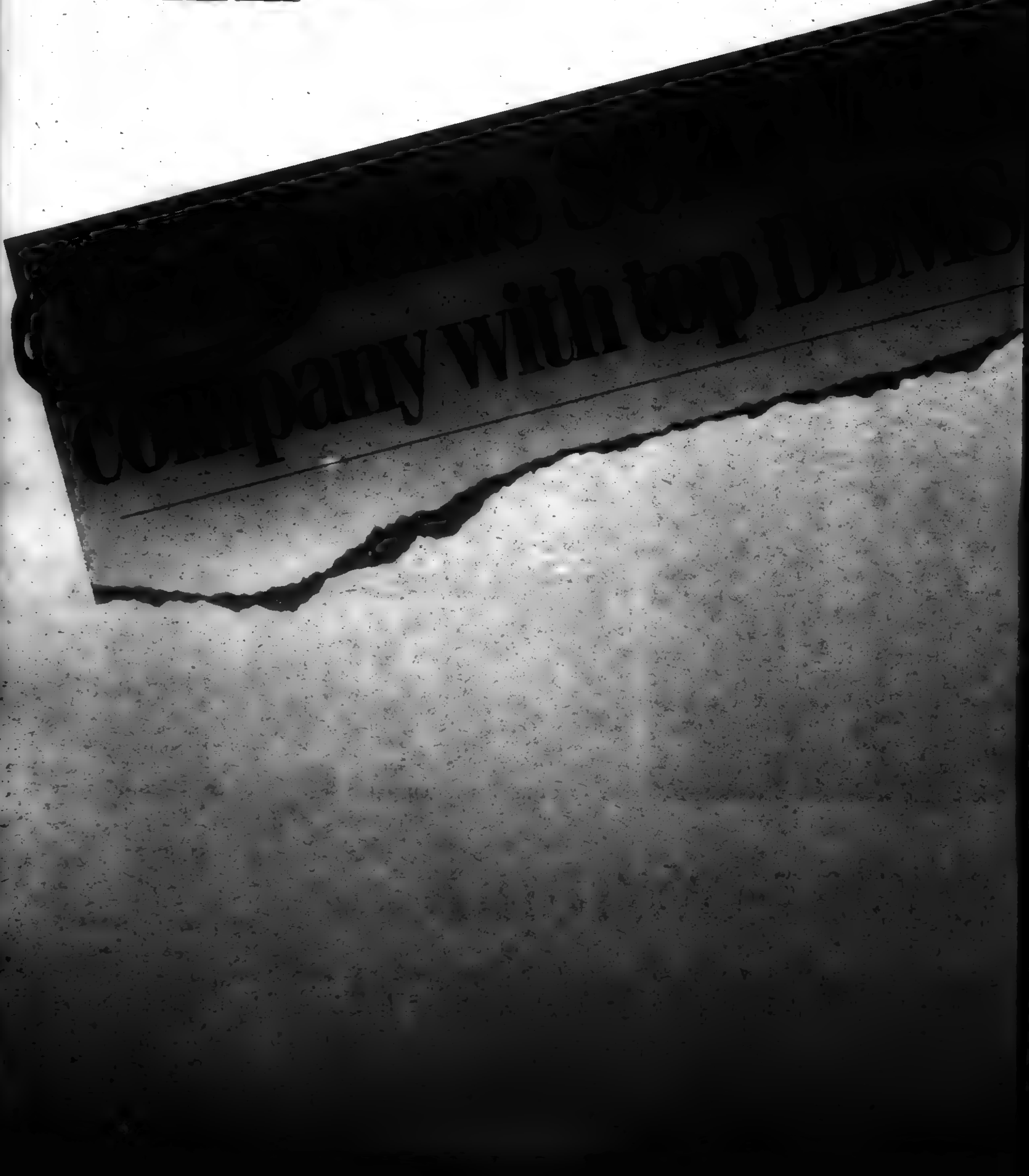
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Features! Of course, performance doesn't help if a spreadsheet doesn't have the features you need. ***ESS*** has those features. It supports ***all*** 3270 terminals, including the 160 column 3290 display. It provides a direct interface to IBM's Presentation Graphics Facility, so you can produce color graphics from your spreadsheet with a single command. The only limit to how big a spreadsheet you can make is the amount of virtual storage available, which can be up to ***16 Megabytes! ESS*** lets you edit data in full screen mode. It can read files created by standard COBOL programs, and files created by the leading microcomputer spreadsheets, ***Lotus*** 1-2-3 and ***VisiCalc***. It has extensive formatting options so you can produce reports that look exactly the way you want them. And the list of features grows longer with each release.

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SOFTWARE & SERVICES

TOOLS

from page 47

■ **Data Processing Design, Inc. has announced that its Decmail-Plus electronic mail software now supports Version 3.0 of its Word-11 word processing package and includes Version 2.0 of Digital Equipment Corp.'s Decmail-11.**

Decmail-Plus includes an automatic answering feature that allows users to specify a response when electronic mail is received and they are not logged on, the vendor said. An Installation Certification Procedure that is said to test Decmail-Plus software installation and new options on the Send menu, including NI (nickname) and ME (Menu) have been added to the product.

A text editor is said to allow users to edit messages using commands consistent with Word-11.

The product includes support for an optional transport facility, DEC VT220 and VT240 terminals and 8-bit characters. Decmail-Plus costs $2,500 for the first license and $1,250 for a secondary license.

Data Processing Design, 1400 N. Brasher, Anaheim, Calif., 92807.

■ **Tektronix, Inc. has released Version 7.0 of its Plot 10 Computer-Aided Drafting (Teknicad) software for Digital Equipment Corp.'s VAX-11/750 and VAX-11/780 processors under VMS.**

Plot 10 Teknicad drafting software reportedly enables users to create drawings without extensive training.

Standard features include geometry and dimensioning capabilities, dynamic graphics and text manipulation, local zoom and pan, multiple plotter drivers and an interface to other computer-aided design systems, according to the vendor.

Enhancements in Version 7.0 include section analysis, user-generated macros, control keys for shortcutting through menus, multiple arrowhead styles, dynamic move and copy of items, construction lines for creating multiview diagrams and drivers for Nicolet Zeta Corp. and Houston Instruments plotters, the vendor said.

Version 7.0 of Plot 10 Teknicad for the VAX-11/780 is priced at $16,000 and at $12,000 for the VAX-11/750.

Tektronix, P.O. Box 1700, Beaverton, Ore. 97075.

MAINTAIN

from page 37

information to change fundamentally the ways in which their employees and their industries do business.

These companies are spending big money to find new ways to exploit information. So it follows that they are seeking similar avenues to reduce the cost of maintaining the status quo.

If you are going to lead your company into the information age, it is important that you minimize the time you spend looking back at what you have already done. There are several ways to begin dealing with the maintenance problem that are not too expensive or disruptive.

Benefits from structured planning

If you are not using structured programming techniques for new development, you should be. Benefits can be realized not only from structured planning but also by closer attention to up-front design and regular, structured walk-throughs. It costs only a dollar or two to catch an error in the design stage, but it may cost as much as $75 to fix it in production, according to some estimates. And those costs do not include the enormous damage that can be done by a simple but destructive error.

High-level languages and application development systems are finally coming into their own. While these technologies are more resource-consumptive, they can offer 10-to-one improvements in programming productivity. In addition, they were designed to be largely self-documenting.

Programming productivity aids have yet to penetrate the realm of large-systems development, but they seem to be heading in that direction. User stories are emerging that demonstrate the viability of these tools in transaction processing.

Emerging technologies

Then there are the emerging technologies that promise to deliver even bigger gains in reliability and productivity. Computer-aided software engineering methods, programmer workstations, reusable code and prototyping aids are all in use and are proving to be viable. Services are even available that automatically translate unstructured programs into structured code [CW, Jan. 28].

There is no reason you should invest in all of these technologies, or even more than one or two. But if you are not concerned about reducing your maintenance burden — either now or in the future — it is time to start being concerned.

In the meantime, you can begin a dialogue with DP managers at other companies in your area. Start a special interest group within a user organization. Or just read about what other companies are doing. Maintenance is a serious issue, and it deserves some serious attention.

UNIX

from page 37

company like [Digital Research] needs."

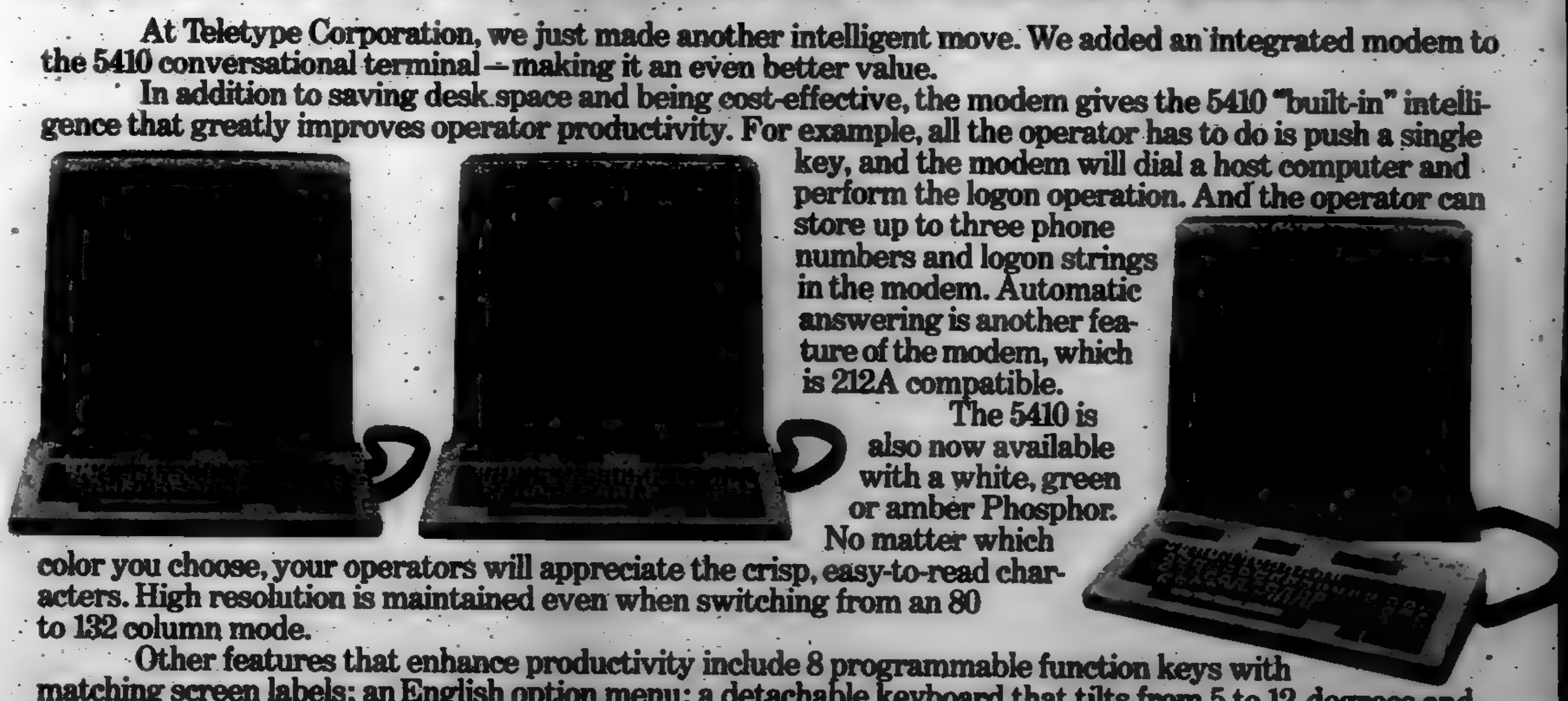
A version of Unix for National Semiconductor's 32000 series will be available in April and will sell for $43,000 per CPU, according to AT&T.

The Motorola version of the port was completed in May 1984. AT&T said that versions of System V for Motorola's 68010 and 68020 microprocessors would soon be available but did not provide shipping dates.

Also at Uniforum, AT&T said plans for a Systems V applications library, announced as a cooperative venture with Digital Research in January 1984, have been scrapped. The library was intended to address the problem of limited availability of System V applications, but that problem now is being solved through other efforts, an AT&T spokesman said.

AT&T also expanded its business relationship with Microsoft Corp. Microsoft reaffirmed an earlier commitment to provide a System V version of its Xenix operating system, which conforms to Unix System III. AT&T, in turn, said it planned to offer Xenix System V on the AT&T 6300 Personal Computer, an IBM Personal Computer compatible.

AT&T is located at One Exchange Plaza, New York, N.Y. 10006.



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In addition to saving desk space and being cost-effective, the modem gives the 5410 "built-in" intelligence that greatly improves operator productivity. For example, all the operator has to do is push a single key, and the modem will dial a host computer and perform the logon operation. And the operator can store up to three phone numbers and logon strings in the modem. Automatic answering is another feature of the modem, which is 212A compatible.

The 5410 is also now available with a white, green or amber Phosphor. No matter which color you choose, your operators will appreciate the crisp, easy-to-read characters. High resolution is maintained even when switching from an 80 to 132 column mode.

Other features that enhance productivity include 8 programmable function keys with matching screen labels; an English option menu; a detachable keyboard that tilts from 5 to 12 degrees and has tactile feedback; standard character sets; and the list goes on and on.

In the interest of operator productivity, write to Teletype Corporation for more information on the 5410 at: 5555 Touhy Ave., Dept. 3223-H, Skokie, IL 60077. Or call 1 800 323-1229, ext. 111.

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AT&T
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MICROS

from page 37

cost-effectiveness issue, this statement has merit to the extent that we cannot identify new contributions that could be made by the multiuser micro.

Finding unique multiuser applications will be critical to solving the multiuser micro problem. Vendors must break out of their conceptual and growing financial stagnation.

The stakes are less obvious, but perhaps even more important to MIS departments and personal computer users. Corporations are beginning to ask if personal computers do not create problems as well as solutions, as illustrated by measurable and increasing personal computer costs and softer and, arguably, diminishing benefits.

This creeping malaise is, fittingly, caused in part by the "personal" aspect of the personal computer. Personal computer outputs are difficult to control and very awkward to share. Human communications, not to mention computer communications, are not furthered and may often be hindered by large numbers of stand-alone personal computers.

The multiuser micro could offer unique functions that would not only be valuable in themselves but could also remedy some of the failings of single-user micros. The multiuser micro could enhance communications among members of a work group, assist in idea- and concept-building and become a work-in-process facilitator.

Multiuser micro components exist

This multiuser micro sounds exciting, but there is some bad news: Such a product does not yet exist, except perhaps in some unknown garage. The good news is that many of the pieces of such a product do exist. The components of this tool are computer conferencing software, an outliner/text editor and a data retrieval mechanism.

Computer conferencing is very widespread at the informal, bulletin-board level. Limited use has been made of more formal and more powerful tools, such as those offered by Network Technologies, Inc. or Participation Systems, Inc. Their principal, formal use is for dispersed experts to confer by terminals attached to a host, often over an extended period of time, with only part of the group on-line at any one time. Sometimes this conferencing is a communications tool; other times it is used to formulate a position or a document.

One of the problems of computer conferencing is that it is still seen as little more than a cross between a conference call and a teletype. This is partly because work is only beginning on methods to allow indexing and retrieval of the newly created knowledge base.

Outliner/text editors — most notably, Living Videotext, Inc.'s Thinktank but also, to a degree, packages such as Ashton-Tate's Framework — are new products that enable users on a single micro to organize, in an evolutionary manner, ideas and their relationships.

In one sense, these are little more than structured word processors, albeit very valuable ones.

First stage a combination

Combining both the concepts and software of computer conferencing and outliners would serve as a first-stage product for multiuser micros, with the following benefits:

- Members of a work group could work on a common project; for example, adding pieces to the same module or linking separately prepared modules.
- Up to now, computer conferencing has tacitly assumed that participants use the tool instead of face-to-face communications. The kind of work-in-process system described here would serve as a complement to and, hopefully, an expander of personal communications.
- Outliner tools would become much more powerful by being able to capture many people's thoughts at the formative stage of analysis and decision making.

The work-in-process tool just described is all that would be needed in many work situations. However, for complex projects or those of long duration, the "stream of consciousness" aspects of a work-in-process tool would be unwieldy. A second-generation product would allow users to refer back and cross-index issues.

In some instances, key-word indexing and searching would be sufficient. In other cases, however, sections must be indexed topically and associations referenced. Most current data management systems will probably not prove adequate, since they are arranged hierarchically or as matrices.

Ideas are, on the other hand, related in associative networks — to the extent that we understand the thinking process. Visually expressed networks will probably be more suitable; both words and numeric data will need to be referenced. Fortunately, the data management facilities will not be required to demonstrate the usefulness of the concept.

Are these concepts closely tied to multiuser micros? Could mainframe technology not do this as well or better? In my opinion, no. The key difference is that this type of tool will be most useful for relatively small work groups. They will need local control over local data. Using host resources would generally add more overhead than value. Whether it would be useful to have organizationwide "idea collections" is another issue entirely.

Obviously, these concepts need much more definition before even prototype tools can be developed. However, even this rudimentary description of one new way of using multiuser micros should alert people to their potential.

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MULTIPLICATIONS ✻

***UCCEL** has selected Imagine for use with its application software products. Multiplications has offices in the following locations: Cambridge, MA. Atlanta, GA. New York, NY. Oakland, CA. Rochester, NY. Toronto, CN.*

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COMMUNICATIONS

INSIDE

Protocol Converters/54

Multiplexers/Modems/54

Private-line net design tool debuts

MNDS package permits user performance analysis, least-cost routing calculation

WEST BRIDGEWATER, Mass. — A network modeling package that runs on IBM Personal Computers and can be used in private-line network design to do performance analysis and least-cost routing is available from Connections Telecommunications, Inc.

Called Multipoint Network Design System (MNDS), the software can be used on an IBM Personal Computer or Personal Computer XT that has a minimum of 256K bytes of memory, two 360K-byte, double-sided, double-density disk drives and IBM graphics capabilities.

The system enables users to build a file containing characteristics of their network and use this to do performance analyses and least-cost routing calculations, according to company President Gerald Ryan.

In performance analysis, for example, users can compare how switching from IBM's Binary Synchronous Communications (BSC) protocol to IBM's Synchronous Data Link Control (SDLC) would affect their networks. The basic system is said to include four protocols, including BSC, SDLC half-duplex, SDLC full-duplex and High-Level Data Link Control. Users can add to this to build a library of protocols.

Using the least-cost routing program, users can optimize networks for cost after defining certain criteria such as type of protocol used, response time desired, permissible line utilization and number of sites supported. These costs can be calculated using tariffs of different carriers or multiple tariffs from a single carrier. Unless otherwise instructed, MNDS calculates private-line circuits using AT&T tariffs, including Tariff 260, Inter-Local Access and Transport Areas (Lata) analog or Inter-Lata digital tariffs.

AT&T tariff may be adopted

Ryan said the private-line tariff filed recently by AT&T, which is presently scheduled to go into effect March 4, will be adopted for use if it looks like it has a good chance of being accepted by the Federal Communications Commission. Ryan pointed out that Connections Telecommunications does not offer a tariff service — where every new tariff filed would be adopted for its customer — but noted that the company will conform to new tariff structures.

MNDS comes on 10 floppy diskettes, each dedicated to a task. These include the following:

- A file-building program to create the network data base.

See MNDS page 54

Comm+ adds net products

Dnas for IBM 370s features inventory management, troubleshooting functions

SEATTLE — Comm+ Systems, Inc., a newly formed subsidiary of Pacific Northwest Bell Telephone Co., has released three products aimed at, respectively, network control, network integration of personal computers and printer optimization applications.

The firm also announced that it will offer a service for management of small- and medium-size data networks.

Targeted at operations that maintain their own network control centers, Comm+ Systems' Data Network Administrative System (Dnas) is said to provide network inventory management, automatic trouble ticket generation and monitoring and troubleshooting functions.

Key features

Key functions of Dnas include the following:

- Network inventory, including hardware characteristics, user information, locations, circuit numbers and access authorizations.
- Automated on-line trouble ticket generation.
- Comprehensive report generation capability, including the ability to coalesce information on component availability as well as performance and vendor responsiveness.
- Installation and management, providing a data base and a communications vehicle for tracking installations.
- Network configuration, including coordinating of network changes as components are added and moved within the network.
- On-line documentation, which enables network control personnel to access data on alarms, trouble tickets and test equipment operation without having to locate a printed version.

Comm+ Systems reports that, for certain networks, Dnas allows network control center personnel to view the entire network configuration with color graphics. Various colors indicate different network conditions, according to a Comm+ Systems spokesman.

Dnas runs on IBM 370 and equivalent mainframes under OS/MVS or

See NETS page 54

Honeywell Scomp earns top DOD system security rating

MCLEAN, Va. — The Secure Communications Processor (Scomp) from Honeywell, Inc.'s Honeywell Information Systems division has earned the first A 1 security rating based on the U.S. Department of Defense's Trusted Computer System Criteria.

Scomp provides eight levels of security, 32 independent security categories and secure partitioning within a system, the vendor said.

A Honeywell DPS 6 minicomputer is converted to a Scomp system by replacing its communications processor with an enhanced processor and adding a security protection module. The security protection module provides a demand-paging virtual environment, four Honeywell Multics-like rings of protection and a fast descriptor store.

Software support is reportedly provided by Honeywell's Trusted Operating Program, a multiuser operating system. The foundation of the system is the computing base, which controls data access through its embedded security policy.

Boeing, GM to demonstrate multivendor net at Autofact

By John Gallant
CW Staff

DALLAS — Boeing Computer Services Co. recently announced that it will cosponsor with General Motors Corp. a second multivendor computer network demonstration — similar to that staged at the 1984 National Computer Conference (NCC) — at the Autofact Factory Automation Trade Show to be held in Detroit in November.

According to Laurie Bride, Boeing's manager of networking technology, the Boeing-GM demonstration will showcase two local networks that incorporate the International Standard Organization's (ISO) Open Systems Interconnect (OSI) protocols.

As the company did at last year's NCC, Boeing will sponsor a baseband local-area network that uses the carrier-sense multiple access with collision detection access method. Designed for office environments, the network conforms to the IEEE, Inc.'s 802.3 standard.

In the other half of the demonstration, GM will demonstrate a token-passing bus network that conforms to the IEEE's 802.4 standard. Boeing made the announcement after the opening ceremonies of Infomart, an exhibition/market facility here. Bride said that the demonstration will show how these networks can be interconnected via the OSI Internet protocol, the third layer of the network reference model. The OSI model is a seven-layer architecture specifying computer net communications.

The demonstration will also operate with the OSI transport, session and file transfer protocols, which represent the fourth, fifth and seventh levels, respectively, of the reference model.

Vendor demonstrations

Bride said Boeing and GM have not yet selected all the companies that will participate in the multivendor equipment demonstration. She said booth size constraints would likely limit the number of participants to between 20 and 25 companies.

Bride added that most of the vendors that took part in the NCC demonstration, which featured equipment from 10 manufacturers, would participate in the November Autofact demonstration.

In addition, those vendors will probably be joined by AT&T, Wang Laboratories, Inc., Northern Telecom, Inc. and Sperry Corp. Bride said that more than 28 companies have expressed interest in participating in the demonstration of the 802.4 network alone.

In preparation for the joint demonstration, Bride said, Boeing has asked several major computer manufacturers to participate in the creation of an OSI testing center at the company's headquarters in Bellevue, Wash. She said the center will make use of test methods specified by the U.S. National Bureau of Standards for ISO protocols. Bride said Boeing is confident that the establishment of the facility will help speed acceptance of the OSI standards.

COMMUNICATIONS

PROTOCOL CONVERTERS

■ Datagraph, Inc. has announced two versions of its Hasp Host Protocol Converter. The products support a number of communications protocols, including IBM's Systems Network Architecture/Synchronous Data Link Control and Burroughs Corp. Remote Job Entry synchronous and poll-select protocols.

Hasp Host LTD supports one card reader and either a line printer or a card punch, the vendor said. Hasp Host Max supports eight devices, four of which can be the same type of device.

Hasp Host LTD costs $4,995, and Hasp Host Max sells for $5,745.

Datagraph, 6626 Silvermine Drive, Austin, Texas 78736.

MULTIPLEXERS/ MODEMS

■ Gandalf Data, Inc. has enhanced Pin 9101E, an X.25 packet-switching multiplexer.

One enhancement allows a remote console user to access the Pin 9101E console from any point in a network, the vendor said. An autocall feature allows an incoming call to be routed automatically to a predefined destination, according to the vendor.

Pin 9101E was designed to enable asynchronous terminals or systems with asynchronous ports to access X.25 packet-switched networks, the vendor said.

Pin 9101E's cost ranges from $2,650 to $5,250.

Gandalf Data, 1019 S. Noel, Wheeling, Ill. 60090.

MNDS from page 53

■ A rate file that includes the mentioned AT&T tariffs and can be updated by the user to accommodate other carrier tariffs or cost changes.

■ Performance analysis programs for response time and utilization, graphics and terminal requirements.

■ Network layout and pricing program.

■ Four diskettes that provide vertical and horizontal coordinates used to calculate circuit mileage. This program provides the numerical vertical and horizontal coordinates for user sites when the area code and exchange number of network locations are entered. It also identifies Lata designations.

■ A program that identifies locations of AT&T serving offices or points-of-presence and lists available services in all Latas.

■ Sample network data base.

The system is said to be capable of processing up to 200 sites on a single data base and accommodate larger networks using mulitple data base files. Up to 50 transaction types can be considered on any one pass-through.

The company makes one caveat. Because the product is micro-based — as opposed to a time-sharing service that offers similar functions — some types of analysis can be time-consuming.

The purchase price of MNDS Version 2.0 is $6,500. This is said to include one year of free updates and a one-day training seminar. Optional annual maintenance after the first year is $1,000. The company is located at 322 E. Center St., West Bridgewater, Mass. 02379.

NETS from page 53

MVS/XA. Pacific Northwest Bell has been using Dnas since 1979 on a network containing 10,000 terminals. Use of the product reportedly enabled the telephone company to reduce the number of people on its prime shift in the control center from 30 to 40 people to eight. Dnas will be available in July for $90,000.

For users who cannot justify a dedicated network control facility, Comm+ Systems is offering a new service, the Remote Network Service Center (RNSC). Intended for nets containing from 50 to 2,500 terminals, RNSC requires the installation of an access panel in front of the user's network front-end processors.

When problems are reported, RNSC can perform diagnostics via a data line and assess the nature of the problem. According to the company, many problems can be solved over the phone, and for those that cannot, Comm+ Systems will dispatch the appropriate vendor.

The company also announced a Printed Output Management System (Poms) and the Micro-Mainframe Access Node (Microman) products.

Poms reportedly functions like an electronic message clearinghouse that reduces the number of printers needed in a network. It is a centralized controller for printers that is said to allow common distribution logic commands that enable all applications to access any printer.

Capable of suporting up to 256 designated printer locations, Poms costs $70,000 and can be used in IBM 370 and compatible Btam and Vtam networks with 3270 or teletypewriter printer formats. Minimum software requirements include Release 1.6 of CICS. It will be available in July, according to the vendor.

The Microman product is based on an IBM Series/1 minicomputer which, under the direction of Comm+ Systems software, functions like an intelligent controller. This hub connects to IBM hosts via two connections, one used for file transfers and the other for access to the terminal network.

Microman can support up to 24 IBM Personal Computers, providing file transfers between connected Personal Computers or between Personal Computers and mainframes.

Hardware requirements include IBM and compatible hosts running Job Entry Subsystem 2 or 3 with RJE support. It costs $1,500 and will also be available in July.

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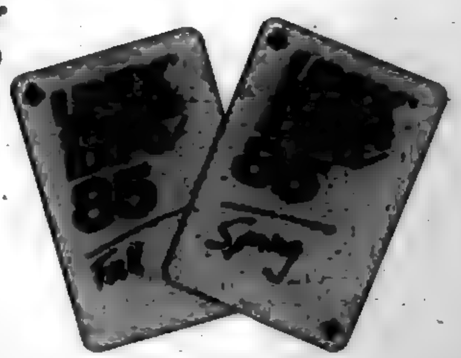

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SYSTEMS & PERIPHERALS

Floating Point releases FPS-264

BEAVERTON, Ore. — Floating Point Systems, Inc. has announced the FPS-264 64-bit scientific processor, said to be 4½ times faster than its predecessor, the FPS-164.

The 264 is rated at a peak processing speed of 38 million floating-point operations per second (Mflops) and features a main memory of up to 4½ million words, or 36M bytes. Floating Point also announced a hard-disk subsystem, the FPS-FD64, offering up to 16G-byte storage for the FPS-264.

All application software for the FPS-164 will run on the FPS-264, the company said. The increased processing speed on the FPS-264 is attributed to its use of emitter-coupled logic (ECL) gate arrays, which feature 45-nsec cycle time, and the use of static random-access memory (RAM) instead of dynamic RAM.

Other features of the FPS-264 reportedly include parallel processing, in which multiple processors work simultaneously; the use of eight pipe-lined data paths connected by seven high-speed protected buses; a main memory ranging from 512K words (4M bytes) to 36M bytes; high-speed buses that allow 24-bit addressing of memory words; and 64-bit accuracy with 15 digits in the answer, instead of seven digits in 32-bit answers.

Programmed in Fortran 77

The FPS-264 is programmed in Fortran 77, and included in the 264's software is a Fortran 77 compiler and the System Job Executive, Floating Point's proprietary operating system. All FPS-164 software is compatible with the FPS-264, the company said. Third-party programs for science and engineering applications have been adapted for use on the 164 and 264.

The FD64 disk subsystem, which connects to the FPS-264 through an intelligent controller, includes a Winchester disk drive, a controller in the disk drive cabinet and an adapter in the CPU's I/O controller. Each controller is said to handle up to four disk drives, and up to six controllers can be attached to the FPS-264. With each drive offering 680M bytes of formatted storage, the FD64 subsystem can store up to 16G bytes of data.

The 264 is aimed at scientific applications, including structural analysis, computational chemistry, electronic circuit design, computational physics and petroleum and natural gas reservoir modeling, the company indicated.

Prices for the FPS-264 start at $640,000, the vendor said. Shipments are

See FPS page 60

■ Data General Corp. unveiled a removable media disk drive for its Eclipse MV line of superminicomputers/56

■ NBI, Inc. announced a series of products that include an entry-level version of the firm's Oasys system, a multiuser configuration and a technical system/56

■ Perkin-Elmer Corp. enhanced the main memory capacity of its 3210 superminicomputer to 16M bytes/57

■ Digital Equipment Corp. took the wraps off an ink-jet printer/57

INSIDE

Turnkey Systems/57
Graphics Systems/57
Power Supplies/60

Adage offers workstation for IBM 5080

BILLERICA, Mass. — Adage, Inc. has announced the Adage 6080 workstation, said to be compatible with IBM's 5080 graphics system and based on Adage's Ocean graphics engine.

The 6080 is said to feature 50 nsec/pixel drawing speed, local pan, zoom and scroll and highlighting techniques.

Among the software packages that run with the 6080 workstation are Cadam, Inc.'s Cadam and Integrated Prance Cadam, McDonnell Douglas Automation Co.'s Unigraphics and Precision Visuals, Inc.'s DI-3000, the company said.

Options available with the 6080 workstation include IBM 3270 terminal emulation and two- and three-dimensional transformations and clipping. The 6080 workstation includes 256K bytes of memory, expandable to 1.25M bytes. A maximum of 256 colors can be displayed from a palette of 4,096. Several communications options are supported at speeds up to 3M bit/sec.

The 6080 workstation is said to be compatible with existing channel units for Adage 4250 Vector Refresh and Raster workstations. Up to 32 6080 and 4250 workstations can be supported by one channel unit.

The 6080 workstation includes a 19-in. 60Hz noninterlaced display with 1,024- by 1,024-pixel resolution. Interactive devices include an alphanumeric keybord, data tablet with stylus or four-button cursor, programmable function keys and eight continuous-turn control dials.

Prices for a typical 6080 workstation configuration range from approximately $18,000 for a monochrome system to approximately $22,000 for a 16-color system, the vendor said. Shipments are scheduled to begin in March.

The Model 4201 channel interface unit is needed to connect the 6080s to an IBM system. The price for the 4201, which accommodates up to 32 users, is $13,000, the vendor said.

Adage is located at One Fortune Drive, Billerica, Mass. 01821.

Nohalt announces Reliant II

Microprocessor-based fault-tolerant system boasts support for up to 100 users

FARMINGDALE, N.Y. — Nohalt Computers, Inc. has released a microprocessor-based fault-tolerant system that uses paired hardware and runs Musys Corp.'s Turbodos operating system.

The system, which reportedly can accommodate up to 100 users, uses distributed fault tolerance that is said to permit continued operations and protect data despite hardware or software problems by distributing the fault tolerance to user sites.

The Reliant II consists of 16M bytes of random-access memory (RAM) and up to eight dual-application processors connected via dual data buses to a mirrored file system of dual file processors, dual disk controllers and dual hard disks. The system is powered by dual power supplies and dual power buses, backed up by duplicated internal uninterruptible power supply battery packs, the vendor said.

The system can be tailored to the individually required level of dual-processor redundancy needed, according to the vendor. Users on the system who need dual-processor fault tolerance can have it, while other users on the system can operate at a single-processor level.

Cost of an entry-level Reliant II with one fault-tolerant processor pair is less than $30,000. A system with 140M-byte files fully mirrored on a pair of hard disks with any combination of dual processors, using 16 Intel Corp. 8086s each with 256K bytes of RAM costs less than $85,000.

More information is available from Nohalt Computers, which is headquartered at 1750 New Highway, Farmingdale, N.Y. 11735.

HP 260 targets small businesses, first users

PALO ALTO, Calif. — Hewlett-Packard Co. today will introduce the HP 260 line, which the the company claims is its lowest priced line of multiuser systems. Designed to be compatible with its predecessor, the HP 250, the three HP 260 minicomputers are aimed at first-time users in small businesses.

The entry-level Model 15, priced at $10,500, includes 256K bytes of main memory, a 15M-byte hard disk drive, a microfloppy disk drive and a workstation.

The $16,300 Model 24 will combine 512K bytes of main memory, a 24M-byte hard disk drive with streaming tape backup and a workstation.

At the high end, the Model 55 will cost $20,500 and offer 512K bytes of main memory, a 55M-byte disk drive with streaming tape backup and a workstation. This system can support up to 18 users, the company said. The HP 260s are the vendor's first multiuser machines to support the HP Thinkjet and Laserjet printers, along with the HP 7475A and 7550A plotters, HP said.

More information is available from HP's Inquiries Manager at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

HARD TALK/TOM HENKEL/CW Senior Editor

Testing new technology means risky business

There seems to be a growing love/hate relationship among users over new technology in computer systems. In the face of rapidly growing end-user demands for computing power, it is clear that new technologies must be employed to develop bigger and faster systems. But for users whose businesses rely on the data stored in their computer systems, experimenting with new products can be costly and risky.

Problems with products that employ emerging technology are certainly not new. Delivery delays and glitches in early versions of products date back to the first days of data processing. But in spite of improved methods for designing and testing products, the increased complexity of today's computer systems still leaves the possibility that some new products may not initially work as well as the vendor originally claimed.

Consequently, there seems to be a developing preference for products that build on existing technology

See DEBUTS page 60

NBI expands Oasys 64 line with series of products

BOULDER, Colo. — NBI, Inc. has introduced a series of products aimed at expanding the firm's Oasys 64 shared resource system and office and technical product lines.

The products include the following:

- The Oasys 64M, an entry-level member of the firm's Oasys line.
- The multiuser System One ISS 5/10.
- The S! Technical Computer System.
- The NBI Optical Character Reader.
- The NBI Legal Management System software and a 55 char./sec printer.

The Oasys 64M is an entry-level shared resource system for up to seven operators that runs under NBI's proprietary operating system. It is said to feature 30M bytes of storage, 512K bytes of memory and eight ports. Oasys Mail (an electronic mail package), asynchronous/binary synchronous communications, NBI's 3270 Plus communications and Digital Equipment Corp. VT100 emulation are optional. The system can be upgraded with an additional 16 ports and up to 76M bytes of storage, the company said.

The price of the basic system is $16,900.

The System One ISS 5/10 and the S! Technical Computer System are both based on Motorola, Inc.'s 68010 microprocessor and use a dual bus architecture and memory management units that allow up to 4M bytes of memory to be accessed with no-wait states while running the University of California at Berkeley's Unix 4.2 operating system.

The ISS 5/10 is an applications processor for office environments. The system is said to extend the functionality of NBI's Oasys and System One products by providing electronic filing and retrieval, data base management and industry-specific software solutions. The ISS 5/10 features 112M to 225M bytes of hard-disk storage and comes with a range of programming languages that includes Fortran 77, Ryan-McFarland Corp.'s RM Cobol, C and Lisp. A relational data base management system is also standard with the ISS 5/10.

The System One ISS 5/10 will be available in March, and prices will start at $21,500, according to the company.

The S! Technical Computer System is aimed at the technical, scientific and engineering communities. It is said to provide users with a means of sharing AT&T's Unix computing tools and peripherals, such as printers and communications devices. NBI's U! Technical Workstation may use the S! Technical Computer System as a server and for centralized storage, the vendor said. The S! may also be used as an interactive timesharing system with up to 24 users.

Standard system software includes Berkeley 4.2 Unix (with integrated Ethernet networking software) and a library of utilities. The S! is available as a deskside or a rack-mounted model. Both models come with 1.25M to 4M bytes of main memory, and the deskside model comes with 52M to 224M bytes of hard-disk storage. The rack-mounted model comes with 52M to 1,500M bytes of hard-disk storage.

Prices for the deskside model start at $19,850 and for the rack-mounted model at $22,150.

The NBI Optical Character Reader (OCR) reads typed text and enters it into NBI's Oasys systems for access by word processors and personal computers. The NBI OCR is said to input one page in 25 seconds. It provides recognition of 12 type styles; reads 10-pitch, 12-pitch and proportionally spaced text; feeds 75 sheets automatically; and formats text.

The price of the NBI OCR is $11,300, the vendor said.

The company also released the NBI Legal Management System application package that runs on the ISS 5/10 system under the Unix operating system. The package — designed for law firms with 25 to 99 users — includes time/billing, general ledger, accounts payable, payroll, trust accounting, docket control, conflict of interest checking and other legal applications.

The package is priced at $18,900.

The company also introduced a 55 char./sec daisywheel printer that provides 10-, 12- and 15-pitch type faces. The printer will be available Feb. 15 and is priced at $5,200.

More information is available from NBI, P.O. Box 9001, Boulder, Colo. 80301.

DG offers disk drive for Eclipse

WESTBORO, Mass. — Data General Corp. has announced a removable storage disk drive (RSD) for its Eclipse MV family of superminicomputers that is supported by DG's AOS/VS operating system. The Model 5061 RSD is targeted at the federal government and other markets requiring data security.

The Model 5061 comes in a rack-mountable housing with two removable media — 146M bytes of total data capacity — that fit into 12¼ in. of vertical rack space.

A single-drive system is $17,000.

More information is available from DG, 4400 Computer Drive, Westboro, Mass. 01772.

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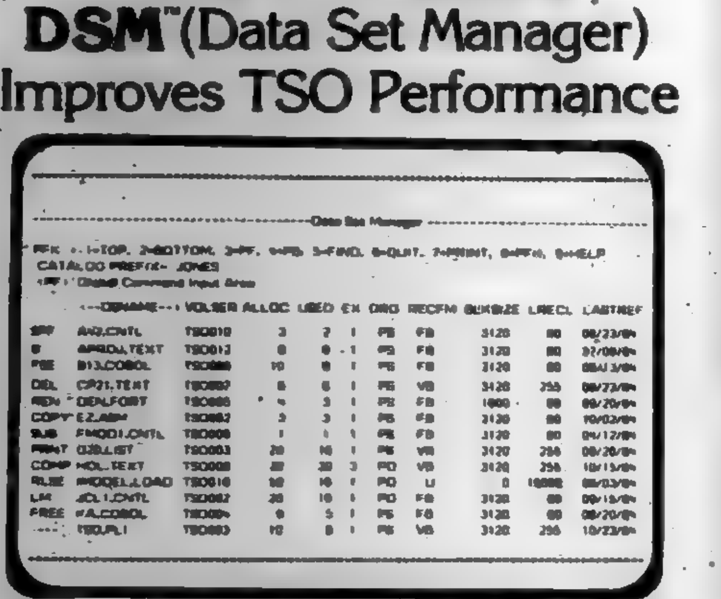

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TURNKEY SYSTEMS

■ Data Innovations, Inc. has introduced two image film recording systems, the DI100 and DI200, which are said to produce computer-generated photographs from any minicomputer or superminicomputer with an RS-232 port.

The DI100 relies on the power supply of the Digital Equipment Corp. VT100 CRT terminal, and the DI200 has its own power supply.

Each system — which can produce slides, negatives or prints in either color or black and white — consists of Data Innovations' graphics processor board and a Polaroid Corp. Palette computer image film recorder. Both the color and the 864- by 576-pixel resolution of the slides are independent of the monitor.

The graphics processor board creates bit-mapped images from graphics software that supports Tektronix, Inc. 4010/4014 terminals. The image is then photographed on the film recorder's flat screen black-and-white monitor through three primary color filters.

The DI100 system costs $3,600; the DI200 system costs $4,200.

Data Innovations, 660 Suffolk St., Lowell, Mass. 01854.

GRAPHICS SYSTEMS

■ Calma Co., a wholly owned subsidiary of General Electric Co., has introduced a 32-bit computer-aided design workstation for the layout of integrated circuits and printed-circuit boards.

The workstation is powered by a Data General Corp. DS/4200 32-bit graphics workstation running under DG's AOS/VS operating system and is linked to larger Calma Graphics Design System II (GDSII) systems via Ethernet hardware and Calmanet software communications. The GDSII system is a DG Eclipse-based system running under Calma's Cdos, a modified version of DG's Rdos. The workstation is dependent upon the GDSII system for background processing.

The workstation includes a 1,024- by 1,280-pixel, 60Hz, noninterlaced color monitor; 2M-bytes of main memory; two 5¼-in., 105M-byte Winchester disk drives; and a hardware floating-point unit. It comes with GDSII computer-aided design software that includes Calma's Chips two-dimensional graphics system for very large-scale integrated circuit artwork and a number of applications packages.

The price of the workstation is $95,000 per station.

Calma, 2901 Tasman Drive, Santa Clara, Calif. 95050.

■ Intecolor Corp. has introduced a color graphics terminal said to be compatible with Digital Equipment Corp. VT100 terminals.

The Colortrend 210 is said to offer a detached keyboard and one-touch tilting capability. Another feature

Continued on page 60

PE enhances 3210 supermini

OCEANPORT, N.J. — Perkin-Elmer Corp. has announced that its Model 3210 superminicomputer has been enhanced to support up to 16M bytes of directly addressable memory. Boards are available in 1M-, 2M-, 4M- and 8M-byte sizes, which can be plugged into the 3210's two available slots.

The Model 3210 uses PE's OS/32 operating system or PE's Xelos operating system, a derivative of AT&T's Unix System V.

Prices of the expansion boards are $7,000 for a 1M-byte board; $13,000 for a 2M-byte board; $23,000 for a 4M-byte board; and $34,000 for an 8M-byte board.

More information on the enhancements is available from PE Data Systems Group, 2 Crescent Place, Oceanport, N.J. 07757.

Ink-jet color graphics printer works with all DEC systems

MAYNARD, Mass. — Digital Equipment Corp. has announced an ink-jet color graphics printer that works with all DEC computer systems as well as its VT100/125 terminals and VT240/241 color graphics terminals.

The printer produces business-presentation graphics on paper and transparencies. The LCP01 printer contains DEC's J-11 microprocessor and page buffer memory that are said to take the graphics processing burden off the host computer system.

The printer requires approximately two minutes to provide hard-copy graphics images on either A- or A4-size paper.

The resolution is 154 dot/in. horizontally and vertically. It feeds, processes and stacks 100 sheets of paper or 50 transparencies automatically, the vendor said.

The LCP01 printer is compatible with DEC's Decslide text- and diagram-generating tool, Decgraph business graphing tool, Datatrieve office software and Pro/Gidis graphics interface descriptor instruction set, the company said.

The printer costs $14,595 and will be available in March.

More information is available from DEC, Maynard, Mass. 01754.

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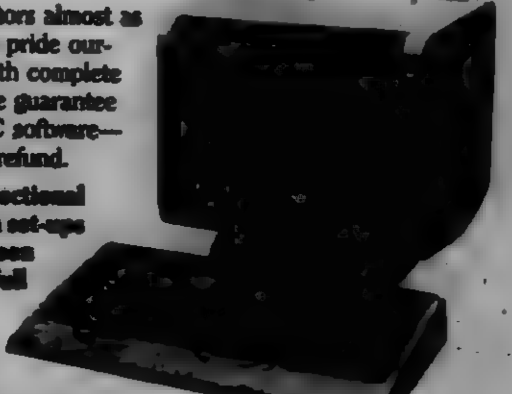
Standard features: advanced video standard • bidirectional printer port • two pages of memory • plain English set-ups • user-programmable function keys • green screen with screen saver • superior 132-column clarity • full one-year warranty.

Also available is the ERGO301FK (function keys) terminal with total DEC VT100 compatibility, plus 20 function keys that are user-programmable, down-loadable and savable in non-volatile memory. The 20 function keys are switch-selectable to let you choose DEC VT220 or TeleVideo 970 defaults. The ERGO301FK includes all the standard features of the ERGO301 at a list price of only $745.

An optional ReGIS and Tektronix 4010 add-on graphics board is available for the ERGO301 and ERGO301FK for only $595.



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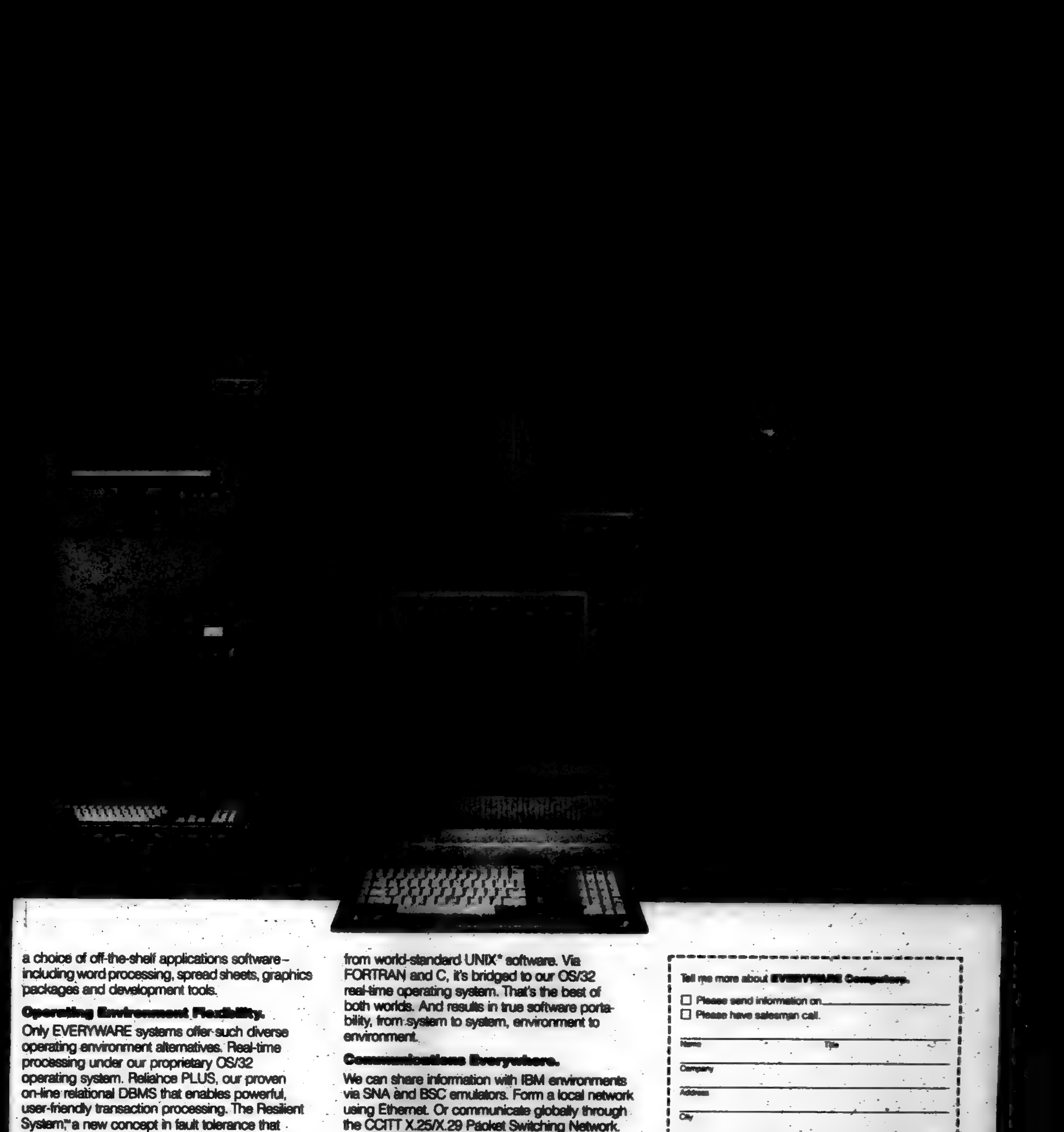

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Continued from page 57

enables the user to add color to existing black-and-white software without the need for reprogramming, the vendor said.

The Colortrend 210 costs $1,295.

Intecolor, 225 Technology Park, Norcross, Ga. 30092.

POWER SUPPLIES

■ Cyberex, Inc. has introduced a line of solid-state uninterruptible power supply (UPS) systems that will serve larger minicomputers and single- or dual-mainframe computer installations as well as communications systems.

The SIII line of UPS includes four single-phase and six three-phase output ratings from 12.5 to 150 kVA.

The line's pulse-width modulation technology is said to be compatible with most computer systems. The UPS provides battery backup power from five minutes to one hour depending upon battery size and provides power conditioning, which takes the spikes and dips out and regulates frequency.

A front panel includes operating instructions, power flow description, alarm panel with built-in memory, digital metering with selection of more than 40 functions (three phase) and system controls with indicators, according to the vendor.

The prices range from $15,000 to $100,000.

An optional computer-aided telediagnostic system is available for approximately $4,000.

Cyberex, 7171 Industrial Park Blvd., Mentor, Ohio 44060.

DEBUTS

from page 55

over products that have not proven their worth in the field. Cases in point are the recent superminicomputer announcements by Prime Computer, Inc. and Data General Corp. Both products employ enhancements to existing products that are designed to counter the VAX 8600 processor that Digital Equipment Corp. unveiled in late 1984. Some industry watchers contend the Prime and DG products may have a slight edge over DEC's 8600, not because their systems are inherently better than DEC's but because the technology used in Prime's 50 series and DG's MV series machines has been proven reliable. DEC's 8600, on the other hand, employs some architectural changes over earlier VAX series products.

No one is suggesting that DEC will have problems with its 8600, the first deliveries of which are slated for April. In fact, DEC has had a better-than-average track record in bringing products to the market. But because the 8600 is still something of an unknown quantity, there appears to be some concern that something could go wrong.

Another example of the "proven technology" trend is the current preference for popular microprocessors and operating systems in workstations and microcomputer products. One cannot ignore the fact that it is far less expensive to buy off-the-shelf components than to design totally new products. Nonetheless, many vendors are currently playing up the proven reliability aspects of products like AT&T's Unix operating system and microprocessors from Intel Corp. and Motorola, Inc.

Of course, a distinction must be made between marketing hype and genuine concern over the reliability of new technologies. Sales representatives pushing products that look exactly like 10 other products currently on the market are naturally going to play up the reliability issue because otherwise they have very few strong selling points. But there are genuine reasons for users to look at new-technology products with a skeptical eye.

> **”**
>
> ***The idea of buying "new and improved" seems to be taking a back seat to buying improved products that are not necessarily new.***

Take IBM's 3380 disk drive. There was a great deal of excitement from users when IBM offered the 3380 in 1981. Then IBM ran into problems with the innovative thin-film head technology used on the drive and was forced to delay deliveries about a year. As a result, some users were left without an alternative. Many were forced to scrounge around for the older IBM 3350-type disk drives, just to meet end-user demands until the 3380s were available.

Generally speaking, users of high-tech items are not unwilling to try new products. What seems to be changing is that users tend not to be as enthusiastic about being the first to use a new product — they would prefer to let someone else discover all the hidden bugs. Also, the idea of buying "new and improved" seems to be taking a back seat to buying improved products that are not necessarily new.

FPS

from page 55

expected to begin in the third quarter of 1985.

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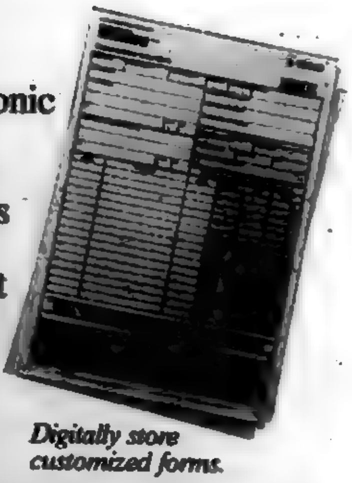

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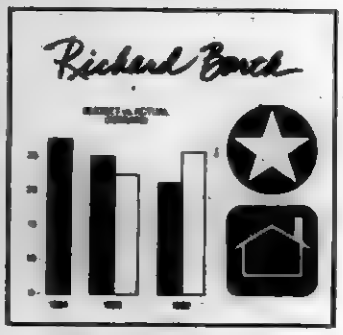

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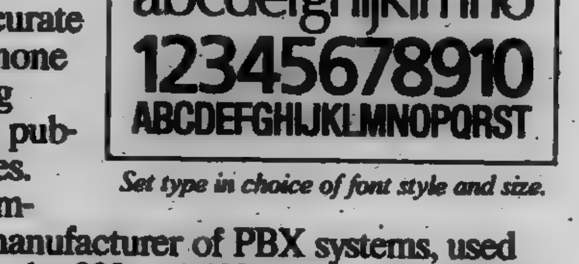

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MICROCOMPUTERS

Corporations not jumping to PC Xenix

By Edward Warner
CW Staff

Corporate microcomputer managers will not be flocking to their computer dealers to greet the arrival of IBM's new multitasking, multiuser Personal Computer AT operating system, PC Xenix.

They will hold off on buying until sufficiently attractive PC Xenix applications come on the scene, said most of those contacted by *Computerworld* recently.

That day may not be long in coming. Ryan-MacFarland Corp. in Aptos, Calif., planned to announce Jan. 28 that its RM Cobol was available in a version for PC Xenix, and Micro Focus, Inc. in Palo Alto, Calif., has already made available PC Xenix versions of three Cobol development products (see story page 79).

PC Xenix began shipping to dealers Jan. 4 along with IBM's PC Xenix Software Development System and PC Xenix Text Formatting System.

But until specific PC Xenix applications arrive, Margaret Levine, manager of office systems for Columbia Pictures Industries, Inc. in New York, said she "doubts we're going to use it in a big hurry." Levine said she has talked with other New York microcomputer managers and found that "nobody is thinking about it [PC Xenix] very seriously."

A big reason for this, she explained, is that "software just isn't available," a point with which corporate software dealer Dan Spiner agreed. Spiner, chief executive officer of Management Information Software, Inc. of New York, said he has so far sold only a negligible number of copies of PC Xenix and by year-end expects the various versions of AT&T's Unix for personal computers to have captured no more than 3% to 5% of the corporate market — provided PC Xenix applications come available.

"I can't do anything about it until Ashton-Tate, [Micropro International Corp.] and [Samna Corp.] do," he said.

Spiner also noted that PC Xenix is de-

See SYSTEM page 78

Apple net targets IBM shops

Appletalk, other vendors' products to aid in link of Macintosh systems to IBM micros, mainframes

By Eric Bender
CW Staff

CUPERTINO, Calif. — Apple Computer, Inc. expects its new Appletalk Personal Network, supplemented by numerous offerings from third-party suppliers, to form the backbone for communications links that will move Macintosh personal computers into IBM shops.

Speaking here late last month at Apple's annual meeting, company President John Sculley said, "It is necessary for Apple to connect with the IBM world at three strategic points: mainframe corporate data bases, System/36 and the Personal Computer/Personal Computer network level.

"Apple and third-party developers will provide gateways from Appletalk into different IBM host computing environments, giving networked Macintosh users on Appletalk the same access to mainframe information currently available to stand-alone Macintosh computers through Macterminal, Appleline and the Apple Cluster Controller," Sculley said.

"Also, Macintosh users will be able to exchange revisable documents with IBM systems through the [Document Interchange Architecture/Document Content Architecture] format," Sculley stated.

On the micro level, Apple intends to provide an Appletalk card for the IBM Personal Computer this summer. "Additional software will let the IBM Personal Computer also be used as a file server itself and as a communications gateway into IBM's Personal Computer Network," Sculley said.

Further details on these plans and on future products connecting to the System/36 were not disclosed.

Despite its name, the Appletalk Personal Network is not now a network because it

See APPLE page 80

■ Autographix, Inc. unwraps a graphics system based on the IBM Personal Computer AT/68

■ Applied Computer Techniques Ltd. enlists support from leading software vendors and launches a high-end version of its Apricot personal computer/72

■ Microsoft Corp. introduces an expansion unit for Apple Computer, Inc.'s Macintosh/72

INSIDE

Software/74
Communications/79

MICRO BITS
Thomas W. Madron

Micro reference materials abound

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See INFO page 76

Madron is manager of computer services at North Texas State University in Denton, Texas.

NEC criticized

Personal computer users satisfied with system, dismayed with service

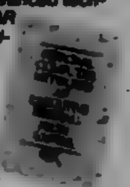
By Paul Korzeniowski
CW Staff

A classic love-hate relationship characterizes Daniel Runyan's experience with his NEC Information Systems, Inc. Advanced Personal Computer (APC).

Runyan, a mathematical analyst at Ball Aerospace in Boulder, Colo., loves the quality and performance of the machine. "It has excellent graphics, a fast processor and plenty of storage," he said.

Yet, Runyan said he is dismayed by the lack of support the manufacturer supplies. "I should have received updates to five software packages I purchased, yet I only received one," he said. "[NEC Information Systems] has repeatedly promised, but

See APC page 77



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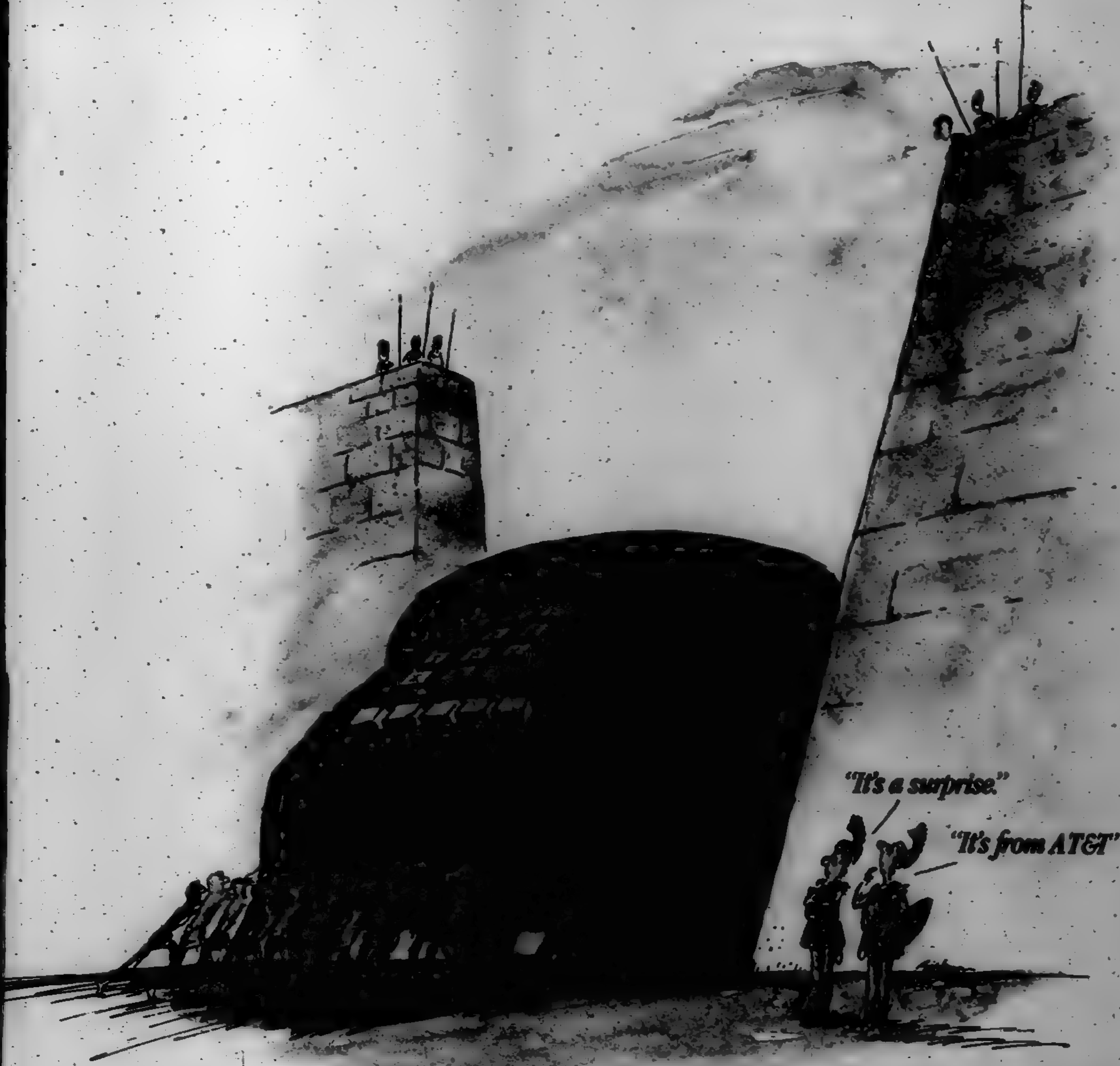

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Unix success hinges on low-cost, single-user micro

By Paul Korzeniowski
CW Staff

DALLAS — An inexpensive, user-friendly, single-user system based on AT&T's Unix would represent the most important hardware introduction since IBM announced its Personal Computer in 1981.

Doug Hartman of Hewlett-Packard Co. made that observation at "Hardware Trends," a seminar held here recently at the 1985 Uniforum International Conference of Unix Users.

If this system is not developed, Unix advocates will remain a rather elite group, Hartman maintained. He noted that Unix's strengths — its upward compatibility, portability and ability to adapt to hardware changes — do not translate into a great number of system sales.

While a single-user Unix system would lead to a large volume of sales, Hartman listed a number of obstacles to the development of this type of system.

Hartman said Unix's origin-created one problem in pricing. "At first, Unix users received the product for free," he said. "Its users were not concerned with Unix's system costs. They always had enough terminals and memory to work with the operating system." For Unix to become more popular, costs must be cut, Hartman said.

Another problem has been a lack of Unix applications software. "Primarily, program developers worked with Unix," he noted.

One Unix strength is a double-edged sword, Hartman suggested. "Unix was designed for multiuser systems," he said. "But these systems inherently cost too much to ever become very popular."

Hartman added that Unix presents software houses with difficult choices. "There are many variations of Unix," he said. "There is not the target system that a software developer needs. He wants to write a package and reach a large number of users. Unix does not provide this capability."

Hartman maintained that two types of machines have been touted as being capable of overcoming these limitations. One type would run Microsoft Corp. MS-DOS and Unix operating systems, and the other type is an engineering workstation.

Popularity limited

"The problem with the first type of machine is that MS-DOS does not work well with Unix," he said. "As soon as a multiuser MS-DOS machine [is] introduced, the Unix/MS-DOS machines [will] lose popularity."

An additional drawback is that engineering workstations are geared toward high performance, which usually means high price, Hartman noted.

Hartman forecast a promising future for a single-user Unix machine, but he disagreed with some other predictions. "A user will not see much improvement in microprocessor capabilities for a long time," he said. "It takes time for a vendor to develop systems that use a new microprocessor."

He added that powerful graphics systems for general use are not on the horizon. "Vendors are limited by the display power of television sets, and I don't think that will change for quite a while," he claimed.

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Autographix offers graphics systems based on IBM micros

WALTHAM, Mass. — Autographix, Inc. has introduced a graphics design and production system based on the IBM Personal Computer AT and a graphics workstation based on the IBM Personal Computer.

The Personal Computer AT-based design system, the Autographix 200A, reportedly can drive its own optional film recorder to generate 35mm slides as well as overheads and prints. The system was designed specifically for large audiovisual departments and commercial slide producers and can be linked to video systems for electronic boardroom presentations, the vendor said.

The Autographix 150, based on the Personal Computer, includes software to enter and design speaker-support material, such as slides, charts and graphs, the vendor said. The system also is said to be able to transmit design data to the Autographix 200 or 200A supporting a film recorder.

The Autographix 200A is priced at $43,900. The Autographix 150 is priced at $19,500.

For more information, Autographix is located at 100 Fifth Ave., Waltham, Mass. 02154.

Users hesitant in accepting Vault's data-eating 'worm'

By Peggy Watt
Special to CW

A data-destroying "worm" created to deter illicit copying of software is not squirming into any programs yet, but its originators said they are confident the market will accept their controversial copy protection concept.

Vault Corp.'s new Prolok Plus, designed to surface on an illegally copied disk, first warns the user and then releases a modified "tapeworm" program that eats data on the program disk and sometimes on hard disks.

Computer users met the concept with limited enthusiasm and some outrage when the Westlake Village, Calif., company announced the worm last fall. Since then, another software protection firm has dropped its plans for a similar product, and at least one Vault customer opted for a different protection scheme to avoid association with the worm plan.

Ashton-Tate, the Culver City, Calif., developer of Framework and the Dbase series, was not using the worm-protected version of Prolok but nonetheless switched its copy protection to Superlock from Softguard Systems of Santa Clara, Calif.

Ashton-Tate representatives said they do not want customers to confuse the basic Prolok protection — which takes the "thumbprints" of a disk and requires insertion of an uncopyable key disk to run the program — with the more drastic protective worm. According to Scott Brown, an Ashton-Tate spokesman, his firm still protects its multiuser version of Dbase II with Prolok but has no plans to use the worm-bearing Prolok Plus.

"We want to stay as user-friendly as possible, and that worm isn't," he said. The irony is that Ashton-Tate owns 20% of Vault, although both companies said the protection plan swap does not affect that relationship. "Users didn't like using the key disk when making copies," Brown said. Superlock allows a user to install programs on a hard disk and also "de-install" them.

Vault's copy protection competitor, Defendisk of Denver, has no plans for worms, Defendisk spokesmen said. "We use a signature system" similar to Prolok's key disk, a Defendisk spokesman said. "There are no booby traps."

But Vault said that enough software developers have expressed interest in protecting their programs with Prolok Plus that the product will be released by spring. "Press reaction is somewhat different from customer reaction," said W. Krag Brotby, Vault chairman. "Based on the publicity, we've held off releasing it. We're waiting for the heat to cool and the light to shine." Because most of the software firms interested in Prolok Plus are overseas, Vault may release the protection plan offshore only, he added.

"We're still discussing the matter," he said. "We're reconsidering exactly to what lengths the product should go. One possibility is to limit the destructive potential to the illegal disk." A malfunction that could unleash the worm on a legal disk is always a possibility, Brotby admitted.

Brotby denied Vault has lost worm-wary customers and said Ashton-Tate's switch was "purely economic." Other companies also continue to use the standard Prolok plan, and last month Vault expected to release a Prolok protection scheme that accommodates hard disks.

Watt is a reporter with Computerworld's *sister publication,* Infoworld, *a weekly newspaper covering personal computers, in which this story first appeared.*

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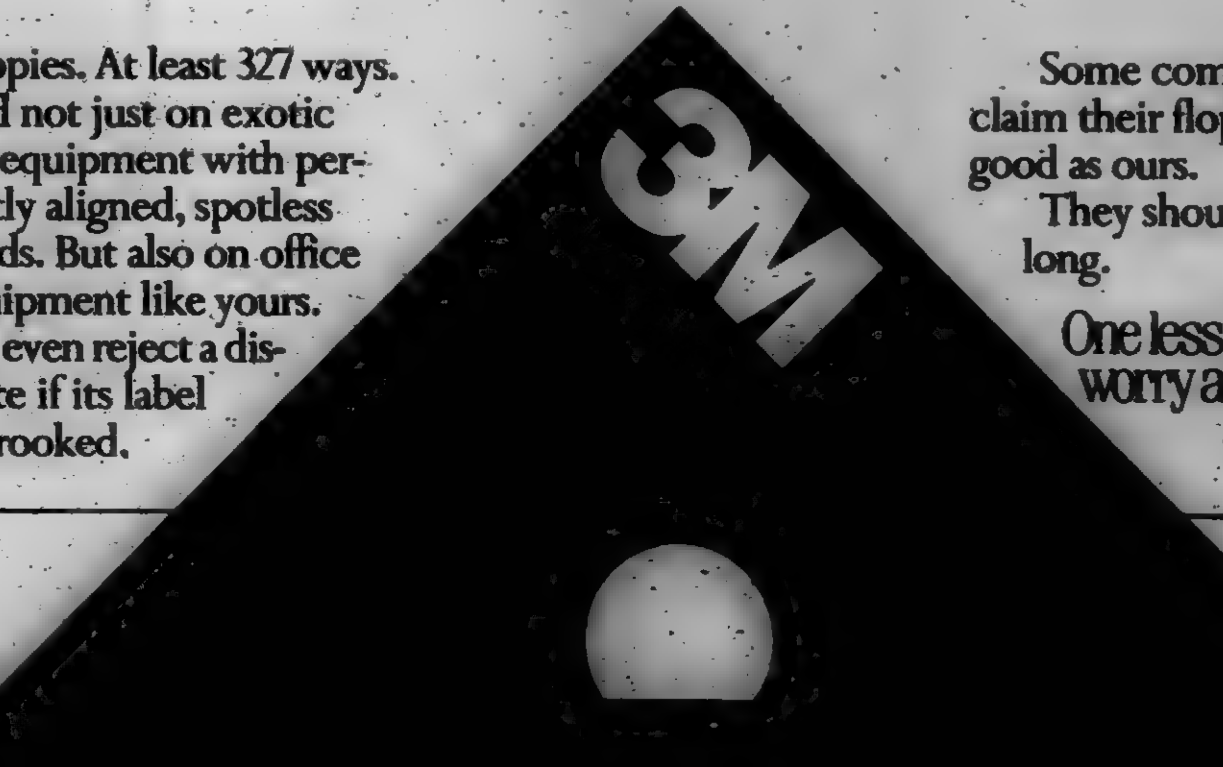

Software for Apricot to draw ACT into U.S. micro arena

By Kathleen Sullivan
CW West Coast Bureau

MENLO PARK, Calif. — In a move that promises to open a door to the European personal computer market, a trio of major U.S. microcomputer software companies last week said they will develop versions of their products for the Apricot line of computers designed by the British firm of Applied Computer Techniques Ltd. (ACT).

ACT also introduced a new high-end Apricot and lowered prices across the product line.

The Apricot, based on Microsoft Corp.'s MS-DOS and using 3½-in. disk drives, is the best-selling micro in Great Britain, according to ACT.

Orchestrated by Roger Foster, ACT's group managing director, the announcements coincided with the start of ACT's $7 million U.S. advertising campaign, which will pit Apricots against Apple Computer, Inc. computers. Foster acknowledged that the U.S corporate market already is an IBM bastion and said ACT decided to go up against Apple so the British company could become quickly famous in the American market.

The company, which sells business personal computers, hopes to win 1% of the U.S. business market within the next three years by selling 70,000 systems, Foster said.

Ron Posner, vice-president of Ashton-Tate's international division, said the company will begin shipping Dbase III and Framework for the Apricot series by Feb. 1. Ashton-Tate, a Culver City, Calif., firm, is already shipping Dbase II for the Apricot, he said.

Bill Gates, chairman of Bellevue, Wash.-based Microsoft, promised his firm's Microsoft Project and Word within two months and Chart within four months. Apricot users already have access to Microsoft Basic, Networks and Multiplan, he said.

Fred Gibbons, president of Software Publishing Corp. in Mountain View, Calif., said his company's PFS:Graph and PFS:Write will be available within the next two months. Versions of PFS:File and PFS:Report have already been developed, he said.

Also at the announcement, ACT unveiled the latest addition to the Apricot family. The Apricot XI-20 is an MS-DOS computer with 1M byte of random-access memory (RAM) and a 3½-in., 20M-byte hard disk. The XI-20, which uses the Intel Corp. 8086 microprocessor, is said to include bundled productivity and graphics software. It will be available in March for $4,495. A version of the XI-20 with 512K bytes of RAM will be priced at $3,995, Foster said.

The firm's price cuts ranged from 10% to 25%. The entry-level Apricot F1, a 256K-byte computer that includes a 3½-in., 720K-byte double-sided disk drive, has been reduced to $1,495 from $1,695, the company said.

The Apricot Portable, which features a 25-line LCD screen and is said to include voice recognition, offers 512K bytes of RAM and the same 3½-in. disk drive available on the entire Apricot line. ACT has reduced its price to $2,495 from $3,295, the company said.

ACT also lowered the price of the Apricot PC to $2,195 from $2,495. The Apricot PC comes with 256K bytes of RAM and a 3½-in. disk drive.

Finally, the company marked down the Apricot XI-10, which is said to include a 10M-byte hard disk drive and a 3½-in. disk drive. The XI-10's price has been reduced to $2,995 from $3,895, the company said.

Apricots are marketed in the U.S. by Apricot, Inc., 3375 Scott Blvd., Santa Clara, Calif. 95051.

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Microsoft offers five-port hookup for Apple micro

BELLEVUE, Wash. — Microsoft Corp. has announced a hardware/software expansion unit that allows an Apple Computer, Inc. Macintosh microcomputer to be connected to as many as five peripherals.

The Macenhancer expands the Macintosh by providing three additional ports — one IBM-compatible parallel port for parallel printers and two IBM-compatible serial ports for serial printers, modems or host connections. The three ports are provided without losing either of the two existing ports, a company representative said.

The unit includes printer-driven software said to allow a variety of printers to support the Macintosh's text and graphics capabilities. It also includes Macenhancer Terminal terminal emulation software, which provides links to mainframes or to dial-up data bases such as Dow Jones & Co.'s Dow Jones News/Retrieval, Compuserve, Inc.'s Compuserve and Source Telecomputing Corp.'s The Source.

The Macenhancer will be available, beginning Feb. 15, for $249, the vendor said.

Microsoft can be reached through Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

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- Review past performance
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- Access each transaction record online

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Captures transaction level information without extensive file handling. Provides basis for online and batch reports.

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- Very low overhead
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- PAII conversion provided

Storage Monitor

Provides information for and analyzes effects of tuning CICS and operating system. Aids in pinpointing problems.

- Analyze CICS storage online
- Display, alter storage
- Show program compression
- Track temporary storage
- Show subpool use

File Monitor

Pinpoints problem files/volumes and shows effects of tuning. Aids VSAM file definition. Analyzes I/O contention.

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- Provides VSAM split data
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MICROCOMPUTERS

Apple's Lisa 7/7 scores highest in integrated micro software test

WYNNEWOOD, Pa. — Software Digest, a publisher of software evaluation reports, has announced that the Apple Computer, Inc. Lisa 7/7 integrated software scored higher in testing than 15 competing IBM Personal Computer integrated programs.

The announcement was made in the first of Software Digest's "Primary Data Reports," a series of evaluations to be published this year.

The Lisa 7/7 software reportedly received an overall rating of 7.3, compared with 7.0 for both Ashton-Tate's Framework and Dun & Bradstreet Corp.'s Dunsplus packages, the highest scoring of the Personal Computer integrated products.

The packages were evaluated in five categories, weighted on the basis of their importance. Those categories were ease of use, weighted 35%; performance, 20%; versatility, 20%; ease of learning, 15%; and error handling, 10%.

Ten volumes of "Primary Data Reports" will be published this year. The price for all of them is $7,500. The first report, which carried the Lisa 7/7 software evaluation, costs $1,500 for the first copy and $300 for each additional copy.

Software Digest is located in Wynnewood, Pa. 19096.

SOFTWARE

■ **Primavera Systems, Inc. has announced Version 1.5 of Primavision, a plotter graphics system that can be integrated with Primavera's Project Planner software for the IBM Personal Computer XT, Personal Computer AT and hard disk compatibles.**

The updated version includes the ability to change the scale definition of plots with a choice of days, weeks or months per sheet; a variable start date for plots; the ability to plot early or late dates on logic diagrams; plot targets on bar charts as well as off-page connectors for multipage plots and a progress bar chart, a company spokesman said.

Primavision supports plotters emulating Hewlett-Packard Co.'s graphics language.

The product is priced at $1,500.

Primavera Systems, Suite 925, Bala Cynwyd, Pa. 19004.

■ **Datacopy Corp. and Autodesk, Inc. have announced CAD/Camera software, which is said to allow the digitizing of drawings into Autodesk's Autocad drafting system.**

With CAD/Camera software, users of Datacopy's Model 900 Integrated Imaging System can use nearly any drawing to produce an Autocad drawing, which can be edited, viewed and plotted with Autocad software, Datacopy said.

The 900 imaging system is intended to work on the IBM Personal Computer XT or Personal Computer AT.

The CAD/Camera program used with the Model 900 is capable of scanning drawings and creating a raster image file of up to 4.9 million pixels. Features of the software include scan initiation, focus aid, scan windowing and line thresholding, according to the vendor.

The price for CAD/Camera software is $3,000, the vendor said.

Datacopy, 1215 Terra Bella Ave., Mountain View, Calif. 94043.

■ **Phoenix Computer Products Corp. has announced various utilities enhancements for its line of programming tools, including support for IBM's Personal Computer AT.**

The vendor's Pmate, Pfix86, Pfix86 Plus and Plink86 utilities are now available for the Personal Computer AT. According to the vendor, Pmate is a text editor/processor; Pfix 86 is a dynamic debugger designed for use with assembly or any other high-level programming language; Pfix86 Plus is an advanced version of Pfix86 with symbolic debugging; and Plink86 is a linkage editor.

The vendor also announced that Pfix86 Plus now supports Microsoft Corp.'s Link linkage editor. In addition, the vendor unveiled a custom machine-specific version of Pfix86 Plus for Tandy Corp.'s Model 2000, Wang Laboratories, Inc.'s Professional, Texas Instruments, Inc.'s Professional and Applied Computer Techniques Ltd.'s Apricot microcomputers.

The vendor also announced that Plink86 now supports IBM's and Ryan-McFarland Corp.'s Professional Fortran. Additionally, a custom machine-specific version of Pmate has been introduced for Tandy's Model 2000.

Pmate is priced at $225, Plink86 at $395, Pfix86 at $195 and Pfix86 Plus at $395.

Phoenix Computer Products, Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

■ **Logistikos, Inc. has introduced PC SEU, software for the IBM Personal Computer that allows programmers to code RPG programs for the IBM System/38.**

PC SEU reportedly emulates the IBM Source Entry Utility and permits source files to be transferred to a 5¼-in. diskette using any file transfer utility. Using PC SEU, programmers reportedly can program at home or while traveling.

PC SEU is priced at $2,500.

Logistikos, Suite 920, One Michigan Ave., Lansing, Mich. 48933.

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MICROCOMPUTERS

■ Lucid Software Corp. has announced a high-level programming language for business applications that run under Microsoft Corp.'s MS-DOS and AT&T's Unix operating systems.

Lucid is said to have [illegible] built-in functions to perform such tasks as data conversion, string manipulation, I/O, form input, data base access, screen handling, report generation, mathematical operations and others, according to a vendor spokesman.

Programmers are said to be able to define their own function in the Lucid language. All statements from the C programming language except GOTO are supported, the spokesman said.

Lucid reportedly can read Ashton-Tate's Dbase II and Dbase III files directly and can access data from Lotus Development Corp.'s Symphony and 1-2-3 programs as well as Ashton-Tate's Framework program.

Scheduled for availability in March, Lucid for the IBM Personal Computer and compatible systems will be priced at $295, the vendor said. Versions will also be available for the Unix and Xenix operating system under OEM and site licensing agreements, with prices depending on customizations, quantity and computer capacity, the company said.

Lucid Software, 3080 Valmont Road, Boulder, Colo. 80301.

■ CP Aids has introduced its 1985 version of its Master Tax Program, which provides several enhancements, including a laser printer option.

The Master Tax Program runs on the IBM Personal Computer, Digital Equipment Corp. Rainbow series and personal computers under Digital Research, Inc.'s CP/M 80 operating system.

Other enhancements for 1985 are said to include the standard offering of such previous print options as preprinted continuous forms, blank paper with overlays and computer-generated forms. Also new is the ability to move backward and forward to each form on the screen, CP Aids said.

The program's laser printer option, priced at $500, reportedly does not require the use of hard-disk storage and was designed for use with the Hewlett-Packard Co. Laserjet printer. The laser printer option runs on the IBM Personal Computer and the HP 150.

The program costs $1,795.

CP Aids, 1061 Fraternity Circle, Kent, Ohio 44240.

■ Technical Support Software, Inc. has released Superscript, a utility designed for word processing programs that run on an IBM Personal Computer.

The package allows a user to type complex, multilevel mathematical expressions such as subscripts, superscripts, integrals, fractions, radicals, special symbols, notations and Greek letters, the vendor said. Superscript reportedly also allows users to create their own special symbols.

The product requires an additional 64K bytes of random-access memory, runs under IBM's PC-DOS and works with a number of word processing programs, including Micropro International Corp.'s Wordstar, Lifetree Software, Inc.'s Volkswriter and Multimate International Corp.'s Multimate.

Superscript costs $475.

Technical Support Software, P.O. Box [illegible], Chestnut Hill, Mass. 02167.

■ Executec Corp. has introduced its Integrated Fixed Asset Management (Ifam) System software for the IBM Personal Computer.

Ifam incorporates fixed-asset accounting with word processing, spreadsheet, data base management and report generation software, the vendor said.

The package reportedly supports multicompany and single-company environments and is able to prepare audit trails for asset changes and deletions automatically. It also can compute depreciation for both book and tax purposes, Executec said.

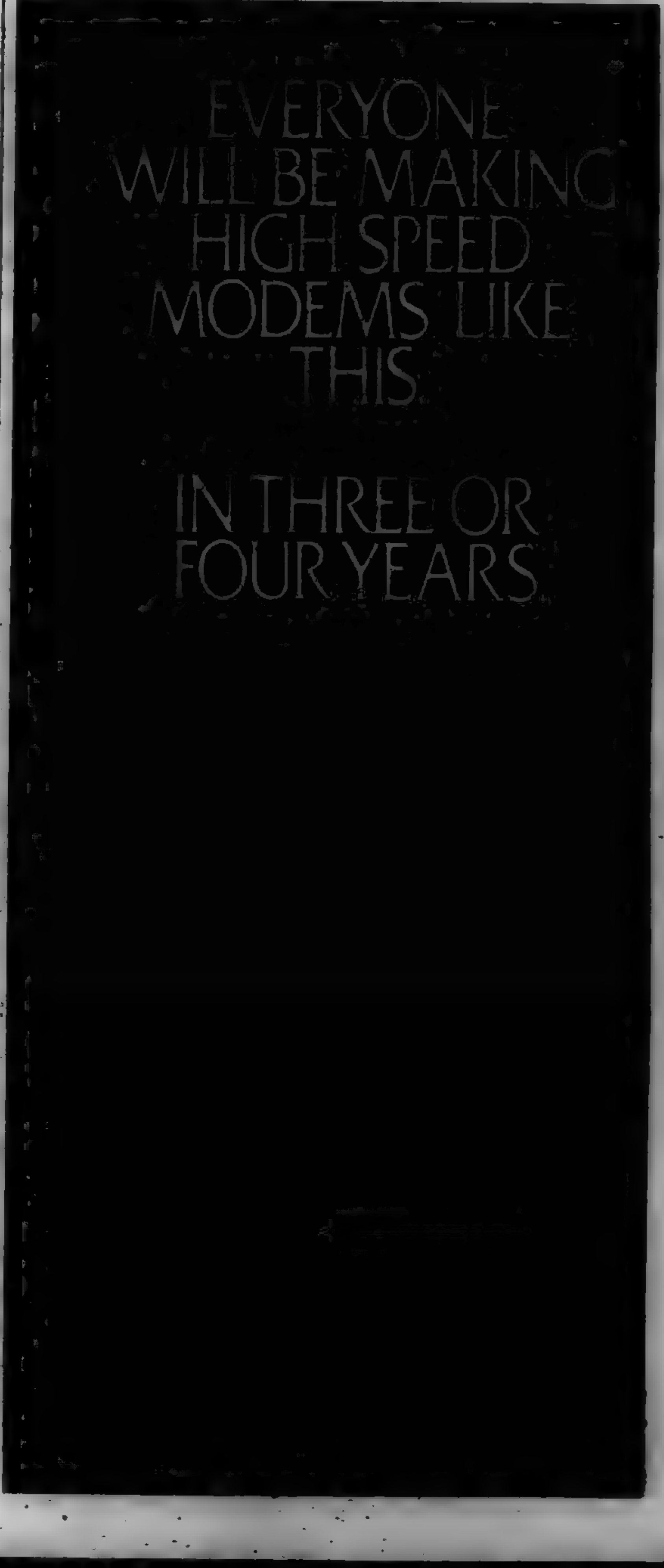
Ifam is priced at $4,500.

Executec, 811 Canyon Creek Sq., Richardson, Texas 75080.

■ Westminster Software, Inc. has introduced its Fortplotter plotting package for the Hewlett-Packard Co. HP 150 personal computer.

Fortplotter reportedly works in conjunction with Westminster Software's

See TOOLS page 76



How did Codex come up with the 2600 Series, a new generation of modems running at speeds from 4800 to 16,800 bps that's so much more advanced than the competition?

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INFO

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professionals on how to find product information. My experience has been, however, that many DP professionals do not know or do not properly use available reference sources.

Products in both microcomputing and communications come to market at an ever increasing rate, and it is difficult to keep up-to-date. But reference materials, a multitude of books and magazines and on-line data base services can be of assistance.

Among the sources of reference materials, Datapro Research Corp., Data Decisions, Inc. and others have provided information concerning products for the DP industry for many years. Unfortunately, many people in DP still do not know about those services, or if they know, they do not use them.

Some older services, originally oriented toward the mainframe DP industry, only lately came to the realization that micros are becoming a major part of DP in large organizations. The older reference services have the distinct advantage of knowing how to put a useful product together in a timely fashion.

Most of these sources are updated quarterly, which makes them relatively current. They still are maturing, but even so, the available materials are impressive.

High price to pay?

The Data Decisions reference on micros carries a subscription cost of $600 per year, and Datapro and other publications have similar pricing. From the standpoint of small businesses or individuals, these services are expensive. However, a large organization, especially a large DP shop with a budget of several million dollars, may not find $600 a high price to pay.

The character of micro magazines has changed over the years, moving away from do-it-yourself articles and toward reviews. *Byte* has always been the most comprehensive and probably the most technical magazine. Of the large number of magazines now on the market, only a few still provide a significant number of technical software features in each issue. Some weekly publications in a newspaper format are directed at the micro buyer and user.

A third source of information is books. Ten years ago, one could only find computer books in college or technical bookstores and libraries. Today, however, bookstore chains typically have extensive computer sections.

The primary difficulty with books is that they may take from three to 12 months to write, then six to 12 months to produce. When a book hits the bookstores it may be anywhere from six to 18 months out of date. Books, however, can provide a level of detail not found elsewhere.

Finally, on-line data base services are now abstracting and providing reference searches on an increasingly wide range of micro publications. Many of the data bases available are not yet as extensive as they could be, but like the older DP reference sources, on-line services are maturing.

TOOLS

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Pertmaster menu-driven project management package, giving it network logic plotting capabilities. It is said to be able to run logic network plots, with multiple color and line-style options.

Pertplotter, which runs on plotters and printers from Epson America, Inc., IBM, HP and others, is priced at $495.

Westminster Software, Suite 2, 660 Hansen Way, Palo Alto, Calif. 94304.

■ **Individual Software, Inc. has announced enhancements to Version 2.0 of The Instructor, a training program for use of the IBM Personal Computer.**

The Instructor reportedly now offers a complete introduction to keyboard operations and explains each key's special features using interactive lessons.

The product is said to allow users to learn the IBM PCjr, the Personal Computer or the IBM Personal Computer AT keyboard.

The Instructor now also offers lessons covering DOS operations and includes an overview of Personal Computer hardware and software as well as specific applications, according to the vendor.

The Instructor is priced at $45 and requires a minimum of 128K bytes of user memory.

Individual Software, 1163-I Chess Drive, Foster City, Calif. 94404.

SYSTEMS

■ A.B. Dick Co. has announced a 16-bit desktop microcomputer said to provide the capability to connect up to 64 workstations.

The Knowledge Worker Resource Processor is said to be fully compatible with the vendor's Knowledge Worker software. Sixty-four Knowledge Workers can be clustered together, according to the vendor.

The Knowledge Worker is comprised of two main elements: a file processor and a cluster processor.

The file processor is said to contain a dedicated 8-MHz Intel Corp. 80186 microprocessor with 256K bytes of random-access memory (RAM) and large-scale integration Winchester disk controller. The device, which runs Convergent Technologies, Inc.'s Ctos operating system file system for the

Continued on page 79

APC

from page 63

failed, to solve the problem."

The mathematical analyst's experience seems to mirror that of other APC users.

Among the complaints mentioned by users recently interviewed by *Computerworld* were the following:

- An inability to contact the vendor's technical support staff.
- NEC Information Systems failure to reply to letters sent by customers.
- The vendor's failure to notify users of software updates.
- A lack of software for the machine.
- A concern that the NEC APC III, manufactured by NEC Corp. of Japan and announced in May 1984, would usurp the little support the APC has received.

Sam Adams, vice-president of marketing and operations at NEC Information Systems, stated that his firm's distribution strategy may have led to problems with users who attempted to contact the company's technical support staff. "We had a two-tier distribution system," he said. "We sold to distributors, who sold to dealers. Users were supposed to receive support from their dealers, not directly from NEC Information Systems."

After Runyan bought his machine, the dealer that sold him the machine went out of business. So, he tried to contact NEC Information Systems directly. "I belong to an APC users group, and one of the members gave me a [toll-free] number for technical support," he said. "For one week, I called the number at various times, and all I ever received was a busy signal."

Adams claimed that his firm plans to establish and support a toll-free number for customers.

Writing to the company

Since many customers were unable to contact the company directly, some wrote to the company. Helen Larson, a self-employed temporary secretary, bought an NEC APC and Micropro International Corp.'s Wordstar for word processing. When she had a problem in trying to properly space text, she went to her dealer for a solution. After the dealer was unable to solve the problem, Larson wrote to NEC Information Systems. "I sent NEC Information Systems three letters and never received a letter or a phone call," she said.

While most microcomputers have 5¼-in. diskettes, the APC uses 8-in. diskettes. Consequently, vendors have to tailor their packages to the APC. Users stated that they were unable to find many general-purpose APC programs. "We designed the APC as a niche product for the graphics market, so there are some excellent graphics packages for the machine," Adams maintained. "There should be enough general-purpose packages available to satisfy most users."

A lawyer with four APCs fears that APC users will become technically obsolete since vendors will not tailor new packages to the APC.

Adams responded, "Users may have to buy other machines to use some newer packages. Vendors probably will not adopt 8-in. disk drive versions of their program."

Despite the abundance of problems, users wavered when asked if they regretted buying an APC. At first, Larson stated that she was satisfied with the machine. Later, she called back and said, "I shouldn't have to deal with some of the problems that I've experienced with the APC. Now I wish I [had] purchased a machine from another vendor who supplies better support."

A NEW LEGEND BEGINS.

INTRODUCING THE NEW KODAK DISKETTES

SYSTEM

from page 63

rived from AT&T Unix System III and pointed with concern to AT&T's recent announcement of Unix System V for the Personal Computer AT's 80286 processor. System V, a newer version of Unix said to be more commercially useful, will compete with System III, he warned, and "nobody's going to sign on the bottom line for an old version."

The Automotive Business Group of Rockwell International Corp. in Troy, Mich., meanwhile, will evaluate PC Xenix shortly but is "moving on these things sort of cautiously," according to John Kane, the group's project manager for marketing and office systems.

Kane, whose department will do the evaluation, said the firm has "looked at [PC Xenix] in terms of planning," but has already found good results with its Nestar Systems, Inc. Plan 2000 local-area network. That network links 75 IBM Personal Computers at the automotive group and has been in use for 18 months.

PC Xenix does not run on IBM's PC Network and supports no more than two terminals or terminal-emulating personal computers. One third-party vendor, however, has said it will begin shipment this month of an expansion board that will reportedly bring to 10 the total number of terminals that can be supported under PC Xenix. Computone Systems, Inc., Atlanta, said that its Atvantage board will sell for $995 but only through Computone's dealers.

The greatest threat to the spread of PC Xenix is the success of local-area networks of personal computers under Microsoft Corp.'s MS-DOS single-user operating system, according to industry analyst Esther Dyson, president of Edventure Holdings, Inc. of New York. "The trend is toward people linking stand-alone [personal computers]," she claimed.

One microcomputer manager who expressed some eagerness to acquire PC Xenix was Bob Lane of Merrill Lynch Pierce Fenner Smith of New York. Lane said his office, the firm's personal computer support group, "will have to go to it [PC Xenix] eventually" but admitted that it was "too early to tell" whether the Unix-based operating system would get widespread use in the firm. At present, he said, it appears that no more than 10% of Merrill Lynch's 40 to 50 Personal Computer ATs will be brought under PC Xenix.

Other microcomputer managers, though, stated additional reasons for wishing to move cautiously on PC Xenix. Columbia Picture Industries' Levine, for one, said she felt uneasy about the arrival of System V Unix for the Personal Computer and also pointed out that IBM already has one Unix-based operating system for the AT — PC/IX. Like MIS' Spiner, she observed, "There is some question as to which Unix is going to win."

According to analyst Brian Boyle of the San Mateo, Calif., market research firm Gnostic Concepts, Inc., heating up that competition will be "pressure from [corporate-level IBM] to support PC/IX not Xenix." In addition, Boyle claimed that IBM has little enthusiasm for any multiuser operating systems for its Personal Computer.

"IBM's idea of a multiuser system is a Personal Computer, a Personal Computer and a Personal Computer — all from IBM," he said.

IBM's Rick Scott, however, maintained that "IBM is making a sizable commitment to Xenix." Scott, spokesman for IBM's Entry Systems Division, developers of the Personal Computer, noted that PC Xenix would allow users to take advantage of the Personal Computer AT's ability to access up to 3M bytes worth of random-access memory but refused to speculate on why support was only provided for two terminals.

Asked whether PC Xenix might cannibalize sales of the PC Network, Scott said that it might but that IBM needed to have both to provide alternatives to Personal Computer users.

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R [illegible]
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"I RELY ON AST FOR

Cobol tools for PC Xenix out for Personal Computer AT

By Edward Warner
CW Staff

Ryan-McFarland Corp. and Micro Focus, Inc. each have introduced Cobol programming tools for the IBM Personal Computer AT running under IBM's PC Xenix multiuser operating system, which became available in early January.

A PC Xenix version of Ryan-McFarland's RM Cobol, introduced last week, reportedly provides record and file locking, full Level II relative and indexed file access methods, multikey indexed files and up to 14 alternate keys, including duplicates. It also is said to offer variable names and Select and Call statements to allow files and called programs to be specified at execution time.

Other features are said to be full arithmetic capability, including Corresponding and Compute statements, as well as direct copying of source code from another file during compilation. Segmentation and dynamic memory management reportedly are provided to reduce storage requirements.

Programs written in RM Cobol for other operating systems can, with few modifications of the source code, be recompiled under RM Cobol for PC Xenix to run on the Personal Computer AT, a Ryan-McFarland spokeswoman said.

Earlier in January, Micro Focus announced three Unix-based Cobol programming tools for PC Xenix: Compact Level II Cobol, Animator and Forms-2. Compact Level II Cobol, a compiler, reportedly offers portability, dynamic loading and interactive screen handling. Animator is said to offer source-code-level debugging and analysis, variable speed, cursor-oriented operation and data value monitoring. Forms-2 offers the ability to translate user screens into record descriptions, screen updating and other features.

RM Cobol for PC Xenix is priced at $1,250. Micro Focus' line for PC Xenix is priced as follows: Compact Level II Cobol, $1,500; Animator, $900; and Forms-2, $225.

Micro Focus is located in Suite 400, 2465 Bayshore Road, Palo Alto, Calif. 94303.

Ryan-McFarland is located at 609 Deep Valley Drive, Third Floor, Rolling Hills Estates, Calif. 90274.

Continued from page 77

cluster, can support up to four 5¼-in. Winchester-type drives with an option to support one removable 5M-byte cartridge.

The cluster processor contains an 8-MHz Intel 80186 processor with 256K to 768K bytes of RAM. It is said to control cluster RS-422 ports running at speeds of 307K bytes or 1.8M bit/sec. Both RS-422 lines have direct memory access to provide data transfer throughput.

A configuration consisting of a cluster processor, file processor, 50M-byte disk module, 5M-byte removable drive, power supply and cables and supporting up to 16 Knowledge Worker workstations is priced at $22,945.

A.B. Dick, 5700 W. Touhy Ave., Chicago, Ill. 60648.

COMMUNICATIONS

■ P2/I has announced a version of its VT/E terminal emulation package that runs on Hewlett-Packard Co.'s Integral Personal Computer, a transportable machine running on AT&T's Unix.

VT/E transforms the transportable into a terminal

Continued on page 80

MICRO-TO-MAINFRAME COMMUNICATIONS SOLUTIONS."

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We expect those new sales offices to grow rapidly. When they do, I'll be adding AST cluster functions so we can use PCs, and VT-100™ or compatible terminals in our configuration. All of them can communicate to headquarters over a shared phone line to reduce our telecommunications costs.

Meeting the challenge of change is a key part of my job. AST always has the products to help me. Like LANs to tie all PCs—including ATs and PCjrs together. There's also an AST-5251™ to connect PCs to System/34, System/36 and System/38 for powerful interactive communications from remote sites.

AST was the first company to offer micro-to-mainframe products for the PC, and they continue to lead the pack with a full spectrum of communications products, including AST-3780™ RJE support. Customer support and product reliability. That's why AST is my single source.

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MICROCOMPUTERS

APPLE

from page 63

offers only the ability to hook up Macintoshes to the new Laserwriter printer. However, more than 50 firms reportedly are developing Appletalk products.

Some local-area network announcements follow:

■ 3Com Corp. of Mountain View, Calif., reportedly will deliver products connecting Macintosh users on Appletalk with 3Com's Ethernet in the second quarter of 1985.

■ Sytek, Inc., also of Mountain View, plans to integrate Appletalk with Sytek's Localnet/PC product line via "an external communications processor." No shipment schedule was released.

■ Novell, Inc. of Orem, Utah, said it is developing a version of its Netware net operating system for Appletalk and expects delivery in the third quarter of 1985.

■ Sunol Systems, Inc. in Pleasanton, Calif., said that both Macintoshes and IBM Personal Computers can act as nodes on its new Sun-Net II network. Connection price is $995, and the network reportedly is available now. Sunol also announced an Appletalk interface that allows its hard disk drives to act as file sharers. It is priced at $695 plus $95 for the Appletalk connector.

■ Banyan Systems, Inc. of Westboro, Mass., said that its Vines virtual networking system will be able to connect Appletalk with other types of local-area nets by mid summer.

■ Micro-Design of Austin, Texas, introduced a series of hard disk drives, offering 10M to 33M bytes of storage, that can function as Appletalk file servers. The devices are scheduled for February delivery. Prices start at $2,095 for a 10M-byte drive, according to the vendor.

■ Iomega Corp. in Roy, Utah, announced a 20M-byte disk server, the Appletalk Bernoulli Box, with two removable 10M-byte cartridges. The device reportedly will be available in the second quarter of 1985 and is priced in the $3,600 to $3,700 range.

Products linking Appletalk to multiuser systems also were announced, including connections to the 32:16 microcomputer offered by Fortune Systems Corp. of Redwood City, Calif., and the System 8000 from Zilog, Inc.'s systems division in Campbell, Calif. Details on pricing and availability were not available at press time.

Tridata Corp. in Mountain View, Calif., introduced Netway 1500, said to provide a gateway to up to four dissimilar host systems or a bridge to other Appletalk nets. The product offers full emulation of the IBM 3278-2 CRT terminal and use of Macintosh features such as pull-down menus, the vendor said.

Starting price for a version supporting 32 devices on Appletalk is $6,500, and the device is scheduled for March shipment.

A multiuser data base program for Appletalk, Wosbase, from WOS Data Systems, Inc. of Austin, Texas, reportedly will ship in March. The cost is $495 plus $50 for each additional network user. When required network connections are available, the package will allow multiple Macintoshes and IBM Personal Computers to share data simultaneously, the vendor said.

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Continued from page 79

so that a user can access information nets. It is said to provide Unix communications capabilities and single-keystroke file transfers.

VT/E reportedly provides Digital Equipment Corp. VT100 terminal emulation and file transfer capabilities between an Integral Personal Computer and a DEC VAX superminicomputer.

The product costs $395.

P2/I, Suite 111, 8205 Spain Road N.E., Albuquerque, N.M. 87109.

■ Renex Corp. has announced R-Link and Renex Asynchronous Protocol (RAP), file transfer software for the IBM Personal Computer.

R-link, when combined with Renex protocol converters, provides IBM 3278 and 5251 terminal emulation, the vendor said. These products reportedly allow the user to accept and use binary files from the host.

RAP transfers data in packets from end-to-end transmissions or public data nets, the vendor said. RAP is said to ensure that packets travel between hosts as binary information and to provide error-free transmission.

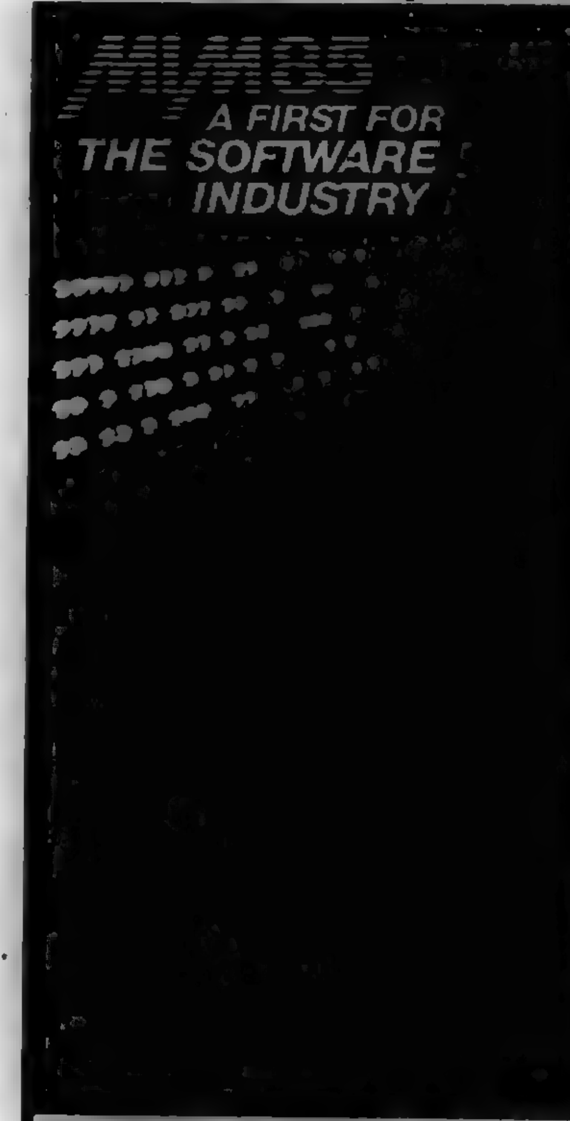
R-Link costs $150. R-link with RAP costs $225.

Renex, 1513 Davis Ford Road, Woodbridge, Va. 22192.

■ Cygnet Technologies, Inc. has announced an enhancement package for its Cosystem integrated voice and data workstation said to allow users to run software designed for smart modems.

A key feature of the enhancement is upgraded communications software said to allow users to access the Cosystem's internal AT&T 212A modem. The electronic mail feature has also been enhanced with an advanced text editor. The enhancement package is $50.

Cygnet, 1296 Lawrence Station Road, Sunnyvale, Calif. 94089.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COMPUTER INDUSTRY

AT&T profits fall short

Revenue disappointing for communications giant following divestiture of Bell operating companies

NEW YORK — AT&T last week released results of its fourth quarter, bringing to a close the communications giant's first year in a competitive environment and continuing a year-long trend of disappointing financial results.

In its first year since divesting the Bell operating companies, AT&T posted revenue of $33.18 billion after deducting payments of $20.63 billion to the former operating companies for telephone access charges. Net earnings for the year were $1.37 billion, or $1.25 per share; although no comparable financial figures were available because of the divestiture, AT&T prior to the start of the year had projected earnings per share of $2.02, or more than $2 billion in profits.

For the fourth quarter, AT&T posted revenue of $3.97 billion after deducting payments of $5.34 billion for access charges. Net earnings for the quarter were $379 million, or 34 cents per share. During the course of the year, AT&T reported earnings of $227 million for the first quarter, $456 million for the second quarter and $317 million for the third quarter.

Charles L. Brown, chairman of the board at AT&T, attributed the results to a number of diverse factors. "We expected to do better. Some factors bearing on our financial performance are attributable to problems created by divestiture, but not all of them. Some reflect gains made by competitors in markets where we had previously faced little competition. Some were the results of regulatory rulings.

See AT&T page 92

Merger index notes trends

FORT LEE, N.J. — Fewer deals were consummated in 1984, but more dollars changed hands through mergers and acquisitions within the information services and software industry, according to Broadview Associates' recently released index.

Produced for the Association of Data Processing Service Organizations, Inc. (Adapso), the Sixth Annual Adapso/Broadview Index logged a 270% increase in the value of merger and acquisition transactions during 1984, compared with 1983.

The large increase in transaction value was due primarily to two major transactions, Broadview said. Those transactions were the acquisition of Electronic Data Systems Corp. (EDS) for $2.5 billion by General Motors Corp. and the $307 million

See MERGER page 91

Infomart head targets goals

[illegible]

Earnings up for supermini manufacturers

CDC acts as exception, reporting profit slide

Superminicomputer vendors posted healthy earning gains for their latest financial quarters, while Control Data Corp. ended one of its worst years ever with an 80.5% decline in profits compared with the previous year.

Digital Equipment Corp., Prime Computer, Inc., Data General Corp. and Harris Corp. all posted robust profit levels for the quarter, while Apollo Computer, Inc. reported its profits for the year to be more than double those from the previous year, and Stratus Computer, Inc. reported a 147% increase in profits for the year. Burroughs Corp. reported a 24% rise in profits for the year, and Gould, Inc., coming off a fourth quarter in which several nonelectronics operations were discontinued and profits declined, posted a 13% increase in profits for the year.

■ **Control Data Corp.**

CDC, which withdrew from the plug-compatible storage equipment market and announced its intent to sell off the Commercial Credit Co. finance subsidiary, reported fiscal year profits of $31.6 million, or 81 cents per share, down from 1983 profits of $161.7 million, or $4.20 per share. Its revenue for the year increased 8.7% to $5 billion, compared with $4.6 billion in 1983.

In the fourth quarter, CDC said profits fell 36.3% to $31 million, or 80 cents per share, compared with $48.7 million, or $1.26 per share, in the fourth quarter a year earlier. Its revenue for the quarter was $1.34 billion, a 7.2% increase from the year-earlier level of $1.25 billion.

■ **Digital Equipment Corp.**

DEC posted a 37% increase in profits for the second quarter as its revenue climbed 14% from the year-earlier level. The company, which has announced but not

See EARNINGS page 92

■ AT&T's new man at the Unix helm recently discussed plans to encourage standardization of the various Unix versions/[illegible]

■ Hewlett-Packard Co. experienced just 7% growth in orders for the first two months of the current fiscal year, HP's president told analysts recently. The company also faces a transition to new-generation minicomputers/[illegible]

Software firms try alternate strategy in copyright fight

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Will software publishers have any more success combating illegal copying than movie publishers had in their attempts to recoup supposed losses incurred by illegal copying of videocassette recorder (VCR) tapes? Probably.

Anyone who knows two or more VCR owners probably realizes that the ominous copyright warning stamped on VCR tapes is totally useless. Even the movie moguls realized that, so they took another tack and tried to get the courts to impose royalties on VCR manufacturers. The courts, however, turned down that attempt to extract copying fees in advance of the actual copying.

The microcomputer software publishing industry has taken quite a different approach. Disregarding home users, the industry's trade association, the Association of Data Processing Service Organizations, Inc. (Adapso), has targeted the business user.

Hoping to persuade corporate America to police copyrighted software packages itself, the industry has mounted what it hopes will be a high-visibility campaign [CW, Jan. 21] with two basic facets — educating chief executives about the facts of copyright protection and bashing selected executives over the head with hefty lawsuits.

It may take time, but if pursued vigorously, this campaign should accomplish its stated goal. Few responsible companies will risk incurring legal liability and public embarrassment over material that essentially is a cheap commodity in the broader light of the corporate balance sheet. This is especially true after they are fully educated to the niceties of copyrights and realize that the software industry is intent on protecting its legal rights.

Whether this campaign will accomplish its goals, though, is another question altogether.

At any micro software trade show these days, you're sure to find a discussion session on the issue of copyrights and software piracy. At any of these sessions, you'll hear the magical 30% estimate bandied about. Micro software publishers are convinced that making a large dent in piracy will add 30% or more to their annual revenues.

Although there are estimates available on how much unauthorized copying is occurring, there does not seem to be any hard estimate for how much piracy occurs at the workplace and how much occurs at home.

Stopping piracy at the workplace is something that could be accomplished to a large extent. Stopping piracy at home is probably impossible, as in the case of VCR tapes.

Adapso committees are working on developing standards for a technology to combat illegal copying. This, in principle, would seem to be the only way to prevent piracy at home, but establishing standards and getting them implemented are two milestones far, far apart.

So the view from this corner is that the magical 30% will never be realized.

Federal protection act benefits designers of chip masks

OUTSIDE LINES
Sidney J. Wartel

Federal law previously failed to specifically provide protection for the design of the semiconductor chip. This was remedied by the Semiconductor Chip Protection Act of 1984, protecting the design of the two- and three-dimensional masks used to produce chips.

Protection is primarily available for the owner of the chip mask design, who is a national or resident of the U.S., for an original design that is not commonplace or familiar in the industry. The wording of the law clearly contemplates treaties with other countries for eventual protection beyond U.S. borders and allows foreign nationals to obtain protection in the U.S. if the other country provides reciprocity.

Effective Jan. 1, 1985, the U.S. Copyright Office was authorized to accept deposits of mask designs and grant exclusive rights to the owners of the designs for 10 years either from the date of registration or the date on which the mask was first used in commerce — whichever is the earlier of the two. The application for registration must be made within two years of the first commercial use of the mask design.

This provision allows those who currently have masks in use, as long as they have been in use for fewer than two years, to apply for protection, as well as allowing new designs to obtain the full benefits.

If, after reviewing an application, the Registrar of Copyrights finds that the work complies with the requirements of the Chip Protection Act, registration will be granted and will be effective from the date of receipt in the Copyright Office. In the case of an infringement claim, this certification of registration will be admissible in court as evidence that the application has met the requirements of the regulations. If an application is refused registration, the applicant may bring the matter to a U.S. District Court of the appropriate jurisdiction for review.

Refusal of registration does not preclude the maintaining of an infringement action. However, if a suit is brought against an infringer after refusal of registration, the Copyright Office must be named in the action and has the right to enter the case to argue the lack of merit of the application. The court may rule on the issue of the denied application, even if the Copyright Office elects not to enter the case.

The Chip Protection Act provides for the optional notice by use of the letter M in a circle. The symbol can be placed on either the mask or the semiconductor using the mask design. Though this specific notice is not required to obtain the full benefit of protection, it serves the owner in providing notice to the public that the chip is protected.

Under the Chip Protection Act, liability is limited so that an innocent purchaser of an infringing chip is not responsible for any chips distributed prior to notice of protection. When notice is received, the innocent purchaser is then only liable for a reasonable royalty payment, which is to be determined by negotiation, mediation and arbitration.

The Chip Protection Act allows the registered owner of the design to request injunctions to prevent commercial infringers from using or distributing infringing chips, as well as providing for the recovery of lost profits, including attorneys' fees. An owner has the option of electing statutory damages, but that amount is set by the court and is limited to $250,000.

Those purchasing the rights to mask designs protected under this act should avail themselves of the provision for registration by subsequent owners to prevent accidental or fraudulent subsequent transfers. Filing the notice of the transfer establishes rights of ownership against others. The statute also specifically excludes protection extending to any idea, process or procedure.

An interesting aspect of the law allows reverse engineering to analyze circuitry or organization of components used in the mask work. This privilege or reverse engineering allowance does not allow duplication of the design but will allow competitors to determine the techniques used by the designer.

The Chip Protection Act will provide a new sphere of protection for the industry, but like many other laws, it is new and untested. It will not be all things to all people in solving the problems of piracy. Emphasis should be placed on the fact that registration is necessary for proper protection, and there is an immediate need for registration by owners of designs that are approaching the two-year anniversary of commercial exploitation.

Wartel is both an engineer and an attorney who writes and lectures on matters dealing with high-technology law. He is a partner in the Boston law firm of Wartel and Wartel, which serves the engineering community, and he is on the faculty of Northeastern University.

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INFOMART

from page 81

derive about 75% of its revenue from those permanent lessors and the remainder from conferences, seminars and symposia.

Before joining the Dallas Market Center staff in 1981, Winsor worked at Texas Instruments, Inc. as merchandising manager of worldwide exhibits, trade shows and point-of-purchase advertising for all of TI's product groups. He has a bachelor's degree in communications from Southwest Texas State University. Winsor talked to Computerworld *Senior Editor John Gallant about the role and future of Infomart.*

Q ***What advantages does Infomart offer to vendors and consumers?***

Infomart will represent a compression of the costly evaluation process that is part of any high-tech purchase. Infomart is an envelope for the user to come into and get a full perspective on the computer industry market. That will help both the user and the vendor.

Q ***What do you see as the key purpose of Infomart?***

Our mission is to deliver buyers. Our whole staff is geared to that role. We think users are already pulling in to the concept. Manufacturers and the media were somewhat skeptical, but users are sold on this elegantly simple idea.

Q ***Why do you think Infomart has made it from the drawing board to reality while other similarly proposed facilities are still in the conceptual phase?***

We made more than a casual commitment to this concept. We did a lot of research, and we have the expertise that comes from developing other market centers. We know how to create an efficient environment.

Q ***Why did it take so long for developer Trammell Crow's nearly 20-year-old idea to come to fruition?***

It was a case of bad timing 17 years ago. There were only a handful of buyers and sellers. The migration of technology to the low end has created a pressing need for something like Infomart, the widening spectrum of users and sellers has made this a necessity.

Q ***From how far away do you estimate that people will be willing to travel, not for a specific trade show, but just to visit Infomart?***

We don't think we are a single-point destination for people. Instead, our programs are designed to bring people in from outside the Dallas metropolitan area. We realize that there will be more regional visitors than national and more national than international visitors. We estimate that 60% of the attendees will come from within a two-hour plane ride.

Q ***You've signed on IBM, AT&T and [Xerox Corp.]. Have you signed on all the firms you consider to be the major players in the computer industry?***

Obviously, we are still working with some that we consider major players, such as Digital Equipment Corp., [Wang Laboratories, Inc.] and [Hewlett-Packard Co.]. I am sure that when they see the three-dimensional Infomart, they will join us.

Q ***What advantages can Infomart offer over a major national trade show such as the National Computer Conference?***

We are a controlled environment. A trade show is a metered environment; it has a set beginning and end time. There is a rush of activity, but your marketing productivity is diminished. The major national show does not offer a controlled way to confront sophisticated buyers.

Q ***Once a customer has visited Infomart, what, with the exception of a major trade show, will spur him to return?***

Once a user has bought a system, he intends to grow with it; he is concerned with issues like upward compatibility. Most users still have a need for a better understanding of where the industry is going. Information processing people are hungry for new tools and ideas; they have a lot of sockets to fill, and Infomart can help them to fill them.

Q ***Who do you see as the target consumers you must attract to be successful?***

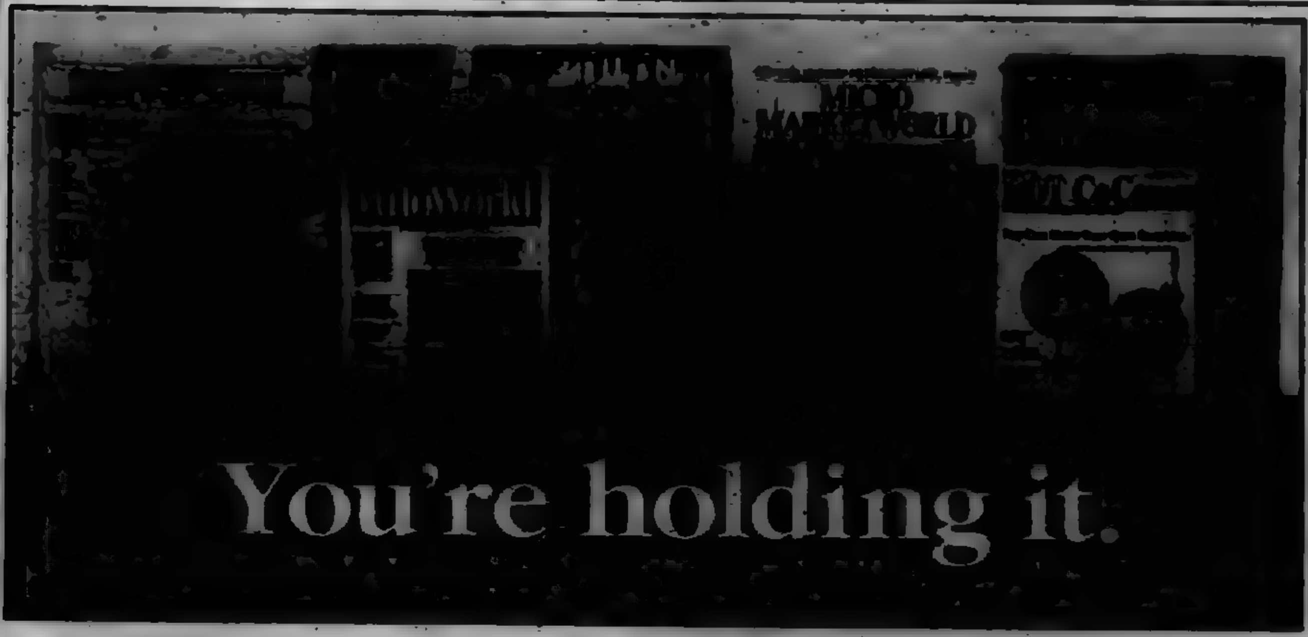
We have delineated three target classes. One is the small- to medium-size purchaser, typically the independent business professional. The second is the large-site, sophisticated user, for example, the head of a big DP shop. The third group consists of resellers; we see that as a critical, high-growth area.

Apple, Geisco to offer service

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) and Apple Computer, Inc. recently announced plans for a cooperative telecommunications service designed for companies with dealer and distributor sales organizations.

Dealertalk will use Apple's Macintosh microcomputer as an intelligent workstation linked to Geisco's worldwide telecommunications network in a system for dealer communications, support and management, Geisco said. The service will be available in the early second quarter of 1985.

Dealertalk will reportedly include electronic mail and bulletin board capabilities.



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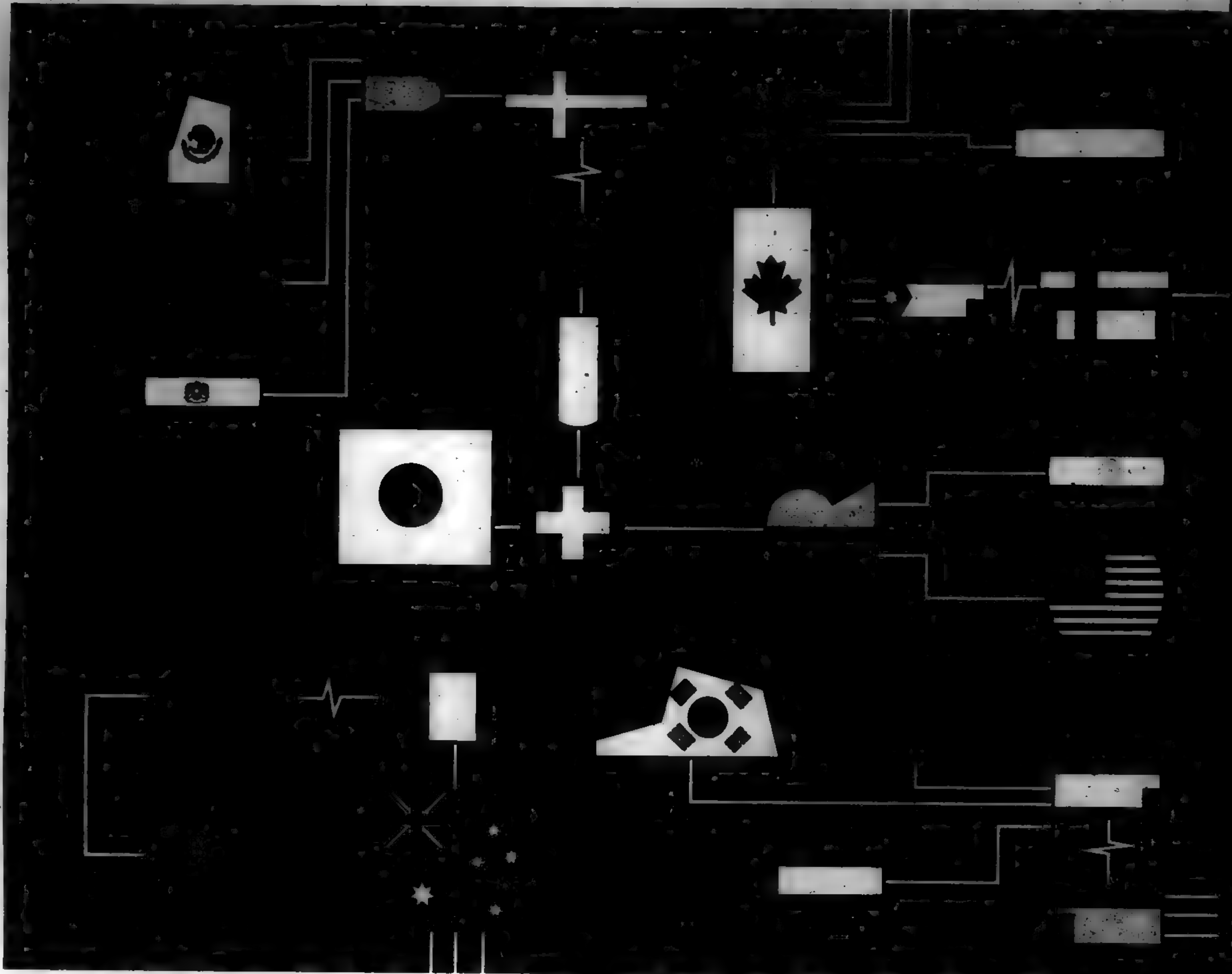

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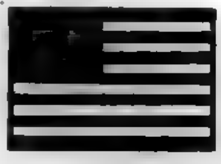

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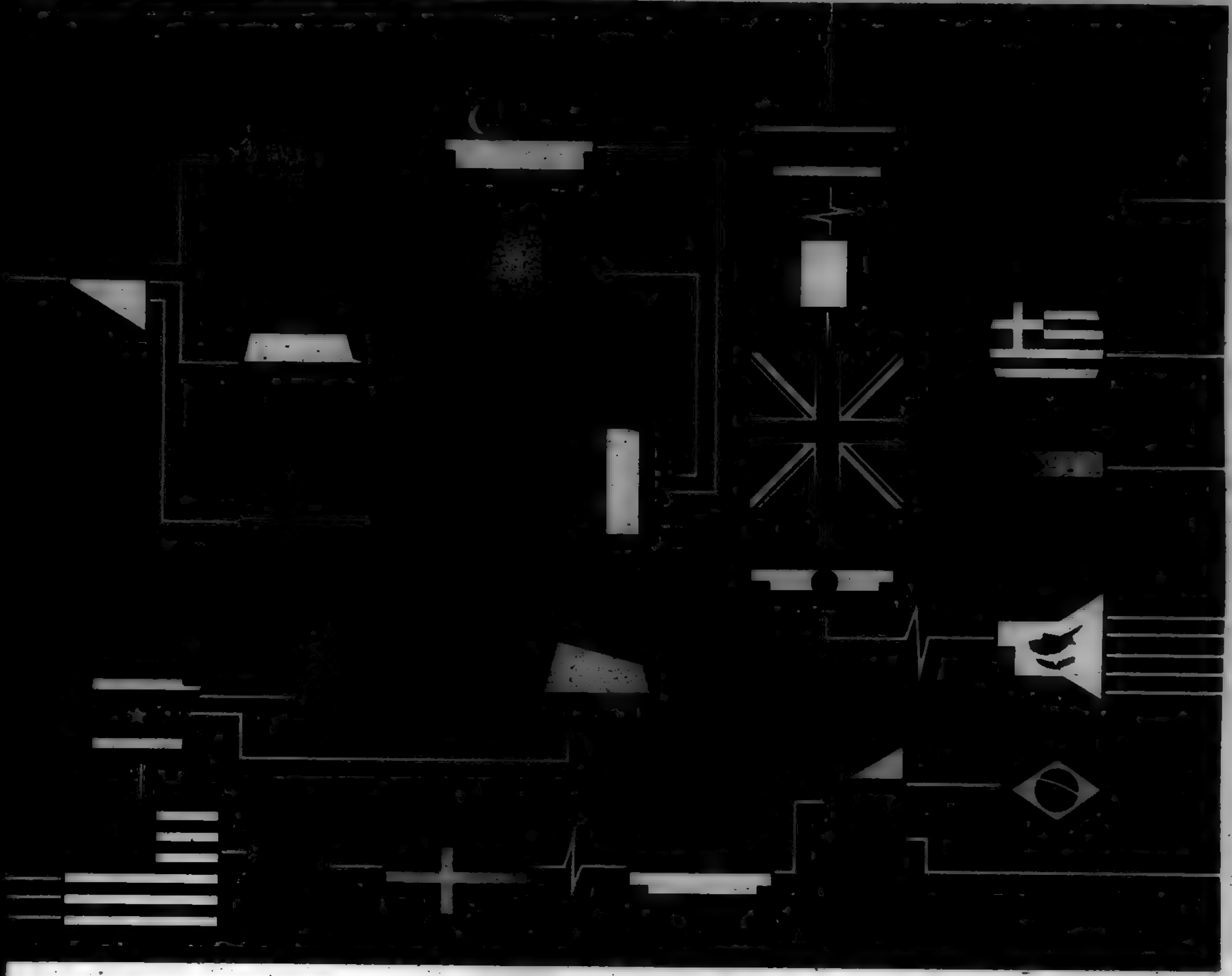

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AT&T Unix exec outlines plans for operating system

By John Gallant
CW Staff

DALLAS — AT&T's new man at the Unix helm recently outlined the industry giant's plans for fostering Unix standardization, explained the recent reorganization of Unix responsibility within the company and stated AT&T's goals for making that operating system more commercially viable.

William O'Shea spoke late last month during a special plenary session of the 1985 Uniforum International Conference of Unix Users here. Earlier in January, O'Shea was named executive director of the Computer Systems Software Division of Bell Laboratories. In that role, he is responsible for product management and development of Unix operating system products for AT&T.

O'Shea explained the restructuring of Unix responsibilities within AT&T as part of an effort by the company to serve the needs of the growing number of users and Unix products vendors better and as a mechanism for AT&T to reduce costs.

"The rationale behind the reorganization is that we are trying to bring together those pieces within AT&T Information Systems, AT&T Technologies and Bell Labs that are involved with Unix into one focused line of business," O'Shea said. "We want to streamline our organization [to serve] our different customer segments [better]."

Source code licenses

O'Shea said that, under the Computer Systems Sales Organization, the Software Sales and Licensing Division will continue to provide source code licenses for Unix as well as service and sales support. The value-added resellers sales division will work with Unix value-added resellers, the Independent Software Vendors/Vendor Involvement Program will foster AT&T's relationships with independent software vendors offering Unix products and the Information Systems sales force will act as the distributor of AT&T Unix products to end users.

In underscoring the growing need for Unix standards, O'Shea said, "The Unix market is growing at an incredible rate. There has been a rapid growth in the number of systems vendors, [valued-added resellers] and independent software vendors. The infrastructure is ready to come together. But the one thing that we still need is systemwide standards."

He said AT&T's moves to push standardization include the recent publication of System V Interface Definitions, which are aimed at providing a standard application interface to the Unix operating system.

O'Shea also highlighted announcements made earlier during Uniforum. One such announcement was an agreement through which Unisoft Systems Corp. will develop a set of validation procedures for System V variations. He pointed out AT&T's evolving arrangements with Intel Corp., National Semiconductor Corp. and Motorola, Inc. to provide ports of System V to the major microprocessors currently available.

Also, O'Shea reiterated AT&T's agreement with Microsoft Corp. to bring that company's Xenix version of Unix more into line with System V.

"To sum up," O'Shea said, "we have defined and published a standard; we are in the process of setting up a System V verification mechanism, and we have unveiled a line of standardized products from micros to mainframes."

O'Shea said AT&T's thrusts toward making Unix more desirable for the business end-user community fall into three areas — commercialization enhancements to System V, better networking capabilities and improved software development facilities.

Among the commercialization enhancements already completed or under way, O'Shea listed record locking and demand paging in virtual memory, file system improvements and research into the development of more user-friendly operating system interfaces. He said AT&T is committed to providing a common networking environment that will not only allow Unix systems to communicate with each other but will also provide for communications between Unix and non-Unix systems.

Finally, he said the company is continuing to improve Unix' application development facilities, which are considered by many to be that operating systems' major strength. Those improvements include efforts to standardize Unix' C interface and to define certain key application generator capabilities.

O'Shea

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Bell Labs exec envisions standardized future for Unix

DALLAS — With responsibility for AT&T Unix operating system products resting with Bell Laboratories, William O'Shea is in the hot seat for Unix' direction and future.

O'Shea was recently named executive director of the Computer Systems Software Division of Bell Labs. He faced the press last month following a speech before a special plenary session of the 1985 Uniforum International Conference of Unix Users here.

O'Shea said he envisions one standard architecture for Unix, including a standard application interface definition, with the possibility of separate local implementations of Unix designed to meet the unique needs of areas such as Japan and Europe.

Concerning stumbling blocks impeding System V standardization efforts, O'Shea maintained, "I think the biggest problem is making the standards real. Once we have systems and suppliers that support standards, then the application developers will move quickly to fill the void in that environment. Getting real systems and products announced, verified and into the marketplace is critical."

IBM role

Although O'Shea declined to comment on what role IBM would play in the standardization process, he said, "I hope IBM will be supportive. IBM needs standards also, and I hope it supports ours."

When questioned on the demise of the joint System V applications library announced at last year's Uniforum by AT&T and Digital Research, Inc., O'Shea said that the idea "missed its window of opportunity."

"The [Digital Research] library is not moving ahead at this point," he said. "We have jointly decided that it was not necessary. At the time it was announced, we were trying to fill the need for applications, to help get Unix applications out there. The library took longer to get going than we expected, and during that time we made our own progress, and OEMs found their own ways to get around the delays."

O'Shea was asked if Microsoft Corp., which jointly announced plans with AT&T to bring its Xenix product into line with System V, would face any difficulties in dealing with both IBM and AT&T. "That is [Microsoft Chairman] Bill Gates' problem," O'Shea laughed. "He seems to be doing a good job of things right now."

Questioned about whether business end users are currently interested in Unix, O'Shea said, "I think the general business user is interested in Unix in an intellectual way. These people read a lot of things about Unix, and they are keeping aware of it.

"But the business end user is looking more for the tools — the applications — with which to do his job," O'Shea continued. "Users are looking for an operating system that provides a good environment for those applications. If Unix is that operating system, then yes, they will become interested in Unix."

NICKELS AND DIMES

BKW, Inc. reported revenue for the fourth quarter ended Sept. 30 of $3.7 million, compared with $210,268 in the previous year. BKW posted a profit of $3,958, or less than 1 cent per share, compared with a loss of $369,742, or a 18 cents per share, in the corresponding quarter last year.

■

Sterling Software, Inc. announced revenue for the year ended Sept. 30 of $18.7 million, up from $9.2 million the previous year. Profits were $1.1 million, or 25 cents per share, compared with $1.2 million, or 40 cents per share, last year.

See NICKELS page 91

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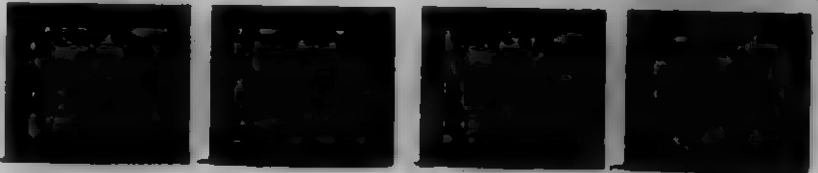

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HP orders lag in fiscal '85; capital spending dip cited

By Kathleen Burton
CW West Coast Bureau

PALO ALTO, Calif. — Orders for Hewlett-Packard Co. equipment were off to a slow start during the first two months of fiscal year 1985, company officials told securities analysts recently.

Speaking at HP's annual meeting for analysts, HP President John A. Young said the company experienced only a 7% increase in orders for November and December, compared with a three-month growth rate of 31% in the first quarter of 1984. He blamed the sluggish orders on an overall decline in U.S. capital spending, which he said drove down order growth rates throughout the industry; on sales force reassignments; and on recent holiday schedules.

According to Douglas C. Chance, vice-president and general manager of HP's newly formed Information Systems Group, which oversees the HP 3000 series, sales in HP's 3000 family were up 25% for November and December. But he conceded that the high orders were sparked by the introduction of the low-end HP 3000 Model 37 product last August, and that sales of HP 3000 Models 48 and 68 remained sluggish.

Growth depends on next generation

Young said much of HP's future growth depends on its next-generation line of high-performance minicomputers, code-named Spectrum, scheduled for introduction later this year; volume shipments of the new machine will not occur during this fiscal year. The 32-bit computers are based on a new HP proprietary technology called Reduced Instruction Set Computer, which simplifies the source code, allowing higher processing speeds and requiring fewer instructions, according to Young.

Until Spectrum is introduced, HP profits will be under pressure because of reliance on the 12-year-old technology of the HP 3000 line, according to some analysts. HP faces stiff competition from newer technology products released by Digital Equipment Corp., Data General Corp. and Prime Computer, Inc.

HP's chief operating officer, Dean O. Morton, said an 800-person division has been created for the Spectrum project and that Spectrum prototypes are now being tested at 40 locations.

Price cuts for HP 3000

The company will aggressively market its entire HP 3000 line "at least until the first of the next-generation products is introduced later this year," Chance said, adding that there will be prices cuts in the HP 3000 line similar to the 10% price cuts of last August.

To avoid "cannibalizing" the HP 3000 product line, HP will create a choice of migration paths to Spectrum, including recompiling or rewriting the system's source code or using an object code compiler. A software emulator will be available to let HP 3000 software run on Spectrum, Chance said.

Cyril J. Yansouni, vice-president and general manager of HP's Personal Computer Group, blamed the reduced earnings on high start-up costs, a competitive personal computer market and slow sales of HP's 150 and 110 Portable personal computer. In the micro market, HP ranks third, behind IBM and Apple Computer, Inc., according to figures from Dataquest, Inc., a market research firm.

Toshiba switch cuts work force

SUNNYVALE, Calif. — Toshiba Semiconductor (USA), Inc. recently said it will lay off 140 workers, about 27% of its local work force, as a result of its decision to change its product line here from wafer fabrication to custom processing for gate arrays and read-only memory chips.

The company said its plant here is presently too small for profitable wafer fabrication, so it will convert the plant to the manufacture of customized gate arrays.

Additionally, a new 25,000 sq-ft plant for test and assembly is being completed here and will be operating by the end of 1985, according to company spokeswoman Nancy Alexander.

Toshiba cited the downward spiral of semiconductor prices and a competitive market in its decision to shift wafer production back to Tokyo-based Toshiba Ltd., its parent company.

Toshiba is the world's fifth largest semiconductor manufacturer, with 1984 sales of $1.6 billion, according to Dataquest, Inc. a San Jose, Calif.-based market research firm.

Raster charged in Lexidata suit

BILLERICA, Mass. — Lexidata Corp., a raster display systems vendor located here, has filed a complaint against Raster Technologies, Inc., a color graphics system manufacturer also based here, alleging patent infringement of its solid modeling display technology.

Filed in U.S. District Court in Massachusetts, the complaint alleges that Raster Technologies' RTI Model One/25-S solid display system infringes one or more patents covering Lexidata's Solidview product. Lexidata announced the Solidview patent last October.

Lexidata is seeking an unspecified amount in damages as well as a permanent injunction to keep Raster from infringing the patents.

Roger Cady, president of Raster, said in a statement that the Lexidata complaint was "invalid and without merit" and would be contested in court.

Louis Doctor, Raster chairman, asserted in a statement issued Jan. 23 that the patent rights involved in the suit, which covers depth buffering techniques, are in the public domain.

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MERGER

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acquisition of Tymshare, Inc. by McDonnell Douglas Corp.

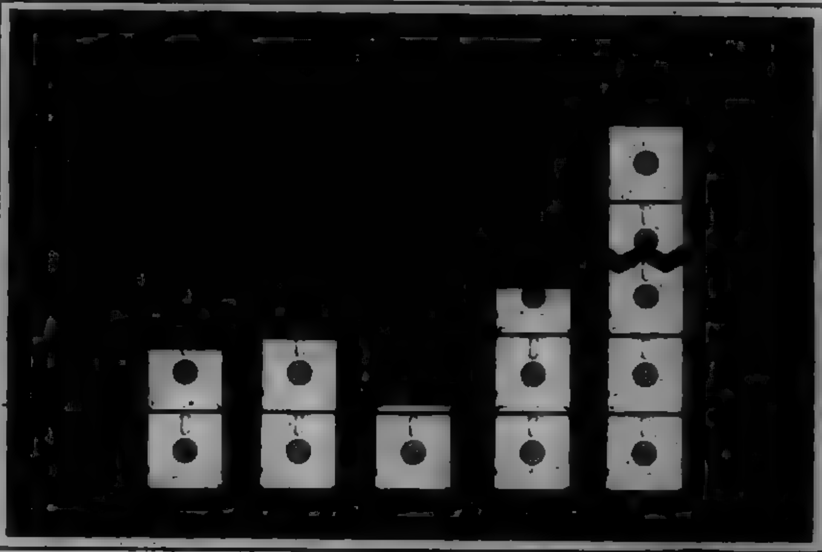
The two acquisitions pushed the index total to $3.7 billion in 1984, compared with $1.01 billion in 1983, according to Broadview. The company is a merger and acquisition consultant specializing in the software and information services industry.

Without those two large deals, Broadview said, industry merger and acquisition activity in 1984 would have amounted to $1.15 billion, more than 10% ahead of 1983. "Both the EDS and Tymshare deals place the computer services industry into new focus," said George Grodahl, a partner at Broadview. "They show that the nation's largest firms are evaluating the leading companies in the computer services industry as a way of diversifying and gaining entry into software and information processing."

Despite the jump in transaction value, the actual number of mergers and acquisitions was only 143, compared with 146 in 1983, Broadview said. However, the median value of transactions was $3 million, 20% greater than in the previous year.

According to Grodahl, financing through venture capitalists and public offerings dried up for micro software companies in 1984. "Acquisition became the primary source of financing available to [micro software companies]. We predict the consolidation will continue in 1985 as there is ample supply of potential sellers with a smaller number of selective buyers," Grodahl said.

Broadview is located at 2115 Linwood Ave., Fort Lee, N.J. 07024.



CW CHART; SOURCE: BROADVIEW ASSOCIATES

NICKELS

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LSI Logic Corp. announced results for the fourth quarter and year ended Dec. 31, 1984. In the fourth quarter, LSI posted revenues of $25.3 million, up 94% from $13 million in the like period a year ago. Profits were $3.7 million, or 15 cents per share, compared with $3.5 million, or 14 cents per share in the like period of 1983. Revenues in 1984 increased to $84.4 million, a gain of more than 142% from $34.8 million reported in 1983. Profits for 1984 totaled $15.4 million, or 60 cents per share, up 55% from $9.9 million, or 44 cents per share reported in 1983.

■

Rexon, Inc. announced results for the fourth quarter and fiscal year ended Sept. 30, 1984. For the year, revenues were $20.3 million, up from $13.2 million in the prior year. The net loss was $5.7 million, equal to $1.98 per share, versus a loss of $703,000, or 29 cents per share in the previous year.

Revenues for the fourth quarter were $5.8 million, compared with $3.2 million a year ago. The net loss was $2.4 million, or 84 cents per share, compared with a net loss of $637,000, or 22 cents per share one year earlier.

■

SEEQ Technology, Inc. reported revenues of $14.8 million for the first fiscal 1985 quarter ended Dec. 31, 1984, compared with $5.2 million in the like quarter one year ago.

Profits were $1.2 million, or 9 cents per share, compared with a net loss of $4.3 million, or 38 cents per share for the same quarter last year.

■

Tandy Corp. reported revenue for the second quarter of its 1985 fiscal year was $893.3 million, compared with $898.2 million for the same quarter last year. Profits were $89 million, or 86 cents per share, compared with $103 million, or 98 cents per share, for the same quarter of 1984. Profits for the three months ended Dec. 31, 1984 were $76.5 million, compared to $101.2 million for the same period 1983.

■

Corvus Systems, Inc. revenues for the second quarter of fiscal 1985 were $14.4 million, compared with $12.4 million in the like period one year earlier. Profits were $541,000, or 5 cents per share, compared with a net loss of $2.4 million, or 24 cents per share for the same quarter one year ago.

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EARNINGS

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shipped its high-end VAX 8600 machine, said profits for the quarter were $110.3 million, or $1.81 per share, compared with $80.4 million, or $1.41 per share, a year earlier. Its revenue for the quarter was $1.62 billion, compared with $1.42 billion a year earlier.

DEC said orders were up from the year-earlier level and up from the first quarter and that orders to date for the VAX 8600 have exceeded expectations.

■ **Prime Computer, Inc.**

Prime posted fiscal-year profits of $59.7 million, or $1.25 per share, compared with $32.5 million, or 68 cents per share, in 1983. The profits included a nonrecurring credit of $9 million from tax law changes concerning domestic international sales companies and reflected a nonrecurring $1.6 million write-down.

Excluding those nonrecurring items, the company said, profits for the year were $52.3 million, a 60% increase over 1983. Its revenue for the year was $642.7 million, up 24% from $516.5 million in 1983.

In the fourth quarter, its revenue was $170.7 million, a 20% increase from $142.8 million a year earlier. Profits for the quarter were $14.8 million, or 31 cents per share, up 48% from year-earlier profits of $10 million, or 21 cents per share.

■ **Data General Corp.**

DG, which in this fiscal year adopted equal quarters of 13 weeks each, compared with earlier years with three 12-week periods and one 16- or 17-week period, reported first-quarter profits of $35.8 million, or 87 cents per share, up 130% from $10.1 million, or 40 cents per share, as restated to reflect the change in fiscal quarters. Its quarterly revenue was $333.7 million, up almost 39% from $240.3 million a year earlier, as restated.

■ **Harris Corp.**

Harris posted second-quarter profits of $21.7 million, or 54 cents per share, up 18% from year-earlier profits of $18.4 million, or 46 cents per share. Its revenue for the quarter climbed almost 23% to $584.9 million, compared with $472.2 million a year ago.

■ **Apollo Computer, Inc.**

A 167% increase in revenue was reported by Apollo, which said sales for the year were $215.9 million, compared with $80.6 million in 1983. Profits for the year were $23.9 million, or 75 cents per share, up 113% from $11.1 million, or 37 cents per share, in 1983.

For the fourth quarter, Apollo posted revenue of $75.8 million, up 173% from $27.7 million in the year-earlier quarter. Profits in the fourth quarter were $8.3 million, or 25 cents per share, compared with $3.6 million, or 12 cents per share, a year ago.

■ **Stratus Computer, Inc.**

Stratus posted revenue for 1984 of $42.1 million, up 105% from $20.5 million in 1983. Profits were $5.4 million, or 29 cents per share, up 147% from $2.1 million, or 13 cents per share, in 1983. For the fourth quarter, Stratus posted revenue of $14 million, up 111% from $6.6 million in 1983. Quarterly profits were $1.4 million, or 8 cents per share, compared with $545,000, or 3 cents per share, a year ago.

■ **Burroughs Corp.**

Burroughs reported revenue of $4.87 billion in 1984, up 11% from $4.38 billion in 1983. Profits for the year were $244.9 million, or $5.40 per share, up 24% from $196.9 million, or $4.60 per share, in 1983.

In the fourth quarter, Burroughs reported revenue of $1.38 billion, up 6% from $1.31 billion a year earlier. Profits in the fourth quarter were $94.4 million, or $2.08 per share, up from $81.4 million, or $1.81 per share, in the year-earlier period.

■ **Gould, Inc.**

Gould continued to divest itself of nonelectronic businesses during 1984 and particularly during the fourth quarter. Total discontinued operations produced a loss of $71.5 million, or $1.58 per share, compared with a loss of $15.1 million, or 33 cents per share, in 1983. In the fourth quarter, discontinued operations lost $68.2 million, or $1.51 per share, compared with a loss of $7.3 million, or 16 cents per share, a year earlier.

From continuing operations, Gould posted 1984 profits of $89.3 million, or $1.98 per share, compared with $79.2 million, or $1.75 per share, in 1983. Revenue was $1.39 billion in 1984, up 5% from $1.32 billion in 1983.

In the fourth quarter, reflecting the discontinuance of certain operations, Gould reported profits of $23.2 million, or 52 cents per share, down about 7% from year-earlier profits of $25.2 million, or 56 cents per share. Its revenue from continuing operations was $251.9 million, compared with its unrestated revenue of $342.3 million a year ago.

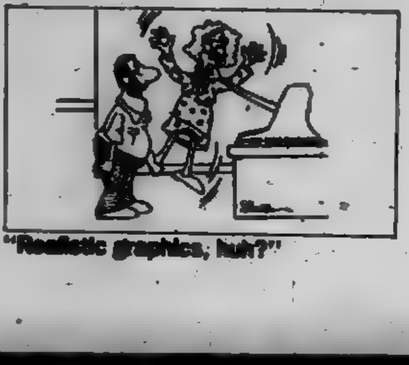
AT&T

from page 81

Some were of our own making."

Brown added that 1984 "established a basis for the successful transformation of the company."

In 1985, according to Brown, AT&T will introduce new products and systems and will ship them into the marketplace more quickly. Additionally, he said, the company will press ahead with efforts to persuade government officials to lessen "unneeded and unfair advantages for competitors."



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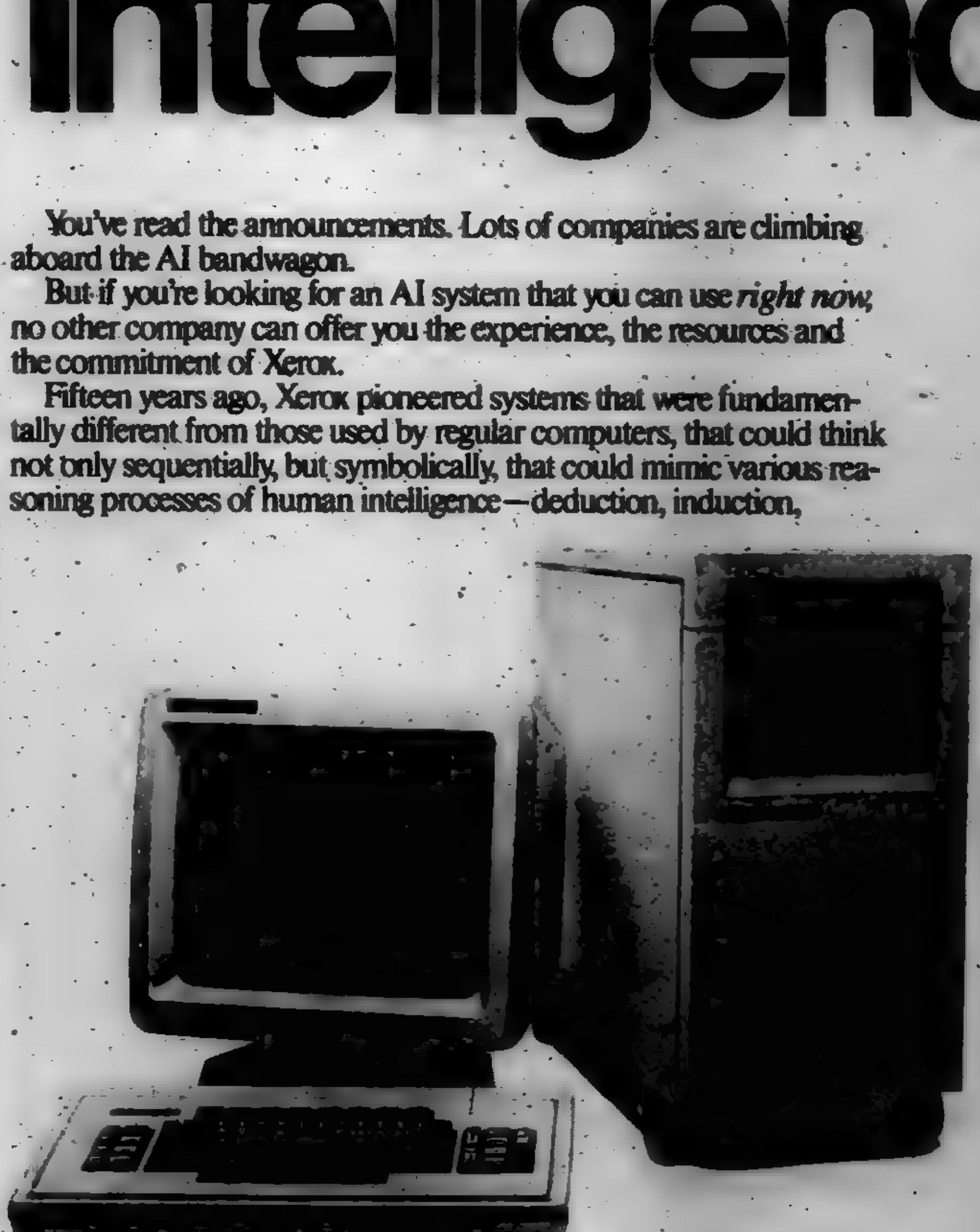

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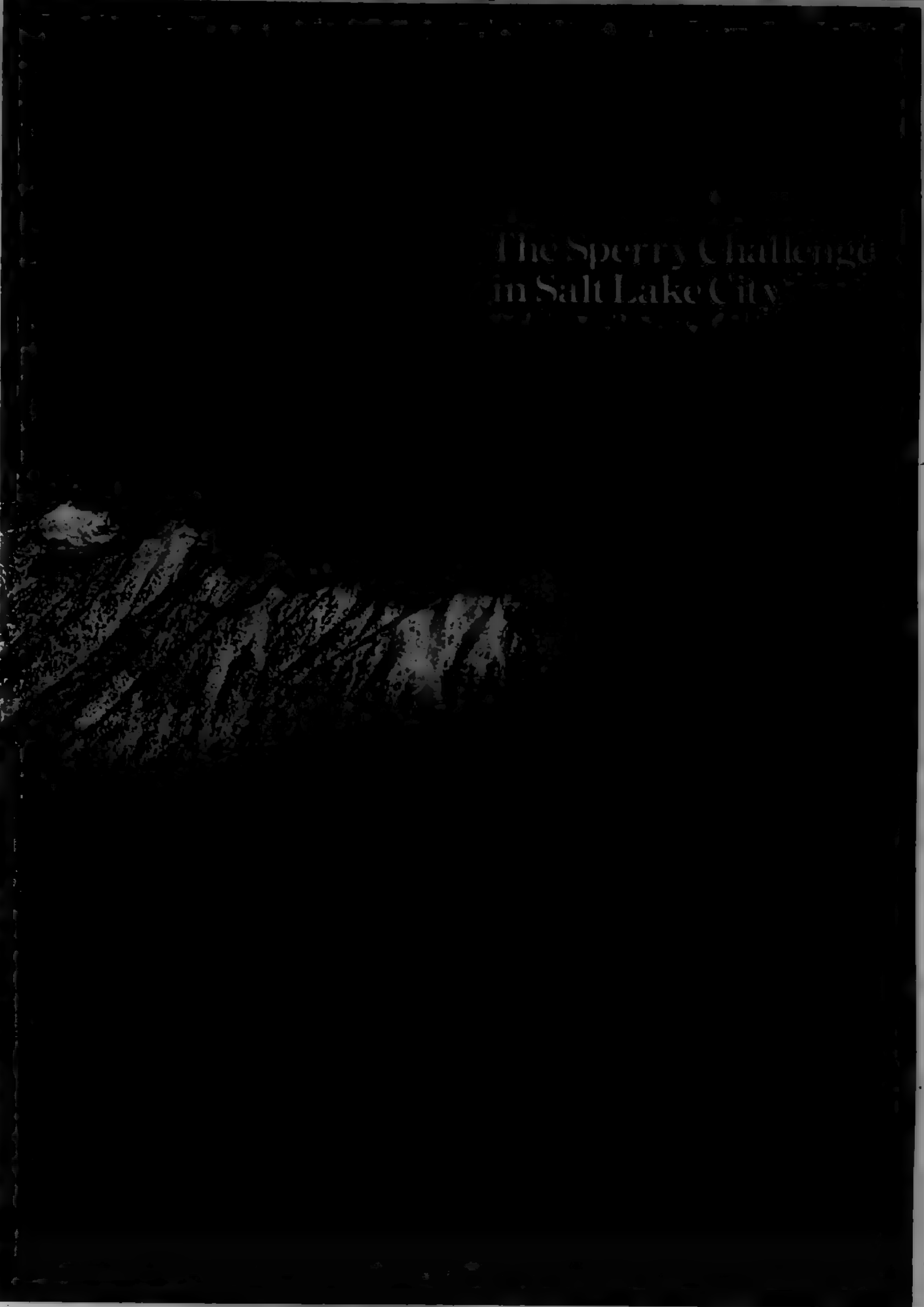

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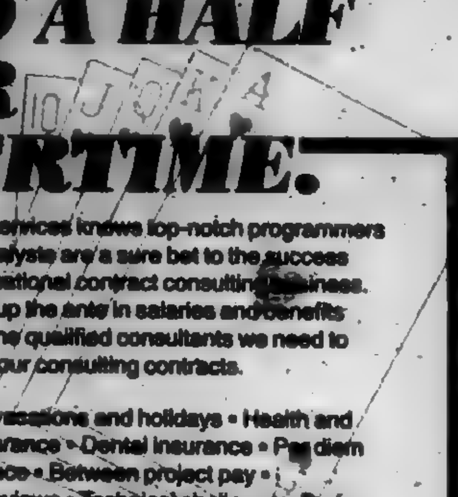

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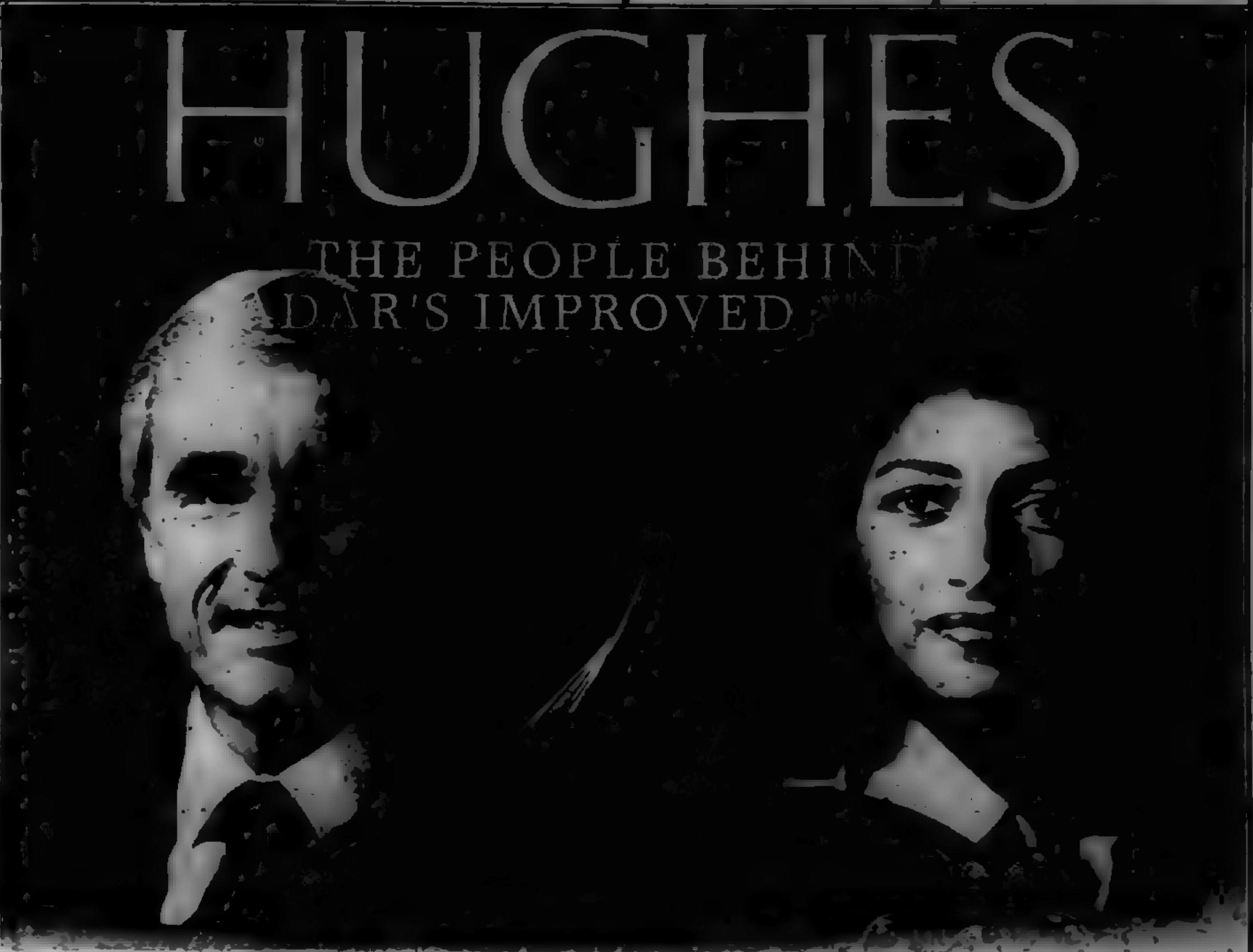

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MISSISSIPPI STATE UNIVERSITY Computing Center and Services is seeking a person to fill the position of Systems Programmer. MSU, a comprehensive land grant University utilizes a variety of microcomputers and Sperry 1100 systems to provide services to the academic, research and major administrative units of the University. The University offers an excellent benefit package and salaries commensurate with experience and education.

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Send resume and salary history to:

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and Planning Commission
[illegible] Riggs Road
Hyattsville, MD 20782
Att: Programmer Analyst Recruiter.

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Employee will work with our customer in development of a wide range of DBMS applications from small micro based to very large complex mainframe based. Support proposal development and conceptual designs of integrated applications utilizing a wide variety of hardware and DBMS software. Qualified candidates will have 10+ years experience in DP, a solid math and/or engineering background, IBM-VAX-CDC, and have a working knowledge of several DBMS's including IMS, INGRESS, ORACLE, RAMIS II.

COMPUTER SYSTEMS DESIGNER

Employees will develop computer systems designs, program, test and implement new and perform modifications to existing, on-line systems. Qualified candidates will have 2-10 years experience on large IBM mainframes utilizing IMS DB/DC (a must), COBOL, OS/MVS. The on-line IBM/IMS system supports our Aerospace customer in the area of MANUFACTURING i.e. inventory, purchasing, requirements, engineering, shop floor and other selected manufacturing functions.

Martin Marietta Data Systems offers an excellent compensation and benefits package as well as a full relocation package. To be considered for these opportunities please forward your resumé to Ms. Gail Hanson, 98 Inverness Drive East, Suite 135, (P155), Englewood, CO 80112 or call (303) 790-3575.

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McDermott Incorporated, a worldwide leader in the energy industry, has openings at various levels for commercial and technical Analysts/Programmers on their Data Processing Staff at their New Orleans Corporate Headquarters.

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Personnel Department
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Hughes Helicopters, Inc., the leading commercial and military helicopter manufacturer, invites experienced data processing professionals to carefully consider the outstanding career opportunities we now have available in the following areas:

Data Communication Analysts

Selected candidates will be key members of the multi-location Data Network team. Responsibility will include technical and administrative activities in the following areas: L.A.N. and Long Distance Data Networks; SNA/SDLC Protocol; Network Hardware Installation and Support; Vendor Liaison; VTAM/NCP; and Network Recovery Procedures. Candidates should have 2-4 years data communications experience in an IBM environment.

Hardware Evaluation Analysts

Will be responsible for equipment evaluation, capacity planning and work load forecasting in a large IBM mainframe environment. Selected individuals will participate in hardware resource allocation, including all peripheral and micro processing requirements. Must have at least 2 years of similar experience and an education including statistical and quantitative analysis to be considered.

Management Systems Planners

These positions are responsible for coordinating and assisting in the development and maintenance of company-wide automation and computer strategic planning. Candidates should have at least 10 years of extensive background in management systems development and the ability to work with senior management.

EDP Systems Auditors

Will be responsible for verifying the intended use and capabilities of auditing internal business applications, optimizing company data flow, evaluating and recommending computer charge back systems, and analyzing computer resource usage. Candidates should have auditing and accounting background with 2-4 years experience in computing (programming and systems analysis).

Data Communications Manager

Will direct the installation of data communications equipment and lines and maintain records. Will also direct allocation expansion and disconnects, manage the operation of our data collection systems, CRT's, printers and associated equipment, and be responsible for strategic and tactical data communications planning. Position requires 6 years experience in data communications/electronics, a Bachelor's degree, good communications skills and a solid general technical background.

Computer Applications Programmers

Will be responsible for the development and maintenance of manufacturing and financial systems in an IBM environment. To qualify, you need a minimum of 3 years experience utilizing COBOL in the development/maintenance of systems. IDMS, ADSO, CICS a plus.

Software Systems Programmers

Positions require a minimum of 5 years solid systems programming experience with IBM MVS/SP, TSO, VSAM, with working knowledge of VTAM/NCP and ACF2. Candidates should be proficient in oral and written communications related to systems software and hardware topics for user support.

Systems Analysts

These positions analyze and evaluate existing or proposed systems and provide guidance to user areas in the application of systems analysis to business problems. Candidates should have 2-3 years experience in systems analyses and be knowledgeable of all processes involved in the design of the utilized business systems. Several years of business application program experience a plus.

Project Leaders

Our systems development area needs personnel who can direct, develop and track project plans, insure project feasibility, provide technical support and assist project staff. Candidates should have 5 years experience in the areas of programming, systems analysis, project control and management. Aerospace experience a plus.

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Will be responsible for the installation of IDMS in an IBM OS/MVS environment, for the design and maintenance of the database and related data dictionary, and for the development and enforcement of standards and procedures for its usage. Candidates should have 3-5 years database design/administration experience.

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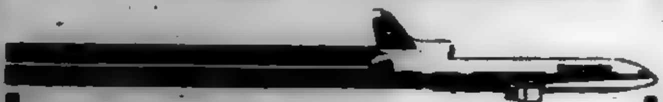

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Responsible for developing new ACP/TPF training courses, refining existing course material, presenting the training course to non ACP/TPF programmers or programmer trainees, and developing assistant instructors for technical training.

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TWA

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Intermetrics offers competitive salaries and an excellent benefits package including 3 weeks vacation, group insurance, tuition reimbursement, and profit sharing. If interested, please call Elizabeth O'Regan between 8:30 a.m. and 5:00 p.m. at 661-1840 or send resume to: Intermetrics, Inc., 733 Concord Avenue, Cambridge, MA 02138. An Equal Opportunity Employer M/F/H.

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Worthington, Ohio 43085 (614) 846-5885
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Dallas, Texas 75230 (214) 661-8600
DENVER: [illegible] Consultants, Inc.
1777 South Harrison, Suite 404
Denver, Colorado 80210 (303) 758-5664
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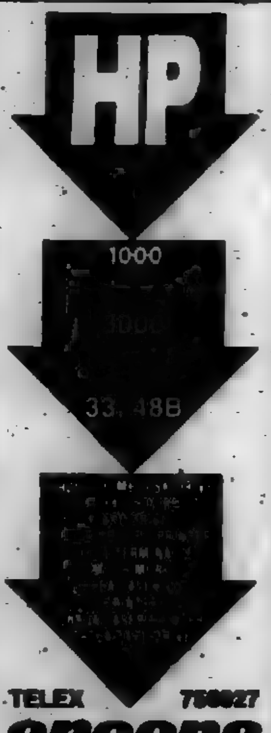

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4361-4	1.15	2 to 12	[illegible]	[illegible].5	8 to 32
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4341-12	1.65	2 to 16	[illegible]	11.8	16 to 48
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4381-1	2.1	4 to 16	[illegible]081K	[illegible]4.0	16 to 48
3032	2.5	2 to 8	[illegible]1KX	15.5	16 to 64
4381-2	2.7	4 to 32	[illegible]4G	26.6	32 to 96
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• First installation 19[illegible]

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470V/7	5.5	[illegible] to 32
470V/8	6.5	[illegible]
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5850	11.[illegible]	16 to [illegible]
5860	1[illegible]	[illegible] to 64
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AS/6043	5.2	8 to 32
AS/6053	6.5	8 to 32
AS/6063	8.4	16 to 32
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AS/9060	11.2	16 to 64
AS/9070	16.2	16 to 64
AS/9080	20	16 to 64

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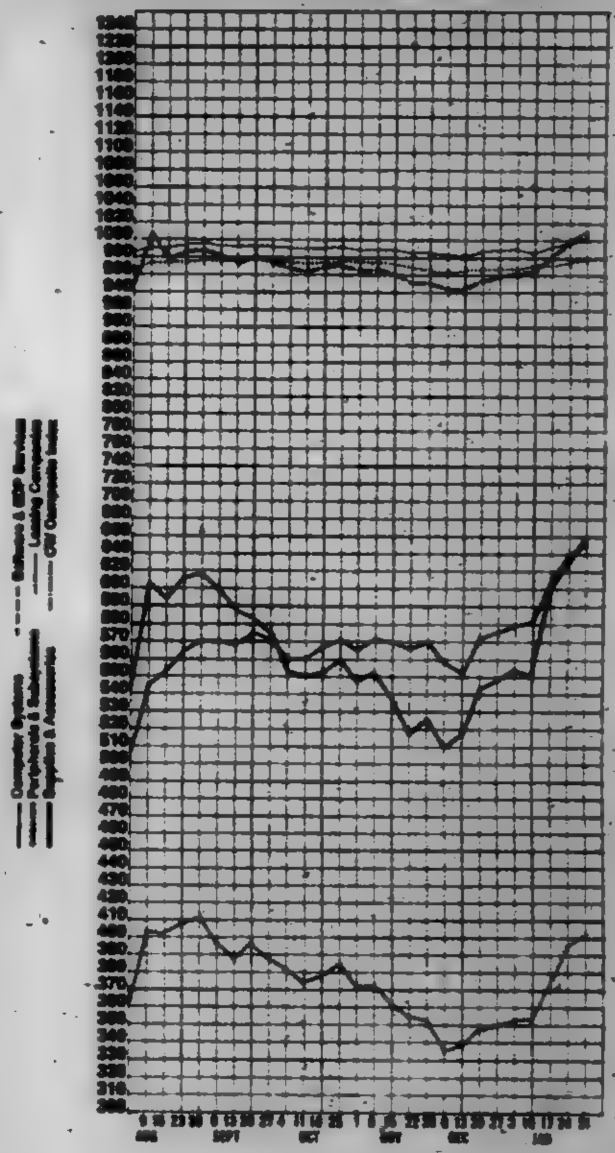

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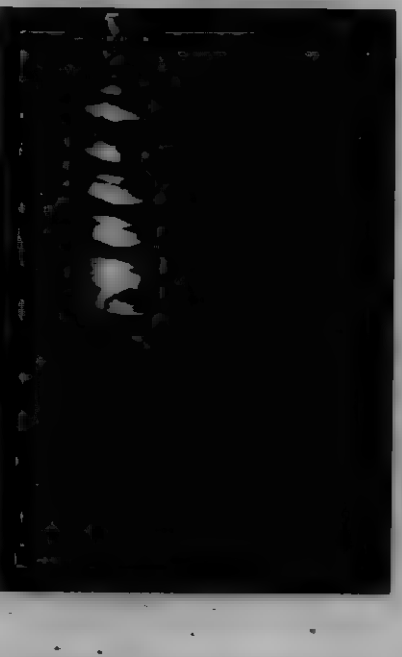

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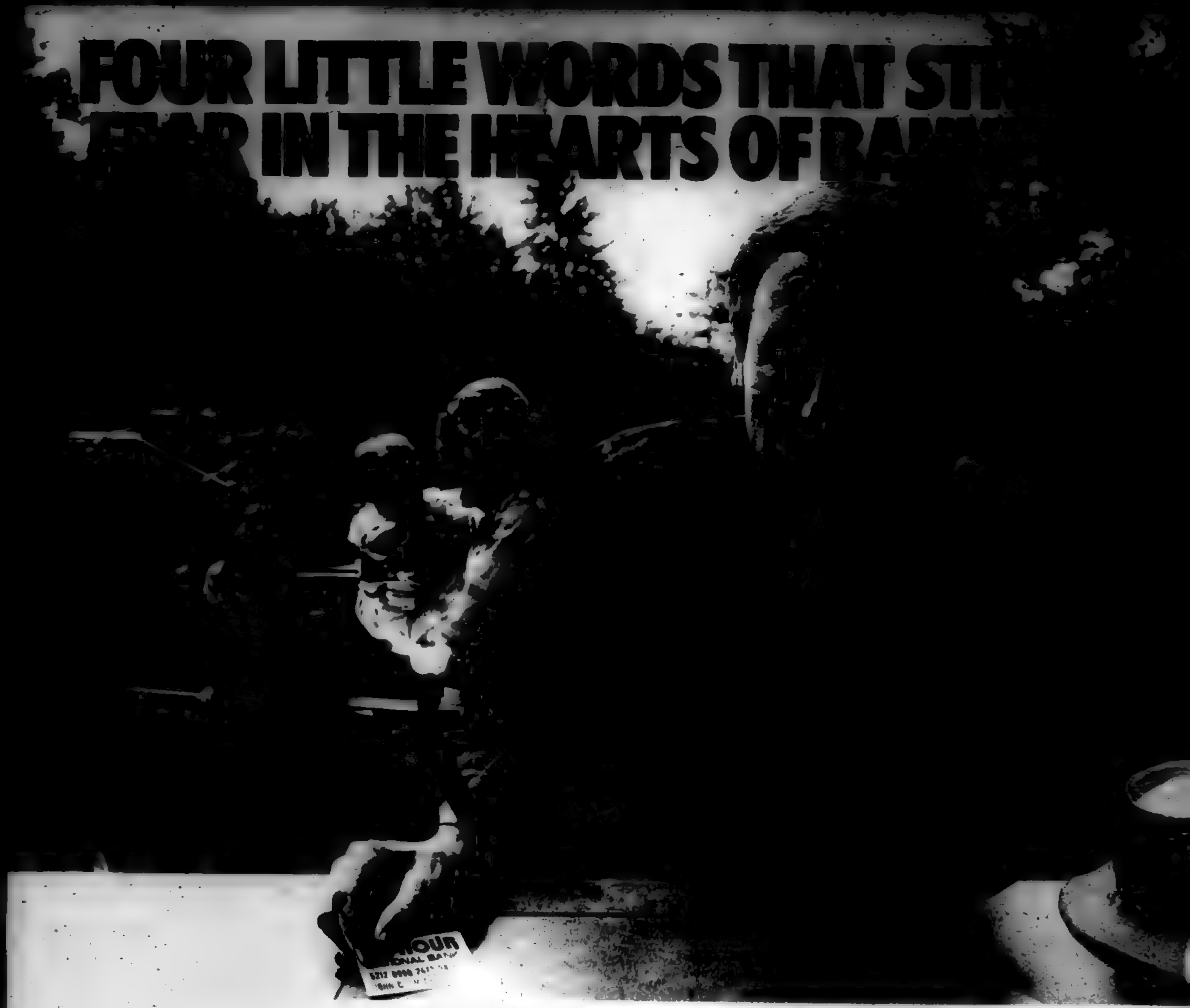

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Editorial Insider

Get the Lead Out!

The information age is upon us, and MIS managers hold the key to unlock it. What's being done with this powerful resource can vary greatly, depending on the skills and farsightedness of the MIS professional in charge.

Computer technology has flooded the office — mostly in the shape of personal computers. The surge of computer capacity onto desktops has enabled capital investment per office worker to surpass that of the factory worker for the first time in history. The money is being spent, but what's being done with it?

Too many MIS departments are still playing catch-up with the personal computer. Taken by surprise by the end-user demand for computing power, many organizations are bringing in microcomputers at a fast and furious rate. What's happening beyond that? There is more to automating the office than the personal computer. New uses for existing equipment — bar code devices for recordkeeping, minicomputers and communications should be analyzed for effectiveness in your organization. MIS managers should beware of letting the surge of technology dictate their choices, possibly leading them down a blind alley until another surge of end-user demand takes them by surprise.

MIS departments need to become more politically savvy. They are caretakers of a powerful resource — information — and can use this resource to their own advantage as well as that of their organization. Resources attract allies, and allies can bring strength, accomplishment and rewards.

First, MIS needs to recognize the business needs of the organization and then objectively assess how the current equipment is meeting those needs. Next, find out what future business goals the company has and become familiar with developing technologies and new uses for existing technologies in order to adapt them to your needs. This may seem elementary, but too many MIS departments still operate in a reactive mode to management's demands or end users' cries for help. Step out from behind the eight ball and provide management and key user groups with a planned agenda for coming computer capabilities that are in line with the business need. Whether you decide to call it office automation or something else, the technology demand exists and MIS should be seen as one of the planners rather than as one of those holding back the inevitable.

By building alliances with top management and those departments most eager or those that will show the most immediate benefits, your position will be strengthened and your future possibilities expanded. This is too big an opportunity to miss — both for your personal career and for positioning MIS in the corporate structure. Don't let it pass you by.

Ann Dooley

Welcome Changes

By Tom Willmott

Over the last several years, the definition of office automation has changed dramatically. Practical implementations of the technology of the '80s, such as cheaper and more powerful microcomputer-based workstations, have made it possible to consider new applications that could significantly alter the quality, process and quantity of our work. Office systems planning issues now include microcomputer implementation and other types of small systems analysis, mainframe data access for end users (along with the acquisition of appropriate transaction-oriented, decision support software), the development of a wide range of brand new departmental applications and the traditional text creation and text retrieval systems. OA is about to become what it is supposed to be — the automation of business activities in the office.

The tools of technology — including a huge array of voice and data communications options, high-resolution displays, software that emphasizes the user interface rather than data manipulation and peripheral chips — have expanded management's view of the automated office. The implementation of new small and distributed systems will result in productivity gains at all levels.

Manual departmental systems (such as records management in a federal agency), are often critical, but few of these systems would be considered for the DP department's mainframe application queue. Large system development is expensive and time consuming. Many departmental applications have a unique character that defies translation into a mainframe DP priority. Now, because the cost of all types of small systems has continued to plummet, more of these unique task-specific applications become plausible every month. These small systems opportunities will become an integral part of OA; the age of the DP/WP multifunction terminal is here.

OA is rapidly becoming a module of the larger, enhanced information systems organization. This clear and steady shift in responsibility for office systems from an organization's administrative group to one charged with information systems or information resource management is another sign of the growing importance of distributed office systems in 1985.

The implementation of office technology will also soon contribute to a flattening of the organization chart. As the computerized reservation system changed the quality and quantity of work that could be accomplished by an airline or travel agency employee, so too will distributed computer resources in the office change the very nature of our decision-making work. Effective computerized information support for managers and executives will reduce the number of personnel in the office. Anyone who has attempted a departmental budget, first by hand and then with a micro spreadsheet package, will agree that more can be accomplished by a computer-equipped manager. As additional business applications are automated, employees will do different kinds of work. More time will be spent on analysis and problem solving and less on gathering data for presentation in one or two limited forms.

Finally, the evolution of communications technology is an additional element in our changed perception of OA. Dedicated peripheral chips such as the Seeq Technology, Inc. microchip (programmed with the logic of the Ethernet algorithm) and other expansion board technology have literally made it possible to communicate between the mainframe and the corporation's copier. Networks of personal computers, micro-mainframe links and communicating word processors are now in the vocabulary and on the planning agenda of office systems groups.

In summary, the new tools of office technology encourage us to imagine an expanded office applications portfolio. The new decision support systems have sharpened the corporate competitive edge by increasing service levels to existing customers and, in some cases, by creating whole new business product lines. The expanded applications have increased management awareness of technology and caused a restructuring of management responsibility. Office systems, after all, must be evaluated, acquired, implemented and maintained. We have witnessed a change in the role of the information systems staff with increased responsibility and visibility in communications, both voice and data. Clearly these trends demonstrate exciting new dimensions for the highest computer systems growth market in the '80s: robust, productive, cost-effective office systems. ■

Willmott is director of user research and services for International Data Corp. in Framingham, Mass.

dB
BY RICH TENNANT
YOU LOOK WRECKED, dB. I DON'T KNOW HOW YOU GET THROUGH THE WEEK.
WELL, ON WEEKENDS I DO SOMETHING ALOT MORE RELAXING.
WHAT'S THAT?
I HANG GLIDE OVER HAZARDOUS WASTE DUMPS.

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Q&A

Danielle Bair is vice-president of office systems at Bank of New England, which has 4,000 employees across Massachusetts. She started two-and-a-half years ago as operations officer for an office systems group and is now responsible for office automation at the bank. She shared some of her experiences with Computerworld Focus.

Would you define office automation?

I don't like the term, but I'd define it as using the best tools to do the job right. We're trying to improve productivity by maximizing people and technology.

Why don't you like the term?

OA has turned off a lot of people. It gives the impression that you're going to change what's being done and breeds a lot of resistance. People tend to look at automation for its own sake, not for improving, maximizing, what they can do.

Is a redefinition necessary before real change can take place?

Not only a redefinition, but maybe a complete reorganization. Right now we're in the systems group and I'm glad we're there. We need to look not only at technological trends but also at sociological ones. What's happening to the work place and to the people here? What about change and organizational development?

Who will handle this reorganization?

It has to be in-house staff. Vendors are there to develop and sell new equipment to us. If developing consulting groups to work with human resources meets a vendor's sales needs, fine. But it's up to us to find out if the equipment fits. If it doesn't, we shouldn't buy it. How are we going to bring it in and integrate it? The in-house staff has the primary responsibility for integrating. We shouldn't take on new technology if we're not totally committed to supporting it.

What about a smaller company?

The development of a user center is critical. Both small and large companies need a resource center, an area where people can come and get some help, some advice and maybe some assistance in developing their first applications. You're going to get better results if you're there with a carrot instead of a stick, saying, "Yes, do this and use this piece of software or hardware." When you say no, people go around you.

Sure, you need to protect your information and maintain data integrity. That doesn't mean people can't use tools; it just means they have to use them the right way. If we don't educate people we can't expect them to understand what data access, data integrity and data security mean. If you don't educate, you're avoiding the issue.

Are there people out there knowledgeable enough to staff a user center?

Yes. When we set up our first user center, we started with one person from word processing, two from finance and another who handled photocopying and microfiche equipment. Today, when we look for a new analyst, we look first to our user areas for someone who has good knowledge of the microcomputer.

You didn't mention an MIS person.

They didn't staff it in the beginning. Now we have three centers and some members of the DP staff do report to me.

What about a single-vendor vs. multivendor environment?

Standardization is probably the sanest route to pursue. A small organization can't afford to have many vendors and software packages out there.

What problems have you had?

The basic problem is communicating with the host. There are serious software problems and end users can't do it themselves. We've been working on one project for almost a year to perfect good data transfer from our host. It's going to be very slick, but it's not easy.

Software seems a bigger problem than hardware integration. Is it improving?

It's getting better. We're seeing more packages with everything rolled into one. PC Focus will allow us to receive information from Focus on the host and send information up and down easily. It's conquered many of the upload/download problems. An end user who knows Focus and can work on a PC can drop it into Lotus, into a text format, into an Ascii format. It's the closest thing we've seen to a product that could be integrated.

But you're looking for something else?

We're looking for something that's going to make file transfer from our host easier. Right now some packages treat the host as a virtual diskette. It's consumptive data transfer. We need some kind of a file server, a central resource so that when I want Lotus, I don't need to have disks sitting on my desk. I can go to my file server and pull down my spreadsheet, work on it and send it back up to my file server. Somebody else can also come and get at that worksheet, so we have shared files. At the same time, I want something that has file-locking and record-blocking capability, so if it is confidential nobody else can get to it.

What about user groups to share information?

There's a need, especially in the world of OA and micros. New professionals have developed and, although they may be in a department, they really don't belong in that department any more. They're microcomputer specialists. They want to keep developing models and programs and bringing in new equipment.

Do you see these people moving into a systems department or into something all their own?

Eventually they'll all come home to systems. We're going to see a complete circle. We have to look at this as part of the DP environment; otherwise, we'll be in an adversarial relationship.

Have you met resistance from traditional DP people?

We did initially, but being able to offer a micro solution when a mainframe solution just isn't practical has really helped. We have systems people working with us on new, exciting and different projects, and it's opening up a whole new world. We work with the computer room, the operations people, the network control people and, ultimately, the systems development people. It's helped win a lot of them over. We're finding solutions that can be done on PCs that don't necessarily involve the host and we can get some quick solutions out. It's an exciting place to be right now. ■

Manager's Corner

By Michael E. Lawson

As information and its effective use grow more important, companies are finding economic viability can turn on less than 1% of a market share. The line that separates survival and the all-too-frequent corporate reorganization is very thin, and long-range plans are essential.

Effective decision making will require substantial effort and careful planning. This task will become increasingly less productive unless information systems is carefully linked to the organization's overall plans. The information systems function must be incorporated into the business planning activity and must take the lead. Some generally agreed upon steps can help you to help your company.

First, know more about your organization's business. This knowledge is essential when you try to identify where and when the information systems function can provide strategic assistance rather than general support. You can gain this insight by examining the company's general business strategy. For example, does your organization provide a unique product, or is its general plan to be a low-cost producer of some rather generic product? The company's mission may be to be responsive to the market by providing new goods and services. Look at the underlying market for your company's product or service and find out the market growth rate and the company market share. A high market share and high growth rate spell significant information needs and importance; low market share and lack of growth often do not.

The second set of tasks requires an examination of the current evolutionary stage of development of the information systems function itself. If this is not part of your department's regular planning process, it should be.

You should now be armed with a good sense of the company, its strategic mission, its market and its goals. The next thing to learn about is the company's planning environment. Companies handle planning in a variety of ways. Some have corporate planning committees staffed by senior executives; others carry out planning as a staff function run out of the chief executive officer's office. Still others have a corporate development office staffed by a senior person. In most larger companies, the planning process has been institutionalized and is a regular part of the fiscal year's activities. Most companies plan from the bottom and make decisions and implement from the top down. The company's culture and management style and the size and complexity of the organization will probably determine the amount of effort put into planning and the amount of formal organization devoted to these tasks.

The third set of activities involves learning how your department or organization fits into this process. Who is the person in your reporting channel who is part of the formal or informal corporate planning process?

You need to meet with this individual to begin building links. If you work in a large organization, you may need to identify some intermediate person in your reporting channel who would carry out such a meeting. Prepare for this meeting by getting a copy of the latest corporate planning document. Review it carefully to identify corporate goals that will have a particular impact on the information systems function. Review those goals in terms of the department's ability to get the job done. With your own plans in mind, determine if there are priorities that would have to be rearranged or tasks that would not get done. This may be difficult because most of the company's goals will not be described in terms of information and system requirements — at least not yet.

Your initial efforts should be aimed at demonstrating two main points: First, you know about the company's business and information systems' role in that business, and, second, corporate goals can be better served if information systems plays a more active role in corporate planning.

Building these bridges between information systems and the organization will require patience and persistence. It can be a frustrating experience and must be entrusted to people with strong interpersonal and communications skills. However, the rewards can be significant. ■

Lawson is director of the Masters Program in Management Information Systems at Boston University's School of Management.

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In the News

Unions Mount Campaign

An 18-state campaign to protect the 10 million employees who use CRT terminals has been mounted by two national unions, the 850,000-member Service Employees International Union (SEIU) and 9 to 5, the National Association of Working Women.

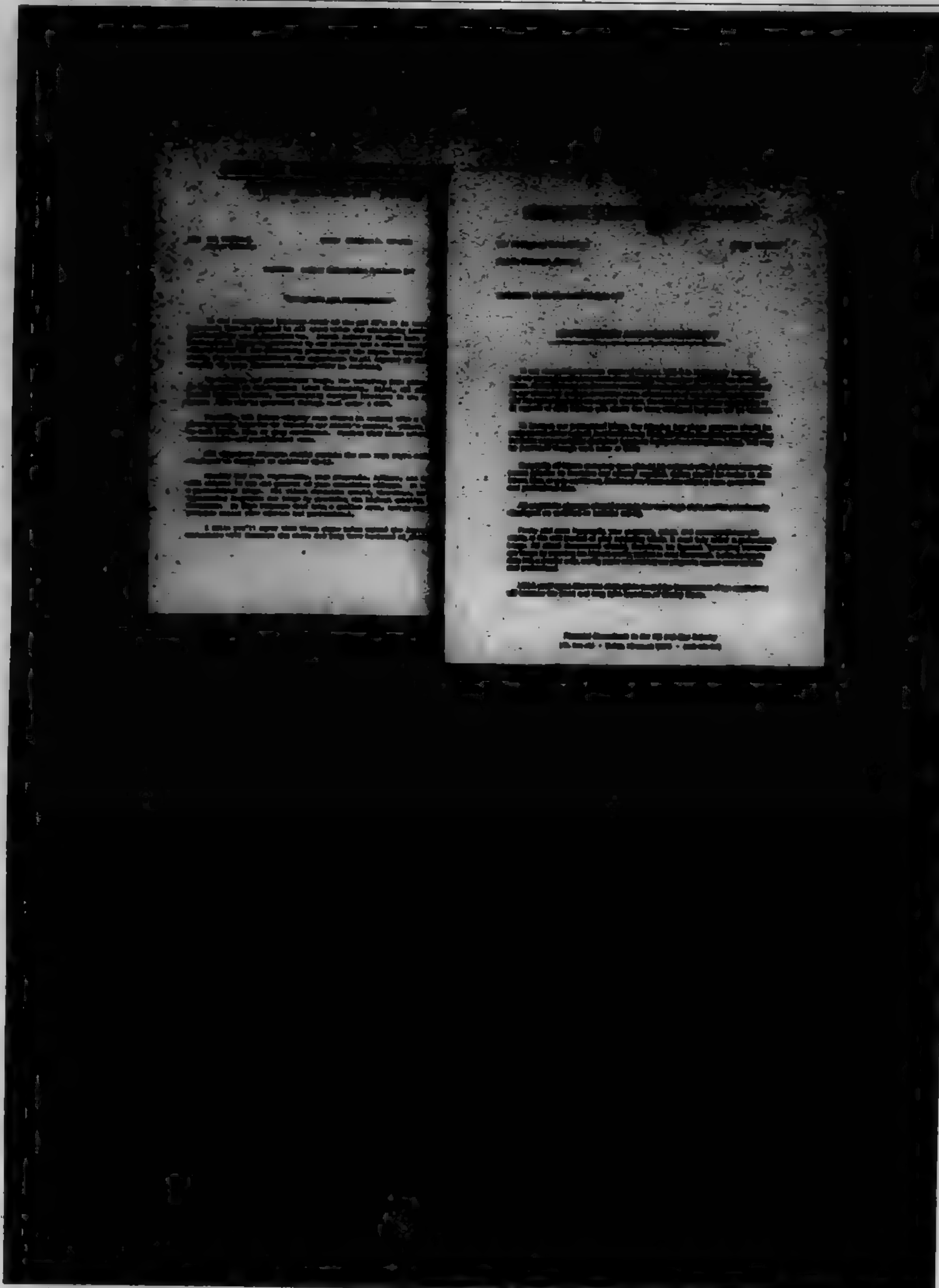
According to a SEIU representative, the goal of the campaign is to introduce two kinds of legislation regarding CRT safety. The first involves right-to-know laws.

The second zeros in on specific issues — the number of hours a person should work on a CRT without rest breaks, the right of pregnant women to transfer to jobs that do not require the use of a CRT during pregnancy and the use of nonglare screens and other ergonomic features.

Chris Funk, a member of the Research Department at the Washington, D.C. headquarters of SEIU, said Connecticut, Maine and Rhode Island had authorized studies of the problems associated with working on CRTS, and New York, Illinois, Oregon and Massachusetts have legislation pending.

Karen Nussbaum, executive director of 9 to 5, stated that, in addition to the more publicized problems (such as radiation emissions, vision problems and muscle strain) associated with CRT use, "the design of the job is an extremely important factor in the health and safety of workers. If there is a high degree of control, a high degree of involvement and some inherent satisfaction, the stress levels will be down. If the job is low level, the demands high and if there are production quotas, deadlines and high levels of supervision, there's high stress. Working on a VDT exacerbates all these problems."

Nussbaum referred to the Framingham Heart Study, which pointed out that a higher level of coronary heart disease was found in female clericals than was found in executives. She listed three factors that could improve the lot of CRT workers: better salaries, frequent rest breaks and better job design.



Hard Choice

What would employers rather spend money for: a new microcomputer or an additional staff person? More than 40% opted for the machine, compared with 13% who chose the person in a research-based program sponsored by Honeywell, Inc. The program studied attitudes among 701 knowledge workers in large Forbes 500 corporations. For the purpose of this study, knowledge workers were defined as professionals and managers who spend a large part of the working day dealing with verbal or mathematical information. Demographically, a vast majority of the respondents were male, over 75% were 30 to 59 years old, 80% had undergraduate or graduate college degrees and 75% earned more than $25,000 per year.

Major findings in the study included the fact that from 53% to 75% of the participants had access to personal computers, computer terminals or word processors. In addition, most of those surveyed believed they could complete more work in a given amount of time because they had office automation tools. Many also said the new technology had contributed significantly to their career advancement.

"The survey [also] revealed that knowledge workers gave high scores to management in introducing the technology into their organizations," said Eugene Manno, group vice-president of Honeywell's Small Computer and Office Systems Group. Manno added, "Conventional wisdom said that people would resist office automation. Our data shows conclusively that this has not been the case. But this data also shows that people are going to resist this technology if management ignores the human dynamic."

As if to underscore Manno's caveat, not all the news was good. When asked if management had realistic or unrealistic expectations about OA, 55% of those who answered "unrealistic" also said their companies paid more attention to machines than to the workers who operated them.

NBI + CCI = NCBCI?

Computer Consoles, Inc. of Rochester, N.Y., and NBI, Inc. of Boulder, Colo., have announced plans to merge the two office automation companies. Barring any snags and assuming the approval of shareholders, the merger would be based on NBI issuing 0.8 shares of newly issued NBI common stock for each share of CCI's common stock. The transaction is valued at approximately $160 million and should be completed by the end of March. A completely new name, not yet agreed upon, will be taken.

After the merger, Herman A. Affel Jr., CCI's chairman of the board, will be appointed to the same slot in the new company, and Thomas S. Kavanagh, head of NBI, will take over as president and chief executive officer. In a joint statement, Affel and Kavanagh expressed confidence that the two companies complement each other and represent a formidable combination of distribution, products, technology and customer support. "Based on these attributes plus our combined financial strength, we believe the new company will be in a stronger position to compete in office systems and advanced computing systems markets than either company alone would be."

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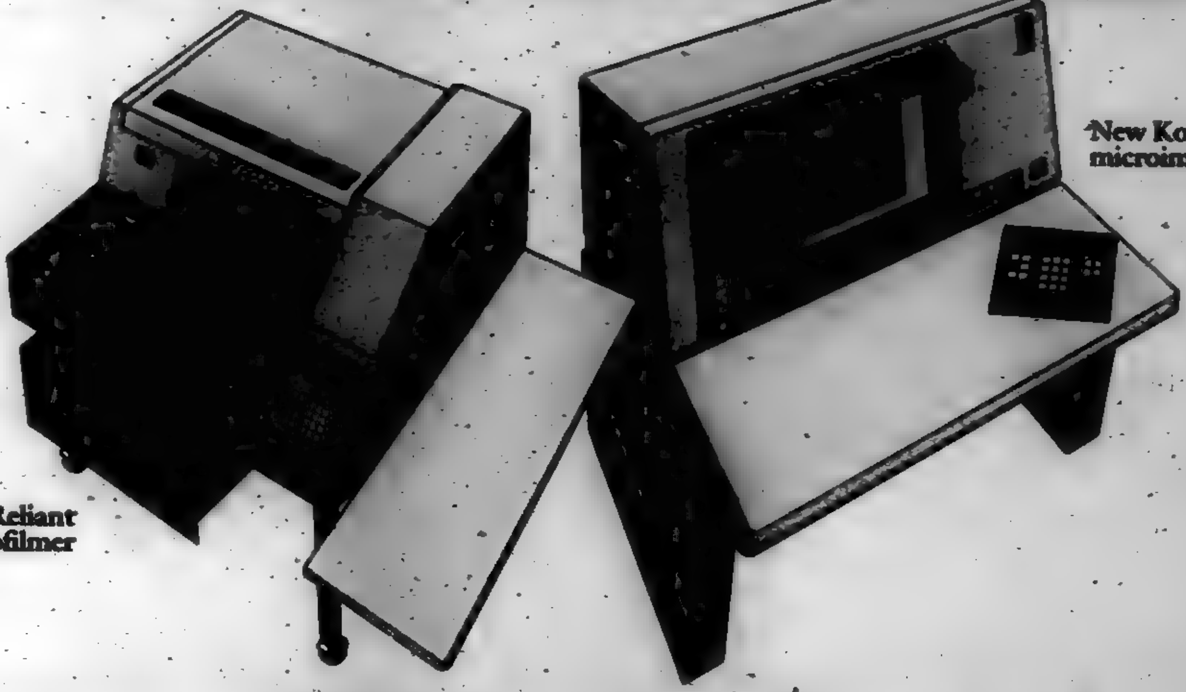
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In the News

Both companies had been considered prime acquisition prospects, according to the Gartner Group's vice-president, Tom Billadeau, who thought the merger has potential. "It seems clear that if NBI was going to merge with someone this was the last good year they could do it, and CCI had been looking for an opportunity for a long time."

Company officials stated that they expect very few changes in employment in their respective locations. Together, the two companies employ more than 4,000 people with more than 200 sales and service locations worldwide.

Industry analysts had heard rumors that AT&T had been looking carefully at CCI for possible acquisition. The merged company could prove to be even more attractive to AT&T in the future, analysts said.

BOC and OA

AT&T has made it clear that it wants a chunk of the office automation market, but it's getting competition from an unexpected source. The recently freed children, the regional Bell operating companies (BOC), have decided Ma Bell isn't the only telephone company that can sell office systems.

In December, Judge Harold Greene, responding to a petition from Nynex Corp., broadened its definition of customer premises equipment (CPE) that can be offered by the BOC to include computer products and systems "interconnectable to telecommunications facilities or used for communications functions." The filing allows the BOC to sell OA and some of them intend to do just that. Nynex, The Pacific Telesis Group, Ameritech, Bell Atlantic and Bell South Corp. have all begun to explore the potentially lucrative OA market.

Nynex, for example, the New York and New England regional company, has jumped into OA in a big way. It recently signed a three-year, $65 million contract with Data General Corp. to offer DG's Comprehensive Electronic Office System (CEO) to Nynex customers. DG has a similar agreement with Pacific Telesis, the western BOC. According to Nynex, CEO will become an integral part of Nynex's advanced Integrated Office Systems.

Nynex, in addition to its agreement with DG, is selling private branch exchanges from Northern Telecom, Inc. AT&T, Intecom, Inc., GTE and TIE. It has already sold OA equipment to such companies as Polaroid Corp. and Riley-Stoker Co. and has opened two retail stores called Datago, in which it is selling PBXs, personal computers, packaged software and extensive office equipment targeted to small businesses.

Consultants are not sure how much impact the BOC will have in the OA market. As Andria Rossi of the Seybold Consulting Group put it, "Initially, they won't have much impact because the PBX vendors have a lot to learn; witness AT&T."

The China Syndrome

In a country with more than a billion people, the need for temporary workers would seem unlikely. But sometime this year, Manpower, Inc., one of the world's largest temporary help agencies, will open up shop in the People's Republic of China. And though a nation that has taken a dim view of capitalism is unlikely to be at the forefront of office automation, the recent influx of foreign firms authorized to operate in China has dramatically increased the need for technically skilled office workers.

With this in mind, the government of China recently approached Manpower, Inc., one of this country's leading temporary agencies, to help alleviate the problem. Together, they established Manpower China Joint-Venture Co., Ltd., the first temporary help organization in China. The organization will be co-owned by Manpower and Consultec, an independent entity under China's Ministry of Foreign Economic Relations and Trade. The new firm will offer temporary Chinese office workers to foreign corporations and will also conduct OA training for selected workers from the Chinese labor force.

According to Mitchell S. Fromstein, president of Manpower, "Companies in China face a dire shortage of skilled office workers. This venture is a unique opportunity to apply the same basic concepts we now use in the Western world and Japan to an entirely new environment. At the same time, the new venture will allow China to build a labor force infrastructure that should help attract foreign companies to the vast China market."

Initially, the project will serve 600 foreign-based businesses in China, many of which are from the U.S. After that, the project will branch out to include Chinese companies.

According to Sharon Canter, an information specialist with Manpower, the first phase of the project will include a "select group" of 25 bilingual Chinese workers (fluent in both Chinese and the language of the firm in which they will work). These workers will be trained in all forms of office procedures — from basic photocopying to use of microcomputers.

Manpower intends to construct a model automated office, based on its successful training programs in the U.S., which will include microcomputers, word processors, data entry systems, copy and

(Continued on Page 45)

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By Bob Ericson And Wally Trapilo

"Audit me! Look, we're working under unbelievable deadlines with a budget and staff that's stretched to the end. We don't have time for this now, why don't you start somewhere else."

"Audit me! Hey, this is an MIS Services Department, not Office Automation. Why don't you go see one of the typists."

"Audit me! Sure, but you ought to know that I have a direct reporting line to the CFO and am matrixed to the MIS director, both of whom have approved my OA setup."

The term audit seems to bring out the fears and anxieties of many people and often brings to light many of the issues it is designed to assess. The above three quotes point to a few of the concerns of a comprehensive audit. The first (too much work and too little time) is a symptom of scheduling and utilization problems. The second (this is MIS not OA) reflects symptoms of organizational confusion of function and perhaps lacks of integration. The third (I'm politically connected) reflects many of the bitter turf battles that have been fought over OA and its role on the organization. It is precisely in these circumstances that an independent outside audit is most useful.

Back in the good old days when life was simpler, office automation was simply another term for word processing. It was done on a single dedicated piece of hardware and had one or two trained operators. Its justification was that typing would get done faster and better.

Technology developed. WP had many alternatives in both software and hardware. For the commercial organization, large multistation systems that were part of local-area networks became available. OA also had the capacity to transmit information via fiber optics, satellites, microwaves or voice-grade lines to remote mainframes; to store masses of information; and to retrieve sections of the corporate data base to be incorporated into reports. Small, stand-alone personal computers put word and information processing into the hands of professionals who heretofore wouldn't consider using a keyboard.

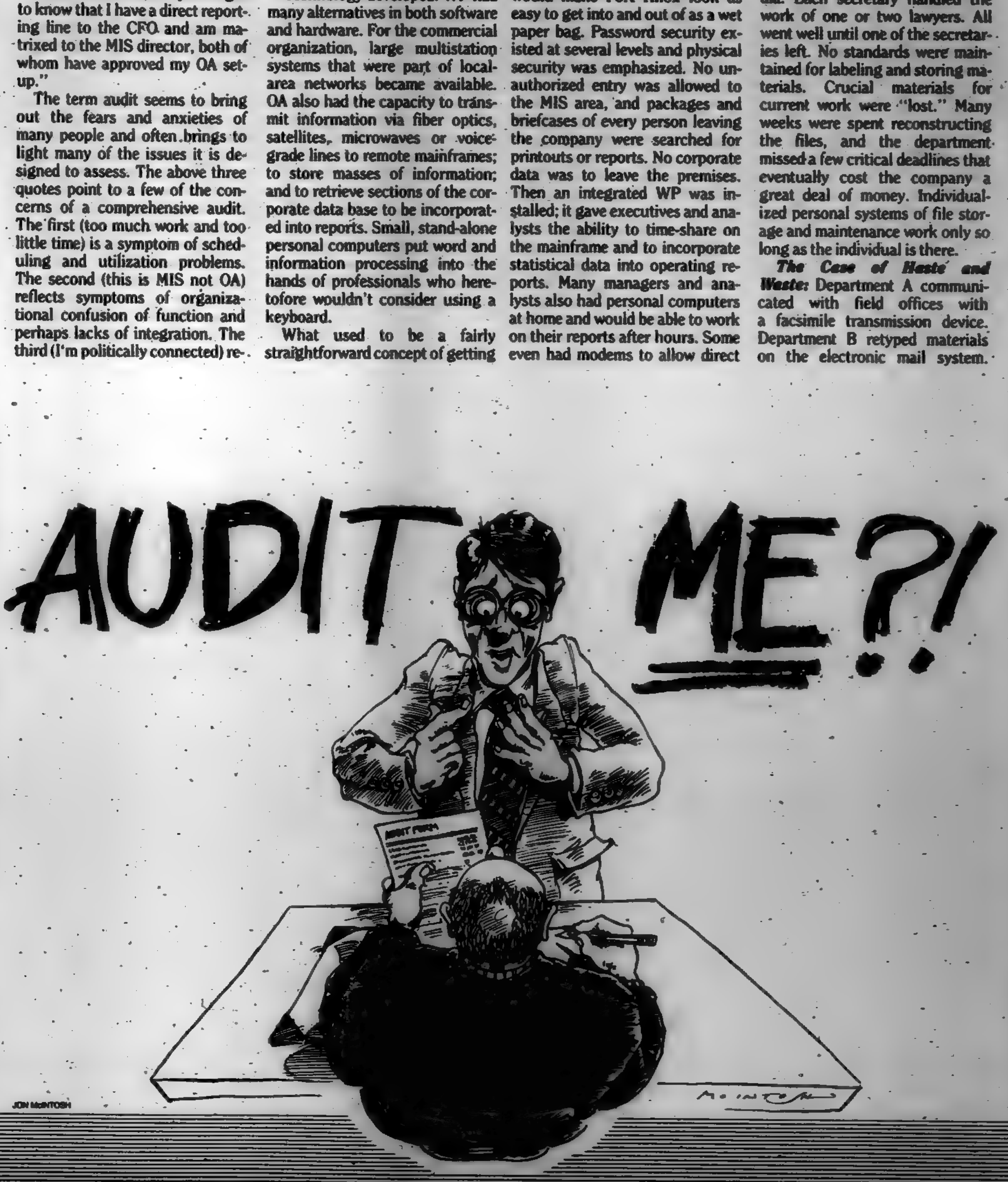
What used to be a fairly straightforward concept of getting material typed faster has become a complex system of office support that in many cases evolved in a haphazard manner rather than according to a rational, planned approach.

The cost of uncoordinated and unplanned growth is often hidden in missed opportunities and subversion of policies. The following examples illustrate these points.

The Case of the Slipped Disk: In one company, management information systems (MIS) security would make Fort Knox look as easy to get into and out of as a wet paper bag. Password security existed at several levels and physical security was emphasized. No unauthorized entry was allowed to the MIS area, and packages and briefcases of every person leaving the company were searched for printouts or reports. No corporate data was to leave the premises. Then an integrated WP was installed; it gave executives and analysts the ability to time-share on the mainframe and to incorporate statistical data into operating reports. Many managers and analysts also had personal computers at home and would be able to work on their reports after hours. Some even had modems to allow direct access to the data base. The same security guard that confiscated printouts ignored floppy disks in briefcases. No controls existed on telecommunications access. In short, the OA system made the security system and related policies obsolete; this one was caught in time.

The Case of the Lost Legacy: In a legal department, a small group of secretaries maintained the department's correspondence, briefs and reports on magnetic media. Each secretary handled the work of one or two lawyers. All went well until one of the secretaries left. No standards were maintained for labeling and storing materials. Crucial materials for current work were "lost." Many weeks were spent reconstructing the files, and the department missed a few critical deadlines that eventually cost the company a great deal of money. Individualized personal systems of file storage and maintenance work only so long as the individual is there.

The Case of Haste and Waste: Department A communicated with field offices with a facsimile transmission device. Department B retyped materials on the electronic mail system.



JON McINTOSH

Department C used a courier system. Each worked independently with little knowledge of the other department's effort. An OA audit revealed that each system was frequently overworked and many instances of underutilization occurred. A simple coordination plan eliminated many of the peaks and valleys of communication loads and problems.

Often companies that need it least are most receptive to and benefit most from OA audits. Improvements are often most difficult to bring about in companies that are fixed in their ways and afraid of change. When the director of MIS (or IS, OA or similar position) calls for an audit, the audit usually results in a statement that all is well or that a mutually developed plan of action will make things better. When the board of directors or the chief executive officer (or chief financial officer or someone in a similar position) asks for an independent audit, the results can be more traumatic. In the former case, the operating department managers are committed to doing the very best job for their organizations. In the latter case, senior management may be distrustful or dissatisfied with current operations. The audit may be a signal of drastic changes to follow.

As the information revolution of the 1980s progresses, the most profitable and growth-oriented companies will be those that have managed their MIS and OA in an integrated and intelligent manner.

By its very nature, an OA audit is tailored to an organization. Organizational complexity, services currently used, size and makeup of staff and degree of integration of OA and MIS all contribute to the formulation of a specific audit plan for a company. In general, however, an audit works as follows:

Preaudit Planning: Before the audit begins, specific planning must be done to assure that the most efficient approach is taken. The individual representing the company (the client) and the staff who will work on the audit meet to discuss the scope of the audit (what constitutes OA in this context or what aspect of the overall OA is to be reviewed). The auditor will acquire any written documentation of the OA program, including standards, objectives, budgets, training plans and accomplishments, MIS goals and objectives and corporate goals.

A preaudit strategy will also be developed. This will include how the audit will be introduced to the staff (a sensitive area); how issues such as security and access will be handled; who key individuals are and how they should be approached; what protocols are required for access to hardware and software; and, finally, what the final product of the audit will be, when it will be delivered and how it will be reviewed and accepted. In addition, a mechanism for change will also be developed. In OA audits, as with DP programs, the scope and nature of the audit will likely change during the process. A means to accommodate this change should be in place from the outset.

Prior to any on-site work the auditor must do a considerable amount of homework to become familiar with the client's materials and goals and audit objectives and constraints. From this, a specific work plan will be developed. Depending on the organization, this may be an interview schedule, work sampling techniques, surveys or other information gathering strategies.

These issues will then be discussed with the client to assure that the procedures will have the minimum impact on daily work activities while acquiring the most relevant information. The product of this phase is a detailed time-phased work plan with specific actions spelled out for both the auditor and the client.

The Audit: The audit is a comprehensive review of the OA environment, hardware, software, staffing and management as it currently exists and is planned for the future. Among the factors that are to be reviewed are the following:

- Standards — Do standards of equipment, software, procedures and responsibility exist? How well are they adhered to? Are more needed? Are some outdated?
- Physical Setup — Is the equipment (terminals, desks, phones, storage and so on) ergonomically designed for aesthetics and production?
- Storage Facilities — Is data stored in a secure and useful manner? Is an archival system in place to assure all required audit trails, reference requirements and backup are taken care of?
- Disaster Recovery — Is there a plan for recovery from fire, flood, vandalism, sabbotage or error? Is the plan managed (regular off-site storage and backup)?
- CPU Protection — Is the CPU adequately protected from environmental damage, such as heat, humidity and dust and personnel damage. Is it locked and physically remote?
- Daily Procedures — Are all libraries maintained on a regular basis? Are disks adequately handled and protected? Is labeling done according to standards? Is scheduling done to support business priorities?
- Equipment Utilization — Is the hardware being used to its maximum potential? Is the right equipment being used for the jobs required? Are there other applications that could be addressed by OA techniques?
- Planning — Are there long-range plans for OA that tie into the MIS planning? (For example, are OA plans tied into plans for fourth-generation language development and information centers?)
- Software Adequacy — Is the correct software being applied to current problems and to anticipated problems? One

(Continued on Page 14)

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Standards

0 We don't have a formal set of standards for our OA hardware and software.

1 We have a corporatewide understanding that we will acquire similar equipment, but it is not enforced.

2 We have a set of standards for some equipment, but new technologies such as WP on personal computers aren't covered.

3 We have formal standards that have regularly scheduled review periods. They are comprehensive and accepted by all departments.

Office Environment

0 As new equipment is acquired we put it where there is room.

1 We try to keep similar equipment together, but haven't reviewed our overall facility.

2 Our department is arranged so work flow should be smooth and efficient, but we haven't reviewed the layout in a while.

3 Our layout is planned and reviewed on a regular basis. New equipment is fit into an overall master plan that takes into consideration both the work flow and the operator's working environment.

Media Organization

0 The secretaries use their own methods for cataloging materials. We don't have a common indexing of stored information.

1 Some of the secretaries are well organized and have structured indexing standards, but it's pretty much hit or miss.

2 We have a common cataloging policy that is not always followed, and finding things is sometimes difficult.

3 We have a well-organized information retrieval system that is managed on a daily basis. We have an access file cross-referenced by author, date and subject. We have established record retention and archival policies.

Disaster Recovery

0 We would probably lose everything if a disaster hit — fire, flood or the secretary leaving.

1 Our hard copies serve as our backup media, and we try to back up important disks when time is available.

2 We have an enforced policy to back up most of our important disks on a regular basis.

3 We have regularly scheduled backup of all key documents and data. We maintain off-site storage and a well-managed index of storage materials. Our retention policies are coordinated with legal and financial requirements.

Information Access Control

0 We really aren't concerned with access to our common or private libraries; any secretary can access and change any of the information.

1 We have a password system, but most operators know each others' passwords.

2 Our password system has been in place for a while, but not updated or changed recently. Frankly, we don't know if it's working.

3 We have a hierarchical password-protected security system with emergency access available only through a system's manager.

Office Automation Utilization

0 We use 10% or less of the equipment's and software's capacity or capability.

1 Our word processors are basically big self-correcting typewriters. We don't know what they are doing with the personal computers.

2 We use most of the features on our WP — pagination, chain filing, communications and so on. Similarly, the personal computer users are making use of all the functions.

3 We have a fully integrated OA system that ties our WP, mail, communications, remote processing and so on into a single comprehensive approach.

Planning

0 When the work load gets too heavy we buy more equipment.

1 We budget a year in advance to buy new equipment.

2 We tie our growth plan to the overall corporate growth plans. Equipment and staff are anticipated well in advance of need.

3 We have long- and short-range OA growth plans that tie in with corporate growth and MIS plans for information centers and end-user computing.

End-User Responsibility

0 Our end users have access to the corporate information/data base. There are no common standards on its use.

1 Some end users have developed information access/processing utilities that are not generally known. The data/information integrity is not assured.

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2 We have a common library of information access/processing utilities. End users remain responsible for use of information and quality of data used.

3 We have controlled access to the corporate data base. Common data and information extraction procedures are available, and corporate standards exist for their use. The techniques have been reviewed to ensure data integrity and timeliness for specific needs.

Software Adequacy

0 We have been using the same software for quite a while. No real thought has been given to improving our approach.

1 We look at new software from time to time as new brochures are sent to us or we hear of new products.

2 We have a users' group that meets periodically to review our systems — including software.

3 On a regularly scheduled basis we review our operations, company needs and resource levels. We consider our alternatives (tie in to mainframe, stand-alones, various vendors and so on) to assure that we have the best application software to address our information needs.

Staff Adequacy

0 When the work load gets heavier, we hire new staff. Most of the staff learn informally on the job.

1 We review our peaks and valleys of work and try to schedule staff accordingly. Most of our staff are trained when we hire them, or we send them to outside vendors for training.

2 We have an annual staff budget review in which we analyze our needs. We provide in-house training on our equipment.

3 We have long- and short-term staff requirement plans that include alternatives of part-time support staff. We have an internal training and support staff. Each OA user is formally trained, periodically evaluated and further trained on new software and equipment as it is acquired.

Scoring

0 - 10 *Your lack of formality may be costing you a considerable amount of money. Your OA operation is at a substantial risk of not being able to provide you the support needed. There is room for considerable improvement.*

11 - 19 *You are most likely experiencing a number of nagging problems in getting work processed through your office. These problems could be eliminated.*

20 - 24 *You fall into the range of most large automated offices. While the work is progressing in a reasonable manner, there are a number of areas where improvements would increase your efficiency and effectiveness.*

25 + *Congratulations! You are one of the industry leaders in OA. We would like to meet you and help advance the state of the art.*

(Continued from Page 12)

company was using a children's learning tool for WP because it was easy to learn — the cost in production time lost was very high.

- Staff Training/Skill Levels — Is the staff adequately trained on the equipment — not in terms of how much training they have received, but whether they can use the functions properly. Is management aware of the power of OA and using it appropriately in the administration of the business?
- Staff Adequacy — Are there sufficient numbers of staff, scheduled adequately to manage the department's requirements?

In a full audit, each of the above areas is reviewed by means of professional investigative techniques. Most important, the audit is conducted by a neutral party who has no vested political or financial interest in the outcome.

Audit Analysis: The investigator will gather information on each of the above areas and compile it into an informational source book. Data is then summarized and analyzed, system flows developed and preliminary findings reached. These findings are then discussed with the client to assure correct interpretation of data.

Audit Submission: The final analysis and recommendations are presented in a comprehensive report to management. The report contains findings as well as the specific steps required to correct current operating problems, in addition to indications of future needs and requirements.

Office automation audits are a proven preventive maintenance technique for OA managers to assure that current and future operations are proceeding in the most efficient and effective manner. A neutral, external observer is able to provide comprehensive professional appraisal of operations and give expert advice on alternative approaches to support overall business goals. Periodic audits should be scheduled into all offices that currently have or are planning to have substantial OA expenditures. ■

Ericson and Trapilo are consultants with the professional services group, Keane, Inc., a Boston firm that provides office automation and management systems consulting to industry and government.

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Integration: Avoiding Mistakes

By Jean Green Dorsey

Integration of new and old technology will become an information processing issue for any user living with or responsible for a dynamic system. Either you will plan for it, or you will find it will just happen.

Most situations where integration is an issue evolve because there is another generation, vendor, or design to be installed and the new "best solution" is different from the equipment already in place. The first decision point requires informed support, not only from top management but also from people who are regular or occasional end users of the system, regardless of their operational levels. All these people must provide management information systems (MIS) management with a charter that lets MIS know what the organization wants. Senior user management should require that MIS present a complete information package on available technologies. This package will provide the necessary background information to managers who must make bottom-line decisions about allocating scarce organizational resources. The package should

include a statement of need for the new system components, a cost/benefits analysis and a flow chart that shows how the project fits into the existing program. Provide a series of system alternatives and their consequences and make a system recommendation with persuasive support for your position.

Alternatives for dealing with the existing system at first appear limitless, but they fall into three categories:

- Leave it as is.
- Integrate it into the new system.
- Change everything to make it uniform with plan.

If the existing system meets the needs of the people it supports and if the health or productivity of the end users are not threatened, you can probably leave it alone. Considering the total resource expenditure, the difference the new system would make is not cost-effective enough to merit the change. Total resource expenditure includes hardware and software, the cost (time and money) of initial training, the cost of training new or additional operators, as well as management orientation and user training.

Integrating the existing into the new system is often not the result of a deliberate plan. The initial round of automated systems may have resulted from individual innovation or a small pilot that illuminated the benefits of computer-based support systems for the entire organization.

In this case, the investment has already been made. Smart user management should designate the responsibility for the development of a comprehensive plan incorporating hardware and software components. This is a major challenge. MIS managers may be tempted to "cluge" part of an automation design — usually the most difficult part, the applications software. This choice can relieve short-term pressures, but it will never allow maximization of a new investment.

Compatibility is a hot topic now. Everybody wants it, and most people have no idea how to test for it. Once achieved, compatibility most often does not live up to expectations. The easiest way to ensure compatibility is to use the single-source approach: Use one specific vendor. However, even the single-vendor choice is no guarantee that your company's requirements have been met in the best way or that various pieces of equipment from the same vendor will be able to "talk" to each other.

The single-source answer is an MIS manager's retreat from taking responsibility for providing the best solution at the best price. However, if a vendor can meet your specific requirements at a price that makes good business sense, it may be a wise decision to give that vendor all your business. If the vendor continues in business and continues to provide service, training and application production support, you'll get the credit for an excellent choice. Another attraction of this choice is the chance of developing real operational expertise as the types of equipment in the system decrease.

However, unless you want to be put in a position of defending a career decision that won't be easily defended, the vendor you choose had better be able to stay in business; recognize your value, both as a reference and as a major customer; and have a plan to provide the on-going customer support you will need. You may want to consider supplier alternatives. Equally important, most organizations have a variety of application requirements. In one New York agency, the primary vendor of the field network is IBM, but two workstation configurations — about 15% of the total — are best covered by Telex and Datapoint equipment. The three suppliers weren't happy when the city acquired its equipment accordingly, but the city reaped the benefit.

New York chose a general contractor to oversee this project, and all equipment, software, training and so on were subcontracted. General contractors are used more frequently as more comprehensive, complex and costly projects are undertaken and top management recognizes a need to assign project responsibility to a single source. This choice deserves consideration when a major project is planned in the absence of the usual resources of in-house

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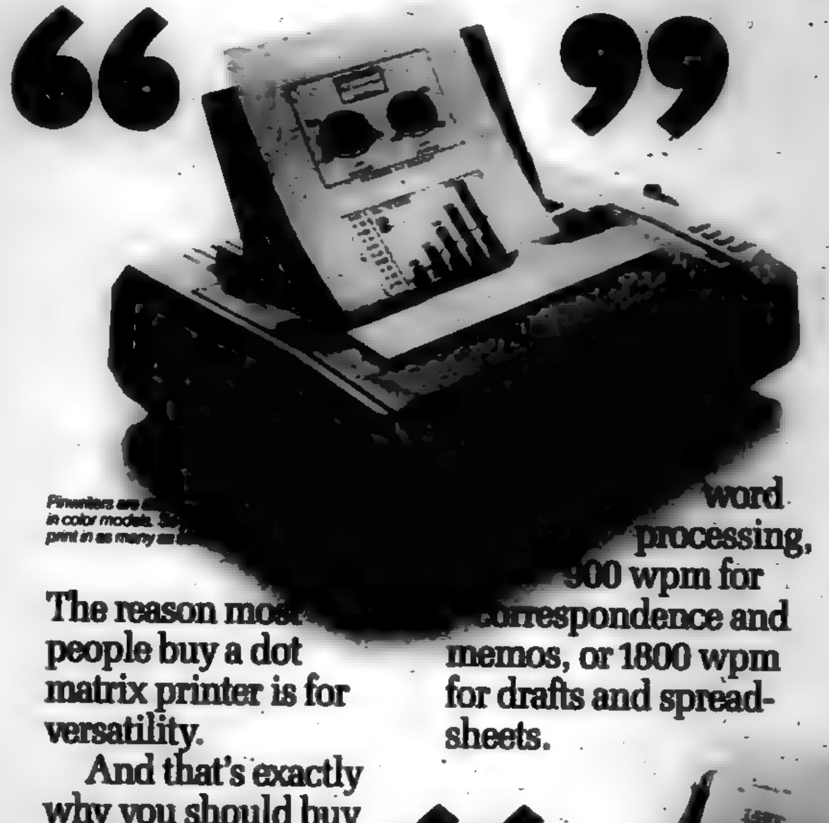

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Limited — but achievable — goals for compatibility are that all equipment in a given organization should be able to pass a data stream between peripherals. Some suppliers are promising such things as imbedded codes and formats, but these are icing on the cake. Now and for the foreseeable future, the major requirement for communications between dissimilar devices is the communication of occasional messages. If major documents, constant usage and complex formats are included in the requirements, minimal planning should dictate the choice of like devices for both sender and receiver. When compatibility is an issue, a company should insist on a "handshake" before buying any system, even if the arrangements are a little difficult for the vendor/supplier.

The third choice, changing everything to make the system uniform with the plan, appears drastic, but it may be the right answer. A new approach, with accompanying equipment, methods and procedures, is necessary when information and its effective processing are seen as critical organizational resources — for example, in the financial industry.

When the decision is made to change everything, integration issues still must be resolved. How will historical information be handled? What will be converted? When and how will all this happen? The key question is how critical and constant is the usage of "historical" information? It's often never touched after it's been filed. In those cases, a stand-alone version of the existing system can be retained for use when necessary. If such a system is not feasible, and the information must be available in editable form, contact a conversion service for a one-time cleanup. For confidential or proprietary information, conversion resources can be brought in-house and internal staff can be trained to manage it.

In such a big changeover, the schedule will have an impact on users; two situations should be considered:

- Installation Plans — Negotiate to have major cabling and electrical work done during peiods other than normal work hours and pay premiums for work done during those hours. Count on concentrated effort by the installation team. Many tradespeople will accommodate this scheduling. If these hours are not feasible, give users official written notification at least 10 work days before the planned installation.
- Loss of Support Services — Users should be able to move from the old system to the new without major processing disruptions. Plan to have a smooth dovetailing of any equipment changes with adequate testing time. Performance-based contracts can be a valuable tool to ensure supplier cooperation. If space requirements preclude parallel operations, plan on a backup system for any portion of the information processing process handled by the part of the new system not yet fully tested. In general, you need a backup program for every component of your information processing system. Consider a brother/sister scheme — you provide backup for someone else and they do the same for you.

Do not be discouraged by innovation. If you're ready to take on that responsibility and have reason to believe you'll get good support from your supplier, being a Beta test may even be the way to go. The decision should be made according to whether the value of the innovation is worth the extra effort to implement? If it's worth it, by [illegible] means go for it!

Integration is one of the most misused words in our vocabulary. OA technology provides the chance to use it in its purest form. In the role of user, senior management needs not to do more than demand a plan that incorporates system integration. Management should also think about changing the meaning of MIS from management information systems to management information services. The concept of service would then be a natural part of the planning process.

Dorsey is computer systems manager with the city of New York and a senior consultant for the Institute for Management Development.

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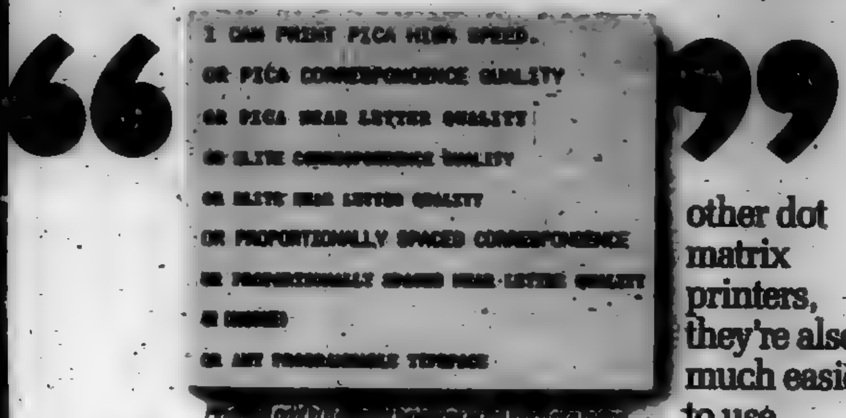

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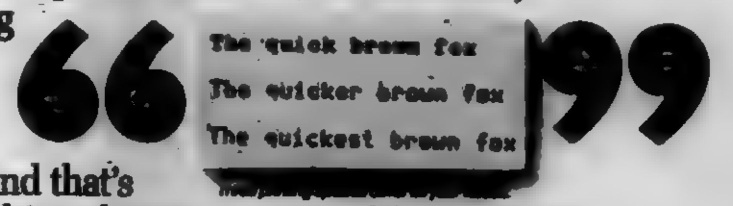

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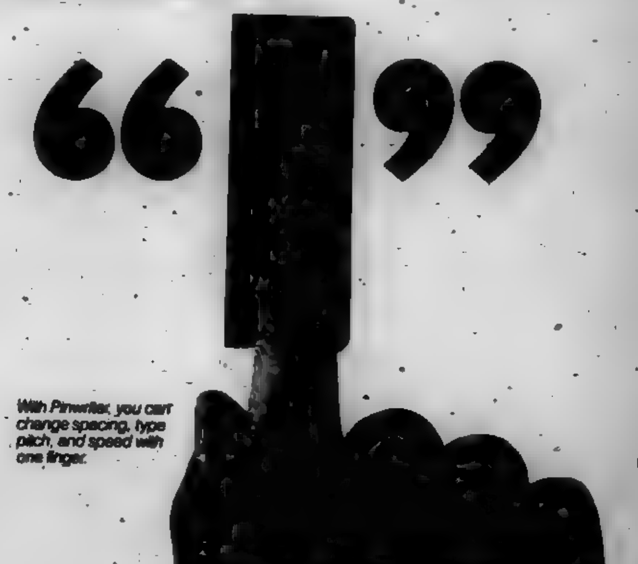

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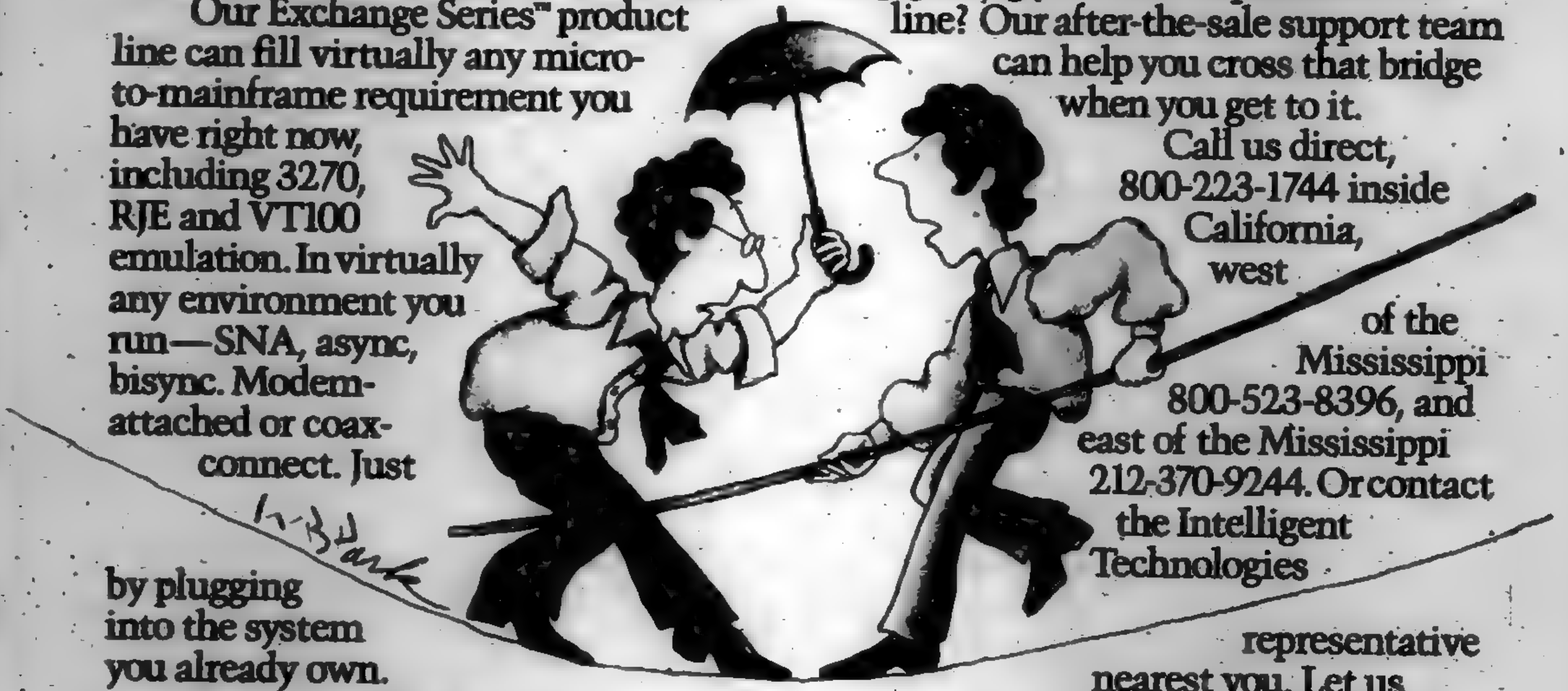

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A High-Level Approach To Local-Area Nets

By Wayne Russell

A widely held myth in the area of office automation says that selecting a local-area network for OA use is as easy as choosing the latest local-area net technology that supports the highest bandwidth, a large number of devices and multiple information types, such as voice video and data.

Over the past several years, this myth has become more popular. Only recently have organizations realized that the preoccupation with the physical aspects of local-area network technology can have negative effects on OA plans as additional people are brought on line.

A company that is selecting a local-area network as the communication vehicle for its OA system should first determine which local-area net technologies are capable of meeting its business objectives and OA requirements. Issues related to higher level services (file transfer, electronic mail and terminal emulation), needs, risks and benefits should be resolved before the local net is purchased. At this time, the company should also address other issues regarding the technical and operational aspects of the physical network.

Too often, organizations discover after installation that other issues should have been resolved before the local net was procured. The integration of OA and local-area net technologies is a two-level problem. On one level, it appears that only the technical issues (topology, bandwidth, RS-232, voice, video and data choices) need be navigated to ensure a successful endeavor. However, lurking below the surface is the reality of local-area network/OA integration: the operational and higher-level protocols and standards issues. For example, the operational issues of the charging policy and network control are sometimes foreign concepts to newer local-area network vendors. Many pioneer local-area network/OA organizations thought about and developed these mechanisms only after initial implementation. In contrast, major private branch exchange (PBX) vendors have built maintenance and control mechanisms into their turnkey products. End users of the less mature local-area network technologies should be aware that these services will be needed and planning for them must precede implementation.

Examining some basic issues of local-area network/OA integration will add a useful perspective to this discussion. Four years ago, local-area networks were in their infancy. When OA managers talked about introducing them into the work place, they emphasized technical characteristics (topology, access method, bandwidth) as the primary driving forces. Soon after, these managers found they needed to add highly specialized personnel to support the local-area network in a universal manner similar to telephone support. It was at this point that the operational issues came to the forefront.

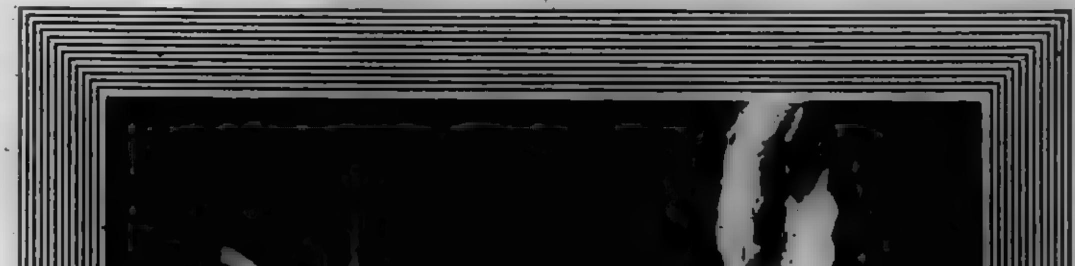
In the past two years, issues related to higher level protocols and standards that support an organization's OA strategy have received more attention. A key example of this new awareness is IBM's Personal Computer networking product based on the Sytek, Inc. local-area network. Higher-level services related to shared resources such as file and print servers as well as network control will come with the standard product. The ability to procure needed services while reliably maintaining and controlling the local-area network at the least cost should be a major concern to the group responsible for the integration of local-area network and OA technologies.

Examples of higher-level services implemented by the various protocols used in your organization's OA strategy include the following:

- File Transfer — facilitates the movement of text, data or other information between host resources on the local-area network.
- End-to-End Encryption — allows information to be protected as it moves through the local-area network.
- Virtual Terminal — similar to a protocol converter. Local-area nets implementing this service hide differences between terminal types when communicating with various hosts.
- Gateways — provide links between local-area network/OA systems and public data networks.

Depending on the particular local-area network/OA system, these services could reside in various forms on personal computers, multiuser microcomputers, large host computers or the network interface unit (NIU) of the local-area net; all should work in harmony. End users should realize that these higher-level services are typically not contained as part of the local-area net. Most local nets are basically mechanisms upon which you implement these services. Many local-area net products implement lower-level protocols (for example, the IEEE 802 standards) to transport packets of information throughout the network at a high speed and without loss of data.

The successful merging of OA technologies (personal computers,



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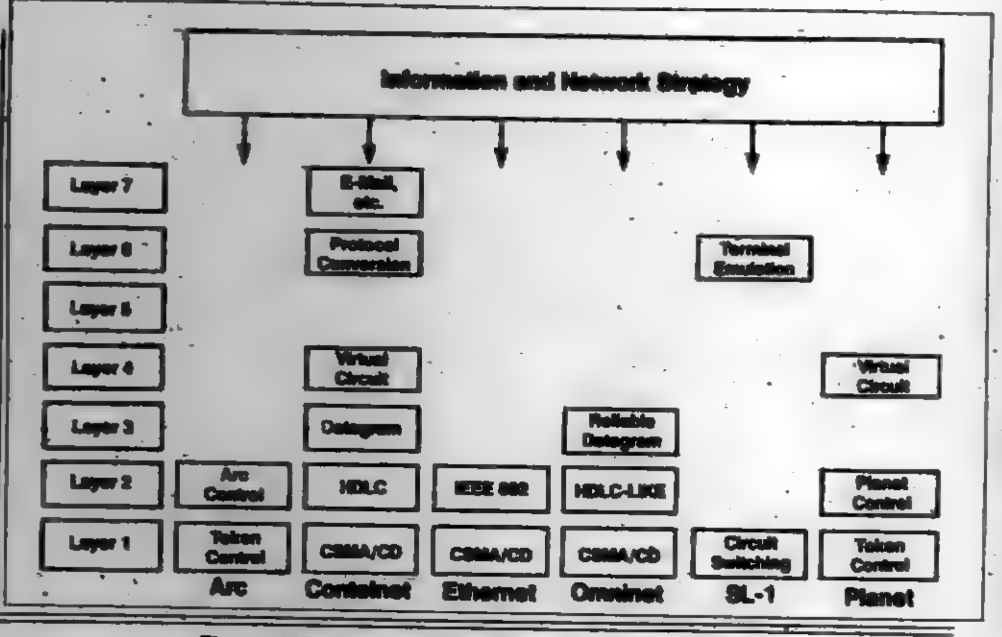

Figure 1. Examples of Local-Area Network Protocols

minicomputers and so on) and local-area network technologies is based on an understanding of where the various protocols and services reside and how they all work together.

Today, at least two models are available which the local-area network/OA planner can utilize to partition these services and protocols. The first is the ubiquitous International Standards Organization Open Systems Integration (ISO/OSI) Reference Model. The second is the Department of Defense (DOD) Internet Model upon which the Transmission Control Protocol/Internet Protocol (TCP/IP) suite of protocols is based.

The ISO/OSI and DOD Internet models, which use seven and four layers respectively, both address all services discussed here.

The model defined above addressed all the necessary services needed in local-area network/OA integration. It is interesting to note the gaps left when an organization implements a local-area network without concern for where the higher level protocols and services will reside. As can be seen with many of the products in Figure 1, the organization is left with a partially implemented system.

Mapping a local-area network/OA strategy to the DOD Internet or ISO/OSI Reference Model is not a rigorous methodology; organizations that take the extra step of examining higher level protocols and services within the scope of one model or another will have an early warning about the areas of their strategy that cannot be fully implemented via today's technologies.

To summarize the higher level protocol approach to local-area network/OA integration from a performance and business point of view: Know your OA requirements, map these [illegible] the appropriate model and, finally, select a local-area network that will best mesh with the requirements you have outlined.

On a more practical level of today's local-area network/OA market, it can safely be said that in most cases, local-area network vendors and OA vendors operate mutually exclusively. Some vendors, however, have begun to realize that using layered protocols in OA and local-area network architectures can make high-technology products more easily marketable. They are also finding that it makes them more easily adaptable to new local-area network technologies.

One example of an OA vendor that has adapted industry-standard higher level protocols to its product offering is Computer Consoles, Inc. (CCI). CCI uses the DOD's TCP/IP suite of higher level protocols to support its OA product, Officepower.

Using these protocols has provided CCI the flexibility to utilizing a multitude of local-area network technologies.

Because CCI and other vendors have defined the higher level protocols initially, they now have the flexibility to integrate more easily with an appropriate local-area network technology capable of improving the efficiency and performance of their products. The organization that uses this approach will give itself a similar flexibility.

Another example is an organization that selected a local-area network based primarily on its technical merits (extremely high bandwidth and the "potential" to support voice, video and data).

In all fairness, this organization is and was a pioneer in the integration of local-area network and OA technologies. Many of the lessons it learned formed the basis for this article.

This organization selected a broadband bus local-area network, the Sytek Localnet 20, typically used for terminal-to-host communications. The Localnet 20 utilizes proprietary protocols up to equivalent session level (Layer 5) of the ISO/OSI model.

After the installation of the Localnet 20, this organization procured CCI's Officepower product. The TCP/IP suite of protocols (Layer 4 and above) expected a datagram service at Layer 3. Because the Localnet 20 products provided proprietary protocols up to Layer 5, there was no convenient way to access the Layer 3 datagram service.

The resultant implementation can best be characterized as a "work-around" to the problem. Extra protocols header and trailer information is now attached to all user data. The final result in this organization is a less than optimal solution. Efforts are now under way to utilize other vendors' NIUs which allow access to the needed datagram service.

It is estimated that local-area net network throughput could be improved by more than 10 to 100 times through the use of local-area network products that more closely match the CCI higher level protocols.

If your organization is considering the marriage of local-area network and OA technologies, it is important to remember these issues and that the use of a higher level protocols approach will aid tremendously in the long-term relationship of your local-area network and office automation products.

Russell is senior consultant with American Management Systems, Inc., a consulting firm based in Arlington, Va.

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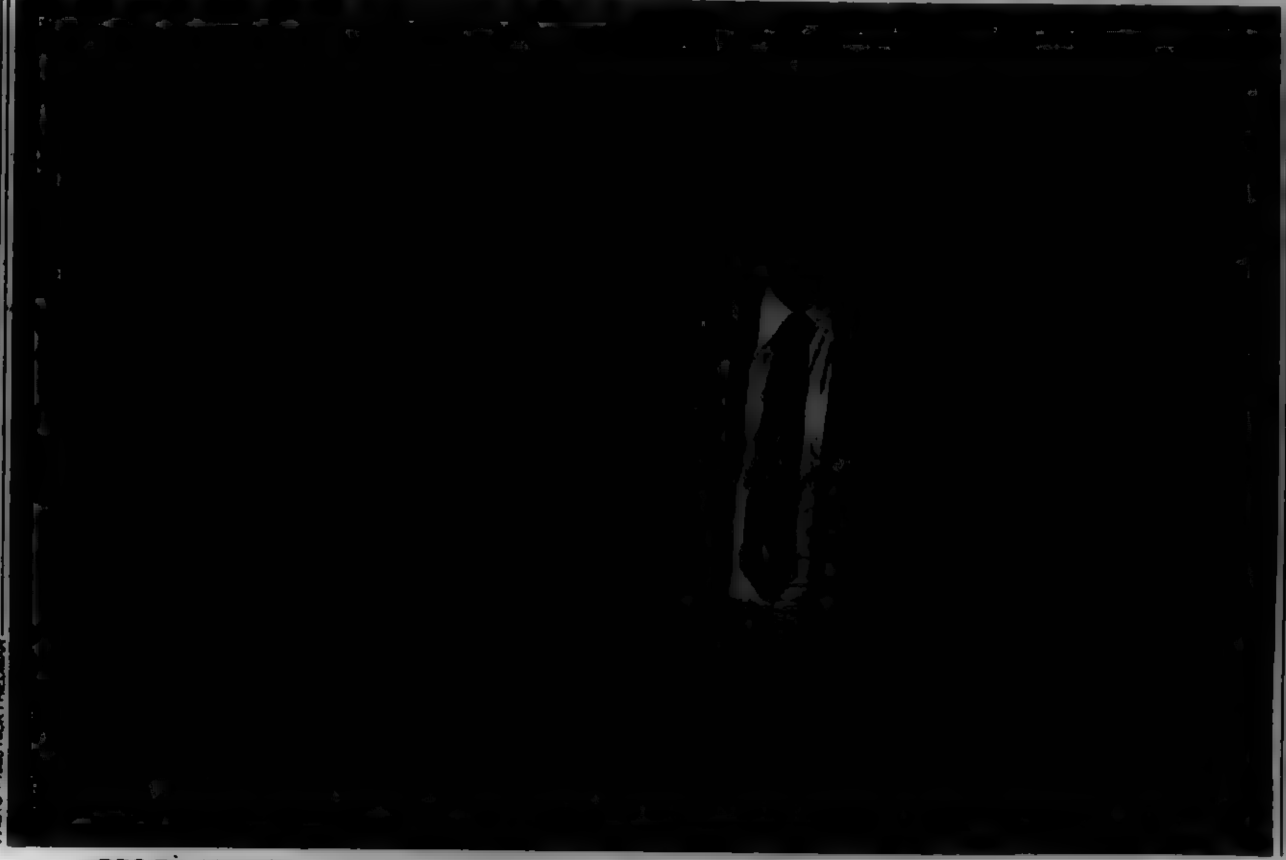
What's Up, DEC?



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DEC President Kenneth Olsen seems pleased with his company's progress since the dark days of 1983.

Three years ago, DEC wasn't known as an office supplier. Now it's one of the top four.

By Glenn Rifkin

As 1985 unfolds, Digital Equipment Corp., the world's second largest computer company, has quietly positioned itself to have an exceptional year. After suffering the slings and arrows of both the computer press and industry analysts 16 months ago, DEC regained some of the shine that it emitted during its rapid rise in the 1960s. With more than 90,000 employees and pushing past the $6 billion mark in revenues, the huge Maynard, Mass.-based firm continues to grow at 20% to 30% annually and has won praise for its rapid turnaround.

Though it has yet to solve its personal computer dilemma, DEC has solidified its product line and strategy, has restructured its internal accounting procedures and will likely sell out every 8600, the new top-of-the-line VAX, that it can produce. In addition, DEC is establishing itself as a force in the office with an enhanced All-In-1 product, solid networking solutions and more connectivity to IBM than anyone else in the market, according to consultants.

Such a stellar report card seemed unthinkable in late 1983. DEC's crisis of confidence centered around a bad economy and its disastrous entree into the retail personal computer arena. Compounding that was the delay of the 8600, which DEC's customers desperately awaited. And topping things off was a single poor fiscal quarter the company failed to anticipate, thus raising the ire of Wall Street.

DEC President Kenneth Olsen and other company officials maintain that, though DEC made mistakes, the bleak picture that was being painted was an overreaction. "We had one bad quarter and as companies go, that quarter wasn't all that bad," Olsen explained. "People wouldn't have noticed it particularly except that we were getting beaten up because personal computers were everything at the time, and we were on a track of big computers, integrated systems and communications."

Obstacles remain, however. Internally, DEC continues to reorganize. Though the company lost several key players, Olsen pointed out that he still has access to the best people at every level. Departures were inevitable when the company began to restructure from as many as 38 individual organizations to one solidified unit, he said and added, "Entrepreneurs don't make good businessmen."

In addition, DEC continues to receive criticism for lack of a cohesive marketing strategy and for not selling aggressively enough outside its customer base. It is also still attempting to shed its reputation as a scientific/engineering vendor in order to be taken seriously in the office market. "That's a very old stereotype," stated Robert C. Hughes, vice-president, marketing, for DEC's Office Information Systems group. "I'm not sure how much money it's going to take to change it. We're the second largest computer company in the world and, regardless of what industry you pick, we're first or second in that industry. We're the second supplier in the Fortune 1000, and it goes from the front office down to the lab."

As 1985 begins, that word is spreading. Among the market segments in which DEC has made the greatest strides is the office. According to Hughes, three years ago, DEC wasn't even known as an office supplier. Despite its problems, DEC has managed to jump in among the top four office suppliers in the market. Analysts estimated that DEC's office sales totaled nearly $1.5 billion in 1984, and Hughes is intent on even greener pastures. "Three years from now, I'd like people to say we are definitely number one or two in office systems," he declared. "That's a big challenge."

Industry analysts agree but tend to feel that of all the challengers to IBM, DEC has the best shot. "DEC is well positioned to sell office automation because they now understand who they are selling to and have a better feel for what the market needs," said Tim Caffrey of International Data Corp. (IDC) in Framingham, Mass. "A couple of years ago they thought throwing things on people's desk meant OA. Now they are focusing on moving VAXs with workstations running All-In-1. That is their traditional strength and it makes a lot more sense."

According to a recent survey by the Yankee Group, DEC ranked first among all office vendors in a rating of departmental system solutions.

The survey measured criteria such as networking, Systems Network Architecture (SNA) support, processor range, integrated applications software and price per user, and it gave DEC a 4.0 rating on a scale of 5.0. Data General Corp. finished second with a 3.7 overall rating.

"Across the board, DEC's product offerings are stronger than any other vendor including IBM," stated Peter Lowber, senior market analyst with Yankee Group.

DEC's office strategy is simple, according to Hughes. Rather then pushing a system into a customer's lap, DEC takes the "warm armpits" approach: Get close to the customer and find out what problem needs solving. "The tools you give people must support the way they work," Hughes said. In that context, the strategy is a five-fingered one consisting of dumb terminals, personal computers, communication products, departmental computers and networking capabilities — all tied together.

The strategy, called All-In-1 (not to be confused with the software product of the same name) positions the five fingers under a single umbrella of VAXs and the proprietary Digital Network Architecture. "People buy the All-In-1 concept; they don't necessarily have to buy the product. You can have a big office system from DEC without All-In-1 on it," said Hughes.

All-In-1, the software product, is considered by DEC to be the key element in its office strategy, however. Though its first release, offered in June 1982, was considered inadequate by many consultants, All-In-1 was well received by customers. In his January 1984 issue of *Monosson On DEC*, Sonny Monosson wrote "With All-In-1, DEC appears to be in the right place with the right product at the right time. DEC has scored a major coup by commanding a lead in this market."

An estimated 1,200 installations of All-In-1 are currently in place (outselling both DG's CEO and Wang Laboratories, Inc.'s Wangoffice). In December 1984, DEC unveiled Version 2 of the system which has met with more than favorable reviews.

"The first version didn't satisfy my requirements," said Andria Rossi of the Seybold Consulting Group, Inc. "But I'm quite pleased with Version 2. They have filled the gaps, and there is now a consistent user interface across the product line. They are great enhancements."

"The enhancements to All-In-1 really help," added Matt Meehan, a computer analyst with Salomon Brothers, Inc. in New York. "It's a good product, and I expect it to be well received."

All-In-1, which runs on the VAX/VMS operating systems, is essentially an integrated electronic mail and word processing system. With the enhancements, DEC has added to the consistency of the menu-driven interface, added interrupt capabilities, network-wide calendaring, fully integrated computer-based instruction, along with an integrated voice and WP option.

DEC's new integrated WP package, WPS-Plus, a Decmate-style package that features a scientific/technical character set, is also available as an option. Adding a bit of sizzle, DEC also incorporated its Dectalk Mail Access and Voice Messaging Support options to the system along with an innovative videotex system for corporate information sharing.

DEC offers a wide range of processors to power All-In-1 — from the new 8600 (yet to be delivered) down to its personal computers. Though All-In-1 currently does not run on the DEC Rainbow, Hughes indicated that that capability would be available this year. The eight-year-old VAX has continued to sell strongly despite complaints from competitors that it lacked current power requirements. The long-awaited (delayed a year and a half) 8600 addresses that issue for DEC.

"IDC believes that DEC will sell every 8600 it can make," said Caffrey. "And high-end sales can definitely lead to OA sales."

At the low-end workstation level, however, DEC continues to face severe questions. The Microvax, which brings the power of the VAX to the desktop, has been well received, but it is expensive ($14,000) and has not yet been clearly positioned in the office. The personal computers, the Rainbow, Decmate II and III, and the Professional 350/380 have had varying degrees of success, but have caused great confusion for end users.

At the low-end workstation level, DEC continues to face severe questions. The Microvax has been well received, but it is expensive. The personal computers have had varying degrees of success, but have caused great confusion for end users.

Hughes insisted that personal computing and personal computers are "not mutually consistent words." Personal computing, he explained, does not require a personal computer and can be done using VT 100, 220 or 240 terminals on a departmental VAX. "That part of our business is growing as fast as the personal computer market."

"They have a gap at the low end," argued Caffrey. "People are looking for a powerful workstation to take the burden off the central processor whether DEC likes it or not."

The Decmate II, a dedicated WP machine with a few personal computing options, has done quite well, according to Hughes. "Decmate, in terms of revenues, is a Fortune 500 company by itself," Hughes stated.

The Rainbow (which Hughes pointed out was never intended to be part of DEC's office strategy) has continued to have problems. Its foray into the retail market was a disaster — "We lost our shirts in that market," said Olsen — and has not sold well even to DEC customers.

Despite this, Olsen is committed to a personal computer product. "We went into personal computers, and we are planning new machines, as terminals for our VAXs. It is an important part of our strategy."

In the office, the Rainbow created problems. "We either misread the market or mismarketed it," said Hughes. "The mix of Rainbow sales was just the opposite of what we thought it would be. Seventy-five percent of them went to larger accounts. Customers said 'I got this thing from DEC and I bought it with a WP product on it. What are you going to do to make it part of your integrated office system?' And we're committed to that."

Though DEC won't discuss unannounced products, the company is currently working on its Rainbow 25, rumored to be an IBM-compatible machine that combines the features of the Rainbow and Decmate into one unit.

"I acknowledge that I need a product to replace the Decmate and the Rainbow," Hughes admitted. "I acknowledge that it has to have that kind of capability on it. But there are a lot of different ways to solve that problem. It's very important that whatever product we come out with be tightly integrated into our own strategy first and also support whatever the industry standard product is."

Industry watchers suggest that DEC settle on either the Microvax or the Pro as its low-end workstation, lower the price to compete with IBM and focus its marketing on that machine rather than continue the confusion. "It's frustrating because they have the product and a window of opportunity," said Lowber. "It's just a matter of taking advantage of it."

In networking and connectivity, DEC is taking advantage. The Yankee Group's survey lauded DEC's networking capabilities and SNA support, giving the company top ratings in both. Decnet, the proprietary networking architecture software and hardware introduced in 1976, is "superior to any other minicomputer offering," stated Lowber. "It has a large installed base (over 20,000 nodes) and supports a broad range of processors." DEC also offers a Decnet/SNA gateway, which features a network-to-network rather than point-to-point design.

"Our customers have told us that their Number One need is a multivendor network," declared Maureen Lawrence, product marketing manager of DEC's networks and communications marketing group. "The MIS manager wants to be able to communicate worldwide and maintain transparency." DEC is involved in both gateway approaches and international standards solutions for networking, Lawrence pointed out.

Perhaps most impressive to consultants is DEC's connection to the IBM world. Last October, DEC announced three new IBM interconnect products including DDXF, a Disoss document exchange facility which allows users on a Decnet network to exchange final form documents with an IBM office systems network. DEC also introduced the Distributed Host Command Facility, which allows IBM 3270 users in an SNA environment to connect to a distributed VAX network; and the VMS printer emulator, which allows users to print information from an IBM mainframe on a high-speed printer connected to a VAX.

With its ability to run Disoss, DEC is at least a year ahead of the other minicomputer vendors in that area, Lowber insisted. "DEC is today where IBM wants to be," added Meehan.

DEC has also expanded its commitment to Ethernet, the local-area network. According to Lawrence, DEC has more than 10,000 computers on Ethernet connections and is extending Ethernet to broadband. "If IBM comes out with an accepted standard, we will interconnect to it as well," Lawrence said.

DEC recently forged an agreement with Vitalink Communications Corp. to market a product called Translan, which allows a transparent interconnect of local-area networks via satellites.

Despite its success with technology, DEC continues to be chastised for the lack of cohesive marketing strategy. Said Rossi, "Advertising and marketing simply haven't been where they should be for DEC to be Number One." "They have to pull the team together and get a focused message across," added Lowber.

Henry Ancona, product group manager for office systems, believes that DEC is doing that, but not by conventional means. "Marketing means listening to your customers," Ancona explained. Rather than spend millions on television advertising, DEC prefers to target its potential customers at trade shows, with direct mail, and at executive seminars and company-sponsored expositions such as the recent Decworld in Boston, Ancona said. Olsen agreed.

"IBM doesn't market their big systems on TV," Olsen declared. "With our kind of marketing, we introduce a system to a company and ask them to grow with us. At Decworld, we had 12,000 people who had specific technical needs. And all the Charlie Chaplins in the world couldn't have gotten our message across because those people knew exactly what they wanted."

Hughes is not convinced. Though he noticed no particular reward from DEC's television advertising in 1983, he acknowledged that it may be necessary. "Running this group, I think we need it," he said. Though MIS managers tend to know DEC, middle-level clerical people who are often key members of OA committees still don't know the company. "I'm not sure what we are going to do yet, but we are looking at ways to test the TV campaigns to find out what they do for us."

Hughes admitted that DEC is hesitant to blow its own horn when landing large accounts as do its rivals. "I'm sorely tempted to do it, but it's not my style," he said.

This low-key approach has frustrated consultants.

"DEC has an incredible window of opportunity in the next two years," Lowber stated. "To really take advantage they need new accounts, and to get them they have to let people know they're not the old DEC anymore. But they have lots of potential, and they *are* going to have a good year." ■

Rifkin is senior editor at Computerworld Focus.

You Can Get There from Here–OA Survey Shows How

By Lee White

Only five years ago, office automation consisted of little more than some stand-alone word processing machines that were operated by the same people who had previously worked on typewriters. What had been the typing pool emerged as the WP department, and the office manager became the WP supervisor.

But all that is history now, according to 23 large businesses and universities surveyed by *Computerworld Focus* in the last weeks of 1984. New technologies have become entrenched in organizations throughout the country. Equipment has been tested, enhanced and replaced. Management responsibility for OA has exited the WP department and climbed the corporate ladder. The number of users of OA hardware and software tools is approaching 50% of the white-collar workers, according to some survey respondents. The information center, nonexistent in 1980, is flourishing and creating a new category of professionals. And, in general, in-house OA personnel appear pleased with the support provided by hardware and software manufacturers.

The most obvious changes have been in equipment and how it is used. The survey found that stand-alone word processors, whether automated typewriters or CRT-based machines, have been replaced by shared-logic systems or personal computers. The shared-logic systems, which had been used predominantly in WP centers, are rarely found in a centralized location today. In most cases, the centers were supplanted by satellite WP stations. Companies that have large, shared-logic systems will probably keep them, and some are adding terminals as the need arises. Most respondents, however, said they believed the personal computer will become the secretarial workstation of the future if WP software continues to improve.

The in-house OA people have more in common than their views on trends in WP. About 50% of those surveyed are members of the management information systems (MIS) department, another 40% belong to the OA or office systems area and the remainder are heads of information centers and generally report to the head of the MIS department. These people most often carry the title of manager, although almost as many are directors or vice-presidents. At least one IBM mainframe can be found at all their companies and almost half of them also have Digital Equipment Corp., Prime Computer, Inc. or Hewlett-Packard Co. minicomputers.

These mainframes and minicomputers are handling very little WP, but they're doing tremendous amounts of decision support. The most frequently mentioned tools were Ramis (Mathematica Products Group, Inc.), Focus (Information Builders, Inc.), ADRS and APLDI (IBM) and Easytrieve (Pansophic Systems, Inc.). In the organizations surveyed, there is not a great deal of electronic mail soft-

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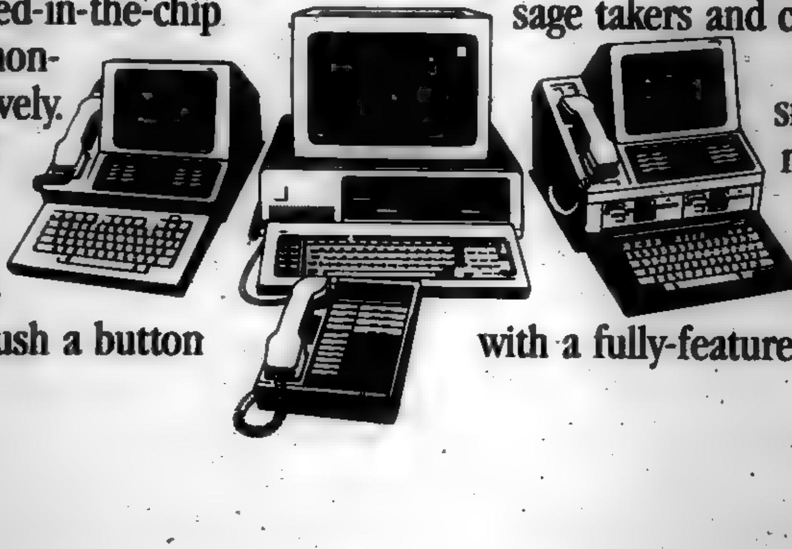

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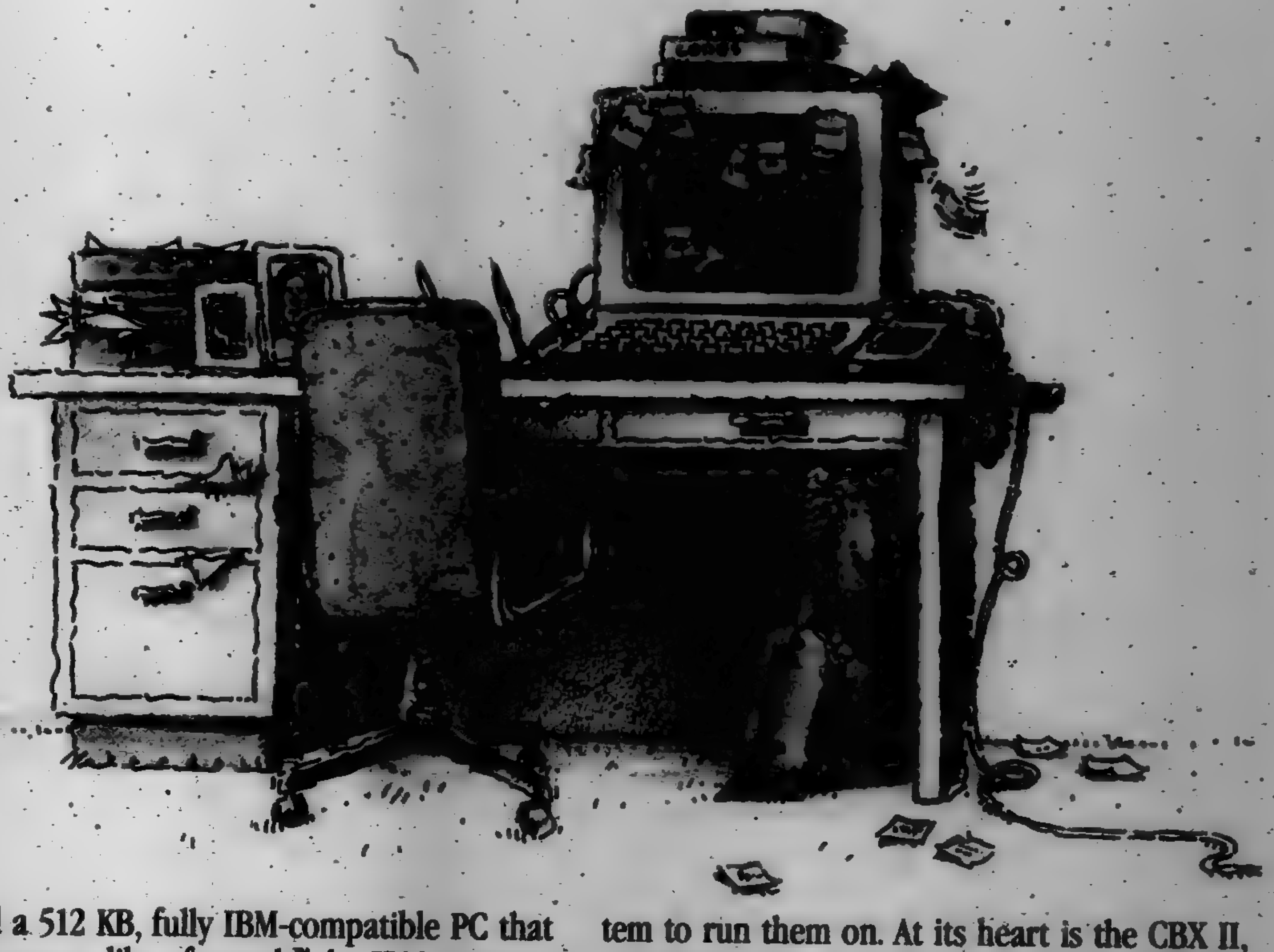

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ware running on the mainframes or minis. Three companies are using IBM's Professional Office System (Profs); two are using products from Wang Laboratories, Inc. and Prime; and a few are playing with a homegrown version. Most respondents viewed electronic mail as a tool for remote locations to talk to one another, not as a replacement for the telephone in a single or clustered environment.

The telephone and the telecommunications function were not viewed as a responsibility of the OA department in a majority of the companies surveyed. Less than a quarter of the people managed the telecommunications department, although many said they believed it should be part of OA. Most of the companies are using private telephone systems and Rolm Corp. was most frequently mentioned.

One aspect of telephone use that seems to be exciting no one at all is its role in allowing people to work from home. Tying a personal computer at home to the company's mainframe via a telephone line may be nirvana to some, but it isn't happening yet and doesn't seem likely in the near future. Although most respondents gave little thought to telecommuting, Harry Oakes, vice-president of Office Systems for Greyhound Corp. in Phoenix, had definite opinions about it. "I don't see it coming. The need for personal contact just won't let it happen." Oakes' sentiments are borne out by a recent survey of 701 knowledge workers contacted by Honeywell Technalysis, a research program sponsored by Honeywell Corp. for its Office Management Systems Division. The study found only 7% would opt to work exclusively at home, and 36% would work half at home and half at the office. An overwhelming 56% said they would continue to go to the office every day even if they didn't have to.

The personal computer may not be playing a part in telecommuting, but it is probably the single most important factor in the growing respectability of OA. Trinet, Inc., a subsidiary of Control Data Corp., recently released a report showing that 51% of executives under 50 years old use computers, and 77% of them have used the machines for less than two years.

The personal computer, which occupies less than one-quarter of the space on an average desktop, is doing for managers, secretaries, chief executive officers and plant personnel what some mainframes did for entire companies a few years ago. It is functioning as a word processor, spreadsheeter, graph maker, communicator, uploader, downloader and file server. The personal computer chosen by all of the companies surveyed in the random sample was the IBM Personal Computer or a compatible machine.

Acquiring a personal computer requires more work than simply filling out a purchase requisition. Most companies insist on either cost or application justification before a personal computer may be purchased. Writing justifications can be very time consuming, and often the paperwork involved hardly seems worth it. Ron Goldfarb, manager of administrative services at Pratt and Whitney Aircraft Co.'s group headquarters in Hartford, Conn., took a different tack from the very beginning.

"In 1981-82, we brought in six PCs as a pilot project," Goldfarb explained. "We chose a cross section of departments to receive them and carefully measured productivity via log sheets. Of course, it couldn't be exact, but the user knew when something used to take two days and now took 10 minutes. After a few months of monitoring, we found that the time saved by going from a manual system to a PC worked out to a 172% to 250% return on investment. This meant that the PC had a six-month payback." Because the initial measurements were so exhaustive, he said, executive management at Pratt and Whitney believes the justification for personal computer applications is already in place.

Although some survey participants

(Continued on Page 44)

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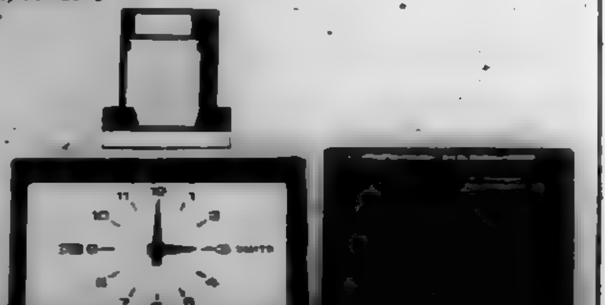

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OA Is Affecting Jobs— Who's Managing Those Changes?

By John J. Walsh

An interesting event went almost unnoticed in 1983: The capital investment for the average information worker equaled that for the average factory worker on the assembly line.

This fact will be quite a shock for those of us raised on the Stanford Research Study statistics that state the total capital endowment for the average office worker is $2,000 vs. $25,000 for the average factory worker. An examination of the present U.S. work force will illustrate why this change has occurred: In 1983, information workers occupied more than 55% of all positions within the U.S.

Concurrently, capital investment in computers and communications has grown at such a rapid pace that it now accounts for almost one-third of total business fixed investment. It follows that, because technology typically flows to the most information-intensive areas of any business, information workers have been the primary recipients of both large capital expenditures and the latest information technology.

The implications of the expanding information economy are perhaps most profound in employment, particularly because the flow of high-tech capital shows no signs of early abatement.

History shows that as machines took over the physical labor of workers, the mental efforts of workers became even more important. These workers moved to jobs that machines could not perform. Today's office environment does not offer such opportunities; office technology offers more efficient and less expensive alternatives to office workers. New York University Professor Wassily Leontief, writing about the developing obsolescence many office workers face, drew a comparison between their situation and that of horses after the 19th century Industrial Revolution. "Even if the horses had been willing to eat less oats, tractors would have replaced them anyway," he stated.

As office automation technologies offer vastly improved functionality at lower cost, productivity enhancements in the range of 40% to 60% are now real possibilities, particularly among certain categories of professional and managerial workers. A recent advertisement from a major OA supplier cited a case study in which productivity benefits of 56% were attained by white-collar "professionals" through the use of an integrated OA system.

In response to the increased demand for office technology, senior managers are expressing more concern and interest in exercising control over the use of the technology. Traditional methods of ad hoc short-term acquisition decisions are quickly disappearing. As procurement of office technologies consumes an ever-increasing portion of corporate capital spending, senior corporate managers are demanding scrupulous financial reviews and cost-justification analyses. And no wonder — investing in several personal computers is a nominal capital investment when the purchase price is $3,000 to $6,000 each.

Consider, however, the organization that acquires 1,000 personal computers. The basic capital investment, which already appears substantial, is in reality probably three to four time larger! The missing figure was composed of additional requirements — installation, educational support, supplies, modems and communications usage, electricity, facilities and maintenance, software procurement and additional system peripherals that are typically added over time.

> **Advanced office systems will enable organizations to distribute more responsibility downward. This downward movement will result in flattened organizational structures and, in turn, will provide opportunities to eliminate many mid-level managers and professionals.**

What initially appeared to be a capital expense of $3 million to $6 million became an inordinately large capital and operational expense more in the range of $9 million to $24 million.

Some companies have used administrative review methodologies and formalized operational/benefit tracking questionnaires to identify direct cost-saving opportunities. By doing so, they have cost-justified significant investment in office technology strictly on the basis of elimination of materials expense and facilities utilization.

Office system technologies can be justified by materials displacement and facilities reduction expense. Nevertheless, many corporations are experiencing an increasing pressure to replace or displace office workers whose skills are no longer required because of the capabilities and efficiencies offered by available office technologies.

The implications of this trend are significant. Advanced office systems will enable organizations to distribute more responsibility downward. This downward movement will result in flattened organizational structures and, in turn, will provide opportunities to eliminate many mid-level management and professional positions.

At the same time, the technology will offer large organizations an opportunity to utilize more and more paraprofessionals in place of mid-level managers and professionals. Many of the paraprofessionals will be women returning to the work force after raising families. Evidence of this trend can already be seen when structural change brought about by the developing information economy is reviewed.

The average corporate staff is distributed as follows: typing (3%), secretarial (10%), clerical (31%), technical and production (6%), scientific/engineering (9%), DP (3%), knowledge (18%), managerial (17%) and executive (2%).

A review of salary costs indicates most salary dollars (about 77%) go to managers and knowledge workers. When executive salaries are added, more than 80% of all salaries are included. Considering that salaries double every seven to eight years, the effect of these figures on corporations is not surprising.

In conjunction with efforts to achieve greater corporate productivity and profitability through use of available information technologies, many corporations are also seriously evaluating basic policies concerning elimination, displacement and employment avoidance of these categories of workers.

Although technological innovation is widely thought to eliminate jobs, high technology is the principal creator of jobs in today's economy. This becomes particularly evident when the growth in high-tech investment from the period 1960-1984 is correlated with the number of employed persons in the U.S. economy for the same period.

Available office technologies are nevertheless significantly changing the way people work and in turn are causing the rapid automation of semiskilled and routine administrative tasks. In this process, knowledge workers, managers and executives are provided significant productivity improvements as the technology enables them to shift from execution to planning, from delegation to participation and from direction to coordination.

To most corporate managers, the establishment of an objective of staff reduc-

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Materials	Preautomation Volumes	Benefits (Reduction)
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Paper Reports	15,000,000 Pages	50%
File Cabinets	10% Office Space	25%
Bond Paper	35,000,000 Pages	50%
Typewriters	800	50%
File Cabinets	2,000	25%
Staff	**Percentage Time Daily**	**Benefits (Reduction)**
Creation of Documents	Executive 24%	25%
	Secretary 30%	25%
Information Retrieval	Executive 5%	25%
	Secretary 7%	25%
Time on Phone	Executive 8%	50%
	Secretary 9%	37%

Figure 1. Benefits Achieved by Advanced Multifunctional OA System

tions as a result of the introduction of the new office technologies remains an anathema. The reality, however, is that over and over these managers are coming to the conclusion that the new office technologies will result in significant opportunities for middle management staff reductions.

Some significant reactions will certainly result from these trends. The awe and admiration of the new office technologies will be replaced by the realization of the efficiency and productivity opportunities they bring. This awareness will produce strains that will have to be addressed and that will become an integral part of company management and staff relations.

Attention will have to be given to all categories of office workers; no one will be exempt from the impact of technology. Particular attention will have to be given to the new type of skilled office workers who have started to appear in the corporate environment. These people come to their jobs equipped with a basic knowledge of text processing, computing and communications, and they quickly become critical to the functional operation of the particular department in which they work. In many organizations and industries, these new office workers are emerging as a type of office elite.

A strain and division has already developed between these younger office technology specialists and older established office workers who are unable to adjust to the new technologies and accompanying revised processes. OA is in many cases particularly bad news for older workers. Their traditional skills often become obsolete, and many find themselves working under the supervision and direction of younger employees. Because of fear and lack of opportunity to communicate their frustrations, many older workers keep their feelings and opinions to themselves. Although this reserve often leads to passive support of technological change, inwardly these employees react to the new office environment by withdrawing and losing enthusiasm for their jobs. In many cases, the psychological impact of automation can be significant.

Both corporations and office workers have remained relatively passive regarding the employment issues associated with OA technology, but implications for the future indicate that both groups will have to give far more thought and effort to addressing this and other related personnel issues. Failure to do so will result in severe problems.

Recent trends in white-collar union membership show startling increases in the number of white-collar workers who are joining unions and in their increasingly vocal attitudes toward issues such as the use of new office technology, lifetime employment, position reassignment decisions and acceptance of the reductions of staff as a result of technology introduction and resultant efficiencies.

As we develop more and more confidence in OA's ability to assist us in achieving corporate productivity benefits, perhaps it is also time to give serious thought to transition support for workers affected by the technology. This support can involve reeducation, new approaches toward job reassignment, job sharing, extended unemployment insurance, employee transfers between different companies and special severance agreements and payments for those whose jobs are eliminated.

Office automation is real in the benefits it will bring; now it's time to address the implications of change office automation will bring to the office work place and work force. By doing so, we will all be better positioned to achieve the full benefit of office automation and our corporations will be strengthened, both competitively and in terms of employee satisfaction, as they mature in its use. ▪

Walsh is with The Visual Technology Group, Inc. in New York, N.Y.

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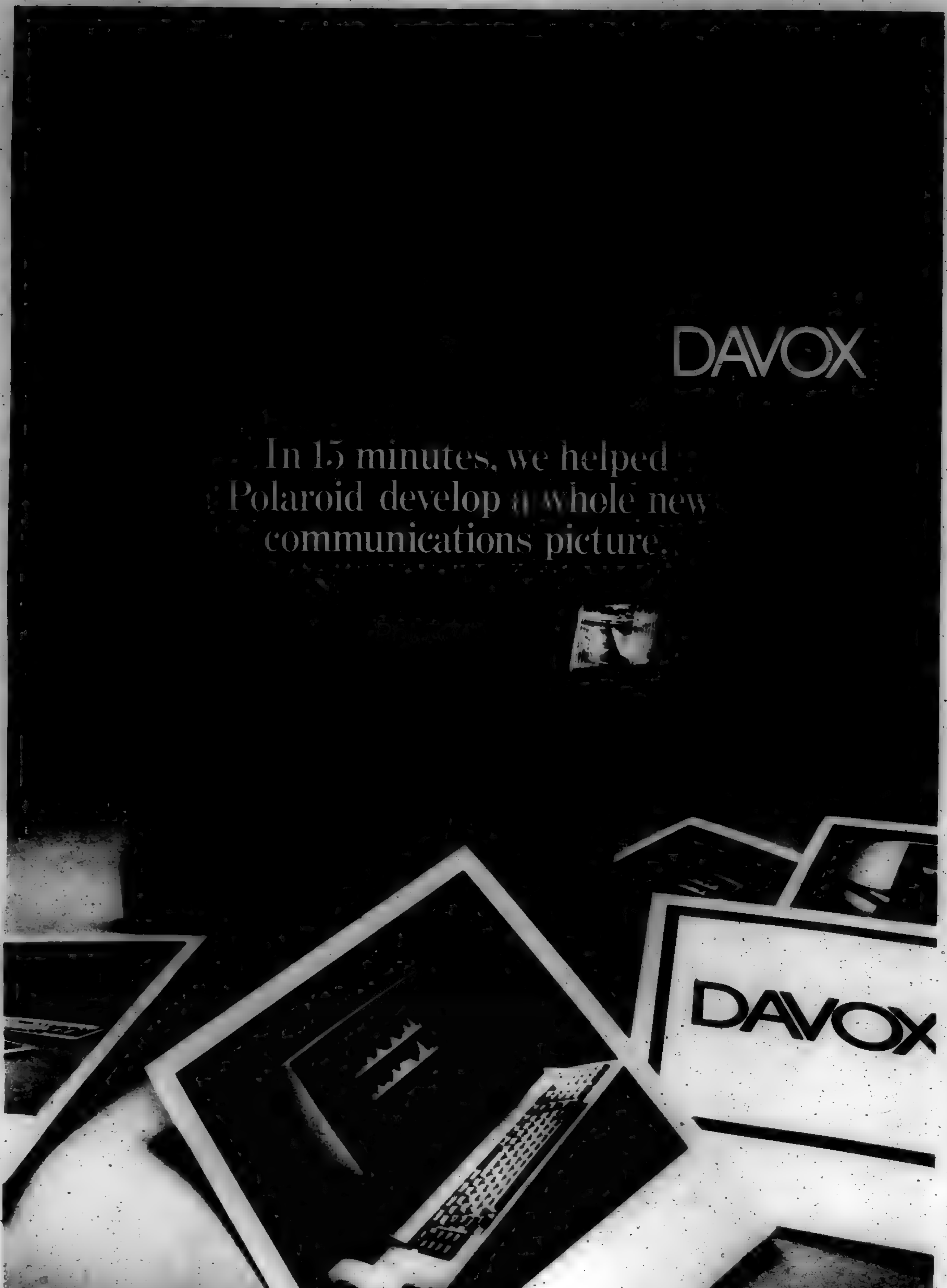
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Security Pacific Is Banking on Office Automation

By Glenn Rifkin

In November 1978, computers at Security Pacific National Bank became the focus of international attention. A computer consultant named Stanley Mark Rifkin was arrested by FBI agents for using electronic funds transfer to steal more than $10 million from the Los Angeles-based bank. Though the record-breaking heist graphically illustrated the downside of computing, it did little to deter Security Pacific from embracing the technology.

While Rifkin went on to prison, Security Pacific went on to create an innovative and fruitful environment for end-user computing. Though security remains a high-priority item, the nation's eighth-largest bank has not hesitated to spread personal computing and office automation throughout the corporation.

The OA push at Security Pacific actually began in the mid-1970s when the bank had a flourishing word processing center — the largest on the West Coast, according to Irving Margol, executive vice-president of management services. At that time, Margol's industrial engineering department felt that offering a central WP center would alleviate secretarial work loads and cut down the need for additional secretarial help. At its zenith, the center became so productive that it kept three full WP shifts busy.

As WP flourished, the bank's Automated Data Processing (ADP) department was feeling the pressures of managing information flow around the organization. As the '80s began, DuWayne J. Peterson, executive vice-president of ADP, was discovering that the increasing load on the bank's time-sharing facilities and the influx of personal computers was creating a potential nightmare of confusion if end-user computing didn't get the attention and guidance it required.

In 1981, Margol and Peterson joined forces to create an OA steering committee. The committee brought together senior officers from all major units in the bank and then hired two outside consultants to help create a formal charter for OA. Though it has not achieved the success it had foreseen, the OA committee has laid the groundwork for controlled end-user computing throughout the bank. According to Margol, "Things were more technology-driven when the committee was formed. Today, everything is user-driven and we've had to become more user-oriented." Another problem that plagued the committee was that it was simply too segmented to oversee implementation effectively.

The committee has, in fact, evolved into a clearinghouse for major issues (such as health-related questions); strategies for users, ADP and vendors; and corporate directions. For actual hands-on implementation, the committee could not respond quickly enough and turned to ADP to administer a solution. The bank's end-user community was chomping at the bit for personal computers and ADP was forced to move quickly.

John Singleton, executive vice-president and second in command to Peterson in ADP, pointed out that "Office automation is possibly a term that has come and gone. While we tried to figure out what to do with it, it passed us by. You're really looking at distributed data processing, which is what OA has become. It started as word processing, but has accelerated to where people are now writing applications, becoming quasi-data processors and developing turnkey systems for themselves — with or without the help of DP."

In April 1983, the OA committee chartered the Interactive Computing Division (ICD) within ADP to serve the end users' needs more effectively. It is at the ICD, run by Vice-President James E. Smith, that end-user computing has truly come to fruition at Security Pacific. The division handles all training, acquisitions, consulting and support for micros throughout the bank and has done so without creating the usual tension between DP and end user.

The division received its formal charter after a grass-roots movement developed in the bank; the movement grew out of the frustrated time-sharing environment, according to James D. Brandt, vice-president of microcomputer services. "Once people saw what PCs could do, there was a lot of pressure for this," he said.

In its haste to respond, ADP outlined clear goals. Among the most important was creating an amicable relationship between DP and users. "If you say to the user community, 'I am going to be the czar of OA, and nothing happens unless I approve it,' it won't work," Singleton said. "People will find a way to beat the system. You need to manage the process rather than control it. You do that by education, by being of value-added."

In order to provide value-added service, ICD has created four subgroups to service users: the micro center, an acquisitions facility, the training and support center and an in-house consulting unit.

First, they established the micro center, a store-like facility that serves as the single point of contact on micros for the entire bank. The center carries a variety of micros, printers, plotters and software for employees to examine for purchase. Though an employee can request any personal computer, the center has a core set of "supported" products — primarily the IBM PC and its peripherals — which it expressly recommends. Thus far, the center has installed more than 1,000 micros in the bank and expects that number to double by the end of 1985.

The ICD is also responsible for all volume acquisitions for the bank and handles all training and support for end users. According to Brandt, more than 2,000 employees will take training classes at the center in 1985, and that will keep the five full-time trainers more than busy.

Finally, ICD serves as the in-house consulting unit for all micro-related projects. The group does all front-end needs analysis, which includes getting vendor proposals, installation and follow-up. For Singleton, this cohesive approach to user support is critical.

"We simply take the risk out of these things for the user. After that, the more the users become full-fledged partners in absorbing responsibility, the better. Then they can look upon us as the architects. In OA, you need an architect," he said.

According to Margol, it became obvious early on that even good architects need top management backing to make a plan work. With that in mind, Margol and Peterson invited all of the bank's executive vice-presidents to spend a full day at the micro center "to get an education about office automation." The executives were given hands-on training on personal computers and used such software packages as Lotus Development Corp.'s 1-2-3. There were guest speakers and case studies and some added incentives. "To get a ticket for lunch, they had to sit at the terminal and punch up a specific program," Margol said, smiling. "We made it very friendly."

In fact, the top executives at Security Pacific may have had all the incentive they needed even before attending the micro center class. The bank's president, George F. Moody, had the first personal computer in the bank.

"He was asking so many questions that people started getting personal computers in self-defense," Singleton explained. "It scared them that the president was one step ahead of them."

With Moody's lead and the success of the executive training, Singleton plans to spread the news down, level by level, through all the management personnel at the bank. Although divisions and individual employees are free to request any products, the ICD makes it clear that IBM is the preferred vendor because of its dominance of the personal computer market.

Since 1982, according to Smith, the bank has spent between $10 million and $15 million on micros (about 90% IBM) and no letup is in sight. Because of its huge commitment to the technology, the bank has access to products several months before they are announced. This gives end users added benefit because the micro center technicians can test and benchmark products against other offerings and, on the day a new machine is announced, can give users a clear idea of what it will do for them.

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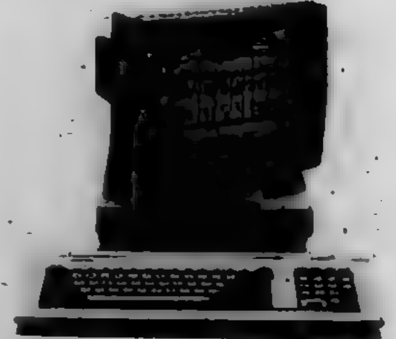

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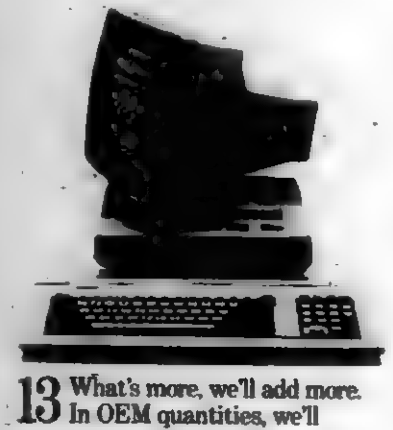

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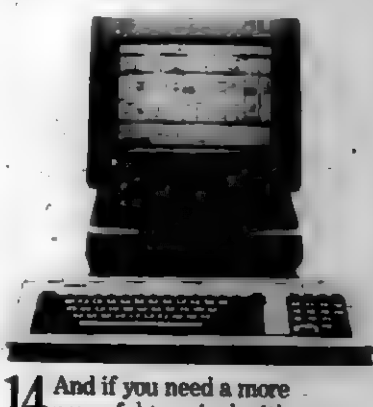

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The bank's president had the first personal computer in the bank. He started asking so many questions that people started getting personal computers in self-defense. It scared them that the president was one step ahead of them.

frame shop, the micro center has taken a stance of "Violate IBM at your own risk." Brandt recalled one user group that insisted on purchasing Apple Computer, Inc.'s Apple IIs and has since replaced them with IBM PCs.

Though the center carries a wide variety of software, it has standardized on Lotus' 1-2-3 for spreadsheet analysis, on IBM's Displaywrite 2 for word processing and on Ashton-Tate's Dbase II for data base management. "We add as demand dictates," Brandt said.

The bank also brought in more than 200 IBM Displaywriters for use at the secretarial level. With the introduction of Displaywrite 2 software for the IBM PC, however, Smith and Brandt agreed the Displaywriter's days are numbered and that IBM will probably cease producing it. They said they have stopped bringing in the Displaywriters.

The center offers access to a broad spectrum of outside data bases, such as Dow Jones, The New York Times, Compuserve and others.

Like other major users, Security Pacific is still seeking solutions to both local-area network and private branch exchange questions. Brandt explained that the center has installed 3Com Corp.'s network using the IBM PC XT as a file server, but is also exploring several other possibilities. Smith added that bids have been submitted by several major PBX vendors — including AT&T, Northern Telecom, Inc., Rolm Corp. and CXC Corp. —for wiring several new bank facilities.

In fact, in October, Security Pacific and MCI Communications Corp. announced a joint nationwide telecommunications network using MCI's Datanet to provide low-cost delivery of financial services to the bank's employees and customers.

Although networking is a concern, the bank has put that on a lower priority level. "It's really an issue of personal productivity," Brandt explained. "We haven't even scratched the surface of personal productivity yet, and we feel no compulsion to be at the leading edge. We have no intention of sacrificing today's users to be at the leading edge."

Though Security Pacific is clearly committed to the influx of technology, it is not doing so blindly. The issues of productivity and cost-justification are of paramount concern and both Singleton and Smith agreed that productivity increases are already being noted. In the bank's commercial lending centers, for example, more than 400 lending officers are being given personal computers to automate their work. The bank is planning to keep the staffing level flat in that area and plans to take on at least 20% more accounts — which reflects a minimum 20% productivity increase.

Despite the optimistic outlook, cost-justification is a strict requirement at the bank. "We have to measure. We just can't assume it's helping," Singleton stated. "I think cost-justification has a broader definition than just dollars and cents. It includes how you plan, how you organize and how you control and direct your work force," Margol added.

The response among bank employees has been overwhelmingly positive. Backlog in the PC area has been brought under control, but office automation has not reduced mainframe backlog significantly because of the enormous growth of the $40 billion bank. The end users, however, have shown remarkable dexterity and innovation when they have gotten their hands on the equipment.

In fact, when Smith went out to identify innovative uses of micros for a technology assessment, he discovered that, of the eight applications he chose, only one had been developed by ADP; the rest were completely user-developed.

Perhaps even greater proof of ADP's success is the recent announcement that it will become a separate division of the bank, operating as the Security Pacific Automation Co. Peterson has been named its chairman and chief executive officer and Singleton its president. ADP had served as an entrepreneurial organization, billing out 100% of its work. Because of ADP's success — a decrease in costs from 26% to 5%, while holding staffing flat for two years — the bank's officers decided it could offer its services on the open market. With a staff of more than 4,000 and total revenues of $280 million, the new company enters the DP service market as the fifth or sixth largest in that business.

Rifkin is senior editor at Computerworld Focus.

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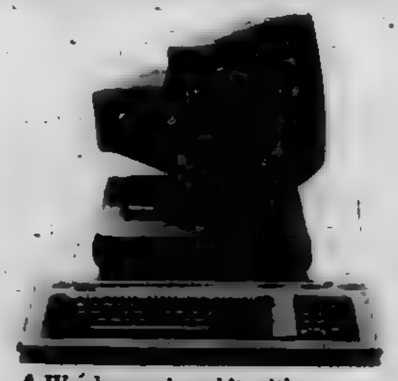
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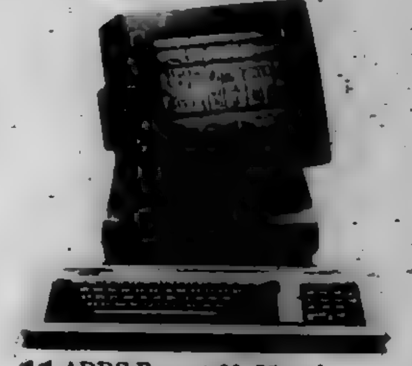
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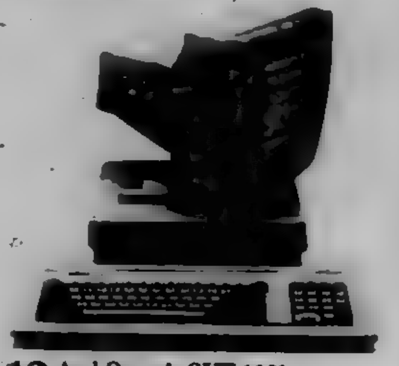
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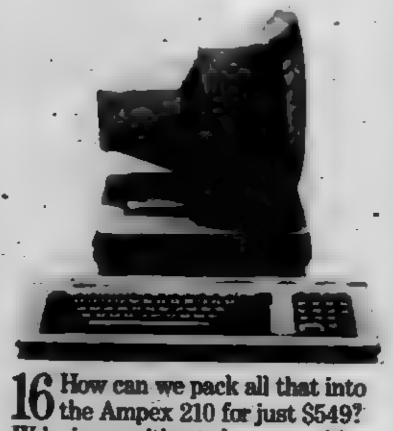
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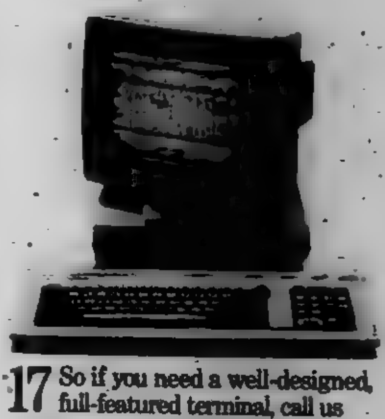
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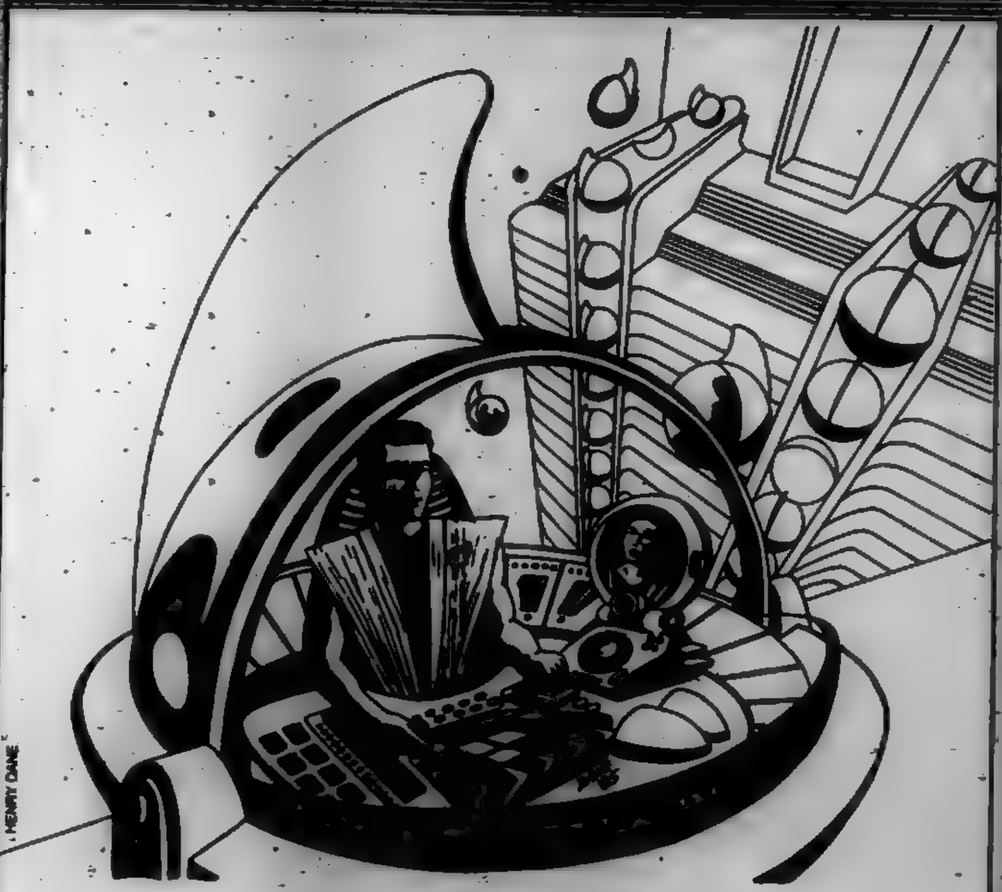

Universal Workstations: Fact or Fantasy?

If the same workstations supported many different levels within an organization, system allocation and integration would be a lot easier. Is this a real possibility?

By Donald D. Bentley

By definition, for a workstation to be universal, it should be all things to all people. Such a workstation must serve executive, managerial, professional, secretarial and clerical staff with equal ease and do all this through a common approach. When we examine universal workstations today, we are really talking about a myth, although some of the products are bringing the universal workstation much closer to being a reality.

An additional requirement for a workstation that is to be considered universal is that it must replace our existing tools — the telephone, calculator, word processor, dictaphone and whatever else presently exists on the desktop as a regular working tool. The user should be able to switch from function to function with relative ease and be able to do more than one activity at any given time.

When the marketplace has arrived at a point where we can truly consider universal workstations throughout an organization, a number of factors will affect the evaluation of vendor offerings, including the following:

- The system should be friendly and should have a pleasant user interface.
- The system should be as personal as a desk and chair are today.
- All functions on the system should be integrated and movement between the applications should be fluid.
- The user interface should be consistent through all applications.
- A portable and/or remote version of the workstation should be available.
- A system (network, output devices and so on) should be in place to support the workstation.
- Users should be able to choose between a keyboard and devices such as the mouse and a joystick, even though the keyboard will probably remain the primary means of interfacing with the system.
- Output to hard copy must be both local and immediate.
- The system should contain a message indicator for electronic mail, voice mail and messages.
- Automatic backup should be available to provide a sense of security for systems users.
- Because all people in the organisation will be using the workstations, the system should be somewhat idiot-proof for basic functions.
- Users should be able to engage in and view simultaneous applications processing through windows.

The system must be all things to all people. The applications software within it should be rich in function and matched to needs at all levels. The ideal system would consist of the following:

☐ For word processing, the system should be menu-oriented with prompts, but should also allow proficient personnel to bypass the menus. Deletion should be a two-step process to prevent inadvertent deletion of files. The system should also include the ability to "undo" instructions such as deletions and should be document-oriented to allow fluid movement throughout an entire document and between documents. Function keys or soft keys, not complex coding, should drive the system. A logical Help function should be available. Spelling verification should be automatic through the entire process. Word processing should be considered an office automation application within the entire system, not a stand-alone function.

☐ The data base management interface should be simple enough to allow it to be used by personnel who are not systems professionals, but merely want to collect and organise information.

As an office automation component, the data base information should be able to be integrated with WP and all other applications processed on the system. The user interface should be menu driven. Audit trails are necessary, particularly for complex applications. Data security and password protection or encryption should exist, and backup should be automatic on the system.

☐ The electronic mail system should contain an in-basket and out-basket and, as closely as possible, should replicate the existing mail system. Prioritization ability is necessary for both the sender and receiver. Annotation (including voice) and forwarding of all electronic mail documents should be possible. The facility for filing electronic messages and mail with textual document files should exist.

All WP, spreadsheet and data base information should be transmittable via electronic mail. Users should be able to access their electronic mail from any workstation, including being able to "listen to" documents from any telephone through voice actuation of textual material. All aspects of the electronic mail system should be secure, necessitating password protection. Users should be able to output electronic mail to hard copy and should have access to registered mail and an acknowledgment function. The software should accommodate telephone message handling.

☐ The electronic filing system should replicate the filing logic that presently exists in the organization. This statement assumes, of course, that the system in place is suitable for the organization's needs. The electronic filing system should be able to capture, store, display and distribute not only text and graphics, but also images. Data integrity, protection and security are necessary ingredients of any filing system, and flexible document retrieval, including full content search, should be available. Provision for capturing information received from the outside world should also be included in electronic filing capabilities.

☐ In the administrative support function, calendar management should include the ability to view and update, at the viewer's discretion, a day, week, month or year. Scheduling of meetings and project planning tools must be accommodated within the system. Another requirement is for personal and corporate directories, including automatic dialing for voice and data sessions. Bring-forward and tickler files should be accommodated, and it should be possible to access calendars from outside the office. The ability to print a hard copy from outside is also desirable.

☐ Voice mail shares most of its requirements with those needed for electronic mail. It should be possible to integrate voice mail into textual documents, and distribution lists, similar to electronic mail, should also be available.

The foregoing barely touches the surface of a requirements listing for a universal system and universal workstations. Most vendors presently offer pieces of this ideal package. Some recent offerings, among them the Voice Station from Sydis and the Centerpoint System from Santa Barbara Development Laboratories, Inc. are very promising. Although these vendors fail to satisfy every need that exists or represent everything available today, a review of their offerings does provide a representative sampling of what's available and what will be forthcoming from other vendors.

The Sydis system integrates voice, data, text and graphics in one system, and all four can be stored in one document. A critical mass of at least eight workstations is recommended, and the system will handle up to 3,000 workstations. The system works with the private branch exchange (PBX); because the lines are multiplexed, however, only one line is required to handle simultaneous voice and data sessions at each workstation.

Features include voice store and forward, voice annotation of text, up to 10 windows, electronic mail and filing, two WP software options, calendar and meeting manager (with a year at a glance), spreadsheet and a data base manager.

The system has an on-line Help and a Superhelp facility. Most of the user interface is friendly through the use of icons, soft keys and the option of a keyboard or mouse. The system can be keyboard-free for many applications. Storage is impressive — up to 3.2G bytes of internal storage on-line and up to 15G bytes using external mass storage devices.

Average system cost for a configuration that includes 24 workstations is approximately $6,500 per workstation. Systems are available through Sydis and will be marketed by GTE as the Omni-Action system.

Two recent announcements are very promising — the ability to adapt the IBM Personal Computer to make it function like a Sydis workstation (cost projected at $1,000 per station and requiring a minimum of 256K bytes) and the addition of a 5-key telephone line handler.

Santa Barbara Laboratories' Centerpoint system incorporates the telephone, calculator, dictation unit, WP and decision support tools in a very colorful package intended to support a boss/secretary relationship. The workstations differ; the boss has one screen and the secretary has two — a touch screen like that of the boss and a conventional CRT for data and text entry.

Features include WP, a 2,000-name Rolodex, speaker phone, two-year calendar, preprogrammed sign-on for data sessions and extensive use of colored icons. Limited MS-DOS is available. Voice annotation of text and play-back voice mail are possible from remote locations. Document filing is very logical: The system uses file folders and the user can virtually thumb through files. Storage is presently offered at 10M bytes per console.

Two advanced features are particularly interesting. The first of these is the ability to conduct a video conference by means of a robotic color camera directed by touching a floor plan displayed on the workstation screen. The second is a virtual slide projector that allows up to 100 internally stored images to be displayed on the workstation screen or a TV monitor. A two-workstation and printer configuration costs upwards of $32,000, depending on features acquired.

Is the universal workstation a myth or reality? It's still something of a myth, but it's closer to being real. For the time being, we'll have to function with the microcomputer and its limited universality.

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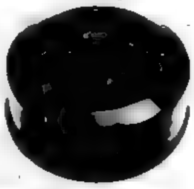

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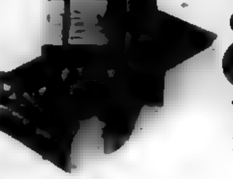

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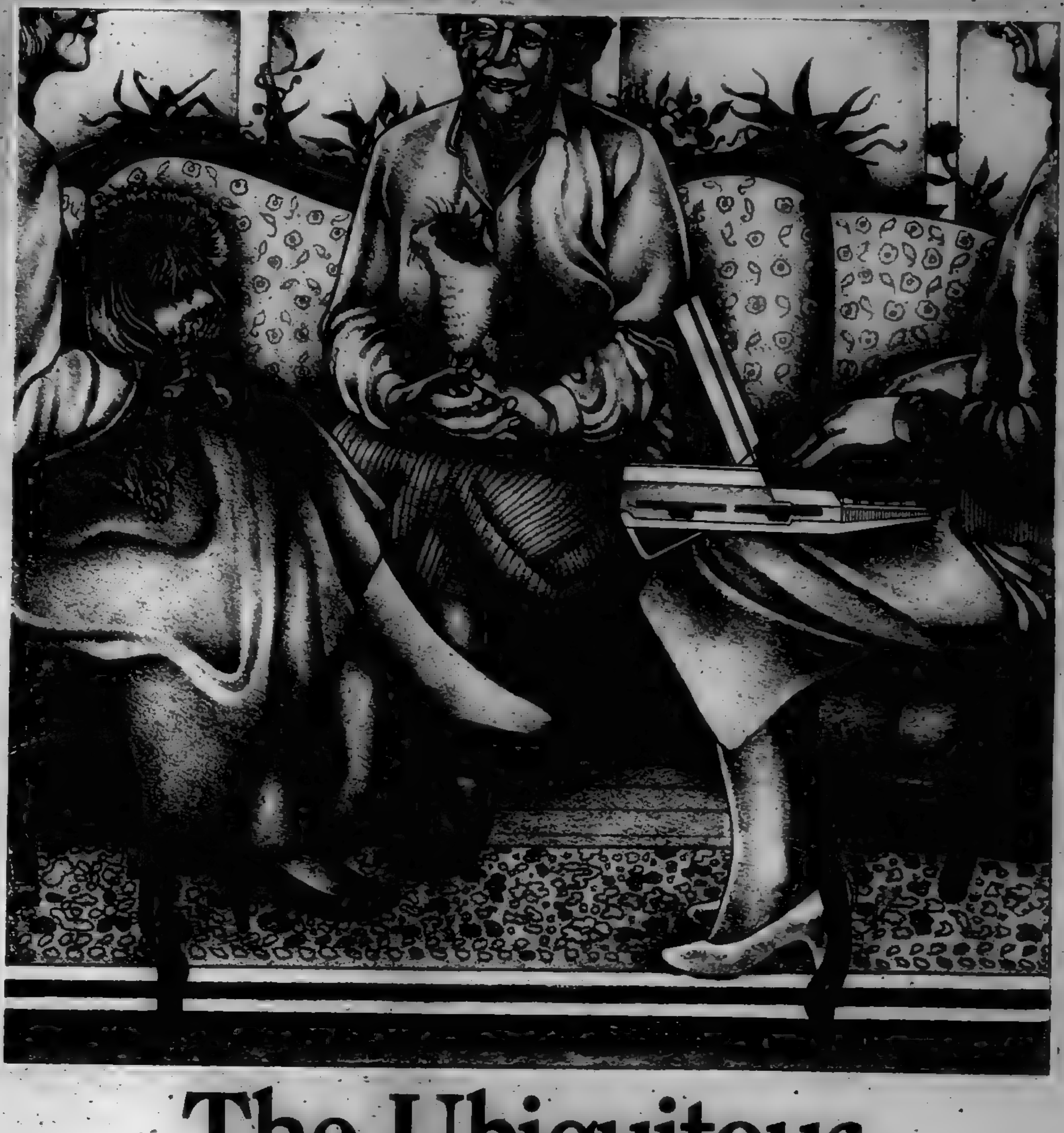

The Ubiquitous Lap-Size

By Lee White

Scene: Croton-on-Hudson Railway Station, Westchester County, N.Y. Young urban professional steps off the train. Appended to his right hand is what appears to be a very heavy portable sewing machine. He walks in a semi-Neanderthal way, right arm hanging low, stooped over, his obviously custom-tailored overcoat hiked up in back.

The scene above is recreated thousands of times each day. The leather briefcase and *Wall Street Journal* that marked the fast-track worker of the '70s have been replaced by the portable computer, the badge of the up-and-comer today.

The first portable computer was created and manufactured by Adam Osborne in 1981. The Osborne 1 was an 8-bit machine that weighed 23 lbs and cost $1,795, and more than 8,000 of them were sold the first year. Shortly thereafter, other kinds of 8-bit computers, notably Kaypro Corp.'s Kaypro II, also hit the market. Following hard on the heels of the 8-bit machines were the 16-bit computers. The first of these was the Compaq Computer Corp. Compaq, which used the Intel 8088 microprocessor, had a base memory of 128K bytes, a 9-in. screen and a 5¼-in. disk drive. The machine was as close to 100% compatibility with the IBM PC as anything on the market.

Vendor (Model)	Weight (Lbs.)	Operating System	Memory (Min/Max)	System Dimensions (In.)	Screen Type and Dimensions (Lines/Col., In.)	Maximum I/O Ports	Communications	Base Price	Distribution
Data General Corp. *DG/One*	9.1	MS-DOS, CP/M, Venix	128K/512K RAM	13.7 x 11.7 x 2.8	LCD 25 x 80 8.5 in.	2	Asynchronous Optional Built-In Modem	$2,895	Dealers
Grid Systems Corp. *Compass 1100*	10	MS-DOS 2.0, 2.1 Grid-OS	256K RAM	15 x 11.5 x 2	EL 25 x 80 6 in.	2	Asynchronous	$4,250	Direct Sales Force OEM/VAR, Retail Stores
1101	10	MS-DOS 2.0, 2.1 Grid-OS	256K RAM 384K Bubble	15 x 11.5 x 2	EL 25 x 80 6 in.	2	Asynchronous, 1200/300 Bit/Sec, Built-In Modem	$4,995	Direct Sales Force OEM/VAR, Retail Stores
1109	10	MS-DOS 2.0, 2.1 Grid-OS	512K RAM 384K Bubble	15 x 11.5 x 2	EL 25 x 80 6 in.	2	Asynchronous, 1200/300 Bit/Sec, Built-In Modem	$6,195	Direct Sales Force OEM/VAR, Retail Stores
Compass II 1121	10	MS-DOS 2.0, 2.1 Grid-OS	256K RAM 384K Bubble 512K ROM	15 x 11.5 x 2	EL 25 x 80 6 in.	2	Asynchronous, 1200/300 Bit/Sec, Built-In Modem	$5,995 w/128K ROM Pack	Direct Sales Force OEM/VAR, Retail Stores
1129	10	MS-DOS 2.0, 2.1 Grid-OS	512K RAM 384K Bubble 512K ROM	15 x 11.5 x 2	EL 25 x 80 6 in.	2	Asynchronous, 1200/300 Bit/Sec, Built-In Modem	$7,195 w/128K ROM Pack	Direct Sales Force, OEM/VAR, Retail Stores
1131	10	MS-DOS 2.0, 2.1 Grid-OS	256K RAM 384K Bubble 512K ROM	15 x 11.5 x 2	EL 25 x 128 8.5 in.	2	Asynchronous, 1200/300 Bit/Sec, Built-In Modem	$6,795 w/128K ROM Pack	Direct Sales Force, OEM/VAR, Retail Stores
1139	10	MS-DOS 2.0, 2.1 Grid-OS	512K RAM 384K Bubble 512K ROM	15 x 11.5 x 2	EL 25 x 128 8.5 in.	2	Asynchronous, 1200/300 Bit/Sec, Built-In Modem	$7,995 w/128K ROM Pack	Direct Sales Force, OEM/VAR, Retail Stores
Hewlett-Packard Co. *HP 110*	8.5	MS-DOS 2.11	256K/640K RAM	10 x 13 x 3	LCD 16 x 80 9 in.	2	Asynchronous, 300 Bit/Sec, Built-In Modem	$2,995 w/4 software packages in ROM	Direct Sales Force, Dealers
Sharp Electronics Corp. *PC 5000*	10	MS-DOS 2.0	128K/320K RAM	12 x 13 x 3.5	LCD 8 x 80 9 in.	4	Asynchronous	$1,995 w/printer	Dealers
Teleram Communications Corp. *Magnum Kookaburra*	8	MS-DOS 2.0	128K/256K RAM	12 x 11 x 2	LCD 16 x 80 9 in.	3	Asynchronous	$2,795	Direct

Figure 1. Sixteen-Bit Lap-Size Portables

These first portables filled the bill for many organizations, particularly those that, on the ground swell of end-user computing, were looking for innovative machines. Priced in the $2,500 range, the machines could be easily shared by users.

They were also useful for training; trainers could bring the portables with them on their rounds. They also allowed the installation of an internal modem, which allowed people to use emulation software and do mainframe work at home at night or on weekends, when it would not slow down processing speeds for other users.

These portables provided new flexibility and encouraged non-computer users to adapt to computing in their own time and space, but they were still not ideal. The machines were not good for carrying long distances — which for anyone in less than prime physical condition meant more than a city block. The sheer bulk of the original machines caused the adjective describing them to evolve from portable to transportable.

But there is little question that the portable market is here to stay. A recent study by Future Computing, Inc., a market-research firm in Richardson, Texas, showed that, although portable computers make up a relatively small part of the personal computer market today, that part is the fastest growing segment of its market. Estimates have been made that U.S. sales of battery-powered portable computers for office and business use will exceed $3.5 billion in 1989, a sevenfold increase from 1984. The demand is there and growing, and the search is on for a real portable — something that can fit in a briefcase, weigh in the neighborhood of 10 pounds, need no external power source, be really IBM Personal Computer-compatible, talk to a mainframe and have a screen big enough to read and clear enough to see.

Today, a number of companies seem to be near that goal. Data General Corp., in Westboro, Mass, toward the end of last year announced the DG/One, a 9.1-lb portable with a liquid crystal display (LCD). The DG/One, which runs MS-DOS, CP/M and Venix, costs $2,895 for the 128K-byte machine with one 3½-in disk drive. The DG/One seems to be out in front in the lap-size portable race. The random-access memory (RAM) can be upgraded to 512K bytes, more than enough memory to run the 70 programs available in 3½-in. format for the DG/One from 30 software firms. These packages include Dbase II from Ashton-Tate; 1-2-3 and Symphony from Lotus Development Corp.; Wordstar from Micropro International Corp.; PPS:Report, Graph, Write and File from Software Publishing Corp.; and Harvard Software, Inc.'s Harvard Project Manager.

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One early purchaser of the DG/One was Wright Line, Inc., a Worcester, Mass., manufacturer of computer-related furniture. Douglas McCartney, information center analyst, said he believes the machine is a particularly good choice right now. "The worst thing about it is the screen," McCartney said. "You can't see it for nothin' unless you have a desk lamp directly behind you." He noted that it will not be able to function as a real portable under all conditions unless DG offers a solution. DG is now giving away a nonglare screen to offset the problem.

A drawback to all the lap-size portables is their inability to transfer files from the desktops because of the diskette size.

At 24 lines by 80 columns, the screen itself, is "the best around," according to McCartney, who said that, in his experience, some of the better features are the built-in 300 bit/sec modem and the 3½-in diskettes, which are in solid plastic casing.

A drawback not only to the DG/One but to all the lap-size portables is their inability to transfer files from the desktops to the lap-sizes, primarily because desktops use 5¼-in. diskettes. Although external 5¼-in. disk drives are readily available, they are by no means briefcase size, and they take away from the machines' easy portability. Another drawback to the DG/One is its "unique operating system software," McCartney said. " It is MS-DOS, but it's Version 2.11." Most of the better known software programs have been written for MS-DOS, Version 2.0.

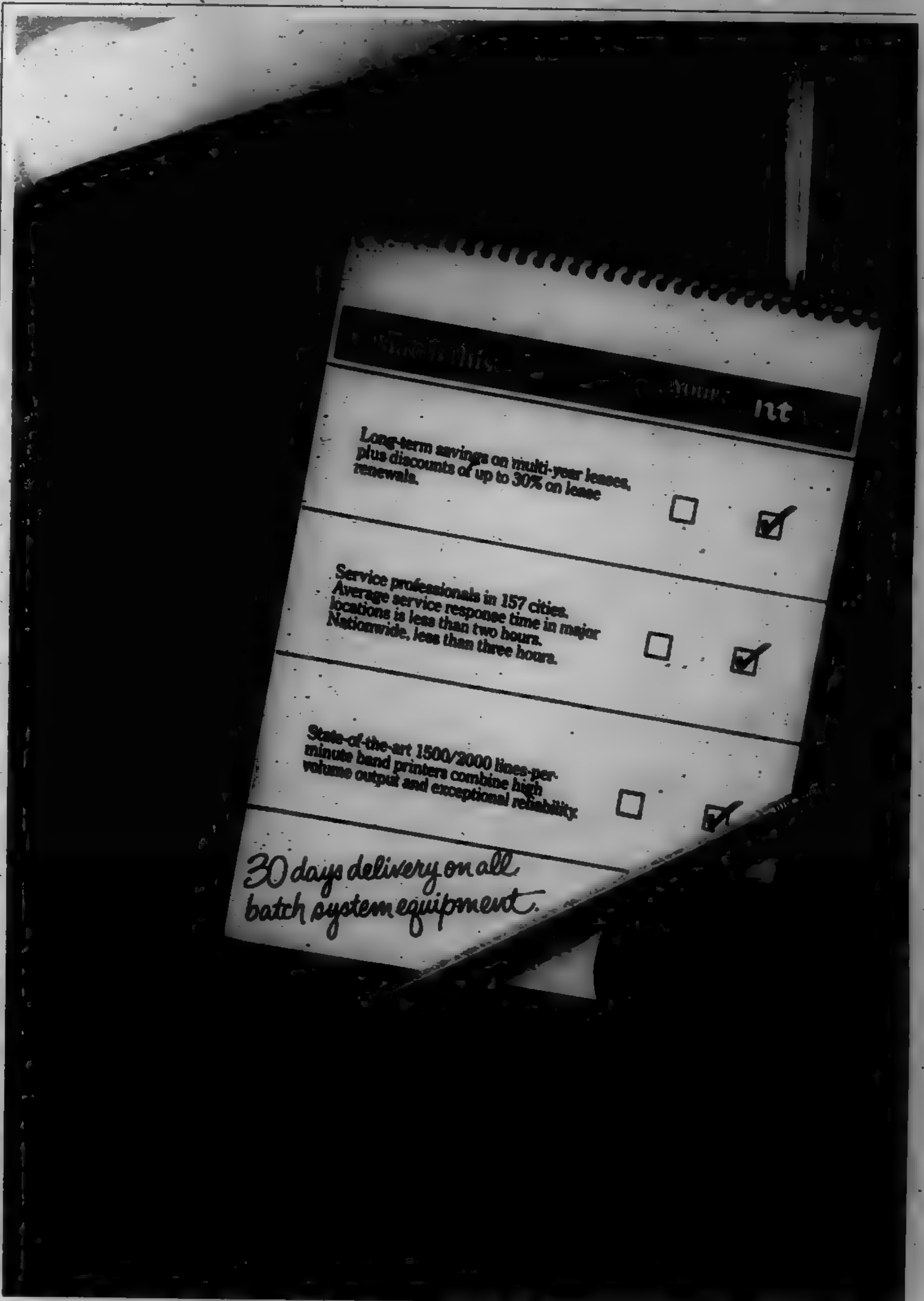
Another manufacturer of lap-size portables is Hewlett-Packard Co., in Palo Alto, Calif. HP offers the HP-110, a 16-bit, 8½-lb portable that also runs MS-DOS 2.11. The HP-110 is priced at $2,995, which includes 256K bytes of memory, expandable to 640K bytes.

A representative from Astra Pharmaceuticals, in Westboro, Mass., has been using an HP-110 for testing purposes, with an eye toward supplying the sales force with portables to use in the field. Astra's idea is that, to improve productivity, it will allow salespeople to carry the portables in their briefcases into customers' offices and to access Astra's mainframe from there. Although the company has not yet tried accessing its IBM System/38, Astra was able to tie into an IBM Personal Computer XT with the aid of the 110's built-in modem.

The HP-110 runs Lotus' 1-2-3 in read-only memory (ROM) via a cartridge and has excellent graphics presentation, according to the Astra user. The screen has very good resolution, but also has one drawback: It is only 16 lines by 80 columns, instead of the preferred 25-line display. However, the user at Astra said, the 25-line displays he's seen have had "terrible resolution. With an LCD display, the more lines the screen has, the longer it takes to refresh the display. The DG/One has sort of broken the display into three parts, but all parts refresh at the same time, and the resolution is not satisfactory."

Teleram Communications Corp. in White Plains, N.Y., has announced its entry into the 16-bit lap-size market with its Dulmont Magnum, manufactured [illegible] Australia by Dulmont Electronic Systems. This 8-lb portable features the Intel 80186 processor and uses the MS-DOS 2.0 operating system. The LCD screen is offered either as an 8-line or 16-line by 80-column display. The price of the 16-line display Magnum with 128K bytes of RAM is $2,795.

Perhaps the Cadillac of lap-size portables is the Mountain View, Calif.-based Grid Systems Corp.'s Compass II line. The recently announced models 1131 and 1139 offer up to 512K bytes of RAM, up to 512K bytes of user-installable ROM and 384K bytes of nonvolatile bubble memory that can be used to store files and programs.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30 days delivery on all batch system equipment.

For the lap-size models, the caveat is the same as for the desktops: The shakeout rate for micro manufacturers continues to grow, and one would be well advised to buy a machine made or sold by a company likely to remain on the scene.

Although the Grid line runs MS-DOS, it also — shades of Apple Computer, Inc.'s Lisa and Mac — has its own Gridmaster, Gridpaint and Gridtask software. Of most interest, though, is the fact that it boasts a 25-line electroluminescent (EL) screen. Sam Weigand, Grid's president, claimed that "these EL screens are the most easily read displays available on any briefcase-size computer." The Grid Compass computers must be plugged in unless a battery pack, at $295, is purchased. The EL displays are Cookie Monsters in the way they need power, and the battery is good for only an hour and a half. They can be recharged overnight. Also available for the Grid portables is a 7-lb floppy disk drive that takes 5½-in. diskettes.

Unfortunately, the Grid Systems portable is a Cadillac in more ways than one. The Grid Compass II 1131 (256K bytes) and 1139 (512K bytes), with 300/1,200 bit/sec modem, are $6,795 and $7,995, respectively. That's a hefty price to pay if a company is entertaining the idea of giving a wandering sales force computing capability.

Although many vendors have entered the lap-size computer market, two question are on everyone's lips: What will IBM's contribution be to this burgeoning market, and when will we see it? Rather than being first into a segment of the personal computer market, IBM has adopted a "wait and see" posture to determine whether the market will support new entries. If the market appears good, IBM then forges in with guns blazing. The pattern worked in its favor with the desktop computer and the home computer (although its first PCjr fell short of expectations). However, IBM's tardy entry into the portable market has been delaying users' buying decisions.

Bob Fertig, president of Enterprise Information Systems, Inc. in Greenwich, Conn., confirmed that IBM has been buying 3½-in. disk drives. "They've purchased 1.8 million drives from two or more suppliers in Japan. Toshiba is one, and Sony might be another." Fertig said he believes the IBM lap-size, which reportedly may be called Attache PC, will be on the market in the first quarter of 1985. The only stumbling block is getting enough supplies, particularly disk drives. "In fact," Fertig said, "IBM is already showing it to customers invited to Boca Raton." A client of Fertig's, whom he cannot name because IBM required the signing of a nondisclosure agreement, was among the invitees. According to his client, Fertig said, the machine "weighs less than 15 pounds, fits in a briefcase and uses an 80188 processer."

A remaining question is whether the machine will use the LCD or plasma display, according to Fertig, who added, "I'm betting on the plasma." If IBM does indeed release its lap-size, the unit will most probably run a pure PC-DOS. It is also expected that its own recently announced collection of business software programs will be available on 3½-in. diskettes.

Whether users wait for IBM to decide whether the lap-size portable market is worth pursuing or choose to buy one of the 16-bit machines available today, the caveat to be borne in mind is the same as that for the desktop market: The shakeout rate for microcomputer manufacturers continues to grow, and one would be well advised to buy a lap-size computer manufactured or sold by a company likely to remain on the scene.

In the meantime, although there is little doubt that the true portable computer is more than a niche market product and that the 16-bit, IBM PC-compatible portable is already here and being refined daily, perhaps the next subject to be touched upon is the briefcase market.

Let's see now: We need a briefcase large enough and sturdy enough to hold a few customer files, an appointment book, some product literature, a calculator, some business cards, an address book, a change of underwear, a blow dryer, a dop kit and, of course, a 10-lb portable computer. ≡

White is a senior writer at Computerworld Focus.

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The State Of Word Processing

By Ronni T. Mars

Something rather bewildering is happening in the world of word processing. Vendors of dedicated systems have all seemed to develop an advanced case of myopia. They have lost sight of what good WP is. It isn't enough, any more, to say that "dedicated is better." Personal computer-based WP used to mean Wordstar, which meant confusion and frustration. And the personal computer keyboard was something most people didn't want to discuss.

But things have changed. Microcomputer software has advanced to a level that rivals dedicated systems in functionality and friendliness. In fact, most innovations in WP have happened on the personal computer in the last year. IBM has already fixed the design on the Personal Computer AT and is expected, at any moment, to announce a WP keyboard for the Personal Computer and the Personal Computer XT. There go two of the major advantages for the dedicated.

Lets take a look at the newest trends in WP and see just where the dedicated systems fall short or where they come out on top.

The past few months have been interesting ones in the history of WP. Just when the experts had rung the death knell for dedicated systems, a whole new crop of low-cost stand-alones were released. A perfect example, and one that is most heralded, is the Wang Laboratories, Inc. Office Assistant.

The Office Assistant is a stand-alone WP system targeted for the secretarial desk in small- and medium-size companies. The system sports a bit-mapped display, a keyboard optimised for document production and a subset of Wang's new editor, WP Plus. You can also buy Microsoft Corp.'s Multiplan and Software Publishing Corp.'s PFS software for personal computer functions.

The system sells for approximately $3,000 with printer, and will be sold by Wang Business Centers and National Office Machine Dealers Association who are used to selling into the typewriter and typewriter-replacement markets. This strategy has also been picked up by the new breed of WP systems, the Display Typewriters.

The Office Assistant is priced attractively and has some excellent features. Particularly impressive is the columnar features and math capabilities. However, even this subset of the newest Wang WP is still page bound and does not allow for interactive inserting. You cannot edit insertions until the insert has been completed, nor can you remain in an insert typing mode when entering and editing text. These are two old-fashioned restrictions that keep even the most modern-seeming system in the Dark Ages.

The Decmate III is Digital Equipment Corp.'s offering in this $3,000 range. Although it is basically a subset of the Decmate II, it seems destined to become the strategic terminal for all users of DEC's integrated office system, the All-in-1. Nevertheless, it is a dedicated WP system. And DEC has not improved or updated the software. Although DEC has some excellent features, including bypassable menus, there is a stationary cursor line, (text scrolls instead of cursor) and all typing and editing is done on the bottom line of the display (when editing, you can't tell what is below the line you are on). For years, industry experts have been complaining, but DEC's myopia has overlooked other, more state-of-the-art choices that could have been made.

Another new low-cost WP system is Wordpal from Wordplex Corp., a major vendor of systems in the UK beginning to make a name for itself in the U.S. Wordpal sells for about $3,000 with a printer, and is a nice little stand-alone unit. But it is also page bound and has some strange quirks which label it as old-fashioned.

The software on dedicated WP systems is just not as slick or as innovative as some of the other WP options. The hardware advantages, which include a production typing keyboard with labeled function keys and minimal disk handling, are not as superior to micro-based systems as they used to be. With hard disks and keyboard templates, not to mention improved keyboard designs, these advantages disappear.

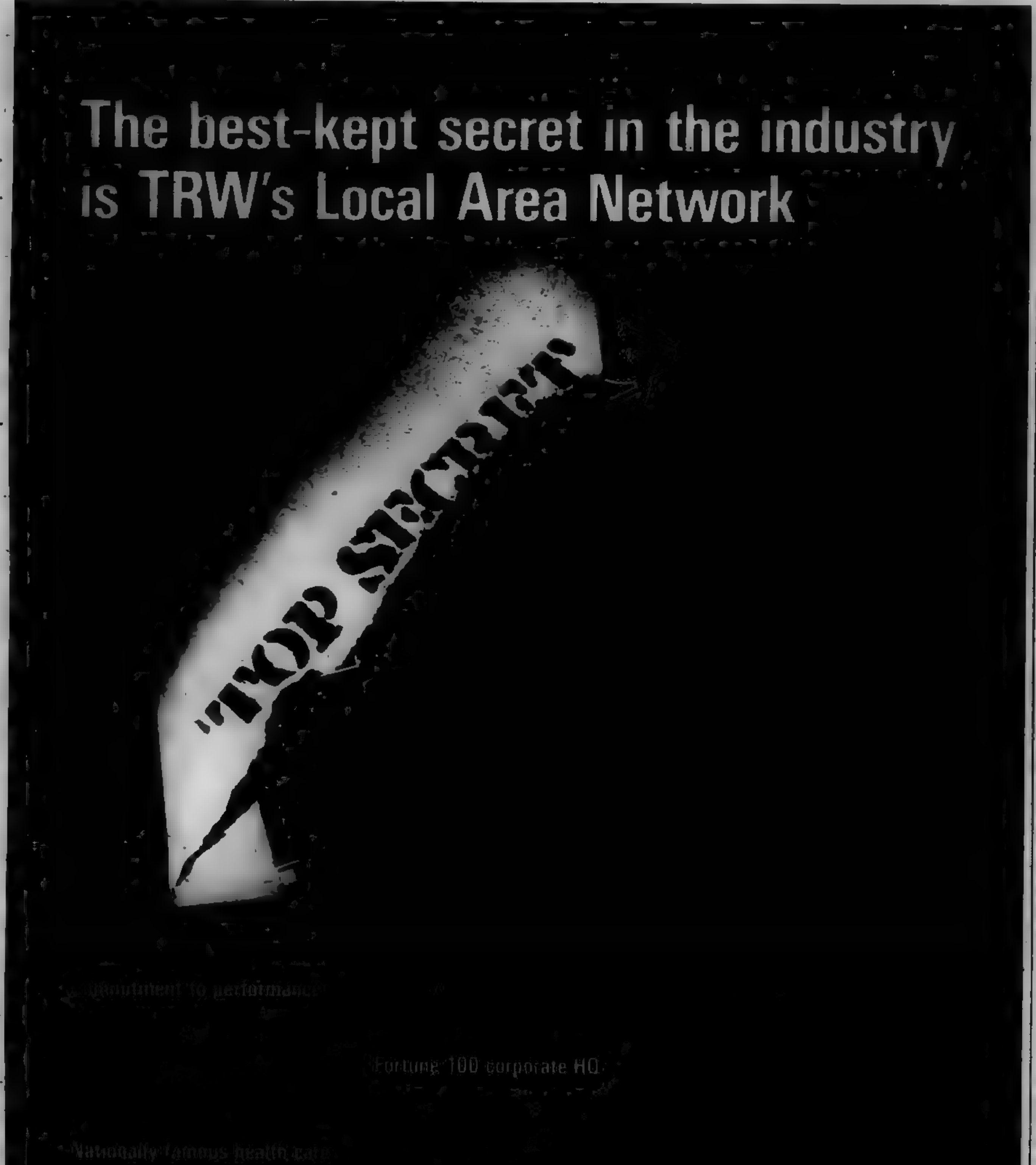
Are there advantages to dedicated word processors? A major area often overlooked is service, training and support. When you buy a microcomputer software package, you are on your own, except perhaps for a toll-free telephone number. Training is provided as a screen-based tutorial. The service contract is between you and your retail outlet. However, Wordpal comes with a two-day training program, customer service representatives and a service contract.

But not all dedicated-systems vendors capitalize on this advantage. Wang has developed a reputation for poor service and being generally unresponsive to customers.

In the past year, as the market for dedicated word processors has declined, vendors have begun looking for a new generation of products and uncovered the electronic typewriters. Many OA vendors have strengthened their positions with electronic typewriter offerings. Among the most notable has been Xerox Corp. whose Memorywriters have added juice to an ailing organization.

Electronic typewriters have never caught on in the U.S. to the degree that they have in the European market. Cost controls are much more stringent overseas and, though they do not have the capabilities of a screen-based system, electronic typewriters often are sufficient for the job at hand. In Europe, Wordplex has been marketing an electronic typewriter networking device that will connect up to 16 standard electronic typewriters to one of its dedicated systems. The same network was offered to the U.S. market; there were no buyers.

But even if they are cost-effective, electronic typewriters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are limited in scope and efficiency. A definite trend toward display typewriters has begun. This past year has brought out at least four such products: Quadrex's Spacewriter, Protypes, Inc.'s Display Typewriter, Samanda's Personal Typing System, and England's Panorama Systems offering. Other similar products such as Minolta Corp.'s PCW-1 combination display typewriter and personal computer are being developed and should be hitting the streets any day.

How do these differ from low-end dedicated systems? In many ways they don't. Both types sell in the $3,000 range, though the display typewriters tend to be a little cheaper. Both come with printers, displays and CPUs. Both have low-end functionality. The differences are primarily in the marketing and secondarily in features.

Display typewriters are sold through typewriter dealers. (Wang's Office Assistant is as well, but that is the exception rather than the rule.) They are marketed as typewriters, not word processors. Features include a typewriter mode for direct printing for such things as envelopes (something word processors never seemed to get right) and forms mapping, the ability to store the format of a standard form.

The personal computer software industry has learned a software package can be both powerful and easy to use.

The Protype system was designed by Steve Kurtin, founder of Lexitron and acknowledged father of display-based WP. This system excels at changing pitch on screen (you actually see the characters in 10, 12, or 15 pitch — and they can be changed at the touch of a few keys), a feature that is simple for a typewriter, but unheard of on a word processor.

Another display typewriter, the Spacewriter by Quadrex, has the functionality of a low-end word processor, but also supports proportional spacing on screen. A typewriter can do this, but it is not available on a standard word processor.

Why are display typewriters cropping up at this point in time? Technology has a lot to do with this, but the emergence of the display typewriter is more a result of what the marketplace can handle. WP tends to be sold through dedicated sales forces. Retail outlets may handle some WP equipment but handle more personal computers. What's left? Dealers. What do dealers know how to sell? Typewriters! And who will these systems sell to? Secretaries.

Although the terminal generation is taking over the world, strongholds of typing power still declare, "Give me white-out or give me tape!" A display typewriter can fit into the secretarial niche with less difficulty than a word processor. Familiarity exists, at least with the name of the product if with nothing else. And for price/performance, the display typewriters have it head and shoulders above the electric typewriters. Bosses will find that attractive.

Personal computer software for WP has grown by leaps and bounds since the early days of CP/M and Wordstar. Early micro-based WP packages offered you a choice: ease of use or power. But the personal computer software industry has better vision than the dedicated vendors; it has learned the two aren't mutually exclusive. A software package can be both powerful and easy, even fun, to use.

Most innovations in WP in the past few years have been on the personal computer level. Soft keys, bypass menus, menus that display at the top or bottom of the writing screen, interactive help facilities and multiple (more than two) windows are all common in the micro world. They are not common in the dedicated world. Microsoft Corp.'s Word introduced the use of a mouse for WP. Aesthetically, personal computer packages make much better use of screen graphics to make WP more appealing.

The hardware is growing up. The IBM Personal Computer keyboard, the nemesis of typing, will soon be corrected, if the grapevine is on target. Hard disks let you write pages and pages of text without running out of room.

Disadvantages do still exist. Though personal computer prices are steadily dropping, the new low-end word processors are slightly less expensive, and the issues of training and support still loom. Nevertheless, several personal computer packages (Word Perfect, Wordstar 2000, Samna and Volkswriter Deluxe) will fulfill almost any secretary's needs. In fact, in a head-to-head test done by a major user of WP, Word Perfect was preferred three to one over the Decmate II.

Which should you get? A personal computer with WP? A stand-alone WP system? A high-end word processor? A display typewriter? The following analogy will help you answer the question: If you want to toast bread, you can buy a toaster oven that will toast, but will also roast, broil and bake. But if all you ever want to do is toast, for the same money you can buy a super deluxe toaster that will toast six slices of bread, each to a different degree of brown. And for considerably less money, you can get a plain old toaster that may not be fancy, but can sure toast bread. Just be sure you'll never want to do anything with that toaster but toast. The toaster is a dedicated system. The toaster oven is a personal computer.

One final word of warning to the WP vendors out there: Daily, the toaster oven is making better and better toast.

Marshak is associate editor, Seybold Publications, at Seybold Co., an OA consulting and publishing company based in Boston.

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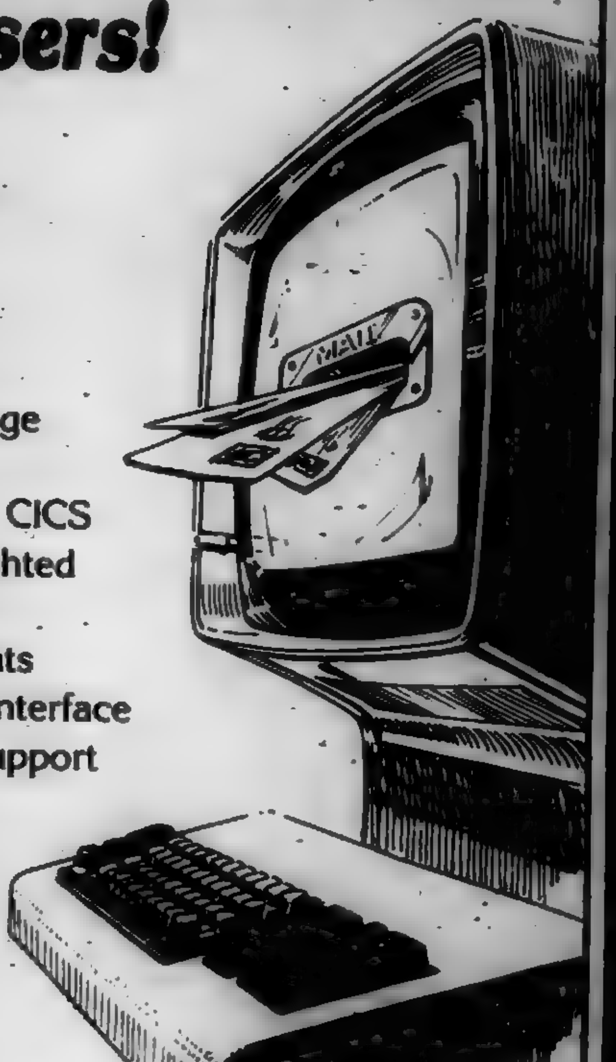

(*Continued from Page 26*)

see the personal computer as a solution to a problem that may not exist, one company had a serious problem that the personal computer solved.

"Our company manufactures capital goods. During the recession, we had a tremendous downturn and at the same time we were hit with a labor strike. We had to look at how to improve our productivity," said Charles McKellar, manager of corporate MIS at Brown and Sharpe in North Kingstown, R.I. "The chairman of our company bought the first personal computer with his own money. We studied them for some time, then standardized on the IBM. We looked at where they could be used to increase white-collar productivity — management productivity. Now managers are doing quite a bit of their own work on personal computers, and a secretary can be shared by four managers."

Brown and Sharpe also put personal computers into the hands of its quality assurance department in the plant. Perhaps most important, the personal computer helped put Brown and Sharpe, which had been primarily a machine tool manufacturing business, into high tech. They now make machine and instrumentation measuring devices that utilize microprocessors.

Although Brown and Sharpe saw enhanced productivity in terms of a survival tactic, few companies have instituted formal measurement activities to quantify productivity gains. "Measurable is the key word. We haven't attempted it. But people say they know they couldn't do what they're doing without [the computer]," said Oakes of Greyhound Corp. Tom Fahnestock, office systems supervisor at Caterpillar Tractor Co. in East Peoria, Ill., said he doesn't believe measurable productivity gains can be quantified at all.

Perhaps the tasks of productivity measurement and justification procedures will become the domain of the information center, an entity that didn't exist in the U.S. in 1980. Every company contacted in the survey now has, in one form or another, an information center.

By definition, the information center doesn't have a definition. For the purposes of the *Computerworld Focus* survey, it was defined as a physical place staffed by people whose full-time job is to be information center analysts. Almost all respondents met the physical location criterion; about half of those had full-time information center staff. A smaller number had personnel who functioned as trainers or application analysts, but had no real place to call home. These people, in an era of high-tech specialization, are making "house calls."

Most information centers in the surveyed companies had both mainframe and personal computer hardware and software. All respondents agreed that the ideal information center should be a large enclosed area with hardware, software and personnel resources equal to the task.

What all representatives of the surveyed companies had in common was their idea of how the center would change in the next three years: growth, growth and more growth. In each case, the need for information center services far outstripped available resources. The respondents agreed that, even if company growth hit a plateau where no one quit and had to be replaced and everyone was able to use all the available tools, evaluating new products could keep a large staff busy for years to come.

Even respondents who were not directly affiliated with the information centers in their companies were satisfied with the way those centers functioned. In fact, they had few complaints that had not been addressed by either in-house staff or vendors. However, when each survey participant was asked to compile a wish list, 80% asked for the same thing: compatibility across product lines. Even single-vendor companies stated that the compatibility problem, although improving, is not where it should be.

Other frequently voiced wishes included more training, more space on the mainframe, mainframe software packages similar to those available for microcomputers, better documentation from software vendors, advances in the field of artificial intelligence, software evaluation houses and good methods for measuring productivity gains. One manager in a fresh food processing company said there was not enough industry-specific software. In contrast, Jim Johnson, director of information technology at the University of Iowa said almost anything he wanted was out there. His biggest wish: lots of money.

Perhaps the most difficult wish to grant was the one voiced by Bill Todd, director of MIS at Coats and Clark in Doraville, Ga. "We have to have better communications. We have difficulty understanding what our user departments need, and they have trouble understanding the MIS side of the coin." Ed Crowe, vice-president of administrative and information services at Coors Beer in Golden, Colo., may have the solution for Todd. "Over time, as more people become more educated, I see users functioning more independently," he said. "Data processing people have to accept it or they will become absorbed."

White is senior writer at Computerworld Focus.

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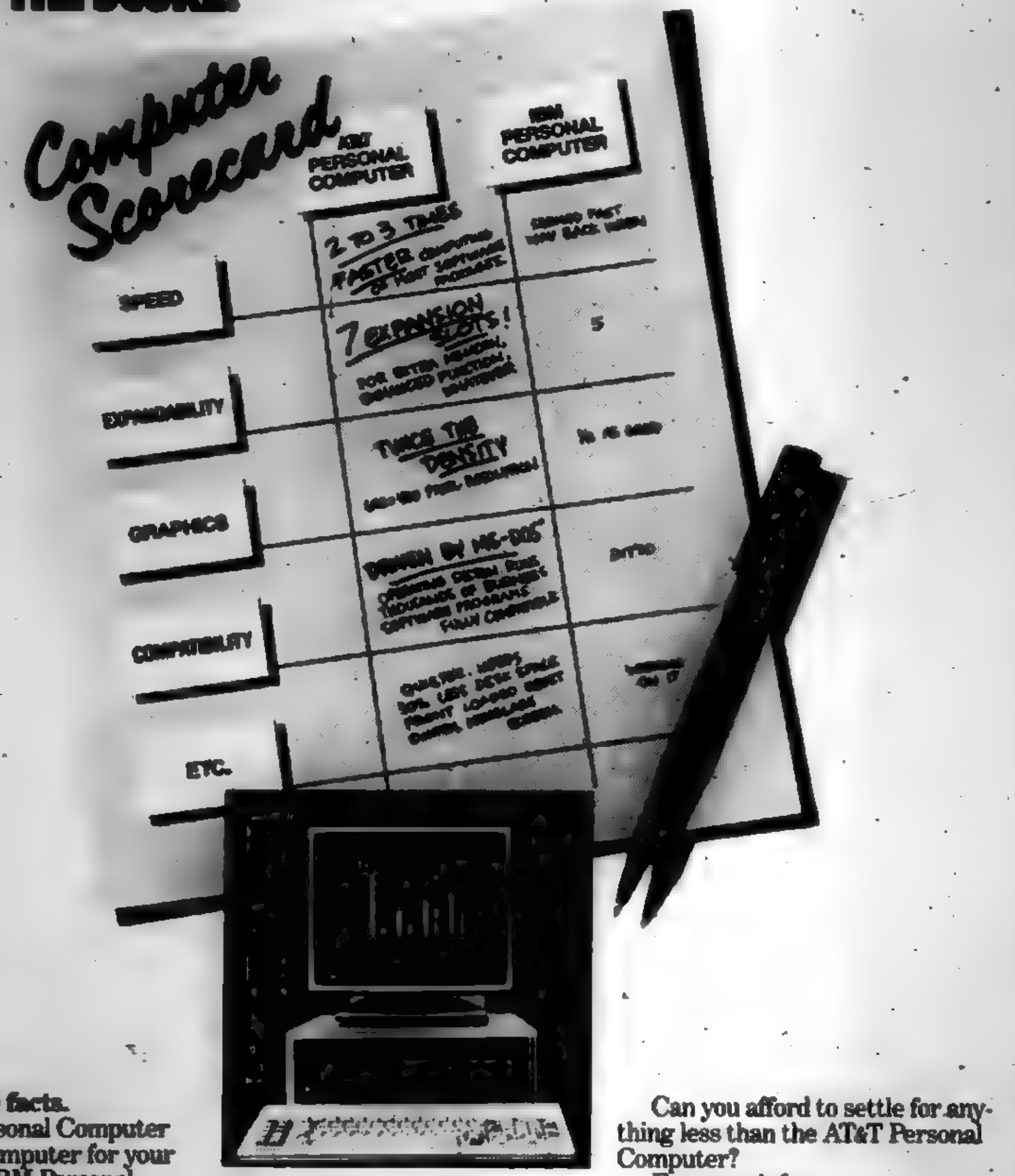

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In the News

imaging equipment, telex terminals, advanced phone systems, electronic typewriters, facsimile transmitters and electronic mail from both U.S. and Japanese manufacturers. Among the vendors whose equipment will be used for instruction will be IBM, Digital Equipment Corp., Wang Laboratories, Inc., Xerox Corp., Fujitsu Ltd., Toshiba Ltd. and Canon.

On the Level

Anyone betting the house on the continued tidal wave of personal computer shipments might be advised to take another look. According to Alan Purchase, director of office automation programs for SRI International, a Menlo Park, Calif., consulting firm, the slowdown in personal computer growth is imminent. In fact, Purchase goes further and points out that as the personal computer's popularity dims, the multiuser workstation will become the shining light in the industry.

"Multiuser systems is where future growth is going to be," Purchase stated. "It may take more time for industry to accept that because it takes more time, money and training to implement them. But we predict a major business opportunity in multiuser systems in the 1986-88 timeframe." Purchase explained that personal computers would continue current growth for this year, but would slow down considerably in 1986. He asserted that the reason for the decline would be competition from multiuser systems and the saturation of what he called "early adaptors" to the technology, those high-tech types with a natural interest in computers.

Purchase isolated two additional growth markets: portable computers and integrated terminals with internal storage. Portables will find ready acceptance with a select group of users today, he said, but won't achieve "strong penetration until there is a new display." The liquid crystal displays available currently are "too limiting," Purchase said. "To pay $3,000 for a portable with a marginal display is just not going to make it." He indicated, however, that new displays are under development and the next generation of portables "will be great."

The focus on storage capabilities will shift away from floppy disks to shared, internal storage in multiuser systems, Purchase added, and there is a "major product opportunity" for integrated workstations with internal storage and good displays. "The need for everyone in the office to have floppies on their desk is declining," he said. "Things are becoming more oriented around work groups with shared data bases and memory systems." SRI announced that U.S. shipments for workstations — including personal computers, word processors, terminals and multiuser systems — totaled 2 million in 1983 and 4.5 million in 1984. This year, the growth rate will slow to 20% or 30% and after 1985 will slow down considerably to a 5% or 6% annual growth rate. ■

In Brief

NEW YORK — AT&T guessed wrong on teleconferencing and it has closed its video-teleconferencing service in six of 11 cities. AT&T began its Picturephone Meeting Service three years ago, when the economy was weak, hoping corporations would use teleconferencing to replace costly corporate travel. Another contributing factor may have been the divestiture: AT&T Communications is prohibited from selling the video-reception equipment of AT&T Information Systems.

It is estimated that AT&T's loss is between $2 million and $4 million.

WELLESLEY, Mass. — On average, more than 50% of the capacity of each function on an integrated software package goes unused, according to the study "Integrated Software for Personal Computers, 1983-1988," conducted by Venture Development Corp. (VDC), a Wellesley, Mass., management consulting firm. The report stated that manufacturers believe the bulk of their customer market is middle managers, but computer retailers and end users of integrated software surveyed by VDC found that the largest group of integrated software purchasers are professional/knowledge workers, who are generally placed low on the list of prospective buyers by manufacturers.

This report, which costs $2,650, can be obtained from Venture Development Corp., 1 Washington St., Wellesley, Mass. 02181.

NORWALK, Conn. — $12 billion will be spent on executive workstations by 1994, according to a new research report from International Resource Development, Inc. (IRD). Designers try to make the new equipment "user-friendly," but some executives won't be able to handle the new gear, according to Kenneth G. Bosomworth, IRD's president. He added, however, that "by the end of the 1980s, it is going to be important for executives to have several new types of skills." The IRD study predicts that up to 85% of the approximately 600,000 candidates for executive workstations will have them on their desks by 1995.

The full IRD report, "The Executive Workstation," costs $1,650 from International Resource Development, Inc., 6 Prowitt St., Norwalk, Conn. 06855. ■

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Products

CUPERTINO, Calif — **Apple Computer, Inc.** introduced Appletalk, the network for the Macintosh Office computers and related peripherals. The Appletalk Personal Network will connect up to 32 Macintosh computers and peripherals. The architecture is layered and nonproprietary, and Apple has published the protocols to encourage developers to create products for Appletalk.

Appletalk and Apple's Laserwriter, a $7,000 laser printer that has Appletalk built in and can be shared by up to 31 people using Appletalk, are the first two announcements in the family of The Macintosh Office. With the expected announcement of other products in the The Macintosh Office, Apple hopes to achieve the goal of establishing Macintosh as "second standard in a variety of business markets."

Appletalk costs $50 per device, which includes the Appletalk connector and two meters of cable, and will be available in March through all Apple distribution channels.

SANTA CLARA, Calif. — **Rolm Corp.** has introduced Cedar and Juniper, two members of its desktop product line that combine personal computers with the Rolm CBX or CBX II Business Communications System.

Cedar, a personal communications computer, combines an IBM Personal Computer-compatible personal computer with a multiline digital telephone. Juniper is a multiline digital telephone that connects to an adapter board that plugs into an IBM Personal Computer. Both Cedar and Juniper connect to the CBX via Rolmlink, a high-speed communications link that provides simultaneous voice, data and control information over a single pair of telephone wires.

Cedar is priced at $4,245, and Juniper at $1,360, both in quantities of 100. For more information, contact Rolm Corp., 4900 Old Ironsides Drive, Santa Clara, Calif. 95954.

TEWKSBURY, Mass. — **Digital Equipment Corp.** recently announced the extension of the Ethernet approach to local-area networks from the baseband to the broadband environment.

The Broadband Ethernet Transceiver (Decom) and Broadband Ethernet Frequency Translator (Deftr) are designed to connect to DEC's Ethernet controllers for VAX, PDP-11 and Professional 300 computer systems. Deftr is used with Decom in single-cable installations to allow Decom to transmit at one set of frequencies and receive on another. Deftr is unnecessary in dual-cable installations because Decom can transmit and receive at the same frequency using separate connection points for each cable.

Available in the spring of 1985, Decom is priced at $4,250 and Deftr is $4,500.

More information is available from Digital Equipment Corp., Maynard, Mass. 01754.

ATLANTA — **Lanier Business Products, Inc.** has developed a VT-100 communications package that provides a link between Lanier business processors and computers from Digital Equipment Corp.

The product reportedly incorporates several features that are not standard on the VT-100, including advanced editing commands, advanced video commands, printer support for both character and line printing as well as disk input/output on Lanier word processing files. The package is available for $500.

Lanier also announced a data base management system for the accounting, legal and insurance professions. The package, called Datamanager II, uses English instructions and, when used with Lanier's One-Step WP package, can do columnar reports, address labels, personalized letters and preprinted forms. Datamanager II is priced at $1,195 from Lanier Business Products, Inc., 1700 Chantilly Drive N.E., Atlanta, Ga. 30324.

EAST HARTFORD, Conn. — **Multimate International Corp.** has announced Multimate Professional Word Processor version 3.30 for the IBM PC. It includes proportional printing, improved repagination and display speed and the ability to edit documents on more than one subdirectory. Multimate 3.30 requires DOS 1.1 or higher, 256K bytes of RAM and two double-sided drives and costs $495. Owners of Multimate 3.22 may upgrade for $50. More information is available from Multimate, 52 Oakland Ave. N., East Hartford, Conn. 06108.

THOUSAND OAKS, Calif. — **Corona Data Systems** has introduced the Corona PC400 Series, an IBM PC-compatible desktop with 640-by-400 pixel resolution and a 14-in. monitor on a pedestal. The graphics adaptor on the motherboard leaves an extra expansion slot. The 16-bit, 8088-based PC400 Series is offered in configurations ranging from $2,650 for a 256K-byte random-access memory (RAM) single disk drive Model 12 to $4,395 for a 256K-byte RAM, single disk drive, 10M-byte hard disk Model HD2 from Corona, 275 E. Hillcrest Drive, Thousand Oaks, Calif. 91360.

LOWELL, Mass. — **Wang Laboratories, Inc.** unveiled its VS 65, a mid-range system in the VS series designed to reinforce the company's departmental-level strength in distributed data-processing. The new system includes a new central

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processor using parallel architecture, a high-speed cache memory and an enhanced bus processor. It has up to 4M bytes of main memory, supports up to 30 users, has the ability to communicate with other VS systems and with host mainframes in a distributed network; supports Wangoffice and has a variety of office automation functions.

A package configuration containing a CPU with 1M byte of main memory, a 5.25-in. 360K-byte diskette drive, remote diagnostics and the operating system, a 147M-byte fixed disk and a 76M-byte removable disk, along with four 4230-VS workstations is available for $54,300.

Wang also announced enhancements to the VS 15 including 2M bytes of main memory and support for external disk drives. In addition, the system will now support a new internal 147M-byte fixed disk drive. For more information contact Wang Laboratories, Inc., One Industrial Way, Lowell, Mass. 01851.

WALTHAM, Mass. — PC Info, a microcomputer relational data base package, was introduced by **Henco Software, Inc.** The product reportedly allows micro users to tap directly into minicomputers. PC Info is compatible with Henco's 4GL minicomputer data management package called Info and has the same screen and report generators, command set, interface to standard data files and relational capabilities.

PC Info offers an upload/download capability that enables users to acess existing Info applications, reports and files on both mini and micro systems. It requires 512K bytes of memory, PC DOS Rev. 2.1, a 10M-byte hard disk and a 5.25 in. diskette drive. It currently runs on the IBM PC XT and IBM PC AT and is available for $1,200 from Henco, 100 Fifth Ave., Waltham, Mass. 02154.

GARDENA, Calif. — A high-resolution desktop image scanner for office automation, the MS-200, was introduced by **Microtek Lab, Inc.** The MS-200, available for $1,700, accepts documents up to 8.5 in. by 24 in., digitizes the images at 200 pixel/in. resolution and transfers the image to host computer memory. Switch-selectable scanning modes include text mode, picture mode and mixed modes. The MS-200 performs Group 3 1-D CCITT data compression at a 10:1 ratio for text and comparable compression ratio for graphics. For additional information contact Microtek Lab, 17221 S. Western Ave., Gardena, Calif. 90247.

MOUNTAIN VIEW, Calif. — **Datacopy Corp.** unveiled its Model 700 Word Image Processing System, which incorporates Datacopy's Wips software permitting image capture and processing. The Model 700 interfaces with the IBM PC's WP and data base management software and operates as a front-end peripheral for the IBM PC XT and PC AT. The system consists of the Model 210 Image Scanner, Model 111 Imaging Interface, Wips software and interconnect cable. The system costs less than $4,000.

Datacopy also introduced an enhancement to its Release 2 Wips software: Character Image Recognition. The software reportedly processes image files of documents that have been scanned by Datacopy scanners and converts the text portions of the documents to standard Ascii code. The Ascii code text can then be processed using standard WP software and reportedly occupies about 1% of the storage normally required for the equivalent file images. The software comes in two versions: CIR-1 is preprogrammed for two widely used office typewriter fonts — 10 point Courier and 12 point Prestige Elite. It is available for $695. CIR-2 is preprogrammed for the same two fonts, but includes an interactive learning capability that reportedly allows the user to train the software to recognise virtually any font or letter pattern, including handwriting. It is available for $1,995 from Datacopy, 1215 Terra Bella Ave., Mountain View, Calif. 94043.

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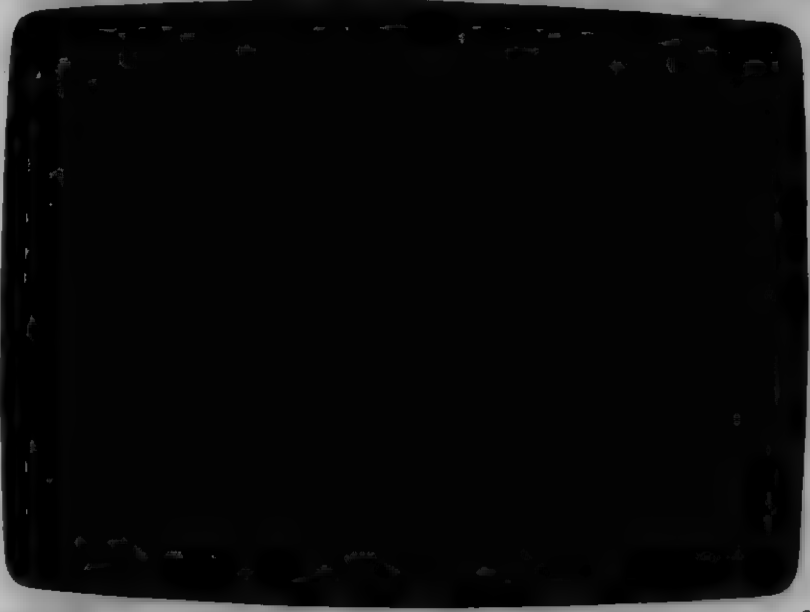

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Feb. 11-12, Princeton, N.J. — **Lotus 1-2-3.** Also, Feb. 25-26, Boston. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

Feb. 13-14, Princeton, N.J. — **Symphony.** Also, Feb. 27-28, Boston. Contact: Data-Tech Institute, Lakeview Plaza, P.O. Box 2429, Clifton, N.J. 07015.

Feb. 20, San Francisco — **Database: Executive Strategies for the Information Age.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Feb. 20-22, Chicago — **Info/Software '85.** Contact: Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

Feb. 20-22, Tucson, Ariz. — **Dataquest Industry Conference.** Contact: Jewel Peyton, Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

Feb. 25-27, Atlanta — **Information Center Software Selection.** Also, May 20-22, New York. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

March 4-5, San Francisco — **Essentials of Personal Business Computing.** Also, March 11-12, New Orleans; March 25-26, Washington, D.C.; April 1-2, Los Angeles; April 9-10, Chicago; and April 16-17, New York. Contact: U.S. Professional Development Institute, Using Microcomputers for Management, 1620 Elton Road, Silver Spring, Md. 20903.

March 4-7, Atlanta — **Interface '85.** Contact: Program Department, Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

March 4-7, Washington, D.C. — **The Federal Office Systems Expo (Foss '85).** Contact: National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

March 6-7, San Francisco — **Personal Business Computers for Managers.** Also, March 13-14, New Orleans; March 27-28, Washington, D.C.; April 3-4, Los Angeles; April 11-12, Chicago; and April 18-19, New York. Contact: U.S. Professional Development Institute, Using Microcomputers for Managers, 1620 Elton Road, Silver Springs, Md. 20903.

March 10-13, Reno, Nev. — **Tenth Annual SAS Users Group International (Sugi) Conference.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511-8000.

March 12-13, Chicago — **Data Communications in the Factory.** Contact: Bob Stearn, The Yankee Group, 89 Broad St., Boston, Mass. 02110.

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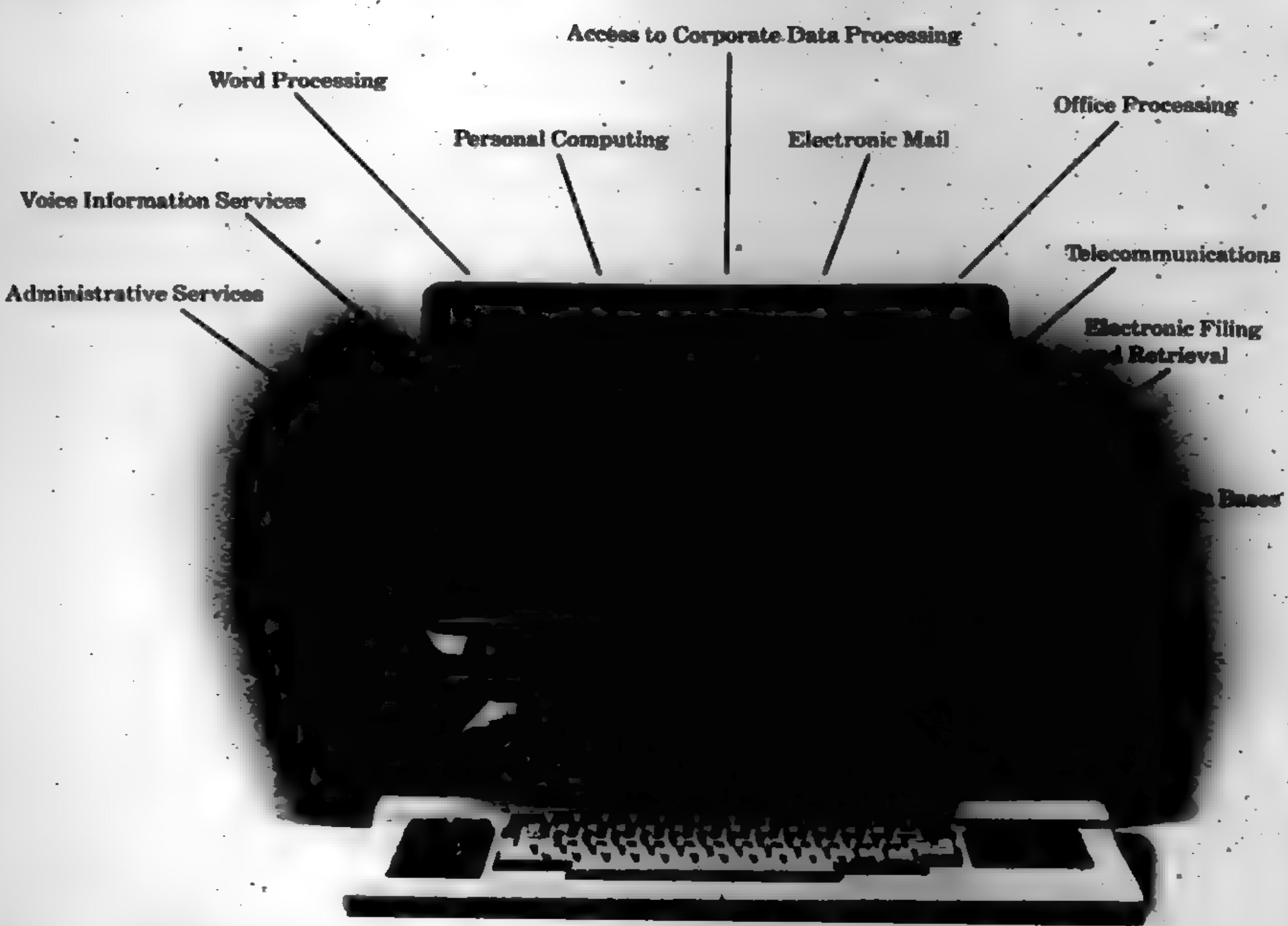
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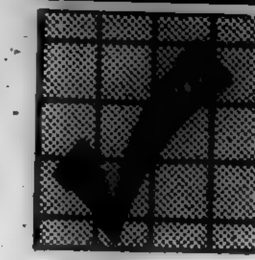

Change for the better?
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In Depth
An anonymous programmer sounds off
Follows 80

In Depth
Meet Peter Benton **ID/11**

IBM adds disk drives

Models seen paving way for Sierra series

By Donna Raimondi
CW Staff

RYE BROOK, N.Y. — In a move analysts said paves the way for the awaited Sierra line of mainframes, IBM last week released two additional versions of its 3380 disk drive and dramatically increased the cache memory capacity of its 3880 Models 21 and 23 disk controllers.

Highlights of the announcement included the following:

■ Two 3380s, which IBM is calling Extended Capability models, in single- or double-capacity versions. The double-capacity models can store up to 5.04G bytes of data. The single-capacity models offer the same amount of storage as earlier 3380s but are field upgradable to the double-capacity units. Users of older 3380s cannot upgrade to the 3380 models announced last week.

■ Expanded cache memory capabilities for the 3880 Models 21 and 23 disk controllers, which use 256K-bit memory chips, to as much as double the cache capacity of the 3880 models. The Models 21 and 23 now have a cache capacity of 48M or 64M bytes.

■ A series of software enhancements that appears to support the newly announced storage devices (see story page 9).

The Extended Capability models al-

See IBM page 7

Decade-old IBM 3420 drive hot item in tight market

By Tom Henkel
CW Staff

While some users are queuing up to buy initial models of IBM's 3480 cartridge tape drive, its 12-year-old predecessor, the 3420, has also become a hot commodity in recent months. According to one dealer of used IBM hardware, used models of the 3420, particularly the top-end Model 8, are selling for close to the IBM list price for new units. Furthermore, used IBM 3803 Model 2 tape controllers, designed for use with the 3420 Model 8, are selling for nearly twice as much as IBM's current list price.

The reason for the unusually high prices for used hardware stems from what industry watchers contend is a temporary shortage of 3420 tape units, apparently brought on by a decrease in IBM production and Storage Technology Corp.'s recent financial problems.

Industry analysts claim that when IBM announced the 3480 last March, it slowed production of the 3420, presumably so it could build more 3480s. But "IBM underestimated the demand for start/stop tape drives," noted Al Tinker, a vice-president at Memorex Corp., who claimed his company is having a field day booking orders for

See DEMAND page 4

Salary gap pervades DP

Women earn 22% less than men working in same positions

By Donna Raimondi
CW Staff

Women in computer professions earned almost 22% less last year than men in the same jobs, according to figures released recently by the Bureau of Labor Statistics.

Despite this disparity, earnings in the computer field still outshine those of most other professions. For example, while women in computing earned 78.2% of what men made in 1984, the median income for women in all jobs last year was only 65% of that for men, the BLS figures showed.

The BLS study is the most recent to point out the significant differences in salaries between men and women computer professionals.

A study conducted last year indicated even sharper salary differences between men and women professionals in data processing than the BLS survey did. Furthermore, those differences were found between men and women with the same educational backgrounds and job experience.

Joyce Currie Little, who initiated the study last year, is chairwoman and a professor in the computer and information sciences department of Towson State University in Baltimore. She gathered information from local community college alumni who graduated in 1978 with associate degrees in computer science.

Her dissertation, "Computer Career Patterns of Associate Degree Graduates from Data Processing Technology Programs in Public Community Colleges," will be published by Dissertation Abstracts International.

Little said she found no significant differences in the educational level or job satisfaction between the men and women surveyed, but she did find that women were clearly at the bottom of the heap in terms of salary. She said she learned that the average yearly salary for men was $32,085 vs.

See WOMEN page 6

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NEWSPAPER

Minis form micro net hub

By Edward Warner
CW Staff

NEW YORK — What some said will be the next wave in end-user computing — departmental minicomputers supporting clusters of personal computers — is a reality in the wholesale operating group at Manufacturers Hanover Trust Co. here.

The wholesale group, a vertically integrated operating group responsible for credit and cash management services, has connected at least 18 Wang Laboratories, Inc. minicomputers at the bank's headquarters here with department-level clusters of Wang's Professional Computer. All of the group's 100 Wang micros are linked to the minis, as are the group's Wang word processing terminals. The clusters include anywhere from one to 50 personal computers.

The Wang micros store data on the minis — at one location they have access to 32M bytes — and the minis act as file servers and gateways to the IBM 3081 and 3084 mainframes of the bank's central data processing operation. The minis provide shared peripherals for their clusters, including shared Xerox Corp. 2700 laser printers at three cluster sites.

Using the Wang mini as a communications server, a Wang Professional Computer user can access Manufacturers Hanover's companywide electronic mail system routed through two Digital Equipment Corp. PDP-11/70 minicomputers or even send documents over the high-speed leased lines of the bank's Geonet network, a

See NETWORK page 4

TOP OF THE NEWS

A Los Angeles man was indicted for illegally accessing federal computers and will be charged under the new law pertaining to illegal entries into government computers. **Page 2.**

■

At least one user has received delivery of IBM 3480 tape drives and found that they lived up to expectations in initial trials. **Page 4.**

■

Apple no-show. Office Automation Conference '85 attendees noted the absence of Apple Computer, Inc. **Page 11.**

■

It's a first. That is what Intel Corp. is saying about its concurrent processing system based on multiple nodal processors. **Page 87.**

■

They had to sell or go public. The cofounder of McCormack & Dodge Corp. speaks out on the challenges the company has met during the past 16 years. **Page 119.**

DP worker charged with hacking

Grand jury cites recent federal computer crime law

By Mitch Betts
CW Washington Bureau

DENVER — A federal grand jury here last week indicted a 26-year-old Los Angeles man on charges of illegally accessing computers at the Colorado offices of the U.S. Department of Agriculture (USDA). The indictment is based on a new law that specifically outlaws breaking into the federal government's computers.

The indictment alleges that Philip Gonzalez Fadriquela, a computer operator at a company the indictment did not identify, used the communications networks at GTE Telenet Communications Corp. and Tymnet, Inc. to access computers illegally at the USDA's Forest Service regional offices, according to Cathy Goodwin, assistant U.S. attorney here.

The defendant allegedly dialed into the Tymnet network, then made unauthorized use of a special password to enter the Telenet network, from which he directed calls into USDA computers, according to Claudia Houston, spokeswoman for GTE Telenet. A USDA spokesman declined to discuss the case because it is subject to continuing investigation and litigation. Goodwin said it was not clear what the suspect did or intended to do with the USDA data files.

The indictment resulted from a joint investigation by Denver's U.S. Attorney's Office and the Federal Bureau of Investigation, according to Robert N. Miller, U.S. attorney here. Miller said that GTE Telenet, Tymnet, Pacific Bell Northwest Telephone Co. and the USDA cooperated in the investigation.

Indictment contains seven charges

The indictment, issued Feb. 5, contains seven charges, which include the following: four misdemeanor charges brought under the new federal law against breaking into federal computers, two counts of felony wire fraud and one felony count for making false statements to a federal agency, Goodwin said.

Goodwin said the indictment states that the defendant gained unauthorized access to computers at the USDA's Denver regional office and the Forest Service's Fort Collins, Colo., office, inserted false user codes and passwords into the computer programs and made printouts of information from the computer files.

She said the charges cover a period from Dec. 22 through Jan. 26. The FBI seized computer equipment owned by the suspect Jan. 26 and arrested him Feb. 6 at his Los Angeles home, Goodwin said.

Last year, Congress enacted the Computer Fraud and Abuse Act of 1984 that specifically makes it a crime to gain unauthorized access to the federal government's computers [CW, Oct. 15]. Under the new law, illegally accessing a federal computer to use or modify unclassified information is a misdemeanor; the first offense carries a maximum penalty of one year in prison and a $5,000 fine, and repeat offenses carry a maximum penalty of 10 years in prison and a $10,000 fine.

"GTE Telenet strongly supported this act during congressional hearings in 1984, and we are working this year to expand the law to protect private-sector computers as well," GTE Telenet President J. David Hadd said in a statement.

The alleged trespass was first identified and traced by Kevin Abt, director of quality management at GTE Telenet in Vienna, Va., Miller said. "We spotted the [unusual] traffic the first day it happened," GTE Telenet's Houston added.

USC looks for phony degree records

By Kathleen Sullivan
CW West Coast Bureau

LOS ANGELES — Officials at the University of Southern California (USC) are investigating allegations that counterfeit degrees, supported by transcripts that were illegally placed in the university's computer system, were sold for as much as $25,000 each.

According to Sylvia Manning, USC's vice-provost, the alleged phony degree scheme was uncovered by the Drug Enforcement Administration in Louisville, Ky., during the course of a drug investigation. At present, both the Los Angeles County District Attorney's office and the university are conducting probes on the allegations.

Neither Manning nor the district attorney's office investigator would comment further on the case or the methods allegedly used to place transcripts in the computer system. At press time, Manning said the university had found no evidence of phony transcripts or sales of fake degrees. As a result of the charges, USC has broadened an ongoing investigation into illegal tampering with the university's computer system.

Last June, a USC employee was dismissed when the university found she had altered grades on student transcripts, selling five grade changes for $1,500. Manning said there is evidence that an even more extensive grade-change operation was in place, in which passwords and access codes were used to gain access to the system.

The university has tightened its computer security measures since the first investigation began, installing an audit trail system and creating a system that will allow USC to perform computerized postaudit checks of transcripts, Manning said.

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We can't be everywhere — but our readers are.

CORRECTIONS

The Dexpo West '84 booth highlighted in the Dec. 17 issue of *Computerworld* was that of Interactive Systems, Inc. of Lowell, Mass.

Exxon Corp. has suspended manufacturing in its Lionville, Pa., office systems subsidiary. However, Exxon Office Systems Co., the subsidiary, continues manufacturing for the parent company and other third-party customers [CW, Jan. 21].

NEWS SUMMARY

Throughout the country, customers are awaiting the arrival of IBM's Model 3480 tape drive subsystem/4

Complex and difficult to learn but has potential as an applications writing tool — this and other observations about Ada were offered by two early users of the programming language/8

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Waiting game ends for one user of IBM 3480 subsystem

By Jeffry Beeler
CW West Coast Bureau

ORANGE, Calif. — In computer rooms throughout the U.S., customers are nervously pacing the floor like expectant fathers as they await deliveries of IBM's Model 3480 tape drive subsystem.

For at least one Southern California company, the protracted wait ended Jan. 4, when two strings of the 3480s arrived at the doorstep of TRW Information Services, Inc., a credit bureau operator whose data base contains millions of financial histories.

Three days later, the eight 3480 storage modules and their two controllers were installed and soon thereafter went into limited production use, according to Al Dewey, director of TRW's computing operations.

In subsequent benchmark tests, TRW dumped data from both its 3380 and 3350 disk systems to the newly arrived 3480s and then compared the observed transfer rates with those of the company's existing 3420 tape drive systems.

When attached to the 3380s, the 3480s yielded 40% to 100% faster job runtimes than the 3420s, Dewey said. With the 3350s, meanwhile, the 3480's performance edge reportedly dipped to 20% to 30%.

"The reason we got different test results with different models of disk systems is that the 3380 [unlike the older 3350] is equipped with data-streaming channels," Dewey explained. "The degree of performance improvement we observed during the benchmarks was pretty much what we expected."

Introduced last spring [CW, March 26], the 3480 reportedly accepts data transfers at speeds of up to 3M byte/sec, compared with a maximum of 1.2M byte/sec for the 3420. The 3480 also occupies significantly less floor space than its IBM predecessor, Dewey said, and uses built-in message units to avoid I/O errors.

Not surprisingly, therefore, the 3480 has already won widespread acclaim as a highly desirable successor to the aging 3420, which has remained a mainstay of Big Blue's product line since its introduction in 1973.

But the 3480 also has its reported drawbacks. Because the 3480 and 3420 store their tape in different forms — cartridges and reels, respectively — acquisition of the newer model storage devices may lead in some cases to conversion woes.

Another even more serious problem currently afflicting would-be 3480 users is the product's simple lack of availability. Even today, nearly a year after its industry debut, the tape system has yet to find its way into customers' hands in large volumes.

Nor do many users expect the dearth to end anytime soon. Sungard Recovery Services, Inc., for example, sees little chance at present of receiving its requested shipment of two 3480 strings before mid-year, according to Bill Flounders, the firm's vice-president of operations.

Until recently, the Philadelphia-based supplier of systems-backup facilities was advised not to expect its 3480s to be shipped until 1986 or possibly even 1987. Since then, however, Sungard's delivery schedule is said to have been greatly accelerated, largely in response to user lobbying efforts. "IBM informed us that it had been pressured by our customers to ensure that Sungard's 3480 shipments received top priority," Flounders said.

But even with recent improvements, Sungard's delivery timetable still pales in comparison to TRW's. At first, TRW was slated to receive its cartridge tape systems around June or July, but when it objected, IBM responded by hastening the arrival date twice: first to the end of January and then to the beginning of this month, Dewey said.

The improvement in shipment schedule has thrust TRW into the enviable position of being among the 3480's earliest recipients. "Because we're so close to Tucson, Ariz., where the 3480s came from, it's conceivable we were the first customer to get them," Dewey said.

Intended mainly for archival storage and backup of the company's huge collection of on-line credit histories, each of TRW's 3480 strings contains one controller and four storage units with two tape transports.

To date, the bulk of the firm's archival files still resides in its long-installed 3420s. But as the files gradually lose currency and give way to more recent historical information, the reel tape systems will be retired and replaced with cartridge-type modules. By year's end, TRW expects its arsenal of 3480s to have expanded to four or five strings, Dewey said.

Reel tape systems, however, are unlikely to disappear from TRW entirely, he added. Because some of its clients may continue to use 3420s indefinitely, TRW will probably have to do likewise.

NETWORK

from page 1

system that connects its New York headquarters with various branches overseas.

The development of minicomputer-based personal computer clusters at Manufacturers Hanover was largely pioneered in the bank's Financial Services Group (FSG), a client of the wholesale group, according to Robert Petrie, the group's vice-president for end-user computing. Petrie was formerly in charge of support for end-user computing in the FSG.

In 1983, Petrie said, the FSG had been looking for a means to interconnect its growing number of personal computers with the several Wang minicomputers already in use, largely for terminal-based word processing. When Wang, in May 1983, announced a board for its Professional Computer that would provide the personal-computer-to-mini connection, Petrie added up the figures and found "it was as cheap to get a Wang [Professional Computer] as [it was] to get a workstation. "We immediately seized upon that," he said.

CW photo by E. [illegible]

Petrie

Though the use of minis as host departmental networks of personal computers has yet to catch on in Manufacturers Hanover as a whole, the wholesale group and FSG in particular are "carrying the word to the masses," Petrie said.

The minis in use by the wholesale group for its clustering scheme range from the Wang VS85 to the Wang VS100 at the high end and from the Wang OIS/60 to the Wang OIS/140 at the low end. One VS100 is supporting 50 Professional Computers.

Petrie said the biggest benefit of the clusters has been the savings that come from sharing peripherals, especially printers and micro-to-mainframe communications boards.

Another benefit, he said, is that the users can still use the Wang word processing software, a package they already understand, and have access to larger amounts of disk storage.

In the future, Petrie said he would like to add automatic backup of user files, most of which are now stored on the mini. Software for that function is now being tested by the wholesale group, though Petrie noted that "ideally, I would like to see the users exercise the discipline to back up their personal files."

Throughout the bank, though, IBM Personal Computers still outnumber Wang Professional Computers. The 200 IBM micros in the wholesale group, for example, hold a two-to-one edge. The bank, however, does not connect IBM Personal Computers to minis but links them to IBM mainframes over its Geonet network, a coaxial cable system that terminates in RS-232 sockets in every office at the headquarters.

An interface board under review by Petrie's office would allow the IBM micros to tie in with the Wang minis. That board, a Wang spokesman said, is the Wang Systems Network Option for the IBM Personal Computer.

Manufacturers Hanover, Petrie said, is also looking with great interest at IBM's announcement of plans to strengthen the connection between its Personal Computer and its System/36 mini and already has a System/36 on order for pilot testing as a departmental host.

IBM, meanwhile, announced in October 1983 the enhancement of its Displaywrite Personal Computer word processing program that would allow it to interchange documents with the System/36 and even the IBM 370.

DEMAND

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3420-compatibles and 3803 Model 2 controllers.

An IBM spokesman said the company has not shipped the 3803 Model 2 controller since September, when a components shortage forced IBM to halt production. The shortage has recently been resolved, IBM said. IBM maintained it has never been slow in shipping 3420 tape drives, claiming the units are available four months after order placement.

Fueling IBM's 3420 shortage have been the financial problems experienced by Louisville, Colo.-based STC. International Data Corp. (IDC), a Framingham, Mass.-based market research firm, said STC had held the lead in selling 3420-compatible products. When STC filed for protection under Chapter 11 of the Federal Bankruptcy Act last October, some concerned customers apparently went running back to IBM trying to buy 3420s.

Svend Hártman, president of Computer Merchants, Inc., a Chappaqua, N.Y., dealer in used IBM hardware, noted that the January edition of the firm's "Computer Price Guide" listed single-density 3420 Model 8 units as selling at 91% of the IBM list price. The IBM double-density model was selling at 93% of the IBM list cost. The publication also indicated the 3803 Model 2 tape control unit to be selling at 160% of the IBM list price, with units costing roughly $44,000, compared with the IBM list price of $27,550.

David Vellante, an analyst with IDC, contended that the popularity of the 3420 and 3803 is a temporary situation.

According to Vellante, "3480 orders are outrageous. People who have not bought tapes in some time" are planning to buy the 3480. The IDC analyst predicted that not only will the 3420 shortage decline quickly, but orders for the older tape units will also decline.

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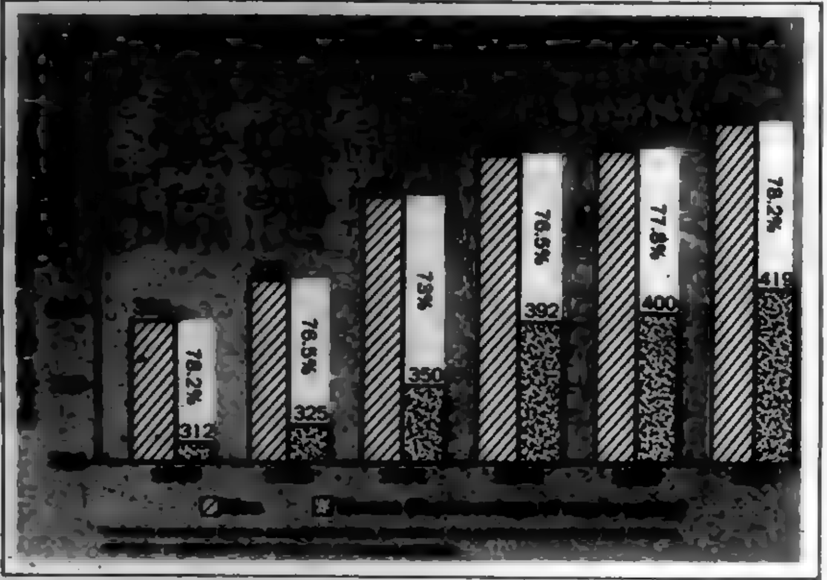


CW CHART

WOMEN

from page 1

$22,050 for women.

Little pointed out that some of the people polled in her study had been working in the field but did not have credentials until they went through the two-year college program, which might account for part of the difference. She used a sample of 80 graduates of Baltimore Community College, 59 of whom were still in computer-related jobs.

While differences in salary exist for experienced men and women in data processing, this is not the case for those just starting out in the field, according to personnel agencies specializing in the computer industry.

There is no difference in the starting pay of men and women in data processing jobs, said Robert Half, president of the Robert Half EDP Personnel Specialists job search firm. "In some cases, a woman is a novelty and can get even more money than a man," he said.

According to Wayne Emigh, vice-president and general manager of Source EDP Personnel Services, Inc., a job search agency for computer professionals, men and women placed by his firm receive the same starting pay for the same jobs. But women are not as aggressive as men in asking for more pay, Emigh said after polling five of his staff counselors who place job seekers. When seeking a new job, women tend to place emphasis on job content and satisfaction, and men place emphasis on salary, he added.

Another study by the Scientific Manpower Commission (SMC), a statistical collection agency of the American Association for the Advancement of Science in Washington, D.C., confirmed that starting salaries for men and women in DP almost match.

Men who graduated with B.S. degrees in computer science were offered average starting salaries of $24,828 in 1984, said Betty M. Vetter, SMC executive director. Women graduates with the same degrees from the same programs were offered an average of $24,060, she said. "The starting pay for computer science graduates is close but not quite equal," Vetter said, and five years into their careers, women's salaries are considerably below men's.

Why do salary discrepancies develop? One possible explanation is suggested in the the "Dewar's Career Profile: Computer Professionals," a 1983 study of 301 computer professionals. The study, which was performed by the Dewar's Center for Career Development established by the Schenley Imports Co., found that women do not spend as much time on the job as men. A third of the men interviewed and only a tenth of the women polled spend 51 or more hours a week at their jobs, the study showed; half of the women but only a fifth of the men worked 40 or fewer hours a week.

> ”
> *Woman do not spend as much time on the job as men.*
> — Dewar's career study

Companies want people to put in a lot of hours on their way up the corporate ladder, Half said. As an employee climbs to the top, there is more responsibility and more need for decision making, which requires more time on the job, he added. If women are not spending as much time as men on the job, that may contribute to the salary disparity, he said. Employers do not specify that they want employees who will work long hours, Emigh noted. They do say, however, that they want an employee who will occasionally work long hours, or they specify a time period in which overtime will be expected. Women are as apt to take those jobs as men, he said. More than 90% of men in the computer professions have college degrees, the Dewar's study showed, and three-quarters of the women have such degrees.

> ”
> *'There's a single word for it — prejudice.'*
> — Betty M. Vetter
> SMC

Although not broken down by sex in the study, 73% of all computer professionals' backgrounds are in mathematics, computer science, electrical engineering and other sciences.

Women have earned more than 40% of all mathematics-related degrees for several years now, according to Scientific Manpower's Vetter. As far back as the 1960s, she said, women have earned more than 30% of math degrees. "They are not Johnny-come-latelies," she said. As to why women in computer professions earn less than men in the same fields, she said, "There's a single word for it — prejudice."

[illegible] enough to warrant it, because if you are not, you risk losing the job.

Get a computer science degree and top it off with a master's degree in business administration, said Wayne Emigh, vice-president and general manager of Source EDP Personnel Services, Inc. Emigh said that according to a straw poll he conducted among the five most successful women on his staff, there are six additional points to consider for a woman who wants to get ahead as a computer professional:

- Identify your salary and professional goals for a five-year period.
- Determine what responsibilities and skill levels you have to achieve to reach those objectives.

[illegible] get the same recognition that [illegible], said Betty Vetter, executive director of the Scientific Manpower Commission, a statistical collection agency that is part of the American Association for the Advancement of Science that is based in Washington, D.C.

A man is expected to be competent [illegible], but a woman [illegible] many times over, Vetter said.

Women will know that they [illegible] not have to worry about pay discrimination when they can be as mediocre as many men have been and still advance as men have, she added.

ICL eying Soviet plant?

LONDON — International Computers Ltd. (ICL), Britain's No. 1 computer maker, last week labeled as "speculative" published reports that it is planning to build a $100 million-plus computer factory in the Soviet Union.

The company acknowledged that senior ICL executives did meet with Russian trade officials last December, including Yevegeni Valikhov, the Soviet minister in charge of microcomputer development plans. ICL executives at the meetings included Peter Bonfield, managing director, and members of the company's East European marketing department.

But those meetings, ICL said, were courtesy calls by the Soviets covering general trade relations topics between ICL and the Soviet Union.

Britain's Ministry of Trade and Industry declined to comment on the matter.

Meanwhile, another British company, Rair, which designs microcomputer products for marketing by ICL, said it would be willing to cooperate with ICL should such a project with the Soviets materialize.

Feature to target micro impact

The use of micros in corporate America has not been without problems. The April Special Report on "Microcomputers in Big Business" will focus on MIS tactics for integrating micros into the corporate information system, trends in [illegible] hardware and software and security [illegible].

[illegible]

IBM from page 1

low users to double the amount of 3380 disk storage without increasing the floor-space requirements.

The newly announced 3380s are said to offer up to a 15% increase in performance over the three standard IBM 3380 units when used in MVS/XA environments and up to 5% when operating in IBM 370 mode. The units have the same relative arrangement of tracks and cylinders as standard models.

Single-density Extended Capability versions, Models AD4 and BD4, feature the same capacity (2.52G bytes) as the standard models and are field-upgradable to the dual-density models.

The twofold increase in storage capacity is said to be the result of unspecified advances in disk technology and design improvements in the recording heads that write information on the disks and retrieve it. The double-capacity Models AE4 and BE4 have twice as many tracks on each disk platter. An IBM spokesman said specific details of the head disk assemblies used in the newly announced 3380s is proprietary information.

Device configuration sequencing

The Extended Capability storage devices were designed to share 3880 storage control units with standard 3380 models, but old and new 3380s cannot be mixed on the same string. Models BD4 and BE4 can be intermixed in any sequence within strings headed by either a Model AD4 or a Model AE4. Strings headed by Models AA4, AD4 and AE4 can be paired in any combination on any two properly configured 3880 Storage Control Model 3 storage directors or on 3880 Storage Control Model 23 storage directors in a single- or dual-frame configuration.

The single-capacity Models AD4 and BD4 cost $88,780 and $64,440 per unit, respectively, and will be available in March. They can be converted to double capacity at the customer's location at a cost of $45,960 in the fourth quarter of 1985, the vendor said. The 5.04G-byte double-capacity Models AE4 and BE4 cost $134,740 and $110,400, respectively, and will be available in the fourth quarter of 1985.

The Extended Capability models have been designed with fewer components in the power system, the read/write channel and the control electronics. This is said to reduce the opportunity for failure. Consequently, the minimum monthly maintenance charges on all Extended Capability models has been reduced by 10% over standard models, the vendor said.

Cache memory expansion

The maximum cache memory capacities of IBM 3880 Models 21 and 23 storage control units, which were introduced last fall and use IBM's 256K-bit chip technology, have been expanded from 32M bytes to 48M or 64M bytes.

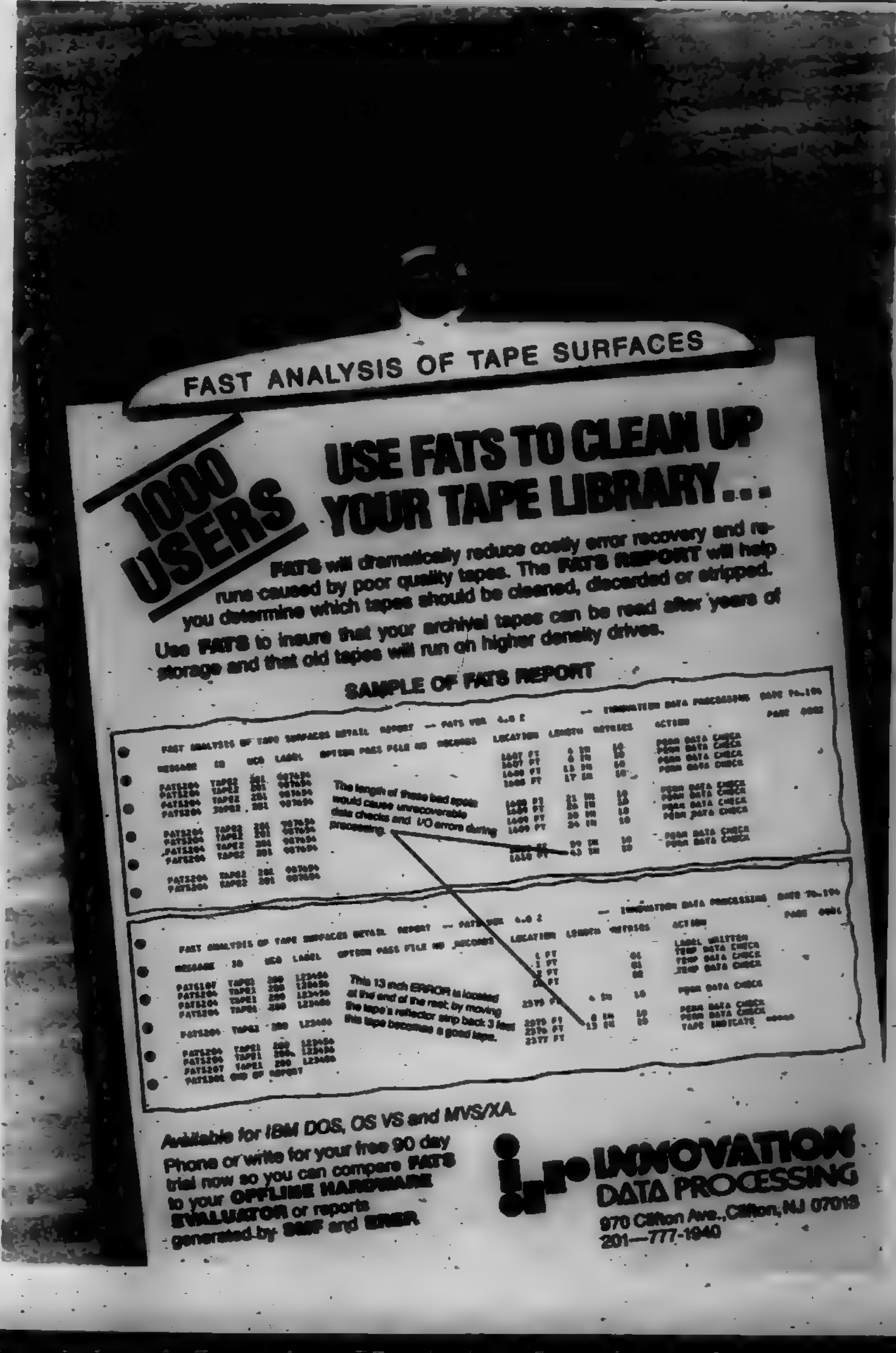
The models were expanded to increase the rate at which data is transferred between the storage subsystem and the main memory and to provide support for the new 3380 Extended Capability Dasd units.

The newly announced 3880 Models H21 and J21, with cache capacities of 48M and 64M bytes, respectively, are said to offer higher probabilities that page data that the host requests for transfer to it will be found in the cache memory and transferred without mechanical delays.

The 3880 Models H23 and J23, with respective cache memory capacities of 48M and 64M bytes, are said to offer performance increases in host access to frequently used application data.

The larger cache memory capacities will be available in the first quarter of this year. Purchase price is $349,975 for a 48M-byte unit and $429,975 for a 64M-byte unit.

IBM's Systems Products Division is located at 900 King St., Rye Brook, N.Y. 10573.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Users: Ada complex but has potential as writing tool

FIRST USER

It is complex, difficult to learn and still lacks some needed features, but it has good potential as a tool for writing portable, readable applications.

These were among the comments of two early users of the Ada programming language that were interviewed recently by *Computerworld*. The users — BDM Corp. of Austin, Texas and Moog, Inc. of East Aurora, N.Y. — each have more than two years of practical experience with the Department of Defense-mandated language. Programming managers from the two companies generally agreed that Ada enforces clean and consistent programming and includes good features for high-volume, repetitive processing.

However, the managers also said that Ada programs written for their compilers tend to be resource-hungry and slow, especially during complicated processes. In addition, Ada's complexity also makes it a difficult language to master, they said, although modest proficiency can be achieved in just a few weeks.

BDM has been working on a defense-related application using the Rolm Corp./Data General Corp. Ada compiler for more than two years, according to Mike Perkins, vice-president of systems design and manager of the project.

The completed application, which Perkins would not describe in detail, will run between 30,000 and 40,000 lines of code. It involves heavy use of interactive, high-resolution graphics and burst strengths of up to 400K bit/sec. About a dozen Ada programmers are involved in developing the program, which is in the detailed design stage, he said.

Ada valuable when reliability is a plus

Moog has completed three Ada applications on Intellimac, Inc. supermicrocomputers using an earlier, unvalidated version of a Telesoft, Inc. compiler. Moog, a maker of electromechanical actuators and electrohydraulic valves for high-precision motion control applications, has found Ada to be valuable for applications in which reliability is a plus, but has been disappointed in Ada's consumption of memory and CPU cycles, according to Terry Westley, software engineer.

> *'[Ada] basically removes some of the uncertainty by forcing you to do things in a logical order.'*
>
> — Mike Perkins
> BDM Corp.

Perkins said BDM has been proceeding slowly in the new language, largely because programmers have been learning on the job. He said Ada is three to four times as complex as Pascal and may take up to three times as long to learn. But he said Ada offers many more capabilities than most languages.

Ada not suited to small applications

Perkins said he has been surprised by the complexity of the language, particularly the procedures required to invoke a program. Because Ada was designed to be portable and because it can freely call other programs, as much as 70% of the code can be taken up in setup commands. For that reason, he said Ada is not suited to small applications.

Ada specification manuals are massive, he commented. "You look at the [specification] and think it looks crazy, but when you look at the language you realize that you need the [specification]," he said.

Moog's Westley agreed that the sheer size of Ada makes it difficult to learn thoroughly, but he asserted that "you don't need a lot of training to begin using it. If you have somebody who's familiar with Pascal, you can have him coding in two to four weeks," he said. Moog has given its five Ada programmers mostly on-the-job training, embellished by videotape courses from Alsys, Inc. of Waltham, Mass. Ada tends to enforce more structured design, although it does not inhibit creativity, Perkins said. "It basically removes some of the uncertainty by forcing you to do things in a logical order," he said.

Westley agreed. "It's a modern language that uses modern techniques in structured programming and design," he said.

Because Ada imposes certain restraints, it lessens the chance of programming errors, he said. For example, a programmer cannot forget to end a subroutine with a RETURN command or write a routine that puts a floating-point number in an address space reserved for an integer.

Other Ada features can be used to prevent common program bugs, Westley said. Exception handling flexibility allows program gremlins like "divide by zero" to be handled at various levels so that the program does not freeze. Loops can be exited at any time, a process that Westley said was more "intuitive" than those of standard languages.

However, Perkins noted that some common features are not yet available in validated Ada compilers. For example, BDM has had to write its own extensions to perform low-level bit manipulation and has designed some of its own logic functions that are still unavailable.

But Perkins said he expects the problems to be solved as the validation suite is expanded. "In the long term, Ada is going to be really slick, but now it's a little primitive," Perkins commented.

Ada is readable and maintainable

Both men praised Ada's readability and maintainability. "It can be more easily understood by people who didn't write it," Perkins said. Westley said one application Moog wrote in Ada has been running in the field without problems for more than a year.

But both also cited problems with the performance of Ada programs. For problems requiring extremely high-speed processing, such as closed-loop applications, Ada has proved to be too slow, Westley said. "We've been able to close loops in less than one millisecond," he said. "But when we've had other things going on [in the program], we have to get into the assembler."

Ada programs can consume up to five times as much memory as programs written in assembly, he said. "In our compiler there's a basic requirement of 32K [bytes] to do anything," he said. Other Moog applications written in Ada have required up to 400K bytes of memory.

Both Westley and Perkins commented that many of the problems they identified should be worked out in future compilers. "The kinds of problems we've seen are not inherent in Ada. We were just early in the technology," Westley said.

Ada handles nearly any need

Perkins sees potential in Ada for corporate applications but said that for the next year or two, any company that implements a project in Ada is taking some chances. "I can't see myself as an Ada zealot right now," he said. "But once things settle, it will be a real boon because you have the capability simply to update and recompile rather than rewrite completely," he said.

Westley, who has several years of Cobol programming experience, said Cobol has some significant advantages for business applications, particularly in report writing. But he said Ada is capable of handling nearly any need if the proper extensions are used.

"And having structured programming gives you huge advantages over Cobol," he said. Westley called portability a key. "I've gone through more than one conversion from one machine to another," he said. "If I had had Ada at the time, I wouldn't have had to pay my vendor $50,000 to move my programs over for me."

UNIX
TRAINING
SYSTEM V

IBM enhances DF software for MVS/XA environment

RYE BROOK, N.Y. — In conjunction with last week's introduction of two model types in the 3380 Dasd family (see story page 1), IBM also announced enhancements to programs in its Data Facility (DF) software series.

The enhanced programs are said to manage the flow of information in IBM's MVS/XA environment more efficiently.

These enhanced programs in the DF series are as follows:

- MVS/XA DF Product Version 2, Release 1 (MVS/XA DFP 2.1), said to support the new 3380 Extended Capability models and to provide virtual-storage constraint relief and additional device support for MVS/XA users. Features include increased available virtual storage below the 16M-byte line, enhanced Dasd space management in allocation and partial release and support for the IBM 3430 Magnetic Tape Subsystem and various band printers. The program is scheduled to be available in the first quarter of 1986 for a monthly charge of $900.
- DF Sort, Release 7 (Dfsort 7), which was designed to improve sorting performance on IBM 370-XA CPUs through the use of Sorting Assists, a set of processor instructions designed for the sorting algorithm used by Dfsort. Features include performance improvements in processor time, use of Sorting Assists in 370/XA-mode processors and 31-bit addressing in combination with IBM's VS Cobol II. Dfsort 7 is scheduled to be available this month for a monthly charge of $231.
- DF Data Set Services Version 2, Release 1 (DFDSS 2.1), said to facilitate the copying of data between different types of storage devices to simplify conversion to the 3380 series storage devices. The program is useful in converting data sets from one Dasd type to another and in logical data-set processing for dump, restore and copy. It offers Dasd space management enhancements that provide centralized storage management functions, including the release of allocated but unused space and the compression of partitioned data sets. DFDSS 2.1 is scheduled to be available in June for a monthly charge of $215.
- DF Hierarchical Storage Manager Version 2 (DFHSM 2), which now supports the newly announced single- and double-capacity 3380 Dasds. Features include additional support for DFHSM primary, migration and backup volumes on IBM 3380 Extended Capability models. It is scheduled to be available this quarter for a monthly charge of $600.

For more information, the National Accounts Division of IBM's Information Systems Group is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

Micropro halts copy protection for WP package

SAN RAFAEL, Calif. — Micropro International Corp. has suspended the use of copy protection for its new Wordstar 2000 and Wordstar 2000 Plus word processing packages for the IBM Personal Computer line. (A review of Wordstar 2000 by Yates Ventures, Inc. published in this issue on page 18 describes the copy-protection scheme Micropro dropped.)

"Although the copy protection we chose is the most technically advanced and the most transparent to the user, we believe it impedes the use of the product enough to warrant its suspension," said H. Glen Haney, Micropro president.

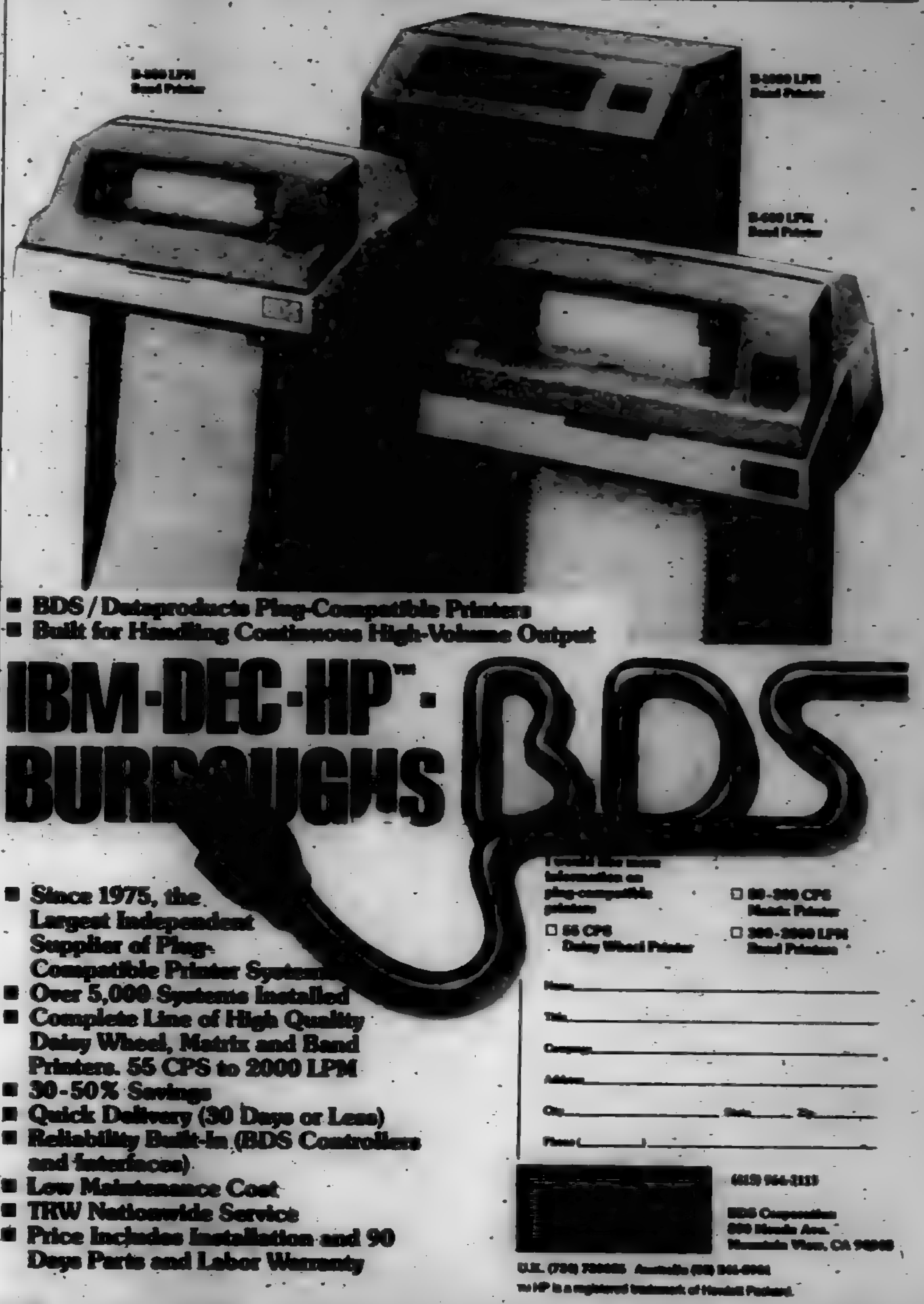
The removal of copy protection, effective Feb. 1, makes installation much easier and increases the number of Personal-Computer-compatible machines able to run the software, Micropro said. Update kits (with replacement diskettes, installation instructions and new labels) will be sent to all registered customers and to dealers who request them.

"Micropro continues to be vitally interested in protecting our products from illegal copying, but we are pursuing copyright enforcement through other channels," Haney said. In January, Micropro and the Association for Data Processing Service Organizations jointly sued American Brands, Inc. of New York and its Chicago-based subsidiary, Wilson Jones Co., alleging software piracy [CW, Jan. 21].

Wordstar 2000 was designed for the broad corporate market where ease of use and ease of learning are critical, according to Haney. The original Wordstar, which the company continues to sell and upgrade, is geared more toward technically oriented users, he said.

Industry observers noted that Multimate from Multimate International Corp. of East Hartford, Conn., which is generally seen as the leading word processing package in the large-corporation market, is not copy protected.

Wordstar 2000 and Wordstar 2000 Plus were introduced in October and shipped in December. They cost $495 and $595, respectively.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Phillips soothes micro phobia with hands-on program

By [illegible]
CW Staff

BARTLESVILLE, Okla. — At Phillips Petroleum Co., evenings are a popular time of day. Groups of Phillips employees remain at the corporate headquarters four nights each week to get some hands-on experience with personal computers.

The company's Automated Information Management (AIM) program was launched last March at the suggestion of group vice-presidents on the company's data processing steering committee.

After management expressed interest in the program, company departments gave their input on the course structure, according to Raymond Stas, director of desktop computer support. Stas heads up the AIM program along with representatives from the company's User Computing Services and Office Systems divisions.

"We went to different parts of the company asking opinions on the types of things that should be highlighted in the seminar," he said. This "town meeting" approach also helped determine the amount of companywide interest in the program, Stas said.

To stir up interest further, Stas and delegates from the two other group sponsors issued personal invitations to about 180 senior executives. "Then we let the program sell itself," Stas said.

Sales were exceptional, he said. Since March, Phillips has expanded the program — conducting two seminars a week. More than 963 of the company's 7,000 Bartlesville employees have completed the two-day, eight-hour course. Another 900 employees are waiting to attend.

A class designed specifically for secretaries was added in August, and a class for engineers was added in October. Other classes are geared toward managers and business professionals.

According to Stas, approximately 20 employees attend each class, which is chaired by a representative from one of Phillips' sponsoring groups and taught by computer consultants from an Arthur Young & Co. office in nearby Tulsa, Okla.

The classroom is equipped with 20 IBM Personal Computers. Six hours of the program consist of hands-on training in spreadsheet, data base programs and word processing, Stas said. Each of the exercises used during the class is tailored to the student groups. Managers, for example, learn more spreadsheet applications, while engineers are taught to implement engineering-oriented calculations, Stas said.

In each class, the teachers assume that employees have no prior knowledge of the computer and begin the seminar with a tutorial on the keyboard. This was particularly interesting for the managers, Stas said. "The majority did not take typing in school," he explained. Nevertheless, he added, "I wouldn't say it was any harder or easier for them than it was for anyone in that age group."

To complement the seminar, Phillips established an AIM support center adjacent to the classroom. Similar to a computer store, the center is open during business hours, stocking one of each of the standard products supported within the company.

Products stocked at the center include Hewlett-Packard Co.'s HP 150 desktop, IBM's Personal Computer AT and Personal Computer XT, Apple Computer, Inc.'s Lisa microcomputer, Compaq Computer Corp.'s Compaq computer and a Grid Systems Corp. Compass micro.

> ”
>
> *The AIM program alleviated requests to information services for assistance with microcomputers.*

The center, staffed by seven employees reporting to Stas and five workers from the company's office systems group, also provides desktop computer programs and tutorials that can be loaned.

Ted Lockin, manager of information services for the petroleum products group and a strong supporter of Phillips' AIM program, said, "It overcomes some of the initial inhibition that employees have about computers. . . . They can relate to what spreadsheet work can do [to assist] in their areas."

Lockin said that while his employees had little need for the computer course, others in the company had been helped. According to Lockin, the AIM program alleviated requests from other departments for assistance with microcomputers. With the new program, users can help each other, he said.

The support center has also proven valuable to his department in other ways. "If we need a word processing package, they can help us evaluate it," Lockin said.

But not all managers were as familiar with micros as Lockin. "I knew just enough to be dangerous," said Dean Lovendahl, a Phillips regional pipeline manager. Lovendahl, whose only use of a personal computer was at home on his Commodore Business Machines, Inc. Commodore 64, took the AIM class last fall.

"I got an understanding of basic spreadsheet ideas and how they can be used to do things," he said. Although he has not added any desktop computers or programs to his department, Lovendahl said Aim "lowered the barriers on how to use them." Employees within Lovendahl's group have attended the class as well. "We've sent as many [workers] as they had classes available for."

Stas said he believes there is enough interest in the program to extend it into 1986. By that time, Phillips expects between 2,500 and 3,000 employees will have attended the course, meeting the steering committee's original goal of educating half the company in the use of personal computers. The company is also discussing the possibility of taking the course outside the Bartlesville headquarters to other Phillips offices, Stas said.

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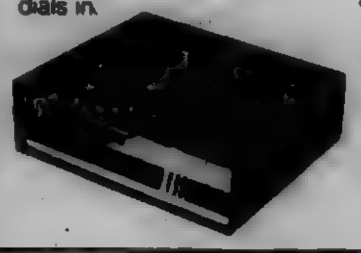

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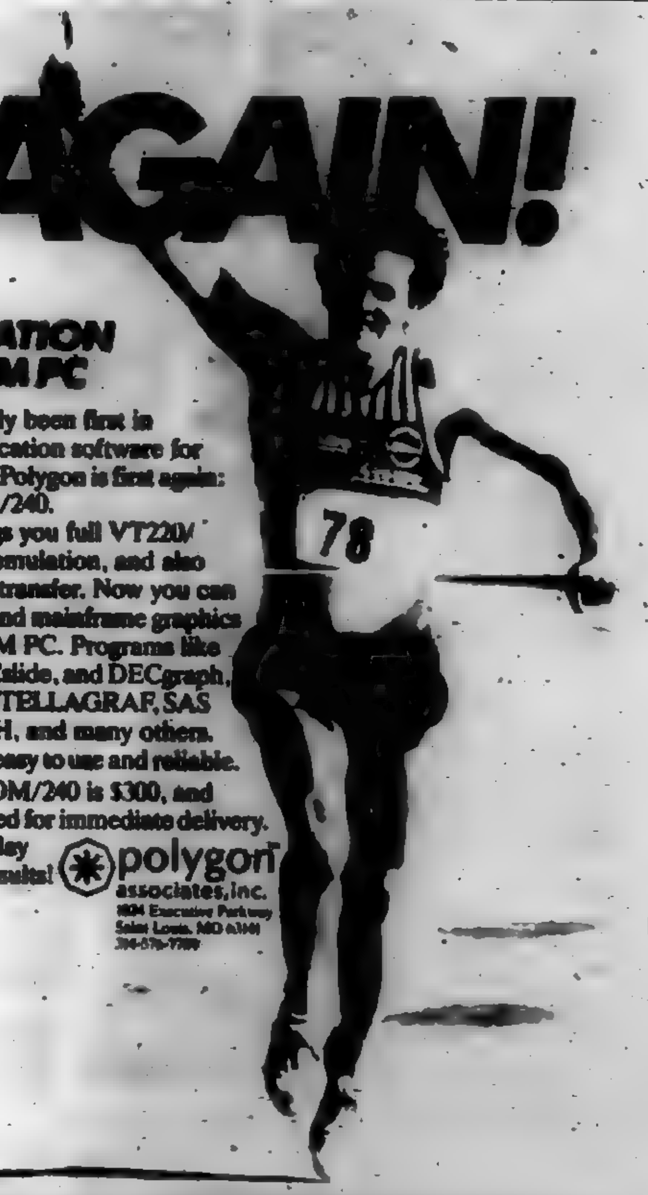

OAC showgoers question motives for Apple's absence

CW AT OAC '85

By David Gimes
CW Staff

ATLANTA — There was a conspicuous absence last week as exhibitors hawked their wares at the Office Automation Conference (OAC) '85 here. Nowhere to be seen was Apple Computer, Inc., which two weeks earlier had unveiled the Macintosh Office, a laser printer and local-area network for the Macintosh microcomputer.

The decision by the Cupertino, Calif.-based firm not to attend OAC '85 left a lot of showgoers puzzled about Apple's strategy for the office market — an area considered crucial if Apple is to remain a major player in the personal computer market.

John Goetzman, office automation coordinator for Georgia Power Co. here, was one of those bewildered by Apple's absence. "[Apple] made a big [advertising] splash during the Super Bowl for the Macintosh Office. And now here it is, the biggest OA show in the country, and it's not here."

> *'[The Office Automation Conference] just didn't seem to fit into our plan.'*
>
> — **Barbara Krause, Apple Computer, Inc.**

Troy Leacock, manager of SCH Business Machines, a computer reseller in Grand Cayman, British West Indies, was one of several attendees who said they would like to have seen the Macintosh Office on display. "If Apple believed that strongly that they are a major contender in the office market, they should have made a serious effort to be here," he said.

Roger Levy, director of office automation for Richardson-Vicks, Inc. in Wilton, Conn., was skeptical about whether Apple is prepared for a major thrust into the office market, noting "I'm not sure it's ready to meet the needs of the office. But [the Macintosh] does have sex appeal." He said he did not view Apple's decision not to attend the conference as a lack of serious commitment to the office segment. Rather, he saw it simply as a marketing decision.

Apple had signed up as an exhibitor at the OAC but withdrew in December, according to Marty Byrne, conference marketing manager for the American Federation of Information Processing Societies, Inc., the show's sponsor. Apple did have an exhibit at last year's OAC in Los Angeles.

> *'I think it's foolish of Apple not to take advantage [of this show].'*
>
> — **Amy Wohl, Wohl Associates**

Barbara Krause, an Apple spokeswoman, said the company chose not to attend because other projects, such as organizing a January annual meeting, took priority. "There is a limit to Apple's resources and our being able to pull something together in a short amount of time," she said. "We want to make sure that the things we do are done extremely well."

Krause said that although OAC enjoys a good reputation as a trade show, "It just didn't seem to fit into our plan." She said Apple is becoming "very selective" in the shows it attends, adding "We've said that our penetration into the business market will be a two-year window."

Some industry observers had urged Apple to attend OAC '85, according to Amy Wohl of Wohl Associates, a Bala Cynwyd, Pa., office automation consulting firm — and an admitted Apple fan. In remarks during a conference session here, Wohl stated that Apple has not yet learned how to market to large companies.

"I think it's foolish of Apple not to take advantage" of this show, Wohl noted. She said Apple does not seem to realize that most people who attend shows like OAC are not students or window-shoppers but rather "the people who sign purchase orders."

Institute offers certification

DES PLAINES, Ill. — The Institute for Certification of Computer Professionals has announced that its 1985 examinations will take place Saturday, May 11, and Saturday, Dec. 7. Application deadlines are April 6 for the May exam and Nov. 8 for the December exam.

The fee for the Certificate in Data Processing exam is $140; for the Certificate in Computer Programming, $105. More information is available from the institute at 2200 E. Devon Ave., Des Plaines, Ill. 60018.

"We had a thirty-day trial but twenty minutes made up our minds about Data Check Recovery."

Linda Lewis, Systems Programmer Blue Cross and Blue Shield of the National Capital Area Washington, DC

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Software Corporation of America

Speakers say plans, employee interest vital to OA

CW AT OAC '85

By David Gimes
CW Staff

ATLANTA — Advance planning and employee involvement at all levels were two keys to successful implementation of office automation systems at two large companies and one small company, representatives from those firms said at a conference here last week.

At a session at the Office Automation Conference (OAC) '85 here, Kenneth Meyers of the American Express Co. in Plantation, Fla., Tom Eustice of Consolidated Rail Corp. (Conrail) in Philadelphia and William Foulkes and M. Louise Parizek of the Bayvet division of Miles Laboratories, Inc. in Shawnee Mission, Kan., described their companies' strategies for successful installation of OA equipment.

American Express' travel-related services divisions embarked on an OA program about 10 years ago when senior management decided that outmoded computer systems and too much paperwork were hampering the firm's operations, according to Meyers. The company initiated a program aimed at creating an on-line computer system, reducing paperwork and providing quick responses to customer inquiries.

Meyers said the problems the company faced could be divided into five areas: business requirements, computer systems testing, employee training, project planning and organization and bringing current and existing employees into the automated office.

At American Express, all the requirements for computer systems have to be approved in writing by the eventual end users of the equipment, Meyers said. He said the company found that "everyone, at all levels of management, needs to see, up front and personal, what the change looks like" well before it is implemented.

Meyers said the company created a separate department to oversee testing of large computer systems and that the department has helped speed automation at the firm.

In the organizational area, American Express found that when creating a new organization it is best to assign new duties to current employees gradually while they are still involved with their old jobs. This avoids creating employee fear and mistrust about new jobs, he said.

Since 1981, Meyers said, American Express has replaced the use of 10 million paper forms with on-line data entry. In addition, its systems have greatly reduced response time to customer inquiries and increased the accuracy of those responses, he said.

Conrail's OA efforts

Contrail's efforts in OA were driven by the company's unprofitable past and a directive to curtail costs sharply and increase efficiency, Eustice said. He listed six main points for a successful automation strategy: create a self-funding environment, emphasize long-range planning, stress change management, encourage user participation, solicit executive support and develop realistic expectations.

As a result of its automation efforts begun in the late 1970s, Eustice said the company achieved $4.6 million in savings last year — mainly from reduced labor costs.

Bayvet, a $70 million company that manufactures veterinarian supplies, began its automation efforts in 1980 with the goal of establishing an intelligent workstation environment for more efficient sales and marketing.

Acknowledging that the company made mistakes along the way, Foulkes said that the system has nevertheless paid for itself. Sales have increased 57% in four years while the number of clerical personnel has decreased 13%, he said.

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DG low-end mini, software debuts top OA show marquee

DEC adds VAX-based applications package

CW AT
OAC '85

By David [illegible]
CW Staff

ATLANTA — Two major computer companies announced new and enhanced products here last week designed to bolster their positions in the office automation arena.

Data General Corp. took aim at IBM's System/36 minicomputer by unveiling a low-end addition to its 32-bit Eclipse minicomputer line, touting it as a processor for departmental and small business users.

The Westboro, Mass.-based manufacturer also announced a variety of integrated software products and enhancements to current offerings designed to link its products together while coexisting with IBM mainframes.

Another major player in the office automation market, Digital Equipment Corp., introduced a line of applications software for sales and marketing departments based on its All-In-One Office and Information System, which is based on the VAX series of superminicomputers. The Maynard, Mass., firm also announced an applications integration kit said to allow DEC, its customers and third-party software suppliers to integrate business applications with the All-In-One system.

Few major product introductions

The announcements came at the American Federation of Information Processing Societies-sponsored Office Automation Conference '85 here, an event most observers agreed was largely bereft of major product introductions.

The new DG processor, the MV/4000 Departmental Cluster (DC), is said to include increased expansion capability, twice the memory and three times the disk capacity of its predecessor, the Eclipse MV/4000 SC. It can support up to 16 users, depending on the application, and up to four synchronous communications lines, the vendor said. It is available with 1.5M-byte diskette storage and a 15M-byte cartridge tape drive. It is also said to offer a link to the Xerox Corp. Ethernet-type IEEE 802.3 local-area network.

According to the vendor, the MV/4000 DC can run the firm's Comprehensive Electronic Office (CEO) integrated software, system and communications software and programming languages, as well as a variety of operating systems. The MV/4000 DC also includes the X.25-based Network Management System, communications products such as Systems Network Architecture (SNA), several emulation packages, the Infos file management and Present W/DG DBMS data base management system products, high-level languages and programming utilities and CEO software.

A typical system with the processor, 3M-byte main memory, 14 workstations, a Xerox Ethernet transceiver and cable, 120M-byte disk drive, a diskette drive and two letter-quality printers costs $79,500, the vendor said. Deliveries will be made 30 days after order date, the vendor said.

First product of cooperative agreement

Topping DG's software announcements was the AOS/VS Decision Link package, which is said to enable users to directly access data in IBM mainframes from DG's CEO system. The package is the first product of a 1984 cooperative agreement between DG and Cullinet Software, Inc., connecting CEO with Cullinet's Information Data Base software via an SNA communications link.

AOS/VS Decision Link operates on the Eclipse MV series running DG's AOS operating system. DG said the software will be available in six months and will cost $5,000 for an initial license and $4,500 for a subsequent license.

Other software-related announcements by DG included the following:

- Two integrated graphics packages for the CEO system, CEO Drawing Board and CEO Wordview, each priced at $2,500.
- An expanded version of the vendor's Trendview graphics package, priced at $3,150.
- DG/Gate, a software enhancement for DG's terminal emulator said to give users access to Mead Data Corp.'s Lexis and Westlaw Services, Inc.'s Westlaw legal data bases. DG/Gate prices start at $1,000.
- An extension of a communications package, CEO Connection, said to enable IBM Personal Computer and DG Data General/One users to access CEO. The package reportedly provides document conversion capabilities between Microsoft Corp.'s MS-DOS operating system and CEO software programs. Package prices are $295 for the DG/One and $395 for the Personal Computer.
- A software package, CEO Document Exchange V, said to provide an interface between DG's CEO and a disk conversion product made by Altertext, Inc. The first license price for

See DEBUTS page 14

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*Comments from interviews with EasyPROCLIB users.
**Comment from Software Corporation of America.
EasyPROCLIB (for IBM, MVS/XA, MVS, SVS, VS1, MVT)

NEWS

Cross-checking leads to indictment of 76

By Charles Babcock
CW New York Bureau

TRENTON, N.J. — Computer cross-checking has lead to the indictment of 76 people for unemployment benefit fraud and has uncovered an additional $1 million per month in excess payments, the New Jersey Attorney General's office said recently. The fraudulent claims ranged from $1,078 to $9,213 per person and totaled $262,000.

Although cross-checking has been used twice before within the state, the 76 indictments were New Jersey's first major crackdown on fraud in the system, Richard T. Carley, deputy attorney general, said. In addition, the cross-checking has unveiled 35,000 cases per year of mistaken claims and excessive payments that are being handled on a noncriminal basis. Those cases represent a potential $1 million per month in refunds to the state; the system will save about $550,000 to $600,000, said Gerald M. Kelly, supervisor of investigations for the New Jersey Labor Department.

The cross-checking was made possible through a $6 million development effort to rewrite the state labor department's unemployment insurance system software. The project was split between an in-house staff and an independent contractor. Approximately 48 state programmers, systems analysts and data base technicians worked on the new system for the equivalent of a year, said Edward J. Mount, a manager in the Office of Telecommunications and Information Systems.

The system runs under CICS on an IBM 3081 Model J here. It governs 220,000 daily transactions disbursing a total of $4 million per day at 40 sites around the state, Mount said.

The large payback yielded by the system has surprised state administrators, Mount added. There are 900,000 recipients of unemployment benefits per year in New Jersey, and it was not possible to double-check each application manually. "The tracking and paperwork were overwhelming," he noted.

WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

Reagan proposal calls for 21% SSA staff reduction by 1990

WASHINGTON, D.C. — The Reagan administration last week said it plans to reduce the staff of the Social Security Administration (SSA) 21% by 1990, and part of that reduction would result from SSA's $500 million computer systems modernization program. Members of Congress and SSA managers have denounced the proposed staff cuts.

About 17,000 SSA jobs will be phased out, 4,500 of them directly attributed to the new computer systems, congressional aides said. Low-level jobs handling paper forms, microfilm and magnetic tapes will be replaced by automation and new magnetic disk storage systems, an aide said.

At a recent press conference, the Social Security Management Association, a group of SSA supervisors and several members of Congress said the proposed staff reductions would result in less-effective service to Social Security recipients. The legislators included Rep. Edward R. Roybal (D-Calif.), chairman of the House Select Committee on Aging and members of the Maryland delegation seeking to protect the jobs of constituents at the SSA headquarters in Woodlawn, Md.

The U.S. Department of Health and Human Services, in its Feb. 4 budget proposal, said a "six-year staffing reduction plan" will provide for retraining and relocation of employees. By 1990, the staff will be scaled down to 62,945 full-time employees, a reduction of 17,006, the budget document said.

Commerce Department extends export regulation grace period

WASHINGTON, D.C. — The U.S. Commerce Department recently announced that the grace period for implementing new export regulations will be extended 90 days, until April 29, to give the computer industry time to adjust to the new rules.

The extension allows time for U.S. high-technology firms to clarify definitions and procedures, according to Vico E. Henriques, president of the Computer and Business Equipment Manufacturers Association.

"There are currently a number of unanswered questions," he said. The new regulations govern the export of certain computer and software products as part of an effort to inhibit the acquisition of technology by Soviet bloc countries [CW, Jan. 14]. Henriques said the computer industry was "surprised by the extent of the new trade regulations. We're still examining the impact on our industry and welcome the grace period as a time to clarify ground rules and criteria."

For example, Henriques said, questions need to be resolved about the regulatory treatment of embedded microprocessors and software.

"Under the new regulations, embedded microprocessors fall into different categories depending on their power and the extent to which they are integrated into the product. We're not at all sure precisely where the cutoffs occur," he said.

Similarly, the new regulations control software sales to U.S. allies but lack clear definitions of what software is covered by the rules, he said.

DEBUTS

from page 13

CEO Document Exchange V is $5,000.

- A letter-quality printer, the Model 6321, for the CEO system, priced at $2,695.

The DEC announcements included an All-In-One applications integration kit for DEC's All-In-One Integration Standard.

Additionally, DEC announced a joint marketing agreement with Ross Systems, Inc., whereby Ross will use the All-In-One Integration Standard and kit to integrate its applications with the All-in-One system.

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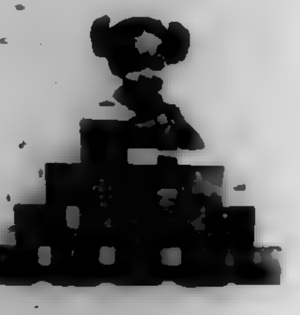

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Airline systems holding up in spite of business boom

By [illegible]
CW Staff

DALLAS — When American Airlines, Inc. announced its Ultimate Supersaver fare in mid-January, its phones began ringing off the hook.

The fare reduction, which American said has reduced prices up to 70% in some cases, boosted sales significantly, the airline claimed, but has not put any strain on the airline reservation system.

According to James Marston, vice-president of data processing and communication services, American is handling a "fairly sizable load" of traffic with the fare decreases, but claimed, "We have not broken any records."

Passenger volume

Despite the new fares and renewed interest in air travel, passenger volume has not surpassed holiday levels, Marston said.

In computer terms, airline volume is based on a message/sec basis: Each message represents a computer transaction. Booking a reservation represents one message; automatic ticketing represents another, he explained.

American's reservation system consists of four IBM 9083 mainframes running consecutively. The 9083 is a faster version of the 3083 Model J designed specifically for airline applications. During the past holiday season, the system handled more than 1,000 messages/sec, Marston said. With today's reduced fares, the system is handling about 950 messages/sec, according to Marston.

Keeping tabs on success

Although the computer system appears to be holding up well, the Supersaver program and the resulting flood of passenger traffic means keeping careful tabs on the program's success. To do so, American is writing new software applications to produce visual displays and printed reports tracking American flights, Marston said.

Other reports will detail booking figures, airline rates and the number of occupied seats per flight, he said.

Not to be outdone, competing airlines responded quickly to American's fare change, matching the price cuts dollar for dollar.

At United Airlines, Inc., an announcement similar to that of American's Supersaver fares brought in passenger traffic usually seen only during the holiday season.

"This year's fare announcement equates to what we would have expected to see in November," said Lyle Hobbs, director of United's Apollo reservation system.

Apollo's message volume peaked at about 700 to 750 messages/sec on the Friday following United's fare decrease announcement, Hobbs said.

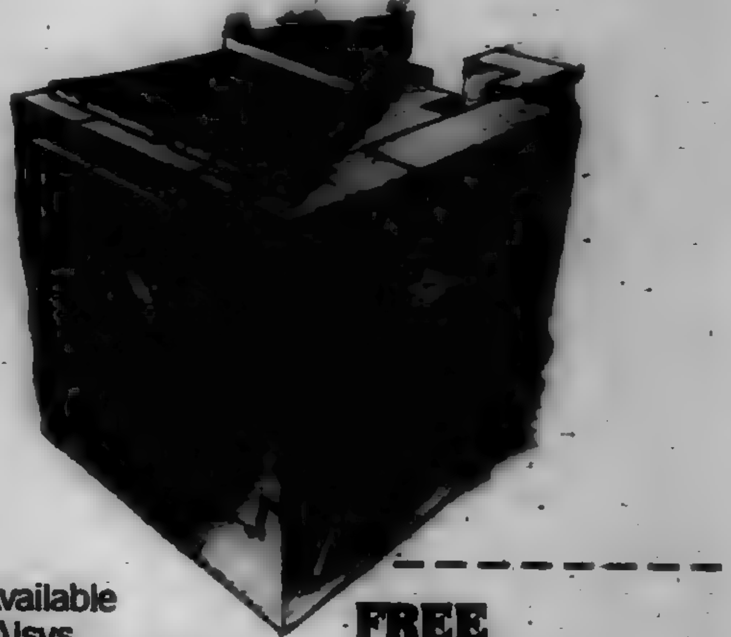
According to Don Karmazan, United's vice-president of computer and communications services, the Apollo reservation system consists of five IBM 9083 mainframes in a loosely coupled environment.

The data base runs IBM's Transaction Processing Facility (TPF) Version 2 and is connected to 300,000 miles of leased data circuits. Apollo is accessed by 50,000 terminals, 30,000 of which are in travel agencies located across the country.

Those machines provided "adequate capacity, and we have been able to accommodate the volume without experiencing a slowdown or stability problems with the machine," Hobbs said.

Being able to handle the traffic, however, meant some advance planning. As part of a two-year planning process, United upgraded its IBM 3350 disk drives last summer, bringing in 340 modules of the IBM 3380 storage devices.

The addition of TPF Version 2 permits system expandability, and other software enhancements allow United to keep up with quickly changing prices, Karmazan said.



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Banks take interest in real-time on-line processing

CW AT ABA

By Bryan Wilkins
CW Washington Bureau

NEW ORLEANS — On-line real-time entries for debits and credits in personal bank accounts are becoming necessities in the banking industry, and telecommunications will make it possible.

At an American Bankers Association (ABA) conference on telecommunications and financial networks here last week, James Hopes, vice-president at Chase Manhattan Bank, said that the traditional 24-hour batch-processing method of handling money transfers is fast becoming a liability for a bank's competitive position.

Hopes said that the use of automated clearinghouses (ACH), where banks form a network to credit and debit accounts, will likely be the means by which same-day settlements take place.

The National Automated Clearing House Association (Nacha) recommended that banks wanting to erect an ACH within their region follow a set of guidelines outlined by the group. Last year, Nacha selected General Electric Information Services Co. (Geisco) to be the provider of ACH services.

However, several bankers expressed alarm that with the fast-changing climate in financial services, Geisco might turn out to be their competitor. Hopes admitted it would be better for Chase Manhattan if Geisco had competition. Nacha selected Geisco over the McDonnell Douglas Automation Co.'s Tymshare division acquired last year.

Hopes said the batch processing used by banks for money transfers took several days to complete and offered banks "float" or free use of the money. Telecommunications networks in the ACH system are making this procedure obsolete because the networks make transactions cheaper.

"The difference between money transfers vs. ACH today is between pennies — a cent and a half for an ACH transaction — and dollars for a Fed Wire transfer," Hopes said. (Fed Wire is the federal wire system of the Federal Reserve Bank.)

A Geisco representative said its research showed that ACH use is expected to grow 15% annually over the next few years and that the dollar value of transactions is expected to jump 80%.

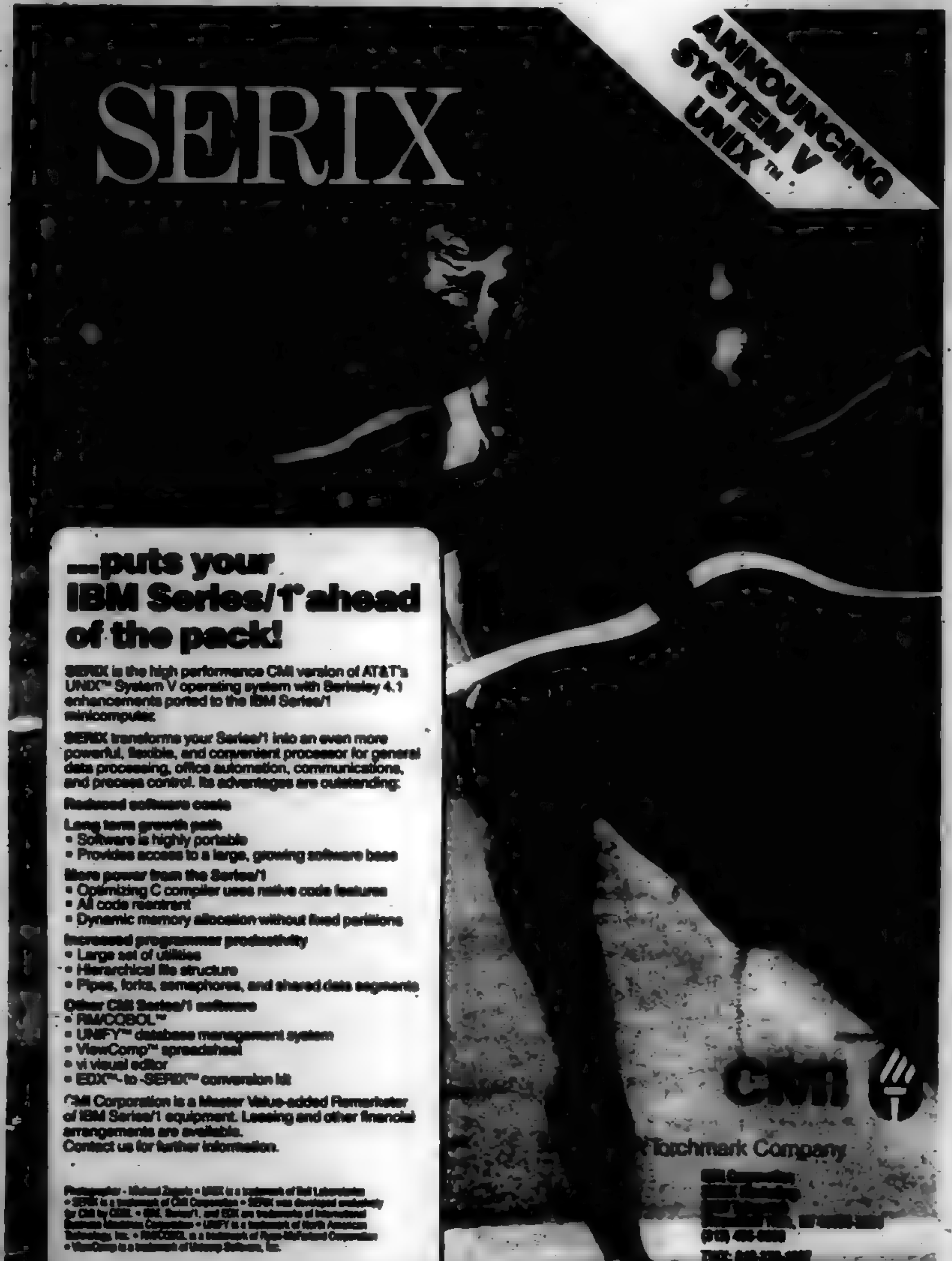
Authentication problem

The transition to on-line real-time settlements on the same day of payment between banks will enable bank customers to have faster use of cash. There are, however, problems facing ACH and telecommunications/automation of bank processing. The major fear is authentication of transactions. "How do you know that the person authorizing a payment transfer on the other end is actually the right person or organization that is supposed to receive it?" Hopes asked.

The security concern is expected to become a major drawback to bank participation in ACH use, especially as dollar amounts grow in electronic funds transfers. "I expect that the banks and other institutions will mandate that authentication be built into the payments systems to handle the risks," Hopes predicted.

Currently, however, an ACH payment message is limited in length to 94 characters. Nacha has not moved to embrace the standards for formatting payment mechanisms that have been adopted by Bank Wire, Swift, Electronic Data Interchange and other organizations that specialize in money transfer systems.

Although acceptance of faster settlements presents banks with a challenge, it is acknowledged that their customers are demanding quicker access to their cash, pushing the formerly staid institutions to adopt automation strategies. "The corporations want their dollars faster. Availability is important," Hopes said.



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AMA seminars to help buyers

SARANAC LAKE, N.Y. — American Management Association (AMA) has announced a series of seminars on using electronic DP as a tool to improve purchasing operations.

Classes will be held March 4-6 at the Sheraton Boston Hotel; March 25-27 at the AMA Management Center in Washington, D.C.; April 1-3 at the AMA Management Center in Chicago; May 22-24 in New York; June 3-5 in San Francisco; and June 10-12 in Atlanta.

The seminars will focus on how the computer can be used to help buyers control the daily work flow, to provide tools and standards of performance for the department manager, to spot volume contract opportunities and to manage inventory.

Individual fees are $695 for AMA members and $795 for nonmembers. Discounts are available for groups.

The AMA can be reached at P.O. Box 319, Saranac Lake, N.Y. 12983.

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Wordstar 2000: Easier to use?

Micropro's enhanced WP tool enters arena in full swing

Waiting until the hubbub over new integrated products had died down a bit in the last quarter of 1984, Micropro International Corp. announced a completely redesigned word processing system, Wordstar 2000, on Oct. 31.

Reflecting IBM's dominance of the personal computer market, Wordstar 2000 in its current version supports only IBM's Personal Computer and full compatibles as well as the new Personal Computer AT.

As Lotus Development Corp. has become almost synonymous with electronic spreadsheets in the user's mind, so Micropro is associated with word processing. And rightly so, since Wordstar, with a base of 1¼ million registered users and a host of mimicking competitors, can be said to have set the standard in powerful business word processors for the personal computer. And it is only Micropro that seems likely to challenge its own standard successfully with the release of Wordstar 2000.

Wordstar 2000, Micropro claimed, is a system that does not demand the traditional trade-off between power and ease of use. The company also touted Wordstar 2000's user friendliness.

With all of this in mind, the Yates Laboratory subjected both Wordstar 2000 and the original Wordstar to a full set of word processing tests. Part of the results of the Yates comparison study are shown in the accompanying charts and in the textual analysis and conclusions that follow.

The biggest difference in installation between the two Wordstar programs is that Wordstar 2000 is copy-protected, a feature totally absent in the original. While a maximum of only three copies are allowed, the installation program does provide an "uninstall" utility that, in essence, resets its counter mechanism. This makes it possible to recopy the program to new diskette media or to remove it from a hard disk for later installation without affecting the number of copies used.

Supports DOS tree structure

The hard-disk installation program supports the tree structure of DOS 2.0 and 3.0 by automatically creating a directory for Wordstar as well as copying the batch file in the root directory during the installation sequence. This makes it possible for a user to access Wordstar 2000 even if he is not currently in the Wordstar 2000 WS2 directory. Wordstar 2000 also supports full path names as part of the document file name, an unusual feature even for word processors designed for use under DOS 2.0.

Wordstar's command structure was set up primarily with the touch-typist in mind. The transition from the typewriter to computer keyboard was made as easy as possible for the user by restricting commands to the use of the Qwerty letter keys in various combinations with the control key.

Along with making it easier for the trained typist to manipulate all program functions as well as text entry from within the familiar confines of the keyboard, Wordstar also had the added benefit of supporting a multitude of terminal types, some of which offered only a control key along with standard Qwerty arrangement.

The word processing commands were not, however, assigned according to a strict system of mnemonic associations between the function name and letter combination used, which contributed significantly to Wordstar's reputation of being difficult to learn. They were, rather, set up to maximize keyboarding efficiency, an ergonomic approach primarily benefiting the touch-typist. Therefore, Wordstar conferred the mixed blessing of being rather hard to learn but easy to use, if that use were fairly heavy and not intermittent.

Wordstar 2000 reversed the design priorities by choosing a strict mnemonic command system for its basic structure. The third chart compares samples of often-used editing commands that typify the differences in command design.

Correlation between letter keys and functions

As with Wordstar, the 2000 system also uses the control key, symbolized by the caret, in combination with letter keys. However, all letter selections now correlate directly with functional names, which has the effect of reducing a new user's initial learning time substantially. Once the user has kept the basic associations in mind, like "Q" for Quit, "L" for Locate, and "R" for Remove, all the finer distinctions such as "QC" for Quit and Continue and "RW" for Remove Word fall quickly into place.

This associative process is also accelerated with the availability of context-sensitive on-line Help, whereby the user can always call for an explanation of a command should the mnemonic link fail to be obvious.

Wordstar 2000 is not, however, limited to this command system. For those users more comfortable with the function key command access utilized by dedicated word processors, the program provides an interface similar to that used by Multimate International Corp.'s Multimate. Prominent file commands are accessed by using the top row keys (1 to 0, hyphen and equal keys) in combination with the alternate key.

> ❞
>
> *Wordstar 2000 goes a long way toward supporting the divergent needs of less sophisticated types of business users.*

In addition, most command editing and formatting commands are invoked using the 10 function keys either individually or with the standard shift key. It is also possible to reconfigure the functions of these keys using the installation program.

As is common with many of the word processors for the IBM Personal Computer, a plastic keyboard overlay illustrating key and function correlation is included for quick reference.

Micropro has attended to almost all the missing features for which Wordstar was criticized by including them in the Wordstar 2000 system. The first chart indicates the notable differences in features between the two.

Saved document formats

In terms of editing, the biggest change is Wordstar 2000's use of saved document formats. With Wordstar 2000, the user must choose a predefined document format or customize one prior to creating a document.

Wordstar 2000 comes with five such predefined formats as well as an unformatted template to be used with data files or documents in straight Ascii format. Each format saves information on the margins, tab settings, line spacing, character pitch, the type of right margin and paper size as well as the format commands that determine the printed page layout. Gone is the system of dot commands made famous with Wordstar and gone is the need for the user to set up margins that differ from the default settings each time the document is edited.

While initial set-ups do take some time, thought and planning, they save time in the long run. This system is sure to be seen as a marked improvement over Wordstar, especially in business, where standard document types and formats are used over and over again.

Proportional spacing available

When it comes to printing, the major difference is Wordstar 2000's ability to perform proportional spacing as well as support background printing. Invoking proportional spacing is a painless process of selecting

See WORDSTAR page 22

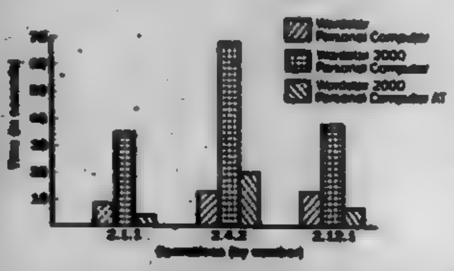
FEATURE COMPARISON
WORDSTAR vs. WORDSTAR 2000

	Wordstar	Wordstar 2000
Context-sensitive onscreen help		Yes
Saves formats with document		Yes
Automatic paragraph reform		Yes
GOTOPAGE command		Yes
Double spacing displayed onscreen	Yes	
Underlining and boldface onscreen		Yes
Undo last command		Yes
Stored glossary feature		Yes
Columnar math operations		Yes
Automatic footnoting		Yes
Mail merge	Yes*	Yes
Alphanumeric sorting		Yes
Windows between documents		Yes
Spelling correction	Yes*	Yes
Proportional spacing		Yes
Background printing		Yes
Automatic indexing	Yes*	Yes
Automatic table of contents	Yes*	Yes

* These features are available for Wordstar as separate stand-alone programs from Micropro International Corp.

PERFORMANCE TEST RESULTS
(All times approximate and machine-specific)

No.	Operation	Wordstar Personal Computer	Wordstar 2000 Personal Computer	Wordstar 2000 Personal Computer AT
2.1.1	Load program in RAM	9 sec	35 sec	4 sec
2.4.2	Global search and replace — backwards, onscreen without approval — 16 occurrences	13 sec	68 sec	20 sec
2.12.1	Save edited 10-page document file to disk	13 sec	38 sec	7 sec



COMMONLY USED WORD-PROCESSING COMMANDS
WORDSTAR'S ERGONOMIC vs. WORDSTAR 2000's MNEMONIC SYSTEM

Description of Command	Wordstar Command	Wordstar 2000 Command & Mnemonic Meaning
Delete word	^T	^RW (Remove Word)
Delete line	^Y	^RE (Remove Entire line)
Delete block	^KY	^RB (Remove Block)
Search	^QF	^L (Locate text)
Search and replace	^QA	^L (same as above using different options)
Save and resume	^KS	^QC (Quit and Continue)
Save and quit	^KD	^QS (Quit and Save)
Quit and abandon	^KQ	^QA (Quit and Abandon)

WORDSTAR 2000 SYSTEM REQUIREMENTS

System Configurations

IBM Personal Computer and compatibles (except AT&T 6300); Personal Computer XT; Personal Computer AT

System Requirements

Personal Computer, compatibles; Personal Computer XT	MS-DOS 2.0, 2.1; 256K RAM; 2 disk drives
Personal Computer AT	PC-DOS 3.0; 320K RAM; hard disk

Installation/Start-Up Procedures

Program copy protected	Yes
Maximum number of copies allowed	3
Hard disk installation	Yes
Boot from hard disk	Yes
User level required for installation	Novice

Micropro International Corp. Company Profile

Founded in 1978, Micropro International is a supplier of microcomputer applications software. Although the company markets a full line of products, it is best known for its Wordstar word processing program, which has been translated into nine languages. Headquartered in San Rafael, Calif., Micropro has 10 field sales offices in North America and subsidiaries in Europe and Japan. More information is available from Micropro, 33 San Pablo Ave., San Rafael, Calif. 94903.

ABOUT THE [illegible]

Product evaluations, specifications and technical information are provided by [illegible]

DP execs split on issue of VDT-related health hazards

By Edward Warner
CW Staff

PARK RIDGE, Ill. — A full third of the 230 corporate data processing managers responding to a recent Data Processing Management Association (DPMA) survey said computer terminals pose a health hazard to users.

Data processing managers contacted by *Computerworld* for response, however, all said they disagreed.

The survey, conducted in December and reported in the January/February issue of the DPMA's "Comp-U-Fax" newsletter, also found that 84% of the respondents worked in organizations that had no guidelines on ergonomics in their corporate policies.

One 'broadly stated' question

According to "Comp-U-Fax" editor Austin Weber, the survey, an eight-question questionnaire mailed to 1,000 DPMA members, asked only one "broadly stated" question about whether the DP managers felt terminals presented a health hazard. The question, he acknowledged, could have encompassed concern about backaches and eyestrain as well as hazards with longer term effects.

The respondents in the DPMA survey singled out the terminal as the most important point where ergonomic changes were needed, Weber noted. Among the changes respondents called for were use of removable keyboards and the adoption of tilt-and-swivel, nonglare VDTs with amber screens, he said.

The survey's respondents consisted of a random sampling of corporate data processing managers chosen from the DPMA's 48,000-member roster. Among the survey's other findings were the following:

- Sixty-seven percent of the respondents believed their end users were concerned about computer ergonomics.
- Ninety-one percent of the respondents believed ergonomics deserved greater corporate recognition.
- About 35% noted they would like greater support from top management to purchase ergonomically designed chairs and workstations.

Those DP managers called by *Computerworld* for comment, meanwhile, all said they did not feel terminals were a health hazard. All also worked in organizations with no formal policy on ergonomics.

At AMF, Inc. in White Plains, N.Y., Bradley E. Hosmer, corporate vice-president for group services and MIS, said, "My position is that I don't think they're a health hazard. I personally don't see any ill effects [suffered by] people who use word processors or terminals heavily." AMF considers the comfort of terminal users a matter of individual needs, he added.

No worse than TV sets

Joel Abramowitz, MIS manager at U.S. Trust Corp., in New York said, "I don't think [they're] worse than anything else, [such as] microwave ovens or TV sets."

The director of New York City's Computer Service Center, deputy commissioner Joe Giannotti, said the users of the city's roughly 1,200 terminals have complained of nothing more than eyestrain. The "only complaint I've heard about terminals is [that] there are not enough of them," he added.

A lighter comment came from John Cronin, controller in corporate information services at Pfizer, Inc. in New York, who said terminals are [not a] health hazard "unless you drop one on your head."

Implementing Ada seminars set for March

TORRANCE, Calif. — The Education Foundation of the Data Processing Management Association (DPMA) is sponsoring a series of seminars in Atlantic City, Washington, D.C., and Boston on implementing the Ada language.

The sessions, titled "Implementing Ada," will focus on the development of a phased Ada technology transfer and training corporate program and will include topics such as coping with the technical risks for real-time, embedded system development; compiler and environment development; lessons learned from early implementation efforts; designing and coding in Ada; and Ada program status.

The seminars will be presented by John T. Foreman, manager of the Ada Technology Branch at Texas Instruments, Inc.

The sessions will be held March 4-5 in Atlantic City, March 11-12 in Washington, D.C., and March 21-22 in Boston.

The registration fee is $525. Discounts for DPMA members and team registrations for university and government personnel are available.

The seminars are being managed by Technology Training Corp.

Information on the seminars may be obtained from Education Foundation DPMA Seminars, Technology Training, Department Ada, P.O. Box 3608, Torrance, Calif. 90510.

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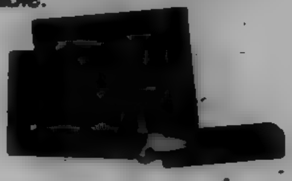

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*National Institute For Occupational Safety and Health Study, August 1981.

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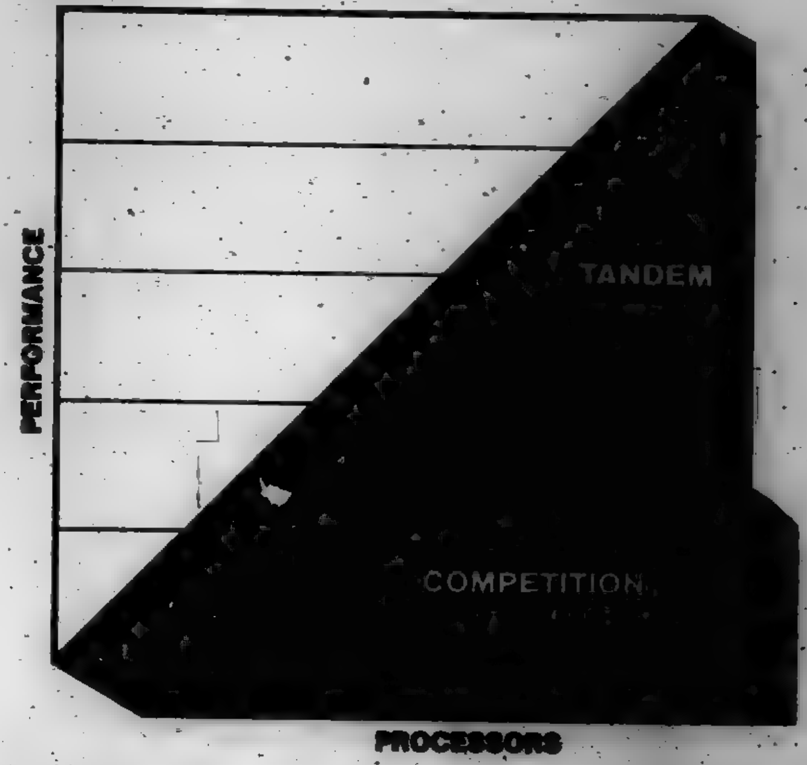

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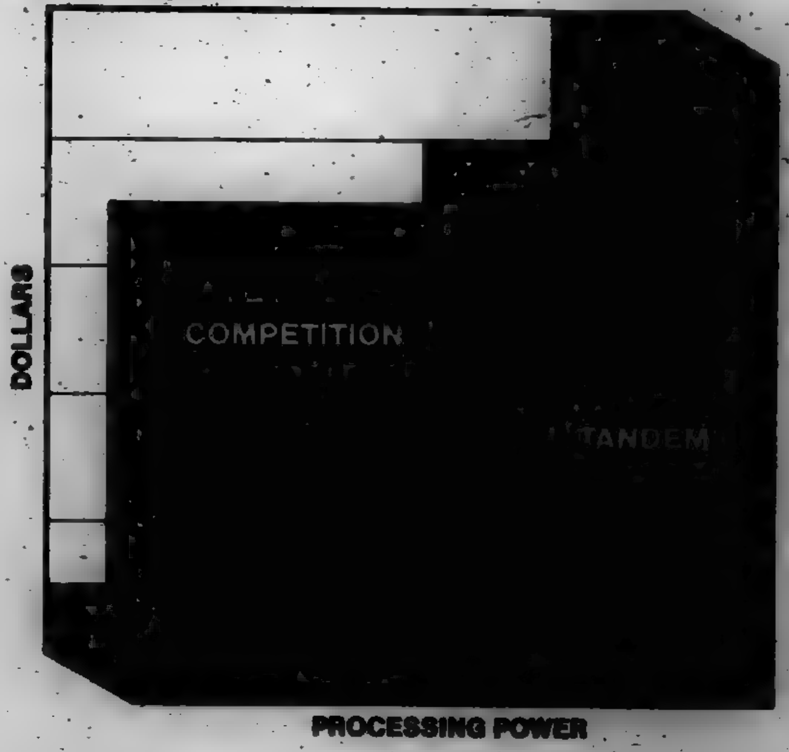

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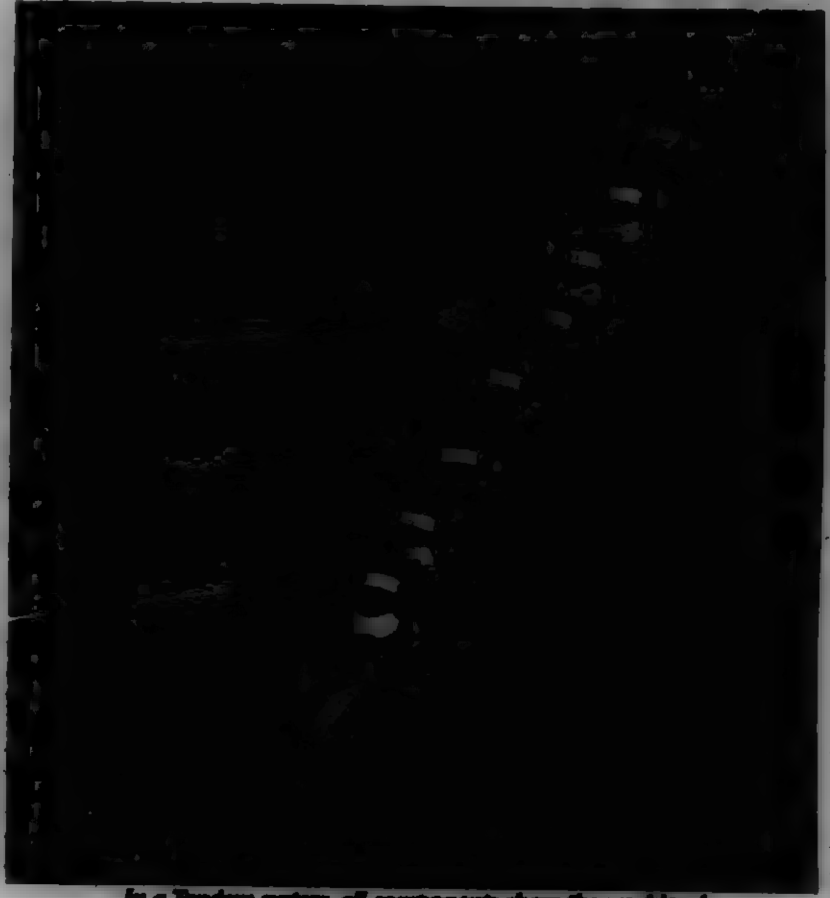

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TANDEMCOMPUTERS

Personal computer conference scheduled at New York Coliseum

ENGLEWOOD CLIFFS, N.J. — The third annual Personal Computer Expo Conference is scheduled for June 17-19 at the New York Coliseum in New York.

Speakers at the three-day conference will include J. Leland Strange, president of Intelligent Systems Corp., who will address the enhancement market and the criteria for selecting these products, and William Gannon, publisher of "Software News," who will discuss the buying criteria for personal computer users in large corporations.

Safi Qyereshy, research president for AST Research, Inc.; Richard Clows, vice-president of Techland Systems, Inc.; and Ralph Ungermann, president and chief executive officer at Ungermann-Bass, Inc., will address the issue of micro-to-mainframe communications links. Other sessions will discuss local-area networks, multiuser strategies, application generators and cartridge tapes.

Registration fees for the program are $25 per day and $50 for two or three days. Before May 29, registration costs $20 per day or $40 for two or three days. More information is available from Personal Computer Expo, 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

WORDSTAR

from page 18

it from the selections on the Print Font menu. This menu is related directly to the type of printer driver selected by the user when installing the package and therefore will not include the proportional spacing option if the printer type is incapable of it.

With Wordstar 2000, the output produced on the test printer with the proportional wheel did not display the haphazard use of white space between words so prominently when using justified margins with Wordstar.

Wordstar 2000's memory requirement of 256K bytes stands in stark contrast to Wordstar's 64K bytes. While this presents no particular problem, since most personal computers are configured well above the minimum, it is an indication that Wordstar 2000 is part of the latest generation of software applications, such as Lotus' Symphony and Framework, that is optimally designed for use with hard disk-based systems like the IBM Personal Computer XT and the Personal Computer AT rather than a Personal Computer with dual floppy disks.

The second chart illustrates the wide divergence in elapsed time when performing some standard file and editing tasks using Wordstar 2000 on the Personal Computer with dual floppy disks as opposed to Wordstar 2000's performance on the Personal Computer AT. As is evident from the graph, the performance of these tasks with Wordstar 2000 on the Personal Computer AT is similar to the performance of these tasks with the original Wordstar on the Personal Computer.

This relatively sluggish behavior of Wordstar 2000 on dual floppy disk systems was obvious at other times during lab testing, even when performance was not at issue. For example, when using a global search and replace procedure to remove hard carriage returns from an Ascii file, the auto paragraph reform feature, invoked with every removal, worked excruciatingly slowly on the Personal Computer. The exact same procedure when performed on the Personal Computer AT produced strikingly different results — efficient performance well within the bounds expected of today's personal computer word processors.

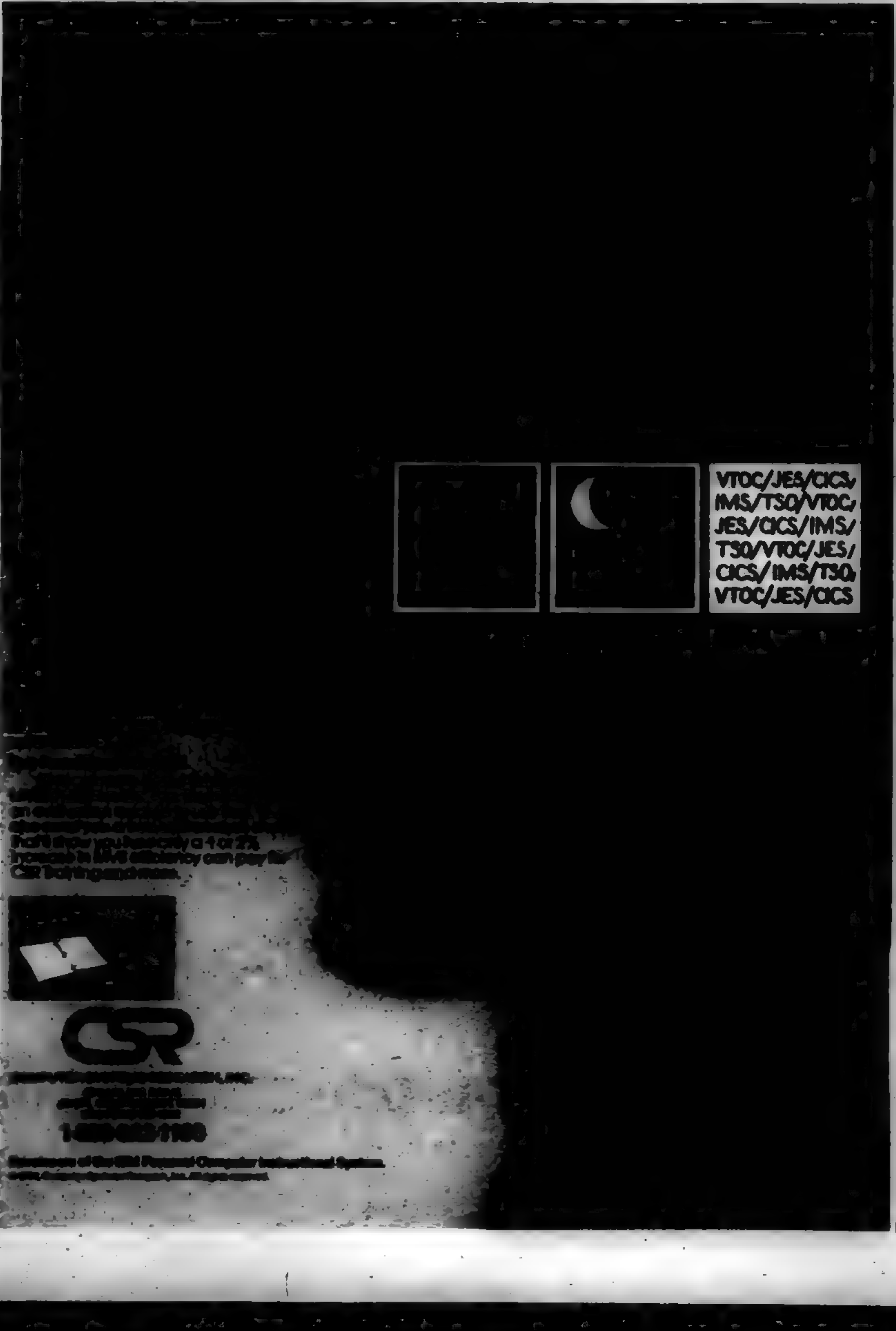
Hard disk recommended

Given the experience of Wordstar 2000 on a floppy disk system, we must underscore Micropro's recommendation that Wordstar 2000 be used with a hard disk for the most satisfactory results.

There is much to recommend the upgrade from Wordstar to Wordstar 2000 to those businesses currently using Wordstar under MS-DOS. First of all, all document files created with Wordstar can easily be converted to the new format used by Wordstar 2000. All that is required to upgrade is to remove the dot commands, choose or create the appropriate style format and run a simple conversion utility.

While the Wordstar pro in the office will be thrown off at first by the new mnemonic system, all but the most hard-core will probably adapt more quickly than the initial experience would indicate. This adjustment is hastened in great part by a similarity in screen design and overall approach to word processing that relate the two versions despite the enormous differences in command design and features offered.

The final inducement for the business considering upgrades centers around the ease of use issue. Wordstar 2000 with its mnemonic system and extensive on-line help goes a long way toward supporting the divergent needs of less sophisticated types of business users.


VTOC/JES/CICS/IMS/TSO/VTOC/JES/CICS/IMS/TSO/VTOC/JES/CICS/IMS/TSO/VTOC/JES/CICS
CSR

IRS enlists system's help in leaning on tax cheats

By Kathleen Sullivan
CW West Coast Bureau

ATLANTA — "A lien is like flypaper. It sticks to you no matter what you do." For the recalcitrant taxpayer who, through design or neglect, has failed to pay what the U.S. government considers its just due, the words of Conrad Clapper of the Internal Revenue Service serve as a reminder that the IRS has a tool at its disposal for dealing with the problem of nonpayment: a tax lien.

"A federal tax lien is a notice to the world that someone owes us money," said Clapper, who works as the assistant regional commissioner of collections in the IRS' Atlanta office.

At present, when the IRS places a claim on a taxpayer's property as security for unpaid taxes, agency staff members rely on an elaborate filing system and a lot of paper shuffling to handle the lien.

But at a variety of beta test sites — in Arkansas, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee and Virginia — the IRS has installed an AT&T Unix-based computer system that could eventually replace its manual operations nationwide.

> ”
>
> *'A lien is like flypaper. It sticks to you no matter what you do.'*
>
> **— Conrad Clapper**
> **Internal Revenue Service**

Within these offices, Clapper said, IRS staff members have begun the process of converting a large number of existing paper liens to electronic records and entering new liens into the system's relational data base.

Instead of filling out a variety of legal forms and the necessary supporting documents by hand, IRS staff members at the test sites are calling up the appropriate forms on their computer screens to enter information. The system generates hard copies of lien reports on preprinted forms, which are then forwarded to a local courthouse, where the lien is recorded.

The system is also designed to help the IRS keep track of what happens after a lien has been filed, said Elizabeth Nichols, president of Digital Analysis Corp., a Reston, Va.-based software consulting firm that is working with the IRS on the new system.

Show links between liens

For instance, the data base will keep track of changes in the taxpayer's residence and marital status, she said. In addition, the system will show the links between liens that have already been filed.

"Suppose I don't pay my taxes after I've filed a 1040 form under the name Betsy Nichols, and the IRS places a lien on my property," Nichols said. "Then suppose I get married and become Betsy Smith. Again, I don't pay my taxes and another lien is filed. After that, I found a company called Digital Analysis, which I run poorly. I neglect to pay the firm's Social Security tax, so the IRS files a third lien."

The data base will keep track of all those changes and reveal the links between the three liens, she said.

Zilog supermicrocomputers

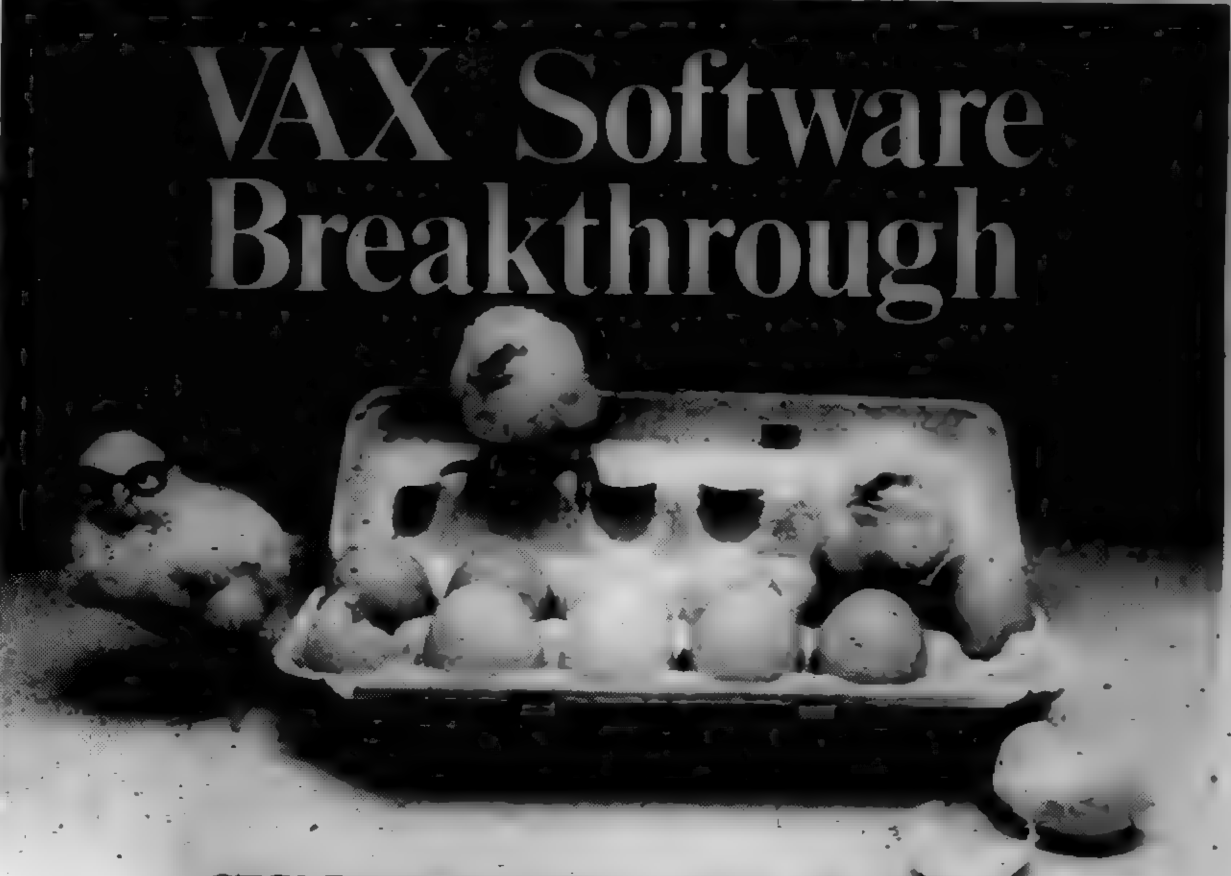
The IRS' system is currently running on supermicrocomputers designed by Zilog, Inc., a Campbell, Calif.-based subsidiary of Exxon Corp. The IRS has installed Zilog's System 8000 Model 31 computers, which are built around the company's 16-bit Z8000 microprocessors. Each system supports 1M byte to 4M bytes of main memory and up to four 80M-byte disk drive storage modules.

The IRS is using a relational data base designed by Unify Corp., a Sacramento, Calif.-based company. Clapper said the size of the data base will vary from one office to another, depending on the size of the operation. He estimated that a medium-size district office such as the one in Seattle, which might be tracking about 150,000 liens, would require about 50M bytes of storage.

Clapper said the agency itself did not make the decision to buy the Zilog systems. But it did need to make a decision on which data base manager to use, so the agency enlisted the help of Digital Analysis. According to Mark Loftin, a computer systems analyst in the IRS' Atlanta office, the agency chose Unify after seeing a series of benchmark tests done on a Digital Equipment Corp. VAX PDP-11.

"We found that the interface with the C [language] programs was much better than [that of] any of the other data base managers we were looking at," Loftin said. He listed Unify's query language, report writers and screen painting function as strong points of the system.

According to Clapper, the IRS expects that the system will result in "tremendous savings in human resources" as well as the elimination of a "great amount of paperwork." In addition, he said, the automated lien system will help ensure accuracy in the agency's record keeping.



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PRODUCT SPOTLIGHT

T1 technology: Mux mart's building block

Still in their commercial infancy, T1 multiplexers are becoming software controlled; support new multinode network managers

By James Connolly
CW Staff

A three-toed sloth could have used the digits of his foot to count T1 equipment vendors back in 1981.

The only significant customers to be served were AT&T, its operating companies and some foreign telephone companies. The broad digital communications pipelines were expensive and used almost exclusively to interconnect Ma Bell's central offices.

But the sloth would need a calculator for his tally today. In the coming five years, T1 may become the type of marketing buzzword that AT&T Unix, micro and spreadsheet are now. Carriers have been slashing prices for the bandwidth, and dozens of vendors are leaping into the marketplace with hardware that they claim will let customers build their own private networks.

T1, a technology originated by Bell Laboratories for a 1.54M bit/sec transmission, can be the foundation for an integrated private corporate network carrying a continually shifting load of data, voice and video transmissions. T1 technology is on the verge of a market explosion, according to vendors and communications consultants.

> ”
>
> *In five years, T1 may become the type of marketing buzzword that AT&T Unix, micro and spreadsheet are now.*

Essentially, a multiplexer combines numerous lines into a single, higher speed transmission line. In the case of the T1 multiplexer, the 1.54M bit/sec line is split initially among 24 64K bit/sec voice-grade lines. The newer, more intelligent multiplexers combine or subdivide those 24 channels several times to yield as few as one large channel for video and other high bandwidth applications, or as many as 200 channels at speeds ranging from 50 bit/sec up to 1.34M bit/sec.

The T1 multiplexer is the tool a telecommunications manager uses to allocate pieces of the T1 pipeline, which could be a copper, fiber-optic, satellite, lightwave or microwave link connecting two buildings on a campus, across town or 3,000 miles apart.

While large private networks and even simple T1 links may not be for every organization, the prospect of a price war among carriers and the addition of more intelligence to multiplexers and to the long-haul carriers' switches mean new flexibilities for major communications users.

T1 may be a 27-year-old technology, but users have had relatively little experience with it. Its commercial application is in its infancy, but it has already sped into a third generation of products, moving from hardware-oriented to software-controlled multiplexers and now to a new line of multinode network managers that features multiplexing as a secondary function.

A December 1984 study by International Data Corp. (IDC) of Framingham, Mass., predicted the worldwide dollar market for all multiplexers will grow from $280.5 million in 1983 to more than $1 billion in 1988. That overall growth will occur despite a downturn in sales for low-end multiplexers, the study reported. At the high end, time-division multiplexers, (all T1 multiplexers inclusive) which allocate specific time slots to each of the slower speed channels entering a multiplexer, will carry the market, according to IDC. The study said T1 multiplexer sales will increase an average of 53.5% annually, from $14 million in 1983 to $119.7 million in 1988.

Until AT&T introduced its Accunet line of T1 services in 1983, T1 was used primarily for central office-to-central office voice links. In the late 1970s, T1 became available on a limited commercial basis for special installations, but it was priced high, costing the same as the 24 voice-grade lines it was meant to replace. But when federal and state lawmakers ruled that AT&T's Telpak multiline discount rates were discriminatory, T1 emerged as Telpak's replacement.

"It is pretty tough to get around the fact that T1 is becoming the fundamental building block of communications. It's a nice general building block that is becoming standardized. Another reason [for its popularity] is economic. If you look at the cost compared with 24 voice-grade circuits, it's not that impressive, but if you look at the cost of 24 [AT&T Dataphone Digital Service] lines, there is no way you can get around the benefit," said Jeff Palmer, director of industry marketing for BBN Communications Corp., a wide-area private network

See T1 page 30

SELECTED T1 MULTIPLEXERS

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Product	2211	Ultramux	D/I Mux	8240	Netlink
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Channel Speed (bit/sec)	768K sync, 19.2K async	1.36M sync, 50 to 9.6K async	1.53M sync, 19.2K async	64K to 1.3M sync; 9.6K async	1.008M
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Voice/Data/Video Support	Yes	Yes	Yes	Yes	Yes
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Number Installed	5,000 (includes earlier 2200)	200	800	Not available	50+
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Manufacturer or OEM	Manufacturer	Manufacturer	Manufacturer	OEM	Both
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Vendor Comments	Any component can be replaced under power. Drop and insert; voice speeds of 16K, 32K or 64K bit/sec, selectable from keyboard. Bit-interleaved; satellite buffer; sync and async support on single card.	Supports statistical multiplexed async channels; alternate path and channel routing; menu-driven; dynamic bandwidth allocation.	Hardware-driven; D3/D4-, CCR-compatible; 64-bit channelization; drop/insert capability.	Software-based; user-programmable system parameters. Multiple external digital clocks on all channels. DS-1 compatible. Redundant common logic, power supply and driver.	Software-based; parameters and diagnostics console-controlled. D4 framing; dynamic bandwidth contention. Dacca DS-1-level compatibility.

CW CHART

T1 technology [illegible] support lagging

[illegible]

SELECTED T1 MULTIPLEXERS

Company	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Product	DCP9100	GLM 528	Megamux +	Infostream	DCX-T1
Maximum Channels	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Channel Speed (bit/sec)	300 to 1.024M	Up to 19.2K	9.6K async, 1.024 sync	19.2K async, 768K sync	Up to 448K
Aggregate Transmission Rate (bit/sec)	1.544M	[illegible]	[illegible]	[illegible]	[illegible]
Voice/Data/Video Support	Yes	Data only	Yes	Yes	Voice and data only
Date First Installed	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Number Installed	250 to 500	Not available	5,000	Not available	About 60
Type of Voice Digitization	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Manufacturer or OEM	Manufacturer	Manufacturer	Manufacturer	Manufacturer	OEM
Price	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Vendor Comments	Console monitoring and control; dynamic clock tracking. D4Fe-, Dacca-compatible. Redundant common logic and power.	Modular design; built-in, autoequalized T1 modem, rack-mountable. Designed for use with Gandalf Pacx switch.	Software-controlled through single console or CRT. Day/night alternate channel configurations; redundant power supply; D4 frame formatting.	Software controlled from user-selected location. Dynamic circuit allocation based on user priorities. Drop and insert; D4Fe-compatible; redundant central logic link interface and power supply.	Supervisory control port; D4Fe-, Dacca-compatible; redundant power supply and common logic.

CW CHART

SELECTED T1 MULTIPLEXERS

Company	[illegible] Fort Lauderdale, Fla.	[illegible], R.I.	[illegible], Mass.	Tellabs, Inc. Lisle, Ill.	Timeplex, Inc. Woodcliff Lake, N.J.
Product	Omnimux T1	BSPT-1	Intraplex Models 153, 155	430 T-Plexer	Link/1
Maximum Channels	[illegible]	[illegible]	24	128	[illegible]
Channel Speed (bit/sec)	460K sync, 19.2K async	50-1.344M	56K	1,200 to 512K	50 to 256K
Aggregate Transmission Rate (bit/sec)	2.048M	1.544M	1.544M	1.544M or 2.048M	2.048M
Voice/Data/Video Support	Voice and data only	Yes	Yes (slow-scan video)	Yes	Yes
Date First Installed	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Number Installed	Not available	100 to 150	200	Less than 100	Not available
Type of Voice Digitization	[illegible]	[illegible]	PCM	PCM, ADPCM	[illegible]
Manufacturer or OEM	OEM	Manufacturer	Manufacturer	Manufacturer	Manufacturer
Price	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Vendor Comments	Modulates voice at 16K, 32K or 64K bit/sec. Software-strappable; single console control of up to 54 Omnimuxes.	Bit-interleaved TDM with statistical mux slide-in capability. Software-based menu-driven. Redundant power supply and logic card.	Model 153 is point-to-point; Model 155 is drop-and-insert multipoint. Crystal-based standby clock; transmit data framing monitor.	Software control; multiple-node control from signal site. Dynamic bandwidth allocation based on time of day or event; bit-interleaved.	Dynamic allocation; multiple data links; CCR compatibility; D4 framing. Network management and reconfiguration; software-driven.

CW CHART

Network features push muxes beyond third generation

By James Connolly
CW Staff

The ability to reconfigure a network, whether it means rerouting a long-haul line through a node 500 miles away when a circuit fails or shifting from a voice-intensive bandwidth during the day to data-intensive one at night, is one of the features that separates the various generations of multiplexers.

AT&T Communications wants to offer that capability through its Customer-Controlled Routing (CCR) feature, which allows the customer to switch circuits via an on-premise dumb terminal tied to an AT&T central office switch and data base (see story page 24). According to some vendors, CCR compatibility, or compatibility with AT&T's D4 channel bank and D4 Fe extended framing format, will soon be required for success in the multiplexer market.

The earliest multiplexers provided 24 frequently fixed bandwidth channels. A second generation offered a range of 24 to 144 channels at varied bandwidths. Some second-generation multiplexer vendors claimed that their products allowed for dynamic bandwidth allocation and rerouting, although the products were still hardware-oriented.

While the distinguishing lines between generations are blurred, multiplexers introduced within the past year have been billed as software-driven, with rerouting and control of several multiplexers from a single site. Vendors have claimed the ability to configure drop-and-insert networks, interconnecting three points with only three multiplexers — compared with up to six multiplexers the interconnection often requires — and switching all communications through one of the three. They are said to allow preprogrammed bandwidth reallocation based on the time of day and user-selectable voice-modulation techniques.

Those techniques include Pulse-Code Modulation (PCM), which digitizes voice signals at 64K bit/sec, and Adaptive PCM (ADPCM) and Continuously Variable Slope Delta (CVSD), which both digitize at 32K bit/sec. Several vendors also claim the ability to compress ADPCM and CVSD to 16K bit/sec.

"I think we're still early in the life cycle for multiplexers. The first T1 [multiplexers] that really provided assignable bandwidth — the ability to really chop up the bandwidth — first started appearing just three or four years ago. They were hardware configurable, so if you wanted to change a line, you had to stand next to the box," said Jeff Palmer, director of industry marketing for BBN Communications Corp. He said the most intelligent devices are just now hitting the market or are still in beta test sites. That equipment, in which multiplexing is a function secondary to network management, can direct 20 or more multiplexers serving up to 500 locations.

Gerald L. Mayfield, vice-president of the consulting firm DMW Group, Inc. in Stamford, Conn., said third-generation products include multiplexers such as Timeplex, Inc.'s Link/1, Avanti Communications Corp.'s Ultramux and products whose vendors downplay the multiplexing capability in favor of a switching capability, such as Network Equipment Technologies' Integrated Digital Network Exchange.

Mayfield said one key feature for future multiplexers will be the ability to tie private branch exchanges (PBX) into AT&T's channel banks. Network Equipment Technologies recently announced that its product had been certified by Rolm Corp. for use with Rolm's CBX PBX and its CBX II computerized branch exchange.

Palmer warned potential customers, "You have to be aware that you are buying up big chunks of capacity and that you are dealing with a technology that is just being rolled out."

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Benjamin West, The Death of General Wolfe, 1770. Courtesy The Bettmann Archive.

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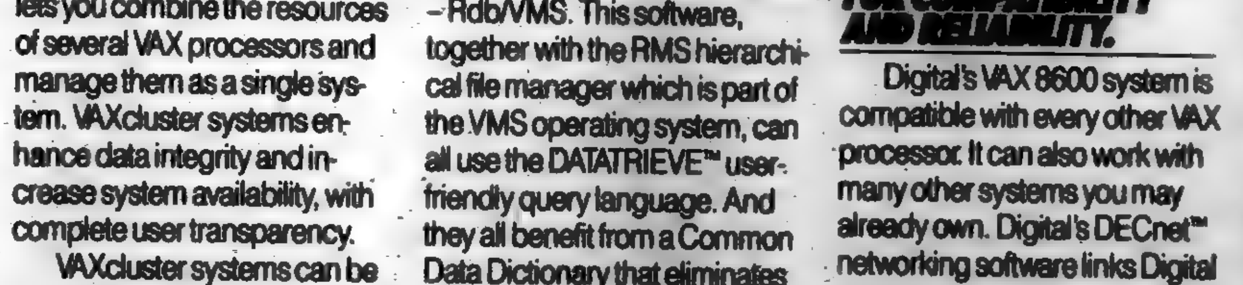
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Fose expo to focus on integrated systems; software show a first

WASHINGTON, D.C. — The Federal Office Systems Expo '85 (Fose Expo) and Fose Software conferences will be held March 4-7, at the Washington Convention Center here. The expositions and conferences are aimed at corporate or government executives, managers, directors, owners and department heads.

The six tracks of the "Integrated Office Systems — Redefining the Bottom Line" theme at Fose Expo are communications and networking, human dimensions, implementation, technologies, managing information and electronic records.

The Fose Software conference and exposition — a new addition to Fose Expo, is designed for large-volume software users with special emphasis on the federal government, the Department of Defense and large-scale business purchasers.

Speakers will include Adam Osborne, who will speak on "The Software Industry Shakeout;" Tom Peters, coauthor of *In Search of Excellence*; Commodore James B. Whittaker, author of *Strategic Planning in a Rapidly Changing Environment*; and George Plimpton, author of *Paper Lion*, who will speak on elements of discipline and planning necessary for the success of office automation.

The price of attendance is $295 for either Fose or Fose Software and $395 for both conferences. For a single day at Fose, the price is $95.

Single-day prices for Fose Software are not available, however, there is an exposition-only price of $10 at the door.

More information is available from National Trade Productions, Inc., which is located at Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

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AT&T

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width, according to Joseph Trombetta, district manager for service marketing of AT&T's Accunet and Skynet services.

"We expect to have a positive impact on the market. We believe CCR responds to the customer's need to adapt the network during the week, rather than having to place a work order," said Trombetta, noting that a customer can implement a preprogrammed alternate route in 15 minutes using CCR, while a work order could mean a three- to six-week delay in the past.

Alternate routes and channel allocations, which allow a customer to switch among configurations with different voice, data and video loads, can be stored in AT&T's data base and called up by a customer at a standard dumb terminal as needed. Trombetta noted that a customer might have a voice-intensive network during the day and wish to switch to a data-intensive network at night for bulk data transfers.

Initially, CCR is being offered in 42 U.S. cities served by AT&T's Accunet Reserved 1.5 service.

Additional AT&T services

Trombetta also said that two other AT&T services will impact the T1 market.

On Jan. 5, AT&T implemented M-44 Multiplexing, which allows Accunet T1.5 service customers to increase the capacity of their circuits from 24 to 44 voice-grade channels using bit compression. That process compresses the normal 64K bit/sec data stream into two 32K bit/sec streams. It is available in two configurations: between an AT&T central office and a customer's location or between two AT&T central offices.

The third new service is M-24 Multiplexing, for which the company has a tariff pending. With M-24, a customer would pay a flat fee for the T1 function plus a per-plug fee for up to 24 plugs, which means the customer only pays for that part of the T1 pipeline that it needs, according to Trombetta.

Another factor that could impact T1 growth is the prospect of a price war among carriers. One shot already fired in that war was AT&T's recent filing of proposed tariffs that would raise by an average of 30% prices for its Dataphone Digital Service, dedicated digital lines handling 2.4K bit/sec to 56K bit/sec transmissions. Meanwhile, the company proposed cuts in T1 services ranging from 9% to 13%.

T1

from page 24

supplier. Palmer noted that T1 is a commodity the carriers can sell with little added value.

Bradley O'Brien, president of Perspective Telecom, a Paramus, N.J., research firm, added, "First, T1 means some improved private-line economics for people who have that much traffic between locations. It enables them to reduce their trunk-line costs.

"Number two, and more importantly, it gives the customer flexibility to manage his own bandwidth. It gives the customer a first step toward a rudimentary [Integrated Services Digital Network]," he said.

World Bank learns value of effective IRM strategy

By Jeffry Beeler
CW West Coast Bureau

CARMEL, Calif. — By devising a strategy for integrating its key electronic technologies, the World Bank has gained a fresh awareness of how much its survival hinges on information resource management (IRM), according to the organization's IRM director, Mel Ray.

Before the bank embarked on a project to develop its first overall IRM strategy in November 1982, Ray said "we hadn't fully understood" information management's crucial role in the institution's efforts to expand its international membership.

Ray's comments came during a private interview at an IRM-related symposium sponsored by the Sunnyvale, Calif.-based Institute for Information Management, a subsidiary of Boole & Babbage, Inc. The three-day workshop, which attracted MIS directors and chief information officers from some of the U.S.'s best-known companies, ended on Jan. 23.

During the executive roundtable's opening-day keynote address, Ray recounted some of the World Bank's experiences in creating its IRM strategy, outlined its development procedures and enumerated the project's benefits.

In essence, the World Bank adopted a two-pronged approach to the task of formulating an organization-wide strategy. On one hand, it used IBM's Business System Planning methodology to take a top-down view of its operations, analyze its data flows and identify vital in-house processes or functions.

At the same time, the bank also examined itself from a bottom-up perspective in an effort to discover how its corporate information architecture applied to each of its constituent operating groups, Ray said.

The ultimate aim of the bottom-up view was to "optimize an information architecture at the individual unit level" and allow users to acquire data "as near to where a transaction takes place as possible," he said.

Merging bottom-up, top-down views

By merging the bottom-up and top-down views, the World Bank ultimately produced a preliminary version of an IRM strategy that reportedly defined the information needs of the institution's managers, professionals and support staff. The strategy, which is continually evolving, will also stimulate individual IRM planning among the bank's various operating units, Ray said.

In all, development of the strategy took about nine months and required the participation of 21 senior bank managers, more than 1,200 staff members, 14 consulting firms and eight internal advisory committees.

"Without question, the No. 1 benefit we've gained from creating an IRM strategy is an improved understanding of our information resource" and its strategic significance, he said.

For the $100 billion World Bank, continued existence depends on sustained support from the 149 national governments that now comprise its constituency. But to preserve the constituency, the organization needs both information and the ability to manage it effectively.

"What we say about ourselves and our constituents is extremely sensitive, and we wouldn't be able to make accurate statements without good information," Ray said.

Another benefit of the recently created IRM strategy was a change in the bank's internal organization. In the past, each of its major information systems technologies, including office automation and communications, was managed by a different in-house entity. Now, all those related areas of responsibility are consolidated under a single corporate officer, whose mission is to promote technological integration.

Worden to open DP, MIS meet

NASHVILLE — The 1985 Annual Conference of the Association for Systems Management will be held here from April 21-24 at the Opryland Hotel. The conference is designed for MIS and DP managers and directors and junior and senior analysts.

Retired U.S. Air Force Col. Alfred M. Worden, the command module pilot for the *Apollo 15* space mission, will deliver the opening luncheon address. The meeting also will feature a two-day miniconference on managing information centers, two full-day programs on executive support systems and communication skills and two special study tracks on "Integrating Systems Technologies-1985" and "Managing Interpersonal Relationships."

The admission price for the full program is $475 for members and $575 for nonmembers. A two-day program is priced at $395 for members and $475 for nonmembers. One day is available for $180 for members and $260 for nonmembers.

More information is available from Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

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Contestants vie for NSF funds

By John Desmond
CW Staff

WASHINGTON, D.C. — Millions of dollars of supercomputer hardware is at stake in a competition sponsored by the National Science Foundation (NSF) here to choose four supercomputer centers from a total of 22 applicants.

The NSF will distribute a total of $22 million in funds authorized by the U.S. Congress among the four chosen centers. Lawrence Lee, the NSF's program director for supercomputer centers, said the winners will be announced April 1.

While the NSF did not disclose the applicants in the competition, recent press accounts indicate that universities, consortiums of university and industry representatives, and supercomputer vendors are competing to establish supercomputer centers.

The initiative to establish the national supercomputer centers was best stated in the 1982 report from the Lax Panel on Large-Scale Computing in Science and Engineering sponsored by the NSF and the Department of Defense, said Neal Lane, chairman of the NSF's advisory committee for advanced scientific computing.

According to the report, "The problem was that a lot of . . . engineering needed to be done, and the research scientists and engineers couldn't get their hands on the supercomputers," Lane said.

The report suggested the following objectives: to provide access to supercomputers for the nation's scientists and engineers who need it, to stimulate a program of education on supercomputers in universities, to provide incentive for industry development of new kinds of supercomputers helping to bring multimillion dollar entry costs down and to develop more software for supercomputers, Lane said.

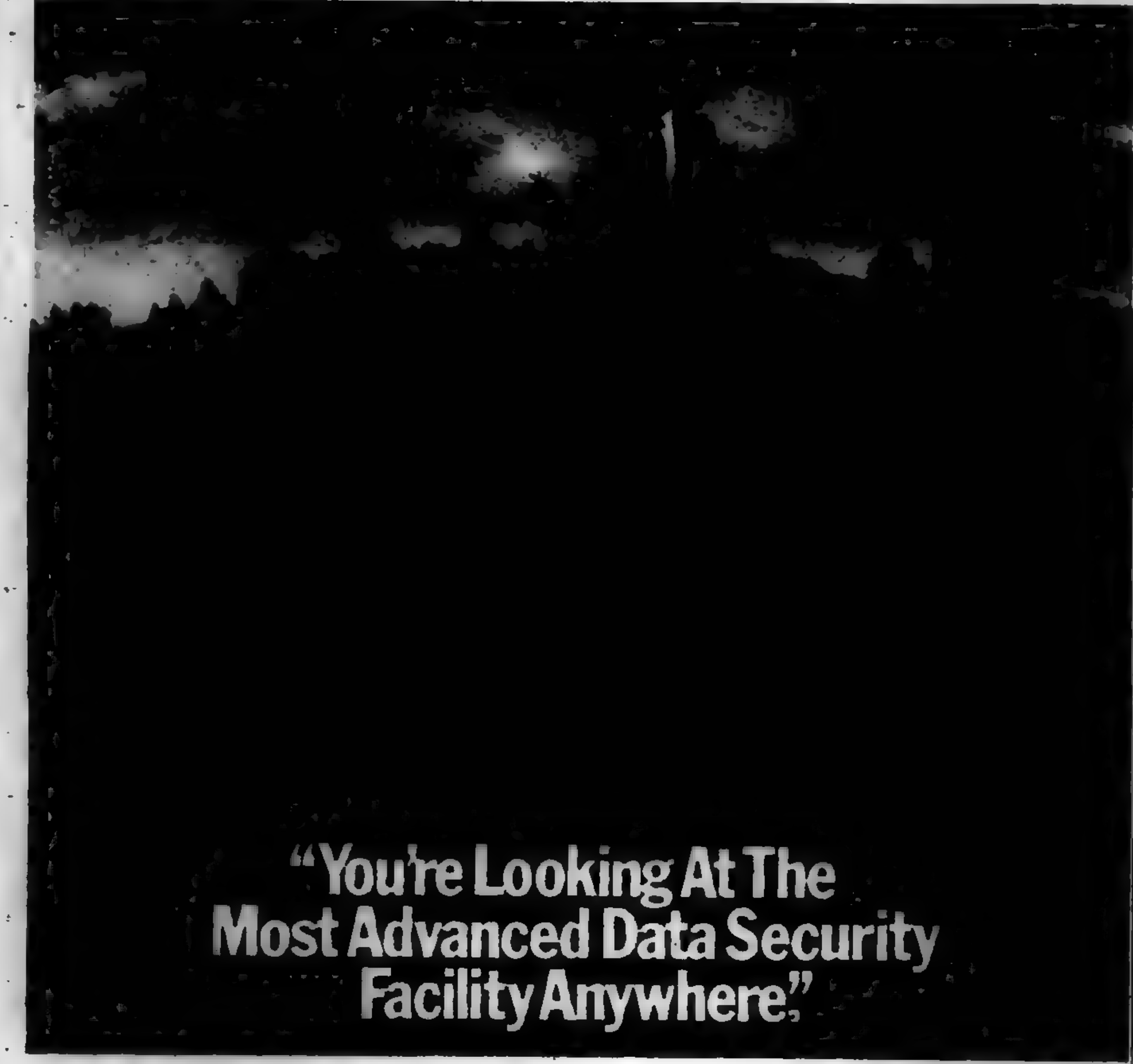
NSF task force

The NSF responded by forming a task force, which recommended that Congress be asked to fund an advance computing program. Not since the early 1970s has Congress funded computer purchases through the NSF, Lane said. "This really is a brand-new thing and certainly is the first response of the NSF to the Lax report," Lane said.

Kenneth Wilson, professor of physics at Cornell University, which is among the 22 candidates vying to be an NSF supercomputer center, has worked to try to marry the interests of academia and industry in the development of the supercomputer.

"The usual put-down of the computing industry is it tries to list the applications that supercomputers are good for, like oil reservoir simulation, aerospace simulation for aircraft design and power plant simulations. That's a put-down if you accept that approach, because nobody will ever list the applications for the IBM Personal Computer. You couldn't do it," Wilson said.

He added, "It's not the sort of need you can categorize like that. The need is in terms of meeting industry-wide goals. They need to be using simulations in all kinds of applications, with the objective of shortening the product development cycle time."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University of Alabama sets sights on supercomputer

By Maura McEnaney
CW Staff

TUSCALOOSA, Ala. — The University of Alabama state school system is getting into the computer business.

As part of a state plan to help diversify a primarily industrial economy, the university is preparing to purchase a powerful supercomputer. In fact, the university wants a machine more powerful than anything currently available on the market.

Edward Moore, senior vice-chancellor for the state's university systems, is the chairman of the state's supercomputer committee, which Gov. George Wallace launched last spring. Moore said the university is considering buying a supercomputer that contains at least four CPUs.

Other specifications include a high-speed memory, capable of processing in a scalar or serial mode at a rate of 100 million instructions per second (Mips), or a vector unit with 500 million floating-point operations per second. Also specified were a random-access memory of 128 million 64-bit words that will be expandable to 256 million 64-bit words and a modular mass storage of one billion 64-bit words expandable to two billion. The university is considering machines from vendors including Cray Research, Inc., Amdahl Corp., Sperry Corp. and Control Data Corp.

Since most machines today process at rates below 20 Mips, the machines eyed by the university probably will not be around until 1987, Moore said. Until then there is much work to be done, he said. The university system is waiting for legislative action on a bill granting $15 million for the purchase and administration of the computer system and the establishment of a communications network.

The site for the supercomputer has not been selected. However, the university plans to establish six access node locations: one for state agencies in Montgomery, Ala., and five at university campuses. Other Alabama state universities involved in the program are Auburn University, the University of South Alabama in Mobile, the University of Alabama branch campuses in Birmingham, Huntsville and here.

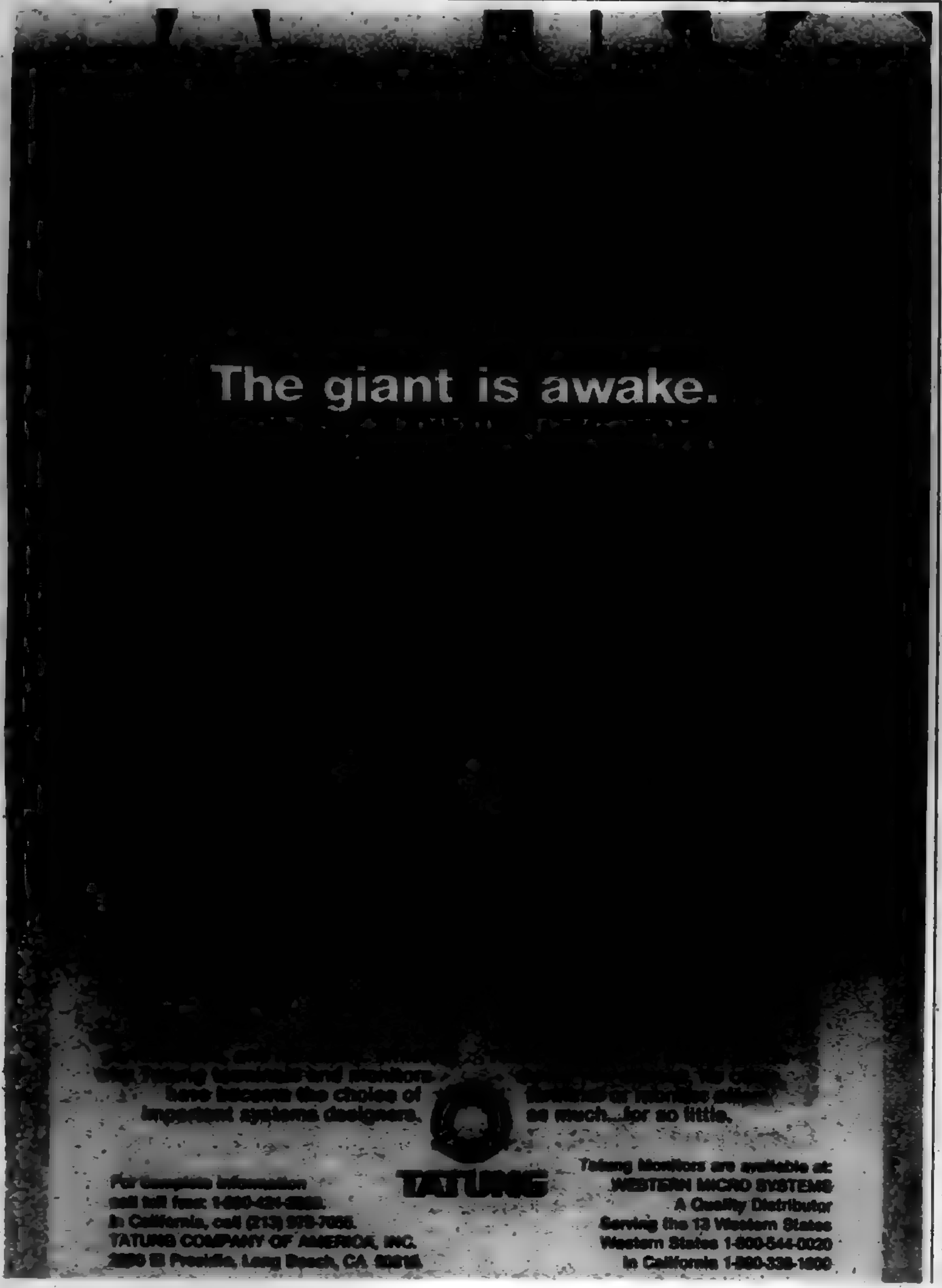
Depending on the legislative action, the university system could begin installation of the communications nodes in July, Moore said. Until the time the computer is purchased, university faculty will be trained on an existing machine, perhaps on a supercomputer used by the University of Georgia system. That computer has been in place for about a year.

'Why not?'

But why does the university need such a powerful machine, particularly when a supercomputer resides in neighboring Georgia? "Why not?" said Thomas Bartlett, university chancellor. "You never need it until you have it and develop the capacity to use it."

Among those who will have the most use for the supercomputer are students and professors studying crystalography (the analysis of crystals as a means of designing biomedical products) and fossil fuels. But when Gov. Wallace originally proposed the supercomputer concept, he intended it to be a resource for the business community as well. "The capacity of these things is so enormous that no single agency or institution could use it," Bartlett said.

To defray the $3 million annual maintenance costs, the university is banking on leasing the system to U.S. defense operations in the Huntsville area, site of the Marshall Space Center, the Redstone Arsenal and the Ballistic Missile Command.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Forms available for DPMA prize

PARK RIDGE, Ill. — Applications for a series of international awards aimed at honoring computer science students, educational institutions and businesses for extraordinary accomplishments are now available from the Data Processing Management Association (DPMA) and its Education Foundation.

The three categories of awards within the program, established in 1984, are business and industry, for organizations said to exemplify excellence in continuing development of information systems professionals; educational institutions, for information science programs in two- and four-year programs; and students, for information science students entering the final year of a two-year associate program or a four-year program. The cash prize in each category is $2,000.

Individuals and organizations interested in applying for the awards must be nominated by a local DPMA chapter, region or nation. The awards will be presented at the DPMA Houston '85 conference and exposition, scheduled for Oct. 28-30 in Houston.

More information and requests for applications are available from Hildegard Klemm, Manager of Educational Services, DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

Researchers making supercomputers big on campus

By Maura McEnaney
CW Staff

WASHINGTON, D.C. — In response to a call for increased access for supercomputing in the U.S. [CW, Jan. 24, 1983], supercomputers are popping up at several educational institutions across the country.

According to John Connolly, director of the National Science Foundation's (NSF) Office of Advanced Scientific Computing, supercomputers are located at the University of Minnesota, Purdue University, Colorado State University and the University of Georgia.

The NSF's Supercomputer program was established in 1983. In October, the NSF began a $40 million effort to make supercomputer time available to American scientists with promising research projects, Connolly said.

By April, the NSF expects to announce the establishment of four supercomputer centers, all of which will be operating by 1986, he said. "The idea is to give our best research people access to the best computation facilities."

This month, Florida State University expects the delivery of a Control Data Corp. Cyber 205 Class 6 supercomputer for the Supercomputer Computations Research Institute (Scri). The institute was established last October in conjunction with CDC and the U.S. Department of Energy (DOE).

According to a university representative, the supercomputer will use 12 units of on-line disk storage containing 4.8 billion bits per unit. Also included will be four to eight on-line tape drives. The Cyber 205 will include 20G bytes of secondary file storage implemented with a CDC Cyber 180-835 acting as file server.

The Scri will arrange access to a supercomputer for DOE scientists. The DOE will have access to approximately 65% of the computer time and will fund approximately 70% of the project cost.

CDC to provide equipment, personnel

The Florida legislature has appropriated funds and 13 faculty positions for the program, and CDC plans to provide equipment and personnel for the Scri.

Long-range goals for the Scri within computational science will be to develop software in the area of large-memory access with shared CPUs.

In 1987, the university will receive a Cyber 250 that will consist of four million words of local memory and a cycle time approximately four times faster than a Cyber 205. The CPUs reportedly will be accompanied by approximately 128 million words of shared memory, the university representative said.

NCGA meet scheduled April 14-18

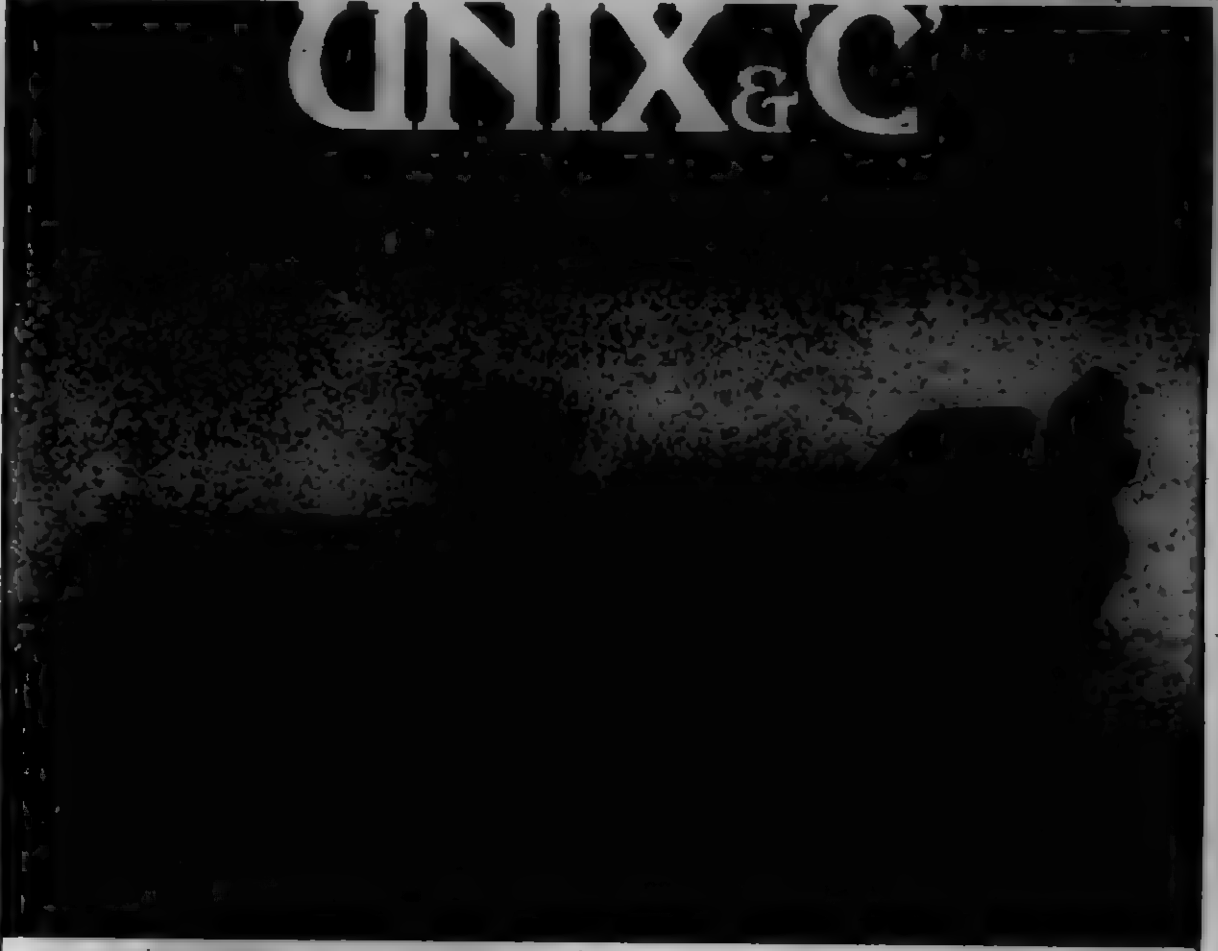
DALLAS — More than 250 computer graphics experts are scheduled to speak during 40 tutorials and 80 technical sessions at Computer Graphics '85, the sixth annual conference and exposition sponsored by the National Computer Graphics Association (NCGA). The conference will be held at the Dallas Convention Center here April 14-18.

According to the sponsor, the conference is designed to keep users up-to-date on the world of computer graphics. The show will feature educational programs in 20 computer graphics applications areas. Papers on developments in architecture, engineering and construction, including automated facilities planning and management, will be presented.

In addition, applications software, data bases and utilization patterns will be reviewed. Topics in the area of computer-aided design and manufacturing (CAD/CAM) will include very large-scale integration design, circuit design and component selection, photo plotting and verification, data base and expert systems for electronic design and electronic simulation and testing. A program on computer-integrated manufacturing is scheduled, and speakers will discuss the increased efficiency and cost benefits from the integration of CAD/CAM.

The price to attend all exhibits is $10 for non-NCGA members; exhibit attendance is free to NCGA members. The cost to attend all tutorials is $425 for NCGA members, $495 for nonmembers. The cost to attend all technical sessions is $395 for NCGA members and $460 for nonmembers.

More information is available from NCGA, Suite 601, 8401 Arlington Blvd., Fairfax, Va. 22031.



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TURNAROUND TIME

Larry Long

***Q** In your description of computer literacy, the advice "Be an intelligent consumer of computer-related products and services" is most important.*

It is our responsibility in the computer industry to deemphasize computer literacy as a priority goal in our society. I would prefer that my son learn to think, feel and understand than to find his precocity in the byways of the computer world. Likewise, I seek a prospective employee who can think analytically and creatively and can relate to other people in a sensitive manner. The computer is a fine tool, but can't it be used to meet the tasks at hand?

You imply that computer literacy and "learning to think, feel and understand" are mutually exclusive activities. Many agree with you. And I agree that thinking, feeling and understanding are worthy developmental goals, but I contend that computer literacy can be a part of that development and, perhaps, even hasten progress toward other goals.

When you recommend that the computer be used as needed, you are suggesting that we be reactive rather than proactive to a need for automation. I have always recommended that computer professionals and other users have a storehouse of knowledge that can be applied to a variety of situations.

***Q** Five months ago I was the victim of a companywide reduction in white-collar workers. After 18 years of service, primarily in programming, systems and, more recently, in staff capacities, I'm looking for a job in an area that already has 13% unemployment.*

Periodically, a position opens up for an experienced programmer. I would be happy to take a programming position and then work up, but my age and recent experience are working against me. The two companies with which I interviewed were seeking people with more current programming skills. I have eight years of programming experience and am confident that I will have no trouble coming up to speed. How can I convince people that this is the case? My wife, who is not employed either, and the children refuse to discuss moving to another part of the country.

Why not demonstrate to prospective employers that you are upgrading your technical skills by taking a few college courses, perhaps in data base management systems and structured programming techniques. If you get hired next week, fine, you can retrain while on the job. But for now, I would recommend devoting some time to developing marketable skills. On your next interview, stress your educational pursuits and how your systems experience will be complementary to any programming assignment.

If the choice is between employment elsewhere and unemployment where you are, I hope your family will reconsider.

***Q** Computer literacy happens to be one of my pet peeves, for exactly the reasons you cite: nobody can define it but everybody is selling it. Your "definition" is as good as any I've seen, but it's nonoperational. Even after reading it, the computer illiterate still doesn't know how to go about [becoming computer literate]. Computer literacy comes in different flavors. We computer professionals are computer literate, but this level of knowledge is not necessary for the ordinary computer user.*

Then what are the necessary conditions for computer literacy? I believe that a necessary condition is an understanding of how a computer "thinks," with all it implies. This means an understanding of the interconnection of hardware, the functions of the operating system and the mechanics of software application.

In essence, what every computer illiterate needs is to attend a good seminar on "Computer Mentality." Do you agree?

Perhaps "computer mentality" may someday nudge out "computer literacy" as the term of choice, but both still address the issue of introductory computer education.

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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

MELBOURNE — Although IBM's IMS data base management system was "the best in its day," it no longer provides the control required, according to Tom Noonan, information services manager for the Hospital Benefits Association Ltd. (HBA). The system at Victoria's largest health insurance company is being blamed for a mess of files and duplicated data, Noonan said. "HBA's data [problems] evolved as a result of traditional systems development — which is to create a new file for each new application. We now have 42 data bases, about 90 permanent files and around 150 temporary files, with historic information being kept on about 100 tapes in branches throught Victoria." Noonan did not say what software will be chosen to replace the 15-year old IBM product.

FRANCE

PARIS — Two massive government projects to promote technology are underway here. The first is the installation of 120,000 microcomputers around France in popular workshops, where the machines will be made available to children, students and adults. The $200 million plan calls for equipment from Apple Computer, Inc. and the French companies Thomson, Bull and Leonard.

At the same time, it was learned that a division of the French Postal Telephone and Telegraph administration has ordered 1.5 million smart cards and 50,000 card readers. Bull is expected to garner the largest part of this order.

JAPAN

TOKYO — Oki Electric Industry Co. has unveiled an integrated personal computer called the 800 Model 60, a high-end addition to the vendor's 800 series. It is said to support multiwindowing software and simultaneous data processing; include Microsoft Corp.'s MS-DOS Version 2.11 and a concurrent Digital Resources, Inc. CP/M Version 3.1; support several communications protocols; and have a main memory of 512K bytes, expandable to 1M byte. The system will be available in March, starting at $1,832, according to the vendor.

■

TOKYO — Fujitsu Ltd. has introduced two large-scale office systems called the K-270 and K-280, which are said to be extensions of the vendor's V series. The additions feature enhanced operating systems and conversion tools to integrate other K series and M series systems, according to vendor. The machines are reportedly one-fourth the size of the V series systems and feature main memories of 7M bytes and 9M bytes, respectively. According to Fujitsu, pricing starts at $37,120 for the K-270 and $72,880 for the K-280.

NORWAY

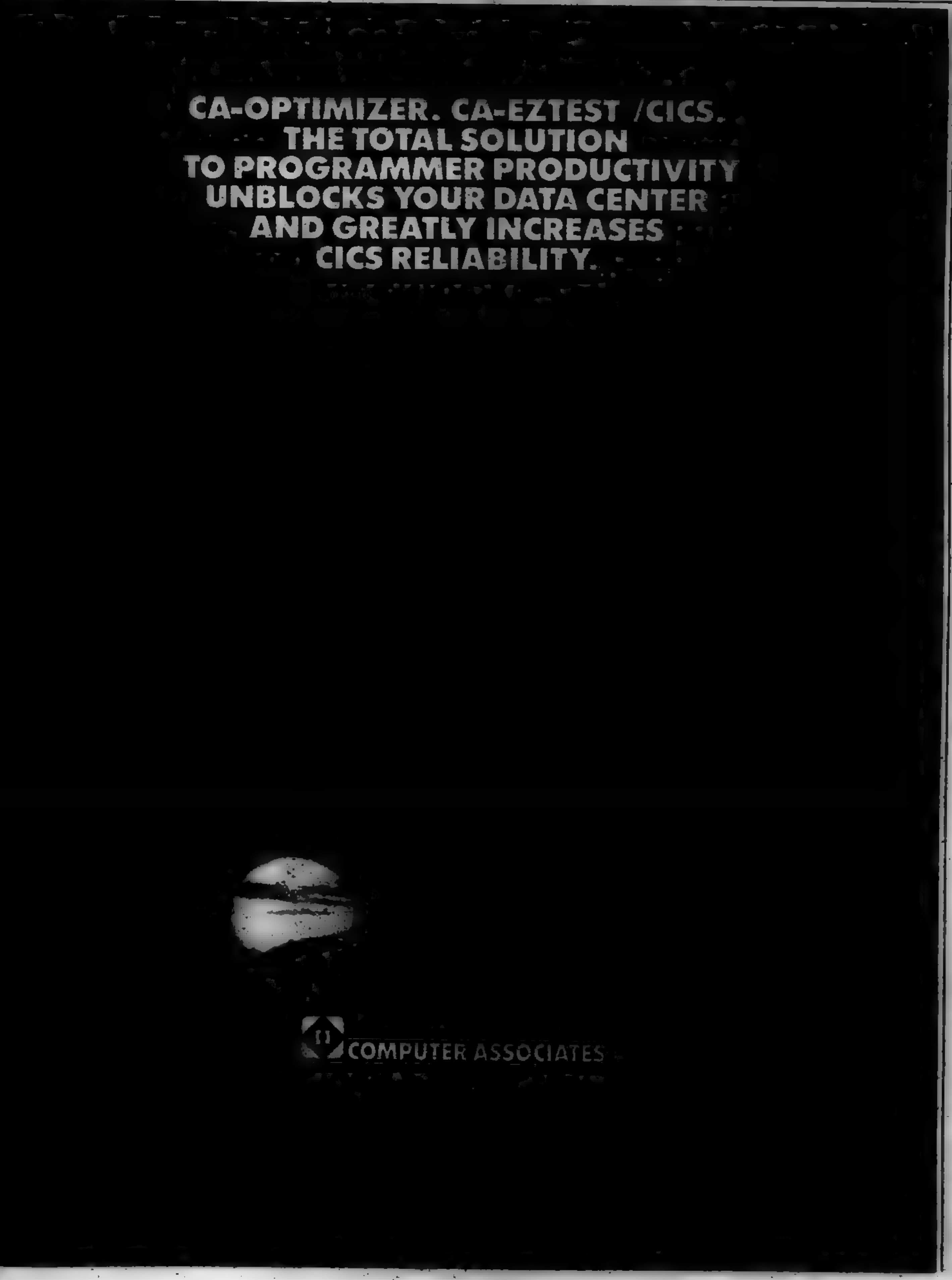
OSLO — A computer-aided design software package intended to run on the IBM Personal Computer has been unveiled here by a company called Productivity Support. The menu-driven software, PS-Cass, reportedly allows the user to create his own library of symbols and performs a range of technical drawings and flowcharts, the vendor said. PS-Cass costs $3,330, according to Productivity Support.

SWEDEN

STOCKOLM — The Swedish government has recently issued the following standards for portable microcomputers here: The machine must not be heavier than 6½ lb and dimensions must be no larger than 8½ in. by 11 in. for it to be called portable. The operating system may be either CP/M, MS/DOS or the Swedish ABC/DOS and must display at least eight columns or 40 characters.

■

STOCKHOLM — The number of Swedish computer exports plunged in 1984, according to recently released figures. After a record year in 1983, when exports increased by 78%, the number slumped to 11% in 1984.



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Systems widen spectrum of data observation

Arecibo Observatory photo

Arecibo Observatory's receiving equipment

ARECIBO, Puerto Rico — Tucked away in a small room at the Arecibo Observatory here is the heart of a system that drives the world's largest radio/radar telescope. In this room, three superminicomputers pump data to and from instrumentation that enables scientists to study objects as distant as 15 billion light-years away.

The telescope's reflector dish measures 1,000 feet in diameter, with a 20-acre surface area, which makes it larger than the combined collecting areas of all other radio telescopes ever built. A 600-ton white steel triangular framework containing the receiving and transmitting equipment is suspended by cables nearly 500 feet above the dish.

The Arecibo Observatory is the major research arm of the National Astronomy and Ionosphere Center, operated by Cornell University and funded by the National Science Foundation. Each year, approximately 150 scientists from institutions all over the world come to Arecibo to perform a variety of experiments. They are selected by a panel of referees after submitting proposals outlining their research projects.

The 118-acre facility was completed in 1963 at a cost of $9.3 million. Another $9 million was spent to upgrade the telescope in 1974 when a planetary radar system was installed and the dish was resurfaced with aluminum panels.

Ideal location

The telescope was erected in Puerto Rico because of the island's location: The planets are directly overhead most of the year, it enjoys a stable political climate, is easily accessible from the U.S. and features a relatively constant temperature and gentle winds.

Geologically, the Puerto Rico site was also desirable because the reflector dish sits in a natural limestone depression, which greatly decreased construction costs. The surrounding hills help shield the antenna from radio interference.

Unlike most radio telescopes, which have movable reflectors, the dish here is stationary, but the receiving and transmitting equipment on the structure 50 stories above it can be rotated 360 degrees. It is automatically put in the most advantageous position by one of the observatory's three Harris Corp. superminicomputers.

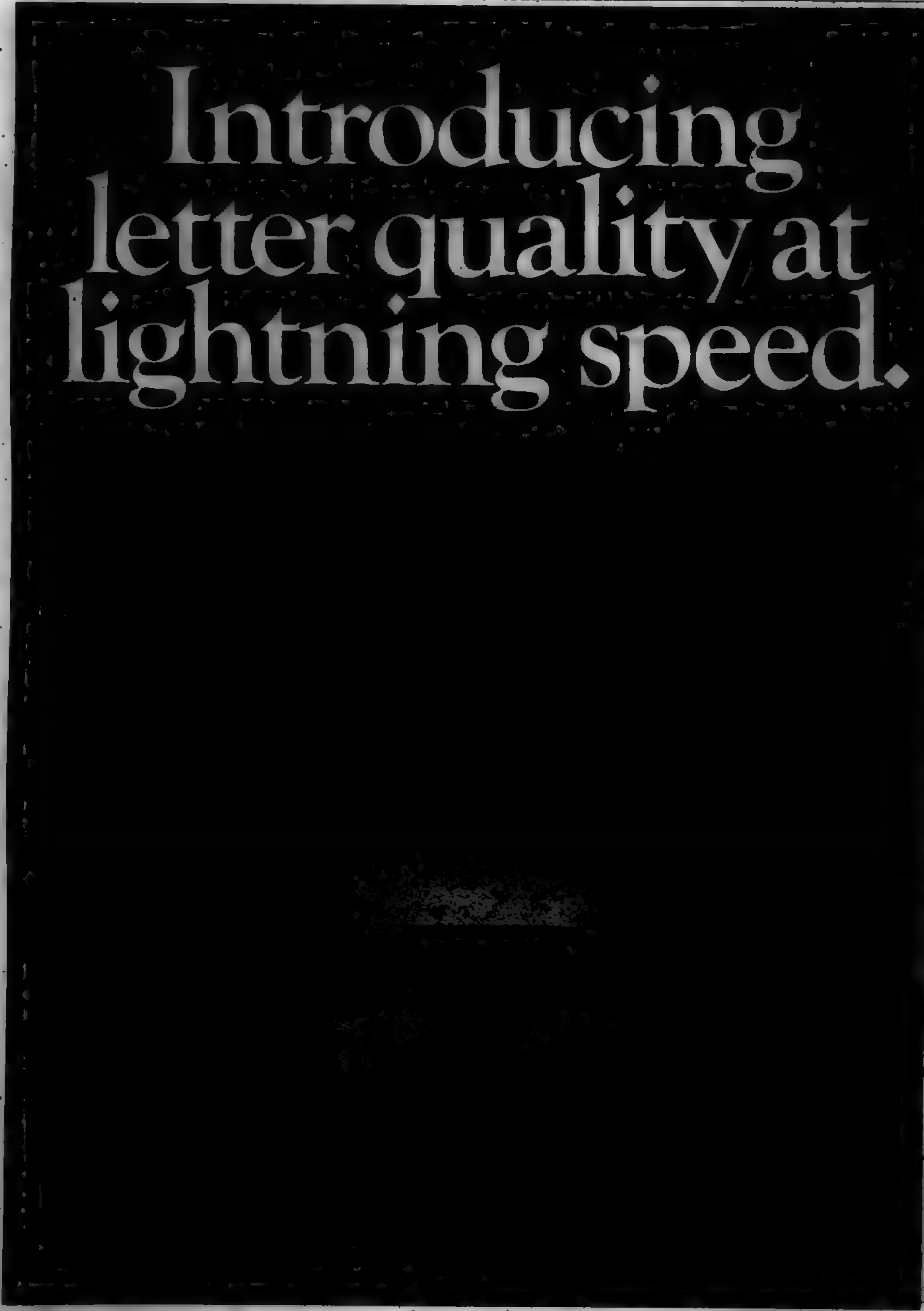
Three Harris superminis

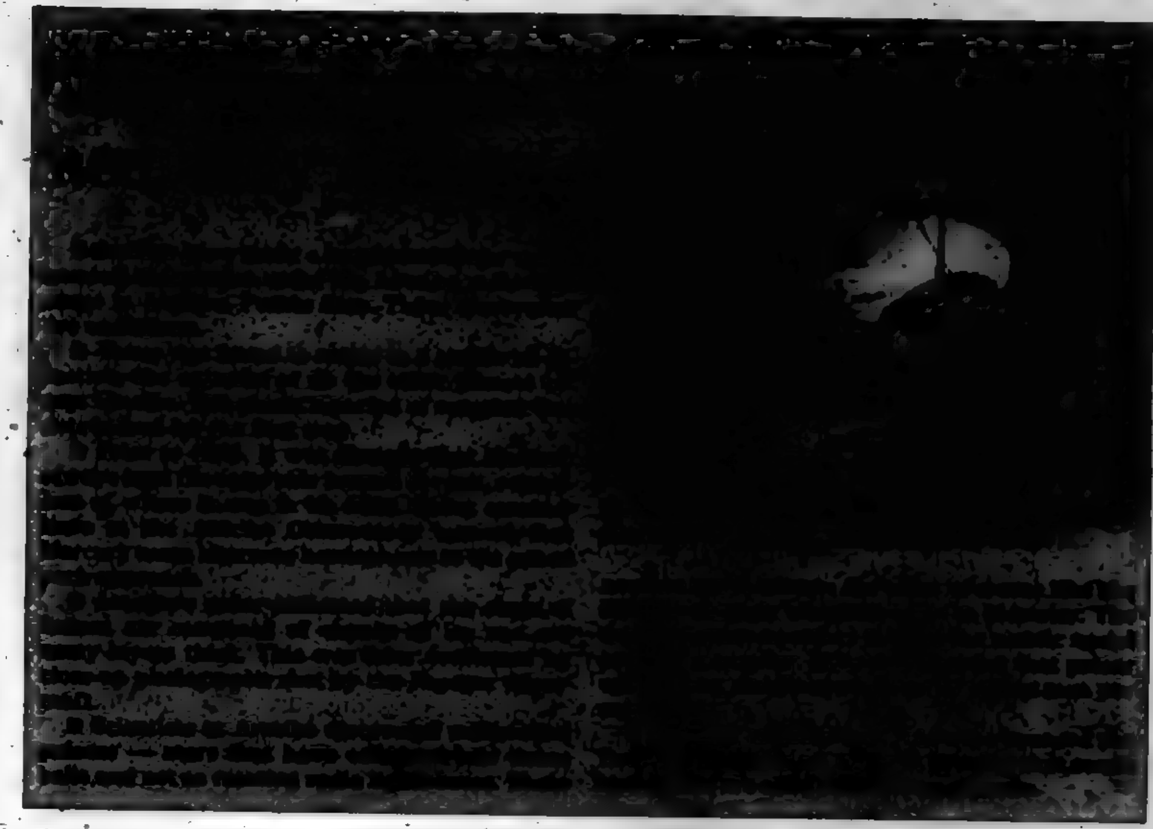
Arecibo's three Harris superminis are involved in almost every facet of observatory life. According to DP Director Richard Murphy, "The computers do everything from pointing the telescope and [performing] time-critical data acquisition to mundane tasks like accounting. I can examine purchase order data from my office while others may be analyzing pulsar data received across thousands of light-years. The sheer spectrum of our computing requirements is unique."

Murphy said the Harris superminis are versatile enough to perform this range of functions but still have the power and speed to support the observatory's scientific data acquisition and processing needs. Murphy said the observatory started out with a Control Data Corp. batch processing system, which was later replaced by a Harris machine in 1974. The original Harris system handled a variety of tasks, including telescope control and some batch processing. Two more Harris computers were purchased in 1983.

The two additional Harris 100-1 computers are primarily used for real-time comput-

See OBSERVE page 41





Exposition to focus on automated vision

DETROIT — The first international conference and exposition on applied machine vision, Vision '85, will encompass robotics, computer-aided design and manufacturing and flexible manufacturing systems. It is scheduled for March 26-28 at Cobo Hall here.

The exposition is being sponsored by the Society of Manufacturing Engineers (SME) and the Automated Vision Association, recently formed by the Robotic Industries Association. The conference is sponsored by the Machine Vision Association of SME.

Technical session subjects will include an overview of machine vision, applications planning, flaw detection, process verification, image sensing, process control and gauging, R&D, methods and techniques and robot vision.

The exposition will feature demonstrations of flaw detection and other uses of machine vision in assembly, inspection, related vision components, computerization technology, robotics, software, part identification and sensors. Also featured will be parts assembly, materials handling, work in process, warehousing, guidance and control technologies with vision capabilities.

The full conference fee is $450 for members and affiliates and $520 for nonmembers. Single-day fees are $190 for members and $260 for nonmembers. A tutorial on machine vision costs $70.

More information is available from the Public Relations Department, SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

OBSERVE

from page 40

ing and instrument control, while a Harris 800-1 is used for data acquisition and reduction. The two Harris 100s are identical, interchangeable systems, so when one is being used for data acquisition and instrument control, the other can be used for program development and maintenance tasks.

The Harris 800 is primarily dedicated to data reduction, both interactive analysis and batch processing. It is also used for data acquisition program development, Murphy explained.

Each Harris 100 has 576K bytes of main memory, dedicated operator console terminals and 80M-byte disk drives. The Harris 800 has 1.9M bytes of physical memory, 1.1G bytes of disk storage and connects to 40 terminals in scattered locations around the site. The Harris systems communicate with each other via X.25 networking and share a range of peripherals.

The path of the signals before they reach the computer can be complicated. Sophisticated receivers detect the signal from space. The signal is amplified, converted down to a lower frequency, then travels more than ¼ mile from the antenna to the receiver room. Here it is patched into instruments for filtering, further amplifying or combining with other signals to shift the frequency.

Five terminals are used by the Harris 100s in the data acquisition stage. One is the control room master terminal, where observers start their programs and monitor data. Another is dedicated to displaying the pointing information for the telescope. A third is used for hard copy and logging. One terminal is located in the receiver room, where all the instrumentation is patched together, enabling the observer to run his software and monitor the instruments more closely. The fifth is used for graphics output.

"We developed a data analysis and display system called Analyz that allows observers to plot and monitor the data that's being acquired. It is particularly useful with atmospheric physics experiments and spectral line observations where instrument adjustments and interference detection are important. Every few minutes, it will display a plot on the terminal showing the output of the autocorrelator," Murphy added.

"Efficiency is paramount in this field when you consider that my typical observations last 50 hours," radio astronomer Riccardo Giovanelli said. "The computers have increased our efficiency by 15% or 20%, which is significant in terms of both man-hours and dollars."

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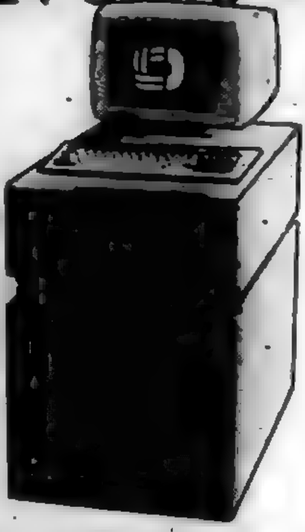

CALENDAR

WEEK OF FEB. 24

FEBRUARY 25, NEW YORK — **Word Processing with Multimate.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 25, NEW YORK — **Introduction to the IBM Personal Computer.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 25-26, SAN DIEGO — **Software Verification and Validation.** Contact: Educational Foundation of the Data Processing Management Association Seminars, c/o Technology Training Corp., Department SVV, P.O. Box 3608, Torrance, Calif. 90510.

FEBRUARY 25-26, SAN FRANCISCO — **PC Local-Area Network Software.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55425.

FEBRUARY 25-26, ORLANDO, FLA. — **Estimate Software Costs.** Contact: Educational Foundation of the Data Processing Management Association Seminars, c/o Technology Training Corp., Dept. ESC, P.O. Box 3608, Torrance, Calif. 90510.

FEBRUARY 25-26, BOSTON — **Lotus 1-2-3.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

FEBRUARY 25-26, DALLAS — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

FEBRUARY 25-26, SAN FRANCISCO — **Personal Computer Local-Area Networks Software.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

FEBRUARY 25-27, DALLAS — **EDP Auditing & Controls.** Contact: Laurie Christie, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 25-27, DALLAS — **The Auditor's Role in Systems Development.** Contact: Laurie Christie, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 25-27, WASHINGTON, D.C. — **Network Protocols and Standards.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 77092.

FEBRUARY 25-27, DALLAS — **Using Focus as an Audit Tool.** Contact: Laurie Christie, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 25-27, DALLAS — **Auditing and Controlling Microcomputers.** Contact: Laurie Christie, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 25-27, DALLAS — **Auditing Microcomputer Networks.** Contact: Laurie Christie, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

FEBRUARY 25-27, DALLAS — **Facilities for Auditing within IBM's OS/VS Operating System.** Contact: Laurie Christie, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701

FEBRUARY 25-27, NEWPORT BEACH, CALIF. — **Structured Development Forum Conference on Expediting System Development.** Contact: Steve McMenamin, The Atlantic Systems Guild, 353 W. 12th St., New York, N.Y. 10014.

FEBRUARY 25-27, HOUSTON — **Data Analysis and Logical Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

FEBRUARY 25-27, NEW YORK — **Introduction to Data Communications.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

FEBRUARY 25-27, DALLAS — **Auditing Advanced Computer Systems.** Contact: Laurie Christie, MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

See FEBRUARY page 46

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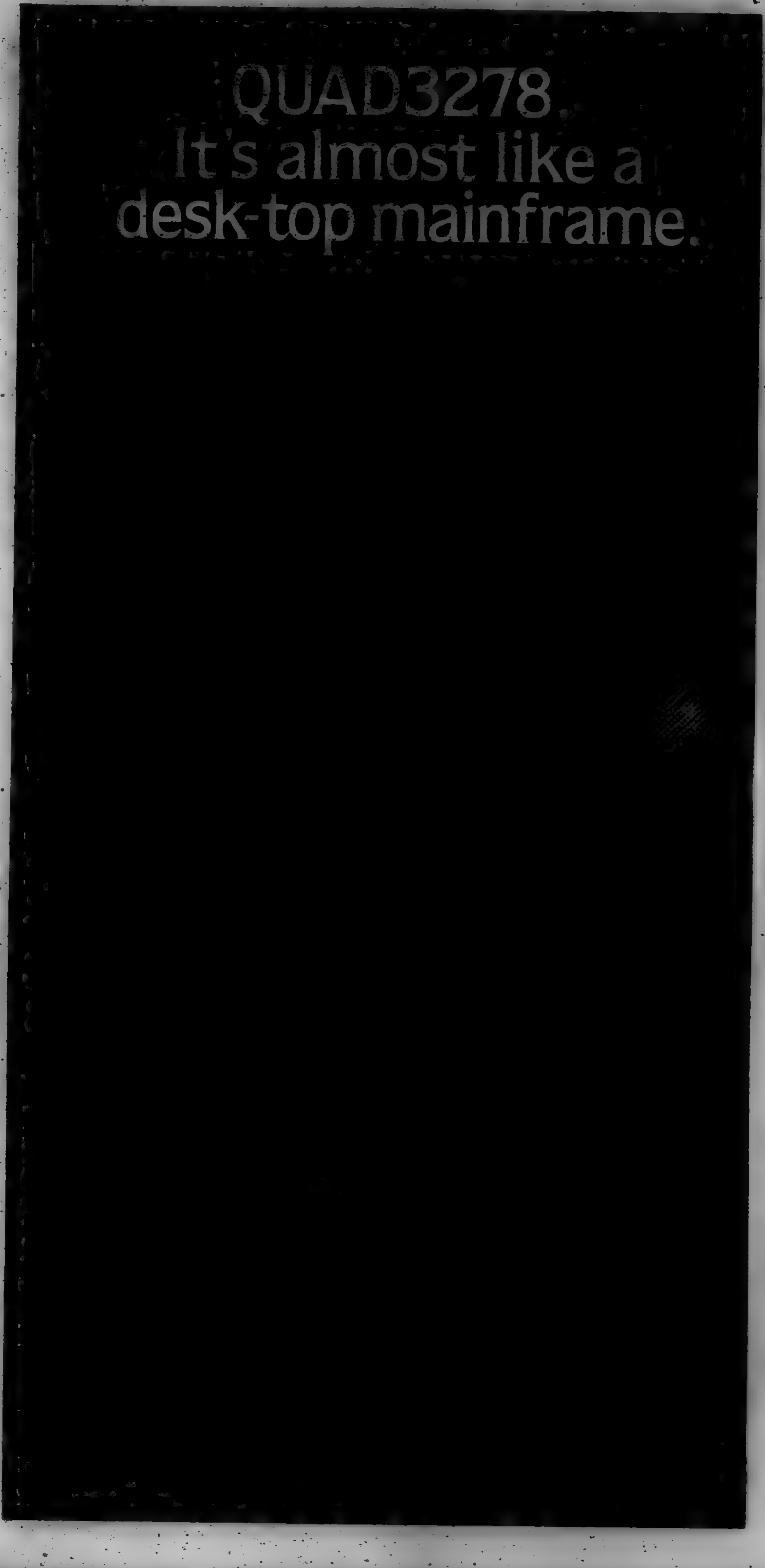

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integrated system software that combines these two industry standards into a powerful, multi-user, multitasking environment that can stand up to practically any application.

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FEBRUARY

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FEBRUARY 25-MARCH 1, NEW YORK — **IDMS ADS On-Line.** Contact: International Computers & Communication Systems, Inc., 10 E. 21st St., New York, N.Y. 10010.

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FEBRUARY 26, NEW YORK — **Spreadsheets Using Lotus 1-2-3.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 26, NEW YORK — **Introduction to Symphony.** Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

FEBRUARY 26-MARCH 1, BOSTON — **Unix: A Hands-On Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

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FEBRUARY 27-28, WASHINGTON, D.C. — **Telecommunications Strategic Planning: Don't Start Vast Projects With Half-Vast Ideas.** Contact: Marilyn Chasteen, The DMW Group, Inc. 2020 Hogback Road, Ann Arbor, Mich. 48104.

FEBRUARY 27-MARCH 1, CHICAGO — **IBM Personal Computers: Communication with Mainframes, Local and Public Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

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WEEK OF MARCH 3

MARCH 4-5, WASHINGTON, D.C. — **Artificial Intelligence.** Contact: EFDPMA Conferences, c/o Technology Training Corp., Department AI, P.O. Box 3608, Torrance, Calif. 90510. Also being held March 18-20 in Boston.

MARCH 4-5, SAN FRANCISCO — **Essentials of Personal Business Computing.** Contact: U.S. Professional Development Institute, Microcomputers for Management, 1620 Elton Road, Silver Spring, Md. 20903.

MARCH 4-5, TORONTO — **Information Centers.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

MARCH 4-6, BOSTON — **Data Communications: A Complete Overview and Update.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

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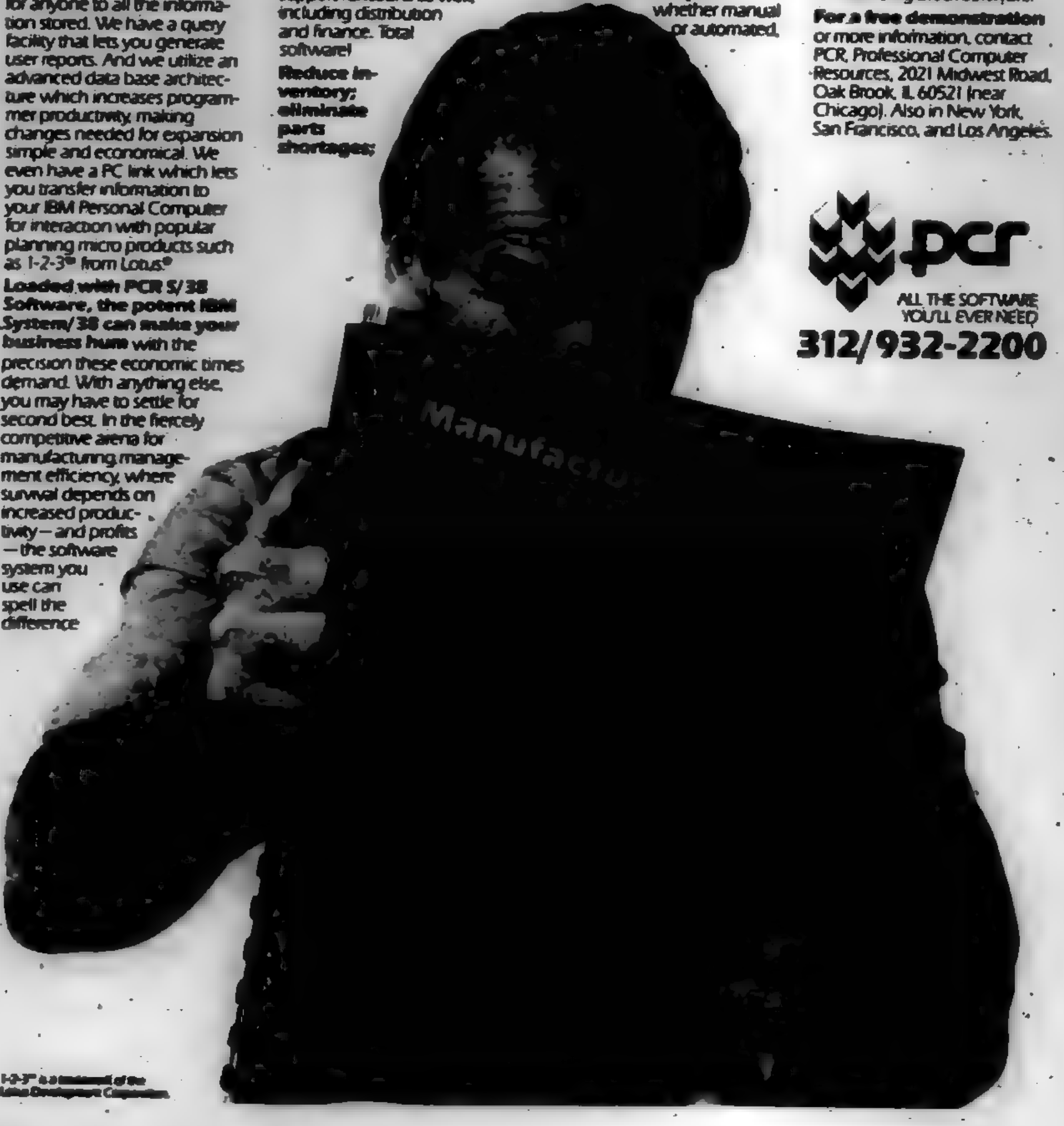

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MARCH 4-7, WASHINGTON, D.C. — **Federal Office Systems Expo (Fose).** Contact: Fose, National Trade Products, Inc., Suite 206, 9418 Annapolis Road, Lanham, Md. 20706.

MARCH 4-6, PARSIPPANY, N.J. — **Job Control Language.** Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07054.

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March 6-7, SAN FRANCISCO — **Personal Business Computers for Managers.** Contact: U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

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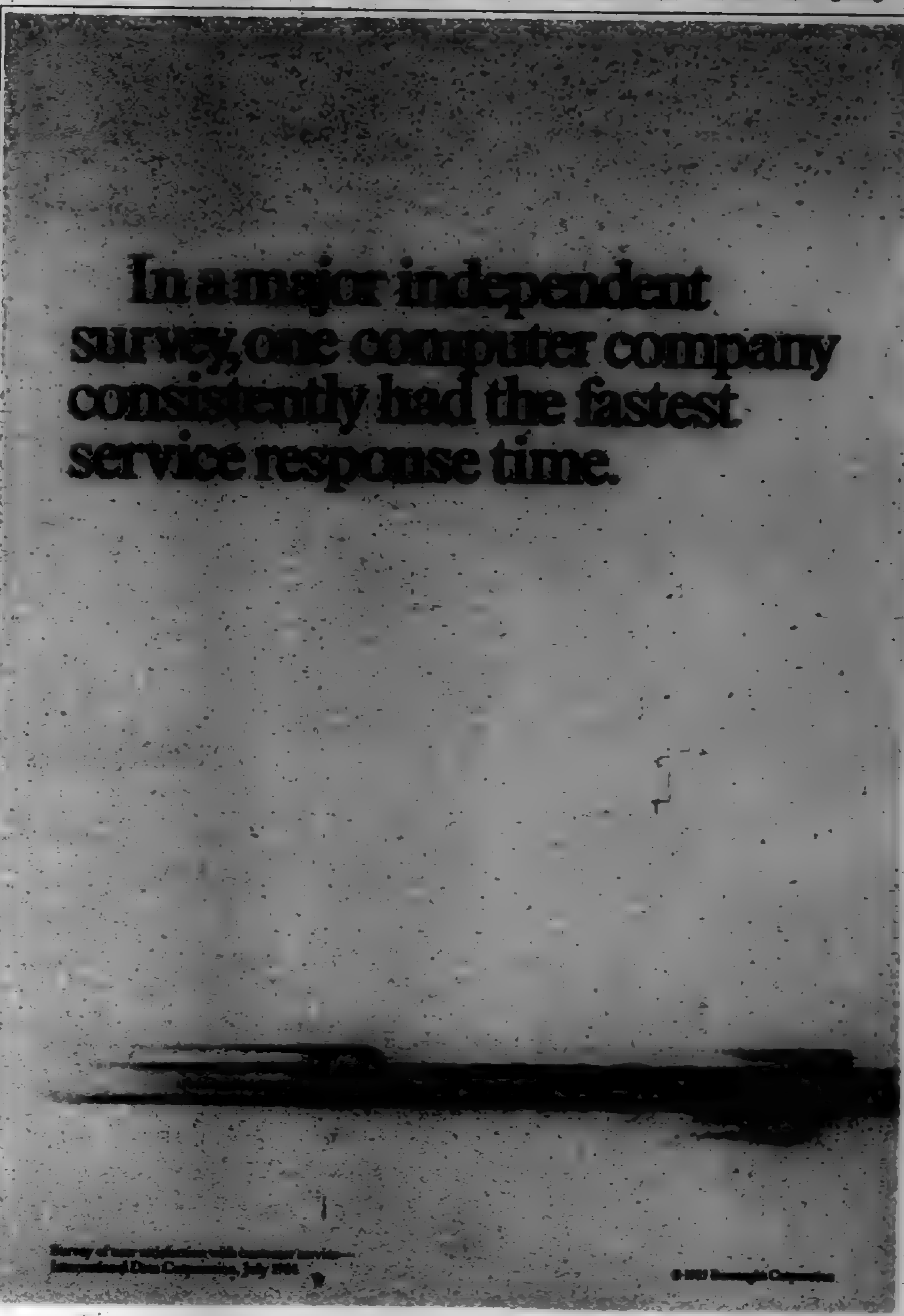
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Survey of user satisfaction with customer service— International Data Corporation, July 1984.

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EDITORIAL

Put AT&T ruling into perspective

Federal Communications Commission member Dennis Patrick said it best: Computer Decision II was based on a snapshot of the market. Today, five years after the decision was drafted, the background in that snapshot has changed radically.

Patrick's comment was made at a communications conference the day before the FCC formally proposed easing the restrictions on Computer Decision II. In particular, the FCC will scrutinize the rules requiring AT&T to maintain a separate subsidiary to market terminal equipment.

The question is, in reconsidering Computer Decision II, will the government risk reconstructing the monolith it so laboriously tore down?

A ground swell of change has been forming at the FCC for some time, as its procompetitionReagan appointees have watched AT&T's share of the terminal-equipment market steadily erode. (AT&T claims that the share of new sales garnered by its Information Systems unit has plummeted from 80% in 1980 to 30% last year).

On the surface, the FCC's reopening of the separate subsidiary debate, sparked by an AT&T petition, could have the long-term effect of adding competition to a market segment in which AT&T has clearly lost its monopoly. This in turn means lower prices for terminal equipment to end users, who in growing numbers are buying up communications hardware to construct their own voice and data networks.

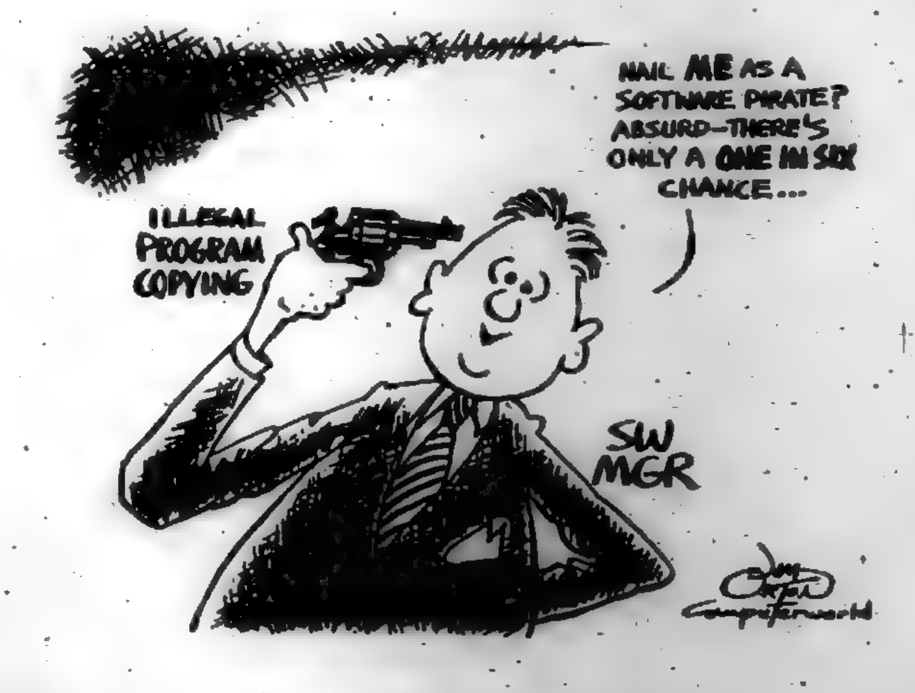
It makes even more sense to reexamine and lengthen the confines of Computer Decision II when you consider the FCC drafted it years before the divestiture of AT&T and its Bell operating companies was conceived. AT&T's meager 1984 revenue ($1.3 billion on $33 billion in sales) shows plainly that the fruits of the company's monopoly have withered.

AT&T's competitors in the terminal-equipment market, as well as some end-user groups, have and will continue to insist that AT&T is just a sleeping giant, waiting to pounce on the competition with its gargantuan, omnipresent position in the installed equipment base.

It's not hard to argue that throwing out the separate subsidiary requirement would give AT&T a golden opportunity to use its communications service income as leverage for a crushing, competitive advantage in the equipment arena. But that ignores the fact that the FCC will, in the foreseeable future, maintain power of tariff review over AT&T.

In addition, should the FCC grant a waiver of separate subsidiary requirements to AT&T, it would most certainly have to do the same for the divested Bell operating companies. They, too, have obvious communications market presence and great production capabilities; as a group they out-earned AT&T three-to-one in 1984.

These arguments and counterarguments will mean little in the coming months because the deregulatory horses have left the barn. As FCC member Mimi Dawson recently put it, Computer Decision II is "in intensive care and the plug should be pulled."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LETTER

'Key' system offers licensing options

As one of the developers of the proposed Association of Data Processing Service Organizations (Adapso) Software Authorization system, I enjoyed the article "Response mixed to Adapso's software protection key" [CW, Jan. 21]. However, there are a few points that I would like to clarify.

Site licensing is not a technical issue but a marketing issue. However, the proposed "key" technology does offer the software vendor more options for site licensing. These issues were among several that prompted the initiation of this project, and the current proposal, still in draft form, deals with both.

One of the major concerns of software vendors in these two issues has been accurately controlling the number of copies put into use. By selling one copy of the software with several copies of the key, both consumer and vendor can be satisfied with site and network licenses. The consumer avoids the need to purchase individual copies for each user, and the vendor is assured that payment is received for all product users.

Corporations are not resistant to copy protection. Rather, users are frustrated by having to insert encrypted diskettes into their machines and by the fear of an inadequate number of backup copies. Because the key can be left resident in the key ring permanently, the user never needs to take any special action to run a key-protected software product. Similarly, because the software is distributed on a standard diskette, there is no restriction on how many backup copies the user can make.

Simcha-Yitzchak Lerner
Cambridge, Mass.

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VIEWPOINT

Properly managed risk key to progress

THE DATA CENTER
John P. Murray

When one considers what might be called the "normal" issues associated with the management of the typical information processing department — the lack of adequate organizational understanding and support, recalcitrant information processing clients, a high degree of vulnerability in areas such as software failure and the myriad difficulties associated with managing independent and creative people — it can be seen that the mission of those charged with this function carries a great deal of risk.

When the issue of the rapid and dramatic pace of change in information processing technology is combined with the usual heavy degree of visibility its function carries in most organizations, it is easy to see that the degree of risk associated with the management of the information processing function is high and growing.

It appears that a number of information processing installations have tended to adopt a too conservative approach in dealing with change and the acceptance of risk associated with it. This seems to result from a feeling that moving aggressively to install and use various components of the developing information processing technology will only add to an already high risk factor.

Rather than acknowledge that there is already considerable risk inherent in the information processing function and then work to improve the management and control of that risk, many information processing managers tend to adopt a conservative approach, which in fact allows the risk factor to manage the installation.

This is not to suggest that adopting a "cavalier" approach to the management of the information processing function represents an acceptable manner in which to operate. Not by any means. However, it should be recognized that by adopting a policy that follows an aggressive approach with regard to moving into new areas of information processing technology, the benefits to the entire organization can be so substantial that the acceptance of a reasonable increase in the information processing risk factor can often be justified by the potential benefits that can accrue from the assumption of that risk, provided sound management control exists.

Sound management key to low risk

Sound management is, of course, the key ingredient. In the absence of sound management, the degree of risk in any information processing department, regardless of its level of technology, will be high — probably too high in the final analysis. Good managers, on the other hand, should be able to competently handle a considerable degree of risk.

Not under consideration here is the issue of identifying and analyzing the various risks and making decisions about the acceptability of particular risks, as opposed to their anticipated benefits, except to state that there are methods that can be used to develop a risk/reward determination process. This process can be most helpful in developing specific criteria concerning particular risk situations to assess the practicality of the acceptance of a particular risk for a particular organization.

While the process for determining the risk/reward factor for any situation can be developed and can provide a clear picture of a particular action's probable outcome, such a process is of little value unless those who must make the ultimate decision about the acceptance of the risk are willing to pursue the required action. The primary issues must be whether or not the information processing department's management is willing to accept increased risk (provided that risk holds potential benefit) and, if accepted, how those risks will be managed.

Risk cannot be eliminated from the information processing function. However, it can and should be controlled and managed so that the tension produced by the assumption that a reasonable amount of risk can be effectively used as a catalyst for change within the information processing department, as well as other areas of the organization.

The information processing department's management should work to help the information processing staff adopt an approach that will encourage the assessment of risk and the acceptance that a reasonable degree of risk is necessary to make progress. Playing it safe may indeed present a long-term hazard to the organization.

Examine system development methods

As an example, the method used to develop and manage application system projects should be closely examined to determine if any portions of that process can be changed or eliminated to speed up the development process without causing undue harm to the final product. Could fourth-generation programming languages be used to speed the process? Can some of the programming with fourth-generation languages be done by members of the client department requesting the project? Can the information processing clients accept increased responsibility for the testing of their new systems? Can they do more of their own system documentation?

A rather simplistic example perhaps, yet it is one to be considered when attempting to locate areas where the acceptance of some additional risk can be used to help move the information processing effort ahead.

An objective analysis can be made of both the inherent risk and reward in any information processing situation. Just as we should not consider risks deemed too high for our particular organization, neither should we back away from reasonable risk, provided the potential benefits justify the risk involved.

The pace in information processing continues to quicken. Information processing functions cannot remain static: If we do not move ahead, our functions will not stagnate, they will fall behind. Acceptance of risk assures some failures. As long as those failures are not spectacular — and we all know of examples of spectacular failures — we can learn from them, and in the long run, the organizations we attempt to serve will be better off.

The goal then must be not to avoid risk but effectively manage it to our advantage. ‡

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Determining need and use for a consultant

MANAGEMENT MATRIX
Walter F. Cutrie

Your stereo needs a new stylus, so you drop by the local store to pick one up. A gray-mustached fellow clad in a burgundy suit and white shoes tries to sell you a new cartridge; he's wearing a litte plastic badge that reads "Audio Consultant."

You go to another store where you find the stylus, and while there, decide to pick up some tape for your videocassette recorder. The teenager behind the counter who handles the sale wears a little plastic badge that reads "Video Consultant."

Back in the office the next day, you open the mail and find a brochure from a "Computer Consultant": just what you needed.

Maybe you've heard it said that consultants paint bull's-eyes over bullet holes. That's something of an exaggeration, but it certainly points out that the term "consultant" has been seriously devalued in recent years. Look in the Yellow Pages and you'll find kitchen consultants, travel consultants, home furnishing consultants — consultants in every conceivable area. What's next — consultant consultants?

A consultant can, in fact, provide valuable services for a DP operation in two areas: offering a different point of view on a current problem and performing as a resource to do specialized work that you otherwise would have to do personally.

Let's take an example. Suppose you have the go-ahead to purchase or design a major new piece of software. The sequence will be, roughly: write the specifications, send out the requests for proposal (RFP), evaluate the bids, select and install the system and convert to the system.

Specifications for a new system often start out as a compilation of wish lists from the departments that will be using it. It is often impossible to get all the wishes in and set priorities on them. An experienced outside point of view is useful here.

Help needed for RFP preparation

Preparing and sending out the RFP is an area where help is welcome and, unless you do a lot of it, is often unavailable in-house. Nobody likes to evaluate bids. It would be nice to have a liaison between you and the vendor representatives. It would be nicer still to have someone knowledgeable go through a 500-page proposal and boil it down to what you really want to know — "company A can do everything to your specifications for B dollars except items 10, 15 and 45. It will cost X, Y and Z extra to put those three features in." (There really ought to be a surcharge on word processors sold to marketing groups for use on proposals — it is getting to be technology run amok.)

All this implies two important qualifications you should look for in a consultant. First, you want someone you can get along with and whose opinion you respect. Second, you want someone who is not beholden to a particular vendor; it is the attempt to conceal the sales motivation that is the real aggravation in dealing with the audio consultant and the video consultant. This may sound nebulous, personal and spreadsheet-resistant, but selecting a consultant is just like selecting any other professional — a doctor, a lawyer or an accountant. You're looking for a personal advisor, a temporary right hand, someone you can trust to think the way you do.

But so much for being nebulous and personal. Boot up your spreadsheet, pull up the budget figures and let's get impersonal and practical. Once you've found your advisor, how much should you pay? And more important, even though it may not seem to be of concern now, how do you end the affair?

Pay scale is determined by the job you need done. Take a good hard look

See CONSULT page 53

Cutrie is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

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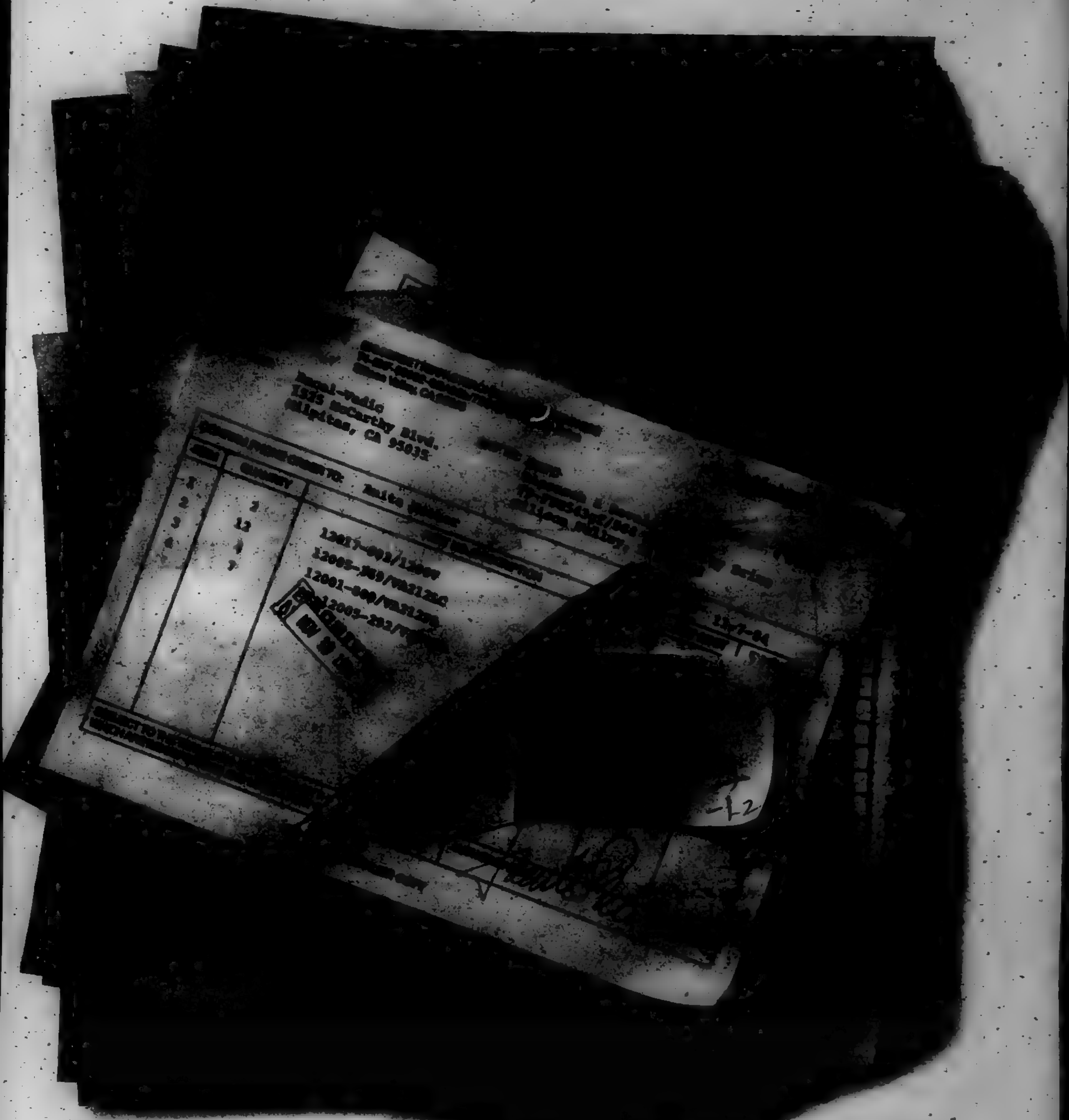

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Agent arbitration effective in software escrow pacts

READER'S PLATFORM
Robert D. Susnin

Software escrow agreements are now commonly accepted as a vehicle by which software vendors can protect their proprietary source code while assuring their licensees continued product vitality. Software escrow agreements provide the licensee with access to the source code in the event of service or product discontinuance, bankruptcy or insolvency.

Despite the popularity of these arrangements, some have expressed reservations about the effectiveness of software escrows. Software escrow is seen as problematic for two reasons: Most software escrow agreements are not drafted to avoid the costs and delays associated with the resolution of disputes between vendor and licensee, and improperly drafted escrow agreements can be ignored by the vendor's bankruptcy trustee.

Most software escrow agreements are set up to allow an uncooperative vendor to impede the delivery of the source code to the licensee after the licensee has given the escrow agent notice of a triggering event. If the vendor takes issue with the licensee, a dispute results. The parties must resort to litigation or arbitration.

While arbitration is much more convenient and less costly than litigation, both alternatives are so costly and onerous the escrow agreement becomes practically worthless.

The simple yet effective solution to this dilemma is to provide, by mutual agreement, that the escrow agent will arbitrate the dispute over the entitlement of the licensee to the source code.

Speed advantage offered

This approach offers several advantages, the most obvious being the speed with which the dispute can be resolved because here the typical delay associated with the selection of the arbitrator is avoided. This is especially important to the licensee because he is typically in dire need of the source code prior to making the request. Escrow agent arbitration thus makes the escrow of practical value to the licensee.

However, escrow agent arbitration also serves the needs of the vendor because the vendor need not spend inordinate sums of money defending against the premature release of its valuable source code. Keep in mind that software escrow is appealing because it allows the vendor to assure the licensee that the software will be maintainable without giving up its source code. Thus, to the extent that licensee is assured that the arrangement will service his needs, the vendor benefits as well.

Another advantage of escrow agent arbitration is that the escrow agent already possesses the escrowed materials. This removes yet another complication and typical cause of delay. This arrangement has proven to be especially workable because the escrow agent has no vested interest in favor of or against either party.

Another perceived problem with software escrow involves the bankruptcy trustee. For example, the article "Software escrow not a guarantee for protection" [CW, Nov. 19] lays out the perceived bankruptcy problem. It suggests that as long as the debtor retains any title to the property at the time of filing bankruptcy, the property belongs to the debtor's estate and may be recalled from the escrow agent by the bankruptcy trustee.

The article assumes that title to the escrowed materials must remain with the debtor (software vendor). This is understandable; most escrow agreements specify that title will remain with the vendor. This reflects a vendor concern that title in the underlying proprietary source code not be lost by virtue of the escrow.

Title transferred to escrow agent

The solution to this problem is to have your escrow agreement specify that title in the media be transferred on the execution of the agreement to the escrow agent. The escrow agent holds the media in trust for the licensee. Because the physical media here is no longer in the debtor's estate, the escrow is safe from the bankruptcy trustee.

With this arrangement, title in the underlying proprietary information remains with the vendor. This means that if and when a triggering event occurs, the licensee gets the media with the underlying source code or other information with restrictions on the code use, as typically set forth in the license agreement between vendor and licensee. The restrictions prohibit the misuse of the proprietary information and thereby ensure that the vendor continues to have a secure proprietary position. The bankruptcy trustee retains the right to dispose of the underlying proprietary rights. However, as mentioned above, the trustee cannot touch the media because the escrow agent holds the legal title and possession. The licensee holds an equitable or beneficial interest. ‡

Robert D. Susnin is president and general manager of Aegis Software Retention, Inc. in Los Angeles.

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LETTERS

Management skills urged

I want to commend *Computerworld* for the editorial "Managing productivity" [CW, Nov. 26]. We simply do not see enough written about managing systems projects at all levels.

This problem, as the editorial pointed out, persists, in spite of dramatic advances in hardware and software technologies.

After more than 30 years in this business, I am coming to the conclusion that our schools of higher learning are not equipping graduates with the skills and knowledge essential to manage successful systems projects.

The continued emphasis on computer science propagates the technical solutions and not the management methods that are required for success. And, that large lump under the computer room carpet is the maintenance sweepings from poorly designed systems.

Patrick J. Mally
Lacey, Wash.

Contract breach warned

The article "A license to save on software" [CW, Nov. 19] detailed how costs were saved at North American Philips Corp. by licensing only one copy of a software package and then loading executable versions of it on other mainframes.

North American Philips may have reached this arrangement with the vendors of its financial packages, but others should be cautioned that moving an executable version of software that contains any vendor-supplied proprietary code without first obtaining a license from the software vendor can be a breach of contract. In my firm's case, a customer is licensed to use any portion of our proprietary software on one mainframe only.

The final executable version is constructed from and may contain proprietary code from more than one source, including the application; the vendor-supplied code referenced and used by the application; and any utility routines, such as I/O and mathematical services, usually supplied by the vendor supplying the compiler.

Louise B. Coutier
San Diego

CONSULT

from page 49

at that job. Now look at the various job descriptions of the people on your staff. Which of them could, in theory, do that job if relieved of present responsibilities? If the answer is you or a member of your senior staff, that's a good argument in favor of the necessity of the consultant. If it would require a combination of senior skills, that's a better argument. But if the answer is someone three levels down and four over in systems design, you may really need a contract programmer or some other type of temporary employee.

In any event, once you are able to formulate the job description, you also have an idea of the annual gross salary you would have to pay to get the job done in-house. This is your cost basis. Convert that annual gross to an hourly figure — because that's how most consultants charge — then figure in minimum overhead by doubling that figure. If you have better defined overhead factors, use them instead. The result is the ballpark, low-end hourly rate you can expect to pay, exclusive of expenses.

Be careful. It's a common and sometimes expensive mistake to pay a consultant on the basis of qualifications rather than product. If you were to hire a programmer to crank out Cobol code, not for a minute would you consider paying more than Cobol-cranking rates, even if the person had the qualifications of a senior systems analyst. The same principle applies to your consultant. Now, depending on the job, good qualifications can result in better productivity, and if this seems to be the case, you may want to up your estimate. But there's no point in paying extra for abilities you won't be using. If the price you are quoted still seems way out of line, either the job is incorrectly defined, you don't need a consultant or you don't need *this* consultant.

Find job's deliverable items

Now that you know the job and the rate, break up the job into definite closed items. Your goal at each point is to come up with something that can be delivered: a written set of specifications, a completed RFP, a written report on the bid evaluations. These items represent the advice for which you will be paying. You already know the rate, so you should be able to estimate the time needed for each item — you now have individual project cost ceilings. Set up your agreement with your consultant so that you can reevaluate the contract as each of these items is produced.

If the billings related to one of the items goes over the ceiling, or if your in-house situation changes, you already have perfect points on which to end your relationship with your consultant without arguments or rancor. This step-by-step, project-oriented approach also protects you from the cost overruns that are almost inevitable if you are paying an hourly rate and have an open-ended agreement.

Now that you have the cost estimates, time estimates and qualifications list, you are all set to find somebody to handle that job for you. More important, you can justify it to your superiors. There's just one more thing you need to remember — beware of consultants wearing plastic badges. ‡

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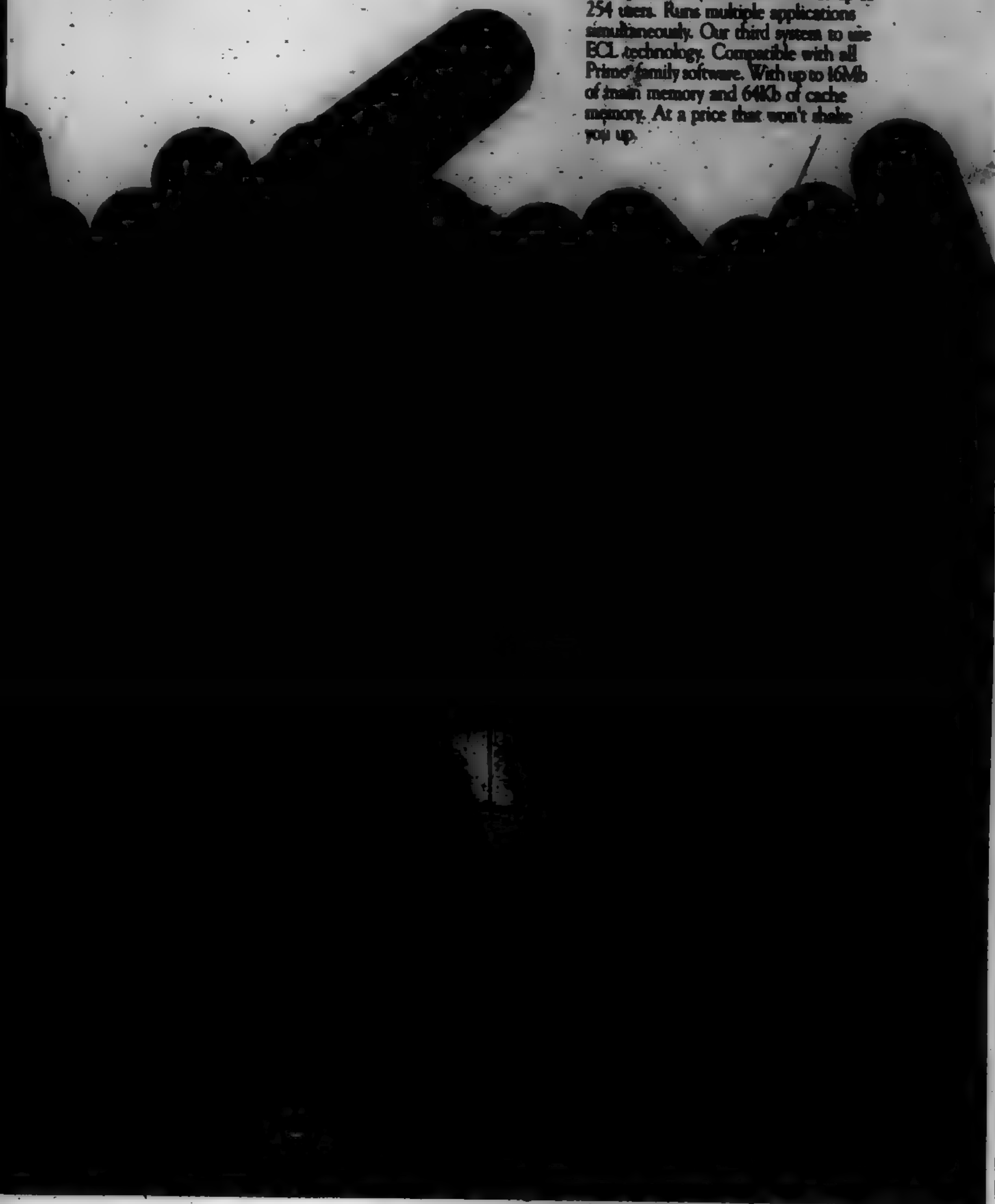

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SOFTWARE & SERVICES

Marines seek a few good tools

Service's DP branch puts software packages to test

By John Gallant
CW Staff

QUANTICO, Va. — The U.S. Marine Corps has earned a reputation for putting its recruits to the test. And just as the service's newcomers have to prove themselves before their superiors, third-party software packages must also show their mettle in order to become standard-issue Marine Corps systems.

At the Marine Corps Central Design and Programming Activity (CDPA) installation here, Marine DP staff members are responsible for reviewing, testing, approving and maintaining mainframe software used in the Corps' data centers around the world. The service maintains two other CDPA installations in Albany, Ga., and Kansas City, Mo., and software approved by the CDPAs becomes part of the standard hardware and software configurations specified for the Marine data centers.

According to Donald Shifflett, assistant head of systems software, the Quantico CDPA is linked via the Marine Corps Data Network to the other CDPAs and to the service's four Regional Automated Service Centers in Hawaii, North Carolina, California and Okinawa. Three recently developed Deployable Force Automated Service Centers — mobile data centers designed to provide support for Marine units in the field — are also expected to become part of that network in the near future (see related story page 63).

Shifflett

U.S. Marine Corps photo

See MARINE page 62

SOFTLINE/STEVEN PFRENZINGER

Productivity aids revitalizing Cobol

An interesting thing is occurring in the world of applications development for IBM's IMS DB/DC, and CICS/DL/1; Cobol is shedding its tarnished image. Rather than dying in the productivity tool revolution, it has become the foundation in the evolution of traditional IMS development.

There are many reasons for this revival, and a few are worth looking at, such as the following:

- No programming language has been able to replace Cobol adequately.
- Most Cobol programmers have resisted the anti-Cobol movement.
- IBM has added significant improvements to its release of VS Cobol II.
- IMS productivity tools have enhanced Cobol with powerful new com-

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Pfrenzinger is president of IMS Consulting, Inc., an Encino, Calif.-based consulting firm that specializes in IBM's IMS DB/DC and CICS/DL/1. He has 15 years of data processing experience and is a regular contributor to Softline.

SOFTALK
John Gallant
CW Senior Editor

A niche that's yet to be filled

While at a conference or a trade show, one phrase you cannot avoid if you read product literature, listen in on the conversations of the species *high-techus* or sit through conference sessions is the ubiquitous "market niche."

The listener is soberly informed that Company X, once merely a spectator to the dramas unfolding in a particular market niche, now intends to invade that niche vigorously. Or the reader is reminded that to succeed, Product Y must be targeted solely to another specific market niche or the ill winds of business fate will drive the product toward the rocky corporate shoals, where it will founder. Similarly, the conference attendee is told that Emerging Technology X must break the shackles of the market niche that confines it if that technology is to achieve all that it is destined to achieve.

With all the attention to market niches, one would think that by now some enterprising individual would have addressed one niche that heretofore has been roundly ignored. There seems to be a vast, unfulfilled need among trade show visitors for a handy manual filled with advice on how to make optimal use of one's time while at such a conference.

Nonsense, you say. Tips on attending a trade show? What, you ask, could be easier? You simply pack up the garment bag, check into that nondescript hotel in Anytown, U.S.A., go to a couple of sessions, stop by a few booths, have a nice dinner and head home two or three days later. Piece of cake, you conclude. How, you ponder, can there be a real market niche for such a conference manual if even the trade show visitor does not see

See SHOW page 58

- An executive information system dubbed Command Center was unveiled by Pilot Executive Software, Inc./63
- Perkin-Elmer Corp. announced a series of software products headlined by the release of a multiprocessor version of its Reliance Plus data base management system/64
- Data General Corp. announced software products, including an enhanced version of DG/SQL, aimed at improving the performance of its superminis/65
- SAS Institute, Inc. introduced a version of its SAS System for IBM's VM/PC environment/66

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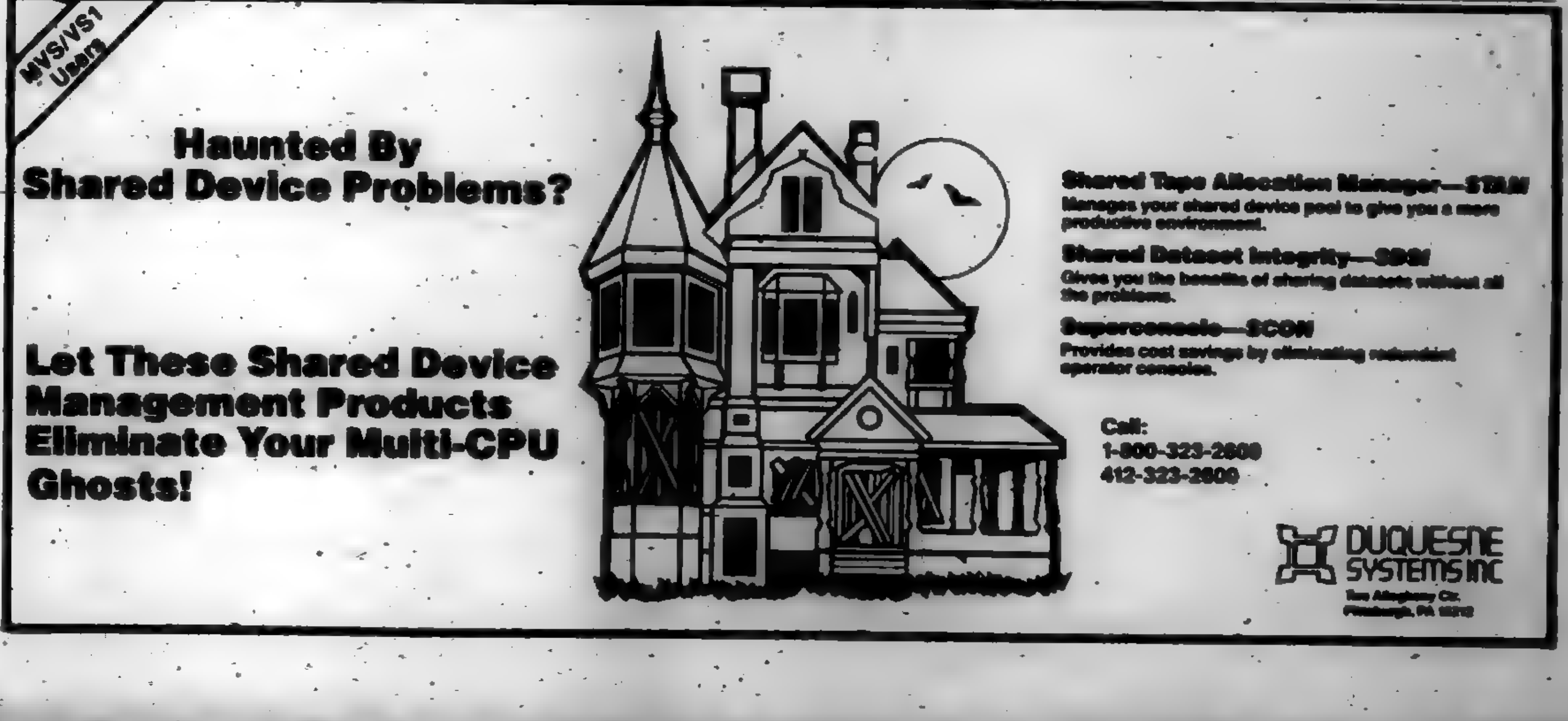

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COBOL

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mands and features.

Because of the semantics problem in the computer industry, it is appropriate to define a few terms as used in this discussion. I have used the term IMS here to reference IMS DB/DC and CICS/DL/1 environments. The term IMS productivity tools (rather than fourth-generation languages or application generators) is used to describe a whole group of new tools that are used by programmers in the development center to build predefined production IMS applications.

I have used the term programming languages to describe languages that are used to define procedural logic. They include the basic IF-THEN-ELSE (conditional tests), PROCESS (moves, calculations, etc.) and DO-WHILE (looping) constructs that are at the heart of all of the IMS productivity tools available today.

Other features for screen painting, prototyping, simplifyng DB/DC interfaces and creating blocks of reusable code are all components of IMS productivity tools that are wrapped around some programming language. For example, IBM's Application Development Facility uses the Audit Language, Informatics General Corp.'s Mark V application development tool uses application-specific logic "requests", CGI Systems, Inc.'s Pacbase uses the Pacbase language and Sage Systems, Inc.'s APS/IMS uses structured Cobol.

Reasons for renaissance

Let us look closely at the four major reasons for Cobol's renaissance. First, the fact that no programming languages have come along to replace Cobol adequately is nothing new. The shortcomings of other languages are substantial and have included performance penalties, reduced functionality and restrictive architectures. These and other shortcomings have meant that no one language can be used in all situations. You could buy numerous new programming languages, most imbedded within a productivity tool, to get the benefits of their individual strengths, but learning numerous new languages is not practical; experience is proving this point.

Different languages are workable between the development center and the user-oriented information center, but within each center, the use of numerous languages can cause problems, such as learning curves and redundant features. This is usually less of a problem in the information center.

Second, resistance to IMS productivity tools and their associated programming languages is greater than most managers will admit. A small percentage of programmers have received these new tools enthusiastically. But only when the the majority accept the use of tools can any DP department expect to gain the increased productivity necessary to address applications backlogs.

The "edict-from-the-boss" approach to force the use of IMS productivity tools in the development center has met with only limited success. Not surprisingly, DP managers will have a better chance to get a large percentage of Cobol programmers to accept an IMS productivity tool that has Cobol as its programming language.

Third, while slow in coming, the new release of VS Cobol II is finally on the horizon, and the improvements are significant. Probably not enough to quiet those who are ardently against Cobol but enough to show that Cobol can be enhanced to improve productivity during development and maintenance.

These new enhancements include a PERFORM statement variation for in-line looping without GOTOs, the new EVALUATE/WHEN statement combination for complex conditional tests in a case structure, the INITIALIZE and SET statements to assign values to data items and conditional variables, a batch debugging tool; formatted dumps and improved compiler listings.

Lastly, the fact that Cobol can be enhanced is not news to the numerous software vendors marketing IMS productivity tools that are wrapped around it. These vendors have recognized that Cobol is a good programming language for procedural logic requirements and that its use can be enhanced with various complimentary commands and features. These enhancements are numerous, and several are worth discussing.

Cobol enhancements

- Screen painters make a simple task of one of the more difficult aspects of on-line programming. The days of coding and maintaining native message format services or basic mapping support screen definitions are definitely over. These painters are easy to use and involve painting one image of the screen, showing literals (screen and field labels) and variables (I/O fields). Then, for each variable, attribute and field-editing logic are specified. This field-edit logic is usually defined in a nonprocedural fashion through such things as numeric ranges, edit masks and table lookups.
- Prototyping features make it easy to demonstrate a working model of the system to the user. The important word here is easy. While early prototyping is generally accepted as a good way to validate user requirements, actually doing it is still a rarity because the mechanics of prototyping have been difficult and time-consuming.
- A command or macro-like facility allows for blocks of reusable code to be inserted into Cobol programs during a precompile process. The block of reusable code can be built by senior developers to blueprint common functions within a system or installation. This facility should in-

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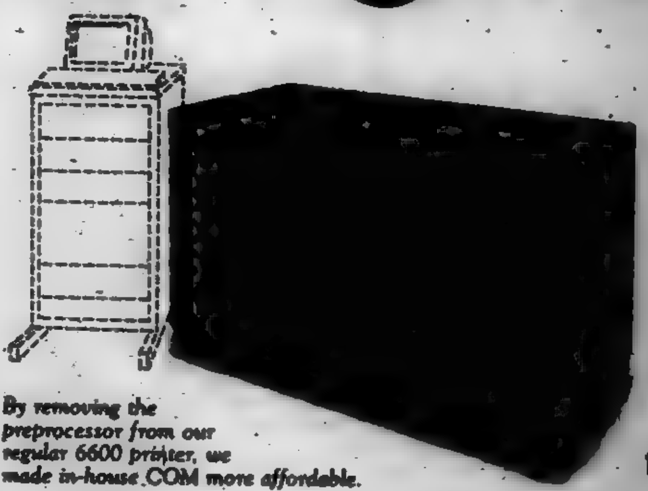

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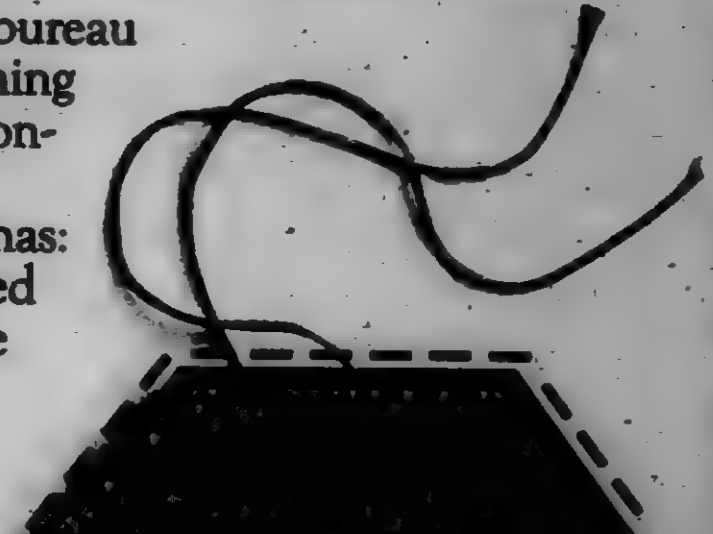

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the need for one?

But consider a few important points. If you are an average DP or MIS professional, you are probably called on to attend anywhere from two to 10 industrywide conferences (Comdex, National Computer Conference), user group meetings (fill in the blank) or technology-specific shows (Uniforum, Siggraph) each year.

Each trip chews up a goodly chunk of time, which is no doubt one of your most valuable assets, considering all those tasks vying for your attention. Too often, if you recall, you return back to the office bleary-eyed and exhausted, sore-fisted from the handshaking onslaught of smiling vendors and straining under a load of product kits and giveaways. To your dismay, you also find that you have learned little and have gained few insights into new technology or products.

It does not have to be that way. Ostensibly you plan, or are ordered, to attend a trade show for a reason — to keep up with the changing forces of the industry and to glean some knowledge that can make you more adept at juggling your responsibilities.

Enter the conference manual. To begin with, such a guide would be a great help in planning just which shows to attend. For example, does the conference offer sessions really geared to your needs and level of expertise, or are the sessions just broad overviews with titles such as "Strategic Planning for Successful Technology Integration" or techie get-togethers such as "Making Better Use of the Grep Command"?

The manual would also offer tips on evaluating speakers. It might offer suggestions to help you divine the speakers who have a real working knowledge of a technology or a specific industry and weed out those who peddle the same tired oratorical wares conference after conference.

Avoiding the hype

The book would inform you, for example, that you should leap at the chance to attend sessions where users relate their experiences with a particular product. These sessions give you a chance to avoid the marketing hype and cliches and can provide the answer to the question you most want to ask — how does this thing work in the real world?

Also, and no less important, the manual would give you some stars by which to navigate more safely the sprawling conference floor dotted with vendor booths. It would help you formulate the questions you really want to ask to help you avoid spending fruitless time in those fancy booths. The manual would also teach you how to read product literature to determine whether the product is new or significantly enhanced or just reintroduced or on display.

In the absence of such a manual, you can make time spent at a conference worthwhile. Take the time to review the conference agenda, research sessions and speakers, map out vendors you want to visit and make a point of seeking out users and picking their minds. That way, you can make a conference visit not only a nice break from the office but also a valuable tool for advancing your career. Fill that market niche by yourself.

COBOL from page 56

clude the capability to modify the block of code as it is inserted into the main program. These modifications are usually specified by parameters passed when the commands are invoked. This feature keeps the maintenance link from being broken. The maintenance link is important because modifications in the blocks of reusable code must be easily implemented across the entire system. Without this link, you accomplish no more than a simple statement-include feature.

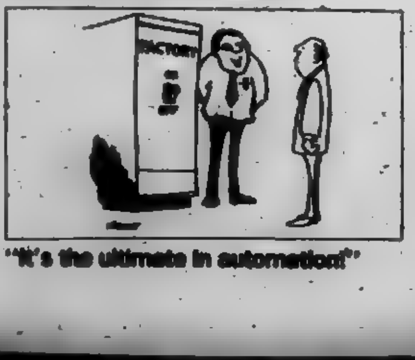
■ Special commands have been added to simplify the DB/DC interfaces. These commands are imbedded in a Cobol program and expanded during the precompiler process into the appropriate native DB/DC code. One of the most difficult tasks in online programming is the native coding for screen handling and data base access. These commands allow for less experienced programmers to become productive much sooner.

Precompiler concept

An interesting feature of the precompiler concept is that it can be used to enforce structured programming concepts. This results in consistent, well-structured Cobol programs that are much easier to debug and maintain.

In addition to IMS productivity tools, look for the development of tools that aid in program design, analysis and documentation. With the power of this new category of productivity tools added to that already available from tools for development, Cobol will become less of a target of controversy.

As for the long-term future of Cobol and IMS development, Cobol may eventually be replaced with a more powerful language that is easier to use, but the change will happen in a slow evolutionary process taking 10 to 15 years. The IMS productivity tools that use Cobol are becoming the "bridge" products for which most traditional IMS DB/DC and CICS/DL/1 shops have been looking.



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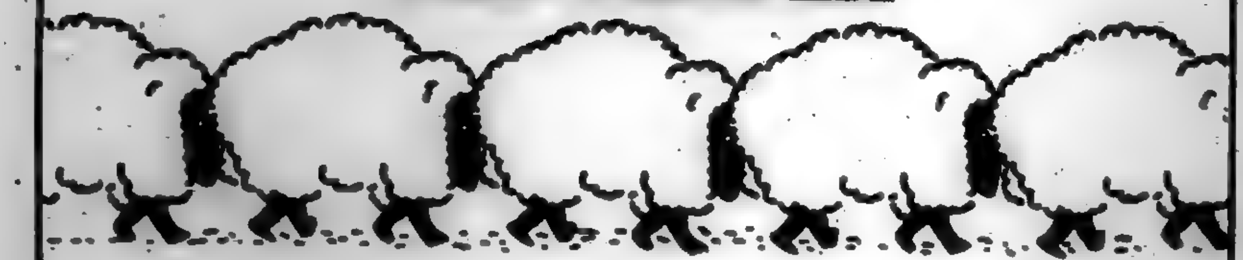

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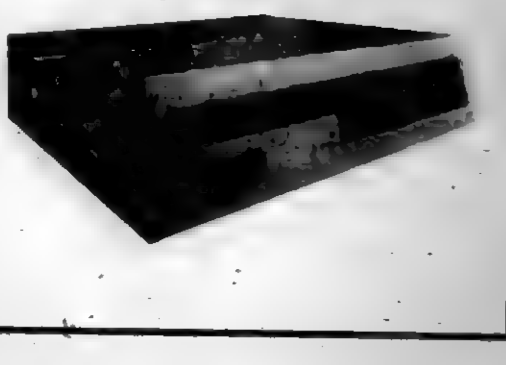

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MARINE

from page 55

Shifflett said an NCR Comten, Inc. processor serves as the Quantico CDPA's front end to the network. The installation runs two Amdahl Corp. 470V/7 mainframes under IBM's MVS Version 1.3.2. A bank of more than 90 Memorex Corp. 3650 and IBM 3380 hard disk drives provides nearly 34G bytes of storage, and 25 tape drives are available for tasks such as archiving.

An extensive selection of third-party software packages is in use at the Quantico CDPA and the service's other data centers because, Shifflett explained, the Marine Corps has found that many off-the-shelf products offer a viable alternative to in-house development projects.

"We advertise in the *Congressional Business Daily* for a particular type of software," he said. "We outline what the minimum requirements for the package are and what we expect it to be able to do. We then do a technical review of the submitted products' documentation. On the basis of that, we select one or more of the packages and install and test them on our computers. Finally, we will make a recommendation to Marine Corps headquarters as to which package should become the service standard."

Among the products the Quantico CDPA has acquired are Candle Corp.'s Omegamon performance management system, Uccel Corp.'s UCC-1 tape management software, IBM's TSO and Network Communications Control Facility, Applied Data Research, Inc.'s Roscoe remote job entry system and Software AG of North America, Inc.'s Adabas data base management syrtem (DBMS), Natural application development language and Complete teleprocessing monitor.

In addition to reviewing software for possible adoption as a serice standard, Shifflett said, each CDPA is responsible for designing, programming and exporting in load modules to other data centers certain Class 1, or top-priority applications, such as logistics, payroll and manpower software. The Quantico CDPA also provides computing services to Marine Corps headquarters and supports the service's Computer Science School. The Quantico CDPA currently boasts about 350 DP employees.

Currently, the Quantico CDPA is in the final stages of approving an access control security system to be used in all data centers. Shifflett said the service's review of that software was prompted by a directive from the commandant of the Marine Corps ordering security to be tightened at the Corps' DP facilities.

As the initial phase of the approval process, Shifflett said, CDPA staffers drew up the minimum requirements for an acceptable access control package. The requirements were as follows: a facility to allow security administrators to establish access rules; user-entry and data set access controls; immediate display of warning messages for security violations detected; reports showing users who have accessed system resources and individual data sets; rule violations and modifications to data sets; capabilities for tracking specific users and resources; and minimal resource consumption.

Of the vendor-submitted packages, four were selected by the CDPA for extensive documentation review and in-house testing. The initial pool of four candidates was quickly narrowed by half because, Shifflett said, two of the packages exhibited problems ranging from difficult installation to poor technical support. The third package, which fulfilled all the criteria, was rejected because it required too many hooks into the host system, he said.

The remaining prospect, CGA Software Products, Inc.'s Top Secret, was recommended for prolonged production testing and, based on its success in a production environment, is now in the process of being approved as the Marine Corps' standard access control package.

"Top Secret offered us a multiphased implementation scheme, which we were looking for," Shifflett said. "We wanted the ability to have only certain resources and users protected at each step in the phased implementation. We did not want to be required to have everyone defined to the system on Monday morning."

In production use, Shifflett said, Top Secret has reduced resource consumption and has helped the CDPA save on Dasd usage. In addition, the package has kept adventurous Computer Science School students from accessing nonschool data on the system.

"There is one big benefit from Top Secret that is hard to measure, and that is resource savings," he said. "It stops browsing, the situation where one employee has nothing to do and begins to look at other data sets, other files. We are CPU and I/O constrained, and when one guy starts doing that, it slows everybody else down.

"Top Secret has saved us in terms of Dasd in that we have discouraged what we call pirating," Shifflett continued. "People would import a Cobol procedure, modify it to what they wanted and save it in their own little library. That does not happen anymore."

But above all, Shifflett said, the security package has given systems administrators just that — a feeling of security.

"We can go home feeling safe," he said. "If you are a systems programmer, you are always worried that somebody will accidentally scratch data sets that are critical to the execution of the system. With the protection we have now, we can go home [knowing] that nobody will scratch one of those critical data sets. That way we know that someone is not going to bring the system down or prevent it from coming up next time."

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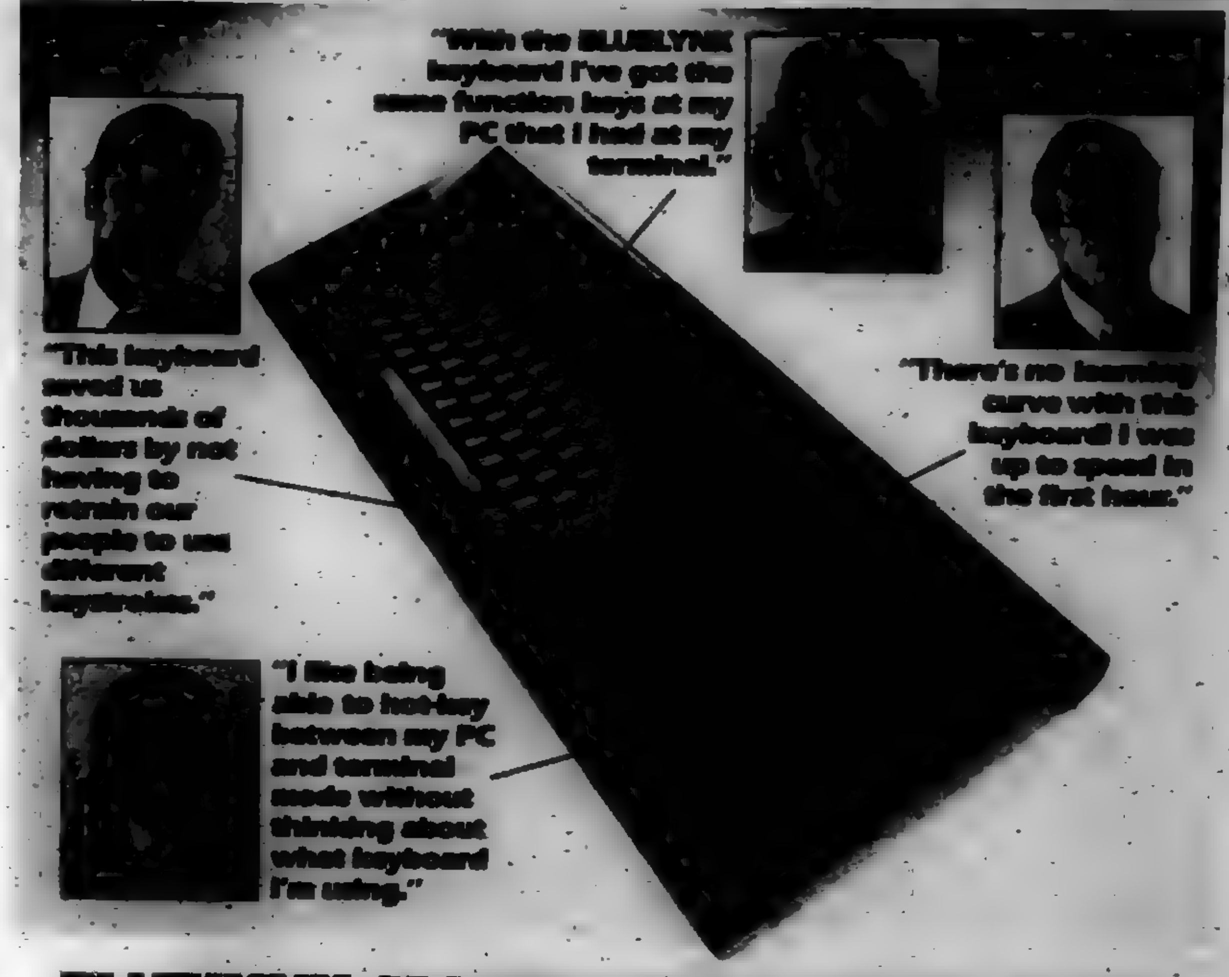
Pilot offers Command Center system

BOSTON — Pilot Executive Software, Inc. has introduced its Command Center executive information system.

According to a company representative, Command Center software resides on a Digital Equipment Corp. VAX series processor and any number of IBM Personal Computers. The software allows the user to review, track and control information and display it in graphics or tabular form. Command Center enables the user to extract, filter and compress data as needed. In addition, the software can alert the user to variances from budgets, benchmarks or user-determined expectations and can monitor performance based on so-called critical success factors.

Extracted data is reportedly maintained on the host and can be downloaded to the micro. The user can manipulate the data using host resources and can use the micro for tasks such as full screen editing, local storage and graphics. Command Center features a data import facility that lets a user extract data from any number of external or internal data bases and file structures and load that information into a dedicated data base. The product also offers embedded routines that can be used for statistical and graphical analysis. An end user can interact with Command Center via a mouse interface, a touch screen or a keyboard to receive summary report formats covering a broad range of management information. The user can specify menus to access internal information from corporate data bases as well as data from external sources.

Command Center costs $75,000 from Pilot Executive Software, 40 Broad St., Boston, Mass. 02109.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PE introduces multiprocessor version of its DBMS

OCEANPORT, N.J. — In conjunction with the announcement of its 3260MPS multiprocessor superminicomputer, Perkin-Elmer Corp. also unveiled a multiprocessor version of its Reliance Plus transaction processing and data base management system (DBMS).

A PE spokesman said the Reliance Star software, an optional component to Reliance Plus, supports a back-end data base processor and up to eight front-end transaction processors. The front ends control terminal and data communications, in addition to running applications software, allowing the back end to execute data base requests.

The design reportedly increases the processing power available to Reliance Plus users and enables DBMS processing to operate in parallel with one or more front-end transaction processors. The spokesman said the increase in power allows more transactions to be run in a specified time period than with a single processor system.

The spokesman said Reliance Star configurations can begin with a two-processor system to which additional front-end processors can be added as data base and transaction processing demand increases. Any single PE processor Model 3210, 3230, 3250XP or 3200MPS system running Reliance Plus can be expanded to a Reliance Star system without modification to existing applications.

Updated cost for Reliance Plus

As an option to Reliance Plus, Reliance Star is priced at $5,000 for an initial fee, and additional copies are priced at $2,000 each. PE also announced updated pricing for Reliance Plus. Pricing for the DBMS ranges from $3,000 to $24,000, depending on the host processor, and additional copies are priced between $2,000 and $9,600.

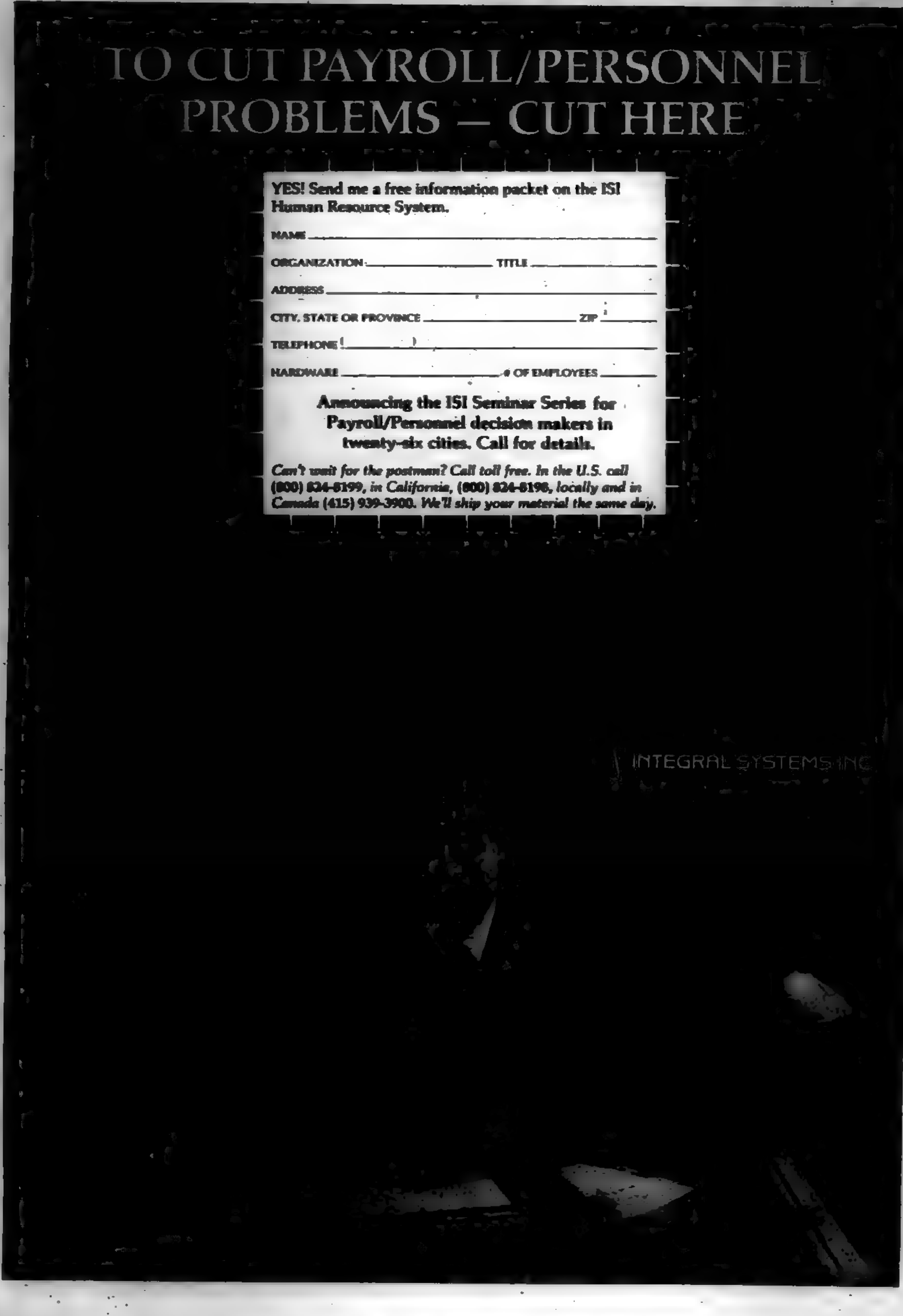
In addition to the introduction of Reliance Star, PE announced four enhancements and two new software packages for Reliance Plus. They are as follows:

- The Reliance Plus Cobol Productivity Aid enhancement. This enhancement is said to extract information from the Reliance Plus DBMS data dictionary and screen form library and automatically create the data division for Cobol programs to improve development productivity and enhance program maintenance.
- A Source Librarian utility enhancement for Reliance Plus. This feature allows a user to maintain a suite of source programs in a secure environment with version and revision control. It provides centralized control of source code to improve disk storage utilization.
- A C language interface enhancement for Reliance Plus. This enhancement gives C programmers access to DBMS facilities formerly available only to Cobol and Fortran programmers.
- The Immediate Reliance facility enhancement for Reliance Plus. This is said to automate the installation, definition and upgrading of Reliance Plus systems. Users only have to define essential parameters, such as a name, for the DBMS system and select disks, terminals and printers to be used.

These four enhancements are included in the updated pricing for Reliance Plus.

- The Reliance Update System (RUS/32), which was described as an option to the Reliance Plus DBMS. It allows individual records within a data base to be created, modified or deleted without special programming. It supports complex data views and data validation and is priced from $800 to $4,000.
- Reporter/32, which is said to be an option to Reliance Plus and allows for the simplified definition of reports. The product uses the interactive terminal facilities of the DBMS and lets users specify and test reports without conventional programming techniques. The price of Reporter/32 is from $1,000 and $5,000.

PE is located at 2 Crescent Place, Oceanport, N.J. 07757.



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DG enhances MV supermini series with software

WESTBORO, Mass. — Data General Corp. has introduced a set of software products aimed at enhancing the performance of the company's MV series of superminicomputers.

DG's Revision 2.0 of its DG/SQL relational data base management system is said to process up to five times as many transactions per second than the previous version. According to a spokesman, Revision 2.0 is also said to alter the memory overhead requirements for running DG/SQL. Under Revision 2.0, 2M bytes of main memory are required to support one user of the package. Each additional 1M byte of memory can support up to six users — twice as many as previously supported.

Other enhancements in Revision 2.0 include a reduction in the amount of time required to open a data base file, the spokesman said. Also, Revision 2.0 is said to reduce the disk space needed to store certain files, and the enhanced version also includes call-level interfaces for Fortran 77, PL/I, C, Pascal, Basic and Cobol programming languages.

Revision 2.0 is a no-charge upgrade for current DG/SQL users. The initial license fee for a new user is $20,000, the spokesman said.

Language compiler

DG also announced a language compiler, Global Optomizer, said to improve the performance of programs written in Pascal, C, Basic, PL/I, Cobol and Fortran 77 by up to 50%. The Global Optomizer reportedly scans programs for predefined code patterns and replaces those patterns with shorter program segments. The Global Optomizer is available as a no-charge option to current users of DG's AOS/VS operating system versions of Basic, C, Cobol, Pascal, PL/I and Fortran 77 compilers.

DG also enhanced its Cobol-77 compiler to include two data types said to improve the compiler's ability to address conditional statements. The compiler was improved to provide closer compatibility with non-DG Fortran, such as the Fortran compiler developed for use with Digital Equipment Corp. VAX series processors.

The Cobol-77 compiler enhancements are a no-charge option for current MV users with DG maintenance contracts.

Also introduced was an enhanced microcoded decimal instruction set for Eclipse MV series processors that is said to accelerate Cobol execution by up to 30%. The enhancement consists of four instructions that reside in the standard microcode space in the Eclipse MV series processors.

For more information, Data General is headquartered at 4400 Computer Drive, Westboro, Mass. 01580.

MIS/OL tool gets manuals

OAK BROOK, Ill. — Pansophic Systems, Inc. has added new utility and programming manuals to Version 8.1 of MIS/OL, its on-line transaction development tool for IBM's CICS environment.

According to a spokesman, the enhanced version allows for an increased number — from 16 to 32 — of active MIS/OL tasks. The Init function in the product's batch mode has been extended to allow more than one set of 10 MIS/OL files to be initialized for update within the same transaction. Version 8.1's other enhancements include improved link and transfer control between MIS/OL and non-MIS/OL applications.

The product is priced at $29,000 for IBM's DOS operating system and $35,000 for IBM's OS operating system.

Pansophic Systems is located at 709 Enterprise Drive, Oak Brook, Ill. 60521.

DOD validates Ada compiler

WALTHAM, Mass. — Softech, Inc. has announced that its Ada language compiler has been validated by the Department of Defense.

According to the vendor, the compiler is part of the company's Ada Language System (ALS), a programming support environment that consists of 74 software tools including a linker, a debugger, performance analyzers, configuration management and data base maintenance facilities.

ALS runs on Digital Equipment Corp.'s VAX-11/780 under the VMS operating system. The entire ALS has completed the Army's Formal Qualification Testing, and official validation of the ALS compiler came from the DOD's Ada Joint Program Office.

ALS, including the Ada compiler and a source code license, is priced at $50,000. The system, including compiler and an object-code-only license, is priced at $20,000, according to Softech.

Softech is located at 460 Totten Pond Road, Waltham, Mass. 02254.

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SAS offers software for IBM micros

SAS System under VM/PC requires minimal mainframe tie-in

CARY, N.C. — SAS Institute, Inc. has announced a version of its SAS System running under IBM's VM/PC operating system. The system includes SAS, SAS/Full Screen Product (FSP), SAS/Econometric and Time Series Library (ETS) and SAS/Operations Research (OR) running on the IBM Personal Computer AT/370 and Personal Computer XT/370.

The SAS System under VM/PC is said to provide the full range of SAS System procedures with minimal mainframe tie-in. Reportedly, it enables users to create and run SAS jobs locally, sharing programs with other XT/370 users via floppy disk, or conducting simultaneous micro-mainframe sessions.

A menu screen called Sassetup is used to download the SAS System in portions to the XT/370.

All features of the mainframe SAS System under IBM's CMS are said to be included under VM/PC, including SAS Display Manager System, the macro facility and Version 5 enhancements.

The base SAS software is used for data management, statistical analysis and report writing; SAS/FSP features full screen data entry, query and letter writing capability; FSP/OR is an operations research tool used to schedule projects, mix projects and plan transportation; and SAS/ETS is an econometric time-series modeling program.

The first-year corporate fee for base SAS software under VM/PC is $2,500 for 50 workstations, and each additional software product can be licensed at fees ranging from $2,000 to $2,500 for 50 workstations, the company said.

SAS Institute can be contacted at Box 8000, SAS Circle, Cary, N.C. 27511.

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Soft-Switch bridge allows Disoss links

KING OF PRUSSIA, Pa. — Soft-Switch, Inc. has introduced a software bridge that links IBM's Distributed Office Support System (Disoss) to the company's Soft-Switch electronic document transfer system for IBM mainframes under IBM's MVS or VM operating systems.

A spokesman described Soft-Switch as a document control system that provides translation, distribution and library services. It provides document interchange facilities for a variety of word processors, microcomputers and IBM host-based terminals.

Translation services convert the text format codes of a document created on one machine and provide for the transfer of the document to a recipient machine.

The Soft-Switch Disoss bridge provides transparent document distribution between Soft-Switch and Disoss users. It also provides a link to office systems from Wang Laboratories, Inc., Xerox Corp. and Multimate International Corp.'s word processing packages. Disoss users can send revisable text documents to users on non-IBM systems, and non-IBM users can send similar documents to users on a Disoss network.

Systems supported by Soft-Switch include: Wang's WPS, OIS and VS environments; IBM's Displaywriter, 6640 and 6670 laser printers, Document Composition Facility and Profs; and the Xerox 860 word processor.

The Disoss bridge sells for $20,000. Soft-Switch is located at 200 N. Warner Road, King of Prussia, Pa. 19406.

SYSTEMS SOFTWARE

■ **Pansophic Systems, Inc. has released Version 10.4 of its Panvalet Interactive System Productivity Facility (ISPF) on-line editor, said to be an interface between the Panvalet library and IBM's ISPF environment. The product runs on IBM and compatible mainframes under IBM's MVS operating system.**

A spokesman said Version 10.4 enhancements include the following: support for Version 2 of IBM's ISPF/Program Development Facility product; menus, tutorials and messages in ISPF's new format; the ability to enter the entire 10-char. Panvalet member name on all Edit primary commands; and the ability to invoke functions such as Copy, Move and Create from user-written macros.

Panvalet ISPF 10.4 costs $15,000.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

■ **Fel Computing has introduced a software system that integrates Digital Equipment Corp.'s VAX-11, Decsystem-10 and Decsystem-20 host machines with the IBM Personal Computer and other microcomputers running Digital Research, Inc.'s CP/M and Microsoft Corp.'s**

Continued on page 68

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European agents: Software Engineering Benelux Inc., The Netherlands, Telex 84431117; Thorn EMI Computer Software, U.K., Telex 851858015.

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SOFTWARE & SERVICES

Continued from page 66

MS-DOS operating systems.

According to the vendor, Mobius users can access host devices and run host programs as though they were resident on the microcomputer. Mobius includes an Instant Terminal Emulation feature that can be used while a micro application program is running. The product uses the asynchronous Ascii communications port of the microcomputer.

Prices range from $3,500 for five users up to $17,000 for 50 users. Micro Mobius software is priced at $250.

Pel Computing, P.O. Box 390, East Dover, Vt. 05341.

■ **Kolinar Corp. has announced an interactive debugger that tests and monitors programs running under IBM's VM/CMS operating systems.**

A representative said Xdebug uses Kolinar's Xmenu/E full screen management system to create an interactive test environment using CMS-compatible commands. It installs without modification to IBM's CMS or CP. While debugging, users can issue any CP or CMS command, define and use symbolic variables and browse external CMS files.

The product is said to support IBM 3270 terminals in native mode. Xdebug will also support basic assembler language. The annual license fee for Xdebug and its source code is $3,600 with an additional one-time license fee of $1,800.

Kolinar, 3064 Scott Blvd., Santa Clara, Calif. 95054.

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■ **Applied Data Research, Inc. (ADR) has announced Release 2.4 of ADR/The Librarian said to provide support for IBM's VM/CMS environments.**

Interactive VM/CMS users can now use features including Source statement archiving, Libaudit and advanced file organization. No VM or CMS system modifications are needed. The Librarian/CMS-ISPF Interface is said to provide integrated capabilities for program development under IBM's CMS, DOS/VSE and MVS.

All services are invoked using either CMS line-oriented commands or ISPF-compatible panels and menus. An audit trail of source program activity can be maintained in the VM/CMS environment. The Librarian/SPF-TSO interface has two added functions, Libedit and Librowse. Libedit is said to integrate the Libget command, ISPF/PDF Edit function and the ability to modify a program stored on a Librarian master file into an operation that appears to occur in memory.

The Librarian/Immediate On-line Update has been enhanced to provide discrete module queuing from any on-line system.

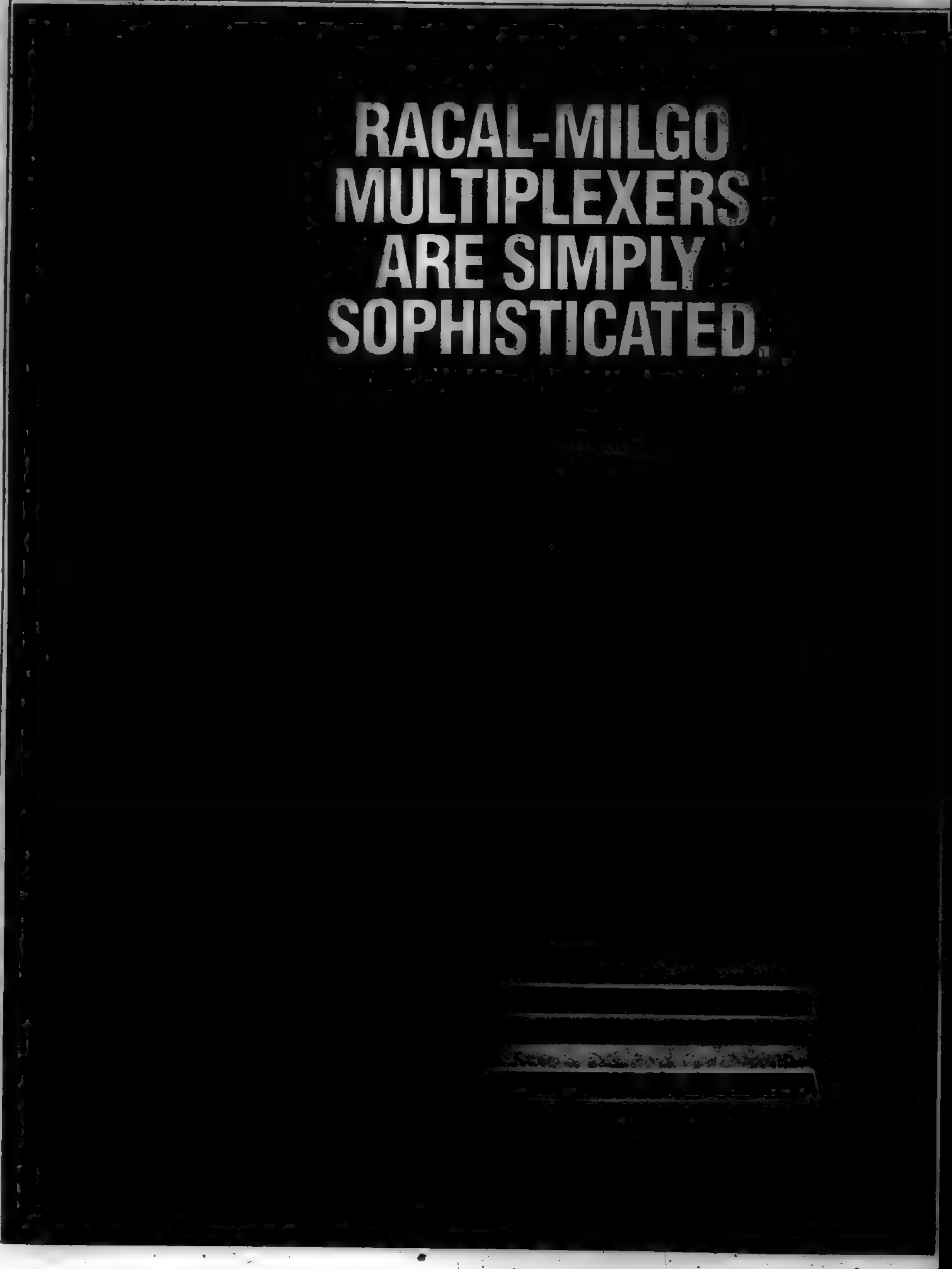
The permanent license fee for The Librarian begins at $18,000 for DOS and $27,200 for OS environments, the vendor said.

ADR, Route 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

■ **Computron Technologies Corp. has introduced a utility that allows users to upload and download data in a Wang Laboratories, Inc. VS environment to a microcomputer.**

According to the vendor, VS-Link can transmit raw data, formula expressions and calculated data to a microcomputer spreadsheet, graphics data base or modeling program.

VS-Link uses standard file formats and uses an asyn-



chronous line to transfer information, a company representative said.

VS-Link costs $2,000.

Computron Technologies, 150 Meadowland Pkwy., Secaucus, N.J. 07094.

■ Formatted print, compare and data base edit facilities have been added to Consumer Systems Corp.'s Databasic/OS utility for testing data base environments in IBM's OS and DOS operating systems.

According to a company spokesman, Databasic/OS allows the user to create miniature IBM DL/1 data bases, produce data base comparison reports, interface with host languages for data base restructuring and create new data bases from existing files. In addition, Databasic/OS allows the user to correct data base content errors, report invalid numeric fields and manipulate data bases and master data base problems using DL/1.

A field initialization option automatically moves spaces or zeros to a specified field location, allowing users to initialize fields without writing special programs, a spokesman for the company said.

A permanent license for Databasic/OS is $28,000. The DOS version is priced at $17,500.

Consumer Systems, 1100 31st St., Downers Grove, Ill. 60515.

■ Migo Software Development, Inc. has introduced Version 3.0 of Dyalog APL, its second-generation APL programming language interpreter for AT&T Unix operating systems.

The enhanced version of Dyalog APL reportedly includes nested arrays, a full screen editor, a full screen data management facility, event trapping, a component file system and auxiliary processors that allow users to share libraries compiled from C language, Fortran and other source code.

The product reportedly includes a standardized file system, virtual work space capabilities and an optional graphics package integrated into the APL interpreter.

Prices for Version 3.0 of Dyalog APL range from $1,500 to $9,000.

Migo Software Development, Suite 104, 31555 W. 14 Mile Road, Farmington Hills, Mich. 48018.

■ Dylakor has announced enhancements to its data management/file management system. Version 8.5 of DYL-260 runs on IBM mainframes under IBM's OS and DOS operating systems.

According to a spokesman, the capacity of the compiler in DYL-260, Version 8.5, has been increased to handle an unlimited number of DYL-260 statements. The enhanced version supports IBM 3375 and 3380 disk drives at the logical I/O control system level. Also, the product's record-found indicator will now be set to E when a sequential file reaches its end, and the sequential disk I/O routines are now compatible with third-party software.

Version 8.5 costs $11,000.

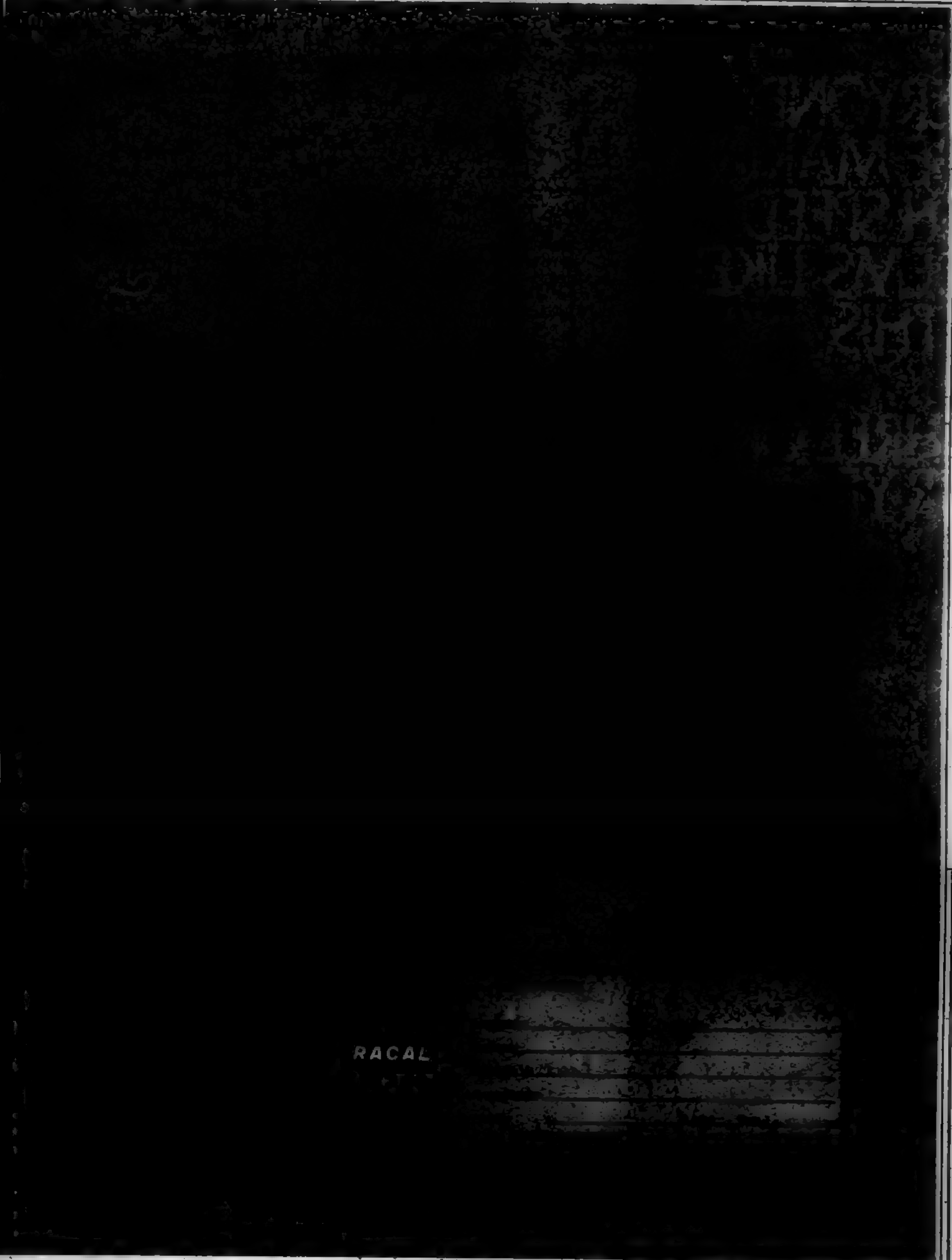
Dylakor, 17418 Chatsworth St., Granada Hills, Calif. 91344.

■ Advanced Systems Concepts, Inc. has announced Vaxshadow for the Digital Equipment Corp. family of VAX processors under VMS Version 3.0 or later, including Version 4.0.

Vaxshadow is said to mirror DEC's Unibus, Massbus and Digital Storage Architecture-type disks. A primary disk is associated with one or two disk volumes to form a shadow set. All write operations are performed on all devices in the shadow set. Read operations are load-balanced for optimum performance.

If a hardware error occurs on any device within the shadow set, operations con-

Continued on page 70



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Continued from page 69

tinue on the remaining volumes with no loss of service, the company said.

When the device is put back on-line, data is restored to ensure redundancy. Vaxshadow operations are transparent to applications programs.

Vaxshadow is composed of a device drive, DEC's Digital Command Language user interface program and a Vaxshadow server.

The price for Vaxshadow is $3,500 per CPU for all VAX-11 models, the vendor said.

Advanced Systems Concepts, 22 Hudson Place, Hoboken, N.J. 07030.

■ Micro Focus Ltd. has announced what the company called Enhanced Technology (ET) versions of its High-Performance Level II Cobol compiler with native code generator, its Animator interactive source-level program analysis and maintenance tool and its Forms-2 screen painter. The products run under more than 60 AT&T Unix environments.

The Forms-2/ET screen painter is said to generate automatically Cobol source code for interactive displays. High-Performance Level II Cobol/ET is said to offer a capacity for code and data beyond the hardware limits of the host. The compiler is said to handle programs with a data division of up to 256M bytes and a procedure division of up to 800M bytes.

Features of Level II Cobol/ET include shared text capability, said to allow an application program to be stored in memory for multiple users to share; mini compatibility with any Ansi Cobol program; and a preprocessor that converts nonstandard minicomputer Cobol source code to Level II Cobol.

Prices are as follows: $2,500 for High-Performance Level II Cobol/ET, $1,500 for Animator/ET and $375 for Forms-2/ET, the vendor said.

Micro Focus, 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

■ Aim Technology has announced enhancements to its Aim Benchmark software for measuring user throughput and multiuser performance of programs developed under the AT&T Unix operating system.

Among the reported enhancements of Aim Benchmark Release 1.6 are the inclusion of test results of the IBM Personal Computer AT, running under either Microsoft Corp.'s Xenix or IBM's PC/IX. Also included are test results of the Digital Equipment Corp. VAX-11/750 and VAX-11/780 minicomputers running under DEC's Ultrix.

Other enhancements are said to be improved benchmark portability between different Unix versions and different processors. Aim Benchmark reportedly uses nine tests of performance.

Aim Benchmark is priced at $2,400 for a single-copy, single-site license.

Aim Technology, Suite 390, 4655 Old Ironsides Drive, Santa Clara, Calif. 95050.

■ Concentric Associates, Inc. has announced Shell Accelerator (Shacc), a C compiler for the Bourne shell, the standard shell associated with AT&T's Unix.

Shacc produces C code and invokes the C compiler to produce an executable file. The generated C code is structured, readable and accessible to the user. Shacc reportedly allows programmers to write production code in the Bourne shell, thus increasing productivity.

Pricing for Shacc ranges from $1,000 to $20,000, depending on the size of the system.

Concentric Associates, One Harmon Plaza, Secaucus, N.J. 07094.

■ Ivan Software, Inc. has announced the Ivan-Virtex interface, designed to provide users of the Virtex on-line communications driver from Bonnecaze, McLeroy and Harrison, Inc. with full screen text editing and source program librarian functions.

The Ivan interface is said to give users access to Ivan-Lib/Ivan-Edit, the company said. Ivan-Lib is a menu-driven source program librarian that keeps production and test libraries separate and provides security for production and development work. File access, program modifications and deletions may be controlled through Ivan-Lib and the system administrator.

Continued on page 74

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The NCR Tower

The Tower XP

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It is powered by the Motorola 68000, one of the most powerful 16-bit microprocessors around. To boost power even further, it has separate processors for disk, CRT and I/O controllers. It offers up to two megabytes of memory. And it's equipped with other guarantees of high performance like a Winchester hard disk and the Intel Multibus.*

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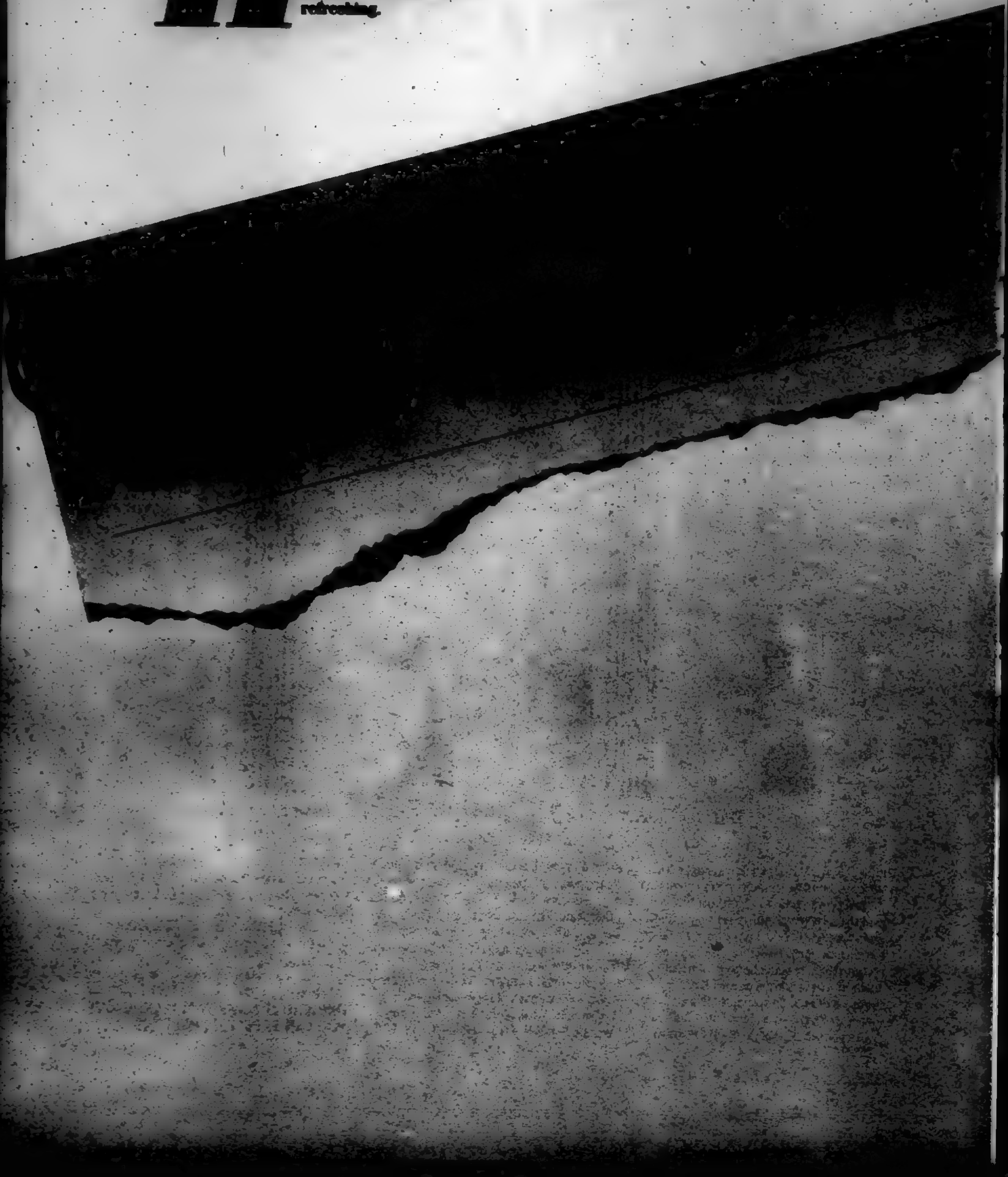

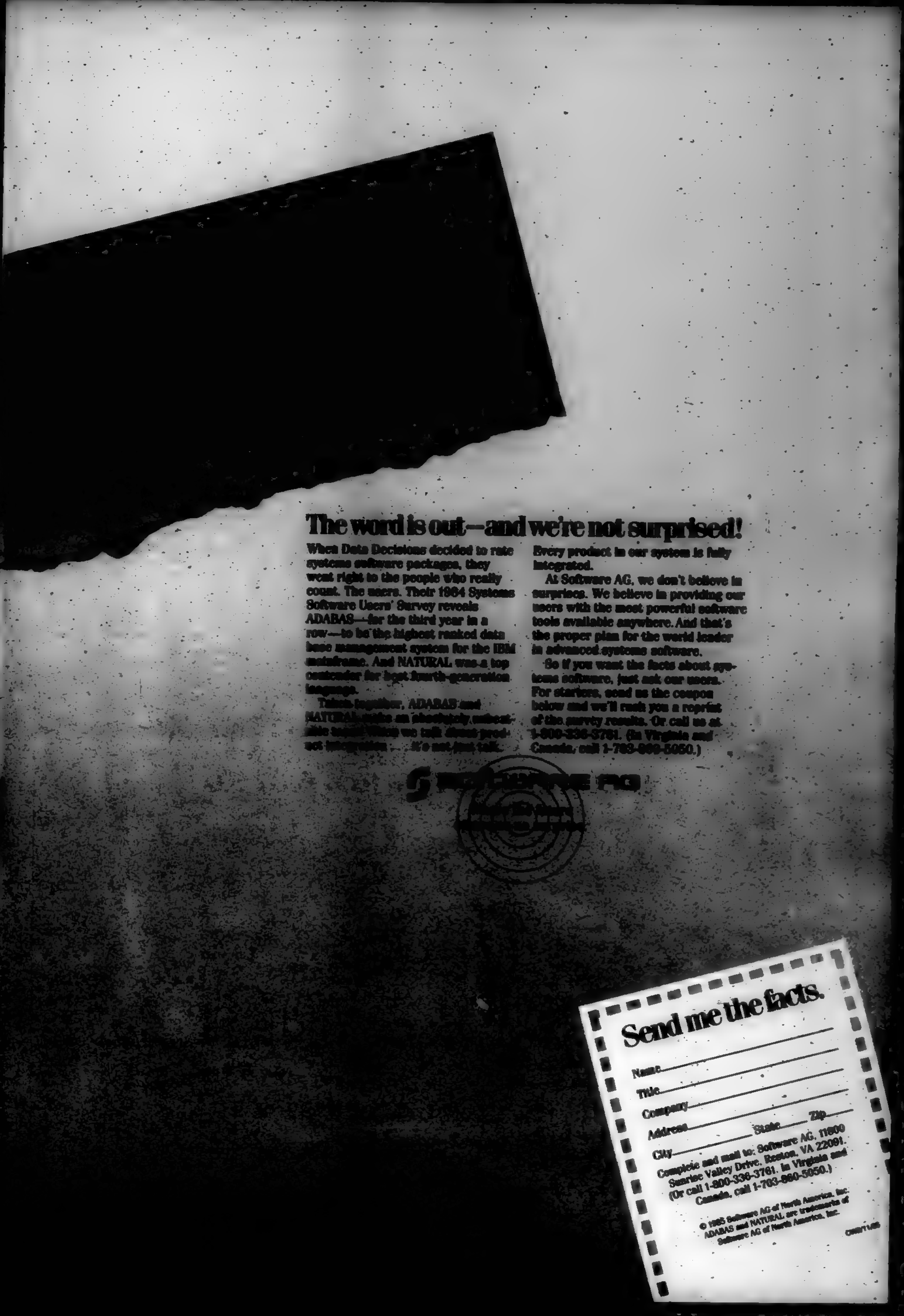

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SOFTWARE & SERVICES

Continued from page 70

Ivan-Edit is an interactive, full screen text editor intended to increase program development efficiency by page-mode cursor control, on-line Help commands, a menu-driven administrator function, a mail file facility and a Scan command. The Ivan-Virtex interface costs $1,500.

Ivan Software, 120 N. Keowee St., Dayton, Ohio 45402.

APPLICATION PACKAGES

■ **Hogan Systems, Inc. has announced a financial management system called Preferred Client Services (PCS) for IBM mainframes that focuses on providing information and managing financial activity for bank customers.**

A Hogan spokesman said customer information is provided via integrated reports including net worth analysis, income analysis and Demand Deposit Accounting transactions. Financial activity is managed by English-language plans, designed to customer specifications within bank tolerances. Funds movement can be between any account within bank systems tied to PCS.

License fees for PCS start at $200,000.

Hogan Systems, 5080 Spectrum Drive, Dallas, Texas 75248.

■ **Chicago-Soft, Ltd. has announced Release 3.0 of its Dynaplan spreadsheet for IBM MVS/TSO and VM/CMS environments.**

A company spokesman said the enhanced version features windowing capabilities similar to those found in Apple Computer, Inc.'s Macintosh microcomputer. Reportedly, Dynaplan can split screens horizontally and vertically and can overlay multiple windows. The windows can be moved around the screen, adjusted in size and stacked on top of one another. Smaller windows can also be zoomed to full screen size and back again.

Help windows appear on the screen when needed to aid the user in entering commands, and up to 255 worksheet planes can be viewed through multiple windows. A formula can refer to any cell or named range in any spreadsheet plane, allowing for consolidation of multiple spreadsheets with differing formats.

Dynaplan applications include nonprocedural decision support, three-dimensional modeling, applications development and report generation. Upload and download of Lotus Development Corp.'s 1-2-3 and Software Arts, Inc.' Visicalc worksheets are also provided.

Version 3.0 of Dynaplan is priced between $10,500 and $13,500 depending on the host operating system; the lease price ranges from $400 to $700 per month.

Chicago-Soft, Suite 2, 738 N. LaSalle St., Chicago, Ill. 60610.

■ **The Mega Group, Inc. has introduced software that adds statistical modeling, analysis and forecasting capabilities to Megacalc, its IBM mainframe spreadsheet package.**

Megastat reportedly allows users of on-line microcomputers or remote display terminals to enter data into the mainframe in spreadsheet format and construct models, forecasts and graphs with keyboard commands. The product includes on-line Help for statistical results and prompting for all commands.

According to a company spokesman, Megastat includes capabilities for regression analysis and model-building techniques for business and scientific applications. Megacalc, which can be used to generate and consolidate reports or prepare sales projections, is priced at $5,000.

The Mega Group, 17701 Mitchell Ave. N., Irvine, Calif. 92714.

■ **Data Processing Services, Inc. has introduced a purchasing module for its Distribution Processing System.**

DPS/38, written in RPG-III for the IBM System/38 minicomputer, includes order processing/invoicing, accounts receivable, inventory control and sales analysis modules.

According to a company representative, the purchasing module generates purchase orders and can handle inquiries and tracking of open purchase orders. Purchase orders can be entered and used to update inventory balances and receipt histories. Transaction lists can be printed to indicate differences in received quantities or unit costs against the original purchase order. DPS/38, including the purchasing module and source code, costs $47,500.

Data Processing Services, 8604 Allisonville Road, Indianapolis, Ind. 46250.

■ **Para Research, Inc. has announced Easy Report for IBM System/34 and System/36 minicomputers. The product is said to respond to English commands to produce listings and reports from any accounting data file without the aid of a programmer.**

Easy Report comes with 28 Para Research accounting files, including general ledger, billing, inventory, payroll, fixed assets, accounts payable and accounts receivable. Easy Report runs under IBM's RPG-II, the company said.

Easy Report is priced at $750.

Para Research, 85 Eastern Ave., Gloucester, Mass. 01930.

■ **Vanguard Software and Systems, Inc. has introduced an integrated accounting and financial package designed to operate on Honeywell, Inc.'s DPS 6 computer under Honeywell's Gcos operating system and on IBM Personal Computers running under Microsoft Corp.'s MS-DOS operating system.**

The Vanguard Software package includes modules for general ledger, accounts payable, accounts receivable, payroll, job costing, purchasing, estimating and tool control.

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ranges from $8,000 to $35,000, depending on equipment. Modules can also be purchased separately and are priced between $2,500 and $5,000.

Vanguard Software and Systems, Suite 500, 12121 Wickchester Lane, Houston, Texas 77079.

■ **Michaels, Ross & Cole Ltd. has announced Release 6.0 of its MRC-Reporter report writing package for the IBM System/38.**

The package is designed to allow nontechnical end users to create reports.

According to the vendor, Version 6.0 includes shared access path logic and features calculation improvements including the ability to define total level calculated fields, which may be entered free format.

Version 6.0 of the MRC-Reporter is priced at $1,140 per module per CPU.

Michaels, Ross & Cole, P.O. Box 4533, Oak Brook, Ill. 60521.

■ **Syntactics Corp. has announced that its Crystalwriter word processing program now supports AT&T's Information Systems' 3B family of computers.**

According to a spokesman, Crystalwriter is an AT&T Unix-based program that was designed for multiuser environments. It features a library of predefined document types, a screen display and English-like commands.

The product is said to be compatible with AT&T's 3B2 supermicrocomputer and the 3B5 and 3B20 superminicomputers. Crystalwriter is priced at $995.

Syntactics, Suite 145, 3333 Bowers Ave., Santa Clara, Calif. 95051.

■ **Koch Systems Corp. has added the Financial Futures and Hedging System to its Thesis securities trading, accounting and portfolio management package for IBM mainframes under VM.**

The Financial Futures and Hedging System reportedly provides accounting and record-keeping support to portfolio managers using financial futures for investment and risk management. It is said to support long- and short-term investment positions, level yield amortization of gains or losses, financial futures contracts and tracking of hedged investments.

The system uses Oracle Corp.'s Oracle relational data base management system. It includes standard reports, including daily transactions, open positions, closed positions, margin variations, initial margins, historical summaries and a general ledger interface.

The system's base price is $60,000.

Koch Systems, P. O. Box 2510, San Francisco, Calif., 94126.

■ **Harris Data Service, Inc. has introduced a human resource information package for the IBM System/34 and 36 minicomputers.**

The Harris Personnel Manager is said to provide a personnel department with real-time information retrieval capabilities that include full security and editing, salary administration, organizational planning, skills inventory, applicant tracking, attendance management and facilities for federal Equal Employment Opportunity and Occupational Safety and Health Administration reporting.

The Harris Personnel Manager, including IBM RPG-II source code and documentation, costs $8,000.

Harris Data Service, 11629 W. Dearbourn Ave., Milwaukee, Wis. 53226.

■ **MCBA, Inc. has announced that Release 7 of its Dibol accounting and distribution system is available for Digital Equipment Corp.'s VAX-11 computers.**

Dibol is said to feature nine packages, including accounts payable and receivable, bill of materials processing, customer order processing, fixed assets and depreciation, general ledger, inventory management, payroll and purchase order and receiving.

Price of the source code licenses for Dibol range from $750 to $6,000.

MCBA, 2441 Honolulu Ave., Montrose, Calif., 91020.

■ **Motorola/Four-Phase Systems, Inc. has announced that Access Technology, Inc.'s Supercomp-Twenty Spreadsheet Modeling package is now available for Four-Phase's AT&T Unix-based Series 2000 and Series 6000 families of office information systems.**

The package features a portable modeling environment in which users can share work on a variety of systems, including microcomputers, minicomputers and mainframes, the vendor said.

Features include matrices as large as 1,000 by 1,000, with cells that may contain descriptive labels, numbers or formulas; goal-seeking capabilities; multiple consolidation; command files; and the ability to read data from a variety of data bases and other application packages.

Supercomp-Twenty costs $500 for both Series 2000 and 6000 systems.

Motorola/Four-Phase Systems, 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

■ **Cericor, Inc. has introduced its CDA 5000 design automation system that runs on a variety of minicomputers.**

The CDA 5000 system reportedly uses a portable language and complexity management techniques. It is said to allow integration of all design functions with a data base, with no need for compilation or linkage steps.

The CDA 5000 runs on the Ridge Computers 32C and 32S and all machines from Apollo Computer, Inc., Masscomp, Sun Microsystems, Inc. and Cadmus Computer Corp. Its integrated data base is said to permit rule

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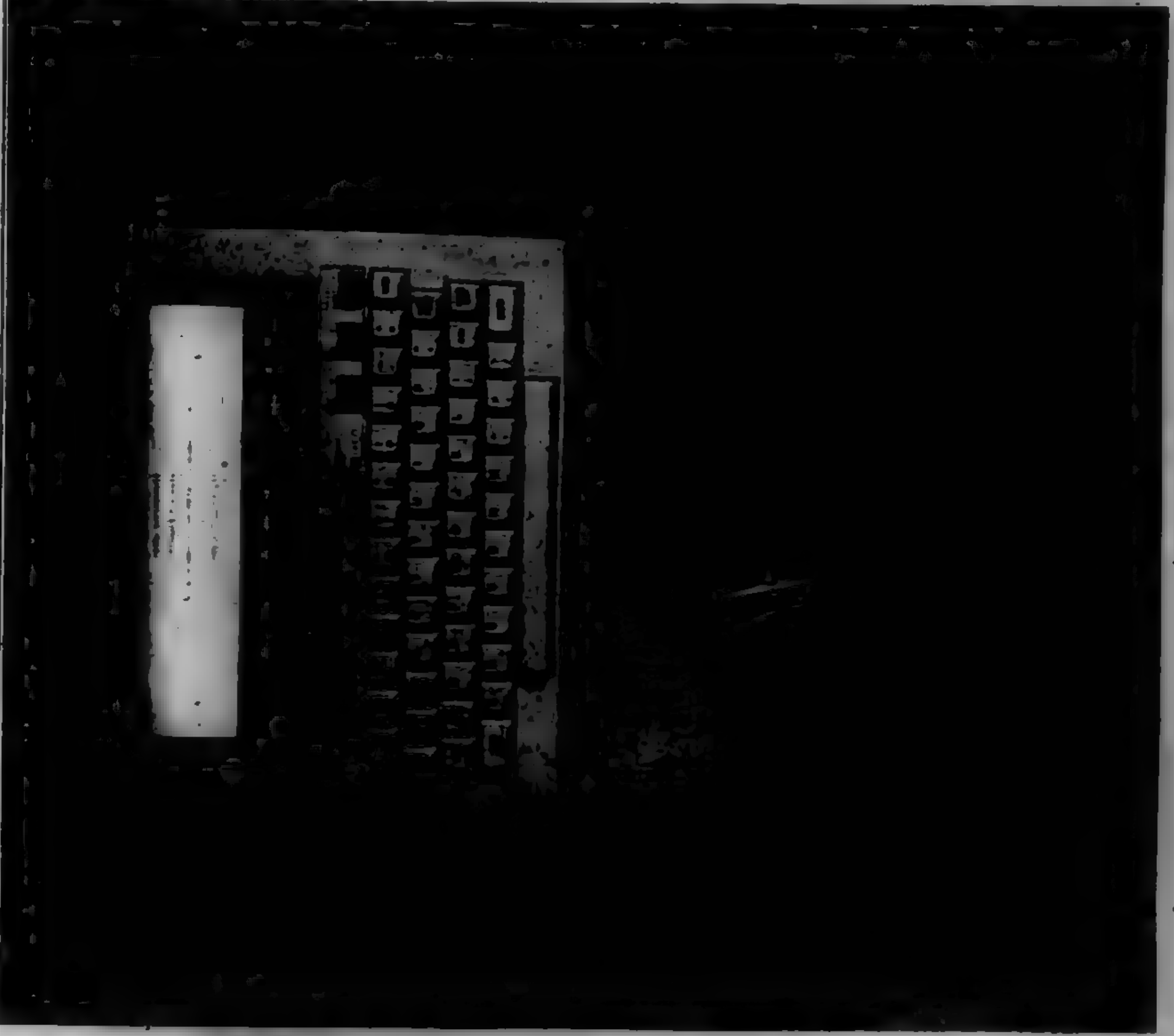

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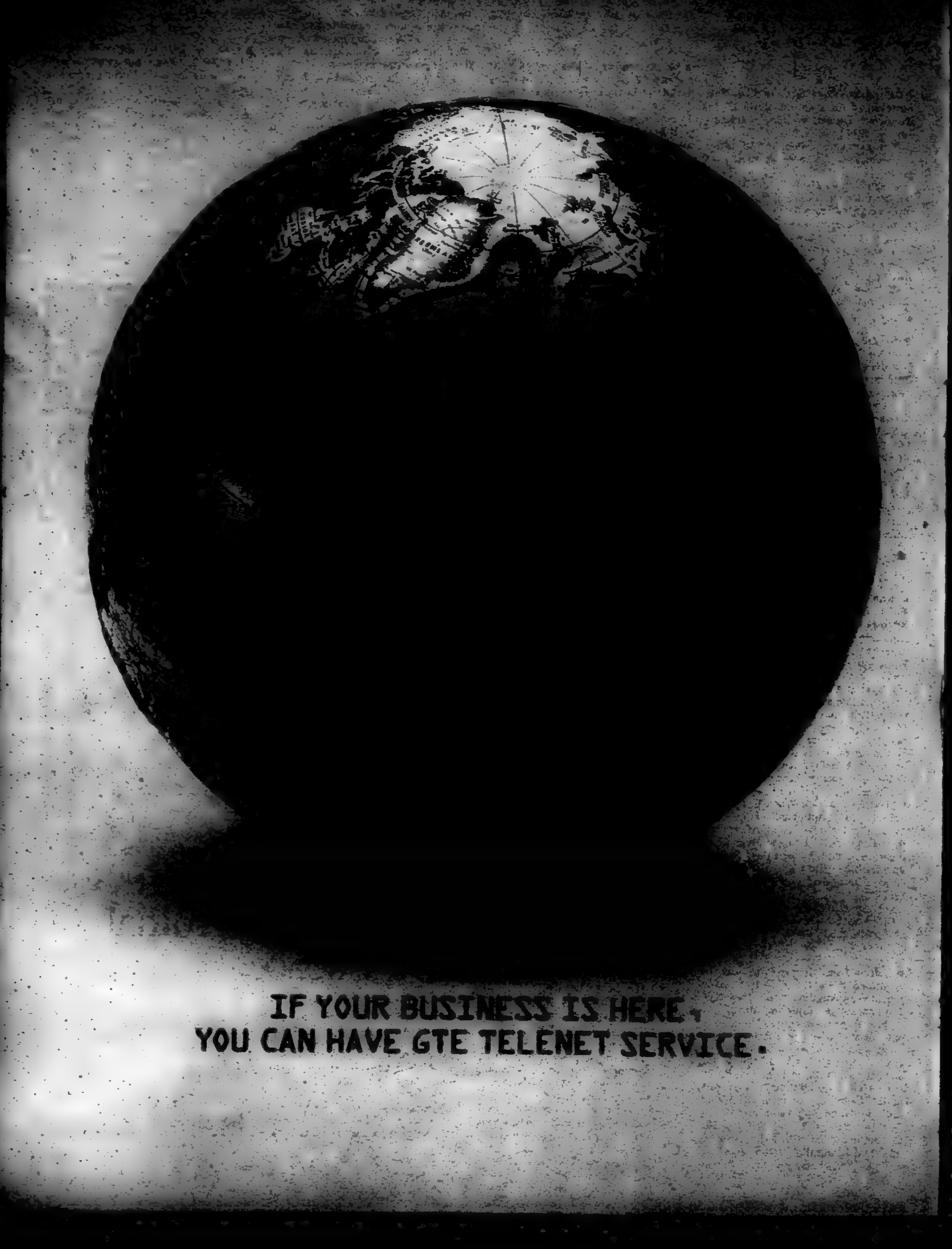
IF YOUR BUSINESS IS HERE,
YOU CAN HAVE GTE TELENET SERVICE.

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INNOVATIVE NETWORK APPLICATIONS [illegible]

SOFTWARE & SERVICES

Continued from page 75

checking as the design is created and to make the simulator and component creator available within seconds.

CDA 5000 is priced at $19,900.

Cericor, 716 E. 4500 South, Salt Lake City, Utah 84107.

■ **Precision Visuals, Inc. introduced a device driver said to allow users of IBM's 3270 PC/G and PC/GX graphics workstations to access Precision Visual's DI-3000 and GK-2000 graphics software packages on IBM mainframes running MVS/TSO and MVS/CMS.**

According to the company, the PC/G and PC/GX driver supports IBM graphics input devices, including the IBM 5277 mouse and the IBM 5083 Model 2 tablet. Applications are said to retrieve cursor positioning data using standard DI-3000 and GK-2000 calls. The product is priced at $1,000.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

DATA BASE MANAGEMENT SYSTEMS

■ **Relational Technology, Inc. (RTI) has announced that Version 2.1 of its Ingres relational data base management system (DBMS) now supports most versions of AT&T's Unix for Digital Equipment Corp.'s VAX processors. Ingres can run under AT&T's System V, the University of California at Berkeley 4.2 Unix and DEC's Ultrix version of Unix.**

RTI also announced a marketing agreement to offer Ingres on Computer Consoles, Inc.'s (CCI) Power 6/32 superminicomputer. RTI will sell Ingres directly for the Power 6/32 operating system, a version of Unix for CCI's supermini. The first binary license fee for VAX/Unix Ingres costs between $22,500 and $60,000 depending on the host machine.

RTI, 2674 N. First St., San Jose, Calif. 95134.

■ **Cincom Systems, Inc. has announced Release 1.6 of its TIS integrated relational data base management and applications support systems for IBM's 3080 and 4300 series and compatible mainframes under IBM's MVS and OS/VS1 operating systems.**

According to a representative, added features in Release 1.6 of TIS include decision support system enhancements, a query copy utility, logical user view (LUV) support for IBM Vsam files, functional improvements to LUV and functional improvements to Dbaid, the system's logical view testing and debugging aid. Release 1.6 of TIS is a maintenance release and is available at no extra charge. The price of the complete TIS system begins at $193,000.

Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio 45211.

■ **Micro Data Base Systems, Inc. has introduced a version of its MDBS III relational data base management system (DBMS) for Digital Equipment Corp.'s VAX-11/780 minicomputer.**

MDBS III runs under DEC's Ultrix operating system and reportedly allows users to define data base structures without redundancy and permits direct representation of many-to-many and recursive relationships.

The software is also said to offer security facilities, integrity checking and automatic crash recovery facilities. It is priced at between $8,000 and $30,000, depending on options and users.

Micro Data Base Systems, P.O. Box 248, Lafayette, Ind. 47902.

■ **Software House has announced Version 116B of its System 1022 data base management system (DBMS) for Digital Equipment Corp. Decsystem-10 and Decsystem-20 mainframes.**

According to a spokesman, the upgraded product features compiled procedures that allow users to compile any System 1022 program and save the intermediate code in disk files for future use. An added Help facility provides messages that explain a system command, display appropriate syntax, present examples and refer the user to related topics and subtopics.

A System 1022 license costs $32,500 for the Decsystem-20.

Software House, 1105 Massachusetts Ave., Cambridge, Mass. 02138.

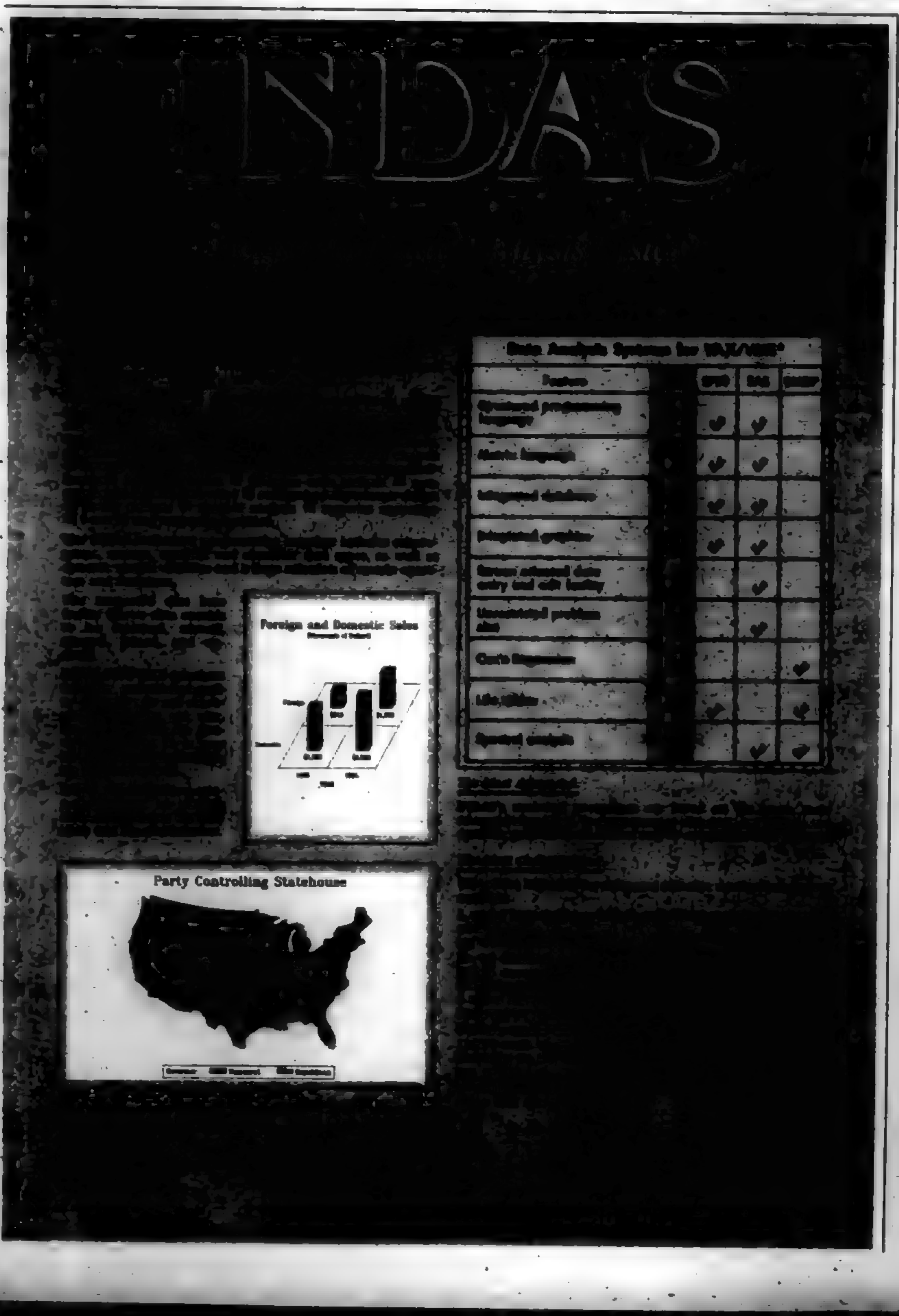
LANGUAGES

■ **Expert Systems International has announced a version of Prolog-1 for Digital Equipment Corp.'s VAX series processors running under DEC's VMS operating system.**

The VMS version of Prolog-1 uses the standard Edinburgh syntax of the Prolog language and is compatible with Digital Research, Inc.'s CP/M 80 and CP/M 86, Microsoft Corp.'s MS-DOS and DEC's RSX-11M+ and RT-11 Prolog-1 implementations.

Reportedly, interprocess communication is provided through the VAX/VMS mailbox facility, allowing Prolog-1 to call or be called by any VAX/VMS language, including Ada. The product's interpreter features an execution time of 1,000 logical inferences per second, floating-point arithmetical capabilities, a trace facility and a backtrace predicate useful in error correction. Predicates may have up to 127 arguments and an equal number of components. The price of Prolog-1 for VMS is $3,275.

Expert Systems International, 1150 First Ave., King of Prussia, Pa. 19406.



■ Digital Information Systems Corp. has introduced a portable version of Digital Equipment Corp.'s Dibol programming language to run under AT&T Unix Systems III and V, Version 7, University of California at Berkeley Versions 4.1 and 4.2 and Unisoft System Corp.'s Uniplus operating systems.

The enhanced version of Data Business Language (DBL) offers the ability to link with non-DBL programs and to interface with subroutines written in other languages, the vendor said.

A software virtual-memory environment reportedly allows the creation of programs of any size without overlaying. Other features are said to include multikey IBM Isam files, full screen programming functions, and a symbolic debugger.

In addition, programs written in DBL can be transported between hardware systems under Microsoft Corp.'s MS-DOS, S&H Computer Systems, Inc.'s TSX and TSX-Plus and DEC's VMS, RSX, RT-11 and RSTS/E, the vendor said.

Prices begin at $449 for micro versions of DBL Version 4 and range up to $3,549 for supermini versions.

Digital Information Systems, Suite 340, 3336 Bradshaw Road, Sacramento, Calif. 95827.

■ Franz, Inc. has announced that its Franz Lisp language product is now available to users of Digital Equipment Corp. VAX series processors under VMS. The company also announced an agreement with Tektronix, Inc. to supply Franz Lisp on Tektronix's 4404 Artificial Intelligence workstation.

According to a spokesman, Franz Lisp includes the Franz Lisp Interpreter, a compiler, a complete Lisp runtime library, Fortran and C runtime Lisp interfaces that allow Fortran or C routines to be executed from Lisp programs and graphics support on processors with graphics capabilities.

For the VAX-11/780, Franz Lisp is priced at $7,000 for the first copy and $1,400 for each subsequent copy. Franz Lisp is priced at $5,000 for the first copy and $1,000 for each subsequent copy for the VAX-11/750 and VAX-11/730 and the Tektronix 4404.

Franz, Suite 203, 2920 Domingo Ave., Berkeley, Calif. 94705.

REMOTE COMPUTING SERVICES

■ National Information Systems, Inc. has announced the availability of BBN Software Products Corp.'s RS/1 research system software on its time-sharing service.

According to a spokesman, RS/1 is a computerized notebook used by engineers and scientists to gather and analyze data. It permits direct entry of data and stores information in two-dimensional tables. An interactive dialogue permits the user to develop scatter plots, line graphs, histograms, bar graphs and pie charts.

The RS/1 system is available for the standard time-sharing fee of $12/hour during peak hours — Monday through Friday between 7 a.m. and 6 p.m. Pacific Standard Time — and $8 per hour during off-peak hours. Users are also charged 37 cents per CPU second during prime time and 31 cents per CPU second during off-peak hours, the vendor said.

National Information Systems, Suite 130, 20370 Town Center Lane, Cupertino, Calif. 95014.

■ Telebase Systems, Inc. has introduced the Easynet retrieval service, which allows microcomputer users to access remote data bases by telephone.

According to the vendor, users can access Easynet by connecting their terminals via a modem to the telephone and dialing the Easynet access number. A series of menu screens reportedly helps the user determine the topic of interest. When the user keys in the desired data base, the network dials out to the data base, logs on, searches, logs off and returns the results, the vendor said.

An Easynet search, which takes about 10 minutes, costs $12.

Telebase Systems, 134 N. Narberth Ave., Narberth, Pa. 19072.

■ Neshaminy Valley Information Processing, Inc. (NVIP) has introduced Resource Management Service (RMS), a remote data service for IBM mainframe users.

According to the company, RMS provides clients with a dedicated large-scale CPU housed at NVIP's corporate data center, an international network and telecommunications facility, systems and applications software, backup and recovery systems, operations and maintenance support and quality control.

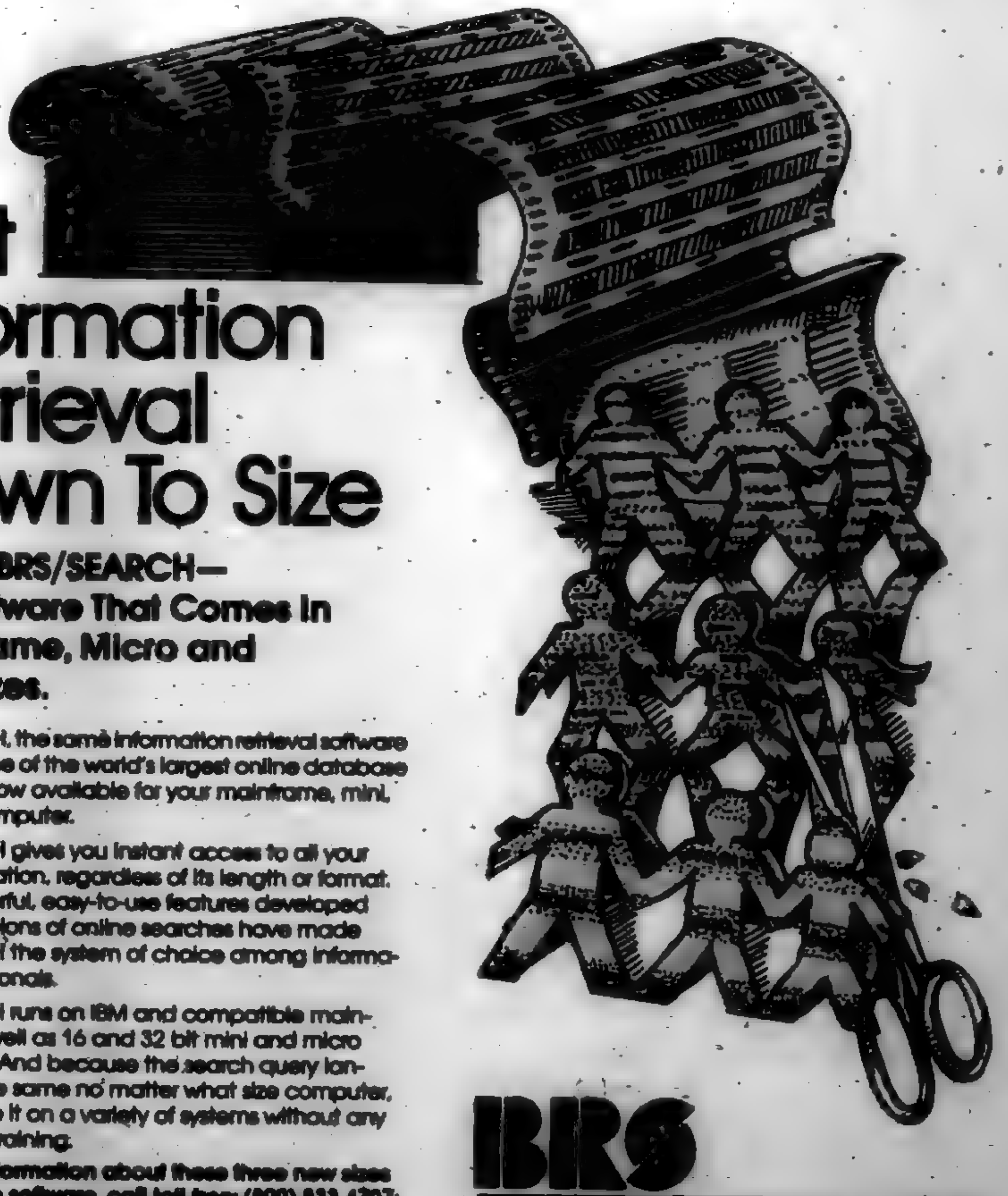
The base price of the system is $70,000, but prices vary depending on CPU size, peripherals, software and telecommunications equipment.

Neshaminy Valley Information Processing, 4850 Street Road, Trevose, Pa. 19049.

■ Control Data Business Centers, Inc. (CDBC) and Information Science, Inc. (Insci) have jointly announced a payroll and personnel service for users of IBM Personal Computers or compatible microcomputers under Microsoft Corp.'s MS-DOS operating system, with a disk drive. The Incontrol service links the Insci 90 Personnel product and CDBC's Payroll 4 product for companies of 200 or more employees.

The payroll service from CDBC includes one-day turnaround with local service, deductions for cafeteria benefits plans, deferred compensation calculations, automatic tax fi-

Continued on page 80



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SOFTWARE & SERVICES

Continued from page 79

ing, direct deposit, data base analysis and financial reporting.

The human resources service from Insci offers capture of 400 information elements per employee, storage of historical information, applicant and recruitment tracking, career development and internal promotion records, government compliance reports, benefit and insurance reporting and salary planning.

According to the vendor, the price of the service varies according to the customer's size and needs. For a company of 600 employees doing payroll twice a month, the cost is less than $4 per employee per month, with an installation charge of about $4,000.

Control Data Business Centers, P.O. Box 7100, 500 W. Putnam Ave., Greenwich, Conn. 06836.

ON-LINE DATA BASES

■ Computer Consoles, Inc. (CCI) has announced the BRS Search text retrieval software for its Officepower office automation system running on the CCI Power 6 superminicomputer.

BRS Search is said to enable Officepower users to retrieve information from a range of private and public document data bases. Officepower reportedly incorporates word and data processing, file management, electronic mail and decision support functions.

Users can keypunch documents produced on the system or from outside sources. Captured text can be displayed, edited, filed, printed or mailed, CCI said. BRS Search reportedly indexes every word in a document, allowing the user to retrieve using key words only.

BRS Search costs $45,000.

CCI, 97 Humboldt St., Rochester, N.Y. 14609.

■ Compuserve, Inc. has added a data base with information on commodities futures contracts to its Consumer and Executive Information Services.

Through the data base, users can retrieve information on the open, high, low and settlement prices as well as the volume and open interest on 58 commodities traded in the U.S. and Canada, the vendor said.

Compuserve charges $12.50/hr for on-line access between 8 a.m. and 6 p.m. and $6/hr for access during off-peak hours, with an 8-cent surcharge for each contract accessed.

Compuserve, 5000 Arlington Centre Blvd., Columbus, Ohio 43220.

METHODOLOGIES

■ Management and Computer Services, Inc. (Macs) has introduced an expanded portfolio of test plan standards that incorporate a series of suggestions for testing on-line systems such as IBM's CICS and IMS/DC and Cullinet Software, Inc.'s IDMS/DC.

The portfolio reportedly includes a 10-step action plan outlining how to build standards tailored to a range of development environments.

According to a vendor spokesman, the standards reflect a range of operating environments and are designed to address the structuring of a test environment and development of procedures to control the portion of the programming life-cycle effort devoted to testing.

Use of the standards does not require Macs' software products to gain improvements, the spokesman said.

The expanded package of test standards reportedly may be obtained free of charge through a written request to Macs on letterhead stationery.

Macs, 74 Great Valley Corporate Center, Valley Forge, Pa. 19482.

■ Advanced Information Management has introduced an enhanced version of its Aim/Safe contingency planning methodology.

According to a company spokesman, Aim/Safe leads a company through development and management of a disaster recovery plan.

The product now includes a sample contingency plan in IBM Personal Computer-compatible diskettes, the spokesman said. New forms, flowcharts, organizational charts and matrices reportedly have been added.

Aim/Safe is priced at $9,950.

Advanced Information Management has also added Aim/Plan, an electronically formatted plan consisting of Emergency Response, Failure Assessment and Control Center modules.

Aim/Plan is available for $3,900.

Advanced Information Management, 1988 Opitz Blvd., Woodbridge, Va. 22191.

TRAINING

■ Deltak, Inc., has announced a set of training videotapes for Cullinet Software, Inc.'s IDMS/R data base management system and Version 10.0 of IDMS/R.

According to a spokesman, Software Updates is a four-course series of programs intended for experienced IDMS application programmers, data base administrators and systems programmers.

The courses may be taken individually and in any order.

According to Deltak, the courses cover improvements to IDMS/R, the product's Integrated Data Dictionary, changes to IDMS/R telecommunications software, enhancements for compatibility with IBM's MVS/XA operating system and improvements to the system's Application Development System/Online and Online Query features.

Course rentals range in price from $50/mo to $130/mo, depending on the volume of use. Each course can also be purchased for $1,750.

Deltak, East-West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

■ DBMS, Inc. has announced an expanded curriculum of training courses for Cullinet Software, Inc.'s IDMS data base management system.

According to a spokesman, an on-line training system containing a sample data base can be installed at the customer site, or users can attend the training courses at the vendor's headquarters.

The expanded curriculum reportedly now includes courses on Cullinet's Application Development System/On-line (ADS/O) Application Generations, ADS/O Programming, Culprit Programming, IDMS-DB Programming, IDMS/DC Programming and fundamentals of the Integrated Data Dictionary.

Course costs range from $300 to $800 for one- to four-day courses held at the vendor's headquarters. Courses held at customer sites cost $1,500 each.

DBMS, 1801 Mill St., Naperville, Ill. 60540.

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IN DEPTH

Reflections of an anonymous programmer

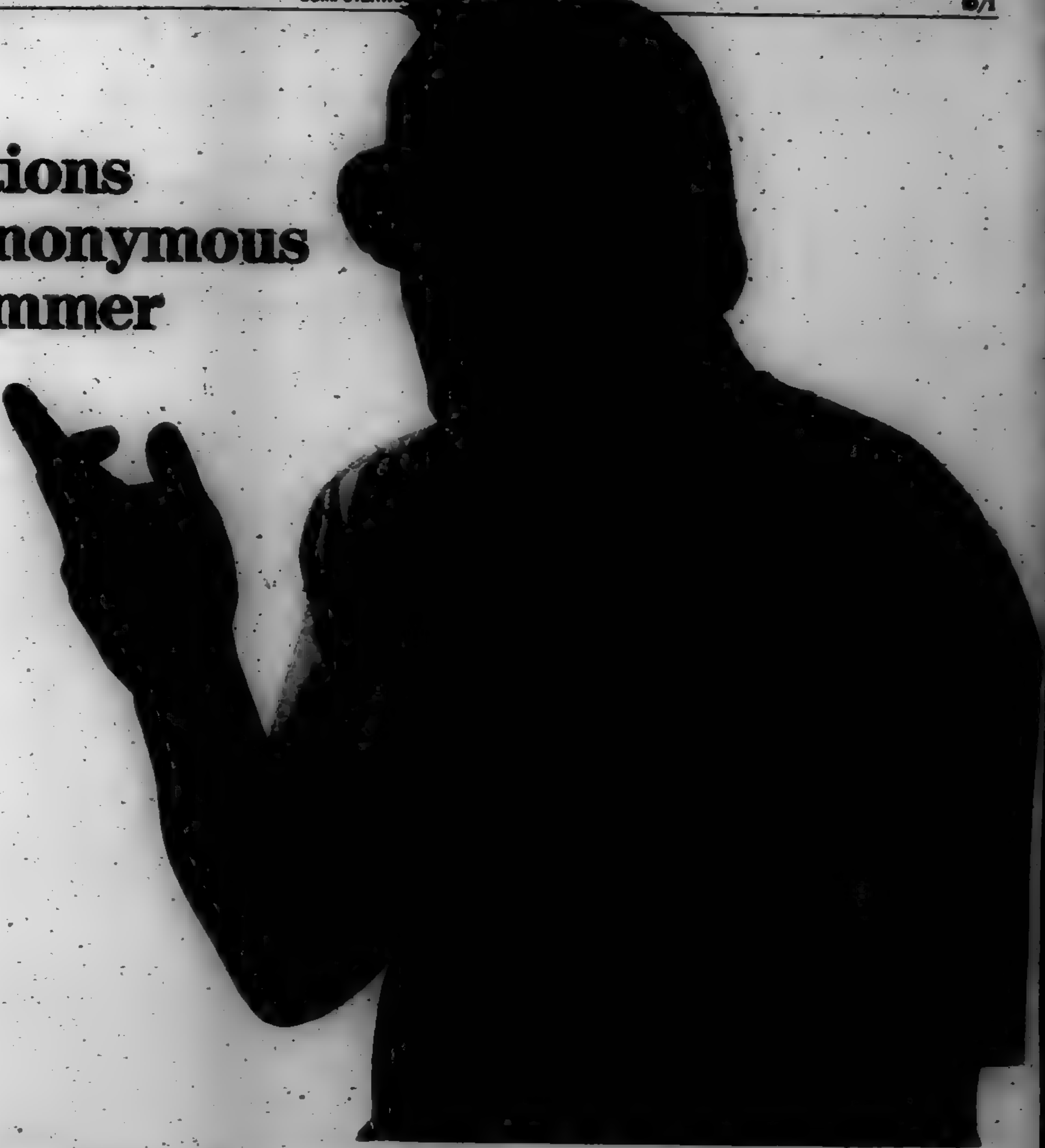

PHOTO © 1985 BY ED BRAVERMAN

> ***"Everyone assumes it is not possible to hold DP to the standards of predictability and cost control that apply to everyone else."***
>
> ***"Groups take so long to use new manpower because they choose to and because wasting time and territory guarding have come to be their major functions."***
>
> ***"I wonder — Couldn't this work be done well?"***

By Programmer X

Corporate officers in charge of real profit-making activities must be constantly puzzled by the slowness, expense and obtuseness of data processing departments. Once, walking down the hall behind a group of visiting dignitaries, I heard the guide say to the new president, motioning broadly to our area of work, "And here is all the gray matter." Programming groups are, to these interested outsiders, "gray matter" — impenetrable, delicate and mysteriously unpredictable.

The activity of a group of applications programmers writing code to accomplish a useful system has never been understood. We do not know how long this work should take, how well it should be done or how much it should cost an organization.

We know how much time has been consumed for the development of a system in our experience, but we have not analyzed that expenditure of time. We assume that systems will be written so badly that 50% to 80% of the department's time is to be expended in their maintenance. We know what it costs to hire contractors to write a new job, but in hiring them, we write off the capacity of our own programming groups to bring in the same accomplishment.

From the point of view of the programmer, and I am one, programming groups show themselves to be insensitive to the main value of their calling, jealous and territorial in their internal relations, unwilling to confer authority, consistently demoralizing and awesomely wasteful of time and budget. Certain statistics repeatedly cited in professional studies seem to bear these opinions out.

Everyone agrees that programmers change jobs at a scandalous pace. An image of the ambitious expert comes to mind with these words. Yet consider the programmers you have met. These are not aggressive personalities making million-dollar demands; these are, well, programmers, pencil-and-paper types, without a Cross pen or the business ambition of your paperboy among them. These are, in the main, professional craftsmen, and when you see a programmer changing jobs, he is in all likelihood fleeing organizational circumstances that make the application of his craft more difficult than it should be.

We have all seen the very low figures surveyors report when they attempt to ascertain the average number of lines of debugged code a programmer produces a month — 30, 50, something of that magnitude. Yet the same surveys consistently show that some productive programmers produce 10 times the average. Here is industrywide evidence for something that working programmers can plainly see, that is, that a few elite people have claimed all the territory, resulting in an extensive waste of man-hours and much nervous fingering of classified sections among the unchosen many.

Finally, studies of the break-in time for a new programmer indicate that it takes one to two years before he is of much practical use to an organization. To claim that anything like 300 eight-hour days are required to teach an already educated and professionally prepared individual enough to take responsibility in what is essentially a technical rather than judgmental role is the uttermost nonsense. Groups take this long to use new manpower because they choose to and because wasting time and territory-guarding have come to be their major organizational functions.

Again, the group activity of program writing to accomplish a useful system has never been understood. The fruit of our craft has restructured other departments, but the structure of our own departments has not generally been open to question.

We go on assumption as to the shape of our working groups. The inefficiency that is produced by our assumptions is subsidized by the vast efficiency of the processing machinery itself and protected by the entrenchment of our departments. If two junior members of a four-member working group are seen to be essentially sitting around absorbing the atmosphere of the institution — well, this is how they gain experience, isn't it? If the analyst of the same group then departs, leaving one productive programmer as the sole source of useful information on all that group's systems and setting work back six months, then, darn, a key person has left, everyone knows and accepts this excuse. And so it goes.

Yet I must wonder: Couldn't this work be done well? Everyone assumes it is not possible to hold data processing activities to standards of predictability and cost control according to real function, which applies to everyone else. This is a matter of complete mystification. Perhaps by looking at the relationships in an applications programming group in light of the functions expected from it we will begin to see how productivity may possibly be improved.

> ”
>
> *Groups take this long to use new manpower because they choose to and because wasting time and territory-guarding have come to be their major organizational functions.*

Hierarchical relationship

All the programming groups I have worked in or heard about are dominated by the hierarchical relationship. Yet the functionality of this work has nothing to do with hierarchy. The activity of system building requires a well-defined, completely understood project context and close and constant communication of details. The hierarchical relationship as I have seen it operate results in partial project contexts for each programmer and inherently limited communication of critical details.

There is only one analyst, after all. If she spends all her time explaining things to people, she won't have any time left for her other responsibilities. This doesn't mean she won't try to be available, but say she is on the phone or at a meeting or with another programmer — the conscientious individual will avoid too much waiting around to ask his question. He ends up muddling around his problems the best he can. Hence, half his days are spent in unclarity and duplicated labor.

This kind of mundane and accepted loss of work potential is built into our hierarchical programming groups. Like unnecessary keystrokes among data entry personnel, questions unanswered until the next day result in very significant deterioration of work schedules among programmers.

In some programming work areas one can clearly see the hierarchical assumption in the floor layout, which provides tidy half-walled cubicles, each one containing, in addition to a desk and filing cabinet, two chairs — one for the authority and the other for the worker.

In organizations employing such floor plans, the obvious inferred work pattern is that the authority will go around to each worker one by one and explain what is to be done. And this is indeed what happens. If questions arise in any particular section of code, the process is reversed, with every point being resolved repetitively for every worker. Here,

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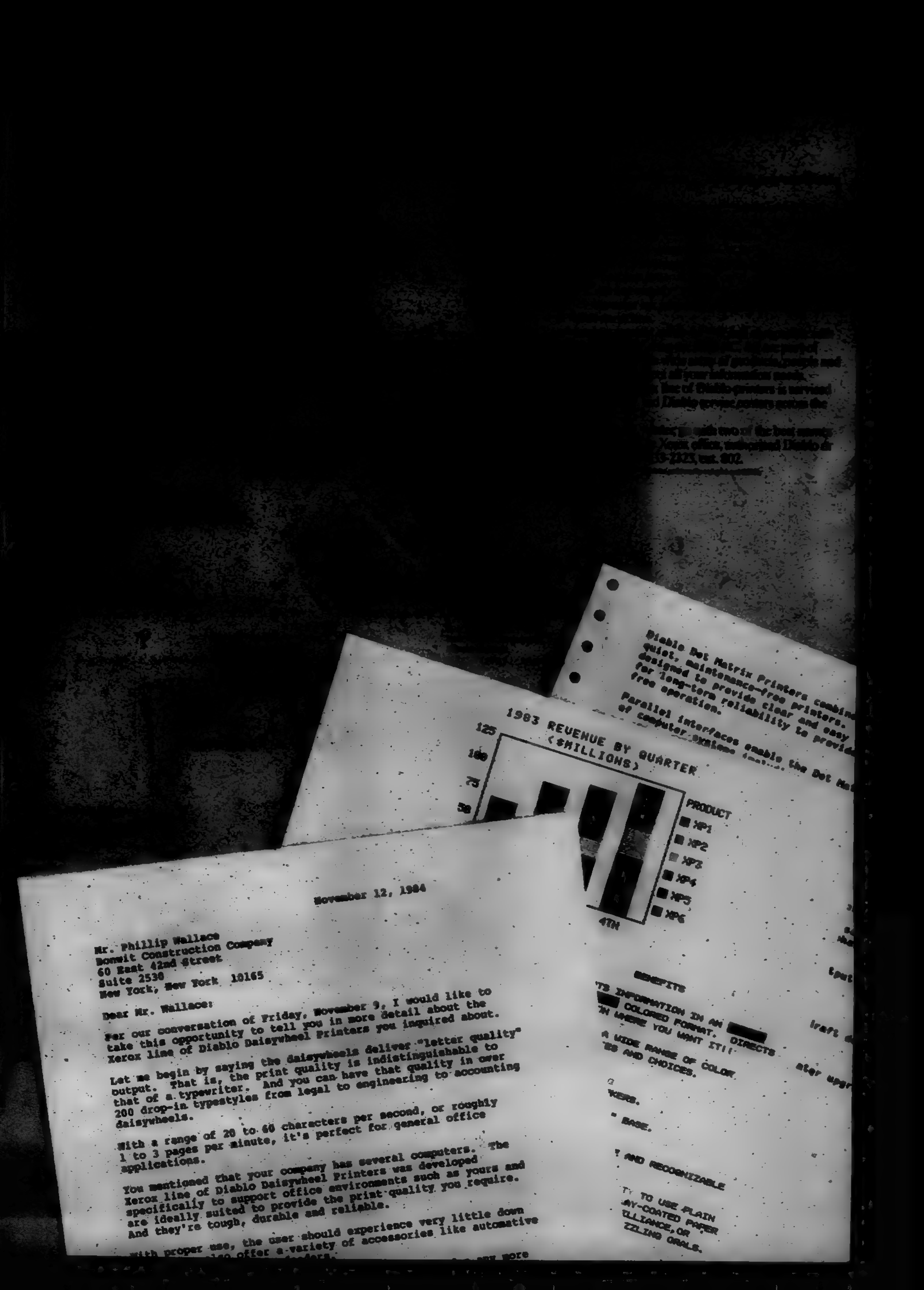

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November 12, 1984

Mr. Phillip Wallace
Bonwit Construction Company
60 East 42nd Street
Suite 2530
New York, New York 10165

Dear Mr. Wallace:

Per our conversation of Friday, November 9, I would like to take this opportunity to tell you in more detail about the Xerox line of Diablo Daisywheel Printers you inquired about.

Let me begin by saying the daisywheels deliver "letter quality" output. That is, the print quality is indistinguishable to that of a typewriter. And you can have that quality in over 200 drop-in typestyles from legal to engineering to accounting daisywheels.

With a range of 20 to 60 characters per second, or roughly 1 to 3 pages per minute, it's perfect for general office applications.

You mentioned that your company has several computers. The Xerox line of Diablo Daisywheel Printers was developed specifically to support office environments such as yours and are ideally suited to provide the print quality you require. And they're tough, durable and reliable.

With proper use, the user should experience very little down
…also offer a variety of accessories like automatic
…feeders.

time is substituted for group understanding.

The isolation of individual programming tasks from purpose, history and function, which is what occurs when one analyst or senior group member communicates and designs and the rest carry out his dictates in program code, results in a lack of healthy redundancy of understanding. Only the key figure really understands what is going on here.

This programmer may know how to add the code "4" to his report; another programmer may be able to add a certain error message in case an unforeseen abend occurs, but only the analyst knows from conversations with the user what the code 4 really means or what input error caused the abend. Only the designing authority is qualified to change a series of system steps in order to accomplish reliably a user-defined requirement. Only he has substantial value and status in the company as a whole.

This situation generally turns the working population into the few with territory and the many without. The goal in such an organization is to get, not to share, territory, and woe betide the group whose "key person" ups and leaves.

Will the manager then consider giving his bright young people something substantial to design? This possibility is not likely as long as useful knowledge is concentrated in the hands of the designer. All the significant decision-making work will go to the veterans, who have company pensions and declining job-getting capacities to consider before cutting loose. Hence, this most revolutionary technology is typically in the hands of conservatives, and our systems tend to be relatively dated and ponderous at the time of their design.

High-priced experts

Not the least ill effect of this sadly ill-considered division of labor is the boon it provides programming contractors by its high overhead. If a programming manager really needs to get some work done, he typically admits the sterility of his own operation by calling in the high-priced experts. They can at least get a job off the ground in a relative hurry. Their basic lack of interest in any organization, however, will manifest itself for years in scanty documentation and difficult maintenance work for the real employees, who must now cope with a system that they have not written and probably do not like.

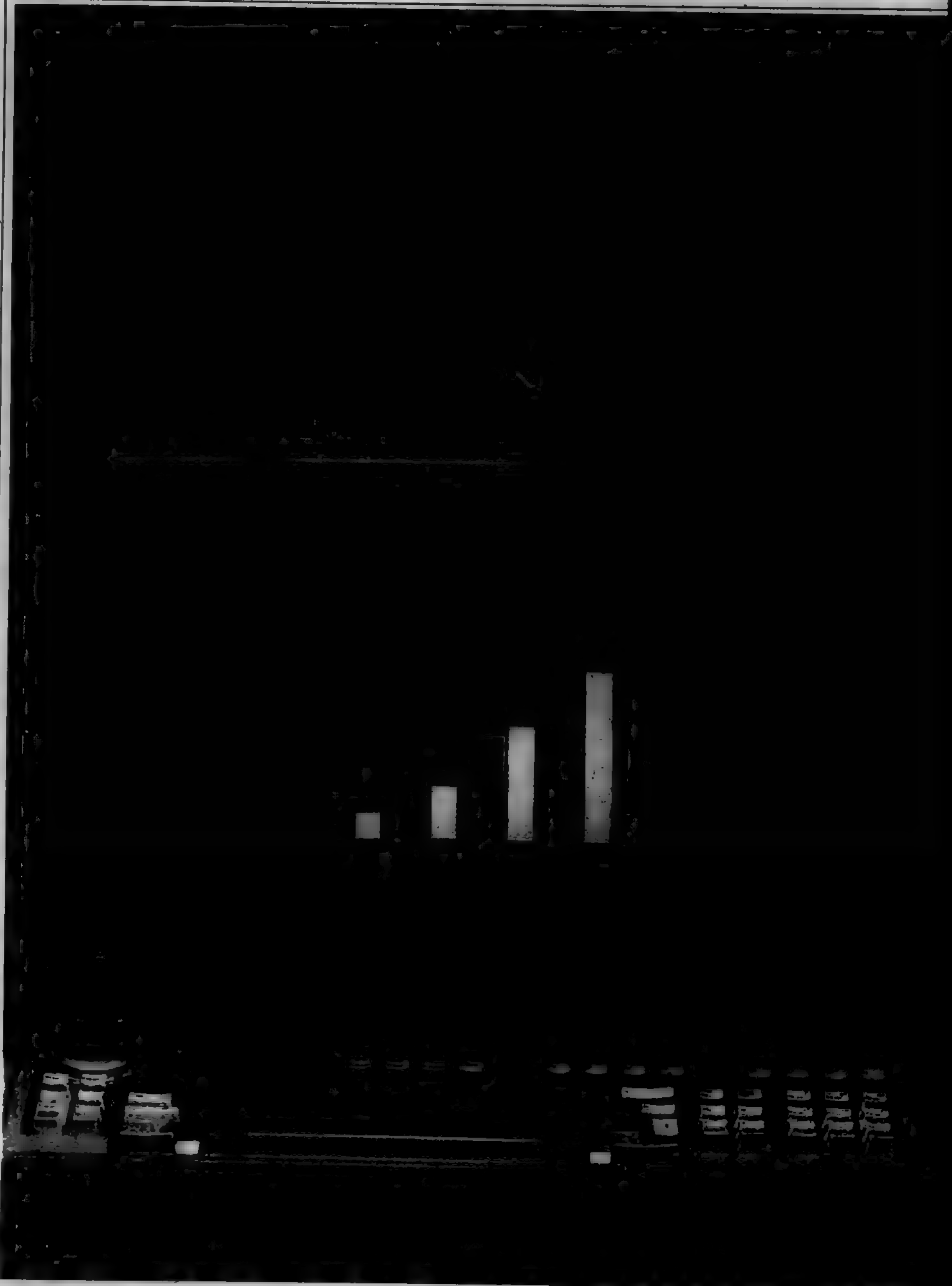
Where lies the superiority of these fly-by-night moguls over the faithful in-house employees? Perhaps they know the next software protocol on the horizon — communications or some relational data base or whatever — but in this case, shouldn't one's own people be given the chance to learn?

Any programmer who has worked awhile knows that the particular vocabulary of a language is a hugely overplayed difficulty in any case. It may take 10 days to teach someone a useful amount of command-level CICS or some data base management system, and not very much longer for anything else in the realm of business applications.

Are these people just smarter than one's own employees? Then why were these people selected and hired in the first place? Just how can one justify the expense and employee demoralization involved in the hiring of outside, apparently "superior" personnel, when it is plain to anyone who is paying attention that half of one's own permanent employees are doing practically nothing at any given time?

The only reason contractors are used is that the resident groups have such limited design potential and such small production capacity that independent programmers, working in unaccustomed surroundings at inflated prices, can get more done more cheaply. This situation is an astonishing indictment of current programming practice, yet the use of contractors for the most difficult and substantial projects is widely accepted as a management necessity.

The normal application group structure is at fault in the high expense and lack of timeliness associated with systems products from the standpoint of corporate users. The problem with the structure of the application group has been located at the point of its hierarchical assumption, defined as the attitude that a few personnel shall properly understand, communicate, define and



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> *This revolutionary technology is typically in the hands of conservatives, and systems tend to be relatively dated and ponderous at the time of their design.*

design, while the majority of workers shall merely accomplish segments of the general plan.

This assumption results in a lack of necessary information for the programmer, both as to the broad ideas characterizing the system on which he is working and the specific details on which his logic hinges.

Also, the programmer in this working role becomes demoralized, as he has been trained to take pride in concept and accomplishment and not rote labor; he is underutilized, as the designing authority cannot keep up with the functional communication required to keep his programmers seriously occupied; he does not have adequate status in the company as a whole; he is made to feel inferior by the hiring of higher paid contractors to accomplish the badly needed projects; and finally, he either accepts a rather unproductive role or seeks employment elsewhere. His lack of productivity is not evidence of any lack of capacity, but of the lack of imagination and functionality of the accepted group structure in which he works.

Those who are satisfied in such a role will persevere with the company and end up doing the designing, while the bright and frustrated ones will likely go through a series of jobs before finally turning their talents over to contracting firms in hopes of finding serious and intelligent employment.

Now consider the possible workings of a more functional group structure, one that would improve programmer productivity and restore energy and initiative to a moribund and systematically depressing area of work.

Bridge building

The job of applications programming is in some ways like building a bridge. This bridge is to stand between stored information and used information. The bridge is a complicated one with many levels for traffic and intricate entries and exits from level to level. It is too large for any one person to build; in fact, it requires a large work crew.

And yet when it is finished, it must function as though it had been built by one person in these respects — it must all fit together harmoniously, the entries and exits between levels must connect the levels in a consistent way so as not to mislead the traveling information, and the signs must all be in the same style.

This is how we think about our data processing systems. We divide labor between designers and concrete pourers, between foremen and truck drivers, because nobody can design a bridge and drive a truck at the same time. This is just common sense and the way of dividing work since Egypt.

This is a mighty funny bridge, however. Thinking about how we build this bridge is a little like thinking about subatomic physics. In the first place, steel girders in any possible configuration have already been driven into the riverbed. All we have to do is choose a desired configuration and indicate it on our little designing machine, and that precise configuration becomes operational, relegating the infinite remaining number of predriven girders back to the realm of the merely possible.

Any number of cement trucks are available to us. They all already contain perfectly mixed cement. The same little designing machine may be used to dump any amount of cement anywhere on the bridge we like. Likewise with signs, tollbooths and road stripes.

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Other aspects of this bridge-building activity bear scrutiny. The bridge is amenable to change on demand, say, if the governors demand more exits from a certain level or even extra levels.

This bridge is so complicated in its traffic patterns that it is possible for misunderstandings to occur all-around as to how one level connects to another or for everyone to forget entirely some necessary sequence of routes across it, making it necessary to study the plans long and hard to rediscover this pathway. Some exits inadvertently may even end in cement walls, into which all traffic may crash for weeks or months until this problem is finally discovered by a maintenance man and remedied!

This bridge needs understanding more than it needs sturdy backs to drive steel girders, because the girders are already driven. It needs clear communication and definite agreement between designers, and it needs well-considered and clear plans, but it does not need any cement truck drivers at all.

The only human work on this bridge is predesign planning, design formalization and design recording. All software is a formalized design for a process. We tend to divide this design up into higher and lower levels for the purposes of division of labor, but the line of demarcation between the two is artificial, arbitrary and destructive of the general knowledge about the system in question.

Our present applications groups tend, in practice, to assign the analyst and one key programmer the predesign, design and design recording tasks, while sending the other two or three group members out to drive the cement trucks, that is, do a little assigned coding. Only one programmer tends to be heavily utilized because by restricting her necessary communications to one worker the analyst finds, under the hierarchy assumption, that she can get more done. Communication is the major burden on her time.

Thus, on the face of it, our typical programming groups waste half the manpower at their disposal. Actually their inefficiency is even greater than half. For programmer productivity to increase meaningfully, we must develop methods of group design that produce data systems satisfying the requirements of fitting harmoniously together, not misleading the traveling information, and having signs all of the same style.

Corporate design

The task of corporate design has always been neglected in our industry, and yet it is the main requirement of sound system development. Applications programming has been produced despite the method of its production, one could say, using the efficiency of the processing machinery to cover for unwillingness to develop efficient methods of system development.

We have jammed an old, hierarchical idea of a working group into an entirely novel technology, and it does not work at all. We have never been forced to make the programming group work very well because high expense and uneven usefulness have stood for years as accepted standards for our work.

The ideas of individualism and corporate territorialism have been institutionalized in programming groups and, because of the interconnected and knowledge-intensive nature of the work of programming, have stifled that work universally.

Everyone accepts this situation and looks to new software and novel corporate enticements to the individual when they consider programmer productivity. Yet these approaches do not address the question at all. The question is how to build group identity, group morale and group design capacity in our programming groups.

Directions for reform

I'd now like to suggest the makeup of a more effective programming group. This task is harder than a critique of the present structure and productivity of the application work group because I've never seen an effective programming group. Yet experience with the day-to-day functions we carry out can indicate directions for organizational reform.

Several aspects of the structure of an effective programming work group are rather clear. First, it must do away very definitely with the notion that one person

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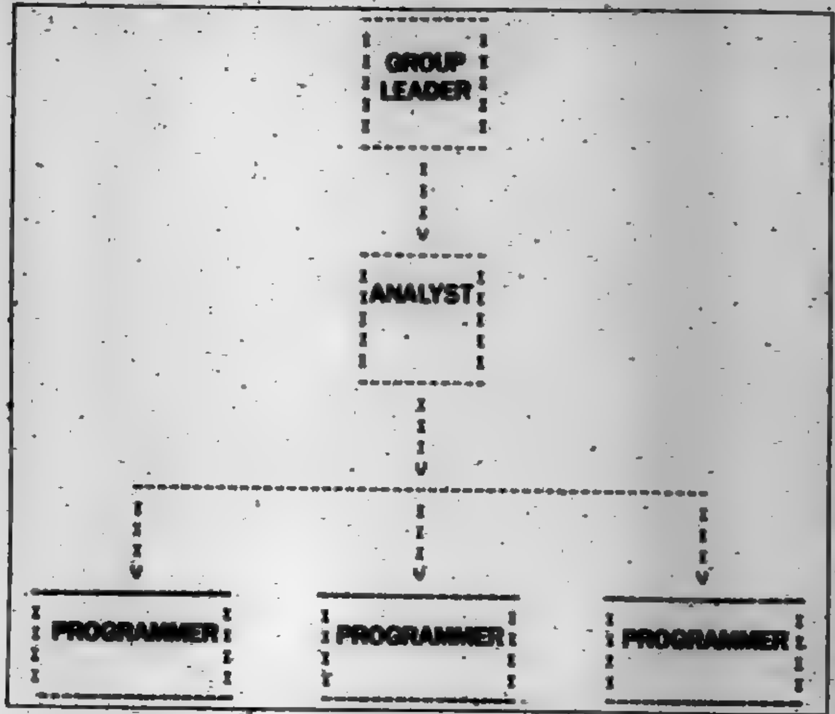

Hierarchical group

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> *The liaison programmer is in charge of operational communications with areas outside his group. He answers the phone on the first ring all morning. He keeps day-to-day relationships with the user departments squeaky clean and acts to shield the group from as much phone annoyance as possible.*

designs, communicates and is responsible while others drive the cement trucks. Everyone designs, everyone communicates, and everyone is responsible. Our people are highly educated enough and disciplined that we can certainly develop procedures for joint design. On such methods hinge any attempt to bring the programming group to life.

Second, an effective group cultivates working meetings. People should grow accustomed to talking comfortably about work matters face to face and making operational decisions in a meeting room. Speech is, after all, a very fast, inclusive and accurate means of communication, which, in our present practice, is quite constricted where not entirely absent. Talking in a disciplined way tends to coordinate efforts, whereas written requirements tend to separate work into individual parcels that will require further communication later on for reassembly into a useful whole.

Third, an attempt to restructure the work group will not cost anyone his already-accomplished status. Analysts will remain analysts and will retain senior standing. It is the other crew members whose status must be changed and that for the better.

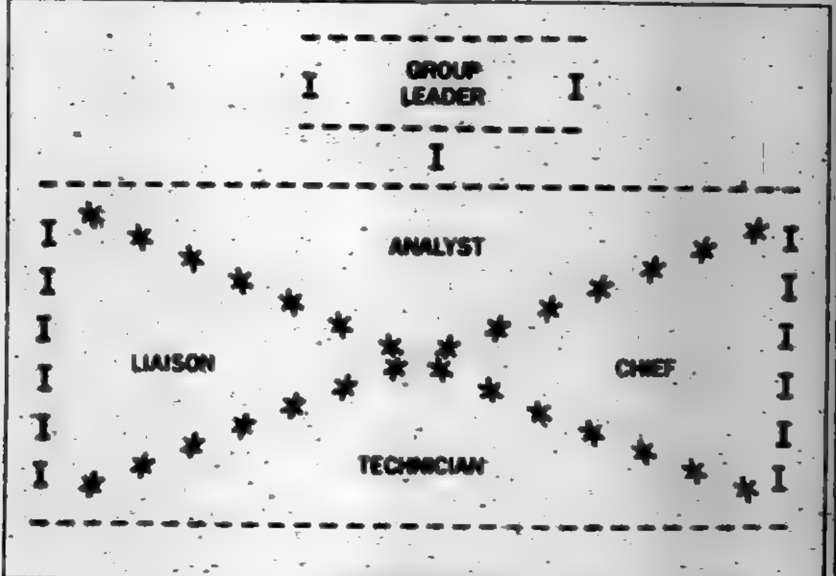
Fourth, the reformulated group, in its newly found unity of function, will be able to take a more aggressive stance with respect to its own future. It will have the capacity to weigh the effectiveness of the system it supports and project future developments for those systems. Under our present hierarchical organizations, the group more or less does what it is told, without its professional judgment being respected or utilized.

Sharing decision making

This situation occurs because the management of the user department is characteristically organized to plan and make decisions, whereas we programmers are not. But if programmers were to develop a capacity for informed and timely recommendations, could we not save our companies a lot of money and bad decisions, while substantially raising the general level of available data processing services?

Fifth, the restructured group will maintain individual programming prowess. Working together at some times, the group members will also work better alone. A necessary balance in the workday will have been achieved, as well as an improvement in the critical judgment and contextual information available for the day's programming activity.

Let us here set out the contrasting models of the traditional programming group and the functionally reconformed group that we are proposing.



Integrated group

In the integrated group, each employee has a special responsibility for one aspect of the group's function.

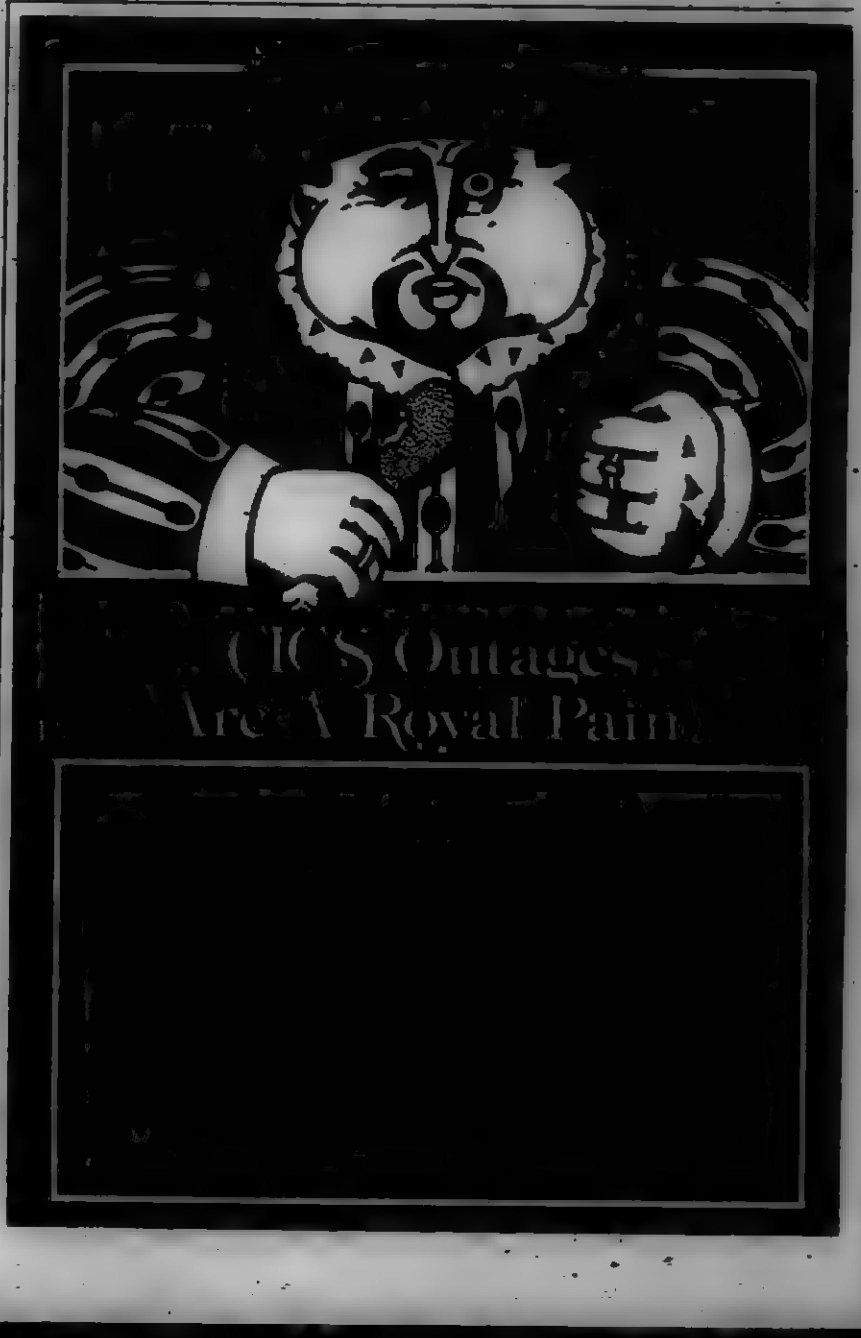
The technician programmer is the expert on the application of the relevant software vocabulary. She is the one to go to for answers on JCL use, CPU time utilization, the relative efficiency of various I/O procedures and the like. If she doesn't know everything, she takes special pride in keeping available every scrap of necessary reference material, including manuals, texts, cards and her own school notes. She will call IBM in White Plains, N.Y., if it comes to that. She is regarded by the group as the sum total of amassed data processing knowledge.

The liaison programmer is in charge of operational communications with areas outside his group. He answers the phone on the first ring all morning. If phone calls break into group meetings, he is always the only one whose attention can be spared to evaluate the urgency and importance of the call. When a group's work interfaces with that of another group, he sets up the meetings and oils the edges. He keeps day-to-day relationships with the user departments squeaky clean and acts to shield the rest of the group from as much phone annoyance as possible.

Kindly bulldog

The chief programmer is a kindly bulldog. She insists that things get done. Her role is actually the management function within the working group. She sets the agendas and stands up from time to time to lead the group meetings. She gets agreement on job schedules and remembers things that slip other peoples' minds.

Time is her bible, yet she is not shrewish but canny, not pushy but encouraging, not flustered but definite in her cajoling. She must judge the time spent on small vs. large matters, seeing that the group neither becomes totally immersed in the


CICS Outages Are A Royal Pain

one nor enchanted by the other.

The analyst continues to specialize in the fitting of available software tools to user needs, but rather than building all the large design frameworks himself, he gets good design out of group design meetings. He spends a lot of time standing at a blackboard asking, Well, shall we do it this way or that?

I have never personally witnessed a group design meeting, but this format must be cultivated if our programmers are ever to produce consistently work that is good, useful and well-understood. To cut them off from design participation on the hierarchy assumption is to render them permanently stupid and demoralized. But let all programmers have a hand in something more demanding than assigned coding, and they will feel respected by the organization and begin to exert themselves. They will produce code much more efficiently because of a close understanding of the system context, and management will no longer depend exclusively on one "key person" for useful knowledge about a given system's operation.

The group leader continues to do what he currently does in a typical large installation; that is, protect the group in the corporation, attend meetings on the group's behalf, submit attendance reports, conduct performance reviews and recommend areas of concentration for the group's activities.

Everybody in the working group writes code, in principle, in addition to his special functional status. This way everyone understands what cement is being talked about. If an analyst has not coded in 20 years and does not intend to start now, fine, we can work with that. But in principle everybody has coding responsibilities.

Now, what have we accomplished with this redefinition of jobs? We went in with one overworked analyst, one overachieving, productive programmer and two hangers-on and came out with four definite and unique functional roles. Each of these people is necessary to the group's daily functioning in a highly visible way, yet none is indispensable. This sort of functional concentration of labor could give rise to a lively give-and-take spirit in a group. An employee would certainly hesitate to leave this type of group in favor of the old, isolated, programmer-behind-a-wall style of another organization.

Whereas all of the steps of system writing and system maintenance are done individually in a group functioning under the hierarchy assumption, an integrated group could in large part take care of the various steps in these processes corporately.

Meetings under our accepted group protocol always stop short of practical doing and hence are avoided whenever possible. Meetings held only for reporting purposes can have only one useful result: the establishment of the lateness of the various parts of a project. If everything is coming along as per schedule, the meeting may as well not be held.

The new group breaks through the "doing barrier" in its meetings, and these meetings may then become supportive of the individual effort by putting individual assignments into complete context and through an exemplary style of rapid problem resolution.

The working meeting begins at some reasonable hour in the morning by which time all the group members can be expected to be present. Perhaps the liaison programmer has been in for an hour or so to take problem calls, but nobody's work really gets going until the meeting defines the day's requirements.

First there is a period of conversation — home talk and shop talk — as the group members take their places around the table. Then the chief programmer asks the liaison for any problems he may have heard of since the previous day, and the group gets to work in earnest. Immediate maintenance requests are handled, whenever practical, around the meeting table. Nothing having a clear and simple resolution ever gets to an individual's desk.

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problem as bad data of a nature that was missed by the edit program. The technical programmer, the analyst and the individual who wrote the original editor huddle around the program listing and discover where the new edit check should be coded. Someone gets on the CRT terminal and makes the change. Someone else looks over his shoulder to make sure he doesn't forget a period.

The liaison calls operations to request the rerun, the forms are filled out for turning over the new version to production, and the problem is surmounted.

Under this method of problem resolution, the sum total of the group's knowledge and experience is brought to bear on all difficulties of this nature. Everyone is paying attention, because at this time of the morning they are relieved from all their other duties. Problem resolution is timely because communication is comprehensive rather than serial, because everything is out in the open so stalling becomes apparent, because the group working together takes pride in a style of prompt competence and because every irksome detail is completed there and then.

Notice that under such a protocol all members of the group witness and experience the practical workings of the systems for which the group claims responsibility, whether or not each one participates in each maintenance activity. Larger maintenance requests may be assigned to an individual for programming or to the liaison for clarification or to the analyst to bring up during the design segment of the meeting.

After this initial flurry of problem solving, the group takes a morning break for coffee, a little walk or personal phone calls. The immediate tensions of the working day have been alleviated. Minds can now be cleared for calm and thorough system building.

The design segment of the working meeting begins with the chief programmer setting a context for the projected activity, reminding everyone about the values to be held in the proposed systems and the time frames involved and speaking in general to the mood of the group. Perhaps she tells a joke; perhaps she waives her speaking role entirely — but she has the job of readying the participants, in whatever way necessary, for their next task.

The analyst then takes over, drawing on the blackboard and handing out system design materials. System planning takes the form of respectful and disciplined discussion. Everybody's opinion is considered. Serious disagreements can result in tabling the issue until the next day or decision by the analyst on the weight of the arguments. Voting would be useless in such a forum, having nothing to do with knowledge and tending to divide the group into competing factions: Professionalism precludes taking any one element of a proposed design too seriously.

Again, everyone's experience is brought to bear on the group problem, and discussions yield quicker and more definite results because of their inclusive rather than serial format. Good design is accomplished by calm and thorough attention, as opposed to the situation currently prevailing, where frequently the analyst is racing faster than he should in his system design in order to stay ahead of the hungry programmers.

Coordination and assignment of various programming tasks also take place here. If someone is having more trouble than he feels he should in his individual work, he may ask for the attention of the group to resolve his problem. The method is flexible and pragmatic, and definite decisions are made and put into practice.

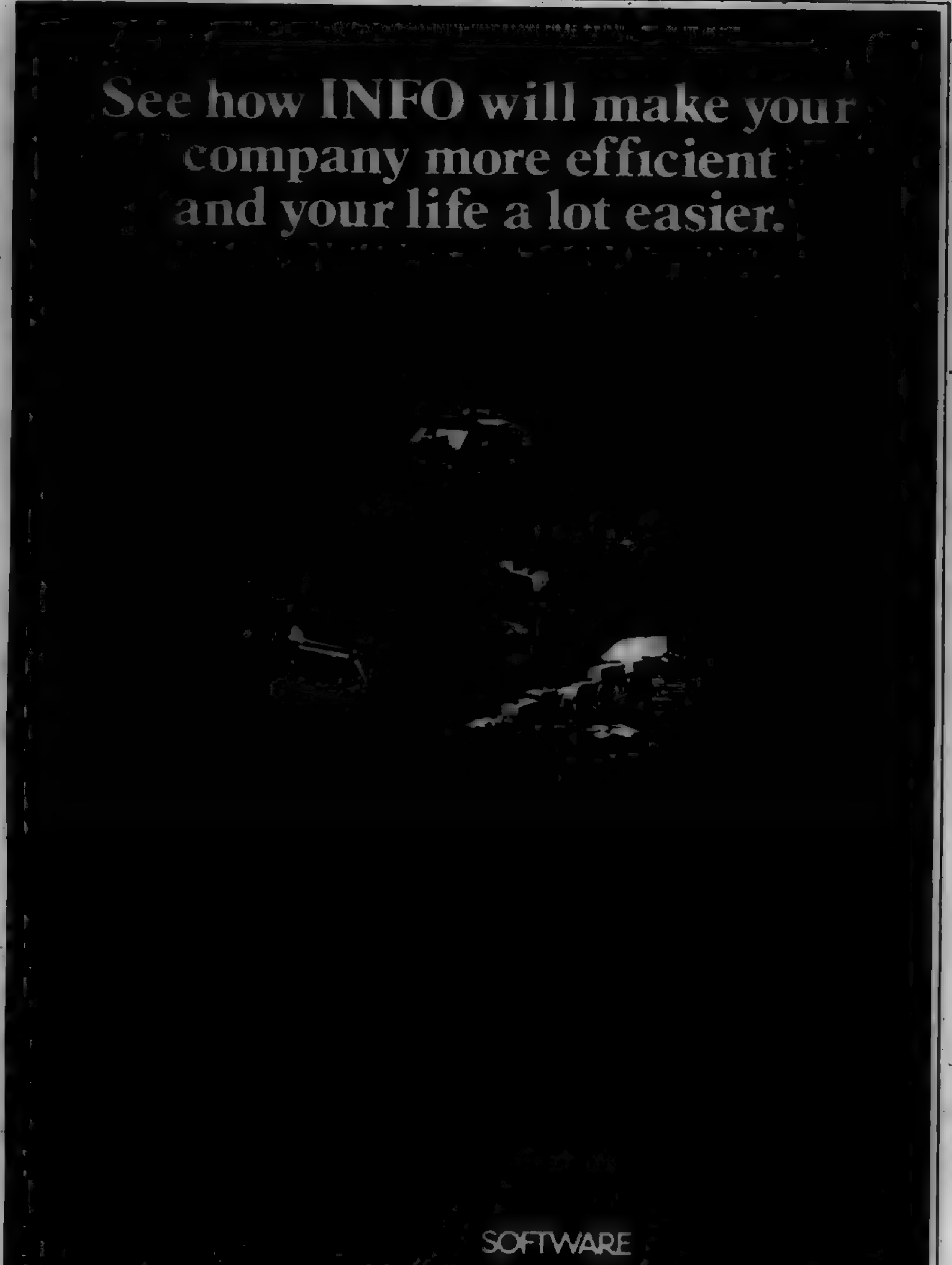
For the remainder of the working meeting, future system development is considered. Perhaps the liaison programmer has heard that vice-president Smith is dissatisfied with his present batch accounts payable system and is exploring available packages. Some conversation goes around the table as to the extent and requirements for an on-line system. The analyst agrees to spend time with the technician programmer getting together rough estimates about how this project could be done in-house. They agree to report back in a week, and the liaison is reminded to stay abreast of Smith's thinking as best he can. Then the meeting comes to an end, having taken about 2½ hours, and the programmers begin their individual work.

To those who contend that such working meetings would take too much time from coding activity, I would answer that nobody can code all day despite good motivation and context, and good motivation and context are generally lacking, lessening coding potential further. Under our hierarchical structure, a programmer can go for months without producing a good day's work, not by his own wish but because of unavailability of information and decisions. A few hours a morning would be very well spent indeed if the time were used to resolve small and immediate problems and get larger work areas started with good design and comprehensive communication.

A test group operating in the framework briefly described here would revolutionize productivity expectations in any medium to large shop. Further, such group procedures could stabilize personnel, spread useful knowledge and responsibility more equitably among programmers, give alert intelligence the chance to take the initiative, decrease reliance upon contractors and create better systems dramatically faster.

About the author

The author has been a programmer for five years, the last two at a major East Coast bank.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IN DEPTH

Peter Benton, apostle of technology

By Susan Blakeney
Director, International News Services

Peter Benton is a self-proclaimed high-tech evangelist. The former director of British Telecom led its 250,000 employees through the organization's turbulent transition from a state-owned, state-run monolith to a publicly held communications giant, a kind of predivested AT&T.

Since leaving British Telecom in 1983, he has been butting heads with power brokers around the world, spreading the gospel of technology with all the fervor of a Southern Baptist preacher.

Benton believes a "true" Common Market in Europe can be achieved by standardizing telecommunications equipment. He believes information technology can lessen unemployment and that society must come to grips with the "information technology concept" in order to enjoy its benefits. Benton claims a full-fledged revolution is needed in the way society deals with technology.

Benton is currently a special adviser to the European Economic Community and also directs the London office of Nolan, Norton and Associates, an American consulting firm that conducts industry research and technical seminars. He was interviewed recently at one such seminar in Tarpon Springs, Fla.

What is your work as special adviser to the European Economic Community?

I concern myself most with the strategic framework for achieving a [technological] infrastructure in Europe. There are two particular areas: creating a pan-European advanced telecommunications network and achieving

CW Photo by S. Blakeney

IN DEPTH/PETER BENTON

full harmonization of standards.

Is British Telecom the UK's equivalent of AT&T?

It is the British equivalent of the old AT&T, yes. Since early December, the shares are about 51% owned by the general public. But prior to that, it went through several phases.

When I was first chief executive officer from 1977 to 1978, it was still an integral part of the Post Office. Then in 1981, there was an act through Parliament that separated Telecom from the Post Office and created a new public corporation, wholly owned by the government, called British Telecom.

The act also removed — or gave the secretary of state the power to remove — the monopoly. Soon after that, another carrier was licensed — Mercury.

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> *It was really a pretty grim situation: The technology was out of date, the organization was monolithic and inflexible, and the unions were very powerful.*

So British Telecom now is, in fact, a monopoly, even though it does not have a legal monopoly in the sense that Mercury is allowed to create networks itself. All the traffic is handled by British Telecom, because Mercury is so tiny that it has really not made any impact.

British Telecom recently lost a joint bid with IBM for Britain's nationwide packet-switching network. What happened?

British Telecom and IBM were making proposals for a new network called Jove, which would be, as originally proposed, initially based on SNA [IBM's Systems Network Architecture], but they committed themselves to making it OSI [Open Systems Interconnection] compatible when the full OSI standards were available.

That network has not been approved, and it is not going to be approved.

You were in charge at British Telecom during the changing of the guard from a government monopoly to a publicly held corporation. What did you accomplish during this period?

Well, I'd like to think I did quite a lot. When I first got there, the technology was entirely electromechanical. There were no electronic switches; it was all clickety click, bangedy bang and absolutely no digital. It was very, very antiquated technology, and the development work for the new range of switches — System X — was in some disarray. It wasn't being properly led, and they weren't getting results.

Also, there had been a government report in 1976 — the Carter Report — which pointed out that it [British Telecom] was very monolithic. I, as the managing director, had a quarter of a million people and absolutely no ability to delegate, because the organization under me was entirely functional. And so a lot of issues came up to my desk, and it was a real heavy work-load job.

It was also in the grip of the unions, and the unions were reflecting their members' fears of new technology and were standing in the way of infusing the technology. It was really a pretty grim situation: The technology was out of date, the organization was monolithic and inflexible and the unions were very powerful.

The first thing I did was a strange and interesting thing. Working with the unions, we put together an audiovisual on the impact of the new technology designed to remove the Luddite fear. The Luddites were the people who smashed up the hand looms in the early 19th century because they feared the new technology.

[The video was] shown to all the 140,000 technical people by their own manager with the union alongside. And that is because the union itself found that the fear of the technology was embarrassing the workers, just as much as it was embarrassing me.

Then in 1979, I did a very interesting thing that had never been done before: I took our 10-year strategic plan, which had been a secret document between me and the cabinet, and I printed 40,000 copies of it without any explications. Every manager was given his own copy of the 10-year plan. And I printed 300,000 copies of a concise version, which every member of the staff was given. And I gave this plan to our customers and customer groups and to the suppliers, the press — everybody knew exactly what we were going to do.

And in that plan, I stated some goals for the creation of the advanced network. For example, one of the first goals was that by March 1983, the 30 major cities would be linked by digital transmission; that by March 1986, the 30 major cities would be linked by switched digital transmission; and that by 1990, the entire network would be digital, and there would be at least five million customer lines on ISDN [integrated services digital network]. We've already passed the 1983 goal, and by March 1986, we will have a switched digital network linking the 30 major cities.

So that was the second thing I did: give the whole corporation a sense of direction and a sense of vision and

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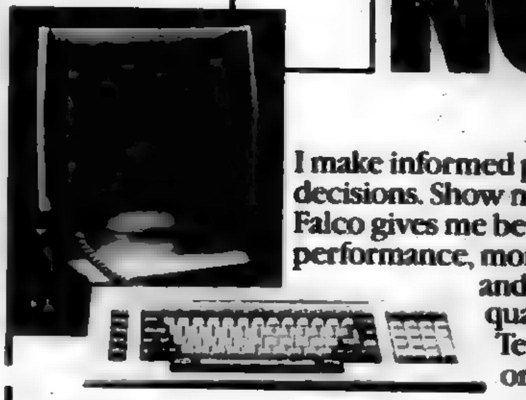

goals. Then the next thing I did was that for five years, I personally selected everybody who was appointed to the top 300 jobs in the corporation, which meant I spent perhaps 1½ days a week interviewing people, because I was absolutely determined that the key posts in the corporation were going to be filled by leaders and not by civil service administrators.

In the old organization, they used to put up as their favorite candidates people whose skill was administering a system, not achieving results. It soon became clear to me that if I left appointments to the system, I would finish up with a lot of bureaucrats, and my organization wouldn't work. So I saved the top 250 to 300 jobs for my own discretion.

In terms of the advanced technology, I don't like to think just of Britain; I think it's a European thing. There's no question that a massive effort is being put forth on several levels. At the European Commission level, there's a program called Esprit, which is about $1.25 billion worth of ideas.

The money comes 50:50 from government and private industry. And then that's matched by national projects — Projet National in France and the British Alvey program. What we're trying to arrange now is that Esprit should act in some kind of coordinating role for the various national programs.

Recently, five European vendors joined together, independently of Esprit and Alvey, to start their own research center. Why are there so many divergent and independent research projects going on? Aren't you wasting energy and resources and duplicating efforts?

> ***The chief executives are all too often just embarrassed by their ignorance, and so they don't expose themselves to understand what the technology can do.***

You can look at it both ways. In America, the joint national effort is quite slim. The only sort of general national direction that's given, I suspect, is from the Department of Defense. Obviously, Europe's approach does give rise to a lot of duplication. On the other hand, there is a great danger in very advanced research of putting all your effort down any particular line, because you may get it wrong.

So I think that I wouldn't claim that we've got the right system, but to try to be overly tidy may well result in leading a whole continent up a blind alley. There's quite a lot to be said for encouraging some national initiatives, so that if the French really believe very strongly in a particular line, for example, they're not forced into some pan-European program when they have their own resources to follow their own inclinations.

There's some very interesting work going on right now. The consulting arms of the 10 PTTs (postal, telephone and telegraph authorities) have put together proposals for a pan-European network at three levels over a period of five years, and I'm sure that will happen. It still needs federal government support, but I'm sure it will come. So from the point of view of creating the infrastructure, Europe will be exemplary. The biggest question is whether European industry will actually *use* the technology and so create the added value.

But people are already using videotex and so much other technology, why would there be any question?

Well, it's an attitude. I chaired the Financial Times Electronics Conference last year. Two very distinguished Europeans there both made the point about the contrast with the U.S., where the users say, "Gimme!" They *demand* the new technology and inspire the producing industry to do new things.

You may have chaos in your system, but you also have market vitality. In the end, that's going to be what counts, because otherwise, having all this lovely technology and all these beautiful networks will just be fruitless.

I've been wondering what one could do to get companies in Britain and Europe to use the new technology. I thought the best thing I could do was to join the leading American crowd and do it company by company — just use one's own knowledge of the nature of the big corporations and the characteristics of the people who lead them (many of whom are my friends and colleagues from the past) and to link this to Nolan, Norton's qualities.

Perhaps this way I could assure a more healthy, more receptive attitude. But that's the big uncertainty, I think, in Europe: whether industry at large will seize the opportunity.

The financial industry is quite advanced, and I think the electronics industry is making use of technology in the area of computer-aided design and manufacturing. But industry outside those areas . . . they're afraid. The chief executives are all too often just embarrassed by their ignorance, and so they don't expose themselves to understand what the technology can do.

What about the U.S. trade restrictions that are currently preventing European users and dealers from getting the equipment they need? The idea is to prevent the technology from seeping into Soviet Bloc countries, but there seems to be a lot of resentment in Europe of these trade practices.

That whole subject is one that is likely to get more complex over the next few years, because what we've seen so far are the problems relating to hardware, and I think that as the software gets more powerful, there may well be issues related to that.

I think that what really upset the European manufacturers is a belief, which may or may not be right, that the U.S. Department of Trade is more expeditious in dealing with export licenses for U.S. companies than it is when dealing with export licenses for European companies.

There's obviously quite general appreciation of the Department of Defense's desire to keep the technology out of unfriendly hands. But I think what is upsetting is that the system has worked in a way that [illegible] discriminatory against non-U.S. companies. It does seem to me that it's pretty heavy-handed, too.

How does the U.S. Department of Trade keep European vendors from shipping to wherever they want?

It's not an area in which I'm a specialist, but many European systems incorporate substantial elements of U.S. equipment that have certain embargoes attached to them. Let's put it this way: I understand the concerns of the Department of Defense, and I have talked with people at very high levels there about it. But it is evident that the system now is regarded as unfair and damaging by many friendly companies and friendly countries. It would be a pity if that situation were allowed to continue unresolved, because it might do more damage to a very important relationship, the transatlantic relationship, than it resolves the issues

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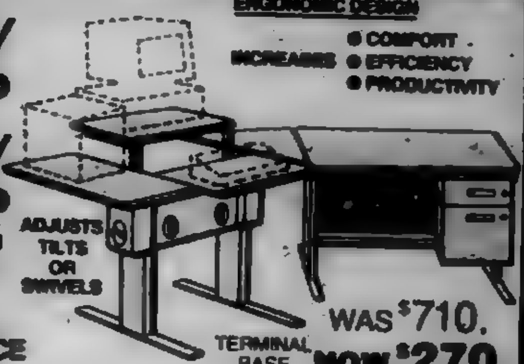

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You've expressed the opinion that many workers in Europe are afraid of high technology. But at the same time, isn't high tech also viewed as a panacea for Europe's economic woes?

Many workers, submanagerial types, are nervous about it, and there are unions who see themselves as having a particular role in making people aware of the dangers. But there are encouraging signs that information technology is creating, rather than cutting, jobs.

At the higher level, I think European governments — certainly France and Britain and probably Italy — are very aware of the importance of information technology to their national economies. The real problem lies with the chief executives of the general industrial corporations and the senior to middle management — their fear of being embarrassed by their ignorance.

It's always a bit of a problem in European industry that senior management distances itself from its troops and from its company. Senior managers are off in some executive-suite world in which everything comes through on bits of paper, and real life isn't encouraged to intrude. I think that's a very bad management style and very, very dangerous.

It's particularly dangerous when a revolution is required, because too many senior managers are out of touch with their companies and their customers, and they're nervous about being embarrassed, about the apparently arcane terminology of information technology.

So, one role that a person like me can play — and I'm not an information technology specialist, I'm a scientist and I run companies — is to act as the middleman between the world of the chief executive and the world of information technology. I think there's a need for that, frankly.

What change, technology or innovation do you consider the most impressive?

What really has impressed me most is the ability of people who appear to be dull and ordinary to respond with electricity when given a vision and a framework within which they can control their destiny. I think that gives a great hope. I still look back on my years at British Telecom as a very remarkable period. It is really quite amazing how 250,000 people who have only recently left the civil service could be this vigorous, sharp-edged, probing, creating, innovating group that one sees there now. I think that gives great hope; if one can do it with a quarter of a million people there, it can be done anywhere.

So it's the people thing, just getting the structure and volition, and very, very great things can be done quite quickly. In five years, you can have a *total* change in attitudes and achievement.

In terms of technology, the really exciting thing is the linking of computing and communications. In my view, the development that's going to be of the greatest utility to the greatest number of people has to be ISDN. There's going to be simultaneous text, graphics and voice communications. What the ISDN is going to offer is 144K bits down the ordinary copper wire into your house. There will be two 64K-bit channels.

Now one possibility is a 64K-bit switch — very low error. Down that one channel you can put compressed voice, you could send graphics and text, and you could use a light pen. So one of my visions here is that I could speak to you in Washington, D.C., or New York, start off conversing by voice and then say, "I'd love you to look at how we're doing in our network expansion." Then I would press a button and pull out of my data base the map of the European network.

I press another button and send it to you, and then you see it there on the screen over the same wire as I talk to you about it. Then I take my light pen and I ring a bit, and as I ring it, it appears on your screen, too. Now I think that combination of voice, text, graphics and light pen communications, which is really going to be made possible by ISDN, is going to be a major utility to every person, not just to knowledge workers. It's going to change the way people communicate.

How fast is Europe moving to ISDN?

What's so pretty about ISDN is that first, it goes with the grain: All the PTTs, for their own internal and operating reasons, are switching over from analog to digital trunk networks. All are doing it, some later than others — Greece is 1995 or something like that, Germany is 1990; we're 1986 and the French are 1985. All of them are moving internally to digital trunk networks, and all of them at a slightly slower pace are moving away from analog local exchanges to digital ones.

The really important thing, the big issue open, is how to get 144K bits out to the customer. Britain's got 25 million copper wires out there, and digital communications needs four wires, not two. So, the technical question is how to get the equipment of four wires working over two wires [without laying] 25 million new wires.

When Britain says that by 1990 there will be universal availability of ISDN, what that means is that by 1990 there will be eight million digital lines on local exchanges. And every local exchange area will have some digital capacity. And there'll be a stock of several million black boxes wherever you are within five kilometers of a local exchange. You just have to say, "I want ISDN," and within two days, bingo!

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Information payoff

> ***The role of information technology, then, will be critical externally in setting marketing strategy and internally in defining organizational design. The chief executive will find a new role as the chief information strategist.***

By Paul Strassmann

Until recently, the technical problems involved in getting computers to do what they were supposed to do at a reasonable cost — the supply side of the computer revolution — have overshadowed the question of whether computers were economically viable. I sense that a major alteration in emphasis is about to take place.

It will be a matter of only a few years before the demand side of the computer revolution will take precedence. Information technology will become so plentiful and so easily installed that management will be able to pay attention to economic objectives rather than concerning itself primarily with the means of getting the jobs done. As this refocusing gradually takes place, the issues of investment levels, payoffs, efficiency and, especially, organizational effectiveness, will become paramount.

There are already good reasons to conclude that there is no direct and simple correlation between management productivity and information technology. They may in fact be unrelated. The preliminary findings of my research raise doubts about the assumptions that managements in the businesses I have sampled so far must have made when they increased their computer technology budgets in pursuit of improved productivity:

- Computers will not make a bad business good.
- Automation is a great cure, but it is not a panacea.
- A bad strategic situation cannot be corrected by automating it.
- Automate success, not failure.

This testing of the concept of management productivity based on value added was completed late in 1983. Forty businesses signed up

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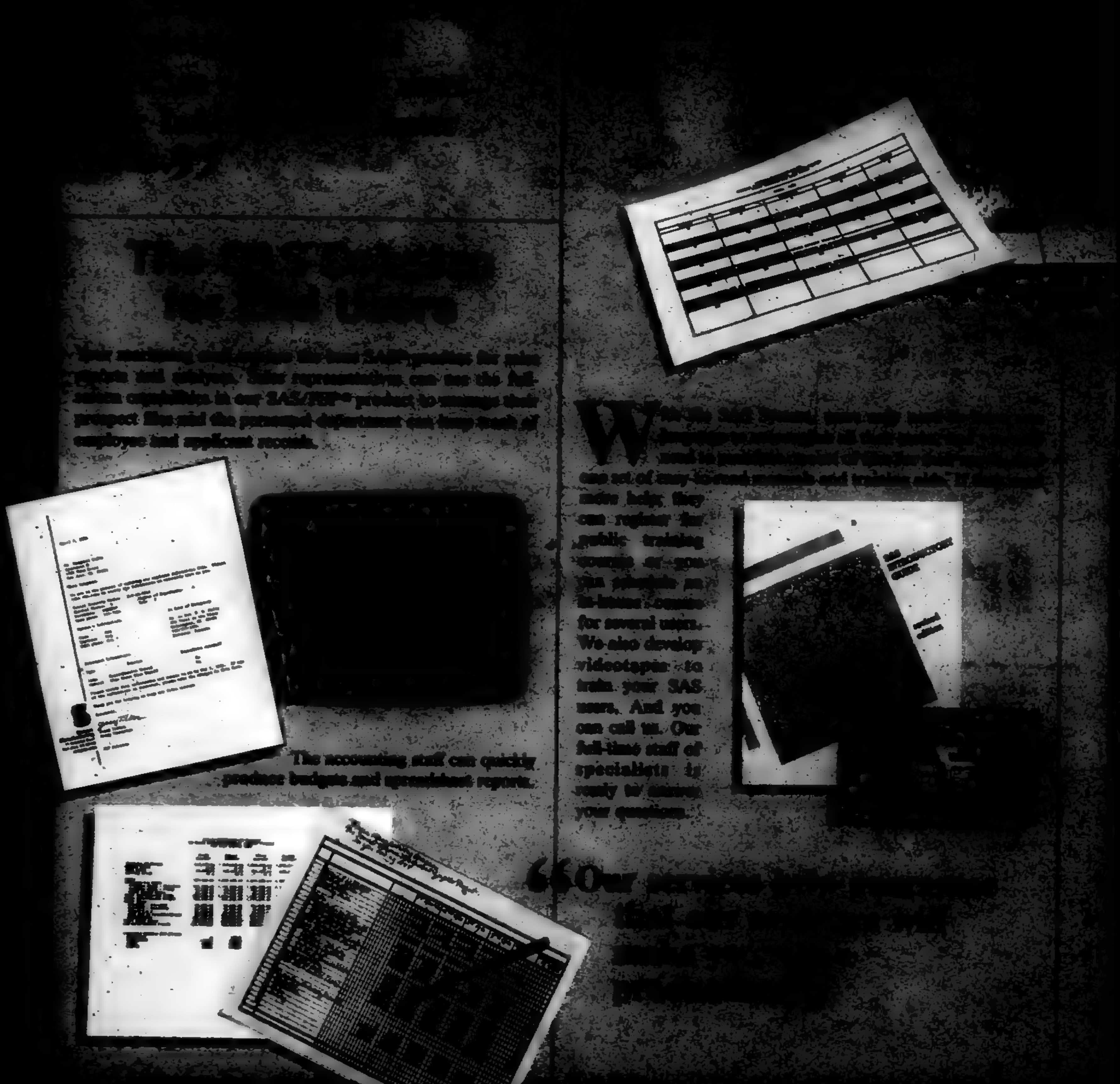

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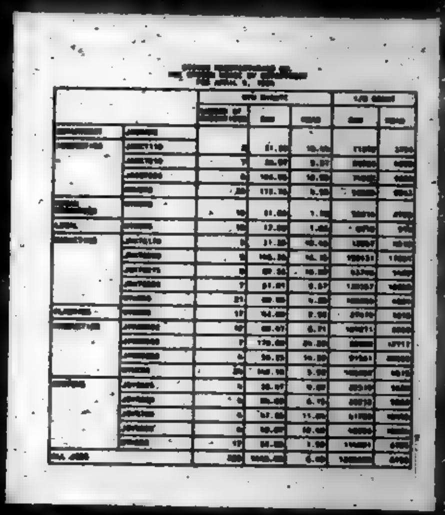

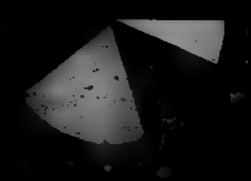

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for the pilot program. They provided detailed data covering the period from 1978 through 1982. Altogether, 200 measurements — each supplemented by information on more than 100 variables describing the businesses — were entered into a research data base maintained by the Strategic Planning Institute.

The primary purpose of the pilot program was to validate the value-added concepts and to test the analytical techniques that link management productivity to information technology. The secondary purpose of the research was to explore whether and how information technology was affected by the strategic position of the businesses.

The research findings apply only to the 40 companies' experiences over the five years under study. The pilot program had only limited data, even though the sample is large enough to be representative of what one may expect in further study. The results are adequate for validation of methodology, but certainly not sufficient to establish definitive rules.

In the absence of any comparable research, the pilot study results are, nevertheless, indicative of certain significant trends:

- *Information technology, as a percentage of management costs, continues to rise.* The median information technology expenditure, as a percentage of total management costs, was found to be 8%. However, total management costs also include external purchases. Therefore, the more meaningful comparison relates information technology expenses to management wages and salaries. The ratio of information technology-related costs (which includes computers, telephone services, programming and similar services) rose from 21.5% of management labor costs to 28.2% over a five-year period for the users in the top quartile. In such firms, information technology became a major share of the administrative cost of conducting business. Such high levels of expense were totally unexpected.
- *Information technology costs showed no correlation with management productivity.* A large number of companies spent less than 10% of management costs on information technology, while delivering 2.0 or better productivity results. There was an equivalent number of companies that spent between 22% and 41% of management costs on information technology while experiencing poor productivity. Then there were companies that spent well over 60% of management costs on information technology. They had, on the average, high productivity — but one could also find instances of very high, as well as below-average, productivity in the sample.
- *Year-to-year increases in information technology expenditures showed improved management productivity if the companies' strategic positions were superior to begin with.* In businesses with an already well-established strategic potential, measured in such terms as market share, product quality or utilization of assets, information technology investments paid off nicely. Year-to-year increases in information technology expenditures were correlated with year-to-year increases in management productivity. Underperformers either did not show improvements or actually deteriorated. Companies with an inferior strategic position showed declining management productivity even with increasing levels of information technology costs.

> *"The rapidity and ease with which text can be moved electronically and then displayed on a [video display unit] has led to the unwarranted conclusion that the 'paperless office' is one of the primary characteristics of office automation."*

The frequently quoted book *Toward Paperless Information Systems* is just one indication of the tremendous interest in developing computer systems that would do without paper. Getting rid of paper is an easily articulated objective. Many leading executives take this objective quite seriously as a simple way of expressing what they are trying to accomplish by computer investments.

In January 1982, I heard the chairman of one of the largest U.S. insurance companies make the pronouncement that by the end of 1983 his company would be free of paper. Although the insurance company did eliminate huge numbers of unnecessary forms and install new computing equipment, there was no noticeable difference in the total amount of paper used in its offices by December 1983.

I think that the chairman was simply appalled by his excessive administrative costs. He should have realized that paper is actually quite cheap and that the truly excessive costs are caused by unnecessary labor expenses. The chairman should have motivated his organization to remedy that problem if he wanted lower administration costs. By going after pages of paper instead, he pursued a merely symbolic goal.

Zealous pursuit of such displaced, instant remedies can actually cause an increase in costs; the effort expended in chasing after pieces of paper may divert attention from the real problems of unresponsive customer service and ineffective organizational design.

The Federal Paperwork Reduction Act of 1980 actually legislated the elaborate annual counting and reporting of pieces of paper eliminated from government transactions. Counting pages of paper while overall costs are escalating and the scope of the government's activities is changing may be of some use.

But it avoids dealing with the more fundamental questions of evaluating the actual results delivered by

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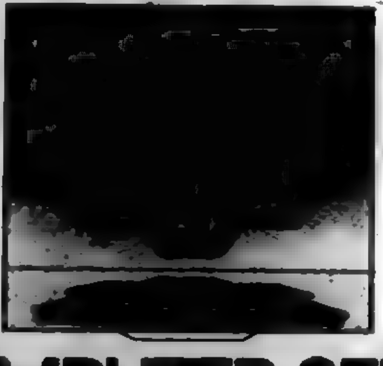

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a government agency. I have examined the annual paperwork reduction reports and found them inconclusive, to say the least.

In an effort to clarify what is fact and what is fiction about the paperless office, I will examine both the economic and the human factors involved.

There is a relationship between the method of office communications and the use of paper. The economics of paper consumption changes with electronic printing.

Office paper usage, per information worker, has been growing steadily since 1946 at a rate about double that of the growth of the GNP. My projected paper-consumption estimate, per information worker, for 1992 is 24,600 pages per year. It is a conservative estimate because occupational shifts continue to favor those personnel who use a lot of office paper. For instance, operations labor — which uses only small amounts of office paper — continues to decline, whereas professional and technical manpower (notorious gluttons for paper, at usage rates of more than 300% of the average) — continues to increase.

We can feel safe about our forecasts of increased paper consumption in the office because of the proliferation of the means to make copies. The number of data processing high-volume printers will most likely increase from the current 250,000 to more than 420,000 by the end of the 1980s. A substantial growth in office printers is also anticipated: from 2.1 million in 1982 to at least 11 million in 1988.

I view electronic printers as highly efficient engines for low-cost printing on paper. More printers certainly generate more paper copies. Moreover, the rapid introduction of VDTs actually promotes the making of copies because VDTs are a very effective means of generating originals. Inexpensive originals breed conveniently produced and inexpensive copies. Copies require paper.

In 1983 I appeared before the American Paper Institute at a meeting devoted to exploring the future impact of electronics on the paper industry. Preceding me on the platform was a consultant with a well-established reputation as an expert on the office of the future. The expert's conclusion was that the VDT screen is so efficient as a means of manipulating text and graphics that people will make much less use of the printed medium in the future. His presentation included about 60 transparencies that he, himself, produced on his personal graphics computer.

To illustrate his point, he noted that at least 240 sheets of paper were saved in the process of preparing his presentation as compared with his prior approach, in which he had to employ a graphic artist to prepare the visual aids. I noted that an unusually large number of transparencies were used during the presentation. The expert agreed: There were so many because they were so easy to produce, he said.

This brought the net savings, based on comparison with old methods, down to only 60 sheets of paper. However, the presentation was executed with such skill that all of the 180 attendees wanted copies of each chart. The result was a net increase in paper consumption of more than 8,000 sheets of paper because of creative use of the electronic medium!

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> *The presentation was executed with such skill that all of the 180 attendees wanted copies of each chart. The result was a net increase in consumption of more than 8,000 sheets of paper because of the creative use of the electronic medium!*

Another way to check on our projected growth rates is to look at the fastest growing part of the office business: computer paper shipments per billion dollars of GNP. Such shipments increase at an 8% compound growth rate. Electronic printing has generated an enormous capacity for printing information at a materially reduced unit cost.

Large organizations are not growing. Nor do they employ ever-increasing numbers of office workers.

One of the theories frequently offered to explain the steady growth in the number of office workers is based on the idea that larger organizations require increasing amounts of information to achieve improved coordination. If this assumption is correct, one should find an increasing proportion of employees engaged in information occupations as the size of organizations increases.

A recent study of this relationship revealed that the fraction of information workers declines as organizational size increases. Similarly, the fraction of managers declines as organizations increase in size from less than 20 employees to more than 1,000 employees.

The trend is unmistakable: Larger establishments employ relatively fewer information workers than smaller establishments. Very small establishments also classify twice as many of their employees as

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managers as compared with large organizations. One way of interpreting this data is to assert that larger organizations are more efficient. Another way of looking at the same statistics is to argue that in smaller organizations, more people can make important decisions. Still another explanation is that smaller organizations are more frequently found in the service sector of the economy, where more managers are required to get the work done.

These facts appear to contradict each other, because they describe only the surface of much deeper changes in employment patterns and in economic performance.

One key to understanding the divergent trends in information employment, organizational size and profitability is to observe how organizations employ information workers as they grow. In small service establishments, for example, most employees are information workers. As service establishments grow, however, they reduce their information worker employment even more rapidly than manufacturing establishments. Consequently, the growth in the number of information workers could not have come about through the needs of large corporations.

The opposite seems to apply. The growth in the number of small service firms has been the principal stimulus to the creation of new jobs for information workers. We employ more information workers because the economy has favored smaller organizations as well as information worker-intensive sectors such as consumer services, government, health and education at the expense of concentrated industries.

With most current economic growth taking place in the service sector, which presently accounts for 71% of total employment and 66% of the GNP, the increased demand for information workers and management personnel is assured.

An increasing proportion of costs for items provided by the goods-producing sector (such as agriculture and manufacturing) is attributable to service intermediaries. When one examines a $2 packaged food item in the supermarket, perhaps as little as $.20 of its price is directly assignable to the goods-producing activities in which farmers, food-processing workers and transportation workers are directly engaged.

Administrative (information processing costs) are tagged on to the price as the product moves from the field to the refrigerator. Produce brokers, produce shippers, receiving and inspection clerks, quality-control inspectors, accountants, auditors, factory managers, warehouse managers, warehouse clerks, packaging-materials designers, brand-advertising agents, shipping dispatchers, supermarket managers, supermarket checkout clerks and advertising by the store itself all add their costs to the item before it reaches the consumer.

> *In the service economy, distribution logistics rather than production costs determine how much information expense is tagged on to the final price of a product.*

> ”
>
> *It is possible to cut services by eliminating information workers, thereby increasing short-term profits. It is equally possible to add new services by adding information workers and thus decreasing short-term profits.*

The full cost of the office work contained in any consumer product cannot be discerned just by examining employment data or by studying the occupational profiles of a particular industry. It is very simple to shift office work from one middleman in the distributive chain to another. To arrive at the total cost of office work contained in a product's price, one must trace the product from initial production to final consumption. The total cost of information then involves tallying up a chain of information-handling transactions.

Whether there are too many or too few information workers in the chain is more a function of the effectiveness with which the entire chain is organized than of how efficient the workers are at any one place in the sequence. If the channels of distribution are changed, even firms with high internal efficiency may be bypassed.

Only if real prices are reduced through simplification of the entire distribution chain does one have an indication that information workers are deployed effectively. With easy transmission of information about customer needs from the retail level directly to the place where the goods originate, the general tendency of information technology will be to diminish the number of intermediaries in the distribution process.

One of the most frequently mentioned ideas about the promise of information technology is that organizational layers within a single company could be substantially reduced. I think that greater attention should be given to the prospect of eliminating costly intermediaries in the delivery of products for an entire market. Ultimately, information technology permits a rearrangement of how goods are distributed on a global scale. Unless a link in the

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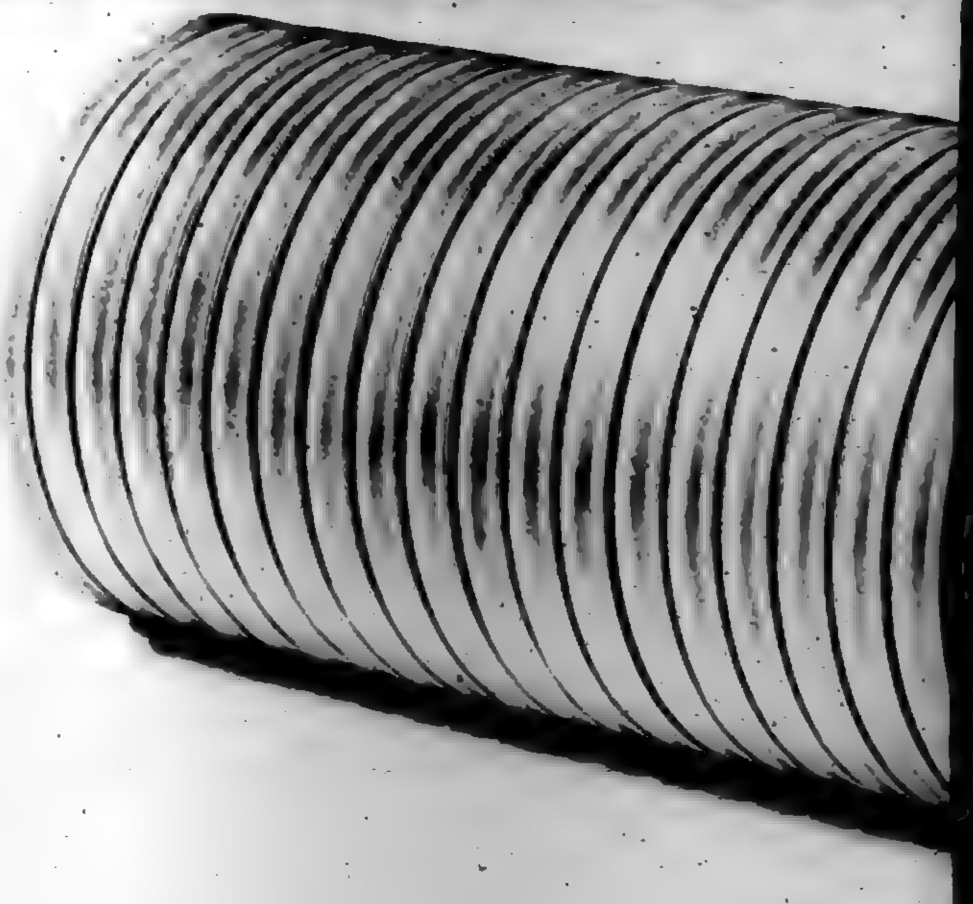

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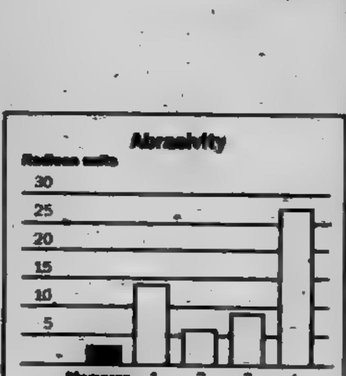

Radicon Test measurements above are obtained by running different computer tapes over an irradiated tape drive head. The higher the count of irradiated particles rubbed onto the tape, the more abrasive the tape.

chain of trades and services adds significant value, information technology will make it possible to bypass it altogether.

Information technology simplifies not only how a single organization operates internally. It makes possible the reorganization of an entire industry to deliver improved value to customers.

The full effects of information technology cannot be evaluated just by observing what happens within the confines of a single enterprise.

It is possible to cut services by eliminating information workers, thereby increasing short-term profits. It is equally possible to add new services by adding information workers and thus decreasing short-term profits. Which option is the right one cannot be answered except by examining the effects that either move will have on the value of the product as seen by the customers.

To understand the shifts in employment patterns it is necessary not only to track occupational data but also to explore the changing structure of the channels of distribution. The exorbitant cost of replacement parts in the construction industry is largely a reflection of an ineffective distribution system. The steady decline in the real costs of electronic components is largely achieved by designing high-quality, standardized products so that they may be distributed through streamlined, global channels.

Information technology investments should be increasingly directed to areas where they can influence the way in which products are marketed. This is why the most far-reaching effects of information technology on the future structure of the economy will depend on how that technology is used in distribution.

The use of information technology in production will be shaped by the needs of the marketplace for products that can be configured, priced and selected through electronic shopping channels. We are moving from a supply-driven economy to a demand-driven economy. The design of information systems will have to conform to this reorientation.

The information worker in the large, supply-oriented organization will be a specialist.

In the future, all products will contain a large share of information value added in their price. High information contents will be included either directly — as in semiconductor components or prepackaged training — or indirectly through information costs incorporated in the cost of the item, as with advertising and research.

All standard products will tend to become competitively priced global commodities. Where there are large opportunities for standardization and streamlined distribution, as in the case of consumer electronics, appliances, pharmaceuticals, automobiles, office equipment and entertainment products, strong forces will favor global consolidation, specialization and concentration of production in a few enterprises. Information employment in the large central organizations will be quite small, prices will decline, and management productivity will increase as essential conditions for sustaining international competitiveness.

The information worker in the small, demand-oriented, specialized organization will be a generalist.

In the case of products or services requiring a great deal of customizing or expertise, such as medical services, government services and education, a strong bias will favor small organizations able to deliver to the customer directly a high proportion of the total value added. To survive, these small organizations will have to maintain easy access to the large supply sources without incurring the costs of passing through too many intermediate layers.

For nonstandard products and services, the largest contribution to the value added will always be closer to the consumer's end of the product pipeline. The closer one gets to the ultimate consumer, the greater the advantages will be for smaller enterprises.

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needs of generalists rather than specialists.

Information technology will be the principal influence on the way service organizations operate. In the case of the small, generalist-based service organizations, information technology will become the means for defining the market segments that such organizations can serve profitably. Internally, information technology will become the means for deploying individuals in their new role as generalists — people who can integrate a variety of products and services so as to add value in meeting a customer's unique needs.

The role of information technology, then, will be critical externally in setting marketing strategy and internally in defining organizational design. The chief executive will find a new role as the firm's chief information strategist.

The whole question of how to improve productivity resolves itself into two issues:

- Can the information sector reduce its charges to the production sector by investing in capital that will increase its own productivity?
- Can the production sector reduce its operating costs through superior management aided by information technology?

Jonscher's analysis gives us an indication of what the answers may be. The first step is to examine the growth rates for each sector for the period from 1947 through 1972. The key growth figure, which relates to the issue of capital investment vs. output, is the 433% increase in shipments from the production sector to the information sector. The net cost gain of the information sector was 370%, while its costs to the production sector were up by 383%.

When compared with a mere 259% increase in purchases by consumers, these extraordinary increases in expenditures by the information sector should be viewed with alarm. The faster growth in the costs of the information sector relative to the production sector means that the former suffered a steep decline in its productivity, despite these large infusions of capital.

The figures on productivity in the production sector are more encouraging. Production sector costs increased only by 213%, while direct sales to consumers went up by 259%. This increase is an indication that the production sector was gaining in relative productivity. Whatever its gains, however, they were canceled by the large increases in costs transferred to it by the information sector.

Business strategy should dictate the choice of information technology. Organizational structure will follow.

Until recently, information system design issues did not require the attention of top management. Management had always been able to assume that a production process determined the configuration of information management tasks. Information jobs were not subject to much change: They were the by-product of simple relationships with operating personnel and with customers. Only flows that concerned products or services warranted any sort of formal design.

Some workers were aided by machines and some were not. Who got such equipment was easily determined by economic analysis on a case-by-case basis.

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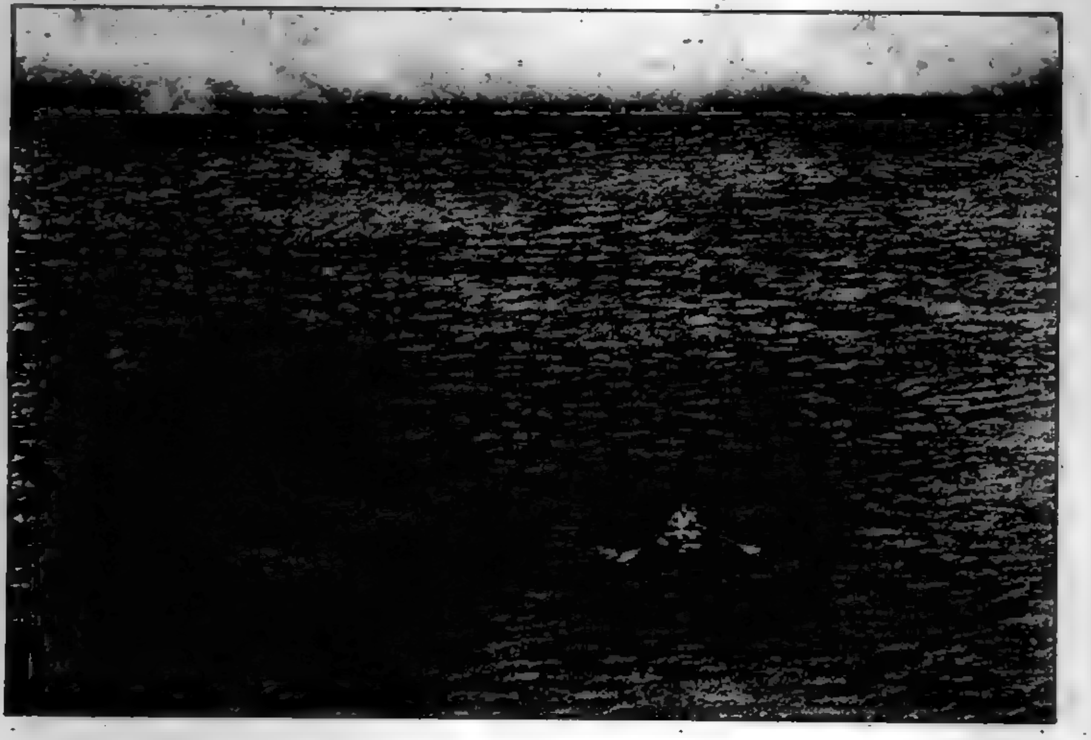
If information questions figured at all in this design, they related to questions of control, auditing and managerial prerogatives. The command structure remained simple. Efficiency was achieved through disciplined execution of operating functions. Information about the firm's environment, customers, suppliers or competitors was gathered



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by the marketing and purchasing divisions — and then left to be evaluated by central management, which alone interpreted what information was provided.

In this way, management reinforced its role as the source of all important decisions.

Information technology requires that organizations be deliberately designed rather than allowed to evolve spontaneously.

Computer networks are well suited to moderating conflict by means of instantaneous evaluations of complicated alternatives. For instance, an organization may experience contention between channels of distribution attempting to accomplish the identical marketing mission. Rather than install rigid rules that cannot adequately discriminate among unique cases, all parties can simultaneously view the short as well as long-term consequences of proposed alternatives.

To design job relationships that do not discriminate between management and operating tasks, information technology should be available to everyone. There will have to be an easy relationship between man and machine, so that choices about the characteristics of each personal machine can be made by the individuals concerned from modules that can be arranged to suit their needs.

If this is the case, individuals performing both management and operations tasks can deal with a diversity of customers by mixing and matching what is needed for their own personal workstations from a supply of readily available software. Such workers do not require a high degree of technical expertise to make the necessary choices. They are able to assemble and try out a variety of software from a central library of standard procedures representing the accumulated knowledge capital of entire organizations.

The modules representing central know-how, shared data bases and shared techniques fit together only if there is a common architecture allowing people, machines and standard software to work together without large added costs for integration. Even though the term "information architecture" is ordinarily applied in an exclusively technical sense to describe how terminals and computers transmit messages back and forth, I am using this term in a much broader sense. From the standpoint of organizational design, information architecture is really the plan an organization chooses to give its members access to data, to enlarge the scope of an individual's responsibilities by means of acquired software and to determine who can access another's electronic files and under what terms.

The plan also provides guidance on how to insert safeguards against erroneous electronic transactions, how to ensure a consistently high quality of work without electronic surveillance, how to test systems modifications without damaging the network and how to stimulate the exercise of personal initiative in an environment that is abstract and machinelike.

Positive surveillance

Information architecture in this sense also involves the design of a system that can monitor an individual's work electronically to create personal incentives or attribute productivity gains. Whereas electronic surveillance can be viewed as a repugnant and undesirable feature of electronic networks, we should also recognize that a computer is ideally suited for a person to keep score of his own accomplishments (or errors) so that he can channel his efforts in the most constructive directions. Architecture, then, includes rules about appropriate behavior in an electronic environment.

A deliberate system design pays due regard to how people and machines interact. For instance, it defines what patterns of behavior should be cultivated so that computer workstations are not viewed as omnipresent time-motion study engineers — or perhaps even as policemen. It specifies how electronic communications with customers should be organized so that an individual aided by a workstation can act autonomously and make legally binding agreements.

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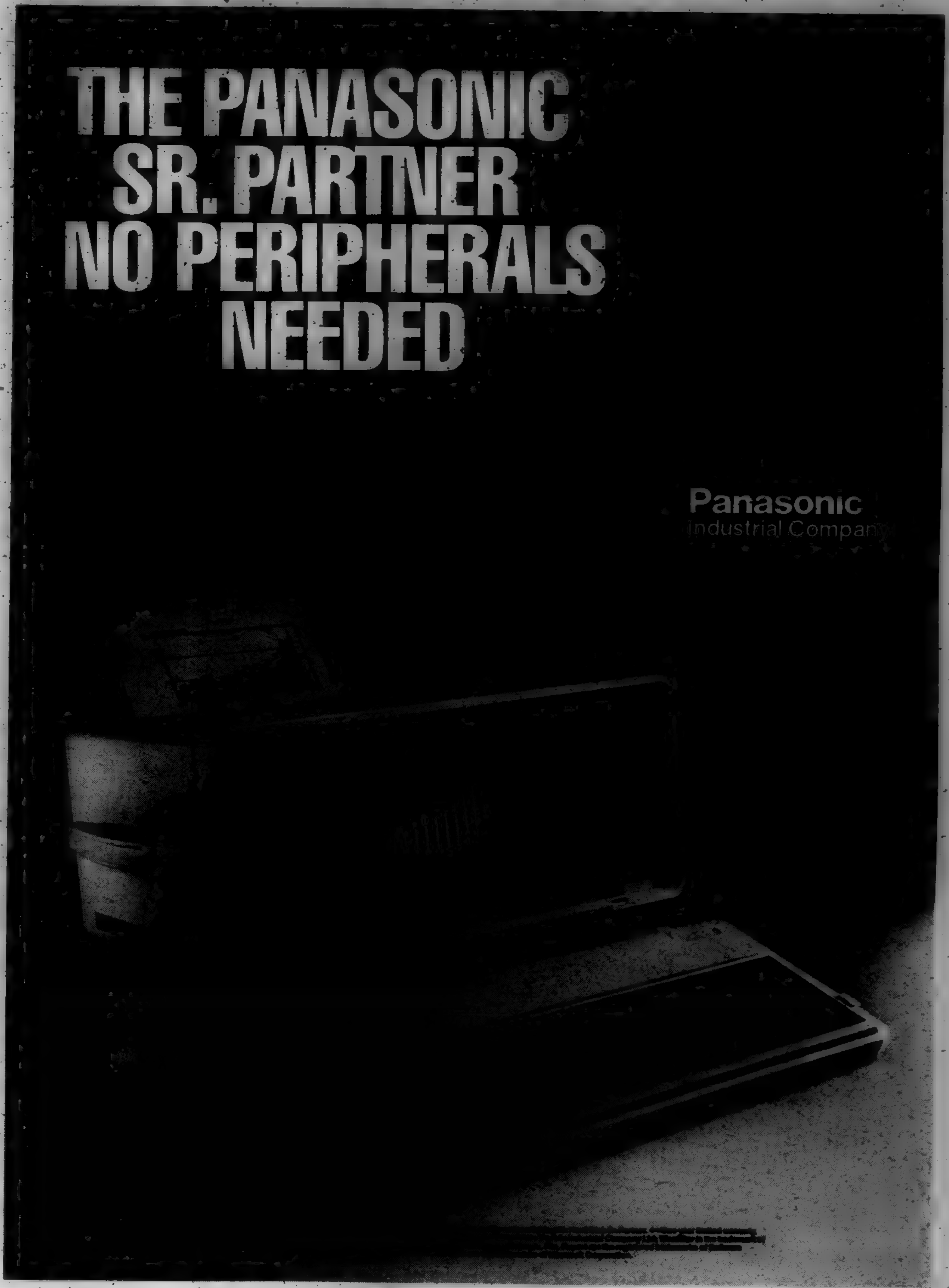

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> ***Organizational design must recognize that information technology will totally transform traditional roles. Executives will be upgraded from investors to planners. Managers will be upgraded from coordinators to investors.***

all customer requests. Competitive advantage in the service sector will then depend on its personnel's superior information-handling capabilities in satisfying customer needs. To this end, system design must focus on helping people to apply their fullest skills rather than on optimizing the computer system's own technical performance.

Such design stimulates the personal initiatives of its operators by means of rapid feedback. For example, this kind of system provides rapid (less than one second) access not only to local data bases but simultaneously to remote computers and multiple telephone contacts as well. The design informs the operator whether he is delivering an improved service to the customer. An indication as to payoffs is included along with every customer transaction.

Future organizations will need more, not fewer, managers.

Information technology is supposed to dispense with much of the need for middle management. Mechanization of engineering work is supposed to decrease the number of engineers needed. Prognosis after prognosis reiterates the simple formula: If a computer can do what X does, then X will not be needed any more.

Such simplification is based on a static view of business and on limited perceptions about the roles of people in the economic environment of the future. I am convinced that with growing use of robotics in factories, the fraction of information workers will increase from the present 56% to more than 70% by the year 2000. The U.S. work force can also be expected to grow to more than 140 million by that date. Simple arithmetic shows that at least some information worker occupations will have to expand enormously.

Current trends do not support forecasts that the numbers of managers will diminish. On the contrary, all detailed observations suggest that management positions increase with office automation. What adds to the confusion is that as old management jobs are eliminated, the dynamics of the process that creates new management jobs are not as well understood.

Changing work roles

Information technology will ultimately result in a complete overhaul of present management roles. Along the way it will create a large array of vastly more productive jobs. In this process of creative destruction, the weak link is the middle manager, about whose fate everyone is so worried. Indeed, concern about the continued viability of the manager as a coordinator of specialists is justified.

More than two-thirds of the contemporary manager's time is expended in passing intraorganizational information to others. We know that most of these tasks can be performed much better through computer networks. The role of the manager as a coordinator and as an information intermediary will largely disappear — in its place we will see the manager assuming an important role as an investor.

With the advent of the information middleman, enormous operational efficiencies in the handling of information work will be realized. However, rising costs of labor will make it necessary to devote an increasing share of a firm's revenue to investments in the future, rather than just to cover current expenses.

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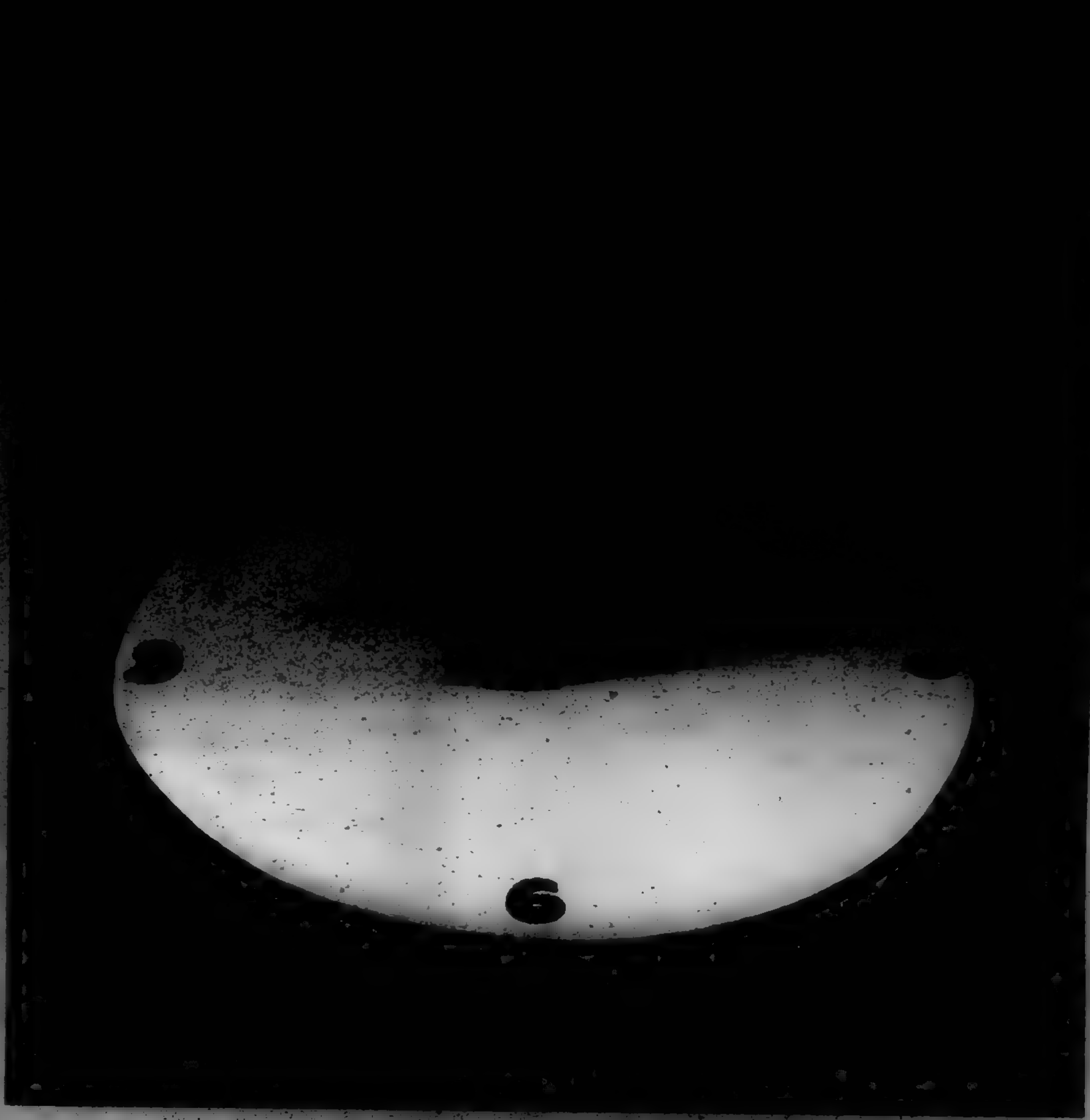

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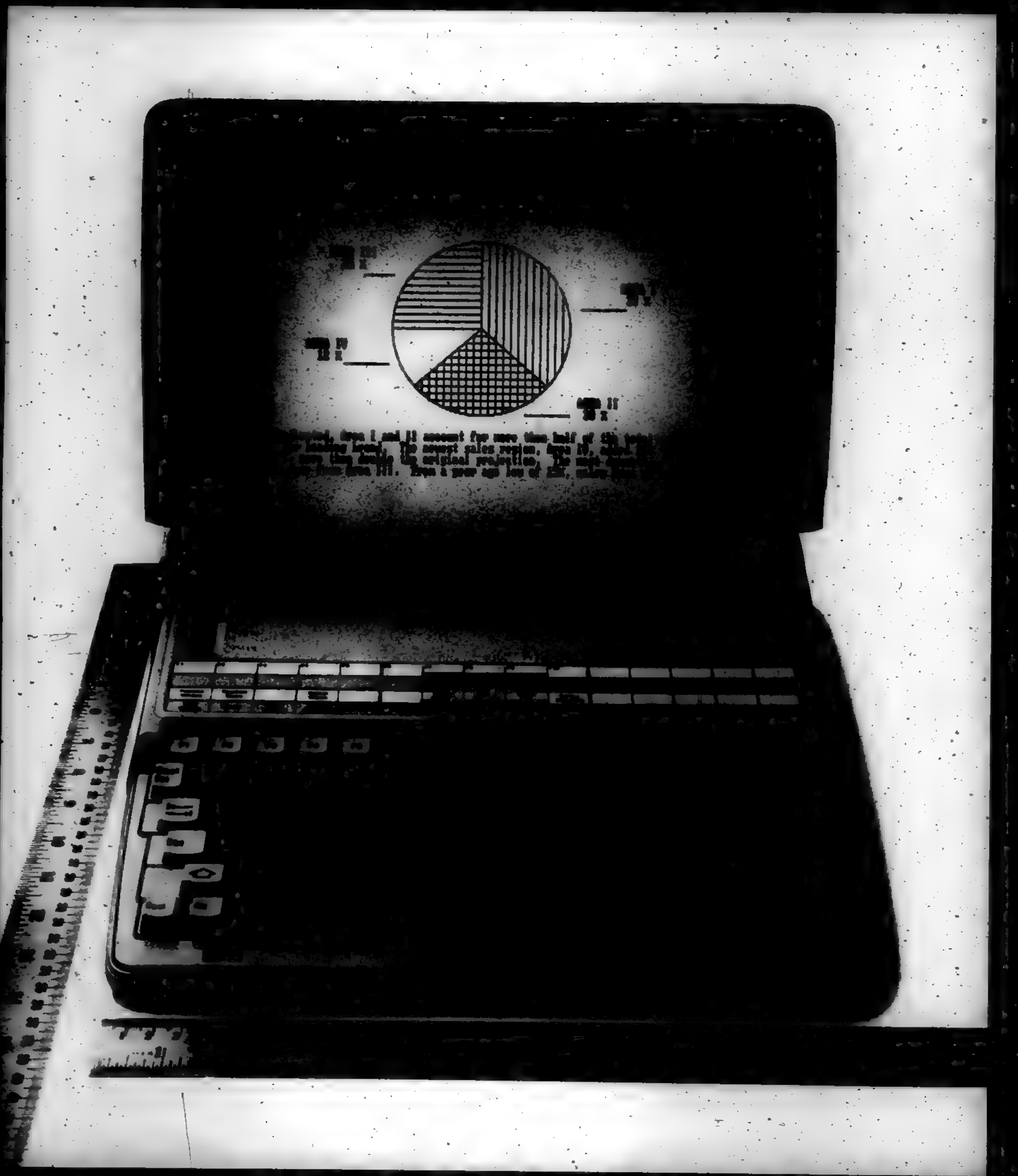

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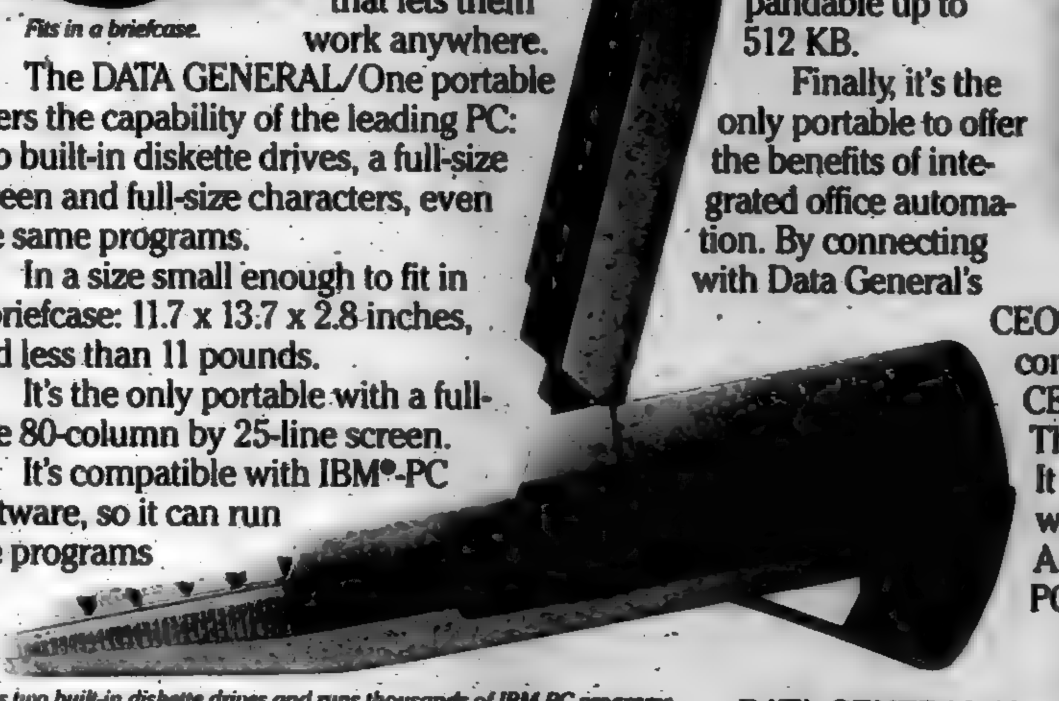

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This capital expenditure will not apply to information technology alone; it will apply even more to investment in human capital. A great deal of management time is needed to provide proper guidance for activities such as training for quality, growth and work enlargement, building up an individual's experience on the job and reducing employee turnover through leadership-inspired motivation.

None of this can be done by means of a computer program. The manager of the future will have more work to do than anyone dreams of today. The ranks of management will expand, not shrink, although the manager of the future will have to possess distinctly different skills from those presently required.

The manager of the future, in his role of investor, will take over many of the responsibilities presently cloistered in the executive suite. As long as investment decisions were essentially of a financial nature, it was possible to restrict them to top executives. Managing investments made in people can be done only where those people are. With most of the investment decisions out of the hands of top executives, they will finally have time for their truly essential role: to be the planners, strategists and creators of a unifying vision of the enterprise and articulators of a shared language that binds the parts into an integrated whole.

The top executive can then concentrate on his role as innovator and entrepreneur. With a large increase in the number of small to medium-size enterprises in the future, I anticipate an expansion in the demand for people who can fill executive and management jobs. The fraction of the total work force in executive and managerial jobs can be expected to increase from the present 11% to perhaps as much as 17% of a work force larger by some 40% just 20 to 30 years from now.

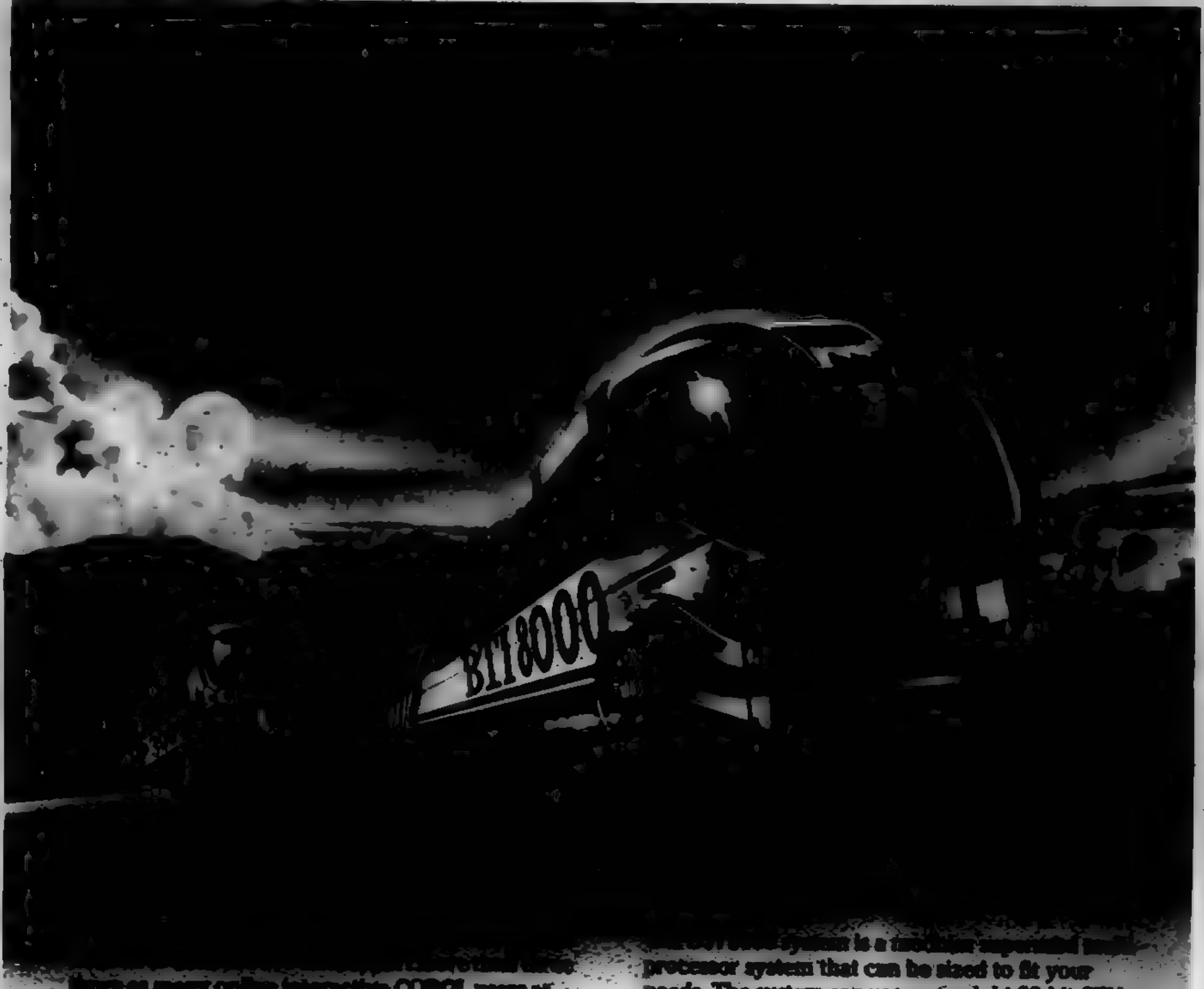
The greatest changes in work patterns will be found among professional and technical personnel; they presently account for 16% of the total work force and can be expected to rise to 24% in the next two to three decades. They will be the largest occupational group, delivering most of the information services that our high-tech society will require in such large quantities.

The rise in average compensation levels for this group will lead the average increase of per capita income for the entire society. In contrast to current fears that a high-tech society may become a two-tier society, the professional and technical group will create the conditions for a large concentration of highly paid wage earners at the middle of the income distribution curves.

Professional and technical people will change their current roles as specialists, controlled in every respect by their coordinators/managers, to become generalists who include many traditional managerial functions in their everyday work. They will provide full service to customers, rather than just working on small fragments of it. They will be the equivalents of the factory of the past — except that now they will be delivering both producer and consumer services, rather than producer or consumer services.

Their jobs will expand in complexity. Due to the fast pace of technological change, their know-how will be subject to rapid obsolescence. Consequently, this group will become large consumers of training and education. A significant portion of their time, perhaps as much as one-fourth, will be devoted to improving their work skills.

Designing organizations of the future cannot proceed on the assumption that this change merely involves rearrangement of existing occupations and skills. Organizational design must recognize that information technology will totally transform traditional roles. Executives will be upgraded from investors to planners. Managers will be upgraded from coordinators to investors. Professional and technical personnel will be upgraded from specialists to generalists engaged in organizing the delivery of services to customers. Clerical personnel will be upgraded from support staff members to specialists in the delivery of information services. Sales personnel will be upgraded from distributors of information to general managers of customer care and



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retention. Only such upgrading can create organizations that will deliver increased value for everyone — lower prices for customers and higher income for the work force.

The history of information technology can be characterized as the overestimation of what can be accomplished immediately and the underestimation of long-term consequences.

The attitudes of information technology managers are a curious mix of overoptimistic faith in the power of the latest technology, blended with a totally conventional view of what the ultimate results will be. I call this peculiar syndrome "technological macromyopia." The costs of the next technology project will always be underestimated. The implementation lead time for the latest product will always be much longer than expected.

The choice of technology may be almost the last matter to be decided. This critical point can be illustrated by the following case. A few years ago, a government agency built a model computer system to solve its severe administrative problems. As time passed, the people operating the system became mere appendages of the computer, because all available investments were absorbed by the drive to achieve maximum automation of even the most trivial clerical tasks.

The technology's design dictated that operations personnel should perform increasingly narrow and mindless tasks. The cumulative investment in the software and computer equipment was compounded over a long period of time. When external changes imposed new demands, they could be dealt with only by squeezing new requirements into old procedures.

After a few years, obsolescent technology and rigid organization finally caught up with the system. Employee dissatisfaction rose. Failure and error rates reached scandalous levels.

At this point, both the system and the people operating it lost all adaptability to evolutionary change because their energies were fully taxed just keeping the indispensable system from falling apart. Consultants recommended that a brand-new system be built at another site to replace the existing technology as well as the existing organization. Those running the current system had to be motivated, however, until the new replacements were ready.

The cost of creating a duplicate environment was enormous — and the human costs associated with job displacement were astronomical. Needless to say, the entire project collapsed when those operating the old system found it easy to make the new system fail. The government agency in question has not yet recovered from the ravages of this experience.

> ***The choice of technology may be almost the last matter to be decided.***

The lesson to be drawn from this story is simple: Do not let technological priorities get ahead of organizational consequences. In any information system, the value of the people operating it will always be worth much more than the accumulated hardware and software — unless a deliberate decision is made to reduce the people to mere appendages of the computer.

If most maintenance expenses are allocated to the advancement of technology rather than to the development of people, someday the penalty will have to be paid. Obsolescence is a term applicable not only to technology. People and organizations also age. A computer system never becomes obsolete because electronic circuits cease to work but because people cannot use it effectively anymore.

Sometimes this is due to changes in the external environment. In my experience, it happens primarily from internal causes. When external failure is finally analyzed, it comes as a revelation that the system had been rotting from within for a long time.

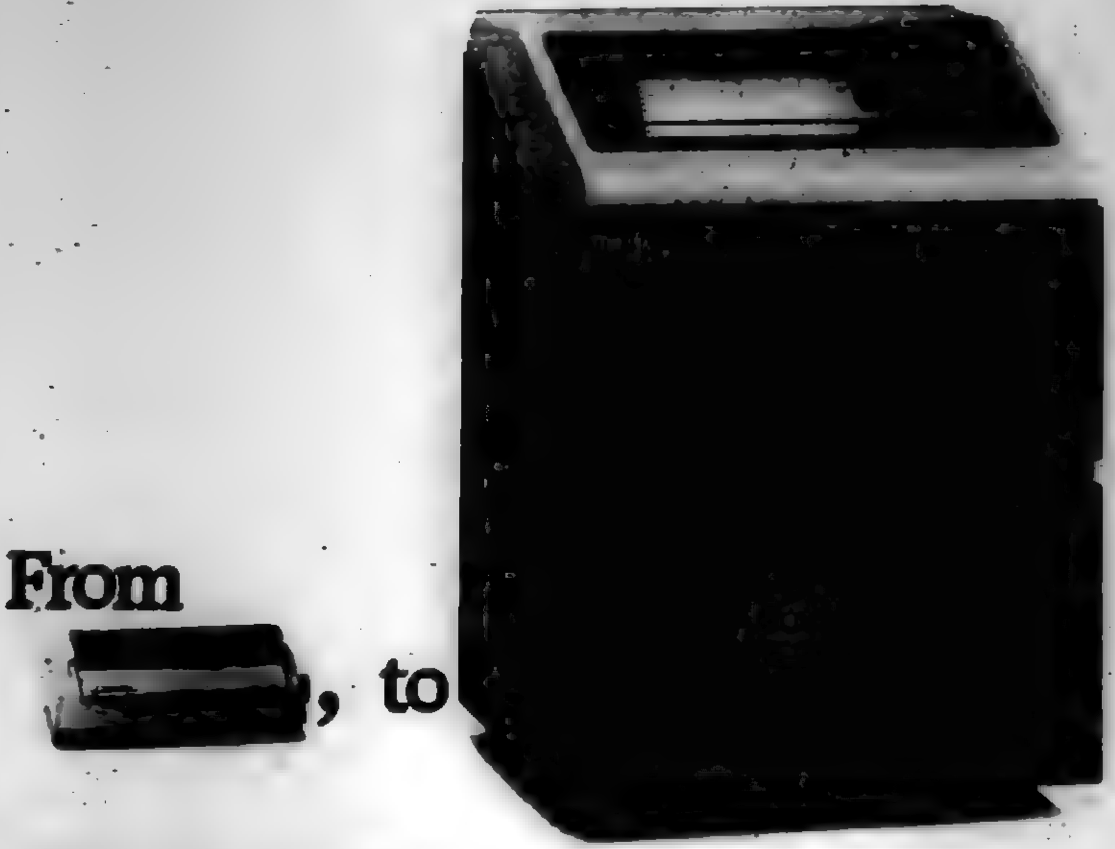
Rigidly organized applications, administered by organizations that do not develop their personnel to meet new challenges, add up to a sure prescription for disaster.

Managers who want to learn more about making investments in computer technology usually sign up for studies in computer literacy. This endeavor may enhance their general education, but it will waste their time in other respects. The proper way to learn how to manage computers is not to study technology per se. It is more important to learn how information technology can be shaped to meet the needs of organizations.

The sequence, evolution and application of information technology must be secondary to the pursuit of managerial objectives. Knowing something about bits and bytes is not a bad idea — unless it leaves the manager with a case of technological macromyopia. The role of good managers is to integrate diverse demands for internal resources so that the entire organization succeeds in using information technology to improve its competitive position. Always subordinate technology to business strategy.

About the author

Paul A. Strassmann is vice-president of the Information Products Group at Xerox Corp.



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DATA STREAM
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Appletalk sets micro net trend

Unconventional by today's standards, Apple Computer, Inc.'s recently announced Appletalk local-area network portends a new trend in local networking where all that must be done to connect nodes to the network is add a small device that puts the signal on the cable and add communications software that runs on embedded silicon.

The simplicity of this approach — as compared with the normal requirement to dissect computers and add a special interface board — is particularly appealing when networking microcomputers.

Personal computer networks are important in the broader scope of things because, from today's perspective, it seems that most users will initially employ local networks to support personal computer clusters rather than opting for a buildingwide net. When needed, these network islands can be tied into a corporate network through a gateway or a private branch exchange or strung together with a high-capacity premisewide backbone network.

Simplicity of use is probably more important to personal computer network acceptance than cost, although Apple has also crushed that barrier. It overcame both hurdles by embedding three communications chips in its Macintosh personal computer: a programmable Zilog, Inc. 8530 serial communications controller, an RS-422 driver and an RS-422 receiver.

The only hardware needed to interconnect Macintoshes with Appletalk is a $50 transceiver and a cable that contains a single pair of shielded, twisted-pair, telephone-type wires. The transceiver connects to the Macintosh's printer port and has two female connectors, one each for adjoining Macintoshes. Appletalk is self-terminating so that the last processor in such a daisy chain does not need a special terminating device.

Up to 32 Macintoshes can be supported in a single cluster that doesn't exceed 1,000 feet. Each processor vies for access to the network, which operates at 230.4K bit/sec using a Carrier Sense Multiple Access with Collision Avoidance access method. Data is packetized to be shuttled across the network by software. It is this software, in combination with the embedded silicon, that enables the network connection to be so inexpensive.

Besides the Macintoshes, other devices meant to be supported by Appletalk are also intelligent, including a concurrently released laser printer called Laserwriter and a file server under development. The roughly $7,000 Laserwriter, for example, is based on Motorola Inc.'s 68000 microprocessor and contains 1.5M bytes of random-access memory and 0.5M bytes of read-only memory. By bundling intelligence into attached devices, instead of the network, a higher level language can be used for communications.

See APPLE page 86

RCS-100 switch enhanced

Atlantic Research's X.25 net system, recorder, CRT system join switch's new criteria

Atlantic Research Corp. has announced an enhancement for its RCS-100 Remote Control Switch and three products, the Xpert Packet Terminal System, the CRT Controlled Remote Fallback Switch System and the Interview 20R Data Recorder.

The company announced an automatic switching criteria for the RCS-100, which is said to provide automatic restoration of failed circuits without operator intervention.

The RCS-100 performs remote crossover, spare and group switching of two-, four-, six- and nine-wire analog circuits and two-channel and two-wire coaxial circuits, according to the vendor. It can reportedly be controlled by a touch-type telephone, a CRT terminal or locally.

The RCS-100 is modular, costing $3,500 for every 16 circuits.

The Xpert is said to be the first terminal designed for X.25 networks, allowing interaction with up to four different host computers at the same time. It was designed to emulate IBM 3270, Digital Equipment Corp. VT100, graphics and Ascii devices. It reportedly allows the user to switch back and forth between data sources with a minimum of keystrokes and requires no protocol converters or packet assembler/disassembler.

Xpert costs $2,995.

The CRT Controlled Remote Fallback Switch is said to provide local and remote control of existing Atlantic Research Data/Patch patch-switch and switch systems. The switch reportedly displays a system map and circuit status and provides a starter approach for service restoral at unattended sites. It costs $2,000 for an entry-level system and $8,000 for 100 circuits.

The Interview 20R Data Recorder is designed to minimize service calls when it is left at a remote site and accessed through a dial-up modem. It captures data and sends it back to a central site for analysis. It costs $3,950, plus $500 for the unattended remote option.

Atlantic Research is located at 5390 Cherokee Ave., Alexandria, Va. 22314.

Bridge Communications adds server to give session-level Ethernet records

MOUNTAIN VIEW, Calif. — Bridge Communications, Inc. has announced a network management server that provides complete records of session-level activities for Ethernet local-area networks.

The NCS 150 Network Control Server, which will be available March 1, is priced at $5,900 and provides audit trails on-line or in hard copy for devices attached to local networks. A connection record is generated when a terminal session is first established, recording the time of the connection; the two units involved such as terminal to host, terminal to terminal or terminal to gateway; time of disconnection; the status of the disconnect; and the number of bytes or packets transmitted during the session.

The NCS 150 will also set off an alarm at the time of system overload, contention backup or if printer thresholds are exceeded. Typical transmission speeds through the NCS 150 are 9.6K bit/sec and 1.54M bit/sec, said William Carrico, Bridge Communications president.

The NCS 150 incorporates all the features of the NCS 100 server, which loads operating system software, configuration files, resource names and utility programs from its 1M-byte disk drive. The NCS 150 and NCS 100 can support up to four communications servers, each of which can support up to 32 terminals or a total of 120 plus terminals.

The NCS 150 is compatible with servers supporting the Ethernet standard (802.3) at the physical and data link layer.

Bridge Communications is located at 1345 Shorebird Way, Mountain View, Calif. 94043.

USC business school plans telecom center

LOS ANGELES — The business school at the University of Southern California (USC) has announced its Center for Telecommunications Management.

The school plans to offer an executive graduate degree program in telecommunications management with a business school orientation beginning in the next school year. The program will focus on case studies, seminars, guest lectures, travel and topics such as technical issues, regulation and deregulation, competition, markets and customers.

According to Center Director Jagdish Sheth, the center will conduct numerous telecommunications-related seminars and workshops and an annual international conference and will produce several publications and newsletters.

The Center for Telecommunications Management is located at the USC School of Business Administration, Los Angeles, Calif. 90089.

Case Rixon introduces Beeline system in U.S.

Case Rixon Communications, Inc. has announced that its Beeline Electronic Mail Exchange, introduced in the UK 18 months ago, is now available in the U.S.

Based on Motorola, Inc. 68000 microprocessors, the Beeline system uses a Case DCX Data Concentrating Exchange as a front end and is said to provide private mailbox and electronic mail facilities for existing terminal devices.

The system can be accessed locally or remotely using dial-up or dedicated lines. Mailboxes can be accessed from virtually any type of terminal device, including personal computers and word processors, telex/TWX lines or packet-switched circuits.

Prices range from $50,000 to $100,000, depending on the number of users and features desired. Beeline supports up to 1,024 ports.

Case Rixon Communications is located at 2120 Industrial Pkwy., Silver Spring, Md. 20904.

- Paradyne Corp. has announced its HDX 12000, a 12K bit/sec switched-network modem for half-duplex, point-to-point applications and the FDX 2400 2.4 bit/sec full-duplex modem/82
- Racal-Milgo, Inc. has announced Localink, which is said to allow data to be transferred over standard intrafacility telephone lines without disturbing simultaneous voice communications/82
- Interlan, Inc. has introduced an integrated network terminal server for use with Digital Equipment Corp. VAX-11 superminicomputers running DEC's VMS/86

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Controllers/82
Voice/Data Communications/82
Protocol Converters/82
Multiplexers/Modems/82
Local-Area Networks/86

CONTROLLERS

■ Morning Star Technologies has introduced its Horizon series, a board-level communications processor that can support two new communications packages.

The communications processor, Model 200 Multibus, is an intelligent processor designed for supermicrocomputers that utilize IEEE 796 Multibus standard structure, the vendor said.

The processor reportedly features a Motorola, Inc. 68000 microprocessor; 128K bytes of random-access memory (RAM), which can be expanded to 512K bytes of RAM; two synchronous data communications lines; and a direct memory access interface to the bus, Morning Star Technologies said.

One communications package, MST/Hasp, provides full-featured file transfer capabilities, and the MST/X.25 features packet-switching protocol support. The Multibus processor sells for $2,500, the MST/Hasp software is priced at $2,400, and the MST/X.25 package costs $3,000, according to the vendor.

Morning Star Technologies, Suite 204, 4510 Kenny Road, Columbus, Ohio 43220.

VOICE/DATA COMMUNICATIONS

■ Racal-Milgo, Inc. has announced Localink, which is said to allow data to be transferred over standard intrafacility telephone lines without disturbing simultaneous voice communications.

Localink allows a company to install a terminal using existing telephone wire as its line, the vendor said. The product reportedly features protocol transparency, full-duplex capabilities, transmission distances of up to four miles and transmission speeds up to 14.4K bit/sec.

Localink reportedly is designed for use in point-to-point communications or in conjunction with Planet, Racal-Milgo's private local-area network system. Localink costs $500.

Racal-Milgo, 8600 N.W. 41st St., Miami, Fla. 33166.

PROTOCOL CONVERTERS

■ Diversified Data Resources, Inc. has announced a 32-port version of its Hydra II, a direct channel-attach protocol converter and controller that works with IBM mainframes.

The product attaches to the byte channel of IBM hosts and provides IBM 3278 and 3279 terminal emulation for microcomputers and Ascii terminals, the vendor said. Ascii printers that emulate IBM 3286, 3287, 1403 and 3211 printers are reportedly also supported.

The 32-port version of Hydra II, available in rack-mounted or standalone models, sells for $13,900.

Diversified Data Resources, Suite 7, 25 Mitchell Blvd., San Rafael, Calif. 94903.

MULTIPLEXERS/ MODEMS

■ Paradyne Corp. has announced its HDX 12000, a 12K bit/sec switched-network modem for half-duplex, point-to-point applications; and the FDX 2400 2.4 bit/sec full-duplex modem.

The HDX 12000 is said to be an advanced signal-processing modem for synchronous data transmission over the public-switched telephone network. It reportedly includes an automatic fallback to 9.6K bit/sec. It is scheduled for first-quarter 1985 delivery and costs $3,600. The FDX 2400 is said to be a 2.4 bit/sec full-duplex, autodial modem designed for two-wire public-switched telephone network applications.

The FDX 2400 reportedly automates call connection, information transfer and disconnection for synchronous or asynchronous host-to-terminal and terminal-to-terminal applications. The modem reportedly features dual RS-232C ports for continuous access and use of synchronous and asynchronous terminals for synchronous host-terminal communications and traditional asynchronous communications.

Also scheduled for first-quarter deliver, FDX 2400 costs $805, Paradyne said.

Paradyne, 8550 Ulmerton Road, Largo, Fla. 33540.

■ Coherent Communications Systems Corp. has introduced its DSM-32 Digital Speech Plus Data Multiplexer for use with 56K or 64K bit/sec wideband digital circuits.

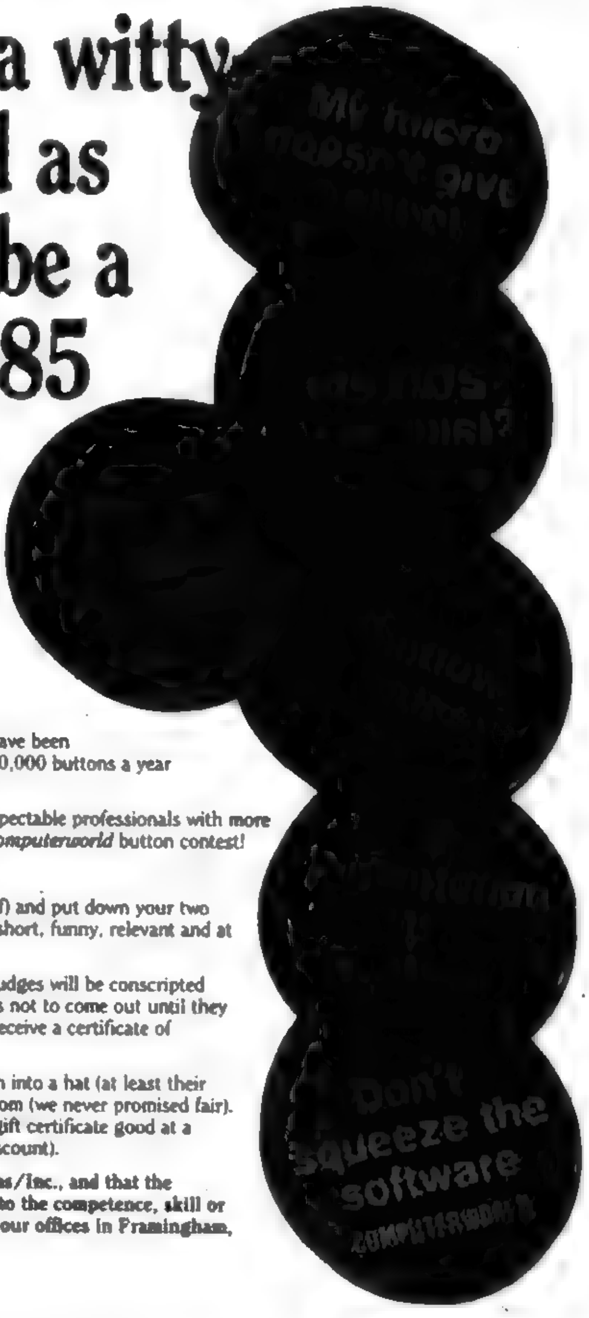
The DSM-32 reportedly provides simultaneous transmission of one 32K bit/sec digitized voice channel and up to three high-speed data channels. It uses the vendor's Adaptive Pulse Code Modulation (APCM) to digitize the voice signal at 32K bit/sec.

It also reportedly can pass analog modem signals at speeds up to 9.6 bit/sec. The company claimed that its APCM technique provides a signal-to-noise ratio comparable to that of 64K bit/sec pulse code modulation. The DSM-32 can be strap-configured with the voice channel and combinations of 19.2K bit/sec and 9.6K bit/sec data channels for 64K bit/sec or 56K bit/sec channels, according to the vendor.

Scheduled to be available during the second quarter of 1985, the DSM-32 is priced at $2,245, the vendor said.

Coherent Communications Systems, 60 Commerce Drive, Hauppauge, N.Y. 11788.

If you can write a witty one-liner as good as these, you could be a winner in the 1985 Computerworld Button Contest.



Since 1968, as all you real old-timers know, *Computerworld* buttons have been a major hit at trade shows around the country. Recently, more than 100,000 buttons a year have been given out to otherwise normal people.

Many of these buttons have been written by people like yourself — respectable professionals with more than half a wit who have submitted winning entries to the incredible *Computerworld* button contest!

Now you have but another chance to participate in this madness.

Here's how it works: You take the entry blank below (or a copy thereof) and put down your two best ideas (two's the limit because we get tired easily). They should be short, funny, relevant and at least moderately clean.

Send in your entry to the address below. After the deadline a panel of judges will be conscripted and thrown into a windowless room with a case of beer and instructions not to come out until they have picked six winning lines. If your slogan is among them, you will receive a certificate of appreciation (suitable for framing, of course).

In addition, all the people who submitted winning entries will be thrown into a hat (at least their names will be) and six lucky winners will be drawn more or less at random (we never promised fair). These lucky people (or animals, as the case may be) will receive a $75 gift certificate good at a selected computer store (probably the one that'll give us the biggest discount).

Remember that all entries become the property of CW Communications/Inc., and that the decision of the judges will be considered final. No representations as to the competence, skill or fairness of the judges are being made. All entries must be received at our offices in Framingham, MA, no later than March 1, 1985.

Yes,

I'd like to enter Computerworld's ridiculous button contest. I hope your judges can see. Here is my entry. (If you have more than one, please put them on separate forms).

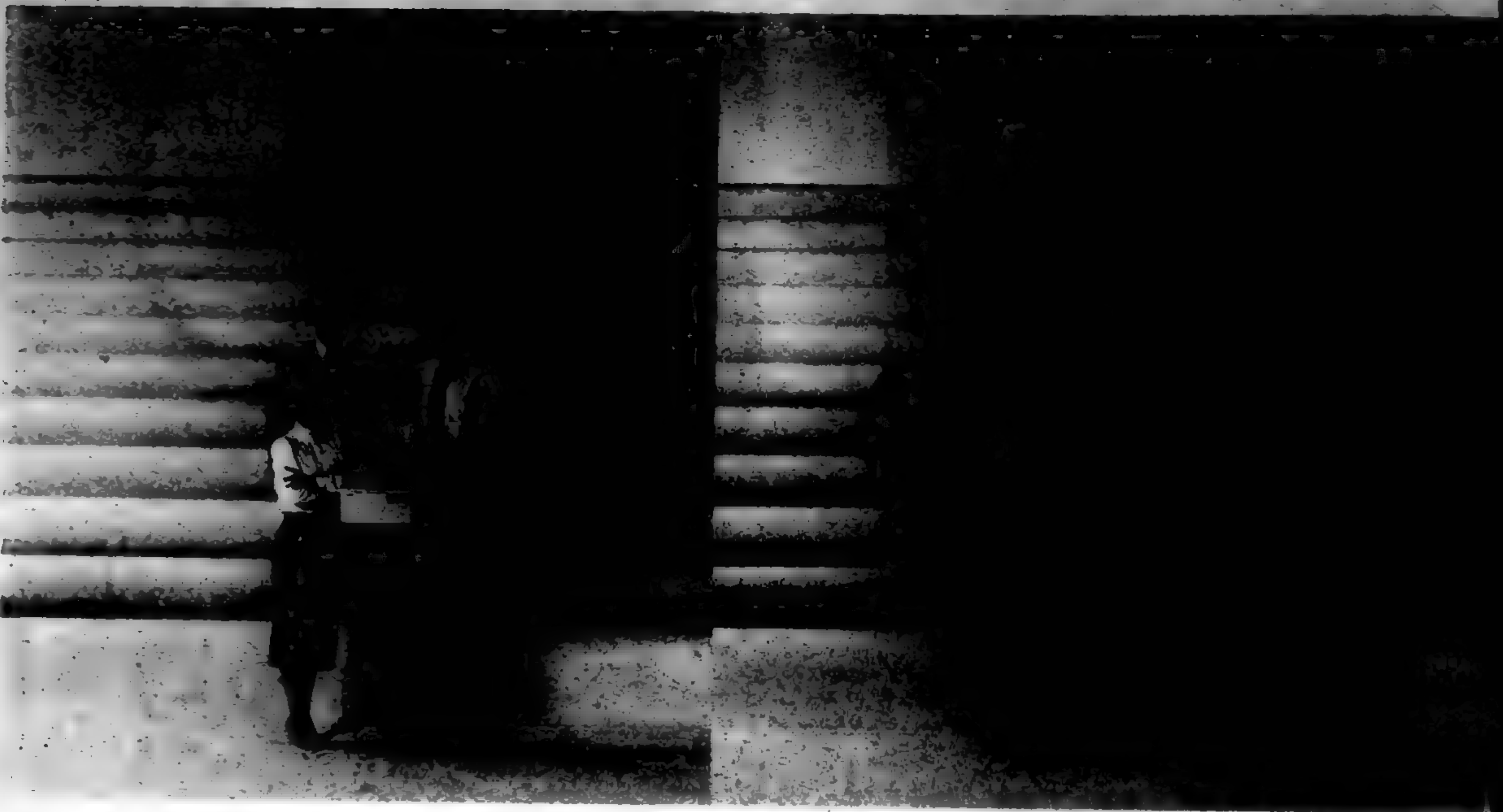
COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Write your entry here:
____
____
Name ____________________
Company ____________________
Address ____________________
City __________ State ____ Zip ______
Phone ____________________

Send to: Nancy Langmeyer, Marketing Services Department, Box 880, Framingham, MA 01701.

TKO

Computer Corporation of America

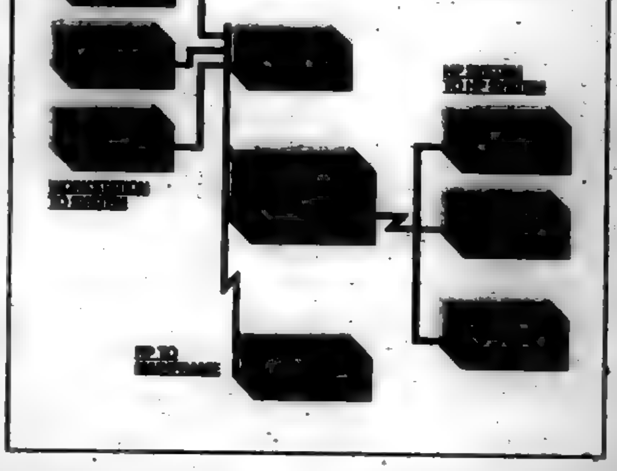


The HP 3000 compu

However much you change, you're going to need both office automation *and* distributed data processing. Fortunately, one company gives you both in a single system.

Hewlett-Packard's HP 3000 is a fully compatible family of computers, ranging from a new system that handles as few as two users to a distributed mainframe that connects up to 400. You can run the same software right up the line.

And all of our systems can change and grow right along with you. Whenever you're ready for upgrades and additions, you simply plug your existing programs into the new systems. No recompiling. No time and money wasted on conversion.



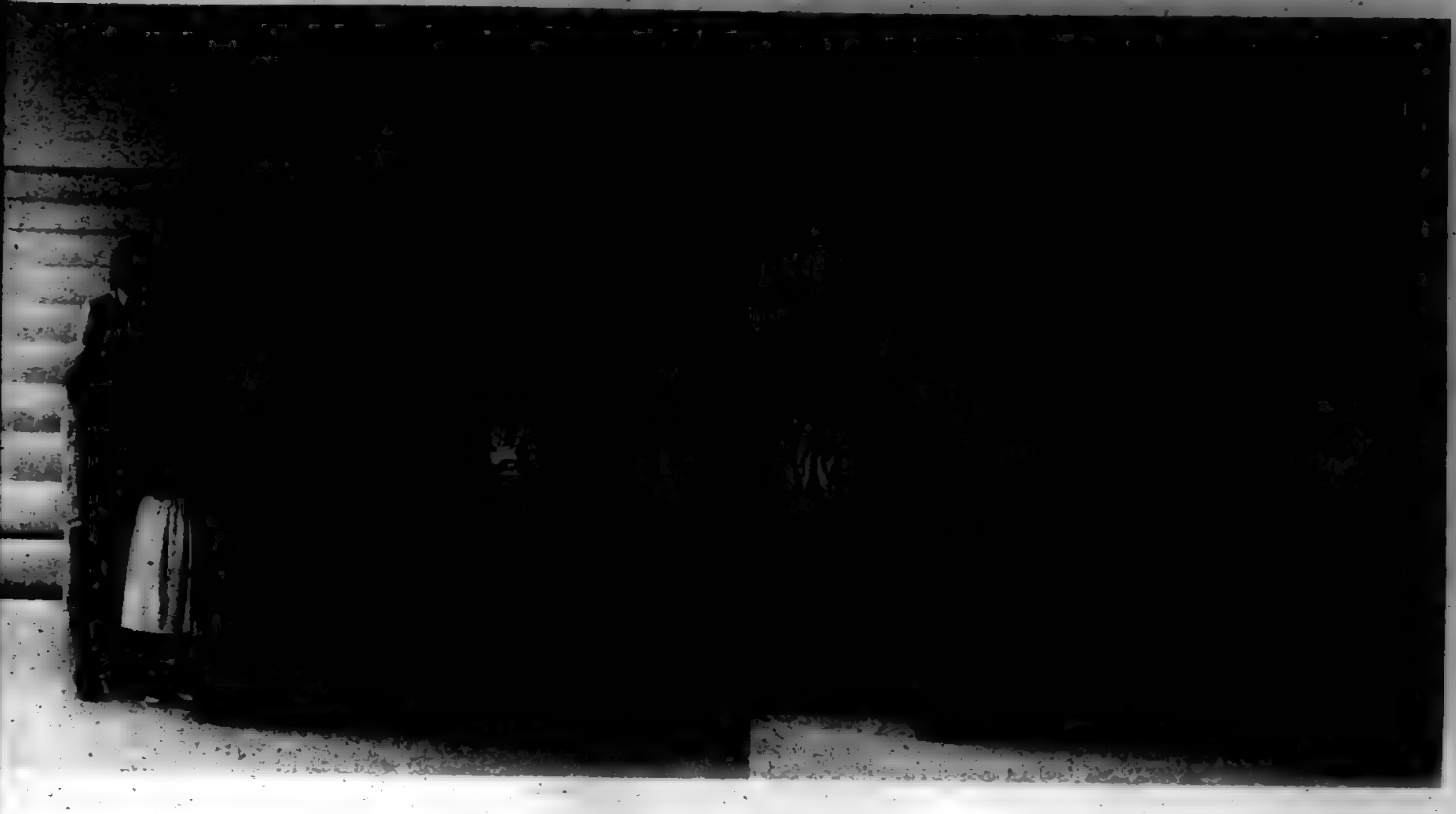
A small, but mighty, addition.

The new HP 3000 Series 37 Office Computer, the latest member of the family, puts the power of the HP 3000 within the reach of smaller budgets.

So now you can afford to give your branch offices and departments their own systems. And they'll still remain part of your overall DP picture with links to other systems.

In the office, the HP 3000 is the heart of our Personal Productivity Center. This integrates the information people need to get their jobs done more productively.

It provides an interface for a wide range of workstations, peripherals and personal computers, including our Touchscreen



ter. One family fits all.

Personal Computer and The Portable, as well as IBM PCs. And it allows them to interact directly with the HP 3000. So your people won't have to learn DP commands.

You'll communicate better with HP AdvanceNet.

Our communications go well beyond this office network. With HP AdvanceNet, they extend to links with other HP 3000s, in the same building or on the other side of the world. And to your mainframe computers, ours or IBM's.

Currently, more than 10,000 HP 3000 systems are working in networks so effectively that our communications were voted #1 in a national survey.

A Datapro poll also rated our service #1. So you get more than office automation and data processing in a single system. You get all the support you need from a single company.

For a demonstration of the single solution for both sides of your company, contact your local HP office listed in the white pages. Or write for complete information to Susan Curtis, Hewlett-Packard, Dept. 003203, 19055 Pruneridge Ave., Bldg. 46T, Cupertino, CA 95014.

In Europe, write Michael Zandwijken, Hewlett-Packard, Dept. 003203, P.O. 529, 1180 AM Amstelveen, The Netherlands.

We'll fit you no matter how much you change over the years.

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HEWLETT
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LOCAL-AREA NETWORKS

■ Interlan, Inc. has introduced an integrated network terminal server for use with Digital Equipment Corp. VAX-11 superminicomputers running DEC's VMS.

The INTS/VMS is said to provide 32 direct links to a VAX/VMS system on an Ethernet local-area network. It is a hardware and software package that uses a single DEC Unibus slot and, according to the vendor, replaces four asynchronous controllers and eliminates the need for separate outboard Ethernet terminal servers.

The product reportedly includes Interlan's NP100 processor board, which off-loads the host from CPU-intensive protocol processing while freeing up three Unibus slots.

It also includes the same set of application-level protocol software found in Interlan's NTS10 terminal server and a set of host-resident software routines, according to the vendor.

The INTS/VMS is priced at $6,190, the vendor said.

Interlan, 155 Swanson Road, Boxboro, Mass. 01719.

■ Ungermann-Bass, Inc. has announced Network Interface Unit Model 180 (NIU-180), a network interface unit that connects eight user devices to Ungermann-Bass' Net/One local network.

The product, based on Intel Corp.'s 80186 microprocessor, expands the number of network management services on Net/One and reduces port connection costs by up to 27%, the vendor said.

Each of the NIU-180's eight ports can support speeds from 9.6 to 19.2 bit/sec, the vendor said.

The product can be used with broadband and baseband coaxial cable, optical fiber and thin coaxial cable. The broadband model has an integral modem that transmits data at a speed of 5M bit/sec while other versions operate at a speed of 10M bit/sec.

NIU-180 costs $2,950.

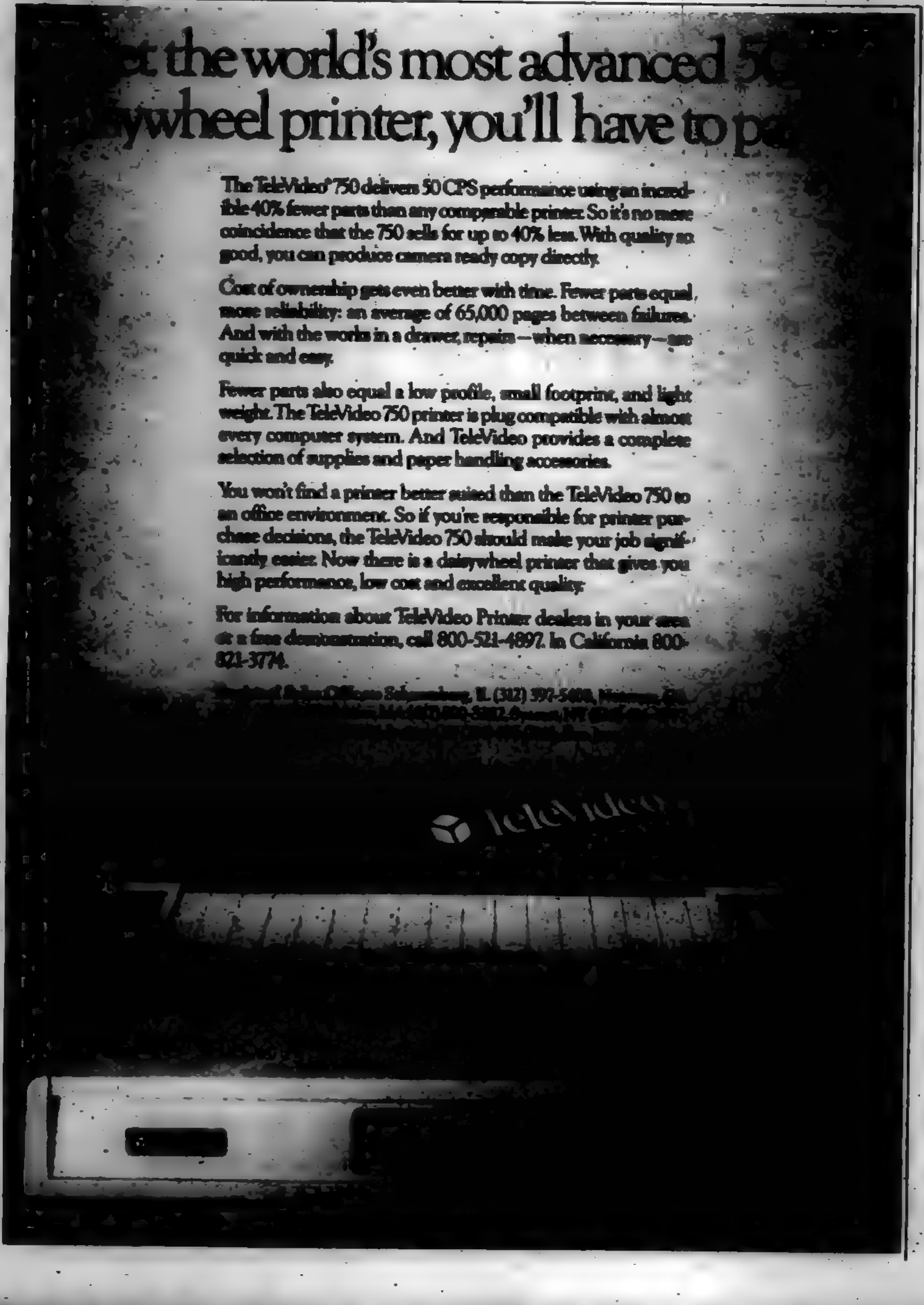
Ungermann-Bass, 2560 Mission College Blvd., Santa Clara, Calif. 95050.

■ Bridge Communications, Inc. has announced an enhanced version of its CS/1-HSM Ethernet communications server for Digital Equipment Corp. minicomputers.

The enhancement involves adding DEC DH-11 multiplexer support to its original DEC DMF-32 communications controller support capability, according to Bridge. The DH-11 functionality is said to allow the CS/1-HSM to serve as a single-cable Ethernet local-area network connection mechanism for DEC systems including PDP-11 minicomputers, VAX-11 superminicomputers running AT&T Unix System V and Decsystem-20 series mainframes that do not have DMF-32 support.

The CS/1-HSM host interface system is a front-end processor supporting up to 64 terminal sessions from other nodes on an Ethernet local-area network to a DEC minicomputer over a single, high-speed serial line. It is priced at $16,500.

Bridge Communications, 1345 Shorebird Way, Mountain View, Calif. 94043.



The TeleVideo® 750 delivers 50 CPS performance using an incredible 40% fewer parts than any comparable printer. So it's no mere coincidence that the 750 sells for up to 40% less. With quality so good, you can produce camera ready copy directly.

Cost of ownership gets even better with time. Fewer parts equal more reliability: an average of 65,000 pages between failures. And with the works in a drawer, repairs—when necessary—are quick and easy.

Fewer parts also equal a low profile, small footprint, and light weight. The TeleVideo 750 printer is plug compatible with almost every computer system. And TeleVideo provides a complete selection of supplies and paper handling accessories.

You won't find a printer better suited than the TeleVideo 750 to an office environment. So if you're responsible for printer purchase decisions, the TeleVideo 750 should make your job significantly easier. Now there is a daisywheel printer that gives you high performance, low cost and excellent quality.

For information about TeleVideo Printer dealers in your area or a free demonstration, call 800-521-4897. In California 800-821-3774.

Regional Sales Offices: Schaumburg, IL (312) 397-5400, [illegible]

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This language, called Postscript, was jointly developed by Apple and Adobe Systems. It enables a description of a page created on the Macintosh's bit-mapped display to be interpreted in only 4K to 8K bytes of data and transmitted to the Laserwriter where it is printed with a resolution of 300 dot/in.

To require only 6K bytes of memory

Part of the beauty of Appletalk is the powerful network software Apple claims will only require 6K bytes of memory. In fact, it is so efficient that the relatively low-speed, 230.4K bit/sec network can achieve an estimated 80% to 85% throughput, claimed Arnie Lapinig, Apple network product manager.

At Apple's annual meeting last month, where it first disclosed Appletalk, the company also showed a product reportedly under development that will provide a gateway to IBM's Personal Computer Network. Additionally, this hardware/software board-level product will enable Macintoshes to use an IBM Personal Computer AT as a gateway and as a file server. Apple reported that other network devices, including file and disk servers, other gateways and additional software, are being developed by third parties.

"Miss Egan, get me the computer operator who thinks he's running this company!"

SYSTEMS & PERIPHERALS

Intel unveils nodal processing system

By Tom Henkel
CW Staff

BEAVERTON, Ore. — Intel Corp. today unveiled what it claims to be the first commercially available concurrent processing system, the IPSC. The three-model line is based on multiple nodal processors, each of which is capable of performing independent computations.

The three models accommodate 32, 64 and 128 nodes, respectively. The nodes, in turn, form five-, six- and seven-dimensional hypercubes. (A hypercube is an interconnection scheme for linking a collection of microcomputer-based nodes.) A 32-node cube, for example, represents a five-dimensional system, whereby each node is directly attached to its five nearest neighbor nodes. Likewise, a 64-node configuration is a six-dimensional hypercube and a 128-node configuration is a seven-dimensional hypercube, the vendor said.

The architecture for the IPSC family was developed by a team of reasearchers at the California Institute of Technology and dubbed the Cosmic Cube [CW, Jan. 30].

Each node contains one Intel 80286 CPU, an 80387 numeric processing unit and 512K bytes of random-access memory. Adjacent nodes are linked via 10M bit/sec, point-to-point communications channels, the vendor said.

Designed to use Microsoft Corp.'s Xenix operating system, each IPSC system consists of a Cube and a Cube Manager. The Cube consists of the interconnected nodal processors. The Cube Manager is a Xenix-based Intel 286/310 microcomputer containing 2M bytes of main memory, a 40M-byte Winchester disk drive and a 320K-byte floppy disk drive. The Cube Manager is said to give users support tools for programming, provide system management functions and help with maintenance.

Communications between the Cube and Cube Manager are performed via a global 10M bit/sec channel connected to each node in the system. This channel is used to distribute programs, data and control options, computational results and other functions, according the vendor. The IPSC systems also feature an Ethernet TCP/IP network interface option that allows them to access external data bases. The TCP/IP interface also can be used to make the IPSC system available to networked users, according to Intel.

The three models announced today are the 32-node, 16M-byte IPSC/D5; the 64-node, 32M-byte IPSC/D6; and the 128-node, 64M-byte IPSC/D7. The company said the units range in performance from 2.7 to 10 million floating-point operations per second and will be available in June. The units are modular, meaning users can field upgrade to a higher performance model by adding 32-node computational units. System memory capacity and memory are said to double with each upgrade.

Intel initally plans to market the IPSC line to educational institutions.

The IPSC/D5 costs $150,000, IPSC/D6 costs $275,000, and IPSC/D7 costs $520,000.

More information is available from Intel at 15201 N.W. Greenbrier Pkwy., Beaverton, Ore. 97006.

■ Gould, Inc. unveiled a low-end addition to its Power series of superminis/88

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Auxiliary Equipment/92

Paradyne adds IBM-emulation terminal line

LARGO, Fla. — Paradyne Corp. announced the PDX Messenger line of terminals said to provide IBM 3270 terminal emulation, IBM networking support and IBM Personal Computer software support.

The six-model PDX Messenger line is said to offer local processing capabilities plus the ability to interface with a host processor via several communications architectures, including IBM's Systems Network Architecture, X.25 and Paradyne's Pixnet. In addition, the PDX Messenger models can also be used to emulate other terminals. Currently available emulation packages include IBM's 3278 Models 2, 3, 4 and 5, as well as IBM's 3279 Models 2B and 3B, the vendor said.

The six models may be upgraded and range from a monochrome unit to a color terminal with support for IBM Personal Computer graphics software. The units use Intel Corp. 80188 microprocessors and include an asychronous communications port, a floppy-disk port and 192K bytes of random-access memory (RAM) expandable to 640K bytes, the vendor said.

Local storage options provide standalone IBM Personal Computer functions. Local storage can be located beneath the base of the terminals in two half-height 360K-byte dual-sided, dual-density floppy disk drives or a 360K-byte half-height floppy disk drive and one 10M-byte Winchester disk drive. An option is also available to accommodate IBM Personal Computer add-on boards, the vendor said.

A controller provides the interface between a PDX loop and a network. PDX controllers can be upgraded to controller/servers with the addition of a Winchester disk drive offering up to 40M bytes of storage. Server software allows teminals on the PDX loop to have access to applications and information stored on the server

See PARADYNE page 94

PE offers low-end supermini

Desk-side, 16-user 3203 can accommodate up to 4M bytes memory, 170M bytes disk storage

OCEANPORT, N.J. — Perkin-Elmer Corp. beefed up the low end of its superminicomputer line with the 3203.

Capable of supporting up to 16 users, the desk-side 3203 can support from 512K to 4M bytes of main memory and up to 170M bytes of disk storage. PE plans to market the system to large-volume end users as well as to OEMs and value-added remarketers.

Available in March, the 3203 uses PE's OS/32 operating system. The unit is also said to support most of the company's existing software. According to the vendor, the basic 3203 system configuration includes the 32-bit CPU, 512K bytes of main memory, communications and peripheral controllers, a 51M-byte, 5¼-in. Winchester disk drive, eight communications ports, a ¼-in. streaming 60M-byte tape drive and a printer port. It costs $16,600.

The same configuration with 85M bytes of disk storage costs $17,990. The basic system configuration with 1M byte of main memory costs $18,990 ($20,990 with 85M bytes of disk storage).

A 2M-byte configuration costs $23,890 ($25,890 with 85M bytes of disk storage). The 4M-byte model costs $31,990 ($33,990 with 85M bytes of disk storage).

PE is located at 2 Crescent Place, Oceanport, N.J. 07757.

Datapoint adds storage systems, OA upgrades

SAN ANTONIO — Datapoint Corp. has introduced two entry-level storage systems, the 9334 and 9339, which are supported under Datapoint's proprietary operating systems. The company also announced office automation enhancements and some communications and information access abilities.

The 9334 storage system consists of a 28M-byte Winchester fixed-disk drive with a bit-transfer rate of 5M byte/sec and a 65M-byte removeable streaming cartridge tape drive. A 28M-byte disk drive can be transferred to a single tape unit in approximately 10 minutes, the vendor said.

The 9339 system is a tape-only system that is said to be a replacement for floppy diskette units.

The price for the 9334 is $8,500. The 9339 costs $5,000.

The OA enhancements to Datapoint's Pro-Vista Office Automation software include the following: the Vista-Spell spelling checker module that is priced at $1,500 for a one-time license fee for each copy on each mass storage device; the Vista-Finder filing and retrieval tool, which costs $1,000; and a Calculator Emu-

See OA page 94

Graphics subsystem among Cadmus debuts

LOWELL, Mass. — Cadmus Computer Systems, Inc. has announced a graphics subsystem, a graphics software package, list manager software and a development system.

The Q-bus-compatible, monochrome graphics subsystem was designed to run Cadmus' Cadmac graphics software. The subsystem comprises a graphics controller; bit-mapped, noninterlaced, monochrome display; a Digital Equipment Corp. VT100-style, bit-mapped keyboard; and a three-button mouse.

The graphics subsystem will be available in the second quarter of 1985 at a cost of $5,890.

The company also announced that the Neo-Visuals modeling and animation software from Neo-Visuals, Inc. — designed to create three-dimensional color simulations — is available for the Cadmus 9770 color graphics workstation with a display controller from Raster Technologies, Inc. of Billerica, Mass. Applications include broadcast and production, architectural design and planning, interior design, scientific analysis and simulations, computer-aided design and manufacturing, graphic arts and automotive design.

See CADMUS page 94

TERMINALS

■ Sidereal Corp. has enhanced its Micronet 25E desktop communications terminal with mechanical modifications that cut its size and weight, reduce time required for repair and increase disk storage capability.

The size of the updated system has been reduced by 90 sq in. to a desktop space requirement of 15.8 by 16 in. The weight has been reduced by 20.5 lb. Mean time to repair is said to have been cut to less than 10 min by increased modularity of cabling and modifications to component layout.

Sidereal has implemented half-height disk technology in the terminal, and archival storage has been doubled to 656K bytes (formatted) using double-sided, double-density disks with a formatted capacity of 164K bytes per side.

Base price for a single Micronet 25E is $5,995, including the printer.

Sidereal, 9600 S.W. Barnes Road, Portland, Ore. 97225.

PRINTERS/PLOTTERS/ PERIPHERALS

■ Ithaca Peripherals, Inc. has announced a two-station printer for point-of-sale system applications. The Model 200 is designed to provide two printers on one chassis and can be used as a combination invoice and receipt printer.

The Model 200 contains an 80-col., 120 char./sec printer that is compatible with Epson America, Inc. and Okidata Corp. machines and a 40-col., two-line/sec thermal printer.

The suggested retail price of the printer is $995, with an evaluation unit available for $650, the vendor said.

Ithaca Peripherals, Cornell Industry Research Park, Building One, Brown Road, Ithaca, N.Y. 14850.

■ Lee Data Corp. has introduced a color graphics matrix printer for use with its Series 70 Personal Workstation.

The eight-color Model 1310 printer provides images of personal computer graphics and IBM 3279 Model S3G-type host graphics, both of which are supported by the Series 70 Personal Workstation, the vendor said.

The printer costs $1,960.

Lee Data, 7075 Flying Cloud Drive, Minneapolis, Minn. 55344.

■ Hermes Precisa International, a Swiss-based manufacturer of office equipment, has introduced its 615 Color Printer to the U.S. market.

The 615 single-pass printer has eight-color printing capability at speeds of up to 600 char./sec in draft mode and up to 150 char./sec in correspondence quality.

The price of the 615 is $2,695.

Hermes Precisa International, Printer Division, 1900 Lower Road, Linden, N.J. 07036.

■ Davox Corp. has released a printer adapter that is said to allow any workstation to output to any system printer, personal computer printer or its own screen printer.

The Series 410 Printer Adapter emulates IBM 3287 LU-1 and LU-3 printers and allows the output of Systems Network Architecture character stream data. This is said to permit the user to employ a variety of serial or parallel printers.

It costs $2,195.

Davox, 4 Federal St., Billerica, Mass. 01821.

GRAPHICS SYSTEMS

■ Metheus Corp. has announced three members of its Omega series of color graphics controllers: the Omega 2300, the Omega 2400 and the Omega 2500.

The standard configuration of each of the Omega 2000 series includes a 256K-byte display-list memory and a transform processor. The

Continued on page 99

Gould extends supermini line with low-end Power Node

FORT LAUDERDALE, Fla. — Gould, Inc. has released a low-end member of its Power series family of superminicomputers that runs under the company's UTX/32 operating system.

The desk-high Power Node (PN) 6031 has a 32-bit virtual CPU, 2M bytes of main memory, upgradable to 4M bytes of main memory.

It is said to be designed for use as a general-purpose, multiuser system running AT&T's Unix, a back-end computational node or a network file server.

The price of the basic PN6031 system is $89,900 for the nucleus system with 2M bytes of memory, an 80M-byte, 8-in. Winchester subsystem, a ¼-in. cartridge magnetic tape system, console CRT, one additional eight-line asynchronous controller, an additional RS-232C panel and a power supply module, according to the vendor.

More information on the PN6031 system is available from Gould through P.O. Box 9148, 6901 W. Sunrise Blvd., Fort Lauderdale, Fla. 33310.

Why Britton Lee's relational database software comes with its own hardware.

ACCOUNTING
MAINFRAME
SCIENTIFIC APPLICATIONS

Because database software, like a series of freight cars, adds weight. The more you add—inquiry requests, applications, additional data—the more demands you place on the engine. Total system execution is sacrificed. Britton Lee adds database software and its own engine, to pull more capacity at greater speeds.

Continued from page 90

Omega 2000 series instruction set and Metheus-supplied graphics library software provide a virtual device interface that supports abstractions of the GKS and ACM-Siggraph Core graphics standards.

Price of the 2300 is $10,950; the 2400 is $13,950; and the 2500 is $17,950 in single-unit quantities.

Metheus, P.O. Box 1049, Hillsboro, Ore. 97123.

POWER SUPPLIES

■ MPL Power Systems PLC has announced the CVT series of eight power conditioners, intended for applications where data processing systems and sensitive electronic equipment are affected by an unstable and poor-quality power supply.

The conditioners were designed for use with equipment requiring power supplies between 100VA and 2 kVA, 30Hz. The units are available for use on the following single-phase supplies: 220V or 240V, 50Hz; and 120V, 60Hz, the company said.

The price for the CVT series of power conditioners ranges from $150 to $650, the company said.

MPL Power Systems, 3011 Lincoln Ave., Richmond, Va. 23228.

■ Product Technology International (PTI) Industries has announced the Datashield Surge Protector, said to give a personal computer user automatic power control.

One of the unit's six sockets activates the automatic master switch (AMS) inside the surge protector. When the power switch is used for any device inserted into the AMS socket, the remaining five sockets are activated and can be controlled by the switch of the equipment plugged into the AMS socket. Any peripheral containing 30W to 300W of power can be used.

The price for the Datashield Model AMS 110 Surge Protector is $119.95, the vendor said.

PTI Industries, 320 River St., Santa Cruz, Calif. 95060.

■ Helionetics, Inc. has introduced a family of large commercial ac power sources. The line uses high-frequency pulse-width modulation, and the available models range from 12 to 72 kW in single-phase and three-phase versions.

The power sources are available in variable (45Hz to 500Hz) or fixed (50Hz, 60Hz or 400Hz) frequency, one-phase or three-phase control. They can be used for motor generator replacement, receiving inspection and computer power conditioning and can handle mainframe-size computers.

Prices range from $16,000 to $61,000 for the one-phase units and from $17,000 to $64,000 for the three-phase units.

Helionetics, 17312 Eastman St., Irvine, Calif. 92714.

■ Best Energy Systems, Inc. has released two uninterruptible power supplies (UPS) which come equipped with on-board microprocessors and RS-232 ports, which allow the display of line power conditions at a terminal.

The UPS protect electronic equipment against blackouts, brownouts, spikes, sags, surges, noise and frequency shifts.

The Model 500 VA costs $1,345 with 10-min backup. The Model 250 VA costs $945 with 35-min backup.

Best Energy Systems, P.O. Box 280, Necedah, Wis. 54646.

■ Oneac Corp. has introduced its Power Interface product designed to provide power conditioning in a minicomputer environment.

The 20- by 21-in. Power Interface provides single-phase power requirements in the 7.5- and 10-kVA size range. The customer has a choice of hard-wired or user-specified connectors.

The price of the Power Interface ranges from $5,000 to $5,800 depending upon size.

Oneac, 2207 Lakeside Drive, Bannockburn, Ill. 60015.

■ Power Distribution, Inc. has announced the Model 516 Computer Power Center, said to protect processors and peripheral devices from electrical line noise and disturbances.

The product is based on the 8-bit Zilog, Inc. Z80 microprocessor, the company said. The Model 516's CRT displays system power status, including I/O voltages, current, time, date, temperature and humidity. The device is also said to monitor two internal transformer temperature alarms and eight building alarms.

Power ratings for the Model 516 range from 15 kVA to 225 kVA. Prices for the product start at $15,000, the vendor said.

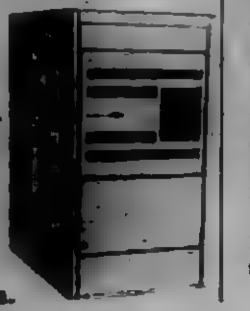
Power Distribution, P.O. Box 3145, 2510 Professional Drive, Richmond, Va. 23235.

■ Cyberex, Inc. has announced a family of uninterruptible power supplies (UPS) called Fifth Generation, featuring the ability to operate for hours or days from a backup engineer generator equal to the rating of the UPS.

A dc system is said to reduce distortion of input power and to feature high ac I/O efficiency. The system uses an inverter concept that is a combination of stepwave type and high-performance computer-compatible type, the vendor said.

The equipment is packaged in a front-accessible cabinet. The overall size of the 313 kVA, 250 kW three-

Continued on page 98



Relational database management systems provide the outstanding tool for easy-to-use, high level inquiries, for fast applications development, and for creation of an information resource for improved productivity.

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Britton Lee
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Los Gatos, CA 95030

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Continued from page 89

phase UPS, split into two sections for shipment, is 145-in. wide by 36½-in. deep by 77-in. high, the vendor said.

The price for the product is approximately $100,000, the vendor said.

Cyberex, 7171 Industrial Park Blvd., Mentor, Ohio 44060.

BOARD-LEVEL DEVICES

■ **Proximity Technology, Inc. has announced Spell-ROM, said to detect errors and make corrections by use of five read-only memory (ROM) chips that store the Proximity/Merriam-Webster, Inc. linguistic data base.**

Spell-ROM includes five 256K-bit ROM chips coupled with 8K bytes of random-access memory. Four of the ROM chips store the 50,000 word linguistic data base, and the other ROM chip contains code to perform spelling error detection and correction.

The firm licenses the product to manufacturers and software developers only, for $3.99 to $21.90 per unit, depending on royalty arrangements.

Proximity, 3511 N.E. 22nd Ave., Fort Lauderdale, Fla. 33308.

■ **Data-Sud Systems/U.S., Inc. has announced a dual-ported random-access memory (RAM) module that reportedly can be accessed from both the extended VME bus and VMX bus proposed architectural standards.**

The DSSEDPRX-1 is said to be supplied with 128K bytes of 8K- by 8K-byte static Cmos RAM. The DSSEDPRX-2 is supplied with the vendor's DSSEDPRX-P daughterboard, which extends the total capacity to 256K bytes. The board is also available unpopulated as the DSSEDPRX-0. The board is supplied with 15 Joint Electronic Device Engineering Council (Jedec) sockets and can support 8K by 8K bytes of Jedec erasable programmable read-only memory devices, the vendor said.

Jumper-selectable VME bus memory access times can reportedly be set between 150 and 300 nsec, while VMX bus access time can be set between 180 and 330 nsec.

Prices for the boards are DSSEDPRX-0, $1,295; DSSEDPRX-1, $2,295; DSSEDPRX-2, $3,995; and DSSEDPRX-P, $1,995.

Data-Sud Systems, Suite J, 2219 S. 48th St., Tempe, Ariz. 85282.

■ **General Micro Systems, Inc. has announced a VME bus module said to provide serial and parallel I/O. The unit is also said to be software-programmable.**

The GMSV01 is said to be the first module to offer up to eight asynchronous serial communications channels and 24 parallel I/O lines plus an onboard control latch that permits software configuration control. According to the vendor, the module meets all VME double-width specifications for timing, signal levels and physical dimensions.

Each of the eight serial channels can be selected to operate on RS-232 or RS-422 standards and can be connector-selected for either data terminal equipment (terminals) or data communications equipment (modems) operation, with no strapping required, the vendor said.

The 24 parallel I/O lines can offer one Centronics Data Computer Corp.-type printer port plus 12 additional bidirectionally buffered lines or two printer ports, the vendor said. An onboard control latch is said to permit interrupt on any level, one to seven, to allow for masking the interrupt for the 24-bit timer and also to permit polled operation of the modules.

The GMSV01 is priced at $1,130.

General Micro Systems, 4740 Brooks St., Montclair, Calif. 91763.

■ **Data Translation, Inc. has announced its DT772 series of analog input systems for 8-bit and 16-bit Intel Corp. Multibus systems.**

The DT772, DT774 and DT778 are board-level devices that reportedly feature 24-bit addressing capabilities and are compatible with the IEEE-796 Multibus specification.

The DT772 is for high-level analog input, the DT774 for low-level analog input and the DT778 for simultaneous sample and hold analog input, according to the vendor. All are said to include an on-board clock and support for multiple operating modes.

The DT772 costs from $895 to $1,095; DT774 from $995 to $1,195; and the DT778 from $1,295 to $1,695. Prices vary according to the number of input channels ordered.

Data Translation, 100 Locke Drive, Marlboro, Mass. 01752.

■ **Connecticut Microcomputer, Inc. has introduced a four-channel binary coded decimal (BCD) input module that is a self-contained IEEE-488 bus device.**

The Busster MA4-G works with any computer system that has an IEEE-488 bus either built in or added on and is programmed through Basic commands from the controlling computer.

The MA4-G accepts commands from the host to read up to four 3½- or 3¾-digit BCD meters or to activate the timer and buffer.

The Busster MA4-G sells for $695, which includes case and power supply.

Connecticut Microcomputer, 568 Danbury Road, New Milford, Conn. 06776.

■ **Dyna Five Corp. has announced a Digital Equipment Corp. Q-bus expander said to allow Micro PDP-11 or Microvax users to double the number of backplane slots and the amount of electrical power avail-**

Continued on page 92

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	STAR	GEMINI 10X	48	399
	IBM	5152	36	494
			CHARACTERS PER SECOND	
DAISY WHEEL	C. ITOH	A10-20S	29	$ 699
	QUME	LP20	20	799
	NEC	2010	20	950
	DIABLO	620	20	995
	C. ITOH	F10-55	68	1,449
	DATA PRODUCTS	DP55	55	1,895
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SYSTEMS & PERIPHERALS

Continued from page 90

able to them.

The D5-BE100-A expansion module with 16-, 18- and 22-bit addressing is said to allow an eight-quad slot expansion backplane to be added using a dual-height board in the Micro PDP-11 or Microvax and one in the expansion enclosure.

Applications for the product include data acquisition and process control for analog and discrete I/O signals, communications systems supported by added power and backplane space and larger peripheral configurations.

The price for the D5-BE100-A expansion module is $650 per pair, one in the CPU and one in the expander box, the company said.

Dyna Five, 12040 Western Ave., Garden Grove, Calif. 92641.

■ Intel Corp. has introduced an expandable communications board said to be designed for multiuser and distributed processing needs. The company also introduced two expansion boards that reportedly can be used to increase the memory and I/O capabilities of the communications board.

The ISBC 188/48 is said to distribute processing functions by off-loading data from a host computer. It can function as a cluster controller, a front-end processor or a stand-alone system, the vendor said.

The board is said to contain eight I/O channels, dual-port random-access memory (RAM) and sites for programmable read-only memory/erasable programmable read-only memory.

It is said to have the intelligence and speed to manage multiuser and multiprotocol communications tasks.

The two Multimodule expansion boards reportedly can be used to increase the capabilities of the 188/48. The ISBC 307 board can increase on-board RAM to 192K bytes with parity, the vendor said, while the ISBX 354 board adds two serial I/O channels to any board with ISBX connectors.

The ISBC 188/48 is priced at $2,995.

The ISBX 354 and ISBC 307 expansion boards cost $450 and $800, respectively, according to the vendor.

Intel, 5200 N.E. Elam Young Pkwy., Hillsboro, Ore. 97123.

■ DY-4 Systems, Inc. has announced a Zilog, Inc. Z80 microprocessor-based CPU card with math processor for the standard bus and an optional 9511A or 9512 floating-point arithmetic processor.

The DSTD-109 is provided with one RS-232C serial I/O channel using the Motorola, Inc. 6850 Asynchronous Communications Interface Adapter.

Three 28-pin sockets can accept various combinations of read-only memory, erasable programmable read-only memory or static random-access memory (RAM), the vendor said.

The DSTD-109 is said to generate all address and control signals needed to refresh dynamic RAM.

The price for the DSTD-109, aimed at number-crunching applications beyond the capabilities of the Z80, is $559, according to the vendor.

DY-4 Systems, Suite 202, 1475 S. Boscom Ave., Campbell, Calif. 95008.

AUXILIARY EQUIPMENT

■ AT&T Information Systems has introduced the AT&T FAX 3510D thermal printing facsimile machine, said to be capable of automatically feeding a stack of up to 30 pages for transmission.

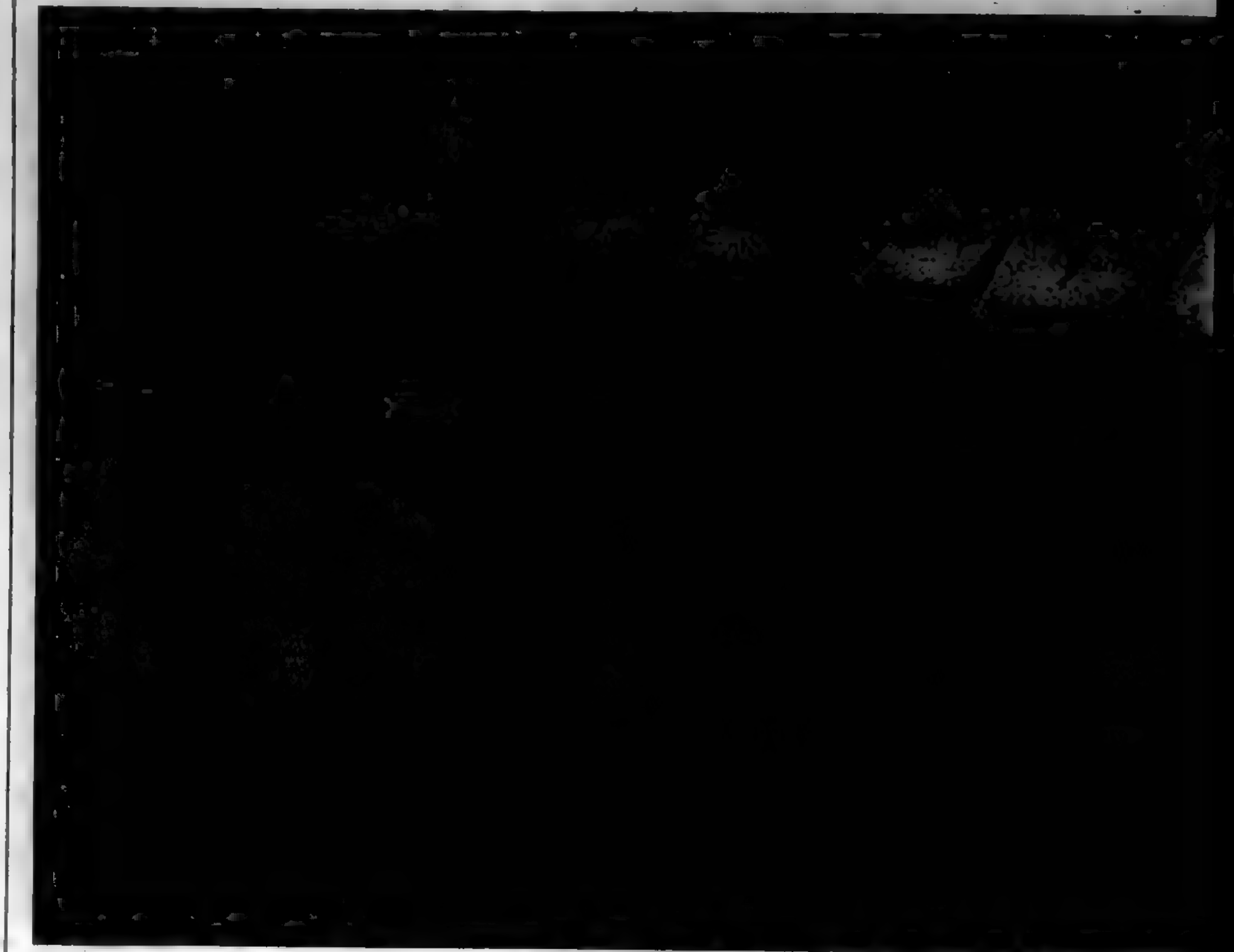
The product conforms to CCITT facsimile standards to assure compatibility with older and newer machines, the vendor said.

Features of the 3510D include near-letter-quality resolution of 200 by 200 dot/in. and a transmission rate of 20 sec. This compares with 4 to 6 min/page for the oldest machines and 2 to 3 min for newer models, according to AT&T.

Other features of the FAX 3510D are self-diagnostic capabilities, 12-in. by 17-in. desktop size and a weight of less than 30 lbs, the vendor said.

The price for FAX 3510D, available now, is $3,495, the vendor said.

AT&T Information Systems, 100 Southgate Pkwy., Morristown, N.J. 07960.



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Within the PC environment, today's RAMIS II integrates the best of mainframe and desktop technologies in a strategy designed for corporate

SYSTEMS & PERIPHERALS

■ Data Innovations, Inc. has announced the DI100 and DI200 computer image film recording systems, said to produce computer-generated photographs from any minicomputer or supermini with an RS-232 port.

The systems are said to produce slides, negatives or prints in either color or black and white. Each system consists of a Data Innovations graphics processor board and a Polaroid Corp. Palette computer-image film recorder.

The processor board is said to create a bit-mapped image from any graphics software supporting Hewlett-Packard Co. 7475 or Tektronix, Inc. 4010/4014 protocols. Both products can produce slides in 35mm format, and both offer four color planes with an unlimited color palette and a resolution of 964 by 576 pixels, the vendor said.

The company's graphics board includes a NEC Information Systems, Inc. 82720 8-bit graphics display controller and an Intel Corp. 8051 8-bit microcontroller, a spokesman said.

The Data Innovations system is available either as a DI100 graphics board that plugs into an expansion slot on a Digital Equipment Corp. VT100 terminal or, as the DI200, in a packaged version with its own power supply.

The price for the board and the Polaroid film recorder is $3,600. The price for the DI200 graphics processor board with its own power supply, which can be connected to any terminal with an RS-232 output, and Polaroid film recorder is $4,200.

Data Innovations, 660 Suffolk St., Lowell, Mass. 01854.

■ Hewlett-Packard Co. has announced a bit-error rate test set that contains the tests that are needed for verifying proper network installation and troubleshooting of data links.

The HP 4925B is said to be able to analyze analog impairments and perform digital measurements. It reportedly can test high-speed AT&T Dataphone Digital Service circuits that employ V.35 interfaces. The basic price of the HP 4925B is $1,195, and many options are available.

Hewlett-Packard, 3000 Hanover St., Palo Alto, Calif. 94304.

■ Telamon, Inc. has announced the Console Engine, said to provide security for remote-console access to the Hewlett-Packard Co. HP 3000 superminicomputer.

The Console Engine interface requires a password from anyone dialing into the HP 3000's remote console port and can also be set up to require validation from another Console Engine at the caller's end.

The engine is said to recognize system halts and console messages indicating conditions such as data base problems or program aborts and responds by automatically dialing an assigned message-logging terminal to notify the operator on call.

The Console Engine is priced at $2,150.

Telamon, 11th Floor, 1615 Broadway, Oakland, Calif. 94612.

■ Analog Devices, Inc. has announced the 1S64 series of four resolver-to-digital converters (RDC) for measuring voltage and mechanical motion, said to be capable of replacing mechanical tachogenerators.

According to Analog Devices, the 1S64 series RDCs provide a velocity output with 0.1% linearity. The devices develop a velocity output with a reported digital angular position output of 10

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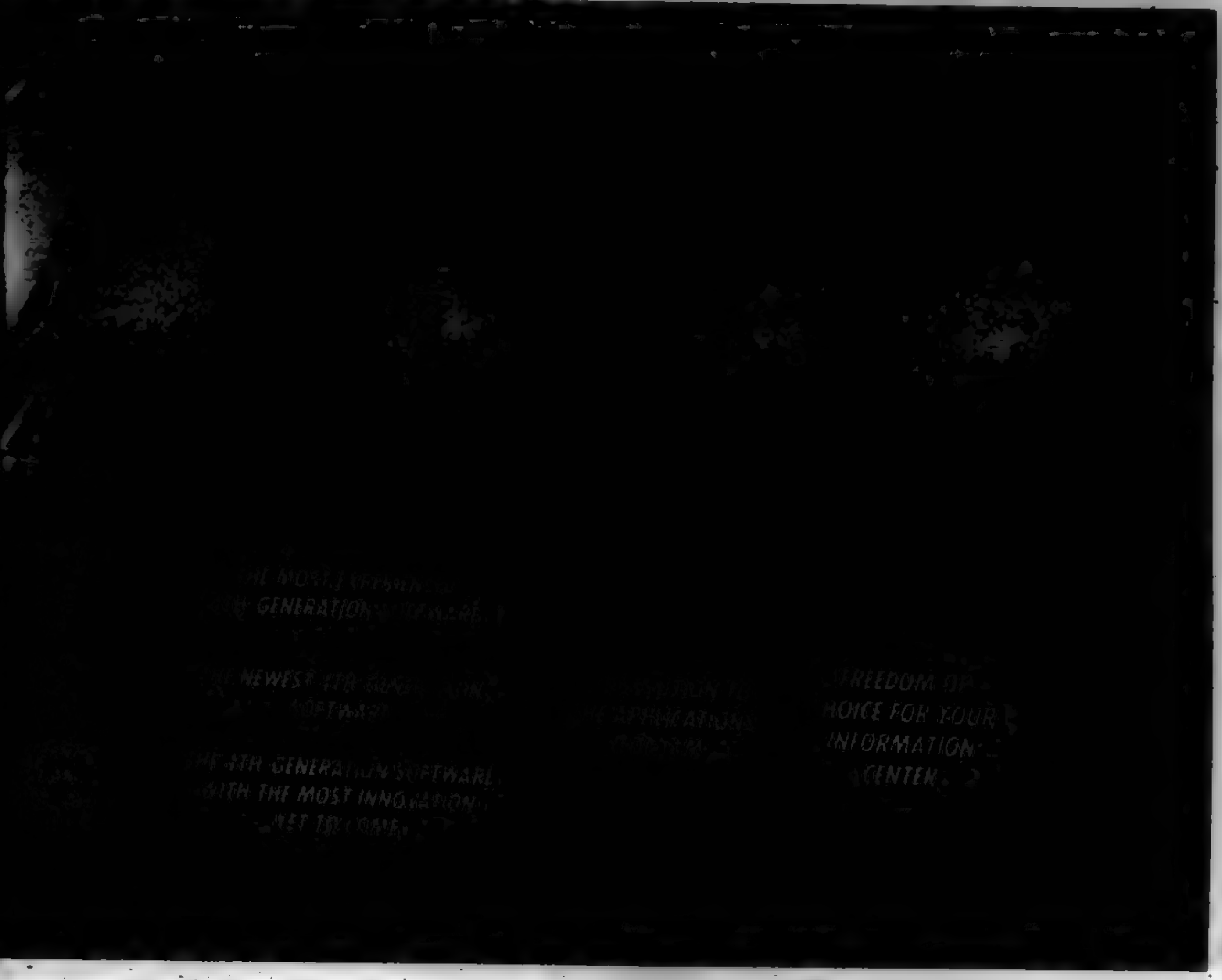
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Continued from page 93

to 16 bits and a voltage output proportional to speed of rotation.

The single-unit price of the 1864 series in quantities of 100 or more is $157 to $479, depending on resolution and temperature range, the vendor said.

Analog Devices, Two Technology Way, Norwood, Mass. 02062.

■ RVS Electronics, Inc. has introduced the Model SS-24 two-position computer switch, which provides for interfacing of most computers with two printers or other RS-232 devices.

The Model SS-24 switch is equipped with A and B ports and an Off mode and can be positioned on metal, plastic or wood surfaces with a variety of mounting attachments.

The switch is priced at $75 for one; $64 in quantities from 25 to 99; and $42 for 100 to 500 units.

RVS Electronics, P.O. Box 87, Circleville, N.Y. 10919.

■ The Computer Products Measurement and Control Group has announced its Q-Bus Direct Memory Access Input/Output Bus Converter, which is compatible with any Digital Equipment Corp. Q-bus-based computer system.

The product allows customers to assemble their own data acquisition and control system with the advantage of direct memory access transfers on the DEC Q-bus.

The converter is priced at $1,450.

Computer Products Measurement and Control Group, 2900 Gateway Drive, Pompano Beach, Fla. 33069.

CADMUS

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The package is priced at $20,000 and is available from Neo-Visuals in Willowdale, Ont., Canada.

LLMS, development system offered

Also available is the Leverage List Management System (LLMS) from Unisource Software Corp. The LLMS runs on the Cadmus 9700 family of workstations under Cadmus' operating system, which is the University of California at Berkeley's Unix 4.2 BSD, with Cadmus' Unison proprietary distributed file system.

The LLMS is a relational data base for business applications that is built around a full screen editor specifically designed for data handling, according to the vendor. The system reportedly offers menu-driven, mail-merge utilities for producing form letters and mailing labels. Commands may be stored in Unix shell scripts for reuse.

LLMS is priced at $395 and is available from Unisource Software, 71 Bent St., Cambridge, Mass. 02141.

Cadmus has also introduced its Development System for the Motorola, Inc. 68020 processor. The Development System comprises a Cadmus 9730 computational workstation with a 68010 processor; the monochrome graphics subsystem including Cadmac graphics software; and 68010/68020 C and Fortran 77 compilers.

The Development System is priced at $21,790 and will be available from Cadmus in the second quarter of 1985.

More information is available from Cadmus Computer Systems, 600 Suffolk St., Lowell, Mass. 01854.

OA

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lator module, which is priced at $1,500.

Datapoint also enhanced its RMS operating system. Enhancements include teletypewriter access to information networks and mainframes for $1,000; a virtual communications facility that supports X.25 protocol and Open Systems Interconnect compatibility for $1,500; and support of IBM 3270 terminal emulation with SNA compatibility for $1,500. Prices are waived under certain conditions for RMS users with current maintenance agreements.

Datapoint is located at 9725 Datapoint Drive, San Antonio, Texas 78284.

PARADYNE

from page 87

disk. Printer output from microcomputer applications can be spooled to the server and printed on loop-attached printers.

Available immediately, the newly announced models are as follows:

■ The Model 7812-01, a 12-in. CRT terminal said to be a replacement for an IBM 3178-type terminal, for $1,525.

■ The Model 7812-02, a 12-in. CRT terminal that features IBM 3278 Model 2 emulation. Other features include 80-col. by 24- or 32-line screen formats, up to 640K bytes of RAM and standard asychronous, parallel and local disk ports. It costs $2,100.

■ The Model 7812-03, which features the same basic capabilities as the Model 7812-02 but also includes monochrome graphics capabilities, for $2,595.

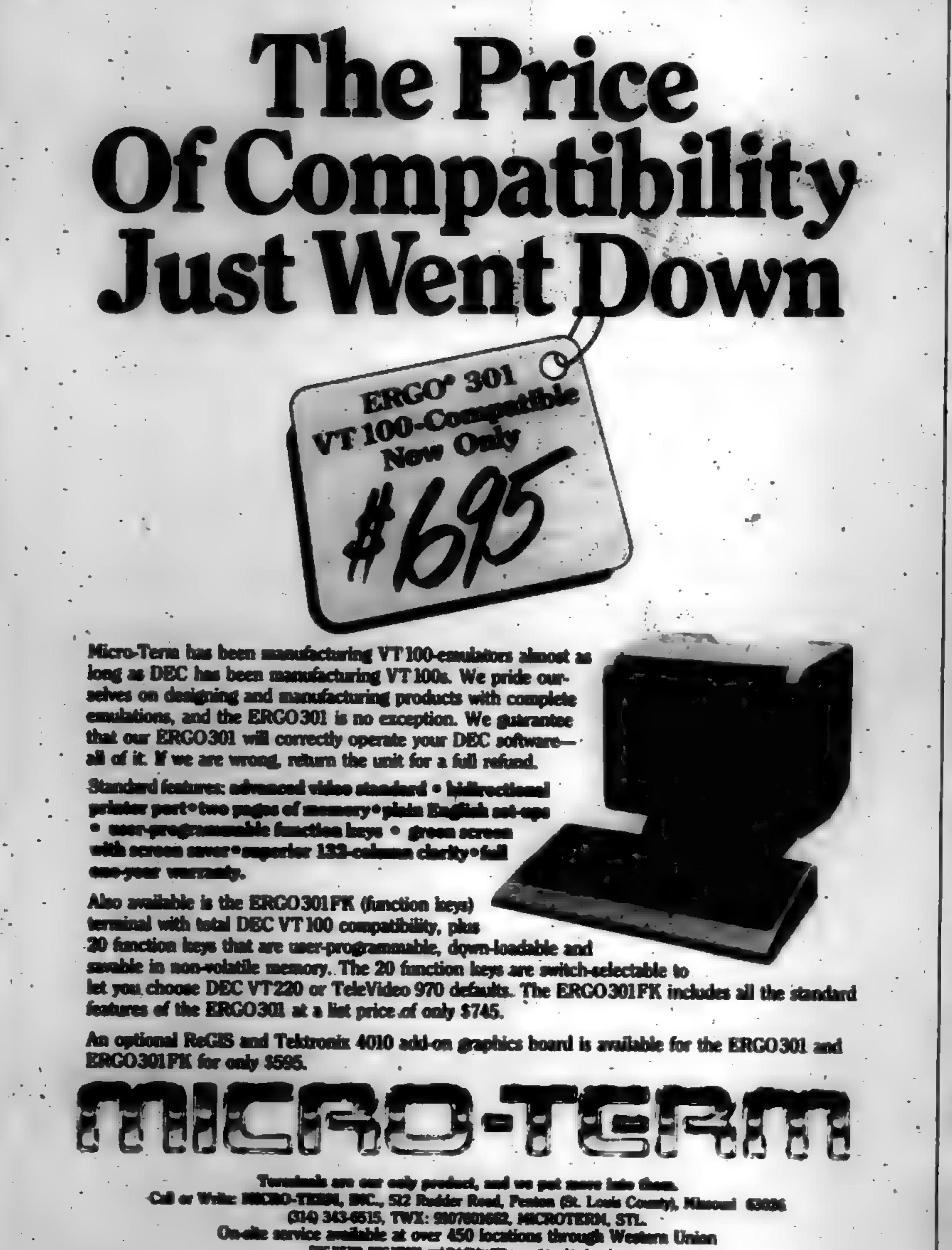
■ The Model 7814-02, a 14-in. CRT terminal that features emulation for IBM 3378 Model 2, 3, 4 and 5 terminals. It has the same basic features as the 7812-02 and costs $2,400.

■ The Model 7814-03, an enhanced version of the 7814-02 that includes the capability to perform IBM Personal Computer graphics, for $2,895.

■ The 7913-01, a 13-in. color terminal that features graphics capabilities. The unit can emulate IBM 3279 Model 2B and 3B terminals and offers 16 colors. It costs $3,150.

A controller/server unit costs $4,000, and the 360K-byte floppy disk drive costs $1,600. The 10M-byte Winchester disk drive costs $2,900.

Paradyne is located at 8550 Ulmerton Road, Largo, Fla. 33540.



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Also available is the ERGO301FK (function keys) terminal with total DEC VT100 compatibility, plus 20 function keys that are user-programmable, down-loadable and savable in non-volatile memory. The 20 function keys are switch-selectable to let you choose DEC VT220 or TeleVideo 970 defaults. The ERGO301FK includes all the standard features of the ERGO301 at a list price of only $745.

An optional ReGIS and Tektronix 4010 add-on graphics board is available for the ERGO301 and ERGO301FK for only $595.

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MICROCOMPUTERS

Higgins gets thumbs-up

Early users applaud desktop organizer program

By Eric Bender
CW Staff

Conetic Systems, Inc.'s Higgins package for the IBM Personal Computer XT, billed as an administrative assistant, successfully deals with a stream of small but crucial tasks facing white-collar workers each day, according to early users' reports.

"I use it all day, and I would be lost without it," said Gene Dougherty, a regional sales manager for Nashua Computer Products in San Mateo, Calif., who said he depends on the software to handle customer information, scheduling and word processing.

Kristina Case, a vice-president at Security Pacific National Bank in San Francisco, logs meetings and tracks projects with Higgins. "I just find it very comfortable to use," she commented.

Higgins integrates nine modules — time manager, directory, to-do list, personal files, calculator, expense reporter, scratch pad, clock and tickler reminder — with a common data base. The package also includes global information retrieval through key words, along with the ability to create macros or links to external PC-DOS files.

In addition to accessing his customer contact information through Higgins's di-

See ASSIST page 103

Borland announces Superkey

SCOTTS VALLEY, Calif. — Superkey, a program for creating macros that offers automatic data encryption, has been introduced by Borland International for the IBM Personal Computer line.

Like Borland's Sidekick desktop management package, the $69.95 Superkey package resides in random-access memory. It reportedly permits users to create and work with macros, a series of keystroke commands executed by striking one key, while working with their main applications program.

Users can use Superkey to define, edit, save, load and recall macros and can bring up, move around in and exit the program with single keystrokes, according to the vendor. Superkey's full screen macro editor can be pulled down on-top of the main program, and its display-only macros can be customized on the screen without being

See MACRO page 118

Dangers in micro project management

By Douglas Schoenberg
Special to CW

Microcomputers are sprouting on every desk. After the spreadsheet, word processor and data base manager are installed, the project management system is not far behind.

Why are microcomputers taking over this task, which was once solely the domain of large mainframes? The reasons are not hard to see.

Traditional mainframe-based project management required project managers to spend weeks learning the intricacies

See MICRO page 117

Schoenberg works in marketing at AGS Management Systems, Inc. in King of Prussia, Pa., which supplies both mainframe and microcomputer project management software.

SMALL TALK
Ed Warner
CW Staff

Which micro is wrong one?

With the Super Bowl now a part of history, we are left only to ponder its biggest enigma — Apple Computer, Inc.'s annual supercommercial. Last year's Apple offering presented us with a Blue-tinted Big Brother, this year's with a line of blindfolded executives whistling blithely — as they marched off a cliff.

And the meaning of it? My theory is that the blindfolded executives who traipsed over the edge knew where they were going. They were committing a corporate version of hara-kiri for having bought the wrong personal computer. And what qualities might make a personal computer the wrong one for business? For starters, consider the following:

- Lack of color display. A bar chart of your sales vs. those of the competition is nothing unless your sales are in Royal Blue and theirs are about the same color as battery acid.
- Use of a mouse in place of additional keys. Mice are cute — for doodling. Business users, though, prefer a numeric keypad for spreadsheets and function keys for word processing.
- Has few business applications written for it. Some people would like a variety of choices beyond two word processors.

From the foregoing, one thing becomes obvious: It is not the IBM Personal Computer that we are talking about here. Despite Apple's attempt to paint IBM as either Big Blue Brother or the producer of a product that might drive you to the cliff's edge in humiliation, its advertising ignores the fact that corporate microcomputer managers have been buying the Personal Computer in droves — and loving it.

See AD page 102

- Sorcim/IUS Micro Software enhances the Easywriter II word processing package and the Easyplus windowing system/96

INSIDE

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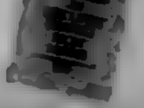

Local Area Networks For Large Institutions

NESTAR

Sorcim enhances Easywriter, Easyplus

Adds line drawing, printer selection, windowing net interface

SAN JOSE, Calif. — Sorcim/IUS Micro Software, a division of Computer Associates International, Inc., has announced enhancements to its Easywriter II word processing package and its Easyplus 1.1 windowing system, both for the IBM Personal Computer.

It also announced the addition of Plus Series Networking, a network interface for Easyplus.

Easywriter II Version 4.0 reportedly now offers line drawing capability and automatic printer selection. Lines drawn under Easywriter II, using the cursor control keys, will be useful for charts and graphs, the vendor said.

An additional enhancement in Easywriter II Version 4.0 reportedly is supported under the Easyplus 1.1 windowing system, introduced by Sorcim/IUS in August 1984.

The enhanced version of Easyplus 1.1, meanwhile, will reportedly be available in March and will offer windowing of Sorcim/IUS's Supercalc3, a spreadsheet, and Superproject, a project management package. Easyplus 1.1 will also be able to provide windows for the packages of other vendors, including Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase II and Micropro International Corp.'s Wordstar, according to the vendor.

Plus Series Networking reportedly will provide an interface of the Easyplus 1.1 windowing system to 3Com Corp.'s 3Com Network.

Plus Series Networking is priced at $600 per unit of access and is due for release in April.

Easywriter II is priced at $395, and Easyplus is priced at $149.

More information is available from Sorcim/IUS, located at 2195 Fortune Drive, San Jose, Calif. 95131.

Hayes trims 1,200 bit/sec modem costs

NORCROSS, Ga. — Hayes Microcomputer Products, Inc. has dropped prices on its 1,200 bit/sec modems, effective this month.

The price of the Smartmodem 1200 will decrease from $699 to $599, and cost of the Smartmodem 1200B will be reduced from $539 to $489. The price of the Smartmodem 1200B bundled with Smartcom II communications software will drop from $599 to $549.

Hayes is located at 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

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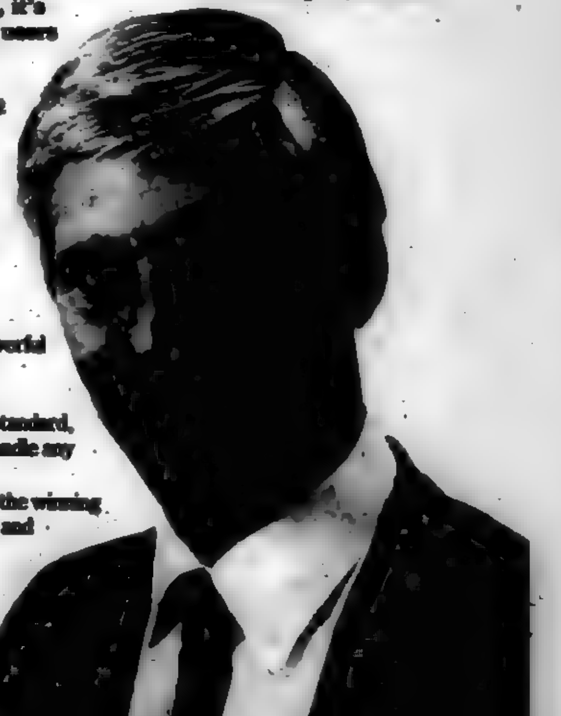
Robert A. Goodman
— Robert Goodman —
Professional Computer Software, Inc.
Los Angeles, California



Robert Goodman chose MCBA software for good, solid reasons.

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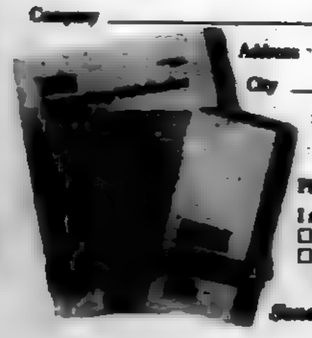

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SOFTWARE

■ Infostructures, Inc. has introduced Fact Cruncher, outline processing software for the IBM Personal Computer with word processing and project management features.

Fact Cruncher reportedly supports outlining, charting, data base manipulation and program editing. Its outliner is said to offer move, search, copy, replace, insert, delete and undo functions.

When lines are rearranged under Fact Cruncher, indentation is changed automatically, the vendor said. Outlines can be charted into boxes that are arranged in a tree-structured hierarchy, the vendor added. The word processor reportedly offers centering, right justification, emphasized print and title lines and footers.

Fact Cruncher is priced at $295.

Infostructures, P.O. Box 32617, Tucson, Ariz. 85751.

■ Datamate Co. has introduced Jetset, a set of utilities for use with a Hewlett-Packard Co. Laserjet printer connected to the IBM Personal Computer or HP 150 personal computer.

The two utilities are Setlaser and Runoff. Setlaser reportedly executes a string of commands that initialize the printer and direct its output to the communications port. It also is said to display a menu that provides access to the Laserjet's formatting capabilities, such as typeface and lines per inch.

Runoff, a text formatting program, reportedly allows users to change typefaces and to set tab stops, margins and page feeds from within the document being printed. Users also can generate titles at the head or foot of the page, underline portions of text or have the program generate page numbers, the vendor said.

Jetset is priced at $79.

Datamate, Suite 128, 4135 S. 100 East Ave., Tulsa, Okla. 74146.

■ The Programmed Press has introduced Version 1.2 of its Statistical Software package for the IBM Personal Computer line.

Statistical Software reportedly contains 20 interactive programs for data analysis and forecasting. Forecasting capabilities for multiple cor-

MICROCOMPUTERS

relation and regression analysis are included, according to the vendor.

The software is said to be able to perform linear and logarithmic trend projections, move averages and perform exponential smoothing. It reportedly requires a Personal Computer with one diskette drive and 128K bytes of internal memory.

Statistical Software is priced at $100. A $19.95 handbook, which lists all programs in Basic, is also available.

Programmed Press, 2301 Baylis Ave., Elmont, N.Y. 11003.

■ Florida Systems Consulting Group, Inc. has announced Screen Painter and Screen Handler software for developing commercial applications under AT&T's Unix System V on AT&T's 3B2 CPU.

The package is intended for application programmers who are developing software for multiuser computers under Unix. Written in C, the Screen Painter and Screen Handler provide a standard set of C function calls to control terminal I/O from a variety of terminal types.

The Screen Painter is a menu-driven tool for defining screen maps that are used by Screen Handler for managing terminal I/O, the company said.

The license fee for source code and documentation for the package is $7,500, the vender said.

Florida Systems, 7954 Baymeadows Way, Jacksonville, Fla. 32216.

COMMUNICATIONS

■ Western Digital Corp. has introduced its WD4025 packet-switching data communications controller board for use with the IBM Personal Computer line.

The board features the Western Digital WD2511 controller, an X.25 controller chip that reportedly incorporates on-board data security. The WD2511 has been certified for GTE Telenet Communications Corp.'s Telenet, Tymnet, Inc.'s Tymnet and other networks, a Western Digital spokeswoman said.

The WD4025 reportedly will link computers at the same site or in other areas via dial-up, leased lines or a packet-switched network.

The WD4025 is priced between $423 and $579 without the X.25 protocol and between $1,023 and $1,379 with X.25.

Western Digital, 2445 McCabe Way, Irvine, Calif. 19714.

■ Epson America, Inc. has introduced a multiunit, which combines a snap-on modem reportedly capable of transfer at up to 300 bit/sec and a 64K random-access memory disk, and telecommunications software, both for the company's Geneva portable computer.

The telecommunications software, Geneva Connection, reportedly is provided on a read-only memory cartridge that can be inserted into the Geneva portable computer. The software is said to permit telecommunications with remote computers using an add-on modem, external modem or acoustic coupler.

The multiunit is priced at $360. The Geneva Connection is $79.

Epson America, 2780 Lomita Blvd., Torrance, Calif. 90505.

"No, you may not have three guesses!"

■ Polygon Associates, Inc. has introduced its Poly-COM240 software package, which provides the IBM Personal Computer with Digital Equipment Corp. VT125/VT240 graphics terminal capabilities.

Poly-COM240 reportedly allows users to access DEC's Datatrieve, Decslide and Decgraph; SAS Institute, Inc.'s Sasgraph; Bolt Beranek and Newman, Inc.'s RS/1; and others. It is said to be offered with Poly-XFR software for error-free file transmission.

Poly-COM240 is priced at $300. Current owners of Polygon's Poly-COM or Poly-TRM/VT will be able to upgrade for $125.

Polygon Associates, 1024 Executive Pkwy., St. Louis, Mo. 63141.

■ Interlan, Inc. has expanded the services of its Net/Plus systems product line with the announcement of a Network Communications Server/Internet Router (NCS/IR) and Network Management Utilities that run on the IBM Personal Computer.

According to a spokesman, NCS/IR provides transparent data transmission between two physically separate Ethernet lines at speeds up to 224K bit/sec. Packets are routed across one or two dedicated synchronous data links using the Xerox Corp. XNS and ITP protocols.

The Network Management Utilities run on the IBM Personal Computer, Personal Computer XT, Personal Computer AT or Compaq Computer Corp. Compaq and provide a method for controlling a large collection of network terminal servers and other Interlan servers on an Ethernet line, the vendor said.

In addition, the NCS/IR reportedly lets users transparently initiate both interactive and file transfer sessions between nodes on two different Ethernet lines, Interlan said. The routing

Continued on page 96

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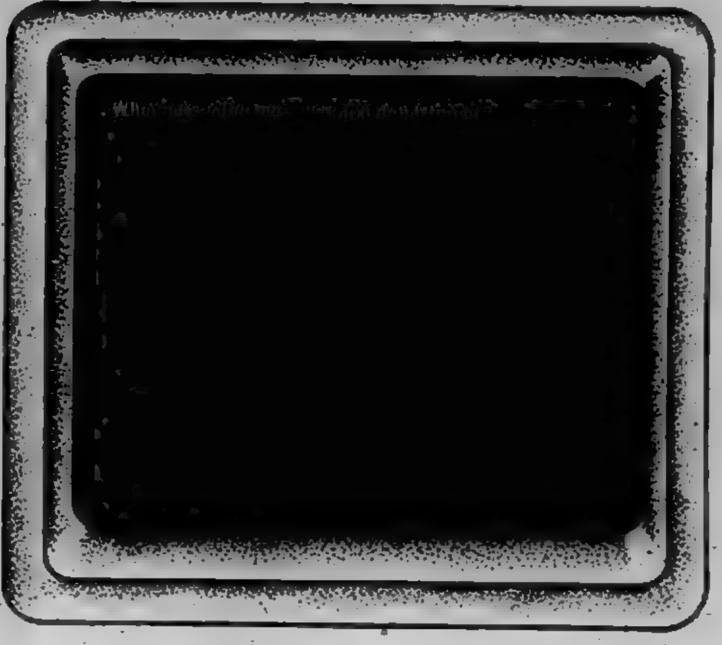

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MICROCOMPUTERS

Continued from page 97

is accomplished via the XNS Internet Protocols. The product's use of the XNS ITP protocol is said to provide full compatibility with Interlan's other system products.

Network Management Utilities provide a network operator with tools for controlling servers on an Ethernet line and allow microcomputer management to service boot requests from any server on the network, the vendor said.

NCS/IR is priced at $6,500, and the Network Management Utilities are priced at $1,000, including an IBM Personal Computer-compatible Ethernet controller board and diagnostic software.

Interlan, 3 Lyberty Way, Westford, Mass. 01886.

■ **Hayes Microcomputer Products, Inc., has introduced versions of its Smartmodem 300 and Smartmodem 1200 for the Apple Computer, Inc. Macintosh.**

The Smartmodem 300, a direct-connect modem, reportedly offers full- and half-duplex operation, unattended answering and calling abilities at speeds up to 300 bit/sec. Users can call via either a Touch-Tone telephone or pulse dialing, Hayes said.

The Smartmodem 1200 is said to have the same features as the 300 bit/sec unit.

Smartmodem 300 costs $289; Smartmodem 1200 is priced at $699.

Hayes Microcomputer Products, 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

■ **Cambridge Computer Corp. has enhanced its PC77/78 and PC/FTF Honeywell, Inc. terminal emulation packages that run on the IBM Personal Computer line.**

PC77/78 reportedly emulates the Honeywell VIP7700 and VIP7800 series of asynchronous terminals. On the Personal Computer AT, the product allows access to the host via multiple windows and provides for remote printing simultaneously with host inquiries and updates, the vendor said.

PC/FTF is a polled VIP file transfer facility said to emulate the transfer of files from a Honeywell host to a Honeywell DPS 6 Level 6 minicomputer system.

PC77/78 is priced at $795. PC/FTF costs $150.

Cambridge Computer, 151 Bender Road, Mount Carmel, Conn. 06518.

STORAGE

■ **Data Technology Corp. has announced Teammate 1120AT and 1132AT, hard disk storage systems for the IBM Personal Computer AT.**

The Teammate 1120AT supplies 20M bytes of storage and the Teammate 1132AT provides 32M bytes of storage, Data Technology said.

Teammate models plug into a Personal Computer AT's controller and include cables, installation guides, slides for mounting the drives and Infotools, Inc.'s Bakup, a backup software program that normally sells for $150, the vendor said.

Teammate 1120AT costs $1,295, and Teammate 1132AT costs $2,495.

Data Technology, 2775 Northwestern Pkwy., Santa Clara, Calif. 95051.

■ **Davong Systems, Inc. has announced that it has expanded the capacity of its hard-disk storage system for the IBM Personal Computer, Personal Computer XT and Personal Computer AT.**

The vendor's Fixed Disk System is said to provide 86M bytes of formatted Winchester drive storage for programs and data files. The unit is housed in a cabinet that fits under the IBM monitor. An indicator light panel allows the user to monitor disk activities, the vendor said.

Both versions of the vendor's software are said to work with the expanded capacity unit. They are the standard Fixed Disk Software, which is shipped with the unit, and the optional Multi-OSR software, which offers higher performance, Davong said.

The 86M-byte unit is priced at $6,995.

Davong Systems, 217 Humboldt Court, Sunnyvale, Calif. 94089.

■ **Mom Corp. has introduced its Max Disk Drive, a 10M-byte removable cartridge disk drive for the IBM Personal Computer AT.**

The Max Disk Drive reportedly can back up 10M bytes in 90 seconds. An overflow cartridge feature reportedly advises the operator to insert a new cartridge.

The drive reportedly uses an air gap to prevent the read/write heads from contacting the disk surface.

The Max Disk Drive for the AT is priced at $2,895 in its single-drive version and $3,995 in its dual-drive version.

Mom, Two Northside 75, Atlanta, Ga. 30318.

■ **RMTC Systems has introduced Porta-Tape, a 10M-byte tape backup system for the IBM Personal Computer XT.**

The tape system reportedly attaches to the XT's 37-pin floppy drive port. The package includes software that backs up the tape, either in streaming or in file-by-file mode, the vendor said. In streaming mode, a hard disk drive reportedly can be backed up in less than 10 minutes.

The product costs $1,495.

RMTC Systems, P.O. Box 456, Boulder, Colo. 80306.

■ **Distributed Logic Corp. (Dilog) has announced four controller products and associated software for integrating large disk drives and backup tape drives to Digital Equipment Corp.'s Microvax-1.**

The devices are the Micro Tape MV132, which includes a Dilog

Continued on page 102

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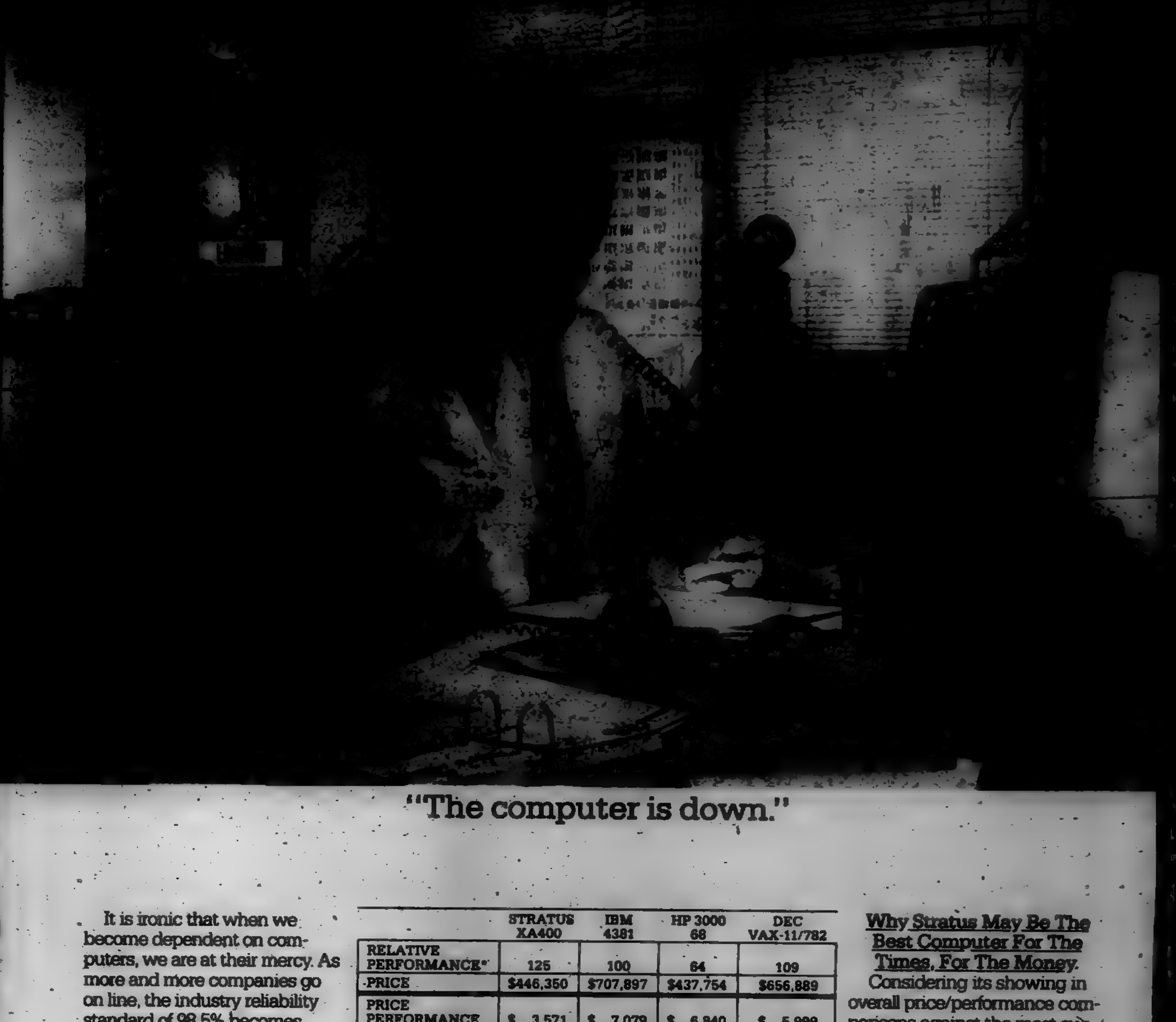

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Relative Price Performance Index

**Computerworld, August 20, 1984*

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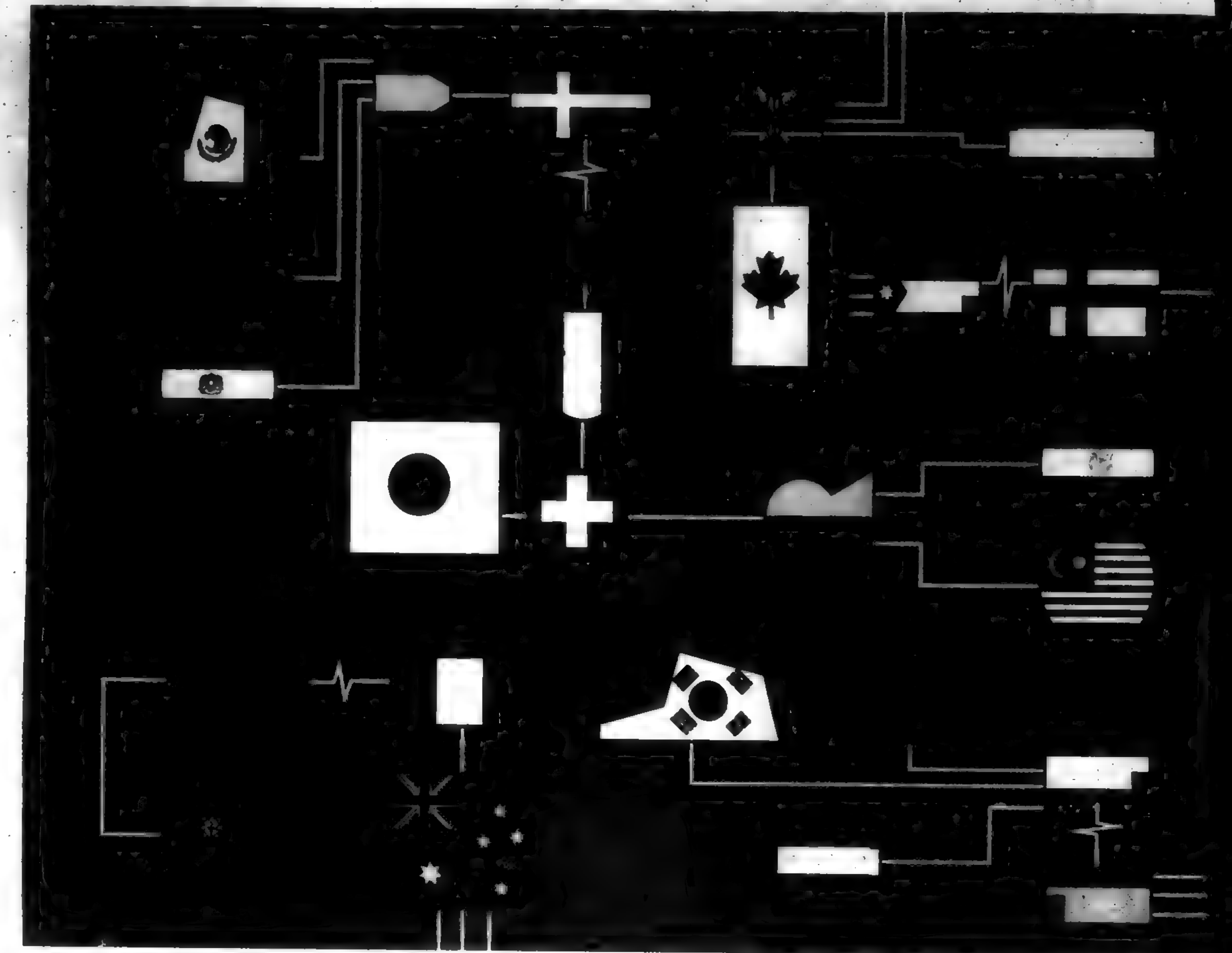

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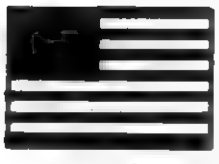

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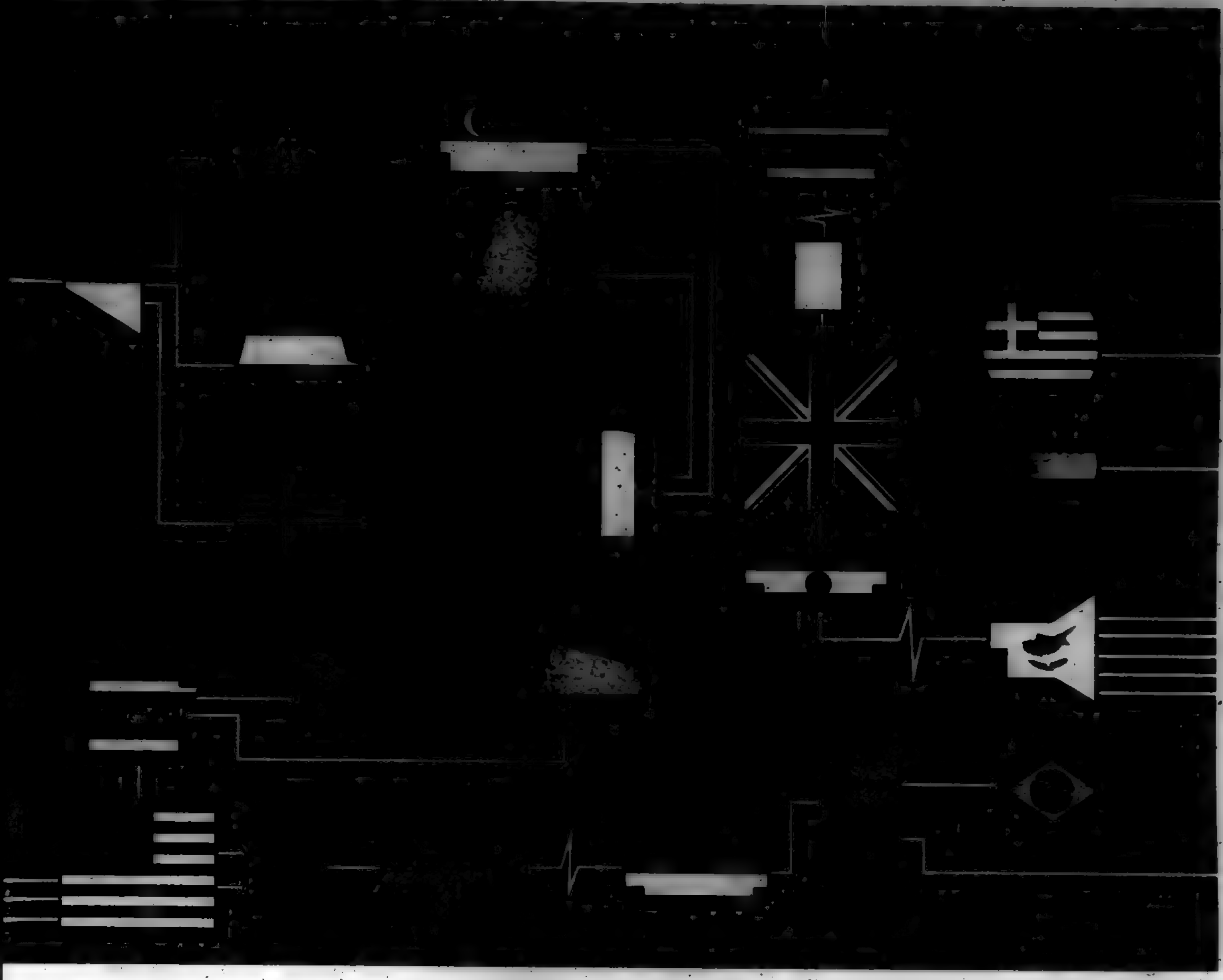

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MICROCOMPUTERS

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DQ132 ½-in. tape coupler and software for interfacing all popular ½-in. streaming and start/stop tape drives with densities up to 6,250 bit/in.; the Micro TK MV342, which includes a Dilog DQ342 coupler and software for interfacing Control Data Corp. Sentinel cartridge tape drives; the Micro SMD MV210, offering a Dilog DQ210 disk controller and software; and the Micro 506 MV610, which includes a Dilog DQ610 controller and coupler with software.

Prices are as follows: $1,100 for the Micro Tape MV132 controller; $990 for the Micro TK MV342 controller; $1,270 for the Micro SMD MV210 controller; and $1,345 for the Micro 506 MV610 controller, the vendor said.

Dilog, P.O. Box 6270, 1555 S. Sinclair, Anaheim, Calif. 92806.

■ **Computer Products International, Inc. has introduced networking capacity to its line of Universal mass storage systems.**

The systems, which range from 10M to 368M bytes, reportedly feature full multiplexing and networking capability that includes compatibility with Ethernet, IBM's PC Network and Datapoint Corp.'s Arcnet, among other networks.

The systems may be accessed by users of several different brands of computers running on a network, Computer Products said. The units are said to be compatible with the Apple Computer, Inc. Apple II, Apple IIe, Macintosh and Lisa; the IBM Personal Computer line; the Kaypro Corp. Kaypro IV; the Digital Equipment Corp. Rainbow 100 and 100 Plus; and others.

They are priced ranging from $1,995 to $13,500.

Computer Products International, 740 S. Hillview, Milpitas, Calif. 95035.

■ **Viasyn Corp., formerly known as Compupro, has released a mass storage option for its System 816 microcomputers.**

The Tri-Disk Subsystem offers combinations of two 8-in. floppy drives, two 5¼-in. floppy drives or one each of 8-in. and 5¼-in. floppy drives — all with a choice of a 20M- or 40M-byte hard disk drive.

The floppy drives are double-sided, double-density with storage capacities of 1.2M bytes on the 8-in. drive and 800K-bytes on the 5¼-in. drive.

The subsystem is packaged in the standard Compupro disk enclosure and includes the company's Disk 3 Direct Memory Access disk controller and Digital Research, Inc.'s CP/M 80 and CP/M 86 operating systems.

Prices are $4,995 for the subsystem with a 20M-byte hard disk and $5,495 for the subsystem with a 40M-byte hard disk.

Viasyn, 3506 Breakwater Court, Hayward, Calif. 94545.

■ **Alloy Computer Products, Inc. has announced enhancements to its line of integrated storage subsystems, hard disks, tape backup units and multiuser products to achieve full compatibility with IBM's Personal Computer AT.**

The enhancements to PC Qicstor and Qicstor-Plus, according to the vendor, are designed to increase the storage capacity and tape backup ca-

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AD

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To understand why, consider the Personal Computer's history. Introduced in 1981, the Personal Computer was then a pretty impressive piece of equipment, particularly for its 16-bit microprocessor and memory expansion capability. The Personal Computer, moreover, was never offered as a product for both the home and office; it was an office machine, pure and simple. That clarity of position told buyers that here was a machine that was no toy, here was a computer on which they could expect to conduct business.

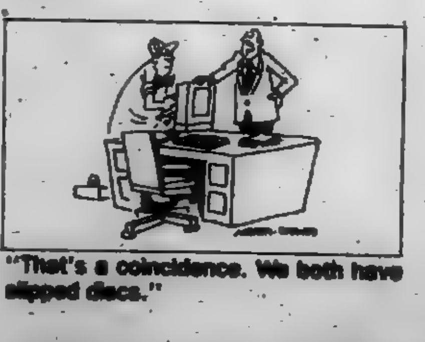
It was also a statement to software developers, such as Lotus Development Corp., the developers of 1-2-3.

Now about the Macintosh. There is no doubt the machine is revolutionary, particularly for its use of bit-mapped graphics, pull-down menus and, oh yes, the rodent-on-a-wire. But, on its arrival, Macintosh was aimed at the home market, where Apple's sales have always been strongest. As the above list suggests, its homeyness shows.

Had the Macintosh been targeted to the corporate user, it might have come with a more extensive keyboard, a word processing package capable of producing documents of 15 pages and larger and either a color monitor or, at least, an expansion slot for a color card. Most importantly, software developers would have taken notice and begun the development of business applications to take advantage of the Macintosh.

Instead, the Macintosh to date has a number of nice art-graphics packages, a slew of education and home-finance packages — and the promise of Jazz from Lotus.

Whether or not Apple can move out the back door of the home and into the office, even with Macintosh Office leading the charge, one thing is certain. Apple's charge is a much-belated one — and all of its video slights against IBM cannot change that.



"That's a coincidence. We both have slipped discs."

MICROCOMPUTERS

pabilities the Personal Computer AT requires to operate optimally as a multiuser machine. PC Qicstor reportedly includes a hard disk — 20M bytes to 170M bytes — and a streaming cartridge tape backup unit with a file-oriented, formatted capacity of more than 50M bytes.

Qicstor-Plus is a high-capacity subsystem for IBM Personal Computers said to integrate in one cabinet five Personal Computer expansion slots, a hard disk drive and a file-oriented ¼-in. streaming tape.

Prices for PC Qicstor range from $4,995 for the 20M-byte version to $11,295 for a 120M-byte version. Prices for Qicstor-Plus range from $5,595 for a 20M-byte version to $10,595 for a 120M-byte version.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ **Innovative Data Technology, Inc. has announced four hard disk systems for the IBM Personal Computer AT.**

The 5¼-in. drives can be installed in the AT by connecting two cables to the AT's disk controller card, Innovative Data Technology said. According to the vendor, the drives include software that allows the user to select an appropriate drive, format the disk, certify operations, partition the drive and exit to the operating system.

The drives feature a 5M byte/sec data transfer rate and automatic thermal compensation for track stability.

The drives range in cost from $3,000 to $8,000.

Innovative Data Technology, P. O. Box 178160, 4060 Morena Blvd., San Diego, Calif. 92117.

■ **OSM Computer Corp. has announced the Zeus Streaming Tape Backup (STB)-20, a 20M-byte streaming tape drive designed for backup and retrieval of data.**

According to a spokesman, the product is designed for use with data being processed on the company's Zeus 4B multiuser business computer systems.

The Zeus 4B reportedly handles from two to four users and provides each user with a dedicated CPU, 64K bytes of random-access memory and I/O ports.

The Zeus STB-20 streaming tape drive executes data backup at 90 in./sec with standard ¼-in., four-track serpentine tape. The Zeus STB-20 weighs 11 lb, and the product is priced at $1,995.

OSM Computer, 665 Clyde Ave., Mountain View, Calif. 94043.

■ **PC's Limited has announced a 117M-byte internal hard drive for the IBM Personal Computer AT.**

The disk drive contains 117M bytes of formatted storage and 140M bytes of unformatted storage, drops into the AT and works off the existing controller and power supply. The drive has an average access time of less than 30 msec, the company said. Half-height, streaming tape backup units are said to be available. Cost of the product is $3,395.

PC's Limited, Suite E-200, 7801 N. Lamar, Austin, Texas, 78752.

■ **Syntactics, Inc. has introduced Pulse Junior, a streaming tape backup utility software system designed for Archive Corp. ¼-in. streaming tape drives running with**

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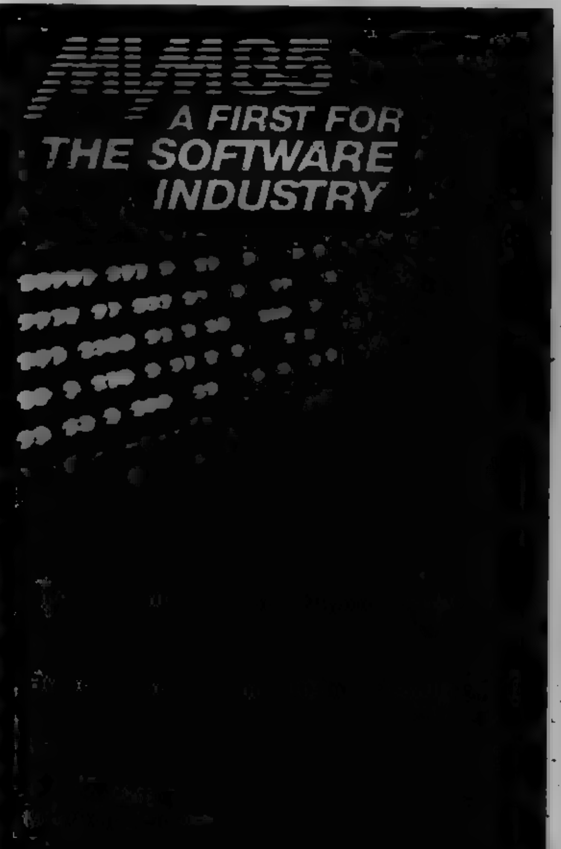

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ASSIST

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rectory, Dougherty calls up the to-do list throughout the day. "In the morning I give myself a printout of the to-do list including appointments," he said. "I can make myself a copy of my schedule with notes attached to it and print out a copy for my secretary." Later in the day, items from the to-do list that need further attention go into the tickler module.

Like Dougherty, Rodney Hildenbrand, product division manager with Robert Bailey Design Group in Portland, Ore., tracks customers and projects with Higgins. "It keeps me very honest," he said. "Nothing slips through the cracks."

Among other features, the built-in clock is "really great" for keeping on schedule, Case said. However, neither she nor Dougherty bother with the on-screen calculator or the expense report generator, although Hildenbrand uses both.

Dougherty uses the Higgins note writer for most word processing applications but said that the package is not suitable for documents more than two typewritten pages long.

Although the users contacted by *Computerworld* lacked modems, they all expect to get the equipment in the future, and they predicted that Higgins' autodialing functions will then save them time.

In addition, they all pointed to the advantages of the package's key-word retrieval feature and emphasized the ease of switching from Higgins to other PC-DOS applications.

The package also drew favorable reviews for ease of learning and ease of use. Each user said he had run Higgins for several months without reading the documentation.

"Higgins is the kind of program that I've been looking for since I first got a computer two years ago," Dougherty summed up.

Conetic, whose marketing group for Higgins is based in San Leandro, Calif., began shipping a $395 single-user version in December. Local-area network versions also are available, primarily through resellers, the vendor said.

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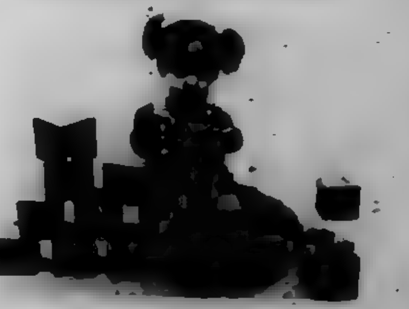
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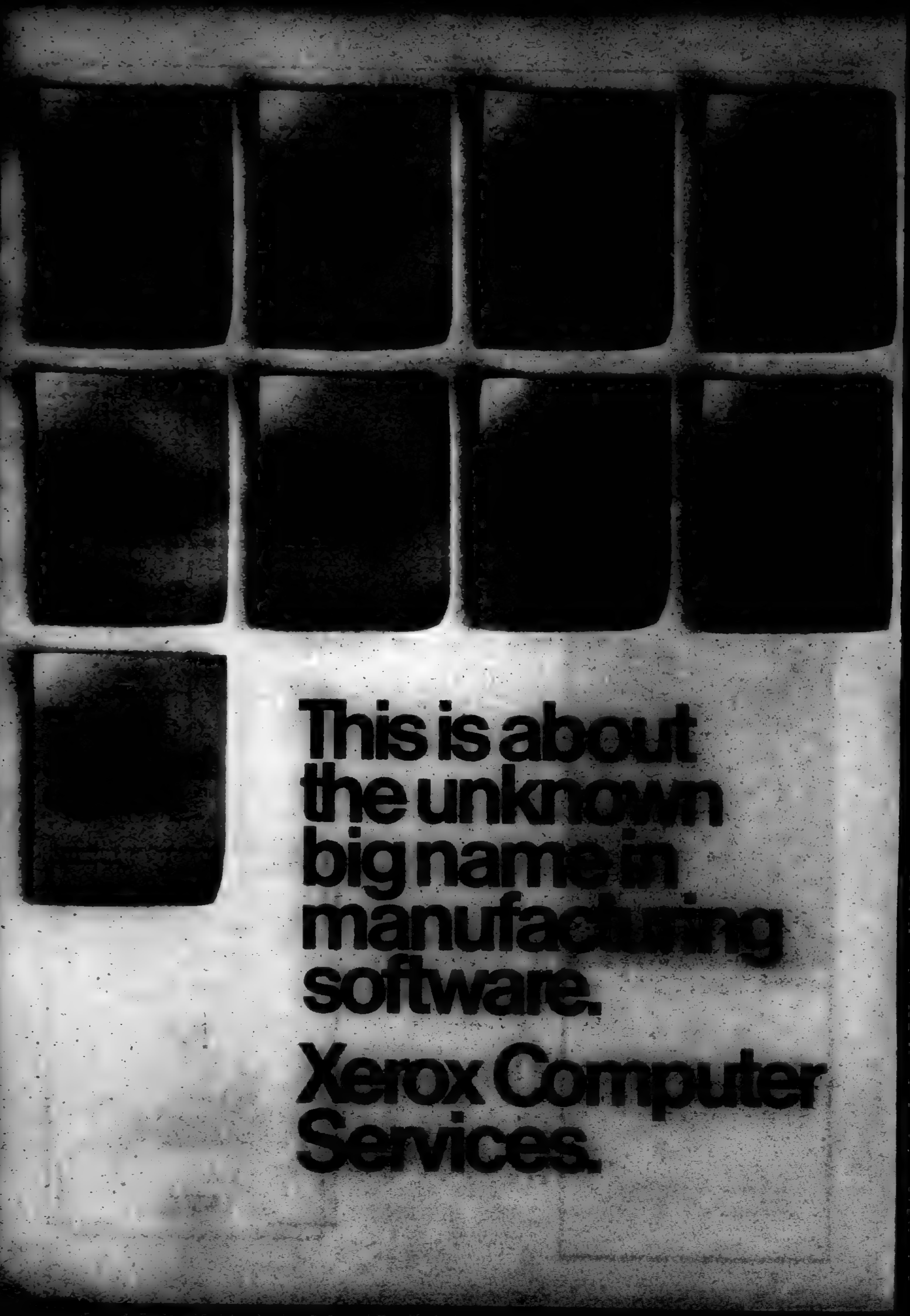
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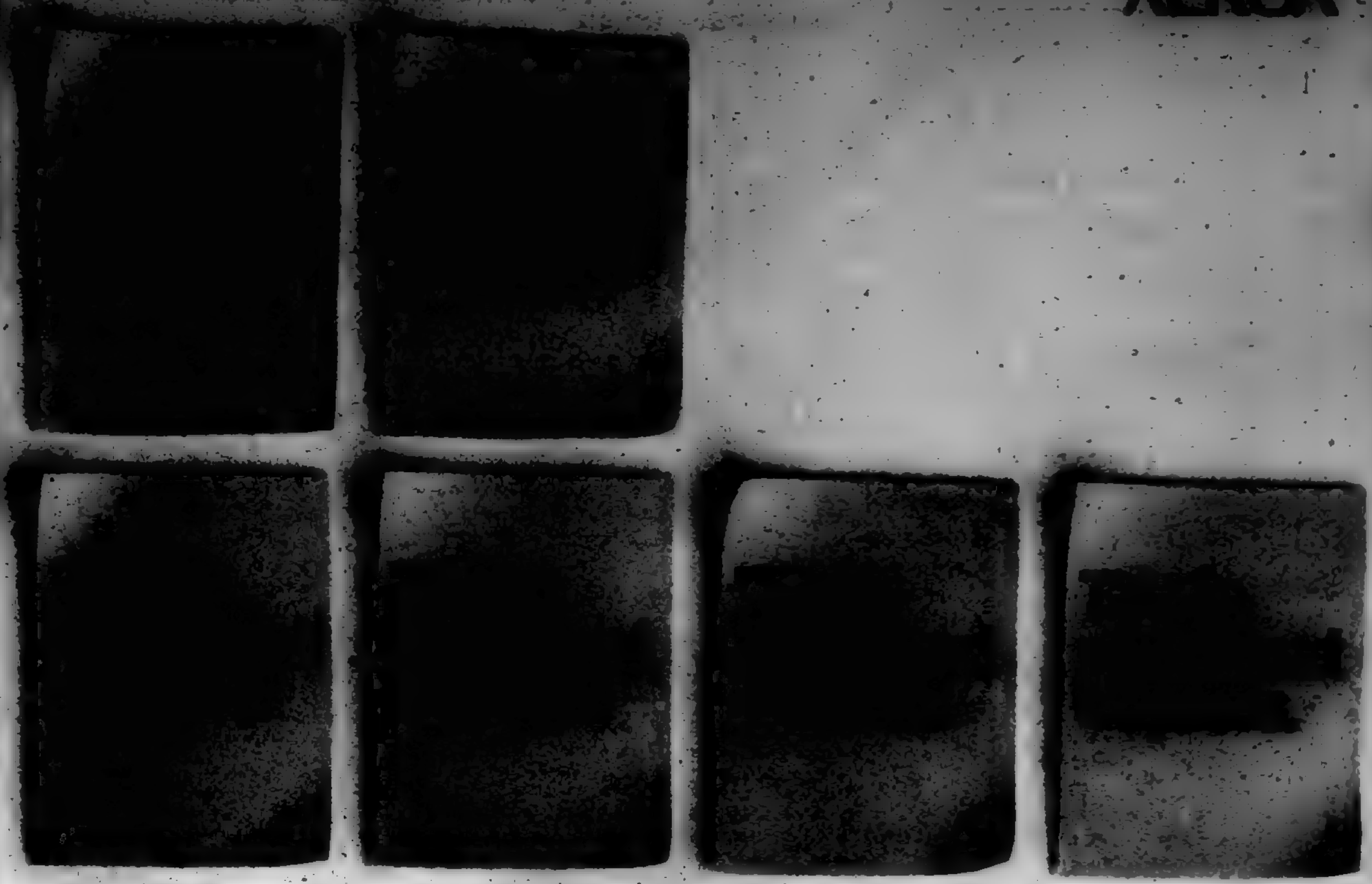

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*Industry report refers to IDC Industry Report

MICROCOMPUTERS

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the IBM Personal Computer and compatibles.

The software, which is downloaded from the micro's hard disk, reportedly will perform a full-image backup of a 10M-byte hard disk in just over three minutes.

Pulse Junior costs $69.95.

Syntactics, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ **Wow Enterprises has introduced its Fixed Disk Upgrade Package for the IBM Personal Computer XT and XT/370.**

The Fixed Disk Upgrade Package reportedly increases the amount of fixed disk storage in either machine to 20M bytes without the use of an external expansion unit. Instead, the computer's diskette drive is replaced by a half-height, 10M-byte hard disk and a dual-sided diskette drive, the vendor said. The upgrade is designed for large amounts of storage.

The computer's 10M-byte hard disk is left in place and works in conjunction with the new disk without modification of the XT's original controller card, Wow Enterprises said.

The upgrade package costs $784.

Wow Enterprises, 1500 Middlefield Road, Palo Alto, Calif. 94301.

■ **Aquix Advanced Systems Corp. has introduced the AQMS 188, a mass storage system for networked IBM Personal Computers.**

The AQMS 188 reportedly includes a 188M-byte, 8-in. Winchester drive, a ¼-in. streaming tape backup unit and software. The AQMS 188 can be used as a file server in networked applications and allows users to have a start-up system when installing a local-area network, the vendor said.

The product reportedly operates on the same software partitioning and security as the firm's AQMS 513 and is compatible with IBM Personal Computers in a local-area network.

AQMS 188 is priced at $18,450.

Aquix Advanced Systems, 140 Adams Blvd., Farmingdale, N.Y. 11735.

■ **Data Technology Corp.'s Teammate division has introduced a 3.3M-byte flexible subsystem for the IBM Personal Computer AT.**

The Teammate 1103 subsystem reportedly offers double the capacity of the Personal Computer AT's 1.2M-byte drive and can read standard IBM 96 and 48 track/in. diskettes. The AT's 1.2M-byte drive reportedly does not write to the IBM Personal Computer's 48 track/in. diskettes.

The Teammate 1103 with a backup storage utility sells for $945.

Data Technology, 2775 Northwestern Pkwy., Santa Clara, Calif. 95051.

PRINTERS/PLOTTERS/ PERIPHERALS

■ **Sakata U.S.A. Corp. announced its SP-1000 dot matrix printer.**

The SP-1000 reportedly offers nine- by 11-dot printing with 12 variations for character printing within the same line. The SP-1000 accepts fanfold, single-sheet and roll paper.

The 80-col. printer is said to be equipped with a Centronics Data Computer Corp.-type parallel interface and to include an adjustable tractor feed unit. The printer's speed is 100 char./sec, and bidirectional printing is offered in text mode.

The SP-1000 is priced at $349.

Sakata U.S.A., 651 Bonnie Lane, Elk Grove Village, Ill. 60007.

■ **Epson America, Inc. has introduced a thermal transfer printer for its Geneva portable computer and a dot matrix printer, the LX-80.**

The P-80 thermal transfer printer reportedly is the size of a typewriter roller and prints on both thermal and standard bond paper at 45 char./sec in a variety of type styles.

The LX-80 printer is said to feature both draft- and letter-quality dot matrix printing. It reportedly offers such print styles as compress, italic, elite or double strike.

The P-80 costs $249. The LX-80 is priced at $349.

Epson - America, 2780 Lomita Blvd., Torrance, Calif. 90505.

■ **NEC Information Systems, Inc. has introduced its Spinwriter Elf, a letter-quality printer for the IBM PCjr, the Apple Computer, Inc. Apple II series and other personal computers.**

The Spinwriter Elf reportedly prints up to 190 word/min. and offers pitch selections of 10, 12, 15 and proportional pitch. It also can provide bold and shadow print, bidirectional print capability and autoloading, the vendor said. A cut-sheet guide is said to be included.

The Spinwriter Elf also reportedly offers built-in command code and interface selectability and is supported by such software as Lotus Development Corp.'s 1-2-3 and Micropro International Corp.'s Wordstar.

Spinwriter Elf is priced at $545.

NEC Information Systems, 1414 Massachusetts Ave., Boxboro, Mass. 01719.

■ **C. Itoh Digital Products, Inc. has announced a 29 char./sec version of its Starwriter series Model A10 daisywheel computer output printer.**

According to a spokesman, the Starwriter A10-30 is designed to enable micro users to print letter-quality, finished manuscripts and formal documents at 29 char./sec.

The system is said to work with IBM Personal Computers. It features a 138-char. column width for wide paper, 200-byte (or optional 2K- to 8K-byte maximum) buffer memory for bidirectional printing and RS-232C serial or Centronics Data Com-

Continued on page 108

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DIGILOG®

MICROCOMPUTERS

Continued from page [illegible]

puter Corp.-type parallel communications interfaces.

The printer offers friction and optional bidirectional tractor paper feed, the vendor said. Logic-seeking bidirectional printing reportedly eliminates the need for carriage return at the end of each line, and the 100-char. set provides all letters, numbers and punctuation needed for business correspondence.

The Starwriter A10-30 costs $825.

C. Itoh Digital Products, Suite 220, 19750 South Vermont Ave., Torrance, Calif. 90502.

■ **Fujitsu America, Inc. has announced Dotmax 24, a 24-wire dot matrix color printer.**

The product allows users to print charts, bar graphs, line graphs and text in eight colors, Fujitsu said. A four-color ribbon reportedly features red, yellow, blue and black printing on a single pass and green, orange, purple and brown on a second pass.

The printer is said to produce 360 dot/in. by 180 dot/in. resolution in text mode and 180 dot/in. by 180 dot/in. in graphics resolution.

It prints letter-quality output at a speed of 80 char./sec and draft-quality documents at 240 char./sec, Fujitsu said. Dotmax 24 costs $2,145.

Fujitsu America, 3055 Orchard Drive, San Jose, Calif. 95134.

■ **Princeton Graphics Systems, Inc. has announced two terminals and an enhanced monitor.**

SR-12P is a color monitor for professional and scientific users who require high resolution and a wide range of colors, according to the vendor. The terminal is said to feature 690- by 480-pixel resolution and an antireflective coated panel that reduces glare and enhances color contrast, the vendor said. The monitor reportedly displays up to 4,096 colors and is compatible with the IBM Professional Graphics card.

HX-9E, a 9-in. color monitor, operates on dual-scan frequencies and offers 640- by 200-pixel resolution in graphics mode and 640- by 350-pixel resolution in text mode, Princeton said. The monitor reportedly displays 2,000 characters on 80 columns in 25 lines. HX-12E, a 12-in. color monitor, is said to provide 690- by 240-pixel resolution in graphics mode and 690- by 350-pixel resolution in text mode. It displays 2,000 characters on 80 columns in 25 lines.

All three monitors work with the IBM Personal Computer, and the HX-9E can be used with Apple Computer, Inc.'s Apple IIe microcomputers.

SR-12P is priced at $999, HX-9E costs $650 and HX-12E sells for $785.

Princeton Graphics Systems, 170 Wall St., Princeton, N.J. 08540.

■ **Sumicom, Inc. has announced its 2120 Color Monitor, a 12-in. terminal that can be used with the IBM Personal Computer or Apple Computer, Inc.'s Apple II line of microcomputers.**

The monitor reportedly supplies 640- by 200-pixel resolution. A user can choose from either 16 standard or eight user-defined colors, the vendor said.

The terminal is designed for business, scientific and educational applications, according to Sumicom. The 2120 Color Monitor is said to supply an 80-col. by 25-line format that displays up to 2,000 characters. Front panel controls include adjustments for contrast, brightness and horizontal and vertical hold, the vendor said.

The 2120 Color Monitor costs $490.

Sumicom, 17862 E. 17th St., Tustin, Calif. 92680.

■ **NEC Information Systems, Inc. has announced a four-color pen plotter that is compatible with Hewlett-Packard Co.'s 7470 graphics plotter.**

The Britewriter four-color pen plotter is available with felt-tip pens in black, blue, green and red. An optional set of four colors — violet, orange, brown and pink — is also available.

Pens can be changed without interrupting the job, the vendor said.

The Britewriter reportedly can deliver full-color printing directly onto transparencies.

It is said to operate at 60mm/sec in low-speed mode and up to 112mm/sec in high-speed mode. Plotting speed is 4.6 char./sec in monochrome and 2.6 char./sec in four colors.

Plotting direction is along the horizontal axis, with 0.1mm accuracy in both horizontal and vertical directions, according to the vendor.

Other features are said to include 256 bytes of character and instruction storage in memory, Ascii character code and serial or parallel interfaces.

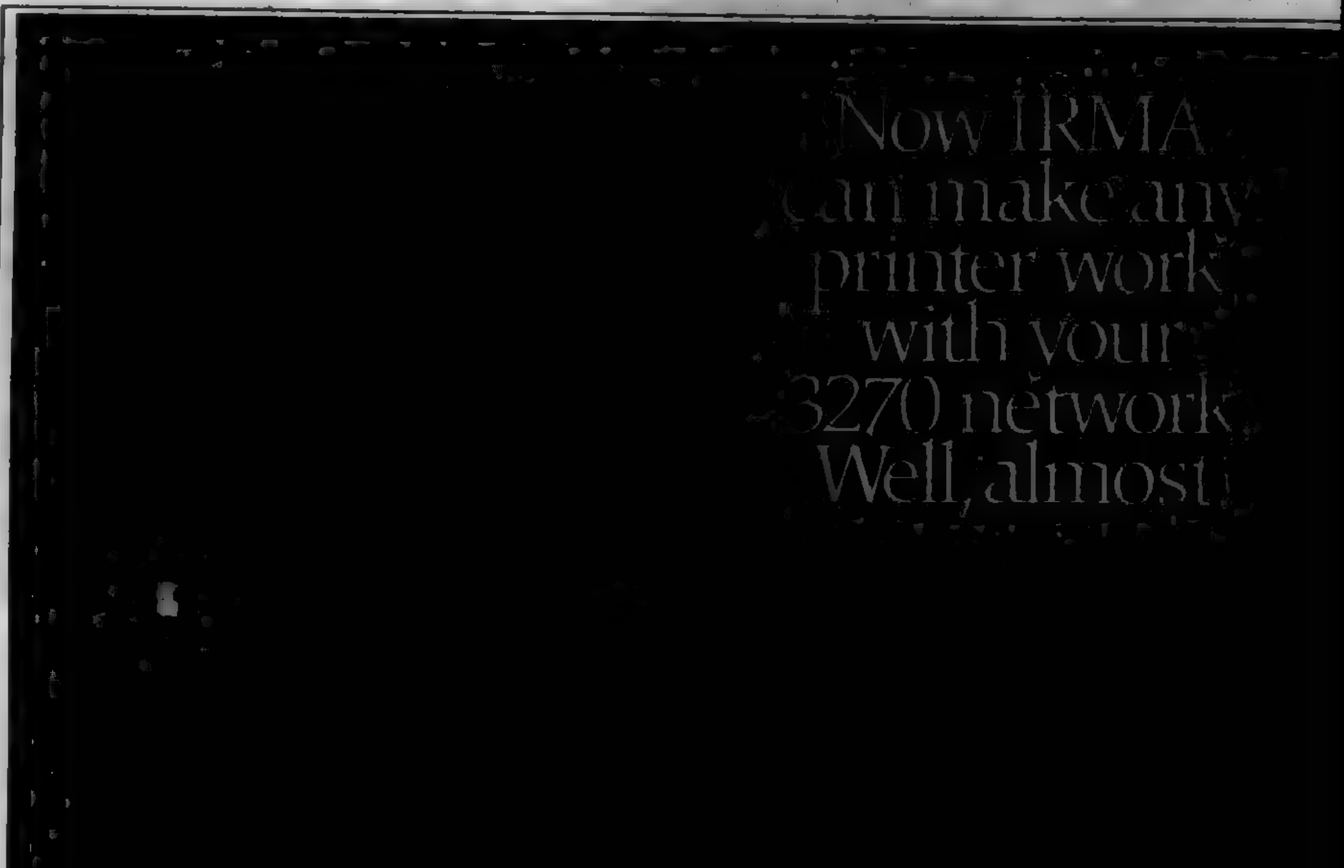
The plotter is said to be compatible with a variety of software packages, including Lotus Development Corp.'s 1-2-3 and Symphony. The Britewriter is scheduled for delivery in January 1985 and will be priced at approximately $599.

NEC Information Systems, 1414 Massachusetts Ave., Boxboro, Mass. 01719.

BOARD-LEVEL DEVICES

■ **Star Gate Technologies has introduced Octacom, an expansion board with multiple serial ports for the IBM Personal Computer line.**

The board provides four to eight ports and fits in any full-length expansion slot on a Personal Computer, the vendor said. The product allows microcomputers to tie into modem lines, monitor security systems and communicate with mainframes, ac-



cording to Star Gate.

Octacom features reportedly include an address decoder and interrupted circuitry, contained in programmable devices for custom configuration.

A four-port module costs $295, a six-port module sells for $345 and an eight-channel module is priced at $395.

Star Gate Technologies, P.O. Box 764, Cleveland, Ohio 44036.

■ Computer Development Services, Inc. has introduced Power Drive, a high-speed printer interface to the IBM Personal Computer.

Power Drive plugs into one of the Personal Computer's expansion slots and supports printers at speeds up to 800 line/min without requiring user program modification, according to the vendor.

Power Drive requires a Centronics Data Computer Corp.- or Dataproducts Corp.-compatible high-speed printer and comes with an interface board for use in the Personal Computer.

It is priced at $1,095, according to the vendor.

Computer Development Services, 1851 Dana St., Glendale, Calif. 91201.

■ North Star Computers, Inc. has announced that its multiuser Dimension line of IBM Personal Computer-compatible computers now supports the Intel Corp. 8087-2 coprocessor.

The Dimension line, which supports up to 12 users, features an Intel 8088-2 microprocessor operating at a speed of 8 MHz.

The 8087-2 coprocessor, designed to support floating-point arithmetic, can increase a Dimension system's processing speed by as much as 500%, the vendor said.

An 8087 processor board costs $550.

North Star Computers, 14440 Catalina St., San Leandro, Calif. 94577.

■ Teletek has announced Teletek Z-150MB, a multifunction memory board for Zenith Data Systems Corp. Z-150 and Z-160 microcomputers.

The board is said to provide up to 384K bytes of random-access memory (RAM). The Z-150MB's real-time clock features battery backup and accurately keeps time for up to two years, Teletek said.

The package reportedly includes Timesavers, a software program that includes a RAM drive program.

Teletek Z-150MB costs $199.

Teletek, 4600 Pell Drive, Sacramento, Calif. 95838.

■ Bronson Electronics Corp. has announced Innovation 1007A, an expansion board for the IBM Personal Computer AT.

The Innovation 1007A consists of a parallel printer port, IBM light pen accessory connector and socketed random-access memory and read-only memory to accept alternate character fonts, the vendor said.

The board reportedly provides color, graphics and printing capabilities.

The product supports red-green-blue and monochrome composite monitors as well as television sets with a radio frequency modulator, Bronson said.

Innovation 1007A costs $244 with a printer port and $225 without the port.

Bronson Electronics, 12700 Nicollet Ave. S., Burnsville, Minn. 55337.

■ Chorus Data Systems, Inc. has introduced its Screenmaster, a half-width expansion board that reportedly provides 16 true shades of gray for the IBM Personal Computer color monitor.

Users reportedly can switch their color monitor (IBM Model 5153 or equivalent) between color operation and monochrome mode manually or under program control. Screenmaster reportedly gives black-and-white display of text or continuous tone pictures.

When used in conjunction with a Tecmar, Inc. Graphics Master board and Chorus's PC-Eye and Photobase software, Screenmaster reportedly allows users to extend data base management systems such as Ashton-Tate's Dbase II to include cross-indexed photo albums.

Screenmaster is priced at $195.

Chorus Data Systems, Box 370, 6 Continental Blvd., Merrimack, N.H. 03054.

■ Zendex Corp. has introduced its ZX-186/30 single-board computer and its ZX-940, a configurable desktop Intel Corp. Multibus system chassis.

The ZX-186/30 reportedly offers up to 1M byte of random-access memory (RAM), one RS-232C serial port, a Centronics Data Corp.-type parallel port and one RS-422/449 or RS-232C port for high-speed data communications. It also is said to offer four 28-pin programmable read-only memory sockets, a disk interface and two auxiliary RS-232C serial ports.

The ZX-940 chassis reportedly offers two 5¼-in., half-height disk drive positions, a full-height disk drive position, four Multibus card slots and a 250W switching power supply. The unit has a 16¼-in. wide by 17-in. deep footprint when used with a terminal atop its chassis, Zendex said.

The ZX-940 is priced at $1,595. The ZX-186/30 is priced from $2,195 to $3,395. A $1,495 expansion board is available to upgrade the ZX-186/30 from 512K bytes to 1M byte of RAM.

Zendex, 6700 Sierra Lane, Dublin, Calif. 94568.

See BOARD page 110

When you set up an IBM® 3270 network, you're faced with the fact that you can't just go out and buy any printer to work with it.

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BOARD

from page 109

■ **Chorus Data Systems, Inc. has introduced its PC-1200 video digitiser board for the IBM Personal Computer line.**

The PC-1200 reportedly stores images directly to main memory or the graphics adapter's memory and can use a video camera or video recorder to record 640- by 512-pixel by 8-bit images.

The PC-1200 includes menu software for users to capture, store and print an image, Chorus said. Subroutine libraries supporting C, assembler and Basic languages also are included.

The PC-1200 is priced at $1,495.

Chorus Data Systems, P.O. Box 370, 6 Continental Blvd., Merrimack, N.H. 03054.

■ **AST Research, Inc. has introduced Ramstak, a series of expansion boards that provides up to 2M bytes of random-access memory (RAM) for Apple Computer, Inc.'s Lisa.**

The product fits into a Lisa expansion board slot and comes in 512K-byte, 1M-byte, 1.5M-byte and 2M-byte models, according to the vendor. The product is designed to allow users to take advantage of the Lisa's RAM expansion capabilities and to support multiuser operating systems like AT&T's Unix and Microsoft Corp.'s Xenix, AST Research said.

A 512K-byte board costs $1,395, and each additional 512K bytes sells for $1,000.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

■ **Sigma Designs, Inc. has introduced its Color 400 high-resolution color/graphics board for the IBM Personal Computer.**

The Color 400 board reportedly offers 640 dots by 400 lines of point-addressable graphics in noninterlaced mode and also runs existing software written for 200-line cards.

It is said to be compatible with the Sigma Design CM12 and the Princeton Graphic Systems SR-12 monitors.

The Color 400 board also reportedly offers 16 colors and is compatible with 40-char.-by-25-line and 80-char.-by-25-line alphanumeric modes.

The Color 400 board is priced at $795.

Sigma Designs, 2023 O'Toole Ave., San Jose, Calif. 95131.

■ **Charles River Data Systems, Inc. has announced two memory boards designed to give its Universe supermicrocomputer systems up to 10M bytes of total memory.**

The 2M-byte and 4M-byte boards are intended to provide added memory capacities for applications such as scientific computing, computer-aided design and computer-aided manufacturing and image processing.

The company said the memory boards allow configuration flexibility under which a four-user Universe system with 512K bytes of memory and 35M bytes of disk storage can be expanded to a 64-user system with 10M bytes of memory and 1.6G bytes of disk storage.

The 2M-byte memory board costs $8,000, and the 4M-byte memory board costs $15,000, according to the vendor.

Charles River Data Systems, 983 Concord St., Framingham, Mass. 01701.

■ **Advanced Digital Corp. has released an 8-MHz, 16-bit, single-board processor for adding users to an IBM Personal Computer or compatible machine.**

The processor contains an Intel Corp. 8088 CPU, 256K bytes of random-access memory, a personal computer bus interface and two serial ports.

The user plugs the PC-Slave/16 into the personal computer bus and adds a dumb terminal to get the capability of an additional personal computer, according to a vendor spokesman. Disks and peripherals are reportedly shared.

Advanced Digital's RTNX Executive software is required to run two or more users, the vendor spokesman said.

For installations requiring many users, Advanced Digital's PC-Exbus expansion chassis can accommodate up to 12 PC-Slave/16 processor boards, according to the spokesman.

The PC-Slave/16 processor board is priced at $1,095.

Advanced Digital, 5432 Production Drive, Huntington Beach, Calif. 92649.

■ **Sanyo Business Systems Corp. has introduced a video expansion board for its MBC 550 series microcomputer said to allow the microcomputer to run Lotus Development Corp.'s 1-2-3, Software Publishing Corp.'s PFS series and other IBM Personal Computer applications.**

According to the vendor, the MBC 555-2 video board will allow additional video functions for the MBC 550. The board operates as an IBM color video board, the vendor said, allowing the user to utilize IBM software that directly accesses the IBM video memory.

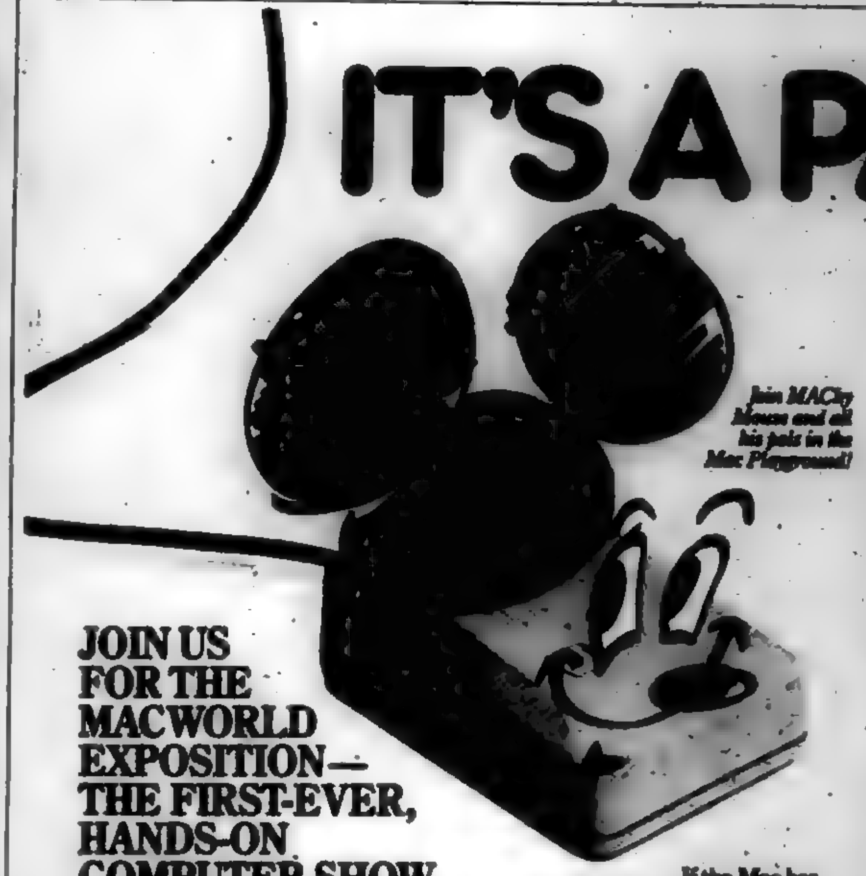
The vendor's original video mode will continue to operate when the video board is installed, the vendor said.

Using the IBM mode, there are reportedly 16-color graphics capabilities with 320- by 200-pixel resolution or 640- by 200-pixel monochrome display.

The video board sells for $199, the vendor said.

Sanyo Business Systems, 51 Joseph St., Moonachie, N.J. 07074.

IT'S A PARTY



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■ **Princeton Graphic Systems, Inc. has announced Colorview, a color graphics board for the IBM Personal Computer.**

Colorview is plug-compatible with the IBM Color Graphics Adapter and provides 32K bytes of random-access memory rather than the 16K bytes that the IBM board offers, the vendor said.

The board is said to provide background and foreground color from a range of 16 colors that are available in IBM high-resolution graphics mode.

The product supports a light pen and connection to a radio frequency modulator on a television, the vendor said.

The Colorview graphics board costs $289.

Princeton Graphics Systems, 170 Wall St., Princeton, N.J. 08540.

■ **Mega Omega Systems, Inc. has announced Omega Diskless Memory, a multifunction memory board designed for the IBM Personal Computer.**

The board provides random-access memory of 896K bytes (expandable to 1M byte), supports an Intel Corp. 80186 coprocessor and has serial and parallel port capability, the vendor said.

The product reportedly features error checking, correction and logging capabilities.

Omega Diskless Memory is said to provide its users with battery backup capability.

The Omega Diskless Memory board costs $1,695, according to the vendor.

Mega Omega Systems, Suite 108, 5477 Glen Lakes Drive, Dallas, Texas 75231.

■ **Advanced Logic Systems, Inc. has announced a version of its CP/M Card that allows Digital Research, Inc. CP/M and Apple Computer, Inc. Prodos files to share a hard disk.**

The CP/M Card adds the hardware and software necessary to operate CP/M 3.0 on Apple II, II+ and IIe computers.

Prodos remains intact when CP/M 3.0 is loaded, and the CP/M system, including programs and data, is contained in a single file on the disk, the vendor said. The CP/M file, operating on top of Prodos, can be any size the user requires up to the maximum 10M bytes.

This reportedly enables the user to take advantage of software applications, including Micropro International Corp.'s Wordstar, Sorcim Corp.'s Supercalc and Ashton-Tate's Dbase II.

The CP/M Card costs $399.

Advanced Logic Systems, 1195 E. Arques Ave., Sunnyvale, Calif. 94086.

■ **Omni Marketing Concepts, Inc. has introduced Micro-Guard, Westford Systems' personal computer expansion board for providing security to the IBM Personal Computer, Personal Computer XT and Personal Computer AT.**

Micro-Guard reportedly prevents unauthorized persons from accessing personal computer data.

It is said to provide audit tracking, productivity measurement, tamper detection, a secure event log and a clock/calendar. Micro-Guard requires 128K bytes of memory, a full-size expansion slot and an 80-char. display.

It is priced at $595.

Omni Marketing Concepts, P.O. Box 613, Lindenhurst, N.Y. 11757.

■ **Action Computer Enterprise, Inc. has released two expansion boards for its line of Discovery multiprocessor, multiuser microcomputers: DPC-88U and Discovery Concurrent PC Attachment.**

DPC-88U features an Intel Corp. 8088 microprocessor, Digital Research, Inc.'s CP/M 86 and Concurrent DOS operating systems and 256K bytes of random-access memory, which can be expanded to 1M byte, the vendor said.

As many as 16 DPC-88Us can reportedly be integrated into a Discovery multiprocessor system. The DPC-88U is said to include onboard erasable programmable read-only memory with diagnostic routines to permit testing of memory array and the interprocessor communications channel.

A DPC-88U with 64K bytes of memory is priced at $695. A 256K-byte version costs $995, and a 1M-byte option costs approximately $1,600.

Discovery Concurrent PC Attachment reportedly allows Action's DPC-186, DPC-816 or DPC-88U multiuser systems to run Digital Research's Concurrent DOS 3.1 operating system.

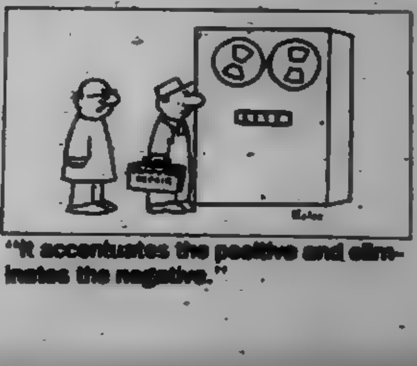
The product reportedly allows workstations on a local-area network to access a data base and other resources, such as printers and disk drives.

The system supports up to 16 users who can run Digital Research CP/M, Microsoft Corp. MS-DOS and IBM PC-DOS software, Action said.

The Discovery Concurrent PC Attachment consists of one part for the attached microcomputer and another part for the host processor.

Each microcomputes attachment is priced at $350, and host attachments average $105 per connection.

Action Computer Enterprise, 430 N. Halstead St., Pasadena, Calif. 91107.



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Here's our three-day conference schedule:

Thursday, February 21: Industry/Press Sessions

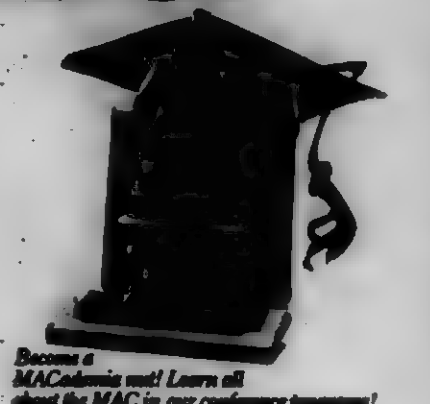
10:00-11:30 • Industry Forum: the Outlook for the Macintosh in the Office
11:30-12:00 • Industry Roundtable Discussions
12:00-1:00 • (lunch break)
1:00-2:30 • Industry Forum: Developing Software for the Mac–Opportunities and Pitfalls
2:30-3:00 • Industry Roundtable Discussions
3:00-4:30 • Industry Forum: the Outlook for the Macintosh in the Home and School
4:30-5:00 • Industry Roundtable Discussions

Friday, February 22: Business/General User Sessions

12:00-2:00 • Keynote Presentation: the Future of the Macintosh and What It Means for You
2:00-3:00 • How to Start and Survive in Business with Your Macintosh
• Maximizing MacPaint
• The Mac Clinic
3:00-4:00 • Interfacing the Mac with Other Apples
• A Guide to Better Business Graphics
• How to Create Useful Documentation
4:00-5:00 • What the Fat Mac Can Do
• Maximizing MacWrite
• Putting LANS to Work for You

Saturday, February 23: Education/General User Sessions

12:00-1:00 • The Macintosh in the Classroom
• All About MacBasic
• Unveiling the Mac's Hidden Features
1:00-2:00 • The Mac in Higher Education
• All About MacPascal
• How to Write User-Friendly Software
2:00-3:00 • Developing University Courseware with the Mac
• Data Base Management of the Mac
• How to Become a Wizard at Machine Language Programming
3:00-4:00 • Understanding the Power of Peripherals
• Getting the Most Out of Spreadsheet Programs
• File Management Tips and Techniques
4:00-5:00 • How to Get Your Programs Published
• What's Available in Mac Software
• Maximizing Mac's Disk Storage



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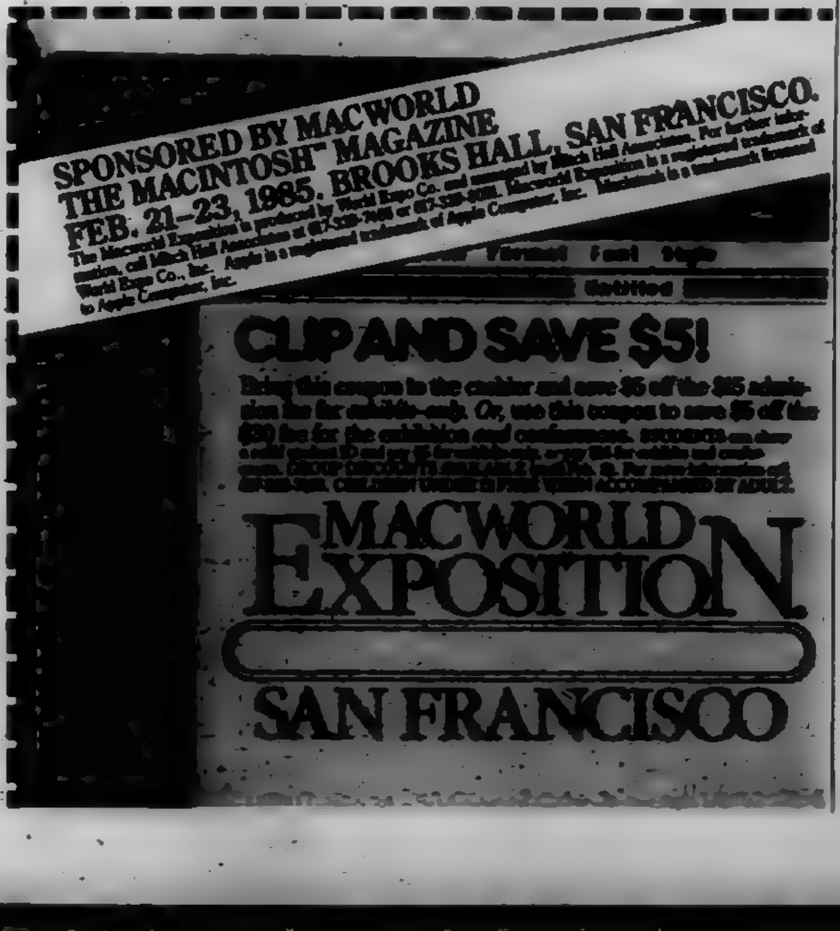

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AUXILIARY EQUIPMENT

■ **Adtech Power has announced Model 4KS 150 IBM, a power supply for the IBM Personal Computer and Personal Computer XT.**

The power supply provides 150W of power, compared with the IBM Personal Computer's 63.5W of power and the Personal Computer XT's 130W of power, the vendor said. The product also reportedly is equipped with four sources of output.

Model 4KS 150 IBM costs $210.

Adtech Power, 1620 S. Sunkist St., Anaheim, Calif. 92806.

■ **Innovative Electronics, Inc. has announced the AC-10 Uninterruptible Power Supply, intended to keep power on a microcomputer system when ac line voltage fails.**

When line voltage drops or fails, the battery inverter is said to supply 200W-square ac current with peak voltages within 1.5 msec for at least 15 minutes of full load. In addition, the AC-10 is said to save typewriter memories when unplugged, operate security systems and run retail point-of-sale terminals during a blackout.

The price for the AC-10 is $995, the vendor said.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

■ **Tech Sketch, Inc. has introduced its Micro Illustrator, a light pen color graphics system for the IBM Personal Computer line.**

Micro Illustrator's color software is said to offer the ability to store light pen pictures on diskette and to print pictures in color or black-and-white.

The product is also said to offer a choice of 10 different brush strokes and 10 different drawing modes, including lines, rays, boxes, circles, color filing, free-hand drawing and others.

Micro Illustrator is priced at $69.95.

Tech Sketch, 26 Just Road, Fairfield, N.J. 07006.

■ **Dayna Communications, Inc. has introduced MacCharlie, a hardware add-on that enables the Apple Computer, Inc. Macintosh to run software written for the IBM Personal Computer.**

MacCharlie reportedly permits Macintosh users to connect to serial networks for the Personal Computer and to use Personal Computer-compatible printers. MacCharlie is said to function as a coprocessor and is connected to the Macintosh via a cable, also included.

Under MacCharlie, the Macintosh is reportedly able to behave as either a Macintosh or a Personal Computer. Several Macintosh features, such as its desktop utilities and clipboard, will work with MacCharlie while in the Personal Computer mode, the vendor said.

MacCharlie costs $995.

Dayna Communications, 50 S. Main St., Suite 530, Salt Lake City, Utah 84144.

■ **Cyborg Corp. has introduced Isaac 41-I and Isaac 91-I, packages that allow scientists and engineers to use an IBM Personal Computer for data acquisition and control.**

The packages are designed to automate analytical instruments and industrial processes such as temperature monitoring and control, vibration measurements and physiological testing, Cyborg said.

The Isaac 91-I, a general-purpose computer interface for workstation applications, is said to include an IBM Personal Computer interface, 16 channels of 12-bit analog-to-digital conversion, four channels of 12-bit digital-to-analog conversion, 16 binary I/O channels, four programmable Schmitt triggers, a 16-bit timer and eight expansion slots.

The Isaac 41-I, a building block for applications, features an IBM Personal Computer interface, four expansion slots and the ability to accept 256 low-level inputs, Cyborg said.

The Isaac 91-I is priced at $1,900, and the Isaac 41-I costs $4,400.

Cyborg, 55 Chapel St., Newton, Mass. 02158.

■ **Bits Power Systems, Inc. has announced two on-line uninterruptible power systems (UPS) for microcomputers, with a multicolor bar graph display indicating either output power or battery level.**

A six-digit LED clock indicates correct time during normal operation and automatically becomes a backup timer if utility power fails, the company said. When utility power is restored, the correct time is said to be displayed automatically. Audible and visual alarms also are standard.

Unlimited backup time is possible by attaching the appropriate batteries to the expansion jack on the system, the company said. The standard, internal, sealed lead-acid batteries are said to provide a minimum backup of 10 minutes. Model UPS-310 is housed in an IBM Personal Computer-type enclosure, and Model UPS-700 is said to be suitable for larger systems.

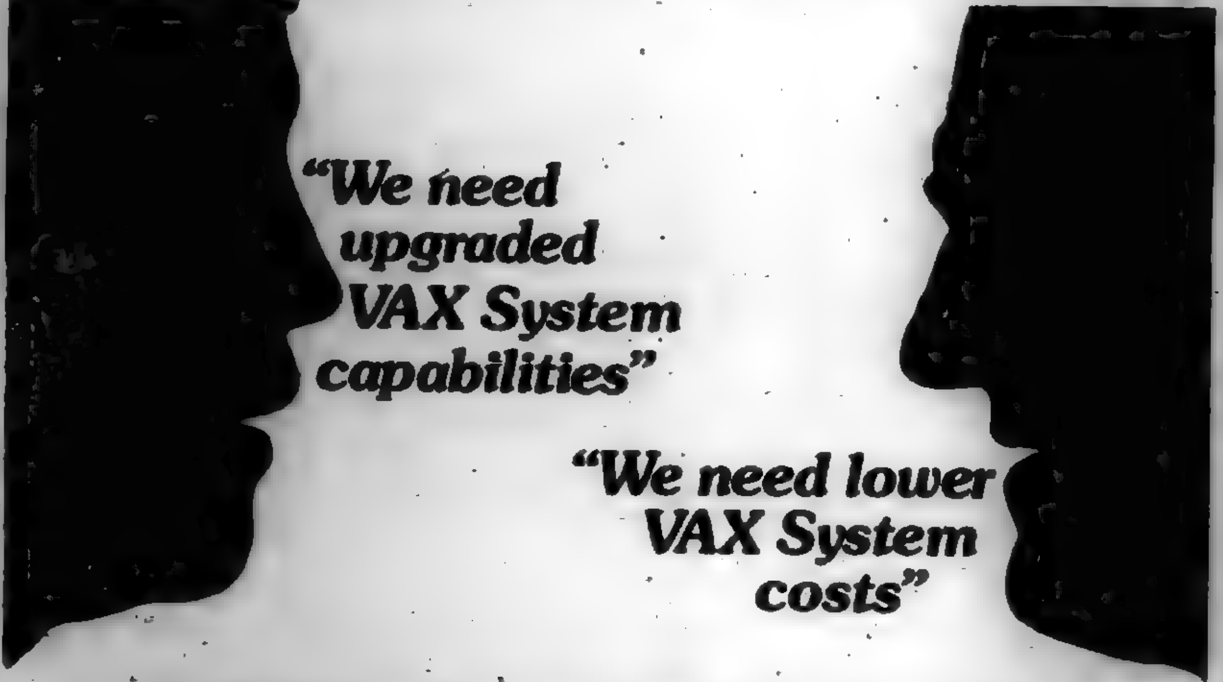
The price of the UPS-310 is $895, and cost of the UPS-700 is $1,240.

Bits Power Systems, Suite B114, 11020 Audelia Road, Dallas, Texas 75243.

■ **Chorus Data Systems has announced Imigit, an image creator and picture creator with video digitizer support for the IBM Personal Computer.**

Imigit is capable of capturing and editing high-resolution (up to 640- by 512-pixel) images from a standard camera or videocassette recorder, Chorus Data Systems said.

Continued on page 116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Continued from page 112

Graphics from packages such as Lotus Development Corp.'s 1-2-3 reportedly can be enhanced with features such as multifont annotation, texturing, color fill and integration of photographs, drawings, logos or scenery.

Imigit's PC-EYE board connects to an EIA RS-170 or RS-343 video source and converts the video signal into digital format, according to Chorus. Images captured by PC-EYE can be displayed and edited by Imigit.

Imigit costs $695.

Chorus Data Systems, P.O. Box 370, 6 Continental Blvd., Merrimack, N.H. 03054.

■ **Para Systems, Inc. has announced the Minuteman 500 Uninterruptible Power Supply, said to provide 500W backup power to prevent loss of data during blackouts and brownouts for up to 30 minutes.**

The Minuteman 500 is intended to protect all microcomputer systems and word processors. Features include internal, sealed, maintenance-free batteries; two alarm systems and three light indicators for notification of system inverter and battery status; audible alarm disable switch; low-voltage battery cutoff for battery protection; and three grounded National Electrical Manufacturers Association 5-15R receptacles to provide multiple unit protection.

The price of the Minuteman 500 is $699.

Para Systems, Suite 404, 11425 Mathis St., Dallas, Texas 75234.

■ **Sun Research, Inc. has announced four power supply systems for microcomputers and minicomputers: the SR3, SR6, SR30 and SR60.**

SR3 provides blackout protection and filters ac power, according to the vendor.

The product reportedly is a 300W backup system with a built-in, maintenance-free battery that gives users 15 minutes to close down their system before data is lost.

SR6 supplies 600W of power and features an ac current meter that allows the operator to keep track of current draw and prevents overloading of the system, Sun said.

SR30 reportedly provides 120 volts of 60Hz sine-wave power.

It is said to feature an LED that indicates the battery's condition and an alarm that warns the user when battery power is low.

SR60 provides protection from blackout, brownout, sag, spike and surge on an ac circuit, Sun said. It provides up to 15 minutes of 600W power.

Prices for the SR3, SR6, SR30 and SR60 systems are $695, $995, $995 and $1,495, respectively.

Sun Research, Box 210, Old Bay Road, New Durham, N.H. 03855.

■ **Futurenet has introduced a version of its Dash-1 schematic design system for the Texas Instruments, Inc. Professional microcomputer.**

Dash-1 is said to include a graphics editor, a Futurenet RS-232 mouse and a complete set of part symbol libraries. The package reportedly converts the Professional into a board-level and chip-level design tool.

Dash-1 is said to operate without interfering with the Professional's other applications.

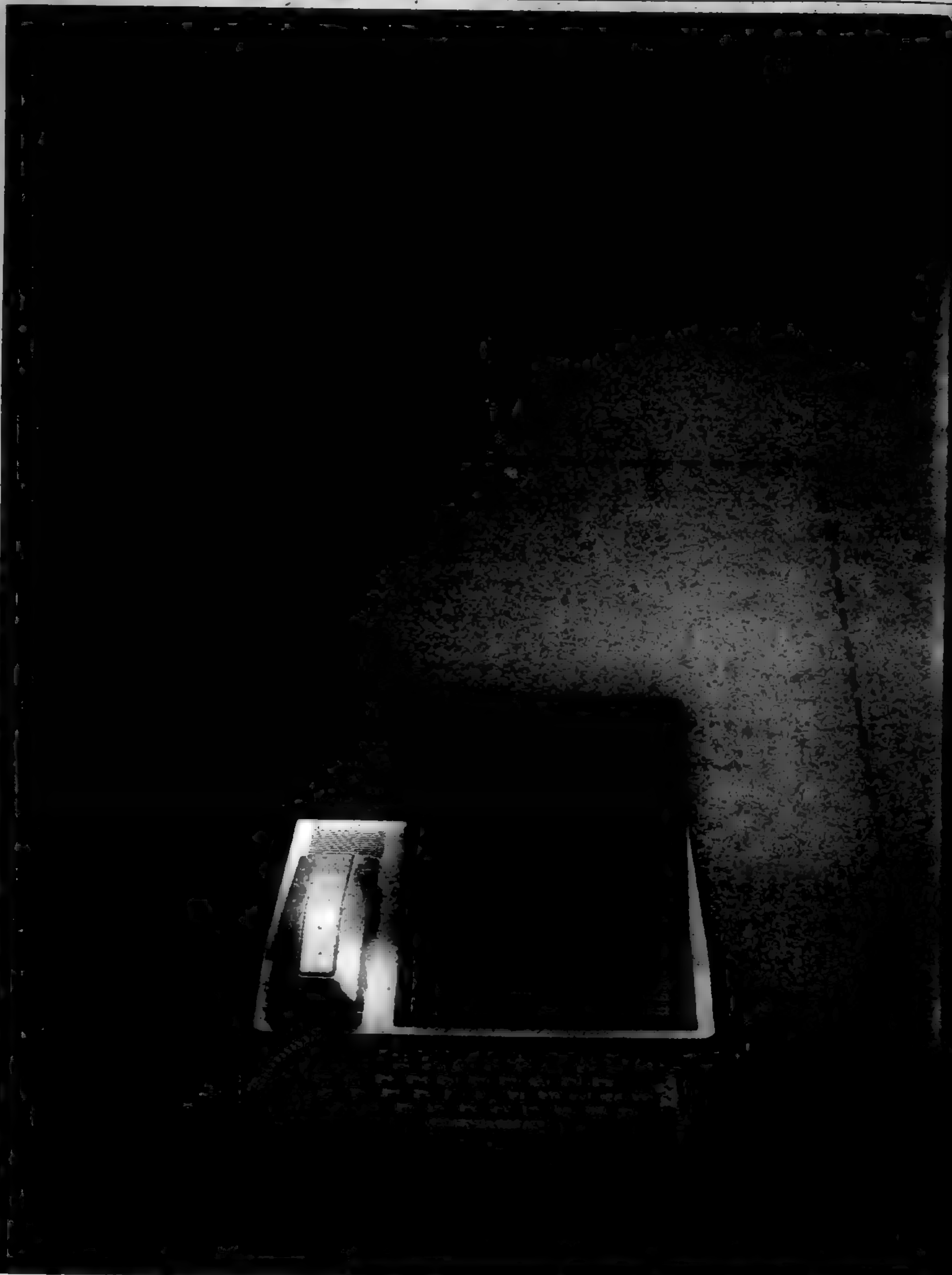
The software's list of materials function is produced automatically, while its net list function can be used to aid circuit board layout and artwork preparation, Futurenet said.

Dash-1 for the TI Professional is priced at $4,980, the vendor said.

Futurenet, 6709 Independence Ave., Canoga Park, Calif. 91303.

■ **Kimtron Corp. has announced a data display terminal designed for the IBM Personal Computer, XT, AT and compatibles.**

The KT-7/PC reportedly provides 25 lines of display, Personal Computer look-alike character sets, video attributes and keyboard.



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The terminal also provides such features as tilt and swivel and height adjustment of the monitor, a serial printer port, optional amber screen and optional 14-in. screen, the vendor said.

It is also said to be able to emulate a standard Ascii terminal.

The KT-7/PC is priced at $895.

Kimtron, 2225-I Martin Ave., Santa Clara, Calif. 95050.

See EXTRA page 118

MICRO

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of a system, coding up worksheets with project data, turning it into keypunching and waiting for results. If they were lucky and made no mistakes, they would get back their project schedule. Obviously, only the biggest, most complex projects warranted this type of effort.

Mainframe-based project management systems have improved greatly with the addition of interactive capabilities, report writers and graphics systems. But they still remain a long way from the simplicity and interactivity of personal computers.

Today, some personal-computer-based project management systems produce color Gantt charts and network diagrams, develop resource loading and even maintain cost information. Much of the software provides this data in seconds and requires only hours to learn. Project management is now being used by departments that have traditionally shied away from the mainframe tools that MIS and engineering have used.

Well, none of this sounds dangerous, but I do see two major reasons to fear this trend — credibility and corporate coordination.

Previously, project schedules were taken with a grain of salt. Everyone knew that the factors affecting the schedule were many and complex. Therefore, people producing these schedules were more likely to provide them in a discussion than in formal project proposals with endless support documents and subschedules.

With today's personal computer tools, project schedules are being prepared more formally, and because they are generated on a computer, they are utilised with greater confidence.

However, the assumptions that go into these schedules are simplistic. What about general and administrative overhead time, cross-project utilization of common resources and vacations? Personal computer systems generally do not address these issues. If they did, they would no longer have the simplicity and interactivity that is demanded.

In short, a personal computer schedule is much better than no schedule at all, but an understanding of its limitations is vital. If this understanding is missing, credibility will disappear as quickly as project end dates pass.

Even more significant are the problems of corporate coordination and communications. But micro-based systems are, by nature, oriented toward ignoring the corporate view.

A company needs a way of seeing the big picture. This is where mainframe systems have excelled, because they have a hierarchical design.

No micro system can do this vital and sophisticated analysis — if it tried, it would quickly bog down under the mass of data.

Product diversity

Corporate communications are further hampered by the incredible diversity of products being utilized within a company. Not only is the engineering department using a different product than MIS, but even project managers within the same group are working with different tools. There is no way to get data from one product to the other short of reentering it, and, in many cases, terminology and philosophy differences make even manual transfer impossible.

Personal-computer-based systems are excellent for project setup, initial planning, simulations and other such tasks. Mainframe products work well for corporate collection of information, sophisticated resource availability scheduling and cross-project reporting and tracking.

Personal computer project management software must be designed to develop and schedule projects on the micros and then upload them to mainframe systems. This setup obtains the advantages of the mainframe while preserving the personal computer's interactivity, simplicity and graphics.

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■ Chorus Data Systems, Inc. has announced a converter said to change National Television Standard Code (NTSC) composite color signals into analog red-green-blue.

Colorverter can be used in conjunction with the vendor's PC-Eye Video Capture System to digitize color signals from industrial and home color video cameras, video cassette recorders and laser disks, Chorus Data Systems said.

The user reportedly has control of the color intensity, tint, brightness and contrast. RS-170A synchronous is available on all signals and there is a separate monochrome output for black-and-white applications.

The half-width IBM PC-bus-size card is priced at $295, and the stand-alone packaged version is $350.

Chorus Data Systems, P.O. Box 370, 6 Continental Blvd., Merrimack, N.H. 03054.

■ Datacopy Corp. has announced an image processing system that is said to let users integrate images, text and numbers into complex documents and data bases.

The Model 700 Word Image Processing System (Wips) is a front-end peripheral for the IBM Personal Computer XT, IBM Personal Computer AT and compatibles. It reportedly interfaces with most popular word processing and data base management software for those systems.

The Model 700 consists of Datacopy's Model 210 Image Scanner, Model 111 Imaging Interface, Wips software and interconnect cable. To operate the system, the user raises the cover of the Model 210 and places a document face down on a glass plate. The contrast level can be set manually from the scanner control panel or automatically from the host. Scanning takes about 30 seconds.

Resolution of the scanned image is said to be 200 dot/in. across the horizontal scan line, while the user can select either 200, 150 or 100 line/in. vertically.

The price of the system is $4,000.

Datacopy, 1215 Terra Bella Ave., Mountain View, Calif. 94043.

■ Random Access, Inc. has introduced its R/A-350 mouse and interface board for Digital Equipment Corp. Rainbow, Decmate and Professional personal computers and VT200 terminals.

The R/A-350 reportedly generates cursor position and mouse button information in a form compatible with keyboard information and does not require modification of software.

Its parameters of mouse resolution, motion key codes and button key codes may be altered by users.

When power is turned on, three buttons on the R/A-350's mouse are defined to be the equivalent of pressing Do, Resume and Exit on the keyboard.

The R/A-350 interface is priced at $245, and the mouse is priced at $250.

Random Access, 246 Highland Road, Pittsburgh, Pa. 15235.

■ Altertext, Inc. has announced a version of its Altertext disk conversion product said to be able to convert diskettes produced on other microcomputers to a format usable on the Digital Equipment Corp. Decmate I and Decmate II.

Altertext, a hardware and software product, reportedly makes the conversion using either disk-to-disk transfer or communications. In disk-to-disk conversion, one disk is written to another without the use of a transfer medium or communications, the vendor said.

Altertext is offered in three systems: the low-end ACS, the mid-range System I and the top-end System II. Hardware for the ACS is priced at $4,500. Hardware for the System I is priced at $7,500. Hardware for the System II is priced at $15,000.

Software is priced for each system between $100 and $500 per package, Altertext said.

Altertext, 210 Lincoln St., Boston, Mass. 02111.

■ The Computer Colorworks has introduced a version of its Digital Paintbrush product for the IBM Personal Computer.

The Digital Paintbrush, a hardware/software graphics package, reportedly permits creation of full-color charts, diagrams, pictures and text. The Digital Paintbrush permits its images to be shown on a color monitor and photographed, according to the vendor.

Included are a pen-like drawing device and two rotating sensors housed in a plastic case attached to the pen tip by control lines, the vendor said.

Movement of the pen reportedly is detected by the sensors and interpreted by the software.

According to the company, the software enables users to store, organize and display pictures in the form of a slide show.

Digital Paintbrush is priced at $299, the company said.

The Computer Colorworks, Suite 201, 3030 Bridgeway, Sausalito, Calif. 94965.

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entered into the main programs as commands, Borland said.

Two data encryption modes

Superkey also supports two modes of data encryption — direct overwrite protection and text-file mode. The first is said to prohibit reconstruction of a nonencrypted file — no second file is generated. The latter method enables users to encrypt binary files by transforming them into Ascii files, Borland said.

Superkey reportedly also supports user-definable macro titles, clear screen, access of Help menus, changes of current logged drive or path on hard disk, date and time information, alternate arrow key definition and key click switching.

The software can recall automatically the last 20 entered commands and display them in a menu window, according to Borland. Users are said to be able to select one or more commands to be edited and reused, even at the operating system command level.

Borland International is located at 4113 Scotts Valley Drive, Scotts Valley, Calif. 95066.

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COMPUTER INDUSTRY

Firms find union blissful

McCormack & Dodge execs cite freedom to plan for long-term as biggest benefit of firm's sale

By David Gimes
CW Staff

COMPANY PROFILE

NATICK, Mass. — As McCormack & Dodge Corp. management tells the story, it was a marriage born of necessity that has evolved into a blissful partnership.

When Dun & Bradstreet Corp., the New York-based financial and information services giant, came courting two years ago, McCormack & Dodge (M&D) was a fast-growing maker of business applications software with a yearning to become bigger and better known. But the privately held M&D was hampered by cash flow problems and the persistent need to raise new capital from sometimes recalcitrant investors. Meanwhile, it was trying to cope with stiff competition from a number of rivals — some of them larger and richer — in the booming software market.

"It was clear we had to do something," said Frank Dodge, M&D's president and chief executive officer, in explaining the firm's 1983 decision to either become a public company or seek a buyer. "It was a selling process all the time. . . . It was a constant struggle to juggle things and keep the cash coming in."

Several interested buyers, including Dun & Bradstreet, had approached the company with proposals. For reasons primarily involving corporate direction and the issue of autonomy, Dodge and James McCormack, the firm's chairman of the board, eventually decided to sell the firm that they had cofounded in 1969 to Dun & Bradstreet. The sale took place in May 1983, and McCormack left the company in 1984 to pursue a career in real estate investment.

Today, nearly two years after the sale, both parties agree that the partnership has been a successful one.

"They [M&D] are delivering what we

See PROFILE page 120

Speakers at chip maker meet cite need to improve methods

By Kathleen Burton
CW West Coast Bureau

NEWPORT BEACH, Calif. — With semiconductor sales in the U.S. and Europe expected to total $16 million in 1985, manufacturers of semiconductor equipment and materials are under pressure to improve manufacturing processes, industry representatives said recently.

A number of industry problems were addressed by speakers at the eighth annual Semiconductor Equipment and Materials Institute Information Services Seminar here.

According to Donald Van Luvanee, vice-president of Kulicke & Soffa Industries, Inc., a semiconductor manufacturer in Horsham, Pa., the industry's rapid growth during the last decade has brought with it semiconductor manufacturing processes that were unknown 10 years ago. But while semiconductor manufacturers continue to develop new production equipment and materials, he said, advances in integrated circuit assembly and factory automation have lagged because the industry "still doesn't understand the root problems of factory automation."

Van Luvanee said industry executives can analyze statistical data but still think factory flow and equipment design processes are "a magic process." He said this is compounded by manufacturers — including Hewlett-Packard Co., Texas Instruments, Inc. and Motorola, Inc. — that

See CHIP page 134

DG chief sees slower growth in year ahead

By David Gimes
CW Staff

BOSTON — Data General Corp. President Edson de Castro, citing predictions of an economic slowdown, said he does not expect the Westboro, Mass.-based company's revenue to grow at the same rate in 1985 as last year.

"The business cycle does not appear to be maturing," de Castro told shareholders at the company's annual meeting here Jan. 30. Because capital spending by business is expected to slow, he said, the company does not expect to match its 1984 revenue growth rate of 40%.

DG recently issued its results for the first quarter of fiscal 1985, ended Dec. 29, reporting revenue of $333 million, compared with $240 million for the comparable period in fiscal 1984. Profits for the period totaled $23 million, or 87 cents a share, compared with $10 million, or 40 cents a share, a year earlier. Because of an accounting change, DG's first quarter this year was one week longer than the previous year.

De Castro said that while orders so far this year are "substantially higher" than a year ago, he is "more cautious" about the coming year.

De Castro said orders for the company's highly promoted Data General/One portable computer, introduced last year, have been "satisfactory." He acknowledged that most customers of the portable unit have been OEMs and dealers, not the Fortune 1,000 market the computer was targeted at. "It is still too early to determine the success of the market," he added.

Questioned about reported discussions between DG and IBM over the sale of Rolm Corp.'s military computer division, de Castro confirmed that talks are taking place but said there is "nothing definitive" yet with IBM. In approving IBM's acquisition of Rolm last year, the U.S. Justice Department ordered IBM to sell off Rolm's Mil-spec unit, which makes rugged versions of DG superminicomputers for sale to the mil-

See REVENUE page 134

■ A look at the operations of a Japanese agency focusing on information technology development, funded jointly by government and industry/128

■ The downturn in the semiconductor market caused a wafer fabrication operation to schedule a two-week shutdown/132

■ Hogan Systems, Inc. hinted that it will trim its work force after posting a $1.4 million loss for the third quarter/134

Datapoint takeover fight reaches bare-knuckles stage

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

The gloves have come off in the battle for control of Datapoint Corp., and the cautious sparring has been abandoned in favor of a bare-knuckles brawl aimed at winning over the company's shareholders.

Arbitrageur Asher B. Edelman, who moved in on Management Assistance, Inc. and Mohawk Data Sciences Corp. and convinced both companies, in essence, to liquidate themselves, recently withdrew his controversial offer to buy out San Antonio-based Datapoint, and said he will seek consents from shareholders to take over the company's board of directors.

Edelman, after gaining control of 10.8% of the company's shares, presented an offer to buy the company's remaining stock for $416.3 million or $23 a share. Datapoint's board, however, objecting to certain financial guarantees that Edelman wanted included in the deal, rejected the offer and invited Edelman and any other interested parties to up the ante.

Other measures threatened

Edelman said his bid would stand, and he threatened to take other measures — seeking consents — if the offer was not accepted. It was not, and Edelman said he would seek consents.

Such a move would enable him to replace the board of directors without holding a shareholders' meeting if shareholders representing more than 50% of the stock agreed to the plan.

Datapoint, which manufactures computers and networks aimed at office automation applications, has been through a downturn in fortunes, and its current management seems tired of the fray and willing to accept a favorable buy out.

A cash cow

But Datapoint's products are aimed at a market just gathering steam, and its reportedly profitable service organization is the type of entity that many capital-intensive corporations would dearly like to acquire as a cash cow.

Splitting up the company and revamping management may be just the cure for Datapoint's current malaise, and it almost certainly would provide current shareholders with an immediate payoff.

But there is something more than just a little distasteful about submitting to an arbitrageur who wants to participate in the rewards while obtaining a premium not available to shareholders in general.

Edelman would undoubtedly argue he deserves something for making it all happen, but that is just like a gambler using somebody else's money and requiring the backer to guarantee him a return if somebody else wins the hand.

Upping the marketing ante is key to firm's growth plan

By [illegible]
CW Staff

During its early years, McCormack & Dodge Corp. (M&D) was a reasonably successful software company. Revenue and profits rose steadily, if unspectacularly, as the firm gradually built a loyal base of customers among IBM mainframe users. Cofounders James McCormack and Frank Dodge, in fact, handled all the company's sales calls during its first eight years.

But as its product offerings grew, M&D began to realize the need to shed some of its small-company ways in order to better compete against a new crop of business software concerns. It was not until 1982, however, when the firm's revenues hit $32 million, that a full-fledged marketing department was created with its own senior manager.

"We always tended to think of ourself as more of a product company, but we began to recognize the fact that you can only sell so many products by word of mouth," said Robert Weiler, M&D's vice-president of marketing. "We came to the recognition that if we wanted to play in the big leagues, we had to have a well-oiled marketing and sales force."

McCormack

Since its 1983 acquisition by Dun & Bradstreet Corp., M&D has mounted an aggressive marketing campaign, with an aim of spending about the same percentage of revenues — roughly 8% — as its main rivals, Management Science America, Inc. (MSA) and Cullinet Software, Inc.

Today, the company has sales representatives in 40 countries and a 75-person sales staff scattered across nine district offices in the U.S. Its products are installed at more than 3,000 mainframe and large minicomputer sites. (See Figure 2, page 124).

M&D built its business selling financial applications — general ledger, accounts payable, fixed asset analysis — to banks, insurance companies, manufacturing companies and other IBM mainframe users. However, during the past several years the company has broadened its product line with the aim of becoming, in the jargon of the software industry, a "total solutions" vendor. In doing so, the company has pitted itself against some new competitors.

"We're offering more, so our competition has changed," Weiler explained. "Instead of going into a particular market niche and saying we're the best in that niche, we're now going in and saying we can offer you the best solution. Now we're competing against the Cullinets and MSAs of the world."

Weiler

McCormack, who last year quit his post as chairman of the board but maintains close ties to the company, believes the firm's Millennium-based technology poses a different kind of marketing challenge for the company.

"It's one thing to sell an application product because you're selling it to people who are knowledgeable in the applications," McCormack said. "But to sell a software technology that is a productivity or development tool is a different sell. You really have to get somebody to understand concepts as opposed to applications."

Competing against companies with larger resources and more experience selling "total solutions" poses a difficult challenge for M&D. In the past, the company often lost sales because it lacked a particular product — a payroll package, for instance — that would provide a customer with a full line of applications.

Because the Millennium series incorporates many features of a data base management system (DBMS), there was speculation at the time of its introduction that M&D might be moving into the DBMS market — an assertion company executives denied.

Last October, though, M&D signed a marketing agreement with Applied Data Research, Inc. (ADR) that will enable Millennium products to run ADR's Datacom/DB DBMS environment.

Interestingly, ADR earlier had inked a similar pact with M&D archrival MSA.

According to Weiler, "We're positioning ourself so we can go to the independent [data base vendors], the [IBM] CICS market and the IBM data base market, which is IMS DB2 [IBM's new relational data base product].

"We aren't going to jump into the data base marketplace," he observed. "And we certainly are not going to develop a DBMS [internally]."

Linking critical to growth

Peter Lowber, an industry analyst for the Yankee Group in Boston, believes M&D's efforts to link its products to DBMS environments are critical if the company is to retain its present large customers and gain new ones.

"I think DBMS software is the foundation of any big data center," he said. "Perhaps general applications will remain in data centers in the future, but some will be moved out."

Industry analysts have speculated that M&D and its parent firm might move toward integrating M&D applications with D&B Computing Inc.'s Nomad2 Information Center, but according to Weiler, there are no plans to unite the two.

PROFILE from page 119

thought we were going to get," said David Fehr, a corporate senior vice-president who heads Dun & Bradstreet Computing Services, Inc., a Wilton, Conn.-based division of the parent firm.

Life with a rich uncle

From M&D's perspective, the money raised from the sale of the company — about $50 million in cash — plus subsequent investments by Dun & Bradstreet has provided a significant financial boost. Based on interviews with M&D executives and employees, life under Dun & Bradstreet might be likened to having a rich uncle who visits infrequently and does not meddle in family affairs.

"[The acquisition] has been better than I expected," said Dodge, a former systems engineer for IBM and one-time elementary school math teacher. "They've been very supportive; they've left us alone. It's been great."

Dun & Bradstreet's investments have enabled M&D to strengthen its marketing, product R&D, customer support and other activities. Robert Weiler, vice-president of marketing for M&D, said, "[Dun & Bradstreet] has allowed us to get [R&D] projects underway that have planned returns in 1987 or 1988. Imagine a software company talking about working on projects four years out. That's something we've never been able to do before."

The influx of money has also enabled the company to open customer training schools in Los Angeles and Chicago, to spruce up its corporate headquarters in Natick, Mass., and, in general, to help it create among users and prospective customers the image of a successful and stable company.

Additionally, M&D now works with Dun & Bradstreet's growing collection of computer software and services units in sharing expertise. The parent firm recently snapped up RTZ Computer Services Ltd., a British-based financial software company, whose acquisition has enhanced M&D's European software business.

Rapid growth in the 1980s

M&D's growth during the 1980s has been rapid. Revenue ballooned from $15.6 million in 1980 to an estimated $59 million in 1983, industry analysts said. Dun & Bradstreet does not separately report revenue of its subsidiaries. The number of employees has nearly quadrupled in the past three years to 1,200.

The company, which no longer makes its financial reports public, claims its sales grew about 50% in 1984, which would put it close to $90 million in sales for the year. (See Figure 1).

If M&D's pretax profits stay within their range of the past several years — between 6% and 9% of revenues — the company would realize profits of between $5 million and $8 million for 1984.

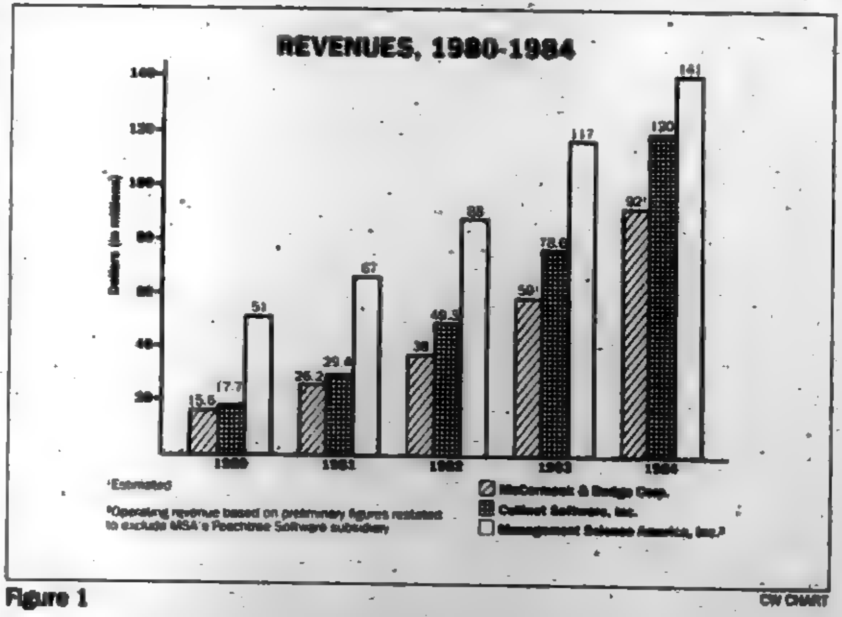

Figure 1

CW CHART

Although Dodge asserted that the firm has "always been profitable," he said M&D has always given top priority to growth instead of profitability. He said Dun & Bradstreet's management shared his philosophy that growth and market share are more important than profit for a company in a high-growth market like computer software.

"[Dun & Bradstreet's] goal for us clearly is to grow," Dodge said. "They would like to see us become the No. 1 software company in the world. They would like to see us run the company in a reasonable way and not be careless or sloppy in how we spend money."

Dun & Bradstreet's own description of its objectives for the division seemed to square with Dodge's. The parent firm, Fehr said, wants M&D to become a "more established player" in the applications software market, to broaden its product line and to increase its revenue and market shares.

He added that profitability is more a concern for the long run.

See PROFILE page 124

FRANK H. DODGE

Frank H. Dodge, president and chief executive officer of McCormack & Dodge Corp. (M&D), was recently interviewed by David Olmos, Computerworld staff writer. Excerpted below are his responses to questions relating to his company and the general state of the software industry.

Q ***What are your goals for the company?***

I would like to see us become the No. 1 software company in the world. But I don't want to see it happen at the expense of losing any of the things that have been so important to me.

Q ***It's been said the "corporate culture" changes once a company nears the $100 million annual revenue mark. Now that M&D is approaching that, has anything changed?***

I don't buy the $100 million mark as some kind of a magic barrier. It's very important to me to preserve the culture here. I work pretty hard at it.

The duality is that you have to change because our industry is changing, the competitive marketplace is changing, the technology is changing, the size of the company is changing. So we have to change. We have to look [constantly] for ways to change and improve what we are doing, but we have to do that in the context of the basic things that have made the company successful.

We have a company cafeteria. I try to have lunch there as often as I can, just so people can see me. I work hard at knowing all the people as best I can. I have breakfast once every three to four weeks with 10 people — nonmanagement people from different departments whom I've never met before.

Q ***What are your views of the software industry's competitive environment at present?***

I think there's a shakeout coming. I think that there are some companies that have become a little panicky based on, perhaps, not reaching their hoped-for or preannounced goals. So they're doing things that are pretty shortsighted, such as discounting. I think some of the smaller companies will be forced out or forced to merge because it's clearly becoming a market where you have to have a full product line. Increasingly we're seeing that companies want to buy all their software products from one vendor. And there are enough good alternatives now that they really can do so."

Q ***If Dun & Bradstreet Corp. had not come along as a buyer, would your company be public today?***

I don't think so. That would have been such a change. I tell you, there's nothing like hindsight. I'm tremendously glad we're not a public company because of what's happened [to the stock price of some publicly held software firms. Dodge cited the steep decline in the stock of Management Science America, Inc. (MSA), a chief competitor.] If you're an investor in MSA or an analyst who's promoted the stock, what are you doing now? And what are John Imlay [MSA's board chairman and chief executive officer] and Bill Graves [MSA's president and chief operating officer] hearing from those people? God! Who wants that?

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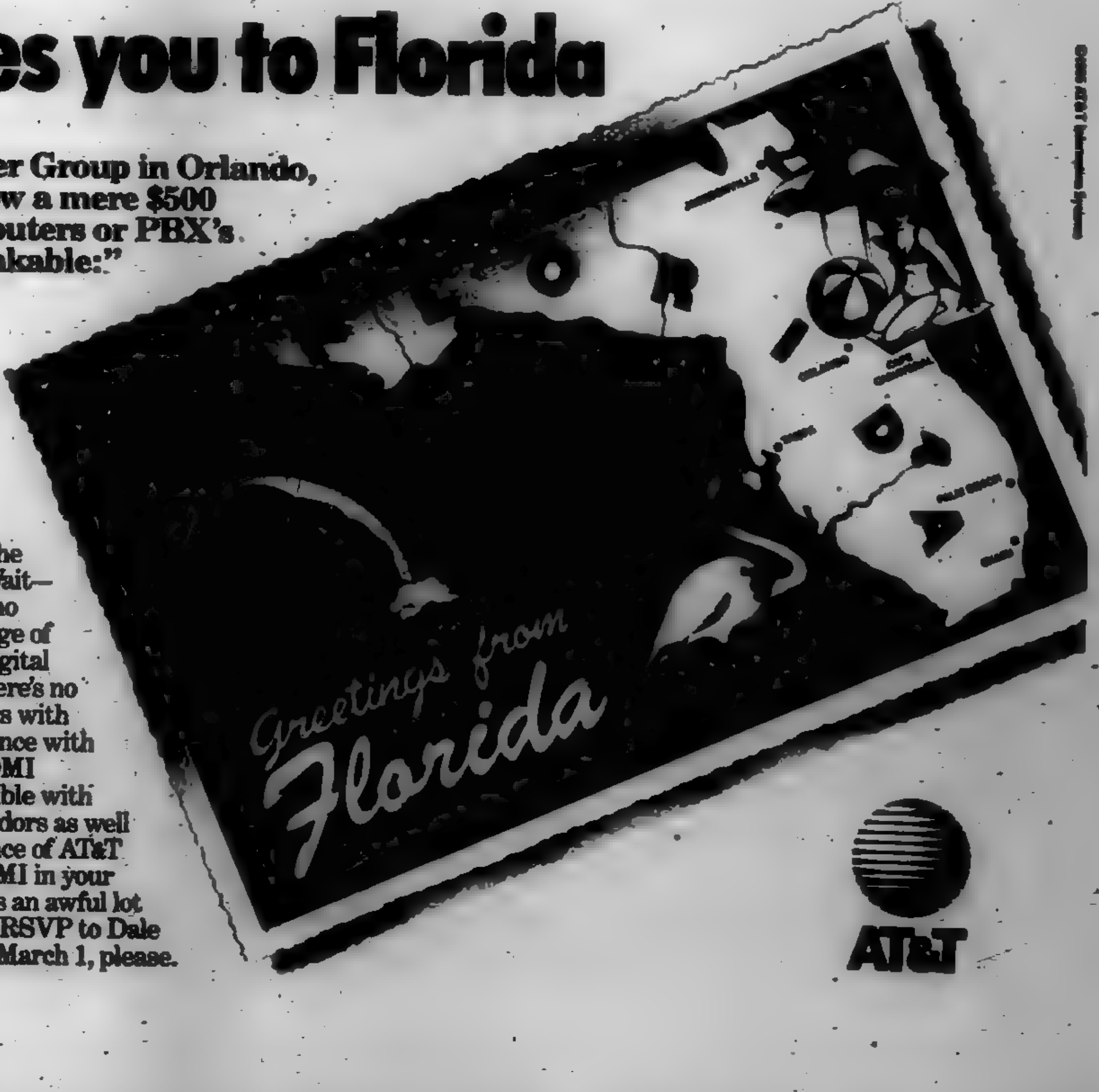

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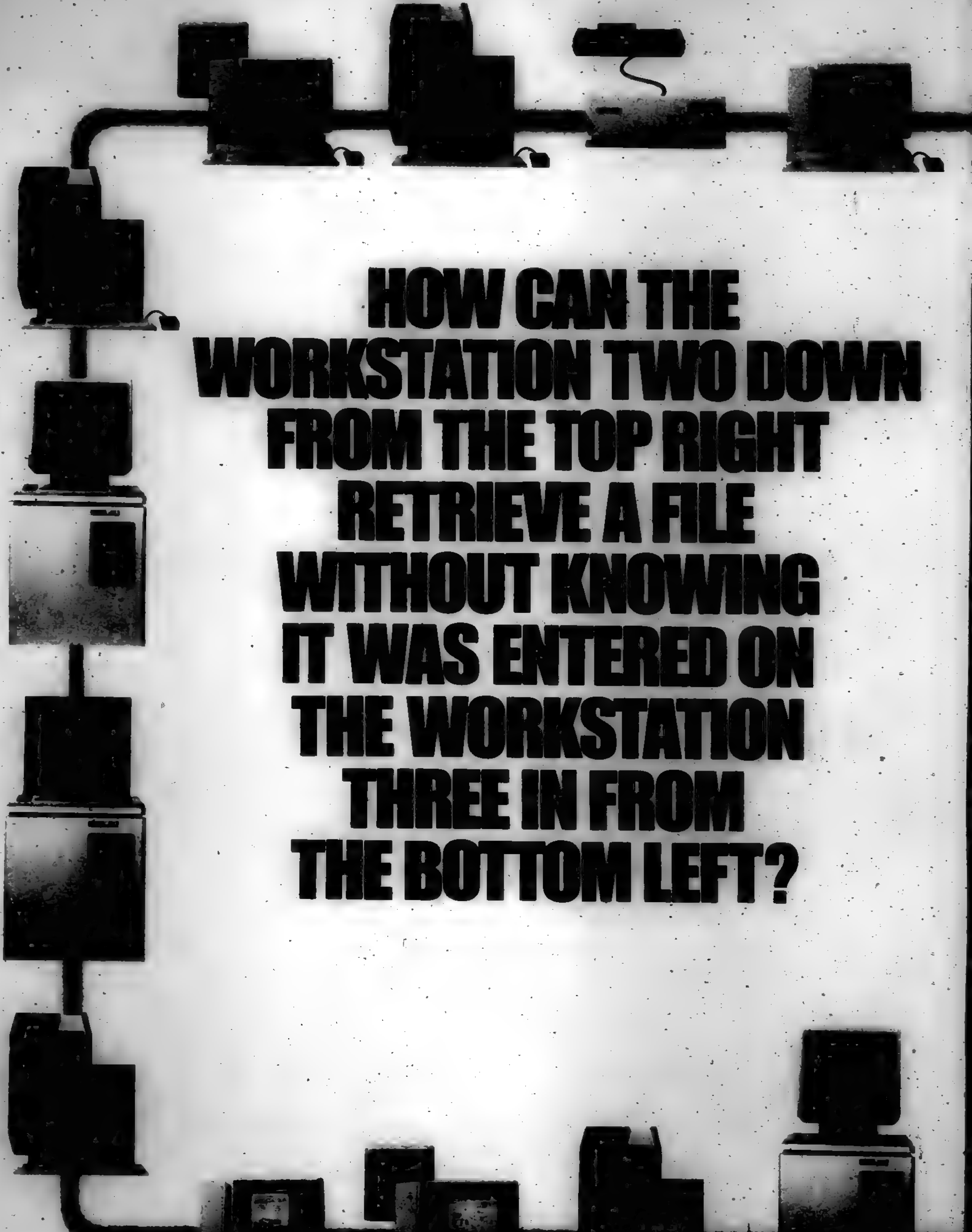
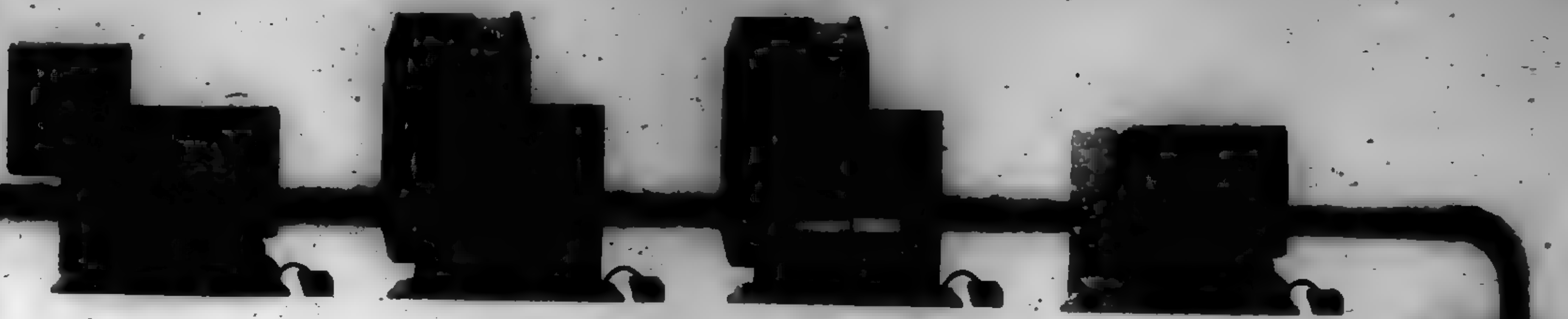

HOW CAN THE WORKSTATION TWO DOWN FROM THE TOP RIGHT RETRIEVE A FILE WITHOUT KNOWING IT WAS ENTERED ON THE WORKSTATION THREE IN FROM THE BOTTOM LEFT?



It's a well known fact that most networks require a user to know exactly where a piece of data is stored in order to retrieve it. Which means even systems designed to share data and programs place inordinate demands on the people who use them. Failing unforgivably to make sharing anything short of laborious.

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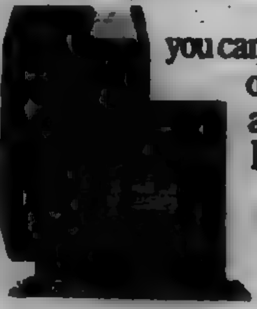
It means that engineers, scientists, architects and other technical professionals can effortlessly share information and files. Never sacrificing individual power.



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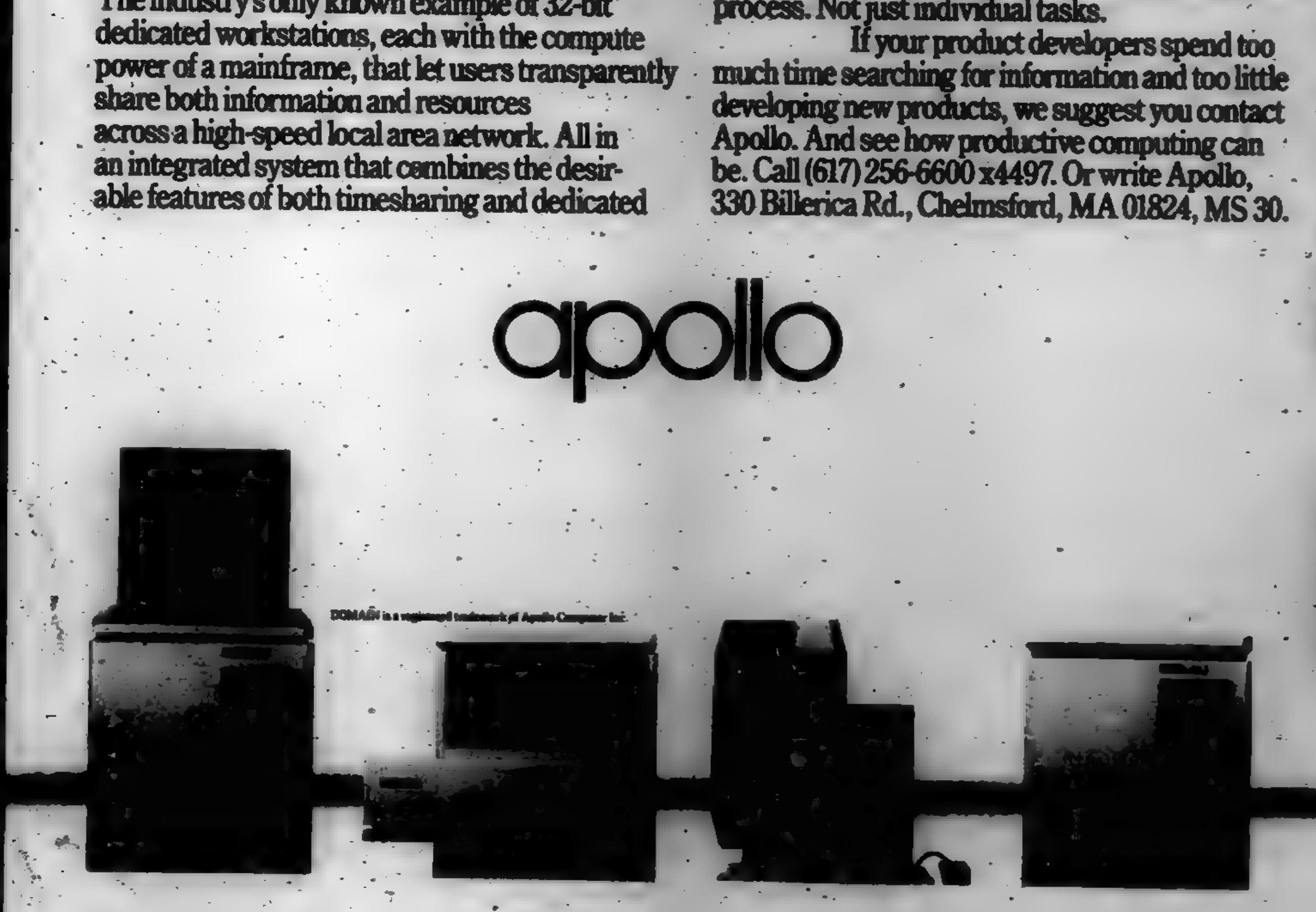

DOMAIN is a registered trademark of Apollo Computer Inc.

McCORMACK & DODGE
PRODUCT INSTALLATIONS
(as of January 1985)

GL:Millennium (General Ledger)	[illegible]
AP:Millennium (Accounts Payable)	750
PO:Millennium (Purchase Order)	200
FA:Millennium (Fixed Assets)	685
CP:Millennium (Capital Project)	175
HR:Millennium (Human Resources)	300
Millennium:SDT (Systems Development)	50
Interactive PC Link	100

Figure 2

CW CHART

PROFILE

from page 120

M&D introduced its first product in 1969, a program for fixed-asset analysis and accounting applications, which chalked up $90,000 in sales in 1970. At the time, packaged software was in its infancy. However, the demand for packaged software soon accelerated. No overnight success, the company's annual revenue did not top $1 million until 1977. McCormack and Dodge personally made all sales calls during the firm's first eight years.

However, when the company unveiled a general ledger package in 1977, sales started to climb. In 1981, M&D introduced an on-line query program called Hilite and the following year acquired a human resources package, H/R Plus, from Dyatron Corp. The most significant product development came in 1983 when M&D announced it was rewriting its entire series of on-line packages to create a new group of packages dubbed the Millennium series. Now the cornerstone of the M&D product line, Millennium is an on-line development and customization technology for IBM mainframe and plug-compatible users under which all applications share common system functions.

The year 1983 was a watershed one for M&D. Not only was it introducing the Millennium technology and retraining its sales force in that technology, but it was also deciding whether to go public or be acquired.

About this time, several software companies, including Cullinet Software, Inc., Management Science America, Inc. and Lotus Development Corp., had already gone public, raising enormous capital and bringing exceptional wealth to the firms' principals almost overnight. In fact, M&D had a prospectus prepared in the event a suitable buyer could not be found. "A lot of people were trying to get us to go public," Weiler recalled. "Every morning another company would go public at something like 80 times earnings. People were saying, 'Look at that; that's what we can get if we go public on Monday.' "

But Dodge and McCormack decided that the drawbacks of going public outweighed the financial gains. "It was pretty clear that in being a public company, Jim McCormack and I would be spending a lot of time talking to the financial community, to investors and analysts," Dodge said. Dun & Bradstreet also promised to take an arm's length position in overseeing the unit, allowing M&D to operate virtually autonomously. Dodge said that promise has been kept so far, adding that the parent firm has placed no personnel at M&D.

"Frank Dodge is the chief executive officer and he runs the company," Fehr said. "I consider myself more his interface with the company than his boss." Dodge does, however, provide monthly reports to Fehr.

> ”
>
> *Life under Dun & Bradstreet might be likened to having a rich uncle who visits infrequently and does not meddle in family affairs.*

Freed from the obligation to justify quarterly performance, M&D executives said they have more time to concentrate on long-range planning and other business concerns. "This has been a lot more fun," Weiler said. "I sleep nights. A quarter can come and go, and the only way I know is by the moon or something."

NICKELS AND DIMES

Data Access Systems, Inc. reported a revenue of $34.7 million for the year ended Aug. 31, compared with $32.9 million in the same period one year earlier. In the year just ended, the company reported income from continuing operations of $2.9 million, compared with a loss of $40.6 million from continuing operations one year earlier. Including a net gain of $676,436 relating to Chapter 11 proceedings under the Federal Bankruptcy Act and a reduction in income taxes arising from a $1.67 million carryforward of previous years' operating losses, the company reported a net income of $3.6 million for fiscal 1984.

Televideo Systems, Inc. announced that profits for the fourth quarter ended Oct. 31 were $30.5 million, a 30% decrease from $43.6 million in the same quarter a year ago. This resulted in a net loss for the quarter of $7.9 million, or 19 cents per share, compared with profits of $5.7 million, or 14 cents per share, in the same quarter one year earlier.

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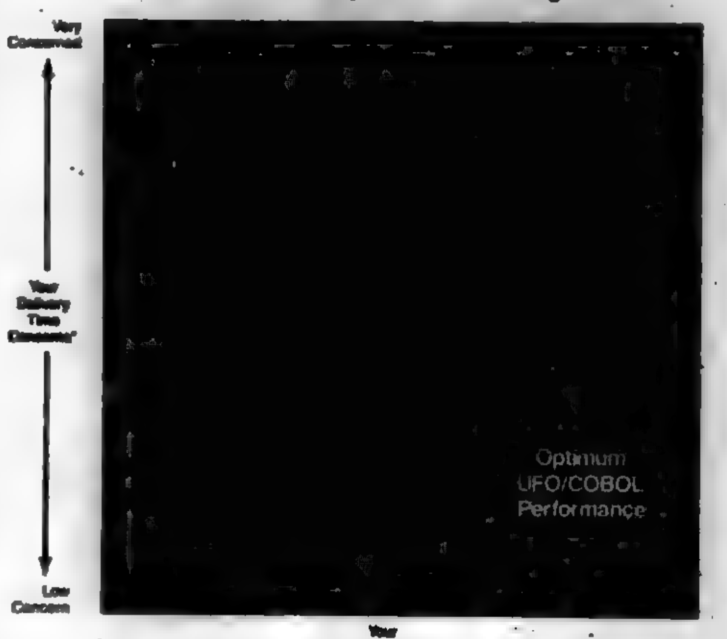
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Optimum UFO/COBOL Performance
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* A Function of—Number of programmers, Number of applications, Skills available, Due dates.
** A Function of—Machine resource availability, Application complexity, Transaction volume.

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Jipdec guiding Japan's information processing growth

OUTSIDE LINES
John McWilliams

The Japan Information Processing Development Center (Jipdec), a semiprivate Japanese organization founded in December 1967, seeks to promote "information processing and the information processing industry in Japan."

"Legally speaking, Jipdec is a foundation," explained Toshihiko Nishiwaki, executive director of Jipdec. "It was established by endowments from the Ministry of International Trade and Industry [Miti], Nippon Telegraph and Telephone Public Corp. [NTT] and the private and public companies and corporations that make up its membership. It relies on these organizations for its annual funds and the appropriations necessary to carry out its various activities."

"Although Jipdec is funded in large part by Miti, it is not directly controlled by that ministry, as so many folks want to believe," Nishiwaki said. "Nevertheless, Jipdec's official and unofficial ties with Miti are very close. For example, Jipdec submits annual reports of its activities to Miti and usually has one or more retired Miti members serving in top executive positions. Thus, while Jipdec is free to plan its operations as it sees fit, Miti's influence on the way those operations are carried out is quite strong. Still, the relationship is more symbiotic than authoritative."

Jipdec is composed of four departments: administration, business, engineering/research and development. Rounding out the organization are the Microcomputer Promotion Center; the Institute of Information Technology (IIT), a special training center; and the Japan Information-Technology Engineers Examination Center (Jitec), a testing center. Both IIT and Jitec are listed as affiliated organizations but come under the direct control of Jipdec.

Studies conducted in Japan and abroad

Jipdec engages in studies and surveys both within Japan and abroad, as well as research and development of hardware and software systems; consultation services; education, training and testing of systems engineers, programmers and other information-processing-related personnel; and the exchange of information with overseas government and private organizations.

"Many of our studies deal with problems related to hardware and software development and/or standardization, the results of which often serve as input for government decisions regarding legislation and the formulation of standards applicable to information processing in Japan," Nishiwaki explained.

Jipdec conducts two types of studies: those carried out on a regular basis to update information on designated aspects of the information processing industry and those conducted in response to specific requests from Miti, NTT and more than 200 other Jipdec members.

"Systems development now accounts for nearly half of Jipdec's overall operations, requiring the efforts of approximately 70 of our 150 full-time [employees]. And Jipdec's two affiliated organizations, IIT and Jitec, are dedicated to carrying out basic and advanced training and testing, respectively," Nishiwaki pointed out.

Some practical systems currently under development are a trademark retrieval system and an administrative information system. The latter will incorporate a massive data base containing all the laws, statutes, ordinances and regulations that currently comprise the Japanese legal system.

IIT, since its establishment as the education and training arm of Jipdec in 1976, has trained more than 15,000 information processing technicians and managers from various parts of government and private industry. Subjects offered range from computer science, business and management courses to systems design and software engineering, all packaged to present trainees with equal amounts of theory and practical applications.

Beginning in early 1984, Jipdec also assumed full responsibility for administering Japan's national Certified Data Processing Examination (CDPE) aimed at certifying Japanese systems engineers and programmers. Jipdec established Jitec last April to prepare and administer this annual examination. "To the best of my knowledge, Jitec is the first organization of its type anywhere in the world," Nishiwaki said. "No other country has an organization devoted solely to the testing and certifying of information processing personnel."

During 1984 more than 170,000 systems engineers and senior and junior programmers applied for the CDPE, with around 100,000 of those technicians actually sitting for the test. And the number of applicants is expected to continue to grow in years to come.

Jipdec currently publishes two regular English-language reports: the annual *Computer White Paper* and *Japan Computer Quarterly*, formerly known as *Jipdec Report*. The former is an annual review and update of computer utilization and the status of the information industry in Japan, while the latter takes the form of a quarterly magazine, designed to provide readers with articles on the latest technological, legislative and commercial developments in the Japanese data processing industry.

Concerning future ventures, Nishiwaki said Japan needs a data base clearinghouse and that Jipdec is considering that role. Also, he said, the center will expand its role as an information processing consultant and provide those services to regional municipal governments striving to update their information networks and data communications capabilities as Japan moves toward an advanced information society.

McWilliams is managing director of the Word Shop, Ltd., a Yokohama, Japan-based firm specializing in Japanese-to-English translations of primarily computer-related papers, reports and articles. He has worked with Jipdec to translate the Computer White Paper *and the* Japan Computer Quarterly.

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Mexico rejects plan for IBM microcomputer factory

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — Mexican government officials recently rejected a proposal submitted by IBM last year to build a wholly owned microcomputer factory in Mexico. The Mexican government had previously indicated it might relax a requirement that foreign factories located there be at least 51% owned by Mexican nationals.

Mexico's National Commission of Foreign Investment, which voted on the proposal, said in a statement that the plan was rejected because, "There are already companies in existence that manufacture personal computers with a majority of national capital."

Mexican-based joint development companies sponsored by other U.S. vendors had reportedly lobbied against the IBM proposal, arguing that a wholly owned IBM Mexican operation could wipe out all other competitors in Mexico's fledgling personal computer market.

Hewlett-Packard Co. and Apple Computer, Inc. have complied with Mexico's majority ownership rules while establishing manufacturing projects in Mexico, but both HP and Apple said they engaged in no formal lobbying efforts against IBM's proposal.

"We followed Mexican government guidelines and have been happy with the result," HP spokesman Rob Bouzon said. HP opened its joint venture minicomputer manufacturing operations in Mexico in 1982 and began manufacturing personal computers there in April 1984, Bouzon said.

Barbara Krause, a spokeswoman for Apple, said the firm's Mexican subsidiary, Apple de Mexico, has manufactured its Apple IIe microcomputers there for about a year. "We're building for the long term, using Mexican keyboards and developing software with Mexican vendors," she said. Krause said Apple did not lobby against IBM's proposal but added, "We do not control what Apple de Mexico does."

Proposed exports

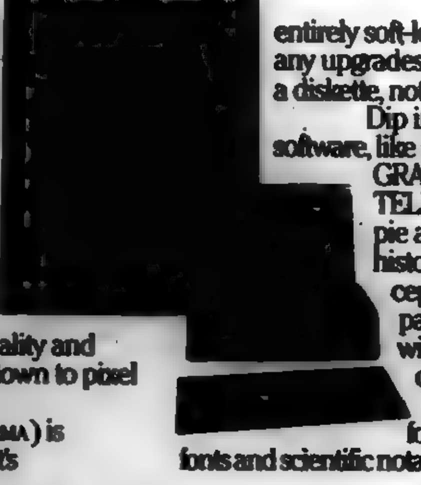
IBM reportedly told the Mexican government that its proposed assembly plant would produce over half a billion dollars in exports during the next four years and that the fixed assets at the plant, to be located in a suburb of Guadalajara, would be $6.6 million, with another $30 million slated for technical assistance and purchase of microcomputer components.

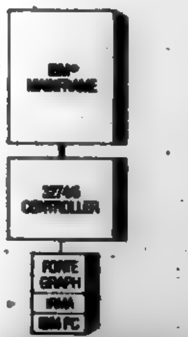
The Mexican government is reportedly still seeking further concessions from IBM, industry watchers said.

In a prepared statement, Rodrigo Guerra, president of IBM Mexico, said the company will "continue its dialogue with the Mexican government, examining alternatives and other proposals that will permit its microcomputers to reach Mexican users."

John Dean, an analyst at Montgomery Securities in San Francisco, said Mexico has historically taken a strongly nationalistic position with foreign multinational companies. Dean said the Mexicans believe that giving up a majority ownership position in the IBM case would lead to foreign majority-owned projects in other industries, such as commercial real estate and oil.

IBM may ultimately accept a face-saving compromise but will not accept majority Mexican control according to Brian Jefferey, vice-president of International Technology Group, Inc. in Palo Alto, Calif.





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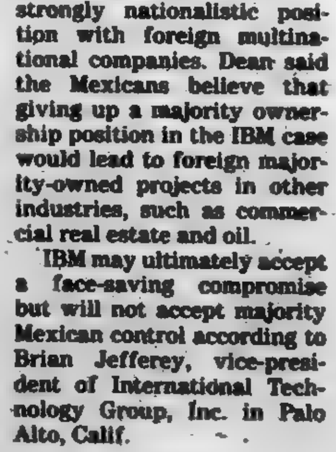

"We got it so cheap because it's very poor at math."

Paladin President Folk resigns; vice-president named to post

SANTA CLARA, Calif. — Paladin Software Corp., which merged with troubled Visicorp in November, recently announced the resignation of its president and founder, Ray Folk.

Folk, who started Paladin about a year and a half ago and helped engineer the merger agreement, said he left because he could no longer pursue his ideas or interests at the company.

Named to the post of president and chief executive officer was Ted Newlin, formerly sales and marketing vice-president. David Douglass, former chief financial officer of Paladin, assumed the role of executive vice-president and chief operating officer.

The company also announced the layoff of 18 employees, primarily in the firm's development division. Paladin's total work force now numbers 55. The layoff reflects a realignment of the firm's business strategy, Douglass said.

Paladin has scaled back its internal development efforts, which had focused on designing a business productivity package, from a large-scale engineering approach to a "tiger team" of people, the company said.

In addition, the company will be putting more emphasis on marketing the five key products originally sold by Visicorp, including Flash Calc, PC Paint, Visi Plot, Visi Schedule and Visi On, he said. Paladin will also extend its role as a software publisher. Within the next six months, Douglass said, the firm will announce the launch and distribution of software designed by outside authors.

Stratus, IBM ink OEM pact

MARLBORO, Mass. — Stratus Computer, Inc., a vendor of fault-tolerant superminicomputers aimed at the transaction marketplace, recently signed an OEM agreement that allows IBM to remarket the firm's systems on a nonexclusive basis.

A Stratus spokesman said that the agreement, which took effect Jan. 31, gives IBM the option to purchase selected products in the Stratus line and to remarket those products either directly or on a value-added basis.

The spokesman declined to state specifically which Stratus products are included in the agreement but noted that most of the fault-tolerant line is involved. The spokesman said that the company has already shipped evaluation systems to IBM's Systems Products Division.

IBM not committed

An IBM spokesman, who maintained that details of the Stratus contract are confidential, said that IBM has not yet formally made a commitment to remarket Stratus hardware as part of its product line.

Stratus will continue to sell its systems to end users and can still remarket its systems to other third-party vendors, according to the Stratus spokesman.

Currently, the Stratus/32 product line consists of three models: the FT 200, XA 400 and XA 600.

Cray reports 1984 profit of $45.3 million

MINNEAPOLIS — Cray Research, Inc. recently reported profits of $45.3 million, or $3.06 per share, for fiscal year 1984 on a revenue of $228.7 million.

Included in the company's profit statement was an extraordinary benefit of $6 million, or 41 cents per share, reflecting a 1984 tax law change eliminating deferred taxes owed by domestic international sales corporations.

In 1983, Cray earned profits of $26 million, or $1.77 per share, on a revenue of $169.6 million.

During the fourth quarter, the supercomputer manufacturer experienced a decline in revenue to $70.8 million, compared with $82.7 million in the year-earlier quarter. Profits for the quarter declined to $15.9 million, or $1.08 per share, compared with year-earlier profits of $19.3 million, or $1.31 per share.

During the most recent quarter, the company installed nine computer systems, compared with 12 systems installed in the comparable quarter of 1983.

Met 1984 business plans

John A. Rollwagen, chairman of the company, said the company met its business plans for 1984 by installing 23 new systems and reinstalling eight other systems. Two of the systems were installed for internal software development and marketing support.

Of the 21 systems installed at customer sites, 12 were purchased and nine were leased, he said. During 1983, the company installed 16 new systems, of which 12 were purchased and four were leased.

Rollwagen said demand for Cray's products remains strong and that the company already has under contract half of its anticipated installations for 1985.

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Comdisco airs $61 million profit, posts highest quarterly gain

ROSEMONT, Ill. — Comdisco, Inc. recently reported profits of $16.3 million, or 61 cents per share, for the first quarter just ended. That marked the company's highest quarterly profits ever and compared with year-earlier profits of $9.7 million, or 33 cents per share.

Widely regarded as the largest independent computer dealer and leasing company, Comdisco posted a revenue of $153 million for the quarter, compared with $135.8 million a year earlier.

Kenneth N. Pontikes, chairman and president of the company, said the record profits were primarily due to an expanded lease portfolio and an expanded volume of tax-advantaged transactions.

During the first quarter of 1984, Comdisco was operating under the cloud of an Internal Revenue Service investigation of its tax-advantaged transactions; the investigation was ended without any charges of wrongdoing, but the situation served to deter outside investors from participating in financing Comdisco lease packages.

Pontikes said the company entered into 1,874 new leases during the first quarter, compared with 1,238 new leases in the year-earlier quarter.

Tandem boosts profits by 39.5%, tallies $134.1 million in revenue

CUPERTINO, Calif. — Tandem Computers, Inc. recently reported a 39.5% increase in profits for the first quarter of 1985 and a 26.3% hike in revenue for the same period in comparison with revenue of a year earlier.

The company said profits for the quarter totaled $14 million, or 34 cents per share, compared with $10 million, or 24 cents per share, a year earlier.

Revenue for the quarter was $134.1 million, up from $106.4 million in the comparable period of 1984.

James J. Treybig, president and chief executive officer of Tandem, said the company made good progress during the quarter with its attempts to improve overall profitability.

He said total employment decreased slightly while the number of sales employees grew by 7% over the previous quarter.

Treybig added that repricing of the company's Nonstop II system at the end of the last fiscal year produced a positive response among customers.

The repricing also "played a strong role in attracting first-time users to Tandem," Treybig said.

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Siltec furloughs wafer plants

MENLO PARK, Calif. — Siltec Corp. recently announced its silicon wafer manufacturing operations will shut down for two weeks beginning Feb. 18, because of low demand for the wafers.

The company, which also manufactures silicon production and testing equipment, said 650 employees in California and Oregon will be affected by the shutdown. The equipment division, Cybeq Systems, "has not been affected by the overall semiconductor industry downturn and will continue normal operations," the company said.

Siltec also announced 1984 financial results, posting for the year a revenue of $64.8 million and profits of $2.7 million, or 78 cents per share, compared with a 1983 revenue of $44.1 million and profits of $1.1 million, or 33 cents per share.

Xerox profits decline 33%

STAMFORD, Conn. — Absorbing a fourth-quarter after-tax loss of $85 million from operating losses and the write-off of its Shugart Corp. subsidiary, Xerox Corp. recently reported that 1984 profits declined 33% from the previous year.

In addition to the costs of phasing out the Shugart disk manufacturing operations, Xerox lost $10 million for the year through its Crum & Forster, Inc. insurance subsidiary, which posted a fourth-quarter loss of $23 million. In 1983, the insurance subsidiary posted $26 million in profits for the fourth quarter and $145 million in profits for all of 1983.

Including all Xerox operations, the company posted profits of $291 million, or $2.53 per share, in 1984, compared with year-earlier profits of $466 million, or $4.42 per share.

The company's continuing reprographics and information systems businesses recorded a 1984 revenue of $8.79 billion, up 6% from $8.26 billion in 1983. Profits from those businesses were $354 million in 1984, up 8% from $328 million in 1983.

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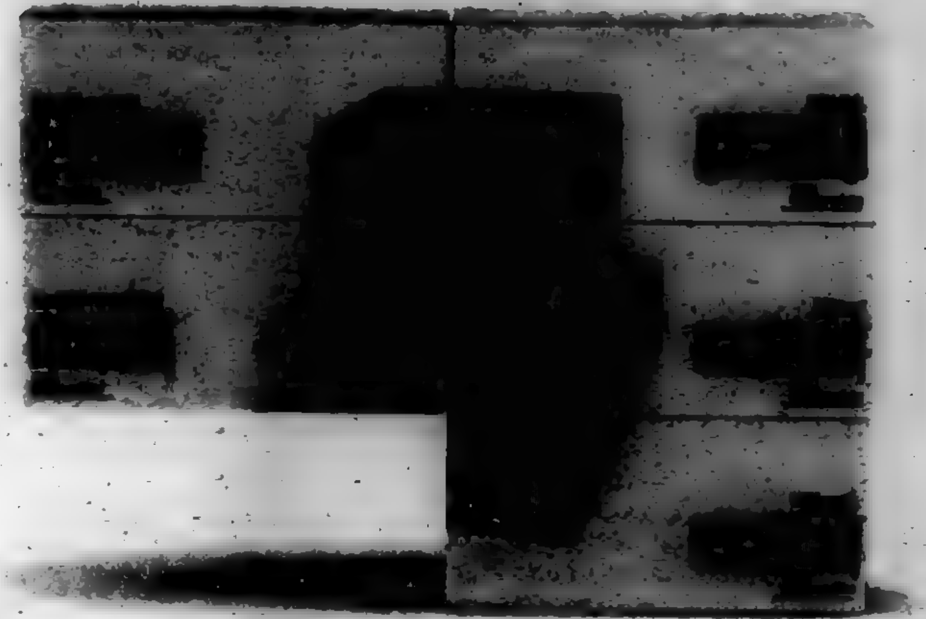

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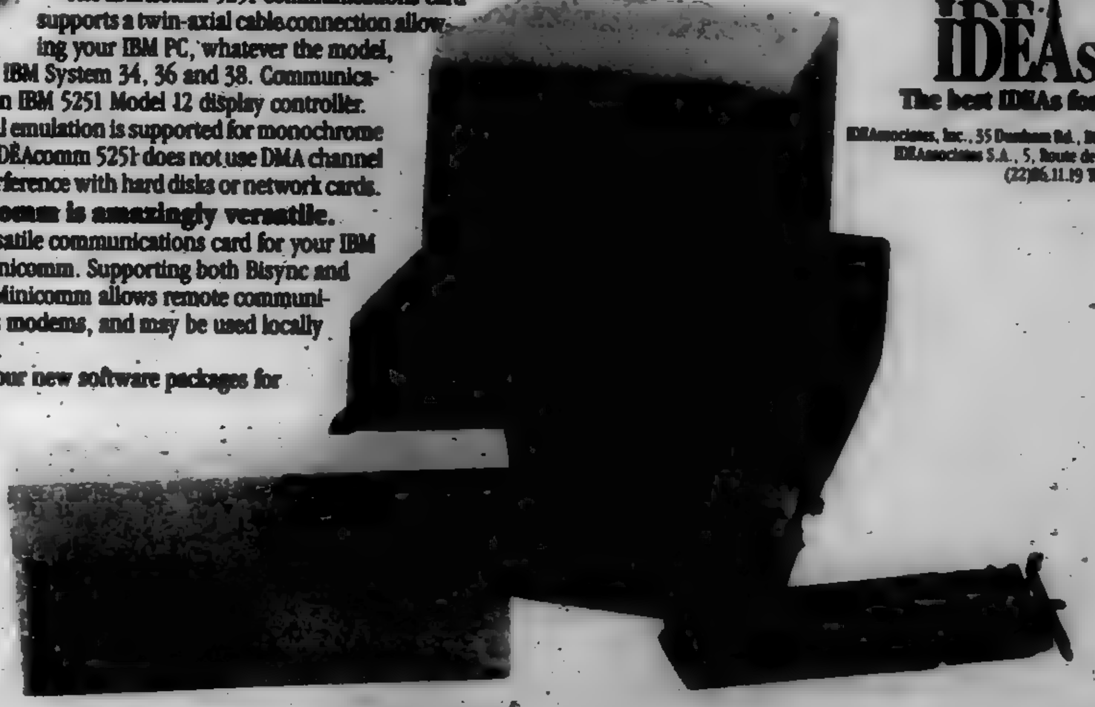

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Hogan eyeing layoffs in wake of third-quarter revenue dip

DALLAS — Hogan Systems, Inc. recently hinted that it will trim its work force after reporting a third-quarter loss of $1.4 million — or 10 cents per share — after tax benefits reduced an operating loss of $5.5 million.

In the comparable quarter a year earlier, Hogan earned a profit of $622,000 or 5 cents per share.

A manufacturer of integrated applications software for large financial institutions, Hogan experienced a decline in revenue to $4.6 million from $7.2 million a year earlier.

According to Richard Streller, the firm's chairman and chief executive officer, the results fell well below expectations and were due to delays in the signing of several licensing agreements during the quarter.

The delays, Streller said, were a result of customers seeking more assistance to implement Hogan systems, prospective customers taking longer to study the product before making a commitment and other issues "competing for executive time" in the banking industry.

Streller said the company will take further steps to trim operating costs and improve efficiency, including "selected staff reductions in all parts of the company."

CHIP

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will not talk about ongoing factory operations. Those manufacturers, Van Luvanee charged, are "hoarding information like gold."

He suggested equipment manufacturers improve process monitoring and sensing and incorporate artificial intelligence into production nodes by developing "smart equipment" that will monitor itself. Also needed, Van Luvanee said, are more interfacing standards and the ability to diagnose equipment and processing problems on the manufacturing floor in less time.

'Nastiest chemicals in the world'

According to Dan Rose, president of Rose Associates, an integrated circuit materials consulting firm in Los Altos, Calif., the integrated circuit materials industry has recently been plagued by several problems related to the handling of toxic chemicals. Rose asserted that "the semiconductor industry uses the nastiest chemicals in the world.".

Other trends in the semiconductor materials industry, Rose said, are higher quality control standards for automated environments, the increased use of subcontractors for integrated circuit assembly and a chronic shortage of polycrystalline silicon; the basic material used in semiconductor wafers.

Even though the worldwide poly silicon supply in 1985 will jump a projected 26.9% over last year's supply, increased demand — especially from Japanese semiconductor manufacturers — could lead to shortages, Rose said.

Robert Kopp, president of Kopp Semiconductor Engineering, a New Mexico-based consulting firm, said wafer fabrication processing technology is also rapidly changing, as integrated circuit dimensions increase, and as more experiments with refractory metals like tungsten and aluminum-based metals improve integrated circuit conductors.

Reduced particle contamination

Kopp added that a recent example of a significant improvement in wafer fabrication processing was HP's detection and reduction of process-induced particles during semiconductor production at HP's Corvallis, Ore., plant. Kopp said HP measured the particles with a new laser scan tool and reduced the particle contamination in its equipment environment, thereby increasing integrated circuit output of its largest chips.

According to Robert McGeary, manager of the Semiconductor Equipment and Materials Service at Dataquest, Inc., worldwide semiconductor capacity will increase 10% to 11% annually and will peak in 1989. He predicted that the growth of the Japanese semiconductor industry will outpace that of the U.S. by almost 10% next year. The Japanese, he said, are "in a capital expansion growth phase and we aren't."

In 1984, Japanese semiconductor manufacturers spent 34% of their earned revenue on capital expansion, compared with 22% in the U.S., McGeary said. Unlike the U.S., Japan can support high debt-to-equity ratios, McGeary said, since Japanese capital is funded by debt. In the U.S., capital spending is funded by equity, with a heavy emphasis placed on short-term growth, he said.

REVENUE

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itary. De Castro said he expects the competition across the company's product lines to become more intense in the coming year but predicted that some competitors may fall by the wayside.

He asserted that the computer community might by better served by having eight to 10 large companies in the market instead of the present "chaotic scramble among lots of competitors."

On the subject of IBM's growing dominance in the industry, de Castro said that there is no other company that he "respects and fears" as much as IBM.

He added, however, that "while [IBM is] big and good, it can be beaten from time to time."

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GTE Data Services

Senior Scientific Programmer

The National Optical Astronomy Observatories (NOAO) needs a Programmer to work at its Cerro-Tololo Inter-American Observatory (CTIO) in Chile. The job involves design and implementation of control programs for astronomical instrumentation and for the reduction of astronomical data. The NOAO utilizes both DEC PDP®-11/73 and Data General Eclipse computer for telescope and instrument control MV®/8000 and a VAX® 11/750 at CTIO. The position offers the opportunity to work with a small group on forefront problems in the applications of computers to observatory astronomy. Current projects include visual detector systems using CCD's and two-dimensional photoncounters, a cooled multichannel spectrometer for the infrared, infrared array imaging detectors and the implementation of 32-bit UNIX workstations to provide online data reduction. The ideal candidate will have a Masters or PhD in Computer Science, Astronomy or Physics and experience with real-time operating systems, instrument control application and assembly and high level languages. Candidates with Bachelor's degree and several years related experience will also be considered. The CTIO offices and housing area are located in La Serena, Chile, a pleasant coastal city in a mild climate 500 KM north of Santiago. The telescopes are 90 KM east of La Serena at an altitude of 2200 meters. Staff have excellent benefits and living conditions, including U.S. scale salaries, overseas allowance, annual travel benefit and tax exclusions. Please send curriculum vitae in confidence and addresses of three references to: Personnel Office, NOAO, P.O. Box 26732, Tucson, AZ 85726 with a copy by Air Mail to Director's Office, CTIO, Casilla 603, La Serena, Chile. The NOAO is an EEO/AA Employer.

WYOMING UNIVERSITY COMPUTER SERVICES

The Division of Computer Services at The University of Wyoming provides a broad base of hardware and software services and support for both academic and administrative computing. Computer Services also administers the central computer facility which houses an IBM 4381, a CDC Cyber 760, a CDC Cyber 835, a VAX 11/785, as well as several minicomputers. In support of this activity, the following position is available for immediate hire:

SYSTEM PROGRAMMER III

Supports the administrative computing effort in a senior systems role. A primary function is to maintain and enhance the MVS-SP/CICS system and to advise administrative users. A secondary function is backup support for NOS, VMS, and ULTRIX operating systems. Works closely with programmers in the Systems department and administrative application programmers. Candidate must have B.S. in Computer Science or related field. Four years of system programming plus good oral and written communication skills are required. Experience with IDMS and other systems already mentioned are a plus. Salary range is $24,000 to $28,000, commensurate with experience.

Qualified candidates should forward their resumes, current salary and three references with telephone numbers to William B. Jones, Computer Services, P.O. Box 3945, University Station, Laramie, Wyoming, 82071.

The University is an Equal Opportunity/ Affirmative Action Employer.

Director of Software Development

Dynamic software company in the Southwest needs an exceptional manager to direct its mainframe development activity. Environment is IBM IMS and CICS under MVS.

Product line is state-of-the-art; the staff is top quality and the working environment close to ideal.

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You should have 2 to 3 years of Data Security experience, and the ability to work with all levels of management. Thorough knowledge of bank and data processing operations, and complete knowledge of RACF, MVS Externals and some MVS Internals are required. Some management experience and knowledge of IMS and CICS are preferred.

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Sun Bank

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- San Francisco Bay Area -

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We are seeking a senior-level Programmer/Analyst to assist in the installation and customization of IBM's Inforem II, which will support buyer forecasting at our various divisions. We require previous experience installing Inforem II and knowledge of CICS/DMS. Experience with IMS/ADF is helpful.

We offer a competitive salary and benefits package. Please send your resume, including current salary to Suzanne McFadden, LUCKY STORES, INC., MIS Systems Support (CW14), Box BB, Dublin, CA 94568. (415) 833-6534. Relocation assistance may be provided. We are an equal opportunity employer. Individuals only apply.

Lucky

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We have opening in our MIS area requiring personnel with Univac 1100 experience in a medium to large installation, knowledge of COBOL, TIP, DMS and MAPPER, with a BS degree in Business Administration desirable.

SYSTEMS SUPERVISOR

Minimum of 5 years experience with 2 years technical supervision required in manufacturing, purchasing and accounting systems desired for this position in the Operation Application Development area. Must possess excellent communication skills.

SENIOR ANALYST PROGRAMMERS

Minimum of 5 years experience with manufacturing systems. MAPPER experience desirable but not required.

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Livingston, CA 95334

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We offer comprehensive training and competitive salary and benefits. Qualified applicants should forward their resumes with salary histories to:

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Tenure-track position as Assistant/Associate Professor of Computer-Aided Architectural Design. This position supports the Department's commitment to developing computer graphics beyond drafting aids into design and architectural modeling tools and combines research and teaching in the area. Emphasis is on preparation of students for professional practice. Candidate selected will also be involved in Project Athena, MIT's $70 million dollar experiment in computer-assisted education. Qualifications include strong architectural design ability and experience; [illegible] degree minimum; expertise in designing with computers, including familiarity with [illegible] structures and [illegible]. Experience in teaching and in software development related to computer graphics and advanced programming techniques desirable. Resume and references to Professor [illegible], Head, Department of Architecture, MIT, 77 Mass. Ave., Cambridge, MA 02139 USA by March 15, 1985.

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DATA BASE MANAGER

Requires a strong technical manager to guide the design, maintenance and control functions of a large database system. Provide short and long range direction and set standards for developmental and use of data within a large volatile information system. Manage a small staff of systems professionals and have 5-7 years experience managing a data base environment. Knowledge of ADABAS helpful but not necessary.

MANAGER, NETWORK SYSTEMS SOFTWARE

Responsibilities include the management, direction, and control of the implementation of systems, programming, equipment and procedural changes to the Data Center production and test on-line environment. In addition, the direction and control of any and all changes to the on-line environment with systems, programming, and computer operations. Candidate must have strong background in VTAM, NCP, NCCF, NPDA, and CICS. College degree and 6-10 years experience preferred.

MANAGER, SYSTEMS SOFTWARE

Responsible for the Development and maintenance of systems software in a large-scale IBM facility under MVS-JES2. Also responsible for support of System Development monitors and third-party system support packages. Position manages a small staff of systems professionals in a rapidly expanding, challenging environment. A successful candidate should have 7-10 years IBM Systems Software experience with 3-5 years in a management capacity.

COMPUTER OPERATIONS MANAGER

Responsibilities include the management of 4 computer operations shifts engaged in operational management of a large, multi-CPU, MVS operating system supporting TSO, JES2 and a CICS on-line system with approximately 2500 terminals. Responsible for a 24-hr./day, 7 days/week data center while providing direction and assistance to the Operation Shift Managers as well as to provide support for Production Control, Network Services, Systems Programming and Data Processing users. A college degree and 5-10 years experience preferred.

COMPUTER OPERATIONS SHIFT MANAGERS

Responsibilities include the management of a computer operations shift engaged in operational management of a large, Multi-CPU, MVS operating system supporting TSO, JES2 and a CICS on-line system with approximately 2500 terminals. Responsible for the management of the activities of MVS console, tape and printer pool operators. Position reports to the Computer Operations Manager. A college degree and 2-5 years experience preferred.

PRODUCTION CONTROL MANAGER

Responsibilities include the management of the Production Control Department consisting of input, output, tape library and scheduling sections. Manage overall activities of staff members working a 24-hr./day, 7 days/week schedule engaged in data preparation, input job setup, scheduling, output distribution and control functions as well as coordination of efforts among Computer Operations Management, Technical Support Management and Programming Management. Candidate must be familiar with all facets of computer operations, input/output medias, control techniques and be highly attentive to detail. A college degree and 5-10 years experience is preferred.

MVS CONSOLE OPERATORS

Responsibilities include the operation of a systems console in a large IBM 308X multi-CPU OS/MVS operating environment. Individual should have a minimum of 2 years hands-on experience with CICS, JES2, TSO and SDSF.

PRODUCTION CONTROL OUTPUT UNIT MANAGER

Responsibilities include the Management of the Production Control Output Unit in a 24-hr./day, 7 days/week operating environment. Responsible for the quality review and timely distribution of computer generated reports to the Data Processing user community. Coordinates overall efforts with computer operations in the procedures to control, reconcile, and distribute output in accordance with departmental standards. Candidates must be attentive to detail and highly motivated. College degree and 2-5 years experience preferred.

SYSTEMS PROGRAMMERS

Responsibilities include the generation, testing, implementation, and performance tuning of computer software in the areas of MVS, CICS, VTAM, and NCP. Individual will be required to install changes to operating system software and assess and document the impact of those changes to application programmers and operations personnel. Responsibilities will also include providing technical expertise to all areas of the Data Center. A college degree and 2-10 years experience preferred.

TECHNICAL ASSURANCE ANALYSTS

Responsibilities include the coordination, control, and implementation of all system, programming, equipment configuration and procedural changes to the computer operations environment. Requirements include knowledge of OS JCL, library update procedures, use of TSO and IBM utilities and disk allocation methodologies. College degree and 2-5 years experience preferred.

OPERATIONS SUPPORT ANALYSTS

Responsibilities are to provide computer operations with operations support. Individual will perform problem determination on all production-related job abends. Individual must have a minimum of 1-2 years experience and have a good working knowledge of OS JCL and restart procedures.

PRODUCTION CONTROL INPUT UNIT MANAGER

Responsibilities include the management of the Production Control Input Unit in a 24-hr./day, 7 days/week operating environment. Responsible for the data preparation, input job setup, and staging of scheduled batch work to Computer Operations. Managing the daily application setup activity in accordance with department standards and procedures as well as coordinating efforts with operations and systems support functions. Candidate should be familiar with all facets of computer operations, have a JCL background, attentive to detail and be highly motivated. College degree and 2-5 years experience preferred.

NETWORK OPERATIONS MANAGER

Responsible for the planning and maintenance of on-line system availability for a major SNA network consisting of 2000+ terminals supported by large-scale IBM 308X multi-CPU's running CICS, ACF/VTAM, ACF/NCP. Responsible for performing continual system and network monitoring, perform problem determination and implement remedial action. Must be experienced in the development and implementation of a network control center consisting of a major patch panel complex, datascopes, oscilloscopes and Bradley instruments. College degree and 5 years management experience in this environment is preferred.

NETWORK OPERATIONS ANALYSTS

Responsible for the continual monitoring of on-line system availability for a major SNA Network consisting of 2000+ terminals. Responsible for performing continual system and network monitoring, perform problem determination and implement remedial action. CPU mainframes are IBM 308X running MVS, CICS, ACF/VTAM, ACF/NCP, NCCF and NPDA. Should have 1 year experience and be familiar with patch panel, datascope, oscilloscope, and Bradley instruments.

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TWO SENIOR DATA
PROCESSING ANALYSTS

Responsible for systems analysis & programming for business applications. Bachelor's Degree (experience may be substituted) and two (2) years programming/analyst experience. Knowledge of Assembler, COBOL, DL/I, CICS, Easytrieve, and DOS/VSE.

SYSTEMS PROJECT LEADER

Bachelor's degree or equivalent. Training in systems analysis, project management, data communications and management information systems is required. Six (6) years work experience required including data processing and project planning or supervision. Interest in working with severely physically disabled adults preferred.

Submit official FJC application and resume to:

Florida Junior College at Jacksonville
Personnel Department
501 W. State Street
Jacksonville, Florida 32202
(904) [illegible]

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Computer service bureau in the direct mail business has an opening for a computer room operations manager with large mainframe MVS experience. DOS experience a plus. Looking for a hard (shirt sleeve) worker with proven management experience and good administrative skills. Current hardware AMDAHL 470/V8 with planned second quarter 85 migration to XA. Minimum 5 years operations management experience. Excellent salary, bonus plan and benefits program. If you are interested in a city job with country living, Fredericksburg, Virginia is just an hour from both Washington, DC and Richmond and an ideal setting for family living, please send resumes to:

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Career Opportunities
The News
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Get the latest data in our new, free 1985 Computer Salary Survey and Career Planning Guide.

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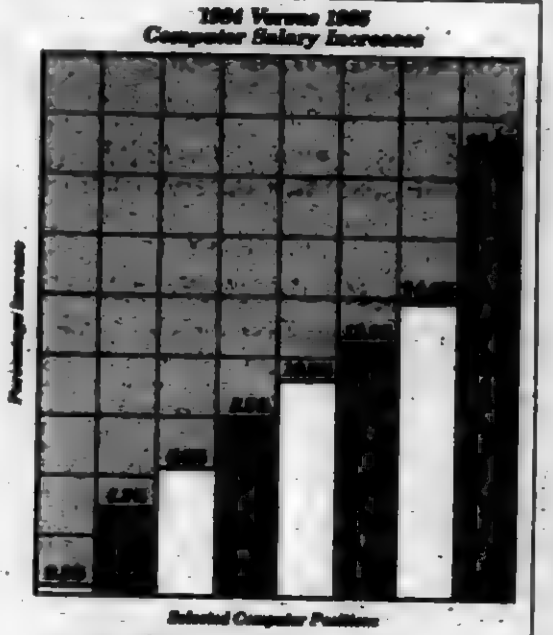


Who will get the biggest increases?

- *Current salary increases for sixty-three different position and experience levels in computing ranged from a relatively low 6.3% to as much as 22.4% over the previous year. Our new 1985 Salary Survey will show you how your salary compares and what you can expect to earn as you advance your career.*

Our most comprehensive Survey ever

The new *1985 Computer Salary Survey and Career Planning Guide* is based on contacts with more than 48,000 information processing and computer professionals and 35,000 firms that hire them. Included is a review of salaries at sixty-three different position and experience levels. So no matter if you're in programming, systems analysis, design, software, communications, operations, sales, marketing or management, you'll learn whether or not your salary is keeping pace with your peers—and what you can expect to earn as you advance your career.

A program to help you progress

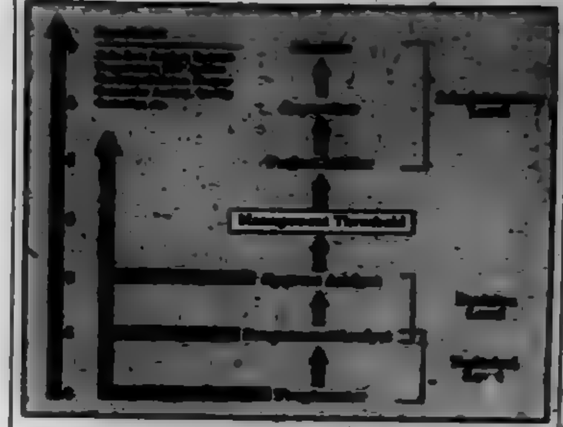
In addition, the new Survey includes a number of comprehensive charts, exhibits and graphs which are designed to help you gain a thorough understanding of emerging industry and career trends and what you could do to capitalize on them. Through documented case studies, you'll also learn why some computer professionals advance while others do not—despite the positive economic outlook.

Included is a seven-step career planning system that can help you assess your current position and take corrective action when and if needed. This is a unique system that Source Edp developed and refined over the last twenty-three years, which has helped thousands of computer professionals advance in their careers.

Free to computer professionals

The new 32-page Survey is available without charge. Since 1966, we have distributed Surveys to more than five hundred thousand computer professionals like you who are determined to realize their fullest career potential.

You owe it to yourself—especially if most of your career lies ahead—to call or write today.



How new trends may affect your career

- *Besides reviewing some of the newer trends in technology—such as CAD/CAM, robotics, communications, networking and more—the new Survey can help you get a clearer picture of how to advance both your career and earnings in computing today. For example, by specializing in narrow areas of expertise, some computer professionals have been able to challenge the traditional salary and career barriers that are normally encountered in many information systems environments, as shown in the chart above. This means they are often able to earn as much or more than those in supervisory or administrative roles.*

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You should have a minimum 3 years' experience maintaining and servicing IBM 3350, 3420 and associated controllers, IBM 3890 banking equipment, or IBM 3033 CPU's.

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Position requires a minimum of 3 years' experience maintaining and servicing IBM 3800 and IBM 3890 banking equipment.

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IMS Systems Programmer/Analyst required. Will be responsible for software and hardware evaluation of computer systems. Will be working with IMS environment using TSO & BTS software systems and JCL and PL-1 programming languages. Applicant must possess Bachelor's degree in engineering or computer science and 2 years prior experience with PL-1 programming and must be familiar with TSO, BTS, JCL and large scale IBM mainframe computers. Minimum salary to be $25,000 per year for a 40 hour work week, however, additional salary up to $36,000 per year will be paid for additional experience. Interested applicants should contact The Oklahoma Employment Security Commission, 3105 East Skelly Drive, Tulsa, Oklahoma 74105. Phone: (918) 749-6881. Refer to job order #090544.

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The ideal candidate will have a minimum of 5 years systems programming, with prior applications development experience. Specific areas of expertise must include COBOL, DOS/VSE, CICS, database and teleprocessing experience, excellent communications skills both oral and written, and the ability and desire to take on managerial responsibilities as needed. A college degree is preferred.

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The following positions require COBOL, OS/MVS, and CICS experience in a large IBM-mainframe environment.

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In these positions you will perform detail design, coordinate programming and testing, perform system testing, document and install advanced business systems.

These positions require a BS Degree in Computer Science or related major, along with a minimum of one year of design experience and a minimum of four years' programming experience in business applications systems.

PROGRAMMER ANALYSTS

In these positions you will code, compile, test and document business applications programs written in COBOL language.

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Interested applicants should forward their resume to:

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AUBURN UNIVERSITY DIRECTOR DIVISION OF UNIVERSITY COMPUTING

Auburn University invites nominations and applications for the position of Director, Division of University Computing.

RESPONSIBILITIES: The Director reports to the President's office, and has primary responsibility at the policy level for the planning and delivery of the information, computing, and digital communications systems and services which support the diverse administrative, instructional, research, and extension activities of Auburn University.

QUALIFICATION: Applicants must have demonstrated: the highest level of competence in management, planning, and budgeting for large-scale research, instructional, extension and administrative programs; a thorough familiarity with financial, student, human resources, and other data base systems at both operating and policy levels; a thorough familiarity with current products and vendors of both hardware and software; and the ability to communicate and work effectively with diverse groups of administrators, faculty, and students. Applicants must have appropriate advanced degrees or equivalent experience.

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Professor Jack W. Rogers, Jr.
Search Committee for Director
Division of University Computing
Mathematics Department
Auburn University, Alabama 36849

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UNIX

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Apply Civil Services Department, 2014 Main, Dallas, Texas 75201

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Submit cover letter and resume by March 1, 1985 to: **Cynthia Smithbower, Staffing Services, or call: 607-256-5531, CORNELL UNIVERSITY, 130 Day Hall, Ithaca, New York 14853.**

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*Salary commensurate with knowledge and experience.

To apply, resumes must be received by February 15, 1985.

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We're looking for individuals with experience in one of the following areas, or the equivalent: Portable C compiler, Fortran run time libraries, 4.2 BSD Kernal internals, and TCP/IP networking protocols. 3+ years experience is required.

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Use your industry expertise to market the capabilities of our product and organization with identified segments of the scientific and engineering computer marketplace. Additionally, as the internal expert, you will interpret market needs, establishing CHI policies for pricing competition, distribution and overall product strategy. 5-8 years industry experience in the scientific/engineering computer business addressing such specialized segments as CAD/CAM.

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CHI Systems offers industry competitive compensation and an exciting arena to explore your own potential. For more information on these career opportunities, please send your resume to A. Riederer, CHI Systems, 100 Burns Place, Goleta, CA 93117. We are an equal opportunity employer.

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CHI Systems

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This position involves a number of challenging duties and tasks related to providing technical support of VAX 11/750. Among the responsibilities are maintaining VAX 11/750, UNIX operating systems as well as ensuring OS integrity and compatibility through configuration and change control procedures. You will implement security requirements through access, backup and recovery mechanisms. Provide VAX 11/750 resource utilization reporting and user accounting. Develop disk space management procedures and support capacity planning. Serve as Systems Manager and accountable technical contact for vendor support. Consult with systems users to improve service and resolve problems.

You must have three years or more of experience with at least one year with UNIX OS. A BS degree in Computer Science along with a knowledge of OS principles are also required.

We seek resumes from all qualified individuals. Minority candidates are encouraged to apply. For consideration, send your resume to: Staffing and Development (SD 19), P.O. Box 1625, Idaho Falls, Idaho 83415. U.S. Citizenship Required.

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Product Development And Design Engineer. Design and develop customized software based on proprietary system for control of computerized integrated manufacturing process for small and medium sized manufacturers of computer keyboards and peripherals. Must provide I.E. design services to customers and prerequisite to software customizing; and must install and document software. Must have M.Sc. in Industrial Engineering and use Fortran and N/C machine programming languages. Forty hours per week. Overtime as necessary. $23,500 per year. No formal training or experience required. Submit resume to Illinois Job Service, 910 South Michigan Avenue, Third Floor, Chicago, IL 60605, Attn: Joan Sykstus. Reference #4172-T. An employer paid ad.

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Even though we are a recruiting firm, we do offer a free resume service. Write or call for a resume preparation form. Complete the form and mail to us and we will return a completed resume to you. This is a confidential service with no obligation.

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So, if you're highly talented with the motivation to match, we will offer you an environment with intriguing applications, unparalleled challenges, and diversified career growth. Just send your confidential resume, with salary history, requirements and position preference, to: Box DDC 221, 380 Fifth Avenue, Suite 3820, New York, NY 10118. We are an equal opportunity employer M/F/H/V.

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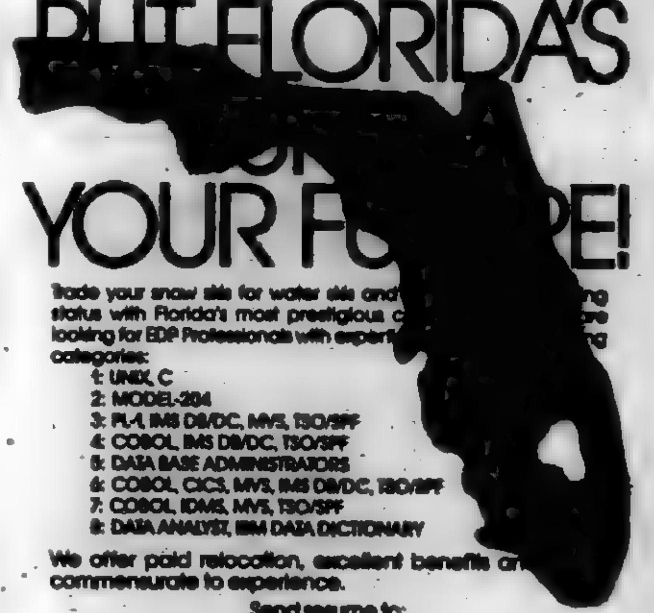

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6: COBOL, CICS, MVS, IMS DB/DC, TSO/SPF
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Marin County Personnel Office
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San Rafael, CA 94903
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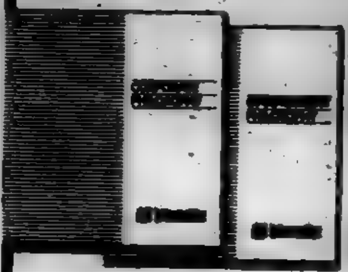
Computer Professionals, PHOENIX



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If you are ready for a professional environment, investigate your potential with Informatics General Corporation. Our unique operating philosophy is captured in two brief booklets which we will share with you during an interview. The concepts described have enabled us to build and retain a superb staff of over 2800 fulfilled career professionals and 22 years of prosperous, uninterrupted growth.

Our growth has created additional needs for skilled professionals seeking greater satisfaction from their work and better rewards for their skills.

PRODUCT MANAGER •
Requires minimum 5 years' background designing computer application software, and minimum 2 years with legal office automation financial and accounting software systems. Ideal experience would be consulting for Big 8 accounting firms or similar, and developing systems suited to meet their needs. Phoenix based. Relocation costs covered. Maximum 30% travel.

PROJECT LEADER
You'll need 8+ years of software applications development with 2 of those years as software development project leader. COBOL programming skills essential. One position requires experience with legal information processing and word processing system development; one requires experience developing legal, financial and accounting systems. We prefer that some of your experience is with a software vendor. Phoenix based. Relocation costs covered. Maximum 10-15% travel.

PROGRAMMER/ANALYSTS
COBOL programming skills and 3+ years' application development experience required. Experience with financial and accounting applications system development or word processing system development for the legal community required. Phoenix based. Minimal travel required.

For immediate consideration, please send your resumé stating position of interest in confidence to: Employment Manager, INFORMATICS GENERAL CORPORATION, 2111 East Highland, Suite 400, Phoenix, Arizona 85016.
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Informatics general corporation

Data Processing

SOFTWARE PRODUCT DEVELOPMENT

We Have Some Big Shoes To Fill!

To provide IBM mainframe users with the most sophisticated and advanced software products available, we are expanding our Product Development teams and beginning several major products which will impact the future of data processing.

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In addition to at least 5 years BAL programming (PASCAL a plus), expertise with some or all of the following areas could qualify you to join one of our talented development teams.

- OS/MVS or VM Operating System Internals.
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We provide competitive salaries and benefits (relocation available if required), and a unique opportunity for a career with an industry leader. If you are ready to step into one of these key positions, please send your resume in confidence or call: S. Worthy, Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, Illinois 60521, 1-800-323-2301.

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PRIME or HP 3000
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We look for people who place the same emphasis we do on excellence and results. In turn, we provide an open, participative style; competitive salaries; and attractive benefits, including fully paid insurances, relocation assistance, stock participation and sabbatical leave.

CRA is headquartered and operates in the Harrisburg, PA area, the State's capital. This Southcentral PA region features a moderate climate, reasonable cost of living, excellent schools and a wide variety of recreational facilities.

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If you qualify, call Ken Podd at
(717)737-[illegible], or write to:

COMPUTER RESOURCE ASSOCIATES
1000 Market Street-Suite 3
Lemoyne, PA 17043

All replies will be treated in strictest confidence, and all replies will be answered.

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At Wheat you will have the opportunity for responsibility earlier in your career ...and a broad range of assignments. You will work independently, from your private office, making direct contact with managers as your assignments require. Your achievements will be highly visible and recognized.

You will be joining a growing data processing staff in the dominant brokerage securities firm in Virginia, and a leading financial services firm in the East. The Wheat data processing professionals support a full range of financial products and services through a 750-terminal network using a current operating environment of two IBM 4341's, MVS, TSO, TCAM and CICS; with plans to upgrade to an IBM 4381 in the near future.

If you have 2 years of programming experience using COBOL, a working knowledge of MVS/JCL and IBM hardware exposure, call Jane Bailey, Personnel Representative, (804) 782-3229 or send her your resume at 20th Floor, 707 East Main Street, Richmond, VA 23219.

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The Las Vegas area offers year around sunshine, a variety of recreational activities and the finest dining and entertainment anywhere. Colorado River fishing, Lake Mead, Hoover Dam, mountain camping, and winter skiing are all within a 45 minute drive. Nevada has no state income tax.

We are currently seeking to fill the following professional positions of:

APPLICATION ANALYSTS AND PROGRAMMERS — Experience with either: IDMS DB/DC, MSA payroll/personnel, or McCormack and Dodge financial systems. Must have good communications skills and project leadership ability.

SYSTEMS PROGRAMMERS — Qualified personnel to support our environment of IBM 43xx mainframes using shared spool and NCP. Successful candidates will be proficient in MVS/SP, JES2, VTAM/NCP, SMP/4, TSO/ISPF and ALC. Additional consideration will be given those with experience maintaining Series/1's, ACF2, UCC-1/TMS, LOOK or LIBRARIAN.

DATA BASE — Principal responsibility in one or all areas of IDMS online/data base design, inhouse product consulting, or maintaining the data base software. The Cullinet products installed include: IDMS/DB/DC/UCF, ADS/0, IDD, OLM, OLQ and CULPRIT.

If joining Summa Corporation involves a move, we will help you with our personalized relocation program.

Send resume and salary requirements in confidence to: Craig A. McCall, Summa Corporation, P.O. Box 14000, Las Vegas, Nevada 89156. equal opportunity employer

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SENIOR SYSTEMS ENGINEERS
SENIOR PROGRAMMER/ANALYSTS
PROGRAMMER/ANALYSTS

You need Model 204, IBM 43XX background, 1 to 4+ years' experience and U.S. citizenship. Experience in one or more of the following desirable: intelligence data handling systems, intelligence related contract, DODIS network architecture, automated message handling systems (AMHS) – either MAXI, PDSC or CSP.

For immediate consideration, please send your resumé in confidence to: **Planning Research Corporation, Government Information Systems, 1500 Planning Research Dr., Dept. JA-35, McLean, Virginia 22102.**
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Associate Research Computer Scientist

Perform applied research & development in integrated switching, token ring, CSMA/CD, broadband & baseband local area networks. Evaluate computer network performance. Develop network interface devices for networking various kinds of computer systems. Develop mathematical tools for analyzing network statistics. Develop network service and management packages. Carry out research on inter-network long-haul communications. Compose technical reports for research results and provide consultations toward the goal of a nationwide computer network for all corporate data communication operations.

Minimum Requirements: Ph.D. in Electrical Engineering. Strong background in data communications, expertise in local area networking, and knowledge of modeling, statistical analysis and delay/collision prediction, as evidenced by (1) graduate-level course work (one quarter) in each of the following subjects: data communication networks, advanced topics in communication theory, stochastic process & communication theory I, stochastic process & communication theory II, and by (2) completion of a doctoral dissertation on integrated switching telecommunication networks, both long-haul and local area.

Salary: $42,000 per year. Basic 40-hour work week plus benefits typical of the industry.

Apply at the Texas Employment Commission, Houston, Texas, or send résumé to:
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TEC Building
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$2171 - $2773 per month. Performs duties in the evaluation, installation, and maintenance of all systems software for IBM 4361. Four years experience in software maintenance and installation in an IBM VM/VSE, CICS environment or an equivalent combination of experience and training. For application contact:

Douglas County Personnel
Courthouse Room 322
Roseburg, Oregon 97470

INSTRUCTIONAL COMPUTING COORDINATOR

COMPUTER - Berea College is seeking an Instructional Computing Coordinator in a twelve month administrative position with some teaching responsibilities, beginning July 1985. Candidates should have experience using the computer in the classroom, knowledge of microcomputers, been trained in teaching, and be conversant in BASIC and PASCAL. A Masters in computer related field or Masters and three-four years experience in the instructional use of the computer is required. Berea is a Christian, liberal arts college of 1525 students and actively seeks applications from minorities and both sexes. PRIME 400 and [illegible]. Send resume, statement of interest, and names of at least two references to: Director of the Computer Center, CPO [illegible], Berea College, Berea, Kentucky 40404.

S/38 DP MANAGER

If you are looking for an opportunity to be responsible for our newly installed S/38, if you want growth and recognition for your ideas and work—read on. Our 8 year old firm in the Virginia suburbs of Washington, D.C. is looking for a dynamic manager that wants to be an important part of the coming years of growth. Along with RPG III experience, you should be strong in system analysis and have demonstrated the ability to organize and maintain a small but highly efficient DP Shop.

Send resume with salary history to: Box #CW-B4130, Computerworld, P.O. Box 880, Framingham, MA 01701

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Software Engineers wanted for development of telephone systems software.

Applicants must have 3-7 years experience with call processing and/or data base management software for digital telephone switches.

Florida location, 6 months to 1 year.

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A Division of Comuterware Inc.
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(214) 620-2091

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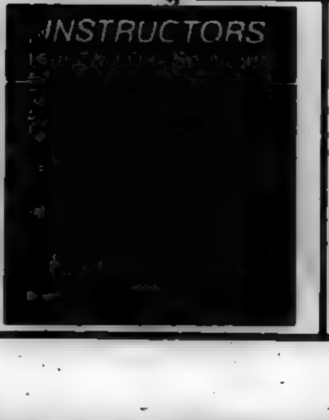
Analyze user needs for new student database system. 2-3 years programming and/or analysis experience and degree required. IDMS, VM, CMS helpful. Submit resume and 3 references no later than 2/28/85, to: Martin Cohen.

BROOKLYN COLLEGE COMPUTER CENTER
Ave H & Bedford Ave
Brooklyn, NY 11210
EO/AA Employer M/F

COORDINATOR INFORMATION CENTER $30-$40,000

Leading fast growth Twin Cities based manufacturer seeks first microcomputer coordinator to supervise: business problem solving with PC's, long/short range planning for information center, development of micro-to-mainframe strategies, training programs. For more information about this outstanding opportunity call Mark David or Tim Smith at (612) 339-9001 on Job # 8877.

ROBERT HALF OF MINNESOTA, INC.
3636 IDS Center
Minneapolis, MN 55402



MANAGER APPLICATIONS DEVELOPMENT

Blue Cross Blue Shield of Greater New York, a progressive organization in the health care field, is rapidly expanding in the data processing area. As a successful growing organization, we are seeking a talented and highly motivated individual to lead technical personnel to ensure that company information processing goals are achieved efficiently. Our data processing environment consists of an IBM 370/3081 mainframe using OS/MVS, VSAM, CICS, TSO/SPF. This newly created position is available in our New York Blue Cross Medicare operation located in Syracuse, New York.

The incumbent will be responsible for managing systems development activities and staff for work being performed on a statewide Medicare claims processing system.

The successful candidate must have held progressively responsible positions in a large IBM mainframe environment with at least 8 years of data processing experience in the areas of systems design and programming, and at least two years experience at the management level. Experience in an insurance environment is highly preferred. Medicare experience would be ideal, and a baccalaureate degree in an appropriate field is desired.

We are offering a competitive salary and an excellent package of company-paid benefits. For immediate consideration, please send your resume or letter with salary history to:

NEW YORK BLUE CROSS MEDICARE
Human Resources
615 James Street
Syracuse, NY 13203

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AUBURN UNIVERSITY
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DIVISION OF UNIVERSITY COMPUTING

Auburn University is seeking a highly qualified individual to serve as Data Base Administrator.

RESPONSIBILITIES: This position reports to the Director of the Division of University Computing, the centralized computing organization within the university. The duties of this position include planning, designing and implementing data base systems using the TIS DBMS from Cincom Systems. The DBA will also develop standards and procedures to ensure the integrity and security of the data base, and will assist the application development staff in implementing integrated systems in a data base environment.

QUALIFICATIONS: A Bachelor's degree in an appropriate discipline is required; a Master's degree is desired. Applicants should have a minimum of three years experience as a Data Base Administrator, preferably with a major DBMS on IBM systems in a university environment. Strong interpersonal and communication skills, and the ability to effectively interact with all levels of management are attributes the applicant must possess.

COMPENSATION: An excellent salary, commensurate with experience, and a liberal fringe benefit program are offered for this position.

AUBURN UNIVERSITY was chartered in 1856. The main campus, with an enrollment approaching 19,000 students, is the largest single campus in the state. Auburn is a land grant university with a broad base of programs in the liberal arts, sciences, and professional areas, and a strong commitment to graduate education and research. It is located near the border of Alabama, 50 miles from the capital, Montgomery, and just over 100 miles from Atlanta, GA.

APPLICATIONS: The closing date for applications is March 1, 1985. Applicants should submit a letter of application, a current resume, and the names, and phone numbers of three references to:

Bruce R. Lewis, Acting Director
Division of University Computing
144 Parker Hall
Auburn University, Alabama 36849-3502

Auburn University is an Equal Opportunity, Affirmative Action Employer

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SOFTWARE ENGINEER

Software Engineer (Dayton area) to design and program interfacing for avionics integration support facility, test and analyze software validation and verification network. Will modify software systems utilizing the VAX 11/780 VMS. Requires Bachelor's in Computer Science with one year software programming experience. Experience must be with utilization of VAX 11/780. 40 hour week 8AM to 5PM. Salary $19,200 per year. Send resume and ad to:

Ohio Bureau of Employment Services
P.O. Box 1618
Columbus, Ohio 43216
Attn: L. Ellison
J.O. #0724159

DIRECTOR RESOURCE AND PLANNING DATA SYSTEMS UNIVERSITY OF ILLINOIS AT CHICAGO

University of Illinois at Chicago currently seeking Director of evaluation, planning, and implementation of budgetary, staffing, facilities and other related data systems used through out the campus. Candidate should possess masters degree in relevant field, extensive knowledge of and experience with data systems used within higher education, demonstrated management ability. Mainframes used on the campus include the IBM 3081, 3081A, 3081D, 4381, 168, and Amdahl V8. Salary is competitive. Letters of application detailing experience and equipment familiarities and resume with names of three references to T. Chan [illegible] 10[illegible], Office of Planning and Resources Management, 2715 University Hall, P.O. Box 4348, Chicago, IL 60680, (312) 996-8210. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

SYSTEMS PROGRAMMER

Medium-sized, state of the art shop is seeking individual with B.S. in computer science or related field plus a minimum of 5 years of computer experience with at least 3 years in systems programming. Desirable experience includes VM/SP, CMS, ICCF, DOS/VSE, NCP, VSAM, CA-DRIVER, CA-SORT, CA-DYNAM, CA-JASPER, EASYTRIEVE, and Cullinet's IDD, IDMS, ADSO, Query, and CULPRIT.

To be considered for this position which offers an outstanding education and training package as well as an excellent salary and benefit program, please submit resume and salary requirements to: Deaconess Hospital of Cleveland, 4229 Pearl Road, Cleveland, Ohio, 44109, Attention: Amy Clark.

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☐ ASSEMBLER
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Middle South Services, Inc., is the service, consulting arm of one of the nation's largest electric utility systems. Approximately half of Middle South Services' staff works in our Management Information Systems Department providing Data Processing support to one or more of the Operating Companies in the Middle South Utility System.

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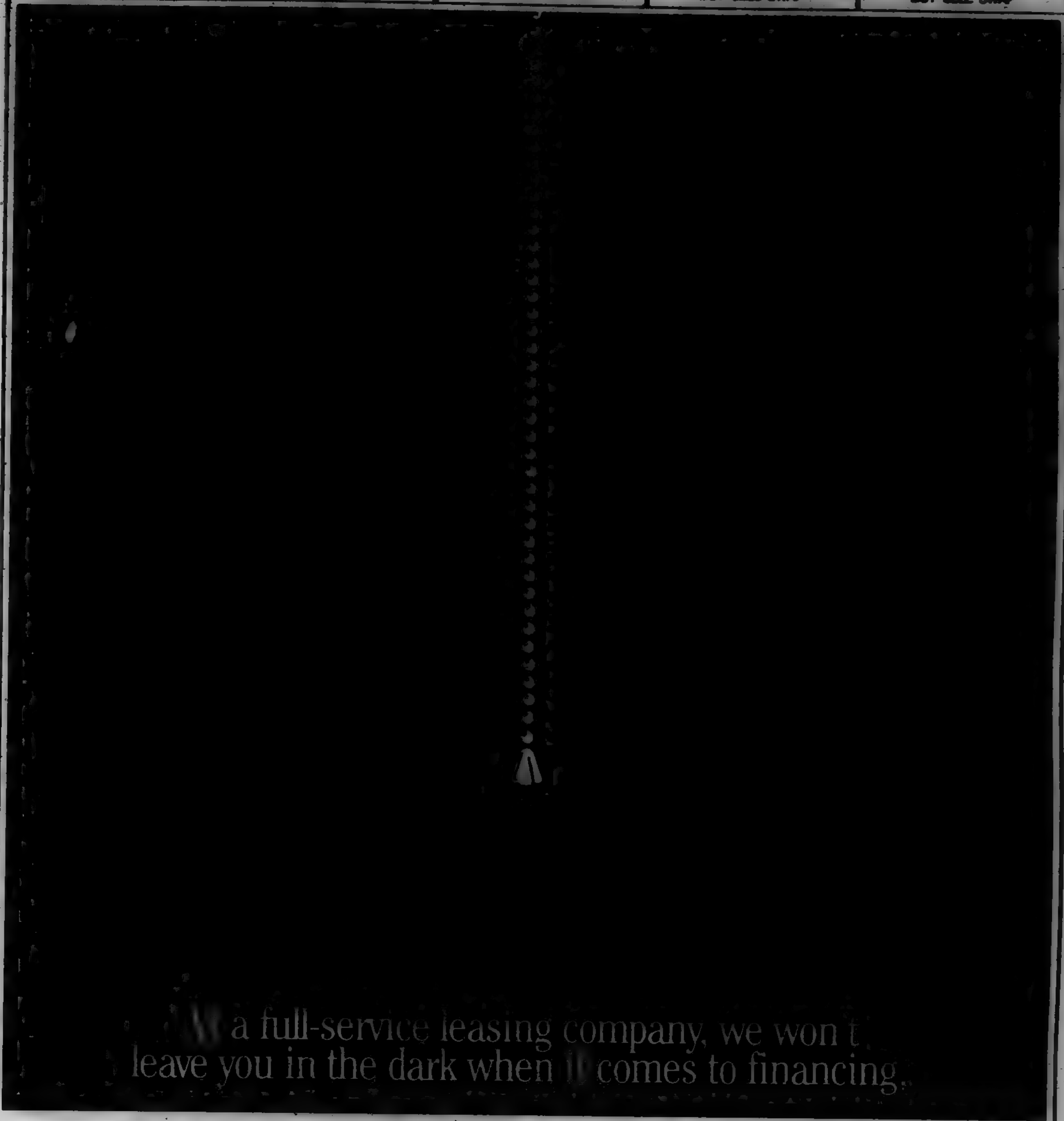

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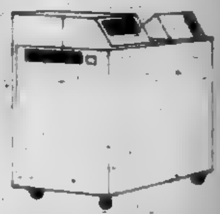

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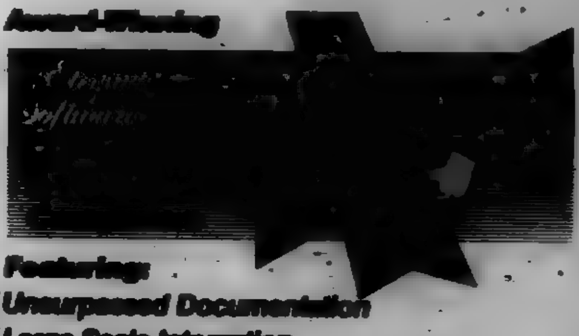

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-6250 BPI Capability
-Free Testing

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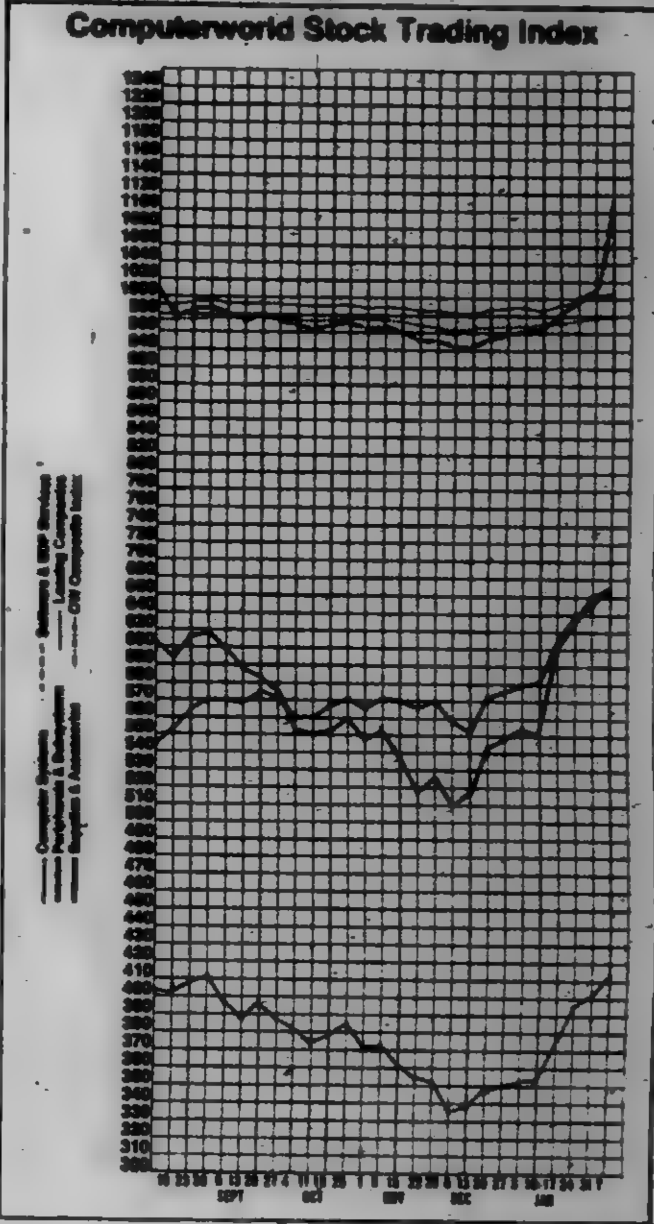
Computerworld Stock Trading Index



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 6, 1985

All statistics compiled
computed and formatted
by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

E X C H		1984-85 RANGE (1)	CLOSE FEB 6 1985	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	6- 20	7 3/8	+ 3/8	+5.3
N	ALTOS COMPUTER SYST	7- 20	11 3/4	+1 3/8	+13.2
A	AMDAHL CORP	10- 30	15 3/8	- 3/8	-2.3
O	APPLE COMPUTER INC	16- 33	30	+ 1/8	+0.4
N	AT&T	16- 22	21	+ 3/8	+1.8
N	BURROUGHS CORP	46- 64	63 3/8	[illegible]	+1.8
O	COMPAQ COMPUTER CP	6- 18	8 1/8	+ 1/8	+1.5
N	COMPUTER AUTOMATION	3- 17	6 7/8	+ 3/8	+10.0
O	COMPUTER CONSOLES	6- 28	11 7/8	- 1/8	-1.0
N	CONTROL DATA CORP	28- 62	37	+1 3/8	+3.8
O	CONVERGENT TECHNOL	9- 41	10 1/2	+1 1/4	+13.5
N	CRAY RESEARCH INC	38- 78	78 3/4	+3 1/4	+4.3
O	[illegible] SYSTEMS CORP	14- 38	38	+ 1/4	+0.7
N	DATA GENERAL CORP	37- 76	75 7/8	+4	+5.7
N	DATAPOINT CORP	14- 31	30 3/8	0	0.0
N	DIGITAL EQUIPMENT	84-125	122 1/8	+2	+1.8
O	ENTO INC	12- 18	15 3/8	+ 3/8	+0.2
N	ELECTRONIC ASSOC	3- 17	4	+ 1/4	+6.6
N	FLOATING POINT SYST	10- 44	30	+1 3/4	+6.4
N	FOXBORO	27- 47	36 1/8	-3 1/2	-11.2
O	GENERAL AUTOMATION	5- 12	8 7/8	+ 3/8	+4.7
N	GOULD INC	20- 44	28 3/4	- 3/8	-1.4
A	HARRIS CORP	22- 48	30	+1 3/8	+4.9
N	HEWLETT-PACKARD CO	31- 48	37 5/8	- 1/8	-0.6
N	HONEYWELL INC	46- 66	64 5/8	+1 7/8	+2.9
N	IBM	103-127	130 3/8	+1 1/8	+0.8
O	IPL SYSTEMS INC	1- 14	2 1/2	+ 1/8	+5.2
N	ITT CORP	21- 47	31 1/2	+1 1/8	+4.1
N	M/A-COM INC	13- 38	21 7/8	0	0.0
N	MANAGEMENT ASSIST	9- 25	21 1/8	+2 1/8	-11.0
N	MATSUSHITA ELEC(ADR)	33- 60	58 5/8	-3 1/8	-4.1
N	MODULAR COMPUTER SYS	6- 16	7 1/2	+ 3/8	-7.6
N	MOHAWK DATA SCI	8- 17	11 3/8	- 1/8	-1.6
N	MOTOROLA INC	29- 48	37 1/8	+ 7/8	-2.3
N	NAT'L SEMICONDUCTOR	11- 20	13 1/4	- 1/4	-1.8
N	NBI INC	10- 35	16 3/4	+ 7/8	+5.5
N	NCR	21- 30	29 3/8	+ 1/8	-0.4
N	PERKIN-ELMER	18- 37	27 3/8	-2 3/8	-7.8
N	PRIME COMPUTER INC	14- 28	17 1/2	-2 1/4	-11.3
N	SPERRY CORP	39- 50	48 1/4	+ 1/8	+0.3
O	STRATUS COMPUTER INC	8- 17	13 1/8	+1 3/8	+12.7
O	TANDEM COMPUTERS INC	16- 40	26	+2 1/8	+8.0
N	TANDY CORP	24- 62	31 1/8	+2 7/8	+10.1
O	TELEVIDEO SYSTEMS	3- 41	3 1/2	- 1/8	-3.4
N	TELEX CORP	8- 26	18 1/2	+1	+5.4
N	TEXAS INSTRUMENTS	101-160	130 7/8	-2 1/8	-1.6
O	ULTIMATE CORP	10- 26	11 1/8	+1 1/8	+11.2
O	VECTOR GRAPHICS INC	0- 6	5/8	- 1/8	-20.0
A	WANG LABS "B"	23- 42	28 1/8	- 3/8	-1.3
A	WANG LABS "C"	23- 42	28 5/8	+ 3/8	+1.3
N	XEROX CORP	35- 52	44 1/8	+2 1/8	+5.0
	LEADING COMPANIES				
O	BOOTHE FINANCIAL CP	10- 22	21 3/8	- 1/8	-0.5
N	CDC CORP	6- 10	8 1/8	+ 3/8	+5.0
N	COMDISCO INC	9- 42	18	+1 3/8	+8.4
N	CONTINENTAL INFO SYS	3- 10	5 3/8	+ 3/4	+16.0
N	DPF INC	10- 17	13 1/8	+ 5/8	+5.0
A	FINALCO GROUP INC	6- 12	4 3/8	- 1/8	-2.8
O	PHOENIX AMERICAN INC	3- 17	5 7/8	0	0.0
O	SELECTERM INC	8- 21	11 1/2	+ 3/8	+3.3
N	U.S. LEASING	25- 40	41 7/8	+3	+8.0
	SEMICONDUCTORS				
N	ADVANCED MICRO DEV	22- 41	24 3/4	-1 1/8	-4.1
O	ADV'D SEMICONDUCTOR	10- 30	22	+2 3/4	+14.2
N	ANALOG DEVICES INC	20- 32	27 1/8	1 3/8	+1.4
O	ANALOGIC CORP	16- 31	[illegible]	[illegible]	[illegible]
O	APPLIED MAGNETICS CP	8- 37	[illegible]	[illegible]	[illegible]
O	HARRY CORP	9- 12	9	[illegible]	[illegible]
N	MICRO MASK INC	10- 18	10 3/8	- 1/2	[illegible]
N	TERADYNE	22- 39	28	[illegible]	[illegible]

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E X C H		1984-85 RANGE (1)	CLOSE FEB 6 1985	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	2- 6	3	0	0.0
O	ADVANCED SYSTEMS INC	6- 22	13 3/8	- 7/8	-6.0
O	AGS COMPUTERS INC	10- 22	15 7/8	- 1/8	-0.7
O	AMERICAN SOFTWARE	12- 31	18 7/8	+1 3/8	+7.9
N	AMERCOMP INC	2- 10	3 1/4	- 1/8	-3.7
O	ANALYSTS INTL CORP	9- 17	8 1/2	+1 1/4	+17.2
A	APPLIED DATA RES	10- 20	20	+4 1/8	+12.1
O	ASHTON-TATE	8- 18	8 1/2	+1 1/8	+15.1
O	ASK COMPUTER SYSTEMS	13- 30	23 1/2	+ 3/8	+3.2
O	ASTROSYSTEMS CORP INC	1- 7	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	30- 45	45 1/8	+ 1/2	+1.1
O	COMPUTER ASSOC INT'L	19- 28	22 3/4	- 1/4	-1.0
O	COMPUTER HORIZONS	6- 30	7 7/8	+ 1/2	+6.8
O	COMPUTER NETWORK	3- 11	6 7/8	+ 1/8	+2.0
N	COMPUTER SCIENCES	15- 25	18 7/8	+ 1/8	+0.7
O	COMPUTER TASK GROUP	12- 19	15	+ 3/8	+2.7
O	COMPUTER USAGE	1- 10	7/8	0	[illegible]
O	COMPUTONE SYSTEMS	6- 22	7 3/4	- 1/4	-3.3
O	COMSHARE CORP	1- 10	3 5/8	0	0.0
O	CULLINET	8- 16	8	+1 1/4	+18.1
N	CULLINET SOFTWARE	13- 30	30 1/8	+2 1/8	+9.5
O	CYCARE SYSTEMS INC	18- 30	22 3/4	0	0.0
O	DYNATECH SYSTEM INC	7- 27	7 1/4	+ 1/8	+1.7
N	GENERAL ELECTRIC CO	48- 66	63 1/4	- 5/8	-0.8
N	GTE CORP	284 46	41 7/8	-1	-2.3
O	INFORMATICS GENERAL	10- 27	18 1/2	- 1/8	-0.6
O	INFORMATION SCIENCE	6- 17	4 1/2	+ 1/4	+5.8
O	INTELLIGENT SYSTEMS CP	10- 40	19	-1 1/2	-7.3
O	KEANE ASSOCIATES	6- 15	12	- 1/8	-1.0
A	LOGICON	20- 31	30 5/8	- 1/8	-0.4
O	LOTUS DEVELOPMENT CP	15- 40	30 3/4	- 3/4	-2.3
O	MCI COMMUNICATIONS	6- 20	10 1/2	+ 3/8	+4.2
O	MGMT SCI AMER INC	9- 32	15	-1 7/8	-12.0
O	MATHEMATICAL APP GRP	6- 16	8 1/8	+ 3/4	+13.8
O	MICRO SYSTEMS INC	27- 40	20	- 1/8	-0.7
O	MICROPRO INT'L CP	2- 10	3 1/8	+ 3/8	+13.6
O	NATIONAL DATA CORP	8- 30	11 1/2	+ 3/4	+6.9
O	ON-LINE SOFTWARE INT	6- 28	6 3/4	+ 3/4	+12.5
O	PANSOPHIC SYSTEMS	11- 30	20 1/2	+1 7/8	+10.0
O	PLANNING RESEARCH	10- 21	10 1/4	+ 1/4	+1.8
O	POLICY MGMT SYSTS CP	22- 38	32	- 1/2	-1.5
O	PROGRAMMING & SYS	4- 9	5 1/8	- 3/8	-6.0
O	REYNOLDS & REYNOLDS	20- 33	40 1/4	+2	+0.3
O	SCI CORP	11- 24	17 1/8	+1 1/8	+7.0
O	SHARED MEDICAL SYST	23- 43	30 7/8	+ 3/8	+1.2
O	SCIENTIFIC COMPUTERS	3- 14	6 3/8	- 1/8	-1.8
O	SOFTWARE AG	9- 21	20 1/2	- 7/8	-4.0
A	UCC CORP	10- 18	13 1/4	+ 3/8	+2.8
N	UCCEL	7- 17	15	+ 1/4	+1.6
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	3- 7	4 3/8	+ 3/8	+20.3
A	ANDERSEN JACOBSON	3- 20	4 1/2	+ 3/4	+20.0
O	AUTO-TROL TECHNOLOGY	8- 20	10 3/4	+ 1/4	+2.3
O	AVANT-GARDE COMPUTING	11- 30	10 1/2	+1 1/2	+6.0
O	BARRETTE INC	5- 22	7 1/2	+ 1/8	+3.4
A	BEEHIVE INT'L	0- 7	3/8	0	0.0
O	BOLT BERANEK & NEW	17- 30	25 1/2	+ 1/8	+0.5
O	CAMBEX CORP	1- 3	2	+ 1/4	+11.1
O	CENTRONICS DATA COMP	6- 20	8 3/8	+ 1/8	+1.3
A	CETEC CORP	7- 12	8 3/4	+ 3/8	+4.5
O	COMPUTRONICS	6- 20	6 1/8	+ 5/8	+11.3

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O	COMPUGRAPHIC CORP	20- 40	20	+2 1/2	+11.4
O	COMPUTER TRANSCEIVER	1- 10	7/8	- 1/8	-12.5
O	COMPUTERVISION CORP	30- 50	42 7/8	+ 3/8	+1.0
N	CONRAC CORP	12- 28	24	- 3/8	-0.8
O	DATAPRODUCTS CORP	14- 28	19	+ 7/8	+4.8
O	DATARAM CORP	4- 12	5 1/2	- 1/4	-4.7
O	DATA SWITCH CORP	5- 21	8 5/8	+ 1/8	+0.1
O	DATUM INC	5- 17	6 3/4	+ 1/8	+1.8
O	DECISION DATA COMPUT	8- 17	17 3/8	+2 1/8	+12.5
O	DECISION/OLIVETTI	0- 30	3 3/4	- 3/8	+14.2
A	ELECTRONIC M & M	8- 17	8 7/8	- 1/8	-2.0
O	EMULEX INC	8- 16	6	- 1/2	-7.6
O	EVANS & SUTHERLAND	31- 60	13 1/8	- 3/8	-2.4
O	GENERAL TECHNOLOGIES	8- 14	11 3/8	- 5/8	-6.2
O	GENL DATA COMM IND	10- 30	10 3/8	+ 7/8	+4.7
O	HOGAN SYSTEMS CORP	18- 31	27 3/8	- 1/2	-1.7
O	IDDT CORP	3- 8	3 3/4	+ 1/2	+5.5
O	INFORMATION DATA INC	10- 18	13 1/2	0	0.0
O	INTERMEC INC	7- 21	8 1/2	-1 1/8	-11.3
O	INTEL CORP	27- 40	28 3/8	- 1/2	-1.3
O	LANDY ELECTRONICS	7- 12	11 3/8	- 1/4	-2.8
O	MEMOREX CORP	3- 8	6 3/8	+ 5/8	+10.2
O	MDS DATA CORP	8- 20	11 3/4	+2 1/4	+11.8
O	MICROS CORP	15- 38	20 1/4	+ 1/8	+0.4
O	NETWORK SYSTEMS CORP	18- 30	20 3/8	+ 3/8	+1.3
O	NO AMERICAN PHILIPS	30- 44	42 3/4	+2 1/8	+5.6
O	NORTHERN TELECOM LTD	30- 40	40 1/8	+ 1/4	+0.6
O	ONEX	[illegible]	1/8	0	0.0
O	PARADYNE CORP	11- 28	10 3/4	-1	-8.5
O	PENRIL CORP	8- 14	12 1/2	+ 7/8	+8.3
O	PLESSEY CO LIMITED	30- 41	16 1/2	+1 1/8	-7.1
O	PRINTRONIX INC	13- 26	16 3/8	+ 3/4	+4.7
O	QANTEL CORP	6- 22	3 1/4	- 1/2	+10.3
O	RECOGNITION EQUIP	10- 17	18 3/8	+1 1/8	+6.0
O	SANDERS ASSOCIATES	30-120	30 5/8	-1 1/2	-5.3
O	SCAN-TRON CORP	9- 18	13 1/2	- 1/8	-0.8
O	SCIENTIFIC ATLANTA	6- 23	12 7/8	- 3/8	-3.0
O	SEAGATE TECHNOLOGY	6- 26	7 3/8	- 1/8	-1.8
O	STORAGE TECHNOLOGY	2- 20	2 5/8	+ 1/8	+5.3
O	SYKES DATATRONICS	1- 13	1 3/8	+ 3/8	+25.0
O	SYSTEMS & COMP TECH	11- 28	13	0	0.0
O	T BAR INC	7- 17	8 3/8	- 1/8	-1.4
O	TAB PRODUCTS CO	12- 20	17 1/2	+1 1/2	+8.0
O	TANDON CORP	6- 20	7	+ 1/8	-7.8
O	TEC INC.	6- 13	10 3/4	+ 3/8	+7.3
A	TEKTRONIX INC	50- 82	60 1/4	+ 3/8	+4.1
O	TRW	10- 48	48 1/4	+3	+6.8
O	TELEVIDEO SYSTEMS CP	2- 17	2 1/8	+ 1/8	+26.7
A	TIMEPLEX INC	13- 28	21 1/4	- 3/8	-4.7
O	VERBATIM TECHNOLOGY	7- 20	2	- 1/8	-11.1
	SUPPLIES & ACCESSORIES				
O	AMERICAN BUS FORMS	17- 22	23	+ 3/8	+1.8
O	BARRY WRIGHT	21- 28	27	-1 1/4	-4.4
A	DUPLEX PRODUCTS INC	23- 28	28 1/8	+ 3/8	+1.3
O	ENNIS BUS. FORMS	18- 28	30 7/8	+2 3/8	+7.9
O	3M COMPANY	80- 90	82 3/4	- 1/2	-0.3
O	MOORE CORP LTD	28- 33	30 3/4	0	0.0
O	STANDARD REGISTER	37- 50	34 1/2	+2 1/8	+11.2
O	WALLACE COMP SERVICES	28- 38	29 1/8	+2 1/8	+8.2

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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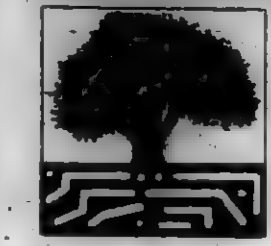

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Large companies do accounting on micros
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Sierra arrives, leads IBM blitz

Users: New life for VM

. . . but VM tools draw mixed reviews from observers

By John Gallant
CW Staff

Amid the broad expanse of IBM's major software announcements last week, there was one focal point — the VM operating system. But while users and industry observers agreed that IBM's software maneuvers clearly indicate a new commitment to VM as a strategic product, they had mixed feelings about the importance of the blue giant's VM-related moves.

Rex Widmer, technical specialist in applications development support for Trans World Airlines, Inc., said IBM's VM offerings were overdue. "IBM was relieving a whole backlog of VM needs last week," said Widmer, who coordinates the efforts of some 100 applications programmers on three IBM mainframes under MVS/SP at TWA's data center in Kansas City, Mo.

"IBM was criticized by users for not having 31-bit [Extended Architecture] support in VM," Widmer continued. "Thus, we have been expecting VM/XA for some time now. Also, some of the recent VM-related software announcements have been awfully pricey for small users. That is why the VM/Entry product is important. It provides full IBM CMS support without all the expensive bells and whistles for the smaller users."

But Widmer expressed doubts about the roles VM itself and the AT&T Unix System V implementation running under VM — IX/370 — will play in the realm of mainstream corporate infor-

See VM page 11

Software steals 3090's thunder

VM gets XA version; Unix fully supported

By John Gallant
CW Staff

RYE BROOK, N.Y. — An unheralded flood of major software announcements from IBM last week stole much of the limelight from the company's top-of-the-line 3090 processors.

In a series of close-knit software announcements seemingly aimed at quashing debate over its commitment to the increasingly popular VM operating system, IBM introduced an Extended Architecture version of VM, a fully supported implementation of AT&T's Unix System V running as a guest under VM and an entry-level VM version for IBM 4300 sites.

In addition to its VM operating system moves, IBM also announced the following (see story page 9):

- Extended Recovery Facility, an MVS/XA, Systems Network Architecture and IMS enhancement designed to improve the availability of IMS transaction-processing applications to users during system disruptions.
- The VS Fortran Program Multitasking Facility, which allows a single IBM VS Fortran application under MVS to use the parallel processing capabilities of systems with multiple central processors, such as dyadic or four-way computers.
- Enhancements to MVS/XA that support both XRF and versions of IBM's JES2 and JES3, which were also unveiled last week.
- A release of the IMS/VS data base management system that supports XRF and provides increased applications data availability and improved

See LIMELIGHT page 8

Two 3090s out

Model 200 coming soon, more powerful Model 400 delayed until early 1987

By Tom Henkel
CW Staff

RYE BROOK, N.Y. — IBM last week announced the long-awaited Sierra series, its most powerful mainframes to date.

The company ended months of speculation about how it would supersede its top-end 3080 series by unveiling the first two members of the 3090 line of processors.

The 3090 Model 200 is a dyadic processor complex said to offer roughly the same performance as IBM's four-processor 3084 complex but occupy about 50% of the floor space. The four-processor Model 400 complex, which will not be available until 1987, is said to offer roughly twice the performance of the 3084 while increasing floor space requirements by about 15%.

The 3090 models incorporate emitter-coupled logic circuit technology, which replaces the transistor-transistor logic circuits used in earlier 3080 series mainframes. The units are also the first IBM mainframes to use 288K-bit memory chips, the highest density memory chips IBM manufactures.

The change in circuit technology precludes the 3080 models from being field upgradable to currently installed 3090 series mainframes. IBM did, however, maintain its current I/O data transfer rate of 3M byte/sec on the 3090 processors.

Other highlights of last week's hardware announcement include the following:

- An average 5% cut in the purchase price of most 3080 series processor configurations. IBM also lowered the monthly minimum maintenance prices on 3080 series processors by 10.2% to 12.5% and cut the model upgrade price for additional processor main storage by $30,000 (see story page 4).
- An addition to IBM's 3800 line of laser printers called the 3820. At $28,350, the 3820 is a cut-sheet, duplex, all-points-addressable unit that reportedly can print up to 20 page/min for single-sided copies and has a double-sided copying speed of up to 10 page/min (see story page 4).

See SIERRA page 4

Packaged software outlays rise 10% in 1984

Datapro poll foresees spending drop ahead

By John Gallant
CW Staff

DELRAN, N.J. — Users spent more for packaged software in 1984 than in the previous year, based on the findings of Datapro Research Corp.'s annual "User Ratings of Proprietary Software" survey. It seems that, for the most part, they were satisfied with the software packages they purchased.

Datapro's 1984 survey, the company's 12th such poll of user satisfaction with off-the-shelf software, showed that total expenditures for software packages increased substantially between 1983 and last year. Outlays in 1984 were nearly 10% higher than in the previous year, an increase that translates into an average dollar expenditure for packaged software of more than $76,000 per user site, compared with about $71,000 in 1983.

Datapro charts appear on pp.18-25

That trend, Datapro predicted, will be reversed this year. Total spending on software packages in 1985 is expected to be roughly 3% lower than in 1984 as a result of two major factors, the research firm said.

The first of those factors is the "increasing amount of processing being assumed by microcomputers and the substantially lower" cost of microcomputer software, according to the research firm survey.

"Second, we [Datapro] believe that requirements for much micro software are not anticipated far in advance

See DATAPRO page 17

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NEWSPAPER

Northern Telecom releases processor, enhances PBX

By John Dix
CW Staff

LAGUNA BEACH, Calif. — Northern Telecom, Inc. last week introduced an integrated voice/data processor for use in branch offices or departments within large organizations, the heart of which is also found in a concurrently announced enhancement for the company's private branch exchange (PBX) product line.

The announcements share the same product family name of Meridian and include the Meridian DV-1 voice/data processor, the Meridian SL-1 and SL-100 PBX enhancements and the introduction of Meridian terminals, including digital telephones and an integrated terminal/telephone.

The DV-1 is a "data processing product into which voice call processing and voice connectivity has been integrated," according to Roger Bushnell, director of marketing and product line management. Based on dual 20M bit/sec buses, the DV-1 can support from five to 35 concurrent terminal or personal computer users and up to 100 telephones.

The primary processor in the DV-1 is a Motorola, Inc. 68010 that supports Northern Telecom's XMS operating system. Various configurations can be achieved by adding devices called shared resource units to the dual bus structure, including additional processors, storage, line cards and other units designed to drive high-speed communications links with desktop devices.

One of the 20M bit/sec buses handles asynchronous packetized data transport, while the other is a synchronous circuit-switched bus for voice communications. The bus structure is common to both the DV-1 and the processor used to enhance the company's PBXs. Also used in both products is the shared resource unit, which supports the Meridian terminals and other devices at 2.56M bit/sec.

Called the Lanlink in the DV-1, this shared resource unit can drive 12 dual twisted-pair links at 2.56M bit/sec at distances of up to 2,000 feet. Using a Lanlink interface unit at the desktop, that capacity can be divided to provide two RS-232 19.2K bit/sec asynchronous interfaces and a Centronics Data Communications Corp. parallel port.

This link's 2.56M bit/sec bandwidth can be used to ship different device personalities to the Meridian M4020 terminal when the system is initialized. These terminals emulate Digital Equipment Corp. VT100 terminals or, through the processor, IBM 3270-type displays. Protocols supported include 3270 bisynchronous, Systems Network Architecture/Synchronous Data Link Control and asynchronous communications. When connected to an IBM environment, the DV-1 appears as a 3274 terminal controller.

Applications processor for DV-1

Another shared resource unit available for the DV-1 is an applications processor that contains another Motorola 68010 and supports either Northern Telecom's XMS or an AT&T Unix-based operating system. Northern Telecom said it intends to provide another processor, based on Intel Corp.'s 80286, that will support Concurrent DOS, an operating system from Digital Research, Inc. that includes MS-DOS and CP/M 86.

The initial applications supported on the DV-1 include a Unix-based bundle of packages called the Q-Office. It enables DV-1 terminal or personal computer users to access word processor, calendar, spreadsheet and message applications.

Northern Telecom's SL-1 and SL-100 PBXs were enhanced to Meridian status with the addition of a processor similar in architecture to the DV-1. But, according to Fred Glave, vice-president of office communications systems, the Meridian SL processor uses a different operating system and associated software as well as different applications processors than the DV-1.

Information services provided with Meridian SL PBXs that Meridian terminals and appropriately outfitted personal computers can access include the following:

- **Directory.** Users can maintain personal telephone number directories and access corporate listings.
- **Messaging.** Voice, text or combined messages can be processed together.
- **Forms.** Boilerplate forms can be created and stored to be accessed and completed when needed.
- **Access.** Speed, code and protocol conversions are performed, enabling Ascii devices to emulate DEC VT100s or IBM 3270 terminals.
- **Share.** Users can interact using their terminals to update or alter information.
- **Computing.** Applications are supported under Microsoft Corp.'s Xenix operating system.

Terminals announced for use with the Meridian products include the $1,395 M4020, a telephone/terminal that supports windowing and has a 12-in. bit-mapped display and 128K bytes of random-access memory, expandable to 1.5M bytes; the $695 M3000 Touchphone, a digital phone with a touch-sensitive LCD that replaces the keypad and supports an RS-232 data option board; and two digital telephones, the M2112 and M2018, that cost from $325 to $350 each. The M4020 will be available in the second quarter of this year, and the others will be available in the fourth quarter.

A small DV-1 system supporting eight data users and 18 voice users costs $47,100, the company reported. A DV-1 supporting 20 data users and 40 voice users costs $93,165. It will be available in the second quarter.

Glave said that a Meridian upgrade for the SL PBXs supporting 300 users costs between $400,000 and $600,000.

Northern Telecom is located at 259 Cumberland Blvd., Nashville, Tenn. 37228.

AT&T to cut Net 1000?

By John Dix
CW Staff

In what may be yet another telltale sign of the health of AT&T's Net 1000 programmable networking service, AT&T admitted last week that, in an effort to cut costs, it is considering consolidating the service, eliminating some network nodes.

AT&T currently operates six Net 1000 processing sites, including centers in New York, Chicago, Los Angeles; Salt Lake City, Camden, N.J., and Somerset, N.J. Each AT&T processing site contains two nodes, each comprising a Digital Equipment Corp. VAX-11/780 with four IBM Series/1 minicomputers configured as front-end communications processors. Each node is said to have a redundant standby VAX-11/780.

Although AT&T would neither confirm nor deny it, an unidentified source said that AT&T plans to close the Salt Lake City, Camden and Somerset processing sites, leaving the New York, Chicago and Los Angeles sites open.

An AT&T spokesman said that even if the company decided to combine the processing hardware from a few nodes at one location, the capacity of the network would not be changed.

Ford Motor Co. said it decided not to use Net 1000 after beta testing the service for six months. Ford said the service was not ubiquitious and that it did not have enough nodes [CW, Oct. 8].

Tell us your scoop

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If so, we'd like to hear from you. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

CORRECTION

The article "AT&T sets pace for mux vendors with T1 service" [CW, Feb. 11] should have said that AT&T has proposed a 30% price cut for its portion of the Dataphone Digital Service, rather than a 30% increase.

NEWS SUMMARY

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IBM unveils laser printer

Display stations added, 3850 put on hold

By Donna Raimondi
CW Staff

RYE BROOK, N.Y. — In conjunction with the debut of Sierra, IBM has unveiled a 20 page/min laser printer addition to its 3800 family and two models of a display station. IBM may also have taken the first step in dropping a mass storage system.

The IBM 3820 printer features IBM's Advanced Function Printing Software Support under MVS/370 and MVS/XA operating systems with either JES2 or JES3 and under VSE with VSE/Power. The 3820 is host-attached via IBM's Systems Network Architecture/Synchronous Data Link Control communications facilities and can be attached to IBM Personal Computers connected to the IBM Personal Computer Network or the Corvus Systems, Inc. Omninet network.

The unit prints text, graphics and digitized images on one or both sides of cut-sheet paper. An entry-level version of the printer costs approximately $29,900.

Along with the announcement of the IBM 3090 processors, the company released two models of its 3180 Display Station. The IBM 3180 Display Station Models 140 and 145 can be used by operators for control and monitoring of system functions and by IBM customer engineers for maintenance and service support. The Model 145s are plant-merged and shipped with the 3090 Processor Complex. The Model 140s, which are the same in function, may be added to the system as an option. Both models cost $2,395 with a $300 annual maintenance charge.

IBM said last week that it does not intend to enhance its 3850 Mass Storage System beyond its current capabilities. Attachment of the 3850 to the newly announced 3090 Processor Complex Model 200 and Model 400 is supported, but the 3090 processor is the last type on which IBM will support 3850 attachment. The company recommended that, over time, customers move active data currently stored in the 3850 to the IBM 3380 disk drive.

More information on the introductions is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 95193.

IBM trims 3080 prices, cuts maintenance costs

By Tom Henkel
CW Staff

RYE BROOK, N.Y. — In addition to taking the wraps off its biggest mainframes yet — the two high-end 3090 mainframe models — IBM also announced cuts in the purchase price, model upgrade charges and monthly maintenance charges on the older 3080 line of processors.

Purchase prices of most 3080 series CPUs were cut a modest average of 5%, and monthly maintenance charges were reduced 10.2% to 12.5%.

IBM cut the purchase price of an 8M-byte memory upgrade for the 3080 series from $130,000 to $100,000, thereby reducing the cost per 1M byte of main memory from $16,250 to $12,500.

Processor price cuts

As examples of the processor purchase price cuts, IBM lowered the cost of a 3081 Model KX3 processor from $3.2 million to $3 million.

A 3083 Model JX3 configuration was reduced from $2.2 million to $2 million, and an entry-level 3084 Model QX3 was reduced from $5.5 million to $5.2 million.

However, the reduced price for a 3084 entry-level system is still roughly $210,000 more than the purchase price of the newly announced 3090 Model 200.

Upgrade prices reduced

Model memory upgrade prices were also reduced. An upgrade from a 3083 Model JX2 to a JX3 configuration was reduced $30,000 to $100,000. The cost of upgrading a 3081 Model KX3 processor to a 3084 Model QX6 was cut $190,000 to $2.5 million.

The monthly maintenance charge on the 3083 Model JX3 was cut from $4,175 to $3,695.

For the 3081 Model KX3, the monthly maintenance charge is now $3,365, down from $5,015, and maintenance on the 3084 Model QX3 was reduced from $8,340/mo to $7,090/mo, according to IBM.

IBM made the announcement through its Information Systems Group, located at 900 King St., Rye Brook, N.Y. 10573.

SIERRA

from page 1

- The 3180 Model 140 and 145 display stations that reportedly allow operators to control and monitor system functions on the 3090 processor complexes.
- IBM also announced that its 3850 mass storage subsystem will not be enhanced. IBM recommended that 3850 users move their active data stored on the 3850 to 3380 disk drives and use the 3850 for archival storage (see story above left).

The 3090 Model 200 processor complex consists of two CPUs with an 18.5-nsec cycle time, a 3092 processor controller Model 1 and a 3097 power and coolant distribution unit. Also required are two 3089 Power Unit Model 3s or a similar 400Hz power source.

> **"**
>
> ***[With the announcement], IBM ended months of speculation over how it would supersede its top-end 3080 series.***

In addition, the processor complex requires two IBM 3370 Model A2 disk drives to record system-level data, such as error data or diagnostic information, and to load microcode for engineering changes. One 3370 is used to record data; the other is required as a backup.

Other prerequisites include two IBM 3180 Model 145 display stations and an IBM 3864 Modem Model 2, equipped with an automatic calling unit.

IBM said the Model 200 offers between 1.7 and 1.9 times the internal throughput of the 3081 Model KX processor in a commercial job mix under IBM's MVS/XA operating system. The system is said to offer between 1.9 to 2.9 times the performance of a 3081 Model KX in an engineering/scientific job mix under MVS/XA, according to the company.

The Model 200 processor complex contains two central processors, 128K bytes of buffer storage and 64M bytes of main memory. Users can order the system with 32, 40 or 48 integrated channels.

Furthermore, users of the Model 200 can purchase up to 128M bytes of optional cache memory that is dedicated to reducing I/O paging from Dasd. This memory, which IBM is calling expanded storage, is available in 64M-byte increments.

Available in November 1985, an entry-level Model 200 costs $5 million. Optional expanded storage is available for $475,000 for the first 64M-byte increment and $355,000 for subsequent 64M-byte increments.

The Model 400 reportedly offers between 1.7 and 1.9 times the internal performance of the Model 200 and features 128M bytes of main memory. The unit features 256K bytes of buffer storage, expanded storage of up to 256M bytes and the ability to accommodate 64, 80 or 96 integrated channels.

Available only as a field upgrade to the 3090 Model 200, the Model 400 contains four CPUs, with the same 18.5-nsec cycle time used on the Model 200. The Model 400 processor complex requires one additional 3180 Model 145, which is used as a system console, enhancements to the existing 3092 processor controller, two additional 3089 power units and an additional 3097 power and coolant distribution unit. Additional 3370 disk drives for system-level storage are not required, IBM said.

The upgrade costs $4.3 million and will be available in the second quarter of 1987.

More information is available from IBM's Information Systems Division at 900 King St., Rye Brook, N.Y. 10573.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Relative Performance[1]	[illegible]	735	[illegible]	1,323	[illegible]
Mips[2]	[illegible]	16.3	[illegible]	29.3	[illegible]
Memory Size in Bytes (Minimum-Maximum)	[illegible]	16M-64M	[illegible]	64M	[illegible]
Purchase Price[3] (Memory Size)	[illegible]	$2,995,000 (16M)	[illegible]	$5,000,000 (64M)	[illegible]
Lease Price (Lease Term)	[illegible]	None	[illegible]	None	[illegible]
Machine Cycle Time (nsec)	[illegible]	24	[illegible]	18.5	[illegible]
Channels (Minimum-Maximum)	[illegible]	16-24	[illegible]	32-48	[illegible]
Cache (Buffer) Size[4]	64K	64K	[illegible]	128K	[illegible]
Bus Architecture?	[illegible]	No	[illegible]	No	[illegible]
Price (per 1M byte of main memory)	$12,500	$12,500	[illegible]	12,500	[illegible]

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For the processor only.
4. The 3081 processors employ dyadic, or two closely coupled, processors. The buffer size listed is per-processor.

CW CHART

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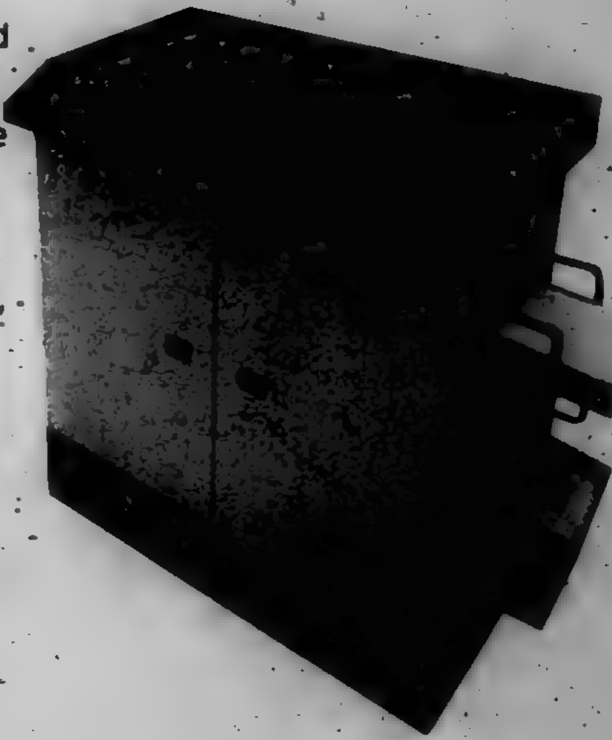

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Sierra debut draws positive but muted user response

By James Connolly
CW Staff

Large system DP managers expressed no shock and little surprise when contacted after IBM's Sierra announcement last week. Those executives did, however, temper their comments pending full evaluations and imminent sales presentations by IBM representatives.

Computer operations managers at various U.S. companies said they were pleased with what little they had heard about the IBM 3090 series. The basic complaints were about the two-year delay in delivery for the Model 400 processor and the 3M byte/sec transfer speed, a rate some observers thought would be faster.

The users voiced little concern about the impact that the announcement, which prohibits field upgrades from the IBM 3080 series to the 3090s, will have on the value of their installed equipment.

"We had a pretty good idea prior to the announcement that we would be very interested in the new product," said Lloyd Peterson, second vice-president for information operations at Bankers Life Co. in Des Moines, Iowa. "We have an [IBM] 3033 Model AP that we have been using as a test machine and looking to replace. We have an [IBM] 3084 Model Q that has been our production machine. So we probably will put in a first-day order for the 3090 as a production machine and move the 3084 over as a test machine." Peterson was one of several managers to add that IBM will have to increase the transfer rate to at least 4.5M byte/sec.

Jack Pfeiffer, vice-president for information services at McKesson Corp. in San Francisco, noted, "We have two [3081 Model Ks] now, and we plan to keep them. I'm sure we'll order the 3090s, but when we'll install them, I don't know."

Pfeiffer had no complaint with IBM for capping the 3080 line. "We think we are getting our money's worth out of the 3080 series just by using them. I see it in the same light as the guys who had [IBM] 370/168s when the 3033 came out. They lost some value, but they still used the 168s for several years and got the most out of them."

Noting that the 3081 market "might get a little soft" because the 3090 Model 200 "doubles the power for two-thirds the price," David Jackson, manager of computer operations at Florida National Banks in Jacksonville, Fla., said the 3090 was the next logical step for IBM. "But the 3083 market is fairly strong. If Sierra starts out at the [3084 Model Q] level, there are still plenty of people below that level who would want a [3083]," noted Jackson, who said there is still "plenty of room to grow" in the 3080 series for his company.

In Dallas, Zale Corp. computer center director James Arnette said he "would think about going to a second 3084, which is a good system and has plenty of growth potential, before going to the 3090."

Mike O'Toole, second vice-president for information processing at John Hancock Mutual Life Insurance Co., said, "We're pleased that it doesn't [make] any of our recent acquisitions [obsolete]. The fact that [the 3090] can coexist with the 3080 family makes us feel comfortable."

Analysts say 3090 intro a break for compatible makers

By Tom Henkel
CW Staff

Industry analysts said IBM's 3090 series announcements last week offered positive news for some IBM users, frustrating news for others and a rare opportunity for makers of IBM-compatible systems.

IBM's latest top-end mainframes apparently failed to fulfill the high expectations many industry watchers had for the processor line. Most industry watchers agreed the newly announced processors were overshadowed by the landslide of highly strategic software products that Big Blue unveiled (see related story page 1).

The long delivery time for the high-end Model 400 and the marginal price/performance improvement the 3090 Models 200 and 400 offer make last week's announcement a nontraditional one, noted Ken Harvey, president of CSP by Ken Harvey, a Toronto-based consulting firm.

Harvey explained that IBM traditionally improves the price/performance ratio each time it announces a new line of mainframes. Harvey said the 3090 does not do that. He noted that the 3090 Model 200 offers roughly the same price/performance ratio as the 3084 Model QX. The 3080 Models 200 and 400 require less floor space for the same internal performance as the 3084; this will prove very attractive to many users, Harvey added.

Harry Edelson, managing partner of Edelson Technology Partners in Saddle Brook, N.J., noted that IBM is in such a strong position in the high-end mainframe marketplace that it was not under any pressure to unveil dramatic price/performance improvements.

Two-year wait a mystery

Why IBM is waiting two years to make the 3090 Model 400 available to users seems to be a mystery. "What the world needs most is the Model 400," Harvey noted, adding that users of saturated 3084 processors will probably be frustrated by the 3090 announcement because it indicates they will have to wait until at least the second quarter of 1987 to get performance relief from IBM.

Jack Hart, a vice-president with International Data Corp., a market research firm in Framingham, Mass., said perhaps one reason why IBM is waiting until 1987 to make the Model 400 available is to allow software development to catch up with the technical abilities of the 3090 hardware.

Edelson theorised that parts shortages and glitches with the Model 400 may have caused the two-year delivery time on the Model 400.

Last week's announcement seems to represent good news for current users of 3080 series mainframes because the 3090 does not directly replace the 3080 line, as some industry watchers expected. Harvey noted that the resale value of 3080 series processors will probably remain stable and may even increase in the short term.

Donald Haback, vice-president of research at Smith Barney, Harris Upham & Co., noted that the reprieve for 3080 series users will not last forever. Since IBM appears able to deliver the dyadic 3090 Model 200 processor by November 1985, it appears certain that IBM could unveil a uniprocessor version of the 3090 line any time it wants.

But for now, Harvey said, IBM seems intent on making sure the 3080 line remains viable, especially in light of the company's expected flat first-quarter earnings.

Harvey noted that the modest average 6% purchase price cuts on 3080 series processors appear to be, at least in part, an effort to assure users that IBM is not holding one of its famous "fire sales," which typically signals the demise of a product line.

IBM prepping for flat quarter

ARMONK, N.Y. — IBM said last week that "it will be very difficult to show any growth in earnings" for the first quarter of its fiscal year 1985, compared with its first quarter a year ago. The company said the continued strength of the U.S. dollar overseas has maintained pressure on profits generated by overseas sales.

The announcement was made Feb. 11 in response to queries from analysts and the media after two brokerages reduced short-term earnings estimates and the price of IBM stock fell $3.75 on the New York Stock Exchange, closing at $133.50.

IBM spokeswoman Elise Schepeler noted that the company, in releasing its 1984 financial results last month [CW, Jan. 21], warned that "if the dollar continues at the present level, it will impact 1985 non-U.S. revenue growth as reported in dollars, particularly in the first six months."

Schepeler said that the continued strength of the dollar abroad has affected non-U.S. growth, but that the company continues to expect "solid year-to-year earnings growth" in 1985.

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LIMELIGHT

from page 1

data sharing capabilities.

- Two functionally enhanced releases of MVS/SP that provide support for the new 3090 processors in both IBM 370 and XA mode.

According to an IBM spokesman, the VM/XA Systems Facility is a strategic product that supersedes the VM/XA Migration Aid Release 2, which was also announced last week (see story page 10). It will allow VM users to take full advantage of the IBM 370 XA. VM/XA incorporates all Migration Aid functions and is said to offer significant performance benefits through exploitation of IBM's XA Start Interpretive Execution (SIE) assist. Introduced last week for 3080 and 3090 series processors, SIE was designed to provide improved performance for MVS/XA and MVS/SP running as guests under VM/XA.

VM/XA allows users to run multiple operating systems on a uniprocessor or a dyadic processor. It reportedly can support the full dyadic capabilities of the 4381 Model 3, 3081, 3090 Models 200 and 400 and the 3084. VM/XA incorporates a priority scheduler facility for guest operating systems that allows the user to allocate system resources among guests to tune VM/XA performance dynamically in order to support changing requirements.

VM/XA enables guest operating systems to issue reserve and release commands to Dasd devices so they may be concurrently shared among both virtual machines and other processors during operating system migration and production.

VM/XA is scheduled for shipment in November. It will have an initial license fee of $10,500 and a monthly fee of $3,500.

The IBM Interactive Executive for the IBM 370 (IX/370) is Big Blue's implementation of Unix System V running as a guest under VM/SP Release 3.0 and above. Reportedly, IX/370 provides Unix applications execution, program development and text processing environments for VM users. Although based on System V, the first fully supported large-system Unix product from IBM contains several IBM-specific enhancements, which include the following:

- Virtual memory support that provides a virtual address space of 8M bytes to each Unix application or process regardless of real processor size.
- Multiple IX/370 system support, which allows several IX/370 systems to reside together on the same processor either by running in several virtual machines or by running several images of IX/370 in a single virtual machine.
- A Connect command that facilitates concurrent work on two IBM IX systems, such as PC/IX — IBM's Personal Computer Unix offering — and IX/370, by allowing one system to act as a terminal and as an active system simultaneously.
- Enhancements to the Unix file system to provide data file block sizes of 4K bytes, extended file and logical record locking, an enhanced Print command to facilitate spool queue manipulation and a full screen editor with windowing.

The IX/370 system is capable of communicating with other Unix systems over asynchronous communications lines. It provides program development tools, including a C compiler and subroutine library, and it features the Source Code Control System, a collection of programs that manages changes to text files. IX/370 is scheduled for October shipment and reportedly will be priced according to the number of users on the system. A one-time license fee for up to 16 concurrent users is $10,000; 32 concurrent users, $20,000; and 64 concurrent users, $40,000.

The IBM spokesman described VM/Entry as a preconfigured system that provides an interactive, entry-level VM/SP environment for selected configurations of the 4300 series. It includes the full IBM Conversational Monitor System (CMS) facilities of VM/SP but provides no support for guest operating systems. VM/Entry supports only CMS applications running on a uniprocessor.

VM/Entry is distributed in object code. Once installed, the operating system will support existing VM/SP CMS applications and other selected IBM software. The spokesman said VM/Entry is not intended as a production guest machine, but it may be run as a guest of VM/SP with support limited to eight concurrent CMS tasks. The operating system supports a maximum of 128 concurrent CMS users regardless of hardware capacity. VM/Entry was designed to run on IBM 4300 processors with at least 4M bytes of real storage. It is scheduled for general shipment in the fourth quarter and will be available for a one-time fee of $40,000 or for a monthly fee of $2,000.

IBM's Information Systems Group is located at 900 King St., Rye Brook, N.Y. 10573.

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Enhanced IMS, Fortran option among software debuts

By John Desmond
CW Staff

Accompanying the 3090 processor announcements last week, IBM unwrapped a raft of software, including a product that allows applications written in Fortran to use multiprocessor capabilities such as those the 3090 processors offer; an enhanced version of IMS, IBM's data base management system; and a facility aimed at providing more reliability to online users of IMS.

The Extended Recovery Facility (XRF) is an MVS/XA, IMS/VS and Systems Network Architecture (SNA) enhancement said to increase the availability of IMS transaction processing applications to users. XRF allows an alternate IMS system to take over during planned system maintenance or unplanned system failures so that, in many cases, online IMS users will be unaware of the disruption.

The XRF function is provided in enhancements to five software products. These products are as follows:

- The newly announced IMS/VS Version 2 Release 1.
- MVS/SP Version 2 Release 1.3 with Availability Enhancement.
- ACF/Vtam Version 3 for MVS/XA.
- ACF/Network Control Program Version 4.
- MVS/XA Data Facilities Product Version 2.

The XRF enhancement is included in the prices of the products, an IBM spokesman said.

According to the spokesman, IBM's IMS/VS Version 2 Release 1 runs under MVS/SP and MVS/XA. It offers all functions of IMS/VS Version 1, in addition to improved application program data availability, improvements to data sharing capabilities and virtual storage constraint relief for IBM Fast Path users. IMS/VS 2.1 is scheduled for release in the first quarter of 1986, and XRF support is planned for release in the third quarter of 1986. The basic monthly charge for IMS/VS 2.1 will be $3,900.

Scientific, engineering routines

For scientific and engineering users, IBM announced the VS Fortran Program Multitasking Facility, a set of routines that permits a single VS Fortran application program to use all the processors of a multiprocessor system simultaneously. VS Fortran applications running under MVS can exploit the parallel processing abilities of dyadic or four-way CPUs.

VS Fortran Compiler and Library together have an initial fee of $699 and a monthly charge of $233. For the library only, the initial fee is $207, and the monthly charge is $69. Other software announcements by IBM include system control programs that provide support for the newly announced 3090 — or so-called Sierra — processors, the IBM 3480 cartridge tape drive, and the recently announced 3380 disk drive models. Specific announcements include the following:

- New releases of MVS/XA for 3080 and 3090 series models to better utilize virtual storage and to improve software reliability, availability and serviceability. MVS/SP Version 2 Release 1.3, providing support for the 3090 processors in 370 or XA mode, support for expanded storage on the 3090 processors and reliability, availability and serviceability enhancements.

MVS/SP 2.1.3 Availability Enhancement provides support during an XRF takeover through a base control program component called the Availability Manager. The Availability Manager maintains the identity of the active and alternate subsystems and communicates with operations personnel.

MVS/SP 2.1.3 has a basic initial license fee ranging between $12,000 and $13,500 and a monthly charge between $4,000 and $4,500. The Availability Enhancement is provided for no extra charge. MVS/SP Version 1 Release 3.5 is an enhancement of MVS/SP 1.3.4 that provides support for the IBM 3090 processor in MVS/SP mode (but not for the 3090's expanded storage) and stand-alone dump support for the IBM 3480 Magnetic Tape Subsystem in full-function mode. Monthly licensed program support charges for MVS/SP 1.3.5 range from $225 to $484.

- MVS/SP-JES2 Version 1 Release 3.6 provides enhanced functions, and Version 2 Release 1.5 provides virtual storage constraint relief in the MVS/XA environment. Other features include spool restructure and constraint removal, improved spool off-load facility and reduced planned outages through initialization parameters that can be modified by operators.

The JES2 component within MVS/SP-JES2 Version 2 Release 1.5 is said to provide virtual storage constraint relief by using the 31-bit addressing and extended private virtual storage capabilities of MVS/XA. The following major data areas have been moved above the 16M-byte line: the checkpoint area, the processor control elements and the device control tables.

The basic monthly charge for MVS/SP-JES2 1.3.6 is $2,031. The initial license fee for MVS/SP-JES2 2.1.5 is $12,000, and the basic monthly charge is $4,000, IBM said.

See DEBUTS page 10

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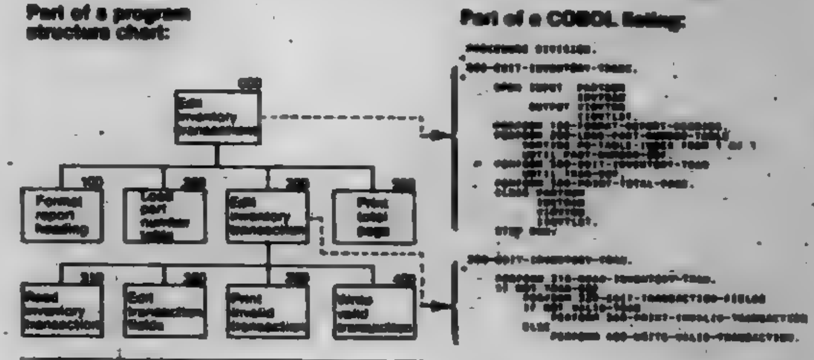

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NEWS

IBM software seen protecting system investments

By John Desmond
CW Staff

Industry analysts described the IBM software announcements last week as evolutionary because they protect user investments in hardware and software, answer demands for Unix portability and guide users into the MVS/XA operating system.

Michael Geran, vice-president of research for E. F. Hutton Group, Inc. of New York, said, "It's clear that IBM, given its capability as a marketing organization, recognized the need to offer, in addition to its proprietary operating systems, Unix capabilities for those people who want it and . . . to offer it on a large-scale system."

Geran found intriguing the fact that the Unix implementation runs under VM. "VM started out as a nonstarter in the IBM world, but over time [and] based on user requirements, its popularity has grown, and IBM has acceded that popularity by continuing to improve it."

As a result, IBM is offering more options than ever to VM users, he said.

In Geran's view, the various IBM operating system announcements are designed to do three things: "One, protect the user investment in the old machines; two, expand the functionality of the new machines; and three, induce people over time to cut over to MVS/XA."

Memory consumed viewed as significant

Geran said IBM did not indicate how much main memory overhead is consumed by the new software versions and enhancements, but he suspects the overhead is significant.

However, analyst Romney White pointed to the Start Interpretive Execution (SIE) Assist as a way of lowering overhead for 3080 series users running operating system guests under VM/XA. White is president of the Adesse Corp. based in Ridgefield, Conn., a VM systems software and services firm.

IBM's IX/370 implementation of AT&T's Unix System V has Unix fans happy. Stanley Shein of Management Techniques, Inc., a Boston-based turnkey systems house, said, "It's really super that IBM has decided to embrace Unix."

He said that running Unix under VM is what Amdahl Corp. has been doing with its VM-like operating system. "But the fact that IBM does it makes it news and legitimizes it for the IBM user community, scores of whom refuse to buy Amdahl," Shein said.

In Shein's view, the IX/370 is the most important IBM announcement because it will affect the greatest number of users. But White said that most important was the absence of any announcement of a CMS/XA product. "What people need is a CMS that runs in virtual mode under VM/XA," he said. The VM/XA products announced have no interactive capability, he said.

Characterizing the overall impact of the announcements, White said, "IBM defines the rules, leaves the holes and we fill them. I don't think you can say there is any one direction. IBM is a lot of different companies."

On the IX/370 announcement, White said that the inventors of Unix saw one of its strengths as source code, but that the IBM version is object code only. "It's difficult to tell where it fits," he said. White referred to the MVS/XA enhancements as a continuing effort by IBM to push users toward that operating system.

DEBUTS from page 9

■ MVS/SP JES3 Version 2 Release 1.5 provides enhanced virtual storage constraint relief through MVS/XA exploitation, expanded trace facilities, greater flexibility in initialization statement definition, improved ability to use in job networking and two additional JES3 user exits. The monthly charge for MVS/SP JES3 2.1.5 is $1,250.

■ VM/XA Migration Aid Release 2, which allows guest operating systems to share concurrently Dasd devices among virtual machines and other processors. It also provides dedicated-only support for 3370 Dasd attached to 4381 and 3080 series processors running in XA mode. VM/XA Migration Aid has an initial license fee of $10,500 and a basic monthly charge of $3,500. Release 2 is scheduled to be available in the second quarter.

■ VM/SP High Performance Option (HPO) Releases 3.6 and 4.2, which support the IBM 3090 Model 200 in 370 architecture. Both releases also support the 3090 Model 200's expanded storage and up to 48 channels. The 3090 Model 200 and VM/SP HPO are said to form a growth system from the 30 series and 3080 series CPUs.

VM/SP HPO Release 3.6 contains all the functions now available in Release 3.4, and VM/SP HPO Release 4.2 contains all the functions of Releases 3.6 and 4.0. Release 3.6 is scheduled for shipment in November, and Release 4.2 is scheduled for general release in the first quarter of 1986. The initial license charge for VM/SP HPO Releases 3.6 and 4.2 is $4,980, and the monthly charge is $1,660.

IBM also announced that VM/SP HPO will support the IBM 3880 Model 13 and 23 controllers by a programming enhancement to VM/SP HPO Release 4.0. The support enhances the control program functions, allowing the installation to specify the minidisk that may use the cache, causing I/O requests to other minidisks on the subsystem to bypass the cache.

More information on the software offerings is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

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VM from page 1

mation processing. "As far as I can tell, VM is nice for end-user computing. It is applicable to certain types of development tasks, but I think it is greatly lacking for commercial applications development."

'Unix is a cult thing'

"It seems clear that IX/370 is IBM's competitive response to [Amdahl Corp.'s] large-systems Unix strategy," Widmer said. "But I think Unix is a cult thing. I am not sure what it is that is so wonderful about Unix.

"IBM's Unix implementation may be an effort to address the university and scientific/engineering markets, but I do not see it as being very important for the commercial world," Widmer said."

Lee Steinbrenner, senior software engineer for ITT Courier Terminal Systems, Inc. in Phoenix, also felt that IBM's VM Unix announcement was a response to Amdahl's recent Unix moves. ITT Courier runs Amdahl's Universal Timesharing System (UTS) implementation of Unix under VM/SP on a National Advanced Systems Corp. AS/9050 mainframe.

"I have a general interest in the IBM announcement of Unix support," Steinbrenner said. "But I think IBM was simply responding to the support given to Unix System V by Amdahl at Uniforum [International Conference of Unix Users] last month. It seems clear that IBM is a little behind the times when it comes to Unix. In addition, IBM has given no indication that it intends to have its Unix implementation certified as [conforming to] System V by AT&T."

But Bruce Hunter, Unix system administrator for Interstate Electronics Corp. in Anaheim, Calif., said IBM's IX/370 announcement was an important endorsement of Unix. Hunter's firm also uses Amdahl's UTS under VM/SP on an Amdahl 470V/7 mainframe.

'Seal of legitimacy on Unix'

"This [IX/370] is what we have been waiting for. Until now, IBM has not put its backing firmly behind Unix. For IBM to support a large systems version of Unix puts a seal of legitimacy on Unix," according to Hunter. "Since we were already heavily into UTS, we have had a VM Unix for quite some time. But it is exciting to me, as an individual involved with Unix, to see IBM take this step."

While VM/XA may not have come as a surprise to industry watchers, its announcement was still seen as an important strategic move by IBM — a response to the needs of the growing population of VM users. According to Philip Dorn, president of New York-based Dorn Computer Consultants, Inc., VM users were out in the cold until last week.

"It is about time IBM announced VM/XA," Dorn said. "VM has been something of a stepchild for several years because it did not have XA support. VM started as something of a bootleg operating system, an interim thing, but its ease of use and its reliability made it a favorite of users. I think these announcements indicate IBM's commitment to really support VM, whether that commitment has been stated or just implied."

Computerworld *staff writer Maura McEnaney aided in the research for this story.*

IBM fiber-optic unit allows 2-km links

By John Dix
CW Staff

RYE BROOK, N.Y. — Buried in its avalanche of concurrently announced processor and software products, IBM last week also released a fiber-optic link that can be used to channel-attach processors at greater distances than previously possible and provide remote peripherals with response times similar to locally attached devices.

The IBM 3044 Fiber-Optic Channel Extender Link can be used to attach low- to medium-speed — up to 1.25M byte/sec — I/O control units, switching units and channel-to-channel interfaces to byte and block multiplexer channels on all IBM 4300, 30 series, 3080 series and 3090 series systems at distances up to two kilometers.

For data streaming applications between hosts, the previous maximum distance that could be maintained between processors was 400 feet. Using IBM's 3088 Multisystem Channel Communications Unit, which can be used to interconnect four to eight processors, the maximum distance between any two processors is 800 feet.

The 3044 extends the permissible distances between processors to two kilometers. The product consists of a pair of units interconnected using two fiber-optic cables. The 3044 CO1 is for attachment to the processor channel, and the 3044 DO1 is used at the remote end of the link. The CO1 takes one of eight electrical, nonaddressable control unit positions on a processor channel. Remote DO1s can be attached to another processor channel or used, in turn, to support eight control units, such as terminal controllers. When used to support remote peripherals, the 3044 is said to provide near-local response time.

When the 3044 is used in conjunction with the 3088 for channel-to-channel communications, the maximum distance supported between processors is doubled from two to four kilometers. Scheduled to be available in July, the 3044, excluding the fiber-optic cable, costs $17,000, $8,500 each for a CO1 and a DO1. There is an additional $25 monthly minimum maintenance charge.

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Telecom profitability cited

Seminar targets revenue drain reversal

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Telecommunications departments, often thought of as a drain on corporate revenue, can become a major revenue source. So said several telecommunications users and a consultant attending the American Management Association seminar titled "Developing a Corporate Telecommunications Plan," held here last week.

"Telecommunications departments are usually viewed as siphoning off corporate energies and revenue," said James W. Davis, president of the Omni Group, a Chicago-based telecommunications consulting firm. However, according to Davis, while most revenue-generating applications for telecommunications are still in the future, alternative methods do exist to reduce telecommunications costs.

Timothy Lyons, director of communications services for Phoenix-based Ramada Inns, Inc., said that while telecommunications is still an expense at Ramada's headquarters, revenue is being generated by reselling corporate long-distance services to hotel customers at a 20% profit.

According to John Marino, communications manager for Summa Corp., a Las Vegas-based holding company for the estate of the late Howard Hughes, his company is taking a conservative approach to reducing telecommunications expenditures by cutting overhead costs, a tactic he called "the other side of revenue generation." Summa has reduced its telephone overhead costs by 40% by using services such as direct-dial rates and Wats, Marino said.

Summa is considering methods for generating revenue from telecommunications, such as a telephone surcharge for office and hotel tenants and the sale of excess telecommunications capacity and video-teleconferencing services to office park tenants, Marino said.

According to Judy Byrnes, telecommunications supervisor at Butterfield Savings and Loan in Santa Ana, Calif., telecommunications is still a major expense for her company. Butterfield recently doubled its telephone switching capacity with a NEC Corp. voice/data switch to keep up with its monthly average of 80,000 outgoing calls, Byrnes said.

Butterfield's primary telecommunications revenue source is "Bank By Phone," a telecommunications network that allows institutional investors to purchase certificates of deposit via a special phone hookup. The company also plans to lease its telecommunications services to real estate tenants, she said.

Exec calls plan essential part of telecom management

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — A carefully researched and written telecommunications management plan encompassing facsimile, image, video, voice, data, text and other special applications is necessary more than ever for corporations today, the president of a telecommunications firm said at a seminar held here last week.

At an American Management Association seminar aimed at helping corporate users develop telecommunications plans, James W. Davis, president of the Chicago-based Omni Group, said most corporate telecommunications users are "victims rather than customers" and are ill equipped to make efficient use of telecommunications. The majority of corporate users, Davis said, still do not understand telecommunications technology and view its management as "merely an unwelcome and unmanageable expense."

Davis said that, for the most part, telecommunications planning does not exist in corporations today. When it does exist, he said, it generally consists only of tactical planning such as listing next year's projects, rather than long-range strategic planning.

Davis said a plan for educating upper management is necessary. "You have to let the people on the 14th floor know how bad things really are," he said, citing inadequate resources and staff as major problems.

Davis added that a plan is necessary because the telecommunications market will eventually be crowded with vendors offering a confusing variety of hardware and calling services. Pricing confusion in the marketplace, a lessening of vendor support due to regulatory upheaval and a shortage of qualified telecommunications professionals will also trouble companies that have failed to develop a coherent telecommunications strategy, he said.

Davis said the corporate telecommunications management plan should include three basic components: a personnel and systems inventory showing the present level of service and outlining its inadequacies, a statement of objectives and strategies to achieve stated goals.

Telecommunications management is also a potential revenue generator for corporations that take the time to learn the basics of the technology and its applications, Davis said. Revenue-generating possibilities include allocating coaxial cable for resale as well as for internal operations, charging a subsidiary for telecommunications services and reselling long-distance services to customers, he said.

It is crucial, Davis warned, to choose technology that addresses corporate needs. Five years ago, he said, telecommunications management consisted of "deciding on which desk to put the one telephone with six buttons." Now the user is faced with a dizzying array of choices ranging from Centrex replacement considerations to resale opportunities, equal access lines, shared-user systems, teleconferencing and bypass options, Davis said.

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Micro compiler simulates mainframe programming tools

By Paul Korzeniowski
CW Staff

PALO ALTO, Calif. — Micro Focus, Inc. today announced VS Cobol Workbench, an operating environment that works with or simulates mainframe programming tools on a microcomputer.

The product runs on an IBM Personal Computer with IBM's PC-DOS operating system and 256K bytes of random-access memory (RAM). It allows a user to develop, test and maintain source code on a microcomputer and use an IBM 3270 Personal Computer or a Personal Computer with a file transfer facility to upload the code to a mainframe for integration testing and running.

"We worked with other microcomputer compilers and found that not all microcomputer source code ran on a mainframe," said Jeffrey Wilson, development workstation program manager at the Data Systems Division of General Dynamics Corp. in St. Louis. "VS Cobol Workbench allows a programmer to test code more thoroughly so that it will execute when transferred to a mainframe."

VS Cobol Workbench supports almost all features found in Ansi 74 Cobol and most features in OS/VS Cobol and in VS Cobol II, which is based on the yet to be finalized Ansi 80 Cobol, the vendor said.

Enhanced, added tools

VS Cobol Workbench enhanced some previously released Micro Focus Cobol features and added other tools. The package includes a syntax checker, Build function, editor and Animate function.

The various tools are stored on three diskettes. VS Cobol Workstation incorporates virtual memory techniques to allow a user to switch from one tool to a second by pressing a single keystroke. "Being able to move from a syntax checker to an editor without exiting to the operating system saves a tremendous amount of time," noted Steve Rabin, a consultant based in Ossining, N.Y.

The product's syntax checker generates Cobol code and flags non-Ansi 74 code. For each error, a user can continue to compile a program or return to the editor, correct the error and recompile. Switch features allow a user to compile OS/VS Cobol 74 or VS Cobol II code, the vendor said. For example, a user can take Ansi 74 Cobol code and run it as an OS/VS Cobol program. The package will identify differences between the two versions of Cobol. A user can then change conflicting code or compile a program that includes both versions of Cobol.

A Build command allows a user to combine runtime functions with user-written Exec commands that run outside the VS Cobol Workstation environment, the vendor said. With this feature, programmers can test, through simulations, statements that require host data base and data communications services such as IBM's IMS and CICS.

The editor provides a forms option that allows a user to paint a screen and generate data division, procedure division or indexed program code, the vendor said. "VS Cobol Workbench includes an excellent editor with advanced features such as an Undo feature that restores text that was accidently deleted," Rabin noted.

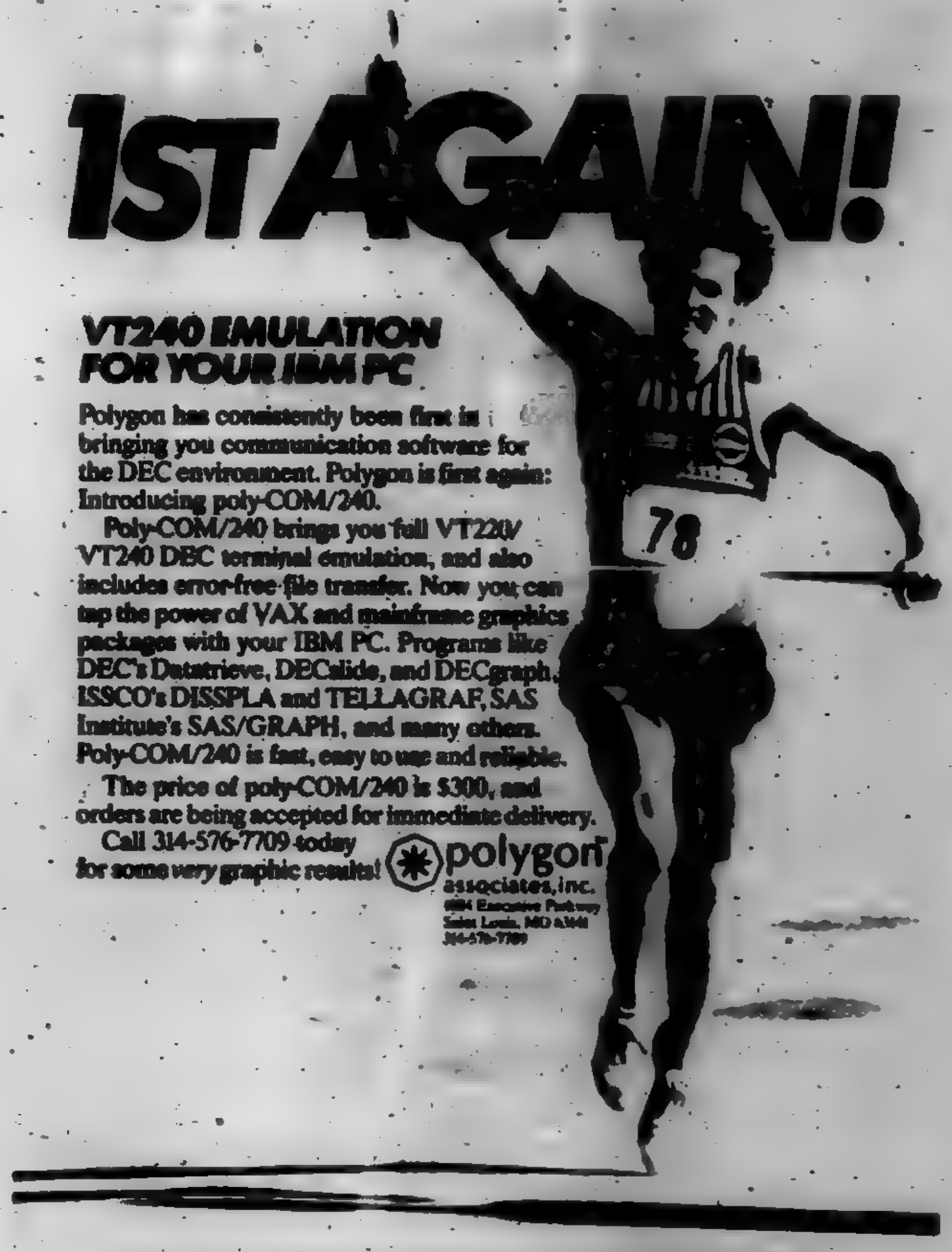
An Animate function helps a user debug a program. With it, a user can query data values, set data values to data items or set break points.

Rabin and General Dynamic's Wilson reported that the IBM Personal Computer's RAM and processing speed limitations did not create any problems. "We compiled approximately 1,000 lines a minute," Wilson claimed. General Dynamics runs VS Cobol Workstation on IBM Personal Computer XTs with 640K bytes of RAM.

However, they listed a few possible enhancements. They suggested that a file transfer facility be integrated into the product, that it support graphics and that it work with true rather than simulated testing of mainframe products such as CICS.

The product costs $4,000.

Micro Focus is located at 2465 E. Bayshore Road, Palo Alto, Calif. 94303.



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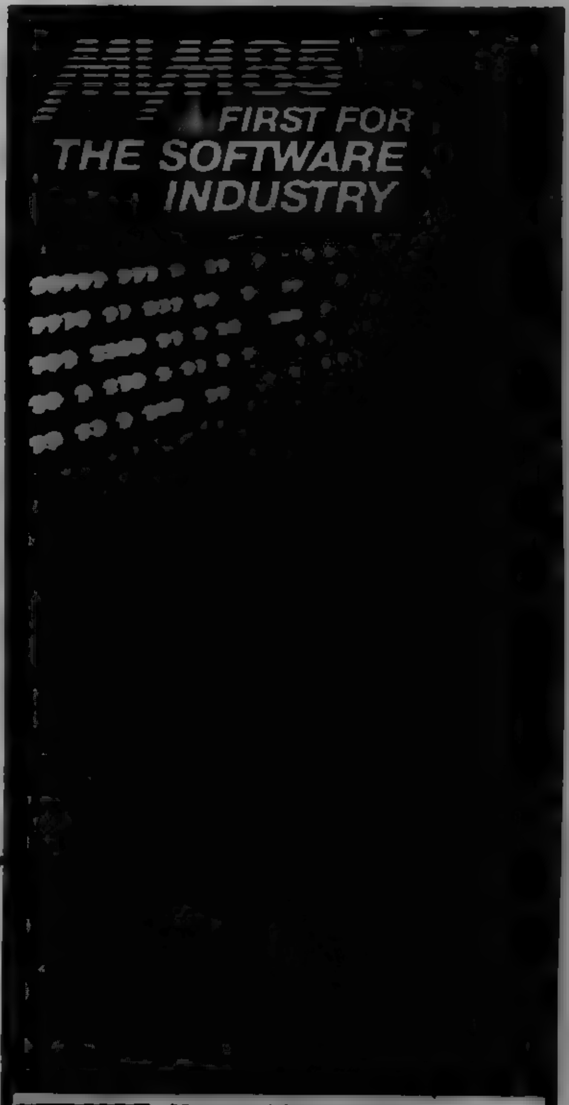
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Westmoreland libel case rouses computer crime fears

By David [illegible]
CW Staff

A military computer used to calculate estimates of enemy troop strength during the Vietnam War is playing an obscure role in the high-stakes libel suit brought by retired Army Gen. William C. Westmoreland against CBS, Inc.

Westmoreland's $120 million suit was prompted by a 1982 CBS News documentary, "The Uncounted Enemy: A Vietnam Deception." Among the charges contained in the broadcast were CBS' claim that one military commander had, in effect, accused his superior of engineering a cover-up of intelligence records by ordering a computer's data base changed so future estimates of enemy strength would be reduced automatically.

Whatever the outcome of the 19-week-old trial in the Federal District Court in New York, troubling questions about the alarming consequences of people using computers for deceitful purposes will be raised anew (see story page 15).

The CBS documentary attempted to show that Westmoreland's command "cooked up" the enemy strength numbers — using the computer as a tool — to give the impression that the American war effort was going better than it actually was. An important figure in the computer-related aspect of the case was retired Cmdr. James Meacham, a senior intelligence officer in Vietnam.

In the broadcast, Meacham, now a journalist covering military affairs for *The Economist* magazine in London, was described by CBS reporter Mike Wallace as accusing Lt. Gen. Daniel Graham, Westmoreland's chief of intelligence, of erasing a historical data base resident in an IBM computer to alter the record on enemy troop strength for Westmoreland's command. The CBS program relied heavily on letters Meacham sent home to his wife from Vietnam, one of which referred to the military's enemy troop numbers as "lies."

In one such letter, Meacham wrote: "Tomorrow will be a sort of day of truth. We shall then see if I can make the computers sort out the losses since the [1968] Tet offensive began in such a manner as to prove that we are winning the war. If I can't, we shall, of course, jack the figures around until we *do* [sic] show progress. Every month we make progress here."

> ***'Looking back, I think I made a great mistake in putting [the intelligence data] in a computer.'***
>
> **— Retired Cmdr. James Meacham**
> **Senior intelligence officer in Vietnam**

The letters were written after the Tet offensive, while Meacham was embroiled in a debate with Graham and other intelligence officials over the methodology used to calculate enemy strength. Graham, who favored changes in the data base that would reflect a lower enemy count, prevailed in the argument.

In a recent interview with *Computerworld*, Meacham acknowledged that his recollection of events has dimmed in the 17 years since he returned from Vietnam. He suggested that the strongly worded letters he sent home might have been influenced by the heat of the time. Meacham said that although he disagreed vehemently with the data base changes and thought they were "intellectually dishonest," he does not believe today that they were part of a military conspiracy to deceive the American public.

Meacham was sharply critical of the way his views were presented in the CBS broadcast. In an unaired portion of a 1981 interview between Meacham and CBS producer George Crile, Meacham had said the changes Graham ordered were "not a falsification of official records."

Meacham said it was his idea to enlist the computer's help for handling the massive amounts of intelligence data that came to the Military Assistance Command in Vietnam. He said that, in retrospect, the big numbers hassle might have been avoided if the computer had not been used.

"Looking back, I think I made a great mistake in putting [the intelligence data] in a computer in the first place. . . . If we'd still been doing that by hand, it would have been so time consuming, so difficult, almost impossible to go back and do those thousands of calculations by hand, that I don't think [Graham] would have ever thought of [making the changes].

"It wasn't until we began to produce computer printouts and [Graham] saw them and thought we could tinker with them as easy as pie that we had this problem. If we'd still been doing it by hand, the sheer magnitude of the labor would have militated against it," Meacham said.

The documentary alleged a "conspiracy" by Westmoreland's command to demonstrate U.S. progress in the war by deliberately underestimating the size and nature of the North Vietnamese and Vietcong forces in South Vietnam before the Tet offensive.

Westmoreland, commander of the U.S. forces in Vietnam from January 1964 to June 1968, claimed CBS defamed him by saying he lied about the enemy's troop strength to President Johnson and the Joint Chiefs of Staff. He is suing CBS and three defendants, including reporter Wallace.

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End of the Rainbow? Production stops, support goes on

By Eric Bender
CW Staff

MAYNARD, Mass. — Digital Equipment Corp. is shutting down production of its Rainbow line of personal computers, a company spokesman acknowledged last week.

But he insisted that the company is not abandoning the Rainbow. DEC will continue to sell and support the low-end system, and there have been no changes in marketing strategies or top-level personnel, he said.

With ample supplies in inventory, a Westfield, Mass., Rainbow assembly plant is being shut down to retrofit for new products, the spokesman said. "We could start up [Rainbow] production again, not necessarily at that plant," he said.

Death sentence for Rainbow

Industry analysts, however, generally perceived the announcement as a death sentence for the Rainbow, and some were puzzled by the move.

Company officials have admitted that Rainbow sales have been disappointing. International Data Corp., a Framingham, Mass.-based market research firm, estimated that only about 60,000 of the microcomputers were shipped domestically in 1984.

But dropping the machine would leave the second-largest computer company without a general-purpose personal computer, analysts noted.

"If [DEC doesn't] have a personal computer offering, that leaves the door open for IBM and others to get into its accounts," commented Norman DeWitt, an analyst with Dataquest, Inc. in San Jose, Calif.

'A three-year-old product'

However, there will be further Rainbow enhancements, according to the DEC spokesman. He declined to comment on reports that DEC is developing a successor to the Rainbow, but pointed out that "the Rainbow is a three-year-old product."

"We're committed to developing personal-computer-class machines" as part of an overall strategy based on VAXs, networking and desktop workstations, he said.

The spokesman declined to discuss industry rumors that the Westfield plant is being geared up to produce the still-unannounced Microvax II.

Approximately 1,400 employees work at the Westfield plant. As a corporate policy, DEC does not lay off workers, but many will be encouraged to find work elsewhere, either within DEC or outside the company, the spokesman said.

He described the move as part of a corporatewide effort "aimed at reducing indirect labor in our manufacturing." DEC currently employs about 30,000 in manufacturing worldwide and aims at cutting 5,000 of these employees over an unspecified period, he said.

Suit to affect all computer users

By David Olmos
CW Staff

Computer crime and security specialists said the issues raised by Army Gen. William C. Westmoreland's libel suit against CBS, Inc. have implications for computer users everywhere, not only for those in the military and intelligence worlds.

"The issue is a lot broader than just what the military or intelligence communities might do with data that's specious," said Jack Bologna, an Ann Arbor, Mich., specialist on computer-assisted crime.

"There's an ethical issue involved," he said. "Suppose noncomputer people accept as gospel truth whatever the computer generates in the form of a report? There is a temptation and a tendency, I suspect, for underlings to generate and throw into that system whatever . . . the brass wants to hear."

"The computer gives us a great deal more power to manipulate data and put it into a more believable form," said Donn Parker, a computer-crime consultant with SRI International, Inc., a Menlo Park, Calif., think tank, and the author of several books on the subject.

The 1982 CBS documentary, on which Westmoreland's suit is based, alleged that an officer accused his superior of "engineering a cover-up" by altering a computerized historical data base containing Vietnam War intelligence data.

In cases involving general accounting fraud via computers, according to Bologna, "When the future's beginning to look bleak, there's an . . . incentive to start fudging the numbers."

Prof. John Carroll, a computer security expert who teaches at the University of Western Ontario in London, Ont., said the growing use of micro-to-mainframe links is increasing computer security risks. "Any accountability that did exist is going right out the window," he said.

"Management wants to be able to stop computer abuse where it would be to its detriment but permit it where it would be to its benefit, Carroll asserted.

"I think management wants the option to rewrite history if the need should arise," he added.

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RECOVERY

NEWS

WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

Extension of DP crime bill to private systems sought

WASHINGTON, D.C. — Three major bills dealing with computer crime were introduced recently in the U.S. Congress, all of them seeking to protect the private-sector computers that are not covered by the 1984 computer crime law.

The bills, which are similar to ones introduced last year, are as follows:

- H.R. 930, sponsored by Rep. Bill Nelson (D-Fla.), would outlaw unauthorized access to computers used in interstate commerce or in financial institutions.
- H.R. 995, sponsored by Rep. Ron Wyden (D-Ore.), would penalize the unauthorized access to or alteration of individual medical records through a telecommunications device.
- H.R. 1001, sponsored by Rep. William J. Hughes (D-N.J.), would establish felony and misdemeanor charges for unauthorized access to computers used in interstate commerce if the defendant reaps $5,000 or more in the crime.

The bills sponsored by Hughes and Wyden were passed by the House of Representatives last year but failed to get Senate support. Congress did, however, enact the Computer Fraud and Abuse Act of 1984, which outlaws unauthorized access to the federal government's computers and certain financial data bases [CW, Oct. 15].

U.S. agency issues rules to up Medicaid efficiency

WASHINGTON, D.C. — The U.S. Department of Health and Human Services (HHS) will require state Medicaid agencies to implement three new features for their Medicaid MIS systems, which are partially funded by the federal government.

HHS' Health Care Financing Administration (HCFA) recently issued rules requiring state Medicaid MIS systems to use a uniform diagnostic coding system, to use a common claim form for inpatient and outpatient billing and to use a uniform electronic billing format for institutional billing.

The new requirements, which must be implemented by 1986, will improve the efficiency and effectiveness of the Medicaid program and reduce paperwork, the HCFA announcement said.

Another HHS office recently announced it will provide grants for the development of innovative computer systems that help states track child-support enforcement cases that cross state boundaries.

Cbema book out

WASHINGTON, D.C. — "Privacy and Security Bibliography," a reference periodical that contains more than 460 entries on subjects such as security, information privacy and transborder data flow, has been published by the Computer and Business Equipment Manufacturers Association (Cbema).

The bibliography was compiled by Rein Turn of California State University. It contains listings of books, proceedings, monographs, journal articles, newsletters and government and industry publications.

Free copies are available from Privacy & Security Bibliography, Cbema, Suite 500, 311 First St. N.W., Washington, D.C. 20001.

Telcom study to consider possible policy changes

WASHINGTON, D.C. — The National Telecommunications and Information Administration (NTIA) last week announced it will conduct a study of the structure and regulation of the U.S. telecommunications industry "in order to identify and promote policies suitable to a changing technological and industry environment."

In its Notice of Inquiry, published in the Feb. 11 Federal Register, the NTIA said it would study the issues of telecommunications pricing, stability, technical quality, regulation and competition. The study will update a 1979 NTIA study in order to reflect such changes as the breakup of AT&T, the agency said.

The NTIA said it is seeking public comments on these issues. Written comments, due March 29, should be addressed to the Telecommunications Policy Study, NTIA, U.S. Department of Commerce, Washington, D.C. 20230.

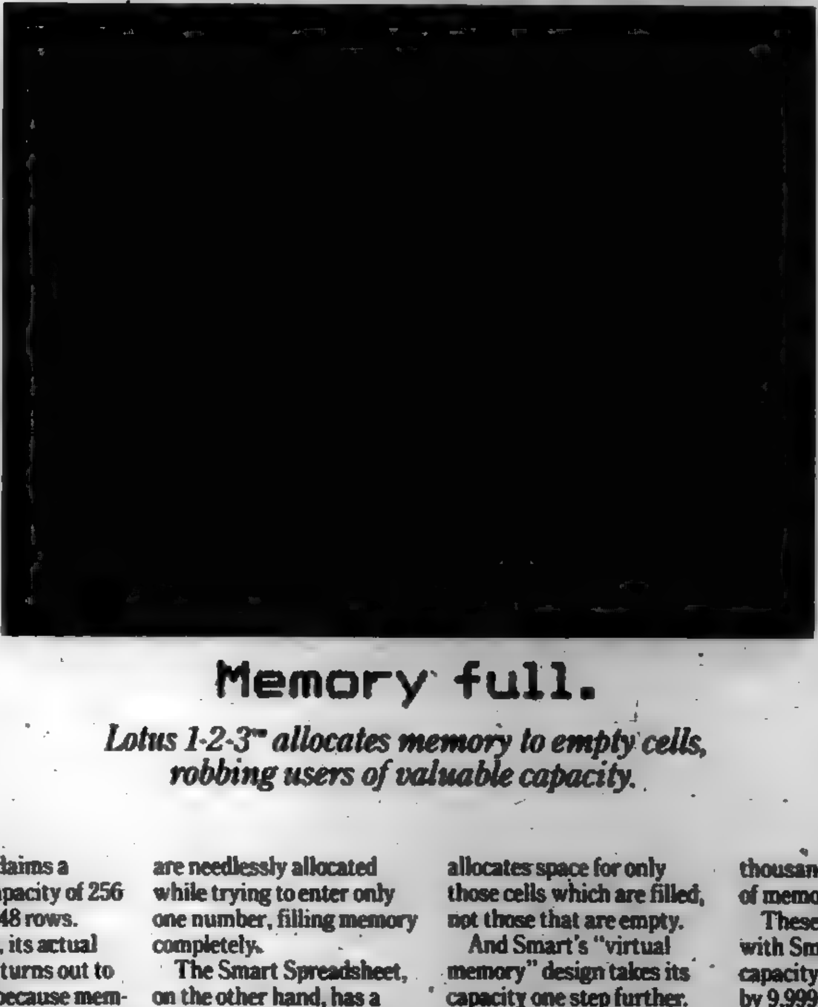
U.S. agency to cosponsor seminars on export rules

WASHINGTON, D.C. — The U.S. Department of Commerce's Office of Export Administration, in conjunction with two computer industry trade groups, has scheduled a series of one-day seminars on the department's new export control regulations for computer products.

The rules are meant to restrict the transfer of sensitive computer technology to Soviet bloc countries [CW, Jan. 14].

The seminars will be held here and in Boston, San Francisco and Dallas. More information is available from Tom Farewell, Association of Data Processing Service Organizations, 1300 N. 17th St., Arlington, Va. 22209.

Dumb.



Memory full.

Lotus 1-2-3™ allocates memory to empty cells, robbing users of valuable capacity.

Lotus 1-2-3 claims a spreadsheet capacity of 256 columns by 2048 rows. Unfortunately, its actual capacity often turns out to be much less, because memory is wasted on empty cells.

That's the case in the screen on the left,* where all unused cells between column R(18) and row 2048 are needlessly allocated while trying to enter only one number, filling memory completely.

The Smart Spreadsheet, on the other hand, has a unique space-saving feature called "sparse matrix," which prevents such a calamity from occurring.

That's because Smart allocates space for only those cells which are filled, not those that are empty.

And Smart's "virtual memory" design takes its capacity one step further. It means that the size of a spreadsheet is not limited by a computer's RAM (as it is with Lotus 1-2-3), but by disk space alone. It's like having thousands of additional cells of memory on reserve.

These features, coupled with Smart's enormous capacity for 999 columns by 9,999 rows, make it the largest spreadsheet available.

But The Smart Spreadsheet's unequalled power and capacity are only part

*[illegible]

DATAPRO

from page 1

and are not included in the overall DP budget for software," the survey stated. "The DP manager may be totally unaware of expenditures for micro software made by user departments."

Generally satisfied with packages

Along with the increasing acceptance of packaged software indicated by the rise in spending on packages in 1984, it appears that users were generally satisfied with the packages they rated for Datapro.

Of 97 products that were evaluated by more than 10 users each, fully three-quarters (72) of the packages tested fell into the top two "clusters" — roughly equivalent to ratings of "excellent" and "good" — in Datapro's cluster analysis of overall user satisfaction (see charts pages 18-25).

Approximately 3,500 users responded to Datapro's questionnaire, either by mail or by telephone. Users were asked to rate no more than two packages each, on a scale of one to four, with one equaling "poor" and four equaling "excellent."

Cluster analysis

From those package ratings Datapro calculated mean average ratings that were then analyzed using a mathematical procedure known as cluster analysis. As a result, four package clusters were identified and assigned a value from one to four, with one being the highest rating and four being the lowest.

The packages represented in Datapro's survey range in price from a few hundred dollars to hundreds of thousands of dollars.

In terms of overall satisfaction, user ratings put almost one-third (30) of the packages into the highest cluster. Almost half the packages (42) earned a place in the next highest cluster, while only 24 products fell into the two lowest groupings in terms of overall satisfaction. Just two packages placed in the lowest rated cluster.

The survey also found that:

- Most respondents (96.6%) use separately priced — unbundled — software from a computer vendor or an independent software company.
- Almost 91% of the respondents said at least one of the packages they rated performed as the vendor promised immediately, while 6.3% reported that the rated package never performed as advertised or promised.
- The primary benefits offered by the packages rated by respondents were savings in human resources (99.2%), flexibility (93%) and simplicity (86.8%).
- The primary disadvantages of evaluated packages cited by respondents included excessive resource use (27.4%), high cost (27.2%), slowness (23.2%) and complexity (21.2%).
- Fully 100% of users said they saved money with at least one of the packages they rated. Less than 4% said they actually lost money by installing a package they evaluated.
- The vast majority of respondents said that no modifications were required to the rated software.
- Users unanimously said they had acquired at least one package by permanent license.
- More than 45% of the respondents said that previously published user ratings influenced their decision to acquire a particular package. Of those users, nearly 70% said their experience confirmed the survey information. Only 3% said their experience contradicted survey information.

Respondents to the Datapro survey rated packages in a total of nine categories:

- Reliability.
- Efficiency.
- Ease of installation.
- Ease of use.
- Vendor technical support.
- Troubleshooting.
- Documentation.
- User education.
- Vendor maintenance.
- Overall satisfaction.

The survey is available for $25 from Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

Datapro poll procedures

Datapro Research Corp.'s 1984 survey, "User Ratings of Proprietary Software," took shape from a list of 7,000 computer sites drawn up by International Data Corp. (IDC), a Framingham, Mass.-based market research firm.

The sites that eventually received Datapro's user questionnaire were selected from IDC's list on an "nth-name" basis after computer manufacturers, software vendors and service bureaus were excluded. The questionnaire featured a general section with three questions addressing the use of separately priced software, the user's packaged software budget and [illegible]

[illegible]

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98% memory free.

Smart does not allocate memory to empty cells, so you have all the capacity you need.

of the reason why more and more corporate users are buying it.

It's also fully relational, allowing for easy financial consolidations; includes an extensive business graphics package; and is part of a fully integrated system that works automatically and effortlessly with The Smart Word Processor and The Smart Data Manager.

So don't shortchange yourself on a spreadsheet program that eats up memory like there's no tomorrow. Get Smart instead. And if you already own Lotus 1-2-3, keep in mind that Smart will translate all your files and formulas.

Smart Software, from Innovative Software, is currently available for the IBM PC, PC/XT, PC/AT, and compatibles. For more information, please call 800-GET-SMART. (In Kansas, call 913-383-1089).

Smart Software
from Innovative Software

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User ratings of s

Vendor and Package Name	No. Ratings Received	Significant Advantages Noted by Users					Significant Disadvantages Noted by Users						Did Package Perform as Vendor Promised			Did Package Result in Dollar Savings		
		Simple	Flexible	Inexpensive	Saves System Resources	Saves Human Resources	Inflexible	Costly	Complex	Slow	Uses Excessive Resources	Lacks Key Capabilities	Yes, Immediately	Yes, Eventually	Never	Yes	No Savings	Lost Money
Advanced Data Management																		
DRS	22	1	13	2	2	15	1	4	9	5	5	2	15	4	—	15	3	—
Ashton-Tate																		
Dbase II	21	12	19	13	13	17	4	6	9	5	—	2	15	6	—	16	4	—
Applied Data Research, Inc.																		
Datacom/DB	45	25	28	6	21	21	—	4	—	—	—	2	—	—	—	19	7	1
Datacom/DC	10	5	3	3	5	4	1	2	1	—	—	1	—	—	—	7	2	—
Email	19	13	6	6	3	12	1	—	—	3	5	2	13	—	—	9	2	—
The Librarian	14	7	6	4	7	9	—	1	—	—	—	—	—	—	—	10	—	—
Look	15	11	2	1	8	6	—	—	—	1	1	2	10	—	—	5	6	—
Roscoe	28	13	13	3	19	15	2	3	2	—	—	3	—	—	—	20	2	—
Vollie	20	17	19	4	14	17	—	1	—	—	—	—	—	—	—	19	1	—
Battelle Software Products																		
Basis	18	6	11	1	3	14	—	—	—	—	—	—	14	—	—	—	—	—
BGS Systems, Inc.																		
Best/1	16	7	9	3	9	12	1	1	2	—	—	2	—	—	—	11	1	—
Boole & Babbage, Inc.																		
Resolve	12	4	4	3	6	8	1	—	—	—	—	—	6	—	—	6	—	—
The Cambridge Systems Group																		
ASM2	22	7	20	4	15	16	—	—	3	—	—	—	18	—	—	19	—	—
Candle Corp.																		
Omegamon	38	4	20	3	19	21	—	13	10	—	2	—	28	—	—	20	5	—
Century Analysis, Inc.																		
Boss 3	10	6	8	5	7	8	—	1	1	2	1	—	6	4	—	8	1	—
CFS, Inc.																		
Docs	17	13	11	7	8	13	—	1	—	—	—	1	15	—	—	10	4	—
Cincom Systems, Inc.																		
Total	25	12	9	3	8	8	2	6	4	2	3	6	15	—	—	13	6	—
Computer Associates International, Inc.																		
Converter	16	6	10	4	5	15	—	—	2	—	1	1	—	—	—	—	—	—
Dynam/D	41	15	19	6	19	23	—	1	1	2	1	1	31	—	—	24	5	—
Dynam/T	60	34	20	15	20	31	1	4	2	5	1	2	52	—	—	34	15	—
Dynam/TLMS	13	4	5	2	5	8	2	—	2	—	—	1	10	—	—	6	3	—
Jars	21	9	11	8	2	8	1	—	3	—	2	—	—	—	—	6	8	—
Jasper	56	15	21	—	6	17	4	—	11	16	10	6	31	—	—	8	38	3
Sort	35	25	19	15	23	11	—	—	—	—	—	—	30	—	—	26	3	—
Computer Corp. of America																		
Model 204	18	—	17	—	—	12	—	3	2	—	—	3	12	—	—	12	—	—

DATAPRO RESEARCH CORP. CHART

oftware packages

Vendor and Package Name	No. of User Ratings Received	Hierarchical Cluster Groupings								
		Reliability	Efficiency	Ease of Installation	Ease of Use	Vendor's Technical Support			Vendor's Maintenance	Overall Satisfaction
						Troubleshooting	Documentation	User Education		
Advanced Data Management										
DRS	22	3	2	1	3	2	4	2	2	3
Ashton-Tate										
Dbase II	21	2	2	2	2	3	3	3	3	2
Applied Data Research, Inc.										
Datacom/DB	45	2	1	2	2	2	3	3	3	2
Datacom/DC	10	2	1	2	2	3	3	3	4	2
Email	19	2	2	1	1	2	2	3	2	2
The Librarian	14	1	1	1	1	1	2	2	1	1
Look	15	2	1	2	1	2	2	3	2	2
Roscoe	28	2	1	1	1	2	1	2	2	2
Vollie	20	1	1	1	1	1	2	2	1	1
Battelle Software Products										
Basis	19	1	2	2	2	2	3	2	2	2
BGS Systems, Inc.										
Best/1	16	2	1	1	2	1	2	2	1	1
Boole & Babbage, Inc.										
Resolve	12	3	2	2	1	3	2	3	4	3
The Cambridge Systems Group										
ASM2	22	2	2	2	2	3	2	3	2	2
Candle Corp.										
Omegamon	38	1	1	1	2	1	2	2	2	1
Century Analysis, Inc.										
Boss 3	10	3	2	3	2	2	3	2	3	3
CPS, Inc.										
Docs	17	1	1	1	1	2	2	3	3	1
Cincom Systems, Inc.										
Total	26	2	2	2	2	2	2	3	3	2
Computer Associates International										
Converter	16	2	2	2	2	2	3	3	2	2
Dynam/D	41	2	2	1	2	3	2	3	2	2
Dynam/T	60	2	2	2	1	2	2	3	2	2
Dynam/TLMS	13	3	2	2	2	2	2	3	3	2
Jars	21	2	2	2	3	3	2	2	3	3
Jasper	56	4	3	3	3	4	3	4	4	4
Sort	35	1	1	1	2	1	1	3	2	1
NOTE: The range of average user ratings attributed to each cluster for each characteristic is as follows:										
Cluster 1:		3.83 to 4.0	3.41 to 4.0	3.41 to 4.0	3.41 to 4.0	3.38 to 4.0	3.21 to 4.0	2.91 to 4.0	3.54 to 4.0	3.51 to 4.0
Cluster 2:		3.51 to 3.82	2.86 to 3.40	2.91 to 3.40	2.89 to 3.40	2.88 to 3.37	2.78 to 3.20	2.41 to 2.90	3.12 to 3.53	3.12 to 3.50
Cluster 3:		3.13 to 3.50	2.21 to 2.85	2.40 to 2.90	2.34 to 2.88	2.29 to 2.87	2.26 to 2.77	1.51 to 2.40	2.62 to 3.11	2.72 to 3.11
Cluster 4:		Below 3.13	Below 2.21	Below 2.40	Below 2.88	Below 2.87	Below 2.26	Below 1.51	Below 3.11	Below 2.72

DATAPRO RESEARCH CORP. CHART

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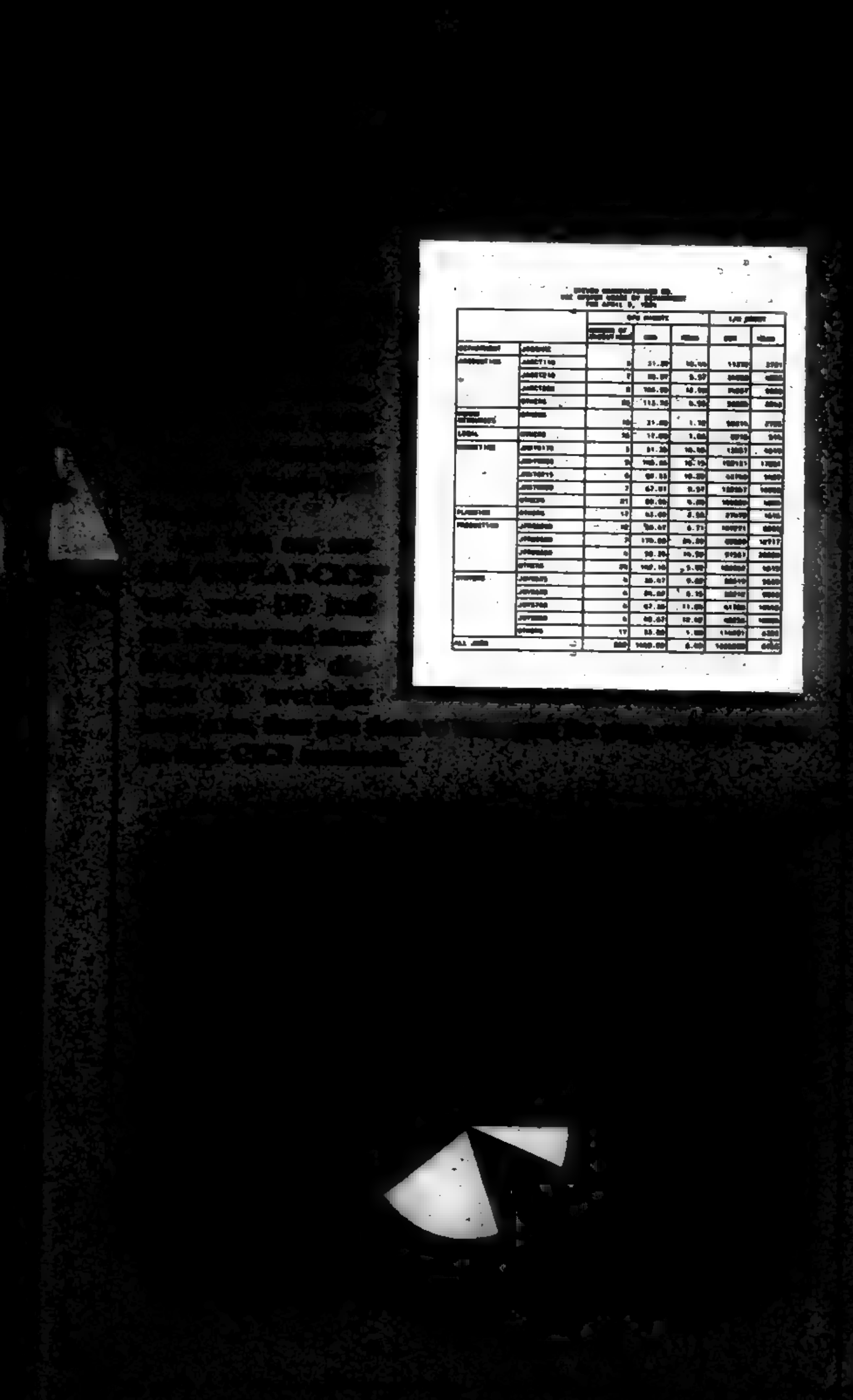

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User ratings of s

Vendor and Package Name	No. Ratings Received	Significant Advantages Noted by Users					Significant Disadvantages Noted by Users						Did Package Perform as Vendor Promised			Did Package Result in Dollar Savings		
		Simple	Flexible	Inexpensive	Saves System Resources	Saves Human Resources	Inflexible	Costly	Complex	Slow	Uses Excessive Resources	Lacks Key Capabilities	Yes, Immediately	Yes, Eventually	Never	Yes	No Savings	Lost Money
Compuware Corp.																		
Abend-Aid	12	10	9	—	6	12	—	—	—	—	—	—	—	—	—	12	—	—
Corodale, Inc.																		
System/Manager	11	8	6	—	—	6	—	—	—	—	—	—	—	—	—	—	6	—
Cullinet Software, Inc.																		
Culprit	15	10	11	6	5	10	—	1	1	—	1	1	15	—	—	14	1	—
IDMS/R	39	8	21	—	—	18	—	15	9	1	7	—	30	—	—	14	13	—
Data Processing Design, Inc.																		
Word-11	14	10	11	4	—	6	—	—	2	—	—	—	—	—	—	9	—	—
Digital Research, Inc.																		
CP/M	15	8	8	—	—	—	—	—	—	—	—	—	7	—	—	7	—	—
Dylakor																		
Dyl-280	12	8	9	6	5	10	—	—	1	1	1	—	—	—	—	9	2	—
Dyl-280	13	13	10	7	3	13	—	—	—	1	—	1	—	—	—	10	1	—
Forth, Inc.																		
Forth	17	—	15	—	15	15	—	—	—	—	—	—	15	—	—	15	—	—
Goal Systems International, Inc.																		
Flee/XP, Flaqs/XP	64	48	42	37	50	43	—	—	—	—	—	2	64	—	—	46	9	—
IBM																		
CICS/VS	22	3	7	—	6	10	1	—	11	—	7	—	10	12	—	10	6	—
Dmas	13	6	7	2	6	10	3	3	3	2	3	2	6	6	—	8	3	1
DMS	13	5	8	1	3	9	3	1	3	2	3	—	7	6	—	12	1	—
General Ledger	16	11	10	4	7	15	2	5	4	3	2	2	9	5	1	11	2	—
IMS/VS	66	8	47	6	10	42	9	33	43	—	38	6	—	—	—	43	17	1
Mapics	74	44	40	26	25	53	20	16	17	24	31	14	48	24	1	55	15	1
Payroll	14	11	12	8	7	13	4	3	3	4	5	1	11	3	—	9	3	—
Text Management	18	10	15	14	9	15	1	3	2	1	—	1	16	2	—	16	2	—
Info Data Systems, Inc.																		
Inquire	11	4	8	—	1	5	1	—	3	1	7	—	—	—	—	—	—	—
Innovation Data Processing																		
Fats/Fatar	10	5	4	3	5	6	—	—	—	—	1	—	—	—	—	6	1	—
FDR	23	12	11	8	20	12	—	1	1	—	1	2	11	12	—	16	—	—
Intel Corp.																		
System 2000	21	8	11	1	—	13	3	7	4	5	6	2	7	—	—	10	4	—
Lawson Associates, Inc.																		
GAS	11	9	8	4	4	7	1	4	—	5	6	2	4	3	—	3	8	—
Lotus Development Corp.																		
1-2-3	85	55	64	43	32	64	4	7	9	6	6	2	71	11	1	72	11	—

DATAPRO RESEARCH CORP. CHART

oftware packages

Vendor and Package Name	No. of User Ratings Received	Hierarchical Cluster Groupings								
						Vendor's Technical Support				
		Reliability	Efficiency	Ease of Installation	Ease of Use	Troubleshooting	Documentation	User Education	Vendor's Maintenance	Overall Satisfaction
Computer Corp. of America										
Model 204	18	2	2	1	2	3	3	2	3	2
Compuware Corp.										
Abend-Aid	12	2	1	1	1	2	1	2	2	2
Corodata, Inc.										
System/Manager	11	1	1	1	1	1	1	2	1	1
Cullinet Software, Inc.										
Culprit	15	1	1	2	1	1	2	2	2	2
IDMS/R	39	2	2	2	2	2	3	2	2	2
Data Processing Design, Inc.										
Word-11	14	1	3	1	1	3	2	3	3	2
Digital Research, Inc.										
CP/M	15	2	3	2	2	3	4	3	3	2
Dylakor										
Dyl-260	12	2	2	1	3	2	2	3	2	1
Dyl-280	13	2	1	1	1	2	1	2	1	1
Forth, Inc.										
Forth	17	2	1	2	1	2	2	2	3	1
Goal Systems International, Inc.										
Flee/XP, Fleqs/XP	64	1	1	1	1	1	1	2	1	1
IBM										
CICS/VS	22	2	2	3	3	2	2	2	3	3
Dmas	13	2	2	3	2	2	2	2	2	3
DMS	13	3	3	2	2	3	2	2	2	3
General Ledger	16	3	2	2	2	1	1	1	2	3
IMS/VS	66	3	3	3	3	2	2	2	2	3
Mapics	74	3	3	3	3	2	1	2	2	3
Payroll	14	3	2	2	3	2	1	1	2	2
Text Management	18	2	2	1	2	2	2	2	2	2
Infodata Systems, Inc.										
Inquire	11	2	3	2	2	4	3	3	3	3
Innovation Data Processing										
Fats/Fatar	10	2	2	1	2	2	2	3	1	2
FDR	23									
Intel Corp.										
System 2000	21	2	3	2	2	3	3	2	3	3
NOTE: The range of average user ratings attributed to each cluster for each characteristic is as follows:										
Cluster 1:		3.83 to 4.0	3.41 to 4.0	3.41 to 4.0	3.41 to 4.0	3.38 to 4.0	3.21 to 4.0	2.91 to 4.0	3.54 to 4.0	3.61 to 4.0
Cluster 2:		3.51 to 3.82	2.86 to 3.40	2.91 to 3.40	2.89 to 3.40	2.88 to 3.37	2.78 to 3.20	2.41 to 2.90	3.12 to 3.53	3.12 to 3.50
Cluster 3:		3.13 to 3.50	2.21 to 2.85	2.40 to 2.90	2.34 to 2.88	2.29 to 2.87	2.26 to 2.77	1.51 to 2.40	2.82 to 3.11	2.72 to 3.11
Cluster 4:		Below 3.13	Below 2.21	Below 2.40	Below 2.88	Below 2.87	Below 2.26	Below 1.51	Below 3.11	Below 2.72

DATAPRO RESEARCH CORP. CHART

User ratings of s

Vendor and Package Name	No. Ratings Received	Significant Advantages Noted by Users					Significant Disadvantages Noted by Users						Did Package Perform as Vendor Promised			Did Package Result in Dollar Savings		
		Simple	Flexible	Inexpensive	Saves System Resources	Saves Human Resources	Inflexible	Costly	Complex	Slow	Uses Excessive Resources	Lacks Key Capabilities	Yes, Immediately	Yes, Eventually	Never	Yes	No Savings	Lost Money
Macro 4, Inc.																		
Dumpmaster	15	—	7	8	10	15	1	2	—	—	—	3	—	—	—	13	—	—
Logout	18	11	12	9	13	16	—	1	—	—	—	—	—	—	—	10	4	—
Management Science America, Inc.																		
General ledger	10	6	7	4	3	7	—	3	—	2	3	—	8	2	—	7	1	—
Payroll	13	4	8	1	4	8	3	8	5	2	6	1	7	5	1	8	4	1
Mathematica Products Group, Inc.																		
Ramis II	27	19	24	2	3	25	2	6	—	5	8	5	20	—	—	22	3	—
Medical Information Technology, Inc.																		
Mis	18	12	14	—	10	10	—	—	—	4	—	—	18	—	—	13	—	—
McCormack & Dodge Corp.																		
General Ledger	25	12	20	2	5	17	2	12	9	8	12	2	11	13	1	18	4	2
Micropro International Corp.																		
Wordstar	29	12	18	16	10	16	5	—	10	3	1	4	24	5	—	24	4	—
Microsoft Corp.																		
Multiplan	14	12	10	12	4	10	2	1	1	1	—	2	13	1	—	11	3	—
Monno Associates, Inc.																		
TSO/MON	10	—	4	—	4	10	—	—	—	—	—	—	—	—	—	8	—	—
On-line Software International, Inc.																		
Intertest	29	8	16	3	11	29	—	5	9	—	—	—	23	6	—	22	—	—
Omnilink	22	13	9	7	7	12	1	4	1	—	—	4	19	—	—	17	—	—
Oracle Corp.																		
Oracle	30	10	20	—	4	22	—	—	2	8	—	5	13	—	—	18	3	—
Oxford Software Corp.																		
UFO	12	—	9	—	—	12	—	—	—	—	—	—	12	—	—	12	—	—
Pace Applied Technology, Inc.																		
Komand	22	4	15	—	1	15	—	—	8	2	1	—	16	—	—	11	—	—
Panesophic Systems, Inc.																		
Easytrieve	32	26	24	10	10	27	—	2	1	1	2	3	31	1	—	29	2	—
O-W-L	16	8	10	6	6	16	—	2	—	—	—	—	16	—	—	12	—	—
Panexec	10	7	8	5	—	7	2	2	2	2	1	1	8	—	—	6	3	—
Panvalet	21	7	10	4	7	12	—	—	—	—	—	2	13	2	—	14	1	—
Para Research, Inc.																		
Easycalc	10	8	5	9	6	9	2	—	—	5	1	3	9	1	—	8	1	—
Easytext	17	9	8	14	4	11	3	—	5	5	3	5	13	1	1	9	5	—
Phoenix Computer Corp.																		
Condor	36	30	34	13	—	36	—	—	—	—	—	—	32	6	—	31	—	—

DATAPRO RESEARCH CORP. CHART

oftware packages

Vendor and Package Name	No. of User Ratings Received	Hierarchical Cluster Groupings								
		Reliability	Efficiency	Ease of Installation	Ease of Use	Vendor's Technical Support			Vendor's Maintenance	Overall Satisfaction
						Troubleshooting	Documentation	User Education		
Lawson Associates, Inc.										
GAS	11	3	3	2	2	2	3	2	3	3
Lotus Development Corp.										
1-2-3	85	2	1	2	2	2	2	1	3	2
Macro 4, Inc.										
Dumpmaster	15	1	1	1	1	2	3	4	2	1
Logout	18	1	1	1	1	2	2	4	1	1
Management Science America, Inc.										
General Ledger	10	2	3	3	2	3	2	1	4	3
Payroll	13	4	3	4	3	4	3	2	3	4
Mathematica Products Group, Inc.										
Ramis II	27	3	3	1	1	3	2	2	3	2
Medical Information Technology, Inc.										
Miis	18	1	1	1	1	1	2	3	1	1
McCormack & Dodge Corp.										
General Ledger	25	3	3	3	2	3	3	1	3	3
Micropro International Corp.										
Wordstar	29	2	2	2	2	3	2	2	4	2
Microsoft Corp.										
Multiplan	14	2	2	1	2	2	2	1	3	2
Morino Associates, Inc.										
TSO/MON	10	1	1	2	2	1	2	3	1	2
On-line Software International, Inc.										
Intertest	29	1	1	1	2	1	2	3	1	1
Omnilink	22	2	1	2	2	1	1	3	2	2
Oracle Corp.										
Oracle	30	4	3	2	1	3	3	3	3	3
Oxford Software Corp.										
UFO	12	3	3	2	1	2	2	2	3	2
Pace Applied Technology, Inc.										
Komand	22	2	2	2	2	2	1	2	2	2
NOTE: The range of average user ratings attributed to each cluster for each characteristic is as follows:										
Cluster 1:		3.83 to 4.0	3.41 to 4.0	3.41 to 4.0	3.41 to 4.0	3.38 to 4.0	3.21 to 4.0	2.91 to 4.0	3.54 to 4.0	3.51 to 4.0
Cluster 2:		3.51 to 3.82	2.86 to 3.40	2.91 to 3.40	2.89 to 3.40	2.88 to 3.37	2.78 to 3.20	2.41 to 2.90	3.12 to 3.53	3.12 to 3.50
Cluster 3:		3.13 to 3.50	2.21 to 2.86	2.40 to 2.90	2.34 to 2.88	2.29 to 2.87	2.26 to 2.77	1.51 to 2.40	2.82 to 3.11	2.72 to 3.11
Cluster 4:		Below 3.13	Below 2.21	Below 2.40	Below 2.88	Below 2.87	Below 2.26	Below 1.51	Below 3.11	Below 2.72

DATAPRO RESEARCH CORP. CHART

User ratings of

Vendor and Package Name	No. Ratings Received	Significant Advantages Noted by Users					Significant Disadvantages Noted by Users						Did Package Perform as Vendor Promised			Did Package Result in Dollar Savings		
		Simple	Flexible	Inexpensive	Saves System Resources	Saves Human Resources	Inflexible	Costly	Complex	Slow	Uses Excessive Resources	Lacks Key Capabilities	Yes, Immediately	Yes, Eventually	Never	Yes	No Savings	Lost Money
Programart																		
Strobe	19	10	3	5	12	9	1	—	2	—	—	—	15	—	—	14	1	—
Quodata Corp.																		
QDMS	13	8	10	6	—	11	—	—	—	6	—	—	7	6	—	—	—	—
SAS Institute, Inc.																		
SAS	43	27	37	24	7	39	—	7	5	9	15	5	—	—	—	22	15	—
Software AG of North America, Inc.																		
Adabas	19	11	13	—	6	13	—	3	1	2	1	2	16	—	—	16	—	—
Complete	14	7	6	1	3	8	3	2	1	1	2	—	11	3	—	7	4	—
Software International Corp.																		
General Ledger	14	9	12	2	3	12	1	3	1	5	5	1	10	4	—	13	1	—
Software Pursuits, Inc.																		
DOS/MVT/VSE	15	7	14	8	10	—	—	—	—	—	—	—	13	2	—	12	—	—
Software Results Corp.																		
Comboard	14	12	6	—	—	11	—	3	—	—	—	—	11	2	—	11	—	—
SPSS, Inc.																		
SPSS	12	5	8	5	4	9	—	4	4	1	6	1	11	1	—	3	8	—
Sterling Software Marketing																		
DMS/OS	17	12	15	5	15	16	1	1	2	3	—	—	16	1	—	16	—	—
Syncsort, Inc.																		
Syncsort	18	13	15	8	13	9	—	—	—	—	1	—	17	1	—	15	2	—
System Support Software, Inc.																		
Quikjob II	24	16	15	17	7	19	1	—	—	1	1	—	—	—	—	20	—	1
Tone Software Corp.																		
Tone	15	3	11	4	9	13	—	3	1	—	—	—	—	—	—	12	—	—
Tower Systems International																		
Epic/VSE	14	7	12	4	—	14	—	—	—	—	—	—	—	—	—	10	2	—
TSI International																		
Data Analyzer	23	13	18	2	7	21	1	5	4	2	3	3	—	—	—	18	1	—
Data Catalog 2	10	7	8	4	4	5	1	—	1	3	—	2	—	—	—	4	2	—
Universal Software, Inc.																		
Ados	29	23	17	18	20	23	1	1	—	3	2	5	26	—	—	25	3	—
Uccel Corp.																		
UCC-1	35	10	13	—	9	—	2	—	5	—	—	—	30	4	—	30	—	—
UCC-7	30	13	14	3	6	23	—	2	5	1	1	—	20	9	—	25	1	—
UCC-10	17	3	7	—	—	10	3	—	7	—	—	2	10	—	—	8	5	1
UCC-11	14	7	—	5	10	8	1	—	1	1	—	—	13	—	1	13	—	—

DATAPRO RESEARCH CORP. CHART

software packages

Vendor and Package Name	No. of User Ratings Received	Hierarchical Cluster Groupings								
		Reliability	Efficiency	Ease of Installation	Ease of Use	Vendor's Technical Support			Vendor's Maintenance	Overall Satisfaction
						Trouble-shooting	Documentation	User Education		
Pansophic Systems, Inc.										
Easytreve	32	2	1	1	1	2	1	2	2	1
O-W-L	16	1	1	1	1	2	1	2	3	1
Panexec	10	1	2	3	2	3	2	4	2	2
Panvalet	21	2	1	1	1	2	2	2	2	2
Para Research, Inc.										
Easycalc	10	3	2	2	2	2	1	2	3	3
Easytext	17	3	3	1	3	2	2	2	2	3
Phoenix Computer Corp.										
Condor	36	1	1	2	1	2	2	3	2	1
Programart										
Strobe	19	2	1	1	1	2	2	2	2	2
Quodata Corp.										
QDMS	13	1	2	1	1	1	1	2	1	1
SAS Institute, Inc.										
SAS	43	1	2	2	1	2	2	2	2	2
Software AG of North America, Inc.										
Adabas	19	1	1	1	1	2	2	2	2	1
Complete	14	2	2	1	2	3	3	3	4	2
Software International Corp.										
General Ledger	14	3	3	3	2	3	3	2	3	3
Software Pursuits, Inc.										
DOS/MVT/VSE	15	1	1	1	1	1	2	2	1	1
Software Results Corp.										
Comboard	14	2	1	1	1	2	2	3	2	2
SPSS, Inc.										
SPSS	12	2	2	1	2	2	2	2	3	2
Sterling Software Marketing										
DMS/OS	17	2	1	1	1	2	1	2	2	1
Syncsort, Inc.										
Syncsort	18	2	1	1	1	1	1	1	2	1
System Support Software, Inc.										
Quikjob II	24	1	1	1	1	2	2	3	2	1
Tone Software Corp.										
Tone	15	2	1	2	1	2	2	2	2	1
NOTE: The range of average user ratings attributed to each cluster for each characteristic is as follows:										
Cluster 1:		3.83 to 4.0	3.41 to 4.0	3.41 to 4.0	3.41 to 4.0	3.38 to 4.0	3.21 to 4.0	2.81 to 4.0	3.54 to 4.0	3.51 to 4.0
Cluster 2:		3.51 to 3.82	2.86 to 3.40	2.91 to 3.40	2.89 to 3.40	2.88 to 3.37	2.78 to 3.20	2.41 to 2.80	3.12 to 3.53	3.12 to 3.50
Cluster 3:		3.13 to 3.50	2.21 to 2.85	2.40 to 2.90	2.34 to 2.88	2.29 to 2.87	2.26 to 2.77	1.51 to 2.40	2.82 to 3.11	2.72 to 3.11
Cluster 4:		Below 3.13	Below 2.21	Below 2.40	Below 2.88	Below 2.87	Below 2.26	Below 1.51	Below 3.11	Below 2.72

DATAPRO RESEARCH CORP. CHART

User ratings of

Vendor and Package Name	No. Ratings Received	Significant Advantages Noted by Users					Significant Disadvantages Noted by Users						Did Package Perform as Vendor Promised			Did Package Result in Dollar Savings		
		Simple	Flexible	Inexpensive	Saves System Resources	Saves Human Resources	Inflexible	Costly	Complex	Slow	Uses Excessive Resources	Lacks Key Capabilities	Yes, Immediately	Yes, Eventually	Never	Yes	No Savings	Lost Money
Value Computing, Inc.																		
DCMS	12	—	11	—	6	11	—	2	—	—	—	2	11	—	1	10	2	—
Valu-Lib	10	3	8	3	2	8	—	—	2	—	—	—	8	1	—	8	—	—
Westinghouse Electric Corp.																		
Disk Utility System	20	18	17	14	16	14	—	—	—	—	1	—	12	8	—	18	1	—
Scepter-Plus	10	10	10	—	10	10	—	—	—	—	—	—	6	4	—	8	—	—
Westi	15	10	11	8	12	11	—	—	—	—	—	—	—	—	—	10	1	—

DATAPRO RESEARCH CORP. CHART

software packages

Vendor and Package Name	No. of User Ratings Received	Hierarchical Cluster Groupings								
		Reliability	Efficiency	Ease of Installation	Ease of Use	Vendor's Technical Support			Vendor's Maintenance	Overall Satisfaction
						Troubleshooting	Documentation	User Education		
Tower Systems International										
Epic/VSE	14	2	1	1	1	2	2	3	2	1
TSI International										
Data Analyzer	23	2	1	3	2	3	3	3	3	3
Data Catalog 2	10	3	2	1	2	3	3	4	3	2
Universal Software, Inc.										
Ades	29	2	2	2	1	2	3	4	2	2
Uccel Corp.										
UCC-1	36	1	1	2	1	2	2	3	2	2
UCC-7	30	1	1	2	2	2	3	2	2	1
UCC-10	17	2	3	3	3	3	3	3	3	3
UCC-11	14	1	1	2	1	2	2	3	3	2
Value Computing, Inc.										
DCMS	12	1	1	3	2	3	2	2	3	2
Valu-Lib	10	2	2	3	2	2	4	3	3	3
Westinghouse Electric Corp.										
Disk Utility System	20	1	1	1	1	2	1	2	1	1
Scepter-Plus	10	1	1	1	1	1	1	1	1	1
Westi	15	1	1	1	1	2	1	2	2	1
NOTE: The range of average user ratings attributed to each cluster for each characteristic is as follows:										
Cluster 1:		3.83 to 4.0	3.41 to 4.0	3.41 to 4.0	3.41 to 4.0	3.38 to 4.0	3.21 to 4.0	2.91 to 4.0	3.54 to 4.0	3.51 to 4.0
Cluster 2:		3.51 to 3.82	2.86 to 3.40	2.91 to 3.40	2.89 to 3.40	2.88 to 3.37	2.78 to 3.20	2.41 to 2.90	3.12 to 3.53	3.12 to 3.50
Cluster 3:		3.13 to 3.50	2.21 to 2.85	2.40 to 2.90	2.34 to 2.88	2.29 to 2.87	2.26 to 2.77	1.51 to 2.40	2.62 to 3.11	2.72 to 3.11
Cluster 4:		Below 3.13	Below 2.21	Below 2.40	Below 2.88	Below 2.87	Below 2.26	Below 1.51	Below 3.11	Below 2.72

DATAPRO RESEARCH CORP. CHART

Banks eye interlinking networks to boost transactions

By Bryan Wilkins
CW Washington Bureau

NEW ORLEANS — The U.S. banking industry is on the verge of major institutional changes in its way of doing business, thanks to data processing and telecommunications technology.

In Europe, bank customers have grown accustomed to universal acceptance of checks, walking into any bank and obtaining cash or making deposits. Generally, banks are interlinked into one vast network.

In the U.S., however, sharing proprietary automated teller machine to networking that banks have moved.

According to John Langor, vice-president of Datek Instacard, a regional ATM network in Buffalo, N.Y., who addressed bankers recently at the American Bankers Association's conference on telecommunications and financial networks, financial institutions that developed independent ATM networks are reluctant to give other banks a shot at their customers by sharing or interlinking resources.

Progress was slow enough to permit an opportunity for third parties and retailers to develop their own systems for debit and customer purchases, according to Langor, who cited the example of Publix Super Markets, Inc. in Florida, and Wegmans Food Markets, Inc. grocery store chain in upstate New York.

Wegmans, which has 43 ATMs in 33 stores, is averaging 5,000 transactions per month for each ATM.

"Food retailers have been willing to join battle with the banks because they do as much banking business as banks," Langor said.

While the growth in the use of debit cards by customers has been pushed by retail food establishments, banks have been more reluctant to accommodate them, fearing loss of lucrative credit card revenue, Langor said.

Point-of-sale (POS) technology is being acquired by retail establishments that see advantages of instant collection or deposit of a customer's cash into their own accounts. The costs, according to Langor, justify the move.

Payment by bank cards costs the retailer an average of $1.62, while payment by check costs an estimated 46 cents and the POS transaction costs the retailer an average of 11½ cents.

Looking into the future, Langor predicted that regional ATM nets will recognize the potential in the growth of POS use by the retailers driving its development.

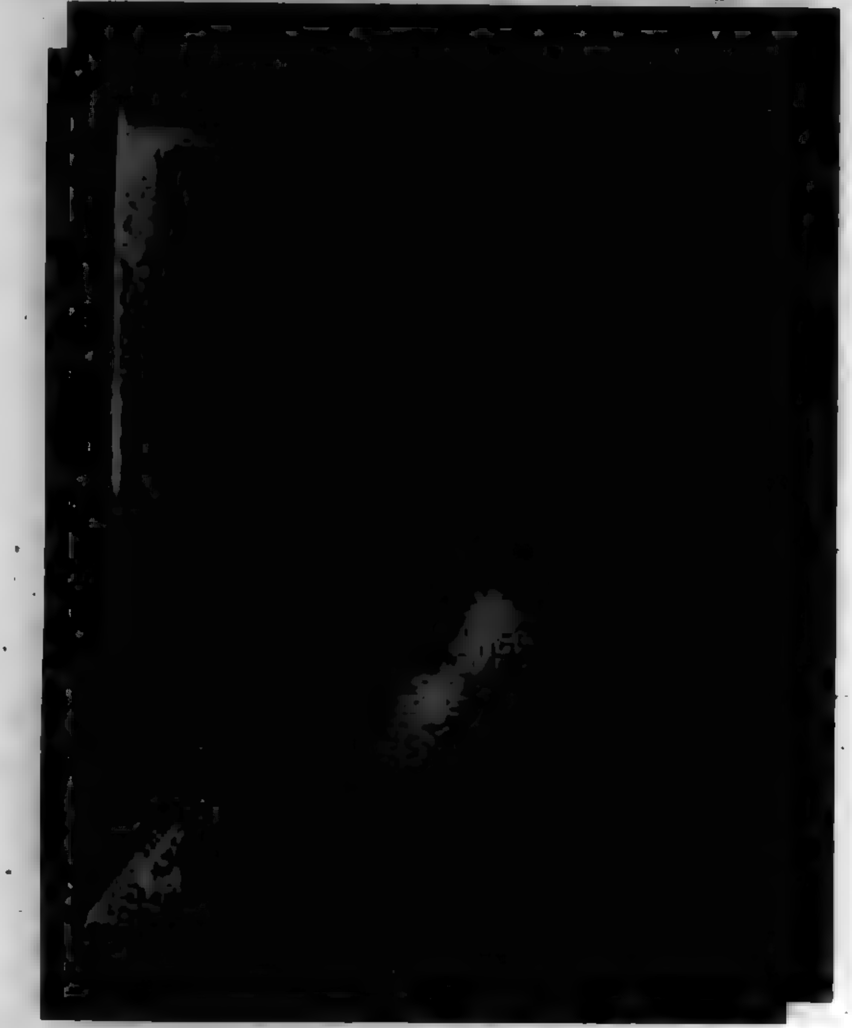
Datek Instabank, New York's largest shared ATM network, has recently signed an agreement with New York Telephone Co. to act as a payment agent for customer bills as part of its campaign to boost use of its facilities.

"We have looked elsewhere for volumes, and I think other regional ATM switches will do the same," added Langor, who cited long-distance companies; gas, electric and water utilities; food stamps; and all other types of payments as areas of growth for ATM machines.

Currently, Instabank has 418 ATM machines representing 19 financial institutions and customers with one million cards.

"Through interchanges with [five] other regional networks, we boost our reach and grasp fourfold," Langor said. Banks that were not part of a regional or shared ATM network are faced with customer complaints, he added.

According to Langor, the future role of banks in harnessing the use of electronic payment systems is still up in the air.



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Chicago ACM slates seminars

CHICAGO — The Chicago Chapter of the Association for Computing Machinery (ACM) has announced two one-day seminars, one on information centers and another on legal issues, to be held at the Holiday Inn Chicago City Centre here.

Ray E. Youstra of IBM, chairman of the first seminar, "Effecive Strategies for Information Center Success," plans to address such issues as managing an information center, evaluating the center's success and promoting its growth. The present and future role of personal computers in information centers is also a scheduled topic of the seminar, set for March 30.

Thomas J. Smedinghoff of the law firm McBride, Baker & Coles will address legal concerns of individuals who own, operate or are employed by a computer business. The legal seminar is scheduled for April 20.

The registration fee up to one week before each seminar is $50 for members of the ACM's Chicago chapter and $58 for nonmembers. After that period, registration fees are $60 for members and $68 for nonmembers.

More information on the two ACM seminars is available from Sharon Pryce Kaminecki, ACM, Chicago Chapter, P.O. Box 2381, Chicago, Ill. 60690.

AT&T submits reorganization plan, asks FCC waiver

WASHINGTON, D.C. — AT&T has proposed a reorganization of itself and its Information Systems subsidiary if and when the Federal Communications Commission relaxes conditions laid down by its Second Computer Inquiry decision.

The communications giant is seeking a waiver to share systems from parts of its AT&T Technologies and Bell Laboratories sectors with AT&T Information Systems. The systems involved integrate design and development, manufacturing, material logistics, marketing and sales.

AT&T said that under its proposal, AT&T Information Systems will be structured as three integrated lines of business: large business systems, consumer and general business systems and computer systems.

AT&T Information Systems will also create a separate service organization to provide installation, maintenance and material logistic support to all three units.

Specifically, AT&T revealed that it wants to transfer six factories and their employees to AT&T Information Systems. Two of the factories are producing equipment for Teletype Corp., and the other four factories are manufacturing equipment for AT&T Technologies.

All of the factories are using locally developed computerized production facilities as well as centrally developed systems for payroll; manufacturing, purchasing and cost bulletins. AT&T said no proprietary information or network information would be transferred to AT&T Information Systems with the reorganization.

AT&T said that the reorganization can be delayed no longer and that it could not afford "piecemeal waivers of the structural separation requirements" while its competitors, "unfettered by such restrictions, have continued to move swiftly in entering upon new business arrangements and ventures."

AT&T's action came two weeks after the FCC opened a formal rule-making process inviting public comment on a plan to permit joint marketing of equipment with AT&T's regulated common-carrier services, such as Wats and private line, by eliminating the separation rules [CW, Jan. 28].

EFT expo set for March

SAN FRANCISCO — The annual convention and exposition of the Electronic Funds Transfer (EFT) Association will be held here March 25-27 at the Fairmont Hotel.

Dee W. Hock, special adviser to the board of Visa International, will deliver the keynote address at the opening session of the conference. Hock reportedly was instrumental in the formation of both Visa U.S.A., Inc. and Visa International.

Among the topics to be addressed at the conference will be retail networks, the future of EFT, the benefits of point-of-sale systems and the future role of regional automated teller machine networks.

There will also be two forums on videotex services.

Conference registration is $650 for nonmembers and $525 for members.

Spouse registrations cost $150.

The EFT Association can be reached through P.O. Box 66200, Washington, D.C. 20035.

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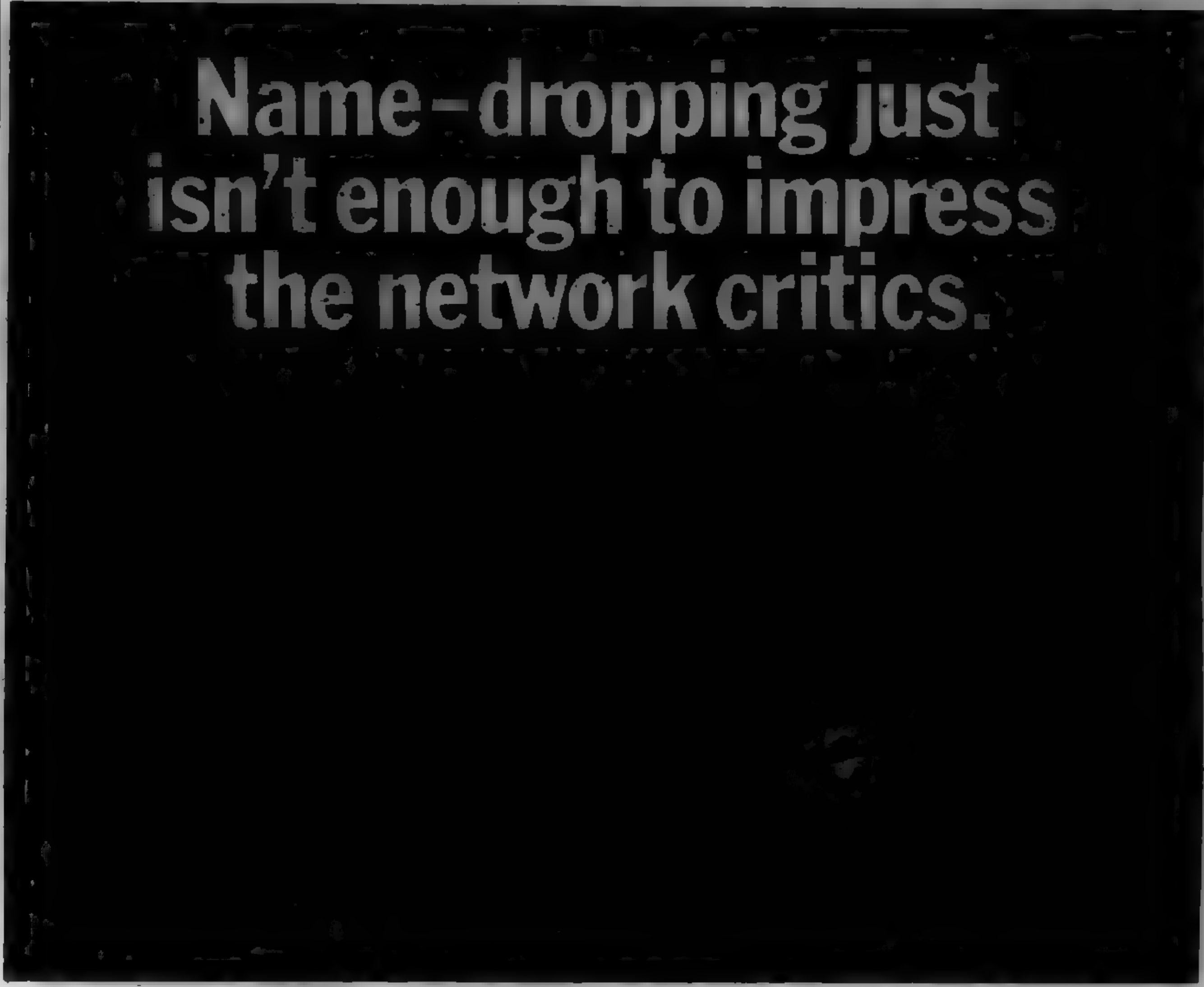
Name-dropping just isn't enough to impress the network critics.

Now that the local area network (LAN) industry is booming, some pretty big names in the computer business are jumping on the bandwagon. Their goal is simple: get a LAN on the market and let all those who pay homage to The Name run out and buy it.

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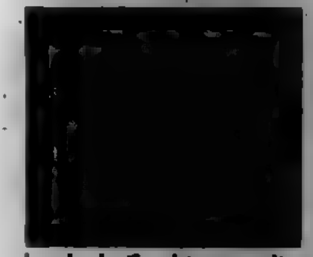

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No LAN operating software outperforms NetWare. With speed, flexibility, security and hundreds of multiuser applications, NetWare sets a standard for the entire LAN industry.

Versatility.

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Alaskan project's mini system charts Eskimo habitats

By [illegible]
CW Staff

ANCHORAGE, Alaska — The North Slope Borough (NSB) of Alaska is home to a few thousand Eskimos in eight small villages scattered across the ice who hunt, fish and gather vegetation for their subsistence.

It is also home to a minicomputer and a software system that is gathering knowledge about Eskimo habitats to help control conflicts between the natives' subsistence living and industrial interests.

The director of the NSB Geographical Information System project here, Earl Nordstrand, said that the Eskimos are collecting data from elders in the villages, adding it to data collected from a Landsat satellite, digitizing it and mapping geographic data so they can analyze their land. The information helps to determine if land use permits should be granted or not, he said.

Geographic problems

The borough is about the size of California, Nordstrand said, and the villages are far apart from each other. Traveling is difficult on the ice and tundra, and in the past, it was hard to know the consequences of granting a permit to oil, coal or mineral companies for each piece of the land because the people who issue the permits could not visit each site, he said.

With the Geographical Information System — developed by Environmental Systems Research Institute of Redlands, Calif. — NSB administrators can type in the position of the requested permit to locate the area, Nordstrand said.

The system "cookie cuts" through all the maps in the data base to find out what is near the location, he said. The system then compiles information and runs a series of checks against the laws and regulations of the borough that impose constraints on activities on that land, he added.

Flagging land areas

If an oil company applies for a permit to use land that is a known caribou calving area, for instance, the system will flag the area, tell how many acres are affected and list the scientific evidence about the environment, laws governing that area and any other pertinent information, Nordstrand said.

According to Karla Kolash, a planner in the NSB's coastal management program in Barrow, Alaska, the Geographical Information System is composed of the following four parts:

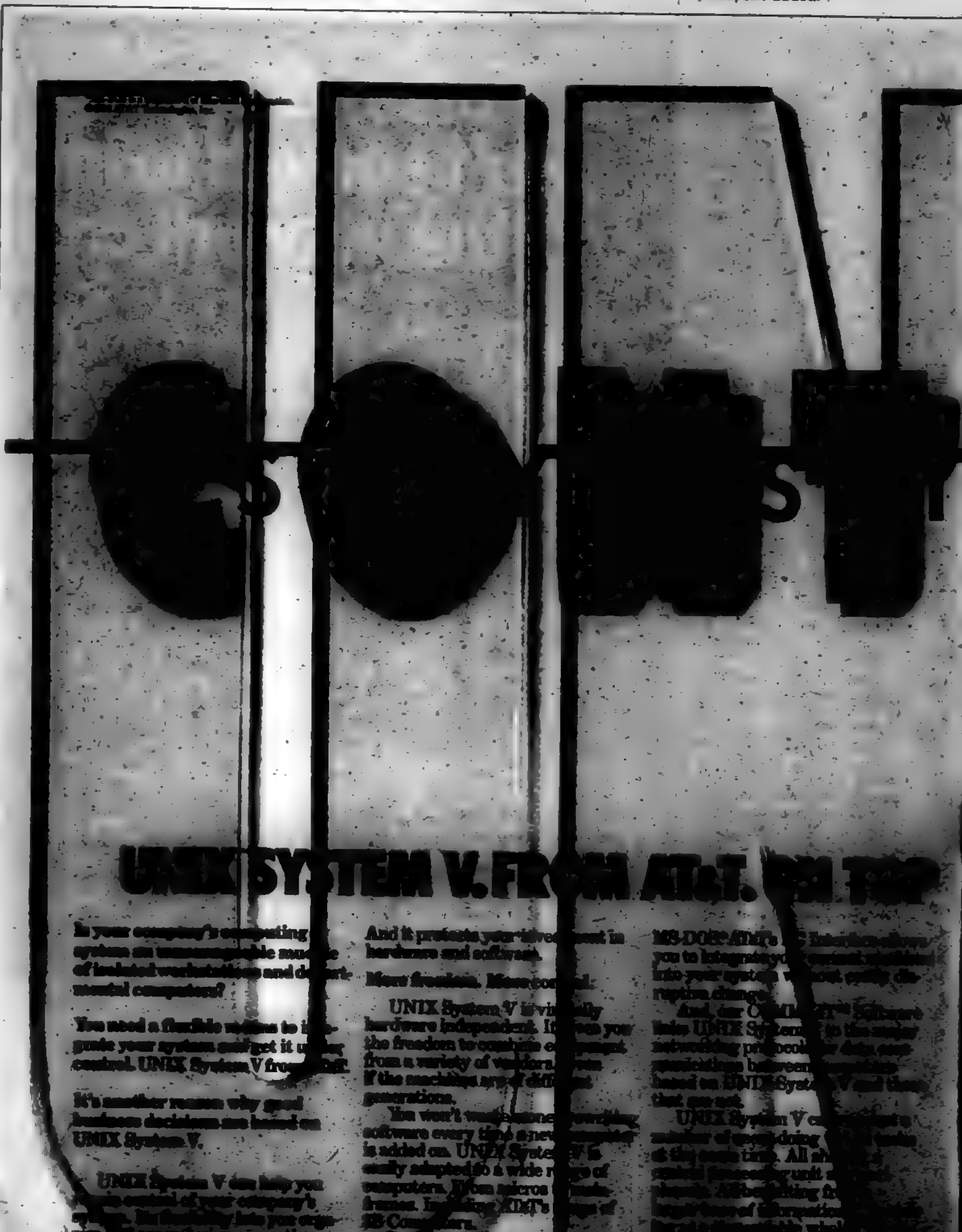
- The Automatic Review and Comment System, which determines proper land use for an area.
- The Library and Information System, which catalogs all bibliographical references.
- Land Records, which contains all tax records and other legal documents, such as mineral rights and ownership of land.
- The Environmental Information System, which contains all information relative to the natural environment, such as the habitats of animals.

The system in Anchorage runs on a Prime Computer, Inc. 550 Model 2 minicomputer and on Tektronix, Inc. and California Computer Products, Inc. plotters. The Barrow office has a Tektronix 4054A computer and a digitizer and plotter, Kolash said.

The NSB currently has connected three villages to Alascom, Inc.'s Alaskanet communications system and will eventually connect all the villages to allow them to share information, Nordstrand said.

A small number of permits are actually denied, Kolash said. "We realize that oil exploration is the source of our economy. We don't say no to [the oil companies]," she said.

If the permitting section refuses a site, the NSB offers an alternative as close as possible to the requested area, she added.



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Automation hushes hubbub for Chemical bank traders

By Charles Babcock
CW New York Bureau

NEW YORK — In a setting where traders once waved their arms and shouted across the room as millions of dollars changed hands, 300 people sit quietly staring at narrow banks of video displays.

Chemical Bank has automated its trading room, the nerve center where major money transactions take place daily, and the traders said they now have more information at their fingertips with less noise.

"There's a huge difference — like day and night," said George Kotsonis, vice-president for retailing municipal bonds and an active trader.

"Before, if I wanted to find out how the municipal bond market opened, I had to either call a broker or get up and go across the room to talk to one of our traders. Now I can check the screen, and that's it," Kotsonis said.

Nearly $65 billion changes hands in the trading room each week, bank officials said.

At a cost of $30 million, Chemical Bank moved its trading room from the tip of Manhattan to its midtown headquarters in November 1984, installed 1,200 telephone lines, 380 miles of cable and 700 monitors and redirected a massive information stream.

Controlling the traders' information flow is a Rich, Inc. modular video switch. News, quotes, bids and other information pours into the trading room from 45 different sources. They total the equivalent of 9,000 pages per day, said Anthony P. R. Herriott, senior vice-president for operations for the bank's capital markets group.

At one time, traders attempted to put monitors on their desks for each information source that they needed. In some cases, that amounted to 14 monitors, each with its own keyboard.

The Rich video switch system allows a variety of sources and functions to be controlled by one keyboard. By pushing preprogrammed keys, a trader can call up the latest information from the numerous available sources and view it on one of the four to eight desktop monitors.

The information is transmitted by page and updated in the blink of an eye, barely detectable to a casual observer watching the screens, Herriott said.

Row upon row of upright Rich modular switching units in what looks like a locker room off the main trading floor provide the processing power for the video system.

Personal Computer [illegible]

Many traders were not computer-oriented before the room was automated, doing their spreadsheet-style calculations or financial modeling on the backs of envelopes and other scrap paper, Herriott said. The bank, however, offered them a 60% discount on an IBM Personal Computer.

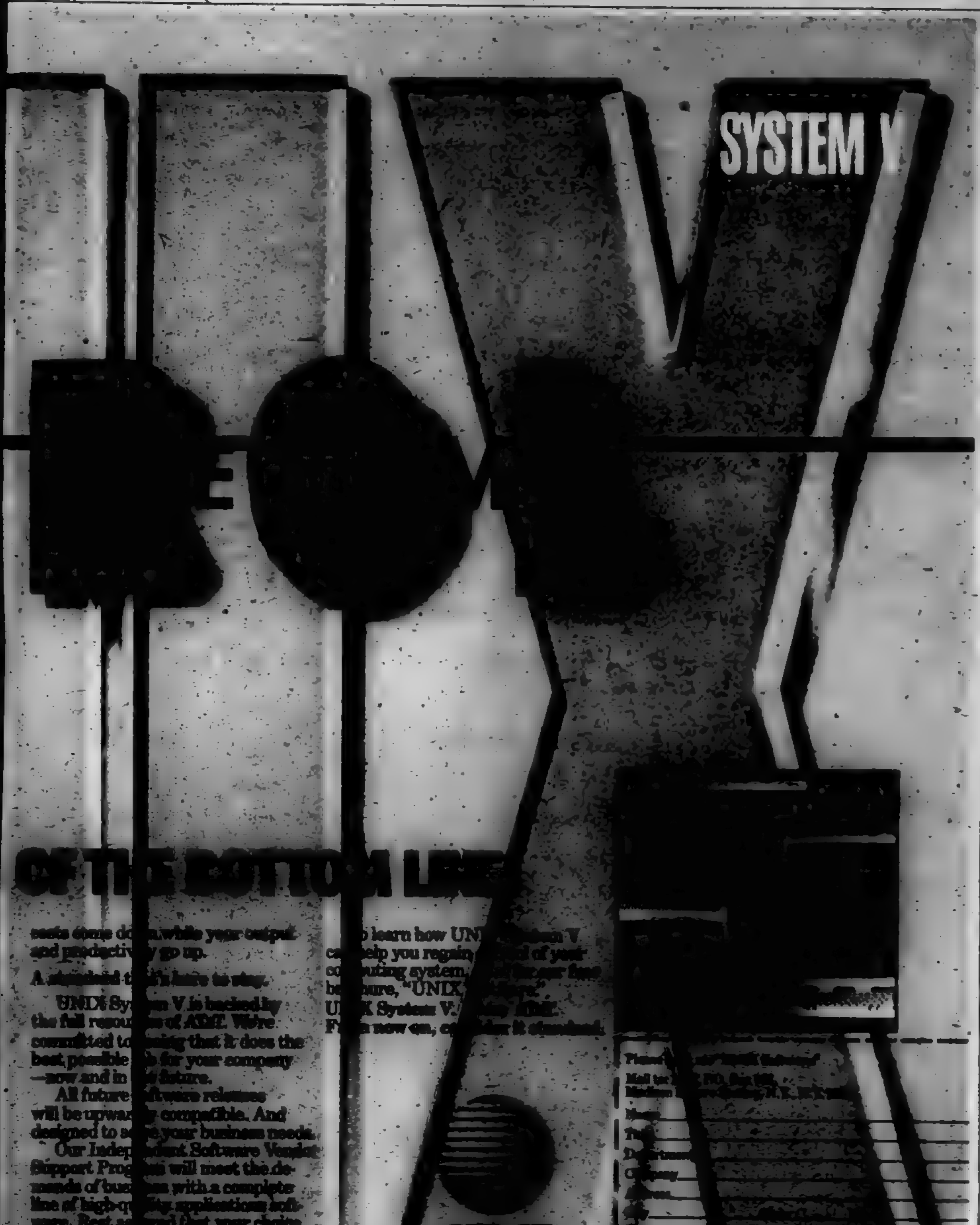
Chemical Bank has developed its own software for processing transactions in municipal bonds and money markets.

The trading activity is processed by four IBM System/38s, each with its own backup unit, which is more processing power than is needed. The bank aimed to establish a system that would allow for growth, Herriott said.

Exchange transaction processing and accounting is controlled by Midas, a software package sold by BIS of the UK. An IBM software package, the Data Page Manager, running on an IBM Series 1, pulls internal trading data out of the System/38s for circulation on the floor.

The Foreign Exchange Information Systems, from the Swedish company Autophon, is the software controlling the foreign exchange information services.

Perkin-Elmer Corp.'s Position Management Information System, running on a PE 8/32 computer, provides the front-end system for trading in the U.S. Department of the Treasury bills and other government securities.



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Firm saves space, time with micrographics

Ace Hardware Corp.'s processing department has cut down on paper with a documentation system upgrade.

OAK BROOK, Ill. — A national hardware wholesaler here uses a micrographics documentation and interactive invoice processing system that utilizes microfilm to minimize file space and provide customers with prompt answers to billing inquiries.

Ace Hardware Corp. sells roughly 40,000 products — ranging from nuts and bolts to crystal glassware — to independently owned stores from its 10 distribution centers. Dealers also purchase products directly from vendors, with all billing processed through corporate headquarters in this Chicago suburb.

Ace has been microfilming accounts payable and accounts receivable documents for 14 years. In 1982, it replaced an Eastman Kodak Co. Miracode retrieval terminal with Eastman Kodak IMT-150 terminals. The upgrade allowed the 60-year-old firm to extract data from documents and enter it into its computer system before microfilming the documentation. With this approach, Ace was able to reap advantages without making extensive changes to its data processing procedures.

To maintain and access information from accounts payable and dealer receivable files, the company combines an IBM 8100 distributed processing system with an IBM 3081 mainframe and three Eastman Kodak IMT-150 microimage terminals.

The company's micrographics file stores an estimated 50 million invoices on 16mm microfilm and is used when more detailed information is needed. The computer assigns and tracks addresses of the four million microfilm documents added to the system each year.

The computer system generates invoice indexes that are output on microfiche as a document retrieval aid. When an invoice must be checked, an Ace staff member finds the document's microfilm location in the microfiche index. The 16mm microfilm magazine is inserted in the IMT-150 terminal, and an operator keys in a document number to call up the image. A paper copy of the invoice can be produced in seconds.

Dan Bushell, the firm's controller, said that during 1983 Ace processed more than one million vendor invoices, averaging four documents per invoice, for the $770 million in goods it purchased. These goods generated more than $800 million in sales, a 9.3% increase over 1982 and a 14.9% increase over 1981. The system easily accommodated these volume increases, Bushell said.

Since it installed two Eastman Kodak Reliant 800 microfilm units and three IMT-150 microimage terminals, Ace has doubled its micrographics staff's productivity while enhancing its ability to give users instant access to information.

The microfilm units reportedly cut microfilming expenses by 44.8%. Since the IMT-150 terminals were added, Ace has been able to reassign some employees to other duties.

Prior to bringing up its micrographics system, Ace took several steps to maximize user acceptance.

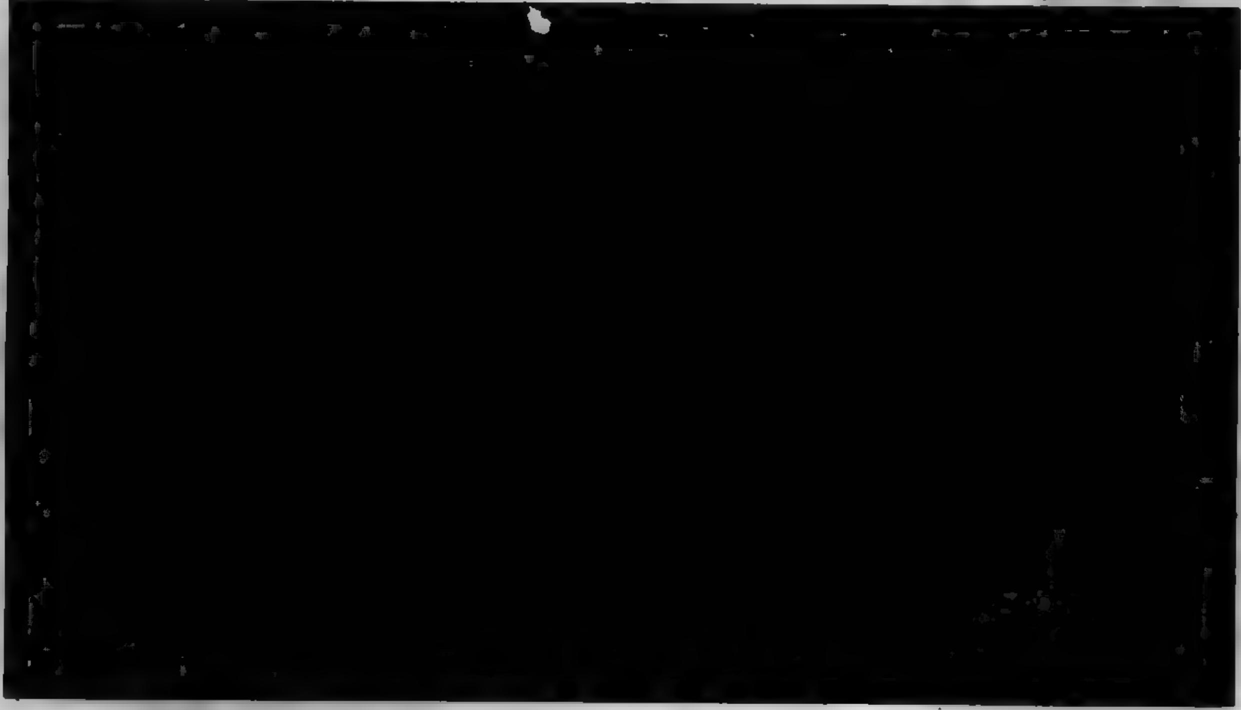
'Virtually no problems'

"We put microfilm operators through two weeks of part-time training," Bushell said. "We also involved them in the decision-making process, and we took them to Kodak's Oak Brook center to make their jobs easier. We experienced virtually no problems when we went live with the system.

"We have perfect microfilm records," Bushell added, expressing confidence in the system and staff. "Since we do not retain the paper copies, the line supervisor responsible for microfilm reviews every roll to ensure consistent quality."

Bella Prager, accounting service manager, said, "We have not had one complaint from any department in the time we've had the new system. Our micrographics system fits our objective of answering every letter or every dealer's request in one day. We're going to answer all correspondence, and we're going to do it very quickly."

The success of the interactive invoice processing and micrographics system has recently prompted other Ace departments to adapt the technology to their needs. The purchase order reconciliation department recently began microfilming purchase orders, eliminating 170 file cabinets in its offices. The application is expected to boost system usage about 30% and add another 1.2 million documents a year to the firm's micrographics file. Bushell expects the conversion to pare that department's record retention costs by 73.6%.



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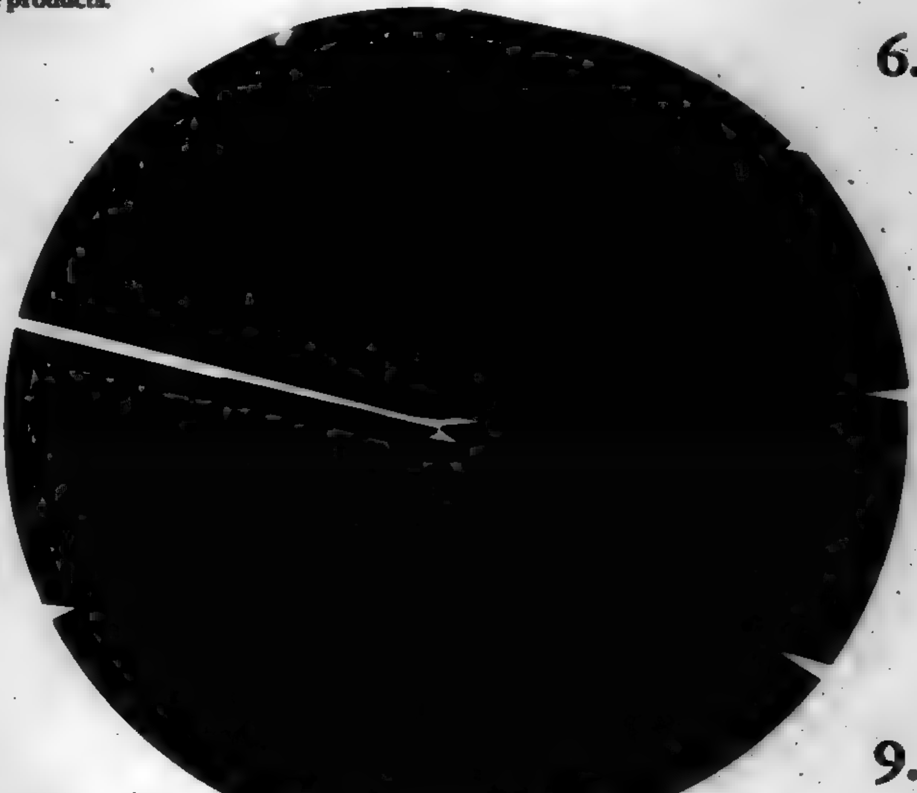
Dr. George Schussel, *President,* Digital Consulting Associates, Inc. is a frequently featured speaker on software productivity issues to both users and vendors of advanced software tools. He holds an M.S. from the Harvard Computation Laboratory and a Doctorate from Harvard Business School. Dr. Schussel will lead the Management Track Session on Day 1 of the Symposium with the expertise and experience which prompted ICP Interface Magazine to call him the "Guru of Data Base Management".

9 REASONS WHY YOU SHOULD ATTEND



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INTERNATIONAL REPORT
CW International
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AUSTRALIA

REGENTS PARK — The installation of Xitel's X-Net broadband local-area network is said to be the first of its kind in the nation. Solarex Pty. Ltd., a producer of silicon solar cells, bought the local-area net as part of its newly constructed production management system.

A Digital Equipment Corp. PDP-11/34 minicomputer connects to the X-Net running the Adam-PMS system developed by Sea. A Sea representative said Solarex needed a local-area net to accommodate its spreading operations.

ENGLAND

LONDON — Four of England's largest banks have selected IBM and British Telecom (BT) as the suppliers for the world's first nationwide, cashless shopping system, according to sources. The system will enable shoppers to make instant, electronic payments.

Lloyds Bank, National Westminster Bank, Barclays Bank International Ltd. and the Midland Bank Ltd. will call on IBM to supply the central computers, and BT will chip in with the network, sources said.

■

DORSET — Two men were sentenced to up to three years for illegally exporting computers to Soviet bloc nations. Bryan Williamson, director of the computer-aided design firm Datalec, and the firm's codirector, Christopher Carrigan, admitted charges of illegally exporting computers and software to Bulgaria and Czechoslovakia, sources reported.

The goods shipped to the communist countries were valued at nearly $2.2 million. Customs officials said both men ignored warnings to end their exporting operations 10 months prior to their arrests.

■

LONDON — Prices for microcomputer applications packages are on the rise as the value of the British pound continues to drop against the American dollar. U.S. software manufacturers Microsoft Corp. and Ashton-Tate hiked the cost of their packages in the UK by 5% to 11%.

Lotus Development Corp. is expected to follow suit shortly by jacking up the prices of its 1-2-3 and Symphony packages by approximately 9%.

FINLAND

HELSINKI — Northern Telecom, Inc. is buying more Finnish-made personal computers for its Vienna office automation series. Nokia, Finland's largest privately owned company, has joined forces with Northern Telecom in a four-year OEM deal said to be worth $40 million.

A Nokia plant being built here is expected to produce more than 25,000 micros in 1985, with Northern Telecom expected to buy one-third of that total. The recent agreement followed a year-old pact under which Nokia delivered several thousand micros to Northern Telecom.

KOREA

SEOUL — U.S. semiconductor maker Intel Corp. has licensed the Korean firm Samsung to manufacture and market its products in Korea. Samsung, which posted a 1984 revenue of $9 billion, produces semiconductors and telecommunications systems.

NETHERLANDS

AMSTERDAM — Prime Computer, Inc. has chosen Schiphol Dutch International Airport as its European distribution site. Damco Distribution International will handle Prime's distribution activities in Europe at Schiphol.

■

AMSTERDAM — Five communications consultants have teamed up to work on a European fiber-optic network to be called the Transnational Broadband Backbone. The net will overlay existing European infrastructures and initiate additional broadbands in major European cities. According to the consortium, the proposed network will connect 10 densely populated cities and business centers.

WEST GERMANY

FRANKFURT — Commodore Business Machines, Inc. unveiled its CBM Personal Computer line at the Microcomputer 1985 computer show here. Commodore rolled out the PC-10, a micro with a 256K-byte random-access memory and 360K-byte floppy drives, and the PC-20, which is compatible with IBM's Personal Computer XT and features a 10M-byte hard disk. The machines are not yet scheduled for an appearance in the U.S.

COMPUTER WORLD

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Realia COBOL is priced at $995, including one year of maintenance and upgrades. Subsequent maintenance and upgrade contracts are currently priced at $125/year/copy. Available for the IBM PC, PC XT, 3270 PC, PC AT, PC-compatibles, and the TANDY 2000.

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NEWS

OFF THE PRESS
George Harrar

BOOK REVIEWS

THE HUMAN FACTOR IN COMPUTER CRIME
By Julia Van Duyn

This book proposes the "keep your employees happy" means to computer crime prevention.

Sure, you can batten down the mainframe and lock up the software from outsiders, but the insiders, with their often-easy means to abuse the privilege, remain. Do not give them the motivation, the author writes: "Get management to subscribe to a computer security program that is based on the acknowledgment and appreciation of the fact that a *disgruntled employee* is a potential computer criminal, while a *satisfied employee* is the best deterrent a company can have against computer crime."

The problems with this approach are many. How can management keep all employees satisfied? It only takes one to rip open a computer system. And why presume that anger at a company is the primary motivator of computer abuse or crime? Greed, mischievousness, adventure, foolhardiness, financial problems, mental instability and desire for power can all motivate even the most corporately satisfied employee to abuse the computer at his fingertips.

An emphasis on worker satisfaction necessarily means management must be convinced, persuaded, asked, involved, assisted and prevailed upon — as the author says — to establish the proper security environment. DP plays the support role, the advocate of control.

"Unless employees are security conscious, *computer abuse and other computer crimes are quite possible* in any organization," the author says. Management must create a climate of security, a policy directed to the whole company, not just DP's part of it.

Personnel checks should not end, as they often do now, when a new worker is hired: "Unless there is an affirmative personnel follow-up system ensuring that employees' performances and skills are routinely reviewed, updated via some type of performance evaluation system and considered in a well-structured career-pathing, the probability that an employee (without any prior criminal record) becomes disgruntled and turns to some form of computer crime is always present."

Signs of discontentment include excessive absenteeism, tardiness, sudden low-quality or low-output performance, complaints and putting off vacation. By talking to the employee showing discontentment, the DP manager "can minimize if not completely eliminate job frustration and consequent possible security threats."

A human-factored security policy mandates that computer operators never be allowed to make program changes, programmers never operate the computer, personnel are rotated in jobs, employees take annual vacations and that two people must be present in the computer room at all times.

Case stories, some of them very familiar by now, illustrate the human factor at work in crime. Stanley Mark Rifkin committed a $10.2 million electronic funds transfer from Security Pacific National Bank in Los Angeles. The former consultant got past the security guard by flashing an outdated identification badge. In the wire-transfer room, he found the day's security code posted on the wall.

Chapter three of the book deals with this security breach by prescribing sensible physical measures, which have nothing to do with worker satisfaction.

The book rightfully targets "terminals, whether local or remote, stand-alone or mainframe-connected, dumb or intelligent, typewriter or video display type, [as] the most vulnerable devices in today's on-line computer systems, bar none."

A few software security packages are described that combat this threat, including Michael Blank's Intruder Detection System. In its on-line version, the Intruder security system plays along with an intruder who is using an invalid password in order to learn his intent and gather evidence for prosecution.

For some unfathomable reason, this book includes 15 pages on the Hay System, a means of describing and evaluating qualifications important to any job. The space would have been better filled by more product-specific information.

Hardcover, 162 pages, $24.95, ISBN 089433-256-2. Petrocelli Books, Inc., Research Park, 251 Wall St., Princeton, N.J. 08540.

THE HUMAN INTERFACE: WHERE PEOPLE AND COMPUTERS MEET
By Richard Bolt

Welcome to "Dataland"! The room is your terminal, and your voice and fingers guide you to the data.

This slim book investigates the concepts and situations promoting "completely natural dialogue or interaction between machines and human beings." ("Natural" here means natural for humans, of course. If computers could "prefer," no doubt they would choose a less taxing means of communicating than human speech recognition and synthesis.)

The Defense Advanced Research Projects Agency (Darpa) funded this research into spatial data manage-

See BOOKS page 37

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CALL FOR PAPERS

1985 CONFERENCE ON FACTORY AUTOMATION MODELS AND STANDARDS

Gaithersburg, Md., Nov. 20-21

Conference organizers are now seeking papers addressing issues of factory models, including descriptions of proposed models for automated manufacturing systems, the philosophy behind such factory models, interface between levels of the model and the functions performed at each level, problems encountered in implementing the models and the associated data base management systems and communications networks.

Abstracts of proposed papers, approximately 250 words in length, should be submitted before May 15 to Dr. A.T. Jones, A127 Metrology Building, National Bureau of Standards, Gaithersburg, Md. 20899. Final papers are due by July 15.

TWELFTH ANNUAL CONFERENCE ON COMPUTER GRAPHICS AND INTERACTIVE TECHNIQUES

San Francisco, July 22-26

Artists using computer graphics in a variety of media such as sculpture, photography and video are encouraged to enter their work for consideration. Deadline for entries is March 15. To receive details contact: Sigraph '85, Conference Services Office, Smith, Bucklin and Associates, Inc., Chicago, Ill. 60601.

THE NINTH WESTERN EDUCATIONAL COMPUTING CONFERENCE

Oakland, Calif., Nov. 21-22

Papers are now being sought that deal with computers and computer applications in any area that might be of interest to instructors and administrative personnel dealing with computers at the college or university level.

Send two copies of original papers to Dr. Virginia S. Lashley, Glendale College, 1500 N. Verdugo Road, Glendale, Calif. 91208.

IEEE, INC. GLOBAL TELECOMMUNICATIONS CONFERENCE FOR 1985 (GLOBECOM '85)

New Orleans, Dec. 2-5

Original papers are being accepted on virtually all facets of telecommunications. Authors are particularly encouraged to submit papers addressing the conference theme, "Communication Technology to Provide New Services." Miniconferences consistent with this theme are planned on network integration, communications software and communications terminals.

Papers are due by April 22. For more information contact D.P. Dodd, Technical Program Chairman, Bell South Services, P.O. Box C360, 4th Floor, Birmingham, Ala. 35283.

10TH CONFERENCE ON LOCAL COMPUTER NETWORKS

Minneapolis, Oct. 7-9

Papers are being solicited in the following areas: new technologies and research results, user experience, measured performance, mid-level protocols, interoperation of different local computer networks, personal computer local networks and integrated services using local computer networks. Papers in related areas will be considered.

Submit three copies of each paper by May 1 to Dale N. Murray, Program Chairman, 10th Conference on Local Computer Networks, TRW, Inc., Software and Information Systems, Requirements Analysis and Test Department, 213 Wynn Drive, Huntsville, Ala. 35805.

THIRD ANNUAL CONFERENCE OF THE AMERICAN VOICE INPUT/OUTPUT SOCIETY (AVIOS)

San Francisco, Sept. 10-12

Papers should address applications, research or technology in categories such as telecommunications, office systems, manufacturing, materials handling, medicine, aid to the disabled, robotics, voice and store forward, education and consumer products.

Send abstracts to Avios, P.O. Box 60904, Palo Alto, Calif. 94306.

MANAGERS ON THE MOVE

DAVID C. ANDRY was named assistant vice-president of Management Systems for the F.A. Barlett Tree Expert Co. He will be responsible for all of the company's systems of management information.

Prior to his promotion, Andry was the data processing manager for F.A. Barlett. He attended the University of Hartford in Connecticut and graduated from the Program Systems Institute in N.Y.

Barlett provides tree care and utility line clearance operations in several states east of the Mississippi.

•

THOMASYNE HUBERT recently joined the Chicago Tribune Co.'s Information Systems Department as assistant director of systems. In her new position, Hubert has overall responsiblity for the development and implementation of high-quality systems that will assist clients in attaining Chicago Tribune objectives.

Hubert was senior vice-president/manager of systems for Becker Paribas, Inc. in Chicago, where she had been employed for the past 11 years.

Hubert earned her bachelor's degree in mathematics from Rosary College and her master's degree in computer science from Kansas State University.

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BOOKS

from page 35

ment by MIT's Architecture Machine Group. Author Richard Bolt and colleagues developed the Media Room, a place where voice, gesture, eye contact, touch and similar nonkeyboard interfaces communicate between man and machine.

An eerie "talking-head persons" takes shape by projecting back a color TV image upon a face-shaped screen. In a teleconferencing application, the projection arrives via a videodisk and telephone.

The face screen nods and turns; its lips open and close in time with the speech. The sense of human presence — not just an image of a person — is dramatic.

In the World of Windows, a hypothetical manager faces a 13-ft diagonal screen filled with from 15 to 30 TV-size images. He sits amid the cacophony of multiple sound tracks.

By wearing a tracking device mounted on glasses, the manager's eyes control the windows. Gazing at one window blocks out the sounds from all the others after a few seconds. Continued focusing on one window triggers the expansion of that image to full screen size.

These examples reflect a wide-open approach to communications in which "the person is the true terminal of any computer-based information system."

Paperback, 113 pages, $16.95, Lifetime Learning Publications, a subsidiary of Van Nostrand Reinhold, 135 W. 50th St., New York, N.Y. 10020.

BOOKS OF NOTE

CICS COMMAND-LEVEL PROGRAMMING, a guide to help batch programmers design and code on-line applications, by Alida Jatich. Paperback, 360 pages, $29.95, ISBN 0-471-88533-9. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10158.

THE LOTUS GUIDE TO LEARNING SYMPHONY, the first in a series of learning and application books from the software developer (Lotus Development Corp.), edited by Mark Boyer. Paperback, 419 pages, $22.95, ISBN 0-201-16686-0. Lotus Books, Addison-Wesley Publishing Co., Reading, Mass. 01867.

DATAPRO/MCGRAW-HILL GUIDE TO MICROCOMPUTER ACCOUNTING SOFTWARE, profiling 770 packages, by Datapro Research Corp. Paperback, 143 pages, $17.50, ISBN 0-07-015409-0. McGraw-Hill, Inc., 1221 Avenue of the Americas, New York, N.Y. 10020.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, *P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.*

Links topic of seminar

NEW YORK — New York University's (NYU) Graduate School of Business Administration has scheduled a Microcomputer-to-Mainframe symposium for May 22-24.

The symposium, sponsored by the NYU Computer Application Information System Department, will focus on linking micros with mainframes and management techniques for integrating end-user computing with centralized DP activities.

Scheduled topics include hardware and software advances for micro-to-mainframe communications, micro-to-mainframe data bases and decision support systems for end users. Other items include system development and implementation strategies and the relationship between the MIS professional and end users.

The registration fee is $400. More information is available from NYU's Computer Application Information System, 90 Trinity Place, New York, N.Y. 10006.

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CALENDAR

WEEK OF MARCH 17

MARCH 17-19, FORT LAUDERDALE, FLA. — **Intelligent Building Information Systems Spring Conference.** Contact: Thomas Cross, Cross Information Co., Suite C, 934 Pearl, Boulder, Colo. 80302.

MARCH 17-20, DALLAS — **Computer-Based Training Conference and Exposition.** Contact: Warren/Weingarten Publications, 38 Chauncy St., Boston, Mass. 02111.

MARCH 18-19, FORT LAUDERDALE, FLA. — **Intelligent Building and Information Systems.** Contact: Thomas Cross, Cross Information Co., Suite C, 934 Pearl, Boulder, Colo. 80302.

MARCH 18-20, CARY, N.C. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511. Also being held March 19-21 here.

MARCH 18-20, DALLAS — **International Computer and Telecommunications Conference (Comtel '85).** Contact: Joseph Fulvio, Comtel '85, Suite 600, 13740 Midway Road, Dallas, Texas 75244.

MARCH 18-22, CHICAGO — **CICS/VS Internals.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Mar. 25 in New York.

MARCH 18-22, NEW YORK — **IMS/DC and Message Format Services Programming.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

MARCH 19-21, WASHINGTON, D.C. — **Effective Management Techniques for Data Processing Managers and Project Leaders.** Contact: Abbott, Galvani Associates, 1850 Union St., San Francisco, Calif. 94132.

MARCH 19-21, HAMILTON, BERMUDA — **Bermuda Computer Fair 1985.** Contact: Kaye Harries, Computer Society of Bermuda, P.O. Box 1479, Hamilton 5, Bermuda.

MARCH 19-21, CARY, N.C. — **SAS Programming for New Computer Users Course.** Contact: SAS Institute, Inc., Box 8000, Cary, N.C. 27511.

MARCH 19-22, WASHINGTON, D.C. — **AT&T Unix: A Hands-On Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

MARCH 19-22, NEW YORK — **TSO ISPF.** Contact: Sysed, Inc., 35 W. 35th St, New York, N.Y. 10001.

MARCH 20, MONTVILLE, N.J. — **AT&T Unix: The Operating System for the '80s.** Contact: James Yachnik, Montville Township Community Education, 100 Horseneck Road, Montville, N.J. 07045.

MARCH 20-22, FORT LAUDERDALE, FLA. — **AT&T Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

MARCH 20-22, NEW ORLEANS — **International Spectrum U.S.A. Computer Conference and Exhibition.** Contact: International Database Management Association, Suite 210, 9740 Appaloosa Road, San Diego, Calif. 92131.

MARCH 20-22, OAK BROOK, ILL. — **SAS Processing Course.** Contact: SAS Institute, Inc., Box 8000, Cary, N.C. 27511.

MARCH 21-22, NEW YORK — **Understanding Telecommunications Technologies for Non-Engineers.** Contact: Telestrategies, Inc., Suite 102, 6842 Elm St., McLean, Va. 22101.

MARCH 21-22, DALLAS — **SAS Report Writing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MARCH 21-22, CARY, N.C. — **SAS Color Graphics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MARCH 21-24, ANAHEIM, CALIF. — **The Second National Winter Conference & Exposition for Independent Sales Organizations (Comdex/Winter '85).** Contact: Peter B. Young, The Interface Group, Inc., 300 First Ave, Needham, Mass. 02194.

MARCH 22-26, LOS ANGELES — **Advanced Systems Analysis.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

MARCH 23-24, NEW YORK — **CICS Internal Architecture Intensive.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

MARCH 24-27, SAN FRANCISCO — **1985 Annual Convention & Exposition of the Electronic Funds Transfer Association.** Contact: Electronic Funds Transfer Association, P.O. Box 66290, Washington, D.C. 20035.

MARCH 24-27, ORLANDO, FLA. — **Texas Instruments, Inc. Minicomputer Information Exchange 1985 International Computer Symposium.** Contact: Texas Instruments Minicomputer Information Exchange, M/S 2200, P.O. Box 2909, Austin, Texas 78769.

MARCH 24-28, ARLINGTON, VA. — **Institute of Electrical and Electronics Engineers, Inc. (IEEE) Infocom '85.** Contact: IEEE Infocom '85, P.O. Box 639, Silver Spring, Md. 20901.

MARCH 25-26, MILWAUKEE — **Managing Information Centers Effectively.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

MARCH 25-26, LOS ANGELES — **CICS/VS Performance & Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Park, Fort Lee, N.J. 07024. Also being held March 25-26 in Chicago.

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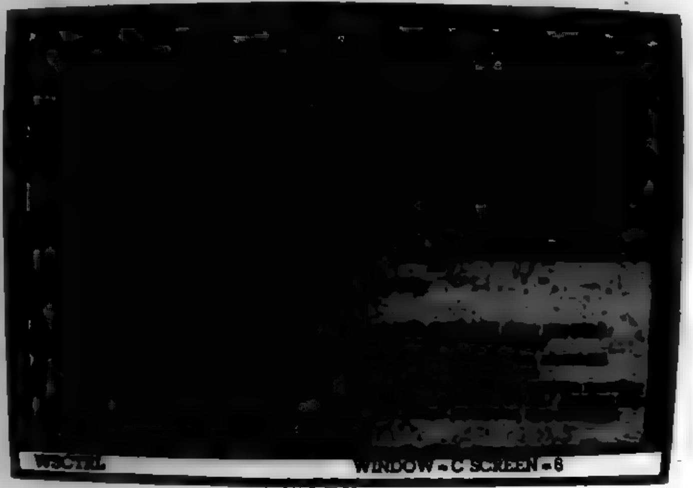

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EDITORIAL

Industry suffers with salary gap

Information processing in the U.S. is the most progressive industry in the most progressive country in the world, right?

Don't bet on it if you are a computer professional who happens to be female. According to the latest figures from the Bureau of Labor Statistics, women in computer professions earned almost 22% less in 1984 than did their male counterparts in the same jobs [CW, Feb. 11].

In 1979, the salary difference between men and women performing comparable jobs in the computer industry was also about 22%.

No matter how you choose to play with these numbers, the overriding message is that the gender-based salary differential has stayed virtually the same for at least five years. That is hardly impressive progress from an industry that prides itself on being advanced and on the cutting edge.

Why does this salary gap exist? Both male and female computer professionals armed with math, computer science or engineering degrees earn about the same when they enter the field. But within five years, women are earning considerably less than their male counterparts, and most never catch up.

Several reasons are given for the income disparity. Many women are supposedly unwilling to work the long hours required from those on the lower rungs of the corporate ladder. In addition, women are supposedly not aggressive enough in asking for more pay. Another purported factor is that many women have not developed the skills necessary to emerge a winner in the corporate political arena.

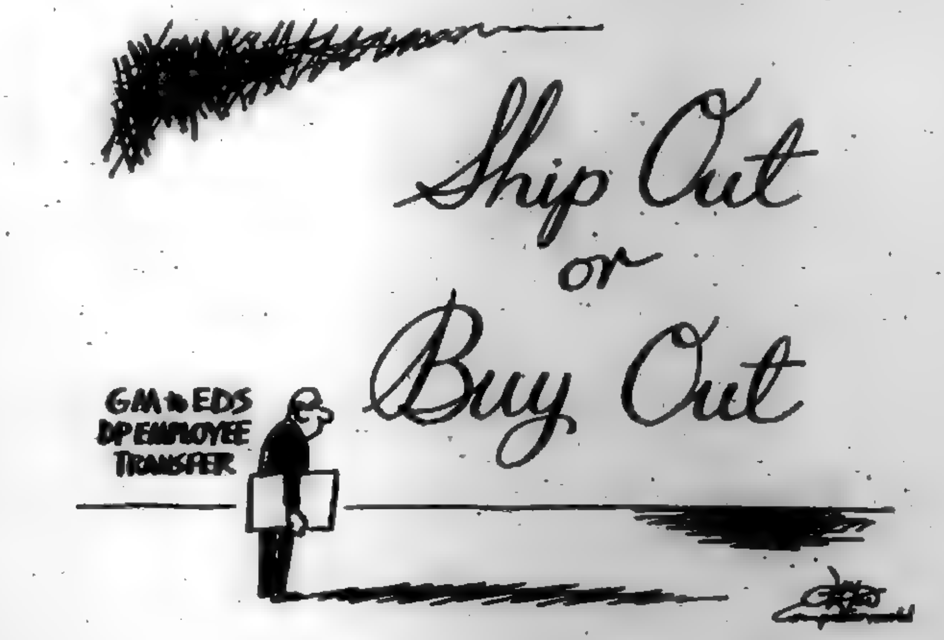
All of these reasons are currently valid to some extent, but what about the rare woman who knows how to win corporate battles, is willing to put in long hours along with the guys and is not afraid to ask for the salary she feels she deserves? According to the BLS survey, when a woman asks for the high-level position and the salary that goes along with it, the reply is all too often "no." And if she refuses to take that answer permanently, the next step is to opt out of the corporate arena and start up her own firm.

While many women operate at technical levels, very few hold executive positions in corporate MIS departments. Rather than fight what they consider a losing battle, many of the best and brightest women eventually found their own firms or become consultants because they refuse to accept the artificial barrier imposed on them simply because of gender.

These women are the winners. The losers are the companies with the shortsighted view that it is acceptable to pay a woman less than a man for the same work.

Considering the competitive environment pervading today's U.S. information industry, it seems plain foolhardy to ignore intelligence and achievement because of physical packaging. If the best brains available in your department happen to come in a female envelope, so be it. If you don't utilize that resource, the resource might not stay around.

MIS executives are operating in a corporate arena where information is considered a strategic resource, DP departments are expected to become profit centers rather than cost centers and information control is corporate power. If the reason for the salary gap is prejudice, as Scientific Manpower Commission Executive Director Betty M. Vetter believes, pure self-interest indicates that that sort of prejudice is rapidly becoming a costly anachronism.



LETTER

Documentation the best prevention

I would like to thank *Computerworld* for the coverage of the very important area of system documentation in "Documentation: The time-saver" [CW, Nov. 5]. Advice like this is quite valuable to DP shop managers, but is also very useful for end users — the department head who bought the system and will be forced to continue supporting it throughout its life cycle. Few people recognize that in the area of system documentation, an ounce of prevention is worth tons of cure.

Applied Science Associates, Inc., longtime system design contractors to some of the largest corporations in America, has found that awareness of this need for documentation has faded over the past few years. In the 1970s, management dictum required specific design documentation at the end of each phase, and most DP shops complied. With the advent of fourth-generation hardware and software, however, it appears that less emphasis is being placed on preparing extensive documentation that lets others know how, why and when the software works. As the article pointed out, it's a classic case of "Pay me now or pay me — over and over again — later." Real-time systems with only a few memoranda to explain their evolution from one release to the next will defy good documentation, confuse users and frustrate the DP staff until the systems are finally replaced.

Here's hoping that those systems are subsequently replaced by ones that have been carefully designed and documented with a total system design approach.

Margaret Nesbitt
Valencia, Pa.

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VIEWPOINT

Getting know-how technology off and rolling

LECHT ON SCIENCE
Charles P. Lecht

Part 4 of a series

The increasing use of know-how machines will no doubt bring a chorus of complaints about their imperfections. When the imperfections are discovered in the top-of-the-line expert systems, they will elicit the same kind of guffaws their human forebears did, claiming expertise and occasionally muffing it. Tales of "outrageous" mistakes caused by know-how machine ineptitudes at all levels will arise, although these will be no more outrageous than those previously made by people doing the same jobs. The recent Bhopal and 1979 Three Mile Island calamities gave us example enough to support this thesis. Additionally, our fears about a runaway technology initiating war may numb our minds so much that we may forget that people running amok are more likely to initiate it.

Cries for "the good old days" when human ineptitudes were all we had to deal with will be heard. The truly absurd idea that we won't find enough employment for people if we employ too many machines — in fact, those previously made by the same people — will be echoed throughout corporate America, and its effect will ricochet into our factories and union halls. But, our remembrance and reevaluation of what life was like before we had such technologies as the loom, steam shovel, computer and nuclear energy will dampen its effect. Enough remembrance of this will lead us to write off those good old days as having been really quite terrible work-wise and reinforce our will to go forward with more technology. And after enough time has passed, we will finally become intelligent enough to see that we'll never be free of work, not through automation anyway, so why not make work as pleasant as possible?

No longer fearful of computer systems taking over our jobs, we'll happily get on with using them wherever we can. Through this, the quality of work we must perform to remain alive will greatly improve for all of us, peon to president. We will off-load the mundane tasks like shuffling paper, walking through airline terminals and the disposal of waste and get on with spending our time experiencing, thinking and creating. It is hard to envision willingly reassigning a job machines do now back to people, including those who produce hand-made goods. Now I'm not saying that your Aunt Debbie isn't better at baking than any machine could ever be, but mass production of truly key survival items like milk and airplane parts cannot be done without machines. Neither can the production of medicine, heat lights and so on.

> ”
>
> ***We will off-load the mundane tasks like shuffling paper and walking through airline terminals and get on with spending our time experiencing, thinking and creating.***

The fact that pilot error had been the overwhelming cause of flying disasters could not have escaped National Aeronautics and Space Administration officials as they made their space shuttle plans. Their conviction that operating a spacecraft was really no job for a pilot was amply shown by their (and our) huge investment in ground-controlled shuttle missions. Today, no one argues that these crafts should be piloted by their occupants regardless of how much of "the right stuff" they may possess. But for a period of time, a lot of static surrounded this issue. The time frame in which the actual task of flying was off-loaded from people to machines provides a paradigm for what is to come in all areas where use of know-how machine technology is increased. As in the case of pilots who, when replaced by machines, were elevated to become true scientists, people will see an improvement in the quality of their work.

Still many impediments

In 1985, many factors still impede a fast introduction of know-how machines. Some are obvious: cost, lack of artificial intelligence software for systems (expert to "dimwit"), resistance to change and so on. Some are not so apparent. Fear that the system is nothing but a programmer's joke leads the list; that it is obeying someone else's program while feigning obedience to ours consumes us. Why not? Its human analog did it regularly.

When interactive languages are involved — so that the computer engages us in discourse — our patience with machine-based know-how is most strained. We may accept just about any kind of nonsense from another human being, but we are appalled when the same stuff is delivered by a machine. We expect more from machines and are disappointed when they don't deliver it. And we are stripped of our capability to yell, "idiot" and watch it flinch. But most impeding is our lack of experience in incorporating know-how technology in our day-to-day activities. Oddly, this is more the case in the white-collar world that really desires the technology than in the factory world that doesn't.

Making a perfect match between a person and his know-how machine is the strangely exciting

See KNOW-HOW page 42

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Direct R&D efforts to knowledge acquisition

THE DATA CENTER
John P. Murray

How much, if any, of your information-processing budget is allocated to what might fall under the heading "research and development"? I would guess that the answer in most organizations would be very little, if any.

Given what is occurring in the world of information processing and given the growing number of options available, it seems reasonable to at least consider the attempt to devote some time and money to an approach that will allow the information-processing department to investigate new methods that may be of value. This should be done in a spirit of obtaining increased knowledge, rather than attempting to produce results that will offset the cost of the research. It would appear, given the appropriate support, such an effort would, over time, produce a more than acceptable payback.

The reality in a typical case is that more pressures and demands now rest upon your MIS staff and budget than you can handle. This is probably accompanied by at least some subtle, if not overt, signals from senior management that it would be nice to reduce information processing expenses, rather than consider increases. Given that circumstance, it is difficult to push for money for an R&D effort.

Benefits can be dramatic

But still, the issue should be pursued. The potential benefits to the organization that can be derived from the effective use of information-processing technology can be dramatic. Indeed, in the future, the health of the organization may be determined by the information-processing function's degree of sophistication. In fact, that really is the case in many organizations today.

Given the role information processing is beginning to play and the certain future importance it will have in all organizations, perhaps the information-processing R&D effort simply cannot be overlooked.

The areas where an R&D effort might be concentrated depends, of course, on the status of your particular information-processing function, but some general areas might include the following:

- Data base management systems.
- Information centers.
- Project management systems.
- Local-area networks.
- The use and/or control of microprocessors.
- Fourth-generation processing languages.
- Office automation.
- Methods to improve documentation.
- A systems and programming development center.
- An approach to improve MIS-client relationships.
- Methods to reduce cost and/or improve service in the data center.

What might be a reasonable level of funding to support an MIS R&D effort? Request as much as seems obtainable. Some percent of the MIS budget should be requested, perhaps 2% to 6%. One approach might be to go for as high a figure as you dare; if it becomes an issue, you can always agree to "settle" for something less. It would be too bad to ask for and obtain 2% and come away feeling you could have gotten 6%.

Use funding to add staff

Assuming you do obtain support (and funds) for such a project, I would like to suggest an appealing method for pursuing the effort. Take the money and increase your staff. Assign these new people the responsibilities now held by some of your senior staff and then give these senior people the opportunity to conduct these various research projects. This should be done in a manner that frees these people of current responsibilities so that they can concentrate on the research aspects of whatever projects they accept.

They should be given space outside of the MIS department where they can work and think without interruption. Let someone else carry the load for awhile. They should have specific subjects they are considering, but there should be no pressure to produce "results"; the idea should be to carefully consider the subject, determine its value — if any — to the organization and report the conclusions. If such a need develops, actions and a definitive plan can come later on.

See R&D page 42

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

VIEWPOINT

R&D

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These assignments should not be permanent; there should be a rotation among the senior staff members so that everyone with the organization awhile has an opportunity to participate. Part of the process should also be to let these people get out and see what is being done in other organizations. Also, everyone, the MIS clients in particular, should understand that these new positions support the research effort — they do not provide increased support for direct project or systems maintenance.

Of course, not every effort will be a winner: No R&D effort always produces a winner. But, given sufficient time and support, some very sound ideas should be developed that, if implemented, can produce significant results. If nothing else, the opportunity to spend some time simply considering what is being done and how it might be improved, can be a very positive experience for some of the departments' long-term employees.

Can such an approach be sold to senior management? It depends on the particular organization, its health and the view senior management has of the information processing function (this may indeed be easier to "sell" in an installation where MIS is viewed as being in difficulty). The concept may be easier to sell as a means of addressing and solving existing problems than as a somewhat more esoteric approach to "blue-sky" proposals.

In any event, this does appear to be a worthwhile project to pursue. There is merit in the idea. The potential for a solid payback should be there if the project is appropriately structured and supported.

KNOW-HOW

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and randomly illogical world of business management is no easy task. Before a general theory of how to do this is available, we must gain a great deal more experience in matching methods. We may need to approach this problem in ever-so-delicate stages, each of which yields, say, a machine specially geared to provide the supportive neuroses that best defuse those neuroses that are destructive to its human operator. That is, in addition to whatever artificial intelligence it may contain. Other systems may have to be equipped with feigned conspiratorial behavior to have their results taken seriously.

Whatever the problems in know-how machine acceptance, today's intense thirst for personal automation in offices everywhere and the speed with which this is being quenched confirms our belief that we've got better things to do with our time.

LETTERS

The 'inn' is well-equipped

I am writing to update you about the presence of computers and other office services at hotels in response to the article, "There's no room at the inn for personal computers" [CW, Jan. 14].

Last spring, the Royal Sonesta Hotel in Cambridge, Mass., opened the most complete Business Center in this area offering a wide range of facilities and service. From secretarial support to computer services, translation, transcription and notarization, our Business Center can function as an office away for any guest. Our equipment includes an IBM Personal Computer with communications, electronic mail, various data bases and software packages. The center also features a comprehensive reference library, five international clocks, telex, photocopier and a variety of standard office supplies.

From the way guests often line up at the Business Center door at 7 a.m. opening time, I'd have to say there is a great demand for these services.

Michael M. Schweiger
Cambridge, Mass.

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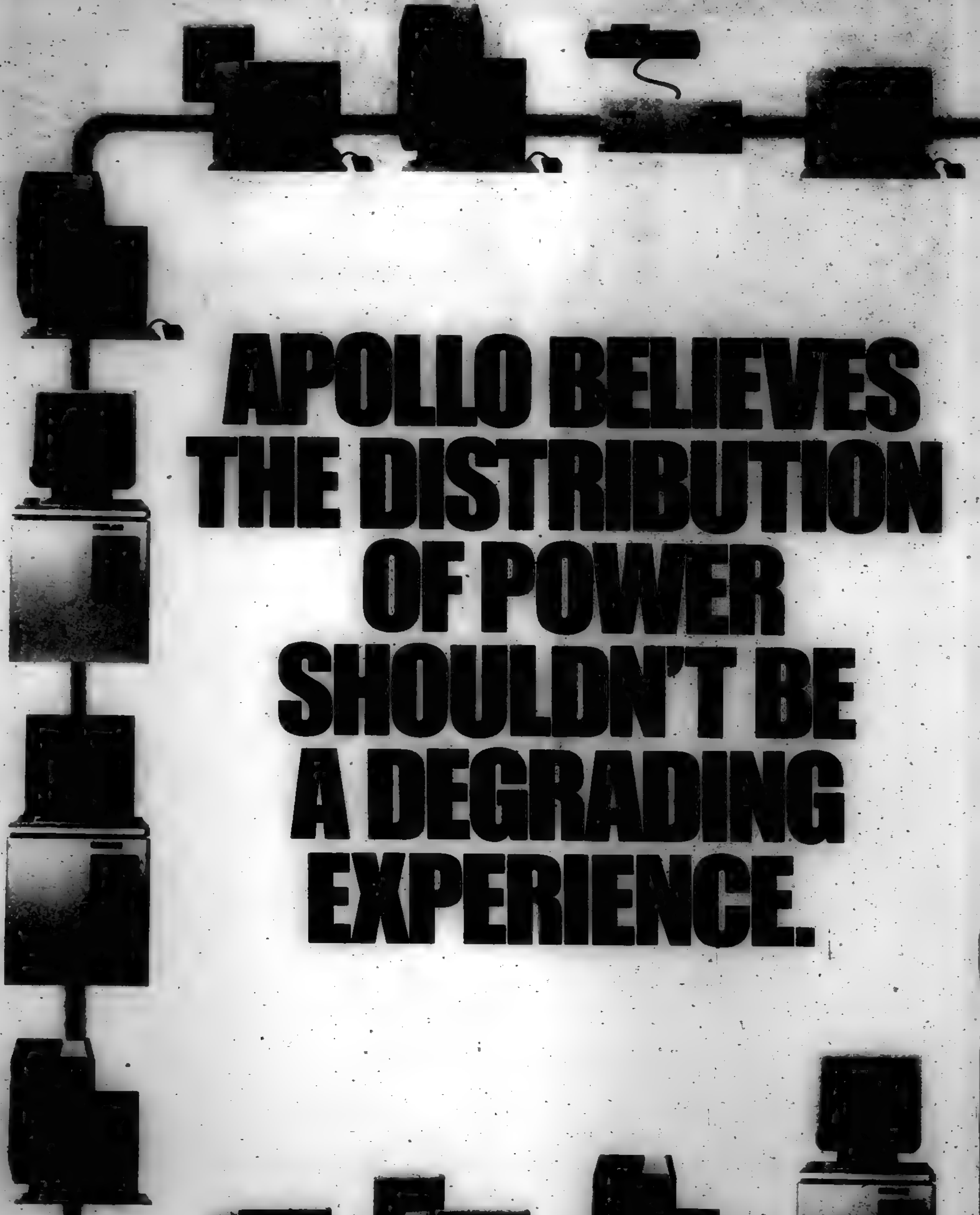
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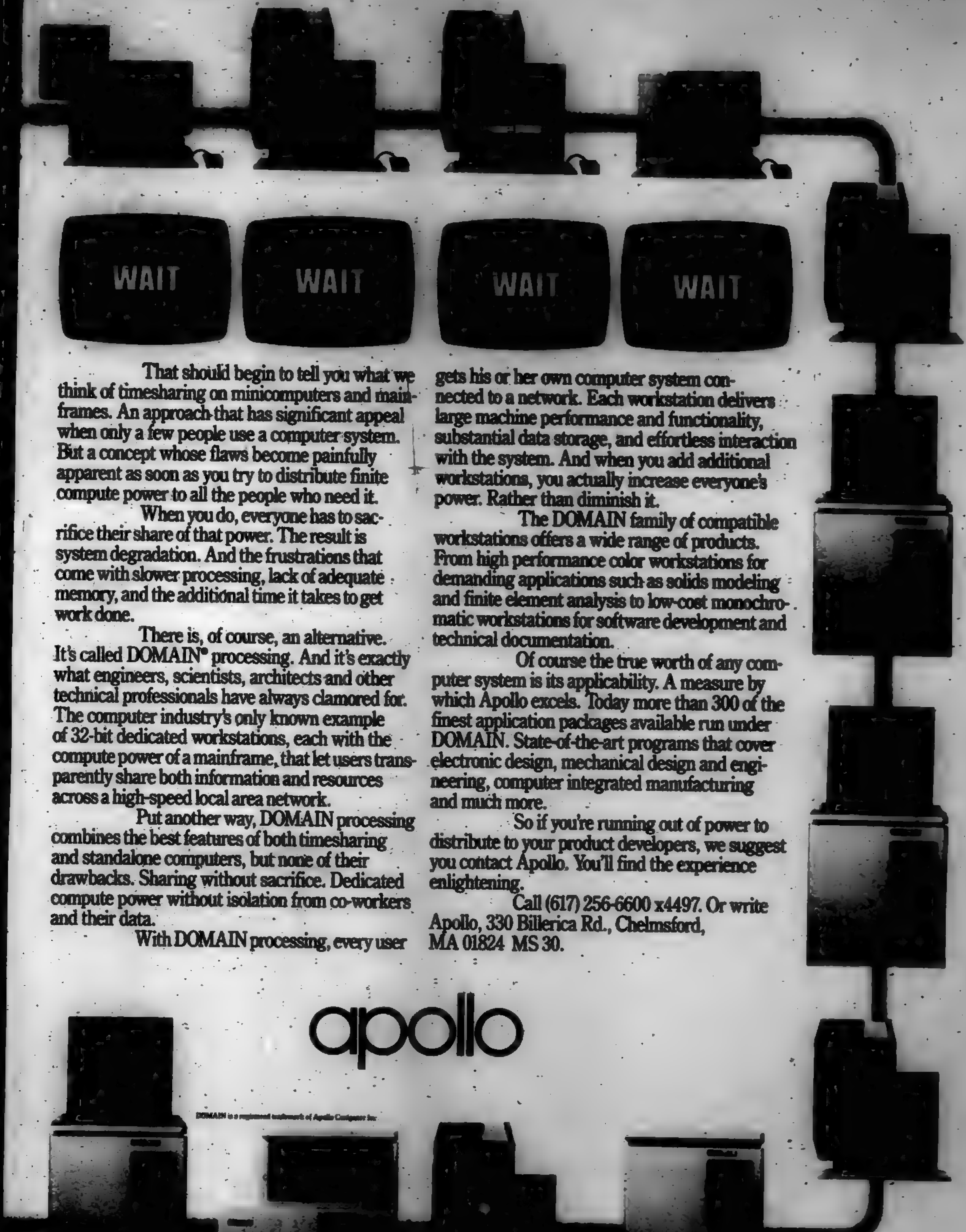

That should begin to tell you what we think of timesharing on minicomputers and mainframes. An approach that has significant appeal when only a few people use a computer system. But a concept whose flaws become painfully apparent as soon as you try to distribute finite compute power to all the people who need it.

When you do, everyone has to sacrifice their share of that power. The result is system degradation. And the frustrations that come with slower processing, lack of adequate memory, and the additional time it takes to get work done.

There is, of course, an alternative. It's called DOMAIN® processing. And it's exactly what engineers, scientists, architects and other technical professionals have always clamored for. The computer industry's only known example of 32-bit dedicated workstations, each with the compute power of a mainframe, that let users transparently share both information and resources across a high-speed local area network.

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Of course the true worth of any computer system is its applicability. A measure by which Apollo excels. Today more than 300 of the finest application packages available run under DOMAIN. State-of-the-art programs that cover electronic design, mechanical design and engineering, computer integrated manufacturing and much more.

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The nicest thing about the windowing feature is that it lets the operator take better advantage of multi-tasking capabilities of operating systems such as UNIX* System V.

As if that's not enough, the operator can do full-screen windowing without changing a program to fit the screen. At the same time, two more windows, which can overlap and vary in length and width, can be opened. The screen also can be divided into four independent windows which act as viewports into the terminal's 9600 character memory.

With 38 downloadable function keys and 16 screen labels, the 5425, which is also VT102* compatible, opens new levels for productivity. And the optional integrated intelligent modem features five programmable autodial keys to speed the dialing and logon functions. The modem also permits remote transmission from a standard phone jack.

If you want to open new doors in your career, look into our 5425. It'll make you look good. For more information, write AT&T Teletype Corporation, 5555 Touhy Ave., Dept. 3223-F, Skokie, IL 60077. Or call **1 800 323-1229, ext. 801.**

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SOFTWARE & SERVICES

Semantics muddling AI issues

SOFTALK
John Gallant
CW Senior Editor

> "*Many people . . . would like to see a more appropriate name applied to all that is currently considered artificially intelligent.*"
>
> Howard Dicken
> Publisher, "AI Trends"

In the January issue of DM Data, Inc.'s newsletter, "AI Trends," Publisher Howard Dicken's colleague and newsletter Editor Harvey Newquist III summed up in one pithy phrase what the coming year holds for artificial intelligence.

"It's 1985," Newquist said, "and the audience is waiting. It's show time."

While Newquist was discussing the need for AI hardware and software companies to come up with some working, marketable products to satisfy both consumers and investors, his words are equally applicable to an issue raised by Dicken in the same issue of "AI Trends."

Misuse of 'artificial intelligence'

Dicken lamented the misuse and abuse of the term "artificial intelligence" and called for vendors and analysts alike to be circumspect in their use of that phrase.

"Some harder definitions will have to be arrived at," he said, "as will some realities. We do not currently have the technology to develop true simulated intelligence. . . . The market has had an annoying tendency to intermix the words artificial intelligence with expert systems or natural language. The technology exists to produce the latter two applications, but we have not yet reached a point where we can claim to

See AI page 60

Firm charts path to efficiency

By John Desmond
CW Staff

FRAMINGHAM, Mass. — For Japanese software developers, everything begins with the charts — the coding comes later.

According to Katsuyasu Satomi, planning administration manager in the Information Network Systems Development headquarters of Mitsubishi Electric Corp. of Tokyo, a heavy reliance on manually drafted charts is one important way in which Japanese programmers differ from their American counterparts.

Programmers at Mitsubishi — the manufacturing giant that lists semiconductors and computers among its many products — adhere to the traditional software life-cycle model of systems analysis, systems design, design coding and testing. But Japanese programmers follow a tedious practice of first coding by hand on charts, or worksheets, instead of directly into a terminal, Satomi said in a recent interview with *Computerworld* here.

"We believe it is the fastest way" and results in fewer programming errors, Satomi said of the method. The practice may also relate to a lack of software development tools and a shortage of computer hardware within the company. Mitsubishi currently has only one terminal for every 20 programmers, Satomi said.

After a buying program, scheduled to be completed in 1988, the company intends to have one terminal for every two programmers, according to Koichi Sada of the networking engineering section in Mitsubishi's Computer Systems Works.

Satomi said Mitsubishi currently has so few terminals per programmer because "the productivity is low when we use one terminal for each person. It's a problem of price vs. performance." Considering the software development tools currently available at Mitsubishi, the company can-

See JAPAN page 52

SOFTLINE/KEN HARRAP

DP should not shun new ideas

The message is loud, clear and repetitive: North American business must increase its productivity to compete successfully in domestic and world markets.

As DP professionals, we should be mindful of that fact. We must remember that each business is not an anonymous entity but rather a collection of departmental units working toward a common goal.

Systems departments are quick to act as agents of change. They develop and introduce systems aimed at improving productivity in other organizational units. However, they are often slow, if not resistant, to adopting changes or new ideas.

Problems looking for solutions

More enlightened DP executives, however, are looking for ways to address the growing problems they face. Those problems fall under two broad headings: those affecting users and those affecting development management. User-related problems include the following:

- An increased need for interactive systems brought about by competitive forces in the marketplace requiring improved service levels and more timely decision-making information to achieve such results as reduced inventory levels, faster order processing, improved cash flow and better use of capital.
- The need for a reduction in the time between system conception and implementation. According to recent IBM surveys, 50% of all on-line systems take more than a year to complete and 30% take more than two years. Thus, when the user is asked to accept the system, time will have significantly contributed

See PRODUCE page 54

Harrap is vice-president of product marketing at Synerlogic, Inc. (formerly Bailey & Rose, Ltd.) in Vancouver, B.C.

- Decision support system moves: Management Decision Systems, Inc. unveiled two financial packages based on its Express DSS, and Execucom Systems Corp. announced Release 10 of its IFPS DSS/48, 49
- Samna Corp. has introduced a package linking office equipment and software from a variety of vendors/48
- SAS Institute, Inc. has offered Version 5 of its SAS System software/48

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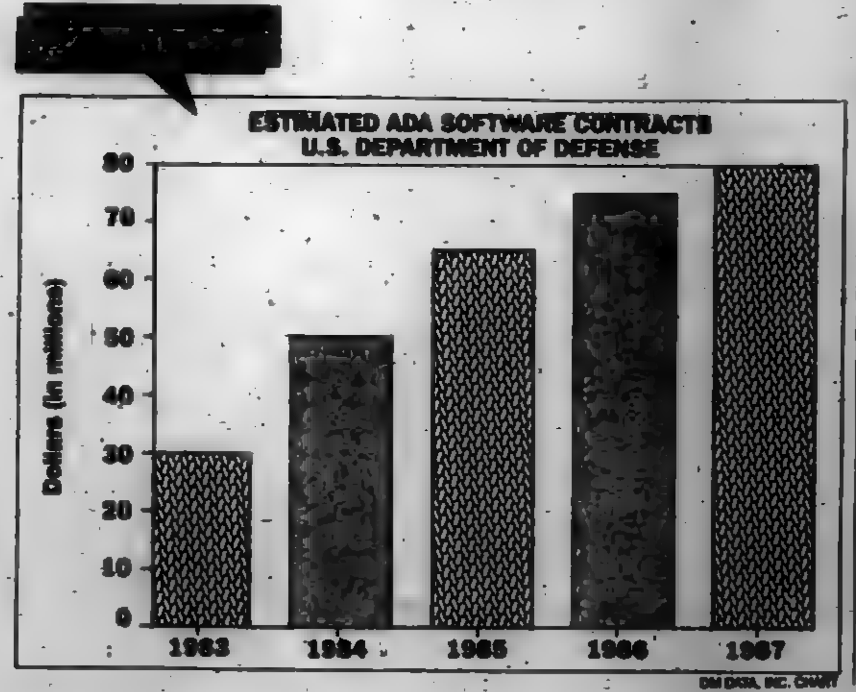

DM DATA, INC. CHART

Questa offers Surevsam tool for boosting Vsam performance

MIDWOOD, N.Y. — Questa Corp. has announced Surevsam, a preprocessor utility intended to improve performance and space utilization for IBM Vsam users.

Surevsam is said to correct for the inability of IBM's Idcams utility, which is used to maintain Vsam files, to take into consideration various applications parameters that directly affect performance. It reportedly calculates and analyzes all versions of a data set and generates the best set of Idcams control statements in accordance with user-specified criteria and parameters. The user can select the most appropriate version for the application and modify recommended control statements or let the utility submit the best set to create a file automatically, the vendor said.

The utility is said to allow a programmer to enforce a desired value for any Idcams parameter.

Surevsam reportedly also accepts applications-related specifications; number of updates, deletes and insertions; space and speed efficiency criteria; random, sequential or mixed access pattern; IBM 3330, 3340, 3350 and 3380 disk drive types; and anticipated data-set growth. Reports generated include a recommended set of control statements, performance analysis of alternative versions and recommended buffer allocations for all access patterns.

Surevsam is priced at $5,000.

Questa is located at 1580 E. 13th St., Midwood, N.Y. 11230.

Interactive Images enhances Easel IBM-based graphics tool

WOBURN, Mass. — Interactive Images, Inc. has announced Release 1.1 of its Easel graphics programming tool and command interpreter for the IBM Personal Computer and compatibles. The product allows systems developers to create graphics-oriented color interfaces to host data bases and applications, according to the vendor.

According to a spokesman, Easel is a graphics programming language that runs under IBM's PC-DOS and Microsoft Corp.'s MS-DOS. Programmers can use the software on the micro to create applications or data base-specific interfaces that allow users to manipulate symbols or icons to access applications and data. The software translates the user-selected icon into appropriate mainframe commands and reformats host data into the user interface format.

Features in Release 1.1 include support for Diablo Systems, Inc.'s color ink-jet printer; a 30% increase in drawing speed; and the ability to run one or more applications simultaneously.

Prices for Release 1.1 begin at $24,000.

Interactive Images is located in Suite 4500, 600 W. Cummings Park, Woburn, Mass. 01801.

Financial packages for IBM, Prime systems out from MDS

WALTHAM, Mass. — Management Decisions Systems, Inc. (MDS) has announced two financial software packages — Express Easyscan and the Financial Consolidation and Reporting System (FCRS) — that the vendor said were designed for use on IBM and Prime Computer, Inc. mainframes.

Express Easyscan allows a user to analyze Standard & Poor's Compustat II data bases of corporate financial data for purposes of investment analysis and research, corporate planning, merger and acquisition research, financial modeling and reporting, liquidity analysis and competitive positioning analysis.

Easyscan can generate graphics, statistical models and custom financial statements, an MDS spokesman said. The software also allows for data downloading to spreadsheet programs on the IBM Personal Computer and compatibles.

The spokesman said FCRS is a menu-driven, interactive system for the consolidation and reporting of general-ledger data, such as that from multiple divisions of a large corporation. Both Easyscan and FCRS are built on the firm's Express decision support system (DSS), the spokesman said.

Express includes DSS applications supporting budgeting, econometric modeling and forecasting, competitive analysis, operations and marketing, a tool kit for ad hoc query capabilities, data analysis and graphics and a DSS data base.

Easyscan and FCRS run under IBM's VM/CMS operating system and on Prime Computer, Inc.'s Primos system.

Easyscan costs approximately $50,000, and FCRS costs $120,000 as part of an Express system.

MDS is located at 200 Fifth Ave., Waltham, Mass. 02254.

SYSTEMS SOFTWARE

■ **Davis, Thomas and Associates, Inc. (DTA) has announced a batch recovery facility for IBM users updating IBM Vsam files in IBM CICS/VS environments.**

DTA/Recov reportedly eliminates the need for CICS Vsam users to reenter data after a Dasd failure. Using standard CICS journal files and a previous file backup, the utility will bring up the Vsam files current at the time of disk failure.

All Vsam file organizations are supported by the utility, and an audit report is provided as part of the recovery process for verification of data updated during the recovery. An additional report produced during the journal backup shows the amount of activity on each data set as well as journal use data that can be used for systems planning.

The utility will operate on either of IBM's DOS/VSE or MVS operating systems. The permanent license fee for DTA/Recov is $1,200 per year with a $150 maintenance fee after the first year.

Davis, Thomas and Associates, 8800 Highway 7, Minneapolis, Minn. 55426.

■ **Kolinar Corp. has announced the Program Development and Debugging Facility (Xdebug), a full screen interactive debugger for programs running under IBM's VM/CMS. Xdebug is designed for use with Kolinar's Xmenu/E display systems.**

A spokesman said that while debugging, users may use any IBM CP or CMS commands, define and use symbolic variables and browse external CMS files. An IBM Subcom interface allows users to write custom debugging macros in either Exec or Rexx, IBM's system product inter-

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Execucom introduces Release 10.0 for IFPS decision support software

AUSTIN, Texas — Execucom Systems Corp. has announced Release 10.0 of its Interactive Financial Planning System (IFPS) decision support software.

According to an Execucom spokesman, the enhanced release includes an Edit command that gives users access to system-resident full screen editors and a System command that provides access to host operating system commands and procedures. Execucom's IFPS Release 10.0 features a descriptive and nonprocedural modeling language, independent models and data, a report writer and a command language for automating applications development.

Additional features

Additional features of IFPS include data entry and validation facilities, a relational data base management system, data transfer and file sharing capabilities and graphics tools.

IFPS runs on mainframes and minicomputers from some 30 vendors, including IBM, Digital Equipment Corp. and Hewlett-Packard Co. The base price for IFPS Release 10.0 is $69,000.

Execucom is located at 3410 Far West Blvd., Austin, Texas 78731.

Samna package unites micros, word processors, laser printers

ATLANTA — Samna Corp. has announced software that facilitates communications between word processors, microcomputers and high-speed laser printers from a variety of vendors.

According to the company, Samna/Document Archival Retrieval and Transformation (Samna/Dart) transforms documents created on one machine into the formats required by others. Once transformed, the documents can be edited as if they were created on the receiving machine.

The product is also said to handle formatting instructions and includes a document management system. It runs on IBM mainframes under MVS and in networks using IBM 2780 or 3780 communications protocols.

Samna/Dart can work with the IBM Displaywriter and Displaywrite 2, Wang Laboratories, Inc.'s Office Information System, Xerox Corp.'s 860 word processor and 2700 and 3800 laser printers, the company's Samna Word I, Word II or Word III word processing software and Multimate Corp.'s word processing software. The base price for Samna/Dart is $35,000.

Samna is located at Suite C-7000, 2700 N.E. Expwy., Atlanta, Ga. 30345.

SAS System Version 5 out

CARY, N.C. — SAS Institute, Inc. has announced Version 5 of the SAS System, including the recently announced SAS Display Manager System — a full-screen editing facility said to allow users to interact with all parts of an SAS job.

According to a spokesman, Version 5 includes features for comparing SAS data sets, statistical features such as procedures for survival analysis and categorical data modeling and a statement for repeated measures analysis.

Added features in the SAS/Graph portion allow users to create customized graphs, place multiple graphs on one screen and define multiple axes. The system's SAS/Full Screen Product (FSP) software has been enhanced with an expanded Help command, a full-screen editor, user-definable function key settings and a catalog for storing SAS/FSP screens. Enhancements to SAS/Operations Research software, the system's project management tool, allow users to put time constraints on each project activity, the spokesman said.

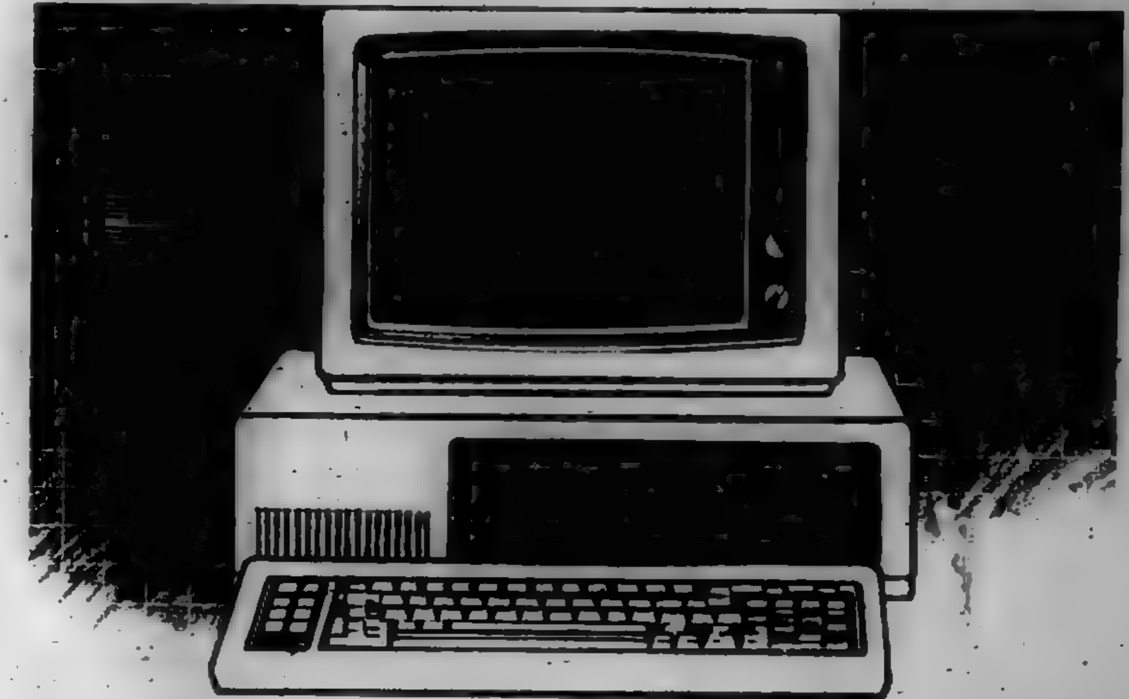
Enhancements to SAS/IBM-DL/1 software, which interfaces with IBM's DL/1 data bases, include security and Help features.

Display Manager includes an online Help facility, scrollable log and print screens, user-definable function key settings and automatic execution of a command list.

The SAS System runs under IBM's OS, TSO, CMS, DOS/VSE, SSX and ICCF systems on IBM 370, 3080 and 4300 series processors; Digital Equipment Corp.'s VAX under VMS; Data General Corp.'s Eclipse MV series under AOS/VS; Prime Computer, Inc.'s Prime 50 series under Primos; and the IBM Personal Computer XT/370 and AT/370 under IBM's VM/PC.

Version 5 is scheduled to be released for IBM's OS and CMS in the second quarter of 1985. Version 5 will be made available for other operating systems at later dates. First-year license fees are $8,000 for base SAS, $6,000 for SAS/Graph, $5,000 for SAS/FSP, $5,000 for SAS/OR, $4,000 for SAS/IMS-DL/1 and $4,000 for SAS/ETS, the vendor said.

SAS Institute can be reached through P.O. Box 8000, SAS Circle, Cary, N.C. 27511.



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SOFTWARE & SERVICES

Continued from page 48

preters. Full-screen storage displays allow scrolling, location of character or hexadecimal strings, instruction disassembly and formatting of control blocks. Xdebug supports IBM 3270 series terminals in native mode and installs without modification to the operating system. The initial release supports basic assembler language.

The annual license fee for Xdebug is $3,600, with a one-time initial license charge of $1,800. The annual license fee for Xmenu/E is $2,000, with a one-time initial charge of $1,000.

Kolinar, 3064 Scott Blvd., Santa Clara, Calif. 95054.

■ **North Ridge Software, Inc. (NRS) has announced Version 1.2.5 of the Network Director, a network management facility for use on IBM or compatible processors running IBM's ACF/Vtam terminal subsystem and the MVS operating system.**

Enhancements in Version 1.2.5 include execution within the Network Director's own address space without any permanently assigned pages of real or virtual storage.

The package currently supports IBM's CICS and TSO, Applied Data Research, Inc.'s Roscoe, Cullinet Software, Inc.'s IDMS/DC and Software AG of North America, Inc.'s Complete teleprocessing monitors.

A perpetual license for Version 1.2.5 costs $15,000.

NRS, Suite 900, 10900 N.E. 8th St., Bellevue, Wash. 98004.

■ **PBL Associates has introduced systems software that schedules and manages streams of jobs on Tandem Computers, Inc. mainframes and superminis under Tandem's Guardian operating system.**

PBL Tapqueue lets systems managers control batch processing from one location, a company spokesman said. The product reportedly accepts and logs execution commands and runs them according to time, date or priority. The product provides multiple queues of jobs for each user, and each queue holds up to 999 jobs.

Tapqueue costs $2,500.

PBL Associates, 10 Cottage Ave., Point Richmond, Calif. 94801.

APPLICATIONS PACKAGES

■ **Screen definition and file output facilities and an interface to IBM's Graphical Data Display Manager (GDDM) are among the enhancements to Version 1.4 of Altergo Products, Inc.'s Friendly Query System, which was described as a query system for IBM DOS/VS(E), OS/VS1 or MVS operating systems. The enhanced version is also said to include a descending sort function and increased security facilities.**

According to a company spokesman, FQS 1.4 allows the user to browse through data with forward and backward paging. It allows the user to sort or print selected records and save queries for future use. The product includes a data dictionary with on-line definition capabilities.

FQS reportedly accesses files using the standard file control facilities of the host teleprocessing monitor. Information is retrieved directly from the file. The base price of the DOS version is $20,000, and the OS version sells for $24,000.

Altergo Products, 999 Plaza Drive, Schaumburg, Ill. 60195.

■ **Wang Laboratories, Inc. announced a new spelling verification package and additional communications capabilities for the Wang Office Assistant microcomputer.**

The Wang Office Assistant Spelling Verification package is based on the Random House Concise Dictionary and allows users to create multiple personal dictionaries of up to 300 words each. The spelling program is scheduled to be available in May for $150. Communications capabilities said to be available for the Wang Office Assistant in March include Wang Systems Networking, consisting of two programs, Wang-to-Wang File Transfer and Virtual Storage (VS) Terminal Emulation, which are combined in one package priced at $250.

File Transfer allows the Office Assistant to store files on Wang's VS minicomputer system or to receive files from a VS and exchange documents with other Office Assistants. With VS Terminal Emulation, users can run the Wang Office on the VS, allowing users access to Wang Office's mail, messaging, time management and Office File Manager capabilities, the vendor said.

Wang, One Industrial Ave., Lowell, Mass. 01851.

■ **Outlook Software, Inc. has announced enhancements to its financial modeling package for the IBM System/38.**

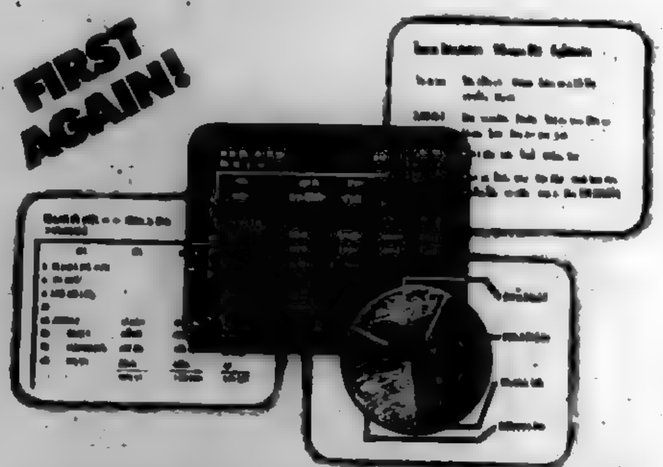
Version 4 of Outlook/38 reportedly allows users to load data base file information from spreadsheets back to data base files automatically and allows users to enter up to eight fields of file selection criteria and place multiple conditions on each of the eight fields.

The size of the selection criteria fields has been increased from 10 to 40 characters, the spokesman said. Ten predefined calculation functions have also been added to the package. Outlook/38 costs $3,950.

Outlook Software, Suite 117, 1 Woodfield Lake, Schaumburg, Ill. 60195.

■ **Transcomm Data Systems, Inc. has announced the Tolas Inquiry and Reporting System, a report writer and query program for Digital Equipment Corp. PDP-11 and VAX processors under DEC's VMS.**

Tolas can be used for accessing and generating reports from data bases, including Transcomm's File Management System and formatted files in DEC's Record Management System. Tolas features include support for up to 10 input files, a variety of user-defined calculations and print masks, ascending or descending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sorts on any field, complex record selection criteria, break logic for intermediate and grand totals of numeric information and user control of output formatting.

License fees for the Tolas Inquiry and Reporting System range from $3,000 to $9,000, depending on the CPU.

Transcomm, 1380 Old Freeport Road, Pittsburgh, Pa. 15238.

■ **Information Systems of America, Inc. (ISA) has announced Prism, a securities management system for IBM mainframes running under IBM's OS and DOS operating systems.**

The core Prism system is an investment management and accounting module. Other modules include securities movement and control, collection management and control, portfolio analysis and trading.

Features of the on-line, real-time system include long- and short-position processing of securities such as stocks, bonds, money market instruments, options, futures and variable-rate securities; accrual accounting; multiple bank accounts per portfolio; foreign securities and currencies processing; an unlimited historical data base; automatic daily calculation of net asset value per portfolio; and financial modeling and audit trails.

The core Prism system is scheduled for delivery this summer. Prism ranges from $300,000 to $750,000.

ISA, 500 Northridge Road, Atlanta, Ga. 30338.

■ **Satcom, Inc. has announced Prodstar-MRP, described as application software for manufacturers interested in labor and lot-control reporting from the shop floor.**

Prodstar-MRP runs on Digital Equipment Corp. VAX series superminicomputers, Hewlett-Packard Co. HP 3000 series superminis, the Texas Instruments, Inc. 990 Business series and the IBM System/36 minicomputer. The program will also run on the IBM Personal Computer XT, the HP 150 and DEC Rainbow Plus micros.

Functions of Prodstar-MRP include bill of materials and inventory management, labor management, master scheduling, cost accounting and materials requirement planning and purchasing.

The price of the minicomputer version of Prodstar-MRP is $35,000; the micro version is $9,900.

Satcom, P.O. Box 68, Glen Rock, N.J. 07452.

■ **MCBA, Inc. has announced accounting and distribution packages for Perkin-Elmer Corp. 3200 series superminicomputers and PE Model 7350 supermicros running under AT&T's Unix.**

The company also announced Micro Level I accounting and distribution software running on Intel Corp.'s 286/310; Altos Computer Systems, Inc.'s 586, running Microsoft Corp.'s Xenix; and the Zilog, Inc. System 8000, running OSM Computer Corp.'s Zeus operating system.

Among the MCBA packages that run on these hardware lines are accounts payable, accounts receivable, bill of materials processor, customer order processing, fixed assets and depreciation, general ledger, inventory management, job costing, labor performance, payroll, purchase order and receiving, shop floor control and standard product costing.

Prices for the software range from $700 to $6,000, depending on the specific package and hardware used.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

■ **Tektronix, Inc.'s Information Display Group has announced an interactive, raster-oriented software package for automating the creation and production of color presentation graphics. The package runs on Tektronix terminals and color graphics workstations.**

Plot 10 Teknicap consists of a series of modules used to enhance presentations with illustrations and presentation graphics fonts. Interaction with the system is through a series of menus and prompts, with graphics input via keyboard cursor keys, thumbwheels or a graphics tablet.

Plot 10 Teknicap is compatible with the Tektronix 4107, 4109 and 4115B computer display terminals; the 4120 series of color graphics workstations; and the Tektronix 4691, 4692 and 4695 color graphics copiers.

Plot 10 Teknicap costs $1,950.

Tektronix, P.O. Box 500, Beaverton, Ore. 97077.

■ **Arens Applied Electromagnetics, Inc. has announced Presentation Graphics for the Digital Equipment Corp. VAX superminicomputer running under AT&T's Unix Version 4.2 BSD. The package is also available for the Hewlett-Packard Co. HP 3000.**

Presentation Graphics is used to create business graphics and other specialized graphics charts. The product includes Business Graphics, the Graphics Toolbox, Draw Manager and the Menu program.

Business Graphics can produce pie, bar, line and word charts. Graphics Toolbox allows users to create specialized graphics charts by building a plain language file of commands and responding to a conversational output program. More than 60 commands are available, including Circle, Arc, Line, Arrow and Polygon. Draw Manager is said to allow the user to draw charts created with Business Graphics and Graphics Toolbox to the same page or screen.

Presentation Graphics is said to support all HP, Tektronix, Inc., Nicolet Zeta Corp. and Houston Instruments plotters; Tektronix, HP and

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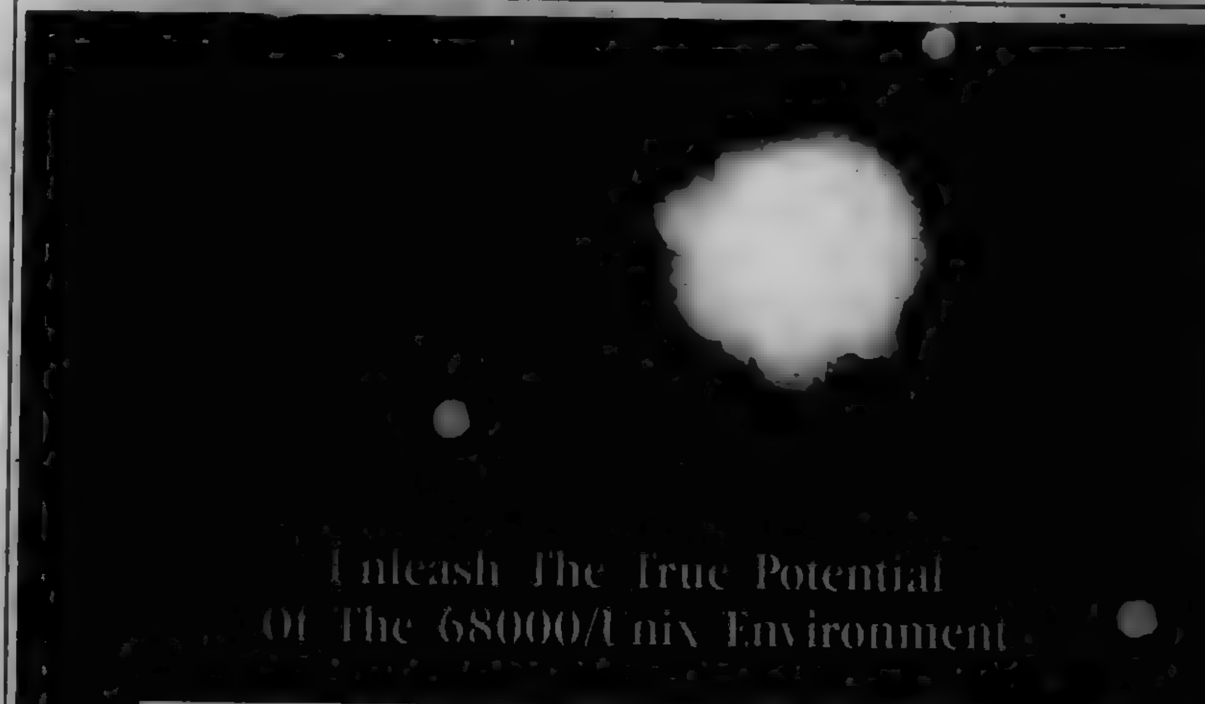

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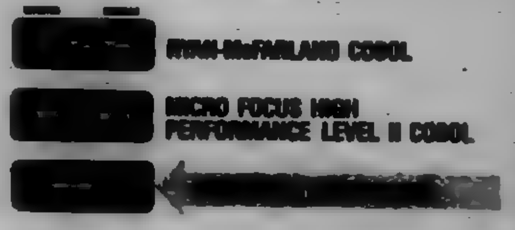
BYTE Magazine Sieve Benchmark



In a comparison of Ryan-McFarland COBOL 1.6A, Micro Focus COBOL 2.0 and PHILON FAST/COBOL 1.0 using the BYTE Magazine sieve benchmark the results are conclusive. PHILON FAST/COBOL executes the benchmark 34 times faster than Micro Focus and 47 times faster than RM/COBOL. (System configurations: 68000/UNIX/[illegible] style.)

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JAPAN

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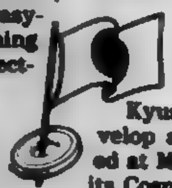
not justify the cost of additional terminals for minor gains in productivity, Satomi said.

As an aid to its program development, Mitsubishi is interested in software development tools such as Carnegie-Mellon University's Gandalf, which Satomi described as an easy-to-use Ada language programming environment with a syntax-directed editor.



Strong in hardware

Describing the common belief in the U.S. that the Japanese are strong in hardware but weak in software, Satomi said, "Most people don't think so anymore. I think that opinion has changed over time, although we do have to learn from the U.S. about applications software." Satomi called the marketing and distribution of third-party applications software in the U.S. advanced. Applications software in Japan is not as well distributed, he said.

"There is a shortage of programmers in Japan," Satomi added. Mitsubishi does have subsidiary software development companies, called Mitsubishi Electric Computer Software, in Tokyo, Nagoya, Osaka and Kyushu. The four companies develop applications software targeted at Mitsubishi products, including its Cosmo series mainframes and its MX 70 Model 3000 superminicomputer running the company's AT&T Unix-like operating system, UX.

In an effort to overcome the shortage of programmers, Mitsubishi is seeking agreements with U.S. software development firms to prepare software for use in Japan, Satomi said.

American-made applications programs cannot be used on Japanese terminals because the keyboards are different; however, utility programs can be used as they are, according to Satomi.

Unix is achieving growing popularity in Japan, with 2,000 to 3,000 users at present and 50 companies licensed to develop Unix software, Satomi said.

"Many companies are now making an effort to apply the Unix operating system to their own computers," he said. Japan's five mainframe manufacturers all run proprietary and incompatible operating systems, but Unix has the potential to become a standard for medium- and large-scale mainframes in Japan, Satomi said.

CW photo by J. Desmond

Satomi

Continued from page 81

Chromatics, Inc. graphics terminals; Versatec, Inc. printer/plotters; and compatible peripheral equipment.

The price for Presentation Graphics is $7,500, including two days of on-site installation and training and 90 days' maintenance.

Arens Applied Electromagnetics, 435-B E. Diamond Ave., Gaithersburg, Md. 20877.

■ **Henco Software, Inc. has introduced versions of its Info-Versagraph and Info-Text software for the Harris systems H60 through H1000.**

Info-Versagraph is a relational graphics management package that is integrated with Henco's Info data management system and permits graphs to be plotted from ad hoc figures entered at the time of graph creation or from data in existing Info files or from both, the vendor said.

Info-Text reportedly adds document retrieval and free-text query facilities to Info. Its query facilities are said to offer the option of retrieving information by idea searches or by conditional logic.

Info-Versagraph costs $10,000, and Info-Text costs $14,300.

Henco Software, 100 Fifth Ave., Waltham, Mass. 02154.

■ **Syntactics Corp. has announced that its Crystalwriter word processing program now supports Digital Equipment Corp.'s VAX series of computers and the Sun Microsystems, Inc. Sun workstation.**

According to the vendor, Crystalwriter is a Unix-based program for multiuser environments that uses soft-key commands and an object-based design.

Crystalwriter is priced at $995 for DEC's Microvax; $1,795 for the VAX-11/725 and 11/730; $2,995 for the VAX-11/750; and $4,495 for the VAX-11/780 and 11/785. Crystalwriter for the Sun 2/120 workstation is $995.

Syntactics, Suite 145, 3333 Bowers Ave., Santa Clara, Calif. 95051.

■ **National Information Systems, Inc. has announced that its VUE project management system is now available for Convergent Technology, Inc.'s Megaframe, AT&T's 3B and Zilog, Inc.'s Z8000 systems running under Unix.**

Continued on page 83

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"Windows" allows you to work on different documents—simultaneously. "Undo" lets you replace text you mistakenly removed. A built-in spelling corrector checks and corrects misspellings from over 97% of the most commonly used words.

WordStar 2000 also has a "typewriter mode" to fill in forms or envelopes easily. Plus "format sheets," which give you ready-made headings, tabs and margins at the touch of one key. It can even insert frequently used text with a simple command.

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WordStar 2000 can also read files from other major software products, such as Lotus 1-2-3® and D-Base III®

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With WordStar 2000, the keys you press are the keys you'd expect to press ("c" for copy, "p" for print, etc.), so they're easy to remember. You may also use function keys. Uniquely designed menus give you easy access to all features. And

SOFTWARE & SERVICES

Continued from page 52

VUE is said to be a menu-driven project management system that allows users to modify data and generate "what-if" scenarios.

VUE also runs on IBM mainframes running VM/CMS and Digital Equipment Corp.'s PDP-11 and VAX processors. Prices vary from $2,995 to $23,000.

National Information Systems, Suite 130, 20370 Town Center Lane, Cupertino, Calif. 95014.

DATA BASE MANAGEMENT SYSTEMS

■ Michaels, Ross & Cole Ltd. has announced Release 6.0 of MRC-Technician for users of the IBM System/38 under IBM's CPF Release 6.0.

MRC-Technician is said to be a relational data base management system and productivity aid designed for nontechnical end users.

According to a vendor spokesman, features of Release 6.0 include Help key documentation, multilevel security, multifile retrievals, relational file joining, single- or multimember file capability, flat-file look, unlimited sequencing and total levels and Boolean selection criteria.

MRC-Technician offers several modules, including a maintenance program generator, a summary and extract file generator and a fourth-generation report writer.

Module licenses cost $1,140/CPU.

Michaels, Ross & Cole, P.O. Box 4533, Oak Brook, Ill. 60521.

REMOTE COMPUTING SERVICES

■ Tymnet, Inc. has announced that its Asynch-to-3270 service now includes printer support, multidrop service and the ability to access multiple hosts.

The Asynch-to-3270 service reportedly provides users of Ascii-compatible terminals and micros with access to IBM 3270 applications. The service now supports printers attached to Digital Equipment Corp.'s VT100 terminals and Tymshare Scanset Models 410 and 415 as separately addressable printers.

The 3270 Public Multidrop Service provides communications between 3270 terminals and applications via shared multidrop lines. Other enhancements include the 3270 Synchronous Data Link Control (SDLC) Switched Virtual Call capability that reportedly allows SDLC terminals to access multiple hosts.

Base charge for the Asynch-to-3270 service is $400 per month, the vendor said.

Tymnet, 2710 Orchard Pkwy., San Jose, Calif. 95134.

TRAINING

■ Crwth Computer Coursewares has introduced a computer-based training course designed to teach users SAS Institute, Inc.'s SAS/Full Screen Product (FSP).

The product reportedly allows students to edit, browse, search and modify SAS data sets, generate letters and examine output.

Users write SAS/FSP commands and programs after receiving instructions through interactive narratives and questions, according to the company.

The product, Using SAS/FSP, runs with computer-based training presentation systems including IBM's Interactive Instructional System, Goal Systems International, Inc.'s Phoenix and Boeing Computer Services Co.'s Scholar/Teach 3.

The product leases for $3,125 annually.

A perpetual license is priced at $9,375.

Crwth Computer Coursewares, 613 Wilshire Blvd., Santa Monica, Calif. 90401.

■ QED Information Sciences, Inc. has announced a series of training courses designed to enable data processing personnel and end users to work more effectively together.

The offerings are two- and three-day courses held at the company's regional learning centers at Babson College in Wellesley, Mass.; Fairleigh Dickinson University in Teaneck, N.J., and Madison, N.J.; Drexel University in Philadelphia; and the Uni-

Continued on page 57

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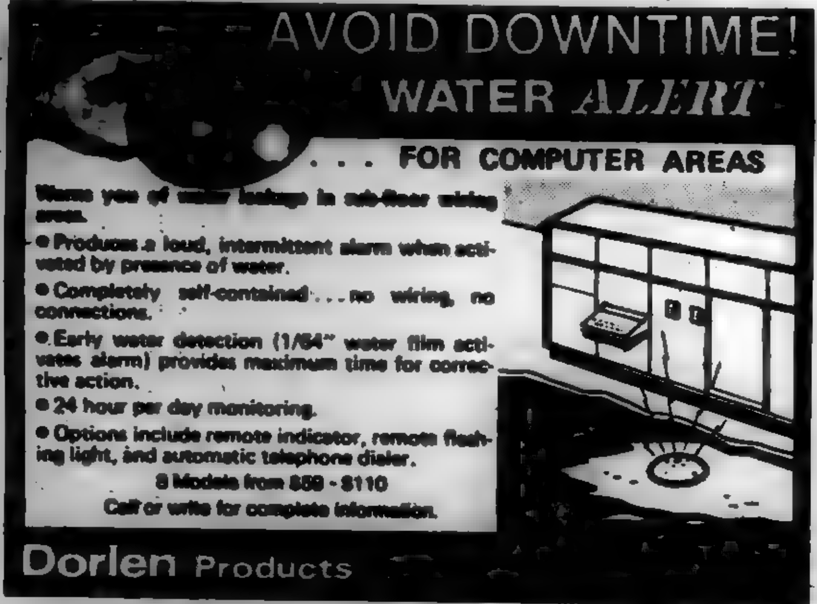
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Dorlen Products

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to the fact that the system is not what the user now needs, even if the system accurately reflects what was originally requested.

Management-related problems include the following:

- More requests for systems than can possibly be handled by existing staff, resulting in backlogs.
- Geographic dispersion of the organization.
- The high cost of maintaining existing systems.

In summary, interactive systems are increasingly necessary but are not being delivered in a timely fashion at an acceptable cost.

Why has this happened? It is primarily the result of a failure to recognize that developing interactive systems is substantially different from developing batch systems and that trying to fit the development of an on-line system to a batch-oriented development methodology can only aggravate the problem.

The problem can be seen in greater detail by examining the typical development methodology that most organizations use.

According to the Savant Institute, 83% of the program errors discovered at the acceptance-testing stage can be directly attributed to inappropriate or erroneous specifications made during the requirement identification, specifications and system design stages.

That problem stems from inadequate communication with the end user, both written and oral. Despite the mounds of written specifications and endless meetings, organizations wind up in an adversarial development process complete with conversations filled with statements like, "That's what you asked for," and "I know, but that's not what I wanted."

Having cycled through the methodology more than once, the end user is often told, "Use it for a while, keep track of any changes you might require and we will incorporate them into the next release." Now the organization has a maintenance/enhancement problem to contend with, and it is not altogether surprising that some are spending as much as 70% of their data processing budgets on maintenance and enhancements.

Consider an alternate approach, one that allows the organization to undertake meaningful acceptance testing prior to expending large amounts of time and money defining program specifications and writing and testing code. First, consider prototyping.

Prototyping is a way of life in industries like engineering, manufacturing and construction. In their highly acclaimed book, *In Search of Excellence*, authors Thomas J. Peters and Robert J. Waterman Jr. identified the first ingredient in the recipe for success. They wrote: "Rather than have 150 engineers working on a single project, which has a planned completion time of 15 months, the engineers are split into groups of five to 25 people who work closely with clients to develop prototypes in a matter of weeks. The unsuccessful ideas are discarded and the successful ones implemented."

The DP industry is awakening to the applicability of this idea to the development of on-line systems, and a number of software companies have recognized and responded to this need. Prototyping, however, is not without its problems. Unfortunately, the majority of these companies have been founded upon the success of their data base management software. That is unfortunate because, while the past can become a stepping stone to the future, it can also become the stumbling block to new and more appropriate ideas.

To develop a prototype, the designer is expected first to identify all the data elements the system is expected to use. All new elements must then be incorporated into a data dictionary, and the data base must be designed conceptually before a prototype can be created — not unlike expecting an architect to design all the plumbing and lighting before designing the external structure.

A more natural and appropriate approach to prototyping is to start

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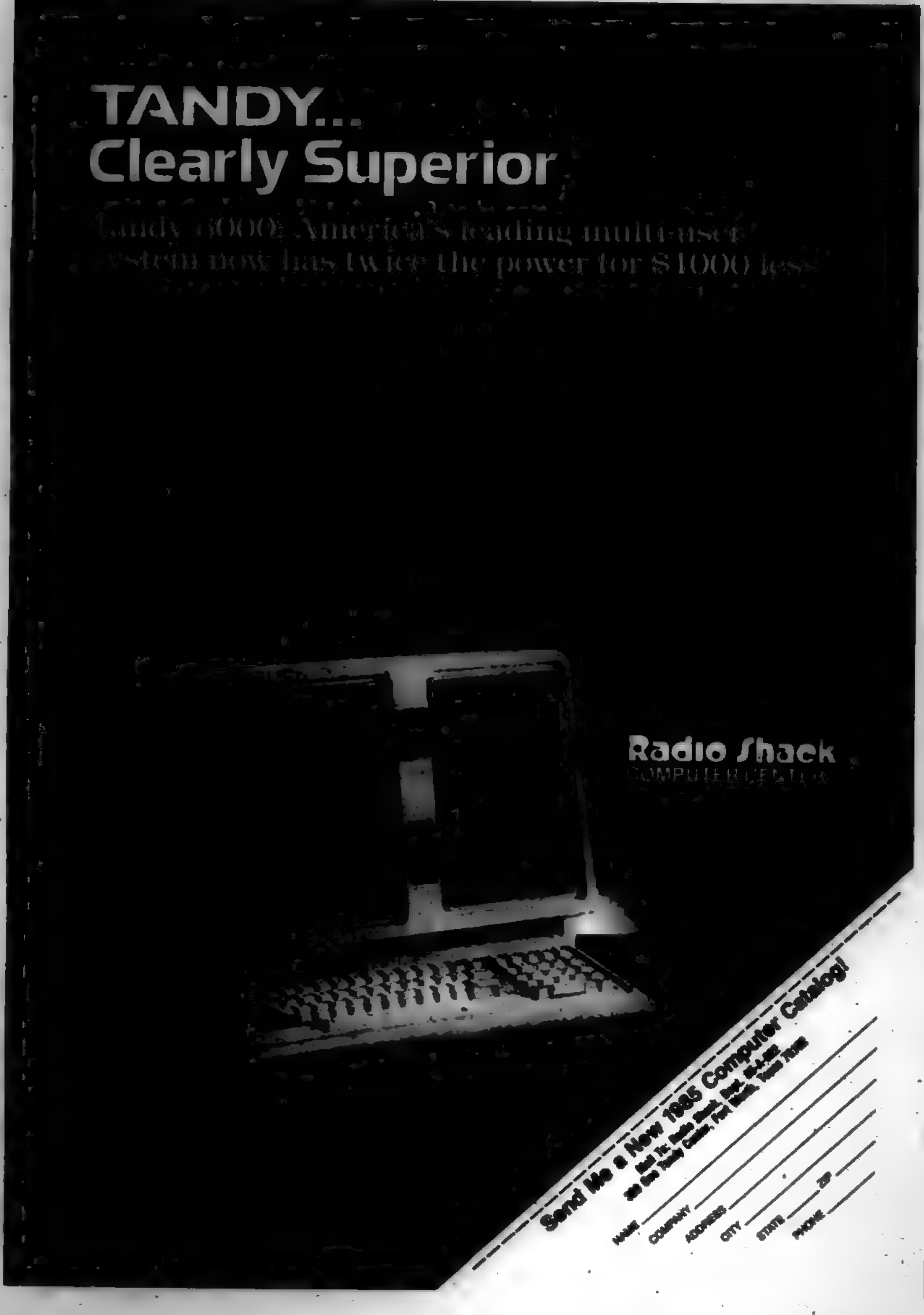
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VM
SOFTWARE INC.

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versity of Texas located in Arlington, Texas.

Course titles reportedly include "Communicating With Users," "Involving Users in Systems Design," "Product Selection Guide for the Information Center," "The Information Resource Environment — Micro or Mainframe" and "Fourth-Generation Software: Tools for the '80s."

Two-day courses cost $650; three-day courses cost $795.

QED Information Sciences, P.O. Box 181, QED Plaza, Wellesley, Mass. 02181.

■ Deltak, Inc. has announced "Advanced Focus: File Management and the Dialogue Manager" (186-45X-KE), a four-course computer-based training (CBT) series for users of Information Builders, Inc.'s Focus query language.

The series covers the creation and use of extract files, the creation of file descriptions and the maintenance of Focus files, the vendor said. It also reportedly instructs in the use of the Focus Dialogue Manager, a facility that allows Focus to prompt the user for information.

An annual unlimited license for the series costs $1,125; an annual limited license is $400; and the per-student price ranges from $17 to $43 per course per month.

Deltak, East-West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

■ Deltak, Inc., has introduced a series of video courses on microcomputing, a computer-based training course on Microsoft Corp.'s Multiplan and a video program discussing micro-to-mainframe links.

"Microcomputing: The Next Step" is a series of video courses that discusses micro hardware, software and the industry. The series is available for $480 or $150 per video.

"Teach Yourself Multiplan on the IBM Personal Computer," designed for the IBM Personal Computer, Personal Computer XT or compatibles, reportedly includes three diskettes for interactive instruction, simulation and exercises. It costs $70.

"Update: The Micro/Mainframe Link" is a 30-min video roundtable discussion with Peter Griffith of Peter Griffith Ltd.; Robert Menar, a senior vice-president with Carter, Hawley, Hale; and Joel Brandon, facility manager at the World Bank. It may be leased for $50/mo to $130/mo, depending on volume.

Deltak, East-West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

■ ETA International has announced a series of video education courses for users of Cullinet Software, Inc.'s IDMS/R data base management system.

"Introduction to IDMS/R and New Features of Cullinet Release 10 Software" is a series of four modules addressing recent enhancements to IDMS/R, network vs. relational data base models and Cullinet's Automatic System Facility, Integrated Indexing, Goldengate micro software and other enhancements.

Modules are priced at $600.

ETA International, 7 Wells Ave., Newton, Mass. 02159.

PRODUCE

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with the user's view of the application before building specific data structures. This approach treats the user interface — system externals — as the key, because it handles everything the user will see and experience at the terminal as though it were a fully operational production application. A model of the application, including all screens, flow logic between screens, error handling and data reformatting, is built for the user to test and modify before programmers or data base designers get involved.

In this way, the prototyping iterations take place more simply and are more quickly conducted by analysts and end users rather than technicians. This assures that the appropriate system internals (code and data base) will be built in support of a full-function externals model of an application that users truly understand. Obviously, to be able to do this in an effective manner, appropriate tools must be found and used.

Such tools should be interactive and should incorporate a sophisticated screen editor and screen painter as well as provide the ability to link the screens together without writing code, whether it is procedural or nonprocedural.

By using such approaches and tools, developers and end users are freed from designing the system internals and are allowed to concentrate on the application's functionality. User involvement and satisfaction can be improved, and subsequent implementation time and maintenance demands can be reduced significantly.

On finalizing the prototype, an application generator can be used to complete the process once the system attributes have been finalized. Often, developers attempt to prototype with an application generator. While this is possible, it is generally ineffective and results in inappropriate systems being created more rapidly. Developing an on-line system without first creating a prototype is analogous to launching a rocket without first confirming the destination — you will likely take off, but who knows where you will land?

If we are to provide accurate systems in a timely, cost-effective manner, we should provide prototyping tools for the analyst as well as application generators for the programmers. Only then will we begin to reduce the development backlog.

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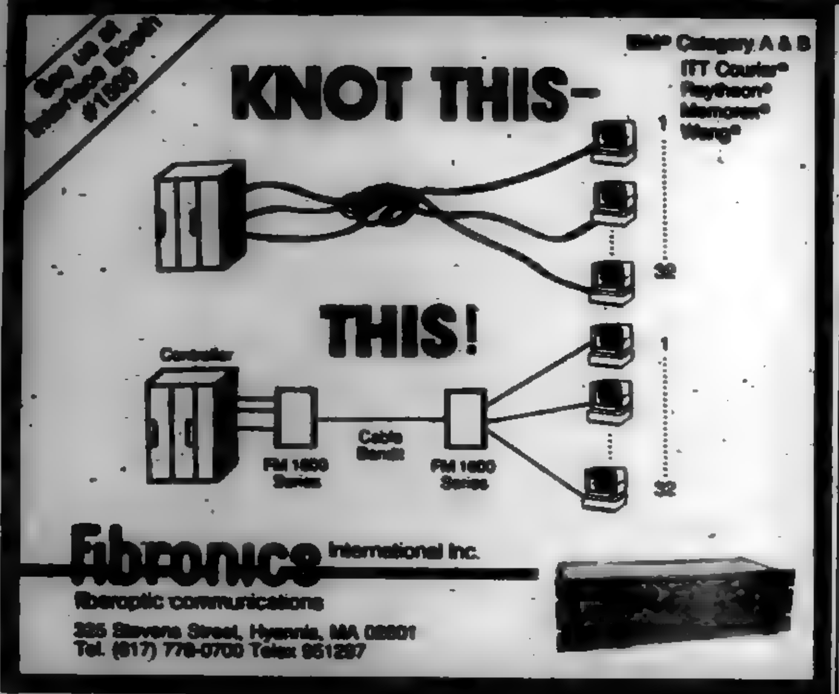

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AI

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have developed true machine intelligence.

"For lack of a more universally used term," he concluded, "the industry will continue to use artificial intelligence as a catchall phrase. But we will all be forced to be more accurate in describing the facets of this industry during the coming year."

Dicken is absolutely correct. His comments take on special importance in light of the fact that the audience — in this case, an amorphous collection of vendors, trade journalists, computer scientists, just plain interested folks and, most important, users — is really waiting for the promised flower of AI to blossom.

DP and MIS professionals have been given a spirited sales pitch for AI. They have been informed, among other things, that AI technology will solve the applications backlog, that it will help them provide upper management with the decision-making tools that class of knowledge workers really needs, and that it will soon restructure the nature and role of computing.

Those same DP and MIS managers have been soberly warned that AI is only beginning to show itself over the technological horizon. AI detractors say the goal of designing and manufacturing hardware and software that exhibits real intelligence, such as learning or the ability to adapt itself to varying situations, is far from being realized and that information systems professionals should look to more routine or conventional technologies for solutions to current problems.

Which viewpoint is correct? Both, at least partially. The answer lies in the problem raised by Dicken. For the most part, DP and MIS professionals do not, and probably cannot, know what to believe until they get some workable definitions of what this thing called AI is.

If technologies such as expert systems, natural language interfaces, speech recognition and vision systems fall under the umbrella of whatever definition of AI is finally accepted by everyone in the field, then, yes, AI has the potential to be a great boon to the DP manager and other professionals in the future.

If such evolving products do not cut the grade according to the emerging (at least one hopes emerging) delineation of what constitutes AI, then it is unlikely that the ethereal technology of AI will be of any practical use to the MIS professional for quite some time.

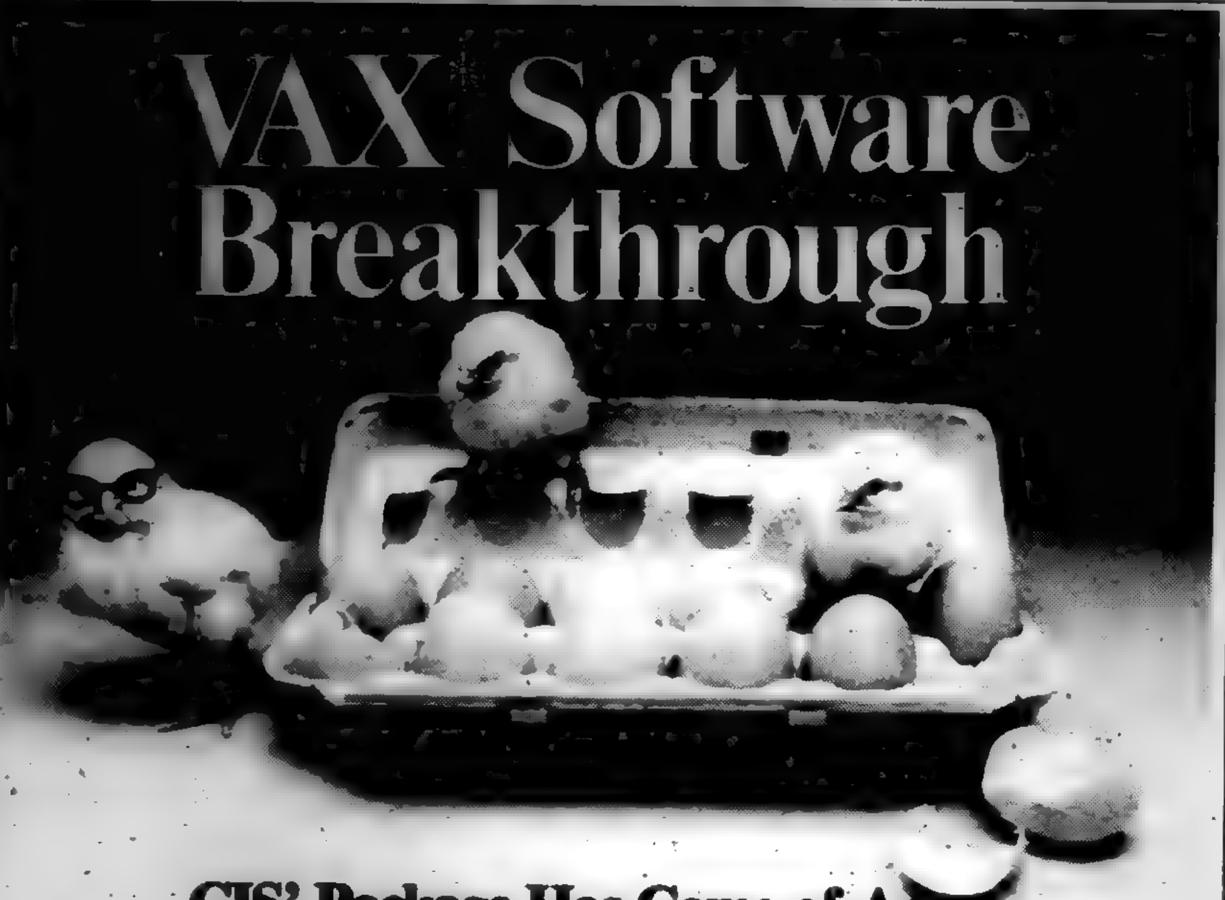
Clear definition needed

The need for a clearer definition of AI is also highlighted in one of Newquist's other statements. "More companies will have to prove the viability and validity of their products, because the 'made for AI' label won't cut it with discriminating buyers anymore," he stated.

Too many vendors — especially software vendors — have taken to calling their products artificial intelligence-based or stating that their tools incorporate AI techniques. Clearly, a relational data base management system with a simplified user interface is not of the AI ilk, nor is a so-called fourth-generation language that makes it easier for a user to access data and applications.

Caveat emptor. Or, more appropriately, let the DP and MIS professional beware. Do not look at new products, promised or real, in terms of their supposed roots in AI. A product or technology is either applicable to your organization or not.

It is easy to be awed by visions of the future. It is also easy to shy away from the task of keeping current with AI for fear of losing sight of what is practical and what is visionary. But where a good AI definition does not exist, DP and MIS professionals must take the time to wade through the hype of start-up company executives and venture capitalists and the trade talk of cognitive psychologists and others in the AI industry today. Get to the heart of the issue — can this product help you meet the current information needs of your organization in a cost-effective way?



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COMMUNICATIONS

Service turmoil may prompt IBM move

By Charles Babcock
CW New York Bureau

Service and rate turmoil in the communications industry may make it hard for IBM to persuade users to go ahead with major communications applications, a predicament that will encourage the mainframe manufacturer's entry into the industry, according to Howard Anderson of the Yankee Group.

Anderson, managing director of the Boston market research firm, said large users will be spending 45% of their communications transmission budgets on data in 1990, compared with 10% to 15% today. However, this growth may be hindered by the unpredictable quality of service provided by telephone companies and the random pattern of price hikes, which could, in turn, make it hard for IBM to market major communications applications, according to Anderson.

In this uncertain environment, IBM may look at its large customers and ask, "Why don't we step in and help them to be small phone companies? We can encourage them to buy big pipelines" to handle their communications needs, he added. Anderson said IBM might go so far as to provide a link between its customers' sites and an IBM central switching office, becoming, in effect, a quasi-public phone company in its own right. This would appeal to users who want to control their networks but are being overwhelmed by telecommunications, which is twice as complex today as it was three years ago and destined to double in complexity again over the next three years, he said.

IBM could then leverage this position into sales of private branch exchanges through its wholly owned firm, Rolm Corp., as well as through the sale of monitoring and test equipment and network controllers needed to run a customer's telephone system, Anderson said.

In the future, IBM may locate network control centers next to data centers and/or manufacturing control centers of large IBM manufacturing customers to encourage further the concept of user-controlled network management, Anderson concluded. IBM spokesman Kenneth B. Simon, telecommunications marketing manager, said IBM sees its customers experiencing "option shock" as they react to the AT&T breakup. "When you don't have a supplier, you have to get a network manager," he said, and IBM is planning to introduce products that allow companies to configure their own telephone networks.

The products will include protocol converters, modems, network controllers, terminal interface units, extended network addressing and links, when needed, to Satellite Business Systems, a satellite communications company of which IBM holds the major share. In general, IBM will develop products that extend connectivity, provide network management, optimize network configuration and expand communications service, Simon said.

■ Codex Corp. has introduced Codex 4250 SNA Gateway, which links non-Systems Network Architecture devices/63

■ Excelan, Inc. has announced two protocol converter products that enable supermicrocomputers running AT&T's Unix to connect to Digital Equipment Corp. hosts/63

■ Timeplex, Inc. has introduced D4 Link Framing Module, which makes Timeplex's Link/1 T1 Facilities Management System compatible with AT&T's D4 channel bank framing technique/63

■ CTS Datacomm has announced a dial-up, full-duplex modem that features automatic dialing and can operate at speeds from 300 to 2.4K bit/sec/64

INSIDE

Controllers/63
Software/63
Multiplexers/Modems/63
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Test Equipment/64

SBS adds public circuit-switched digital service for data, video

MCLEAN, Va. — Satellite Business Systems (SBS) has announced its SBS Dataservice, a public circuit-switched digital service for switched data and video via the SBS Skyline Network Service.

The service reportedly will feature the use of dedicated short-haul leased lines between customers and earth stations in its backbone network and on-demand satellite capacity for long-haul transmissions.

Data rates of 56K bit/sec and 1.34M to 1.54M bit/sec are offered. SBS said charges will consist of the cost of the local leased facilities, satellite transmission fees and associated equipment, including the SBS Selector 500, a device designed to establish point-to-point and multipoint connections dynamically. SBS Dataservice is said to include full-duplex, on-demand transmission; end-to-end, customer-initiated diagnostic capability; flexible calling options; and direct, seven-digit dialing.

Switched data transmission options include point-to-point, stationary broadcast and mobile broadcast, which lets users in a conference-call change point of transmission to different nodes. The service is scheduled to start April 2.

The SBS Selector 500 may be leased for $140/mo. The company said it will file tariffs for other charges in March but that the cost for the satellite usage combined with the local leased facilities needed will total about 35% less than comparable AT&T private-line services based on existing AT&T tariffs. An SBS spokesman said that where the long-haul portion of an AT&T Accunet 1.5 connection from New York to Los Angeles may cost $75,000/mo, an SBS connection will cost $35,000/mo.

SBS is located at 8283 Greensboro Drive, McLean, Va. 22102.

Northern Telecom expands NMS line for data handling, control functions

MARLTON, N.J. — Northern Telecom, Inc. has introduced a model in its Network Management System (NMS) line of network control systems and enhancements that increase NMS data handling and control capabilities.

NMS Model 3030 was designed for small to medium-size networks with 80 to 650 lines, the vendor said. The product reportedly allows a local or remote user to track network fault detection, problem isolation and service restoration. NMS Model 3030 features 31M bytes of hard-disk storage, which can be used to store one month's alarm summaries, trouble tickets and network availability data. The product reportedly can work with most networks, the vendor said.

One enhancement, IBM General-Purpose Interface (GPI), allows NMS to communicate with IBM computers that use a bisynchronous connection. The interface automates the task of transferring network configurations among data bases and allows information collected by NMS to be transferred to an IBM mainframe for storage and analysis, the vendor said.

A second enhancement, Bytex General-Purpose Interface, allows NMS to work with Bytex Corp.'s Autoswitch matrix switch. The enhancement reportedly determines the importance of alarms that pass through a Bytex switch or those from subsystems on a network, the vendor said. Bytex users can define network configurations and maintain them in real time.

Model 3030 costs $59,500. The IBM/GPI price ranges from $2,900 to $7,500, and the Bytex interface ranges in price from $9,700 to $24,000.

Northern Telecom is located at 9000 Lincoln Drive E., Marlton, N.J. 08053.

Uninet offers packet switch

Gen4 lets large firms build private networks

By James Connolly
CW Staff

WASHINGTON, D.C. — Uninet, Inc., operator of a public packet-switched network, has announced what it calls a fourth-generation packet switch that large firms can use to build private networks.

According to Uninet, Gen4 nodes are fault-tolerant and failure-accommodating, using one-for-N sparing, as in the provision of four power supplies to ensure backup when three are needed for operation. It is said to include redundant buses, line modules, processors and power supplies. It also reportedly has a menu-driven console to monitor and control the network.

Uninet, a subsidiary of U.S. Telecom, reported that Gen4 has a built-in modular expansion capability and a 10M bit/sec bus structure and is based on multiple Intel Corp. 286i microprocessors.

As an example of the power of the new switch, a Uninet spokesman said the company will install a single four-chassis unit in the Washington, D.C., area in its own public packet-switched network to replace the 10 Uninet nodes now serving the area.

The product reportedly supports X.25 and X.75 protocols and Uninet said a typical node can process 2,000 packet/sec and transmit at 56K bit/sec. The product is currently targeted at data applications.

The vendor said the starting price for a node without redundancy will cost about $20,000 and will range to more than $100,000. Concurrent with this announcement, Uninet announced Uninet Plus for use with its public packet-switched network. It is an end-to-end error-detection option that utilizes the Microcom, Inc. Microcom Networking Protocol for 2,400 bit/sec communications. The option costs $1 extra per hour during prime business hours and less during off-hours.

Uninet is located at 10951 Lakeview Ave., Lenexa, Kan. 66219.

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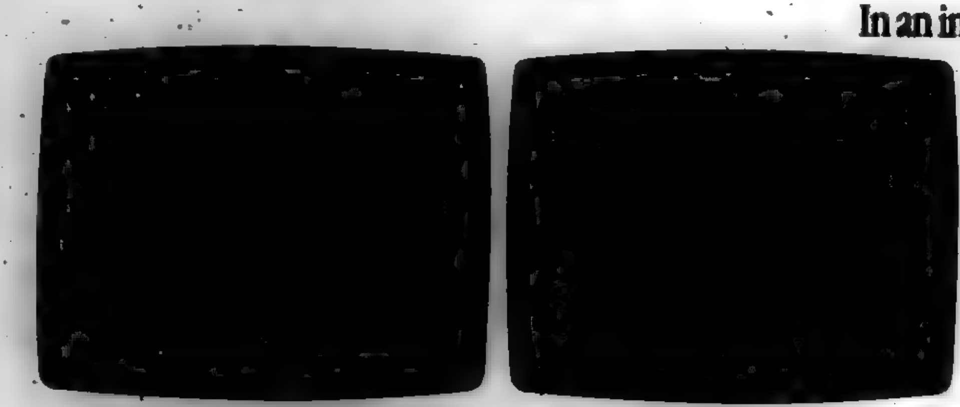

ColorKey lets you make the switch from monochrome to color, without expensive reprogramming.

With ColorKey, eye-catching color is actually at your fingertips. All you do is touch a key for an on-screen menu. Then assign your preferred color combinations to VT100 attributes such as BLINK, UNDERLINE, BOLD or Reverse Video. Even color code negative numbers automatically. That's all there is to it.

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COMMUNICATIONS

CONTROLLERS

■ **Distributed Logic Corp. has announced Optimux/8DZ, an asynchronous communications controller for Digital Equipment Corp.'s LSI-11 board-level processor.**

The communications subsystem provides features similar to those of DEC's DZ11 communications subsystem as used on the DEC PDP-11 and VAX processors, the vendor said.

The product allows a user to double the number of RS-232 channels supported by a DZ11. Optumux/8DZ is said to provide 15 data transfer rates that range in speed from 50 bit/sec to 19.2K bit/sec.

The product costs $770.

Distributed Logic, P.O. Box 6270, 1555 S. Sinclair, Anaheim, Calif. 92806.

■ **Codex Corp. has introduced Codex 4250 SNA Gateway that links non-System Network Architecture (SNA) devices to an SNA network.**

The product operates as an SNA controller for Ascii and bisynchronous devices and concentrates full-duplex lines using mixed protocols at input speeds up to 9.6K bit/sec, the vendor said. The product can be configured with four, eight or 12 terminal ports that support any combination of devices. Downstream lines communicate directly with the host over a single SNA link at speeds up to 19.2K bit/sec.

Reportedly, the gateway is a full implementation of IBM's Physical Unit Type 2 definition for a cluster controller.

Since Codex 4250 SNA Gateway is software-based, additional protocols and devices can be added as they become available. Changes can be centrally implemented by a customer downloading new operating code from a central host to Codex SNA Gateways.

Codex 4250 SNA Gateway's price ranges from $10,000 to $14,000.

Codex, 20 Cabot Blvd., Mansfield, Mass. 02048.

SOFTWARE

■ **Excelan, Inc. has announced two protocol converter products that enable supermicrocomputers running AT&T's Unix to connect to Digital Equipment Corp.'s VAX superminicomputers, PDP-11 minicomputers and LSI-11 board-level products.**

Exos 8030 and Exos 8040 board-level converters are based on an Intel Corp. 80186 microprocessor that monitors network and transport-level protocols, the vendor said. Exos 8030 supports DEC PDP-11 and LSI-11 machines running DEC's RSX-11M operating system. Exos 8040 works with VAX superminicomputers that use VMS operating system.

Exos 8030 has a $10,000 license fee, $2,000 development kit and a royalty fee of $100 for each terminal.

Exos 8040 is available for an initial $20,000 license fee, $4,000 development kit and royalty fee of $150 for each terminal.

Excelan, 2180 Fortune Drive, San Jose, Calif. 95131.

MULTIPLEXERS/ MODEMS

■ **Penril Datacomm has introduced Datalinx, a family of three high-performance modems: the DLX 224, DLX 227 and DLX 229.**

The modems operate in either full- or half-duplex mode, use Phase Shift Keying modulation and can be used with leased or private dial-up lines, the vendor said.

The products reportedly feature a 32-char. LCD and front-panel switches used for diagnostic routines and are compatible with Hayes Microcomputer Products, Inc.'s Smartmodem line. DLX 224, a 2.4K bit/sec modem sells for $895. DLX 227, a 4.8K bit/sec modem costs $1,395. DLX 229, a 9.6K bit/sec model costs $1,795.

Penril Datacomm, 207 Perry Pkwy., Gaithersburg, Md. 20877.

■ **Case Rixon Communications, Inc. has introduced a full-duplex, multispeed modem capable of transmitting at 300, 1.2K or 2.4K bit/sec over two-wire, private or dial-up lines.**

When transmitting at 2.4K bit/sec, the R1224 is said to use Quadrex modulation; at 1.2K bit/sec, it uses Phase Shift Keying, and at 300 bit/sec, it uses Frequency Shift Keying. Switching between asynchronous and synchronous transmission can be controlled from the modem's front panel, the vendor said. The modem features automatic pulse or tone dialing. R1224 costs $799.

Case Rixon Communications, 2120 Industrial Pkwy., Silver Spring, Md. 20904.

■ **Timeplex, Inc. has introduced D4 Link Framing Module that makes Timeplex's Link/1 T1 Facilities Management System compatible with AT&T's D4 channel bank framing technique.**

The product inserts a framing bit that provides testing and synchronization at every 193rd position in a T1 1.54M bit/sec digital data stream, the vendor said. The Link/1 product is then compatible with AT&T circuits, including terrestrial and satellite services and routing through a digital access and cross-connect system.

The product's pattern of 12 framing bits is said to allow the network to identify a customer's data and open 8K bit/sec of bandwidth for synchronization and diagnostics. The module costs $950.

Timeplex, 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

See MODEMS page 64

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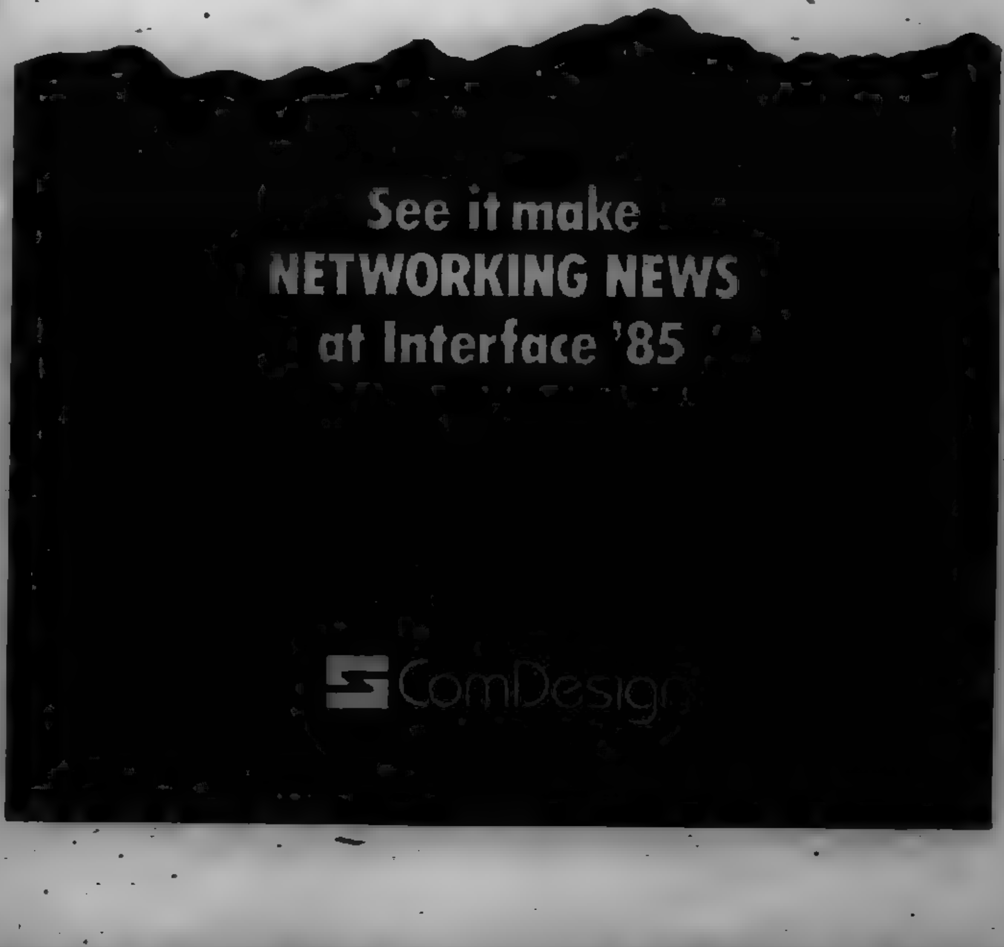

COMMUNICATIONS

MODEM

from page 63

■ CTS Datacomm has announced a full-duplex modem that features automatic dialing and can operate at speeds from 300 to 2.4K bit/sec.

The 2424AD is said to allow a user to transmit asynchronously or synchronously at speeds of 1.2K bit/sec and 2.4K bit/sec. It also transmits asychronously at 300 bit/sec. The automatic dialing feature is said to store up to 10 telephone numbers. The 2424AD costs $795.

CTS Datacomm, 6900 Shady Oak Road, Eden Prairie, Minn. 55344.

■ Coherent Communications Systems Corp. has announced DSM-32, a multiplexer that enables one 32K bit/sec digitized voice channel and several data channels to be supported over a 56K or 64K bit/sec digital link.

The product is said to use Adaptive Pulse Code Modulation to digitize analog voice signals into 32K bit/sec transmissions.

When a 64K bit/sec link is used, the digitized voice signal can be strap-configured to support three 9.6K bit/sec data ports or one 19.2K bit/sec and one 9.6K bit/sec data channel. When a 56K bit/sec circuit is used, the DSM-32 supports either one 19.2K or two 9.6K bit/sec data channels, the vendor said. DSM-32 sells for $2,245.

Coherent Communications Systems, 60 Commerce Drive, Hauppauge, N.Y. 11788.

■ Case Rixon Communications, Inc. has introduced 81X Openline, a communications processor with 10 I/O ports that can be configured for varied tasks with cartridge inserts.

Using program option packs called Pop-Pacs, users can change the nature of their devices to act as an asynchronous-to-bisynchronous protocol converter; a single-link statistical, dual-link network or dual-link network switching multiplexer; or a single-link X.25 packet assembler and disassembler.

The processor costs $1,300. Pop-Pacs range in price from $1,000 to $1,500.

Case Rixon Communications, 2120 Industrial Pkwy., Silver Springs, Md. 20904.

LOCAL-AREA NETWORKS

■ Syntrex, Inc. has announced Remote Document Access (RDA), a hardware and software communications package that allows a remote Syntrex terminal or IBM Personal Computer to access a Syntrex Ethernet-type local-area network.

Syntrex networks consist of a central file server and either Syntrex workstations or IBM Personal Computers.

Using any type of Digital Equipment Corp. VT100 terminal emulation software, a terminal or Personal Computer reportedly can access a Syntrex net through an asynchronous link at speeds up to 9.6K bit/sec.

The remote user can work with any Syntrex function, including text processing, spelling checker, list processing and sorting, full-text file searching and retrieval, print spooling for a high-speed laser printer or printing at a remote location, the vendor said.

RDA costs $5,500.

Syntrex, P.O. Box 657, 246 Industrial Way W., Eatontown, N.J. 07724.

TEST EQUIPMENT

■ The Instrumentation Department/ACD of the Panasonic Industrial Co. has announced a portable protocol analyzer designed for line troubleshooting and analysis of faults in data communications networks.

The VP-3682P reportedly can record and store data in a built-in, 64K-byte memory and display it on the CRT without affecting the on-line status.

Features are said to include a built-in automatic configuration function, time savings through protocol translation according to CCITT X.25 Level 2 or 3 and display in mnemonic code, an idle-suppress function and idle-time display. The unit measures 310 by 150 by 420 mm.

Functional specifications include optional applicable interfaces, including X.20, X.21, X.20BIS, X.21BIS, RS-232C; asynchronous and synchronous transmission modes; full- and half-duplex lines; and a maximum line speed of 19.2K bit/sec.

The VP-3682P costs about $4,100.

Panasonic Industrial, One Panasonic Way, Secaucus, N.J. 07094.

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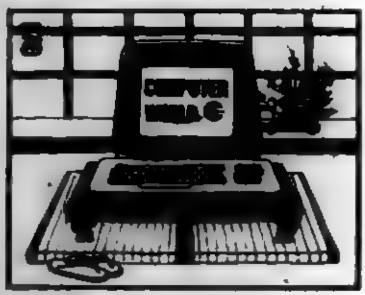

The Japanese computer industry is growing at a rate of 20% per year. There are currently more than 101,000 installed general purpose computers valued at over $18 billion. This figure does not include minis, micros and personal computers. Small business computers are currently the leading growth sector in the Japanese computer market.

Japan is looking for well-developed technology that will meet their future needs. And with no strong independent software industry of its own, Japan offers great opportunity for U.S. manufacturers in the packaged software market.

Computerworld/Japan is a weekly publication covering the latest developments in the Japanese computer industry with reports on new products, services and trends. Its 30,000 subscribers include top management and DP professionals throughout the country.

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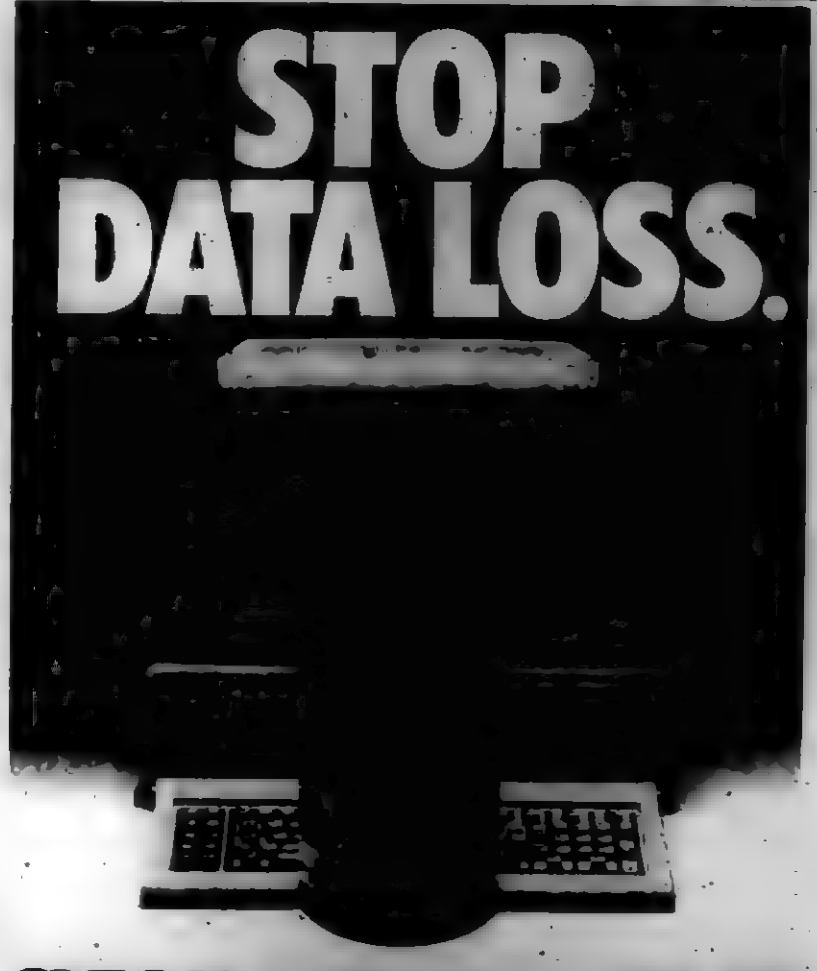

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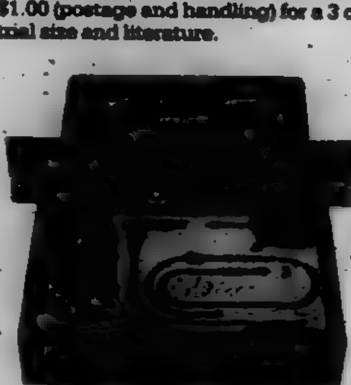

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Large firms keep count on micros

By Sheldon Needle

Large firms are beginning to recognize that microcomputers have their place not only for performing spreadsheet, data management and word processing but also in the very guts of the corporate management information system — accounting.

To be sure, micros are not yet replacing mainframe financial number-cruncher software, but they are slowly starting to carve their own niche in the departments and divisions of big business.

- A regional communications company uses a micro payroll package to handle its nonregulated subsidiaries payroll.
- The refinery of an energy conglomerate chooses to go micro to handle accounts payable, general ledger and special reporting rather than stay with the corporate data service.
- The subsidiary of a large food conglomerate opts for micro-based software to do sales order processing, accounts receivable, accounts payable, purchase order and general ledger instead of using outside services or an in-house mainframe.
- Another communications company uses micro software and hardware to maintain its 8,000 fixed asset records.
- A large construction company tracks performance of its subcontractors on a customized micro accounts payable package.

There are essentially two types of micro accounting software available today. The first type, originally written for minicomputers, is intended for medium-size businesses ($5 million to $50 million in revenues). These packages offer such special facilities as bill of material for manufacturers and have existed for five to 10 years. Many have been downsized to run on micros, but since they were written for minis, many tend to run slowly. They also can be difficult for the typical small business to install and support.

A newer generation of accounting software is springing up. These systems have been written specifically for micros, tend to run faster and usually can be managed by the first-time user. Many are written in fourth-generation data base languages, such as Ashton-Tate's Dbase II, Micro Data Base Systems, Inc.'s MDBS III or Data Access Corp.'s Dataflex.

Appropriate for small businesses or divisions of large businesses, these systems are now starting to replace traditional internal or external time-sharing services. The advent of multifaceted micro software makes accounting at the division level realistic for consolidation reporting and storing data at the operating level.

Accounts payable. Accounts payable offers such capabilities as normal vendor ledger codes for speeding up data entry and reducing distribution errors. Prepaid invoices may be flagged and one-time vendor disbursements recorded without creating an entire master file record. Micro systems will track all open payables and allow for cash-flow projections by multiple cut-off dates. Entries can often be selected for payment by either due date,

Many accounting functions can be performed on a micro cost effectively, accurately and with a level of security perfectly acceptable to users. Micros can yield a level of accounting detail at the division or department level previously unattainable.

PHOTO © [illegible]

discount date or vendor. Some systems will check for duplicate invoice numbers for the same vendor. Managers of the payables function will not be disappointed in micro software capabilities in this area.

Accounts receivable. Credit managers will also find accounts receivable functions well thought out. Many systems offer both open item and balance forward accounting. Open item provides a detailed audit trail. Customer credit is typically checked at invoicing time or, if order entry is used, when an order is entered.

A number of options are available for customizing the account record. These include flagging a customer record to receive interest charges and/or statements. Statements can be printed on a cycle billing basis and sent to certain customer groups at different times. Some systems offer fairly extensive payment history data, including credit rating, average days to pay and number of on-time vs. late payments. The credit manager has the tools he needs for working with customer accounts.

Inventory control. Micro accounting is rather weak in the area of inventory control. Most systems offer only a basic book inventory and reorder point control. Few systems maintain anything but period-to-date and year-to-date data, which means there isn't much data to analyze trends or suggest reorder quantities. On the plus side, back-order control, a big problem for many companies, is available in some systems that track back orders by both item and customer. There are even systems that will make back orders conditional by item or customer.

Reporting of sales and cost of sales by customer is part of gross profit analysis that will track margins by customer, item and, sometimes, sales territory. However, most systems are rigid in handling margin analysis and do not provide for any user inputs other than what the system maintains in its cost and sales history files. Consequently, it is hard to track profits accurately on accounts with special considerations besides standard price discounts.

Manufacturing. For purposes of manufacturing and cost accounting, micros have lagged because of the need for powerful hardware to run file I/O-intensive manufacturing applications such as bill of materials. But more manufacturing software is appearing on the scene with the advent of supermicros. There are packages that have strong features for job costing. These include full integration with accounts payable, inventory control and accounts receivable and the ability to handle allocations.

General ledger. General ledger systems are more developed and are beginning to approach mainframe capabilities. At a minimum, they perform profit center accounting. Some packages will handle multiple entities with security codes for each separate company. Some will allow consolidation (even consolidation of unlike charts of account) and multiple levels of reporting within a single entity (division, profit center, product line, sales territory and so on).

Until about one year ago, most report writers were painfully complex as well as functionally limited. However, we are starting to see data base report generators that take a data dictionary approach and predefine reporting relationships so that the user can position data, create totals and insert text with a reasonable amount of ease. Complex statements such as source and use of funds can be defined. In addition, many packages offer bridges to spreadsheets that can be performed at the application level without any fancy programming. This is currently the best solution to limited report writers.

Payroll. Payroll is another application that is well developed on micros. Features include multistate capabilities, various forms of compensation, different pay periods, multiple deductions, allocation to departments and integration with general ledger. Payroll is an area making real inroads into divisional accounting.

There are other applications of specific interest to large companies such as purchase orders, fixed assets and human resource accounting. Few small companies have reached the stage of using these functions, but these applications are showing up more frequently in micro-based systems.

Why change?

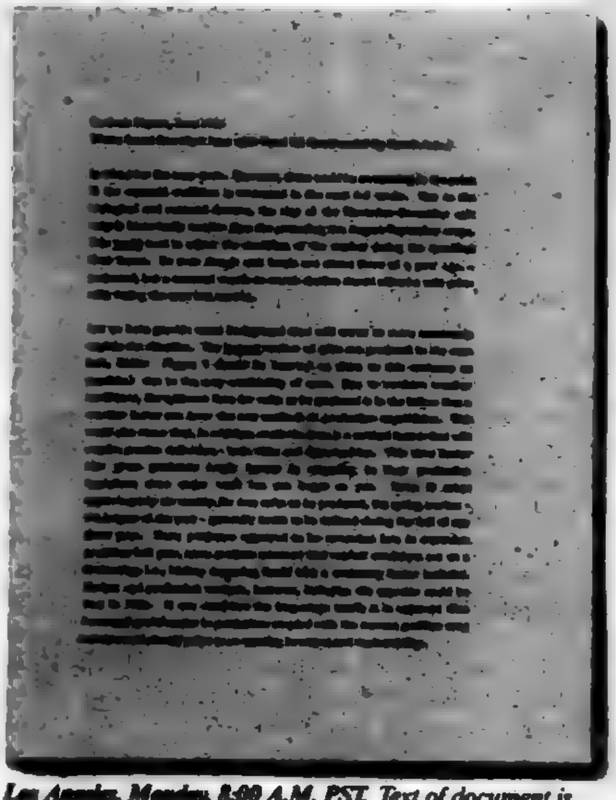
Why are micros being installed for accounting functions at the divisional level by companies that previously were locked into large and expensive hardware and software systems to do even the most trivial of bean-counting functions? Some of the reasons are obvious, some not so obvious.

First, corporate managers are beginning to understand that the functions of many accounting systems can be performed on a small computer cost-effectively, accurately and with a level of security perfectly acceptable to users. Next, it is clear that far from being isolated standalone systems, micros represent a bridge to headquarters accounting that can be approached as fast as technology and user sophistication warrant.

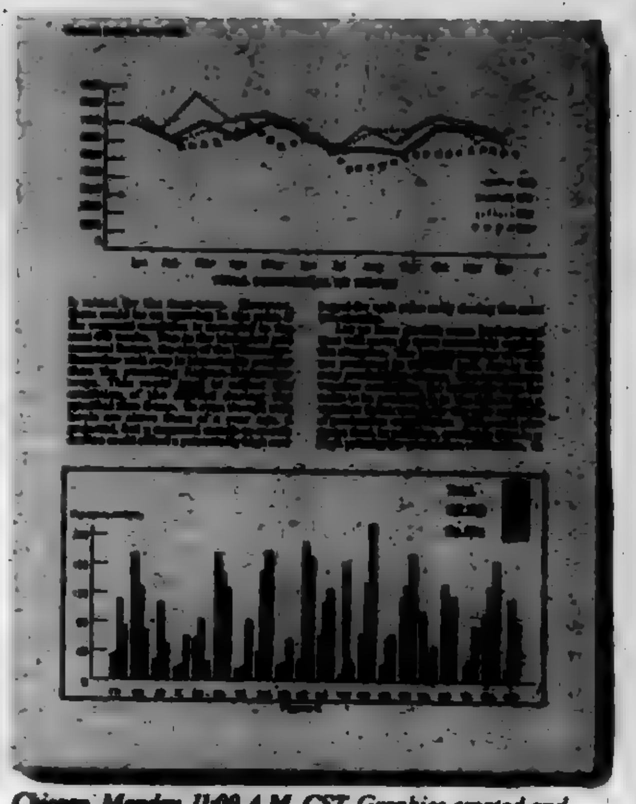
Finally, in many cases, it just makes good economic sense to go micro when a small computer represents the lowest cost option and gives a level of information detail at the division or department level previously unattainable. An extra, not so obvious, benefit may well be improved employee morale attributable to greater responsibility and sense of control.

We are still in the first generation of large company micro-based accounting, but important applications

A day in the life



Los Angeles, Monday, 8:00 A.M. PST. Text of document is created on Xerox 860 Information Processor and communicated on Ethernet network to Chicago.



Chicago, Monday, 11:00 A.M. CST. Graphics created and integrated with received text on Xerox 8010 Professional Workstation and electronically mailed to New York office.

Remarkable, isn't it? The weeks it would have once taken to prepare, translate, print and distribute a complex, illustrated report such as the example above can now be compressed into the span of a single business day.

What makes this feat possible is an extraordinary computer from Xerox called the 8010 Star Professional Workstation.

Star possesses exceptional capabilities—in document preparation, graphics and information processing. Incredibly versatile, Star combines text and graphics in any number of ways within the same document—without changing software. It gives you superlative ease of use through such Xerox innovations as the mouse, icons, windows and property sheets.

Naturally, what you see pictured here is only one example of Star's powers. It's the only workstation that can create and print documents in more than a dozen languages. That includes Russian and Japanese (Kanji, as well as Katakana and Hiragana). This eliminates the need to have separate machines and printers for each language. Which is particu-

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are going up that someday soon will take their place alongside traditional mainframe software.

The insurance company. Merchants Insurance Group of Buffalo, N.Y., chose Great Plains Computer Co, Inc. software to do its accounts payable. On the previous manual system, it took two full-time clerks to handle 1,400 vendors. Now, with the IBM Personal Computer XT, cash flow reports from payables are sent to corporate cash planners, and entries are manually interfaced to the corporate mainframe.

Future plans are to add fixed assets and connect the micro transactions to the company's Honeywell, Inc. Level 66 mainframe. The department manager especially likes the vendor history information available at his fingertips for the first time.

The communications holding company. A communications holding company uses the Great Plains payroll package to handle its 300 employees at newly acquired subsidiaries. The payroll requirements for the subsidiaries differ from corporate because of government regulation. Therefore, it made sense to look for an off-the-shelf package rather than tailor the mainframe system to handle both sets of requirements. This is a stand-alone system with output journalized to the corporate financials.

The company uses an IBM Personal Computer with a 21M-byte Davong Systems, Inc. hard disk. This particular system was chosen over other payroll systems because it allowed up to 20 deductions per employee. The security issue is solved by means of restricted access to a secure building and through password control.

The food conglomerate. A food conglomerate selected Open Systems, Inc. software to perform its sales order processing, accounts payable, purchase order and general ledger for a newly acquired manufacturing division. Expected monthly transaction volumes are 400 purchase orders and sales orders and 500 vendors.

The conglomerate could tailor Open Systems software to the specific needs of its sales order processing. Prior to making this choice, the corporate information systems group conducted an extensive evaluation that considered several options: time-sharing with the corporate mainframe computer, communicating by satellite to other manufacturing facilities in the corporate family, using an outside service or buying an in-house mainframe.

Time-sharing was considered too expensive. The computer facilities at other manufacturing sites were operating at capacity, so that option was eliminated.

Outside services were rejected because of the expense and the need for confidentiality. Finally, acquiring an in-house mainframe required too much support.

Virtually every feasible traditional option was considered and rejected in favor of a micro hardware and software solution.

The company uses two IBM Personal Computers, each with 20M-byte Tallgrass Technologies Corp. hard disks. The Open Systems software was also favored because it offered an interface from accounting modules to spreadsheets, and all subsystems were well interfaced.

Future plans for this company include interfacing nonposting reporting accounts from the general ledger to corporate for consolidation purposes through a communications link.

The three-level password protection in Open Systems was another plus. It provides module, submenu and function access control.

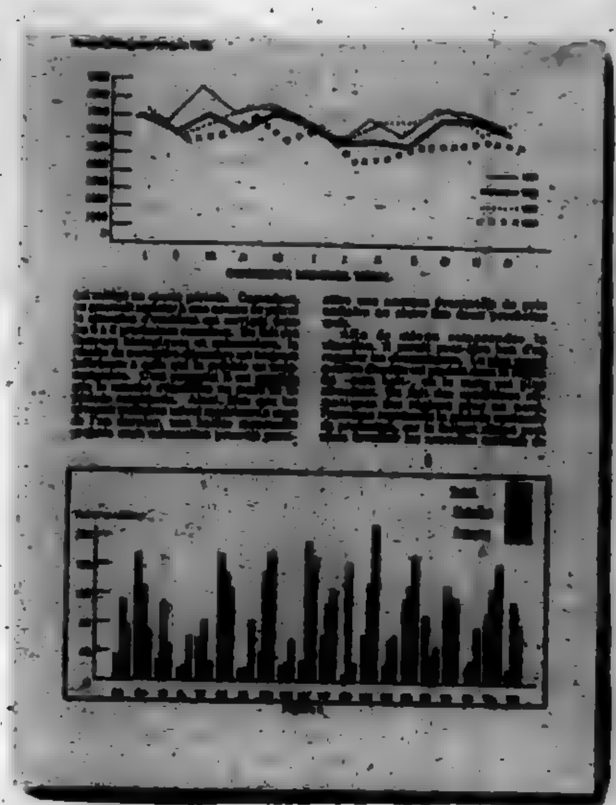
High-tech holding company. A comprehensive fixed-assets system also from Open Systems was recently installed by a multibillion-dollar high-tech holding company for its seven subsidiaries. These subsidiaries were not subject to the same tax rules as the parent and wese good candidates for a special micro-based system. Using an IBM Personal Computer XT, 8,000 fixed-assets records are maintained for one company. Basic financial information is transferred to the tax department, where tax data such as Investment Tax Credit rates are entered. Then, summary numbers are taken from the system and entered to the corporate general ledger.

The great benefit to this approach for the manager of tax methods is that with the Open Systems report writer he can get any type of report he wants without depending on the DP department.

High-tech conglomerate. An Apple Computer, Inc. Apple IIe and the BPI Payroll System is used to do the corporate payroll and the data center payroll for a high-tech conglomerate located in the Los Angeles area. The micro option was chosen for purposes of confidentiality and fast turnaround. To control access, the department manager keeps the entire system on a rolling table and takes it into his office to do the biweekly payroll.

Previously, the company used a

> *We are still in the first generation of large company micro-based accounting, but important applications are going up that someday soon will take their place alongside traditional mainframe software.*



XEROX

of a document.

New York, Monday, 4:00 P.M. EST. Entire document has been translated into French and entered on the 8010, then sent through Ethernet to Paris.

Paris, Tuesday, 9:00 A.M. Document has been received on Xerox 8010; electronic printer prints exactly as transmitted.

larly valuable to international companies that create documents that require quick translations and, very frequently, worldwide distribution.

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Just call your local office systems sales representative for more details on how Star and the Ethernet Network System can make every day of your working life more productive.

bank to handle the payroll but could not get checks out until Thursday of the pay week. It now gets checks out on Monday for Wednesday's payroll. This system also has some special functions to accommodate foreign nationals from eight different countries who are not subject to Social Security withholding. BPI modified the software to handle this requirement. Future plans include direct hookup to the corporate mainframe. The firm is also looking into McCormack & Dodge Corp.'s PC Link to allow for real-time query from the micro.

The banker. Another example of the micro filling a specific niche is the Manufacturers Hanover Leasing Corp.'s selection of American Business Systems, Inc.'s (ABS) General Ledger system to process its small foreign entities. This system will replace a manual system. The separate companies are to be maintained on an IBM Personal Computer XT and consolidated. The data will be manually interfaced to the corporate ledger.

The ABS system was chosen because it closely resembled the Software International Corp. package being used on the company's mainframe. It was felt that interfacing the new system would be easier with the ABS software. Plans include the possibility of buying an IBM Personal Computer AT or NCR Corp. Tower supermicrocomputer system to upgrade processing power.

The refinery. Lest you think all micro accounting is low-volume transactions, a southern oil refinery is processing 3,000 to 5,000 accounts payable and general ledger transactions through an AT&T 6300 system using Great Plains software. The 6300 replaced an IBM Personal Computer XT to improve throughput.

Prior to installation of this system, a manual batch system was used. The process involved mailing transactions to the refinery's Houston headquarters for processing. It took 45 days before completed financial reports came back to the refinery. Now, only summary voucher information is sent to Houston for headquarters accounting, and all the detail is kept at the refinery. If questions arise, Houston calls the refinery. Voucher numbers are specially coded so that particular batches of data can be quickly referenced.

The company integrates its accounts payable with general ledger and does financial reporting twice a month. A month-end preflash report is sent to headquarters. This is subject to adjustments by the corporate office.

At first there were some differences in figures, but now financials are virtually the same between subsidiary records and what the corporate office prepares for them. The company also uses a Hewlett-Packard Co. laser printer. To maintain security, the manager locks the equipment in his office when it is not in use.

The oil service company. Most of the situations discussed so far involve fairly well-defined uses in divisional or departmental accounting. During my research, I ran into one company that had converted its entire corporate accounting to micros. Because of the severely depressed conditions in its industry, a southwestern oil service company took the extraordinary step of phasing out its centralized data processing department, which used an IBM 4341, and installing micros at primary operating divisions as a total replacement. This step was taken principally to cut costs. The firm runs four IBM Personal Computer XTs located in two states under a Novell Data Systems, Inc. network.

Currently, it is doing general ledger, accounts payable, accounts receivable and fixed assets on the micros. The firm selected the Micro Business Applications, Inc. package for ledger, payables and receivables because it felt the vendor and its product were stable. This system supports approximately 1,000 vendors and 2,500 customers. It uses Best Program's Fixed Asset Management System to handle its 25,000 fixed assets across four major operating units. The company formerly used a mainframe fixed-assets system and picked Best Programs' software because it was close to the functionality of a mainframe package.

So far, the results of this conversion have been mixed. Micro accounting is not as sophisticated as mainframe; it lacks some key features such as allocations. It has also forced down functions that used to be done by corporate to the operating level. Such mundane responsibilities as ordering supplies are now the charge of operating personnel.

Instead of requesting special reports of the DP group, users must define the report themselves. They clearly miss the hand-holding. However, it is still early, and once over the learning curve, users may start to appreciate a newfound sense of control.

The brokerage firm. Using five IBM Personal Computer XTs under PC Net, a major New York brokerage firm maintains 40 separate entities for general ledger accounting. The company formerly used a time-sharing service to process all subsidiaries' transactions. This provided a lot of features and processing power but also cost $5,000 per month to operate. The company converted the subsidiaries to the American Business Systems, Inc. (ABS) General Ledger system and had some software modifications made to accommodate its need to choose specific entities to consolidate.

While the system performs adequately, the company did give up one type of report that was available on the time-sharing system. In addition, processing is a bit slow because of the number of transactions, but users still receive their reports

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> *While going to a micro has resulted in some loss of power and features from previous corporate or time-sharing systems, the implicit message is that the economics of the change can justify the trade-off.*

faster than with time-sharing.

The company has also experienced some problems with the network because of the lack of file and record-locking features in the software. The plan is to upgrade the ABS single-user system to the multiuser version. Other plans include building a batch entry module, which can be used to speed up data entry, and making additional modifications to the basic package.

The industrial chemical company, Proveedores Tecnicos, the Mexican subsidiary of Calgon Corp., produces industrial chemicals and cleaning agents. In 1984, it selected and installed Realworld Corp.'s accounting software to perform general ledger, accounts receivable and order entry, accounts payable and inventory control.

To accommodate specific plant needs, the inventory was modified to include production processing, which selects raw materials for mixing batches and performs the accounting for movement from raw materials to finished goods (including addition of labor and overhead). Field sizes were changed to handle pesos.

One of Calgon's microcomputer analysts in Pittsburgh, who, conveniently, is fluent in Spanish, also translated all screens and required documentation to Spanish. The company formerly ran this system on an Apple II and was able to convert it to a four-terminal multiuser supermicro system. The code was transferred from the Apple to the new system via communications and then recompiled using the Realworld backup-and-restore utility.

Embryonic stages

From this survey, it is clear that we are still in the embryonic stages of large company use of microcomputers for accounting. Companies are approaching these applications in a cautious yet sure way. Large firms are turning to micros to cut costs and build bridges to mainframe accounting.

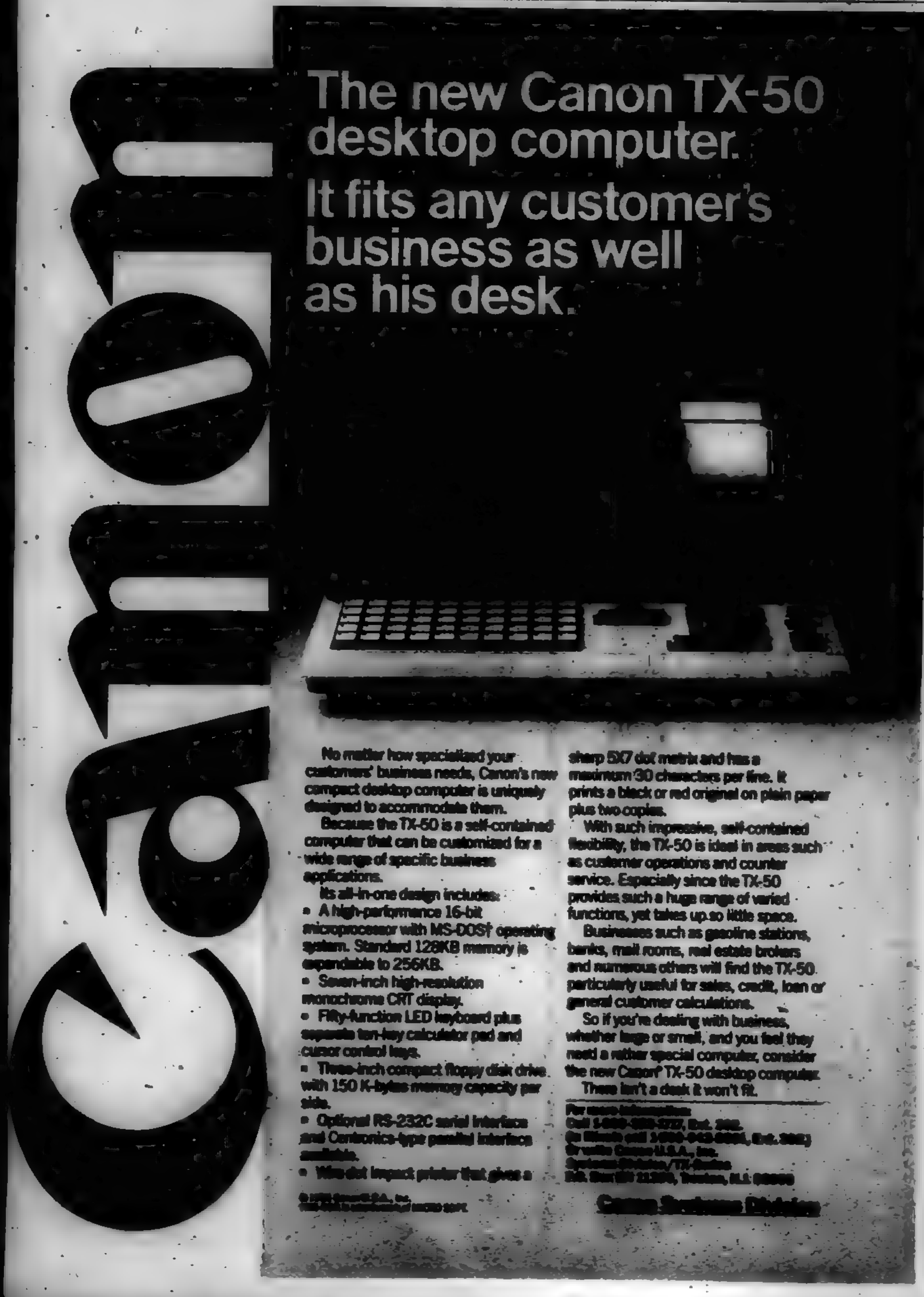
However, relatively few applications are automatically tied into corporate accounting systems. Security, while recognized as a special problem with micros, is not preventing companies from using them, and the level of security is generally considered satisfactory.

Most firms have plans to upgrade their current systems with either new hardware and/or software. While going to a micro has resulted in some loss of power and features from previous corporate or time-sharing systems, the implicit message is that the economics of the change can justify the trade-off.

As large companies become comfortable with the bread-and-butter applications, they may consider branching to other transaction-oriented applications to capture operational data at the division or department level. More powerful equipment and better communications interfaces to mainframes will lead to true distributed processing that provides for the best of both worlds: operational control and centralized reporting.

About the author

Sheldon Needle delivers seminars and consults on the subject of microcomputer accounting systems. He is president of Computer Training Services, for which he wrote A Guide to Accounting Software for Microcomputers, *an in-depth review of eight of the leading packages. The book is available from Computer Training Services, 5900 Tudor Lane, Rockville, Md. 20852 for $78.*



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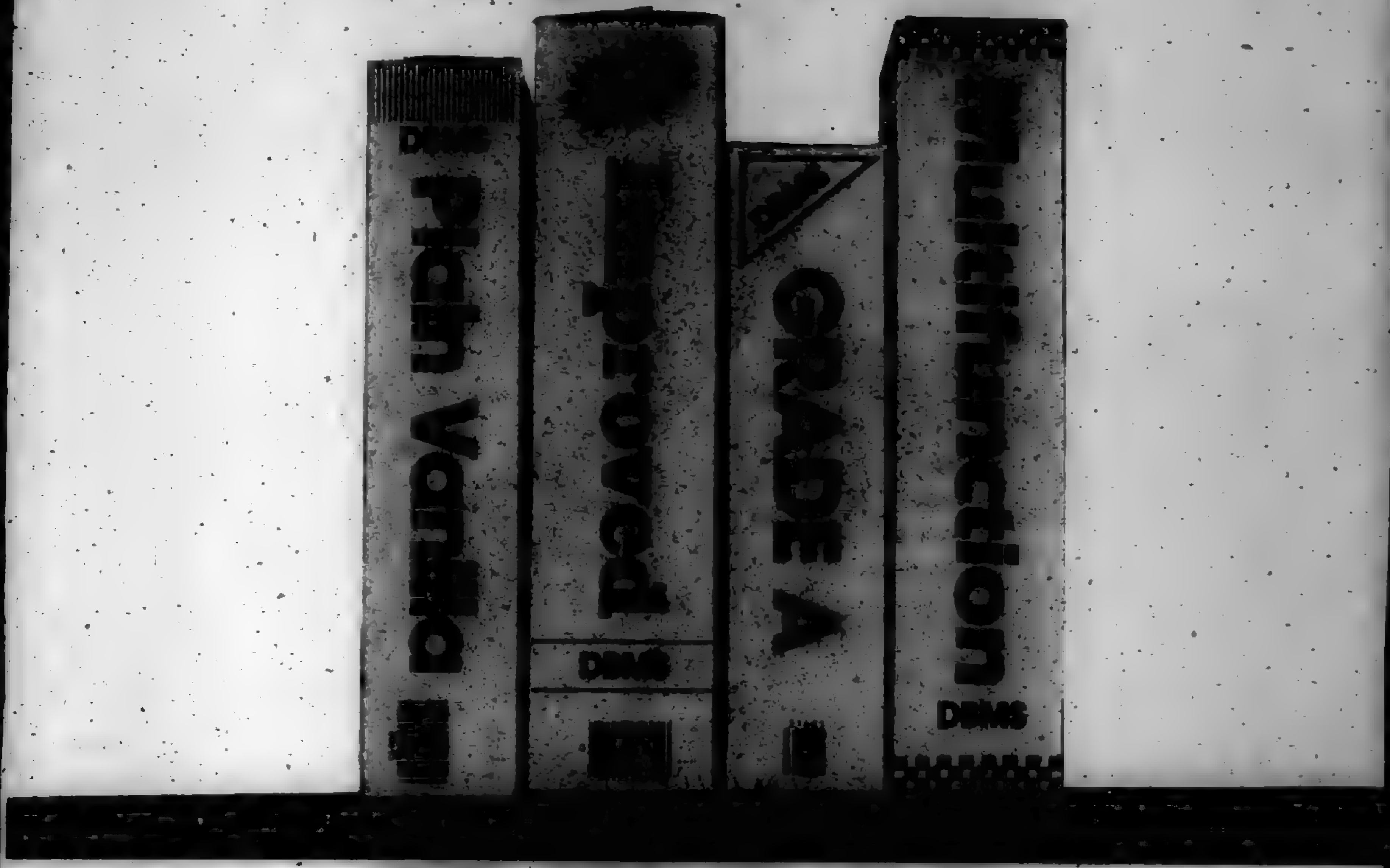
Choosing Your First (Or Second, Or Third)



DBMS

Are you ready for a data base management system? Should you replace your existing DBMS? Here's how to evaluate the latest packages.

By Ronald Shelby and Ronald Dubien

After a decade of refining the first wave of data base software, vendors are moving to deliver multifunctional, integrated software packages that include not only data storage and management but also application generators, data dictionaries, teleprocessing monitors and micro-mainframe links.

The promise of data base management systems (DBMS) looks brighter than ever. But most organizations that are considering DBMS acquisition already have a complex systems environment that may well include a DBMS. Integrating a new, multifunctional product with this environment presents pitfalls that no prudent manager can afford to ignore. Integrated functions promise efficiency of effort but require precise work coordination of functions across the separate software packages when more than one exists. Without careful preparation, the benefits of a purchased integrated data base package will not be realized.

Data base failures occur when DBMS packages are not used to their full potential. A DBMS is a very expensive data access and security mechanism, and yet in many cases, that is exactly how a DBMS has been used. Application projects have been delayed, cost overruns have occurred and, worst of all, the credibility of the data processing organization itself has suffered. To avoid these problems, a new approach to data base planning and use is needed.

In *Managing the Data Base Environment*, James Martin wrote,

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This speed enables the VA to serve a veteran from whatever office he walks into. Questions that once took weeks to answer can now be resolved in minutes.

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Together, we can find the answers.

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> *If you choose to go with the integrated DBMS teleprocessing monitor, you must either live with another monitor and incur extra support costs or convert existing applications, incurring additional costs.*

"Throughout the short history of data base, the main reason for failure has been human problems, not technical problems." The problem lies not in the software itself but in the expectations and methods of those charged with implementing DBMS-based applications within the complex systems environment. We have failed to realize the expected benefits of DBMS technology because we have not recognized the necessary changes in methods, standards and organizational structures.

It is important when considering a possible DBMS acquisition that you evaluate more than the functional capabilities of the available data base packages. You must also look at the impact of a DBMS upon your organization and identify requirements specific to your organization. These requirements can be included in a selection questionnaire along with DBMS functional requirements.

To assess the impact of using a DBMS, an organization's requirements should be developed in the following areas:

a. Software/hardware environment. A DBMS is a general-purpose software product that is added to an existing mix of software products. It can also put an increased strain on the existing hardware configuration.

b. Human resources environment. The types of users (DP, end users, technical or a mix), the organizational structures of users (centralized, decentralized) and the sophistication level of users (batch sequential, on-line random, other DBMS) all affect how well the capabilities of a particular DBMS can be used.

c. Application system environment. The types of applications required (ranging from on-line production systems to decision support), existing development aids and the development and maintenance organizational structure all affect DBMS usage and, in turn, can be affected by it.

d. Security and integrity. The level of security and integrity assurance required will vary from organization to organization and from one DBMS application to the next. This area is growing in importance as the role of computerized data grows in organizations.

e. Long-range planning considerations. DBMS use creates a long-term commitment for an organization. It is important that the product be compatible with the long-range information processing strategy.

f. DBMS architecture. A DBMS' architecture is a major factor to be considered when evaluating specific products. The impact of a new DBMS upon your organization will vary depending upon its architectural components.

Software, hardware needs

Identifying the DBMS impact is a straightforward matter, as long as a thorough review of your existing environment is performed, keeping within the scope of your study. Each of the following components should be reviewed:

- Hardware configuration.
- Operating system software.
- Data storage media.
- Teleprocessing monitor.
- Data security software.
- Automated data base design software.
- Data dictionary or directory.
- Cost accounting software.
- Testing software.
- Screen-building software.
- Source-code management software.
- Report writers.
- Query languages.

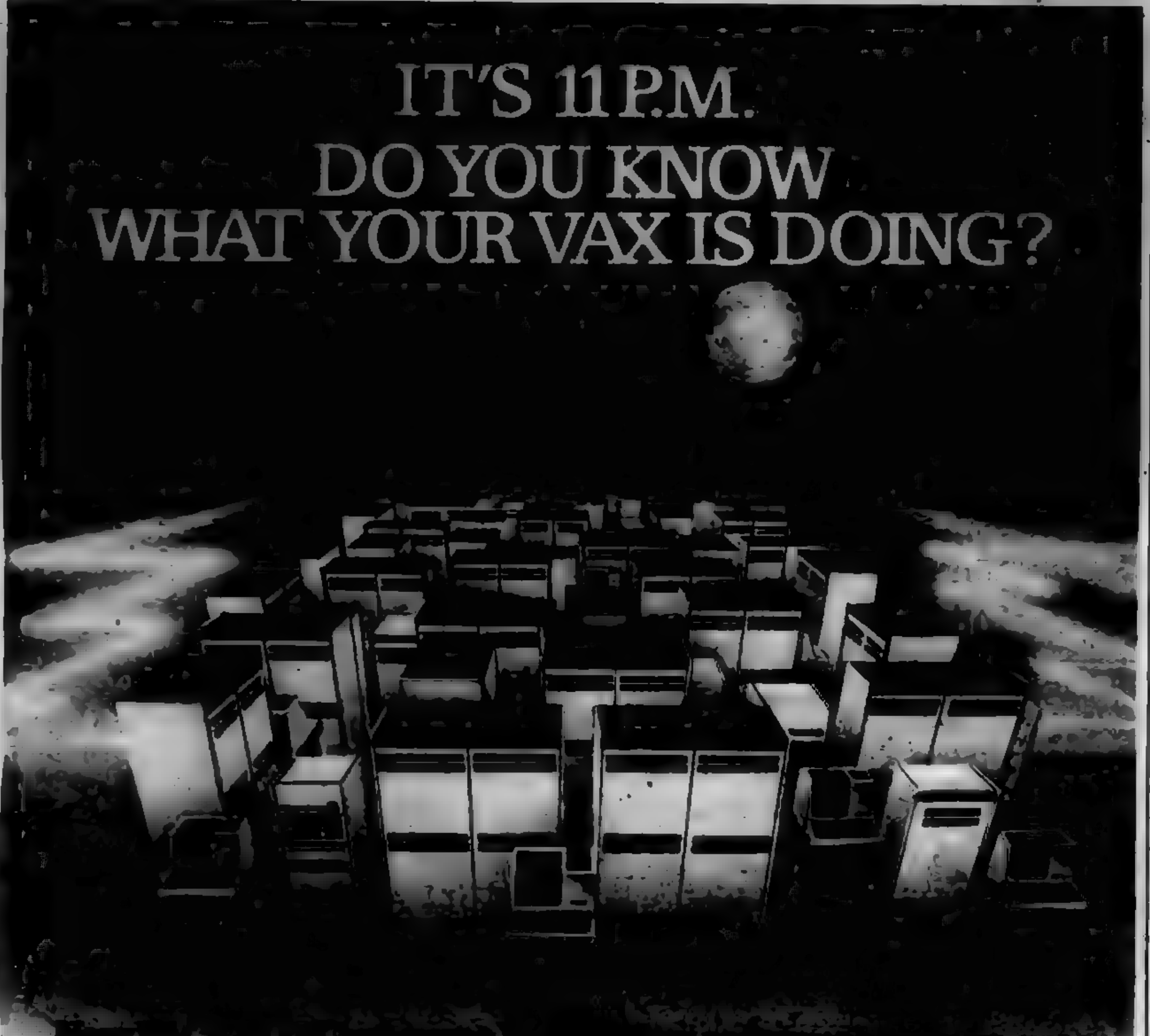
After reviewing your existing hardware and software environment, you should specify which components will need to interface with a new data base package. In this step, you should:

1. Detail how you plan to use a selected data base with existing hardware and software.
2. Describe the interfaces needed between a new DBMS package and the existing hardware and software environments.
3. Identify DBMS package features required to meet your intended use.

This is also a good time to note the interaction between your hardware and software configuration and the costs of a selected DBMS. If you change operating systems, will the DBMS cost more? If you upgrade a machine, will you pay more? What charges are there for multiprocessor usage and for multisite usage? Can you keep an extra copy of the selected package for use at a disaster recovery site?

Trade-offs will be necessary. For example, most IBM-compatible processing environments already have a teleprocessing monitor. Many DBMS products have an integrated teleprocessing monitor, which eliminates the need for interregion communications with on-line applications. An organization must therefore decide whether to use the existing teleprocessing monitor or the new, integrated one.

If you choose the existing one, you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face the problem of maintaining the integrity of data during recovery for independent software products. You could also lose some of the integrated data management features of the DBMS product. If you choose to go with the integrated DBMS teleprocessing monitor, you must either live with another monitor and incur extra support costs or convert existing applications, incurring additional costs.

The results of examining your hardware and software requirements should be used to produce a detailed list for evaluating products. Even while describing your requirements, you will probably be able to narrow the field of candidates, eliminating some products you already know will fall short. Of course, packages that do not run on your intended operating hardware or software can be eliminated. Next, form your requirements into specific questions that will be part of a questionnaire you will send to DBMS vendors.

Human resource requirements

Successful DBMS implementation requires that the people in your shop master the package quickly. Any DBMS installation that fails to address training, use and organizational impact issues is likely to fail. To avoid problems, take some time during the evaluation process to review three areas of concern:

1. Types of users.
2. Organizational environment.
3. Sophistication level of users.

Types of users. List the types of end users who will interact with any part of a selected package. Then, list the data processing staff members who will use the software. Finally, list those staff members who will support others' use of the product.

If you need an ad hoc query facility for end users, then be sure to specify this requirement. Otherwise, you might end up with a high-level programming language intended for use by DP professionals.

Organizational environment. Define the type of data processing organizational structure in terms of centralized or decentralized management responsibility. Different DBMS products lend themselves to either centralized or decentralized use.

Types of DBMS users and their needs

Also identify the extent of data sharing. If there is currently a great deal of sharing among business units, look for a product that can support centralized control. If you find your environment is decentralized, with little data sharing, and your goal is to promote and support data sharing with a new DBMS, ask yourself if your organization is really committed to carrying out the changes that effective data sharing will require. If your plans for data sharing differ from existing business practices, reconsider the direction you will take.

Sophistication level of users. Finally, discuss each group of DBMS users with their managers to identify what training may be needed. How long will it take to make each group of users proficient in the functions they will be performing? What level of sophistication in your programming, technical software support and data base staff will be needed? Since ease of learning may vary from one DBMS package to another, form a set of questions to address the topic. Then contact shops currently using a DBMS product under consideration to learn the answers.

As a result of this step, you may find you have been planning to implement a new product and its features too quickly. You may have to commit a high percentage of your staff to training at the same time. If so, adjust your implementation plans.

Application systems demands

Most DBMS packages are selected to support one or more application development projects. If this is a priority in your shop, you should address these areas of concern: application systems development, end-user decision support and application systems maintenance.

Application systems development. Prepare a set of requirements for the applications upon which you plan to use the DBMS. Most DBMS-evaluation literature focuses upon this type of requirement. Don't hesitate to use information available from these sources.

Questions worth examining include: What data volumes need to be handled? How many different record types are you likely to need in a data base? How many concurrent on-line users are expected?

How frequently will update transactions occur? How important is rapid response?

How much knowledge of the data base structure does a programmer

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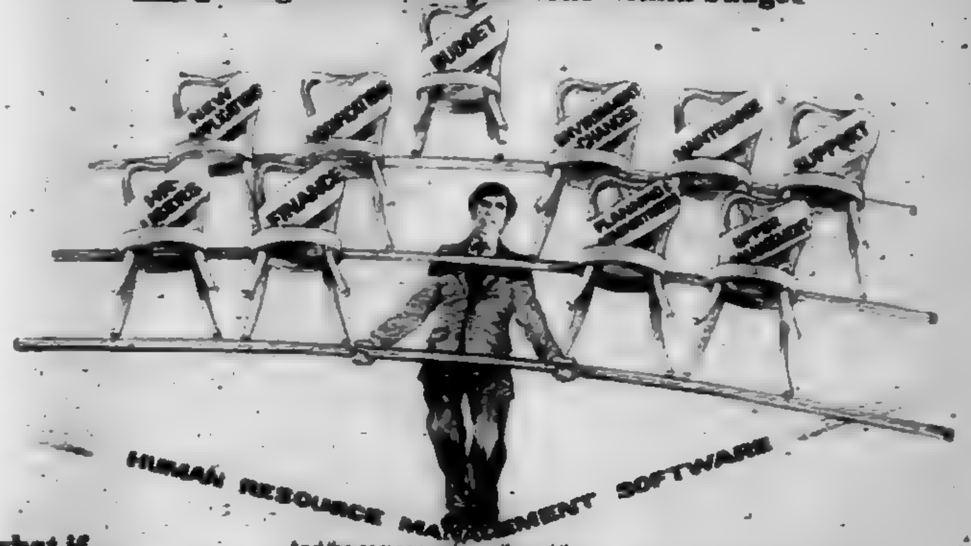

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need? Will you need to load existing data files into a new DBMS application?

What programming languages will you use? What application generator (or screen builder) do you intend to use with the product?

Is your existing system development methodology compatible with data base development? Are there separate steps identified for data base requirements, design, creation and testing?

Some organizations purchase a DBMS as one of the first steps in introducing the data resource concept. The concept usually includes sharing data between applications, something foreign to most systems development methodologies. Significant changes to existing system development methods should be anticipated when a new DBMS is introduced to share data between application systems.

End-user decision support. Organizations with the foresight to manage data and information as a resource have benefited by giving end users access to production data or subsets of production data. Supporting end-user data access is neither as simple nor as easy as one is often led to believe. It involves considerable planning, design and data documentation before end users can locate, access and use data. Identify your established plans in this area before you prepare a checklist for data base evaluation.

Questions that should be reviewed include: What extracts of production data are currently prepared for input to end-user query, graphics, financial modeling or artificial intelligence applications? Who performs the current data extractions, and what tools are used?

A quick look at your current activity in this area will allow you to identify any data access applications that might need to be supported early on by a new DBMS. If you find such applications, you should include questions in your evaluation checklist that elicit information relevant to the continuance of these applications.

For instance, your shop is currently providing an extract of a data base for end-user access via the APL-DI package running under VM, and you are planning to support the source data base with the DBMS you are about to select. You might build questions into your questionnaire as described below.

Can we perform data extractions from the new DBMS with our existing software tools? Will any end-user applications have to be moved into a new query facility if a new DBMS is acquired? If the answer to this question is yes, then you should discuss the required training and any loss of function with the user area involved or drop the migration of the user's application into the new package.

What financial modeling (decision support) packages do you use? Include compatibility questions in your evaluation questionnaire. If these products are important to your user community, and you see that they are going to be affected by a new DBMS, then talk with the users right away. Learn the importance of these applications to the users and their expected lifetime before you assume you can interrupt them.

Do you or will you download data from a mainframe DBMS to a microcomputer? If so, include the microcomputer environments supported in your questionnaire. Be particularly careful to learn if data can be loaded into a third-party vendor's software, because some DBMS vendors may not support downloading to any but their own proprietary microcomputer software.

If your end users currently employ fourth-generation packages such as Information Builders, Inc.'s Focus; National CSS, Inc.'s Nomad; Mathematica, Inc.'s Ramis II; or IBM's Structured Query Language (SQL) to access data, will they want to continue to use these packages against data held in your new DBMS? Users will have invested considerable time and money in learning and building applications in these packages. If the user community wants to continue to use the packages upon data held in your new DBMS, you should include these requirements in your questionnaire.

System maintenance

Many of the questions you examined with regard to applications system development will also apply to maintenance. You should pay particular attention to the two issues below:

- How frequently do your applications require "emergency," or time-critical, fixes? If frequent time-critical fixes occur, you will require a data base that can be restructured without unloading and reloading the entire data base.
- What are your existing systems maintenance methods? Are they compatible with the maintenance of DBMS-served applications? If you haven't adjusted your system testing and change control methods to account for a data base environment, then you should plan for these changes prior to DBMS implementation. An on-line data dictionary/directory can be a great help in determining the impact of a data base change upon the applications the data base supports.

Security, integrity

DBMS packages frequently have advanced data security and integrity capabilities. You should not try to use these capabilities until after you have examined your requirements in this area.

Do you want a DBMS product to interface directly with your file access security facility? If so, you may encounter unanticipated problems.

What password security do you require at different levels: data base or file, record, field, field value?

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Do you require encryption of sensitive data?

Do you want to be able to lock out and report security violations?

Do you want a DBMS to support actively the control of data definitions within the DBMS and related products?

Do you want a DBMS to interface actively with a data dictionary product?

What are your failure protection requirements for hardware and media?

Your requirements in each of these areas should be detailed and questions added to your evaluation questionnaire.

Security-related problem

Existing data security facilities are normally physical data set security packages. These products present a fundamental problem when a new DBMS package is required.

Because a DBMS allows programs and applications to share physical data sets, the DBMS software, not the application, controls the data sets. This means that when you use an existing data set security facility and a DBMS, you will have to choose between having the DBMS software handle the security or allocating your data sets to particular users.

If you select the DBMS security facility, the data set security facility will be of little use to you. If you allocate data sets to specific users under control of the data set security package, you will lose many of the advantages of a DBMS. Either way, a decision must be made, and it is best to address this question before you select a DBMS.

Long-range requirements

The long-range success of a new DBMS product is dependent upon how well the product fits into your plans. If you are selecting a DBMS to support more than one application system, the fit between future plans and a DBMS will be critical.

Review your plans in each of the following areas:

■ In what areas of the application systems environment will the DBMS software be used?

1. All application systems development and maintenance.
2. A particular business area or application.
3. To drive a purchased application software package.
4. A particular hardware technology.

■ When does the break-even point for a DBMS investment occur? For example, will two large applications be sufficient to justify the acquisition?

■ Does the basic architecture of the product suit the organizational structure of your plans?

■ Is the published direction of the product (vendor plans and user community requests) consistent with the plan of your organization?

■ Have you considered the management style, approach and objectives of the organization and the effect they will have upon successfully employing a DBMS?

For example, if you choose an integrated product that requires a central authority to load schemas, maintain the data dictionary/directory and monitor performance, is that consistent with your planned DP structure? If you currently plan to distribute your DP professionals into each semi-autonomous division (or department) of your organization, you will not find it easy using an integrated DBMS across divisions. Political battles between the central authority required by the new DBMS and the increasingly autonomous divisional DP staff could cause

> ”
>
> *If you are selecting a DBMS to support more than one application system, the fit between future plans and a DBMS will be critical.*

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you to become one of the data base failures James Martin mentioned.

Finally, do you really have an organizational commitment to a data base approach in the future? A good sign of a broad commitment is the completion of a strategic data plan with the active participation of management.

Because data plans are usually expensive to create, they signal an increased commitment to improving data management and processing.

If there has been no strategic data plan, do a quick appraisal of how much commitment your organization has to a data base approach. If the level doesn't support the scope of the DBMS use you had been planning in your evaluation project, perhaps you should adjust the project's scope.

■ What are your future staffing plans? Are you willing to staff support of the new DBMS product? Would such a staff be consistent with your DP plans in the area of personnel staffing, training and recruitment? If you see little or no staff being freed up or hired to support a new DBMS, then you should avoid planning to implement an integrated, comprehensive product.

■ Will the availability of trained personnel for DBMS products present a problem to the plans in your areas of recruitment or staff turnover? You may have trouble finding skilled staff if you are located away from urban areas or if you are choosing a product that differs greatly from the mainstream of DBMS products.

What will be the impact of a DBMS product upon your existing software products from an organizational perspective? Is management prepared and willing to address this impact? Areas of concern include, but are not limited to, the following:

Are the support personnel already at their limit in terms of the number of products they can support?

Will this product cause another product to go into "maintenance-only" mode?

Is there a DBMS product that is compatible with your current computer configuration and accounting procedures? Have you considered the impact of central resource sharing upon your accounting system, distributed processing via a network and chargeback for on-line use if you are currently batch?

Are the hardware requirements for a DBMS product reflected in existing business plans, vendor contracts and budgets? There is not much point in getting a new DBMS unless you can also have the machine cycles to run it.

Software support problem

Many data processing organizations today handle a large number of software products. The move to productivity aids has compounded this problem. Typically, the software support group operates close to its limit in supporting the mixed bag of software in use. Likewise, the systems development group has difficulty in deciding which software should be used to meet a particular user requirement.

Adding a new DBMS and related products to this environment means that some of the existing software products will go into a maintenance-only mode, because many new applications will be done with the new package. This usually creates a problem, because people are reluctant to support a product that is being phased out. Organizations experience this problem after acquiring a new DBMS.

The resulting staff turnover and employee discontent are unwanted side effects of a new DBMS, and they can be minimized by a coordinated plan that anticipates the areas to be affected and acts to manage the transition. Involving existing staff to some degree in the planning process is a good way to build support for an anticipated change.

Systems development

Is a data base approach included within your systems development plans? Are existing system development plans oriented to take advantage of DBMS technology? If not, then you might tailor your selection question to be sure that the new DBMS supports your existing development methods. Alternatively, a major revision of your systems development methods will need to be done before you can use a new DBMS productively.

Is management prepared to fund and staff conversion to a new development method? Does management realize this cost will be required?

Are existing systems planning personnel trained to develop DBMS plans and to recognize and promote opportunities for DBMS utilization?

Do the application development software products available with a selected DBMS (either from the vendor of the DBMS or independent vendors) meet the requirements of the existing systems development plans? For instance, if you need a high-volume, operationally oriented DBMS, you should include throughput, benchmark and performance tuning questions.

What programming languages do you plan to support in the future? Include a question about each when you prepare your checklist.

Data environment

What data models do you foresee with planned data bases? Repetitive, unchanging business functions lend themselves to support by a hierarchical or Codasyl DBMS, but information-intensive business functions do not. Be sure of what you want to do with the new DBMS, and structure your selection criteria accordingly.

Do you want a product to provide an interface to data base design software? If so, list the requirement explicitly.

Is the product compatible with

"We had a thirty-day trial but twenty minutes made up our minds about Data Check Recovery."

Linda Lewis
Systems Programmer
Blue Cross and Blue Shield of the National Capital Area
Washington, DC

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your data dictionary plans?

Data dictionaries

Most DBMS products have or are moving toward an active data dictionary. A characteristic of these active data dictionaries is that the various DBMS-related products (teleprocessing monitor, report generator, query facility) are all driven by the data dictionary. This means that data definitions within the data dictionary are used by a variety of DBMS facilities.

Given that a single DBMS product rarely controls all data in an organization, this raises the question of where the corporate data definitions will reside.

You may wish to retain an existing dictionary or even acquire a separate data dictionary to serve as a corporate (master) dictionary, because the DBMS-related data dictionary is often oriented to supporting only the DBMS environment.

Coordinating more than one dictionary will also be a problem that must be solved early in the course of DBMS use. The central problem with multiple data dictionaries is how to control the redundancy of data record and element definitions. Data elements required by the new DBMS must be in the corporate data dictionary to provide a complete cross-reference across technologies, but they must also be available for use in the DBMS environment. If you have a data administrator, he should address these questions before a DBMS is acquired.

If you plan to use the data dictionary that is part of the new package as your corporate dictionary, be sure that it can input and output foreign (non-DBMS) data sets and that you can alter the dictionary's internal schema to add new entity types and relationships.

DBMS architecture

DBMS architecture is a major factor to be considered when trying to determine the impact of the DBMS in an organization. While functional capabilities may vary, three areas are important determinants of a DBMS' impact upon your organization.

These three DBMS architectural dimensions should be reviewed for each DBMS product you are considering: control points, data base model and level of data independence.

Control points. A DBMS environment normally has either a DBMS, the data dictionary or both as the control point for coordinating all processing. Some commercial products have separate control points for runtime and for compile time. For example, Cullinet Software, Inc.'s IDMS, Applied Data Research, Inc.'s Datacom/DB and Cincom Systems, Inc.'s TIS all have two control points, with the DBMS controlling runtime processing and the data dictionary controlling compile time processing. The box above summarizes control points for some popular DBMS products.

These products require central data administration and data base administration functions to be used effectively, because managing the data dictionary at compile time vs. runtime is critical to DBMS use. Acquiring a DBMS with two control points may mean major changes to the personnel and applications systems environments, and it is probably critical to implement a shared data resource program.

DBMS architecture: control points.

Some products have the DBMS as the sole control point. Products such as Computer Corp. of America's Model 204, Cincom Systems, Inc.'s Total, IBM's IMS and Intel Corp.'s System 2000 fall into this category currently, even though some of them are moving toward using two control points. Products with a single DBMS control point do not require central data administration and data base administration functions to use the software and do not provide the central control for data across data bases. This means that there could be a major negative impact upon the strategic plans of an organization attempting to manage data as a resource.

It will be very difficult to implement this concept without a control point that spans individual data bases. A number of research projects are being carried out on products with a single data dictionary control point — for example, IBM's System R — but the future of these products is not yet clear.

Data base model. Each DBMS product has a basic data base model that is either hierarchical (IMS, System 2000, Focus, Ramis II), network (IDMS, Total), inverted list (Model 204, Software AG's Adabas, Datacom/DB) or relational (Relational Technology, Inc.'s Ingres, Oracle Corp.'s Oracle, SQL). A product's basic data model affects an organization as follows:

Software and hardware environment. Hierarchical models are normally the easiest on which to put higher level programming languages

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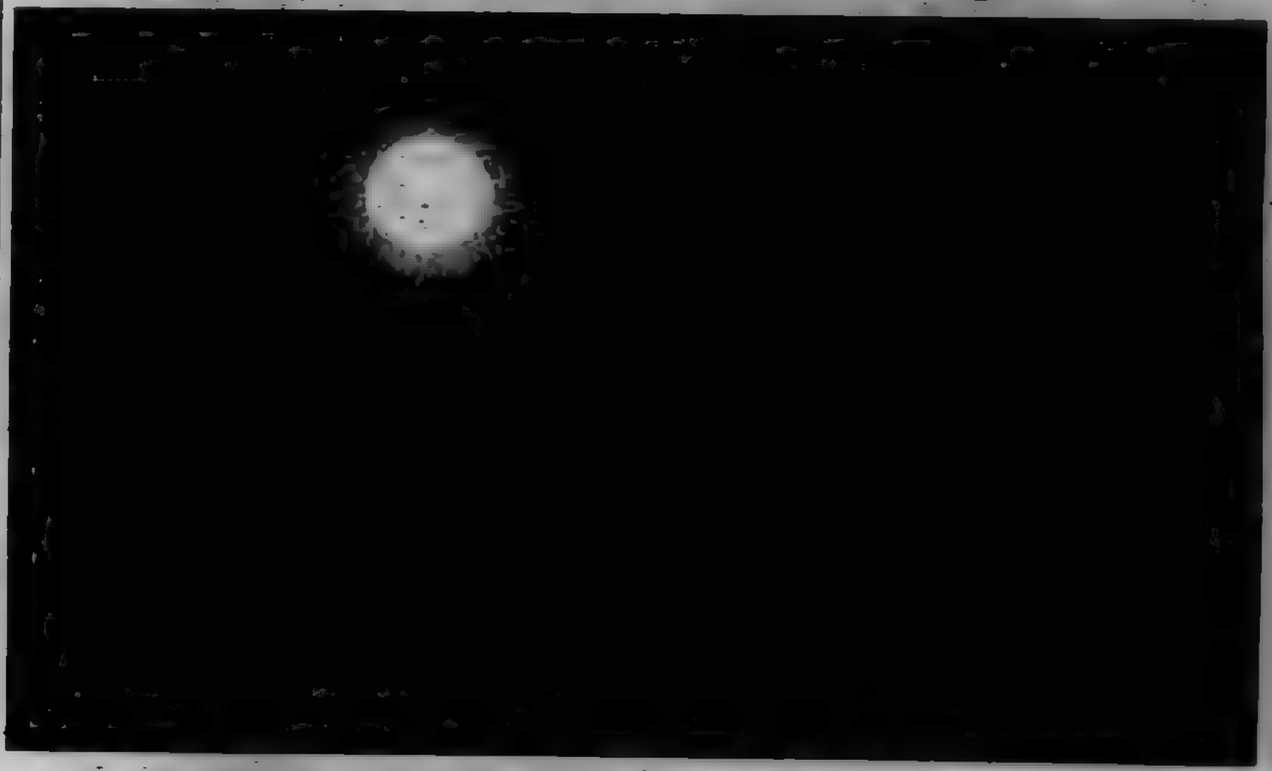

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> *A new DBMS will introduce many problems, but the potential savings and flexibility can be great. The key to success is the manner in which the DBMS is integrated into the processing environment.*

because of their known processing sequence. Therefore, there are likely to be more high-level programming facilities available for hierarchical DBMS.

Network models are the most difficult to integrate with high-level languages because of the navigational complexities. Network models and hierarchical models, however, normally require fewer hardware resources than relational models.

Personnel environment. Relational and hierarchical models are typically more easily understood by end users. They are better suited for applications with heavy end-user programming or reporting requirements.

Applications system environment. Hierarchical and network models are best used with very large transaction processing volumes, while inverted list and relational models are better suited to changing access requirements and low processing volumes. Normally, existing technologies and methods are oriented toward the first type of system; therefore, the hierarchical or network models usually have the least impact on the applications system environment. Inverted list and relational models typically require the development and introduction of new methods, such as prototyping, to adequately address the user requirements while utilizing the capability of the product.

Level of data independence. The level of data independence, that is, program data structure independence, is affected by the data base model but, more importantly, by the existence of separate levels within the DBMS.

The Ansi/X3/Sparc report specified a DBMS architecture of three levels (internal, external and conceptual) as being a target for future DBMS products to supply a sufficient level of data independence to allow data changes to be isolated from the applications programs. Most commercial products today provide two levels (schema, subschema) with restricted mappings between the levels.

As a general rule, more levels and fewer restrictions upon mapping mean more impact on the software and hardware and personnel environments, because software is more complex. At the same time, the impact on the applications systems environment will decrease because of the increased separation between data and applications systems. So products with two or more levels will need more support staff for the DBMS but should require *fewer* people for applications program maintenance than products with only one level.

Summing up

A quick look back at the use of data base management software shows sparkling successes, some spectacular failures and a majority of shops somewhere in between. Overall, the first wave of data base technology failed to fulfill its promise. Costs were not reduced, data redundancy continued to increase, and data sharing rarely took place.

This failure to achieve the promise of data base software can be traced to the selection and acquisition of DBMS packages without doing the following:

- Establishing clear priorities for DBMS acquisition.
- Identifying success factors in reaching these priorities.
- Modifying application system development methods to use data base software effectively.
- Establishing new functions to support a "data base approach."
- Assuring that DP staff was prepared to take advantage of the benefits of a data base.
- Educating user management to fulfill its role in a data base environment.

Addressing each of the issues in turn will increase the chances of success for any DBMS selection and implementation project.

A new DBMS will introduce many problems, but the potential savings and flexibility can be great. The key to success is the manner in which the DBMS is integrated into the processing environment.

Before you prepare a package selection checklist, establish clear priorities, identify success factors in reaching these priorities, review where your organization currently stands and intends to go and identify specific problems that may influence your selection criteria.

About the authors

Ronald Shelby is data administrator at the U.S. Department of the Interior, Washington, D.C. He was formerly data administrator at Travelers Insurance in Toronto, Canada.

Ronald Dubien is a senior product manager with Maxima Computer Management Consultants Ltd. in Ottawa, Canada, where he is responsible for DBMS methodology products. He has eight years' experience in data base administration and related consulting.

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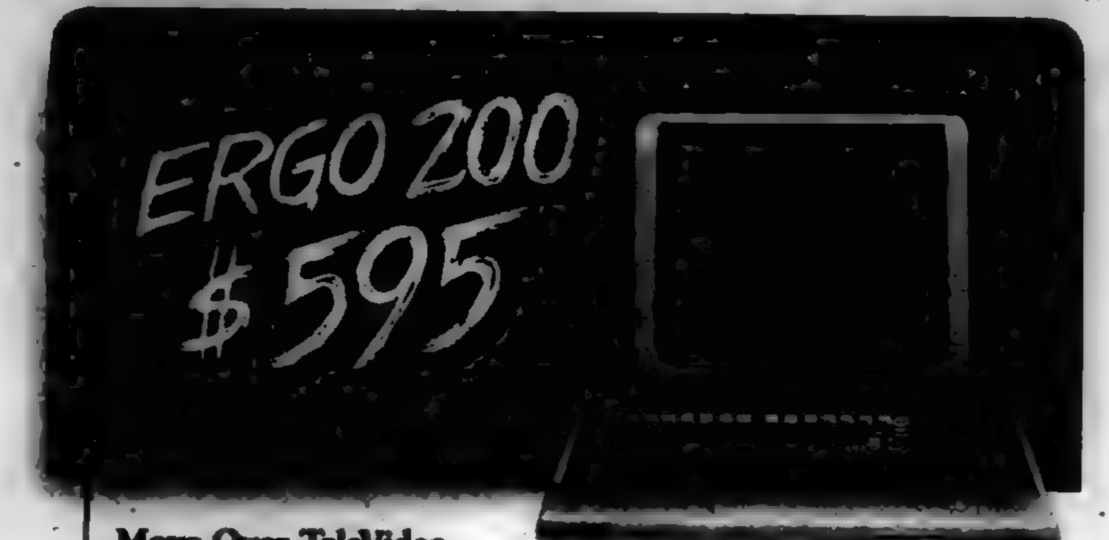

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SYSTEMS & PERIPHERALS

HARD TALK
Tom Henkel
CW Senior Editor

Value of old 3380 models to tumble?

What the future holds for current users of IBM 3380 disk drives is still be a bit unclear in the wake of the recent debut of two upgraded 3380 models. Analysts agreed that the residual value of older 3380s will decline because the units are not directly compatible with or upgradable to those models announced last week. But how quickly the 3380s' residual prices will decline and by how much will depend on several factors.

According to Bill Hegan, chairman of Computer Merchants, Inc., a Chappaqua, N.Y., company that deals in used IBM hardware, the market for older 3380s will probably not dry up instantly. With the demise of Control Data Corp. as a maker of 3380-compatible disk drives and Storage Technology Corp.'s (STC) recent financial troubles, there appears to be fewer 3380-type devices on the market now than a few months ago. Even IBM seemed to take extra care to emphasize that it does not currently plan to stop making the older 3380 models.

So for storage-hungry users, an older 3380 may be better than no 3380 at all. Hegan said the price of the older models will be affected by how many of the newer 3380 models IBM ships starting this March.

Hegan also noted that, even when the newer 3380s are readily available, there will still be a market for at least some of the older models. For example, since users cannot mix older 3380s on the same string with newer models, there will still be a demand for older slave, or B models, of the 3380 for users who want to expand existing 3380 strings.

The field upgradability of the newer 3380 disk drives will clearly be a big selling point for IBM.

See **REACTION** page 72

DG adds disks for DS

Workstation's larger drives boost capacity up to 300%; add-on boards also offered

WESTBORO, Mass. — Data General Corp. has enhanced its 32-bit Distributed Systems (DS) family of engineering workstations with greater capacity disk drives. DG is also offering two add-on circuit boards for the DS line that were previously available only on the company's Eclipse MV series of processors. In addition, the company announced specialized configurations of the DS line, an OEM configuration called the DS/4050 and configurations of the DS/4200 system, which incorporates a newly announced 19-in. graphics monitor.

DG added disk drives that offer capacities of 70M and 120M bytes. The vendor said this means DS systems can be configured with up to 240M bytes of integrated disk storage. The 70M-byte add-on disk is $6,500. The 120M-byte add-on is $12,000.

The two circuit boards are a multicommunications processor and an intelligent asynchronous controller. The processor costs $6,250, and the controller costs $5,500.

The OEM DS/4050 is available in two versions. A configuration including 1M byte of main memory, a 38M-byte disk drive, a 737K-byte floppy disk drive, DG's AOS/VS or DG/UX operating system licenses, IEEE 802.3 interface, communications software and entitlements to purchase additional software costs $26,500. A 2M-byte configuration with a 70M-byte disk drive costs $32,600.

The DS/4200 with color graphics monitor, 1M byte of main memory, a 38M-byte disk drive, a 737K-byte floppy disk drive, AOS/VS or DG/UX licenses, IEEE 802.3 interface, communications software and entitlements to purchase additional software costs $42,500. The unit costs $48,600 for a 2M-byte configuration with a 70M-byte disk drive.

DG is located at 4400 Computer Drive, Westboro, Mass. 10580.

■ Harris Corp. released a microprocessor-controlled remote printing station said to support IBM 2780/3780 communications protocols/**70**

INSIDE
Turnkey Systems/**72**
Data Storage/**72**

Unix-based 32-bit units out

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. has introduced its Iris Series 2000 engineering workstations that are said to adhere to AT&T Unix and Ethernet standards.

The Iris Series 2000 workstations include a 32-bit Motorola, Inc. 68010 microprocessor, a demand-page, virtual-memory Unix operating system, expandable system memory and disk storage and an optional floating-point processor.

Software development tools include the System V operating system with University of California at Berkeley Release 4.2 enhancements; C, Fortran and Pascal compilers; utilities; and editors, according to the vendor.

Prices for the Iris Series 2000 are as follows: $27,500 for the 2000, $37,500 for the 2200, $49,500 for the 2400 and $76,500 for the 2500, Silicon Graphics said.

More information can be obtained from Silicon Graphics, which is located at 630 Clyde Court, Mountain View, Calif. 94043.

Sperry was an early bird at the dawn of computing

By Tom Henkel
CW Staff

Remington Rand, Inc., which eventually became Sperry Corp., is generally credited with being the first company to enter the mainframe computer business when it delivered the first Univac-I processor to the U.S. Bureau of the Census in 1951.

According to Carl Hammer, a retired Sperry executive who was highly influential in developing the firm's systems strategy, Remington Rand made a decision to explore the then-experimental electronic data processing business for three reasons: First, the company had the opportunity to get a jump on its rival IBM. Also, there were increasing user demands for an improvement of the then-popular punch card processing systems. Finally, the earlier success of two University of Pennsylvania researchers, J. Presper Eckert and John Mauchly, in developing in 1947 the first computer system, the Eniac, made it clear that similar machines would be necessary to compete for government data processing contracts successfully.

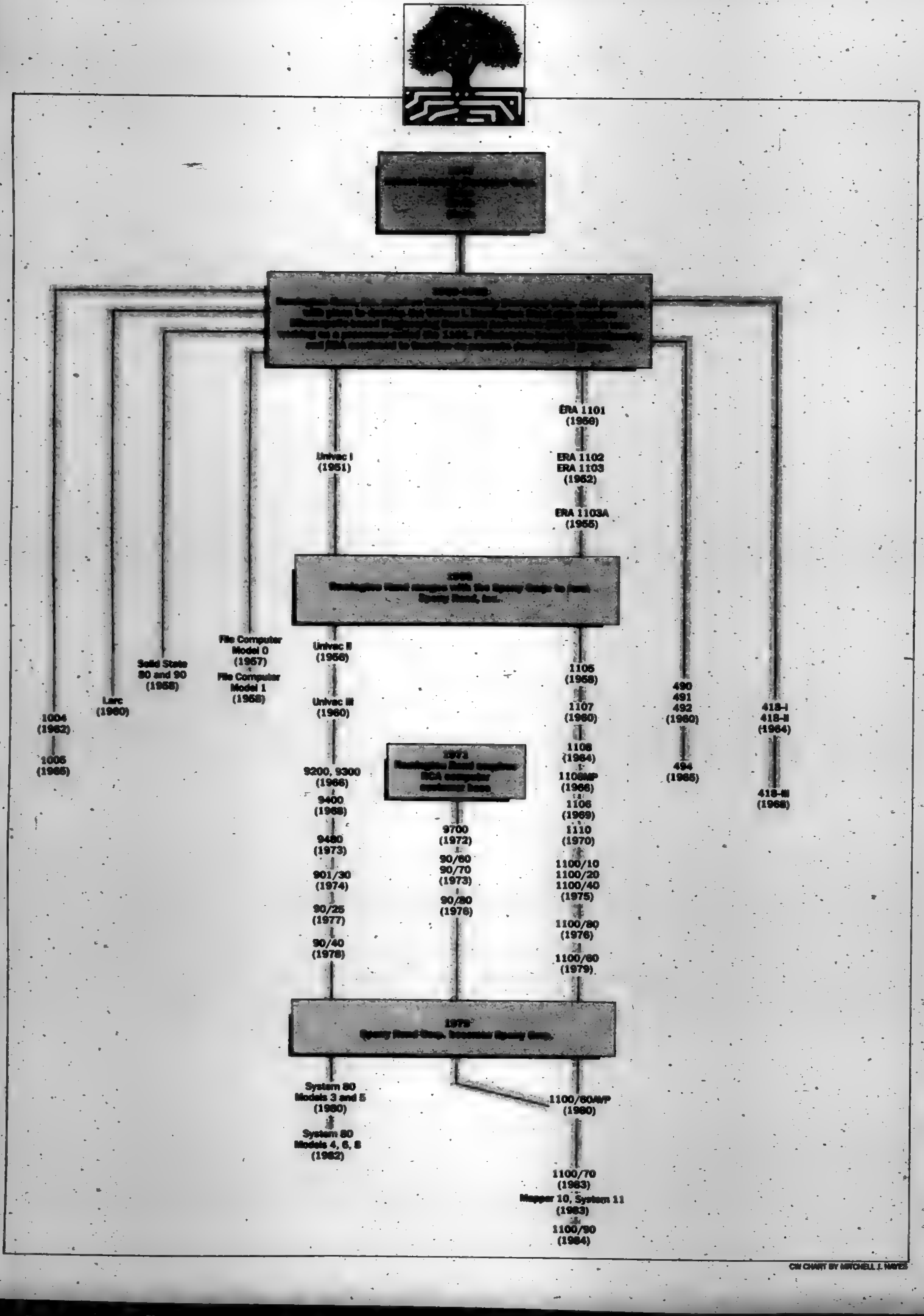
Like IBM, much of Remington Rand's data processing work prior to 1950 had involved punch card processing systems. Both IBM and Remington Rand had unique and incompatible punch card formats, and Hammer recalled that Remington Rand controlled roughly 10% of the punch card market, while IBM had a stranglehold on the rest.

Hammer said Eckert and Mauchly were keenly aware that a fertile market existed for commercial versions of Eniac. After completing work on Eniac and installing the system at the U.S. Army Ordinance Department in 1947, Eckert and Mauchly formed their own company, the Electronic Control Co., which was later incorporated as the Eckert Mauchly Computer Co. in 1949. After developing two follow-on versions of Eniac — Edvac and Binac — Eckert Mauchly Computer began work on the Univac-I.

While Eckert and Mauchly were not the only scientists working to develop electronic calculating machines in the postwar era, their success with Eniac clearly gave them an impressive track record. But even with reasonable support from the governement and private financial backers, the development costs for the Univac-I were becoming too much. One of the researchers working for Eckert and Mauchly, Herman Lukoff, noted in his book *From Dits to Bits* (Robotics Press, 1979) that Mauchly and Eckert appeared to find it difficult to continue the Univac-I development after the death of a key benefactor in a plane crash. Remington Rand acquired the Eckert Mauchly Computer in 1950.

While Eckert and Mauchly continued work to develop the Univac-I, Remington Rand was also negotiating to purchase a Minneapolis/St. Paul, Minn., firm, Engineering Research Associates (ERA). ERA consisted of a group of mathematicians, among them William Norris, currently chairman of Control Data Corp., who had suc-

See **SPERRY** page 70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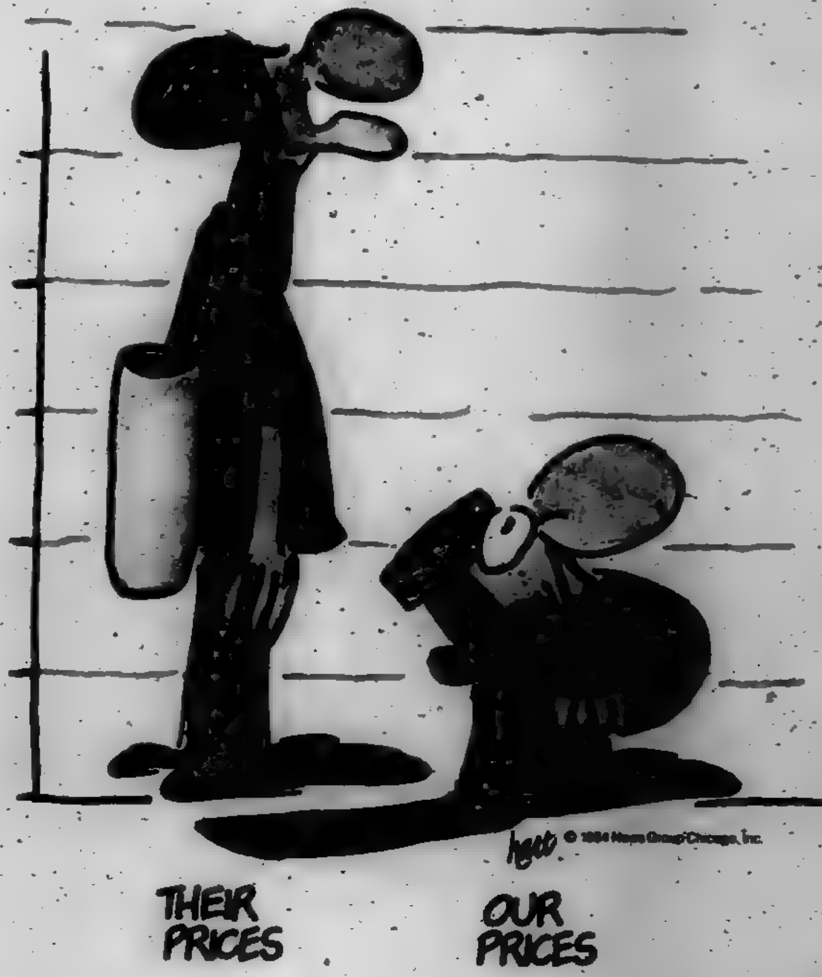
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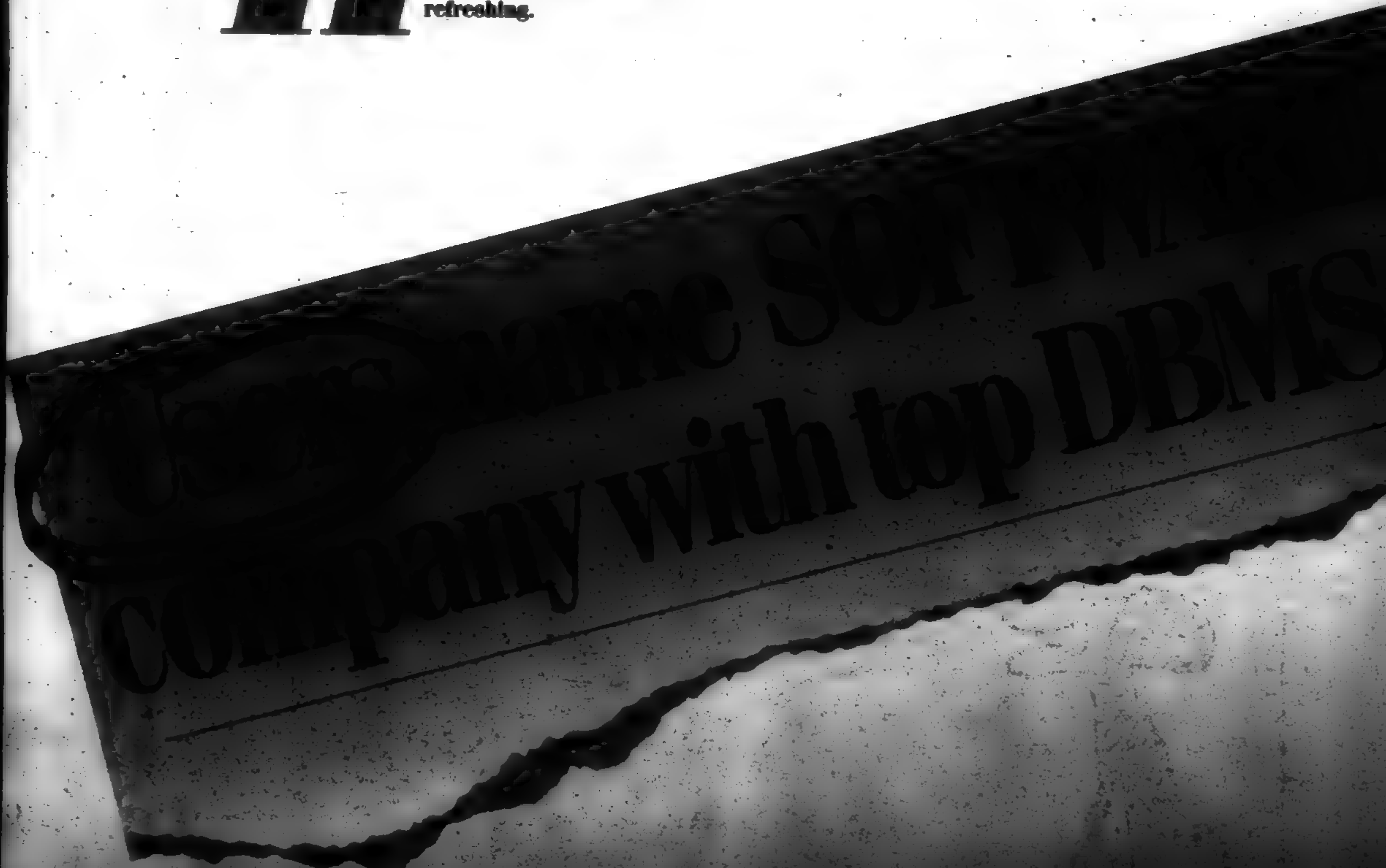

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[illegible]

Harris remote print station said to operate without supervision

DALLAS — Harris Corp. has released its microprocessor-driven Model 1601 remote print station, which supports IBM 2780/3780 communications protocols and reportedly operates without user supervision.

According to the vendor, the unit can be configured with speeds ranging from 300 to 1,250 line/min. The 1601 was designed for entry-level applications and may be upgraded through the Harris 1600 family of remote batch systems and distributed data processing (DDP) systems to the Harris Mind Series high-end systems.

The communications controller is a microprocessor built into the printer with a standard RS-232 interface to a modem, permitting data speeds of 1.2K to 19.2K byte/sec, the vendor said. The remote printing capability includes operation directly from a mainframe host, from the host through a Harris 1600 DDP system or as a remote printer for the 1600 system.

The Model 1601 may be leased or purchased. The 300 line/min configuration is priced at less than $17,500 and leases for less than $500/mo.

More information is available from Harris Information Terminals Group, P.O. Box 809022, 16001 Dallas Pkwy., Dallas, Texas 75380.

SPERRY

from page 65

cessfully built cryptographic equipment during World War II. After the war, the company switched to manufacturing scientific-oriented processing systems. The first such system, called the 1101, was delivered to the U.S. Navy in 1950. Remington Rand completed the acquisition of ERA in 1952, and ERA continued to develop successors to its 1101.

While Mauchly, Eckert and ERA were developing the Univac and 1100 series products, Remington Rand also unveiled a series of highly specific products, the fruits of previous Remington Rand research, said Dewaine L. Osman, currently vice-president of Sperry's Americas Division. These products included the 1004 and 1005 card processing systems; a series of specialized systems for the U.S. Air Force, called the 1050; the 418 message switching system and its military counterpart, the 490 series; and Eckert and Mauchly's specialized scientific processor, called Larc.

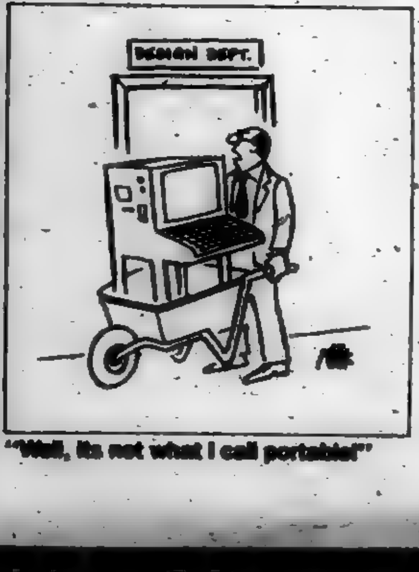
The success of the Univac-I and ERA 1100 series systems quickly caused those systems to became the basis of Remington Rand's product line. When Sperry merged with Remington Rand to form Sperry Rand, Inc. in 1955, the company had two clearly defined product lines: The Univac line for file-oriented commercial processing and the 1100 line for scientific processing, Osman said.

Sperry Rand continued to refine and improve both the 1100 and Univac series of processors to create newer models. The Univac-II and Univac-III processors were later superseded by the 9000 line, which was followed by the 90 series. When Sperry Rand became Sperry Corp. in 1979, the firm announced the System 80 series processors. The 1100 line has remained fairly constant, since the first 1105 machine was announced in 1958. Osman said the company has unveiled progressively more powerful models of the 1100, such as the firm's top-end 1100/90 processor announced in 1984.

> ❞
>
> *Products based on Eckert and Mauchly's Univac-I formed Sperry's mid-range mainframe line, while the 1100 became the upper tier line.*

Osman noted that, over time, the products based on Eckert and Mauchly's Univac-I formed Sperry's mid-range mainframe line, while the 1100 became the firm's upper tier line. Osman also noted that, over time, the purely scientific vs. commercial inclination that separated the early Univac and 1100 processors has slowly faded away. Osman contended both product lines can now perform both scientific and commercial jobs.

In 1971, Sperry Rand signed an agreement with RCA Corp. to develop add-on products to RCA's line of mainframe computer systems. This led to Sperry Rand's 1972 announcement of the 9700 series processors, which were followed by the 90/60, 90/70 and 90/80 units, Osman said.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REACTION

from page 65

For many large IBM users, the growing floor space requirements for Dasd is a serious problem. Consequently, replacing older 3380 disk drives with new ones can cost a good deal less than constructing a new building to house more disk drives, noted Jack Hart, a vice-president with International Data Corp. (IDC), a market research group based in Framingham, Mass.

Performance problems cleared up

Potentially good news for large IBM mainframe users is that the newer 3380 disk units appear to clear up the performance and nagging technical problems of older 3380 units. IBM is not saying specifically what it has done to improve the newer 3380s, but it apparently is confident enough in the new devices to cut the monthly maintenance fee on the newer models by 10%. It is also saying that the newer 3380s offer between 5% and 15% better performance than the older models.

For makers of IBM-compatible disk drives, last week's 3380 announcement was tantamount to being kicked when already down. IDC's Hart noted that none of the plug-compatible manufacturers (PCM) ever really made it into the 3380 marketplace with compatible devices that could be shipped in large volumes.

Hart noted that 3380 compatibles shipped by CDC, STC and Memorex Corp. together amounted to a handful when compared to the roughly 100,000 3380 spindles IBM has shipped. Now, financially strapped STC, Memorex, National Advanced Systems Corp. and Amdahl Corp. have come up with double-density 3380 models just to stay in the IBM-compatible disk drive game.

But Steve Martin, Memorex's director of worldwide storage equipment, said IBM's 3380 announcement was actually good news.

"It's hard to compete with a phantom," Martin said, noting that the speculation over how IBM would enhance the 3380 had hurt his firm's business. Now that IBM has tipped its hand, it will be easier to develop a competing product, he added.

What long-term effects last week's 3380 announcement will have on the PCMs is another question. IDC's Hart contended that IBM appears to be doing to its Dasd products what it has been doing to its mainframe products for the past few years — namely, making frequent, significant changes that make it difficult and expensive for compatible makers to keep up.

Third-party lessors who invested heavily in heretofore stable 3380 products will clearly suffer from last week's announcement. How much suffering lessors will incur depends on how quickly IBM can gear up production of the newer 3380 units and how quickly the residual value of older 3380s falls.

TURNKEY SYSTEMS

■ Data Communications Corp. (DCC) has announced additions to its range of turnkey computer systems with specialized software for mortgage banking applications.

The company has added to its DCC Mortgage Banking System line — previously comprised of various Data General Corp. Eclipse series superminicomputers — a DG Desktop Generation system for users with few loan requirements and an IBM 4300-based system for mortgage bankers with large loan portfolios. The DG system runs under DG's Rdos operating system, and the IBM system runs under a version of IBM's MVS.

The systems have been designed with identical screens and operating procedures so that users may upgrade without retraining.

Features include pipeline/warehouse loan tracking with a report generator, mortgage loan servicing and investor reporting. Additional features provide buydown, loan processing, lockbox interface, electronic funds transfer and taxing authority. The systems can also be linked directly to a loan origination system.

The DG desktop system — including hardware and software, — is priced from $1,900/mo for a lease; top purchase price would be about $140,000. The IBM 4300-based system — including hardware and software — ranges in price from $550,000 to $750,000.

Data Communications, 3000 Directors Row, Memphis, Tenn. 38131.

DATA STORAGE

■ Texas Instruments, Inc. has released its WD800A, a 5¼-in. Winchester disk drive said to offer a greater storage capacity than the older WD800 for its Business Systems 300, 600 and 800 computers under its Dnos 1.3 or DX10 3.7 operating systems.

The drives will be available in 69M- and 114M-byte capacities (formatted) for the Business Systems 300, 600 and 800. A 38M-byte (formatted) version will also be available for the Business Systems 300 and 600. The 38M- and 69M-byte drives will be available in late February, and the 114K-byte system will be available in May.

The systems will continue to use a 14.5M-byte magnetic tape cartridge for backup. Users of the Dnos 1.2.1 or DX10 3.6.1 operating systems software need a software patch for proper operation. The TI suggested price for stand-alone disk subsystems ranges from $7,300 for 38M bytes without a disk controller or cartridge tape drive to $17,700 for 114M bytes with a controller and drive.

TI, Data Systems Group, P.O. Box 809063, Dallas, Texas 75380.

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MICROCOMPUTERS

Microsoft enhances Word

Offers guarantee, adds support for printers, cards

BELLEVUE, Wash. — The latest release of Microsoft Corp.'s Word program, announced last week, comes complete with a 30-day money-back guarantee. The limited-time guarantee will allay the fears of those "who consider computer software a much-too-risky buy," according to Jon Shirley, Microsoft president.

Enhancements to Microsoft's Word include support for several new printers, add-in cards and the IBM Personal Computer AT's Intel Corp. 80286 processor, a Microsoft spokesman said. Word also runs on the IBM Personal Computer and Personal Computer XT. The package costs $375.

Word now reportedly supports the IBM Quietwriter and Wheelprinter, the Xerox Model 2700 laser printer and the Hewlett-Packard Co. Laserjet printer.

The Hercules Computer Technology Graphics Card and the IBM Enhanced Graphics Adapter Card are supported under the enhanced version, as is the IBM Color Display Monitor. The high-resolution graphics cards reportedly add both color and crispness to Word displays.

Version 2.0 of Word is said to include both Microsoft Spell, an 80,000-word dictionary, and Learning Microsoft Word, a software tutorial. The new release runs Microsoft MS-DOS commands without exiting the word processor, a feature useful for formatting filled disks, the vendor said. A Keep-Follow option, to prevent unwanted page breaks, and interactive repagination, which allows confirmation of each page break, have been added.

Also included are a two-sided keyboard template for using Word with a Microsoft mouse or keyboard commands and a setup program.

Version 2.0 of Word requires a minimum of 256K bytes of internal memory and MS-DOS 2.0 or higher. The Microsoft mouse is available separately for $195 with a $50 rebate to Word buyers.

Microsoft is located at 10700 Northup Way, Bellevue, Wash. 98004.

Will Apple's net draw firms in?

SMALL TALK
Kathleen Sullivan
CW West Coast Bureau

When Steve Jobs, chairman of Apple Computer, Inc., talks about the problems facing the local-area network market, he likes to sketch out his ideas. Give him a couple of felt-tip pens — pick any two colors — and with a flourish he will illustrate his analysis with a few deft handstrokes.

He will begin by writing "no networks" on the blackboard. Then, moving clockwise, he will add "no market for network software" at the three o'clock position. At six o'clock comes "no one writing network software," and completing the circle at nine o'clock is "no value."

Jobs refers to the dilemma as "the chicken and the egg" problem. So few networks have been installed, he explained, that there is no market for network software. As a result, software developers are not focusing their attention on writing software for networks. Without the appropriate software, networks have little value. And hence, few networks are installed.

Enter Appletalk, Apple's networking scheme. Jobs predicted that Appletalk will offer a means of escape from this vicious circle. The company, he said, will install 10,000 networks this year, providing a jump start for a sluggish industry.

According to George Colony, president of Cambridge, Mass.-based Forrester Research, Inc., Jobs' analysis is apt but only up to a point.

Within the Fortune 1,000 arena, Colony said, the primary problem facing management is how to connect IBM Personal Computers. But Appletalk — a proprietary network designed specifically for the Macintosh — does not address

See APPLE page 82

Micro-based project tool draws kudos

By Paul Korzeniowski
CW Staff

Early users of Harvard Software, Inc.'s second product, Total Project Manager, reported that the package tracks resources much better than other microcomputer project management packages, including Harvard's first offering, Harvard Project Manager.

The new software's resource management feature allows a manager to determine how many hours an employee has available to work on a project. "Harvard Project Manager tracked resources for only one project," noted Alan Holbrook, manager at Telex Computer Products, Inc. in Norwood, Mass. "There was no mechanism to determine how changing the number of hours an employee works on one project would affect other projects. Total Project Manager allows a manager to see how one change impacts other projects."

Although early users welcomed this feature, one noted its limitations. "I allocate resources on a stable basis without a great deal of employee turnover or change," said David Stewart, systems operation analyst at LTX Corp. in Westwood, Mass. "If a manager constantly changes his resources, it would be difficult for him to track the changes with Total Project Manager. Entering resources and establishing relationships can be time consuming."

Total Project Manager, announced last November, runs on an IBM Personal Computer with IBM's PC-DOS operating system and 384K bytes of random-access memory.

Both managers had worked with Harvard Project Manager; they both received a complimentary copy of Total Project Manager and replaced Harvard Project Manager with Total Project Manager.

Before getting the freebie, the managers examined other project management packages. "I evaluated [Breakthrough Software Corp.'s] Timeline and found it to have as much functionality as Total Project Manager," Holbrook said. "But Total was easier to use; Timeline required a great deal of operator input to get the package running. Also, Timeline works with Gantt charts, while Total uses either Gantt or Critical

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- Aldus Corp. introduced Pagemaker, a page composition package for the Apple Computer, Inc. Macintosh/74
- Ashton-Tate pulls the plug on its Dbase II Multiuser data base management package/74

INSIDE

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Corvus cuts disk drive prices, supports Macintosh, IBM micro

SAN JOSE, Calif. — Corvus Systems, Inc. has cut prices on its Omnidrive Winchester disk storage systems and annouced that the units will now support both the IBM Personal Computer and the Apple Computer, Inc. Macintosh.

According to the vendor, the price for the 5M-byte Omnidrive was lowered 29% to $1,495. The cost of the 11M-byte Omnidrive was lowered 33% to $1,995.

Versions of the 5M-byte and 11M-byte Omnidrive for either the Macintosh or the Personal Computer are priced identically. Both include a network starter kit, reportedly composed of a computer interface and disk operating software.

Other Omnidrives with network starter kits are priced depending on which personal computer they are to be used with.

Omnidrives for the Macintosh are priced as follows: 20M-bytes, $2,995; 45M-bytes, $5,195. Omnidrives for the Personal Computer are priced as follows: 20M-bytes, $3,295; 45M-bytes, 5,495; 126M-bytes, $9,495.

For more information, Corvus Systems is located at 2100 Corvus Drive, San Jose, Calif. 95124.

Smartcom II for Macintosh out from Hayes Microcomputer

NORCROSS, Ga. — Hayes Microcomputer Products, Inc. has introduced a version of its Smartcom II communications software for the Apple Computer, Inc. Macintosh.

Smartcom II for the Macintosh is priced at $149 and reportedly utilizes the Macintosh's graphic interfaces, including icons. It can receive or send a file regardless of size, provided the file will fit on a disk, Hayes said.

The package's Autopilot feature reportedly permits unattended modem operation by automatically performing such functions as logging on, sending and receiving and retrieving information from a data base.

Using the Hayes Verification Protocol, the Macintosh can communicate with machines running other versions of Smartcom II.

When used with two Macintoshes, Smartcom II for the Macintosh reportedly allows users to create a graphics image on one screen and reproduce it in real time on the other as well. The other user may call up and edit, Hayes said.

For more information, Hayes Microcomputer Products is located at 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

Enhanced Wang Professional debuts

Upgraded Tempest version compatible with IBM Personal Computer

LOWELL, Mass. — Wang Laboratories, Inc. has announced an enhanced version of its Wang Professional Computer that meets U.S. government Tempest security requirements, including compatibility with the IBM Personal Computer and several new storage and output components.

The Wang 75PC-T now includes a monochrome monitor controller board said to permit the unit to emulate the IBM Personal Computer and run most IBM PC-DOS operating system software applications.

Wang also introduced fixed- and removable-media 10M-byte Winchester disk drives, a 55 char./sec daisywheel printer, a 160 char./sec. matrix printer and a mouse pointing device, a vendor spokesman said.

The 75PC-T complies with federal Tempest standards, the vendor said. The monochrome monitor controller board is said to provide all the functionality of the 75PC-T, including the ability to display bit-map graphics when operating in Wang Professional Computer mode. Priced at $695 and available in May, this option includes a user-installable board, software diskette and a set of key cap labels, the firm said.

The disk drives are said to enhance the performance and storage capabilities of the unit, while the removable drive adds to the system's security features, the vendor said. Both drives are 5¼-in. random-access storage devices that reside in the Professional Computer enclosure. The fixed drive costs $3,100 and is available immediately. The removable drive is priced at $3,600 and will be available in March.

Wang Laboratories is headquartered at One Industrial Ave., Lowell, Mass. 01851.

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Aldus printing package out for Macintosh

SEATTLE — Software that reportedly provides page composition capabilities to the Apple Computer, Inc. Macintosh 512K or Macintosh XL personal computers has been introduced by Aldus Corp.

Aldus's Pagemaker is said to allow users to design the pages of small publications, such as newsletters and manuals, using files created with Apple's Macwrite, Macpaint and Macdraw software. The text and graphics files created by the Apple software can be incorporated with each other and positioned on the page using Pagemaker, an Aldus spokesman said.

The software, priced at $495, is designed for use with Apple's Laserwriter laser printer and reportedly allows small publishers to eliminate the need for a typesetter. It can be used to publish price lists, manuals, proposals, presentations and other tasks, Aldus said.

Included in the Pagemaker package are an electronic ruler and an alignment guide. Both are said to help users measure and position articles and graphics on the page.

The software's text correction tool is said to allow users to correct spelling or grammatical errors on the page itself and to edit text to fit space limits.

Pagemaker reportedly works in conjunction with the Macintosh mouse interface and includes pull-down menus.

Pagemaker will be available in the second quarter of 1985.

Aldus is located at Suite 400, 616 First Ave., Seattle, Wash. 98104.

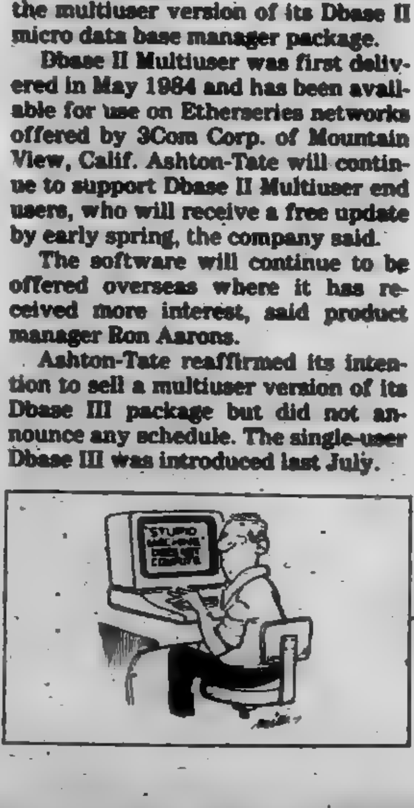
Shipments halted for Dbase version

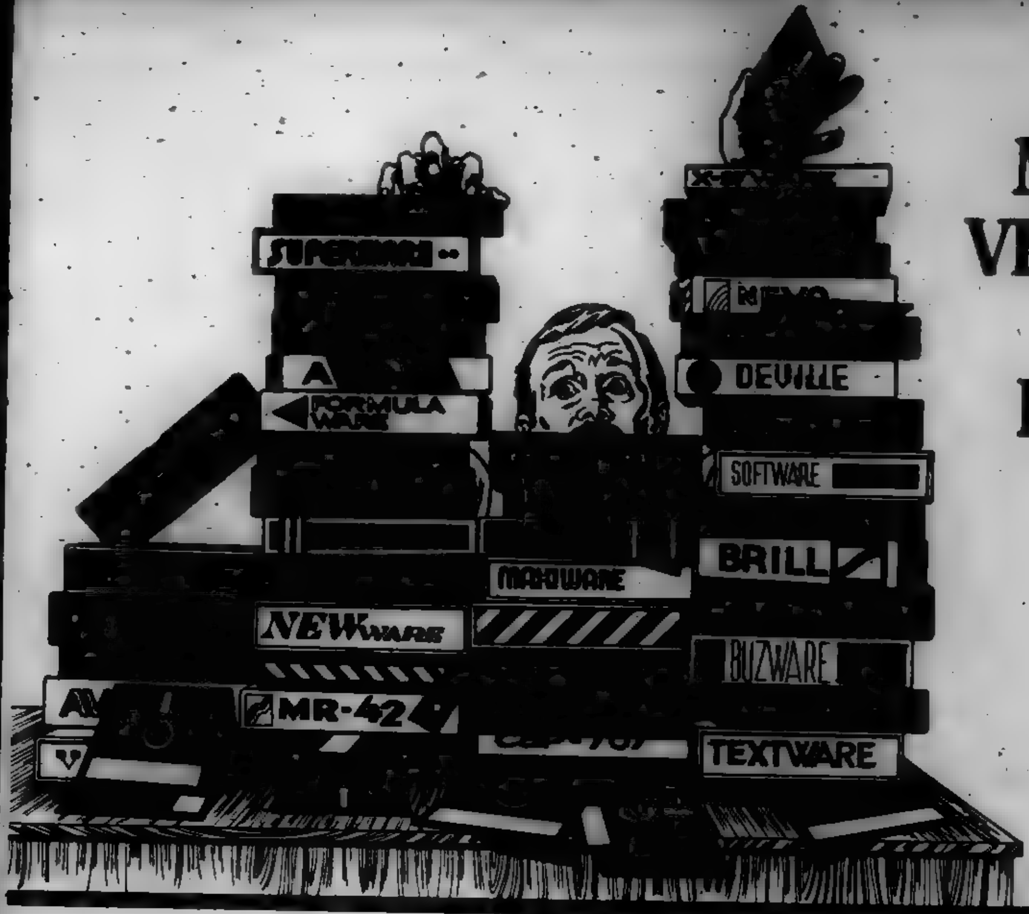
CULVER CITY, Calif. — Ashton-Tate has stopped U.S. shipments of the multiuser version of its Dbase II micro data base manager package.

Dbase II Multiuser was first delivered in May 1984 and has been available for use on Etherseries networks offered by 3Com Corp. of Mountain View, Calif. Ashton-Tate will continue to support Dbase II Multiuser end users, who will receive a free update by early spring, the company said.

The software will continue to be offered overseas where it has received more interest, said product manager Ron Aarons.

Ashton-Tate reaffirmed its intention to sell a multiuser version of its Dbase III package but did not announce any schedule. The single-user Dbase III was introduced last July.





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Framework works like you do. If there are three files open, they're piled three deep on the desktop with the current open file on top. It's design like this which makes Framework intuitively easy, even for beginners.

Framework is versatile enough for serious spreadsheet or data management work, and its graphics capabilities can bring a little bit of "Star Trek" to even the most routine business report.

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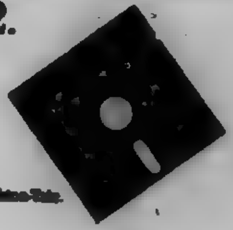

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More than twenty states are preparing special computer legislation to make sure people get what they need.

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Which is why so many computers are technically impressive yet strangely unnatural to use.

Eye strain	55%
Back pain	43%
Headaches	30%
Shoulder	25%
Hand/wrist	18%
Neck pain	15%

(Source: "Ergonomic Principles in Office Automation" Pub. 1983 by E.I.S. AB, Sweden.)

Ericsson, in its very Swedish way, has always believed that excellent ergonomic design isn't a privilege.

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That it isn't just a noble gesture.

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This attitude has made Ericsson No. 1 in Europe twice over:

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It's the first of a complete range of computers to be introduced in the U.S.A.

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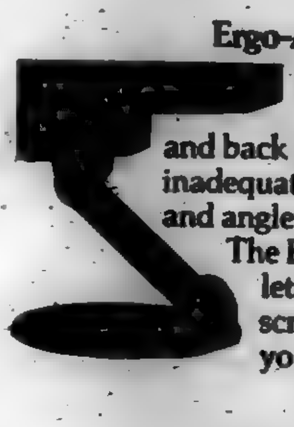
Ergo-Arm.™



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Even the cord is adjustable to suit left- or right-handers.

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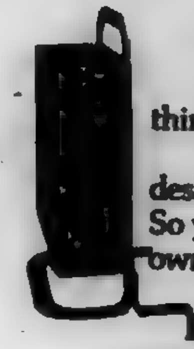

Ergo-Space.™

The system unit is one-third smaller than IBM's.

It even fits under your desk in a special vertical rack. So your desktop is your own again.

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Many companies claim to be compatible. Some are. Some are stretching the truth.

The Ericsson PC boasts the highest compatibility rating there is.

It's operationally compatible.

You can take advantage of thousands of PC-compatible programs already available.

In fact, with the best-selling software, program and data disks are interchangeable with those of the IBM PC.

Service. Not Excuses.

Ericsson wouldn't give you anything less than on-site or carry-in service. The choice is yours.

3 Free Offers.

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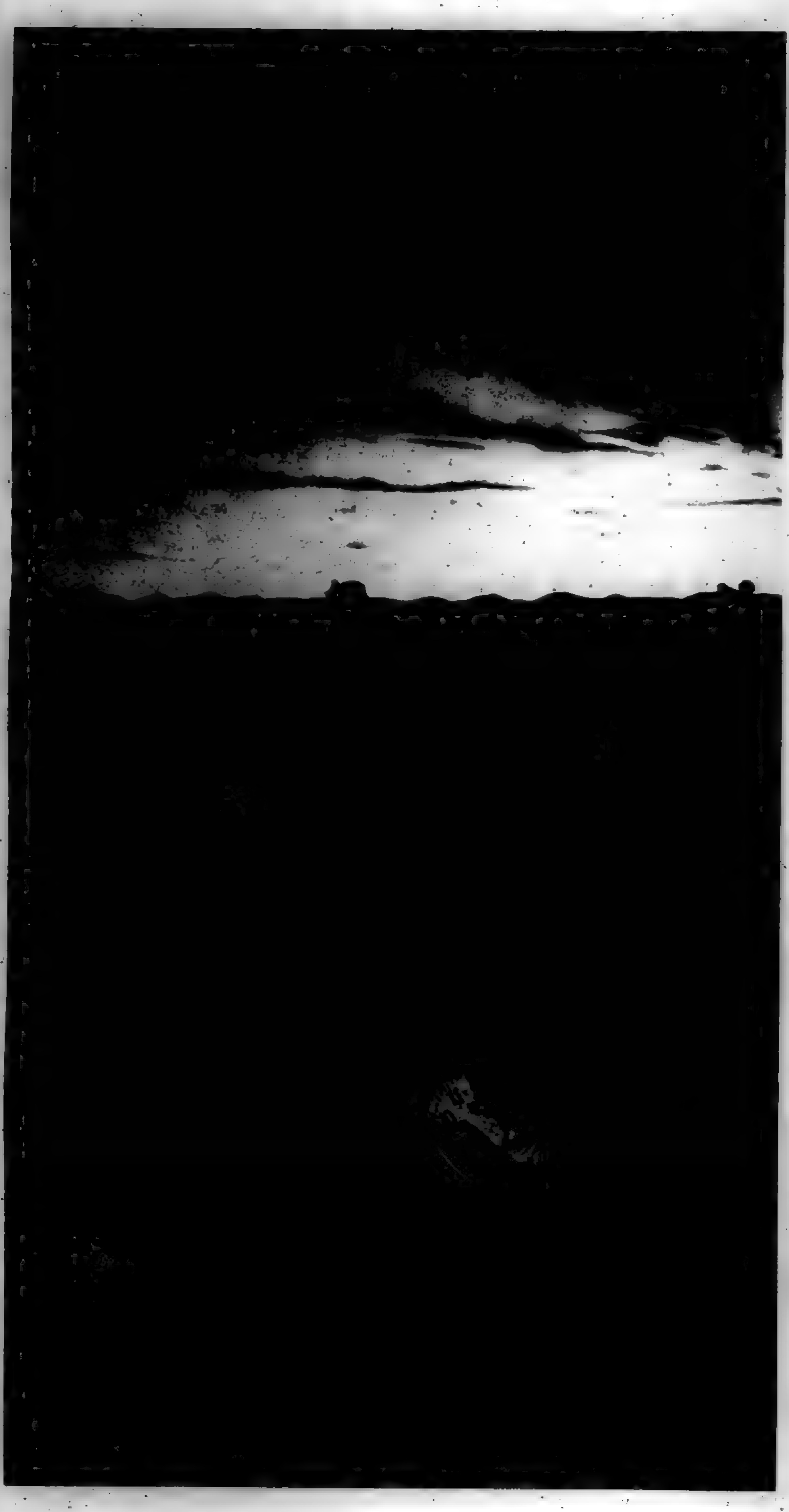

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SOFTWARE

■ Koch Industries, Inc. has introduced PC Em-U-Print software for the IBM Personal Computer line. The software reportedly provides emulation capabilities for such printers as the Hewlett-Packard Co. Thinkjet and Laserjet, the Epson America, Inc. LQ1500 and the Xerox Corp. Memorywriter.

PC Em-U-Print is said to permit software such as Micropro International Corp.'s Wordstar to interface with previously incompatible printers. A menu-driven program, the PC Em-U-Print reportedly allows integration of text and graphics on the same page and provides its emulation capabilities to users with more than one printer attached.

PC Em-U-Print was designed to be copied onto a PC-DOS diskette, making it available each time the Personal Computer is turned on, the vendor said. It is priced at $95.

Koch Industries, Building G, 11 W. College Drive, Arlington Heights, Ill. 60004.

■ Insurance Technology Consultants has announced an enhanced version of its Complete Loss Analysis and Interactive Maintenance System (Claims) software for the IBM Personal Computer and Personal Computer XT.

Claims Version 2.0 reportedly now offers 11 free-form lines, which can be updated, in which the claim or loss can be described. It also is said to offer an alpha search facility for claim identification via the insured's name.

Under Claims, data base interrogation reportedly can be done by claim number, policy number, next diary date, claimant's name, adjuster's name or insured's name.

Claims Version 2.0 costs $795.

Insurance Technology Consultants, Suite F, 1437 W. Palmyra, Orange, Calif. 92668.

■ System Facilities, Inc. has introduced its Microcomputer Programming System, a structured programming language for personal computers under Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M operating systems.

MPS reportedly includes simplified screen formatting and data editing, program chaining with common data and access to most operating system functions. It is also said to offer in-line assembly language coding, string manipulation and source code compatibility between its MS-DOS and CP/M versions.

MPS offers file I/O capabilities including B-Tree, Isam and random and sequential access, the vendor said. It costs $149.95 in its MS-DOS version and $249.95 in its CP/M version.

System Facilities, P.O. Box 7079, Charlottesville, Va. 22906.

■ Mega Cadd, Inc. has introduced its Design Board Professional, a software package for two- and three-dimensional computer-aided design on the IBM Personal Computer, Personal Computer XT and Personal Computer AT.

Design Board Professional reportedly allows users to create designs in two-dimensional plan views and automatically develop three-dimensional perspective views that can be rotated from any angle.

The software is said to permit creation of a data base of three-dimensional drawings. It also reportedly includes all two-dimensional views within a three-dimensional model, allowing changes made in one two-dimensional drawing to be reflected in all other drawings.

Design Board Professional requires the Intel Corp. 80287 math coprocessor and 512K bytes of internal memory. It is priced at $1,750.

Mega Cadd, 401 Second Ave. S., Seattle, Wash. 98104.

■ McDonnell Douglas Information Systems Group has introduced its Management Scheduling and Control System (MSCS) for the IBM Personal Computer XT and Personal Computer AT.

MSCS reportedly uses the critical path method to network project activities and can arrange 2,500 related activities into a time-phased work plan or project model. It is also said to be able to perform time calculations and allocate manpower and material resources.

The software can calculate the earliest time a task may be started and the latest time a task can be completed to meet project completion dates, according to the vendor.

THe software requires 512K bytes of internal memory and either two 10M-byte hard disks or, in the AT configuration, one 20M-byte hard disk.

MSCS is priced at $7,500. An annual license is priced at $3,600.

McDonnell Douglas Information Systems, P.O. Box 516, St. Louis, Mo. 63166.

■ MCTel, Inc. has introduced P/C Privacy: Personal/Confidential software for data encryption for the IBM Personal Computer line and other personal computers.

P/C Privacy reportedly offers a Data Encryption Standard (DES) option to meet the needs of firms required to use DES by the U.S. government. The option is currently available only for the IBM Personal Computer line or compatibles.The software also allows transmission of encrypted data over telecommunications lines, the vendor said.

P/C Privacy is available for micros under Digital Research, Inc.'s CP/M operating system and the Apple Computer, Inc. Macintosh. It costs $195 with the option and $140 without it.

MCTel, 3 Bala Plaza E., Bala Cynwyd, Pa. 19004.

See SOFTWARE page 80

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SOFTWARE

from page 79

■ **Computech Computer Applications has introduced Easy Access software that reportedly provides menus of Microsoft Corp. MS-DOS functions for IBM Personal Computers running in stand-alone or network configurations.**

Easy Access reportedly interacts with MS-DOS to provide menus that are consistent and eliminates the need to memorize commands. Easy Access, priced at $75, is written in C, resides in internal memory during operation and may be stored on a network file server or diskettes.

Computech Computer Applications, P.O, Box 8422, Waco, Texas 76714.

■ **RSA Security, Inc., has introduced Comsafe-X, security software for data communications and information management applications on the IBM Personal Computer and compatibles.**

According to the company, Comsafe-X can be used to protect data in stored or transmitted form. The menu-driven program is written in C language and uses two cryptographic systems that remain transparent to the user. Comsafe-X reportedly allows two users to communicate over various networks or a telephone link using a standard modem.

The product is priced at $500.

RCA Security, 1717 Karameos Drive, Sunnyvale, Calif. 94087.

■ **United Software Security, Inc. has introduced a software program designed for data security purposes for IBM Personal Computers and other microcomputers running Microsoft Corp.'s MS-DOS or IBM's PC-DOS operating systems.**

Privacyplus is said to require only two commands, Lock and Unlock, to secure sensitive data stored in personal computers. It has a built-in mistake protection feature designed to prevent user errors, the vendor said.

Privacyplus runs on microcomputers with a minimum of 128K bytes of memory. The package is said to allow users to protect data, text and programs selectively on both hard and floppy disks. It also has a feature for securing sensitive electronic mail messages, the vendor said.

Privacyplus is priced at $159. A demonstration diskette is available for $20.

United Software Security, 6867 Elm St., McLean, Va. 22101.

■ **Management and Computer Services, Inc. has introduced Showmacs presentation graphics software for the IBM Personal Computer.**

Showmacs reportedly does not require an add-on graphics board and can integrate text, color graphics, rolling titles, animation and special effects in a presentation. It is said to be able to construct, edit, sequence and display presentation components through a single medium.

Showmacs offers multiple type fonts and sizes, multiple colors and the ability to access libraries of shapes, figures and pictures. Showmacs is priced at $495.

Management and Computer Services, Great Valley Corporate Center, Valley Forge, Pa. 19482.

■ **MCBA, Inc. has introduced General Ledger, Accounts Receivable and Accounts Payable software packages for the IBM Personal Computer, Personal Computer XT and Personal Computer AT.**

The packages are said to be written in Ryan-MacFarland Corp. RM/Cobol and to run under the Microsoft Corp. Xenix operating system on the Altos Computer Systems, Inc. 986 micro. Features of the packages include the use of a control file, a user-defined general ledger account number structure and multicompany capabilities, MCBA said.

For the Personal Computer, the packages are priced ranging from $700 to $1,500. For the Altos, the packages are priced ranging from $900 to $4,500.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

■ **Micro Data Base Systems, Inc. has announced that its relational data base management system, MDBS III, is now available for Intel Corp.'s 286/310 microcomputer.**

MDBS III runs under the Xenix operating system on an Intel 80286 microprocessor. It employs an extended-network architecture, the vendor said.

MDBS III is said to be able to reduce the time required for application development by users of the 286/310, the vendor said. It reportedly allows users to define data base structures without the need to use redundancy to describe data relationships. According to the vendor, it allows direct representation of many-to-many and recursive relationships. It also provides security and integrity checking as well as automatic recovery from crashed data bases. It can support up to 4.2G bytes of data and 127 simultaneous users, the vendor said.

Prices range from $2,500 to $5,000 depending on options desired and whether MDBS III is for a single- or multiuser system, according to the vendor.

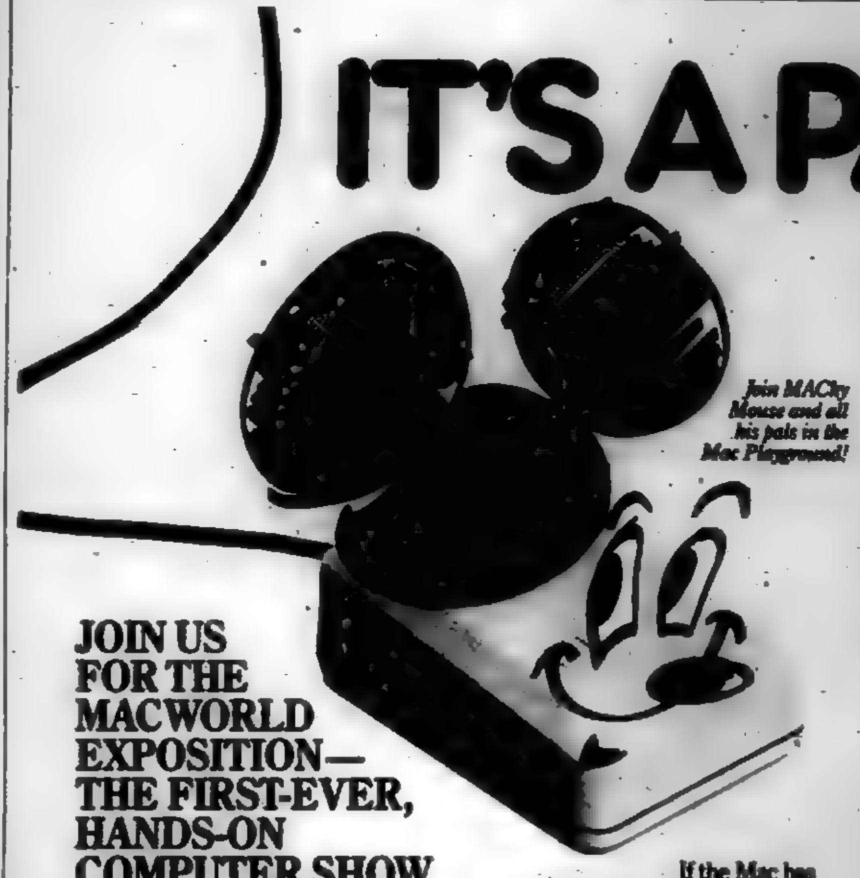
Micro Data Base Systems, P.O. Box 248, Lafayette, Ind. 47902.

SYSTEMS

■ **CYB Systems, Inc. has added the Workmate I and Workmate II to its line of Unix-based computers.**

Workmate I reportedly supports up to four users and offers 512K bytes of random-access memory, expandable to 1.25M bytes. It also is said to offer a 26M-byte half-high,

IT'S A PARTY



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DAY ONE IS OPPORTUNITY DAY! Thursday, February 21, is *only* for the trade, the press and you corporate types. If you're a reseller, it's the perfect time to strike your deal with manufacturers. If you're a corporate user, you can talk turkey with people who'll show you how the Mac can help your business. And if you're the press, it'll be like a turkey shoot for new product announcements and Mac-market news.

DAYS TWO & THREE ARE FOR THE REST OF US! Friday and Saturday, February 22 & 23, is when the real fun begins! The whole world is invited to come play, watch, learn, listen, and compare the first personal computer that understands humans . . . the one that's persuaded people who said they'd never own a computer to say, "I take that back."

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MICROCOMPUTERS

5¼-in. hard disk drive, a 1M-byte diskette drive, six serial ports and AT&T's Unix System V.

Workmate II is said to offer a 54M-byte, full-height hard disk drive, a 1M-byte diskette drive, 10 serial ports and Unix System V.

Prices range from $8,995 for a single-user version of the Workmate I to $15,995 for the Workmate II in its eight-user version.

CYB Systems, 6448 Highway 290 E., D-111, Austin, Texas 78723.

STORAGE

■ **Aquix Advanced Systems Corp. announced that its Network Data System series, the AQMS 513 and AQMS 188, is now compatible with IBM's PC Network.**

The AQMS 513 and AQMS 188 are mass-storage subsystems with file server capabilities designed to provide micros and local-area network systems with a distributed processing environment, the vendor said. The 513 has 513M bytes of mass storage and the 188 has 188M bytes of storage. The 513 is priced at $28,000, and the 188 costs $18,450.

Aquix Advanced Systems, 140 Adams Blvd., Farmingdale, N.Y. 11735.

■ **Viasyn Corp. has announced the availability of an optional 10M-byte cartridge drive for its Compupro 10 Plus multiuser microcomputer system.**

The tape drive reportedly replaces one floppy disk drive and has a start/stop feature allowing users to back up selected files, the vendor said. The option also is available as an upgrade for users with already-installed Compupro 10 and Compupro 10 Plus systems. The tape drive option can be ordered simultaneously with a Compupro 10 Plus for $825. The tape drive is available as an upgrade for $1,095.

Viasyn, 3506 Breakwater Court, Hayward, Calif. 94545.

PRINTERS/PLOTTERS/ PERIPHERALS

■ **Extended Systems Corp. has introduced its Laserjet Connection family, a line of interface products for use with the Hewlett-Packard Co. Laserjet printer.**

The ESI-2646 reportedly permits the Laserjet to interface with the IBM Displaywriter system without user restraint in the text processor's power. The ESI-1312 is said to allow the Laserjet to work with the IBM Displaywrite 2 software.

According to the vendor, the ESI-2613 includes the ESI-1312 and permits the Laserjet to be shared automatically by up to three IBM Personal Computers equipped with parallel ports.

The ESI-2617 also includes the ESI-1312 and reportedly permits the Laserjet to be shared automatically by up to three Personal Computers equipped with serial ports.

The Laserconnection Driver reportedly permits the user to access many Laserjet features via the commands of IBM's Displaywrite 2.

The ESI-2646 is priced at $1,995, the ESI-1312 at $895, the ESI-2613 at $1,695, the ESI-2617 at $1,695 and the Laserconnection Driver at $895.

Extended Systems, 6062 Morris Hill Lane, Boise, Idaho 83711.

AUXILIARY EQUIPMENT

■ **MPC Peripherals Corp. has introduced its EZ-232 line of interconnecting adapters for use in connecting peripherals to a computer's RS-232 port.**

The EZ-232 adapters reportedly allow full handshaking and signal matching between the peripheral and the computer. Each adapter terminates in a standard six-wire RJ-12 modular jack with built-in strain relief capacity, the vendor said. Each adapter is priced at $19.95. A 7-ft connecting cable is priced at $9.95.

MPC Peripherals, 9466 Black Mountain Road, San Diego, Calif. 92126.

■ **Motorola, Inc.'s Communications Sector has announced the KDT 480 Mobile Data Terminal.**

The KDT 480 portable terminal reportedly can be used as a dedicated radio system or incorporated into an existing radio system. It reportedly allows field personnel to access computers from remote locations.

The unit is said to store up to 3,000 char. in random-access memory and to feature a text area of more than 20 sq in. in a 12-line by 40-char. display.

The KDT 480 terminal costs approximately $3,600 without radio.

Motorola, Communications Sector, 1301 E. Algonquin Road, Schaumburg, Ill. 60196.

■ **Victory Enterprises Technology, Inc. has announced V-6008, a disk duplicator that can produce eight copies of one disk.**

The product supports 48 and 96 track/in. densities and allows users to create their own disk formats with Victory's Diskette Format Generator, according to the vendor. It formats disks for the IBM Personal Computer, the Digital Equipment Corp. Rainbow and Kaypro Corp.'s computer line.

V-6008 reportedly features eight drives, each with its own controller board. The product features two levels of protection from electromechanical interference and a four-month warranty. The V-6008 costs $13,995.

Victory Enterprises Technology, Suite B2, 8910 Research Blvd., Austin, Texas 78758.

See EXTRA page 82

TO THE MACS!

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Here's our three-day conference schedule:

Thursday, February 21: Industry/Press Sessions

10:00-11:30	• Industry Forum: the Outlook for the Macintosh in the Office
11:30-12:00	• Industry Roundtable Discussions
12:00-1:00	• (lunch break)
1:00-2:30	• Industry Forum: Developing Software for the Mac-Opportunities and Pitfalls
2:30-3:00	• Industry Roundtable Discussions
3:00-4:30	• Industry Forum: the Outlook for the Macintosh in the Home and School
4:30-5:00	• Industry Roundtable Discussions

Friday, February 22: Business/General User Sessions

12:00-2:00	• Keynote Presentation: the Future of the Macintosh and What It Means for You
2:00-3:00	• How to Start and Survive in Business with Your Macintosh • Maximizing MacPaint • The Mac Clinic
3:00-4:00	• Interfacing the Mac with Other Apples • A Guide to Better Business Graphics • How to Create Useful Documentation
4:00-5:00	• What the Fat Mac Can Do • Maximizing MacWrite • Putting LANS to Work for You

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Saturday, February 23: Education/General User Sessions

12:00-1:00	• The Macintosh in the Classroom • All About MacBasic • Unveiling the Mac's Hidden Features
1:00-2:00	• The Mac in Higher Education • All About MacPascal • How to Write User-Friendly Software
2:00-3:00	• Developing University Courseware with the Mac • Data Base Management of the Mac • How to Become a Wizard at Machine Language Programming
3:00-4:00	• Understanding the Power of Peripherals • Getting the Most Out of Spreadsheet Programs • File Management Tips and Techniques
4:00-5:00	• How to Get Your Programs Published • What's Available in Mac Software • Maximizing Mac's Disk Storage

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MACWORLD EXPOSITION
SAN FRANCISCO

EXTRA

from page 81

CMC International, Inc. has announced Concurrent PC Dial/Log, a product that records, stores, sends and receives telephone messages while an IBM Personal Computer or compatible micro is running a microcomputer program.

The product consists of an expansion board, software and cable that connects a push-button telephone to the micro. A user can answer a telephone and manipulate data from a microcomputer package.

The product costs $695.

CMC International, 1720 130th Ave. N.E., Bellevue, Wash. 98005.

Polytel Computer Products, Inc. has introduced its Keyport 300 programmable touch input pad for the IBM Personal Computer.

The Keyport 300 allows users to execute program functions instantly without learning the program's command structure. It reportedly features 300 programmable keys and operates in parallel with the computer's standard keyboard.

The Keyport 300 reportedly acts as a master menu for most IBM PC-DOS program command formats.

Keyport 300 is priced at $195.

Polytel Computer Products, Suite 310, 1250 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Kalgie Electronics Co. has announced an uninterruptible power supply for use with business microcomputers such as the IBM Personal Computer XT and Personal Computer AT.

The Line-Saver Model LS-480 reportedly provides standby backup power in 4 msec or less and is available in models for 120/240V, 60/50Hz, with 480W capacity. It is said to utilize pulse-width modulation to regulate the ac output voltage and to provide backup times of 11 minutes at full load, 30 minutes at half load and 45 minutes at one-third load.

The price is $795.

Kalgie Electronics, 6584 Ruch Road, E. Allen Twp., Bethlehem, Pa. 18017.

Chancellor Computer Corp. has announced Symgraph, a graphics editor and adapter card designed for the IBM Personal Computer XT.

Symgraph performs schematic capture and physical layout within one program. The product offers 1,024- by 768-pixel resolution on a 19-in. screen and 640- by 400-pixel resolution on a 13-in. screen.

Symgraph is said to provide 16 colors from a palette of 4,096 colors. The editor features Pan and Zoom functions, five view and windowing commands and eight drawing and digitizing modes. Personal Computer XT versions of Symgraph cost $9,000 for a 13-in. screen and $12,000 for a 19-in. screen. The package can be purchased as part of Chancellor's turnkey graphics systems.

Chancellor Computer, 1101 San Antonio Road, Mountain View, Calif. 94034.

See EXTRA page 86

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APPLE

from page 73

that issue, Colony pointed out.

Personal Computers, not Macs

"The machines that are sitting in clusters in the business environment are IBM Personal Computers, not Apple Macintoshes," he said. "Jobs has the right analysis. He's just talking about the wrong product."

Colony said the only product that can serve as a catalyst to the local-area network industry is one that sets a de facto standard when it is introduced.

"The question then becomes: Is Apple a powerful enough company and the Macintosh a strong enough business product to create a standard? The answer is no," Colony concluded.

No major market impact

Although Colony applauded Apple's network concept, giving high marks to Appletalk's modular approach, ease of use and low cost, he said the scheme would not make a major impact on the market.

"An argument could be made that Apple is setting a standard in network simplicity," Colony said. "But simplicity is not being followed by performance, which is more important to the corporate customer than cost."

And at present, Colony said, cost is not the primary roadblock. Noting that a company can cost-justify a network with a connect cost per node that represents 10% to 15% of the cost of a workstation, Colony said a network that costs $700 per node is tenable to buyers of a $5,000 system.

Targets small-volume users

According to Harvey Freeman, vice-president of Architecture Technology Corp., a Minneapolis-based consulting firm, Appletalk will not set the market on fire. "For a light load and a small number of connections, Appletalk is appropriate," he said. Apple seems to be targeting small businesses or small departments within companies, he said.

The network's slow transmission speed of 230.4K bit/sec limits its usefulness, he pointed out. Although Apple said the network can connect up to 32 users, Freeman questioned whether Appletalk would be able to support more than a handful of users doing file transfers without a noticeable slowdown.

In certain settings, however, Appletalk will offer a strong alternative to an installation of networked IBM Personal Computers, Freeman said. And Appletalk might exert downward pressure on the cost of networks designed to connect a small group of computers, he said.

A small department that wants to install and connect 10 computers, for instance, would weigh the merits of spending somewhere in the range of $7,000 to $10,000 to connect IBM Personal Computers against a $500 price tag for connecting Macintoshes with Appletalk. "For a small organization, that's certainly very attractive," Freeman said.

Vendors 'to reprice downward'

Amy Wohl, president of Wohl Associates, a consulting firm in Bala Cynwyd, Pa., said the introduction of Appletalk will have a beneficial effect on the industry. It expands the list of choices available to users, she said. Like Freeman, Wohl said Appletalk will be a factor in network pricing. "It will cause other vendors to reprice downward in order to be competitive," she said.

Wohl cited yet another side benefit of Appletalk. "We might finally see something interesting happening in the market," she said.

"Local-area networks and [AT&T's] Unix must be the two most [unexciting] things in the industry," she explained. "Everyone talks about them, but nothing happens." Appletalk could get the industry out of that rut, she said.

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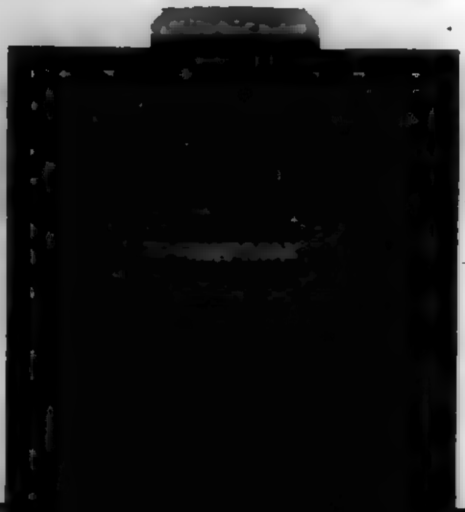

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EXTRA

from page 82

■ **Computer Packaging Technology, Inc. has introduced Mach 1 and Mach 2 utilities that increase the disk access speed of the IBM Personal Computer.**

Mach 1 reportedly is a software package that speeds response time by storing disk information using a memory caching technique. It works automatically, loads with IBM's PC-DOS and can work with up to 512K bytes of memory, the vendor said.

Mach 2 is an expansion card that is said to increase memory in increments from 64K bytes up to 1M byte. Working with the Mach 1, it reportedly stores data for immediate access.

Mach 1 is priced at $59.95. Mach 2 costs $339.95 for 64K bytes of memory and includes Mach 1.

Computer Packaging Technology, P.O. Box 129, Mohegan Lake, N.Y. 10547.

■ **E-X-E Software Systems has introduced Onguard Executive, a security system for hard disks on IBM Personal Computers and compatibles.**

Onguard Executive, an access control package, reportedly mediates disk and file use at the operating system level. It also attaches directly to the disk operating system, is transparent to users and applications and requires no special commands or menus, the vendor said.

The package supports up to 80 users and costs $495.

E-X-E Software Systems, Suite I, 250 E. 17th St., Costa Mesa, Calif. 92627.

■ **Sapana Micro Software has introduced Sapana: Cardfile, a filing system for IBM Personal Computers.**

Sapana:Cardfile reportedly permits entry of six to 24 fields and can accommodate a text of up to 255 60-char. lines. Its variable-length text is said to use only the required amount of disk space and reallocates space to other entries dynamically.

For retrieval purposes, each entry reportedly is classified in a unique way, permitting a savings in disk space and ease of data entry. Search is said to be allowed on all fields.

Sapana:Cardfile is priced at $195.

Sapana Micro Software, 1305 S. Rouse, Pittsburg, Kan. 66762.

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USERS

from page 73

Path Management [CPM]. I prefer CPM."

Stewart evaluated Apple Computer, Inc.'s Mac Project, Scitor Corp.'s Scitor 5000 and Microsoft Corp.'s Project.

He reported that the Scitor and Microsoft packages contained cryptic graphics symbols that most managers might not understand.

"Also, the packages were more limited than Total Project," Stewart claimed.

Mac Project's drawback was its lack of speed, Stewart maintained. "It could take two hours to enter a complicated project into Mac Project," he said.

Both managers said they were satisfied with Total Project Manager and praised its ease of use, documentation and graphics capabilities.

Enhancements recommended

They also recommended some enhancements. "The package's project descriptions are limited to only eight characters," Stewart noted. "I would like to have more room so I could enter a meaningful description.

"The package should have better reporting capabilities," he added. "I would like to look at data in a number of different formats and produce a number of different reports."

Both managers work with a number of other microcomputer software packages. Consequentially, they were interested in translating Total Project Manager's data into Data Interchange Format so that the data could then be loaded into other packages.

The two managers' opinions differed concerning Total Project Manager's ability to complete this task.

"I was unable to convert data so it could be entered into a [Lotus Development Corp.] 1-2-3 spreadsheet," Stewart said. "Some dates came out with decimal points. Other data could not be formatted into a usable manner."

However, Holbrook solved this problem. "I wrote a simple Basic program that converts data so it can be loaded into my spreadsheets," he said.

COMPUTER INDUSTRY

Sperry targets third-party service mart

BLUE BELL, Pa. — Sperry Corp. will announce today that it is entering the third-party service market, using its existing service organization to penetrate a rapidly growing industry segment that is expected to attract additional hardware vendors.

Jerry Dryden, director of customer services with Sperry's Information Systems Group, said last week that the existing third-party service industry is a $1 billion market "that we expect to see triple in the next five years."

Dryden said the company has 3,500 service technicians at 200 locations throughout the country backed up by a parts distribution system and a factory support group.

A separate marketing organization will be created within the customer services division to sell the service.

Sperry's products coexist with those of other vendors in most of its larger accounts, Dryden said. The new thrust will enable the company to serve those accounts better and to provide an established service resource to non-Sperry users, he added.

The service organization will target a wide variety of products made by other vendors, including multiuser minicomputers and microcomputers, personal computers, office automation workstations, networks, peripherals and selected mainframes.

Competing with established providers

The company will be competing with established third-party providers such as Sorbus, Inc. (formerly the Sorbus service division of Management Assistance, Inc.) TRW Corp. and RCA Corp. along with more recent entrants Honeywell, Inc. and NCR Corp.

A 1984 study by market research firm Input, Inc. predicted a 16.8% yearly growth rate in third-party service revenue.

Another 1984 study, conducted by Arthur Andersen & Co. for the Association of Field Service Managers predicted that manufacturers servicing their own products will see a decline in the total service market share, and that most will offer some type of service for other vendors' products by 1990.

Dryden said that increasing product reliability is a reality for all vendors and all products, and that third party maintenance "is a way to expand the revenue stream at a faster rate."

According to Dryden, service is a vital, sought-after product in and of itself, and equipment users "no longer see service as a necessary evil" but instead regard it as critical to productivity.

■ Relationships between U.S. vendors and sales representatives in some foreign countries can be a long-term affair, sometimes longer than desired/89

■ Absorbing a $13.5 million loss from its venture into retail software products, Management Science America, Inc. recently reported 1984 earnings per share of just one cent/92

■ In 1984 IBM Credit Corp. purchased $2.14 billion in equipment and installment agreements from its parent company and was engaged in ventures that involved another $578 million of IBM equipment/96

Shift in IBM strategy cited

Trend toward tolerating competing products noted

By Charles Babcock
CW New York Bureau

NEW YORK — IBM wants to spur the growth of the information industry, even if it means tolerating products of other companies in the IBM environment, according to the Yankee Group.

"If the market grows, IBM knows it will take its share," said Dale Kutnick, executive director of the Boston-based market research group.

Kutnick and other Yankee Group spokesmen conducted a two-day briefing recently on "The Sovereign Superstate of IBM." Among those attending were representatives from AT&T Information Systems, NEC Information Systems, Inc., Prime Computer, Inc. and Wang Laboratories, Inc.

As the dominant force in mainframes, operating systems, networking and microcomputers, IBM has set a de facto standard and created the environment in which other companies do business, Kutnick said.

Two years ago, IBM appeared to be ready to forge ahead in all of its markets and woe to any competitor that expected to exist alongside it, he continued.

Today, the industry giant assumes a more benevolent attitude. If third-party vendors increase the usefulness of the IBM Personal Computer by writing software for it, then there is long-term advantage to IBM in that. And if corporate users increase the demands on the mainframes by developing their own reports with Focus from Information Builders, Inc., then "that's a product that IBM didn't discourage," Kutnick noted.

IBM also mentions Lotus Development Corp.'s 1-2-3 spreadsheet in its advertising for the Personal Computer, even though 1-2-3 competes with its own Personal Service software.

In some cases it appears the company is saying, "Forget IBM products. Sell the best product to help the industry grow," Kutnick said.

See TOLERATE page 90

STC to sell Global-USI shares

By Peter Bartolik
CW Staff

BOULDER, Colo. — Storage Technology Corp. (STC) recently agreed to sell off its 53% interest in Global-Ultimacc Systems, Inc. (Global-USI), the turnkey systems vendor that last year acquired the assets of Magnusson Computer Systems, Inc.

STC also closed down its optical disk division in Longmont, Colo. Fifty workers were dismissed, and another 80 were transferred to other divisions, the company said.

Executives at Global-USI reacted with enthusiasm after it was announced early this month that STC — embroiled in bankruptcy proceedings since filing for Chapter 11 protection under the Federal Bankruptcy Act in October — had signed a letter of intent to sell its equity interest to Hathaway Corp., a Denver-based manufacturer of electronic components and instruments.

Charles J. Siefert, chairman and chief executive officer of Global-USI, said, "We are already well under way with our customers and suppliers in resuming business

See SALE page 96

Follow the leader a losing game

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

The other mainframe vendors and minicomputer manufacturers missed the boat when IBM announced its Personal Computer in 1981 — it sounds so recent but seems so long ago. At that time, few believed that stodgy Big Blue would be able to compete in such a low-technology arena.

Way back then, while IBM was forming alliances with Intel Corp. for a microprocessor and with Microsoft Corp. for an operating system, the rest of the computer establishment stuck to the traditional philosophy of proprietary operating systems and, in some cases, proprietary microprocessors.

Now the industry stands in front of what many believe to be a new wave of microprocessing, led by IBM's Personal Computer AT.

The ability to hook multiple users into

See AT page 94

Record year at Lotus moves firm into top tier

CAMBRIDGE, Mass. — Lotus Development Corp. officially climbed into the top tier of independent software companies last week when it announced 1984 revenue of $156.9 million, up from $53 million in 1983. Profits for the year were $36 million, or $2.24 per share, up from $13.7 million, or 96 cents per share, in 1983.

Lotus' results pushed it ahead of Management Science America, Inc., the Atlanta-based mainframe software vendor that just reported revenue for 1984 of $141.8 million after closing out its disappointing retail microcomputer software business.

In the fourth quarter, Lotus almost equaled its results for all of 1983, posting revenue of $50.4 million, compared with $23.9 million in the last quarter of 1983.

Profits for the quarter just ended were $11.8 million, or 73 cents per share, compared with $6.7 million, or 43 cents per share, a year earlier.

Jim P. Manzi, Lotus' president, said the revenue increase was due to vigorous demand for Lotus' 1-2-3 package and the follow-on product, Symphony.

Additionally, Manzi said, the company is looking forward to shipments of its third announced product, Jazz, designed to operate on Apple Computer, Inc.'s Macintosh.

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OUTSIDE LINES
L. J. Kutten

At any large computer trade show, you will see the American manufacturers' booths with signs saying the company is looking for new dealers and sales agents.

The contract used in such an arrangement is normally the manufacturer's form contract prepared by its American lawyers, and it typically contains two terms: the specific date on which the business relationship between the parties will terminate — usually in one or two years unless renewed in writing, and a stipulation that the manufacturer has the right to terminate the contract of any dealer at any time for the violation of any term of the contract.

While these two provisions are perfectly legal in the U.S., they are not in most foreign countries. Excluding Canada, England and its former colonies, most countries have legislation that makes it difficult for foreign manufacturers to terminate distributorships or sales agencies with its citizens.

Abusive business practices

This legislation exists because in the past, many American manufacturers engaged in abusive business practices such as in the case of a local dealer who would develop an immature market for the American manufacturer's products. As soon as the market had grown, the local dealer would be eliminated and replaced by another local dealer or by the manufacturer's direct sales force.

The foreign dealers put pressure on their governments to pass legislation to protect them. Although these statutes differ from country to country, there are common threads.

First and foremost, the manufacturer must have just cause to terminate the relationship. In Costa Rica, for example, just cause consists of the following:

- The agent committing a crime against the principal's property or reputation.
- The agent's negligence or ineptitude, as determined by a local court, resulting in stagnation or substantial decrease in sales. Import and sales quotas establish a prima facie defense against the charges.
- The agent breaching his duty of secrecy and loyalty to the principal.
- Any other serious contractual breach by the representative that harms the principal.

Second, the statutes make void any contract that requires the application of American law or the intervention of American courts. If there is a dispute, it must be settled under the foreign country's law and in its courts. For example, under Mexico's Law on the Control and Registration of the Transfer of Technology, which applies to software and hardware licenses, any problems with the license agreement are governed by Mexican law or applicable international treaties to which Mexico is a party.

The laws prohibit any contract language that sets liquidated damages or waives any statutory right given to the agent. The agent must be compensated for any damages he suffers because of the unjust termination.

Damages may include compensation for the following:

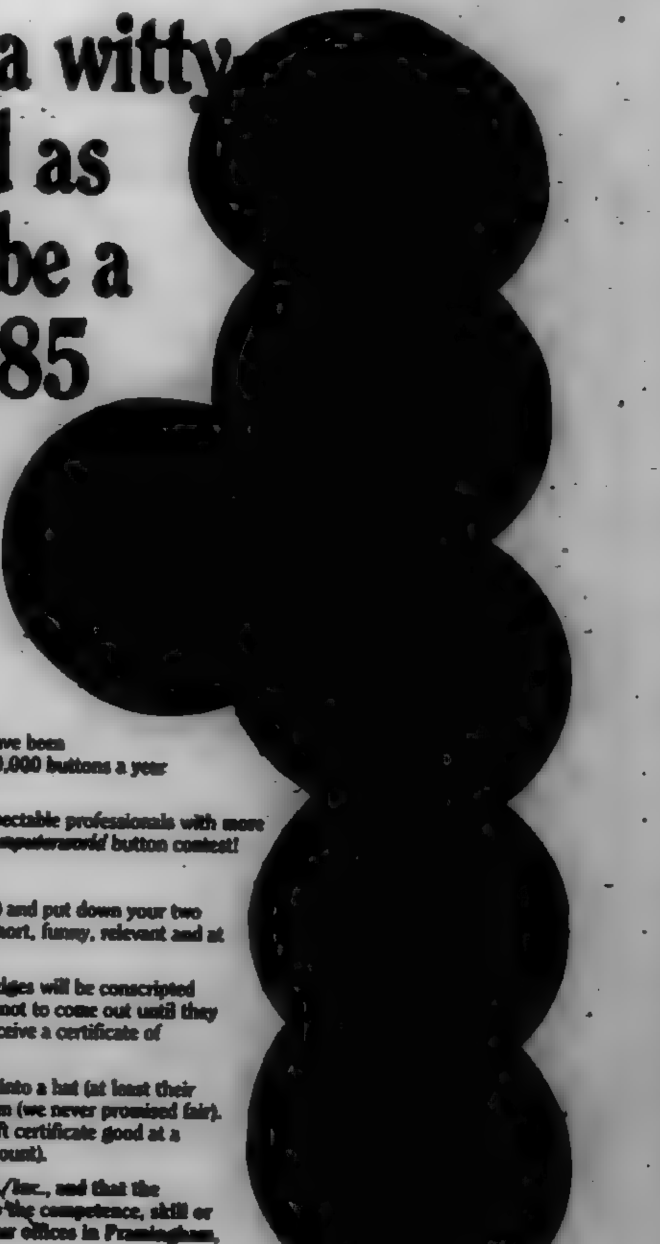
- The actual value of the amount the agent extended in the acquisition and fitting of premises, equipment, installations and furniture that are not useful to any other activity.
- The cost of the goods, parts and accessories he has in stock.
- The good will of the business attributable to the distribution of the merchandise or the rendering of services.
- The amount of any unemployment compensation owed to discharged employees.

Even if the termination is just or amicable, the principal may be required either by law or local custom to pay substantial monetary recompense to the agent for loss of business. For example, in Denmark the established practice is to give the agent an amount equal to 12 months compensation as good will, based on the average of his annual gross commissions for the last three to five years of representation. In Spain, the practice is to give between two months' and two years' earnings as compensation.

Likewise, failure to pay damages or to post sufficient bond to cover the claimed damages can prevent the principal from importing other goods or even replacing the agent. This could result in a business competitor taking control of the local market.

Finally, these laws state that the agent can reasonably expect that the business relationship will continue beyond its stated expiration date. The American business can find itself compelled to continue the business relationship against its will.

Kutten is a writer specializing in computer law. He is a member of the Illinois and Missouri Bar Associations. His book, Computer Buyer's Protection Guide, *was released last year by Prentice-Hall, Inc.*



If you can write a witty one-liner as good as these, you could be a winner in the 1985 Computerworld Button Contest.

Since 1968, as all you real old-timers know, *Computerworld* buttons have been a major hit at trade shows around the country. Recently, more than 100,000 buttons a year have been given out to otherwise normal people.

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Now you have but another chance to participate in this madness.

Here's how it works: You take the entry blank below (or a copy thereof) and put down your two best ideas (two's the limit because we get tired easily). They should be short, funny, relevant and at least moderately clean.

Send in your entry to the address below. After the deadline a panel of judges will be conscripted and thrown into a windowless room with a case of beer and instructions not to come out until they have picked six winning lines. If your slogan is among them, you will receive a certificate of appreciation (suitable for framing, of course).

In addition, all the people who submitted winning entries will be thrown into a hat (at least their names will be) and six lucky winners will be drawn more or less at random (we never promised fair). These lucky people (or animals, as the case may be) will receive a $75 gift certificate good at a selected computer store (probably the one that'll give us the biggest discount).

Remember that all entries become the property of CW Communications/Inc., and that the decision of the judges will be considered final. No representations as to the competence, skill or fairness of the judges are being made. All entries must be received at our offices in Framingham, MA, no later than March 1, 1985.

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Vendors' survival may rest on IBM SNA compatibility

By Charles Babcock
CW New York Bureau

NEW YORK — Manufacturers of minicomputers and IBM-compatible devices will have to build their products to fit into IBM's Systems Network Architecture (SNA) if they hope to survive, an industry analyst said here recently.

Richard Amster, director of data communications research with the Yankee Group, said IBM is rapidly adding features to SNA, a move that increases the appetite for IBM products that tie into it. But IBM has not taken a totally proprietary view toward SNA, he told 350 attendees of a recent Yankee Group briefing on "The Sovereign Superstate of IBM."

"IBM doesn't care who owns the transmission lines over which data communications travel. But it wants to supply the switches and intelligence; it wants to control the network," Amster said.

By tying large users' networks to the company mainframe, IBM expects to leverage its strong position in mainframe production into dominance of company networks, he said.

From a system that was first designed to allow dumb terminals to communicate back to the host, SNA has evolved into a seven-layered environment that allows a variety of operating systems and hardware to communicate with each other.

One of its features, the LU 6.2 general-purpose interface, had to be invented to allow micros and minicomputers to talk to one another as peers in the network rather than being limited to master-slave communications. Now computers within SNA may exchange applications programs.

IBM is also offering Document Content Architecture and Document Interchange Architecture software that allows a document to be moved around SNA as a unit of data, he said.

One SNA may also be connected to another without redefining subarea addresses, logon mode table names or class of service names, but each SNA's security is still maintained, he noted.

Softswitch, Network Applications, Inc. and other third-party vendors are working on LU 6.2 interfaces that will allow outside vendors to place equipment in the SNA network.

At the moment, other manufacturers' minis are filling the gap IBM left between the mainframe and the micro; the minicomputer makers have an 18-month to two-year period in which to bring out their own integration products that will allow them to defend their installed base. "The minicomputer vendors have more flexibility at the low end," Amster said. They may succeed in selling their data base management systems, graphics systems and word processing systems.

Even if they do, they will be contributing to the growing load on the network and large users will find "IBM would like to sell them another mainframe to manage the network."

TOLERATE

from page 87

At the same time, IBM can afford to be tolerant because it now has many of its competitors caught in giant pincers, he continued.

The Personal Computer is so well established in the corporate market place and IBM mainframes so thoroughly dominate the data processing center that many companies are going to find themselves squeezed as IBM starts filling the gap between the two.

Communications costs could fall rapidly in the late 1980s as fiber-optic cable and satellite systems drive down prices. At the same time, IBM is likely to beef up its System/36 and low-end 4300 series models to compete with Digital Equipment Corp., Prime, Data General Corp. and other minicomputer manufacturers, Kutnick said. If other companies wish to survive in the IBM environment, they should be prepared to spend money on research and development and provide innovative features that keep their customers happy, he said.

Meanwhile, IBM can be expected to innovate through new divisions, independent business units, joint ventures with outside companies and agreements with value-added resellers. Two spokesmen from IBM competitors agreed that their companies need to stay light on their feet.

"You've got to stick to your knitting," said David L. Anderson, senior director of product programs at Amdahl Corp., a Sunnyvale, Calif., plug-compatible mainframe maker.

"We have a much smaller technology adoption rate," he added, asserting that new technology can appear in Amdahl products after 4½ to five years of development, while IBM needs seven to nine years.

David A. Litwack, vice-president of product development at Cullinet Software, Inc. in Westwood, Mass., claimed that IBM was just as much a captive of its previous systems as its competitors were.

Cullinet can write operating systems, applications development programs and other software for IBM computers because it has deciphered IBM source code. If IBM changes the code radically, it will be the target of protest by its large base of customers, he noted.

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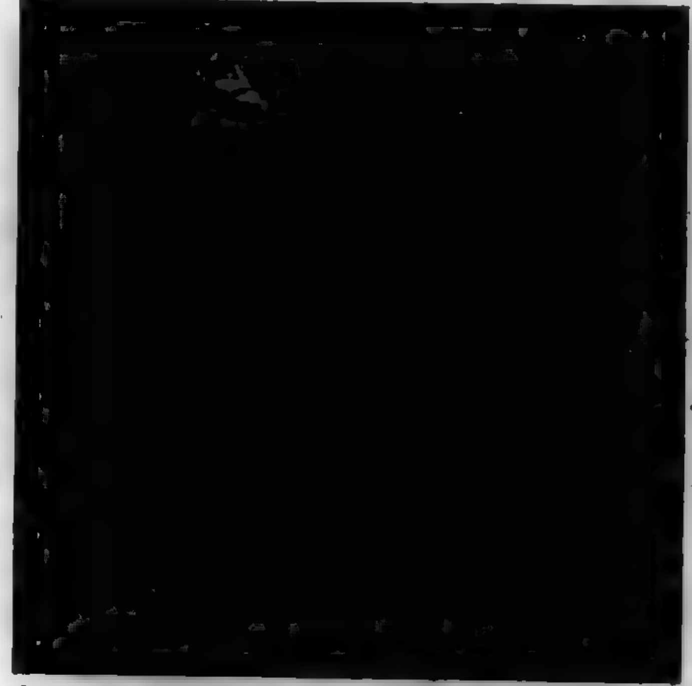

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3-85

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MSA absorbs loss of micro firm

ATLANTA — Posting an operating loss of $7.5 million from its retail microcomputer software business and estimating a further loss of $5.9 million from the disposal of those operations, Management Science America, Inc. (MSA) recently posted profits of 1 cent per share.

The micro software business, which MSA had previously put up for sale, wiped out healthy increases in profits and revenue for its mainframe products.

Despite results that were less than expected earlier in the year, MSA posted revenue from continuing operations of $141.8 million, up from $117.3 million in 1983.

That revenue excluded the microcomputer business that posted profits of $13.6 million, or 77 cents per share, compared with $10.9 million, or 64 cents per share, in 1983.

The company, however, took a loss of $13.5 million, or 76 cents per share, from the operations and anticipated disposal of the micro business. The net result for the year was a profit of $243,000.

MSA's domestic operations generated revenue of $110 million, up 18% from 1983, and foreign operations generated revenue of $32 million, up 33% from the previous year.

During the fourth quarter, which traditionally comprises a large percentage of its annual revenue and profits, MSA posted revenue from continuing operations of $56.3 million, up 19% in comparison with $47.3 million a year earlier.

Profits for the quarter were $11.1 million, or 63 cents per share, before accounting for the micro business losses of almost $8 million, or 45 cents per share. In the fourth quarter of 1983, profits were $10.1 million, or 57 cents per share, from all operations, and $8.8 million, or 50 cents per share, from continuing operations.

NBI, CCI terminate merger talks

BOULDER, Colo. — NBI, Inc., headquartered here, and Computer Consoles, Inc. (CCI) of Rochester, N.Y., recently announced they had terminated merger discussions that were initiated last month.

In a joint statement, CCI Chairman Herman A. Affel Jr. and NBI President Thomas A. Kavanagh said, "After careful study, we have jointly concluded that merging the two companies would not have been in the best interests of shareholders and employees.

"Each of us has every reason to believe that we can continue to prosper and serve our loyal customer bases.

"During the course of our discussions, we identified areas of mutual business interest so that future joint business activities are possible."

Under the terms of a preliminary agreement, announced by the two firms in mid-January, the companies would have merged operations with NBI issuing 0.8 shares of new NBI stock for each share of CCI stock.

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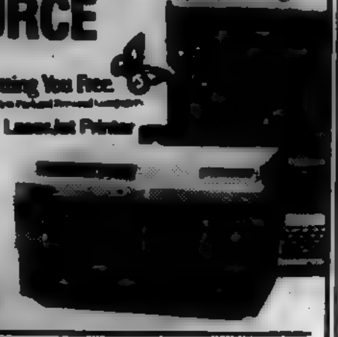

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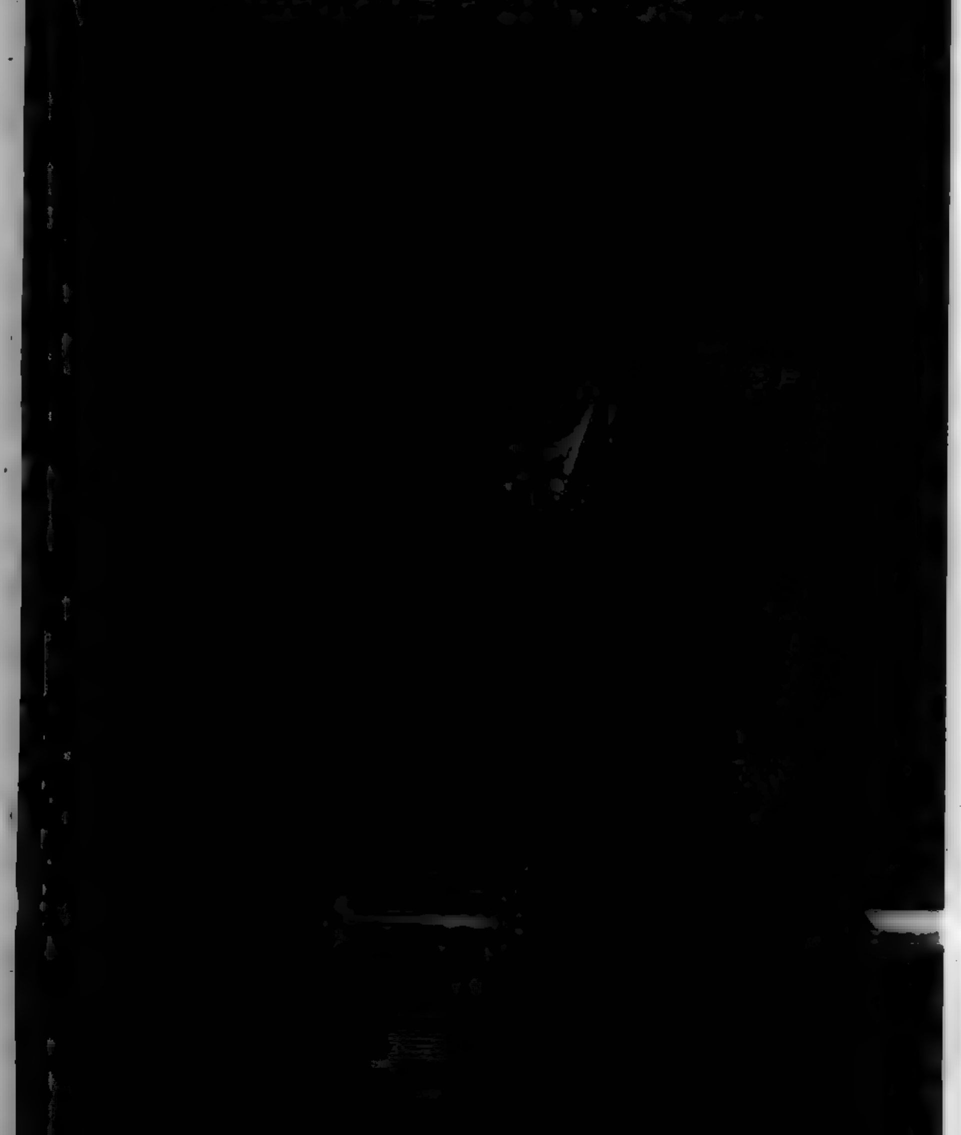

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Amdahl posts slight fourth-quarter gain

SUNNYVALE, Calif. — Amdahl Corp. recently announced slight revenue gains for the fourth quarter, continuing a trend that produced a decline in yearly profits for 1984.

The plug-compatible mainframe and peripherals manufacturer said profits for the year declined to $36.4 million, or 80 cents per share, compared with $43.2 million, or 96 cents per share, in 1983.

Revenue for the year was $779.4 million, just ahead of the $777.6 million posted in 1983.

For the fourth quarter, revenue was up slightly at $227.4 million, compared with $225 million in the year-earlier period.

Profits in the fourth quarter did improve to $16.1 million, or 35 cents per share, compared with fourth-quarter 1983 profits of $15.6 million, or 34 cents per share.

John C. Lewis, Amdahl president, said customer demand grew during the fourth quarter, producing the slight revenue increase.

Like those of most U.S. computer manufacturers, he added, Amdahl's profits were adversely affected by the strength of the U.S. dollar overseas.

Lewis said the company is positioned to benefit from broadened and diversified product lines as it enters fiscal year 1985.

AT

from page 87

a powerful central microprocessor unit is the key to finally automating corporate America, so the thinking goes. If the dynamics in the industry were the same as they were four years ago, the leading hardware vendors would be hard at work developing their own individual solutions to meet corporate America's wishes.

But this is the day of the standard. In the eyes of the computer establishment, Intel's 80286 microprocessor is where it's AT — so to speak — this despite IBM's equity interest in Intel and a shortage of 80286s that many thought would be lengthy. Intel, which has brought a great deal of new production capacity on-line, recently indicated that it could provide the 80286 to whoever needs it in the quantity desired.

Contenders

Possible contenders in the race to bring out a Personal Computer AT compatible include NCR Corp.; Wang Laboratories, Inc.; Sperry Corp.; Texas Instruments, Inc.; Hewlett-Packard Co.; and Digital Equipment Corp.

Although there are those who question whether DEC has the stamina or desire to get into the IBM-compatibility game, there seems little doubt that the computer industry has decided to play follow-the-leader with IBM.

This is the type of situation that will allow investors to breathe easier; after all, who wants to own stock in a company that may at some point have to write off an investment in an entire product line? But this does not seem like the best situation for America in general.

It is impossible to argue that IBM enjoys the monopolistic powers of the old oil barons; there are simply too many companies involved in the computer industry. This is, however, a new age — the information age. When one company has the perceived or actual economic power to curb innovation by its competitors, one has to wonder if we need new definitions to describe free enterprise.

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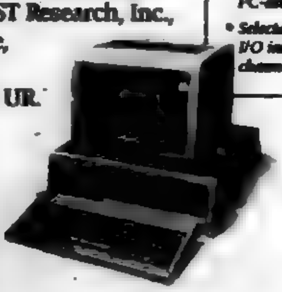

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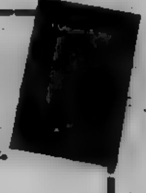

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Repayment loosens Vector control

THOUSAND OAKS, Calif. — Vector Graphic, Inc., an early leader in the 8-bit microcomputer business that experienced problems duplicating that success with 16-bit technology, recently announced a loan repayment guarantee plan under which it will effectively turn over majority control to the loan guarantor.

The company announced it had signed an agreement in principal with Eric Tang, who was representing a group of companies, that will guarantee repayment of $1.7 million of the secured indebtedness of Vector.

The agreement is contingent upon agreement by unsecured and secured creditors and the granting by certain major shareholders of options for Tang to purchase about 3.4 million issued and outstanding shares of Vector common stock. Upon completion of all transactions, Tang's group would be issued 2.5 million shares of Vector stock along with the power to vote an additional 3.4 million shares of major security holders; with 7.8 million shares currently outstanding, Tang would have majority voting control.

According to Vector Graphic, Tang's group is a substantial owner of certain Hong Kong- and U.S.-based companies engaged in consumer electronics, textiles, real estate and other businesses and has additional business interests in China.

Vector Graphic is currently in default of its indebtedness, but debtors had reached a temporary "standstill" agreement to permit the negotiations with Tang to proceed. Tang's group will guarantee $1.7 million of the total $2.09 million indebtedness under the agreement. The company said the association with the Tang group will expand the markets for Vector Graphic products.

The transactions are tentatively scheduled to be completed on or before May 5, the company said.

The options to be granted to Tang would permit him to acquire 1.7 million shares of stock at 1 cent per share from holders of secured notes upon payment in full of the notes and interest. He will also be granted options to acquire an additional 300,000 shares at 1 cent per share.

IBM equips credit branch for more than $2 billion

OLD GREENWICH, Conn. — IBM Credit Corp. in 1984 spent $2.14 billion on installment agreements and equipment it purchased from its parent company, IBM, and was involved in ventures to finance an additional $578 million worth of IBM equipment, according to the company's recently issued annual financial statement.

IBM Credit reported it posted revenue of $296.4 million in 1984 from finance and other income sources, compared with $162.7 million in 1983. Profits for the subsidiary contributed $63.7 million to IBM's earnings, compared with $41.7 million in 1983. During the fourth quarter, IBM Credit posted profits of $22.2 million, compared with $9.8 million for the same period in 1983.

"During the year, [IBM Credit] broadened the range of its financial offerings and took steps to make the financing process simpler for its customers," IBM Credit President David A. Finley said.

According to IBM's annual report to shareholders, IBM Credit accounted for more than 90% of the total activity of its finance subsidiaries, which include IBM Credit, Rolm Credit Corp. and several foreign credit subsidiaries.

SALE

from page 87

as usual and in putting Global-USI back on the . . . track we were on prior to last October."

Global-USI supplies turnkey minicomputer systems to vertical markets and IBM-compatible mainframe systems; last year it acquired Global Software, Inc. of Raleigh, N.C.

George J. Pilmanis, president of Global-USI, said the company had a revenue of $29 million for 1984 and was on target to turn a profit for the year until STC's problems cut into sales.

The company will "continue to supply, support and service STC products" as long as STC continues manufacturing those products, Pilmanis said.

Chief named

LOUISVILLE, Colo. — Storage Technology Corp. (STC) last week announced that Stephen G. Jerritts, currently president of Lee Data Corp., has been named president and chief operating officer of STC.

According to STC Chairman Ryal R. Poppa, Jerritts is scheduled to assume his executive duties beginning Feb. 18, but approval of the contract is required because STC is currently operating under protection of Chapter 11 of the Federal Bankruptcy Act.

Jerritts has been president of Minneapolis-based Lee Data since May 1983. Prior to that he had served 16 years in executive posts with Honeywell, Inc., culminating with his January 1980 appointment as that firm's president and chief operating officer, a post he held for two years.

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NICKELS AND DIMES

Mentor Graphics Corp. reported revenue for the fourth quarter ended Dec. 31 of $30.6 million, compared with $11.5 million a year earlier. Profits were $3 million, or 21 cents per share, compared with $858,000, or 8 cents per share in the same quarter last year.

■

Symbolics, Inc. announced revenue for its second quarter ended Dec. 30 of $15.7 million, compared with $8.9 million in the like period one year earlier. Profits were $815,000, or 4 cents per share, compared with $269,000, or 2 cents per share for the same quarter one year ago.

■

Lee Data Corp. reported revenue for its third quarter ended Dec. 31 of $23.6 million, compared with $26.4 million in the corresponding period one year earlier. Profits were $1.5 million, or 11 cents per share, compared with $4.6 million, or 33 cents per share one year ago.

■

Genrad, Inc. reported revenue for the fourth quarter of $85.6 million, compared with $77.2 million in the same period one year earlier. Profits were $6.4 million, or 40 cents per share, compared with $10.8 million, or 67 cents per share in the corresponding period one year ago.

■

Sterling Software, Inc. reported revenue for its first quarter of $4.9 million, compared with $4.3 million in the like period one year ago. Profits were $247,052, or 6 cents per share, compared with $169,571, or 4 cents per share in the same period one year ago.

■

Compugraphic Corp. announced profits of $24.3 million, or $2.93 per share, compared with $6.7 million, or 81 cents per share in the like period one year earlier. Revenue was $391.2 million, compared with $105 million for the corresponding period one year ago.

■

Dynatech Corp. announced revenue for the third quarter of $55.8 million, compared with $39,6 million in the same quarter last year. Profits were $4.4 million, or 45 cents per share, compared with $3.1 million, or 32 cents per share in the comparable quarter one year earlier.

■

Iomega Corp. reported revenue for the fourth quarter of $19.2 million, compared with $3.2 million in the prior quarter. Profits were $2.1 million, or 15 cents per share, compared with a net loss of $2.8 million, or 21 cents per share in the same period a year ago.

■

Applied Data Research, Inc. announced revenue of $44.4 million, compared with $30.1 million in the corresponding period last year. Profits were $8.4 million, or 94 cents per share, compared with $6.9 million, or 76 cents per share in the like quarter one year earlier.

■

Micom Systems, Inc. reported revenue for its third quarter ended Dec. 31 of $44 million, compared with $34.2 million posted in the same period last year. Profits were $6.4 million, or 42 cents per share, up 18% from $5.5 million for the like period one year ago.

■

Onyx + IMI, Inc. announced profits for the first quarter of $648,000, compared with $146,000 in the same quarter last year. Revenue was $8 million, compared with $6.2 million for the like period last year.

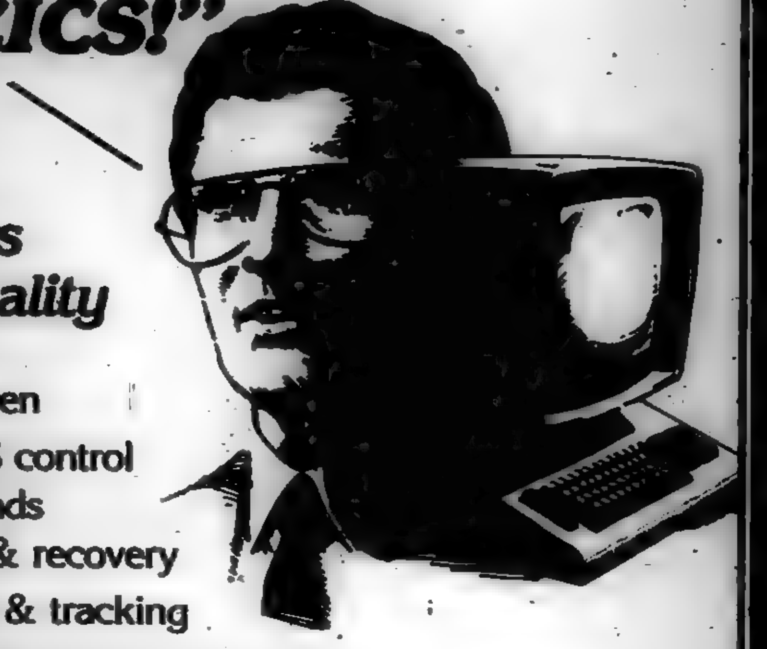
■

Computer Consoles, Inc. reported revenue for the fourth quarter of $34.5 million, compared with $38.7 million in the same quarter last year. Profits were $800,000, or 7 cents per share, from $5.7 million, or 42 cents per share in the comparable period one year earlier.

■

Timeplex, Inc. announced revenue for the second quarter of $23.2 million, a 47% increase over $15.8 million for the like quarter last year. Profits were $2.1 million, compared with $1.4 million for the comparable period one year earlier.

See DIMES page 100



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DIMES

from page 98

Volt Information Sciences, Inc. announced profits for the fourth quarter ended Nov. 2 were $3.4 million, or 47 cents per share, compared with $5.5 million, or 72 cents per share, in the comparable period last year. Revenue was $120.2 million, compared with $91.3 million for the like period one year ago.

■

Boole & Babbage, Inc. reported a loss of $480,000, or 15 cents per share, on revenue of $6 million. In the comparable quarter of fiscal 1984, the company earned 10 cents per share, or $239,000, on revenue of $5.8 million. The company blamed the loss on slow domestic product revenue, partially caused by conversion efforts to a major new IBM release.

■

Lexidata Corp. announced revenue of $5.9 million, compared with $8.3 million in the like quarter one year earlier. A net loss was reported of $955,000, or 17 cents per share, compared with a profit of $175,000 in the like period last year.

■

AST Research, Inc. reported that revenue for the three-month period ended Dec. 31 was $32.3 million, compared with $12.5 million for the like period last year. Profits were $4.2 million, or 50 cents per share, compared with $1.5 million; or 18 cents per share, for the same quarter one year ago.

■

Iomega Corp. announced that revenue for the fourth quarter was $19.2 million, compared with $3.2 million in the comparable period last year. Profits were $2.1 million, or 15 cents per share, compared with a net loss of $2.8 million in the same period a year ago.

■

Wicat Systems reported revenue for its third quarter of $7 million, up from $5 million for the like period one year ago. Loss for the quarter was $2.1 million, or 11 cents per share, compared with a year-earlier loss of $3.2 million, or 16 cents per share.

■

Emulex Corp. announced second quarter fiscal revenue of $27.2 million, an increase of 47% over last year's $18.4 million. Profits were 2.6 million, or 20 cents per share, compared with $3.4 million, or 25 cents per share, in the like quarter last year.

■

International Rectifier Corp. announced second-quarter revenue of $32.2 million compared with $26.9 million in the prior-year period. Profits were $1.3 million, or 11 cents per share, compared with $770,000, or 9 cents per share, in the comparable quarter last year.

■

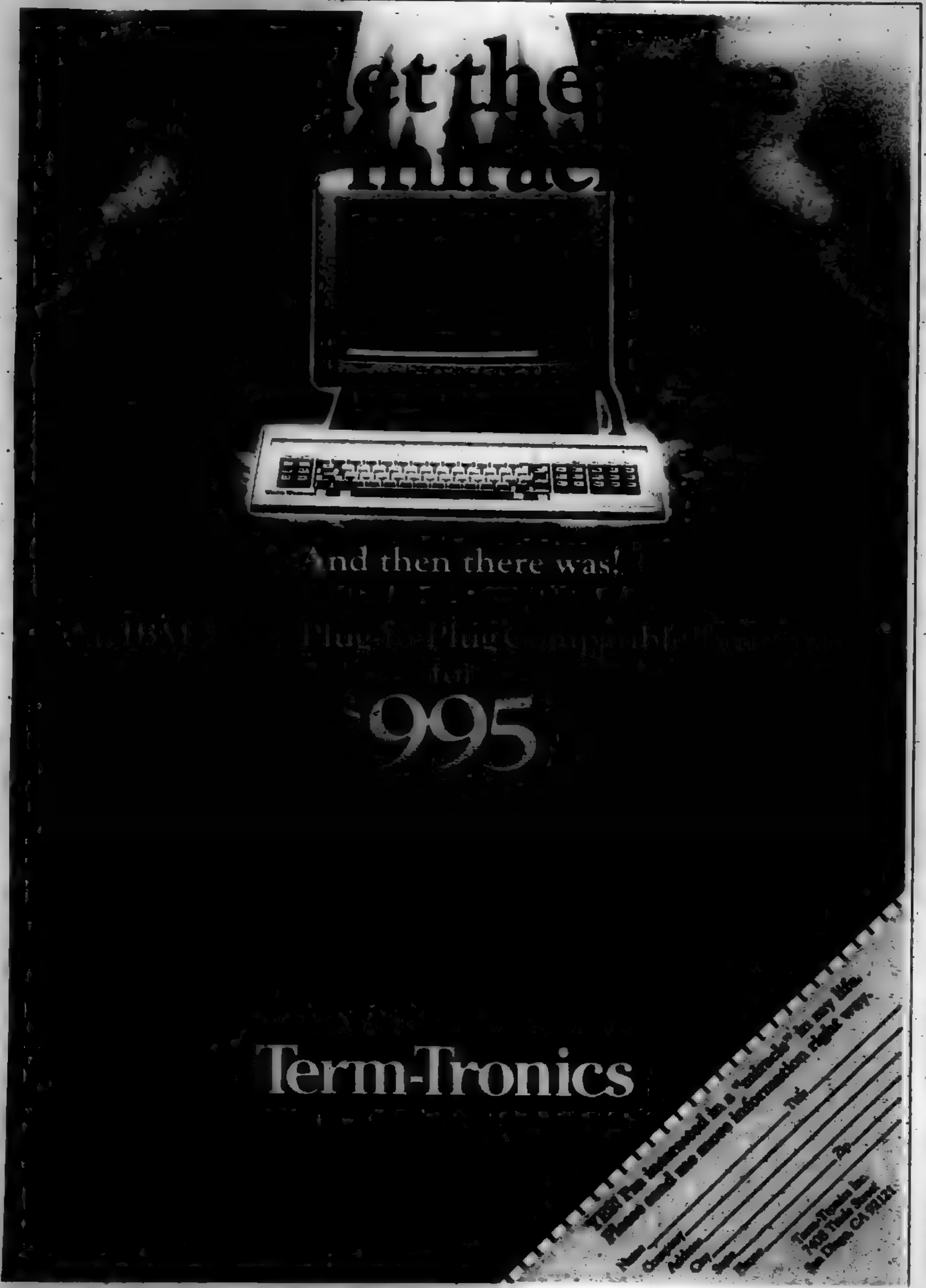
Adage, Inc. reported that revenue for the third quarter ended Dec. 29 was $10.3 million, compared with $12 million for the same period last year. Profits were $141,000, or 3 cents per share, compared with $1.1 million, or 24 cents per share, a year ago.

■

Altos Computer Systems, Inc. announced revenue for the second quarter of $26.6 million, compared with $22.7 million in the like quarter last year. Profits were $1.7 million, or 12 cents per share, compared with $1.9 million, or 13 cents per share, in the same quarter one year ago.

■

Valid Logic Systems, Inc. reported revenue of $48.2 million, compared with $16 million in the same quarter one year earlier. Profits were $6.2 million, or 46 cents per share, compared with $1.8 million, or 17 cents per share, for the comparable period last year.



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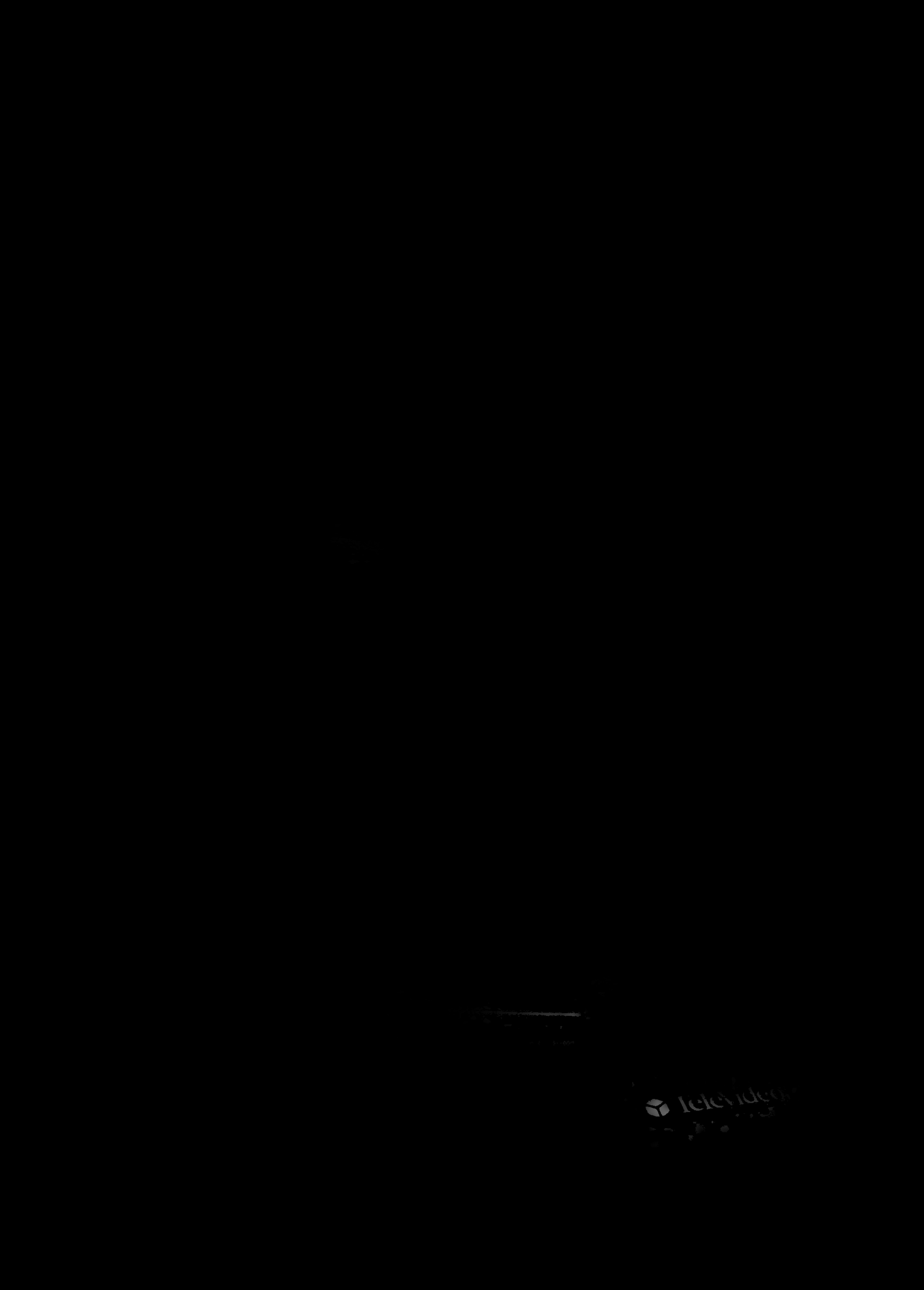

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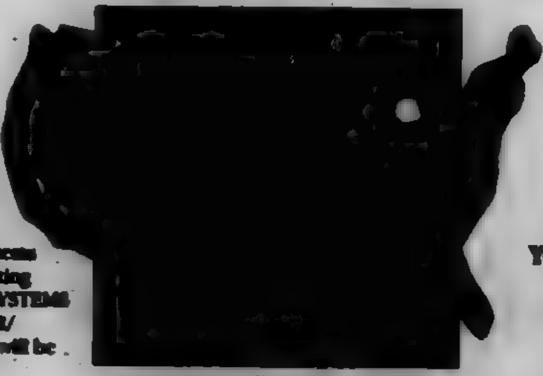

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Position will be responsible for the processing, scheduling, coordination, data file resizes and migration of program changes from development into production status in Prime Information environment.

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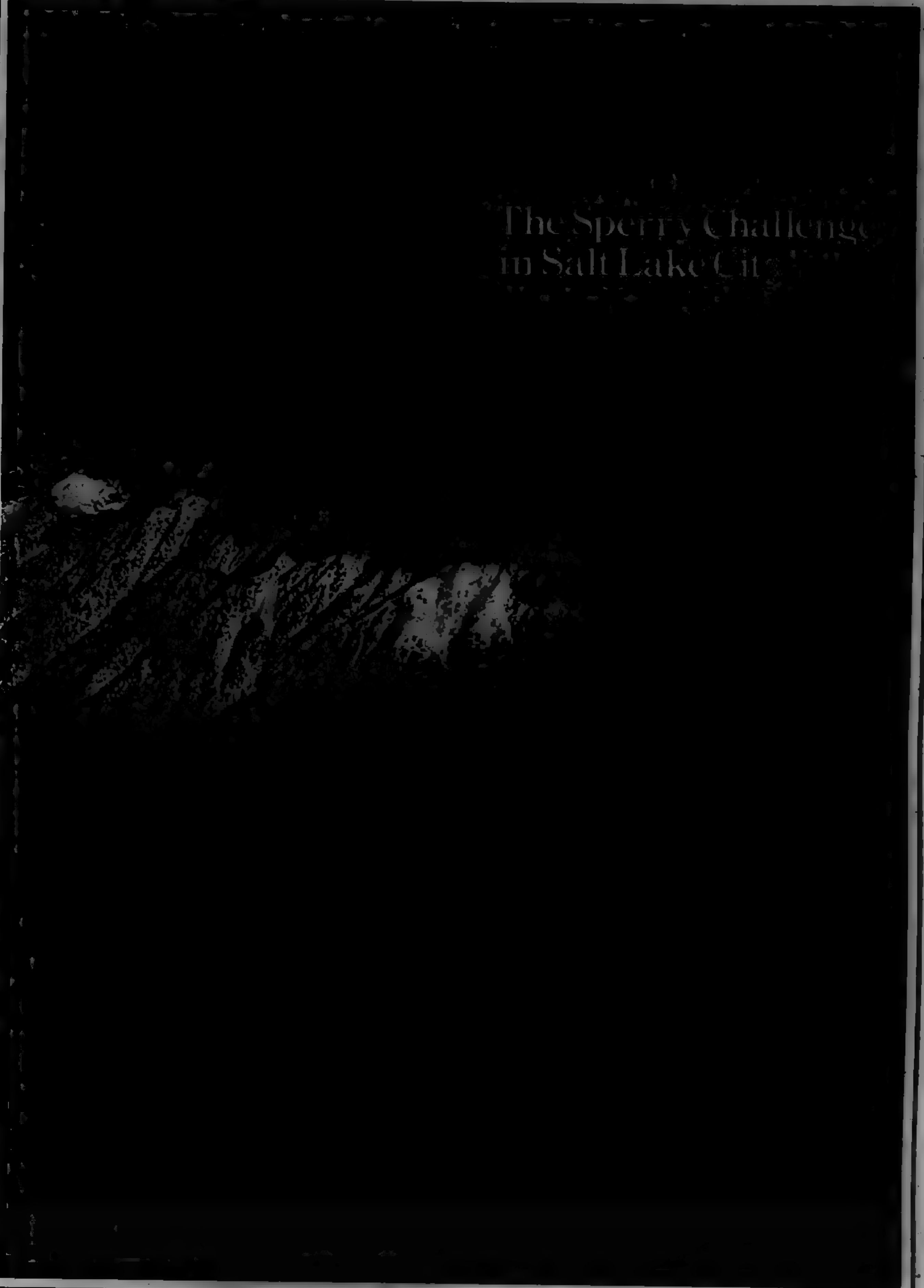

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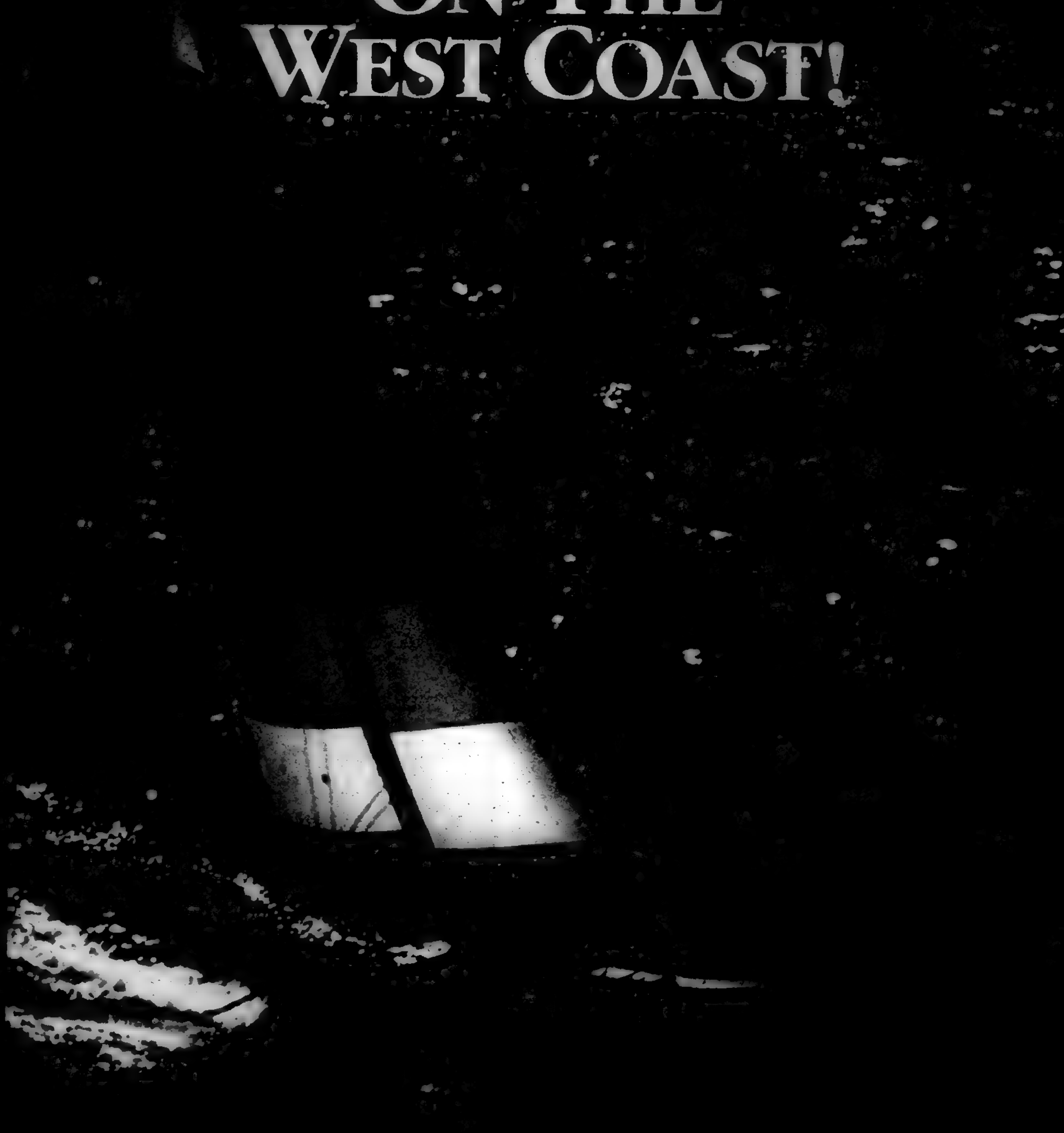

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Software Engineers — Booming Firm! A major expansion for this San Diego-based firm provides opportunity for those familiar with Military software (ASW, C3I, NTDS). Especially in need of ADA experience on M68000 or VAX Systems. To $35,000.

Software Specialist San Diego firm with research and development projects has a need for person with heavy mathematics analysis and navigational systems background. Prefer Kalman Filtering experience, FORTRAN, and VAX (VMS). To $47,000.

Microcomputer Software Engineer San Diego firm has a significant commitment to DBC systems to support engineering and CAD/CAM applications. Provides opportunity for individuals with VAX (VMS) and DEC11 (RSX-11M) to develop state-of-the-art real-time systems. To $36,000.

Real Time Control Programmers San Diego firm has a multi-year project to create real time control systems to monitor nuclear energy facilities. Experience with drivers/handlers, data acquisition, and control systems on 16-bit microcomputers using assembler language needed. To $45,000.

Assembler Programmer — Learn CICS Growing San Diego financial organization has excellent opportunity for person with IBM mainframe Assembly language to learn CICS. To $30,000.

PC Software Engineer — Promotion to Project Manager San Diego-based graphics software firm needs individual to develop micro to mainframe interfaces. Possible promotion to Project Manager. To $42,000.

NORTHERN CALIFORNIA

Systems Programmer — Superb Location National company is looking for an experienced OS/MVS Systems Programmer to support their growing IBM 3083 facility. To $50,000.

Telecommunications Specialist Join a rapidly expanding national computer network using Tandem front end processors and IBM hosts. Experience required with IBM SDLC and Tandem TAL. To $40,000.

Systems Programmer Leading San Francisco based firm seeks a proven OS/MVS Systems Programmer experienced with MVS Internals, Tuning, and Capacity Planning. To $50,000.

Internal Consultant — IDMS Progressive Bay Area firm located in a highly desirable suburb seeks a proven Systems Analyst with background in Systems Development using IDMS. To $45,000.

IMS Programmer/Analyst — Rural Environment Enjoy small town living in a superb recreational area with a low cost-of-living. Solid organization needs IMS hands on experience to lead team. Outstanding relocation benefits. To $35,000.

Manager of Network Architecture Nationally known San Francisco Bay area based firm with extensive TP network. Responsible for network planning, installation, and support from controllers out. Must have large IBM experience. To $50,000.

Project Leader — New Development Major San Francisco financial institution seeks a Programmer/Analyst to lead the development of an Electronic Funds Transfer System in an IBM/OS environment using CICS. To $41,000.

Data Base Administrator — Prestigious Firm Silicon Valley manufacturer offers an excellent opportunity for an experienced IDMS Data Base Administrator familiar with the Data Communication facility. To $50,000.

Systems Analyst — Large System Environment National consumer electronics firm seeks a proven Systems Analyst with strong manufacturing and accounting experience in a large IBM/OS environment. To $45,000.

National Sales Representative International firm located in San Francisco seeks proven Software salesperson to introduce new relational data base package and establish national accounts. Compensation will be structured to the individual. To $65,000.

Software Manager — Major Responsibility San Francisco area division of Fortune 500 Corporation seeks shirtsleeves leader of real-time interactive software group. Technical degree and at least 10 years of progressive development responsibility sought. To $55,000.

Project Leader — Micro Development Senior Level software engineer to lead mini/micro operating systems development team for new 32 bit processor. Requires five years software development with specific operating systems exposure. **To $55,000 and equity potential.**

Software Engineer — Fast Growth Leading San Jose-area growth company seeks microprocessor software professional to develop systems for the communications industry. Experience with VAX or Gould minicomputer. To $45,000.

OREGON

Programmer/Analysts — Minicomputers Multiple opportunities for Programmer/Analysts have recently been created for individuals with solid background in BASIC and the PICK operating systems. Will develop new on-line applications for order entry, financial and inventory on minicomputers and then support field installation. Highly creative environment in Portland. To $35,000.

Systems Analyst — Growth to Management Lead special projects for this well-established Portland company. Initially, will be assigned to design and develop a replacement of the current payroll system. Solid background as PA and SA in COBOL with experience in CICS is helpful. To $36,000.

Senior Programmer/Analyst — New Development Portland financial institution has new expansion position for persons with four years or more COBOL and one year experience with IMS DB/DC. First project in this very progressive and state-of-the-art environment is as team member to implement a new deposit system. To $38,000.

Sr. Systems Analyst — Manufacturing Growth in a leading Portland manufacturing firm has created unique opportunities for Sr. Systems Analysts to work on long range planning of integrated systems in manufacturing and financial areas. Will be heavily involved with users to determine needs and will direct team to implement solutions. Solid background as PA and SA supporting applications development in an on-line (CICS) environment. Exposure to (DL/I) a real plus. To $35,000.

Software Engineer — Control Systems Well-established Oregon Software systems house recently created several new opportunities for ambitious and creative Software Engineers to work in a small team environment to develop and support microprocessors and minicomputer based control systems. Excellent mix of project leadership, hi-level and functional level design, integrated system development, user interface, etc. Desire five or more years experience with control systems utilizing VAX or HP 1000 minicomputers or microprocessors, plus BS degree. To $45,000.

Software Engineers — Hi-Tech Start-up Portland-based software firm involved in developing state-of-the-art array processor products and services has multiple opportunities in the areas of signal image processing, CAT scanners, CAD/CAE simulations, etc. Solid background sought in Assembler and FORTRAN in the defense or electronics industries. To $45,000.

Systems Programmer — Unix Design and develop next generation of hardware/software for expanding hi-tech firm in Portland. Will lead design effort using the UNIX operating system for a product that supports graphics, databases and multiple peripheral devices. To $50,000.

Lead Programmer/Analyst — CICS Aid in design and implementation of new on-line applications. Will also support existing systems as a Team Leader. This solid and progressive Portland firm offers above-average benefits in a state-of-the-art IBM environment. Three or more years of COBOL, one year CICS, and exposure to financial and insurance applications sought. To $35,000.

Marketing Representative — System Sales Start-up position in Portland to market line of microprocessor and minicomputer systems to OEM's and user account in a vertical market. Highly successful company provides high-quality design and technical support. Seek self-starter with track record of successful hardware and/or software sales. First year potential $45,000–$90,000.

Software Engineers — New Product Development Start-up division in a well-established Portland-based, high-tech electronics firm engaged in design and development of engineering work stations, has multiple opportunities. Positions exist in graphics applications, data base applications, I/O interfaces, and diagnostics. Background with UNIX and "C" needed. To $49,000.

Applications Engineers — Vision Systems Rapidly expanding hi-tech company engaged in production of electronic assembly robots seeks experienced and innovative individuals to develop a Robotic Vision Inspection System. Campus atmosphere in a rural environment. Knowledge of "C" and BASIC on 68000 and 8086 and background with Vision systems needed. To $50,000.

Programmer/Analysts — CICS New start-up company, a subsidiary of a well-established firm, has recently created several excellent opportunities in design and applications development. Will support a materials management system in an on-line, large-scale environment. Two-four years of structured COBOL and a minimum of a year of CICS helpful. To $35,000.

WASHINGTON

Data Base Analyst — Ground Floor Position Well-established international software vendor is expanding its staff to include the company's first data base analyst. Successful candidate will promote expertise in a major data base management system such as IMS, TOTAL or IDMS. To $58,000.

IMS Programmer/Analyst — IMS Training Leading Seattle-based Fortune 500 financial organization offers the best in-house training in Seattle and a pleasant, modern working environment. Position requires OS COBOL experience. Relocation assistance provided. To $26,000.

Micro Systems Software — Industry Leader Rapidly growing Seattle-based software development organization has several openings for micro systems software specialists. Position involves design and development of leading edge products such as compilers and operating systems for major microcomputers. To $34,000.

Consultant — Systems Seattle office of a Big 8 CPA firm seeks a professional capable of directing its systems consulting activities. Exposure to a broad variety of commercial applications desired. Degree required. To $40,000.

Software Engineers — Many Opportunities Highly-regarded Pacific Northwest organization has several real-time ASSEMBLER and FORTRAN software development projects to staff. Graphics, SCADA, VAX, SEL, CDC and/or microcomputer skills are preferred. Bachelor's degree required. To $40,000.

Programmer/Analyst — Management & CICS Training Rapidly expanding Western Washington data processing organization seeks a professional having at least two years of IBM OS/COBOL and VSAM experience to work on information systems. Continued expansion provides excellent opportunities for upward mobility. To $30,000.

Systems Programmer Expanding Seattle firm offers state-of-the-art exposure to an experienced IBM OS Systems Programmer. The successful candidate will join the state industry leader while enjoying the unique advantages of the Puget Sound area. CICS, MVS/JES system internals desirable. To $45,000.

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Data Base Analyst Expanding Seattle firm offers state-of-the-art exposure to an experienced IBM Data Base Analyst. A track record in successful IMS Data Base design is sought. Relocation benefits are excellent. To $40,000.

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University of Alaska
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Ideal candidate will have a degree in the sciences with either MS or equivalent experience and 2-5 years mini/microcomputer systems experience in a real-time environment. Experience in INTEL 8088 or 8086, PLM and IRMX 86 a plus. Areas of responsibilities will include design, development, implementation, and testing of real-time software systems, and assuming project responsibility.

Qualified candidates who want to take pride in their careers are invited to send resume or letter of interest to: **PERSONNEL DEPARTMENT. PLEASE - No phone calls.**

ABBOTT
Diagnostics Division

Health Care World Wide
1921 Hurd Drive
P.O. Box 152020, M/S 2-1
Irving, Texas 75015

An Equal Opportunity Employer M/F

PROGRAMMER ANALYSTS

Mediflex Systems Corporation, a leader in the development of Healthcare Software Systems, is seeking Programmer Analysts to join project teams responsible for maintaining, enhancing and supporting healthcare software systems at various facility management sites throughout the United States.

[illegible]

- 2+ years COBOL/CICS programming experience required
- [illegible] software package support experience desirable
- Financial or healthcare applications experience a plus

[illegible]

- PC/DOS programming and analysis experience required
- Order entry/patient care applications preferred
- CICS, COBOL or DL1 desirable

In addition to greater challenges, visibility and potential for growth, Mediflex offers an excellent salary/benefits package including 100% tuition reimbursement, relocation assistance, insurance coverage and more. Please submit resume to: Ted [illegible], MEDIFLEX SYSTEMS CORPORATION, [illegible] Grove Street, Evanston, IL 60201. Equal Opportunity Employer M/F/H

VAR - VAD IBM TURN KEY SALES

Opportunity to join young international distributor of IBM turn-key systems. We are an eight year old manufacturer of multi-vertical software packages for the financial services industry, i.e., credit unions, collection agencies, property and casualty insurance and others. We sell mini-computer and micro computer based solutions on the IBM System/36, System/38 and the IBM PC/XT. We require a quota breaking track record of two or more years selling one of the following: minicomputers, networked micros, business software packages in the 15K to 50K range or turn-key mini-computer solutions. We offer product training, exceptional salary/commission/bonus package. Please call Ed Robinson at (703) 448-9400 or submit resume to [illegible] Systems Corporation, 8111 Old Courthouse Road, Vienna, Virginia 22180.

PROGRAMMER ANALYSTS

The Country Companies, an all line insurance group located in Bloomington, Illinois, has multiple openings for individuals with 1 - 5 years experience in a business application's environment. Requires proficiency in COBOL, JCL, TSO/SPF working in an IBM mainframe environment, MVS/SP/OS, using Structured Programming techniques. Project leadership, experience in PANVALET, CICS, and knowledge of Structured Analysis, advance design techniques, and the insurance industry preferred.

If qualified and interested, please submit a resume and salary requirements, in confidence, before March 1, 1985 to:

Jack Fowler, Director of Employment
The Country Companies
1701 Towanda Avenue
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$27,000 to $43,000

Need several Senior Programmer/Analysts and Applications Development Managers for IBM Shops. Relocation Expenses Paid.

Send resume to:

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These positions offer excellent growth opportunities in a progressive IBM, IMS DB/DC environment.

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1-27N

SOFTWARE ENGINEER

Software Engineer for a software consulting services company to analyze, design, develop, test and implement mini and micro computer software systems; requires a M.S. in Computer Science, extensive knowledge of DEC/VAX mini-computers, UNIX, and the "C" programming language, including simulation techniques, interpreters, queing theory and complex algorithms; salary $28,000/yr.; 40-hour week; send resume to the nearest Colorado Job Service Center, referring to Job Order Number CO 2583851.

PROGRAMMER/ ANALYST

Communication Systems

DIS, a leader in business systems and dealer to manufacturer communication networks, is seeking a Programmer/Analyst. Position is based in Los Angeles and involves working with major corporations to develop and maintain communication networks.

Qualifications include: ability to work with users, Comp. Sci. degree or equivalent experience. Experience with communications and IBM Series I desirable.

DIS offers a comprehensive benefits and compensation package. Please send resume to: Personnel, Technical Dept., DIS Corp., 1221 Fraser, Bellingham, WA [illegible]. EOE. ([illegible]) 733-7610.

DIS Corp.

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COMPUTER SCIENCE: Georgia Southern College (near Savannah) invites applicants for a tenure-track position at the Assistant or Associate Professor level beginning in September 1985. Applicants should have a Ph.D. or ABD (completion expected) in Computer Science or a Ph.D. in a related field with an M.S. (or equivalent) in Computer Science. Rank and salary are competitive and commensurate with experience and qualifications. The department offers a major in Computer Science based on ACM guidelines. Send detailed resume and list of references to Charles L. [illegible], Chairman, Search Committee, Department of Mathematics and Computer Science, Landrum Box [illegible], Georgia Southern College, Statesboro, Georgia 30460. Applications received by March 31 will be considered in the initial screening, but applications will be accepted until the position is filled. AA/EOE

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APPLICATIONS PROGRAMMING MANAGER

- Bachelor's degree in computer science or business administration.
- 5 years DP experience including 2 years of supervisory experience and project management.
- Languages required: COBOL-Assembler.

Position responsible for the management, development and training of all application programmers as well as project control.

CICS PROGRAMMER

- 3 to 5 years experience in on-line environment.
- Macro level Assembler-command level COBOL required.

BATCH APPLICATIONS PROGRAMMER

- 3 to 5 years COBOL experience.

We are a DOS/VSE shop migrating to MVS in 1985. MVS experience would be considered a plus in all of the above positions.

Qualified applicants are invited to forward resume with salary history in professional confidence to:

Ms. Patty Munns
State Employees Credit Union
801 Hillsborough St.
Raleigh, NC 27603

Schlumberger Well Services, a world leader in the oilfield services industry, has an immediate opening in the following position:

PROGRAMMER/ ANALYST

This position is responsible for coding, testing, and documenting programs for application systems; performing systems and programming maintenance for existing applications; interacting with systems development personnel and user departments.

Candidates should have three (3) or more years experience as a COBOL programmer working in an OS/MVS IBM environment; must be proficient in COBOL, VSAM, OS/JCL and CICS. Candidates must also possess at least a Bachelor's degree in Computer Science, Business Administration or a related field. Experience with Fortran, Easytrieve, or ADR DATACOM/DB is desirable.

Interested applicants should forward their resume to:

Schlumberger Well Services
Houston Downhole Sensors
Attention: Personnel Manager
Sensor Product Development/Technology
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Several positions available at all but entry level. You should possess the following skills and capabilities:

- Micro-base software development.
- Graphics/text software background
- Familiarity with Assembly, "C" or Pascal
- Real-Time systems
- Device Drivers, systems supervisors and file systems

Please send resumes to Joe Hart.

NEW PRODUCT DEVELOPMENT

Senior Software Engineers

There are several lead technical positions in new product areas which are just beginning and which represent outstanding challenges and growth opportunities:

- Composition
- Pagination
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- Windows: screens
- Editors

Please send resumes to Dave Stevens.

For the above positions, located in Wilmington, please send resumes to the appropriate recruiter, Compugraphic Corporation, 200 Ballardvale Street, Wilmington, MA 01887.

URBAN CAMBRIDGE

Our Commercial Systems Division in Cambridge, Massachusetts is located in the middle of a lively mix of educational, cultural and entertainment resources with easy access to public transportation and major highways.

NEW PRODUCT DEVELOPMENT

Section Manager Systems Development

- Manage and staff a development group involved in design of new products.
- Provide high-level design ideas and contribute to defining new products.
- BS/MS required, along with a minimum of 6-8 years' supervisory experience.
- File and data management experience plus strong networking abilities.

Principal Software Engineers

Support Software

- Specify and design interactive workstation support software.
- Specify hardware functionality and support software requirements.
- Require BSCS with at least 7 years' technical experience, including 2 in workstation design and implementation.

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- Design and code graphics modules for interactive graphics applications.
- Involvement in module design and programming as well as specifications of low-level graphics functionality.
- BSCS preferred: BA required.
- 2 years' industry experience in "C" and UNIX™ graphics programming.

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Positions in this area require experienced software engineers who have a strong background in "C" or Unix™ programming languages to work on a new turnkey system for the commercial graphic communications industry.

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For the above positions, located in Cambridge, please send your resume to Jim Motley, Personnel Manager, Compugraphic Corporation, Commercial Systems Division, 215 First Street, Cambridge, MA 02142.

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TANDEM PROGRAMMER ANALYSTS & TRAINERS

Several important positions available in St. Louis for individuals that "know the ropes" of TANDEM hardware & how TANDEM is used in a business environment. If you have 2 or more years experience in financial, retail, or telecommunications systems, or the ability and desire to train programmers and analysts on the technical aspects of TANDEM computers, one of these positions could be for you! Salaries range from $25,000 to $38,000. For more information call or forward a copy of your resume to:

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In addition to salaries that are among the industry's best, we offer excellent benefits. Our location provides an unbeatable lifestyle. If you're as ambitious as we are, you'll agree that talking together is the best way to move ahead. If qualified send resume immediately to:

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IMS DB/DC ANALYST

Blue Cross and Blue Shield of Minnesota is one of the Midwest's largest health care companies and because we are an expanding organization using state-of-the-art technology we are offering an excellent opportunity for an aggressive IMS Analyst to work in our pleasant suburban Twin Cities location.

Candidates must have a degree or equivalent experience, four years IMS DB/DC design experience, IBM OS/MVS background and excellent communication skills. Responsibilities include data base design, DBD and PSB generation, on-line screen design, MFS generation consulting to programmers and analysts, performance monitoring and tuning, back-up and recovery using DBRC, and IBM dictionary support.

We offer a salary commensurate with experience, an excellent fringe benefit package, and the high quality of living found only in the Twin Cities. Qualified candidates should send their resume to Verna Rosenberg.

Blue Cross
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3535 Blue Cross Road
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Equal Opportunity Employer

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Full time day shift position is available for a Senior Programmer at Southwest General Hospital.

We are seeking a graduate of a data processing program with several yrs. experience in the field. Candidates must have previous NCR experience in NEAT 3 and VRX operating experience to qualify.

We are an expanding acute care hospital offering a comprehensive benefits package and competitive salary. For consideration, please submit resume listing salary requirements to:

Personnel Dept.
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SYSTEMS PROGRAMMERS

Southern California

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Seek Senior Technical Analyst. Will oversee and follow through the generation, implementation and maintenance of data management software, and other application support software to insure the implementation of hardware and software solutions to problems relating to data base management and application/support software. Participate in installation planning requiring hardware and software changes. Perform complex problem determination, recommending and directing the implementation of technical solutions. Monitor system performance and recommend changes required to meeting data management needs in a cost effective manner. Provide project leadership and technical consultation to other technical analysts to insure continuity and completion of unit activities. Assist in comprehensive planning relative to the structure, standards and practices of the unit. Provide technical data management consultation and/or training to application support groups. Requires Bachelor's in Computer Science or related field plus five years experience in data management and design or a combination of education and experience equivalent to nine years is required. Must possess working knowledge of and experience with IMS and CICS. Apply by March 8 with application letter and resume to: Ms. Nancy Bouc, 225 Nebraska Hall, University of Nebraska [illegible], Lincoln, Nebraska 68588-0521.

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SYSTEMS ANALYSTS

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We offer a challenging environment and involvement with an enthusiastic team of Data Processing Professionals dedicated to a standard of excellence.

Our salaries are competitive and our customized benefits include 33 days paid time off, health plan, wellness program; sports center, and much more. Interested, qualified candidates send resume and salary history to: **Lynn Bobier, Employment Recruiter, THE CLEVELAND CLINIC FOUNDATION, 9500 Euclid Avenue, Cleveland, Ohio 44106.**

THE CLEVELAND CLINIC FOUNDATION

An Equal Opportunity Employer M/F/H/V

SENIOR PROGRAMMER ANALYSTS

We've got our sights on the future—and beyond!

Accelerated growth within the leading financial institution in the Nation's Capitol has created the need for additional Senior Programmer Analysts in our data processing operation.

You should have an extensive data processing background, to include a minimum of 5 years' related experience and knowledge of IMS DB/DC, CICS, COBOL, JCL, ROSCOE and OS/MVS (with future technologies scheduled to be implemented). You should be a skilled communicator with excellent analytical, organizational and problem-solving abilities. Familiarity with the financial industry (preferably a banking environment) and knowledge of on-line systems, including ATM's, would be a plus.

If you're interested in working on diversified assignments from design through implementation and would like to be part of a professional team looking to the future, we encourage you to explore this opportunity.

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ON-LINE

BAL PROGRAMMER ANALYSTS

[illegible]

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PRIME APPLICATIONS PROGRAMMERS

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- **3 or more years of PRIME, INFORMATION and INFO BASIC experience in business applications.**
- **Experience with integrated on-line accounting systems.**
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Positions will be responsible for analyzing requests for new programs; performing program design, coding and implementation; adapting accounting integrated system software to meet changing requirements; and performing program maintenance.

We offer competitive salaries and a comprehensive benefits package.

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Attn: Steve Austin
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El Paso, Texas 79978
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El Paso
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Apply Civil Service Department, 2014 Main, Dallas, Texas 75201

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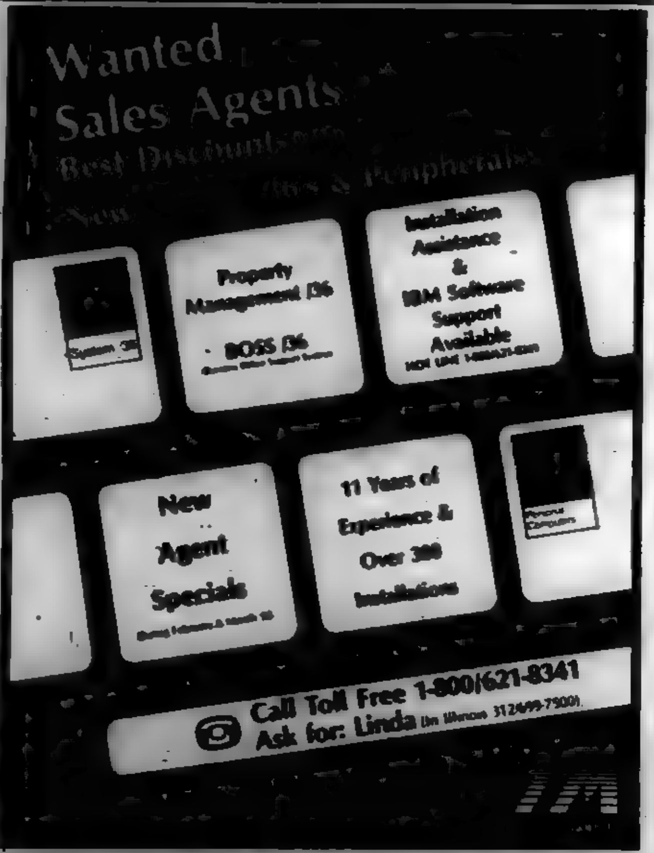
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Request for Proposal No. 976, due 3:30 p.m., Wednesday, March 20, 1985, for the memory upgrade of an IBM 4341/11 processor for the University of Mississippi Medical Center Computer Services Division.

Request for Proposal No. 977, due 3:30 p.m., Wednesday, March 20, 1985, for the upgrade of magnetic tape and disk subsystems running in an IBM 4341/11 environment at the University of Mississippi Medical Center Computer Services Division.

Request for Proposal No. 978, due 3:30 p.m., Wednesday, March 20, 1985, for the acquisition of a software package to facilitate CICS debugging and testing for the University of Mississippi Medical Center Computer Services Division.

Request for Proposal No. 979, due 3:30 p.m., Wednesday, March 20, 1985, for the acquisition of a database package to run in an IBM 4341/11 environment under MVS/SP 1.1.3 for the University of Mississippi Medical Center Computer Services Division.

Request for Proposal No. 980, due 3:30 p.m., Tuesday, April 2, 1985, for the acquisition of an on-line turnkey system with hardware, software and services to automate seven (7) offices in the Washington County, Mississippi Courthouse.

Request for Proposal No. 981, due 3:30 p.m., Tuesday, March 12, 1985, for the acquisition of a multiuser, multiprogramming standalone minicomputer capable of supporting a full-feature relational data base for the Department of Archives and History.

Request for Proposal No. 982, due 3:30 p.m., Monday, March 4, 1985, for the acquisition of microcomputer-based CAD system for East Mississippi Junior College.

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Cost: Our rates are $144.90 per column inch. (Each column is 1 13/16") Minimum size is two column inches (1 13/16" wide by 2" deep) and costs $289.80 per insertion. Extra space is available in half-inch increments and costs $72.45. Box numbers are $15.00 extra.

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Signature:________________

Name:________________

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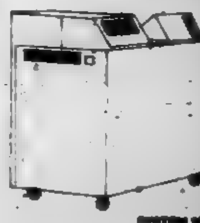
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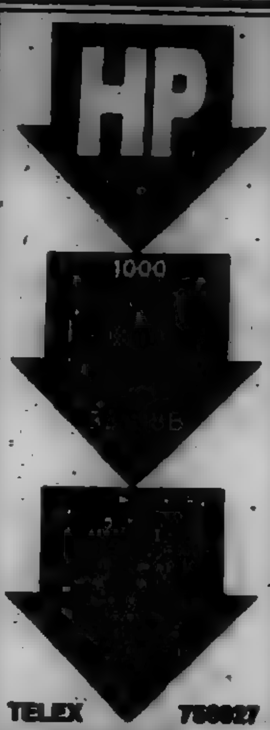

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LETTER OF INTEREST PORTABLE COMPUTER FIELD TEST ORLANDO POLICE DEPARTMENT

Notice is hereby given that letters of interest are being currently received by the Orlando City purchasing agent from firms interested in participating in a police department study on the feasibility of patrol officers using programmable, battery powered, notebook sized portable computers in the field to write police incident reports. Firms will be asked to loan the city the necessary computer equipment for field testing. The city will not be obligated to purchase any of the equipment after conclusion of the test. Any subsequent procurement action will be accomplished by the competitive bidding process. Participating firms will receive copies of all test results. Interested firms are asked to respond to this notice prior to March 1, 1985. Letters of interest should be submitted to the following address: [illegible], City Purchasing Agent, P.O. Box 440, Orlando, FL 32802-0440. For further information contact the city purchasing agent at (305) [illegible].

ATTENTION COMPUTER SOFTWARE MANUFACTURERS AND THIRD PARTY VENDORS

The City of Eugene Oregon is requesting proposals for the acquisition of governmental financial accounting software for the following applications: General ledger, accounts receivable/receipting, and fixed assets. The application software must operate in an on-line, interactive mode on an IBM [illegible] under MVS/SP with CICS for communications and ADR DataCom D/B for data base management system. The software must be operational in a distributed environment. Proposals will be received by the City of Eugene, Purchasing Division, until 1:30 pm pst, March [illegible], 1985.

A pre-proposal conference will be held at 9 am pst on Thursday, March 7, 1985 at the Regional Information Services classroom, Lane County Public Service Building, 125 East 8th, Eugene, Oregon. Specifications may be obtained by contacting the City of Eugene, Purchasing Division, 777 High Street, Room [illegible], Eugene, Oregon 97401, (503) [illegible].

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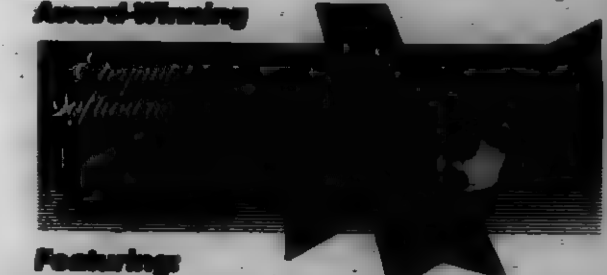

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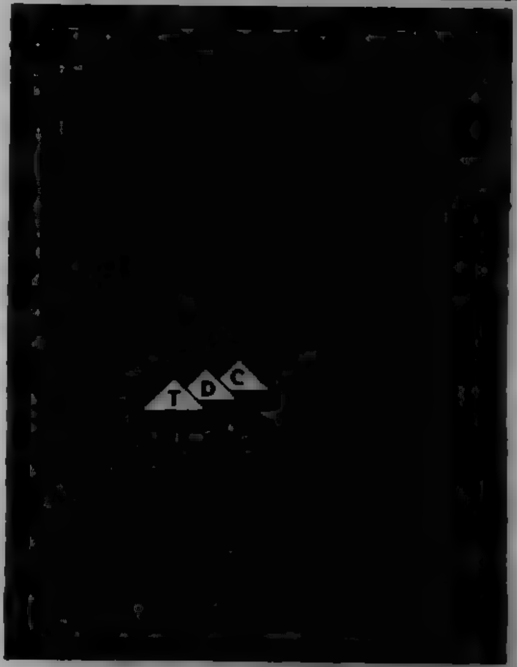

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Cost: Our rates are $144.90 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $289.80 per insertion. Extra space is available in half-inch increments and costs $72.45. Box numbers are $15.00 extra.

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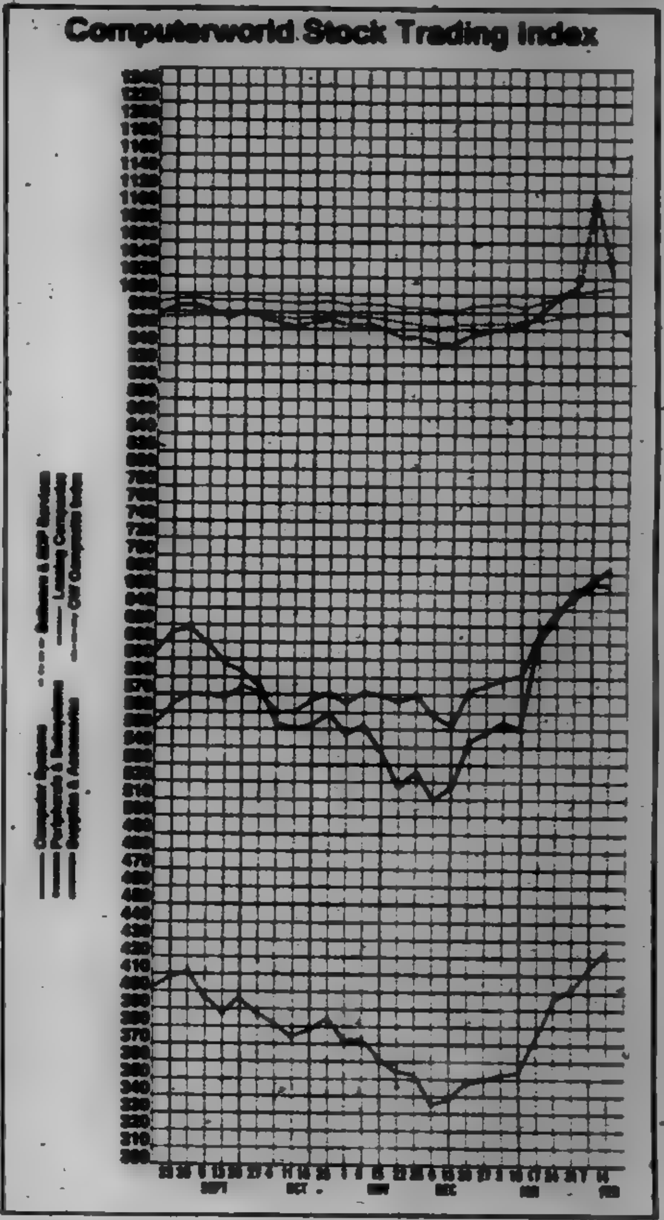

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E X C H		1984-85 RANGE (1)	CLOSE FEB 13 1985	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	LEASING COMPANIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	COMPONENTS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SOFTWARE & EDP SERVICES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	PERIPHERALS & SUBSYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SUPPLIES & ACCESSORIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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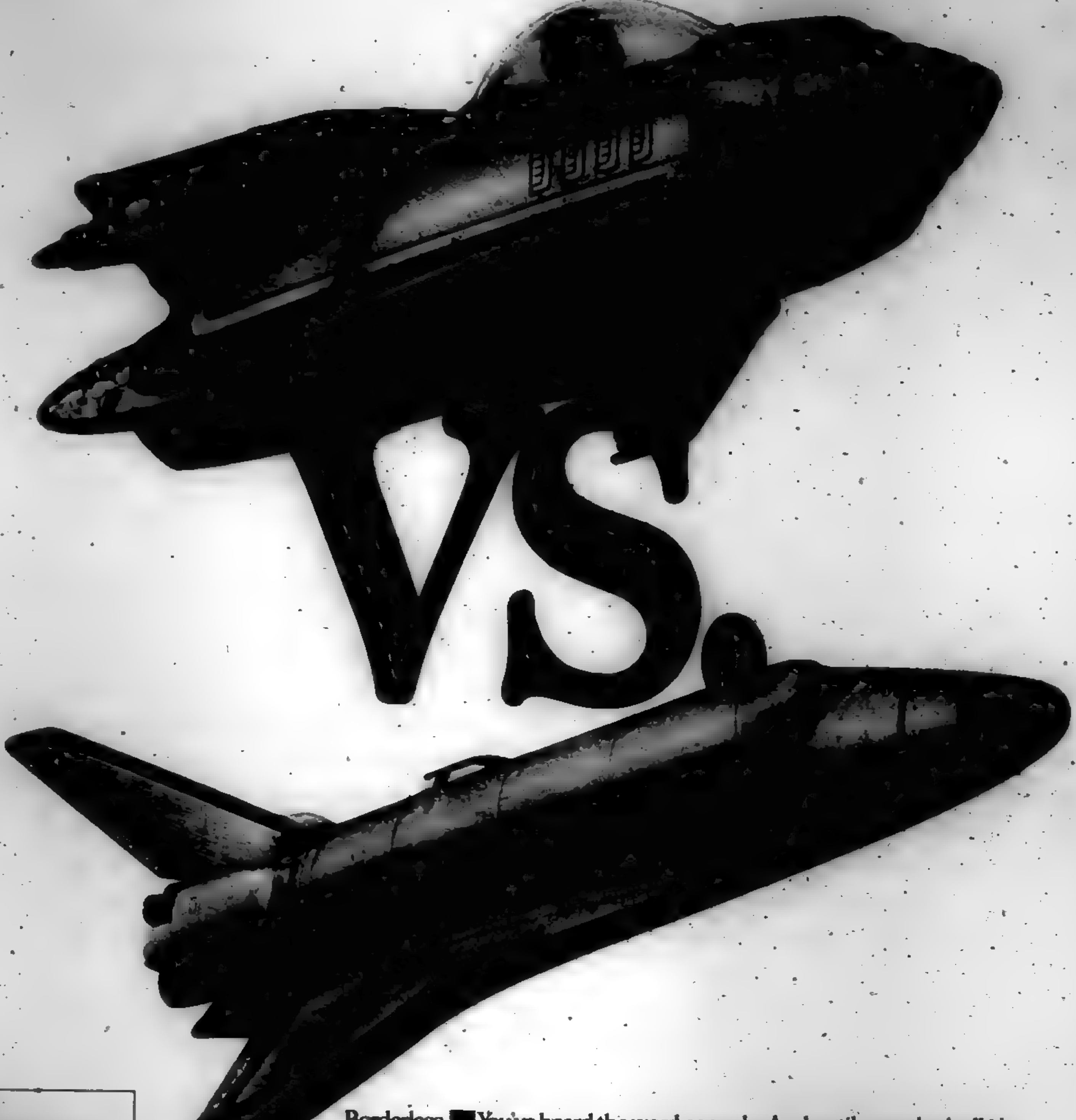

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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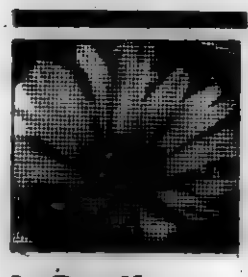

In Depth
Natural languages for end users
Follows 60

GTE shuns Cobol

Mass. shop reduces applications costs with help of fourth-generation tools

By Edward Warner
CW Staff

DANVERS, Mass. — The applications development strategy at GTE Products Corp.'s Sylvania Lighting Center here can be summed up in two words: No Cobol.

Since mid-1983, Sylvania Lighting's data processing shop has relied exclusively on two fourth-generation applications development tools for its new applications, according to Howard Pearce, systems development manager. Those packages are IBM's Applications Development Facility II, used for on-line programming, and Informatics General Corp.'s Mark IV, used for programming in batch mode.

The only Cobol programs running in the shop are several older batch processing programs that have not been converted. The only Cobol programming that takes place is for maintenance of those programs, Pearce said.

Can saying good-bye to Cobol lead to success?

Sylvania Lighting DP manager John R. Hollcraft said he believes it can and pointed to a $780,000 stock replenishment program that came up in November 1984 at a reported cost of $8.67 for each of its 90,000 lines of code. The program provides 23 Sylvania Lighting warehouses around the country with inventory replenishment, based on orders they upload daily to the IBM 3033

See COBOL page 8

TWA makes move to VS compiler

By John Gallant
CW Staff

KANSAS CITY, Mo. — IBM's VS Cobol II may not be a true Cobol-80-compatible compiler, but one early user is already benefiting from the proposed Cobol-80 standards embodied in that product.

Programmers at Trans World Airlines, Inc.'s data center here have not yet begun using VS Cobol II for new development, but they have started migrating a portion of TWA's existing applications base of roughly 10 million lines of Cobol code to the compiler. TWA has been field-testing the compiler for nearly two years as a member of IBM's Early Support Program for VS Cobol II, announced last year [CW, Feb. 2, 1984].

According to Rex Widmer, technical specialist for applications development support, TWA is currently migrating three classes of existing applications to VS Cobol II. That migration process involves recompiling on VS Cobol II and cleaning up any incompatibilities in the compiled code. Those incompatibilities stem from earlier Cobol language standards embodied in the older IBM VS Cobol compiler in use at the data center. The applications initially chosen for the migration effort, he said, are those that can exploit the unique features of VS Cobol II.

The first set of applications being moved are systems involving large data structures. Widmer said IBM's older language products

See TWA page 4

A CLOSER LOOK

Delivery options boosting E-mail

By John Dix
CW Staff

Publicly available electronic mail services are still in their infancy but are gaining popularity because, paradoxically, of hard-copy delivery options that make their use similar to — if not quicker than — overnight mail services.

Electronic mail has been available for some time as an adjunct application supported by computer time-sharing companies and value-added network carriers. This orientation, however, has typically restricted the sphere of potential electronic mail users to the data processing personnel who actually use the computational and data networking services.

The market entrance of Western Union Corp. and MCI Communications Corp. within the last year changed that. Their services are aimed directly at managers and executives, according to Mark Winther, director of new communications services at Link Resources, Inc., a market research firm in New York.

And although still dominated by the computer time-sharing companies, including ITT Dialcom, Inc.; Source Tele-

See E-MAIL page 10

FCC OKs access charge plan

Decision may pave way for AT&T private-line rate hike

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The Federal Communications Commission has approved the structure of special access tariffs that local telephone companies charge, leaving undecided the amount that private-line users and long-distance carriers will pay for service through telephone company switches. That decision, which could come at any time, would pave the way for implementing the special access tariffs as soon as March 1.

Special access is the type of dedicated connection that local telephone companies will offer to users of private lines and long-distance providers of private-line services. Public switched access charges — the counterpart to special access — of $6 per line per month for businesses have been in effect since last June.

While generally approving the special access rate structure, the FCC ordered the National Exchange Carriers Association to make further adjustments to the sections of the special access tariffs dealing with rate structures. Specifically, the FCC required it to list the numbers and locations of so-called hub offices, where bridging and multiplexing functions are performed, so that customers will be able to compute their rates from the listed tariffs.

"They really won't decide special ac-

See RATES page 6

TOP OF THE NEWS

One day at a time. An increasing number of users are turning to short-term rentals to fill some of their microcomputing needs. But software vendors question the legality of third parties renting out their software, claiming this practice violates license restrictions. **Page 2.**

■

San Francisco officials are demanding a computer security investigation after a police lieutenant admitted having access to the city's criminal justice computer system, possibly jeopardizing the disposition of hundreds of criminal cases. **Page 8.**

■

Crystal ball gazing. Attendees at Info/Central: The Information Management Exposition & Conference pondered the future of micro software. **Page 13.**

■

Easier said than done. The government has ordered federal agencies to cut software maintenance costs 25% while obtaining a minimum 10% return on computer technology investments. **Page 16.**

■

Honeywell, Inc. unveiled a communications architecture said to interconnect its factory automation products. **Page 71.**

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NEWSPAPER

Micro rentals fit bill for temporary needs

By Edward Warner
CW Staff

NEW YORK — When the compensation and benefits department at Trans World Airlines, Inc. (TWA) needed to recalculate the pay rate of all airline employees, one IBM Personal Computer was not enough. To get the job done smoothly and on time, TWA rented a second one.

The airline's action is not unusual, according to several New York personal computer rental agencies. More corporations, they said, are turning to rentals to fill temporary needs. Some, they added, are also using rentals to bypass a purchasing department that has put a lid on personal computer buying or to take advantage of tax benefits.

Most corporations, though, said they rent personal computers to fill temporary business needs. At American Express Co., those needs presented themselves last month in the form of a growing backlog of demand for slides from its business communications department. The department produces slides on an Autographix, Inc. Autographix 200 slide-making system powered by an IBM Personal Computer. To meet demand, producer Marianne Locher said the firm rented another Personal Computer for graphics generation.

Rental contract ends in March

The Autographix 200 still produces the slides, she explained, but when its three-month rental contract is up in March, the extra Personal Computer will have proved its worth. "Why should I buy one?" she asked.

Locher's department rented the Personal Computer from New York's PC Services, Inc., a firm that claims it has an inventory of $250,000 to $500,000 worth of personal computers and peripherals. In any given month, according to rental and sales manager Rupal Shah, $200,000 worth of that inventory is being rented — almost all of it to businesses.

Shah acknowledged that the price for renting is higher than that for leasing, but he noted that a lease usually runs at least six months while a rental can be for as little as one day. A typical Personal Computer on lease, he said, costs $100 to $115 per month. His firm rents them, all without software, for $300 per month.

Another New York personal computer rental agency, PC Computer Rental Corp., said it rents both personal computers and software (see story below). Its monthly rates for hardware are $295 for the IBM Personal Computer, $495 for the Personal Computer XT and $620 for the Personal Computer AT.

Shah, meanwhile, noted that his firm's clients number among the largest firms in New York, including the NBC and ABC television networks, CBS Records, Western Union Corp. and the Dime Savings Bank of New York.

At Dime Savings, Assistant Controller Mike Piedra explained that the bank turned to renting to get experience with different personal computers prior to making a decision to standardize. "You [can] go down to Computerland and sit down at one of the computers, [but] that's not enough," he said.

There were other factors that led Dime Savings to rent, however. The purchase of micros must be cost-justified with the bank's purchasing department, he said, and "it was easier to [cost-justify] a rental than a purchase."

In addition, a tax benefit accrues to those firms that rent rather than buy and "that helps from our accounting point of view." As Alex Wong, operations manager of PC Computer Rental, put it: "Rental is 100% write-off." Buying, however, gives only a write-off for depreciation: 15% in the first year and roughly 21% during the next four.

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Amdahl slices prices on 580 CPUs, 6380 drives

SUNNYVALE, Calif. — Amdahl Corp. last week cut prices on its 580 series mainframes and special configurations of 6380 disk subsystems.

A spokesman said purchase prices on the 580 systems were lowered an average of 6% to 12%. For example, a 5880 processor with 64M bytes of main memory and 48 I/O channels now costs $4.60 million. The system used to cost $5.04 million.

Amdahl also announced a version of its 6380 Model B4 disk unit called the Model M4. The Model M4 is functionally equivalent to the Model B4 but can only be used in disk subsystems consisting of a Model A head of string unit and one Model B. Up to two Model M4 units can be used. The M4 disk drives are available immediately and cost $38,950. The Model B units cost $48,700.

Maintenance prices on the 6380 line were cut by 10%.

Amdahl can be reached through P.O. Box 470, 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

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[redacted]

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allowed programmers to assign only 32K bytes of memory for variable-length tables and 132K bytes of memory for fixed-length tables. Previously, he said, if an application required larger data structures, programmers had to cheat, using spillover tables or code fillers to build larger tables.

"VS Cobol II has alleviated the old size restrictions that had been around since [the] Cobol E or F [standards]," Widmer said. "We had applications that demanded megabyte tables, and they became much simpler to support with legal code by moving them to VS Cobol II. With the new compiler, if you need a 3M-byte table, you declare it 3M bytes and it works."

A second class of applications that migrated to VS Cobol II, according to Widmer, involved performance-sensitive systems. TWA recompiled one such massive application, which typically consumed more than 200 IBM 3033 CPU hours each month under VS Cobol II and achieved "significant" performance improvements. "We moved the application to VS Cobol II, and we benchmarked against the older VS Cobol plus [Computer Associates, Inc.'s] CA-Optimizer [Cobol code optimizer package]," Widmer said. "On that test we achieved a performance improvement in excess of 10% over the best we could do before."

The third system to be migrated was a third-party application that TWA acquired during the field test of VS Cobol II. The application had been certified by the vendor on the existing VS Cobol product, and TWA's staff spent less than a day cleaning up the minor incompatibilities that arose from the VS Cobol II move.

Superset of Cobol-74

Widmer described VS Cobol II as a superset of Cobol-74 standards, including extensions to the language proposed in the first draft of the Cobol-80 standards, which are still wending their way toward U.S. and international acceptance. Those extensions include such things as the EVALUATE and in-line PERFORM verbs and scope delimiters.

"The extensions are things from a draft of about three years ago," he said. "But those things have, for the most part, not changed. They are not controversial issues in the evolving Cobol-80 standard."

Widmer said a few of the original Cobol-80 extensions embodied in VS Cobol II have undergone minor revision by both the International Standards Organization and the American National Standards Institute. Thus, users of VS Cobol II may have to put some of their programs through a mini conversion if IBM later introduces a valid Cobol-80-compatible compiler once the Cobol-80 standards are ratified by those bodies.

"What we have done in cases where the Cobol-80 standard has changed since the first draft proposal is to tell our programmers that the standard is undecided in that particular area, and we recommend that they not use that feature for now," Widmer said. "IBM has kept us advised on these issues."

Despite the inconsistencies that may arise with whatever Cobol-80 standard is accepted, Widmer said that TWA will benefit from a number of VS Cobol II features.

Widmer said VS Cobol II's subscript checker easily allows programmers to locate subscript errors, which he said are the most difficult problems to debug in a Cobol program.

"On a keyword-by-keyword basis we can make certain features disappear," Widmer said. "That gives us some standards enforcement. You can say that your programmers are not supposed to use, say, the ALTER verb. But you scan the source code and you find thousands of ALTERs. Now we have a way to really take such things out of [programming]."

CORRECTION

Oki Electric Industry Co.'s newly announced personal computer is called the IF 800 Model 60, not the 800 Model 60 as reported in the Feb. 5, 1985, issue.

Because of an omission by Datapro Corp., the cluster ratings for Innovation Data Processing's FDR software were not included in the charts accompanying the story "Packaged software outlays rise 10% in 1984" [CW, Feb. 18].

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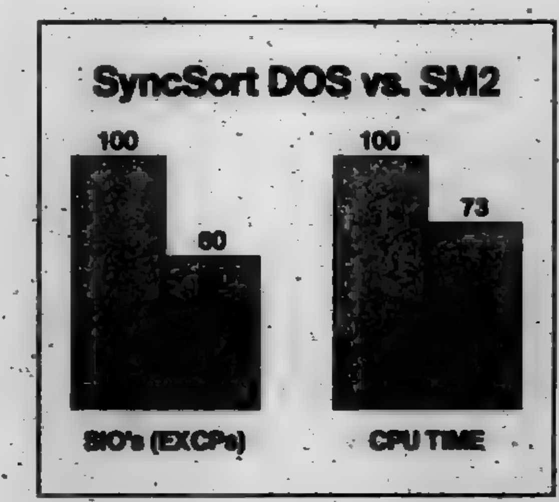

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Sierra: Some good news, some bad for IBM 3084 users

By Jeffry Beeler
CW West Coast Bureau

Users of IBM's largest mainframes differed widely last week in their reactions to Big Blue's announced shipment schedule for its first two Sierra series CPUs [CW, Feb. 18].

By and large, customers of IBM's top-of-the-line 3084 expressed surprise and disappointment at the more than two year delivery lead time for the larger of the two Sierra systems, the 3090 Model 400.

Other users, however, found the distant shipment date wholly unsurprising, and a few even hailed it as a boon to their planning efforts and a welcome statement of clarification about IBM's long-term direction.

Impact on processing operations?

Customers also disagreed sharply in their assessments of whether the extended delivery lead time for the Model 400 will have any noticeable impact on their processing operations. In general, companies with recently installed 3084s and highly I/O-intensive systems environments expressed confidence in the ability of their existing mainframes to meet their computing needs during the long waiting period for the high-end 3090.

But corporations whose 3084s are nearing saturation and whose applications are CPU-bound may find themselves strapped for computing power until the Model 400 begins shipping, according to various user sources.

News of the Model 400's distant release date surprised Robert Delaney, vice-president of information services at Des Moines, Iowa-based Bankers Life Co. Delaney, whose employer uses a 3084 Model QX, had originally expected shipments of the larger 3090 family member to begin about a year earlier than IBM's stated delivery goal.

IBM 'back to its old trick'

Also taken aback by the 400's release date was Anthony Graffeo, vice-president of management information services at New York-based Home Insurance Co. Graffeo voiced disappointment with the processor's two-year delivery lead time. With the Sierra announcement, IBM seems "to be back to its old trick" of introducing CPUs 12 to 24 months before they are ready to be marketed, he said.

Not all MIS executives shared these viewpoints. In Southern California, for example, a 3084 user who asked to remain anonymous expressed no surprise about the Model 400's 1987 availability date, which he described as "pretty much in line with IBM's past practices."

Roughly two years transpired between the shipment of Big Blue's 3081 and 3084. So a similar lag between deliveries of the Model 200 and 400 is probably to be expected, the source said.

Although a two-year wait for the high-end Sierra mainframe may severely test some MIS executives' patience, the long lead time also has its advantages. "My reaction is that, even though shipments aren't scheduled until 1987, it's still nice to know IBM's intentions," said Clyde Whitton, vice-president of management systems at Buffalo, N.Y.-based Marine Midland Banks, Inc.

For Whitton, the two-year delay in the Model 400's availability eliminates much of the guesswork in forecasting IBM's long-term product moves and aids Marine Midland in planning its future hardware acquisitions.

Because the bank obtained a 3084 Model Q last year and still has plenty of unused capacity, the absence of a Model 400 upgrade is unlikely to hinder Marine Midland's computing capability soon, Whitton said.

Forced wait for natural migration path

Not every user organization, however, can make the same optimistic claim. Consider, for example, the plight of Bankers Life. Because the Model 400's extended delivery lead time has forced the company to wait for a natural migration path, Bankers Life may have to buy a second 3084 Model QX and split its on-line systems between the two machines, Delaney said.

Such a division would carry at least two penalties. First, it would compel the firm to undertake a "substantial programming effort" to bridge the communications gap between the two 3084 Model QXs, Delaney said. Second, it would inconvenience the company's end users by forcing them to use a different logon procedure for each system.

Whether IBM's delayed shipment schedule provides hardships for user organizations depends "on where they are in their CPUs' life cycles," according to Charles Feld, vice-president of management services at Frito Lay, Inc.

RATES

from page 1

cess until they decide on the cost and rate structure levels," noted James Blaszak of the Ad Hoc Telecommunications Users Association, which represents 30 large U.S. corporations. It has been pushing for changes in special access rates that will mostly affect private-line usage.

At the same time, large-volume users of private lines are mounting an effort to have the FCC suspend the private-line rate restructuring proposed by AT&T Communications [CW, Jan. 28]. These users have argued that no cost support data has been filed and that the FCC's 18-day comment period was insufficient to analyze AT&T's filings.

"Judging from the pace in which the FCC is moving on special access, the AT&T private-line rates could be reality much sooner than we expect," said Brian Moir of the International Communications Association (ICA), a group that represents the largest communications users in the U.S.

Largest restructuring ever

Moir said the pending private-line rate changes "are the [largest] restructuring of private lines to have faced the FCC." Moir accused the FCC of having "no sensitivity at all" to users who are trying to assess the impact of the proposed changes. "It's almost an insult. ICA does not object just for the sake of objecting, but I doubt whether even the staff of the Common Carrier Bureau [of the FCC] has the slightest idea what the tariffs say," Moir said.

ICA and the Ad Hoc Telecommunications Association asked the FCC to suspend and investigate the AT&T private-line filings.

Blaszak and Moir each said that the FCC could be under pressure to link the implementation of the special access charges with approval of the proposed private-line rate revision, but they argued that this move was not justified.

Extremely ambiguous

Criticizing the private-line proposals, Ad Hoc told the FCC, "The proposed treatment of multipoint circuits is extremely ambiguous." It said AT&T proposed to assume full end-to-end responsibility for multipoint private-line access within the local exchange, but the tariffs do not say this explicitly.

"Without a commitment from AT&T Communications to assume end-to-end responsibility . . . users, as a practical matter, would be forced to subscribe to local [telephone company] channels, under AT&T Communications responsibility . . . however, only at a substantial penalty to multipoint service subscribers. The penalty would arise because of unreasonably rigid and circuitous routing of such circuits under proposed Tariff 11," Ad Hoc said.

The group said users should be given the option of ordering multipoint access service for private lines from the local telephone companies and be able to obtain end-to-end service responsibility from AT&T Communications without incurring separate installation fees for using the local exchange instead of AT&T Communications.

However, the major argument of large users is that AT&T Communications did not file cost support data justifying the proposed private-line changes, which it is required to do under existing FCC rules. In recent months, however, the FCC has given AT&T Communications permission to dispense with cost support data on experimental tariffs.

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Used vs. new: One town, two views on buying equipment

By Paul Korzeniowski
CW Staff

HARTFORD, Conn. — It is not Ted Tanzi's wardrobe that earned him the nickname "Secondhand Ted." Rather, the nickname came from the way the vice-president of MIS at Phoenix Mutual Life Insurance Co. here purchases computer equipment.

"I refuse to buy anthing new," he stated. "I do not want to be on the leading edge of technology. I try to keep our hardware and software a half to a full generation behind what is new on the market."

Depreciation is one reason why Tanzi waits.

"The price of a $2 million system today could drop to $1 million in two or three years," he said. "In addition to saving $1 million on the purchase price, Phoenix pays lower sales and property taxes. The company can take the money it saved, put it in a bank and receive the interest."

Another consideration is that new products often contain flaws. "When IBM first announced its [MVS/XA] architecture, it contained a number of problems," the MIS manager noted. "A corporation had to spend extra time and money to put the operating system into place."

> 99
>
> *'I do not want to be on the leading edge of technology.'*
>
> — Ted Tanzi
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There are shortcomings to Tanzi's strategy. "By buying older equipment, we take a chance," he said. "One has to judge how much the equipment is worth today, what will be available tomorrow and how much your equipment will be worth when you try to sell it. I've made mistakes — waited too long to purchase a package, held on to equipment until it was obsolete. Overall, [however,] Phoenix has benefited greatly by buying older equipment."

Another shortcoming is that some programmers like to work with state-of-the-art equipment. "We have to offer our employees other types of benefits," he said. "Hartford has a number of large insurance companies, and competition for data processing employees is fierce."

Tanzi has structured Phoenix's work schedule so that every other week an employee has a three-day weekend.

"Employees are required to work more than eight hours each day, but they seem to enjoy the three-day weekends — especially during the summer," Tanzi noted.

The MIS manager added that Phoenix may not use state-of-the-art equipment, but the equipment is not from the Stone Age, either. "We do not work with [MVS/XA] today," he claimed. "But we will move to it in time. Today, Phoenix does not need the extra channels that [MVS/XA] provides.

"As the company grows, it will require these benefits and will upgrade to it. Our employees realize that they will work with new equipment when the company needs it," according to Phoenix's Tanzi.

Across town at Cigna Corp., secondhand would be a misnomer for William Brown Jr., senior vice-president, who oversees Cigna's computer operations, which consist of more than a dozen mainframes.

Beta tests at Cigna

"We beta test a number of products and often are involved with a product before a vendor has completed its development and design," he said. "We feel it helps our competitive position if we work closely with a vendor."

The relationship provides Cigna with a clear view of what a vendor plans to manufacture. "When we are formulating our long-range plans, we have to know what products will be available to us," he maintained. "The relationship is synergistic: Our plans are tempered by a vendor's intentions, and, to an extent, we manage vendors by suggesting what hardware we need."

One benefit is that Cigna is able to attract qualified employees. "We can tell potential employees that we offer a state-of-the-art data processing shop," the senior vice-president said. "By working with the newest equipment, their career opportunities are enhanced."

However, there are disadvantages. Sometimes Cigna's plans depend on vaporware. "There could be a problem if the vendor does not meet its delivery date," he remarked. "We attempt to plan projects so they do not hinge on a product's availability date." When the product is delivered, it may not function properly. "When a product does not function properly, it creates competitive problems," Brown noted. "Rather than helping us do our job better than the competition, it may create problems for us."

The key to overcoming these shortcomings is good management. "A manager has to plan the project [carefully] and not depend on items that may not be delivered or function as he hoped," Brown maintained. "We always have a contingency plan available if we run into problems."

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RECOVERY

Police face allegations of accessing confidential files

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — In the wake of allegations that the San Francisco Police Department may have accessed confidential computer files maintained by the city public defender's office, city officials have launched investigations while calling for measures to prevent further abuse.

The controversy erupted earlier this month when police Lt. Thomas Suttmeier admitted that, for about two months, he had access to all the files on the city's criminal justice computer system, shared among several departments. Included among the departments on the system are the public defender, district attorney, sheriff, coroner and the Office of Civilian Complaints, which handles citizens' complaints against the police.

Suttmeier, who works in the Police Department's Office of Planning and Research, said he asked the city controller's office to design a menu that would give him easy access to the files on the shared Wang Laboratories, Inc. VS 100 minicomputer system. Suttmeier said he was given an access level usually granted only to system administrators so that he could conduct an internal investigation of computer use in the Police Department.

Suttmeier described the controversy as "much to-do about nothing" and maintained that he did not read or copy any files in the public defender's system or any other agency's computer.

But according to the public defender's office, which in the past has kept confidential information such as defense strategy notes and transcribed interviews on its system, the prosecution of up to 1,500 cases may now be in jeopardy.

'Irremediably tainted'

Peter Keane, chief assistant public defender, recently told the *San Francisco Chronicle* that the cases have been "irremediably tainted" by the incident, explaining that the defendants' right to independent counsel had been violated "because of police penetration of attorney-client confidence."

According to the public defender's office, other police officers could have gained access to the system by calling up the menu, which was listed as "Tom's menus."

> ***The prosecution of up to 1,500 cases may now be in jeopardy.***

Keane has already asked a San Francisco court to dismiss murder charges against one client, claiming that the security breach had violated his client's ability to receive a fair trial. But the city district attorney's office has countered by stating that no suspected criminal should be released unless the public defender's office can prove that the particular client's files were read by the police.

Keane said it will be impossible to prove whether the police used the program to peruse his office's files because a user could have read or printed documents without leaving any traceable evidence of access. As the system is now set up, there is no audit trail that would record activity on the computer; the system dates a file only when it has been modified.

Remove confidential files from shared system

Mayor Dianne Feinstein has asked the Electronic Information Processing Committee, an independent group of representatives from various city agencies, to review the case and make recommendations this week. As an interim measure, Feinstein advised city agencies to remove any confidential files from the shared computer system and store them on diskettes.

The San Francisco Police Commission, which oversees the Police Department, has also ordered investigations into the matter.

Carol Ruth Silver, who serves on the San Francisco Board of Supervisors, said it was "appalling" to find out that the Police Department and the public defender's office share the same computer system, given the adversarial nature of their work. Silver said the real solution to the problem would be to give the public defender's office a separate computer system.

Jerry Berman, director of the American Civil Liberties Union's technology and privacy project, agreed with public defender Keane's assessment that the incident might have violated the confidential nature of the attorney-client relationship. He noted that with the growth in the number of data bases that are linked together in computer networks, government agencies would have to place a higher premium on security in order to protect privacy rights.

COBOL

from page 1

mainframe at the data center here.

Hollcraft acknowledged that a line of either ADF II or Mark IV may not exactly equal a line of Cobol, but he noted that another GTE data processing shop found it spent anywhere from $25 to $35/line to program in Cobol.

Overall, Hollcraft said, the stock replenishment program is "really an affirmation of fourth-generation tools. [The program] was delivered on time, on the money, and it does what it's supposed to do."

Hollcraft said a big benefit of using fourth-generation tools in his shop's IBM IMS data base environment is that changes to an application can be made quickly. To illustrate, Hollcraft noted that when a major fault was found with the stock replenishment program — just a month before it was to go on-line — the fault was corrected by altering only 5% of the code.

That change reduced to four to five hours the run-time of a portion of the program that had been taking 13 hours to execute.

Others who have worked with both Cobol and fourth-generation tools for IMS development, though, were not as taken by the charms of ADF II and Mark IV as Hollcraft was.

Steve Phrenzinger, president of IMF Consulting, predicted that "companies that commit to ADF II and Mark IV are going to become quite frustrated with the learning curve" for programmers who would prefer to work in Cobol.

'Evolution not revolution'

"I say Cobol is going to be here for some time," said Phrenzinger, whose firm does consulting on IMS-based development. "What people are looking for is evolution, not revolution."

One of Hollcraft's programmers, Mike Palermo, said he originally "had a negative attitude toward" Mark IV because of his greater experience with Cobol. "As I got more familiar with Mark IV . . . I found you could produce reports [with it] much faster."

Hollcraft acknowledged that Sylvania Lighting's programmers probably were uneasy about the new development tools but said that a phased implementation of the two products proved crucial to their success. Although ADF II came on board along with IMS in 1978 and Mark IV came into use there in 1981, standardization did not come until the summer of 1983.

Hollcraft also counseled those thinking of adopting an application generator to "avoid the big project" as a means of implementation: "We didn't bring in any of these tools under the auspices of a big project [being undertaken] in a short time frame."

The standardization was greatly aided by the full support of management, Pearce noted.

The on-line order entry stock replenishment system at Sylvania Lighting was not a new one; it had existed five years but in a Cobol version that had received many patches. The final straw, Hollcraft explained, came when Sylvania Lighting decided to add two warehouses to its system and found the program would not accommodate them without requiring changes in its master file.

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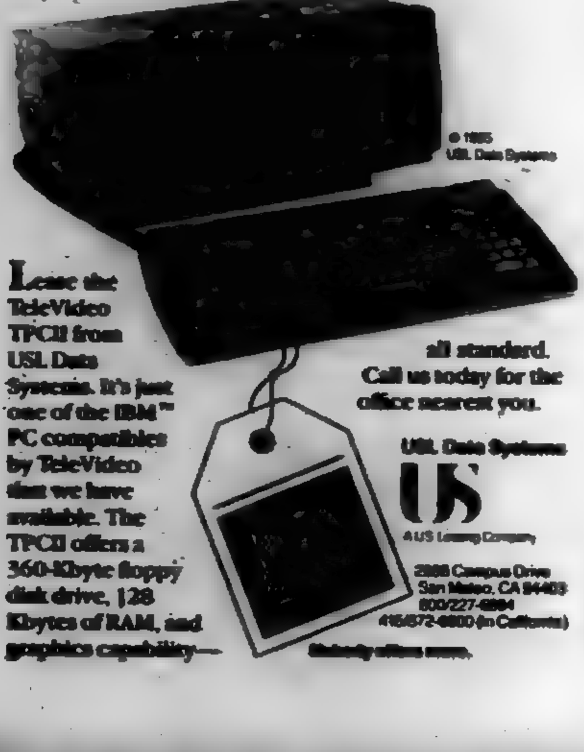

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from page 1

Computing Corp; General Electric Information Services Co.; Compuserve Corp.; and Budget Time Share, Inc.'s subsidiary Electronic Communications for the Home and Office (Echo), Western Union's and MCI's presence will encourage change as all players revamp to reach this broader user base.

The baseline electronic message delivery services offered by all the companies — including the data network carriers GTE Telenet Communications Corp., McDonnell-Douglas Automation Co., Tymnet, Inc. and ADP Network Services, Inc. — are similar in function. They support electronic mailboxes that users can access to read and leave messages.

Asynchronous devices usable

A multitude of asynchronous communications devices can be used with the services, including personal computers, terminals, some electronic typewriters and telex terminals.

All communications devices used with the electronic mail services must have a 300 to 1.2K bit/sec modem. Personal computer users also need the associated communications software, which many of the service providers sell for a nominal fee.

In practice, an electronic mail user can create a message on his personal computer, log into the service, specify the name of the person or mailbox the message is destined for and upload the file. The recipient, using a similar or different type of communicating device, is able to retrieve his messages electronically after logging into the electronic mail service.

Pricing method varies

Traditionally, time-sharing companies and value-added network carriers priced their electronic mail services like they did their other services — on a time basis that also takes into account the amount of computer resources used. Western Union's and MCI's pricing structures are transaction-based like those of regular mail. The most distinguishing feature of Western Union and MCI services, however, is their hard-copy delivery options. Whereas the traditional electronic mail services required the intended recipient to be a subscriber of the service used, Western Union and MCI enable messages to be transmitted electronically to a printing location near the recipient and then delivered within a few hours or overnight by a courier or through first-class mail.

While opting for hard-copy delivery negates half the beauty of electronic mail, it at least enables the sender to cut down on document creation time, provides for the second fastest type of delivery and vastly increases the number of users that can be reached.

Weigh against alternatives

Reducing electronic mail to hard copy for delivery makes it necessary to weigh these services against other delivery alternatives, such as use of facsimile machines. Facsimile is faster and cheaper than the hard-copy delivery options offered by electronic mail services, but there are several caveats — compatible facsimile machines must be used; the print quality cannot match that of the electronic mail services' laser printing; and with facsimile machines it is not possible, as it is with electronic mail, to broadcast a document to multiple locations during the same sending session.

In consideration of any electronic mail service, it is important for users to be able to control and monitor service use. Because of the nature of their business, computer time-sharing companies more often than not provide the best management controls for electronic mail.

'Implement controls'

According to Andrew Rev, vice-president of marketing for Echo, a firm located in Marina del Rey, Calif., "If you want to implement electronic mail successfully, you have to implement controls similar to those used to manage telephone systems."

Echo reportedly provides detailed billing information that includes the following: the average number of characters per message, profiles of message distribution, a message completion rate that compares the number of letters composed with the actual number of messages sent as well as details on what percentage of correspondence went to senior management.

Other control features offered by Echo include the ability to monitor the use of the Help key. By pinpointing when most users ask for help — for example during message creation, transmission or retrieval — managers can possibly effect some change that would facilitate service use.

Hard figures

In addition, Rev said that each Echo user is asked to specify how the message would have been relayed if Echo was not used. Tallying this data gives the communications manager hard figures to use in cost-justification calculations.

Beyond cost-justification calculations — which are hard enough, given the intangibles that must be studied, such as percentage of telephone tag eliminated and other productivity concerns — comparing services by cost is made difficult because of the different pricing structures used. Large volume electronic mail users, for example, may benefit by using a service that charges by the hour rather than by transaction.

Ultimately, the most efficient and cost-effective electronic mail will be that which is created, stored and retrieved electronically, regardless of the fact that available hard-copy delivery options are spurring growth in the use of electronic mail today.

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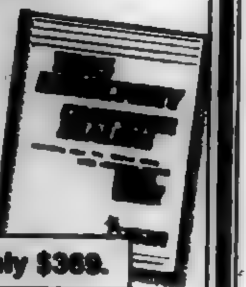

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Number of subscribers	150,000	128,000	12,000	45,000	80,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Minimum Monthly Usage Fee	None	None	None	$500/mo	Three service plans: 1. $100/mo; 2. $500/mo; 3. $2,500/mo
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Electronic Delivery Costs	MCI Instant Message $1/7,500 char. $.45/500 char. or less	$.30/min at 300 bit/sec; $.45/min at 1.2K bit/sec (see notes)	$10/hr at 300 bit/sec. and $12/hr at 1.2K bit/sec during peak hours. $5 and $9, respectively, for off-peak use.	$14/hr during peak hours and $.05/1,000 char.	Service: 1. $14/hr prime time; 2. $12/hr; 3. $10.50/hr; $6.50/hr for off-peak usage for all services. (see notes)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Message Alert Option	MCI Alert, phone verification of message delivery, $1 per message.	Test marketing use of paging devices	Not available	Not available	Not available
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Message forwarding to Autoanswer Device	Not available	Yes	Not available	Message Delivery to network address and off net telephone numbers.	Not available
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CW CHART

Despite risks, firms eager to enter E-mail market

By [illegible]
CW Staff

Although still a young market segment, electronic mail service has already experienced some upheaval.

When Western Union Corp. and MCI Communications Corp. entered the fray, the U.S. Postal Service (USPS) decided to exit, stage left. And now, AT&T is rumored to be readying a service for release later this quarter.

After sinking $56 million into its development and suffering continued losses — an estimated $16 million in 1984 — the USPS decided in June to divest its Electronic Computer-Originated Mail (E-Com) system.

By Dec. 14, Booz-Allen Acquisition Services, Inc., which had been retained to orchestrate the deal, had reportedly brought together several potential buyers. The USPS invited some of those buyers to participate in further proceedings during which they were to [illegible] financial records and equipment inventories prior to submitting a final bid. A USPS spokesman said that this process would be completed sometime this month.

While the USPS would not identify any potential buyers, companies that already provide electronic mail services may be among the bidders. The E-Com assets include 25 serving post offices with computers and printing facilities. The E-Com assets would complement those electronic mail services that do not offer delivery options.

As the USPS readies to sell off E-Com, AT&T is said to be about to unveil its own version of electronic mail. [illegible] that, sometime this quarter, AT&T will offer a service similar to Western Union's Easylink. One feature that may be unique to AT&T's service is [illegible] for use in order entry applications.

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Micro software site licensing gathering user support

CW AT INFO/CENTRAL

By [illegible]
CW Staff

CHICAGO — For corporate users of micro software packages, site licensing is an issue whose time has come, according to a random sampling of opinions from the floor of Info/Central: The Information Management Exposition & Conference, held here last week. Under site licensing, a user company signs a single license agreement with a vendor covering all use of a particular software package at that site.

"It's right around the corner, either this year or next," said Robert Owen of Barker-Coleman, a $250 million manufacturer of electronic instrument and energy management systems in Rockford, Ill.

The company uses about 100 micros throughout its 3,000-employee operation and licenses Lotus Development Corp.'s 1-2-3, Software Art's Inc. Visicalc, and Micropro International Corp. Wordstar products. Scattered use of the micros, however, prevents the company from pursuing any type of site licensing policies, Owen said.

Owen said he would support site licensing to eliminate possible lawsuits against the company from vendors charging software piracy, noting that, "You can't stop the copying" of micro software packages.

> *'It's a matter of letting the vendors know what you need.'*
>
> — John Schillak
> University of Wisconsin

But Owen voiced concern about the costs of site licensing, saying that too high a site license fee could make it cost prohibitive.

With a "couple of hundred" IBM Personal Computers and Compaq Computer Corp. Compaq micros in use at his company, James Burnett, manager of the information center and automation support at Babco & Wilcox Co. in Barberton, Ohio, said site licensing is being examined by his company's corporate MIS group.

Although his firm buys its micro packages at wholesale prices, Burnett said a site licensing policy would be the optimal purchase route for Babco & Wilcox, which uses Lotus' 1-2-3 and Lotus' Symphony spreadsheet packages. "If someone came up with a decent spreadsheet with a site license, we'd be interested," he said.

The site license is of particular interest to universities with large installed bases of microcomputers.

"From an [educational] point of view, [site licensing] has to become a reality," said Jim LaBarre, professor of MIS at the University of Wisconsin in Eau Claire. The university has approximately 155 micros in the MIS department, he said. "We can't afford to go out and buy 20 copies of [Ashton-Tate's] Dbase II — which we did this summer. They're forcing us to violate the copyright."

Decline in sales triggers layoff at Intel

By Kathleen Barton
CW West Coast Bureau

SANTA CLARA, Calif. — Intel Corp. said last week it will lay off about 4% of its work force, phase out two production facilities and shorten the workweek at two others because of deteriorating semiconductor sales and disappointing growth in systems sales.

Intel spokeswoman Rebecca Wallo said two-thirds of the 900 jobs being eliminated are in production, and the remainder are production managers and supervisors. Intel has no further layoffs scheduled, Wallo said, but "cannot rule them out."

Due to an accelerated decline in orders during the past few months, other chip manufacturers have taken steps to cut costs and reduce inventories. National Semiconductor Corp.'s Sunnyvale, Calif., plant was shut down for two weeks this month; Monolithic Memories, Inc. in Santa Clara stopped production for one week; and Dallas-based Texas Instruments, Inc. announced a reduction in force numbering 2,000 people last October.

Intel will dismiss 500 employees at its Hillsboro, Ore., systems and components division and 100 employees at its Phoenix manu-

See LAYOFF page 13

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Panel debates micro software trends, vendor strategies

CW AT INFO/CENTRAL

By John Gallant
CW Staff

ROSEMONT, Ill. — As a microcomputer user, what are the important software advances you can expect to see during the next five years?

That question provided fertile ground for debate among micro users, software vendors and industry analysts during the keynote panel session at Info/Central: The Information Management Exposition & Conference held here last week. Panel members sparred over whether the remainder of this decade will see strategic — formerly mainframe-based — applications moved to micros, if the emergence of so-called accessory packages for tasks such as scheduling and messaging is the wave of the future and whether microcomputer software suppliers need to adopt a new approach to user needs.

Chaired by Mort Rosenthal, president of Waltham, Mass.-based Corporate Software, Inc., the panel included Esther Dyson, president of Edventure Holdings, Inc., a New York venture capital firm; Jeffrey Ehrlich, manager of product applications technology at General Electric Co.; Michael Hammer, president of the Cambridge, Mass.-based office systems consulting firm Hammer & Co.; Jerry Cohen, president of Information Builders, Inc.; David Liddle, chairman and chief executive officer of Metaphor Computer Systems, Inc.; and Dan Bricklin, chairman of Software Arts, Inc.

'Other applications just hype'

Pressing the vendor representatives for insights into what users can expect in the future, Hammer asked, "What are the future directions for [micro] software in large organizations? Thus far, the only two real applications for the micro have been word processing and spreadsheets. All the other applications have just been hype. Since [Software Arts'] Visicalc, all we have seen are enhancements to spreadsheets. What is next?"

In response, Software Arts' Bricklin said a new class of micro applications is beginning to arise in the wake of hardware advances. "When new applications arise has to do with when the hardware will support them," he said.

"It is clear that electronic mail is an important application, as are the accessories — the little tools that you can just pop up and then put away such as appointment schedulers. The hardware capabilities, the required memory, are in place for the accessories and the communications-based products now."

Information Builders' Cohen vehemently disagreed with Bricklin's assessment of the future. "Little things like [electronic mail] miss the mark. Improved spreadsheets are still only a minor application. Those things just automate functions, they do not replace them. Office automation and spreadsheets have not changed corporate society."

Cohen said companies must seek out the strategic applications that can help them compete more effectively in the world marketplace. Consequently, software vendors should be looking to areas such as computer-aided design and factory floor automation. "Management has to concentrate on the areas that can make the company better than others in the field."

But Hammer cautioned that, at least for the near future, such strategic applications are unlikely to be micro based. He predicted that the next generation of decision support system (DSS) tools will be among the products users can expect. "We need a tool as usable for that [DSS] environment as Visicalc was for its environment," he said.

Ehrlich raised a sore point among micro users at GE. "People always come to me asking when they can expect to see an existing application that does what they want. When will we see quality in applications?"

That issue, said Metaphor Computer Systems' Liddle, will force software vendors to be more attentive to user needs. "Most software developers make very naive choices about the applications they bring to market. The software industry has not been a fount of strategy for changing the way information is used in organizations."

Afips names software systems director as 1985 NCC chairman

RESTON, Va. — The American Federation of Information Processing Societies (Afips) has announced that Per A. Holst has been appointed chairman of the National Computer Conference (NCC) Board for 1985.

According to Afips, the appointment was made by Afips President Stephen Yau.

Holst, who was elected vice-president of Afips at its annual meeting in July in Las Vegas, was appointed to serve a one-year term. Holst was formerly Afips director representing the Society for Computer Simulation starting in 1977 and has also served as a member of Afips' executive committee.

As chairman of the NCC Board, Holst said he pledges to continue the growth of NCC in both quality and scope to serve better the needs of industry and users in the field of information processing.

Holst added that he would seek additional ways to serve the technical and professional communities by offering more opportunities for conference interaction and dialogue. Also, he stated his aim to establish national and international conferences and expositions in appropriate fields and markets.

Currently, Holst is director of software systems at Kulicke & Soffa Industries, Inc. in Horsham, Pa.

LAYOFF

from page 12

facturing plant, Wallo said: Intel will phase out its Santa Cruz, Calif., components test facility during the next four months, eliminating 240 jobs, and 75 people at a parts assembly plant in Santa Clara will be relocated within the company.

Additionally, Wallo said, wafer fabrication plant employees in Santa Clara and Hillsboro will work four-day workweeks for the next four months.

No layoffs since 1974

There have been no layoffs at Intel since 1974, when the company dismissed 800 employees, Wallo said. Intel avoided layoffs during an industry slowdown in 1982 by cutting salaries, lengthening managerial workweeks and canceling merit pay raises, she said.

Intel considered such alternatives before the present layoffs and attempted to place the surplus employees in other company operations, Wallo said, but no area of Intel's business had grown rapidly enough to make this possible.

According to Dataquest, Inc., a market research firm in San Jose, Calif., an upturn in the semiconductor industry will not occur until 1986, with 20% to 25% growth predicted for that year.

Daniel Klesken, a semiconductor stock analyst for San Francisco-based Montgomery Securities, said that slow sales of Intel's System 310 microcomputer, a result of the strong sales of the IBM Personal Computer AT, has contributed to the company's sales slump. "It's the AT shock wave," Klesken said.

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Charters map out course of companys' MIS missions

By Jeffry Beeler
CW West Coast Bureau

Eager for new career challenges, a dissatisfied programmer recently quit his longtime job and went to work for another company. The unexpected departure created a vacancy that the former employer wasted no time trying to fill.

A nearby employment agency, sensing a possible opportunity, quickly located an ideal candidate for the position and notified the prospective client firm. At first, the company's reaction to the overture was enthusiastic.

The initial elation, however, promptly gave way to disappointment when the client learned the candidate's identity. Unknown to the headhunter, the prospect whose qualifications it was touting so highly was the same programmer who had left the employer only a few weeks earlier.

Such miscues are by no means unusual, according to Leilani Allen, assistant general manager for the Sunnyvale, Calif.-based Institute for Information Management (IIM). In large corporations throughout the U.S., computing professionals routinely change jobs to pursue professional opportunities that their former employers were secretly planning to make available only a few months down the road.

In Allen's view, unnecessary turnover in the MIS ranks often stems from a simple failure of communication. With disturbing frequency, information systems directors keep their future intentions a secret from their own staff and, thus, lose valued employees they might otherwise retain, Allen said.

But awareness of the communication breakdowns and their often harmful side effects appear to be growing rapidly — a development that accounts in part for today's pervasive interest in information charters. In essence, an information charter is a formal document that defines a systems organization's reasons for existence and makes the reasons explicit for a corporation's key departments and divisions.

"Some of the Fortune 500 corporations that are well-known for their strategic planning have had information charters in place for as long as five or 10 years," Allen said. "For them, the subject is pretty ho-hum."

But for a host of other companies, information charters are still regarded as something of a novelty.

"DP operations tend to assume that everyone else already knows what they do, but very often, that assumption just isn't the case," Allen said. "So the whole point of doing an information charter is to formalize a decision-making process that, in many cases, is implicit."

For Allen, an information charter's chief value is as a communications device. "People down at the bottom of information systems departments constantly tell us that they get no direction from management and that they don't know what their strategies and critical success factors are," she said. "They often have the impression that management has no concept of where the department is moving."

The problem here is not that systems executives neglect to plan but that they often withhold their plans from the subordinates who ultimately have to implement them, Allen said. But by circulating an information charter among the MIS rank and file, computing department directors can forge a common understanding of what their organizations are trying to accomplish and what they consider their top priorities.

Communicating key to strategy

Information charters can prove useful to MIS executives by helping them communicate to senior management and to their own staff members.

Unless a company's key strategists are kept constantly abreast of their systems directors' intentions, the firm's information processing strategies run the risk of "getting out of sync" with its overall business plan, according to William Paul, a speaker at a recent Institute for Information Management conference in Carmel, Calif.

Paul, the information systems vice-president for Atchison, Topeka & Santa Fe Railway Co., said, "If a charter isn't written down somewhere, everyone will have goals in his head, but they may not necessarily be the same."

Similar sentiments were expressed by Donald Hillery, information processing director for Dublin, Calif.-based Lucky Stores, Inc., which began developing an information charter in 1982.

Not everyone, however, finds information charters appealing. "Charters have to be done [illegible], especially if a company is just beginning to recognize information systems as a major resource," according to Joseph Graziani of Southern Pacific Transportation Co.

Managers have final say in micro purchase, survey says

By [illegible]
CW Staff

NEW YORK — Top management continues to wield final control over a company's personal computer acquisitions, while MIS departments supply company-approved brands and models to approved users, a recent survey found.

The survey, titled "Managing the Purchase and Use of Personal Computers in Business," was conducted for *Fortune* magazine by Oxtoby-Smith, Inc. of New York and was distributed to the three following categories of Fortune subscribers: top management, departmental management and engineering and scientific management and staff.

Survey results indicate that MIS departments do less evaluation and more distribution of personal computers within their organizations. According to *Fortune*, 28% of the survey's MIS respondents said they provide management with guidelines or lists of acceptable brands and models of micros, and 20% said they provide information on micros but leave the final choice up to the user. Forty percent of the MIS respondents said they supply company-approved brands and models to approved users.

According to the *Fortune* survey, 65% of the top management respondents in medium and large companies and 93% of the top management in small companies said they had some involvement with micro acquisitions.

Micro acquisition policies

Although business now accounts for more than four-fifths of all personal computers in use, only about one-third of the respondents had formal policies in place governing micro acquisition, the survey said. Nearly all respondents, however, said their companies have some form of guidelines or restrictions on micro acquisitions. Frequently noted guidelines include cost justification, compatibility with other computers, acceptable brands and the ability of the computer to use specific programs, according to the survey.

Variety of available software was the most important criterion for managers selecting a micro, followed by computer reliability, the *Fortune* survey said. DP departments, however, said the reputation of the manufacturer was most important and put more significance on a system's compatibility with other computers.

According to the survey, more than half of the respondents purchased their personal computers from retail stores, whereas three in 10 said they acquired their micros directly from the manufacturer.

Percentage of use of micros was highest among MIS managers. Fifty-six percent said they used micros at work, compared to 37% of top management in medium to large corporations. MIS managers are also more likely to take the micros home, the *Fortune* survey said. Forty-two percent of the MIS respondents said they take the computer out of the office, compared with 30% of top management in large corporations.

More than half the respondents (56%) said they used an IBM Personal Computer, and 16% said they used Apple Computer, Inc. micros. In DP departments, however, 64% used IBM micros, 1% used Apple computers, 5% used Compaq Computer Corp. machines and 4% used Hewlett-Packard Co. micros. The remainder were scattered among other brands.

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OMB: Improve DP investments, cut software costs

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The Reagan administration last week issued management directives that will require federal agencies to obtain a minimum 10% return on investment for all computer technology and to cut software maintenance costs by 25%.

The U.S. Office of Management and Budget's (OMB) "Management for Fiscal Year 1986" report said the moves are needed to "recapture the government's position as a leader in the efficient and productive use of information technology." To accomplish this, the OMB established the following three management principles:

- Agencies will be required to document at least a 10% return on their information technology investments. "Investments in information technology must be treated in a businesslike manner, and the gains from automated projects should be monitored and realized," the OMB report said.
- Agencies will be required to implement standards that foster open systems of communication and permit the exchange of information among systems. The OMB said it will undertake a project to determine whether to adopt interconnection standards from the International Standards Organization.
- Greater reliance will be placed on the acquisition of commercially available software to reduce the government's dependence upon locally developed, customized software. Software costs today amount to 60% of federal computer expenditures, compared with 20% in 1965, the OMB said.

On the subject of software management, the OMB said that because the federal government continues to custom-develop 90% of its software, the transition to modern, efficient hardware is inhibited by large volumes of custom code that require conversion.

"The private sector also is investing more in off-the-shelf software packages than in custom-developing new software. Such packages have the advantages of being maintained by the vendor and do not require substantial in-house technical staff," the OMB report said.

The OMB said agencies will be asked to reduce their software maintenance costs by 25% and their software staffs by 5,000 full-time positions over the next three years.

Consistent with this initiative, the Internal Revenue Service and the Federal Aviation Administration will be converting systems to high-level languages to increase portability, and the Veterans Administration is studying the feasibility of converting its "antiquated" insurance software to a modified commercial package, the OMB said.

WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

Computer crime bill unveiled for federally insured banks

WASHINGTON, D.C. — U.S. Sen. Paul S. Trible Jr. (R-Va.) introduced the Computer Systems Protection Act of 1985 (S. 440), a bill that would assert federal jurisdiction over computer crimes affecting federally insured banks and businesses in interstate commerce. The bill would make it a felony to use a computer to commit a theft or to damage or destroy information stored in a computer. In addition, the bill would make it a misdemeanor to access intentionally a computer without authorization.

Trible's bill establishes federal jurisdiction over computers used by entities engaged in interstate or foreign commerce, and by certain financial institutions.

The proposed maximum penalty for the felony is five years in prison and a $50,000 fine; the maximum penalty for the misdemeanor is one year in prison and a $5,000 fine.

GSA micro network raises productivity, reduces costs

WASHINGTON, D.C. — A local network of microcomputers at a U.S. General Services Administration (GSA) regional office has increased employee productivity and decreased the cost per unit of work, according to a study by the U.S. Office of Personnel Management.

Work studies before and after installation of the Merlin experimental network demonstrated the effect of office automation on productivity at the GSA's San Francisco office, according to Edwin W. Thomas Jr., GSA regional administrator.

The Merlin system now includes 84 IBM Personal Computers connected by a local-area net from Nestar Systems, Inc. of Palo Alto, Calif. An electronic library provides such software as word processing, graphics, electronic mail, data management, project management and calendars.

The study did not quantify the overall results but calculated the improvements for specific tasks.

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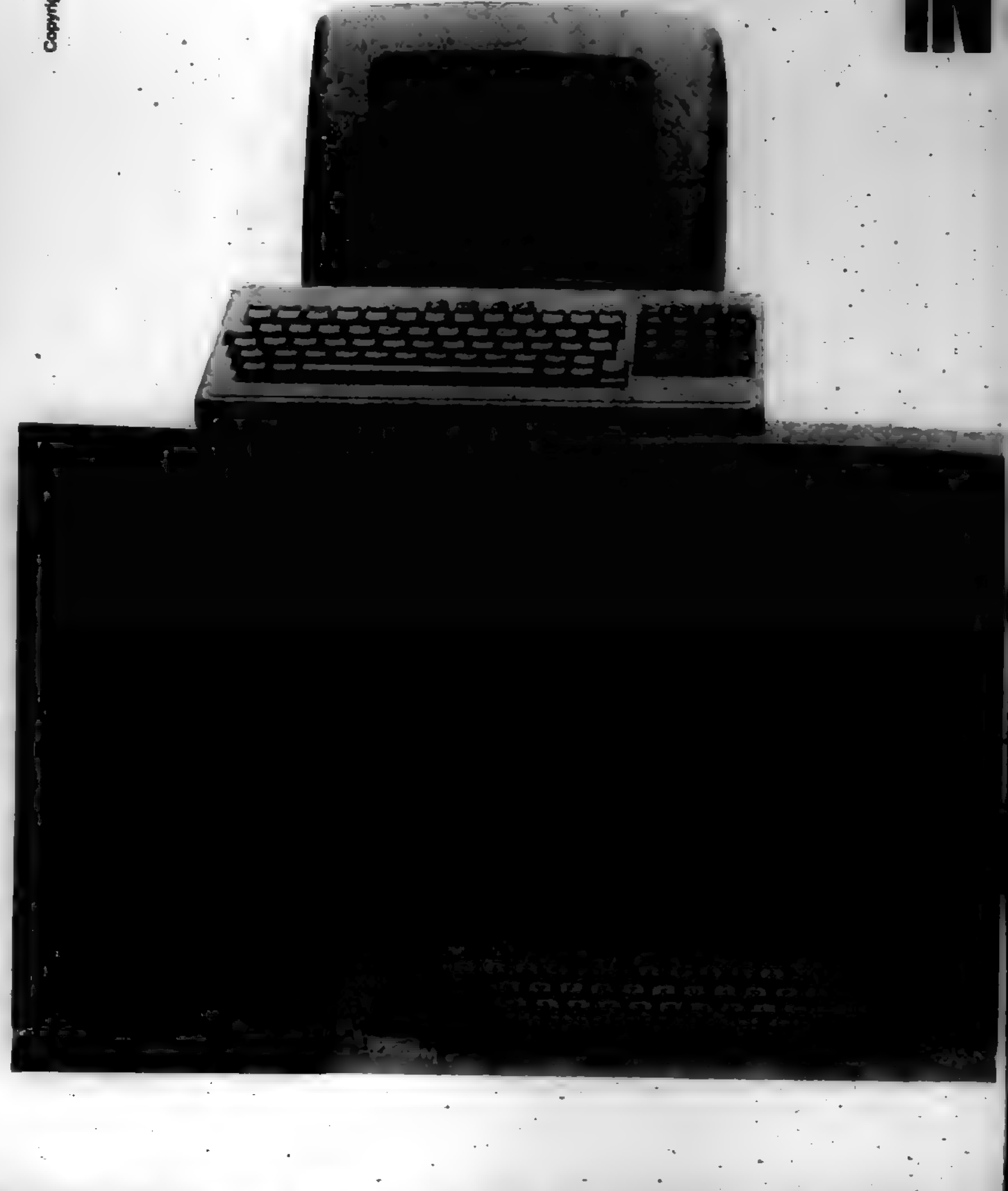

Stockman halts plan to replace federal telecom service

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — David A. Stockman, director of the U.S. Office of Management and Budget (OMB), has put the brakes on the federal government's plan to replace its 22-year-old Federal Telecommunications Service (FTS) — the largest private-line network in the world — with a state-of-the-art system capable of voice, data and video traffic.

Shortly after the U.S. General Services Administration (GSA) opened the bidding process for the FTS replacement system earlier this month, Stockman abruptly halted the procurement process pending a White House review of the budget, policy and technical ramifications of the $4.2 billion replacement program.

In a Feb. 15 letter to Ray Kline, acting GSA administrator, Stockman ordered, "You are to take no further action toward the award of a contract pending the completion of a broader executive branch review."

Vendors already briefed

Only two days before, GSA officials had briefed scores of telecommunications vendors, saying the GSA planned to award a 10-year contract in fiscal-year 1987 that could produce revenues exceeding $4 billion over the life of the contract.

Stockman wrote that it would be "premature to begin a procurement of this magnitude, which could define the structure of federal telecommunications for the next 20 years, without a thorough policy and budgetary review by OMB, the user agencies and the [U.S.] Department of Justice."

Furthermore, Stockman questioned "what the technological and economic assumptions underlying the strategy are, whether a central service should carry data as well as voice traffic, what current or proposed standards would apply and whether and under what circumstances agencies would be required to use such services."

At the public briefing, GSA officials announced that they are seeking a single prime contractor to provide one-stop communications services and total management of the intercity system and a substantial price discount.

The contractor will design and organize the system, provide the services defined by the GSA and then bill the GSA on a usage basis, the officials said.

The FTS now serves 1.3 million users nationwide, organised around 1,655 local private branch exchanges and Centrex systems.

It carries 1.5 billion minutes of traffic annually and consists of 52 major switching centers, about 15,000 long-distance trunks, 36,000 access lines and 10,000 miscellaneous circuits.

Expenditures for intercity FTS service are expected to reach $450 million this year, GSA officials said. Though the FTS today is mostly an analog switching system, it is carrying an increasing volume of data traffic — about 15% of current traffic — and sometime in the 1990s, the data traffic is projected to exceed analog messages, GSA officials reported.

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> *It would be 'premature to begin a procurement of this magnitude . . . without a thorough policy and budgetary review.'*
>
> — **David A. Stockman**
> **U.S. OMB director**

Bernard J. Bennington, deputy assistant GSA administrator for central information services, said he hopes the FTS procurement will set an example for other big telecommunications users by focusing on buying services rather than hardware.

The prime contractor will provide all management, administration, engineering, billing, upgrades and control of the system, GSA officials said.

"Since GSA is not buying hardware or architecture, it does not expect to be involved in circuit rearrangements, traffic analysis, trouble location and diagnosis or restoration of faulty service — all of this will be the responsibility of the single system manager," a GSA briefing paper said.

The new FTS 2000 system contractor must provide continuous technical upgrades, ensure connectability and reliability, provide for a rapid transition from the existing system to the new one and ensure that government communications can be sustained during emergencies and for national security, officials stressed.

GSA said it will define the terms of the service, including minutes of usage, bandwidth, bit rates, error rates and trouble rates, and seek such features as controlled service areas, electronic mail, voice mail, encryption and perhaps broadcasting or mass calling.

Also, the contractor must provide a "service oversight center" where GSA officials can monitor the quantity and quality of the network services, officials said.

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DP director charged with copying system

Allegedly reproduced, sold hospital's customized IBM software

By Charles Babcock
CW New York Bureau

NEW YORK — A Long Island man has pleaded innocent to a charge of copying a hospital's version of a $300,000 IBM Patient Care System and selling parts of it to another hospital.

The accused man, Frank Russo, 40, served as director of systems analysis at University Hospital in Stony Brook, N.Y., between 1977 and 1983.

Russo was indicted recently by a Suffolk County grand jury for allegedly making illegal use of secret scientific material. He allegedly copied features of the patient care and hospital services system at University Hospital and sold them to Albert Einstein Medical Center in Philadelphia, according to spokesmen for New York state Deputy Attorney General for Medicaid Fraud Control Edward J. Kuriansky.

The IBM package was purchased by University Hospital in 1979, and Russo was commissioned to install, maintain and develop it, according to J. Howard Oaks, vice-president for health sciences at University Hospital.

"It was a highly automated system, the most sophisticated system we could find," said Oaks, who noted that the decision to buy it was made before Russo was hired.

Russo occupied a senior management position and was quite visible in talking about the system and how it should be developed, noted Oaks, who was called to testify before the grand jury.

Russo also was president of Stony Brook Systems in nearby Hauppauge, N.Y., now a division of Travenol Laboratories, Inc., a hospital supply firm in Deerfield, Ill. Stony Brook Systems was also named in the indictment.

The indictment stated that Russo "used his position as director of University systems analysis at Stony Brook University Hospital to make an electronic reproduction of certain secret scientific material, namely the hospital computer program worth over $300,000, without the knowledge of the hospital, and sold features of it."

The indictment did not state in what form the copy was made, but a spokesman for Albert Einstein Medical Center said that he believed it was delivered on tape.

Oaks noted that the five-year-old University Hospital, part of the State University of New York at Stony Brook, was considered an innovator in hospital computer services, and Russo showed "a steady stream of visitors" around the site.

The original software, IBM's Patient Care System, was not an applications package but a framework with its own very high-level development language, and the hospital developed its own system with it and continuously upgraded it, said Paul R. Vegoda, deputy director for information services at University Hospital. "It was a leading-edge system," he said.

> ”
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> *'[Russo made] an electronic reproduction of certain secret scientific material . . . worth over $300,000.'*
>
> **— Suffolk County grand jury indictment**

The Patient Care System ran on an IBM 3031 when it was purchased and was recently transported to the hospital's new 3083, he said.

The section of the state criminal code used to obtain the indictment, "Theft, Other Offences," was intended to fill the gap left by prohibitions against stealing tangible property vs. photographing or otherwise reproducing proprietary material and making use of it, according to the state deputy attorney general's staff.

The section of the code has not been used very much, noted Sonya M. Hoover, spokeswoman for the deputy attorney general's office who said the special prosecutor's staff had difficulty finding citations of any previous cases involving software.

Hoover said the indictment did not list how much Albert Einstein Medical Center had paid for the software.

The offence for which Russo was indicted is a felony punishable by four years in prison in his case or a $10,000 fine in the case of Stony Brook Systèms.

Russo was released on his own recognizance after pleading innocent to the charges. A trial date was set for April 23.

Piracy suits on the upswing

A spokesman for IBM said the number of lawsuits relating to copying software is on the increase. Copying microcomputer software is one part of the phenomenon, but those who make a few dollars selling pirated micro software sometimes realize that mainframe software is thousands of times more valuable, said IBM spokesman J. Lyle McGuire at the firm's Armonk, N.Y., headquarters.

The frequency of lawsuits may be increasing because the incidents of copying are on the upswing or because detection has improved, McGuire said. It is usually difficult for someone to copy mainframe software, except for one or two of the highest ranking persons in the MIS department, he added.

Richard A. Haskell, director of academic computer services at neighboring Long Island University, where computer security is an academic subject, said that it is difficult for an organization to protect itself from software duplication by highly placed MIS personnel.

No problem at all

"It would have been very simple for someone in Russo's position to make a copy. No problem at all," Haskell said.

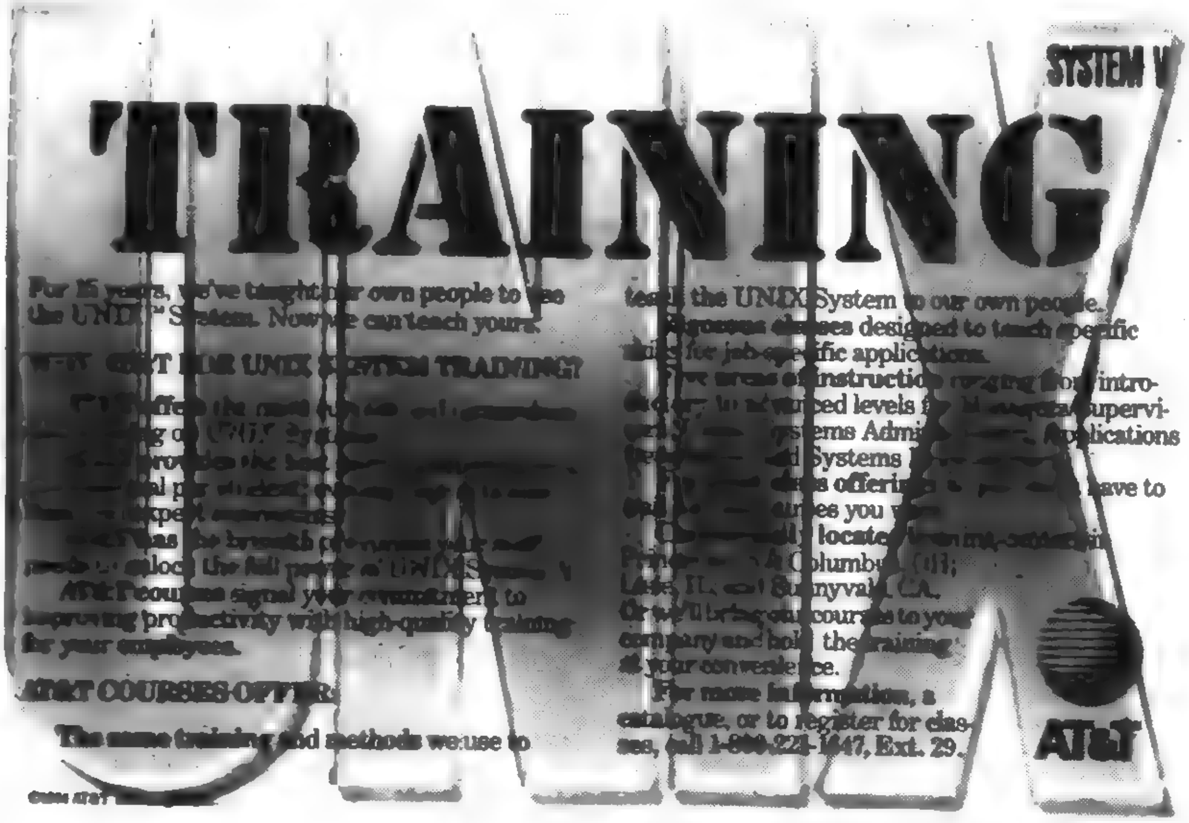
Frank Russo served as the director of systems analysis at University Hospital in Stony Brook, N.Y., from 1977 to 1983 and was indicted recently by a Suffolk County grand jury for allegedly copying features of a patient care and hospital services system at University Hospital and selling them to Albert Einstein Medical Center in Philadelphia.

"You have to trust people in those positions. How do you guard against the guy who has the key to the bank vault?" Haskell said.

IBM's McGuire said his company recommends creating a strong audit trail that will detect when software copying devices have been used, recording which terminal or console issued the commands and under whose password.

"Knowing you'll be caught if you copy something is the best preventative measure," he said.

In a properly managed shop, he added, the people who write software don't maintain it, those who maintain it don't copy it, and those who copy it don't write it, leading to a need to enlist three people and three passwords before a duplicate of mainframe software could be made.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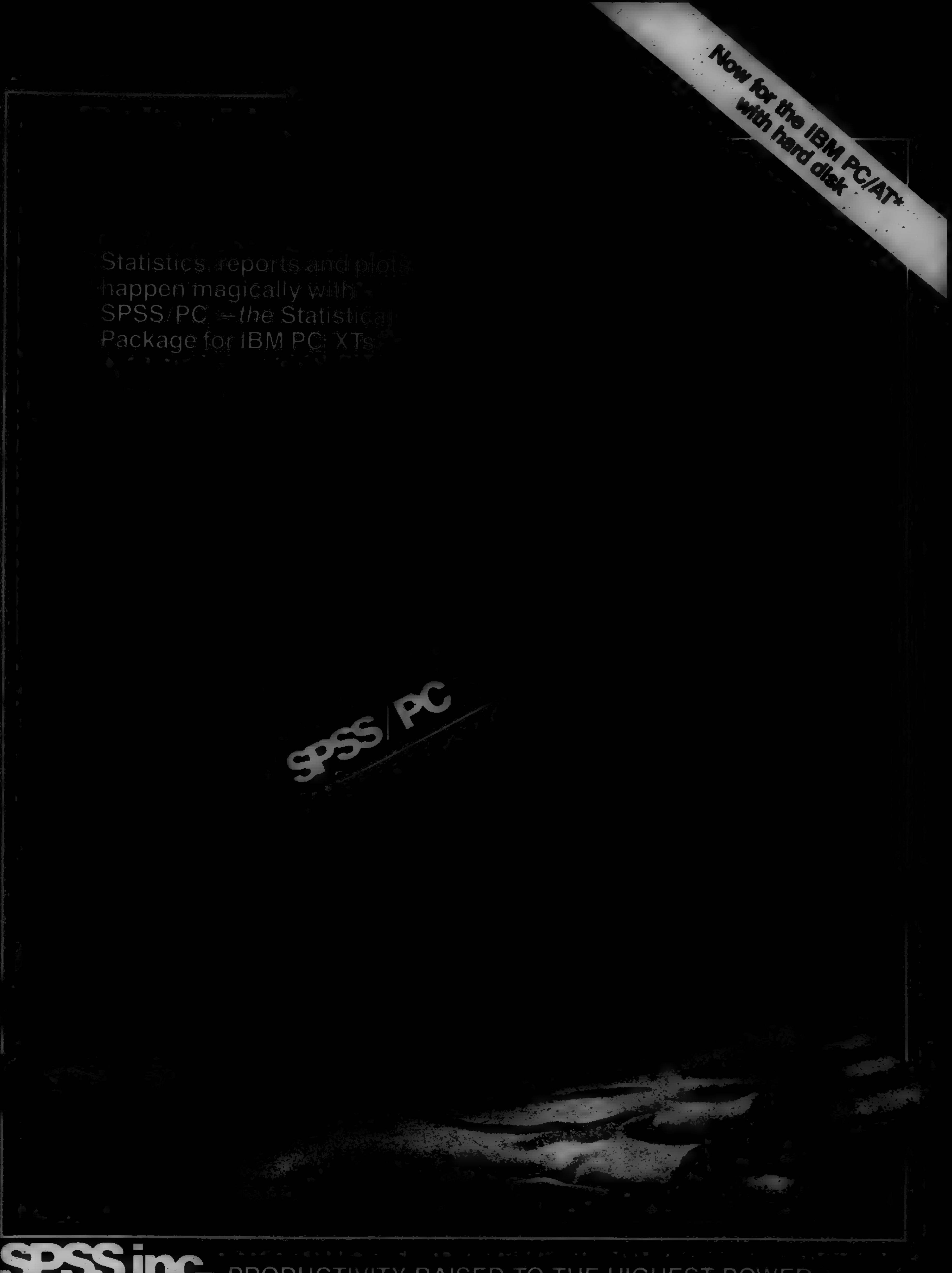
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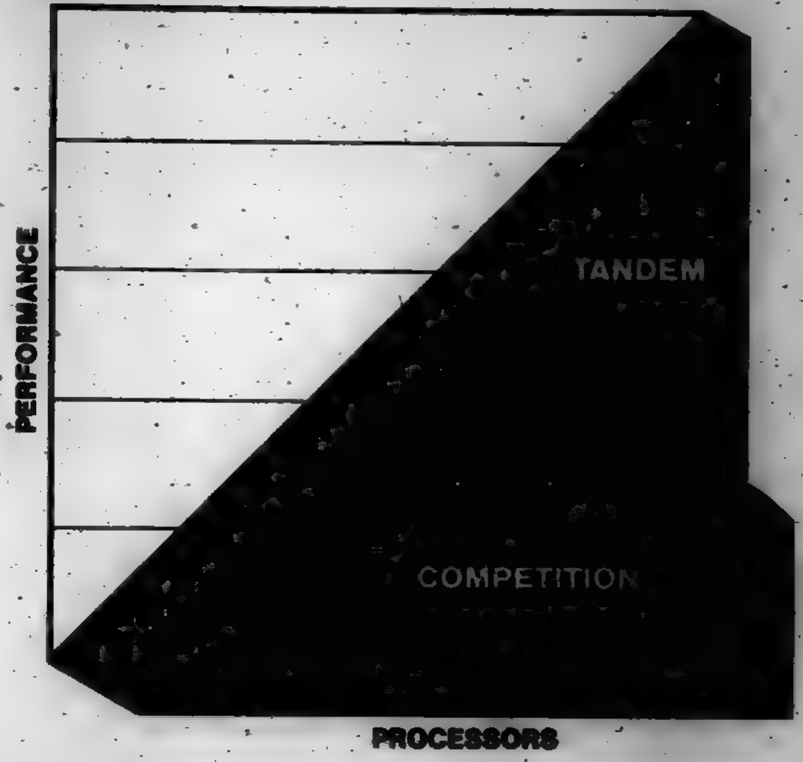

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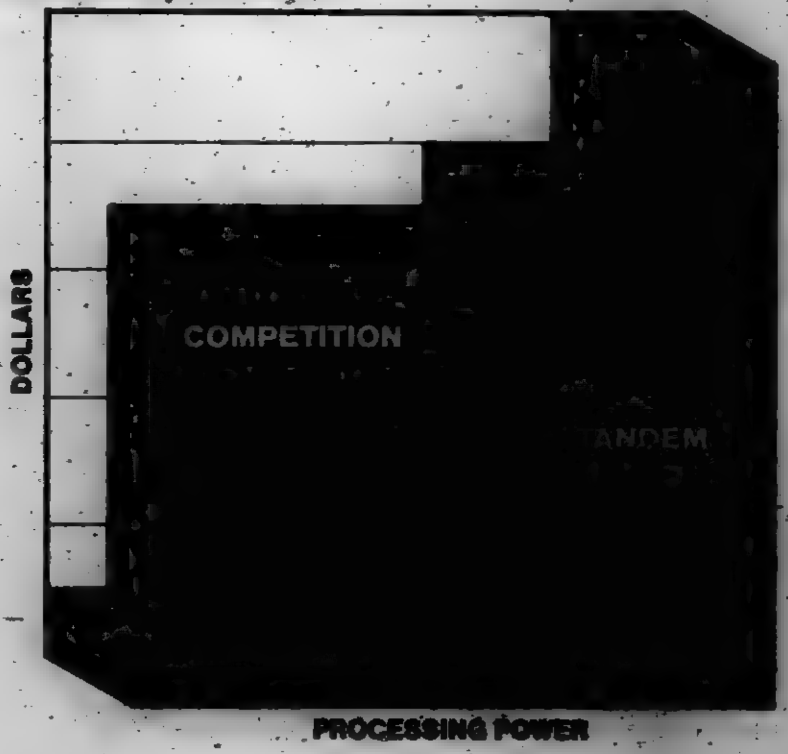

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TANDEMCOMPUTERS

Wary of DEC upgrading, AMS may seek other vendor

By Donna Raimondi
CW Staff

PROVIDENCE, R.I. — The American Mathematical Society (AMS) here loves its Digital Equipment Corp. Decsystem-20 computer system, owns more than $200,000 worth of DEC peripheral equipment and is happy with DEC's service and merchandise. Yet the AMS is considering a move to another vendor.

The society is in the process of examining a number of computer systems to replace its outdated installation, said Samuel B. Whidden, director of computer services. If the AMS goes to DEC equipment and the VMS operating system, "How heavily should we rely on [DEC] to be concerned with the ease with which [we] will be able to move from its VMS operating system to whatever follows it?" he asked.

CW photo by D. Raimondi
Whidden

Whidden said he is concerned that when DEC decides to implement a different technology in the future — such as reduced instruction set machines, data base machines or some combination — DEC's new systems will not be upwardly compatible. "It isn't terribly reassuring to look at what they've done to the 36-bit customer base," he added.

Whidden and Barbara Veznaian, manager of programming and systems analysis at the AMS, were taken by surprise in the spring of 1983 when DEC killed the Jupiter project, its upgrade path for Decsystem-10 and -20 users, Whidden said. Whidden had attended a nondisclosure meeting with DEC where timetables for the Jupiter were discussed.

Whidden said the AMS' first Decsystem-2020 was purchased in 1978 and was used exclusively for business applications and scientific (mostly mathematical) typesetting. One year later, a Decsystem-2060 replaced the first machine, and in February 1983, a second Decsystem-2060 was added to help ease what had become an eight-year backlog, he said.

At the time of the second computer's purchase, the AMS started a data base project and planned to upgrade to the Jupiter system when the data base was ready to use, Veznaian said.

Based on what he knew about DEC and its 36-bit machines, Whidden had concluded that DEC would not abandon the Jupiter project, even though he heard rumors that such a cancellation was possible, he said. DEC widely used the 36-bit machines itself, he said. DEC had a large installed customer base, and company representatives had strongly said they would not abandon the project.

The Decsystem-20 is also excellent as far as hardware and software, Whidden said. "We've had [a DEC Tops 20 operating system] here since 1978, and we are delighted with it," he said. Its user friendliness was in large part responsible for the quick acceptance of interactive use at the AMS, he said.

DEC must be working on other machines, as the VAX has been out for 10 years, Whidden said. The company's small-end computers — DEC Decmates, Rainbows and [Professionals] — do not form a consistent line, he added. Given that the line is not totally integrated and DEC changed its mind about the Decsystem-20s after promising additional upgrades, Whidden said he is not ready to trust them to continue with an integrated line.

If the AMS stays with DEC equipment, it will save a lot of money on peripherals, Veznaian said. The society owns nine RP06 and three RP07 storage devices, which is an inducement for it to stay with DEC, although DEC does not have an edge over other systems the search committee is looking at, she said.

The AMS sent requests for proposals to eight vendors and has narrowed the choices to DEC, Data General Corp. and IBM, Whidden said.

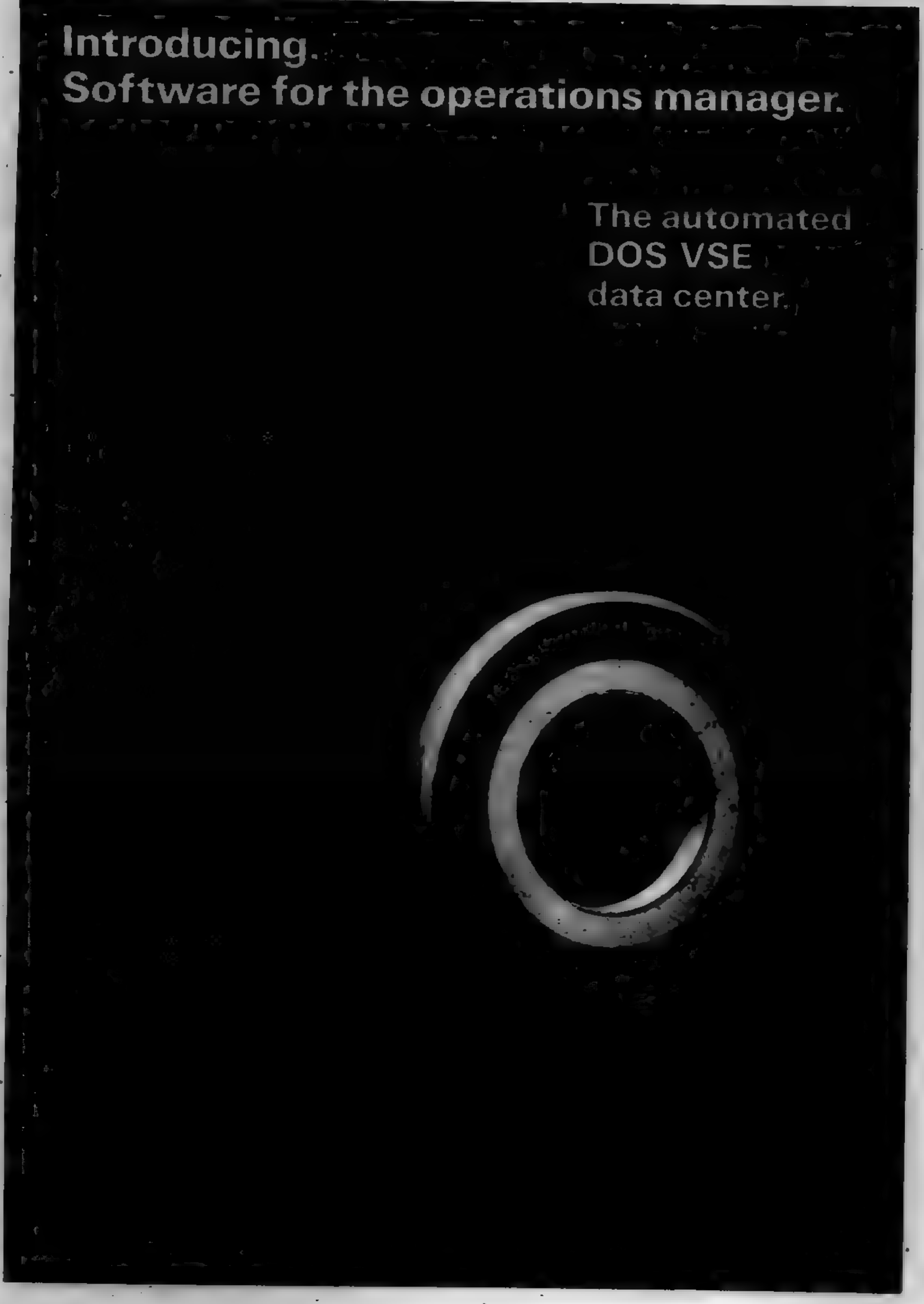
Buying in at top of the line

With DEC, as with most of the other vendors approached, the AMS would be buying in at the top of the company's line, a position it does not relish, Whidden said. "We're hoping [the vendors] will engage in consistent development," he said. One advantage that IBM has over the other vendors being considered is that the society would be buying into the middle of its line, he added.

Whatever the outcome of the computer system search, the AMS hopes to keep its Decsystem-20s for a long time, Whidden said. The society's operations manager, George Ogilvie, has customized the system by loosely coupling the two machines with a shared disk drive, which is clumsy and slow but adequate, he said.

DEC's promised 10-year support seems fair to Whidden and Veznaian, in light of its discontinuation of the line, Whidden said.

Ogilvie has managed to get DEC to sign a six-year service contract recently, and the AMS is gearing up to convert systems before the end of the year.



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False arrests require police to monitor systems closely

By Donna Raimondi
CW Staff

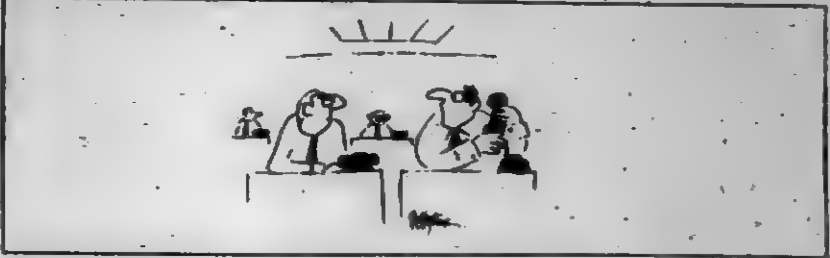
NEW ORLEANS — The city of New Orleans' Police Department and adjacent Jefferson Parish's Sheriff's Office have agreed to monitor their computer systems carefully in an attempt to stop wrongful arrests.

The agreement is part of a consent decree in response to a class action suit filed by the American Civil Liberties Union (ACLU) early in 1983 [CW, March 21], which charged the agencies with false arrests due to computer programming errors, said Martha Kegel, executive director of the ACLU of Louisiana.

The decree will require New Orleans police and the Jefferson Parish Sheriff's Office to improve the accuracy of information on the computers and comply with state and federal privacy laws, said Bob Finklestein, city attorney for the New Orleans police department. The police departments and other criminal justice agencies that use the system will continue to update the system and provide training and education for all users, he said.

Federal magistrate Ronald Fonseca will retain jurisdiction over the case until both the ACLU and the police departments consider the problems solved, Kegel said.

Early in 1983, Shirley Jones brought the suit against the police departments after she had been wrongfully arrested by the Jefferson Parish Sheriff's Office, Kegel said. Jones' name happened to match an alias used by a wanted woman, she added. Although none of the other data matched, the officer arrested Jones, she said, partly because he did not trust the computer file to be accurate. Jones could not be reached for comment.



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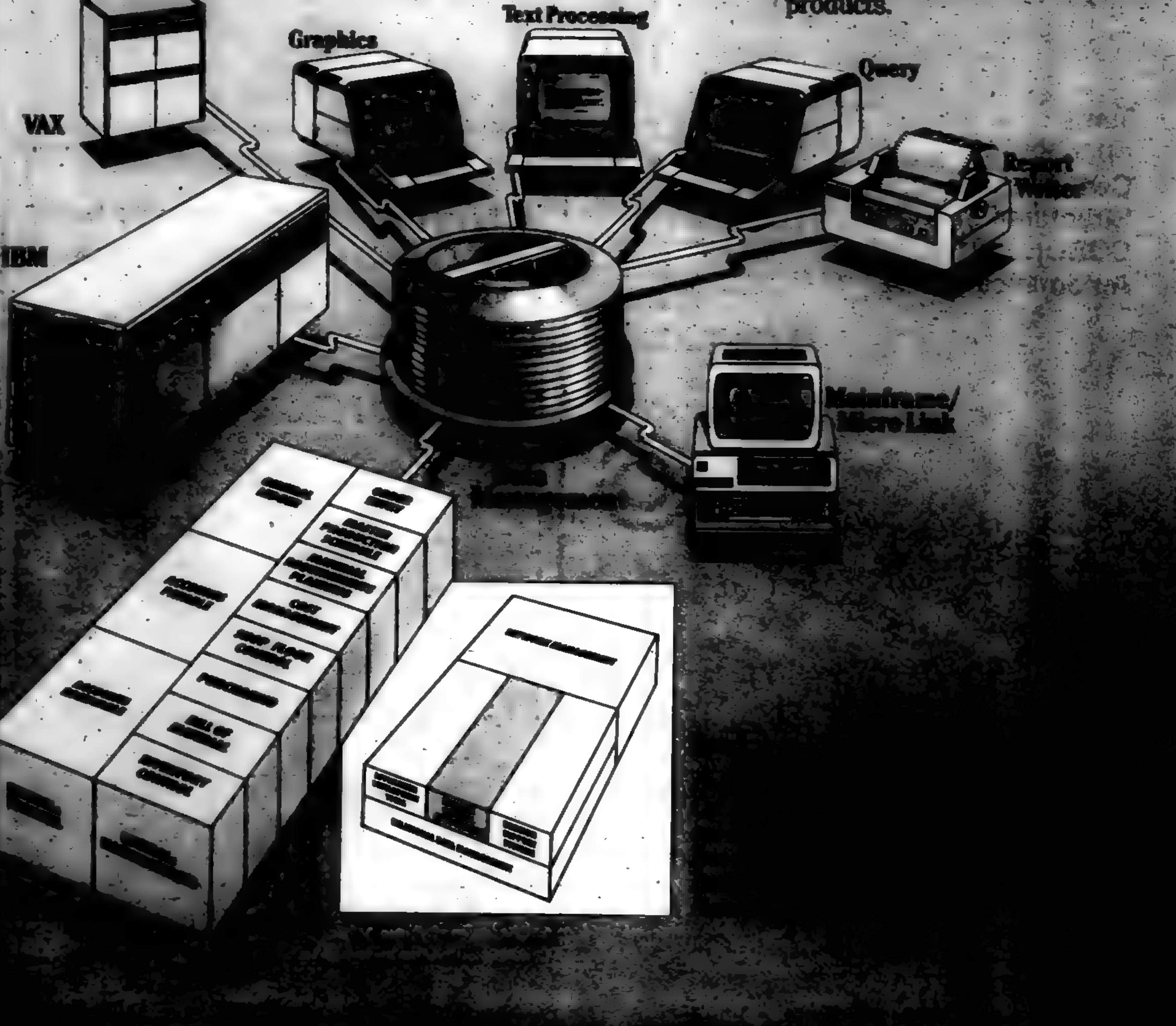

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Computers fill openings for DP personnel recruiters

By Maura McEnaney
CW Staff

The new fiscal year is under way, users group budgets and strategic plans have been laid out for weeks, and your Ada programming specialist just announced he has found greener pastures at a nearby competitor. Although there is a file of resumes in your office, you cannot quite find the time to read through them. Advertising is always possible, but that can take weeks.

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Like any other company in the market for a DP professional, Advanced Systems Applications, Inc., employs traditional recruitment tactics including bold advertisements and aggressive headhunters.

Last June, however, the firm, which provides software packages and processing services to the group health insurance industry, began employing yet another tactic.

Advanced Systems purchased access to a computerized data base of professionals seeking jobs in DP, engineering, finance and accounting, marketing and human resources. "We use it in addition to the current bag of tricks available," said Trudy Norman, Advanced Systems' manager of human resources.

The data base Advanced Systems uses was developed by Computer Assisted Recruitment International, Inc. (Cari), of Schaumburg, Ill., one of several computer-based recruiting services that have emerged over the past several years.

Using a personal computer, Advanced Systems personnel access the data base, which is housed and maintained locally at Cari and accessed through General Electric Information Services Co.'s Mark III network. Through Cari, Advanced Systems identified 25 potential candidates and interviewed about 10, Norman said. None of those candidates was hired, however, because Advanced Systems did not make offers fast enough, Norman said.

High hopes

Nevertheless, she said, she has high hopes for the computerized service and said that if the service nets her between three and five hires in one year, it will still cost less than agency fees . "You really need only one [hire] to make it cost-effective," she said.

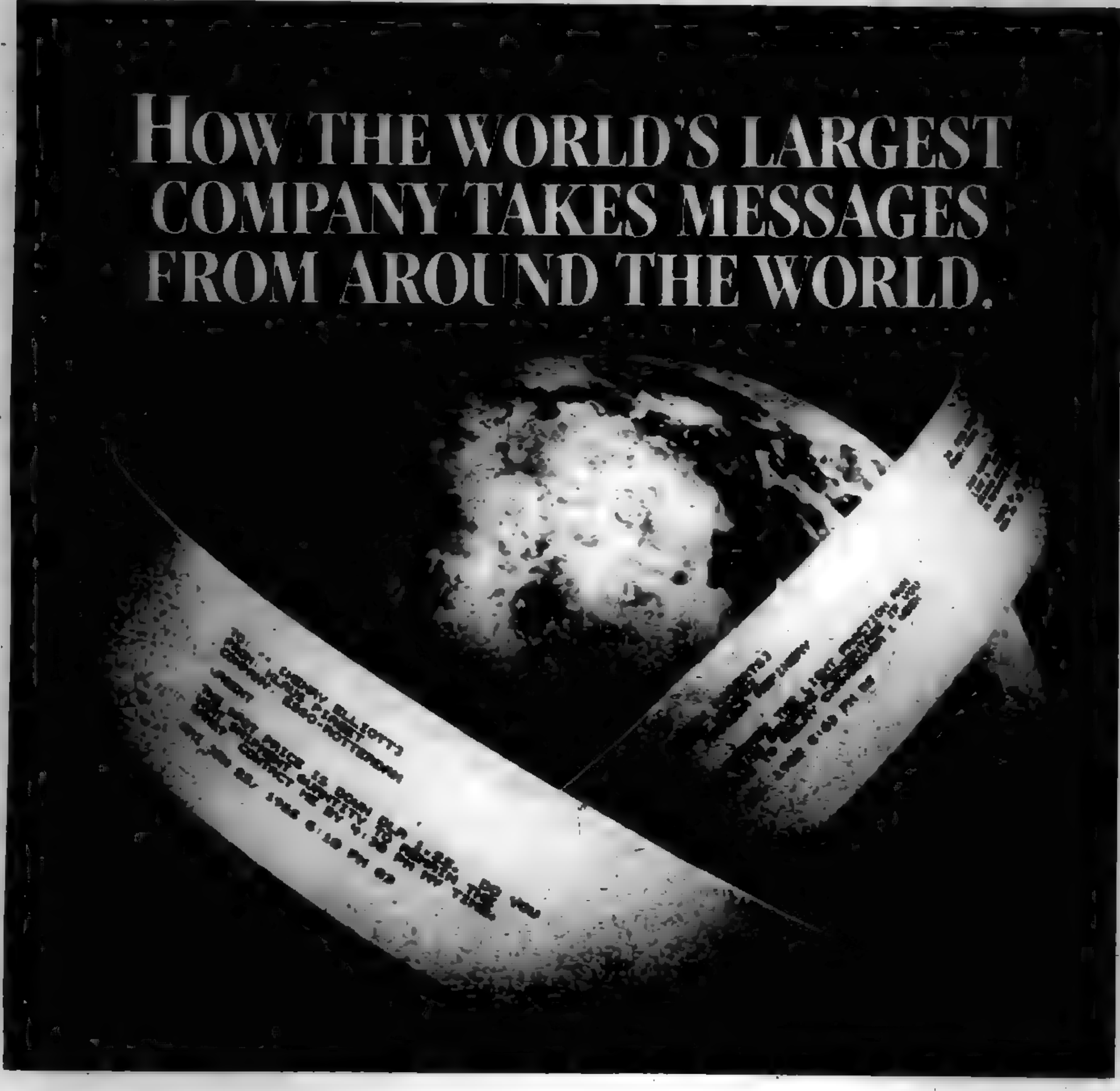
According to Raymond Casper, president and cofounder of Cari, for a $5,000 annual subscription fee, companies with a modem, keyboard and screen printer receive a piece of communications software that gives them unlimited searching capabilities. Companies can further access up to 250 names, addresses and telephone numbers of potential candidates. Companies wanting information on additional candidates are charged another $5,000.

Cari incorporates a purging system that keeps the data base current with applicant information. Candidates are required to renew their candidacy with the company every 60 days. If candidates do not renew, they are removed from the data base, Casper said.

The scarcity of West Coast-based professionals in the Cari data base forced Automatic Data Processing, Inc.'s division of dealer services in Portland, Ore., to abandon the service rather than woo and then relocate recruits, according to Gwen Weld, the firm's personnel director.

Automatic Data Processing purchased access to the Cari data base last year when it was trying to add about 50 DP professionals to its staff of 200 but dropped the system after two months, Weld said. "If we could have pulled two people a year out of that system, it would have been worth our money," said Weld, who spends between $7,000 and $12,000 per hire for agency fees.

See JOBS page 27



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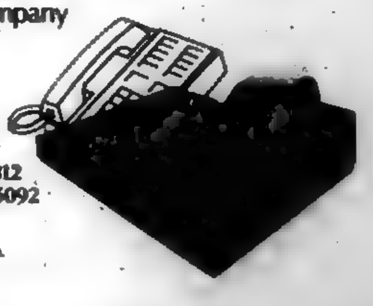

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JOBS

from page 26

Farlow & Associates, Inc., a South Holland, Ill., data processing consulting firm, turned to the computerized data base as a time saver, according to Dale Gouwens, vice-president. "We can recruit people a lot faster," he said. "Within 20 minutes, I can give the system my requirements, and it will tell me the candidates and print the resumes within 30 minutes. In an hour's time, I can be looking through those resumes, and in two hours, I can be calling people to set up interviews." Gouwens compared that method with the process of placing a help wanted ad, which can take up to two to three weeks between placing the ad and interviewing an appropriate candidate.

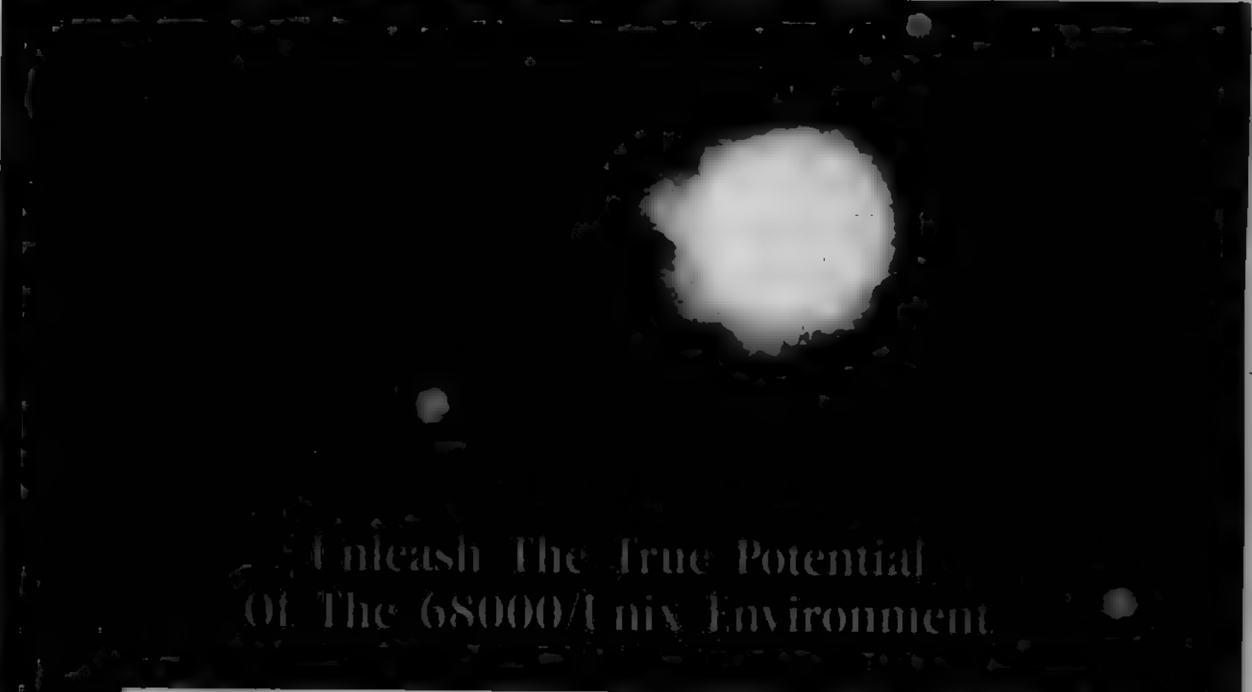
In the first three months that Farlow & Associates used the service, it hired three professionals, saving the company about $10,000 to $15,000 in agency fees, he said. "It is not a replacement for an ad or a search firm, but we use it as our primary source [of recruitment] and ads and firms as our secondary source.

While Cari is a national data base, computerized high-tech recruiting is also done on a local basis. Software Career Link in Burlington, Mass., sponsors of local job fairs designed for software professionals [CW, Nov. 26], has been experimenting with a subscription service for job seekers in the Boston area.

By December, the company had approximately 10,000 names of potential applicants in a data base maintained on an IBM Personal Computer AT. According to Software Career Link's Paul Vincent, by the second quarter of this year, the company expects to implement a subscription service at each of the major cities where it conducts its "Softfair."

For a $9,000 fee, companies subscribing to Softview are guaranteed at least six hires, Vincent said. Companies that hire less than six employees through the service are reimbursed for up to six "nonhires" at a rate of $1,500 each. To help promote the service, companies subscribing to Softview also receive free attendance at the Softfair in their area. Companies that hire more than 12 employees found through the subscription service pay an additional $1,000 per hire, he said.

Vincent said that firms subscribing to the service send their job specifications to Software Career Link, which feeds those requirements through the Personal Computer AT.



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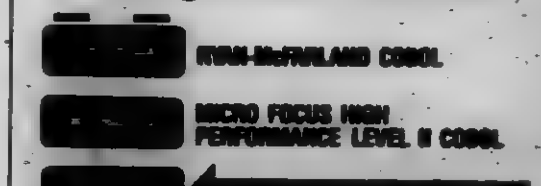

In a comparison of Ryan-McFarland COBOL 1.6A, Micro Focus COBOL 2.0 and PHILON FAST/COBOL 1.0 using the BYTE Magazine sieve benchmark the results are conclusive: PHILON FAST/COBOL executes the benchmark 24 times faster than Micro Focus and 47 times faster than RM/COBOL. (System configurations, 68000/UNIX [illegible].)

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PHILON™

IRS, union join to implement incentive pay program

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — When it comes to implementing an incentive pay program for data entry clerks, the Internal Revenue Service has found it much better to cooperate with its labor union than to fight it, according to M. Eddie Heironimus, associate IRS commissioner for data processing.

After years of acrimonious and costly battles between IRS management and the National Treasury Employees Union (NTEU), the data transcribers union, the two are now cooperating on the implementation of a nationwide incentive pay program that is scheduled to begin in October, Heironimus said in a recent speech here.

> ”
>
> *Unions often oppose incentive pay programs on grounds that they pit one worker against another in an effort to obtain productivity goals that are set by management.*

This effort follows a successful test of the incentive pay program at four IRS service centers, where transcribers enter data from taxpayer forms into the computer, IRS and union officials said.

The design of the IRS program is one of the best in the public or private sector, according to Dr. Alan F. Westin, a Columbia University professor who has conducted research on labor issues in office automation [CW, Dec. 24]. "I'm not a fan of incentive pay programs [unless they] have what I think are the elements of justice, mutuality and participation that the IRS system has," he said.

Unions often oppose incentive pay programs on grounds that they pit one worker against another in an effort to obtain productivity goals that are unilaterally set by management, Westin said.

The IRS program establishes a historical base rate for data entry and a target rate that reflects higher productivity; transcribers receive 50% of the savings achieved if they meet or exceed the target rate and if quality standards are met, Heironimus said.

Designed by labor, management

The key feature of the program is that the general design was established by a national committee of labor and management officials, and details such as the base and target rates are decided and administered by a local joint committee at each data center, he said.

Westin said the IRS program is exemplary because it shares the productivity savings with workers and was not unilaterally imposed on labor by management. In addition, he said, the IRS has pledged not to put transcribers on the dreaded treadmill.

Westin explained that some employers start an incentive pay program and then continually raise the threshold at which workers get extra pay. "So the feeling is that you're on a terrible treadmill, and that the management is constantly speeding up the pace of the work," he said.

Test program improved labor relations

Heironimus said the IRS test programs had been successful in both raising productivity and improving labor relations.

Likewise, NTEU's negotiator, Dennis Reardon, called the test program successful, and said the union supports expansion of the program to all IRS data centers.

"The cooperative effort obviously makes it attractive to NTEU," Reardon said. "It gives employees the opportunity to participate in the design and development of programs at their work sites," he said.

But labor and management discussions of the incentive program were not always so harmonious. In 1980 and early 1981, relations between the IRS and NTEU hit bottom, and the IRS plan for incentive pay was mired in a thicket of charges and countercharges at the Federal Labor Relations Authority. (The NTEU said the program should be part of formal labor contract negotiations, and the IRS disagreed.)

In early 1981, Heironimus said, the parties recognized that incentive pay would benefit both the union and IRS management, so they agreed to form the national joint committee and begin informal talks. The ground rules were that both parties had to temporarily shelve their legal disputes, and either party could leave the talks and return to formal proceedings, he said.

The process enabled the IRS to "improve productivity and share savings with workers while at the same time avoiding the costs associated with negotiation [and] arbitration and the formal structured approach to bargaining," Heironimus concluded.

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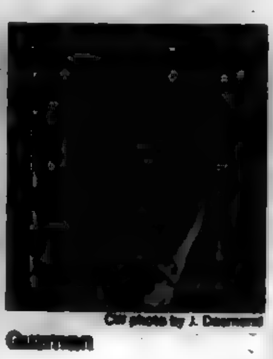
Ancient language may prove key to translation system

By [illegible]
CW Washington Bureau

BETHESDA, Md. — Ivan Guzman de Rojas may have found a way to keep Aymara, a 4,000-year-old language, alive and useful. To Guzman, a Bolivian computer scientist, Aymara is not just a beloved language spoken in the Bolivian and Peruvian highlands, but a computer algorithm that may be the missing link needed to develop multilanguage translation systems.

Guzman explained in a recent interview here that Aymara has a syntax so rigidly structured, logical and unambiguous that its syntactic rules are never broken.

Consequently, he said, the syntax is easily transformed into a computer algorithm, which in turn can be used to translate one language into others.



CW photo by J. [illegible]

Guzman

The Aymara algorithm is used as a "bridge language" for the translation system, so that the language of the original document is transformed into Aymara and then into any number of other languages. For example, the prototype system Guzman is demonstrating in this country translates Spanish to German, English, French and Portuguese, simultaneously rather than in series.

"Any sentence in any language can be translated into another," Guzman said of his technique. If it can be perfected and marketed, it would become the first multilingual rather than bilingual computer translation system, he added.

Guzman acknowledged that use of an intermediate language appears less efficient than direct computer translation, but he said the direct systems now in use are far from perfect. Direct systems, which translate word by word, typically require translators to do editing after the computer translation to correct word order and syntax errors, he said.

Translates clusters of words

His system, on the other hand, translates clusters of words and uses a syntactic approach to place words in their proper order in the target language. Guzman developed the prototype system — called Atamiri, the Aymara word for interpreter — as a hobby in La Paz, Bolivia.

Educated as a mathematician, Guzman said he discovered the algorithmic properties of Aymara about seven years ago when he used Aymara to teach mathematics to children. Then, working nights and weekends on a borrowed Wang Laboratories, Inc. VS85 supermini, Guzman developed the translation system.

Atamiri needs more work, including software debugging and the addition of more lexicons, before it is fully operational and ready for marketing, Guzman said.

But the technique already has attracted the interest of the Organization of American States (OAS), which invited him to Washington, D.C., to demonstrate Atamiri to OAS translators this month.

In addition, Wang's research and development staff is taking Guzman's work seriously: H. Kirk Swann Jr., branch manager of Wang's Federal Systems Division, said Atamiri ultimately could be marketed to the many international and government organizations in the Washington, D.C., area that need multilanguage translation systems.

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Infomatics '85 set for Oct. 21

AMSTERDAM — Infomatics '85, the annual conference and exhibition of the International Information Management Congress (IMC) that focuses on the latest technology and applications for document-based systems, is scheduled to be held here Oct. 21-24.

To be conducted at the RAI International Exhibition and Congress Centre, the conference is expected to attract users and vendors of document systems from Europe and many other parts of the world.

Topics to be covered include automation and records management; optical disk systems; productivity in the office; small-office microfilm systems; computer-assisted retrieval; software considerations; equipment selection criteria; interfacing technologies; and banking and finance, government, engineering and medical applications.

Micrographics, word processing, communications, duplicating, data processing and other information management systems components and software will be displayed at the conference.

The full conference registration fee is $400; the basic registration, not including banquet, is $360; and the one-day registration fee is $185, according to the sponsor.

More information is available from IMC, P.O. Box 34404, Bethesda, Md. 20817.

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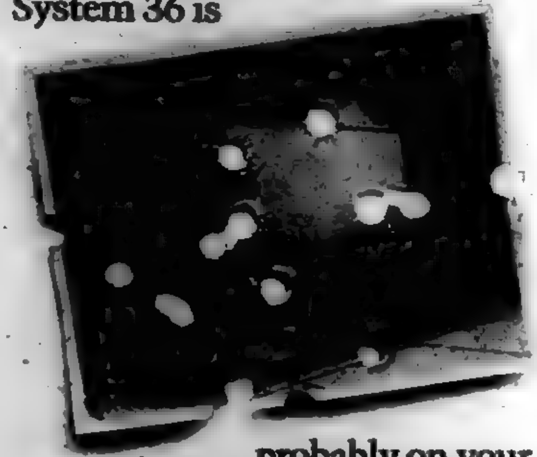

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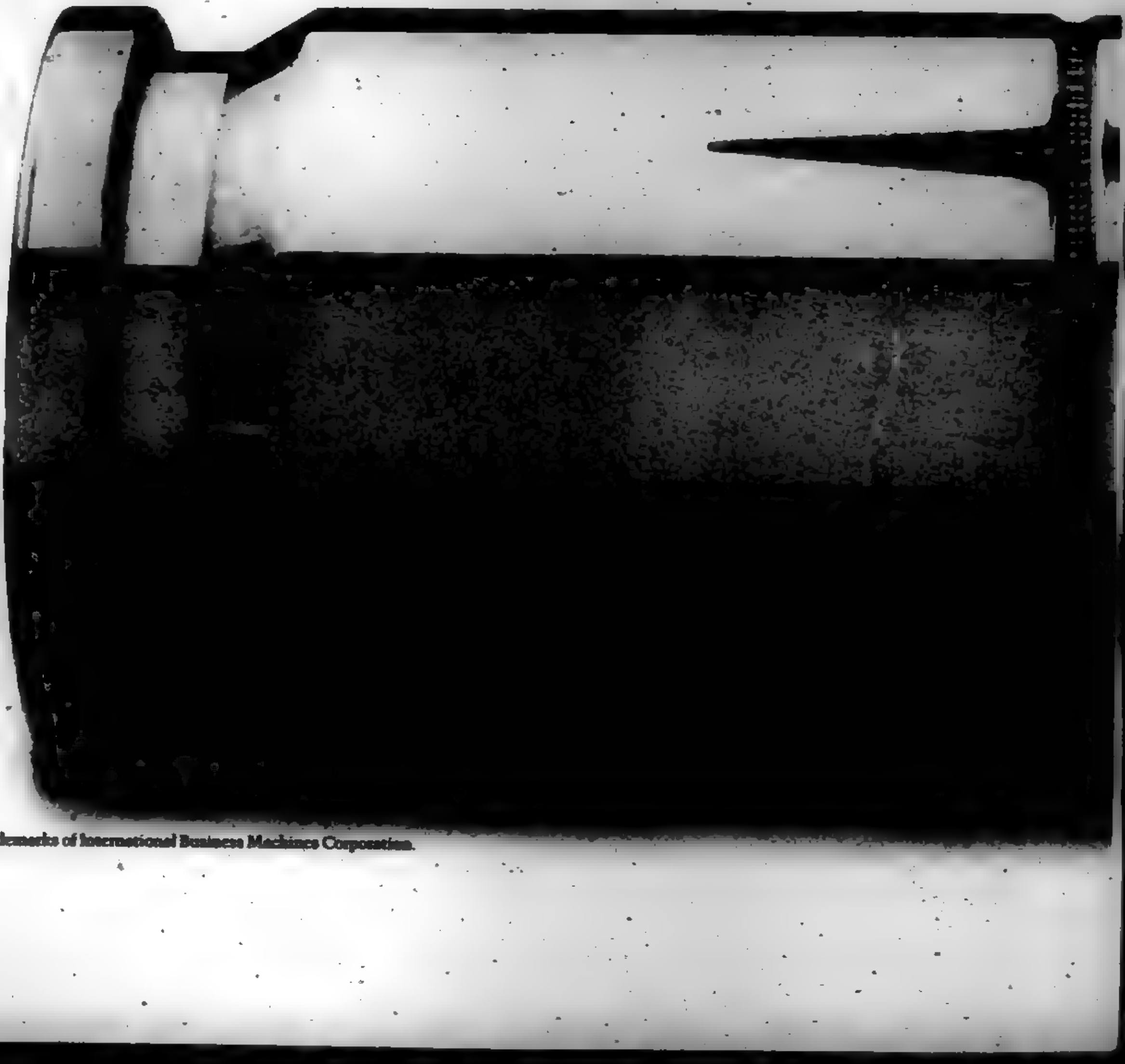

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WANG

A DEC engineer reviews base-plate design.

DEC's Cimlab facility tests CIM products

By Edward Warner
CW Staff

SHREWSBURY, Mass. — A laboratory for the development and testing of computer-integrated manufacturing (CIM) products was opened here last month by Digital Equipment Corp.

The facility, Cimlab 1, consists of a computer-aided design (CAD) center and an adjacent model machine shop. The lab, according to a DEC spokesman, will be used to develop CIM systems for sale or for use within the company.

A second Cimlab will reportedly open in West Germany later this year.

"Cimlabs allow us to reproduce the heterogeneous environment needed to test real CIM solutions," CIM marketing manager Jack Conaway said. "Through this program, we intend to be the No. 1 worldwide supplier of CIM solutions."

Baseway used for transfers

Among the systems on display at Cimlab 1 was DEC's Baseway communications software, in use to transfer instructions from CAD terminals to computer numerically controlled (CNC) machine tools in the model shop. Using Baseway, the VAX series minicomputers of the CAD system downloaded designs to the CNC machinery and received production information in return.

Baseway was linked to the machine shop via a Xerox Corp. Ethernet local-area network, the orange cables for which ran to nearly all of the shop's intelligent machine tools and programmable conveyor belts.

The Cimlab 1 design room also featured several CAD terminals, solid and wire modeling and a DEC Professional 350 personal computer, running project management and financial analysis software.

Several of the engineering workstations in the room were connected to DEC's electronic mail system, which reportedly can transmit messages or drawings to DEC facilities worldwide. Electronic mail and financial analysis functions were included in Cimlab 1, according to DEC's Peter Smith, because "administration tools have to be integrated into the CIM approach." Smith is vice-president of DEC's computer-aided engineering and manufacturing products group.

Cimlab 1 is located at DEC's mass storage devices manufacturing facility, a part of DEC's Northeast Technology Center, and reportedly uses the center's model machine shop and members of its staff.

The storage devices manufacturing facility and other DEC plants will use Cimlab 1 as a living laboratory for their own CIM applications, according to a DEC spokesman.

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INTEGRAL SYSTEMS INC

Tests find low anxiety rate of Cobol programmers

By Donna Raimondi
CW Staff

KIRKWOOD, Mo. — Cobol programmers have very low anxiety levels, according to the results of tests performed on 106 data processing students here.

The battery of 10 tests showed that there is a correlation between certain personality traits and success in Cobol programming or systems analysis, said Dennis Guster, assistant professor of data processing at the St. Louis Community College at Merrimack, who administered standardized tests and followed up on 58 of the tested students after they graduated and found jobs.

According to Guster's research, Cobol programmers tend to exhibit the following traits:

- Low anxiety levels.
- The ability to find figures hidden in a field easily.
- A knack for finding the diagramming of flowcharts to be easy.
- A good attitude toward system design.

Recognizing assumptions

Systems analysts, on the other hand, have better luck at recognizing assumptions, Guster said. The only attribute that Guster has been able to find in common for both groups is ease in diagramming, he said.

Guster and a Cobol instructor at the community college realized that people who did well in Cobol courses did not necessarily do well in systems. They decided that it would be valuable for colleges and businesses to be able to identify distinguishing characteristics of the two job categories, he said.

Guster and his colleague on the testing project — Jim Svaglic, a research assistant at St. Louis University — chose 106 students from two courses of study at the community college, he said. Some were from a two-year associate's degree program in data processing and others came from a one-year data processing program that carried the same core of DP subjects as the associate's program but did not have any other requirements.

The courses in both programs consisted of an introduction to DP, logical methods, computer concepts, two semesters of Cobol, two semesters of systems analysis and design, RPG programming and electives such as data base management or job control language, Guster said.

Guster and Svaglic did a statistical analysis and obtained four variables related to programming ability and two related to systems analysis ability. Guster validated those particular findings by doing a follow-up study.

Predictions come true

So far, the programmers and analysts who have been rechecked by the team have been true to the predictions, he added.

The team used SPSS, Inc.'s Statistical Package for the Social Sciences on the school's IBM 4381 running under IBM's DOS/VSE operating system to study the data.

The tests included "A Scale to Measure Attitudes Toward Any School Subject" by the Purdue Research Foundation; the "Group Embedded Figures Test" by Consulting Psychologists Press of Palo Alto, Calif., and a subset of that instrument called the "Test Anxiety Inventory," including the "Emotions Subtest of the Test Anxiety Inventory"; the "Watson-Glaser Critical Thinking Appraisal," by Harcourt Brace Jovanovich, Inc.; and the "Computer Programmer Aptitude Battery" by Science Research Associates, Inc.

Guster said he hopes to find more traits that would distinguish systems analysts by eventually performing another study with different standardized tests, he said.

DPMA show set for March 28-29

BLOOMINGTON, Minn. — The Northwest Computer Show, sponsored by the Northwest Chapter of the Data Processing Management Association (DPMA), is scheduled for March 28-29 at the Radisson South Hotel here.

More than 100 hardware and software suppliers, including IBM, Digital Equipment Corp. and Wang Laboratories, Inc., are scheduled to exhibit their wares at the show, the sponsor said.

The Northwest Chapter of the DPMA, which is composed of the Minnesota chapters of the DPMA, the Association for Systems Management and the Association for Computing Machinery, plans to hold four two-day seminars. The seminars will discuss management, personal growth, technical issues and future developments.

For preregistrants, there is no charge for attending the computer show. Registration at the door will cost $5.

Each two-day seminar costs DPMA members $195 and nonmembers $210.

More information can be obtained from Sheri Hotzler, Cincom Systems, Inc., Suite 880, 8300 Norman Center Drive, Bloomington, Minn. 55437.

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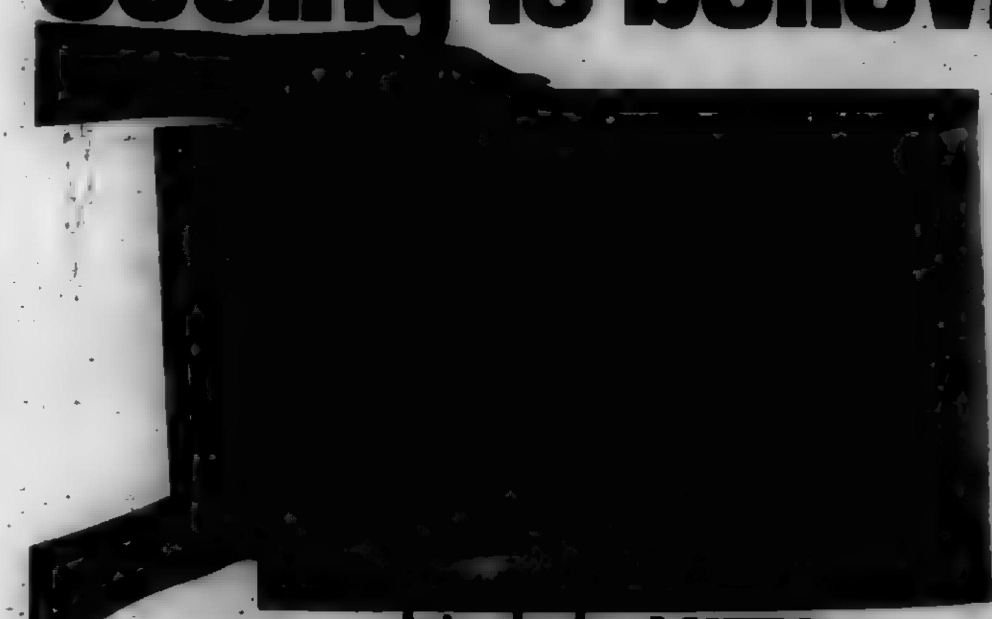

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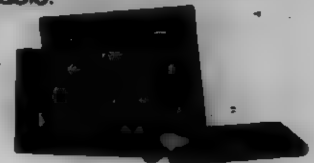

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*National Institute For Occupational Safety and Health Study, August 1981.

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MIS overhaul anchors shipping firm in changing waters

MELBOURNE, Australia — A ship filled to capacity pulls into Melbourne harbor as longshoremen wait on the dock to unload cargo from Japan, Manila and Hong Kong. The vessel is one of 33 operated by the Australian National Line (ANL), the semigovernmental trading entity of the Australian Shipping Commission. The ANL also provides the only sea passenger service between Tasmania and mainland Australia.

Faced with sweeping economic and technological changes in the shipping industry, ANL conducted an organizational review in 1982 to determine how it could become more competitive in the commercial marketplace. One key recommendation was to put financial accountability at the level of line management — a recommendation that entailed a complete overhaul of ANL's management information systems.

Restructuring MIS operations for a $400 million business was a tough task, made more difficult by tight deadlines, according to Douglas Geekie, ANL general manager of finance. "But ANL had no alternative," Geekie said. "Without an effective management information system, we would lose money and jeopardize the organization's future," he summarized.

So, in the course of 12 months, Geekie's staff and a management consulting firm went to work evaluating, installing and implementing the General Ledger (GL) system from Management Science America, Inc. (MSA) of Atlanta. The firm went live on schedule — July 1, 1984.

ANL's computer system is based on Fujitsu Ltd.'s Facom M180 II with 12M bytes of main memory and 8.6G bytes of disk storage. Three tape drives and two 1,200 line/min printers make up the balance of the central site configuration. ANL runs GL under the Facom X8 environment.

Network of 150 terminals

A network of nearly 150 terminals nationwide will give remote-site users access to the new system for data entry and inquiry, Geekie explained. "We'll have GL capability wherever there's a DP hookup," he noted.

Also scheduled for implementation at ANL are MSA's accounts receivable and forecasting/modeling systems, which will run on a Facom M180 II AD installed at ANL corporate headquarters here. When the accounts receivable system is up and running later in the year, all ANL operations will have access to full customer account details as well.

Historically, management information for ANL's five divisions was centralized and supported by an internally developed batch system. With the previous system, the general ledger was kept open three weeks after the month's end.

"With our new on-line system, we expect to close off no later than four or five days after [the end of the month]," said Ken Heard, project accountant officer and a member of the implementation team. "The general ledger can be updated daily and will modify other applications."

Under ANL's new structure, each department within the five divisions has its own controller. For example, the operations department is responsible for ships, terminals and freight containers. Therefore, the marine manager, the ports and terminals manager and the container manager each has a controller maintaining ledgers and providing management reports.

'Masters of their own destinies'

"This structure lets line accountants become masters of their own destinies," Geekie said. "Their financial information can be tailored specifically for their responsibilities and activities."

To help implement the MSA system, a training program was developed by the ANL implementation team to introduce the system's capabilities to more than 200 management and staff employees. The culmination of the training program was a weekend course for accounting staff members, who learned about on-line tools that would allow them to define their own reporting requirements directly to the system.

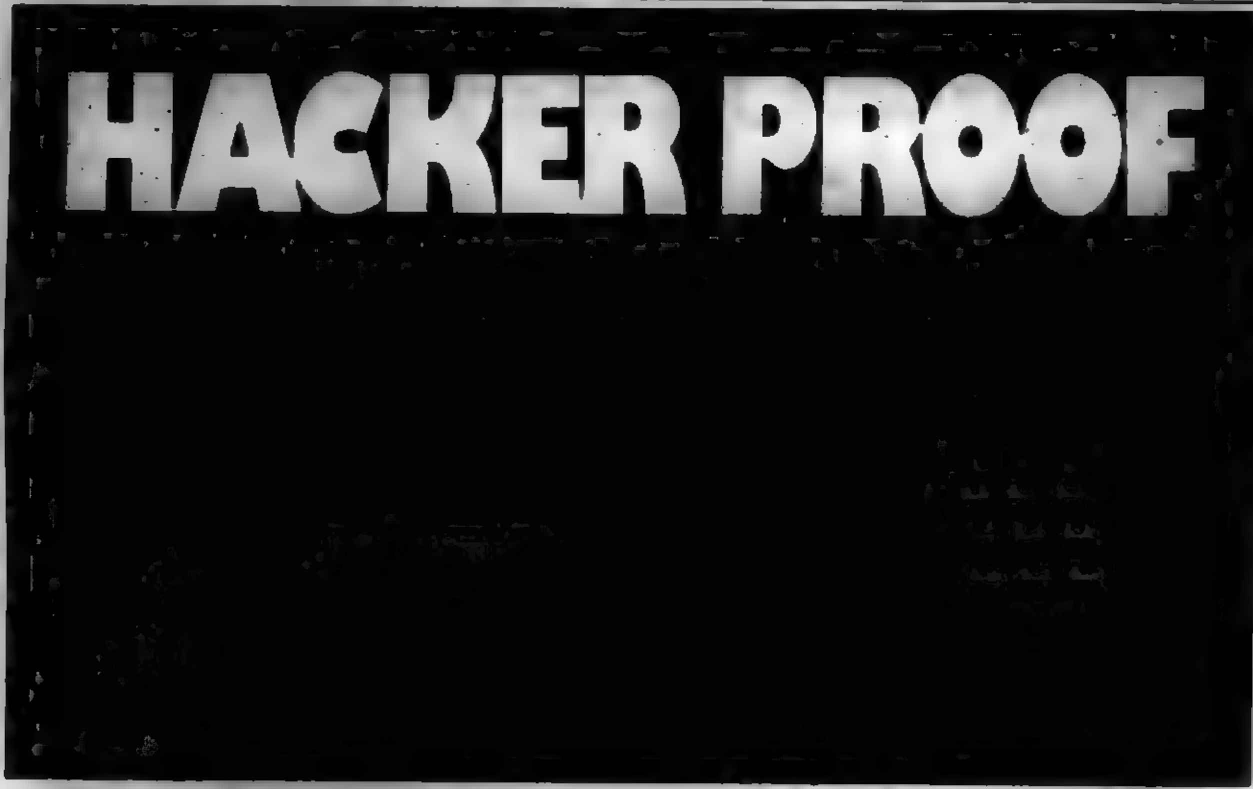
According to Frank Dixon, DP communications manager, these on-line tools are a key benefit of the on-line package. "The flexibility in this system lets us produce reports in a style to suit every manager," he said. "You can't underestimate the importance of this, given the new accountability at the line management level."

Redefinition of chart of accounts

Going on-line with a new system meant that ANL had to redefine its chart of accounts to accommodate a responsibility-based accounting and management information system. At least 15,000 accounts — the function of voyages and legs of voyages — can be operative in a year, Geekie said.

ANL's accounts payable system, with a transaction volume of nearly $28 million a month, has been modified to interface with the MSA package. ANL's existing invoicing software will be modified to interface with the MSA Accounts Receivable System.

"We'll have far better credit information now because the accounts receivable package is a full credit management facility," Geekie concluded.



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Q. WHY ALL THE TALK ABOUT LOCAL AREA NETWORKS?

A. There's been a lot written about Local Area Networks (LANs). What's all the talk about? Why are LANs important? Should your company be looking into them? Is one kind of LAN better than another? The fact is, a lot of people, ourselves included, think LANs are going to play a key role in the total telecommunications picture for most businesses. Here are some questions and answers that might help you better understand LANs.

Q. To begin with, just what exactly is a Local Area Network (LAN)?

A. It's a system for moving information between devices located on the same premises. Now that calls for some further definitions. By "information," we mean data, voice, text, graphics or image. By "devices," we mean big computers, personal computers or other workstations, printers, telephones, scanners, files, sensors and actuators, and PBXs. By "same premises," we mean office building, manufacturing plant, hospital, campus or other geographically confined area. In short, and quite simplified, a LAN is one way of connecting all these devices to each other.

Q. There seem to be a number of different kinds of LANs. Why the variety?

A. The reason there are different LANs is because different work situations have different needs and different cost considerations. For instance, one type of network is capable of linking different kinds of computers, workstations and other devices throughout a building or campus. This allows for the exchange of information and the sharing of resources and large data bases. Then there's a need for a network specifically designed to interconnect personal computers. There's also the need for a special "industrial" LAN to meet the unique requirements of manufacturing plants. And there may be other networks developed to meet other needs.

Q. What if I want to link all the devices in my building?

A. IBM is developing a way to get all the devices in a building to communicate with each other using established computer and communications architectures. This will allow the mainframe computers, company-wide systems, smaller departmental clusters and even individual workstations to interact and share files, applications and peripherals.

We believe this general purpose LAN, utilizing "token-ring" technology, will provide the greatest flexibility and connectivity for different departments, workstations and systems. Other major benefits of this LAN technology will be very high reliability, predictability of performance, and greater overall network management capability.

The token-ring LAN will use the IBM Cabling System as its foundation. Currently being installed, the IBM Cabling System provides the immediate benefits of a common cabling solution for most IBM systems and workstations.

Q. Suppose I only need to connect personal computers?

A. We recently announced an IBM PC Network that allows a department, small company or remote location to interconnect IBM Personal Computers. This low-cost network lets PC users share files and printers, and send messages from one PC to another. The PC Network also lets users access application programs and data bases in larger IBM System/370 computers.

Q. What about a LAN for manufacturing plants?

A. We intend to offer an industrial LAN which will allow factory floor data collection and interconnection of robotic systems, machine tools, numerical processors and industrial computers.

Q. And if I wanted, could I connect these different networks to each other?

A. IBM has announced that its planned token-ring LAN will also act as a "backbone" connecting these different networks. Each network will have the ability to communicate with IBM System/370 host computers and applications.

Q. What if I'm still not sure which way to go?

A. Choosing a LAN is a business decision that will vary from company to company, and from department to department. Remember that LANs are just a portion of your company's overall telecommunications solution—a solution that should be developed in a planned, structured and manageable way. If you'd like some help in figuring out the answer that will best suit your needs today and in the future, call IBM.

There's a lot more to be said about LANs and telecommunications. If you'd like a free copy of "Positioning Local Area Networks," call 1 800 IBM-2468, Ext. 90, or return the coupon.

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NEWS

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BRAZIL

RIO DE JANEIRO — Lotus Development Corp. has accused a Brazilian firm of piracy of Lotus' 1-2-3. Lotus charged that Computer School, a Sao Paulo, Brazil, company that organizes summer camps for children, made illegal copies and translations of Lotus' 1-2-3 spreadsheet software. The software manufacturer claimed that Computer School did not obtain the Lotus package in the proper manner — through the authorized distributor in Sao Paulo.

ENGLAND

LONDON — Wigglesworth, an insurance company based here, has introduced the first specialist insurance policy covering data loss. The coverage will protect insurers against data loss owing to anything from radar interference to malicious damage.

Wigglesworth director Andrew Paddick said the wording of the policy is comprehensive enough to include software bugs. Paddick said the base premium is 0.75% of the amount insured.

■

LONDON — Acorn Computers Ltd., microcomputer manufacturer for the British Broadcasting Corp., suspended its stock shares after significantly lowering its prices. The dramatic drop sparked the Stock Exchange in England to investigate the situation. The collapse of the Acorn stock is being attributed to the company's attempt to enter the American market, a move that cost Acorn an estimated $5.5 million.

FRANCE

PARIS — Groupe Bull, with France Cables et Radio, has begun trials of the actual Telecom 1 satellite after year-long tests using a simulator. The trials will examine the compatibility of Bull products with the digital links of Telecom 1, an apparatus that was launched last year by Postal Telephone and Telegraph authorities.

According to sources, Bull's Datanet 7101 net processor with a V.35 interface currently supports links at transmission speeds up to 64K bit/sec. As a result of the joint effort, the firms expect to boost speeds to 1M bit/sec using a X.21 interface in Datanet 7100.

JAPAN

TOKYO — Fujitsu Ltd. has reportedly penned an agreement with the Chinese Ministry of Post and Telecommunications to install three million lines of F-150 digital private branch exchanges (PBX). According to Fujitsu, the PBX will initially extend throughout 12 districts in China and will eventually include telephone and transmission units by the end of 1987. The pact contains plans for a maintenance center, a training center and a software service center.

SOVIET UNION

MOSCOW — The Soviet Union is reportedly negotiating with Western computer firms to buy thousands of microcomputers for use in secondary schools and scientific institutions. Companies said to be arranging contracts with the Soviets include IBM, ICL Co., Sinclair Research Ltd. and Apple Computer, Inc.

Until Jan. 1, Western powers banned the sale of certain types of personal computers to the Soviet Union. The governments drew the line at advanced desktop micros such as IBM's Personal Computer AT and Apple's Macintosh.

WEST GERMANY

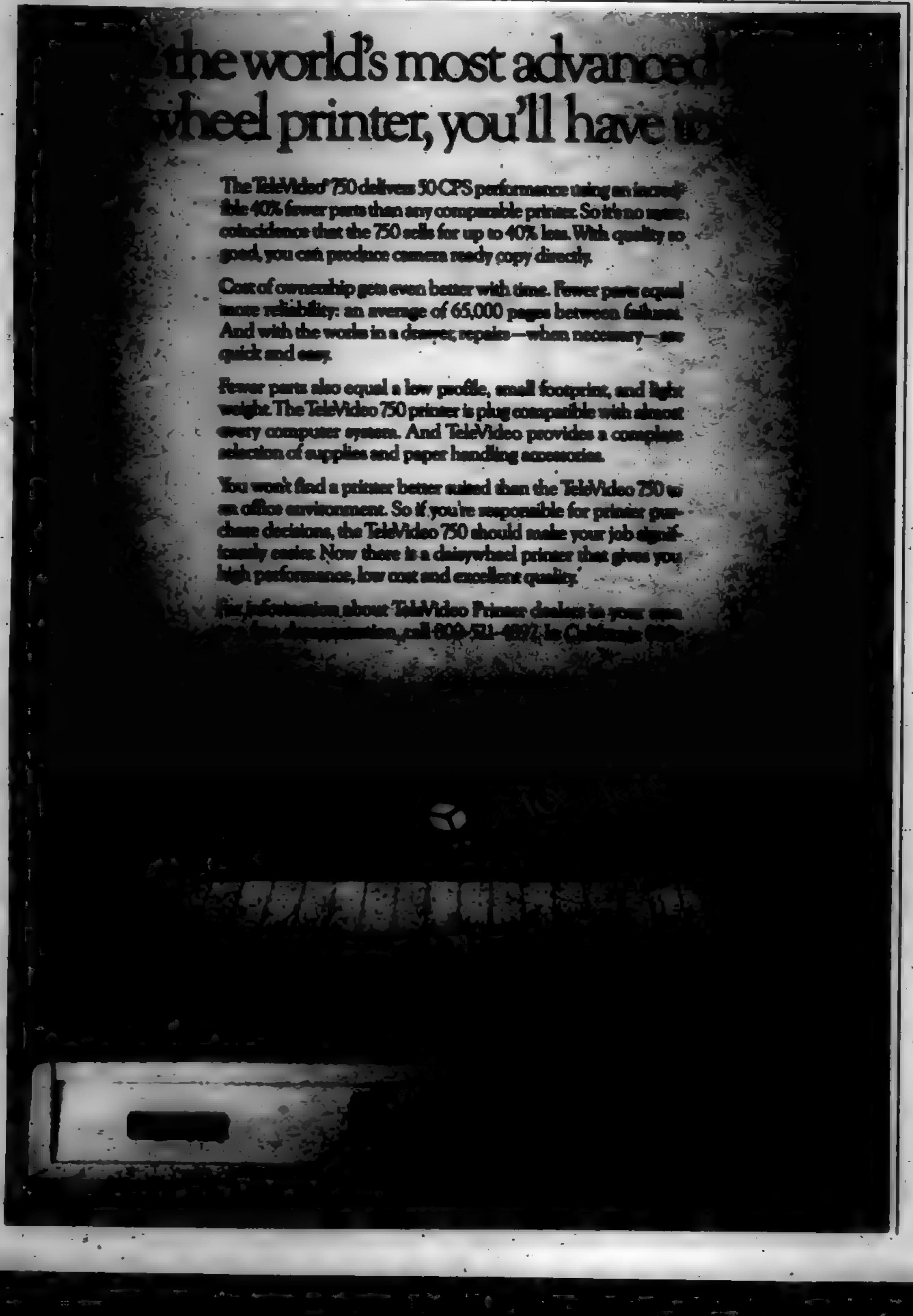
MUNICH — The West German foreign trade volume in the data processing sector increased an average of 75% between 1980 and 1983, reaching a new high of nearly $5 billion. DP systems imports grew by 74% during that time period, with exports swelling to a record 77%. West German imports from Japan jumped 452% from 1980 to 1983, and DP imports from Third World nations rose 200% in 1982.

■

MUNICH — Nearly $3 billion is spent each year in West Germany on training and continuing education. That figure is only about $300 million more than what is spent each year on computer software, according to a study by SCS-Personalberatung, a personnel consulting agency in Hamburg, West Germany.

The SCS-Personalberatung study revealed that approximately 25% of West German firms spend in excess of $300,000/year on data processing training — a skill in great demand in that country. Data processing constitutes 30% of technical education, making it the largest single training priority.

"I fight glare with glare!"



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INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

Minis broaden bank's service offerings

An HP 3000-based net automates Delaware Trust Co.'s daily activities.

'Flexibility' called key to custom applications

WILMINGTON, Del. — Delaware Trust Co. here claims to have gotten an edge on its competitors by offering such services as real estate listings, class action lawsuit processing and investment custody programs.

Those services are possible, a bank officer said, because of the firm's use of an in-house computer network built around two Hewlett-Packard Co. HP 3000 systems. The network at the 85-year-old bank was built up over roughly seven to eight years, starting with an IBM mainframe. The bank moved upwards with IBM equipment, primarily using it to fill massive data storage needs, explained Mike Yacyk, vice-president and deputy controller.

The bank still uses IBM equipment — a 3031 mainframe is the top processor in its network hierarchy — but it has since made a strong move into minicomputers, first with an HP Series 2000 machine and, most recently, with two HP 3000 models.

"The HP 2000's flexibility and ease of use enabled us to develop a number of custom applications — like our investment custody program — that are usually found only on the biggest mainframe computers," said Rolf Eriksen, who was an executive with the bank at the time. Eriksen has since left Delaware Trust.

To meet the growth of applications, the bank upgraded five years ago to an HP 3000 III, which ran a limited office automation package. That processor has since been designated for external use and now houses the bank's real estate listings. For internal use, the bank brought on line last year an HP 3000 Series 48 mini running an OA package.

Yacyk said the bank looked at other vendors when it decided to upgrade to something more than the HP 2000. The bank chose to stay with HP, he said, because of the software for the Series 3000 minis, particularly the development tools and HP's Image data base management system.

An additional factor in HP's favor, he added, was equipment reliability and the responsiveness of HP's support programs. "They come down in less than four hours," on a service call, he said. "They have a response line that calls back in a half hour."

Delaware Trust's hierarchical network has automated the bank's daily activities and enabled it to offer a variety of time-sharing services to professional organizations throughout Delaware and other states, said Yacyk, who replaced Eriksen at the bank.

The bank's IBM 3031 mainframe has 4M bytes of memory and handles a number of large data bases, item processing and bulk check filing. The next level consists of the HP 3000 III, with 1M byte of memory, and the HP 3000 Series 48, with 4M bytes of memory.

At the bottom of the network are roughly 50 dumb terminals, 15 word processors, various peripherals and 15 microcomputers (HP Model 150s and IBM Personal Computers). The micros are tied into the system three ways: directly to the HP computers, directly to the IBM mainframe and, in some instances, to both.

Yacyk said the HP 3000s process most of the information on the network. The two are connected to the mainframe via direct line, RJE and tape to tape. The network allows the bank to handle custom programming, get into large data bases and produce reports.

Library of applications

The bank has developed a library of applications for the HP 3000s, many of which were written for in-house banking applications. Other specialized packages have been developed to allow the bank to offer services to a variety of professional groups.

Most of the bank's OA tasks are handled by the Series 48 mini, using HP's OA software package, Yacyk said. The bank's word processing requirements, which cover everything from memos to 200-page documents, are handled by HP Word. HP List Keeper maintains customer mailing lists and histories and, when working with HP Word, lets the user create a list and merge it with a letter or document. HP Desk Manager is employed in several areas of the bank to communicate programming requests to the computer system, to develop schedules and to send electronic mail back and forth between employees.

In-house programs were devel-

See BANK page 43

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Topics for conference papers could include unique concepts, new discoveries or special knowledge in the areas of computer technology, management, marketing or other business areas. Other topics will also be considered based on their importance to Data General Corp. users.

Presentations will be selected solely on the basis of an abstract of the paper, due April 25. The preliminary agenda will be set by May 13, and presenters will be notified of their acceptance by mail. Call for papers applications for both prospective presenters and exhibitors are available from North American Data General Users Group, c/o DG, 4400 Computer Drive, Westboro, Mass. 01580.

THE SOCIETY FOR INFORMATION MANAGEMENT'S (SIM) 1985 AWARDS PAPER COMPETITION
Boston, September 1985

SIM sponsors the annual competition to recognize outstanding work by seminar managers in the areas of information management and information systems.

Papers must describe a management information system, an approach to developing information systems, a technique for improving MIS activity or the management of MIS activity; the work described must be implemented and must have been evaluated and judged to have a significant impact on the organization involved. The primary author should be a manager of the institution in which the work was implemented.

The work must address top management issues — the impact, the system support of top management decision making, the timely/effective presentation of information to top management and so on. Papers need to define clearly a conceptual and managerial context in which to view the work.

Abstracts should be submitted to E. Nancy Markle, Vice-President for Information Services, Federal National Mortgage Association, 3900 Wisconsin Ave., N.W., Washington, D.C. 20016.

THE 43RD CONFERENCE AND CONGRESS OF THE INTERNATIONAL FEDERATION FOR DOCUMENTATION
Montreal, Sept. 14-18

Papers are now being accepted for this conference. Proposed topics should include new techniques for information handling and information transfer, advances in communications systems, advances in computer systems, electronic publishing, electronic document delivery systems and all aspects of technology transfer. The conference languages will be English and French.

Authors are requested to submit six copies of a summary of a proposed paper to the conference chairman, Mr. E. V. Smith, Director, Canada Institute for Scientific and Technical Information, National Research Council of Canada, Ottawa, Ont., Canada K1A OS2. Deadline date is June 30.

BANK from page 42

oped to meet the bank's specialized requirements in the areas of graphics and spreadsheets, Yacyk said.

The bank also offers applications for outside firms, such as a class action processing service that takes over the clerical duties involved in that kind of suit. The bank also offers a large local law firm a customized program that will eventually be offered to the rest of Delaware's legal community. Like the class action application, this one provides many of the daily, clerical needs of running a law firm. Delaware Trust handles all of the law firm's client accounting, storing case histories, updating files, tracking cases in progress and processing billable hourly activity.

The bank's real estate listing service is utilized by more than 100 real estate offices in Delaware and in parts of Pennsylvania and Maryland.

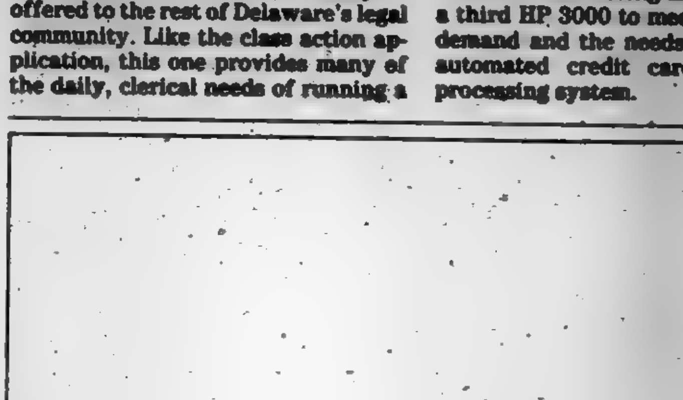
Overall, Yacyk said, the bank is pleased with its HP 3000s, so pleased that it is considering the purchase of a third HP 3000 to meet increases in demand and the needs of a planned automated credit card application processing system.

Interface '85 slated for March 4-7

ATLANTA — "Coping in the New Environment" will be the theme of the Interface '85 conference to be held at the Georgia World Congress Center March 4-7.

Sessions at the conference will include discussions of strategies in the wake of the AT&T divestiture and, in an era of personal computer proliferation, the impact of new technologies on information management, the shifting roles of information managers, the network-to-network interconnect challenge, user case studies, digital modernization of analog facilities, local-area networks, office systems integration, surveys of hardware categories and data communications software.

Information is available from Interface '85, 300 First Ave., Needham, Mass. 02194.



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INFORMATION SERVICES

General Electric Information Services Company, USA

Firm's explosive growth demands system upgrade

ATLANTA — Faced with a spiraling annual growth rate, an insurance underwriting company here found itself in the midst of a processing problem.

At Southern Insurance Underwriters, Inc. (SIU), growth in specialty risk insurance put a crimp in the company's computer facilities.

SIU first computerized in 1976 with Digital Equipment Corp. PDP-11 equipment. Two years later that system was outgrown, according to Stephen Gentilozzi, data processing manager. Gentilozzi said that in mid-1978, SIU purchased a Nixdorf Computer Co. Model 640 minicomputer and four data entry terminals. During the next six years, a Nixdorf 655 and several disk drives, terminals and printers were added to the system.

"In 1980, we transferred our personal automobile and [Southern Insurance Underwriters Premium] business to the 655," said Wes Duesenberg Jr., executive vice-president. The 640 was still used for other functions, including maintenance of statistical data to the generation of brokerage reports. "It wasn't too long before our systems were filled to capacity," he said.

According to Gentilozzi, another upgrade was needed in 1983. "At the rate we were growing we could have added four more disk drives and two additional 600s, and even that would have been only a stopgap measure," he said. "Processing time was increasing, we were running three shifts, and we constantly purged data because we could only store three months' worth at a time. We needed the capability of storing data for a year. We also needed the horsepower of a mainframe to perform number crunching at night and produce paper at a fast rate of speed during the day. And most importantly, we needed an expandable system for the future."

IBM's 4331 and Nixdorf's 8890 were the two systems considered best suited to fill SIU's needs for speed, flexibility, power and expandability. "Nixdorf's price was a bit lower than IBM's, so we went back to IBM and asked if they could be more competitive," Duesenberg recalled. "Well, they lowered the price, but they also reduced the power of the system." Nixdorf made no hardware alterations and offered classroom training time, support and Nidos/VSE, its IBM-compatible operating system, he said.

But other factors, including disk configuration and system expandability influenced SIU's final decision. "IBM was proposing a fixed-disk configuration because it couldn't offer us the multiple-disk structure, which in the long run would provide unlimited storage simply by changing packs," Gentilozzi said. "Furthermore, if you run into a problem on a fixed disk, it just sits there, along with all your programs and data. If that drive goes down your system is down. However, with the 8890 we could take three drives off the line and still operate." In addition, the 4331 was a 1M-byte machine. "In order to upgrade to 2M bytes of memory we would have had to go to the next size machine, which would have involved the added expense of changing the entire CPU," he said. The Nixdorf 8890 provided the ability to upgrade by three generations, Gentilozzi said.

Gentilozzi (l), with Reid Bohning, on the Nixdorf Computer Co. 8890.

SIU's data processing department is now using a Nixdorf 8890 configured with 2M bytes of memory, four 200M-byte disk drives, a single Model 9/16 tape drive, nine terminals and an IBM byte channel patched to a laser printer. The company also uses the Nixdorf 640 with three 66M-byte disk drives and the Nixdorf 655 with four disk drives. The 600 series systems share 32 duplexed terminals, two line printers and seven terminal printers.

Sixty to 70 pounds of mail are received daily from producers in the field. These independent agent submittals are comprised primarily of requests for issuance of new policies and requests to change or cancel existing policies. The volume of new automobile application acknowledgments alone averages 300 to 400 per day, with peaks in excess of 1,200 daily. Busy periods occur just prior to tag time, the deadline date when all Georgians must renew their auto license tags. Other peaks are in the spring when the volume of trailer, motorcycle and boat license issuances increases. This inflow is opened, stamped with the date and sorted by

See SIU page 46

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Regrouped DP boosts baby wear maker's production

GREENVILLE, S.C. — Infant and toddler clothes constitute a highly competitive area of the garment industry, and a relatively young company, based here, is grabbing an adult-size share of this specialized business due, in part, to the consolidation of its computer-based production procedures.

Since its launch in 1976, Kent, Inc. has positioned itself to be a power in the infant sleepwear and playwear trade. Sales last year topped $18 million, double what they were only four years ago.

A large part of Kent's success was attributed to on-line computer communications between its headquarters here and its three manufacturing plants located in Fort Kent, Maine; Liberty, S.C.; and Ballinger, Texas, according to company officials. Production procedures are scheduled by the computer to help smooth the manufacturing cycle.

Kent, Inc.'s NCR Corp. I-9040 schedules production procedures to smooth the manufacturing cycle.

The company runs an NCR Corp. NCR I-9040 mainframe at its headquarters. That computer is linked by 4.8K bit/sec dedicated phone lines and Digital Controls Corp. 6001 statistical multiplexers to NCR data display terminals and printers at its Fort Kent and Ballinger plants, while 2.4K bit/sec modems are used to hook up a New York sales office and the Liberty plant's terminals and printers to the mainframe.

The Fort Kent facility produces 5,000 dozen sleepwear and playwear knit sets per week and 150,000 dozen blanket sleepers per year, the Liberty plant produces 4,000 dozen knit sets a week, and the Ballinger plant manufactures 115,000 blanket sleepers each year. Production at all three plants is scheduled and monitored by the computer at its headquarters.

When the company started out with 30 people working in a previously abandoned Maine factory, Kent installed an NCR I-9020 computer minicomputer at its Fort Kent plant; it later added another I-9020 in its Greenville headquarters.

"We started with just the I-9020 system at our Maine plant and a printer and terminal at headquarters, but that system got a little cumbersome," said Ernie Maness, vice-president, administrative sales at Kent. He noted that sales orders and invoices were handled at the Maine facility, even though the accountants were in Greenville. "The reports were always late," he said, adding that the tendency of the Maine staff was to put priority on production applications rather than month-end reports.

By the end of 1978, the company installed a second I-9020 system at its headquarters, which was used to batch process orders arriving via the Maine office computer system. "Batch processing between the two computers wasn't working," Maness noted. "The biggest problem seems to have been coordination. We had files here in South Carolina and in Maine, and supposedly they were identical. We would enter orders at the end of each day and send them over phone lines to Maine, where files were supposedly updated. At the same time, Maine would do its invoicing and send that information to us at the end of the day."

When the company opened its Liberty plant, order information was prepared in Greenville and sent to the computer in Maine for its operation, and orders for the Liberty plant were printed in headquarters and dropped off each day at the Liberty plant manager's home.

The decision to pull all accounts payable and general ledger into the Greenville office helped tremendously, but the two computer systems did not work out well, Maness said.

Kent then opted to install a single system. They put the I-9040 at headquarters and three display terminals and a 300 line/min printer in Maine.

"We now have control of all files here in Greenville. Before, people at one place didn't know what was happening at the other plant at any given point in time. Today, we all know what's going on at other plants, and we know it right now," Maness said.

Since the system was installed, the Ballinger plant has been equipped with two terminals and a printer, and the Liberty plant has a terminal and printer.

Maness, in addition to being a vice-president, is the resident programmer, and he prepared Kent's applications software by making major changes to a customized payroll package.

Order entry is one task handled by the system. Orders are generated by salespeople with paper copies for key entry. The computer system then generates packing lists for each plant. The lists are used to schedule production runs and to generate shipping labels.

The order entry information is used to generate invoices. Inventory reports and sales analyses are produced weekly and monthly. Accounts payable and general ledger are on the system, as are production reports and payroll.

The toughest task, Maness said, was to integrate a piece-rate payroll. "We needed something that would track and enter the daily tickets, from which individuals are paid," he explained, adding that the computer-generated tickets carry the piece rate for each bundle of pieces that are sewn together to make a garment. The worker's pay is determined by the number of tickets and the rate on each ticket.

In addition to figuring pay on piece rates, Kent's software package gives management a daily report on what each individual in each department has done each day, along with

See KENT page 46

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The Institute for Certification of Computer Professionials (ICCP) has scheduled the first of two 1985 sittings for the Certificate in Data Processing (CDP) and Certificate in Computer Programming (CCP) for May 11, 1985, at test centers throughout the world.

The **CDP Examination** is designed for business-oriented DP practitioners at the management or supervisory level. The **CCP Examination** for experienced programmers is constructed so that each area of specialization—business, scientific, systems programming—includes five general computer programming sections and a sixth section in candidate's area.

Application deadline is **April 6, 1985** for May 11, 1985 exams.

NOTICE
This is the last year you can sit for the CDP and CCP without recertifying. In 1986, successful candidates will be required to recertify every three years!

For a copy of either the CDP or CCP "**1985 Examination Announcement and Application**," check the appropriate box below. The brochure includes an Application, Test Site List, Exam Content and Codes of Ethics, Conduct and Good Practice.
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Official Study Guides for both the CDP and CCP exams are available. Study Guides may be purchased directly from the ICCP, Executive Office, 2200 East Devon Ave., Suite 268, Des Plaines, IL 60018. **Make checks payable to ICCP.**

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SIU from page 44

department. Checks are deposited, and new policy requests are reviewed to determine whether or not they represent acceptable risks. Acceptable risk application data are entered into the system at a terminal. Keyed information includes a six-digit producer number, the date received and the insured's name.

Edit checks during data entry

During data entry, a variety of edit checks are conducted. These are designed to reduce the probability of potential errors during the policy issuance stage.

"We verify producer's name and address, and the computer automatically reads the input codes and adds the total coverage," West explained. "If a customer is only supposed to receive $100,000 coverage plus $250 deductible on their comprehensive, the system double-checks the balances to ensure that what was requested matches what was input. All state regulations have been incorporated into the software."

Differences between rates and coverages that the producer requests and what the computer calculates are electronically flagged. Appropriate letters to the producers explaining the discrepancies and requesting relevant action are automatically printed.

Integration allows 'fancy things'

"Our system does many fancy things because it is integrated," Gentilozzi said. "At the time we key in policy information, we order a motor vehicle report from the state. The application is then compared to the driver's record to determine insurance rates."

Another benefit of the integrated software architecture is realized in the financing. "After the system tallies the premium totals and performs edit checks — most of which agree with the input — the screen menu prompts the operator with financing questions," Duesenberg said.

The system sets up a premium finance schedule, generates an invoice, an identification card and a series of premium finance acknowledgement coupons.

The turnaround between receipt of an insurance application and the issuance of a policy has been significantly streamlined.

"Our response time is now down to two weeks, and we're aiming to trim that [further] to seven days," Duesenberg said.

Realia COBOL.
Migration without migraines.

Until recently, you had to abandon the business computer language when you developed microcomputer application software. The available micro COBOLs were inadequate—too limited, too slow. The best alternative—the XT/370 or AT/370 using IBM's COBOL—was very expensive and still too slow. To get acceptable performance, you had to retrain your programmers in Pascal or C.

Realia COBOL is the cure for such headaches.

Realia's compiler supports most IBM VS/COBOL and VS/COBOL II features, such as:
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You can compile faster with Realia COBOL than in most mainframe environments, even on floppy-based systems. Compile-time options allow cross-reference, brief and full code listings, and helpful features like subscript and decimal value checks.

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The results are startling.

Our users report that their systems run up to 20 times faster when compiled by Realia COBOL. That's compared to our nearest micro competitor. The ratio is up to 100 times faster when compared to any of the others.

On the IBM PC AT, your programs can run at 370/148 to 370/158 speed. Realia's file system really makes your machine deliver, giving it a distinct edge over Pascal or C. Our indexed file system even has full key compression and buffer controls just like VSAM. The generated code is pure MS-DOS, so it can be run on most of the 8088/8086 machine family.

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Realia COBOL is priced at $995, including one year of maintenance and upgrades. Subsequent maintenance and upgrade contracts are currently priced at $125/year/copy. Available for the IBM PC, PC XT, 3270 PC, PC AT, PC-compatibles, and the TANDY 2000.

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Seminar to eye local networks in factories

CHICAGO — The Yankee Group has scheduled "Data Communications in the Factory," a seminar that will examine how manufacturing companies can use local-area networks, for March 12 and 13 at the Westin Hotel here.

The conference will discuss topics such as alternatives to the General Motors Corp. Manufacturing Automation Protocol, the future of proprietary networks and the implementation of today's communications technology.

Other scheduled items include wiring issues, networking in process control and linking plantwide and corporate networks, the Yankee Group said.

For one person attending the conference, the registration fee is $875; each additional person from one company can attend for $775.

The Yankee Group is located at 14th Floor, 89 Broad St., Boston, Mass. 02110.

KENT from page 45

week-to-date totals. Those reports indicate whether a worker is earning approximately the minimum wage.

Tracking inventory and orders

According to Maness, the I-9040 also tracks inventory and orders. "We run reports weekly that show our open orders, our style status and how many dozen garments we have cut against our orders for those garments," he explained.

"If we have orders for 1,000 dozen, and we've cut 800 dozen, we're 200 dozen behind. Because we produce a report that gives a shipping schedule, we'll be OK if those 200 dozen aren't due for four months. However, the program would flag a problem if we were within four weeks of delivery," he added.

Maness observed that in the textile industry it is important to keep inventory to a minimum. He concluded, "There is simply no way we could keep our inventories down and our production smooth without this system."

TURNAROUND TIME
Larry Long

***Q** I know for a fact that personal computers in my department have been used for the unauthorized duplication of proprietary software. Recently, I made it clear that I did not condone this type of activity. However, I learned through the grapevine that since that meeting, one package has been copied for home use. Have other companies been successful in stopping software piracy? If so, how?*

Every time I begin to think that the software pirates are losing the war, I am reminded that the pilferage continues. Only recently, I listened as the president of a company (perhaps $30 million in sales) encouraged more than 100 conference attendees to save money by copying proprietary software. Software vendors are very serious about eradicating this erosion of profits.

Any company that does not have a written policy regarding the duplication of proprietary software should draft one as soon as possible. For the purposes of individual protection, any manager responsible for microcomputers should distribute a memo that articulates the company's policy on the reproduction of proprietary software.

As further protection for the company and as a warning to users, many companies are producing stick-on labels that read something like this: Unauthorized duplication of copyright software is prohibited on this machine.

***Q** A few years ago, I took over our family-owned savings and loan business. I managed our computer center for five years during the 1970s and only recently have become aware of how vulnerable we are to computer crime. Are there any signals that might foretell the possibility of a computer crime?*

Computer crimes occur methodically over a long period of time. Any physical or behavioral change may be so gradual that it may go undetected. The best way to thwart computer crime is to take precautionary measures. Do this by conducting very thorough risk assessments each year.

I encourage both MIS and user managers to get more involved technically in the work of their subordinates. Ask detailed questions of subordinates, even if they do not fully understand the answers. The rationale behind this is that subordinates are given the impression that management is right on top of what they are doing. This perception may be just enough to dispel any thoughts of "fast money."

***Q** Two years ago, I decided to quit working as a computer operator and return to school and work toward an associate degree in data processing. During the three years I worked in operations, I learned I wanted to get out of operations and into programming.*

I am currently attending a community college and am working toward two associate degrees — one in DP, the other in accounting. From there, I want to pursue a four-year degree in computer science. I want my money to go into courses that will help me get into data base development work. What types of courses should I take and, specifically, what languages?

Two degrees at the same level may make you a more knowledgeable person, but the second degree has limited market value. If you know for sure that you are going to pursue a four-year degree, pick a college now and make sure that there will be no problem in transferring your associate degree credits.

Most four-year computer science programs will require a data structures course and a theoretical data base course. Also, take an applied data base course in which you design and use a data base.

Courses in Pascal, C and assembler provide a good foundation for data base development.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.*

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MANAGERS ON THE MOVE

Lilly

MICHAEL J. LILLY has been promoted to director of management information systems operations of AMF, Inc. located in White Plains, N.Y.

In his new position, Lilly will be responsible for systems development for corporate headquarters and international trade operations, all corporate computer applications software and telex and telephone systems.

Prior to joining AMF, Lilly was manager of the corporate data center located in Westbury, N.Y.

Previously, he was a systems analyst with the Square D Co. in Milwaukee.

He joined AMF in 1975 as a software programmer with the AMF Harley-Davidson Motor Co. in Milwaukee.

In 1979, he was named manager of management information systems consulting project, at corporate headquarters in White Plains, and in 1982, he was promoted to manager of the corporate data center.

Lilly studied at the University of Wisconsin and the Milwaukee Institute of Technology majoring in business administration and accounting.

He is currently pursuing a bachelor's degree in management information systems/marketing at Western Connecticut University.

■

WILLIAM E. YOUNGER JR. has been appointed director of systems and project management for the Grocery Products Division of McCormick & Co., Inc. in Hunt Valley, Md.

He will be responsible for the evaluation, development, implementation and maintenance of the management information systems required by all facets of the division.

He will also be responsible for the coordination and implementation of project management principles in all areas of the division.

Younger joined McCormick in 1967 as an industrial engineer and has held various positions within the corporation.

His assignments have included director of manufacturing for the Food Service Division, and since 1979, director of purchasing for the Grocery Products Division.

He graduated from Baltimore Polytechnic Institute in 1958 and received a bachelor's of science degree in industrial engineering from Johns Hopkins University in 1966.

McCormick & Co. is a Baltimore-based international producer of seasonings, flavorings and specialty foods.

■

LIANE WILSON has joined Washington Mutual Savings Bank as senior vice-president and manager of data processing for the statewide financial institution. She will assume responsibility for data processing support to head office management and operations throughout the bank's 40-branch network.

Wilson comes to Washington Mutual after 10 years at Peoples National Bank in Seattle where she successively served as vice-president and manager of data processing operations, programming, research and systems reliability.

Formerly, she was a staff programmer with IBM in San Jose, Calif., and Sperry Hutchinson Co. in New York.

■

RICHARD A. SCHLAGER has been promoted to vice-president of Computer Management Dynamics, Inc. in Middleboro, Mass. He will have overall responsibility for software implementation.

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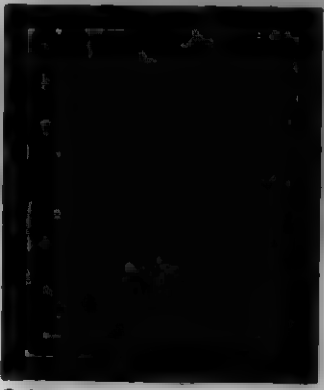
NEWS

Schlager holds a bachelor's degree from New Hampshire College in MIS.

■

MARTIN B. ROSCH has joined Allied Maintenance Corp. in New York and has been appointed assistant vice-president. He will be responsible for management information systems.

Rosch has worked for Sony Corp. of America as director of management information systems, and immediately prior to joining Allied, he was with Ipco Corp. He has more than 20 years of experience in data processing as an educator and industry consultant.



Schlager

Rosch possesses a certificate in data processing, a master's degree from Pennsylvania State University and a bachelor's degree from Brooklyn College.

■

RICHARD D. FRICK recently was named assistant director of information systems for the *Chicago Tribune*. In his new position, Frick is responsible for all operational activities in information systems.

Frick

Frick was director of information services at Snap-On Tools Corp. in Kenosha, Wis., where he had been employed for 10 years. He also had spent nine years with the Advisory Management Services Division of Price Waterhouse & Co.

Frick holds a bachelor's degree and master's degree from Purdue University.

■

NAREN K. BAKSHI has been named director of information systems for TRW Inc.'s Industrial Products Group in Cleveland. In his new position, Bakshi will direct a function that is responsible for the administrative and functional leadership of all management information system activities for the group. He will also manage the centralized computer center located in Jamestown, New York.

He joined TRW in 1980 as manager of information systems on company staff. Two years prior to that, he was vice-president of information systems at Ameritrust Corp.

Prior to that, he served seven years in various management systems positions at Standard Oil Co. in Ohio.

Bakshi received a bachelor's of science degree in industrial engineering from India's University of Ranchi. He also holds a master's degree in business administration in finance and marketing and a master's of science degree in operations research and computer sciences from the University of California at Berkeley.

■

TIM LUKEN has been appointed vice-president of management and business and information systems for RCA Global Communications, Inc. in New York. Luken is responsible for RCA Global's internal management information systems and office automation.

For the last two years, Luken was director of information systems and data processing operations.

He received a Ph.D. in mathematics from the Colorado School of Mines in 1973. He received a master's degree of education in psychology in 1969 as well as a bachelor's degree in mathematics in 1967, both from Xavier University.

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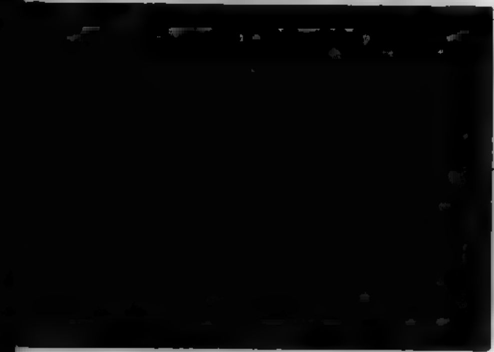
To make your use of existing or new graphics data fast and friendly, the CX Series comes with an IBM-style keyboard. Plus Tek enhancements: individual key programmability, user-selectable ten-key pad, and joydisk for quick cursor movement and graphics input.

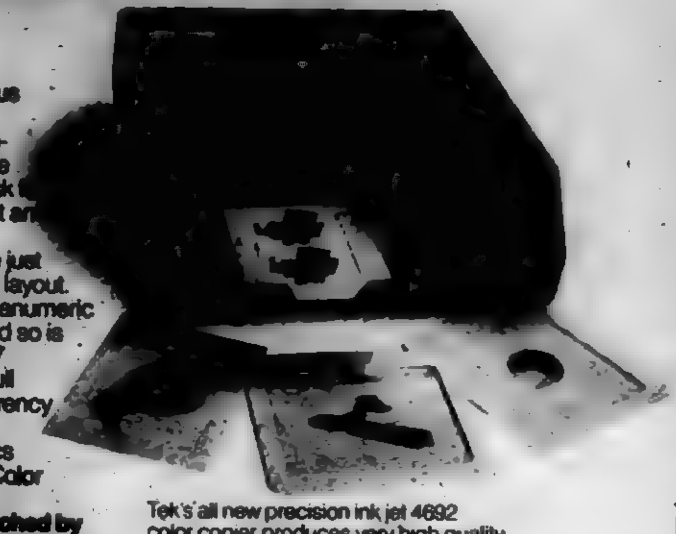
Screen output will be just as familiar as keyboard layout. 32-line 3278/3279 alphanumeric emulation is built in. And so is full support for the 4957 Graphics Tablet, plus full hard copy and transparency output to a full range of Tektronix Color Graphics Copiers and the 4510 Color Graphics Rasterizer.

IBM flexibility is matched by DEC flexibility. In RS-232 mode, the terminals can run all VT100 applications through the extended ANSI X3.64 command set. In addition to the host interface port that transmits data at rates up to 38.4k baud, CX terminals are provided with two additional RS-232 ports and a Centronics-style parallel port for connecting a wide range of peripherals.

But best of all you'll have great graphics and full software compatibility. The CX Series will accept many existing programs written for 4010, 4100, and 4110 Series terminals. And they're fully compatible with PLOT 10 IGL, GKS, and TCS programs as well as with popular third-party software such as SAS/GRAPH,® ISSCO's DISSPLA® and TELL-A-GRAF® and Precision Visuals' DI-3000®



Familiar 3270 IBM-style alphanumeric output is fully emulated on all CX4100 terminals. Enhanced IBM-style keyboard is part of the package.



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CALENDAR

WEEK OF MARCH 24

MARCH 24-27, SAN FRANCISCO — **1985 Annual Convention & Exposition of the Electronic Funds Transfer Association.** Contact: Electronic Funds Transfer Association, P.O. Box 66200, Washington, D.C. 20035.

MARCH 24-27, ORLANDO, FLA. — **Texas Instruments, Inc. Minicomputer Information Exchange 1985 International Computer Symposium.** Contact: TI Minicomputer Information Exchange, M/S 2200, P.O. Box 2909, Austin, Texas 78769.

MARCH 24-28, ARLINGTON, VA. — **Institute of Electrical and Electronics Engineers (IEEE) Infocom '85.** Contact: IEEE Infocom '85, P.O. Box 639, Silver Spring, Md. 20901.

MARCH 25, NEW YORK — **CICS/VS Internals.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MARCH 25-26, MILWAUKEE — **Managing Information Centers Effectively.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

MARCH 25-26, COLLEGE PARK, MD. — **Inventory Control & Record Accuracy.** Contact: Center of Adult Education, University of Maryland, College Park, Md. 20742.

MARCH 25-27, BOSTON — **The Integrated Voice/Data Private Branch Exchange: Architectures and Products.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

MARCH 25-27, BOSTON — **Automating the Office: A Tactical Guide for Success.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

MARCH 25-27, WASHINGTON, D.C. — **Introduction to Data Communications.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015. Also being held March 25-27 in Boston.

MARCH 25-27, HOUSTON — **Planning an EDP Disaster Recovery Program.** Contact: Marjorie Glazer, Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

MARCH 25-27, DALLAS — **Testing Computer Software.** Contact: U.S. Professional Development Institute, Testing Computer Software, 1620 Elton Road, Silver Springs, Md. 20903.

MARCH 25-27, NEW YORK — **Data Communications: A Complete Overview and Update.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

MARCH 25-28, SAN ANTONIO — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Two Executive Drive, Fort Lee Executive Park, Fort Lee, N.J. 07024. Also being held April 1-4 in San Antonio.

MARCH 25-28, FORT LEE, N.J. — **IMS/DC (Data Communications) Programming.** Contact: On-Line Software International, Inc., Two Executive Drive, Fort Lee Executive Park, Fort Lee, N.J. 07024.

MARCH 25-28, PHILADELPHIA — **Association for the Development of Computer-Based Instructional Systems' 26th International Conference.** Contact: Association for the Development of Computer-Based Instructional Systems International Headquarters, Computer Center, Western Washington University, Bellingham, Wash. 98225.

MARCH 25-28, LOS ANGELES — **CICS/VS Logic & Debugging.** Contact: On-Line Software International, Inc., Two Executive Drive, Fort Lee Executive Park, Fort Lee N.J. 07024. Also being held April 1-4 in Fort Lee, N.J., and April 8-11 in San Francisco.

MARCH 25-28, FORT LEE, N.J. — **CICS/VS Application Design.** Contact: On-Line Software International, Inc., Two Executive Drive, Fort Lee Executive Park, Fort Lee, N.J. 07024.

MARCH 25-29, CAMBRIDGE, MASS. — **Knowledge Acquisition for Expert Systems: An Applications Perspective on Planning and Developing the Prototype.** Contact: James Naughton, Expert Knowledge Systems, Inc., 6313 Old Chesterbrook Road, McLean, Va. 22101.

MARCH 25-29, LAKE BUENA VISTA, FLA. — **Tutorial Week East.** Contact: Tutorial Week East, P.O. Box 639, Silver Spring, Md. 20901.

MARCH 25-29, ATLANTA — **CICS/VS Application Programming — Command-Level.** Contact: On-Line Software International, Inc., Two Executive Drive, Fort Lee Executive Park, Fort Lee, N.J. 07024.

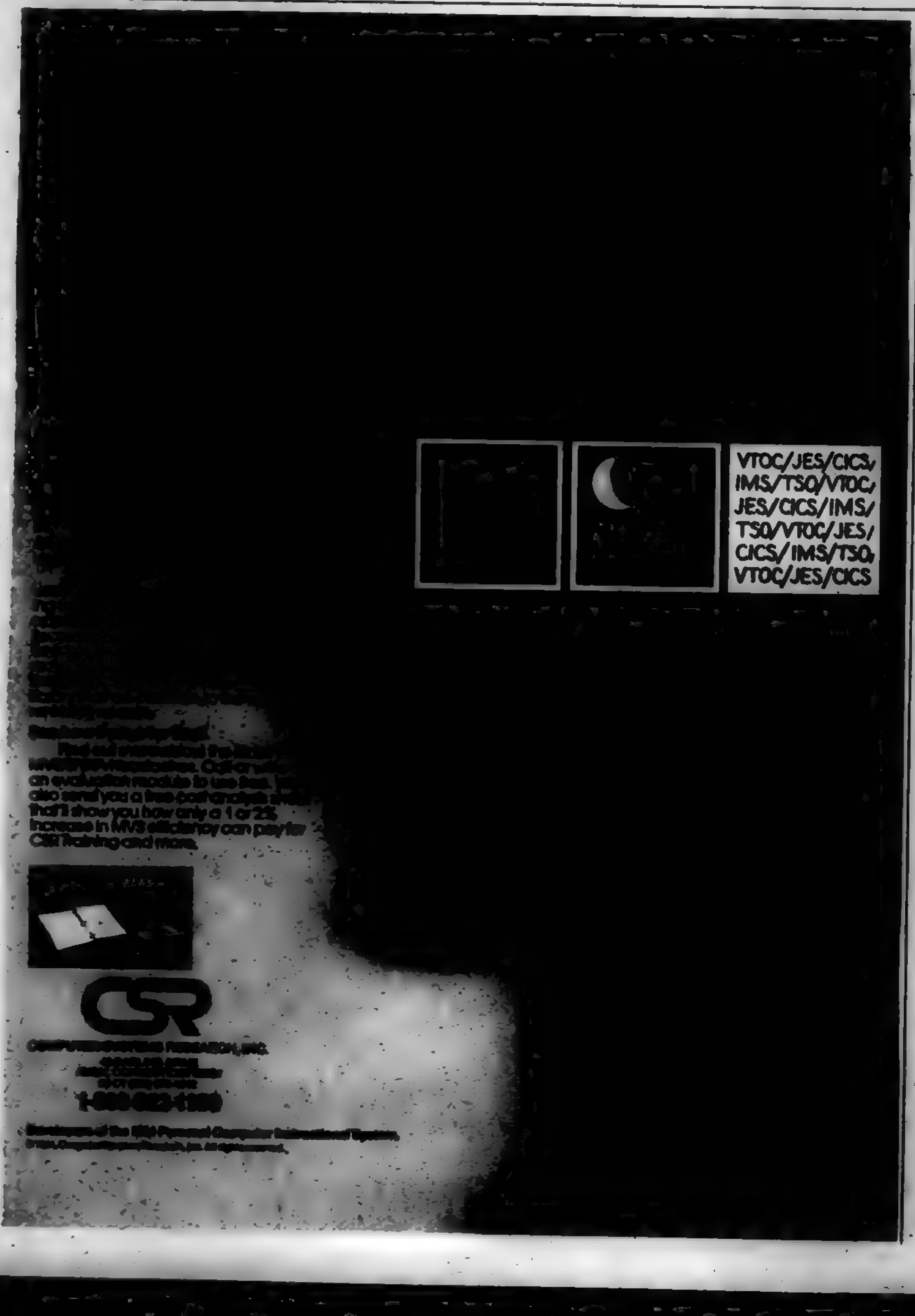
MARCH 25-29, BELLEVUE, WASH. — **C Programming Workshop.** Contact: Kathy Howard, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

MARCH 25-29, PENNSYLVANIA — **The American Society of Mechanical Engineers Short Course Program.** Contact: Melinda Harr, Faculty Building, Pennsylvania State University, University Park, Pa. 16802.

MARCH 25-29, HOUSTON — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

MARCH 26, NEW YORK — **Vsam: Its Structure & How to Use It.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MARCH 26-28, DETROIT — **Vision '85 Applied Machine Vision**



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NEWS

Conference and Exposition. Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

MARCH 26-28, CARY, N.C. — **SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MARCH 26-29, LOS ANGELES — **Unix: A Hands-On Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

MARCH 27, BELLEVUE, WASH. — **Unix for Managers.** Contact: Kathy Howard, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

MARCH 27-28, CHICAGO — **Recovery/Restart.** Contact: On-Line Software International, Inc., Two Executive Drive, Fort Lee Executive Park, Fort Lee, N.J. 07024. Also being held March 27-28 in Los Angeles and April 3-4 in Fort Lee, N.J.

MARCH 27-29, ARLINGTON, VA. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MARCH 27-29, ST. LOUIS — **Association for Computing Machinery Special Interest Group on University Computing Centers Computer Center Management Symposium.** Contact: William P. Heinbecker, Computer Center, 8001 Natural Bridge, St. Louis, Mo. 63121.

MARCH 27-29, FLORENCE — **Association for Computing Machinery European Regional Conference.** Contact: Giorgio Valle, Via Eugenio Curiel, 40145 Bologna, Italy.

MARCH 27-29, ARLINGTON, VA. — **The Network Users' Association (NUA) Spring Meeting.** Contact: NUA, Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22134.

MARCH 27-29, LOS ANGELES — **Decision Support Systems for Practical Applications.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

MARCH 27-29, CHICAGO — **Introduction to Data Communications.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MARCH 28-29, CARY, N.C. — **SAS Report Writing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MARCH 28-29, MIAMI — **Data Communications and Networking for the IBM Personal Computer and Other Personal Computers.** Contact: Digital Consulting Associates, Inc., 6 Windsor St., Andover, Mass. 01810.

MARCH 30-31, CHICAGO — **CICS Command-Level Intensive.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

MARCH 28-29, HOUSTON — **Risk Analysis Techniques.** Contact: Marjorie Glazer, Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

MARCH 30-31, NEW YORK — **CICS Internal Architecture.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

MARCH 30-APRIL 2, SAN FRANCISCO — **The 10th West Coast Computer Faire.** Contact: David Small, Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

WEEK OF MARCH 31

MARCH 31-APRIL 3, ATLANTA — **The International Conference and Trade Fair for Software Merchandisers, Publishers and Corporate and Institutional Users (Softcon).** Contact: Softcon, c/o Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

MARCH 31-APRIL 4, ATLANTIC CITY — **1985 Microprocessor Forum.** Contact: N. R. Kornfield, Widener University School of Engineering, Chester, Pa. 19013.

APRIL 1-2, BOSTON — **Using Dbase III.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

APRIL 1-2, STAMFORD, CONN. — **Structuring & Negotiating Hardware Contracts, Software Contracts and DP Service Contracts.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held April 8-9 in Detroit.

APRIL 1-3, CHICAGO — **Purchasing Management and the Computer.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

APRIL 1-3, BOSTON — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held April 10-12 in Seattle.

APRIL 1-3, NEW YORK — **Data Analysis & Logical Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 1-3, WASHINGTON, D.C. — **Strategic Data Planning '85.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 1-3, WASHINGTON, D.C. — **National Conference on Using Ada: Getting Results.** Contact: Conference/Event Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

APRIL 1-4, LOS ANGELES — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Inc., Two Executive Drive, Fort Lee Executive Park, Fort Lee, N.J. 07024.

APRIL 2, ROCHESTER, N.Y. — **The 30th Annual Upper New York State Systems Seminar.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 2-4, LOS ANGELES — **Corporate Personal Computer Expo.** Contact: National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

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I simply can't be bothered making comparisons.

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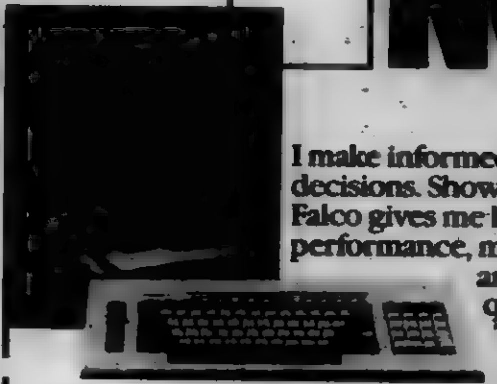

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EDITORIAL

IBM: Dust sets, questions rise

Most major product announcements raise as many questions as they answer, and IBM's cavalcade of software, hardware and communications goodies this month [CW, Feb. 18] was certainly no exception.

Reading between the lines of such a voluminous grouping of announcements must be tempered with a realization that IBM approaches decision making with respect to the market at large like no other computer company; that is, the market reacts to IBM as much, if not more so, than IBM reacts to prevailing market conditions. This happens to a company with a hold on three-fourths of the mainframe business.

The most interesting aspect of the announcements was that most of the new items, including the hardware, came as a surprise. Who would have guessed, for example, that the only Sierra customers will see in 1985 offers only slightly better price/performance than its predecessor, and that its big brother, the 400, won't be seen by anyone except IBM at its development center until 1987? Who foresaw a data transfer rate not even a byte/sec faster than that of previous high-end machines?

Now that the product debut smoke has settled somewhat, questions are filtering out of the dust.

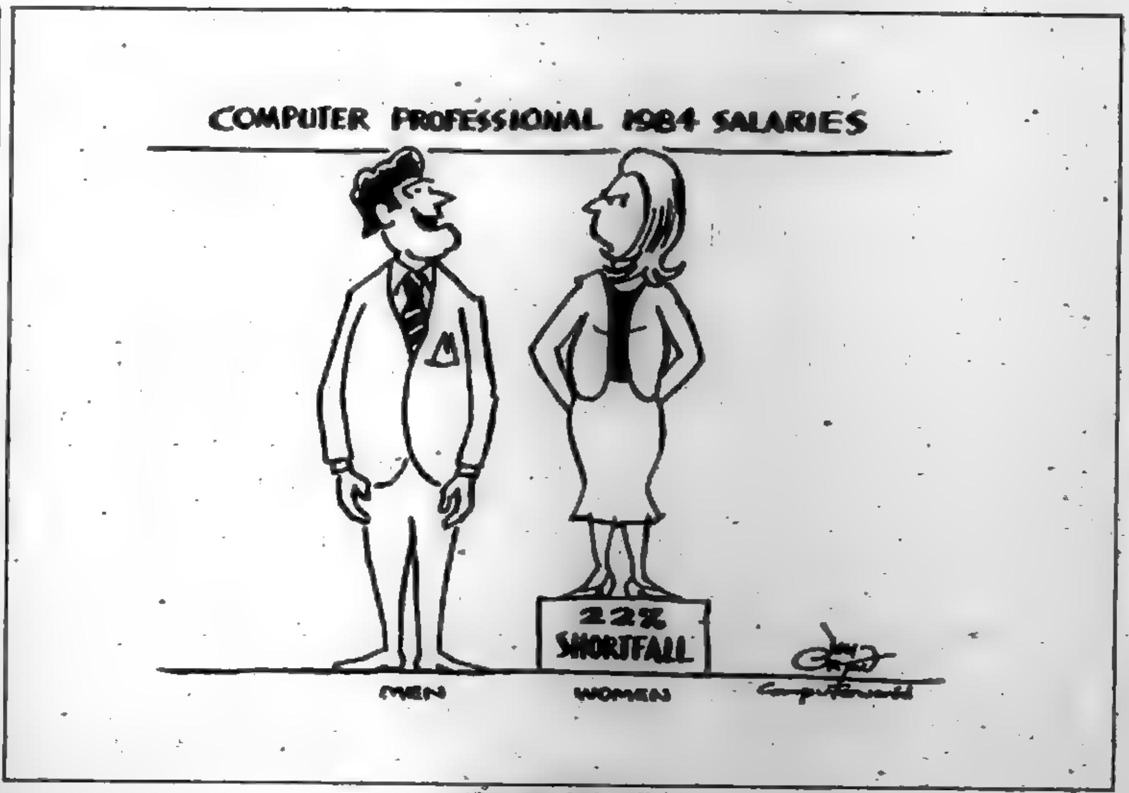
- **Was IBM planning all along to unload such a weighty package of announcements?** Or was this a partial reaction to the company's claims earlier this month that the current quarter would yield flat profit results for it? After all, Data General Corp. said only that its 1985 results wouldn't be as strong as expected and that its stock lost 20% of its value in one day. IBM's profit projection, tempered with the announcements, caused a negligible ripple in the price of IBM stock.

- **What happened to DOS?** Remember DOS? Thousands who use this batch-processing wonder of a disk operating system do and are probably asking why IBM did something positive to just about every one of its mainframe operating systems except DOS. It's so darn cheap, and people who use it love it.

- **Are the plug-compatible manufacturers in trouble now?** Not really. In fact, IBM has created a window of opportunity for the Amdahl Corp. and National Advanced Systems, Inc. companies of the world (and their Japanese partners as well). It would be something if one of them offered machines comparable to the IBM 3090 series but with a migration path from the current top-of-the-line machines. And IBM's distant delivery date for the 3090 Model 400 gives PCMs some time to get to work. Sierra won't do the Bunch companies' mainframe hopes much good, as they just cannot match IBM's production capabilities. But PCMs are another story.

- **Is the news really all good for VM users?** It looks that way. Just when it appeared IBM could have cut the legs out from under VM users and forced MVS/XA on them, along came the Extended Architecture versions of VM. Then the company threw in some AT&T Unix support to run under VM, and it was Christmas in February for VM devotees.

- **Why weren't users upset about their inability to upgrade Series 30 machines to the 3090 series?** Probably because it won't cost them anything not to do so. IBM has demonstrated software support across its entire line of products. Users will just keep the "old" Series 30s and trade up their 3033s and 370s for 3090s, which will at least coexist with the other machines.



'Congratulations!'

LETTER

Unix software not ported to AT&T

The article "Apple presents Macintosh Office, drops Lisa line" [CW, Jan. 28] about the new office automation strategy at Apple Computer, Inc. contains some unfortunate phraseology implying that the new communications software my company has developed has been ported to the new line of AT&T computers.

Lutzky-Baird, Inc. has developed software for AT&T Unix-based supermicrocomputers to link them with Apple's Macintosh computers as the article states. But it has not ported to the AT&T series, as your reporter implied. Instead, it has developed the package on the System 8000 from Zilog, Inc. and also on the Unix-based systems from Charles River Data Systems, Inc.

Both the System 8000 and the Charles River Data Systems supermicros are excellent systems that have served the firm's development efforts well. While I appreciate the recognition of Lutzky-Baird's new software, it is not, at present, ported to the AT&T products.

I hope this point will be clarified in the future.

Andrew H. Olson
Culver City, Calif.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer; they may be edited for clarity and brevity.

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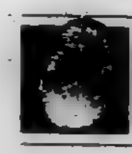
VIEWPOINT

Apple takes eye-opening crack at IBM reign



HUMAN CONNECTION
Jack Stone

No doubt I was one of untold millions who, after seeing Apple Computer, Inc.'s startling full-page ad on Superbowl Sunday in the local newspaper, adjusted the normal physiological course of events so that the televised fourth quarter in its entirety wold not be missed. If you were busy at the data center that day and didn't see the paper, the ad commanded the reader to avoid bathroom duty during that period and stay glued to the TV set, hinting at a monumental product unveiling — a la the year-earlier Macintosh.

Even though no information on the Macintosh Office — aside from the name — was provided in the TV commercial, the promotion was nevertheless dramatic. If you didn't see it, let me present the scenario. A long line of blindfolded businessmen and businesswomen were shown blithely walking to the edge of a mountain precipice where they, one after another, hurled themselves into an abyss, until finally one wise gent lifted his blindfold a moment before his impending self-destruction, saw the new machine in the distant horizon and was saved.

Important point made

Ignoring the excessive allegorical implications, there was one important point to be made; one that is hardly unknown to this industry: With respect to business computer systems in general and personal computers in particular, many users, data processors and independent vendors have embraced the IBM design philosophy, even though in many (but not all) situations, IBM systems, compared with the competitions', cost more, are more complex and seriously need enhancement.

Of course, Apple's notion that this direction leads to disaster is typical of the questionable taste the company sometimes shows in its advertising. On the other hand, for the personal computer front at least, I support Apple's TV spot on this point: An awful lot of personal computer users believe, in a lemming-like way, that they cannot get their jobs done without an IBM-compatible machine upgraded to at least 512K bytes random-access memory and preferably outfitted with a hard disk and incredibly complicated software, irrespective of involved costs and, even more important, the difficulties of use.

Apple's approach via the Macintosh is the antithesis of the current emphasis by IBM software vendors on application systems requiring large machines, more complex operating systems and command repertoires so cumbersome they are impossible to memorize. Lotus Development Corp.'s Symphony, Ashton-Tate's Framework and IBM's Topview (when, as and if it appears) — examples in point — are simply not meeting the broadest range of requirements of the vast majority of business users.

Lemming-style thinking prevails

The ease-of-use factor has been heavily emphasized by Apple in the promotion of the Macintosh, and deservedly so. Yet in spite of the Macintosh's obvious advantages, lemming-style thinking prevails in the selection process in business circles, as demonstrated by the continuing domination of IBM and similar machines. Of course, other well-known problems with the system have played roles in limiting its acceptance within the business environment to date. (The office version of the machine — whose details were unavailable when this article was written — may resolve these problems and improve the acceptability.)

However meager, some free thought may be on the way. One of many reasons why the best-selling "sidekick" utilities program has become popular, aside from the fact that it supplies answers to important but mundane information-handling needs, is that IBM Personal Computer users have discovered at least one very useful and efficient business program that can run on their machines and does not require them to spend hours studying how to install the product, days to determine its compatibility with existing programs and weeks to memorize the contents of a 100-, 200- or 500-page operations manual. $

Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C.

Cluster training avoids 'duckling' syndrome

MANAGEMENT MATRIX
Walter F. Cuirle

You've been running a nice, tidy data processing operation in the corporation for a number of years. It's a taut ship, with projects generally finished on time and on budget. Clear weather and smooth sailing.

One day a friend calls. It seems they've bought a personal computer or two over in marketing and are wondering if you would mind sending someone over just to run a quick, informal, introductory seminar for the prospective users. This doesn't seem to be too much of a problem; there's a little slack in the time budget, so you do it.

A month later, you get another call from the same person. They've got a few new employees and ask if you would mind having that designated instructor repeat the seminar (people really got a lot out of it last time). The two of you agree on a charge back for the time involved, but you don't commit yourself yet. Your instructor is reluctant to repeat the seminar because of the calls for help that have been coming in since the last seminar. Besides, things are tighter this month and you've got to open up some time first; while you're looking for that, another department calls: "We heard about that seminar your people did for marketing. Do you think . . .?"

DP gets the job

Like it or not, DP often winds up with this job. If you were lucky, you were formally charged with providing this kind of support before any personal computers were introduced. If you were not, you wound up with the formal charge at about the fourth or fifth seminar request. Your department is now in the education business.

Education is time and labor intensive: The boss may like the chargeback arrangements on the seminars, but it upsets scheduling to have no real control over the demands that other departments put on you for support. The work requires your best "people" people, too. Sure, you could try to send over you star analyst, but as good as he is on the job, that person orders lunch mnemonically. The best candidates for instructors are often staff members in some kind of supervisory position precisely because of their interpersonal skills. They are the ones whose time you can least afford.

The real pitfall here isn't in finding staff time to formulate and present seminars; it is in the tacit assumption on the part of the participants that you will provide ongoing personal support. Often, particularly in small-group corporate settings, trainees will act like ducklings and call the instructor for all kinds of things after the course is over. It's flattering, but its wearing. You are not staffed for it, you probably don't want to staff for it, and even if you did, it just gets bigger and it's impossible to bill. Solve the duckling problem, and the rest will fall into place.

> ”
>
> *The real pitfall here isn't in finding staff time to formulate and present seminars; it is in the tacit assumption on the part of the participants that you will provide on-going personal support.*

The solution, at least in concept, may well be just outside in the computer room. Consider the difference between a star network with individual terminals and one with clusters. In a situation where every terminal must have a direct connection to the host, you know you are heading for trouble if you add lines willy-nilly. That's the situation your department is headed for if training and support are done by your human "communications handlers" — they get overloaded and nothing gets serviced effectively.

Mentor acts as cluster controller

Now consider clusters. When they are made up of people, the educational equivalent to the cluster controller is called a mentor. Mentors train and support the members of the group from their own departments for which they are responsible. They answer the telephone calls coming from members of their groups. Your department supports the mentors, but once you take a look at how the time works out, they are not ducklings anymore. They are swans.

The client department shoulders a fair amount of responsibility: The client has to nominate the mentor; the client has to free up that person's time for support; the group members, when they get the urge to act like ducklings, will go to their mentor rather than to your people. So far, these advantages for you look like decided problems for the client, but one thing outweighs all that. Because the nominee is selected from within the client department, the mentor already knows how that department operates and what the needs are. That's a powerful advantage for the client, and one your people could not supply as readily or as effectively.

Individual attention is essential if this is going to work at all. Fifteen is about the largest you should allow any group to get in either your sessions with mentors or theirs with their groups. Even that is pushing it; 10 is better. Don't give in to the temptation to expand the attendance —

See TRAIN page 58

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

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VIEWPOINT

Overhaul needed to bolster OAC attendance, interest

VIEWPOINT
Glenn Rifkin

The burning question in Atlanta late last month was, What's happening with office automation? Judging from the turnout at the American Federation of Information Processing Societies (Afips)-sponsored Office Automation Conference (OAC) '85, the answer was clear: Not much.

The show was a dreary affair for the second straight year with a noticeably small turnout from both attendees and vendors. At OAC '83 in Philadelphia, nearly 20,000 visitors poured into the convention center to see the wares of 150 vendors. Afips has stopped giving out attendance figures, but this year's turnout was probably half that of the Philadelphia conference and the vendor count was down to around 100. Cold and rainy Atlanta was certainly a turnoff, but last year in sunny, warm Los Angeles, the response was similarly poor.

Although heavyweights such as IBM, Digital Equipment Corp., Data General Corp., Wang Laboratories, Inc. and Hewlett-Packard Co. were all on hand, their presence was perfunctory at best. Not a single major announcement rocked the show, and the consultants and media spent their time at vendor parties wondering what happened to noticeably absent Apple Computer, Inc.

OA out of gas?

So what is happening to office automation? The consensus of the diehards who marched dutifully to Atlanta is that the term "OA" has simply run out of gas. It is difficult to find another explanation because the issues surrounding OA continue to be among the hottest in the industry. Yet to a good many MIS people, OA still conjures up images of word processing and electronic typewriters.

Clearly, OA has gone far beyond that. Integrated office systems with voice and mail capabilities, compatibility among vendors, personal computers, intelligent workstations, high-speed voice and data networks, communications, integrated software and a host of top priority issues fit easily under the OA umbrella. Unfortunately, it seems that a lot of key people in the data processing industry are unaware of that, and perhaps the time has come to finally put the weary term to rest.

The vendors have already begun to do just that. Only Wang continues to bill itself as the OA company. The others are selling integrated office systems, business automation and office information systems. Corporate America is apparently looking for a jazzy, sexy new way to describe the office of the future, and OA just won't cut it anymore. If OAC '86 is to avoid the continued decline of its recent predecessors (and its scheduled Houston location certainly isn't going to help), Afips should consider changing the name.

How about Integrated Office Expo '86? Or Office Info Systems Conference? Or Just a Big Show to Get You Out of the Office?

A new name, however, may not be enough. Trade shows in general are suffering in the computer industry. Attendance at many major shows, such as the National Computer Conference and Syntopican, has dropped in recent years and may be on the decline, and the large and influential vendors are beginning to question the value of being at these shows at all.

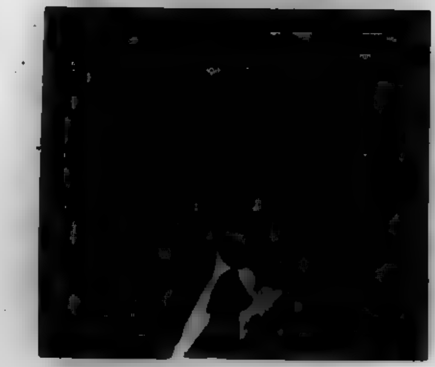
Said one vice-president of a major manufacturer, "The days of the exciting new hardware product announcements are over, and we're at the point now where the customer wants to know how to put all this stuff together." At a cost of an estimated $250,000 for some of the

See OAC page 58

Rifkin is Update editor for Computerworld.

Goal Systems

"MORE MANUFACTURERS CHOOSE US BECAUSE OF WHAT WE CHOSE: VAX."



Mark W. Ciotek
CEO and President
NCA Corporation

American manufacturers are facing a fiercely competitive and highly aggressive environment that's global in scope.

The key to survival in the face of all this is control. Control over shrinking profitability, increasing costs and reduced planning times. Which means automation through computerization.

But computerizing the manufacturing process is no guarantee of survival. Choosing the wrong approach could be just as costly as not automating at all.

As one person intimately involved with manufacturing, Mark W. Ciotek, explains: "Manufacturing today has to be treated as an integrated process instead of as isolated functions. Successful manufacturers are discovering that with the right approach to computer-integrated manufacturing (CIM), you can produce goods quickly without sacrificing quality."

Mark is CEO and president of NCA Corporation, a leading software developer and marketing company that's helping manufacturers stay competitive with a manufacturing resource planning (MRP II) system called MAXCIM.™

With 20 integrated modules, MAXCIM is designed to handle everything from financial planning in the executive office to job tracking on the factory floor.

"Our comprehensive approach requires a flexible computer system with a wide range of solutions," Mark points out. "That's why we chose Digital's VAX™ computers for MAXCIM. And that's why manufacturers are choosing us."

"VAX GIVES YOU THE WORLD'S MOST FLEXIBLE ARCHITECTURE."

Digital designed the VAX computing environment in a unique way – around one architecture and Digital's VMS™ operating system. "They're the only ones who have done this," Mark states. "As a result, we know we're working with the most flexible system available."

Included within the VAX computing environment is the VAX Information Architecture, a comprehensive system of integrated information management software products. From this vast array of products, NCA's customers can select those best suited for their needs.

Three of these VAX Information Management products – FMS™ forms management system, DATATRIEVE™ query language and report writer, and Common Data Dictionary – are used in conjunction with MAXCIM. By incorporating these products, MAXCIM optimizes the user-interface, and provides easy access and universal definitions for all of your data.

Customers also have the option of adding other Digital software such as DECnet™ networking software. The tremendous communications capabilities between Digital systems allows for unequalled distributed processing power. So you can access and exchange information –

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whether it's stored across the plant or at a plant across the country.

"Digital's approach to software is ideal for MAXCIM because the performance of an MRP II package is enhanced by the degree of integration between modules," Mark says. "And the superior integration within both MAXCIM and the VAX Information Architecture gives manufacturers the most flexible solution possible."

"AS PRODUCTION INCREASES, SO CAN THE POWER OF VAX."

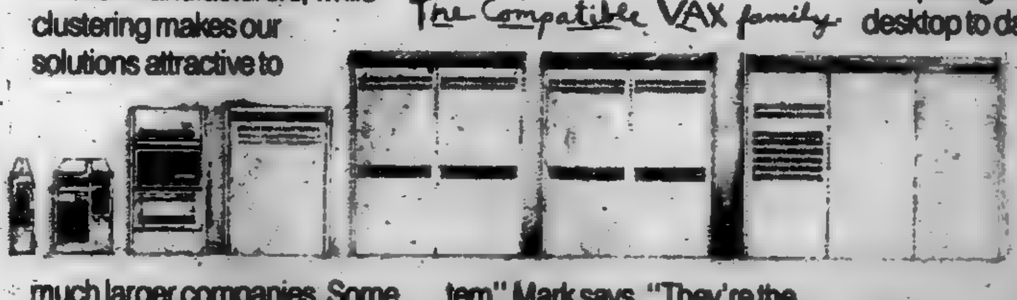
"The economies of manufacturing demand standardization and growth," Mark points out. "With VAX computers, our customers have both."

Every model in the best-selling 32-bit architecture, from the MicroVAX I™ system right up to the largest VAXcluster™ system, is compatible, providing an economical growth path from desktop to data center.

"Because of this compatibility, you can use MAXCIM across the entire line of VAX systems," Mark says. "So when our customers upgrade, they can bring their existing applications right along with them."

This eliminates the need to convert databases, retrain people or totally abandon your investment. And VAXcluster systems provide enough computing resources to meet virtually any requirement.

"VAX computers let us meet the needs of just about any manufacturer," Mark says. "The low-end of the VAX family is ideal for smaller manufacturers, while clustering makes our solutions attractive to much larger companies. Some of our business now comes from existing customers who are upgrading their Digital systems to meet their growing needs."



"DIGITAL IS THE LEADER IN THE MANUFACTURING MARKETPLACE."

"Digital has a solid reputation among manufacturers," Mark states. "After all, they're the leader in distributed processing and are committed to CIM with dedicated resources. And the VMS operating system provides an unparallelled path for growth."

In fact, Digital anticipates and meets manufacturers' needs so successfully that NCA developed MAXCIM to run exclusively on Digital systems.

"We've never felt the need to offer MAXCIM on any other system," Mark says. "They're the experts in systems and we're the experts in MRP II software. Together, we can offer manufacturers the most comprehensive solution.

"Our customers have found that this is the ideal solution for them. With this kind of success," Mark concludes, "we'll never second-guess our choice of VAX computers."

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VIEWPOINT

OAC from page 55

large companies to set up shop for three or four days (not to mention the man-hours of having key personnel on hand), the return may simply not match the costs.

The conference sponsors claim that although attendance is down, the people who do show up are the "quality" types, the serious buyers. At OAC '85, it was difficult to assess who the buyers were. At many booths, company employees were simply standing around talking to each other. At the busier stands such as IBM, DEC, DG and Wang, the number of booth attendants certainly equaled visitors, and if volume sales were being made, it was hard to pick out who was doing the buying.

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> *Said one vice-president of a major manufacturer, 'We're at the point now where the customer wants to know how to put all this stuff together.'*

The usual OA big names such as Amy Wohl and Michael Hammer drew packed sessions, but the rest of the schedule was redundant and inert.

One particular session promised a debate between Karen Nussbaum of the labor interest group 9-to-5 and a trade association representative on the potential health hazards of the VDT. Nussbaum failed to show up but the panel plunged onward and gave 90 minutes to one side of the issue.

Whatever the root of OAC's problem, it is clear that change is in order if it is to survive. Perhaps the end users of America have discovered what Hammer has been saying. There is no such thing as OA; there are only specific business problems that need solving. And perhaps they have discovered that trade shows are simply not the format for finding the answers. ‡

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there's no advantage in it.

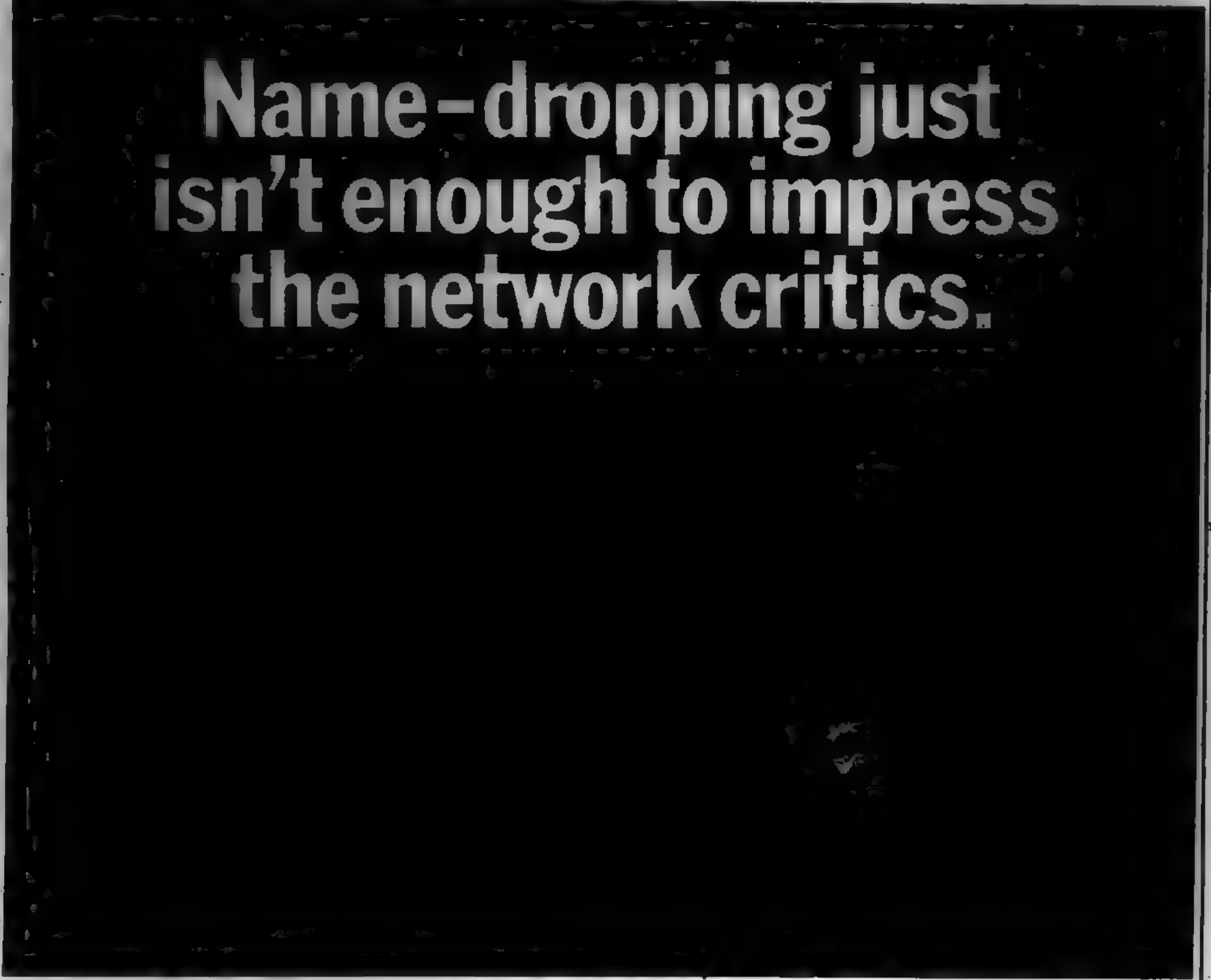
Returns start to diminish rapidly when sessions run over three full days. Less than half a day is relatively ineffective for a formal session. One to two days is nice. Allow the preparation time for your staff person to equal the scheduled length of the seminar if the session has been run before and at least twice that if it's new.

Try to limit your sessions with the mentors to once a quarter but at least that often. Even if the mentors don't have any new applications or apparent changes, your people can offer them "advanced" training and handle their common problems, and they will pick up new points of view about how your operations fit in with other departments'. The sessions are useful for both sides, keep channels open and ultimately cut down on support calls to your people.

Now look at some numbers. Consider one three-day initial session with three one-day advanced sessions on a given package over the course of a year. That's 18 workdays — including new session preparation time — from the year's time budget to train 10 mentors and potentially 110 users altogether. If each mentor makes one 15-minute support call to your staff each week, that's about 16 additional workdays for the year. Overall, you will need to free up about 9% of a work year on your staff to do all of this. That's not impossible.

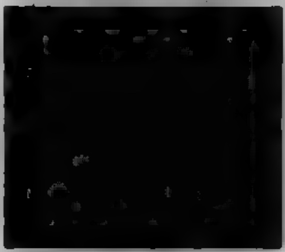
Compare that with the direct training of 110 people. The initial session alone would cost you 69 workdays covering 11 sessions in 10-people groups. Does one 15-minute support call every week from each seminar participant for the first month following the session sound reasonable? Given a session a month, that's an astounding 1,100 calls in a year — about 34 workdays answering essentially the same questions. It costs 25% of a work year just for the initial session — roughly three times the cost for half the actual instruction under the mentor system.

Swans are beautiful.


Name-dropping just isn't enough to impress the network critics.

Now that the local area network (LAN) industry is booming, some pretty big names in the computer business are jumping on the bandwagon. Their goal is simple: get a LAN on the market and let all those who pay homage to The Name run out and buy it.

At Novell, we don't have a big name to drop when selling NetWare, our high-performance LAN operating system. So we let our technology do the talking. And the network critics are not only listening, they are taking notice.



Performance.

No LAN operating software outperforms NetWare. With speed, flexibility, security and hundreds of multiuser applications, NetWare sets a standard for the entire LAN industry.

Versatility.

NetWare is more than a LAN operating system. Currently, NetWare software is available for 24 LAN hardware systems. Plus, four complete LAN systems are sold and serviced by Novell.

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Because NetWare is compatible with DOS 3.1, it can run any application written for the IBM PC Network Program. And NetWare greatly increases IBM PC Network performance and applications software useability.

Internetworks.

Using bridges, NetWare can connect separate LAN systems into one large internetwork. In fact, every LAN Novell supports can be interconnected—any number, in any of the various topologies.

Remember the name.

The one LAN system making a big impression on the network critics is the one with the not-so-big name: NetWare, from Novell. Remember it when you want a high-performance LAN instead of a high-powered name.

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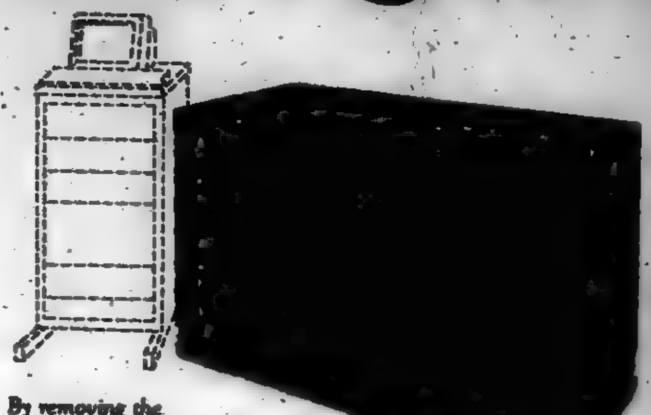

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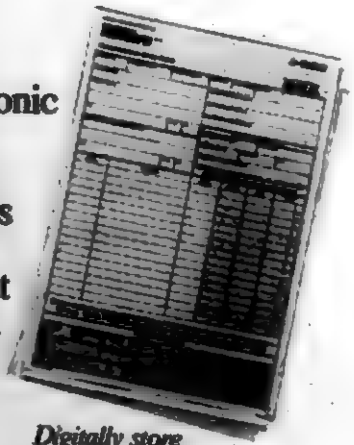

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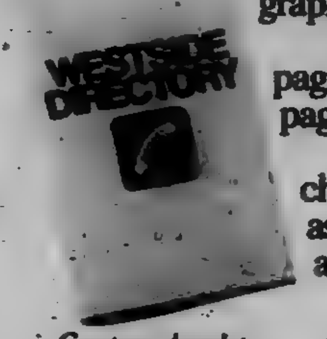

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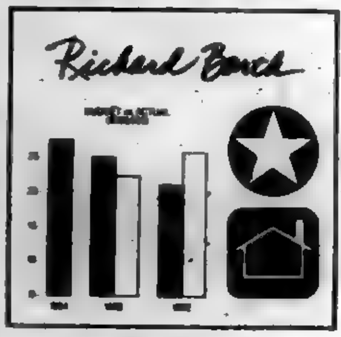

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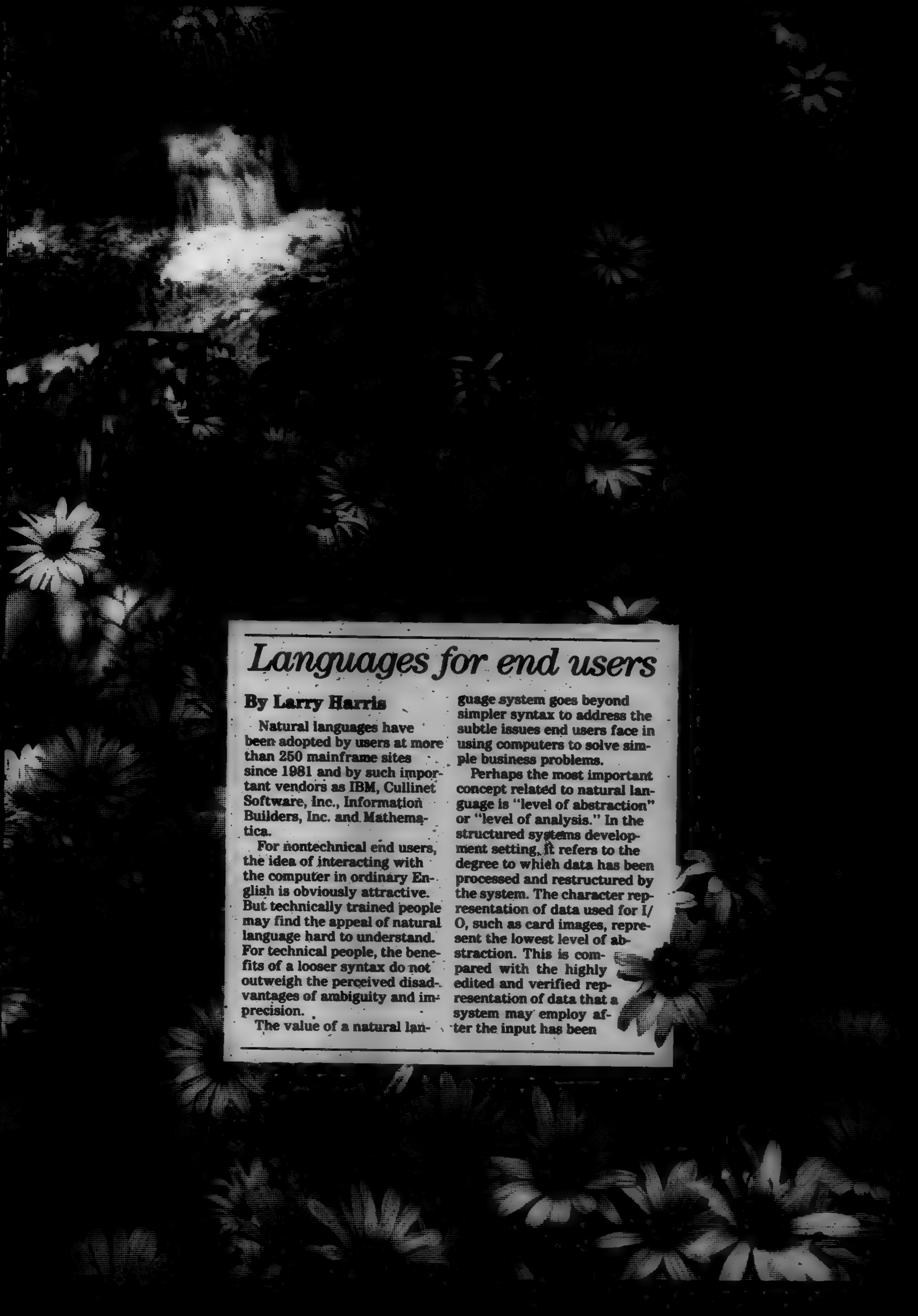

Languages for end users

By Larry Harris

Natural languages have been adopted by users at more than 250 mainframe sites since 1981 and by such important vendors as IBM, Cullinet Software, Inc., Information Builders, Inc. and Mathematica.

For nontechnical end users, the idea of interacting with the computer in ordinary English is obviously attractive. But technically trained people may find the appeal of natural language hard to understand. For technical people, the benefits of a looser syntax do not outweigh the perceived disadvantages of ambiguity and imprecision.

The value of a natural language system goes beyond simpler syntax to address the subtle issues end users face in using computers to solve simple business problems.

Perhaps the most important concept related to natural language is "level of abstraction" or "level of analysis." In the structured systems development setting, it refers to the degree to which data has been processed and restructured by the system. The character representation of data used for I/O, such as card images, represent the lowest level of abstraction. This is compared with the highly edited and verified representation of data that a system may employ after the input has been processed. This is the same information at a higher level of abstraction.

A natural language system is a perfect example of several levels of abstraction in a simple system because it must represent the input request in so many forms. The original input appears as a simple character string, the lowest level of abstraction. Subsequent analysis will represent this same request as a linked list structure of the words in the sentence, the syntactic parse tree representing the syntactic structure of the sentence, and ultimately the semantic list structure that represents the meaning of the request. This is the highest level of abstraction.

Level of abstraction is so important because a given problem is nearly always best solved at a given level. To solve it at that level with the proper data representations is usually very easy. To attempt to solve it too early or too late at the wrong level of abstractions and in the wrong data representation can be extremely uncomfortable. Many problems in system development can be traced to an attempt to solve problems at the wrong level of abstraction, on the wrong data structure. An understanding of this issue is an absolute requirement for effective problem solving of any kind and particularly when using computers. An excellent reference on this subject that illustrates its importance even on complex biological systems is "The Architecture of Complexity" by (Nobel Laureate) Herb Simon.

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> ***Many development problems can be traced to an attempt to solve problems at the wrong level of abstraction on the wrong data structure.***

The importance of this concept with regard to end-user interaction with computers has nothing to do with the internal design of natural language systems. The issue arises because the end user is solving problems. The user wants information that will help solve a real business problem. In essence, the hidden value of a natural language system is that it is a tool at the correct level of abstraction for business problem solving. The issue of easy syntax turns out to be of little importance when compared with the necessity of providing a tool at the proper level of analysis for the user.

All formal computer systems provide a small set of primitive operations for the user. It is up to the user to specify the proper sequence of these primitive operations to solve the overall business problem. Indeed, this is the essence of programming. The only difference is the level of power associated with the primitives. Assembly language provides very weak primitives. Procedural languages such as Fortran or Cobol were a major improvement but still offered relatively weak primitives. Structured programming languages such as PL/I or Algol provided more modular, but still very weak primitives. It was not until the advent of the fourth-generation languages that the primitives became much more powerful.

It should be clear that the concept of level of abstraction really underlies all of this. The entire evolution of programming languages, in a sense, is nothing more than the primitive operations taking place at higher and higher levels of abstraction. That is, they are further and further removed from the physical representation of data on the machines.

I will even include the spreadsheet languages such as Lotus Development Corp.'s 1-2-3 in this discussion. The users of 1-2-3 do not think of themselves as programmers. But in this view, anyone who specifies solutions to problems as a sequence of primitive operations on a computer is indeed programming. The only difference is the level of abstraction of the primitives. The 1-2-3 package appeals so much to users because it provides a set of primitive operations at an appropriate level of abstraction for solving a broad set of important business problems. Indeed, it is an ideal illustration of the power of providing tools at the appropriate level of abstraction and why this concept is so important for assessing end-user problem solving on computers.

Business problem solving

The effectiveness of a business problem-solving tool is related to the degree to which the user can stay at a constant level of abstraction. If the user is forced to bounce back and forth across a variety of different levels of abstraction, he will not be able to solve effectively the business problem at hand. If, on the other hand, the user is able to remain on a constant plane of thought, the solution will be a relatively straightforward sequence of primitive operations.

A good example of the problems caused by mixing levels of abstraction arises in the use of fourth-generation languages. If the problem is such that it can be expressed fully in terms of the nonprocedural primitives, it will be extremely easy to solve. But, if the problem is such that one exceptional situation forces you outside the nonprocedural primitives, then the solution to the problem will be much more complex — if it is even possible.

It is important to realize that we give something up as we use higher and higher level languages. The

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scope of problems they can solve becomes more restricted. The one positive thing that can be said about assembly language is that it can be used to solve any type of problem.

As we go up from there, we give up the ability to solve all problems to solve a more narrow range of problems more effectively. In general, a problem should be solved with the highest level language that can solve it.

There is an even more critical reason why mixing levels of abstraction must be avoided. Very often, switching to a lower level of analysis requires a different kind of knowledge. For example, switching to assembly language for one procedure in a PL/I or Cobol system clearly requires a different set of skills. It is this simple fact that ultimately paralyzes end users in their attempts to use even the high-level fourth-generation tools to solve their problems. They are occasionally required to know things that they simply do not know. It is an obvious manifestation of being forced to use a tool at the wrong level of abstraction.

A perfect example of this is the join clause in a relational data base query. If the user's request requires data from two or more tables (files), then the user is required to include a clause such as "Table1.key = Table2.key." The user may not even know that the data resides in two separate tables, much less what keys must participate in the join. Forcing end users to interact at this level of abstraction forces them to specify things that they simply do not know or understand. For this reason, it is even more critical to provide a tool for end users that allows them to work on a constant level of abstraction that is appropriate for them.

What is right level?

What is the right-level tool for end users? Why aren't the fourth-generation languages and relational query tools appropriate? These are important questions in understanding the value added by the natural language approach. The answer comes once again from considering the different levels of abstraction involved in the representation of data.

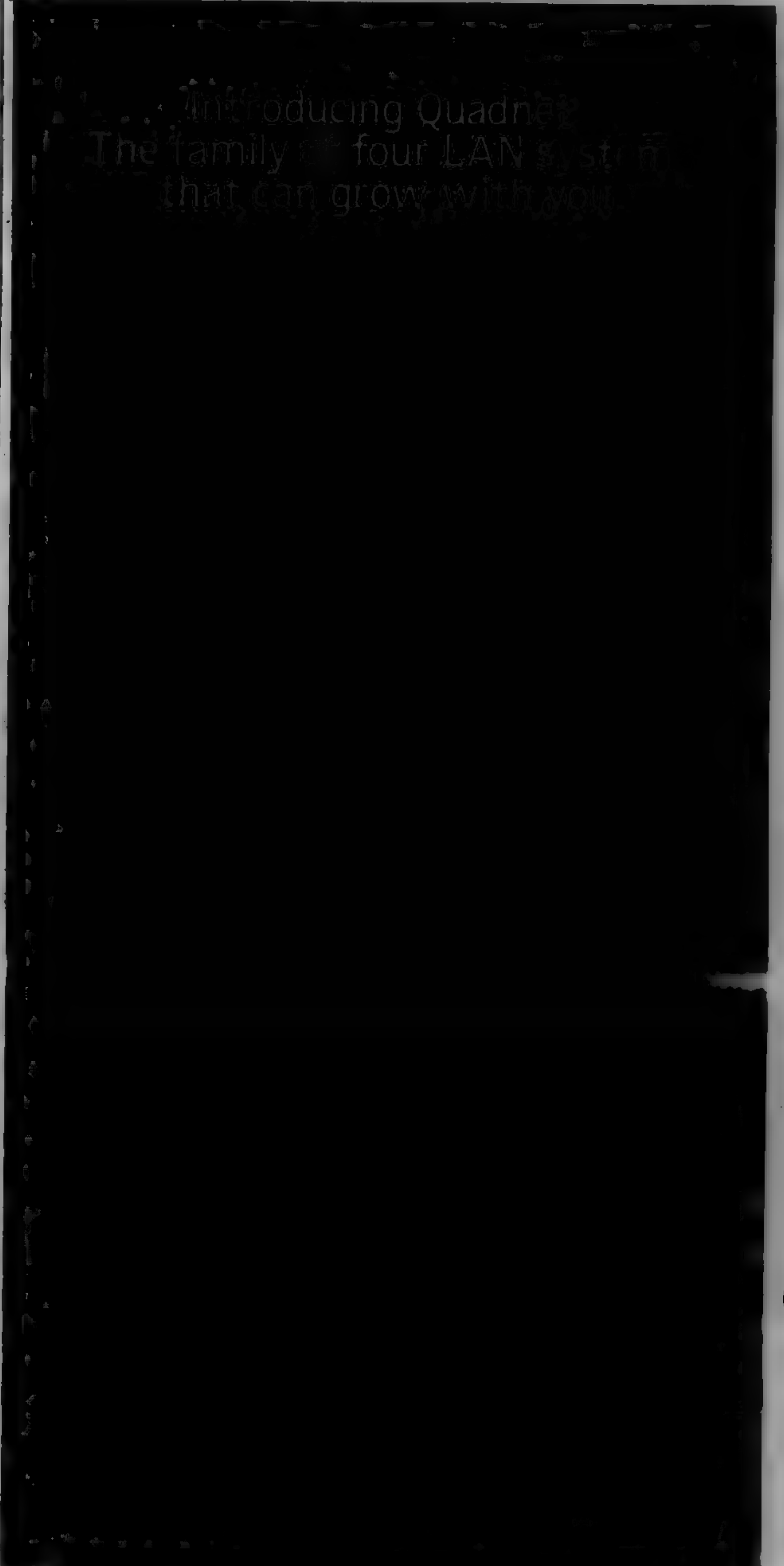
Since the early days of data base theory, it has been recognized that there are at least three important views of the data: the physical level, the logical level and the conceptual level. The physical level represents how the data actually lives on the storage medium. It is the lowest level of abstraction. The logical level represents how the data looks to the application programs that build and manipulate the data. Simply stated, it is the role of a data base management system (DBMS) to map requests for information from the logical level to the physical level.

This role may sound unimportant, but we are all aware of the important benefits that this data independence provides to the application programs. Actually, an entire generation of maintenance problems was caused by application programs working too close to the physical level, that is, at the wrong level of abstraction. Nearly everyone who has been in the data processing business for more than a few years has experienced the painful impact of this mistake.

The conceptual view represents the way users think about the data. This view has nothing to do with computers, because users thought about their data long before computers were invented. Expecting users to interact with the computer at the logical level is even worse than forcing application programs to work at the physical level. At least the application programmers knew enough to make programs work at the physical level — they were just impossible to maintain. Again, forcing the end users to work at the logical level requires a knowledge level that they just don't have.

What is needed is a facility that is the analog of a DBMS, with the exception that it map from the conceptual view to the logical view. This facility would allow end users the ability to interact consistently at the conceptual level of abstraction. It is important to note that if we do not provide such a conceptual-to-logical mapping facility, the user is forced to carry out this mapping himself.

All business problems originate at the conceptual level. There were business problems even before there



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were computers. These problems are clearly independent of any particular logical data base design that we might choose. Of course, asking the user to carry out this mapping is equivalent to asking the user to interact in, and thereby fully understand, the logical view.

Conceptual view

The proper facility for automating this mapping from the conceptual to the logical view is a natural language system. It is crucial to realize that since the conceptual view is the way the user thinks about the data, this view is inherently ambiguous, inherently informally structured and inherently thought of in the user's natural language — namely, English for those of us in the U.S. A commitment to dealing with the user's conceptual view is a commitment to dealing with the English language (and a lot more), because this is the language in which the user thinks.

To introduce any other formalism is to require the user to map from the English conception of the problem to its formal representation. To do so is to avoid solving the exact problem we are trying to solve. Simply stated, the real value of a natural language system is that it allows users to interact at the only level of abstraction with which they are comfortable: the conceptual view. As we can see, this has very little to do with syntactic issues but addresses issues that almost everyone with a technical background has felt directly — solving a problem at the wrong level of abstraction. An example of how this applies in the case of end users will drive the point home.

Consider a product brand manager trying to understand why overall sales were off for his product line so that he can determine the proper corrective action. Assume that he has at his disposal a data base containing the actual and estimated sales for all products for the past year, for all markets and all channels of distribution.

By probing the data, the brand manager may determine that only certain markets are off and that additional advertising may be the proper response. It may be that only a single wholesaler is below plan and that pushing that wholesaler or establishing a new channel is the proper reaction. A sequence of questions such as the following would get at the heart of the issue:

SHOW ME THE SALES PERFORMANCE OF EACH PRODUCT LINE.

In Figure 1, note that year-to-date copier sales are below plan. The next step might be to look at copiers in more detail.

HOW DID COPIERS PERFORM LAST QUARTER IN EACH MARKET?

Figure 2 shows that copier sales are down in the last quarter in nearly all markets. Perhaps the next step should be a graphical display of each of the copier products.

GIVE ME A BAR GRAPH SHOWING THE ACTUAL AND PLANNED COPIER SALES OF EACH PRODUCT.

The graph might show that sales of medium-size copiers are off the most. The user could go further,

AGAIN, BUT FOR MEDIUM-SIZE COPIERS IN EACH DISTRIBUTION CHANNEL.

The resulting graph might show that sales for the medium-size copiers are dramatically off through distributors.

This sequence seems very natural and very simple. It was carried out on a consistent level of analysis. It was independent of the underlying data structure and allowed the user to concentrate on the business aspects of the problem without having to interrupt his train of thought and worry about technical details with

SHOW ME THE SALES PERFORMANCE OF EACH PRODUCT LINE.

PRODUCT	1985 ACTUAL YTD SALES	1985 PLAN YTD SALES	% OF PLAN
COPIER	$127,326,988	$186,986,000	68.1
COMPUTER	$261,708,960	$226,743,600	115.4

Figure 1

HOW DID COPIERS PERFORM LAST QUARTER IN EACH MARKET?

MARKET	1985 ACT Q2 SALES	1985 PLAN Q2 SALES	% OF PLAN
ATLANTA	$1,973,868	$4,672,800	42.4
BONN	$5,121,580	$4,996,200	102.5
BOSTON	$2,362,824	$3,602,000	65.6
BRUSSELS	$1,944,633	$2,592,000	75.0
CHICAGO	$6,766,871	$6,759,200	100.1
CINCINNATI	$1,844,016	$2,818,400	65.4
DALLAS	$3,126,773	$4,672,800	66.9
DENVER	$2,902,110	$3,684,000	78.8
GENEVA	$3,414,267	$3,708,400	92.1
LONDON	$4,184,612	$5,054,400	82.9
LOS ANGELES	$6,613,487	$6,867,200	97.1
MEMPHIS	$2,716,907	$3,026,600	89.8
MIAMI	$1,448,977	$3,713,600	39.0
NEW YORK	$7,150,505	$8,755,200	81.7
PARIS	$2,396,381	$4,406,400	54.4
PHILADELPHIA	$3,596,818	$5,864,400	62.5
SALT LAKE	$1,499,433	$1,872,000	80.1
SAN FRANCISCO	$4,642,842	$5,046,800	92.0
SEATTLE	$1,840,753	$2,836,800	64.9
WASHINGTON	$7,788,328	$7,750,400	100.5

Figure 2

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which he is not trained to deal.

In order to appreciate the value being added by the natural language system, let us consider the nature of the mapping from the user's conceptual view to a typical logical view for this type of data base. In doing so, we will see the issues the user would have to deal with in order to carry out this mapping himself. Forcing the user to deal with these issues is inappropriate.

In addition to structural issues, we have performance considerations. Often, these data bases are so large that subtotals must be stored within the data base to avoid having to calculate them on the fly.

Logical view

In order to provide the information needs of a marketing manager, the marketing data base must contain both actual and estimated sales information over several time periods, which may stretch across several years. In addition, the information must be available for all product lines, each product within a product line and for all distribution channels. Not every problem will require analysis along each of these dimensions, but the data base design must be sufficiently general to handle analysis along each dimension.

The structure of this data is complex. It could be represented in many different ways. It could be in multiple files, one for actual data and one for estimates. It could be stored in several multiple dimensional arrays. It could be stored in relational normal form. It could be stored with the time periods as fields or with time periods as data values. Data base designers will argue over the one best structure. The user, of course, couldn't care less, because the conceptual view is independent of whatever logical design we might choose. However, the user will have to care if we ask him to understand the particular design we elect.

There are various issues that the user must deal with in order to express the first question in the logical form of a fourth-generation language. The issues are of two types: the mapping from the conceptual view and the manipulation of the data to bring it to the proper level of analysis.

Conceptual mapping

These issues relate to where and how the data is stored in the data base. The user must confront the obvious issues of what files to access, fields to retrieve and records to select. Each of these has surprising subtlety.

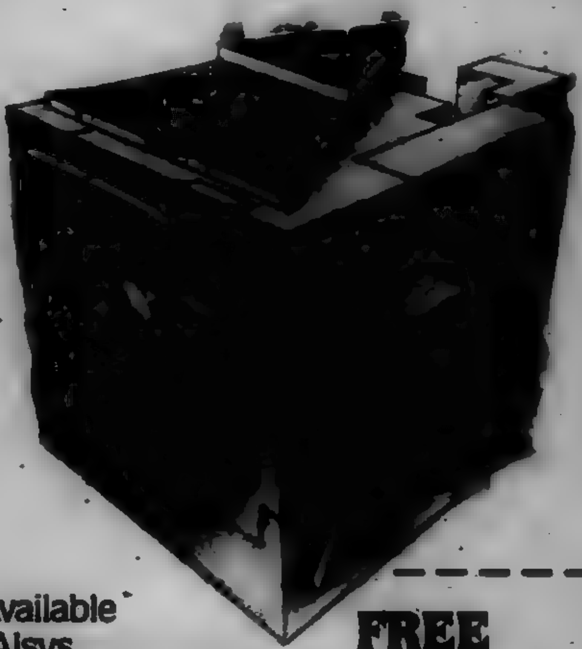
Even the most basic issue regarding which files need to be accessed raises questions. Is all the data in one file? In multiple files? If it is in multiple files, how must the files be joined together?

Expressing which fields to retrieve can be extremely complex. Because the data represents a time series, it may be stored in a periodic group within the data base. In this case, the user must enter a subscripted name such as SALES(16) or SALES(131). The burden of mapping "actual & estimated sales for last month" to this cryptic form would fall upon the user. On the other hand, the field names might be mnemonically named, such as "84-ACT-AUG-SALES" and "84-EST-AUG-SALES."

Even with this improvement, we are forcing the user to think in extremely rigid terms by insisting that every name be fully qualified in a precise order. Even employing one of the form-filling menu schemes does not work on this type of data base, because there may be literally hundreds of time periods, making it extremely time-consuming to scroll across many screens to select them for retrieval. It is hard to imagine a simpler or more natural way than just typing "last month's actual and estimated sales" or "Jan act and est sales" to minimize typing.

Expressing the criteria for record selection is surprisingly subtle. It is obvious that the user wants data for the copier sales, but is "copier" a product line or a product? Is it coded in the data base? If so, how? Does it appear as one code or a different code for each type of copier? Worse yet, if subtotal records are stored in the data base along with detail records, the user must be sure to select them in or out, depending upon the dimension along which the summarization is to be performed.

For example, our second question requires subtotaling



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copier records over the copier product line and all distribution channels. Subsequent requests require more specific analysis within certain distribution channels but summarized across all markets. End users do not normally think in these terms, as is evident from the fact that they do not explicitly ask to subtotal for all channels and markets and all products within the product line. These issues are implicit in the user's conceptual view and must be defaulted properly.

It should be evident from this discussion why many users have resisted using the formal tools we have put before them. These tools require a level of precision and detail that is not required of the user on the conceptual level. The user does not have to understand the solutions to these technical issues in order to express perfectly coherent questions in ordinary English.

Tools for mapping

A good natural language system uses two tools to address the conceptual mapping problem. The first tool is the lexicon, or dictionary, which defines each word or phrase in the user's conceptual view in terms of how it is represented in the logical view. In a sense, the lexicon represents how the conceptual view maps to the logical view on a word-by-word basis. The second tool is the English grammar that the natural language system employs to direct the process of merging the definition of individual words into the meaning of individual phrases and, ultimately, into the meaning of the entire request. The English grammar effectively leverages the finite number of word-by-word definitions into an infinite number of ways that those words can be employed in requests by users.

In addition to the conceptual mapping problem, the user is forced to deal with another issue in using a formal tool to solve business problems. Since the raw data is rarely at the appropriate level of detail to address the business problem directly, some form of statistical summarization is nearly always needed to bring the data up to the correct level of detail. In all our examples, the information desired required summarization above the detail level.

The problem goes beyond this, because in many cases the results of the summarization must be fed into the next level of analysis. Hence, the nesting of statistical functions is required in a way that poses difficulties for most end users. Today's fourth-generation languages make it extremely easy to generate the subtotals, but it can be very awkward to use these results in further calculations. In many cases, temporary variables or hold files must be employed. These require a whole new dimension of understanding for end users to use them effectively. However, even simple business problems require their use.

The solution to the data manipulation problem does not require particularly sophisticated statistical routines but rather a facility for automatically nesting several levels of very simple statistical functions. The nesting of total, minimum, maximum, average, comparison and a few other functions are sufficient for a wide variety of business problems. The need for sophisticated techniques such as Box Jenkins analyses or multiple linear requisition is the exception, not the rule.

The solution to the data manipulation problem involves the orchestration of the nested computations required to answer the user's request. In some cases, this is done by generating a fourth-generation language command stream. In other cases, when working directly with a DBMS, the natural language system must be capable of carrying out the computation itself.

The key point is that the system automates the intricate process of feeding the output of one statistical function into the input of another. This automation is particularly useful in a natural language setting where the user might not even have explicitly mentioned both statistical functions. Take, for example, the request to "Give me a pie chart of the sales of each product." The system would know that subtotaling by product is required input to the pie chart display even though it was not explicitly asked for (and perhaps not even consciously thought of) by the end user.

The beauty of this orchestration concept is that it can be pushed even further. There is no reason why a natural language system must be content in orchestrating the execution of statistical functions. The concept is easily extended to include data base systems and graphics systems. In this capacity, the natural language facility acts as a high-level operative system for the end user. He can take advantage of the capabilities of these subsystems without the need to become familiar with each one of them and without having to learn how to pass data from one subsystem to the other.

It is easy to understand why end users react to the natural language approach so strongly. The value is not so much in the simpler syntax as in the fact that users are allowed to express requests within their own conceptualization of the data. The natural language interface will perform the mapping from the conceptual view to the logical view and place together the necessary statistical calculations over the data.

About the author

Larry Harris is president of Artificial Intelligence Corp. in Waltham, Mass. Harris has taught at Cornell University and Dartmouth College and provided professional development instruction for Yourdon, Inc. He is the designer/author of the Intellect system.

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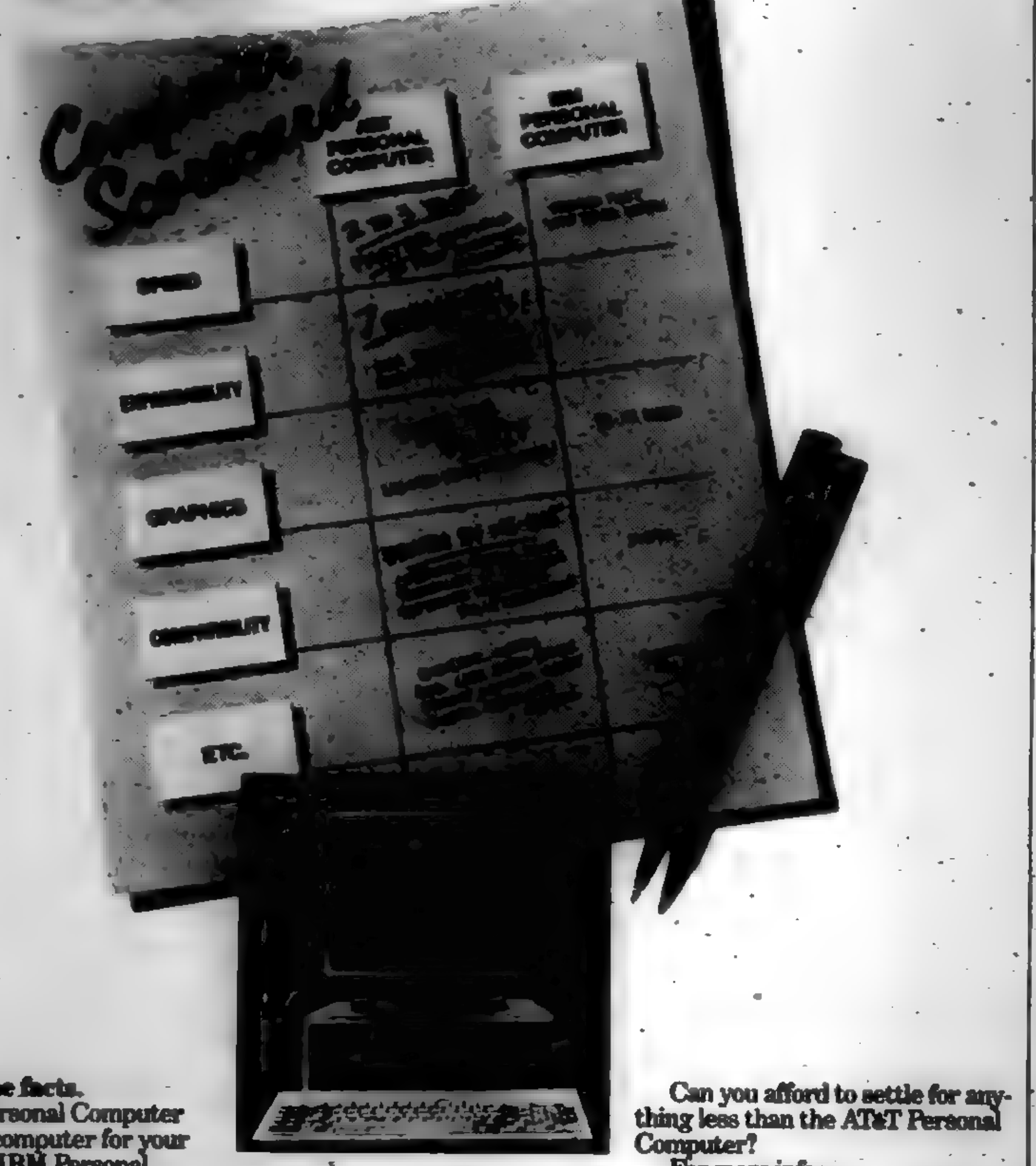

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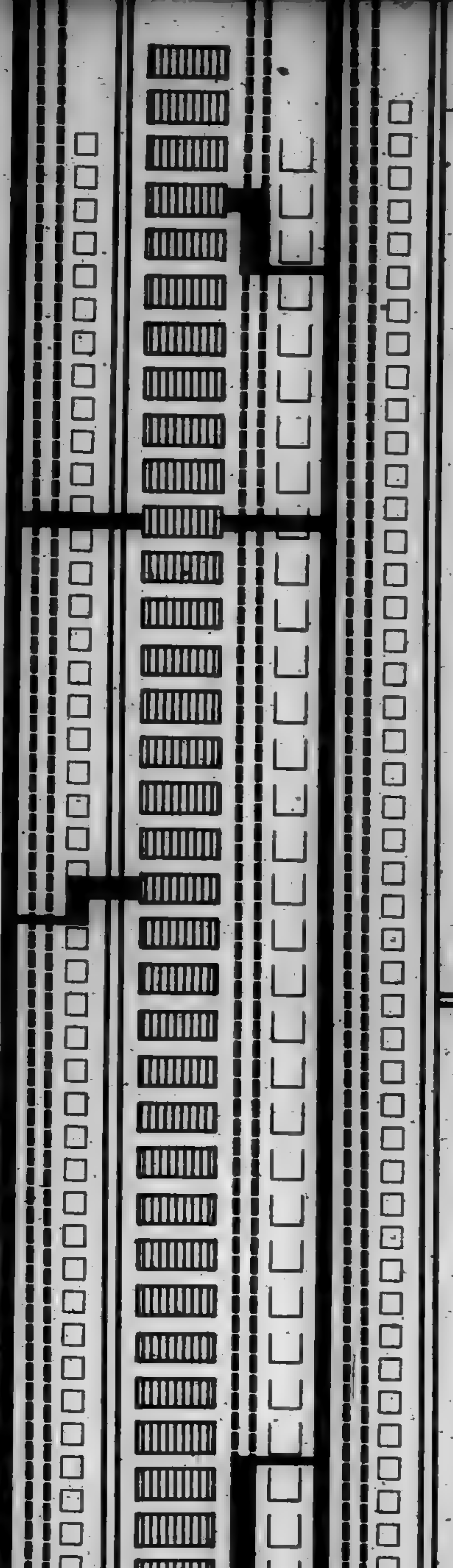

The PBX: equal rights for voice and data

By Holger Opderbeck

With the introduction of PBXs that support virtual connections, we have now reached a point where PBXs support voice and data switching equally well, At last, PBXs are not dominated by voice switching anymore.

It is an irony that private voice switches have pretty much been limited to switching voice connections even though none of their names include the word "voice." They are called private branch exchange (PBX), private automated branch exchange (PABX), computerized branch exchange (CBX) and so on. Yet the information typically exchanged is just voice.

In the early 1980s, PBX manufacturers elected to offer PBXs that handle data traffic in addition to voice traffic (for example, Rolm Corp.'s CBX and Northern Telecom, Inc.'s SL-1). These PBXs took the basic approach of making the data look like voice.

The devices that were used for this conversion had names like Data Terminal Interface (Rolm) or Add-on Data Module (Northern Telecom). Data is accepted by these devices via an RS-232C interface, encoded into a digital bit stream (usually 64K bit/sec) and switched like a voice connection. Thus, these PBXs provided only a very low level of voice/data integration. They were dominated by the voice switching requirements. Data was introduced into these systems as an afterthought.

Since 1984, PBXs have been available with architectural capabilities that deal with voice and data on an equal basis. Examples include Intecom, Inc.'s IBX; GTE Business Communication Systems Omni; Ztel, Inc.'s PNX; and CXC Corp.'s Rose.

These PBXs use switching techniques that are well-suited for both voice and data. They are not limited by the fixed bandwidth allocation schemes used for voice switching in the past, but allow more flexible, dynamic bandwidth allocation even on the local access line. At last, we are seeing the emergence of PBXs that are not dominated by voice switching anymore.

The PBX has long held immense potential as the most economical and workable solution for the rapidly growing voice and data communications needs of business. This potential has not gone unrecognized, but until now it has gone largely unrealized. For years, manufacturers and users of PBXs have seen that their central voice switch would also be the ideal candidate for accommodating their data switching requirements.

Numerous advantages

The points in favor of the PBX as a data switch are numerous. First, the PBX provides an existing network of installed lines that runs from every office to the central switch, creating a de facto local-area network. Second, the PBX can be connected directly to long-haul transmission networks via T1 interfaces using media such as conventional cable pairs, coaxial cables, fiber optic, satellite and terrestrial microwave links. These interfaces provide high-speed access to public and private communications networks. Third, PBXs have always provided the most sophisticated administration and maintenance capabilities required to manage complex telecommunications systems.

The problem, therefore, was one of technology, of fulfilling the potential of the PBX in the area of data communications. Over the last five to eight years, the attempts to produce a completely integrated voice/data PBX have brought it through three basic phases of development. With each phase, the data capabilities of the PBX improved, and the true integration of

> **"**
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> ***The entry of PBXs with digital local access into the market in the early '80s marked the beginning of the second phase of integrated voice/data communications.***

voice and data moved a step closer to reality.

The first phase of data handling was characterized by the use of modems. During this phase, the PBX was essentially unaware of the fact that it was handling data.

The second phase introduced digital technology on the local access wires. Digital technology made it possible for the PBX to handle data more effectively but still left unresolved the fundamental problem of accommodating the unique characteristics of data traffic.

The third phase is characterized by the emergence of a truly integrated voice/data PBX, with switching and local access capabilities that serve voice and data equally well.

In order to appreciate fully the advantages of the third phase of voice/data integration, it is necessary to briefly review the approaches and limitations of the first two phases.

From the late '70s until 1980, PBXs were designed and built to act as voice-only switches. Figure 1 shows a symbolic representation of a switching matrix. The solid black areas represent dedicated bandwidth in the switching matrix and on the local access line. Although data could be sent through these early PBXs, the data stream had to be converted to a format that made it look to the PBX like a voice call.

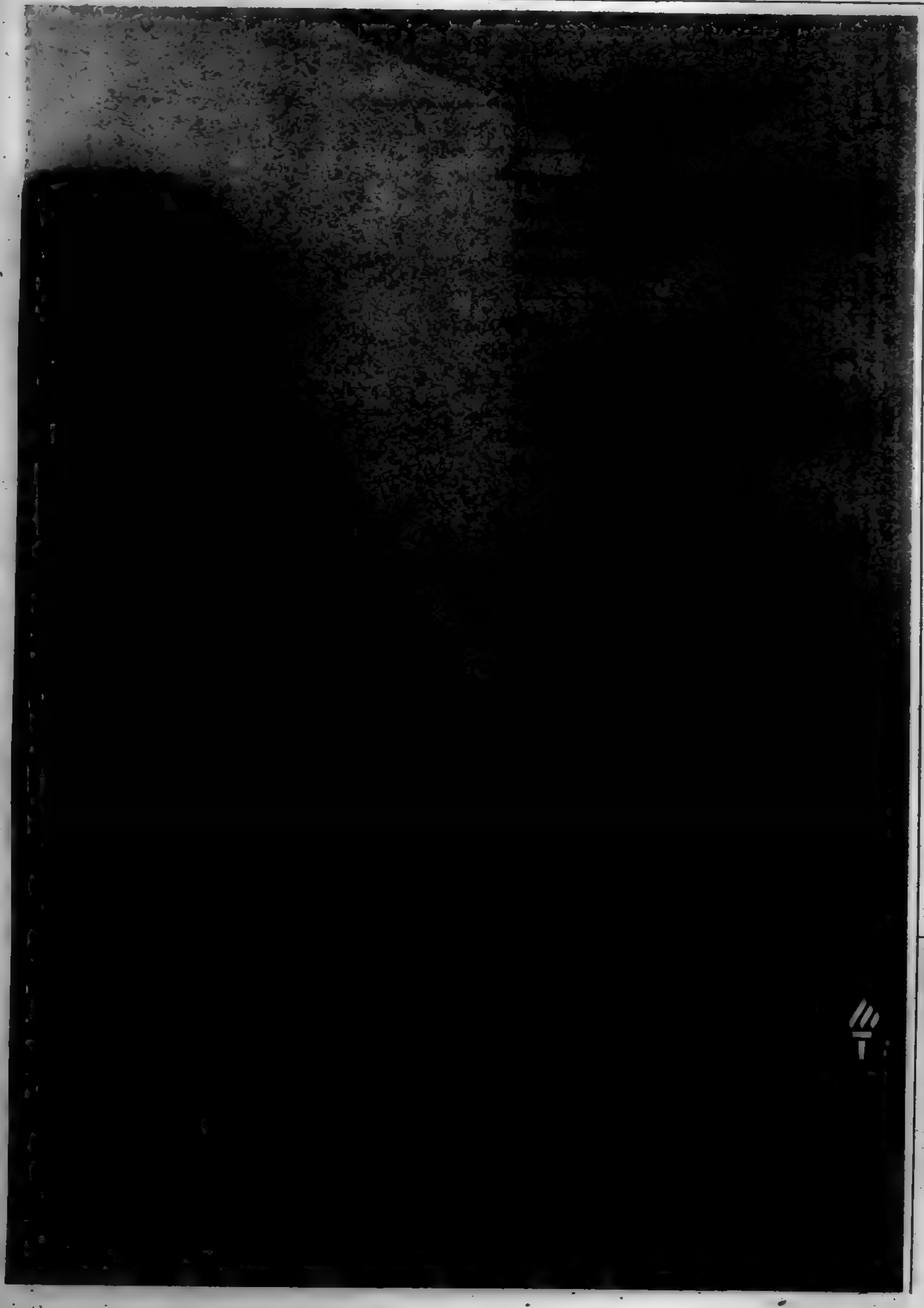
This conversion to voice format at the input and back to data format at the output was accomplished by modems. Thus, PBXs handled data in the same way data was handled for transmission over the public telephone network. Usually, a telephone was associated with the modem to set up the data call in a way that is very similar to dialing voice calls.

Phase I PBXs were unable to provide error correction or concentration of data into high-speed lines or ports. This inability meant that all data had to be switched on a direct line-to-line, low-speed access basis. These constraints not only limited the value of the PBX for data communications, but also demanded substantial investment to support any data communications capability at all. The cost of modems was compounded by the cost of lost voice capacity. The more extensively the PBX was used for data communications, the higher the cost in terms of lost voice capacity.

Conflicting demands

The major factor hampering these early PBXs was the conflicting demands that voice and data traffic impose on switching systems. Phase I PBXs were designed specifically as voice switching devices.

Voice-only PBXs are built for call durations of only a few minutes, which is characteristic for voice calls in the office environment. They dedicate a fraction of the available switching capacity to each voice call. This is an effective way of handling



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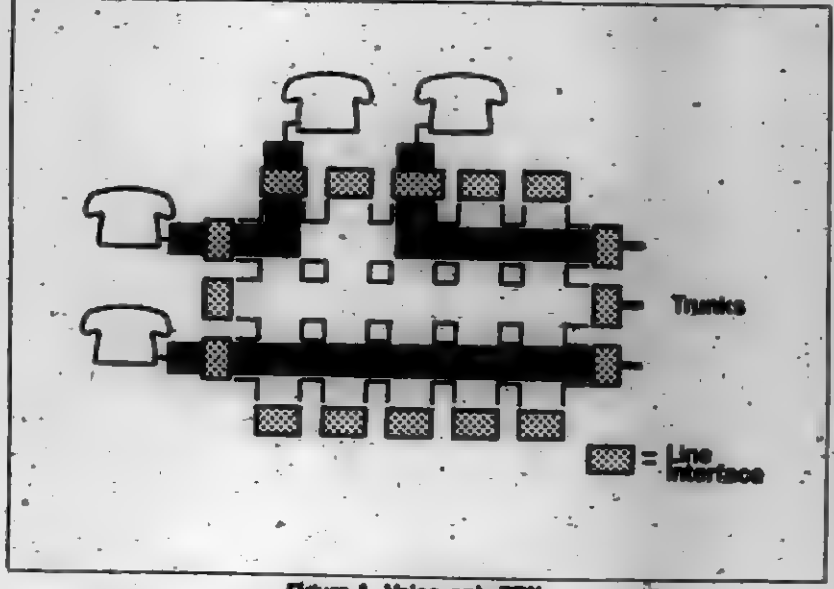

Figure 1. Voice-only PBX

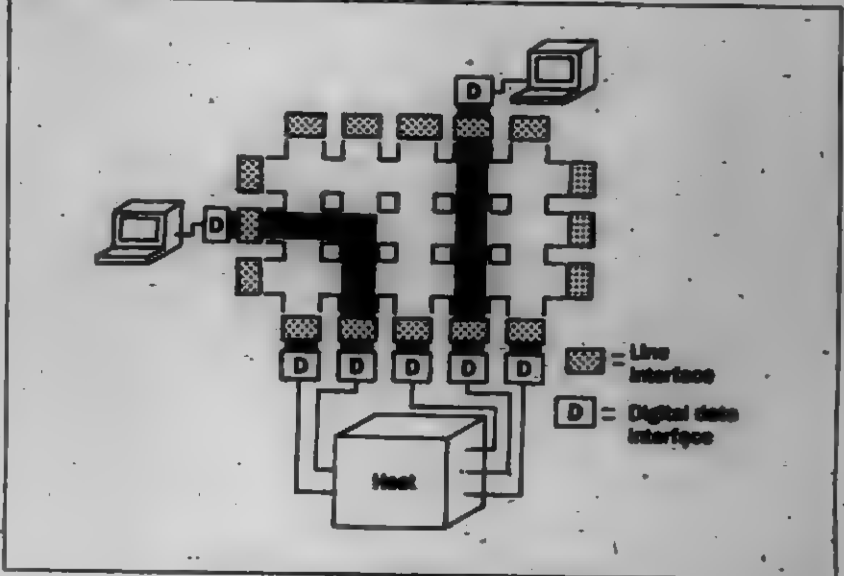

Figure 2. Data via digital data interfaces

voice communications because phone conversations require a continuous information exchange.

The problem arises when PBXs attempt to switch data in the same manner as they switch voice. Data calls, unlike voice calls, can last for hours. At the same time, data connections require short, high-speed bursts of data transmission that are separated by long periods of silence. Most of the time, therefore, the switching capacity of the PBX, which is dedicated to data connections, is unused.

This waste of switching capacity lasts for the extended duration of data calls. In short, running data communications on the voice-only PBX of the late '70s is an inefficient and expensive proposition.

Digital access

The entry of PBXs with digital local access into the market in the early '80s marked the beginning of the second phase of integrated voice/data communications. When a digital local loop is used, the expensive modems are replaced by devices variously called data terminal interfaces, data access modules, data adapters and so on. We will use the term digital data interface here.

The digital data interface connects to the data devices (terminals or hosts) via RS-232C or V.35 interfaces just like modems. The received data bits are transmitted digitally to the PBX by inserting them into a digital pipe — usually, but not necessarily, a 64K bit/sec bit stream. This digital pipe is switched by the PBX just like it switches voice calls (see Figure 2).

The digital data interface is much more intelligent than a modem. It does not require an associated telephone to set up data calls but can directly communicate with the user via the terminal keyboard and CRT. Control information is exchanged with the switch over the same digital access link. The control information is converted into a special message-oriented format that the PBX knows how to interpret. Thus, for the first time, the switch must be aware of the fact that it is not dealing with a standard analog telephone but a more sophisticated device with different requirements.

The digital data interface can be a stand-alone device or it can be integrated into the new generation of station equipment. Several digital telephones have been developed with an optional digital data interface. Advanced workstations have the interface directly built-in, and personal computers can be provided with expansion cards that implement the digital data interface function.

In some cases, this integration is only a physical integration — that is, housing, power supply and so on are shared — but not an integration of voice and data on the access line. There are actually two wire pairs running to the PBX, one for voice and one for data. These wire pairs connect to different line interfaces at the PBX, which itself is only physically integrated.

> ❞
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> *For the first time, the switch must be aware of the fact that it is not dealing with a standard analog telephone but a more sophisticated device with different requirements.*

Cost-effective solution

A more cost-effective solution results if voice and data devices are not only physically integrated, but if they share the local access wires and the line cards at the PBX. The bandwidth of the local access lines is divided between voice and data. The PBX separates voice bits from data bits and switches both information

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streams independently (see Figure 3). We will call this level of integration "access integration" of voice and data. An access-integrated PBX has essentially twice the capacity of an only physically integrated PBX. It has the same number of ports since each port can serve a voice and a data device.

It appears that access-integrated PBXs are able to switch voice and data equally well. A closer look, however, reveals that these PBXs are still heavily dominated by the voice-switching requirements. Bandwidth on the local access line as well as switching capacity is still fully dedicated to a voice or data connection: Thus, even though economies have been achieved because of the access integration, data is essentially switched like voice in a circuit-switching mode and not in the more efficient packet-switching mode.

X.25 services can only be provided by means of a special interface that converts between the circuit and the packet world. This interface may be packaged as a physically separate device or integrated into the PBX hardware. In both cases, however, it is logically separate from the switching function.

In spite of the progress that was made by the Phase II PBXs toward integrated voice/data handling, these systems are still dominated by the voice-switching requirements. A more balanced approach to voice/data switching requires the introduction of true packet-switching capabilities as they have been available in data communications equipment for a number of years. These capabilities are now emerging in the third phase of voice/data integration.

The new concept, which is introduced by this third phase, is the concept of a virtual connection. A virtual connection is a logical association of two end points.

The two end points can exchange information whenever they desire after a virtual connection has been established. The important consideration is that the switch does not reserve any switching capacity to a virtual connection. Therefore, the long intervals of idle time that are so typical for data communications do not consume any switching capacity. Moreover, the bandwidth of the local access line can be allocated to multiple connections as required instead of being dedicated to serve just one voice and one data call.

Virtual connections have several attractive features. They do not care what application they are being used for. They represent a universal transport mechanism that is independent of format, speed or content. Thus, they can be used for voice, data, text, facsimile and other applications equally well. They consume transmission and switching resources only when required. This dynamic allocation of resources reduces the total resource requirements substantially.

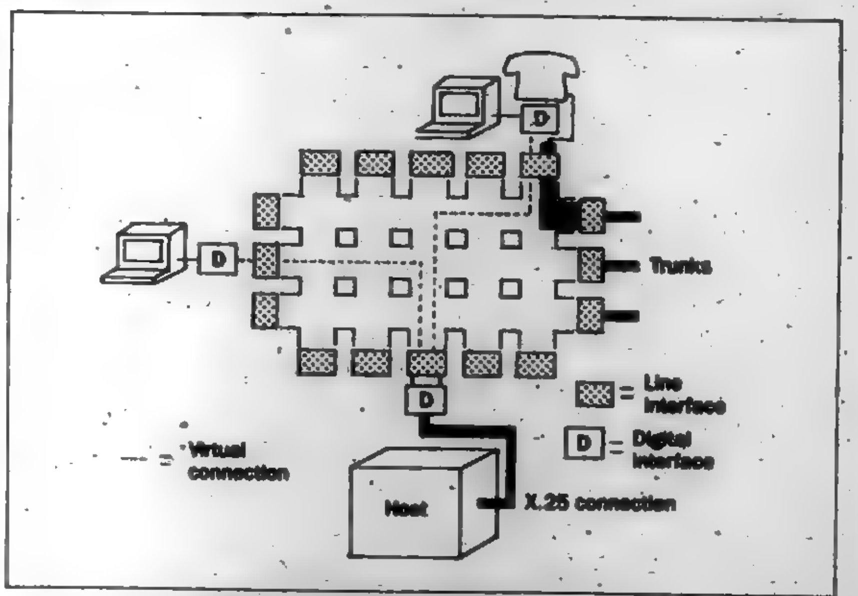

Figure 3. Voice/data access integration

The dynamic resource allocation introduces potential delays because of competition for resources among multiple connections. In the data world, these delay considerations are well-understood, and efficient system engineering guidelines exist to minimize their impact.

> *In spite of the progress that was made by the Phase II PBXs toward integrated voice/data handling, these systems are still dominated by the voice-switching requirements.*

The real-time, high-throughput requirements of a pulse code modulation-encoded voice bit stream will require the handling of voice samples on a higher priority level. This can be accomplished by giving the pulse code modulation samples priority on the local access line while a voice conversation is in progress. The entire local access bandwidth can be used by other applications when the telephone is idle. Similarly, the voice connections can be handled in the switch on a higher priority level by separating the pulse code modulation samples from data bits and switching them via a noncontention bus.

GTE Omni's dual-bus architecture with one bus for the switching of voice in a dedicated mode and one bus for switching of data in a contention mode provides the user with both worlds. It guarantees voice quality because of its priority handling of pulse code modulation samples and brings the flexibility of virtual connections to every station connected to the PBX. Ztel's PNX and CXC's Rose system provide similar capabilities using local-area network technology.

Virtual connections

The advantages of virtual connections have not yet been generally recognized. Most PBX manufacturers are still struggling with the intricacies of data support for single terminals. The concept of multiple virtual connections over the same access line is beyond their immediate concerns.

However, the movement toward more sophisticated terminals that require flexible communications facilities has accelerated significantly over the last 12 months. The advantages of the virtual connection approach will become more obvious as these intelligent devices dominate the communications requirements. There are several applications that benefit from the flexibility of virtual connections:

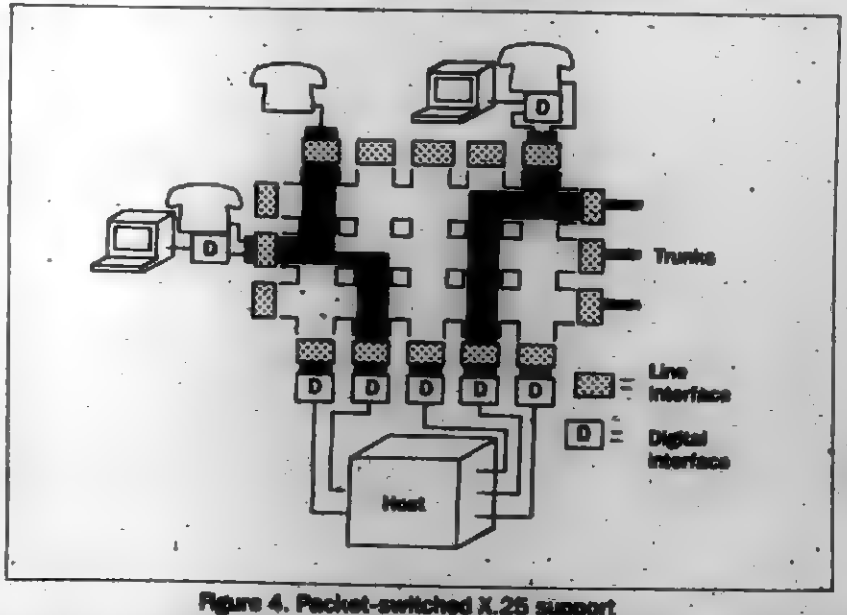

Figure 4. Packet-switched X.25 support

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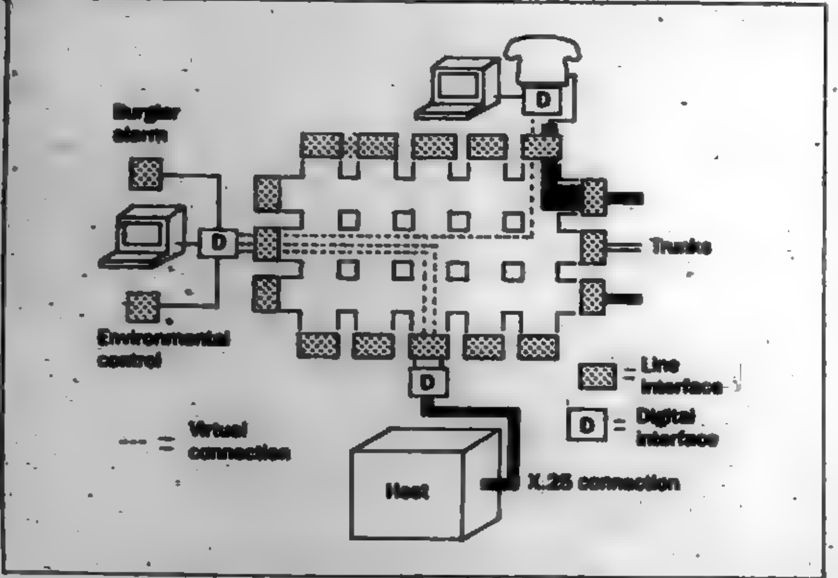

Figure 5. Multifunction terminal support

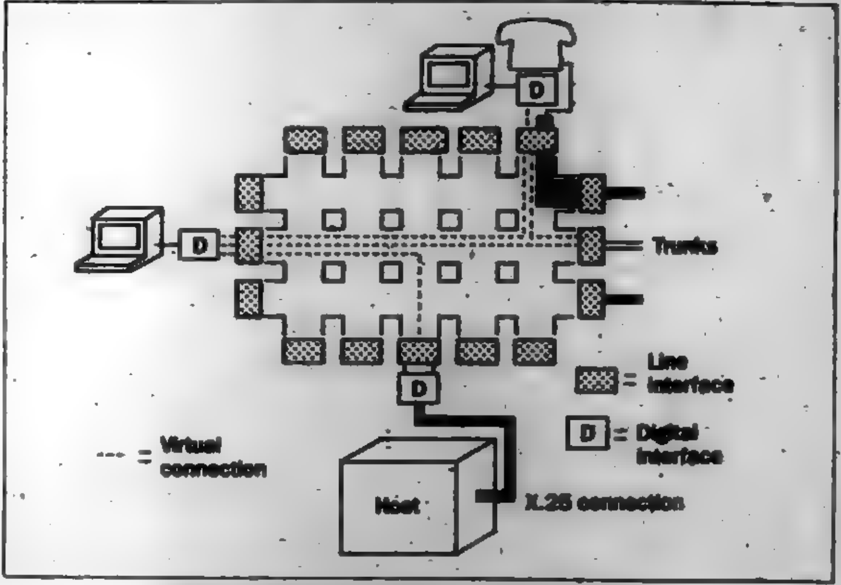

Figure 6. Virtual connections for new services

X.25 support. X.25 has been recognized in the data communications industry as the most efficient interface for data connections. A PBX that supports virtual connections is able to support X.25 very effectively. In particular, virtual connections switch data already as packets, which is the format generic to X.25 (see Figure 4 on ID/12). X.25 converters, required for a circuit-switched communications system, perform a packetizing, depacketizing, concentration and, possibly, protocol conversion function. This approach, which is used by Rolm, Northern Telecom, AT&T's Information Systems and others, works if only a few X.25 connections are required. The converters tend to become a cost/performance bottleneck if many X.25 connections (more than 100) are to be switched.

Multifunction terminals. Intelligent workstations and personal computers have the inherent capability of doing several tasks at the same time. The traditional concept of "one user — one conversation" is inappropriate for these terminals because they can participate in several communications activities simultaneously. Therefore, the PBX must provide these terminals with the ability to establish multiple connections in parallel.

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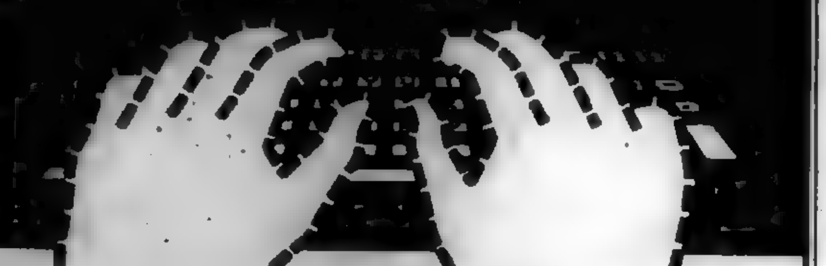

The total communications capability should be limited only by the bandwidth of the access line, not by a protocol limitation that restricts nonvoice connections to one at a time. The concept of multiple windows, which is now penetrating personal computer software applications, must be supported by multiple communications paths to work effectively in a communications environment (see Figure 5).

New services. There are many building applications that have small but periodic bandwidth requirements (fire alarm, burglar alarm, energy control such as heating, lighting, air conditioning). Virtual connections allow the monitoring and controlling of these applications to continue while other data connections are in progress. (You don't want to have your smoke detector alarm message waiting until you have finished reading your electronic mail.)

Virtual connections allow the addition of these services to the existing communications facilities without any new wiring or line cards at the PBX. The same is true for having more than one terminal served by a single access line. Again, the limitation should be the total bandwidth of this line, not a protocol that dedicates the entire bandwidth to a single connection (see Figure 6).

Polling. Many applications require the collection of information at a central point. Polling is the process that the central system uses to transfer the required information from the remote stations into a central data base. This polling process is very inefficient if the central system continuously encounters busy conditions at the target terminals because these terminals have some other communications activity going on at the same time.

Every busy condition requires a retry, which results in a waste of resources and potentially long delays. Virtual connections solve the "busy condition" problem, because they allow multiple activities to be served in parallel.

Transit switching. More and more applications require multiple PBXs to work together effectively in a network environment: This means that the PBX needs to perform transit-switching functions. Therefore, the PBX's task is not only to provide flexible local communications but also to optimize the use of long-distance facilities.

While the merits of virtual connections for local communications may not be well understood, there is no doubt about their advantage for long-distance operation. The multitude of public packet-switching networks now in operation proves this point. For a PBX to act as a transit switch for data communications, it is imperative to switch virtual connections (or packets) effectively. The use of packet/circuit converters to accommodate X.25 interfaces is unacceptable in this application because of performance and cost reasons.

> ”
>
> *Permanent virtual connections avoid the cost and delay of setting up and tearing down these connections.*

Permanent virtual circuits. Since virtual circuits do not use transmission or switching bandwidth while the connection is idle, there is only a small penalty to pay in terms of memory usage if virtual circuits are established permanently. This approach works very well if many short connections to only a few destinations are required. Permanent virtual connections avoid the cost and delay of setting up and tearing down these connections.

The evolution of integrated voice/data PBXs has progressed rapidly during the last few years. From a situation where modems were the only option available to the user, we have advanced to the point where data is now transmitted and switched in its digital format. With the introduction of PBXs that support virtual connections, we have now reached a point where PBXs support voice and data switching equally well. At last, PBXs are not dominated by voice switching any more.

About the author

Holger Opderbeck is vice-president of Advanced Communications Development at GTE Business Communications Systems in Vienna, Va. He is responsible for the development of GTE business terminals, office automation products and the next generation of integrated voice/data switches.

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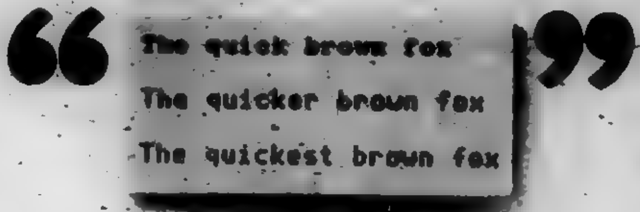

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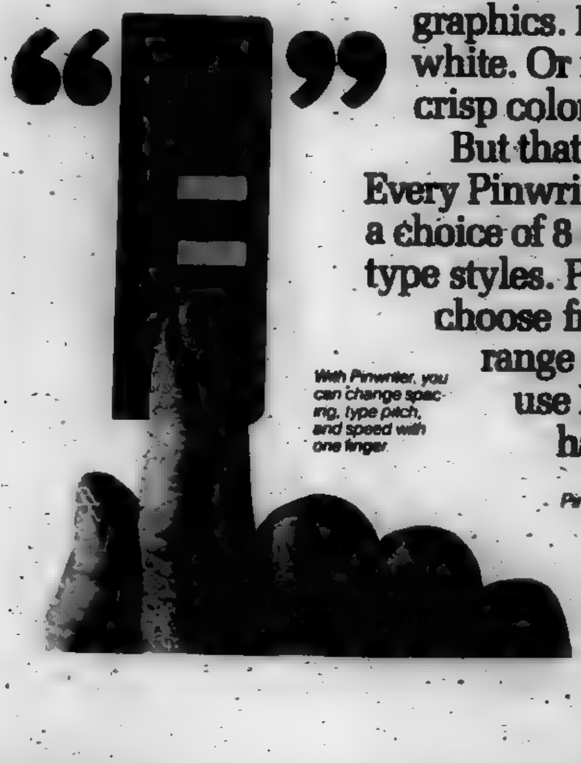

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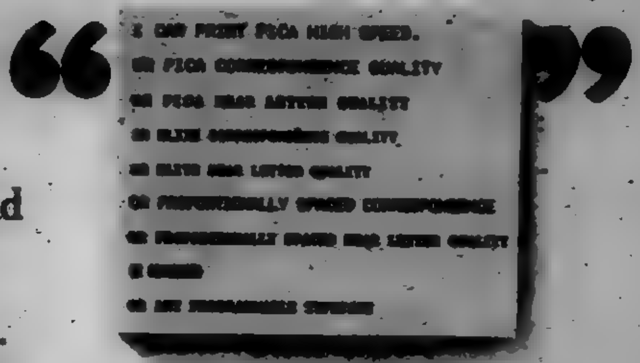

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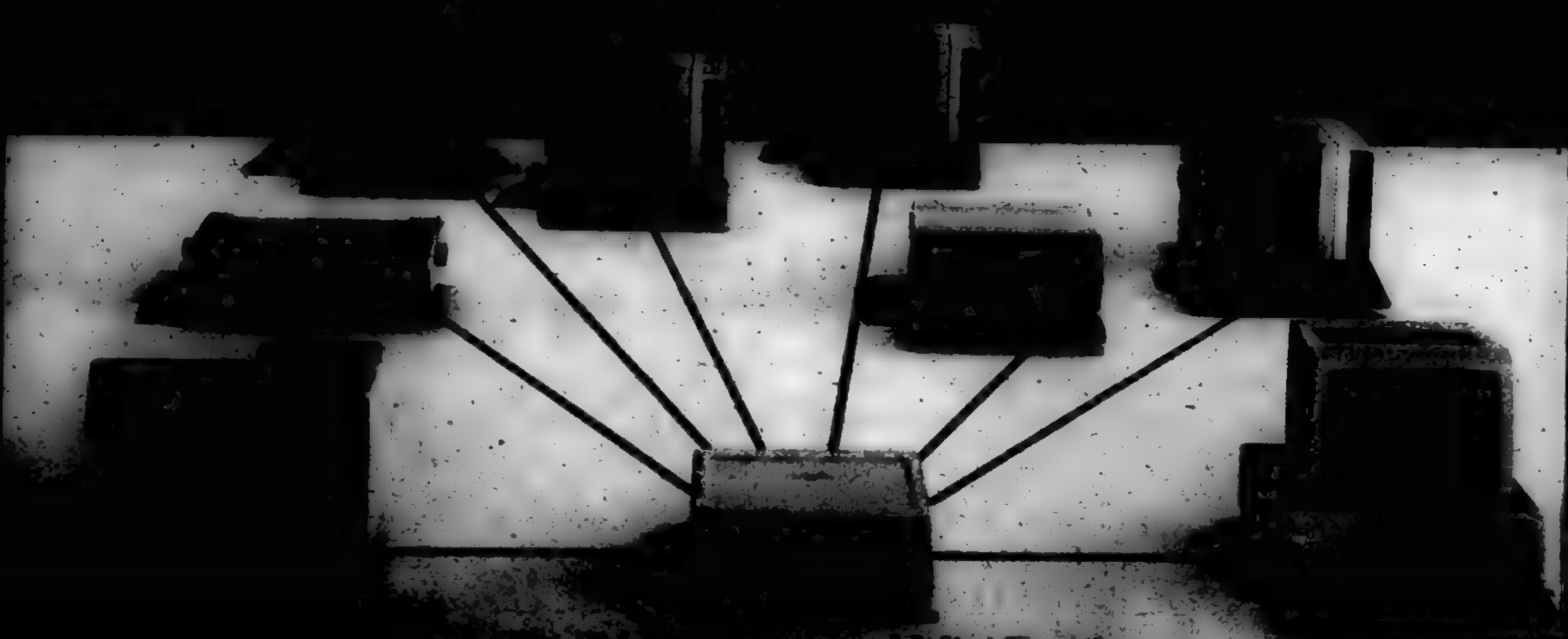

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Special Report

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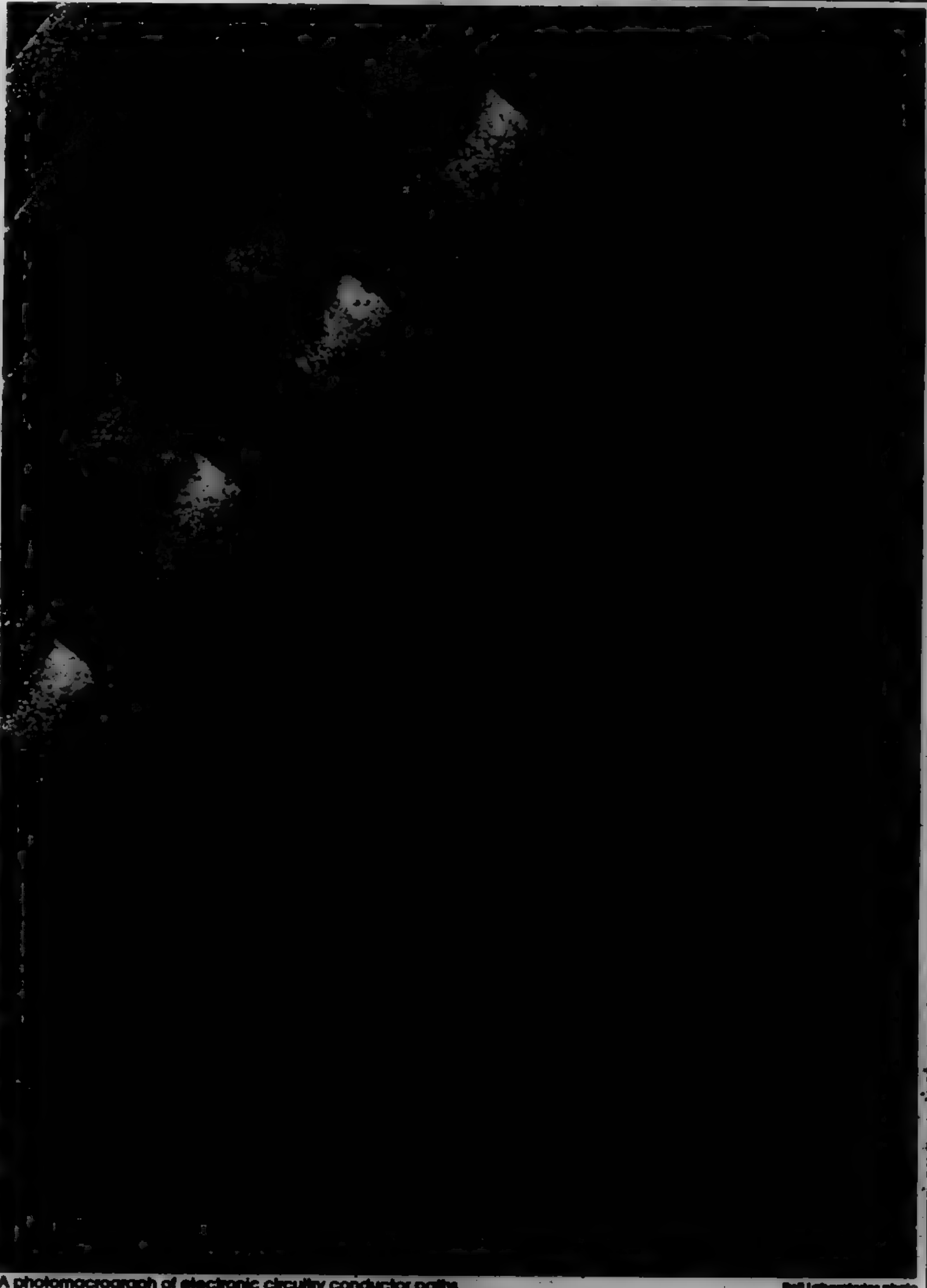

A photomacrograph of electronic circuitry conductor paths
currently used by AT&T in the production of advanced communications systems.

Bell Laboratories photo

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Centrex: the PBX alternative

SR/4
T.1 takes off

SR/6
Fiber optics' bright future

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Trends in European networking

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Private long-haul networks: Look before you leap

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Setting telecommunications standards

Special Report

Centrex service on the rebound

INSIDE

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By John Dix
CW Staff

Contrary to earlier predictions, AT&T's divestiture and the implementation of access-line charges have not led to the wholesale abandonment of Centrex, a communications service offered by local telephone companies that provides telephony features similiar to private branch exchanges (PBX).

Centrex has not only survived 1984 but also has flourished under renewed attention from the former Bell operating companies, which have begun to enhance and market the service actively. The divested Bell operating companies — now allowed to market but not manufacture telecommunications equipment — have come to see Centrex, once viewed as an aging service, as a revenue source that can be better exploited.

Like PBXs, Centrex is used in providing basic telephone services, what is known in the industry as "Pots" — plain old telephone service. The difference between using Centrex and PBXs is the location of the switching equipment. Whereas PBXs are on the user's premises, Centrex services are located at large switches, called central office switches, used in the backbone of the local telephone network.

With Centrex, every telephone within a company is supported with twisted-pair wire that runs back to a telephone company central office switch. Therefore, even internal calls from one extension to another have to be routed out to the switch and then back into the office. PBXs, on the other hand, are installed within a user's building, providing intercom or internal calling without requiring the call to be routed externally.

> *The divested Bell operating companies have come to see Centrex, once viewed as an aging service, as a revenue source that can be better exploited.*

Because a good percentage of all calls are within the building, users with PBXs need only a few trunks to connect their private switch with the local telephone system. Generally, PBXs have a trunking ratio in the range of 1:10 or 1:15, where one trunk can be used to support 10 to 15 phones. This became an imporant difference between Centrex and PBXs when the divested Bell operating companies imposed Customer Access-Line Charges (Calc) last May.

Business Calc rates

When the business Calc was imposed, users began paying an average of $5/line/mo for every trunk they used to connect their PBXs with the local phone system, according to a Federal Communications Commission spokesman. Because of the service's nature, Centrex Calcs were priced differently. Centrex costs the user $2/line/mo for lines put in place before July 1984 and the regular business Calc for lines installed thereafter.

With a 1,000-station system, for example, a PBX user with a 1:10 trunking ratio now pays roughly $500/mo in access fees, varying by state. A Centrex user, on the other hand, now pays $2,000/mo in access fees: $2 for every line or station supported. These figures led many analysts to the presumption that users would turn down Centrex in favor of PBXs.

But that has not happened.

"Not only is Centrex not losing ground to PBXs just now, it is actually on the rebound," said William Rich, a telecommunications analyst with Northern Business Information, a market research firm in New York.

According to Rich, roughly 12,000 Centrex systems representing 5.1 million lines were in place by the end of 1983, up 1% from 1982. In 1984, the installed base of lines grew an estimated 2% to 4%. Interestingly, large Centrex users represent the majority of lines installed, whereas the majority of systems installed are fewer than 100 lines. In other words, 5% of all Centrex users — customers with systems of 2,000 or more lines — account for 40% of lines installed to date. Only 12% of all Centrex users account for nearly 70% of the installed lines, Rich said.

Centrex business has not fallen off as predicted because, even at the higher price, the cost of jumping too fast could be greater than the added access charges. "Users are looking at their options and saying, 'Let's not be in too much of a hurry; let's take a look at what we have and make a move in a more restrained manner,' " noted Jeff Kaplan, a senior market analyst with International Data Corp., a market research firm in Framingham, Mass.

Users' hesitancy is fueled by the confusion surrounding PBX marketing — third generation vs. fourth generation and so on — and the interesting things the divested Bell operating companies are doing with Centrex, Kaplan said.

That aside, many Centrex customers never saw the access charges. Faced with the requirement to charge their user base $2/line/mo, some local telephone companies lowered their basic rates so that in effect the customer would not see the increase. Still others adopted PBX trunk equivalency pricing, reworking their tariffs so that Centrex users would pay the same amount of access charges as typical PBX users. A 1,000-line Centrex customer, for example, would pay the equivalent of 100 trunks, assuming an average 1:10 PBX trunking ratio.

The method of dealing with access charges varies by telephone company and by state, Rich said. New England Telephone Co., for instance, has been generally successful in convincing the public utility commissions in the many states it serves to let it adopt trunk equivalency pricing. New York Telephone Co. is said to be looking at offsetting access charges altogether by lowering its rates. The utility commissions in U.S. West's territory — the regional holding company that serves the single largest number of states: Oregon to Iowa, New Mexico to Montana — are said to be the most progressive in allowing price changes.

Pacific Northwest Bell Telephone Co., a subsidiary of U.S. West, has adopted PBX trunk equivalency pricing, but that is not what is retaining current Centrex customers or attracting new ones, according to Theresa Loft, product manager of the company's large central office services. Flexible pricing, option packages and rate stability make Centrex attractive, Loft said.

Variations of one theme

Pacific Northwest Bell offers Centrex, Centraflex and Corecom, all variations of the same theme, differing by pricing structure and packaging. Corecom is aimed at larger users with 200 or more stations. Last year, the first year the service was offered, 30% of Pacific Northwest Bell's Centrex user base converted to Corecom.

According to Loft, Centrex has traditionally been a price-averaged service, where all users pay the same regardless of what it actually costs the company to provide the service. Corecom is priced on a customer-specific basis.

"We evaluate several areas to determine the costs associated with a customer," Loft explained. "We look at how far they are from the central office that serves them, study their call volumes [looking at calls external to the business and at internal calling habits], consider what features they universally use and then package the service and offer them a contract of three or more years for those services."

One feature available is a simulated trunk facility — a software choke that enables a communications manager to configure Corecom as though it were a PBX. The option essentially enters a degree of blocking to Centrex, creating a situation where, as with a PBX, a user may not be able to make a call because all the trunks to the local phone company switch are busy. The manager can set thresholds so that when the calling volume for incoming and/or outgoing calls reaches a certain level, additional calls are blocked. This enables the user to control traffic and costs, Loft said.

Although customer-specific pricing in some cases results in savings for the user, most of the time, customers will get only a minimal or no change in price. Loft cited this fact as support for her contention that Centrex loyalty and interest is not necessarily based on finances. Customers are attracted to features like the simulated trunk option, she noted, but may find the long-term contracts that offer rate stability one of the most appealing features of Corecom.

Other divested Bell operating companies have made strides in enhancing Centrex, but the type of services they offer and the names under which they are marketed vary from company to company. The divested Bell operating companies, however, can choose from a common pool of hardware and software Centrex en-

despite access-line rates, PBX competition

hancement products that independent companies manufacture. AT&T Technologies — a natural supplier of add-on products, given that it developed the switches that are used to provide Centrex — offers a host of Centrex products.

One feature in the works at AT&T is a simultaneous voice/data feature. Using data over voice technology (where the two signals are transmitted at different frequencies), users reportedly would be able to send data asynchronously at speeds up to 9.6K bit/sec while simultaneously using their telephones, according to Richard G. Sanders, product manager of AT&T's local space division switching systems.

Using what Sanders called a limited-distance data set that is either integrated into the phone or is sitting next to it, users can route data out to the Centrex central office switch. From there, the data can be either turned back to another device within the user's building or routed outside the Centrex group to a bank of shared modems. Modem pooling at the central office relieves the need for each individual to have a modem. Sanders estimated that the limited-distance data set would cost several hundred dollars.

AT&T has also developed a number of software packages for use on its line of 3B computers that, when placed on the user's premises, provide Centrex management and control features. Collectively known as the Advanced Communications Packages, they include the following:

■ Centrex station rearrangement, which enables a customer to move his own phones around and change extension numbers.

■ Station message detail recording, providing real-time access to billing data for each user.

■ An on-premises message desk or message center.

■ Facilities management, enabling the communications manager to monitor the status of the service by accessing the various traffic account centers stored in the central office switch.

> ”
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> *AT&T has developed software packages for use on its 3B computers that provide Centrex management and control features.*

■ An electronic directory function that enables a console operator to type in a name to find an extension.

The 3B that is needed to support these applications (3B Model 2, Model 5 or one of the Model 20s) varies by customer. Sanders said a number of locations are already using these features. Excluding the cost of the computer, the software packages range in price from $2,000 to $2,500.

Another development in the works at AT&T is Nettrex, which is city-wide Centrex. Nettrex would enable a local phone company to offer large businesses with multiple locations within a given metropolitan area the ability to operate several Centrexes as a single service, Sanders said.

With Nettrex, instead of having each location served by a separate Centrex, or some by Centrex and some by PBXs, all locations would appear to be serviced by one large switching entity. Nettrex would eliminate the need to dial an access code and then a seven-digit number to call an affiliated branch; instead, users could place those calls by dialing a four-, five- or six-digit number, depending on the numbering plan. Sanders said all calling options would be operated normally.

Even with the pricing options, features and packages becoming available, Centrex is not for everyone. "Some larger customers are dropping Centrex in favor of PBXs because they can get more technically advanced systems," noted Northern Business Information's Rich. The PBX purchase is also sweetened by the fact that users can get investment tax credits. "But a lot of people don't need anything more than basic [plain old telephone service]," Rich said. And for that, Centrex is more than on par with PBXs. After all, when it breaks, it isn't the user's problem.

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Special Report

T1 exhibits explosive growth; $353 million in sales

By Robert Bauer
Special to CW

In 1983, the commercial use of T1 exploded. That year, the industry sold some $30 million worth of T1 multiplexers. Last year's sales totalled $60 million. In the next few years, major enhancements to T1 equipment will mean continued explosive growth.

T1 is a service offered by AT&T Communications that transfers either voice or data at 1.54M bit/sec over coaxial cable, optical fiber, digital radio, microwave or satellite. Terrestrial service is provided under the name Accunet T1.5, while satellite transmission is available through Skynet 1.5.

Many companies offer items called T1 products. These products are, in fact, multiplexers that permit anywhere from 24 to 128 channels on a single line.

The market expands

Dataquest, Inc., a market research firm, estimates that 1,300 T1 multiplexer units were shipped in 1983 with an average sales price of $23,000, and the firm estimates that some 2,500 units were shipped in 1984.

The reason 1983 seems to be the starting point for commercial T1 service is actually rather simple. There was a severe shortage of facilities until then. Prior to 1983, the T1 cable took a long time to get and was, for the most part, limited to campus environments and local links. When AT&T introduced Accunet, the market took off.

In fact, Dataquest estimates that from the $60 million in sales for 1984, there will be a compounded annual growth rate of 55.7% for the next four years. That translates to about $353 million in sales by the end of 1988.

Dataquest's estimates for shipments of T1 multiplexers show a 42.8% compounded annual growth rate from 1984's 2,500 units to a total of 10,400 units shipped in 1988. The growth rate for numbers of units shipped is a little lower than the amount of revenue.

There are several reasons for the projected rapid growth in the T1 market. The tremendous increase in the use of on-line terminals, intelligent workstations and personal computers is not going to change any time soon. The projection is that there will be at least one terminal per worker by the 1990s.

Further, terminal speeds continue to increase dramatically. That means there is an increasing demand for high bandwidth, which in turn leads to more flexible and efficient multiplexers.

Another reason is that T1 facilities are more available than ever. The amount of plain wire that is available from the telephone companies has increased because they are using multiplexing to get more out of their facilities.

It is estimated that by 1990, there will be some 100,000 new fiber spans available. Each fiber span can carry about 300 T1 links. That works out to about 30 million potential T1 spans available for use by 1990.

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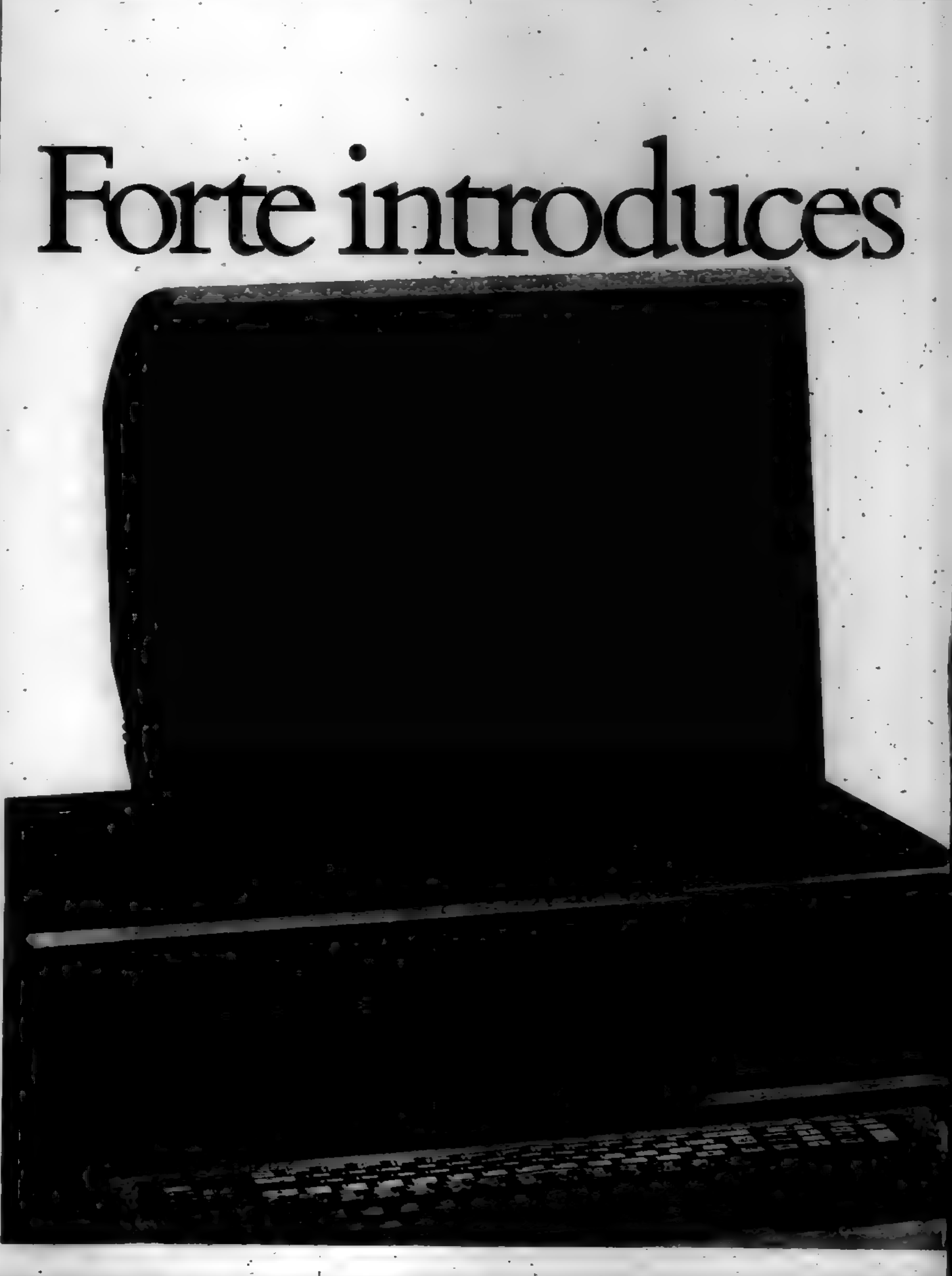
> *Dataquest's estimates for shipments of T1 multiplexers show a 42.8% compounded annual growth rate from 1984's 2,500 units to a total of 10,400 units shipped in 1988.*

In addition, T1 has benefitted from attractive tariffs in the last year or so. For example, a T1 link between two locations costs about the same as three 56K bit/sec links. A single 1.54M bit/sec link costs approximately the same as 10 ordinary telephone voice-grade lines, which typically operate at speeds of around 9.6K bit/sec. In very short-haul situations, the cost for a T1 link is almost equivalent to the cost of a single 56K bit/sec line.

Projections indicate that the cost for T1 multiplexers will increase during the next four years. That projection is based on the increased complexity and sophistication of these devices.

Today, virtually all of the T1 multiplexer-installed base is point-to-point traffic. Some multiplexers, however, have drop-and-insert capability, where a channel introduced at one end is dropped out at one of the other multiplexers in the configuration, and another channel is introduced there to continue through the network.

Bauer is vice-president for marketing and development at Infotron Systems Corp., a data communications equipment designer and manufacturer based in Cherry Hill, N.J.



seen by '88

Networking is clearly the wave of the future. In fact, Infotron Systems Corp. projects that by the end of 1985, 70% of the total T1 market could be used in networks, rather than point-to-point applications. This development will see the importance of price, which is significant in point-to-point applications, become secondary to network management and control capabilities.

Consequently, more functionality will be built into T1 products. More devices will be software driven, as opposed to current units that are purely hardware driven. All of this will result in improved flexibility when configuring and controlling T1 networks. Further, such things as dynamic bandwidth allocation and circuit switching between nodes at T1 speeds will be seen.

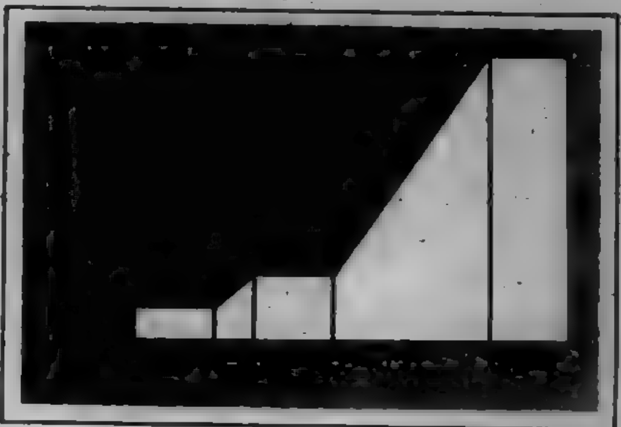
In the future, network management will be increasingly important and it is possible that networking at T1 speeds, where users will have more than one link between two points, is approaching. To that end, redundant paths are going to become more important.

Finally, there is a pronounced move toward better quality compressed voice. Typically, voice was passed over the facilities at 64K bit/sec. But high-quality voice at 32K bit/sec techniques are increasingly being used.

The T1 marketplace has come a long way. From its first use more than 20 years ago by telephone companies for economizing line usage, its commercial use has exploded. The T1 market has only just begun to move.

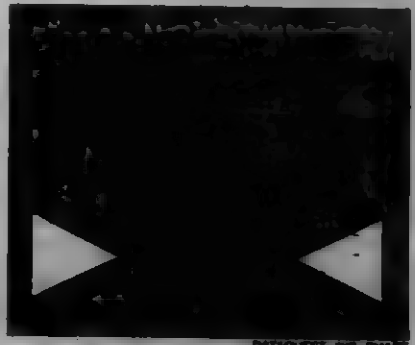
DATAQUEST, INC. CHART

By 1988, T1 revenue will increase by 55.7%



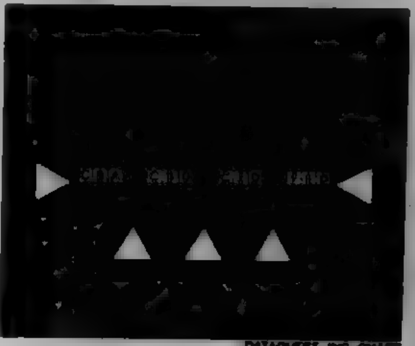
DATAQUEST, INC. CHART

T1 product shipments will soar by 1988



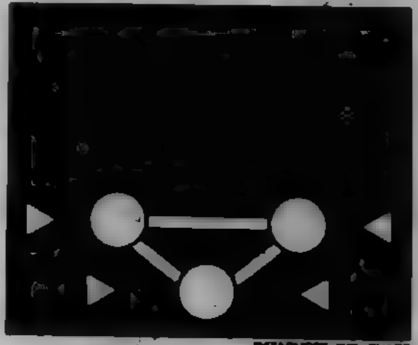
DATAQUEST, INC. CHART

Most T1 devices used now are called first generation. They are characterized by point-to-point configurations and hardware control.



DATAQUEST, INC. CHART

Second generation T1 equipment now available offers more complex configurations like line drop and insert and software control.



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Third-generation equipment is characterized by T1 networking, higher quality voice and a requirement for network management.

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Special Report

Fiber optics comes of age in telecom

Importance of communications efficiency spurs movement

By John Powers
Special to CW

Fiber optics is the hottest item in telecommunications today. This is primarily because of the migration in data transmission industries to a more distributed data processing environment. Also responsible for the trend is the increased importance of efficient communications between computers and expensive peripherals such as file servers, high-speed printers and disk drives.

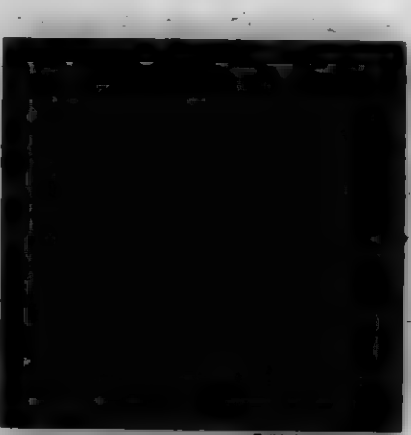
Data processing and office automation planners had a universal problem with distributed data processing applications prior to the use of fiber optics as a transport medium. The farther away the user was from the computation source, the less performance one could expect from the workstation or terminal device.

As the move toward developing higher speed workstations continues, greater bandwidth will be needed for additional connectivity.

Data communications managers are already forecasting the moment at which users could exceed the bandwidth of either twisted-pair copper or RG-62 coaxial cable attached devices. Fortunately, fiber-optic technology has matured to the point where it is a stable and mature information transport medium for many of the data communications applications needs of today.

Growth of fiber-based applications has been in two major areas — telephony and local-area networks. In telephony, private branch exchange vendors have used fiber optics in their systems designs to enable the modular distribution of the switching system over a geographically dispersed area such as an office park or a college campus.

Fiber-optic links provide the necessary bandwidth to support integrated and simultaneous voice/data transmissions while providing inherent immunity from moisture, radio frequency interference, electromagnetic interference and cross-talk conditions prevelant in conventional copper wires.


Bell Laboratories photo

Glass fibers represent the transmission medium for light-wave systems.

One of the most important benefits derived from the use of fiber optics in the telecommunications industry has been the price/performance of fiber optics over conventional copper cable. Without launching into a dissertation on the transmission properties of copper, let us examine the bandwidth of a conventional 900-pair copper cable vs. a two-strand fiber cable.

A 900-pair cable is capable of handling 900 simplex (one-way) communications at speeds up to 19.2K bit/sec for an aggregate bandwidth of 17.28M bit/sec. A single pair of fiber-optic cables produces 336 1.544M bit/sec T1 circuits resulting in 8,064 channels of communications at 64K bit/sec or 560M bit/sec each.

Diameter of a soup can

Using wavelength multiplexing techniques available today, the circuit yield of the single-pair fiber-optic link can be increased to approximately 24,192 channels of communications at 64K bit/sec each, at a cost equal to — or less than — the installation of the 900-pair conventional copper cable. For this almost hundred-fold increase in capacity, it is interesting to note that the diameter of a 900-pair cable is equal to the diameter of a soup can, and the fiber cable, including its shielding and protection, is the diameter of a pencil.

In certain applications, such as shared tenant and high-rise buildings, the size and weight advantages of using fiber vs. copper cable have been dramatic. Using our 900-pair copper cable example, this cable has a weight of approximately 4,800 lb per 1,000 feet. The single-pair fiber cable has a weight of approximately 80 lb per 1,000 feet.

Size, weight, bandwidth and immunity to electrical interference ensures that fiber-optic cable will be an important factor in building construction and renovation in the future.

With the increased demand for higher performance workstations and peripheral devices in a distributed data processing environment, more time is spent in the planning and implementation of the data

See FIBER SR/13

Powers is vice-president of Telecommunications Management Corp., a Dedham, Mass.-based telecommunications consulting firm.

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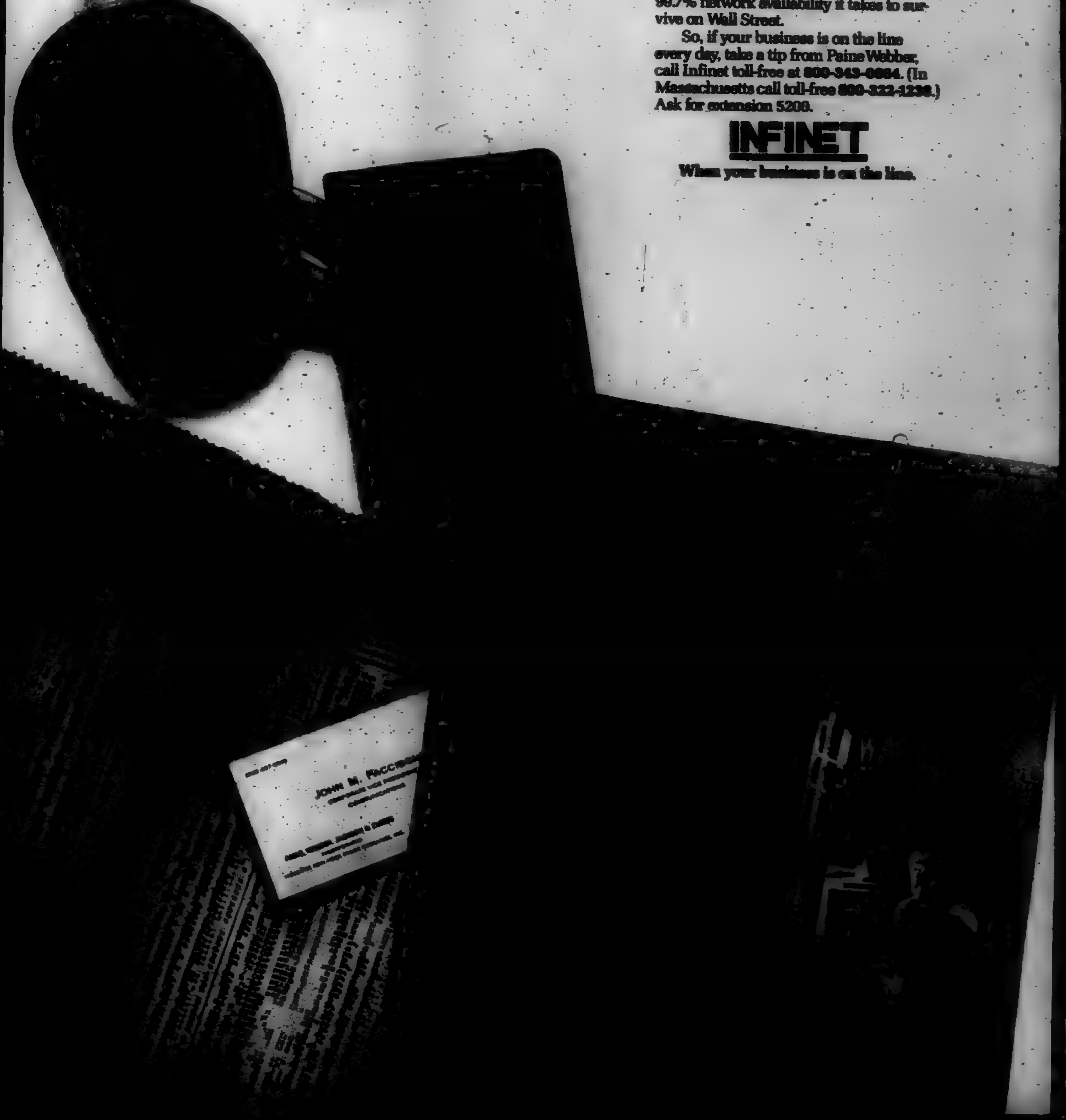

Special Report

Electronic mail software links Nabisco's varied systems

EAST HANOVER, N.J. — In a statement on office automation last year, Nabisco Brands, Inc.'s corporate management committed the firm to two types of office equipment that could not communicate with each other.

According to the statement, Nabisco would move toward installing IBM Personal Computers but would maintain its current base of Wang Laboratories, Inc. word processors.

"Our needs now are more in analytical and management functions within operations and not in strictly secretarial-type functions," according to L. J. Callaghan, the firm's manager of analytical services.

But even with the move toward micros, the firm wanted to continue to benefit from its investment in word processing machines.

With its direction defined, Nabisco looked for a way to get the different machines to talk to each other so that it would not have to replace its original computer systems, retrain its staff or change its future corporate networking plans.

NABISCO BRANDS INC

Nabisco makes and markets Planter's peanuts, Life Savers candy, Fleischmann's and Bluebonnet margarines, Royal desserts and other foods.

When the firm first installed office automation systems in the 1970s, it viewed the machines primarily as a way to increase secretarial productivity, according to Callaghan.

Because Wang's OIS and VS systems were ideal for these needs, Nabisco purchased a number of them, he said. The company also invested in training users to operate the systems and to use Mailway, Wang's electronic mail system.

Today, more than 300 Nabisco secretaries use Mailway to send documents among 21 Wang word processing systems. The firm uses a number of different Wang models, ranging from OIS 50s to VS 100s, which are installed in locations throughout the country. The remote word processors communicate via modems and telephone lines.

When the firm decided last year to invest heavily in IBM Personal Computers, it wanted to maintain a viable electronic mail system. Nabisco has more than 350 Personal Computers installed, 150 of which communicate with the firm's two IBM mainframes — a 3033 and a 3081 — through Digital Communications Associates, Inc. Irma boards that allow them to appear to the mainframes as 3270-type terminals.

Electronic mail had to accommodate document transfers between micros and mainframes, between micros and word processors and among word processors. The company considered using protocol converters, but found that the devices provided only one-to-one solutions, Callaghan said.

He explained that Nabisco would need a separate protocol converter for each type of communications between devices.

"When you are attempting to send as much electronic mail as we do, it is not the most effective solution," he said. At Nabisco, employees exchange between 60 and 75 pages of text per day.

After it looked at other communications options, Nabisco purchased Transnet communications software from Network Applications, Inc. The software, installed on the firm's 3081, accepts messages from Mailway and stores them in TSO mailboxes.

Receiving messages

Personal Computer users check their mailboxes, then ask Transnet to send them the message they want. The software transforms a message's character set to one that a 3270-type machine can accept and sends it on to the user.

"Transnet provided a link between the [Personal Computers] connected to the mainframe and our Wang OIS and VS workstations," Callaghan said. "It also required no retraining because we could continue to use Wang Mailway's addressing scheme."

Nabisco brought Transnet live in December 1984 and has given 12 Personal Computer users access to electronic mail through the software. The firm plans to bring additional users onto the system gradually, department by department, and ultimately connect about 100 micros.

The firm has had response-time problems with the software, which has taken between two and three minutes to transfer documents from Wang to IBM machines. "But when you consider that regular mail takes two or three days," Callaghan said, "two or three minutes is not all that bad." The software vendor has prepared a new release that Callaghan said he expects will solve the problem.

Nabisco is considering a move toward IBM's Professional Office Systems (Profs) and Distributed Office System Support (Disoss) in the future. Callaghan said these will not pose a problem for the firm's electronic mail setup because Transnet supports both Profs and Disoss.

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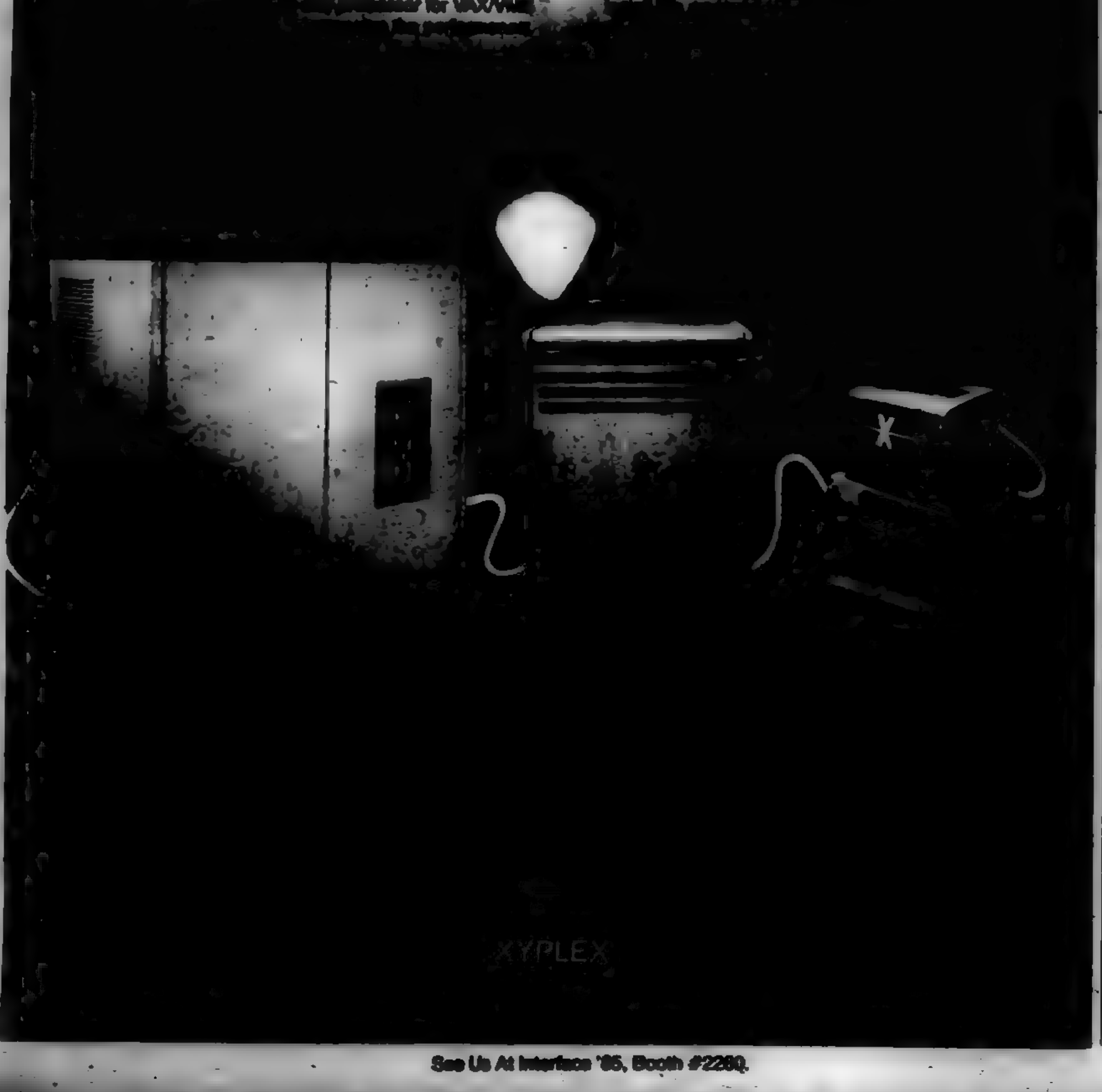

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Special Report

Consider design when choosing a communications net

By James S. Wetterau
Special to CW

During the 1980s, choices for the data communications manager have proliferated as never before. Postdivestiture activities by the newly competitive AT&T, the newborn local operating companies and their competitors make life both complex and demanding. No longer can managers responsible for the planning and implementing of data communications depend on the telephone company to provide an optimal network.

The choices available for data communications require a structured approach to the design of communications networks. These choices basically fall into the following three areas:

- Local-area networks.
- Value-added networks.
- Wide-area networks.

Two types of architectures meet the need for communications. Local-area nets meet local communications needs, while wide-area networks meet remote needs. The value-added networks are a subset of wide-area networks that meet specific needs of traffic density and dispersion.

> ***The only relevant issue is whether to remain centralized or to disperse networking closer to users.***

A local-area network permits locally attached devices to communicate, usually at speeds above 1M bit/sec, to one or more computers. Its most attractive feature is universal connectivity at very high speeds and easy terminal movement. The negative feature of local-area networks at this point is their complexity and high cost per connection.

For IBM networks, a local-area nét must be Systems Network Architecture (SNA)-compatible. SNA offers the multiple machine access promised by local-area networks; SNA even uses coaxial cable for most of its local communications, similar to local-area network cabling requirements.

The major distinction between local-area networks and an SNA network implementation is that SNA is a tree hierarchical structure, while most local-area networks utilize a bus or ring topology, although many broadband local-area networks have adopted a tree structure for running coaxial cable throughout a building.

Another local-area network distinction is that most users have adopted some form of access method utilizing contention with error correction, such as the widely used contention system multiple access/collision detection.

IBM's future local-area network is frequently a topic of discussion. Although the product has not yet been announced, observers anticipate that IBM's local-area net will run on twisted-pair wiring with possible fiber-optic implementation. The topology proposed is a ring structure, and the expected access method is known as token-passing, which would easily complement the polled terminal architecture embedded within SNA.

It is expected that IBM will announce its local-area network in late 1985. The net's cost is not yet known. It is interesting to note, however, that IBM recently acquired many equipment components from Sytek, Inc., one of the best known broadband local network vendors, and is using these components for networking the Personal Computer. It is not known if this indicates a desire to change their local-area network architecture for mainframes.

To select a local-area network properly, the communications planner must first determine that a need exists for the speed and connectivity that a local-area network provides. If traffic topology is important for general communications analysis, it is doubly important for local-area network selection. Furthermore, for IBM users, the SNA environment requires that any selected vendor be able to demonstrate SNA compatibility for SNA devices that will communicate over the local-area net.

This capability is becoming increasingly available from many local-area network vendors. It is not necessary to wait for IBM's local-area network before making a local-area network decision. However, if a clear need does not yet exist for a local-area network, it is certainly wise to wait until the parameters and cost of the IBM local-area net are known so they can be factored into such a decision. For any local-area net selected, be sure that it is compatible with your computer hardware.

The 1970s saw the emergence of the value-added network, a new kind of data transmission service that was particularly well suited to connecting widely dispersed users with one or many computers. These value-added networks used a new kind of transmission called packet switching. Packet switching enabled value-added networks to carry many different users' data in packets, which provided more optimal use of transmission facilities than the usual procedure of dedicating a circuit to a given user.

With these economies of scale, it became possible, by the use of virtual circuits, to provide service to lower density locations and make money at the same time. Note, however, that making money has been a persistent problem for most of the commercial value-added networks.

It has been clearly demonstrated that for interactive traffic, packet switching is the most efficient transmission scheme available. From this technology, the value-added networks have offered virtual circuits for users who wish to switch traffic from many different locations to their hosts. By using the X.25 packet-switching standard, developed by the European Consultative Committee on International Telephone and Telegraph, it is possible to consolidate traffic from many low-speed users into one high-speed line, thus gaining much operational efficiency at the host end.

This technology is very applicable for networks with lower density users who do not require private-line access. A value-added network can reduce the dial-up costs of serving users, while at the same time reducing their long-distance telephone access costs. Furthermore, value-added networks are beginning to offer asynchronous-to-SNA conversion, which makes them more attractive to IBM networks. IBM users have avoided value-added networks in the past because of this problem.

> ***To develop a network plan, know what is available and know the traffic requirements of the corporate computer environment.***

For IBM users considering a value-added network, however, two considerations must be taken into account:

- First, any value-added network service being considered for use with an IBM system should be SNA-compatible. Most value-added networks are compatible with IBM's Binary Synchronous Communications (BSC) protocol and aim for SNA compatibility.
- Second, as IBM has made X.25 access available on their communications controllers, via an interface, it should become easier to interface any desired value-added network services to an IBM host. If the interface is not an option, there are other, possibly more cost-effective, ways to get X.25 compatibility from other vendors.

For the long run, as traffic needs increase, private value-added networks can also be procured from several vendors. Private value-added networks are an increasingly attractive option as users find their network needs expanding. It is also possible to use a composite of private and public value-added network services. But that brings us to our next and last service to consider.

As stated earlier, both local and remote communications needs can be developed once the corporate information flow is considered. Just as local-area networks deal with the local data traffic flow, long-distance traffic needs have been grouped into a category called wide-area networking.

In fact, any collection of data communications facilities is, technically speaking, a wide-area network. A centralized host serving multiple IBM terminals can be a wide-area network.

The only relevant issue is whether to remain centralized or to disperse networking closer to users. In fact, the more wide-ranging issue is whether or not users with a multiplicity of network needs, from dial-up to dedicated, centralized or dispersed, can have all their needs met by a single overall communications architecture.

If it can be determined that economies of scale merit such a unified approach, then the effort is worthwhile. It would certainly be most appropriate for any data communications network planner to consider the need for a unified architecture: An analysis of estimated traffic flow encompassing all applications is an absolutely crucial part of such an architectural analysis.

Once a traffic analysis and a traffic matrix are developed, the architectural issues can be addressed. Wide-area network options range from circuit switching, with concentrators and multiplexers strategically located, to private packet-switching networks for handling a multiplicity of traffic types with transmission facilities, including high-speed microwave or satellite links.

To select a communications hardware architecture properly, a major effort must be undertaken to solicit bids from various communications equipment vendors.

The major constraint on this process is the need for any selected network architecture to be compatible with the corporate computer architecture. While many products are only BSC compatible today, most are addressing the issue of full SNA compatibility.

Another constraint imposed on IBM users is the outright ban on the use of BSC circuits on satellites and the caution that must be exercised if and when Synchronous Data Link Control links are placed on a satellite. With proper buffering and adequate data block storage capacity in the terminal controllers and communications controllers, satellite links can be very cost-effective for high-volume traffic. This should be evaluated quite carefully.

There are two key factors in developing a successful network plan. First, know what is available. The options have briefly been touched on above. Second, and almost more important, know the networking traffic requirements of the corporate computer environment. This is sometimes known as the internal information flow requirement.

The most effective way to control information flow is to establish a strategy, coupled with specific objectives, before expansion occurs. This requires a plan. This plan must consider more than what technology is available or cost-effective.

If corporate control of the flow of information is to be achieved, then information flow requirements must be anticipated, and the application of technology to those requirements must be designed for in a specific, coherent fashion.

In order to ensure sound design for both new and existing applications, user needs must be evaluated. The best way to achieve this is via top-down analysis of information access requirements. If this is done for all departments within a company, a coherent plan for user equipment utilization and needs can be developed. From the total information flow matrix for all departments, both equipment requirements and networking configurations can be determined.

In short, before a network can be designed, the traffic must be fully determined. The optimum network topology will be determined by the traffic matrix. From the traffic and topology requirements, vendors can then be solicited, and a network architecture that will be both cost-effective and compatible with the computer architecture can be installed.

Wetterau is a senior network analyst with a major financial services firm in New York.

Europe focuses on public ISDN, extending satellite nets

By Marc De Villepin
Special to CW

The data transmission approaches in the United States and the European Economic Community have been historically quite different.

For instance, telex use, although no longer increasing, remains an important and common way to communicate short messages in Europe. For small businesses, telex machines are still the second communications device after the telephone.

Nevertheless, telex is quickly being replaced by facsimile, electronic mail systems that use packet networks as a backbone network and, in the near future (1985), the Teletex service.

This last service, Teletex, will use existing telephone and packet networks with an interface to extend to the telex network. It is expected to overcome the incompatibility between word processors from different equipment vendors and standardize communications. Working at 2.4K bit/sec, a letter will be sent from desk to desk in 10 seconds.

For data transmission itself, for instance from CPU to CPU, public packet networks serve as the backbone of European networks. The X.25 packet network technology was used first with the Euronet network in the '70s and was followed closely by the development of highly used domestic networks, such as Transpac in France, which had more than 20,000 direct connections at the end of 1984; Datex-P in Germany; BPSS in the UK; and Iberpac in Spain. Use of X.25 packet network technology provides high speed, flexibility and control for better cost/performance ratios.

Photo by M. De Villepin

Telecom I satellite

It is clear now that the objective of telephone companies in the U.S. and Postal Telephone and Telegraph (PTT) authorities in Europe is the implementation of an Integrated Services Digital Network (ISDN). Pilot services will start in most European countries in 1985-86, with a forecast for public service in the 1988-90 time frame and with national coverage by 1995.

By 1996, 95% of France will be covered by an ISDN. Three million ISDN lines at 144K bit/sec will be installed (as well as higher speed ISDN lines).

At this point in Europe, however, compatible terrestrial and satellite networks have been integrated to respond to communications needs.

For instance, in terms of speed, multiples of 64K bit/sec up to 2M bit/sec, are available now in France for data applications. Alternate communications routes, either terrestrial or satellite, over two compatible digital backbone facilities and a large number of direct connections or satellite antennas add flexibility.

The networks are controlled by direct connections between site locations and the control center of the network.

Since 1977, 17 European countries have been cooperating on a regional basis to develop satellite communications throughout Europe. The European telecommunications satellite organization, Eutelsat, was established for that purpose and is now in full operation.

Eutelsat's main shareholders are France (16.4%), the UK (16.4%), Italy (11.5%) and Germany (10.8%).

The main objectives that Eutelsat has set down are as follows:

- To strengthen the terrestrial networks for carrying intra-Europe and international public telecommunications traffic between main international exchanges.
- To provide a new means (other than microwave) for television program exchanges, coordinated by the European Broadcast Union.
- To provide a satellite multiservice system in Europe.

Photo by M. De Villepin

Telecom I 3-meter antenna

Within this last service the French Telecom I satellite will play a role in the realization of a digital switched network system throughout Europe.

The space segment of Telecom I is composed of two satellites with six transponders each for the Ku-band coverage of Europe, with a capacity of 25M bit/sec per transponder. On the Telecom IA bird, which was launched in early August and became operational as of Dec. 1, 1984, one transponder is dedicated for European digital communications, one is leased by the German Bundespost (the German PTT), three are dedicated for French domestic use and the remaining transponder is dedicated to analog videoconferencing.

Apart from this last transponder, the system is a fully digital Time-Division Multiple-Access/Demand-Assignment network. An extensive ground network has been developed with a capacity of 300 11-ft transmit-and-receive earth stations for the digital services and a mobile fleet of six-ft television receive-only earth stations for analog teleconferencing.

Future applications for Telecom I services include decentralized computer-aided design and manufacturing, picture distribution and teleconferencing.

In conclusion, European networking technology will continue to progress and move toward ISDN standards in coming years. As expected, new technologies will play an important role in the European networking grand plan.

De Villepin is assistant vice-president of France Telecom, Inc. of New York, which is a representative office of the French Postal Telegraph and Telephone authorities.

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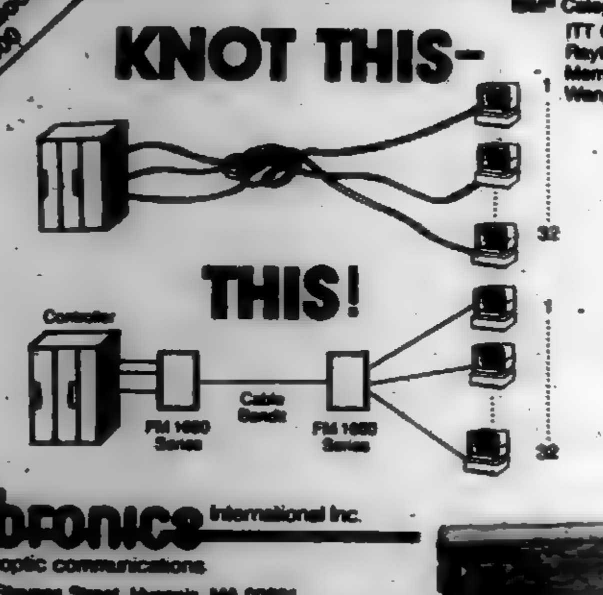

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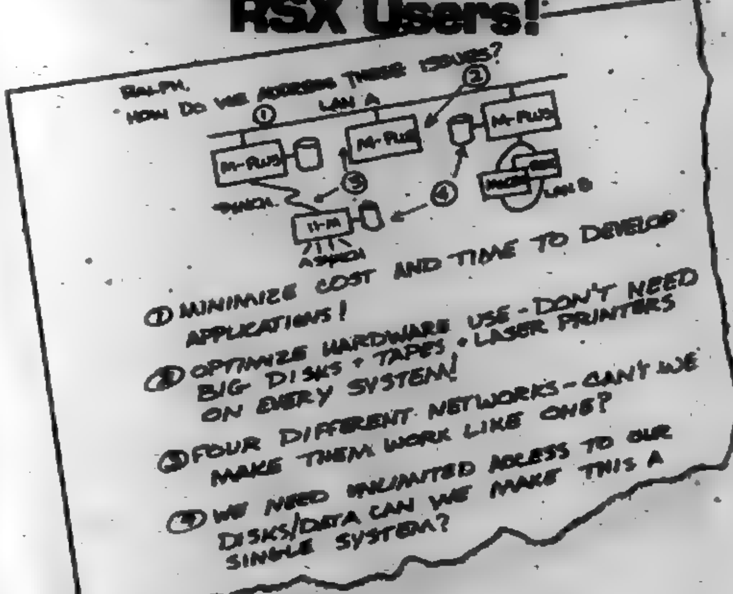

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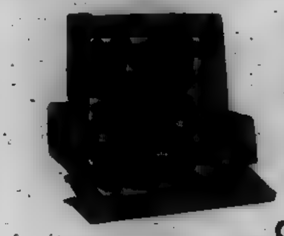

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INFOTRON SYSTEMS

Special Report

Satellite-based network, automation help freight firm

MEMPHIS — After a decade of consistent growth lodged a freight forwarder here in an information gridlock, the firm turned to automation and a satellite-based network to keep its business moving.

Since its founding in 1972, Greater South Traffic, Inc. has grown at an annual rate of 35%. Last year, the freight forwarder moved more than 100,000 truckloads for more than 3,400 clients nationwide.

The growth strained the manual systems on which the company had relied. According to Keith Adney, Greater South Traffic's DP manager, "The company was getting bogged down in paper; it couldn't manage its information properly."

Employees, for example, had to sift through a stack of old invoices to compile profiles on client's billing statuses. "This type of delay detracted from other, more important areas of the business," he said.

The company's success depends on its ability to select the fastest, most cost-efficient routes available for its clients' shipments. "We're a service company in the purest sense," Adney said, "and we rely on information to run our business."

In May 1981, the company installed a 512K-byte Burroughs Corp. 1905 mainframe in its headquarters here. It brought up automated billing and load-tracking software in January 1982 then installed terminals and other peripherals in 16 branch offices. In February 1982, it tied the system together with a satellite-based network from RCA Cyclix Communications Network, Inc.

'Aware of the potential'

RCA Cyclix had just begun to market the network technology, but Greater South Traffic felt comfortable in choosing it, Adney said: "I was fully aware of the potential of satellite communications." He considered the technology's low cost and high reliability for nationwide communications its chief benefits for the firm.

Because Greater South Traffic conducts business throughout the country, satellite communications suited the firm's budget better than leased telephone lines.

"There is no way we could afford direct or multiple-drop lines connecting all our branches," Adney said. "With a satellite-based network, the wider the area over which a user's terminals are dispersed, the greater the user's savings when compared with the cost of leasing phone lines and purchasing modems."

He did a cost analysis comparing leased-line and satellite communications and calculated that connecting nine offices with telephone lines would cost the firm $6,000 per month more than connecting 16 offices via satellite.

But Adney said reliability, not cost, was the main reason why Greater South Traffic decided on the satellite network. RCA Cyclix provides automatic network monitoring, control and diagnostics and coordinates problem diagnosis and correction with local operating companies.

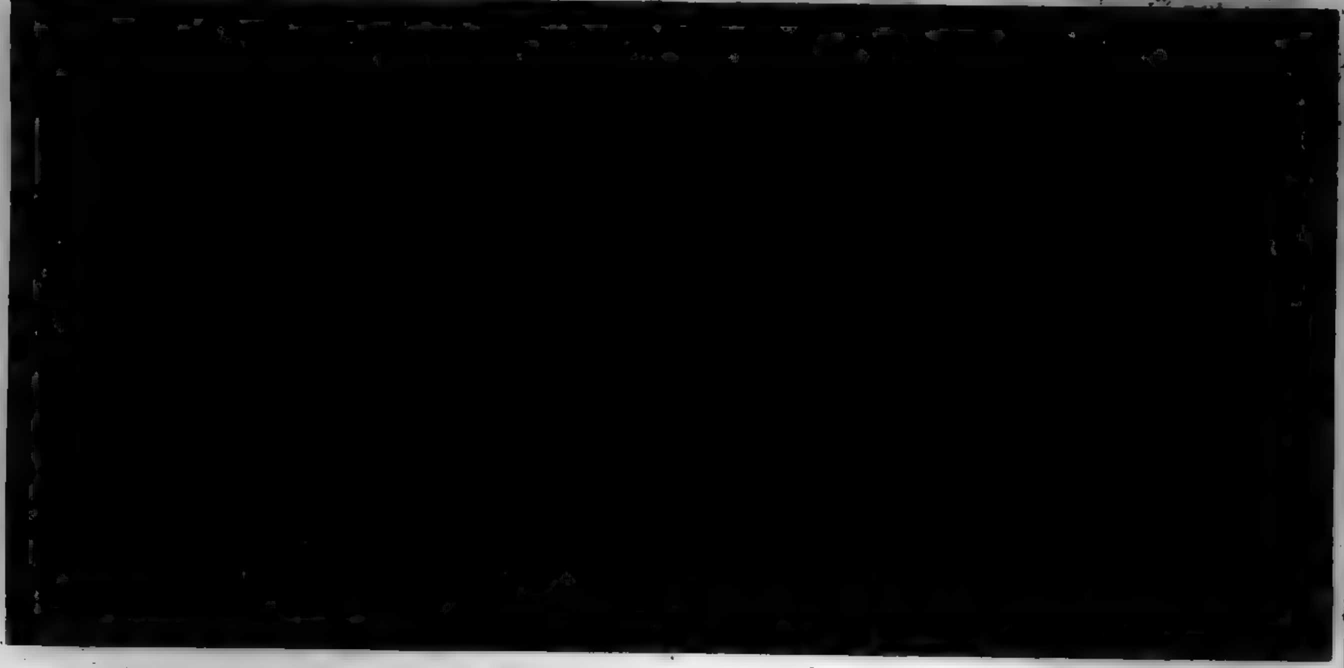
"They deal with the phone company when a line goes down," he said. "All we have to worry about is running our business."

Greater South Traffic has only two DP staff members and would need to hire a network manager if it had to monitor a network on its own, Adney said.

Problems fixed quickly

With the service, he calls RCA Cyclix whenever a problem arises, and they fix it quickly. He said that with a leased-line network, Greater South Traffic would experience longer downtimes, because the firm would have to resolve its own problems with various local telephone companies.

Uptime is a crucial consideration because employees must have speedy access to shipping data from the network. "When they are there



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Special Report

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to get information on a shipment, our network has to be working," he said. "When it's down, we're losing productivity."

Since the firm began using the network, most of its problems have been with local telephone lines that link RCA Cyclix ground stations with Greater South Traffic offices, according to Adney.

The satellite network provides data communications for the firm's 140 employees. Account clerks at branch offices have immediate, on-line access to data concerning shipping transactions.

On-line access speeds the development of bills of lading — documents that list the details of loads being shipped — and the preparation of invoices. Adney said employees can, in the same amount of time, prepare twice as many bills of lading as they did using manual procedures.

The network also gives the firm the ability to monitor loads enroute to their destinations so it can report delays and revised arrival times to customers. "Our employees use the network to relay information on delays or other problems with a shipment, and we, in turn, keep our customers informed so they can plan accordingly," Adney said.

Greater South Traffic also uses the network to operate an electronic mail system that Adney designed. Users communicate office memoranda and sales and marketing information among branches; they type messages on a terminal at one location, and users at another location retrieve the messages either on screen or on hard copy.

Sixteen drops connect 95 Burroughs MT983 VDTs — 65 in the field offices and 30 at the headquarters — with the Burroughs mainframe. The company processes about 1,000 transactions per hour, with between 40 and 45 users transmitting or receiving information at any given time.

Recently, Greater South Traffic installed six IBM Personal Computer XTs, two in its headquarters and one each at four branch offices. Employees use the micros both for word processing and to run spreadsheets that allocate railroad rate increases across the firm's customer base.

FIBER from SR/6

transport medium and methods. It is in these applications areas that local-area networks have flourished.

Although local-area networks are available in various topologies, signaling and access methods, coaxial cable is the most popular transport medium for local-area networks today. The major reason for the use of coaxial cable is its ability to passively tap into various topologies with minimal degradation of available bandwidth in baseband hertz to 10-MHz applications and broadband applications, typically between 50 MHz and 100 MHz.

Protection from obsolescence

The future of fiber optics in a local-area network environment is significant from the standpoint that it provides protection from functional obsolescence due to inherent bandwidths of up to 2 GHz per kilometer for graded-index, multimode fiber-optic cable to hundreds of GHz per kilometer for single-mode fiber-optic cable.

With transmitters and receivers ranging in price from $100-$400 and fiber-optic cable costing $1-$3 per foot for a six-strand cable measuring 100 microns internally and 140 microns externally, it is hard to ignore the cost and performance of fiber-optic technology in your data transport plan.

Data transport planning is becoming the most important task you will be addressing in the near future. The key to the success of a network will be determined by the cost, flexibility, capacity and compatibility with future technologies inherent in your network design.

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Special Report

Divestiture drives demand for private long-haul nets,

By Jeff Kaplan
Special to CW

The AT&T divestiture, improved technology and greater sophistication among major communications users fueled an enormous increase in the demand for private long-haul communications networks in 1984. Although private communications systems can save costs and be more efficient than the public switched network, users should look before they leap at becoming their own telephone companies.

A private network, in its least complicated form, is a transmission system owned exclusively by its user that partially or entirely bypasses switching circuits owned by the local operating companies, AT&T and/or the other common carriers to transmit voice, data or video messages. However, few true private networks exist today because of their excessive costs.

Instead, variations include private lines leased from common carriers. A recent Federal Communications Commission staff report recommended that private lines leased from common carriers be considered a form of private network.

Another variation is that of privately owned systems that are intended to supplement the services provided by the common carriers. Shared service arrangements have made it economically feasible for small- and medium-size companies to use private networks that they otherwise would not have been able to afford.

By adding private networks to the list of corporate communications options, network implementers can determine the most cost-effective network configuration to meet their needs, avoid fluctuating prices and use the most advanced technology available. Furthermore, as more and more vendors enter the market with new products that boast technologies with greater price/performance ratios, the user's position becomes increasingly flexible.

Survey results

A recent International Data Corp. (IDC) telephone survey of approximately 100 telecommunications managers from Fortune 500 companies and major public agencies posed a series of questions concerning private networks. Nearly 50% of the survey respondents indicated that they are currently operating what they termed a private network. Another 20% of the respondents stated that they planned to install a private network within five years.

Three-quarters of the respondents with their own private networks said their systems carried more than 50% of their long-haul communications. These respondents indicated that their private networks included a combination of satellite and microwave equipment capable of transmitting voice and data messages through private channels and public networks. But it was the respondents' heavy reliance on private leased lines that resulted in such a high percentage of users claiming to operate their own private network.

The respondents identified these four fundamental problems with the public telephone system:

- Increased cost.
- Technological bottlenecks.
- Inefficient maintenance.
- Lack of flexibility.

Large corporations with extensive remote communications needs are finding long-haul private networks a cost-effective alternative to the available common carrier services.

Two-thirds of the network operators said the prospect of generating significant cost savings was the most important factor in their decision

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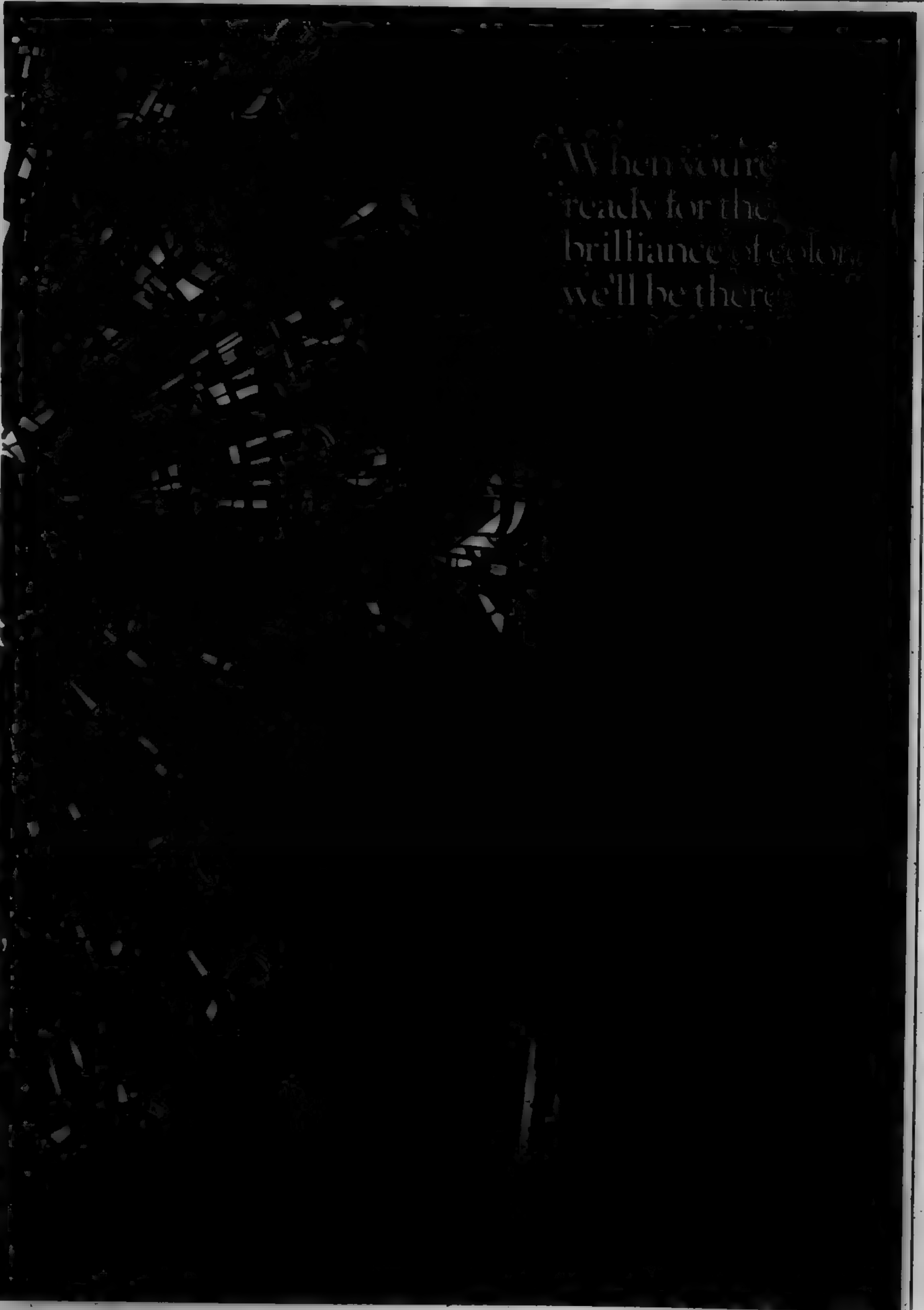
Kaplan is a senior market analyst for the communications industry research program at International Data Corp. in Framingham, Mass.



but users must analyze costs, benefits before buying

to develop a private network. The added control and security that a private network provides was given as the second most important factor. Increased speed and service was less important to the respondents.

Resale capacity pros, cons

Only one of the respondents indicated that his private network was built to take advantage of its resale capacity.

IDC has consulted with a number of firms considering the resale capabilities of their private network facilities. These companies have applied for private microwave licenses with excess transmission capabilities to avoid having to reapply to the FCC in the future to meet their expanded needs. They have acquired oversize transmission systems with additional traffic capacity in hopes of generating added revenue by reselling long-distance services to other users to pay back their investment.

This type of venture should be avoided in cases where the private network operator lacks the organizational capability to manage a resale operation. We have also found that few companies are willing to entrust their communications requirements to an inexperienced and untested service provider like a private network operator. Therefore, the realistic revenue-generating potential of these systems from resale operations is minimal and unlikely to justify the costs.

Many large-volume users, however, are installing their own private networks with considerable excess capacity. The prospect of many of these private network operators finding themselves unable to manage their systems profitably has attracted the attention of a number of telephone service resellers.

Shrewd resale vendors have seen their position in the long-distance services market threatened by intense price competition and are targeting the private network operators as good prospects for their marketing skills. The resellers are offering to market the private network operators' excess capacity by redistributing it locally through a variety of techniques, including digital termination systems (DTS).

DTS are microwave-based and, until recently, were regulated and licensed by the FCC. DTS offer users the high-speed, short-haul transmission capabilities they need to connect to a long-haul system. DTS are still not widely available because of past regulatory requirements and the financial cost of construction. However, IDC expects DTS to become an important link in the local distribution of long-haul services and a common method of reselling private network facilities.

If all or most of the new common carrier systems are constructed, a glut of transmission facilities will drive down long-haul rates significantly. The availability of cut-rate services may lessen the financial need to resort to a private network alternative. Communications users considering a private network should evaluate their future costs in light of these changes in market prices.

The emergence of shared tenant services (STS) represents an important alternative to a private network operated exclusively by a single user. An STS arrangement allows a number of users to take advantage of a transmission system furnished by a facilities manager.

IDC research, combined with similar findings from other user surveys conducted by the FCC and others, clearly shows a trend toward greater private network utilization over the next five to 10 years. Large-volume communications users can benefit from the added control and flexibility that private networks provide.

But flexibility has its price. Users should be careful not to overestimate the capabilities of these systems and ignore other more cost-effective alternatives.

"SOME DAYS JUST GETTING DATA THROUGH THIS CSMA/CD NETWORK IS A REAL BATTLE."
"WE SHOULD HAVE GONE WITH CONCORD DATA."

Alonzo Chappel, *Battle of Bunker Hill*: Courtesy The Bettmann Archive.

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Special Report

Decision-making forum can alleviate apprehension

By Leonard B. Carlson
Special to CW

> *No one wants to make bad decisions, and prospective network purchasers worry about doing just that. So they take a wait-and-see posture, and they do nothing.*

Local-area networks have been touted as the next step in the evolution of the microcomputer. But the micro user community in business has shown a reluctance to take that step.

Just what has gone wrong?

The overriding issue may simply be complexity: Potential buyers feel overwhelmed by involved and foreign concepts such as protocols, gateways, topologies, access methods, standards and basebands vs. broadbands. Alternative technologies, such as private branch exchanges and mini- and mainframe-based networks, add to the confusion.

No one wants to make bad decisions, and prospective network purchasers worry about doing just that. So they take a wait-and-see posture — essentially an abdication of managerial decision making — and they do nothing.

To escape from this stalemate, DP professionals and potential users need to begin to grapple with networking concepts so they can plan for the eventual networking of corporate micros. They can do this by asking a series of questions that promotes a forum for decision making.

The following questions, which are grouped according to their relevance to one of four broad concerns, can help provide a structured review of various network offerings:

Printing

- Is it necessary to have a dedicated print server? If not, can a user access printers at other workstations on the network?
- Is there multiplexed printing capability?
- How many printers may be attached to one server?
- Is there print spooling?

As a firm answers these questions, it should keep in mind that one important reason for having a local-area network is making peripherals serviceable to several users.

Additionally, a good network should permit simultaneous multiplexed printing to several printers and should provide print spooling so that microcomputers can off-load I/O tasks.

Data base and file sharing

- Can an existing micro be used as a file server, or is a proprietary file server necessary?
- If a proprietary file server is unnecessary, then is it possible to use a hard disk as a nondedicated server for local processing?
- What types and up to what sizes of hard disks does the network support?
- Is there read, read/write and shared-access capability for data volumes?
- Is there a network-level data base with concurrency? In that event, what security levels are provided? Is it possible to use locks on the field, record, file and volume levels?

The answers to the above questions should enable a firm to determine how well a

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Carlson is vice-president and manager of computer resources for corporate finance at Smith Barney, Harris Upham & Co., a New York investment firm.

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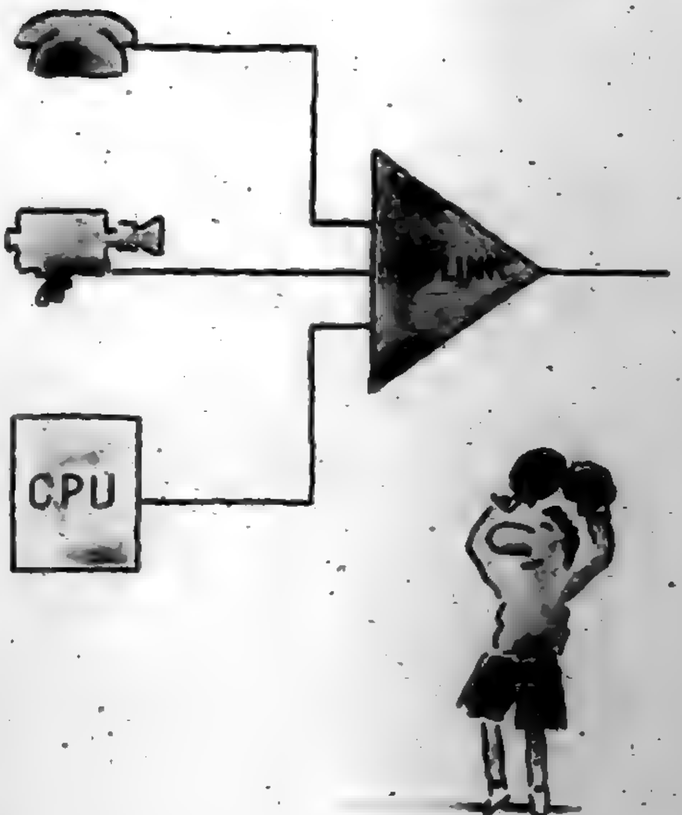

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about installing local-area nets in corporate arena

net can provide a consolidated data base that serves a large user community.

The network should allow for concurrent access to files and should have appropriate lock-out facilities. These ensure that simultaneous update does not corrupt data.

Communications

- How are external communications accomplished? Is it necessary to have a dedicated controller for communications, or can one micro use another's modem?
- Can modem connection and selection be made transparent?
- Can the network communicate with mainframes? Must a separate protocol converter be purchased?
- Can micros in remote locations dial in on the network and be serviced?

A firm's answers to these questions should indicate whether a given network will allow micro users to talk with each other through electronic mail, to dial out to time-sharing services and to establish high-speed bisynchronous communications with in-house mainframes.

Potential buyers should insist on a 3270/Synchronous Data Link Control connection to IBM's Systems Network Architecture and an X.25 link to external communications.

Maintenance, administration

- Can a microcomputer have access to any peripheral on the network, or must specific printers, disk volumes and modems be explicitly assigned?
- If assignment is necessary, how easy is it to reassign?
- How is volume status (read, read/write and shared-access) changed?
- Can the network administrator remove people who are logged on to the local-area network?
- If one node goes down, does this affect the others?
- Are there network- and volume-level passwords? What other security features apply?

Answers to these questions should show a firm how well its in-house DP staff can handle the day-to-day operations of a given local-area network.

Prospective buyers should insist that vendors provide explicit statistics on mean time between failures. With respect to network security, prospective buyers should keep one maxim in mind — more is better.

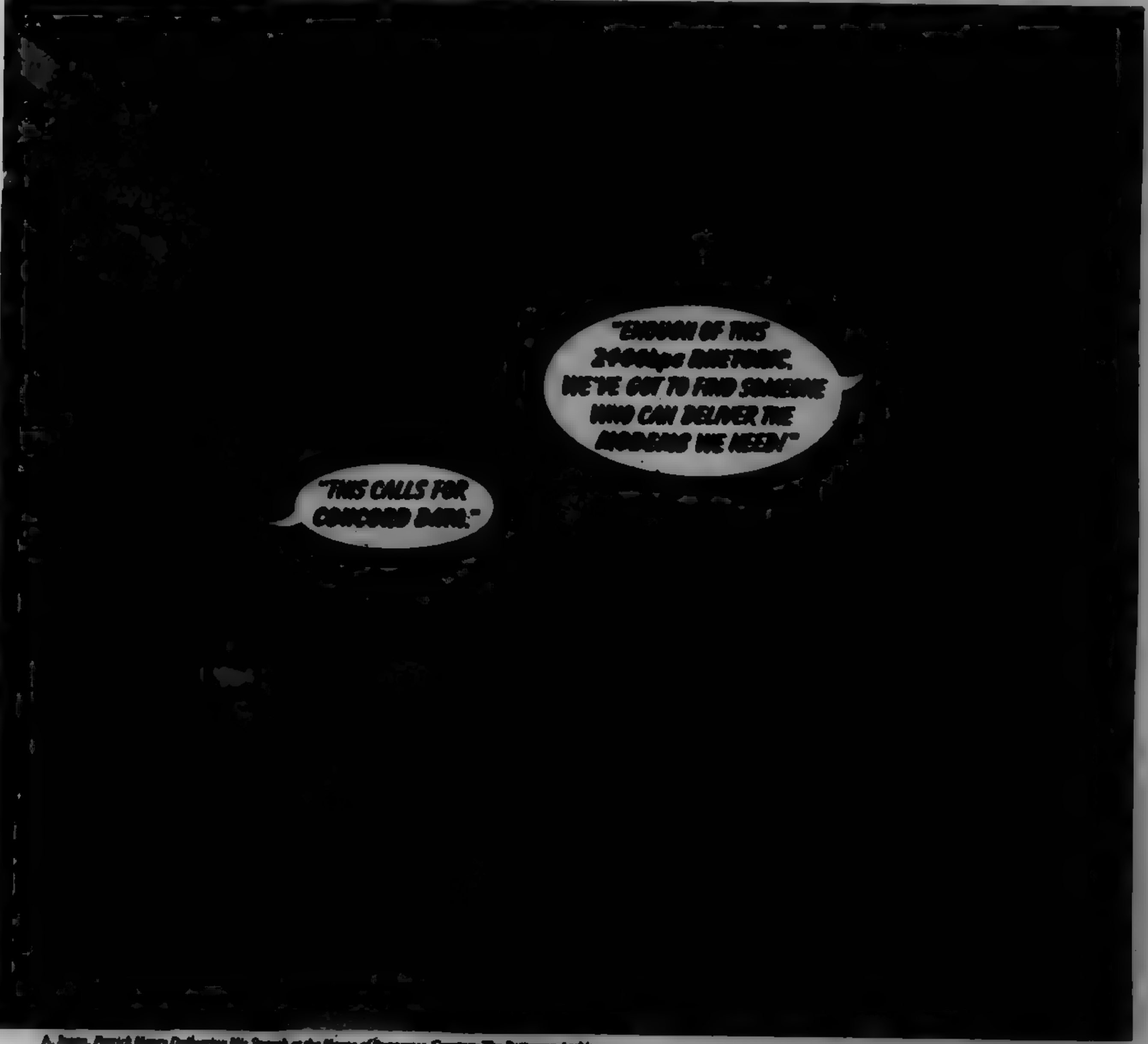
Another consideration a net customer must make is that of cost. When a firm calculates the overall price of a local-area network, it should include the cost of each of

> ”
>
> *Moving toward local-area neworking is a process of planning and problem solving; it is not especially improved by delay.*

the following:

- Interface cards.
- Print servers.
- Communications servers.
- File servers.
- Network software.
- Hard disk systems.
- Protocol converters.
- Wiring.
- Installation.
- Personnel.
- Ongoing support and maintenance.

Finally, the firm that wants to move toward local-area networking should remember this: The process is one of planning and problem solving; it is not especially improved by delay.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Special Report

Custom wiring scheme grants engineering firm the

OAKLAND, Calif. — A custom wiring scheme has allowed a design and construction firm here to meet the data processing requirements of a work force that is in constant flux.

Raymond Kaiser Engineers, Inc. (RKE) moves up to 200 temporary design workers in and out of work spaces throughout its 25-story headquarters building during different stages of work for various construction contracts. A network of twisted-pair wire lets the firm hook up and interconnect, in hours, whatever equipment these workers require.

RKE proceeds in stages through its design and project management jobs — which have included work on the Washington, D.C., Los Angeles and Boston subway systems and the National Aeronautics and Space Administration space shuttle launch facility — bringing on and laying off workers as needed.

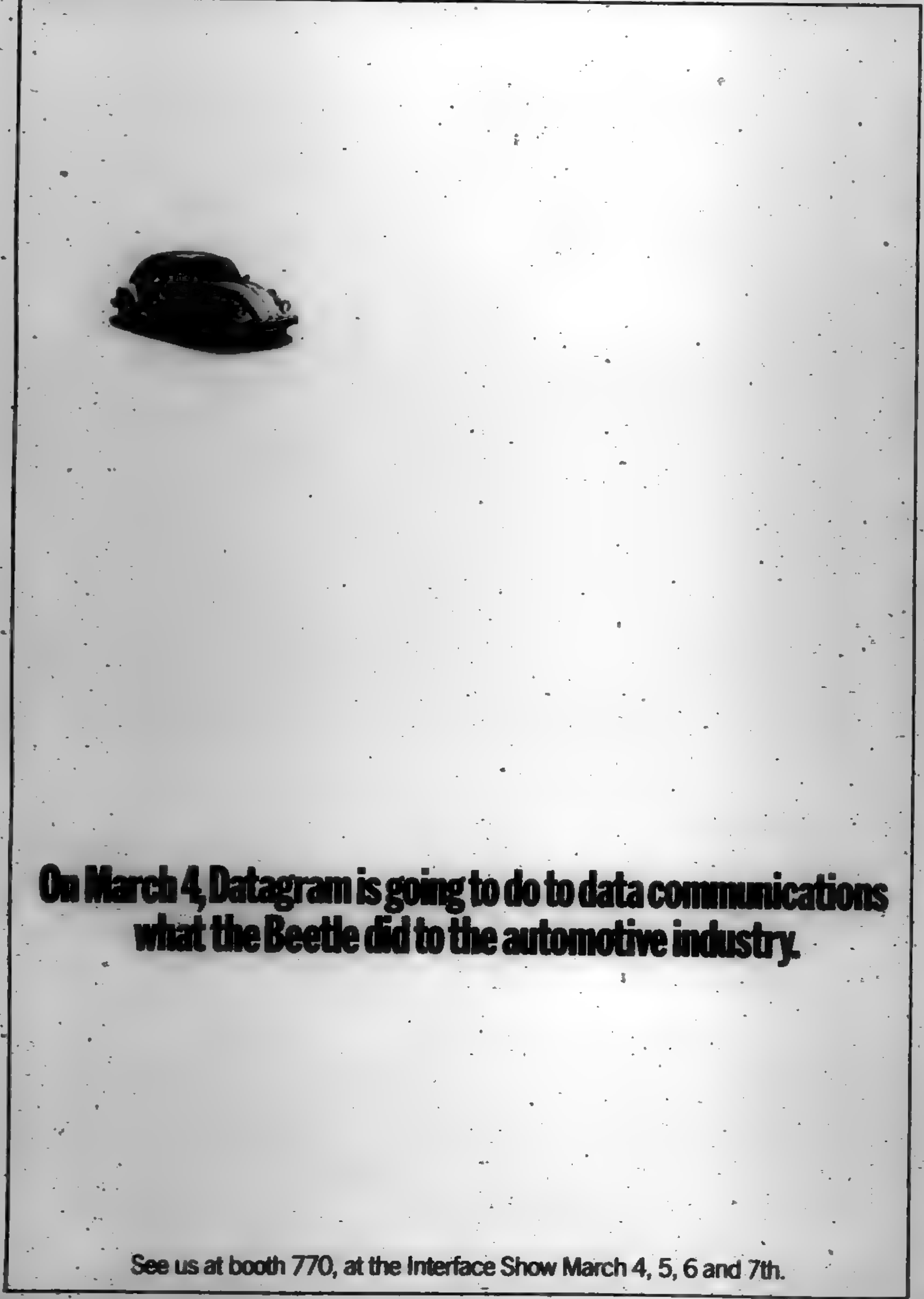
For typical projects it sets up groups of about 30 permanent employees to make bids and arrange schedules, then brings in the temporary workers to do design and procurement tasks, according to Herman Cordes, RKE's MIS manager. "They come in literally off the street and start working," he said. They leave as soon as their work is finished, and the original 30 employees continue to supervise the project and work with the client.

As the work force on a project grows and shrinks, the project group moves to different work areas that can accommodate its numbers. "We move people around quite a bit," Cordes said.

The firm's headquarters, which opened for business last year, was designed to facilitate the flux. Each floor has a layout almost identical to that of all the others. The wiring system works on the same principle.

It provides jacks and adapters that allow most data processing and phone equipment to send and receive signals over a network of twisted-pair wires. The system accepts signals from the firm's Northern Telecom, Inc. SL-1 phone system and its Datapoint Corp. Arcnet minicomputer-based distributed processing system. It also connects RKE's 90 Lee Data Corp. All-In-One terminals and 30 Lee Data Personal Workstations to its 16M-byte IBM 4381 mainframe and links equipment on the Arcnet with the 4381.

All the equipment is adapted to plug into an RJ41 jack, which resembles a common phone jack but contains additional wire, and each work area in the building is equipped with an RJ41. The jack hooks wires from the equipment into flat, under-carpet cables that carry signals from the equipment to their designated desti-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flexibility to meet DP needs of dynamic work force

nations. Each under-carpet cable carries six pairs of twisted-pair wire. Once a piece of equipment is hooked into the network, a wiring expert can establish circuit connection for it by switching on a specified number of the wire pairs. Standard phones and Lee Data terminals require one pair of wires to carry their signals; electronic phones and the Datapoint equipment require three pairs.

Whenever the firm wanted to hook up equipment in its old headquarters, it had to hire wiring experts to pull and retrack wires. The rewirings took about three weeks and cost about $300 per terminal. Sometimes, especially for short-term projects, RKE had to scatter members of project groups to different areas rather than spend the time and money to set up a central work space. "If it takes you three weeks to get something wired up," Cordes explained, "you're already a third of the way through your contract."

Now, each circuit connection reconfiguration requires only a few minutes, and employees from the firm's in-house telephone department can hook up an entire work area on demand in less than one day. Sometimes, problems with faulty wires force the firm to reroute connections. But RKE has always been able to set up the connections it needs, Cordes said. "We haven't hit one yet that hasn't worked eventually."

He said the twisted-pair network can transfer accurate signals between any equipment that communicates at speeds up to about 1.5M bit/sec. Because most terminals transfer data at about that speed, he said, "we feel that we can accommodate about 90% to 95% of those terminals' communications through our lines."

RKE has linked six Convergent Technologies, Inc. AWS 467 micros over the wire and expects to be able to connect IBM Personal Computers once IBM offers a multiuser operating system for the machines. IBM has run some tests with its equipment on RKE's wiring system, and, Cordes said, "They did not anticipate any problem."

Overall, the wiring has more than met RKE's expectations, he said. "Our experience to date indicates that we have accommodated all our phone and data processing requirements with a single type of wire that will meet the physical requirements of our office and the working requirements of our people."

For tasks that require line speeds above 1.5M bit/sec, such as some mainframe-to-mainframe connections RKE hopes to establish when it purchases additional machines for sophisticated computer-aided design and manufacturing, the firm is installing a broadband CATV network.

Modems give phone wires data net use

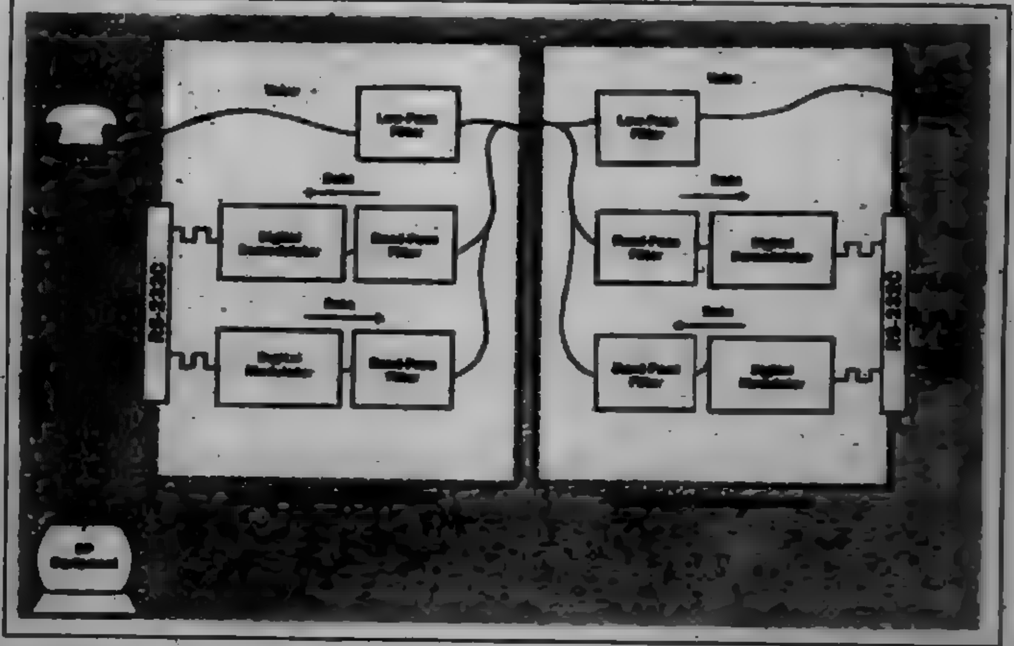
By Jerry Gallagher
Special to CW

With the availability of data-over-voice, two-wire local modems, most firms that have a telephone system in place can handle data networking.

These modems enable voice transmissions and full-duplex, high-speed data transmissions to travel simultaneously on one wire pair. As such, they allow data processing equipment and telephones to share in-house telephone lines. Every telephone station, then, becomes a potential prewired site for DP equipment.

Simultaneous voice and data communications are possible because voice signals do not occupy the entire available bandwidth on telephone lines. Voice signals use only the lower frequencies, and data-over-voice modems use the higher frequencies to transmit data above the voice spectrum.

A system of frequency filters maintains the integrity of the separate voice and data channels (see Figure 1).



GANDALF TECHNOLOGIES, INC. CHART

Figure 1. Remote and central data-over-voice units generate different carrier frequencies for full-duplex operation. The band-pass filters keep the two data channels separate and prevent voice signals from entering the data system. The low-pass filters prevent data from entering the voice system.

The modems work in pairs — a remote unit and a central one. When a digital data signal enters a data-over-voice modem, the unit generates an analog carrier frequency that it modulates with the data pattern. It then transmits the carrier frequency to another modem, which demodulates it and returns a digital signal to the computer system.

For full-duplex operation, remote units generate a different carrier frequency than central units.

Most remote models use standard RJ-11C telephone jacks to interface with the telephone system. They connect to data processing equipment via RS-232C/CCITT V.24 interfaces. In a typical installation, remote data-over-voice modems reside at work sites equipped with DP equipment, and central units reside in a computer room.

Central modems use telephone company-tariffed RJ-71C interfaces to connect to the telephone system on its main distribution frame. The RJ-71C interface, which supports up to 12 data-over-voice modem connections, usually resides in the computer room.

> ***Data-over-voice modems enable voice transmissions and full-duplex, high-speed data transmissions to travel simultaneously on a single pair of wires. . .***

A typical data-over-voice modem application involves terminal-to-mainframe links. The modems can, however, provide micro-to-mainframe, micro-to-micro and word processor-to-printer connections. They work both in private branch exchanges (PBX) and, with some restrictions, in Centrex telephone systems. Although the modems usually provide direct point-to-point links, they also interface with tools such as T1 multiplexers, X.25 network packet assemblers/disassemblers and microwave links.

Users can communicate with resources accessible through the communications devices just as though their DP equipment was directly attached to these tools or to the resources themselves.

Data-over-voice modems can also be used with data networking devices such as PBX and switching multiplexers that tie computer systems together and allow for switching among attached resources. Users gain access to a wide array of resources.

With the modems and a PBX, in fact, a telephone system can form the basis of a comprehensive local-data network.

Anything interfaced to the PBX is accessible over a modem-equipped link, and all of a computer system's resources lie as close as the nearest telephone wall jack. Systems managers and users benefit from the capabilities of the PBX — all available over telephone lines to DP equipment fitted with data-over-voice modems.

In some cases, the modems can be used with a PBX as an alternative to integrated voice/data systems, which tend to be expensive.

The cost of the data option on an integrated PBX, for example, often runs close to $1,000 per channel; the cost per connection in a data-over-voice modem/PBX network is significantly less.

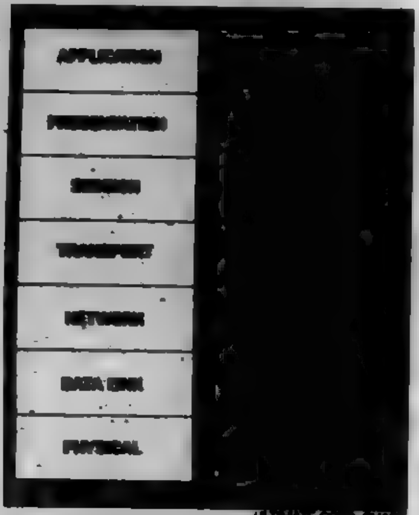
> ***. . . As such, they allow DP equipment and telephones to share in-house telephone lines. Every phone station, then, becomes a potential prewired site for DP equipment.***

When its voice and data systems are separate, a firm does not have to worry about how alterations made in one system will affect the other. Reconfigurations become less complicated, and each system can readily incorporate new technology. This is important because voice and data technologies evolve at different rates and often in very different directions.

Data-over-voice modems are also appealing because they help to maximize the use of existing facilities.

In addition to making use of installed wiring, they extend the useful lives of many telephone systems. Users can, for example, have data on their telephone lines without replacing a voice-only PBX that is providing satisfactory service. This can ensure that a recently purchased PBX becomes fully depreciated or achieves payback.

Gallagher is national manager of Telco Accounts for Gandalf Data, Inc., a vendor whose products include data-over-voice modems.



ULTIMATE CORP. CHART

The Open Systems Interconnect reference model defines a layered architecture, consisting of seven layers.

OSI reference model lays groundwork for

By John Neumann
Special to CW

Unprecedented in the history of computer-related standardization was the close collaboration between the International Standards Organization (ISO) and the Consultative Committee on International Telephone and Telegraph (CCITT) that resulted in the adoption of identical standards for both organizations.

A worldwide consensus concerning the Open Systems Interconnect (OSI) reference model and its related layer services and protocols has been achieved. International Standard 7498, is now recognized as the formal industrywide guideline for the construction of protocols designed to provide full interconnection of heterogeneous systems.

The OSI model does not specify how systems are to be implemented — merely how they are to communicate. Different manufacturers will implement these standards in different ways in order to achieve product identity to gain market share. As long as the rules, or protocols, are followed, it will be possible for different implementations to communicate effectively with one another (see Figure 1 page SR/23).

For the user, this means unlimited configurations can be created when mapping the OSI model onto an actual system or in designing a new system.

The OSI model defines a layered architecture consisting of the following seven layers:

- **The application layer** directly serves the end user by providing the distributed information service to support the application and manage communications.

Protocols being defined at this layer include virtual terminal, file transfer and job transfer.

- **The presentation layer** allows the application to interpret the meaning of the information exchanged. Information is translated and formatted at this layer.
- **The session layer** manages the dialog between the cooperating applications by providing the services needed to establish the communication, synchronize and resynchronize data flow and terminate the connection orderly.
- **The transport layer** provides end-to-end control and information interchange with the level of reliability requested by the user. The transport layer chooses a protocol class that considers the user requirements and knowledge of the underlying network service.
- **The network layer** provides the means to establish, maintain and terminate the switched connections between end systems. Included are addressing and routing functions.

The 1984 CCITT Recommendation JX.25 Packet Level meets the service requirements of the network layer. Additional on-going work seeks to define a connectionless, transaction-oriented network service and protocol.

- **The data link layer** provides the synchronization and error control for the information transmitted over the physical link. An example of a protocol at this layer is High-Level Data Link Control or Synchronous Data Link Control.
- **The physical layer** provides the electrical, mechanical, functional and procedural characteristics required to activate, maintain and deactivate the physical connection.

Each of these OSI layers contains a logical grouping of functions that provides specific services to ease communication between users. Additionally, each layer logically lies over all the interconnected systems that are in a cooperating relationship.

At each interconnected system there are devices that interact via the peer protocol to ease communication.

In a typical interconnection between end systems where the application processes reside, there may be intermediate systems that serve as relay points, such as a switching exchange in a packet network.

Users introduced to OSI concepts often question the practical implications of this new architecture or question if they should consider the model in future equipment procurements. They wonder if the vendors will follow the model. They also ask when vendors will begin offering

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Neumann is a senior consultant for network architecture at Ultimate Corp. and chairman of the American National Standards Institute's technical committee, responsible for the Open Systems Interconnect model's transport and session layers.

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OSI-compatible networking and if local-area networks are compatible with OSI.

A quick scan of the membership lists of the various committees developing the protocol standards within the reference model should dispel some of these fears. The committee memberships read like a "who's who" of the computer industry: IBM, Digital Equipment Corp., Data General Corp., Hewlett-Packard Co., Honeywell, Inc., Burroughs Corp., Sperry Corp., Control Data Corp., Gould, Inc., NCR Corp., and M/A-Com, Inc.

Many government agencies are also active, such as the National Bureau of Standards and the U.S. Department of Defense. Users are not without representation either, as such companies as General Motors Corp. and Boeing Co. also participate in the standards groups.

Several industry giants including Honeywell and DEC have announced that their product offerings in communications and networks in the future will support OSI protocols. Users have the most to gain by stressing the importance of this new architecture in future procurements. It will provide the freedom of choice in computing equipment not currently enjoyed by the user community.

> ”
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> *The European community is strongly behind OSI, and multinational vendors will have to support OSI protocols to remain competitive.*

Vendor offerings containing mature OSI protocol standards should begin appearing by late this year. As the protocols mature at the upper layers of the model, more vendors will migrate to this architecture.

Local-area networks are based on the OSI architecture. The IEEE-sponsored 802 Committee has produced a series of standards positioned at the lower two layers of the model. These standards have gained wide acceptance, and all public offerings are now based on them.

Even the widely touted Xerox Corp. Ethernet will be compatible with 802 Committee standards in its next release. The work of the 802 Committee is now being processed as international standards by ISO and the CCITT.

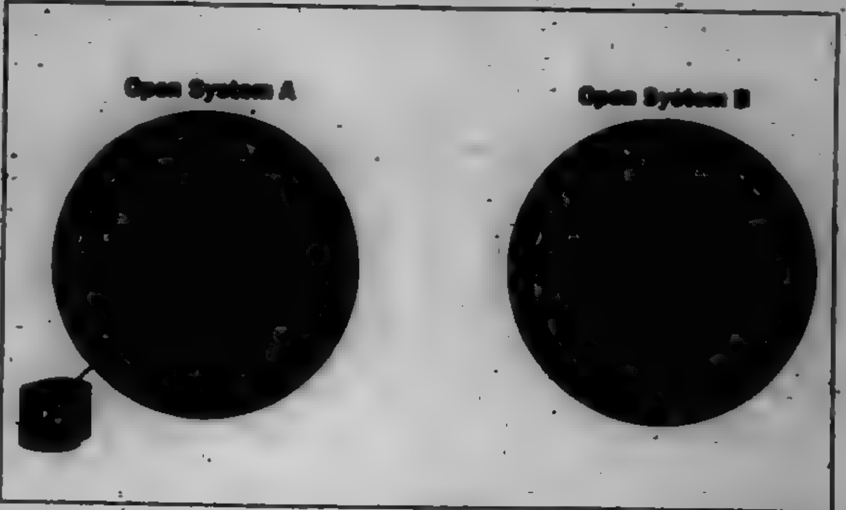
Default industry standards promulgated by one or more vendors for data communications is a thing of the past. While these proprietary offerings will continue to persist, look for a means to connect through gateways to OSI from these vendors in the near future.

The European community is strongly behind the OSI bandwagon, and multinational vendors will have to provide for support of OSI protocols to remain competitive in Europe.

Work within OSI is not complete. While standards are in place for the lower five layers of the reference model, much work is still required in the upper two layers and in the management aspects of the architecture. Given the scope of this work, true interconnection will probably not be possible until the end of this decade.

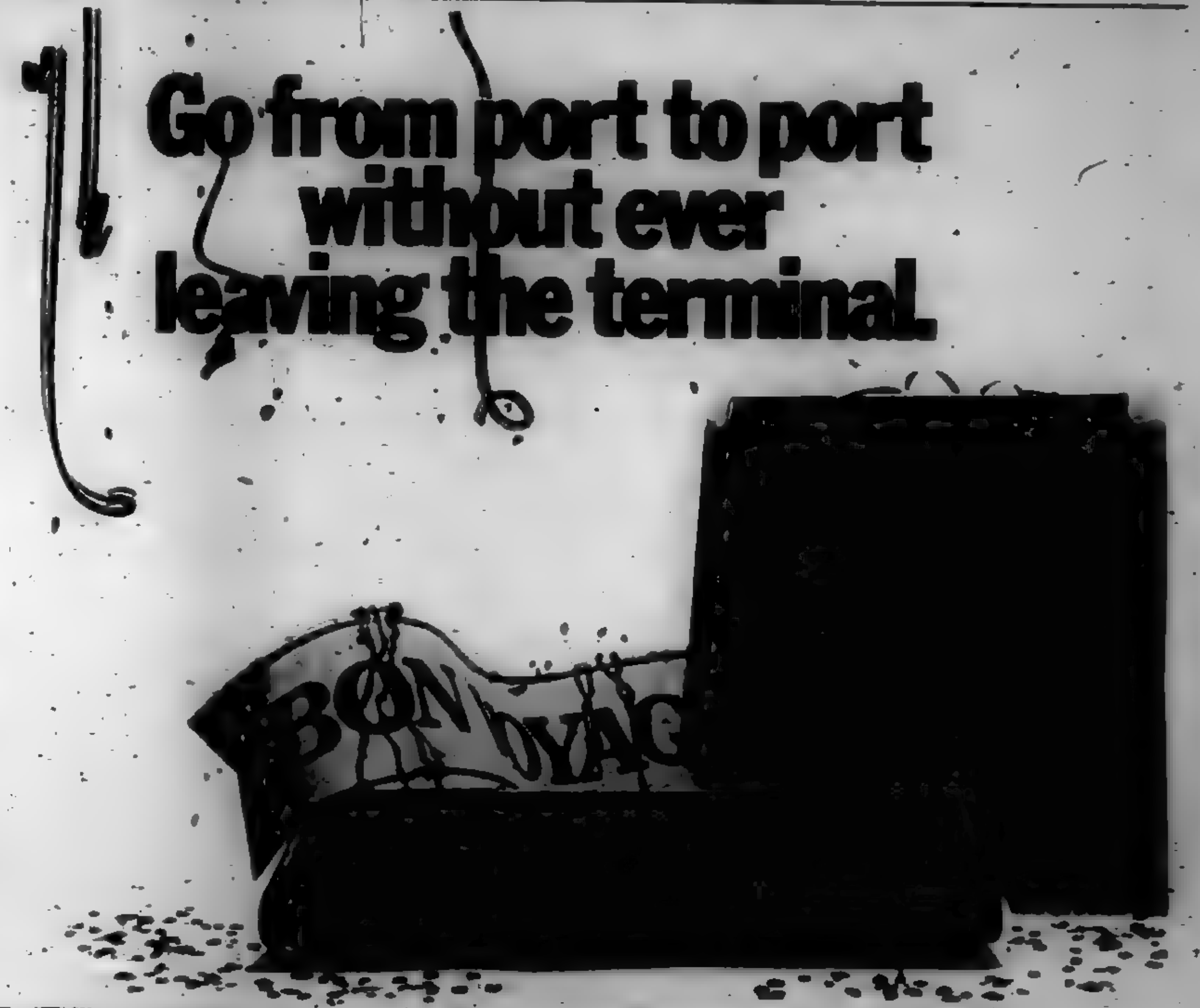
In the meantime, more products will support the completed OSI protocols. Such products should be able to add increasing functional capability as the standards mature. More work is ongoing within the architecture to define directory services, security, addressing and the connectionless, transaction-oriented facilities needed to complete the picture.

Quite simply, OSI is here to stay. It is solid, accepted by the industry and long overdue in the eyes of the user community.



ULTIMATE CORP. CHART

Figure 1. The OSI reference model does not specify how systems are to be implemented, merely how they are to communicate.



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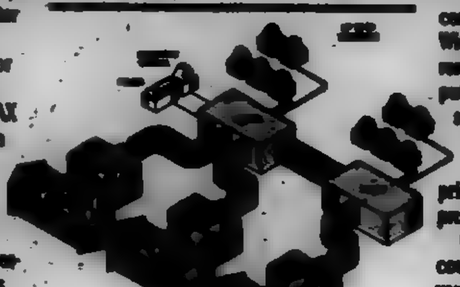

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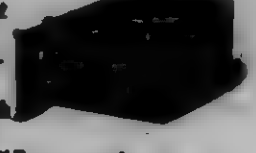
With ATTACH, users select their network destination. The data processing manager assigns user class definitions for various host computers. Then users can initiate switching between any VAX and PDP-11 UNIBUS computer ports in the system. Access to specific data files and applications in the appropriate host computer is readily available.

Navigate The Network Efficiently

With port selection, users match themselves to the application port required — no more wasted user time, or wasted support resources. And no host computer is sitting idle while others are overloaded.

Secure A Safe Passage

The ATTACH system assures the data processing manager of security in the network. With user class definition the supervisor restricts access to any specified host computer, set of computers or subset — this safeguards critical data files. Plus, with ATTACH, the supervisor is free to allocate a particular host computer to high priority users who demand instant access and processing time.



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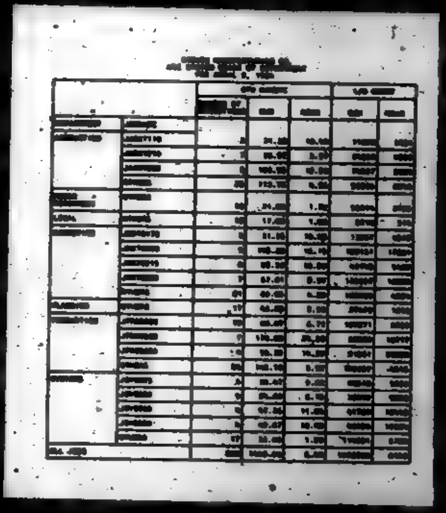

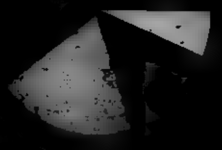

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Special Report

Satellite links clear path to reliable data transmission

By Thomas R. LaBelle
Special to CW

While satellite communications links are not needed by all corporations, they are a communications option. In some instances, they are the only options a facility may have for reliable, efficient and secure data transmission.

For this reason, network managers should know the reasons to include satellite links in a data network. Satellite links are especially useful in the following ways:

■ **Hard-to-reach areas.** If a facility is located in an isolated area where high-speed data transmissions are impossible through the local telephone company, satellite links are viable options. They are the only options in areas where there are no local telephone companies.

■ **Extreme reliability.** Satellites are impervious to sewer company ditchwitches, drunk drivers who knock down utility poles and the countless problems that can and do crop up every day in the central offices, wire centers and toll offices that handle terrestrial lines. A satellite has only two problems: Twice each year it gets in the line of sight between the ground stations and the sun. This causes the solar effluence to overwhelm the satellite's signal.

■ **Long distances.** In a terrestrial circuit going from San Diego to Boston, there may be hundreds of repeaters that have to be paid for, but there is only one with a satellite. The tariffs of many satellite vendors reflect this pleasant fact of life — especially if more than the standard 3-KHz VF bandwidth is needed.

■ **Bandwidth.** Rates of 56K bit/sec and up can be quite economical on satellites. The satellite carriers originally went into the business with the idea of selling raw bandwidth. This meant video, T1 and Telepak.

■ **Security.** For many, this is the most important reason to use satellites; especially in conjunction with a corporate rooftop earth station. Why? First, no one can eavesdrop on company transmissions. Anyone can point a dish at the satellite, but how is he going to know which of the thousands of channels he picks up belongs to you?

Remember, a satellite beams all of its down-link transmissions over every square inch of the country, and those transmissions contain the traffic of every subscriber using that satellite — a communications satellite is, after all, nothing but a broadcast radio. About the only way someone could eavesdrop on a company's transmissions is by finding out from the carrier which channels on which transponders the company owned.

A negative side

There is a negative side to satellite communications, however. While those who have used them to talk appreciate their fidelity, turnaround delay is quite disconcerting because it results in clipped speech and echo problems.

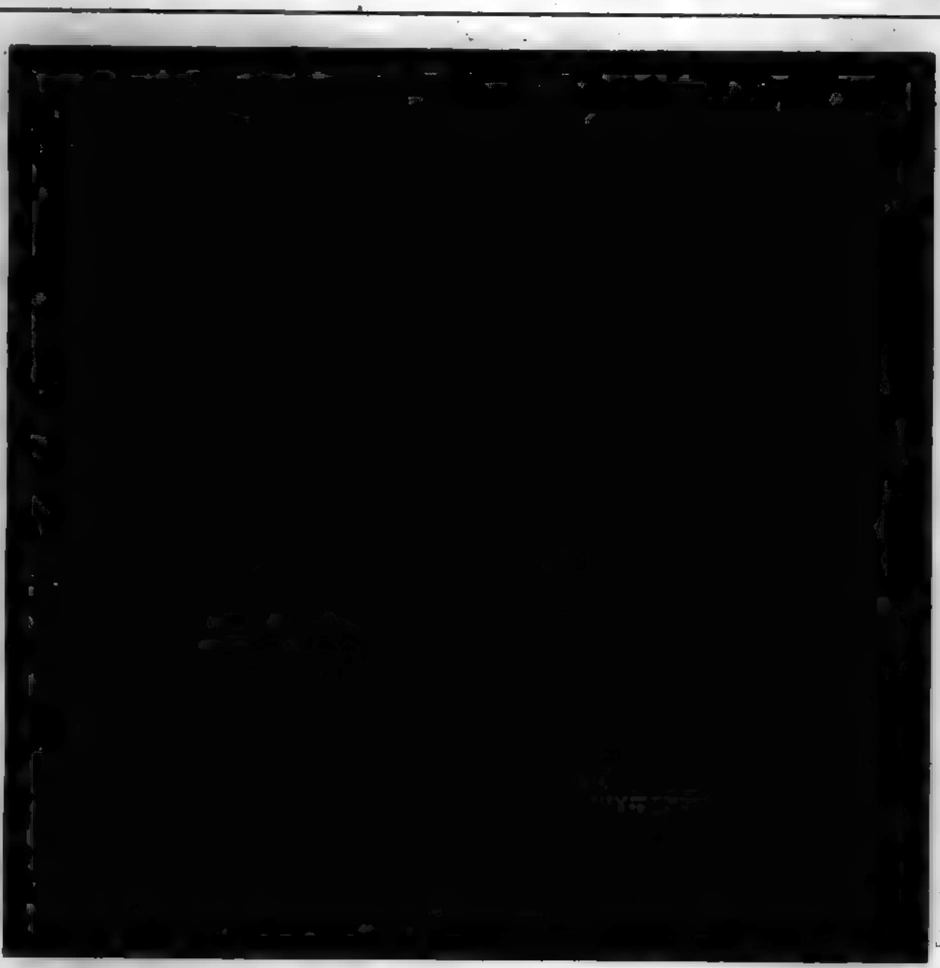
The chief problem with satellites is that they are so far away (22,300 miles) that even at the speed of light (186,000 mile/sec), a signal takes almost 0.25 sec to go from point A up to the satellite then down to point B.

Voice conversation can be rather awkward with almost 0.5 sec of dead time (propagation delay, as the physicists call it) between the end of one sentence and the start of the reply. It is because of this delay that people cannot (or will not) use satellite circuits to transmit certain types of data.

The explanation for this follows. If you have ever watched the monitor of a computer on a data hookup, you know that not all of the on-line time is spent sending data from source to sink. In-

See LINKS SR/28

LaBelle is a senior associate with LaBelle & LaBelle, a data processing and telecommunications consulting group based in Seattle.



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Network trims circuit costs, solves transmission problems

DOE contractor's multiplexed network links 150 terminals to mainframe, minicomputers

LAS VEGAS — Scientists who wanted to exchange data among host mainframes at a firm here that performs R&D work for the U.S. Department of Energy (DOE) once relied on a setup they called Footnet.

Footnet worked this way: A scientist would capture data from one machine on tape or disk, then take the tape or disk, "stick it under [his] arm and hotfoot it over to the next machine," according to Terry Johnson, head of the Network Operations Section in the Computer Systems Division of EG&G Energy Measurements, Inc. (EG&G/EM).

The firm's administrative staff members used dial-up telephone lines to transmit data between their offices and the DOE.

Transmission errors forced these employees to send and resend data up to 15 times until it arrived intact.

Data volumes sometimes shut down voice communications to and from the firm, and dedicated lines cost about $6,000 per month.

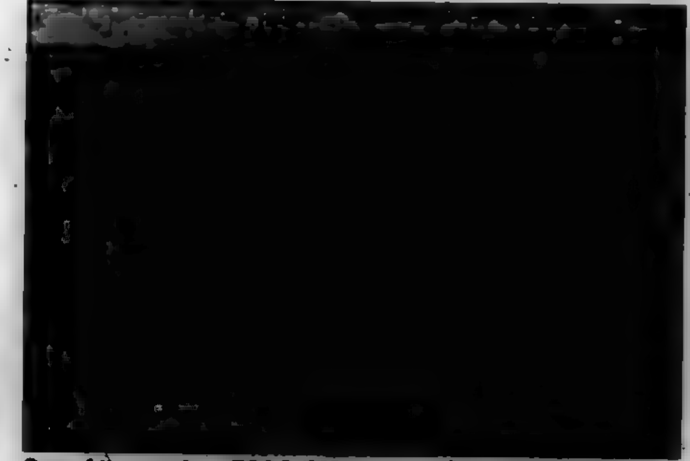
To cut costs and remedy transmission problems, EG&G/EM decided to install a multiplexed communications network. The firm wanted a network that could accurately transmit scientific and administrative data relating to its work.

As a prime contractor to the DOE, EG&G/EM gets paid by and does all its work for that department. It builds instruments that measure emissions from nuclear and solar energy sources, and its employees operate those instruments at DOE sites. The Lawrence Livermore, Los Alamos and Sandia National Laboratories rely on EG&G/EM's equipment and personnel.

The firm supports the department through seven locations in five states. Its 2,400 employees help with underground nuclear weapons tests at the DOE's Nevada Test Site, conduct aerial remote-sensing surveys throughout the country for nuclear radiation and conduct research to improve the precision of nuclear and solar energy measurements.

EG&G/EM's management set four criteria for a communications network to support these efforts. The network had to do the following:

- Provide flexible communications paths to link computing systems supporting both administrative and scientific functions.
- Provide error-free data transmission from all EG&G/EM locations.



One of the services EG&G/EM provides to the DOE is the operation of aircraft equipped to measure hazardous materials in the environment. This helicopter checked for radiation at Three Mile Island during the accident there in March 1979.

- Lower data communications circuit costs.
- Eliminate primary data transmission over voice phone systems.

In June 1981, EG&G/EM bought a data communications network from Digital Communications Associates, Inc. (DCA). The network consisted of one System 355 master network processor and 16 Series/100 statistical multiplexers. Initially, it connected about 45 terminals — mostly Texas Instruments, Inc. 733s and 820s and Lear-Siegler, Inc. ADM-11s — to a Control Data Corp. 6400 at the DOE.

EG&G

EG&G/EM added terminals and hosts to the network until it connected about 150 terminals — the TI and Lear-Siegler machines plus Digital Equipment Corp. VT100s — to both the CDC mainframe and a number of DEC PDP-11 and VAX-11 minicomputers.

Satisfied objectives

The network satisfied the firm's communications objectives by decreasing the amount of time employees spent trying to communicate with the DOE mainframe. Employees could usually complete data transfers in one 15- to 20-minute session, whereas multiple attempts to communicate over the dial-up lines had sometimes consumed 1½ hours, according to Johnson.

"Performance improvement has been profound," he said. In addition, EG&G/EM's use of statistical multiplexers rather than dedicated voice lines has cut the firm's monthly circuit costs in half.

Since 1981, the network has expanded. It now links more than 700 terminals and more than 25 host computers — mainly DEC VAX-11/750s, linked through a Decnet — and includes 16 System 355 network processors. More than 100 Decmate word processors are tied in to the network.

The network handles both synchronous and asynchronous communications through two-channel, bit-interleaved, time-division multiplexing. A multiplexing tool, DCA's Synchronous Channel Option (SCO), allows two independent data streams to share one line.

EG&G/EM uses one data stream for interactive applications and the other for distributed data processing, Johnson said. The firm maintains an SCO on approximately 10 of the 25 dedicated circuits it has in use.

EG&G/EM is working on documentation efforts that fell behind as the network expanded, Johnson said.

LINKS

from SR/26

deed, a goodly portion of the time is spent on the housekeeping function of acknowledgment. Like the human who asks, "Did you get that; did you understand me?" after talking for awhile, the computer, after sending a block of data, asks the device on the other end to return an acknowledgment (ACK) — data received OK — or a negative acknowledgment (NAK) — data not OK, please send the block again.

Because these ACKs and NAKs are not data, they make for unusable but necessary line time; and the more there are of them and the longer they take, the less data there is that can be moved down the line. All terrestrial data networks, be they leased lines or dial-ups, are formulated on a compromise between the following three variables:

- The number of probable error/hour at the desired line speed — the higher the speed (9.6K vs. 2.4K bit/sec) the more error/hour you get.
- Block length vs. retransmissions. Long block lengths require long retransmission times, but the cleaner the line, the longer the block you can get away with.
- The time consumed by the number of ACKs and NAKs you will encounter as a result of block length and the anticipated error rate.

Special Report

Software integral to data network management

Well-selected tools improve service, productivity, resource allocation

By Jim Tyler
Special to CW

Arguments for centralized and decentralized data networks abound, and proponents of each have solid reasons for their beliefs, but one aspect of network management transcends the split in camps: Whether a firm centralizes or decentralizes, software can provide the key to network control.

Network management software allows organizations to pull together diverse resources in order to present a unified picture to their users. The results can include better service, more efficient use of personnel and improved resource allocation.

Features to look for in a network management software system include:

- The ability to manage the entire network as a single entity, regardless of the individual applications in use.
- The ability to control the network from a single terminal.
- The ability to divide the network into logical operating units.
- An error warning system that collects and analyzes error rates and trends.
- An interconnection between CPUs.
- A fourth-generation network control language.
- Automatic activity logging.
- A multiple application interface.
- Data transmission services.

Together, these features can give network managers both flexibility and control for their systems. Separately, they provide a number of benefits.

The ability to manage the entire network as a single entity allows for the use of one sign-on procedure, providing operators with the ability to access all network applications without having to sign on and off constantly. User identifications and security passwords should be in place to prevent unauthorized access.

The ability to control the network from a single terminal allows for the centralized routing of Vtam messages, preventing them from getting lost in the system and divorcing them from the system console. The use of abbreviated Vtam commands and program function keys simplifies Vtam control.

The ability to divide the network into logical operating units allows network managers to partition the network so that operators only receive messages appropriate to the part of the network for which they are responsible. The setup also provides an additional level of security.

An error warning system provides network operators with information to resolve problems before these problems bring down the network. The warning system should integrate user-specific information and should provide a direct interface to System Network Architecture control units so that statistics can be incorporated into reports.

An interconnection between CPUs allows the systems staff to connect multiple copies of network management software with each CPU so that one operator can control a multi-CPU, multisite network.

A fourth-generation network control language provides the ability to automate many day-to-day network operations, to provide predefined command sequences that handle network failures, to permit the construction of standard operation command sequences and to allow for sophisticated tailoring of the system to users' requirements.

Automatic activity logging of all events, commands and responses to disk or hard copy gives managers an overview of of the network's functions. It should permit on-line browsing to give operators immediate access to log information. An interface to the network control language should be provided to allow for unattended reaction to network events.

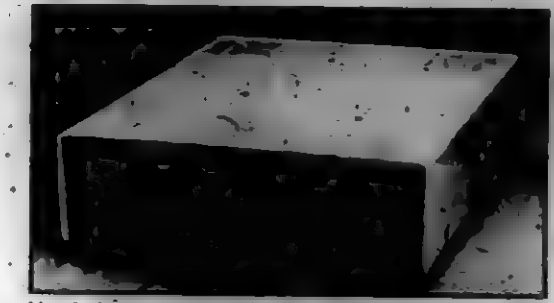
A multiple application interface allows any terminal to access IMS, CICS, TSO and other software simultaneously, thus reducing the need for additional hardware. This feature should also provide multiple sessions to the same application — from the same terminal at the same time — thus improving programmer productivity.

Data transmission services, which provide the ability to transmit data files and data base information around the network, eliminate the need for air freight or mail services and allow for quick and efficient means for the transfer of information. This feature should also provide for the integration of data transfer operations with batch or on-line processing, allowing complete multisite job streams to be built, initiated and executed automatically.

Tyler is a Dallas-based regional manager for Cincom Systems, Inc., a software vendor.

Local Data
Protocol
Converters

DataLynx/3274 connects 1 to 9 async CRTs and printers to a 3270 multipoint network, SNA or BSC.

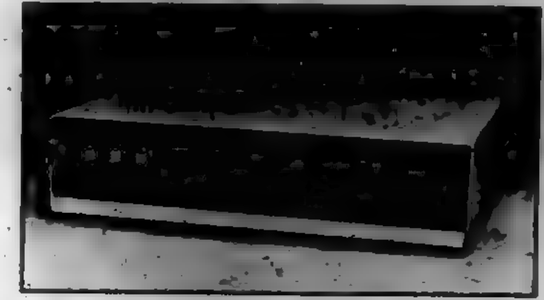


VersaLynx/3278 allows an IBM 3178/3278 terminal to access ASCII systems using asynchronous protocols.

InterLynx/3287 attaches low cost serial ASCII printers to IBM Type "A" coax ports on 3274/3276 controllers and 4331 CPUs.

DataLynx/5251 connects 1 to 9 async CRTs and printers to a system/3X host.

InterLynx/3278 attaches low cost ASCII CRT terminals or PCs to Type "A" ports.



DataLynx/3780 connects asynchronous devices or minicomputers to 2780/3780 BSC networks, and has CRT and printer port and file transfer utility.

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"Your Lynx to IBM"

MIS cannot live by single-vendor net alone: Access in

**By Dawn M. Sutherland
and Michael C. Becker
Special to CW**

The role of MIS managers and network implementers is more complicated than ever. They are confronted on one side by myriad decisions concerning the use of personal computers, local-area networks, wide-area networks and integrated voice/data private branch exchanges and on the other by end users pushing for information access.

Once the acronyms and technologies are understood, the real problem, that of interconnecting all the equipment with the associated applications programs and data bases, begins. In many situations, network implementers must find a means to interconnect equipment from a variety of vendors, often while continuing to incorporate new technologies into their networks.

Most large corporations have already set up complex networks to optimize their communications functions and provide additional features and applications to users. The most widely used network architecture is IBM's Systems Network Architecture (SNA), with an estimated installed base of more than 20,000 host processors.

Users, however, also have a large number of incompatible vendors' systems located at sites with IBM or IBM-compatible hosts. Research indicates that more than 35% of both Digital Equipment Corp. and Control Data Corp. systems are installed at IBM-compatible sites, as are anywhere from 12% to 22% of systems from Burroughs Corp., Sperry Corp., NCR Corp. and Honeywell, Inc.

SNA predominance and lock-in

Because of its popularity among users, SNA has become a de facto industry standard. Furthermore, the continual evolution of SNA shows that IBM has made a commitment to this architecture and is actively seeking to increase its rate of adoption by users.

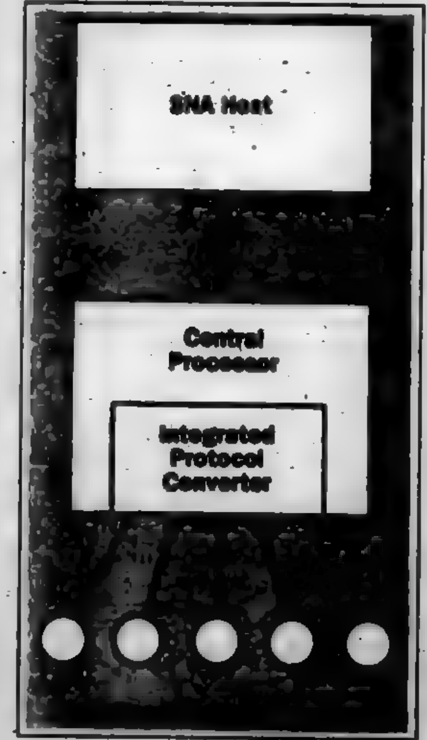
Though SNA-compatible environments are becoming more popular, implementing and maintaining an SNA network is costly and complicated. Additionally, a larger host processor or multiple processors may be required.

A result of SNA's evolution is that it no longer supports many older devices. For the user, this makes it necessary to purchase either expensive replacement equipment or some sort of conversion device.

Of even greater consequence is SNA's tendency to lock a user into a single-vendor situation. Vendors of non-IBM equipment have often suffered because of their products' uniqueness, while plug-compatible vendors have been pressured to keep pace with the changes that IBM has made to SNA.

Non-IBM-compatible vendors may offer better solutions for specific problems, but the user then faces the cost of maintaining multiple DP sites that are not interconnected in a network.

In the real world, few network implementers enjoy the simplicity of working in a single-vendor network situation. Their organizations have made a substantial financial commitment to hardware, software and service from many other vendors, including common carriers. For these implementers, interconnection with IBM networks has three key advantages:



NCR COMTEN, INC. CHART

Figure 1. Access into SNA through protocol converter.

- It provides the ability to share critical resources and information.
- It preserves established and reliable applications programs and associated data bases.
- It eliminates unnecessary barriers to the free flow of information.

Universal connectivity

From a user's perspective, the challenge is to provide economical access to any desired end point in a way

---

Sutherland and Becker are senior research analysts for NCR Comten, Inc., a developer and manufacturer of data communications systems based in St. Paul, Minn.

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and out of SNA provides universal link

that is transparent to the location or device architecture. Such communications ability would help eliminate the costly maintenance of separate data processing sites for different host types and would not entail hardware or software replacement costs.

The Open Systems Interconnect model being developed by the International Standards Organization may eliminate interconnection problems in the future. It addresses the need for a universal communications standard, a need recognized by most suppliers to the data communications user community. The objective of this model is to create a common environment through which all computers can interconnect.

This solution, however, will not be available soon. All seven layers of the model must first be defined and established as a standard. Only then can products be developed and the long process of market acceptance begin.

Access into SNA

Because of the size of users' investment in established non-IBM processing sites, some alternatives are available to network implementers to make noncompatible pieces appear compatible. To date, most of these methods are directed at giving non-IBM users access to an SNA network. This can be understood by briefly looking at the two major methods of connecting non-IBM-compatible devices to IBM hosts.

The first approach allows a terminal or group of terminals to access an SNA host through protocol conversion. These so-called black boxes, which can be free-standing or integrated, and software packages allow network end points to appear compatible with each other (Figure 1). This approach makes sense for users having a large installed base of non-SNA-compatible terminals that would be expensive to replace.

Protocol conversion allows users to preserve their investment in existing equipment and applications without losing networking functions. This approach may also make sense for small users because it gives them the option of purchasing less expensive, non-SNA terminals.

Another approach, used primarily by minicomputer vendors, is emulation of IBM 3270 terminals. This method provides a gateway into an SNA host by making a non-IBM processor look like a PU2 cluster controller. This allows terminals attached to the minicomputer to access applications both in the minicomputer and in the SNA host.

Similarly, most mainframe vendors understand the necessity of coexisting with IBM. Therefore, they have developed interconnect devices to let their non-SNA equipment access IBM-compatible host applications.

Access out of SNA

The limitation of these approaches is that they allow network interconnect only in one direction. In other words, although they allow non-IBM equipment to access SNA hosts, they do not provide for communications flow from devices out of an SNA network to non-IBM hosts.

This escape out of SNA is a networking necessity for many network implementers. It allows their devices in an SNA network to access other hosts by CDC, DEC, Honeywell and other vendors. That access lets users preserve the considerable time and expense they have already invested in established, non-SNA applications programs. Without this access, the users' alternative is a costly and time-consuming migration of their established applications onto an SNA host.

One method of providing access from SNA to established, non-IBM applications is through a communications processor (Figure 2).

In the multivendor environment, the benefits of this approach are many. That capability lets network implementers link their expanding group of departmental personal computer users with either SNA or non-SNA hosts. As a result, users can preserve their specialized non-IBM applications programs while still incorporating SNA. The access out of SNA also lets network implementers fully interconnect the established non-IBM networks they may inherit due to acquisition or network consolidation.

Most importantly, however, options like protocol conversion and access out of SNA let users select their network hardware, software and vendor, based on the merits of their features and benefits, not their market dominance.

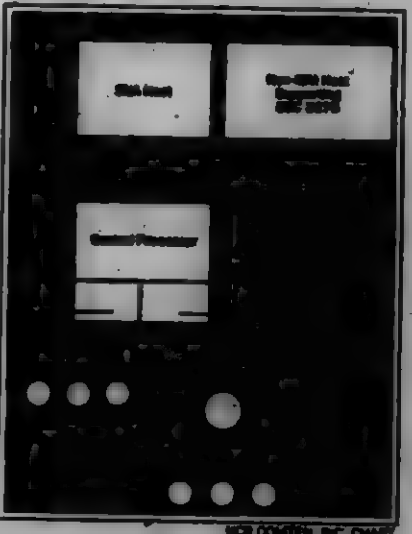
NCR COMTEN, INC. CHART

Figure 2. Access out of SNA to established non-IBM application.

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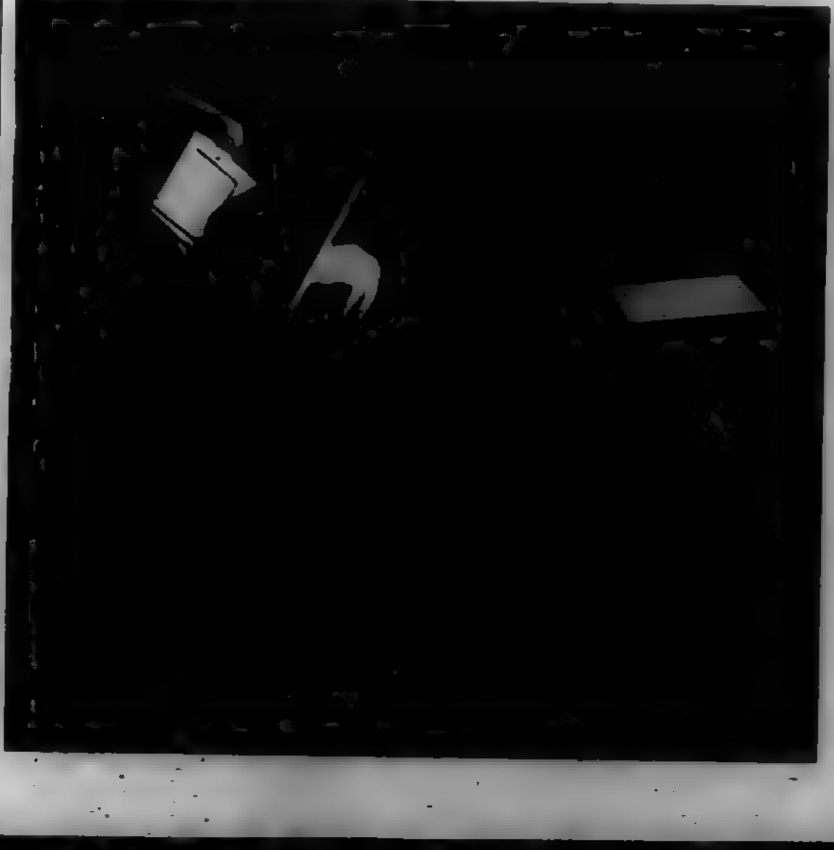

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Aligned with future organizational needs, wide-area

By Jerry Beddow
Special to CW

A wide-area network is an intercity communications vehicle for transmission of voice, data and image of managed facilities. Today, most telecommunications managers are looking closely at the benefits, cost and various means of implementing or integrating wide-area networks for their organizations.

If you are thinking about implementing or integrating a wide-area network, ask yourself, "Can it support my future needs — those I anticipate and those I cannot foresee?" Your answer is especially important because a wide-area network is the only network that affects all divisions and regions of a corporate or state organization.

Since the divestiture of AT&T, many managers have recognized the need for comprehensive wide-area-network planning. Most expect to begin implementing or integrating such a network in 1985 or '86. Yet, they expect a wide-area network to serve their network needs well into the 1990s. At first glance, this long-planned horizon may seem unrealistic in today's rapidly changing telecommunications industry. However, it is really a logical expectation considering the wide-area network's importance.

A wide-area network affects the entire organization whereas the impact of a private branch exchange (PBX) or local-area network is usually restricted to a division or region. Therefore, making wide-area nets future-proof can be defined as the ability to support organizational requirements for at least the next decade.

Managers considering a wide-area network should first address these three general areas:

- Services.
- Compatibility and control.
- Environment.

Services

The demand for wide-area networks will grow dramatically as enhanced services such as data support and videoconferencing are added. Managers can meet the complex requirements of data transport and management with both circuit and packet switching on the wide-area network, which must support the dedicated data end user with semipermanent access and the dial-up data end user who accesses many different locations.

Capabilities of an old network such as an Enhanced Private Switched-Communications Service vs. the future wide-area network can be compared (see Figure 1).

The capability of providing these enhanced services has come from the following two sources:

- The conversion of telephone switches from analog to digital technology.
- The availability of customer-premises, high-bandwidth transmission. For example, T1 has 24 64K bit/sec digital channels that can be combined or compressed based on the user's need.

In the future, more high-speed, high-quality services will become available. Sub-T1 — six 64K bit/sec digital channels — will allow digital, end-to-end connections for most locations, regardless of size. Sometimes that will involve several hundred locations. The wide-area network must permit efficient and responsive management for all locations accessing the network.

Compatibility and control

The wide-area network has a unique demand placed on it for future capabilities. It must be capable of interfacing with many different PBXs, hosts and terminals on the user side and with the many high-quality, emerging transmission alternatives on the carrier side.

To offer effective, long-haul facilities, the carriers will employ satellite, fiber-optic, microwave and other technologies. And several of these carriers' transmission networks will actually be as high quality as AT&T's.

The requirements for both user and carrier will meet at the wide-area network. To make this collision of choices future-proof, the manager must simultaneously provide compatibility and control. Therefore, the wide-area network must have an on-premises, network management center that can accomplish the following:

- Monitor and control the flow of data on the network.
- Monitor and perform sophisticated routing.
- Isolate hardware problems from transmission failures.
- Provide simulations to the customer so that changes in a location's traffic can be tested before expensive commitments are made.

All of these tasks must be done transparently to the end user, who is talking to Los Angeles from New York while accessing a computer that is in Atlanta. Multiply this one user by 50,000 other users, and expand three locations to several hundred, and the importance of centralized, customer-premises control of the

---

Beddow is vice-president of marketing and planning for Honeywell, Inc.'s Communications Networks Division in Dallas.

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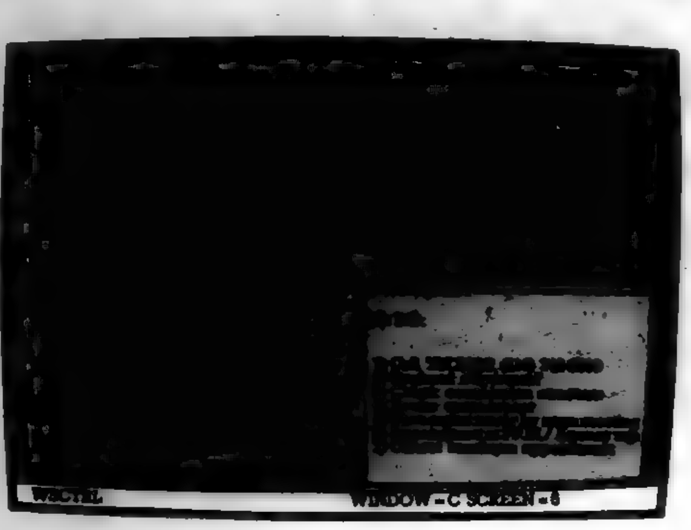

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wide-area network is evident.

Prior to divestiture, the issue of future line costs was quite simple. The manager could estimate his future long-haul costs from AT&T with one certainty — they would go up significantly.

Voice costs

A quick, baseline chart added to projections of his organization's growth yielded the voice costs. A count of leased Dataphone Digital Service (DDS) circuits for data with even higher growth projections gave him data transmission costs. Pretty quick and pretty expensive. The future of line costs is a good news/bad news story.

The good news is that movement of data onto the voice network and intense carrier competition will allow the manager to hold or drop transmission costs for the next several years. Figure 2 shows cost motivation for eliminating DDS service by integrating this data traffic onto the wide-area network.

The bad news is that integration of voice and data will not happen automatically — the wide-area network must be customer-managed like any important resource. Switching costs must be separated from transmission costs so that new carrier alternatives can be used. This management effort is worthwhile because large organizations spend millions of dollars each year for voice and data transmission.

Committed to competition

Congress and the Federal Communications Commission are committed to a competitive environment for long-distance service. Historically, every industry that has gone through deregulation has eventually provided a superior product to the end user.

Future planning in an industry as dynamic as telecommunications is difficult at best. However, the wide-area network is so critical to an organization that attempts must be made to future-proof it. Digital technology switch architecture and the wide availability of digital circuits from many carriers will provide in a private network the service level the marketplace requires to meet its future communications needs.

Future-proofing is not an end in itself. A manager makes a decision future-proof so he can start to implement that decision. Lost savings for transmission and reduced end-user productivity can never be recovered.

Old

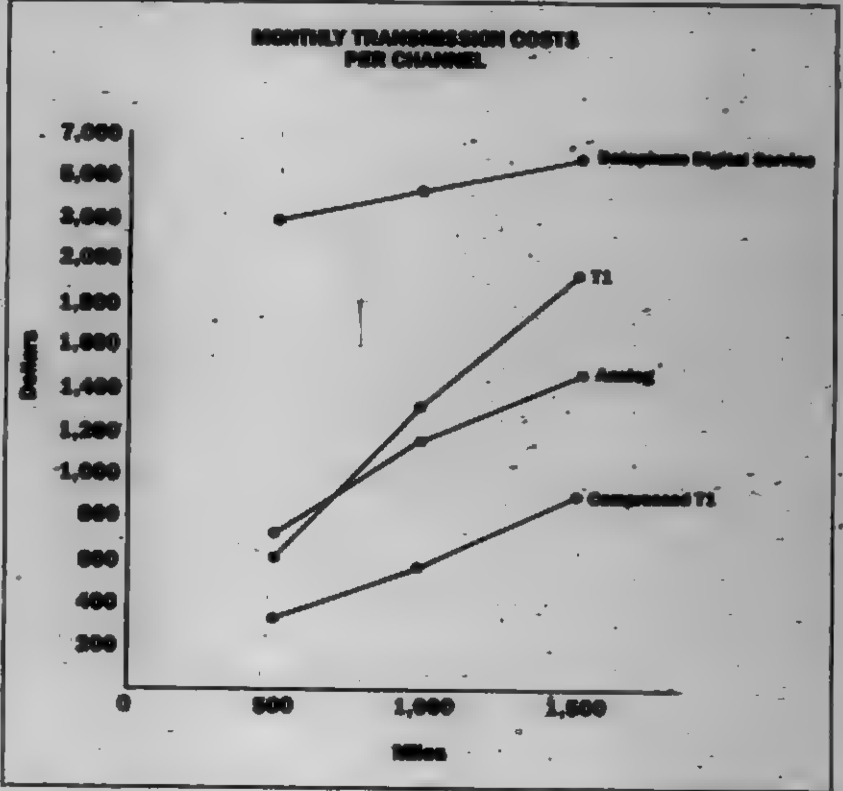
- Toll-quality voice (64K bit/sec)
- Low-speed analog data
- Separate leased-line digital data
- Only large locations on network

Future

- Compressed toll-quality voice (32K or 16K bit/sec)
- Bandwidth management of all data users:
  - Host-to-terminal
  - Host-to-host
  - Host-to-cluster controller
  - Terminal-to-terminal
  - X.25 packet switching
- Majority of locations on network
- Centralized network status and control
- Video teleconferencing

HONEYWELL, INC. CHART

A comparison of an old network vs. the future wide-area network



HONEYWELL, INC. CHART

The cost motivations for the elimination of Dataphone Digital Service are apparent in cost/channel figures.

Options available for implementing wide-area nets

Once a decision has been made to implement a wide-area network, managers are faced with a myriad of implementation options. The possibilities fall into four broad categories:

- Tandem-based.
- Private branch exchange (PBX)-based.
- Common carrier-based.
- Virtual-based.

Tandem switches are useful for large organizations with many locations and sophisticated requirements for voice, data and image. Based on the organization's traffic patterns, tandem switches can be placed strategically to maximize savings on long-haul circuits by managing the different kinds of communications on digital trunks like T1.

Tandem switches interface with all PBXs and carrier services. Routing and networkwide management are integral to Tandem design, whereas these capabilities are add-on applications in PBXs.

The newest generation of PBXs provides office automation with a switch that can support almost any office application from the user's station. The latest designs also support limited networking if the trunking is not excessive and if all the PBXs are from one vendor.

Implementing this type of wide-area network is the best solution for organizations that do not have a large amount of on-net traffic, such as voice and data from one company location to another, and that are comfortable in committing their switching future to one vendor.

Before selecting a vendor, a telecommunications manager should investigate the current networking features of a PBX. Typically, the PBX vendor promotes station features — this is the PBX's strong point. Therefore, the manager should thoroughly investigate the wide-area net features and the [illegible] of the PBX [illegible] when heavy networking and data demands are placed on it.

A wide-area network changes from a private to a dedicated network when a common carrier is used because the telecommunications manager is not in control of his own network from end to end. He is entirely dependent on the carrier for routing and quality. Therefore, the manager should be satisfied with the quality of service, as well as the carrier's commitment to new services, before he selects a common carrier to implement a wide-area net.

The common carrier approach to a wide-area network has merit for smaller organizations that do not have heavy requirements for data or on-net calling. However, in order to get the required service level and cost benefits, an organization generally must be prepared to make long commitments.

The first involves agreeing to use that particular carrier for a year or more in order to get effective [illegible] [illegible] [illegible] technology, such as [illegible]

The [illegible] carrier industry is [illegible] [illegible]. A drawback in implementing a wide-area net by using a common carrier is that any of the common carrier technologies may become less preferable in the future when new offerings based on fiber optics and other technologies become widely available.

Virtual networks, such as AT&T's proposed Software Defined Network (SDN), are based on the concept of adding intelligence to the public network switches so that a customer can request digital or analog connections as needed.

Virtual wide-area networks will not have the effective management features and response capabilities of a private net until the early 1990s.

Reducing vs. maintaining costs

The driving force for virtual-based networks is the possibility of reducing long-haul transmission costs vs. maintaining the existing costs for dedicated private lines.

The inherent design of the virtual network is similar to the tandem-based wide-area network in other aspects. Computers and common-channel signaling are used to define a particular customer's network.

If SDN can survive the regulatory issues, resolve the local access costs and resist the challenges from major common carrier competitors, it has great promise for future-proofing a wide-area net. The major concern for the telecommunications manager is that virtual wide-area networks, such as SDN, will not have the effective management features and response capabilities of a private network until the early 1990s.

Eventually, in an effort to protect the largest customers, nationwide carriers such as MCI Communications Corp. will offer a similar virtual network.

In summary, there are several approaches to implementing a wide-area network. Each solution has its place.

The ultimate right answer depends on an organization's communications needs and its strategic plans.

Special Report

Ethernet system eases information flow at naval site

> *'[The network] gives us the ability to transmit documents of any sort, whether they contain graphics, text, equations or formulas.'*
>
> — Donnie Goettig
> Naval Weapons Center, China Lake

RIDGECREST, Calif. — At the site near here where the U.S. Navy designs and tests weapons such as the Sidewinder and Sparrow missiles, scientists and engineers exchange text, graphs and formulas over one of the largest Ethernet networks in existence.

The Naval Weapons Center (NWC), China Lake, Calif., depends on 11 Ethernets, linked together via modems and phone lines into a larger network, to keep scientists, engineers and administrators abreast of each other's work.

Since its installation in 1981, "the system has become a vital part of the center's activity," according to Donnie Goettig, a program analyst who manages the network in NWC's Office of Computing Applications.

The China Lake center serves as the Navy's principal R&D, test and evaluation site for air warfare and missile systems. Since 1943, when the Navy fired its first 3½-in. rocket here, the station has mushroomed both in size and in importance to the nation's defense.

Today, NWC includes target ranges, test tracks and R&D facilities where hundreds of major weapons development programs take place. It employs more than 4,100 civilians — including about 1,600 scientists and engineers — in addition to some 1,000 Navy personnel. Equipment from 65 vendors serves the staff's information processing needs.

The Ethernet network's primary user group is the center's Electronic Warfare department, which occupies seven sites within a 35-sq-mile area. Scientists in the department develop electronic countermeasures and means to overcome target sites that are heavily defended.

They use Xerox 8010 Star workstations to prepare technical papers, graphics, modeling projections and administrative reports on weapons systems. The network's electronic mail system carries the documents to other workstations and to printers, file servers and facsimile devices.

According to Goettig, the network "gives us the ability to transmit documents of any sort, whether they contain graphics, text, equations or formulas — whether they are project status reports, procurement requests, travel orders, electronic mail — anything."

Because the communications system is not secured, the NWC keeps classified data off the network. Employees prepare classified documents on Xerox 860 word processors. The word processing machines have access to the network but are disconnected from it whenever they process such work.

Digital Equipment Corp. VT100 emulation allows Star workstation users to access data stored in 19 DEC VAX-11s and two large PDP-11s that the NWC maintains on a Decnet. One of the DEC machines, a VAX-11/780, serves as a front-end processor on the center's mainframe, an 8M-byte Sperry Corp. 1100-83. Through this VAX, which runs software that allows it to appear to the mainframe as a Sperry UTS 400 asynchronous terminal, users of the Xerox workstations can access information on the Sperry machine.

The setup also allows terminals hard-wired to a processor on the Decnet to exchange information with the Star workstations and the Sperry mainframe. Terminals hard-wired to the Sperry, however, can only communicate with that machine.

Plans for additional links

A cluster of six IBM Personal Computers, each with a chip-based interface to the Ethernet setup, has been linked with the network as part of a Xerox beta test. Goettig said the connection has been performing well. The NWC plans to link additional micros to the network as interfaces become available.

Some workers at remote outposts in the 1,800-sq-mile China Lake facility lack communications with the central departments that use the Ethernet network. Lou Giegerich, associate division head of the Electronic Warfare department's systems sciences division, said these employees will depend on the center's "pickup truck network" — driving to other sites to fetch or deliver documents — until the NWC installs a comprehensive network that reaches them.

The center recently began installing a fiber-optic network to establish communications throughout the facility. The project will require 50 miles of trunking plus enough cable to wire about two dozen central buildings and should be completed within five years.

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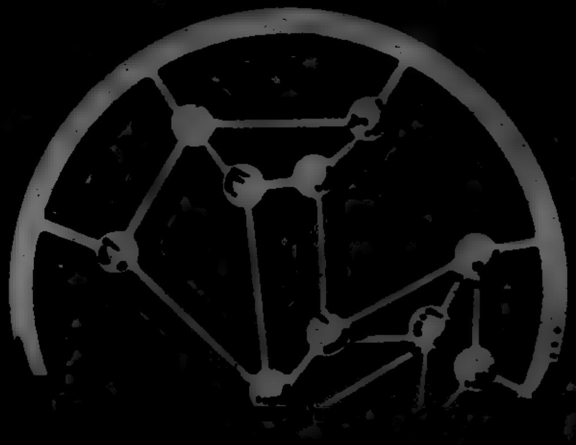

3270 Access

Network designers must fulfill specific requirements

By John Vacca
Special to CW*

Communications network design aims toward the general objectives of balancing costs with capabilities and providing reliable, error-free communications to users.

These general goals translate into the following series of specific design requirements:

- Reliability.
- Transparency.
- Economy.
- Convenience.
- Security.

Naturally, a network designer must consider other topics, such as the general lack of communications standards and the growing concern about personal privacy that has arisen in response to widely shared data bases. But the five design requirements represent the designer's chief technical concerns.

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> *Economic considerations are vital, but they will hamper improvements in data transmission speeds over the next decade.*

Reliability. In a communications network, reliability refers to the ability to provide uninterruptible, error-free service. Providing such service depends on addressing the question: "To what extent should the network provide alternate transmission paths and backup equipment?"

The answer to this question generally requires both a statistical analysis of cost vs. equipment reliabilities and a queuing analysis with representative load conditions. The load analysis is a major factor in the design of communications networks that must redirect traffic automatically depending on dynamic load conditions.

Transparency. Transparency means that the network is completely impervious to the information transmitted on it and that network operation is invisible to users.

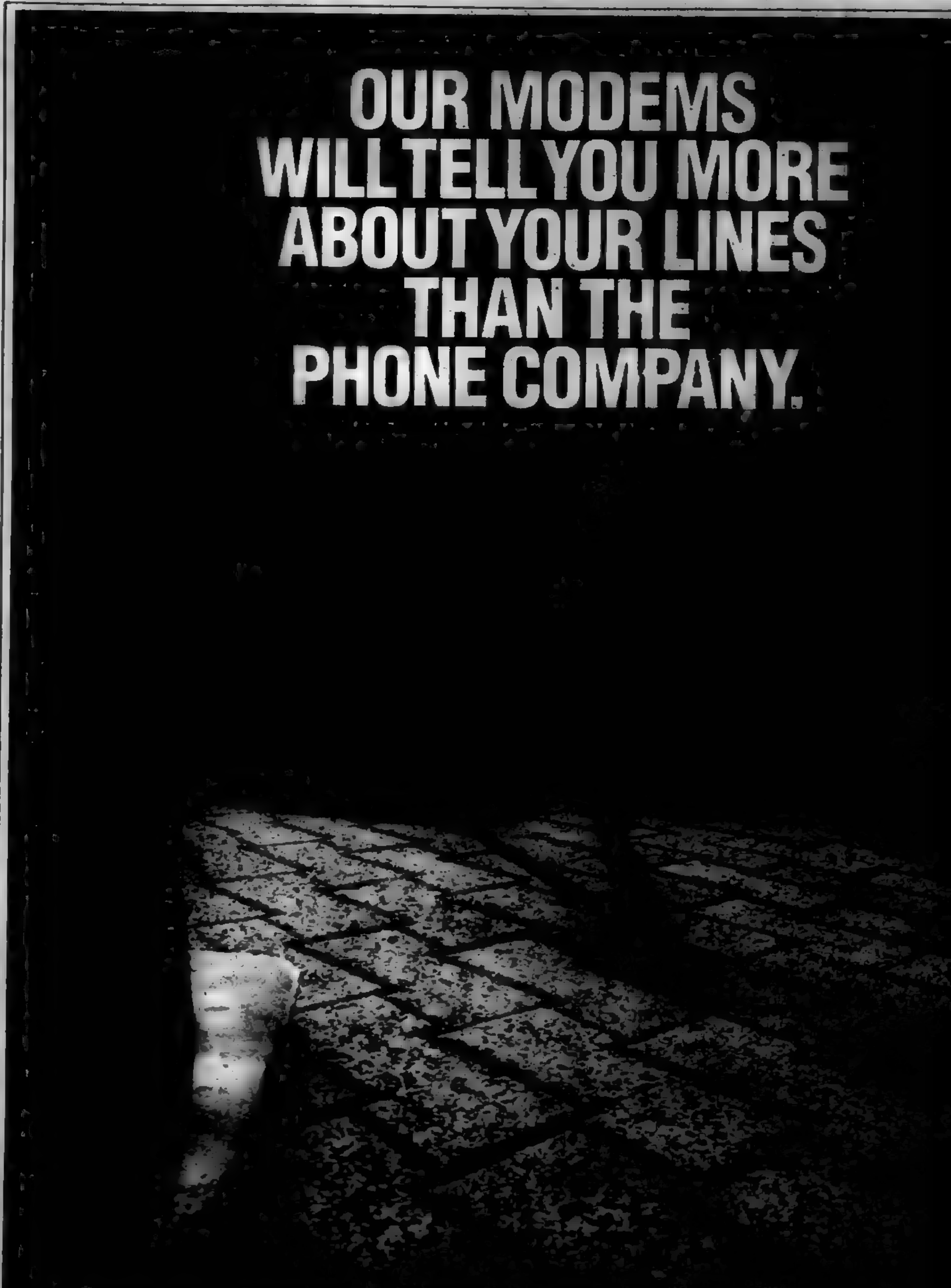
Most networks do not have complete transparency: Certain values or bit configurations cannot appear in the text of a message because they are used for control functions. A network's automatic hardware control may determine that the end of the text has arrived because that text contains a bit pattern mistakenly recognized as an end-of-text character. To network operators and users alike, the result of such an occurrence is both unpredictable and undesirable.

Fortunately, the American National Standards Institute has set aside certain bit patterns, such as Synchronous Data Link Control (SDLC), to be used exclusively for hardware control. Because these patterns are used exclusively for control characters, they seem to circumvent the transparency problem.

Unfortunately, some categories of user information (facsimile and graphics, for example) generate data with unknown values, including a high probability of designated control characters. A common algorithm, called bit stuffing, helps solve this problem in networks that use SDLC or other bit-oriented link-control procedures.

A fixed bit pattern, generally referred to as a flag sequence, isolates text from control information. Transparency is achieved around a text field by placing a flag sequence of a zero bit followed by another zero bit (01111110, for example) at the beginning and end of each text block. All switching computers within the network search continuously for this sequence.

Vacca is a free-lance writer and consultant on information management and computer security. He also serves as planning and design coordinator for the Federal Home Loan Bank in Topeka, Kan.



to provide reliable, cost-effective communications

In byte- or character-oriented link-control procedures, text can contain control characters. A specific control character, which is known as a data link escape character, precedes all other control characters and provides data transparency.

Economy. To provide economy, a network must have a minimum overhead and use its communications media efficiently. Networks should be designed to provide service that will accommodate the needs of the majority of users without degrading service to infrequent users.

The power of computers to which communications links are attached normally exceeds what is necessary to saturate existing low-speed links. Overhead, then, is essentially a concern about loads on interconnecting links rather than loads within communications processors.

Link overhead refers to those messages, exclusive of text, that facilitate communications between computers. A certain amount of control information must be attached to each message so the receiving computer can examine the message and determine what to do with it.

An efficient procedure for transmitting control information will minimize overhead without seriously affecting flexibility. Differing media and computer interface characteristics, however, lead to problems in the design of a scheme that minimizes overhead.

Economic considerations are vital, but they will seriously hamper significant wide-scale improvements in data transmission speeds over the next decade.

Users resist upgrading

This problem arises because the primary communications media in existence — the land line — was designed for voice communications at bandwidths less than those required for high-speed data transmissions.

Users are not willing to invest the money involved in the upgrade of an existing land-line network or the installation of a new medium capable of communicating high-speed data.

> ”
>
> *Regardless of other advantages that a network may have, its reputation can quickly be damaged because of its user interface.*

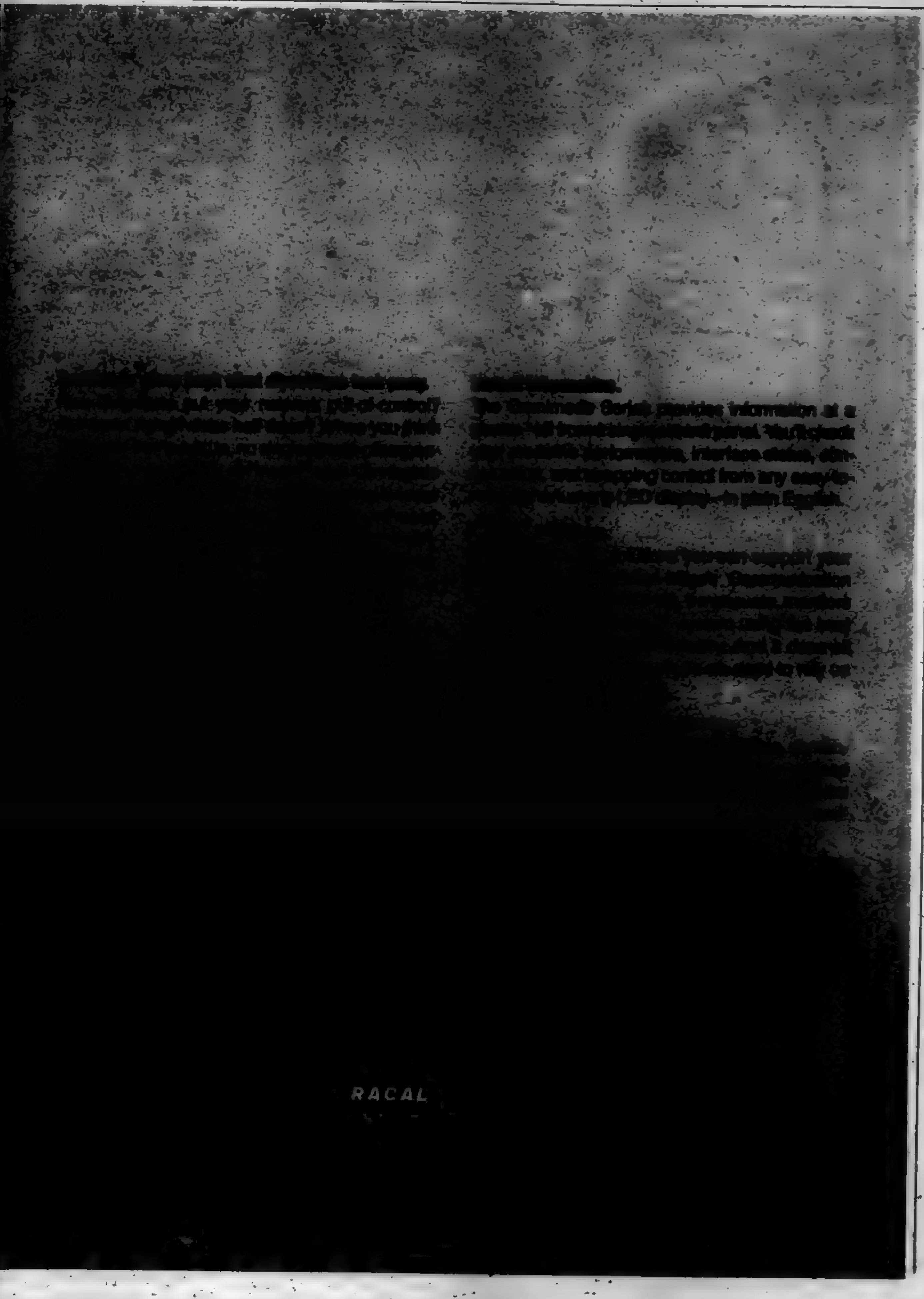
Convenience. In a communications network, convenience means simple user access. If users find communicating with a specific type of network troublesome, that network is placed at a competitive disadvantage to other types. Regardless of other advantages that a network may have, its reputation can quickly be damaged because of its user interface.

The physical interaction required of users must be simplified so that they can establish connectivity with minimum effort. Once users make connections, their physical interaction with the network should be near zero, except for unusual occurrences such as failures.

Security. Data transferred through a communications network should be protected from undesired disclosure.

Several state-of-the-art encryption techniques allow users to communicate using privacy keys. Network users should keep in mind, however, that there are no perfectly secure computer systems, regardless of the image a vendor may give them.

The network designer, then, must consider various design features that enhance security rather than seek a perfect solution. Some computers, of course, have better security features than others.



Special Report

Price attracts manufacturer to electronic mail system

ELGIN, Ill. — A manufacturing firm here had no pressing interest in electronic mail software for its IBM mainframe until a piece of direct mail that described just such a product at just the right price arrived at its headquarters.

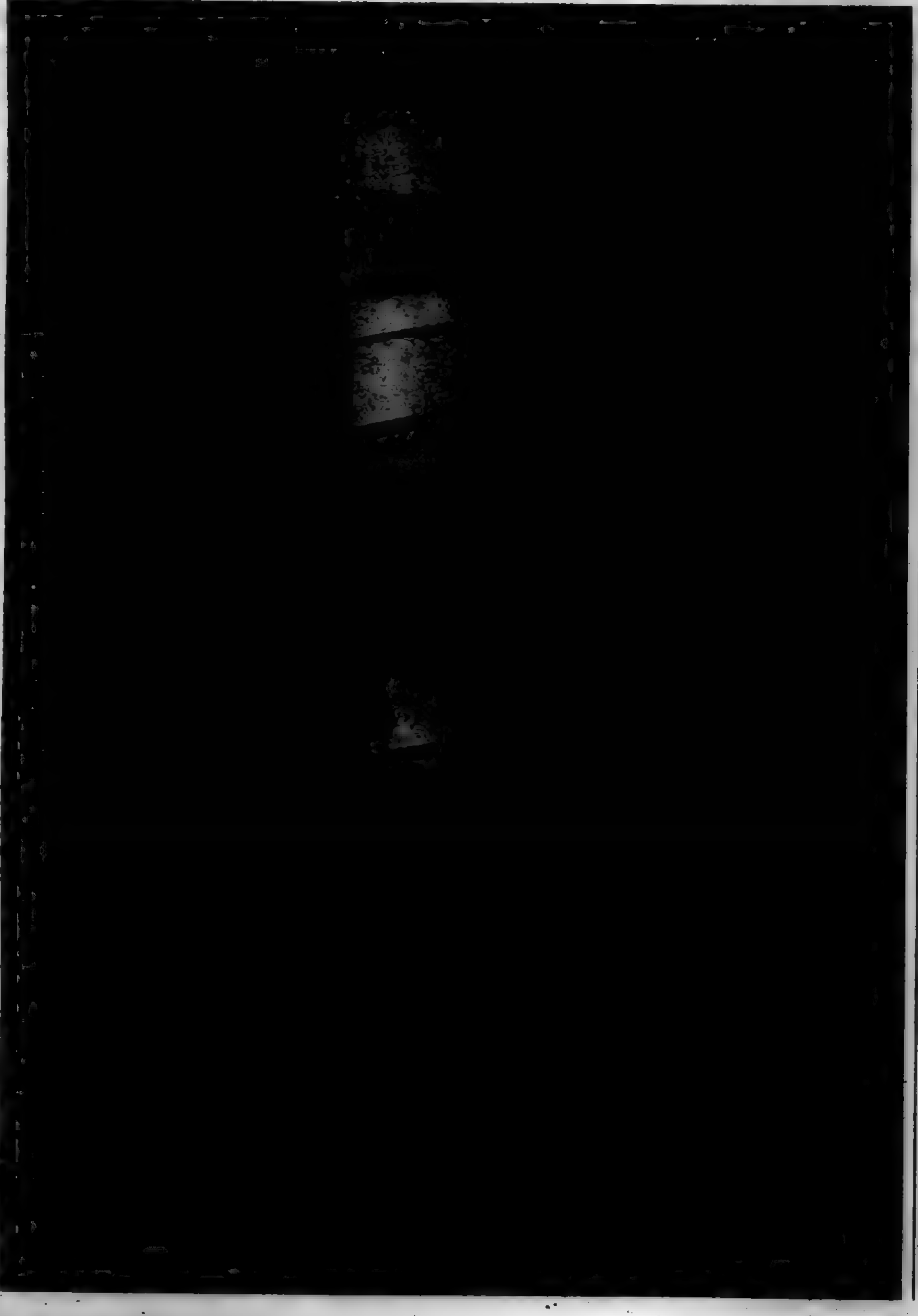
"It was kind of inexpensive," said Norman Winter, a systems programmer for Chicago Rawhide Manufacturing Co. "We had a little extra money in our budget."

So after the firm looked into prices for other electronic mail systems and decided against them, it bought the advertised product. The electronic mail software, Wizard Mail from Wizard Computer Products, cost $995.

Last March, Chicago Rawhide installed the software on its 16M-byte IBM 3083 mainframe and gave 50 users electronic mail capabilities. In two months, the firm recovered its costs from reductions in long-distance phone bills.

Chicago Rawhide manufactures oil seals, gaskets and automotive parts. It registered $100 million in sales last year. When it started operating in 1879, the firm manufactured buggy whips — hence, the name.

The company uses electronic mail to send inventory counts among its seven plants and eight warehouses throughout the country, to let workers at the plants and warehouses exchange messages with employees at headquarters here and to give employees at headquarters an option to calling each other on the phone.



Approximately 235 IBM 3179 terminals currently have access to electronic mail. Terminals in the plants and warehouses are connected to the IBM mainframe via a leased-line network that the firm maintains for data communications.

Winter, who manages the electronic mail service for Chicago Rawhide, said the biggest benefit the software provides is the ability to send a message to someone, regardless of whether or not the intended recipient is at his desk.

> *'We had a little extra money in our budget.'*
>
> **— Norman Winter**
> **Chicago Rawhide**
> **Manufacturing Co.**

When it accepts a message, the receiver's VDT displays a few words that indicate a message has arrived. If the recipient is logged on to the system but away from his desk, the notification remains on the screen until it is acknowledged. If the recipient is logged off, the notification appears as soon as he logs on again. "It's easier than making phone calls all the time," Winter said.

Recipients can retrieve their messages at any terminal, because the electronic mail is routed by name rather than by location.

Sending messages

To send a message, an employee first types a command that gives him access to an electronic mail screen. He then types the recipient's name and the message. When the user completes his message and strikes the Enter key on his keyboard, the message gets sent.

Winter has written a program so users can call up a list that shows all the possible destinations for their messages. Each destination is an abbreviation for the name of an employee who has access to electronic mail. To add new users to the system, Winter enters their names into a CICS file that sets up the electronic mail capabilities.

Each night, Chicago Rawhide prints hard copies of all the messages carried over the system, except those that are designated confidential. Each department receives its hard-copy messages the next day. Chicago Rawhide's employees send about 100 messages through Wizard Mail each day.

Special Report

Software gateways are micros' path to the processor

By Gregg Zimmerman
Special to CW‡

Of all the communications schemes existing for personal computers, the software gateway to the mainframe environment for both the single personal computer and personal computer network is one of highest priority.

The software gateway to the mainframe environment for either a single personal computer or a personal computer network, must continue to be a management concern throughout 1985. Just as the single microcomputer will always have an application in the corporate environment, so will a variety of multiuser micros.

Their use within the corporate environment, however, is complex because neither AT&T's Unix-based systems nor local-area networks are consistently the correct networking choice for them.

For example, if a system is designed to support only three to five users, a multiuser system could be far less expensive than a local-area network. On the other hand, if a substantial personal computer investment is at stake and a communications scheme is required, a local-area network might be the correct choice.

A communications gateway, therefore, must be applicable across numerous configurations. But the challenge does not end there. Communications gateways also must exist in environments where a standard networking architecture has not been defined.

The lack of a standard networking architecture has confused newcomers to the networking market. New technology is cumbersome; buzzwords such as "broadband," "baseband" and "token" are not important; and market presence is the major selling point. In this context, IBM has a clear advantage in effecting standardization. This is evidenced by the increased popularity of IBM's Systems Network Architecture (SNA), which is developing as the predominant networking architecture. SNA is IBM's approach to distributed processing and communications management. Unlike many networking schemes, SNA is mature, supporting numerous devices and able to operate on non-IBM hardware. In light of SNA's flexibility in different environments and current reputation as a mainframe network, it is logical that a software gateway support a solid SNA implementation.

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>
> *Communications gateways must exist in environments where a standard networking architecture has not been defined.*

In this context, the following rules of thumb are important in selecting an SNA gateway for optimal performance:

- **Determine your system needs.** Before a software gateway is selected, it is important to assess your system and communications requirements to determine how many devices need be supported by your system for communications and which hosts, host applications and operating system environments you want to access.

Once this is done, an SNA gateway should be selected with full cluster controller emulation that is able to support multiple display stations and printers and access numerous hosts, popular applications (CICS and TSO/SPF) and common operating systems (OS/VS, VM, DOS).

In addition to being able to configure a variety of control units, displays and printers to the SNA net-

See PATH SR/44

Zimmerman is the director of marketing and sales at Pathway Design, Inc., a manufacturer of communications products in Wellesley, Mass.

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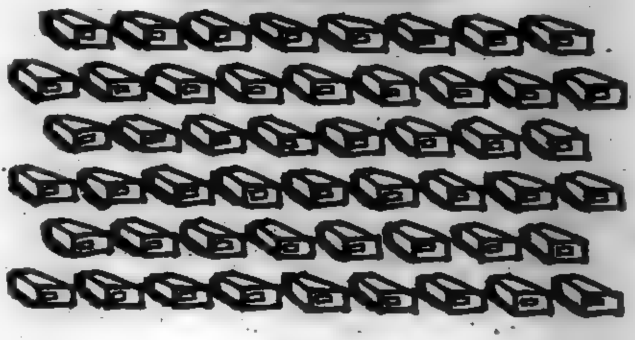

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Standards key to continued network development

By Judith Estrin
Special to CW

In the complex communications marketplace, the existence of more than one local-area network standard is not only technically desirable but also commercially unavoidable.

Technically, one standard local-area network cannot be expected to fill the needs for all local-area network applications. Commercially, the issue is driven partly by vendors that are unwilling to discard huge investments in networking simply because some industry groups are pushing in other directions for standardization.

However, the lack of a single standard makes the potential local-area network user's choice a difficult one. An abundance of physical connection methodologies and high-level communications protocol sets — such as Xerox Corp.'s Xerox Network System (XNS), TCP/IP, Digital Equipment Corp. Decnet — exist.

Furthermore, the user may want to expand the network in the future, connecting today's assorted equipment. Without standard products, such expansion may not be possible, and the user may be locked out of future developments.

Managers considering a local-area network purchase should ask a number of questions, including how standard the product is, which local-area network approach best fits the particular applications and which products are currently available. Understanding the various local-area network approaches and the market forces behind them will clarify some of the issues surrounding these questions.

A local-area network technology — the method used to transmit packets between network stations — is defined by four parameters:

- Media — twisted-pair, coaxial cable, fiber-optic cable.
- Signaling method — broadband, baseband.
- Topology — star, ring or bus.
- Access mechanism — carrier-sense multiple access with collision detection, (CSMA/CD) token-passing.

High-level communications protocols are not included in this definition.

Three main local-area network technologies using various combinations of these parameters have emerged as market contenders. All three have been the subject of the Institute of Electrical and Electronic Engineers, Inc. (IEEE) standardization committees.

- **The IEEE 802.3** standard, often referred to as Ethernet, is the best entrenched because it was the first of the three local-net technologies to be commercially available. Approximately 5,000 802.3-based systems are now installed, with an estimated 25,000 expected by 1990. Strong in data processing, office automation, engineering and scientific applications, the IEEE 802.3 uses a bus topology, its access mechanism and CSMA/CD. It has been implemented chiefly over baseband media, but also has been used on fiber-optic and broadband links.
- **The IEEE 802.5**, or token-ring technology, uses a token-passing access mechanism with baseband signaling over twisted-pair media. This technology is being driven largely by IBM, which in early 1984 announced a cabling system through which its own token-ring network will run when it becomes available in several years.
- **The IEEE 802.4** is a token-bus scheme used primarily on broadband cable. Formerly a third runner behind the other two, this technology received a powerful push in early 1984 when General Motors Corp. announced plans to promote its Manufacturing Automation Protocol (MAP) as a standard for factory automation. Products implementing this technology probably will not be on the market until 1986.

One sign of a standard's acceptance is the availability of semiconductor chips implementing it. Ethernet chips have been available since 1983. Token-ring chips are expected to be available in 1985. And token-bus chips are expected in 1986.

As critical to a local-area network choice as the basic technology, however, is the network's higher level protocol set. While the two lowest layers (such as the local-area network technology) provide a means to move data packets from one station to another, the next four layers provide the session establishment, reliability and flow control necessary for devices to communicate effectively over the network.

The specific protocols used can determine, for example, whether local networks can be linked into long-haul networks; they also can affect network performance significantly.

Several protocol architectures have emerged as formal or de facto industry standards. Among the most firmly established is the XNS protocol set. XNS was developed by Xerox and placed in the public domain in 1981; XNS is the only commercially available protocol set specifically designed to work with local-area networks. One strength of XNS is its internetworking capability (protocol Layer 3), which permits user-transparent networking between multiple Ethernets and from Ethernets to other network types.

XNS evolved from an earlier protocol set called TCP/IP, which was developed as a combined local- and wide-area solution by the U.S. Department of Defense's Advanced Research Projects Agency. An important force behind TCP/IP in recent years has been its incorporation into the AT&T Unix 4.2 BSD operating system kernel.

See NET SR/45

Estrin is vice-president of engineering for Bridge Communications, Inc., a Mountain View, Calif., firm that manufactures XNS and TCP/IP products.

LOCAL-AREA NETWORK PROTOCOLS

ISO 3-6

[illegible]	[illegible]		
System Network Architecture (SNA)			IBM EDP
[illegible]	[illegible]	[illegible]	
Transmission Control Protocol/ Internetwork Protocol (TCP/IP)	Unix 4.2 CAD/CAM DOD		
[illegible]	[illegible]		
	Ethernet IEEE 802.3	IEEE 802.4 Token-Bus	IEEE 802.5 Token-Ring

ISO 1-2

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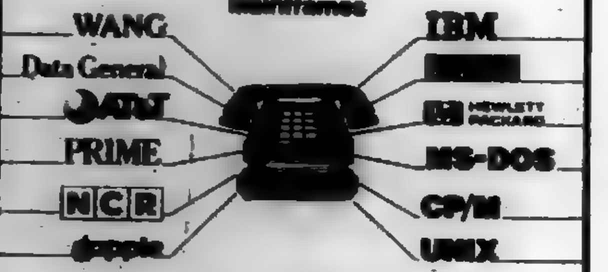

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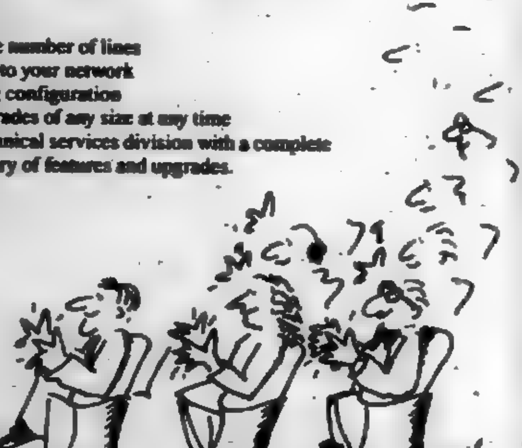

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Office-linking mail system revs up truck firm's savings

CINCINNATI — A trucking company rolled back its business costs by an estimated $300,000 a year after it installed a communications network to link its field offices with its corporate headquarters here.

Intermodal Transportation Services, Inc., a firm that ships goods nationwide in its 500 trucks and arranges for piggyback shipments by train, installed its network two years ago. As part of a plan to streamline and control its business, Intermodal wanted to let employees at its 22 shipping terminals feed data to automated billing and tracking systems.

Although the firm had written extensive custom programs to run on a mainframe at its headquarters, it had no automatic means of capturing data generated in the field. "They didn't have anything out there but a pencil," said Chris Banks, Intermodal's MIS director.

Employees at the terminals coded billing data onto forms and sent the forms to Intermodal's headquarters, where keypunchers typed the information into a 6M-byte Burroughs Corp. Model B5930 mainframe that generated bills.

In June 1982, the firm bought an Apple Computer, Inc. Apple II personal computer for each field office and one Apple II for its headquarters. It linked the micros to each other and to the Burroughs mainframe via Western Union Telegraph Co.'s Easylink electronic mail service and some custom-written protocols.

Now, workers type customer and billing information on daily shipments into the Apple IIs and send it to the Burroughs mainframe for processing. Custom software running on the mainframe adds appropriate rates for each shipping or receiving firm involved in the shipment. The software also apportions customer payments to various groups within Intermodal and to railroads that help transport the shipment.

Turnaround time

Within 24 hours the firm sends back to the terminals data that allows employees to code invoices and release the shipment. The 24-hour turnaround time is essential, Banks said, because the terminals cannot let a shipment go without first obtaining coded rate data from headquarters.

Before Intermodal started using the electronic mail service, it experimented with letting the terminals convey shipment data and receive rate codes over the phone. After it tried this system on some sample transactions, the firm estimated that if it used voice lines to convey information for all its billing transactions, it would spend $800 on Wats and labor costs per day. Using electronic mail, the cost per day to transfer billing data is under $100 dollars.

According to Banks, the communications system saves the firm an additional $100 a day in Wats usage as the medium over which the terminals report their cargo loads to headquarters. In the past, the procedure required between four and five hours of Wats line time at $20 per hour. Workers at the terminals phoned in information to an employee at headquarters who devoted his time to receiving calls and logging information.

Under the new system, workers at the terminals fill in on-screen worksheets that request information about cargoes and day-to-day operations. They send the information to the firm's headquarters via Easylink and an autodial modem. An electronic mailbox at headquarters receives the data, and employees there check the mailbox periodically for incoming data.

Intermodal also uses the electronic mail service in conjunction with custom-written reporting software to keep a lid on costs associated with renting piggyback trailers.

[illegible] their work.

— [illegible]

Railroads lease the trailers — containers specially constructed to fit on flatcars — on an escalating per diem basis: Daily rental rates rise according to how long the trailers are under lease. The daily rates can more than quadruple if lessees keep the trailers out too long.

Without a reporting system, Intermodal's terminals sometimes lost

See MAIL SR/48

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Why key DP/MIS managers are keeping RCA Cylix a secret.

Special Report

Atomic accelerator gets broadband boost

Five-mile coaxial cable network pumps life into The Machine

MENLO PARK, Calif. — A five-mile-long broadband cable network serves as the life support system for a two-mile-long atomic particle accelerator that scientists at a laboratory here use to test theories of high-energy physics.

The accelerator — known simply as The Machine — consists of some 10,000 devices physicists use to generate and monitor speed-of-light collisions of electrons and positrons.

The network — an intelligent, bidirectional, midsplit cable system — supports the devices. "If that network goes down, the accelerator stops," according to Warren C. Struven, an electronics engineer at the Stanford Linear Accelerator Center (Slac).

Stanford University operates Slac for the U.S. Department of Energy.

Struven said the network, SLCNET, gets its intelligence mainly from Intel Corp. 8086 microprocessors that provide local control and monitoring for the various devices the physicists use in their experiments. Two Digital Equipment Corp. VAX-11/780s provide overall network monitoring.

SLCNET represents advancements made by Slac engineers on basic technology brought forward by Sytek, Inc., Struven said. Technological features allow it to support voice, video and digital signals over coaxial cable similar to that used in CATV and to have the signals available for access from any point along the cable.

> *'We're running the world on a ¾-in. cable.'*
>
> — Warren Struven
> Stanford Linear Accelerator Center

Two-way traffic

The network uses ¾-in., 75-ohm coaxial cable with a 300-MHz bandwidth split into two frequency ranges — one for transmission, the other for reception. Frequency converters known as translators allow for the two-way traffic.

Translators take transmission signals coming in at one frequency and convert them into reception signals at another frequency. Slac uses three translators — one from Sytek and two from Coherent Systems, Inc. — to do the conversions for various facets of the network:

- One Coherent translator supports four video channels Slac uses to monitor devices involved with particle beam acceleration, a pilot channel that monitors the coaxial cable and 40 voice channels over which scientists along the acceleration chamber can talk back and forth with one another.
- The second Coherent translator supports six high-speed, point-to-point data transmission channels that carry information that tells the various devices along the particle beam's route how to operate.
- The Sytek translator supports one channel for software development, one for communications between the VAXs and various terminals connected to them and one that controls The Machine.

SLCNET supports more than 350 dissimilar devices, including pulsed radio frequency sources, vacuum systems, steering and focusing magnets and particle beam position monitoring equipment. "We're running the world on a ¾-in. cable," Struven said.

Mobile control

Scientists can tap into that world from any one of 30 control points along the length of The Machine. Mobile control systems that Struven and his colleagues designed allow experimenters to move equipment among the different sites.

The mobile units carry a variety of devices — including terminals, digital displays and touch-panel equipment controllers — which plug into the cable network through Sytek hardware/software interface devices.

Most of the mobile control systems are carts that carry Ann Arbor Terminals, Inc. Ambassador terminals as their main component, but Slac uses some systems based on Tandy Corp. TRS 80 Model 100s that scientists carry from site to site in briefcases.

All mobile and permanent equipment links into the cable via CATV-compatible modems. Both the modems and the various devices undergo a series of tests before they are connected to the SLCNET. "Every component on the system must be very clean and transmit only the signals it's meant to," Struven said.

He explained that because the network uses time-division multiplexing, a bad signal from a single component can wreck a communications channel, and "one errant modem can knock the whole system down."

A small section of The Machine, a linear accelerator Stanford operates for the U.S. Department of Energy.

If the particle accelerator stops, it cools down, and components that guide particle beams go out of alignment. These components must then be realigned to tolerances within millionths of an inch, a process that can take a full day.

The Machine is geared toward running 24 hours a day for months at a time, Struven said, and downtime costs between $3,000 and $4,000 per hour. Downtime also disappoints physicists from around the world who visit Stanford to perform experiments, Struven said.

The accelerator measures two miles from beginning to end (represented above by arrows).

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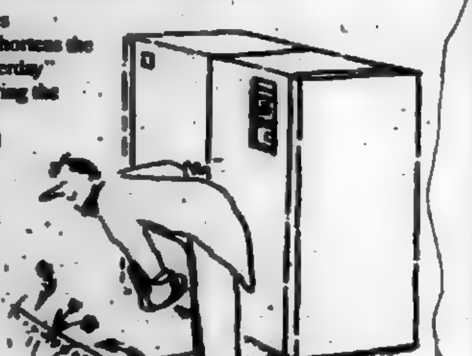

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PATH from SR/39

work, the gateway should also support the configuring of printers as personal computer dedicated, host dedicated or shared to suit different applications. These capabilities will offer a great variety of selections for satisfying user requirements.

Another feature a solid controller emulator should possess is the ability to support up to 32 concurrent sessions in any combination of printers or displays.

■ **Consider the communications speeds and error-detection mechanisms offered by the gateway.** Speed and error detection are important communications requirements. A gateway that follows a full SNA implementation will provide a 4,800 to 9,600 bit/sec synchronous connection to the host. In addition, a solid SNA gateway will not only monitor and detect problems with the actual communications line but also detect and recover from errors in the message being transmitted.

> ”
>
> *The demand for a software gateway to the mainframe is increasing significantly in the corporate environment.*

■ **Look at gateway transparency at the personal computer level.** The ability for the local application to interface with the gateway is desirable for transparent access to host communications during local processing. Another example of transparency is the ability to interface with a custom application that reformats host data for direct inclusion in a local application. A gateway should be able to accommodate these requirements by providing routines for this interfacing.

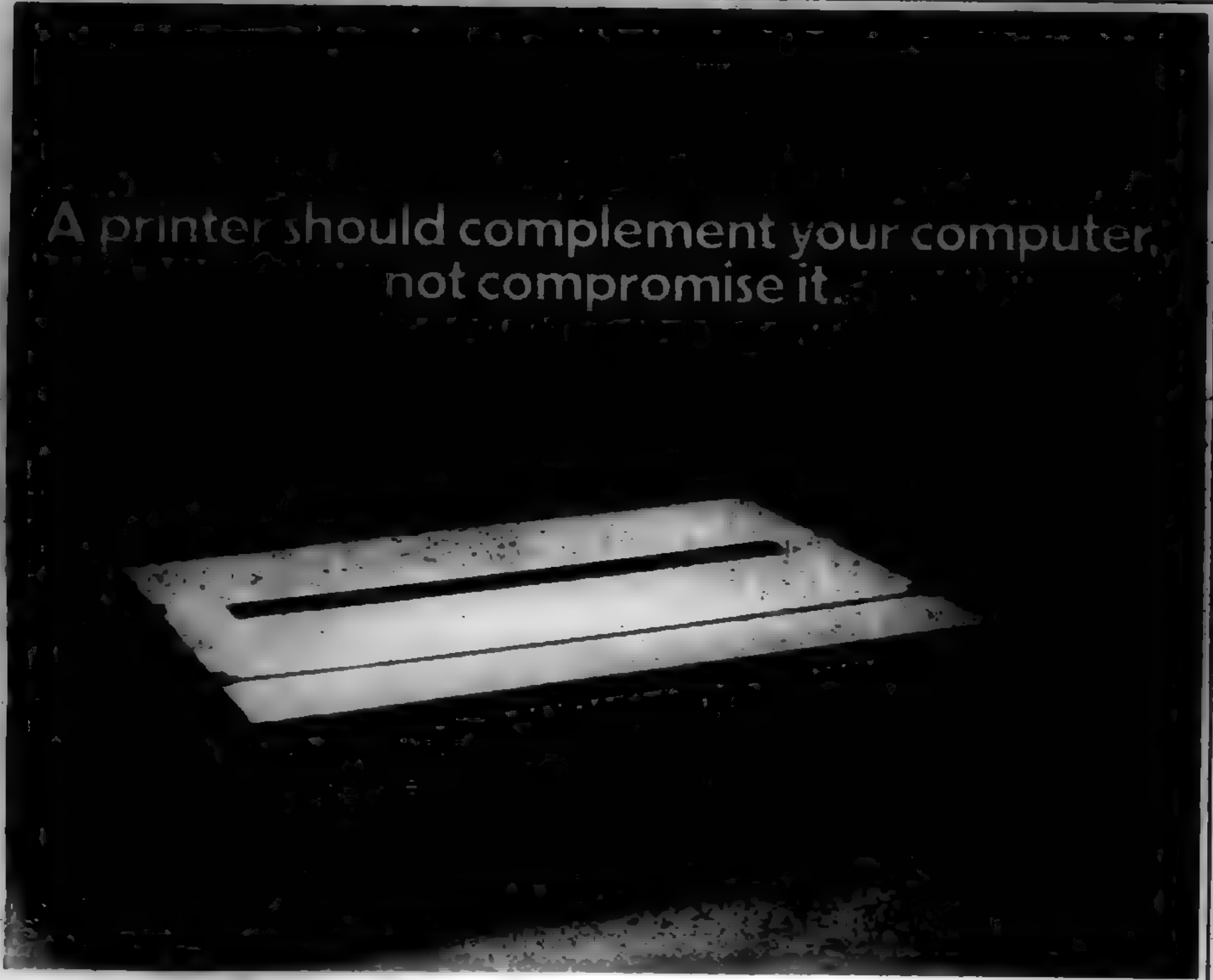
■ **Look for gateways for different configurations and training and support options from one supplier.** It is likely that the environment requiring gateways will be composed of a combination of single- and multiuser systems. A single gateway supplier offering a product that supports all these configurations will reduce the learning curve for users working on various micro configurations. In addition, look for a supplier that provides comprehensive training and consistent support.

■ **See if the gateway can adapt to system expansions.** In the multiuser environment, it is conceivable that you will want to expand to accommodate more users, different devices and so forth. It is important that the gateway matches your system's capacity to grow. This expansion might include multiple gateways on a local-area network to one or multiple hosts.

In both the Unix and local-area network environments, there are factors to consider in selecting the SNA gateway. Specifically, the way in which SNA layers are structured affects the trade-off between communications performance and normal Unix or local-area network processing. Faster processors, more advanced add-on boards and, in the case of Unix, additional addressable space, will make possible maximum communications performance during normal processing. In selecting an SNA gateway, buyers must look at the degree to which the connection's performance or normal processing is compromised and whether or not the trade-off is the best for their applications.

As discussed, the gateway's flexibility and ability to adapt to future technological advancements is important for both improving performance today and applying the gateway to new environments in the future. Applications in future environments will include providing communications capabilities between the mainframe environment and interconnected, dissimilar local-area networks, as well as networked Unix-based clusters.

The demand for a software gateway to the mainframe is increasing significantly in the corporate environment. Today's selection of a gateway is dependent on a solid SNA implementation. As important, product selection must also be dependent on suppliers that can provide a reliable product and responsive support in a relatively new, yet quickly maturing industry.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NET from SR/40

A third set of protocols, which is not available in products but could emerge as the ultimate local-area network standard, is being specified by the International Standards Organization (ISO).

The seven-layer ISO protocol effort has gained the support of the U.S. National Bureau of Standards and the European Computer Manufacturers Association; its Level 4 transport layer protocol already is an accepted industry standard.

Many companies planning to supply network products have indicated that their initial offerings will be ISO compatible; even established vendors, who have been slow to move toward this standard, are likely to find themselves having to provide migration paths from their own protocols to the ISO set. The ISO protocols received a major push when they were announced as part of GM's MAP specification.

Other protocols

Two other protocol sets not specifically designed for local-area networks have evolved to fit the local-area network environment. IBM's Systems Network Architecture (SNA), with the world's largest installed network base, is based on a hierarchical topology designed for long-haul IBM networks.

Generally believed to be the protocol set that will be used with the IEEE 802.5 token-ring technology over IBM's announced cabling scheme, SNA has been enhanced to permit peer-to-peer communication, making it better suited for local networking.

Like SNA, Digital Equipment Corp.'s Decnet protocols originally were conceived for point-to-point networks rather than local networks. Decnet Phase IV, however, is enhanced to permit local-area network functionality.

The local-area network choice should be determined by a user's specific applications needs and by the immediacy of those needs.

Whatever the current needs, users should also keep in mind future requirements and be sure their local-area network vendors can provide the right migration paths — such as to SNA- or ISO-based networks — when they need them.

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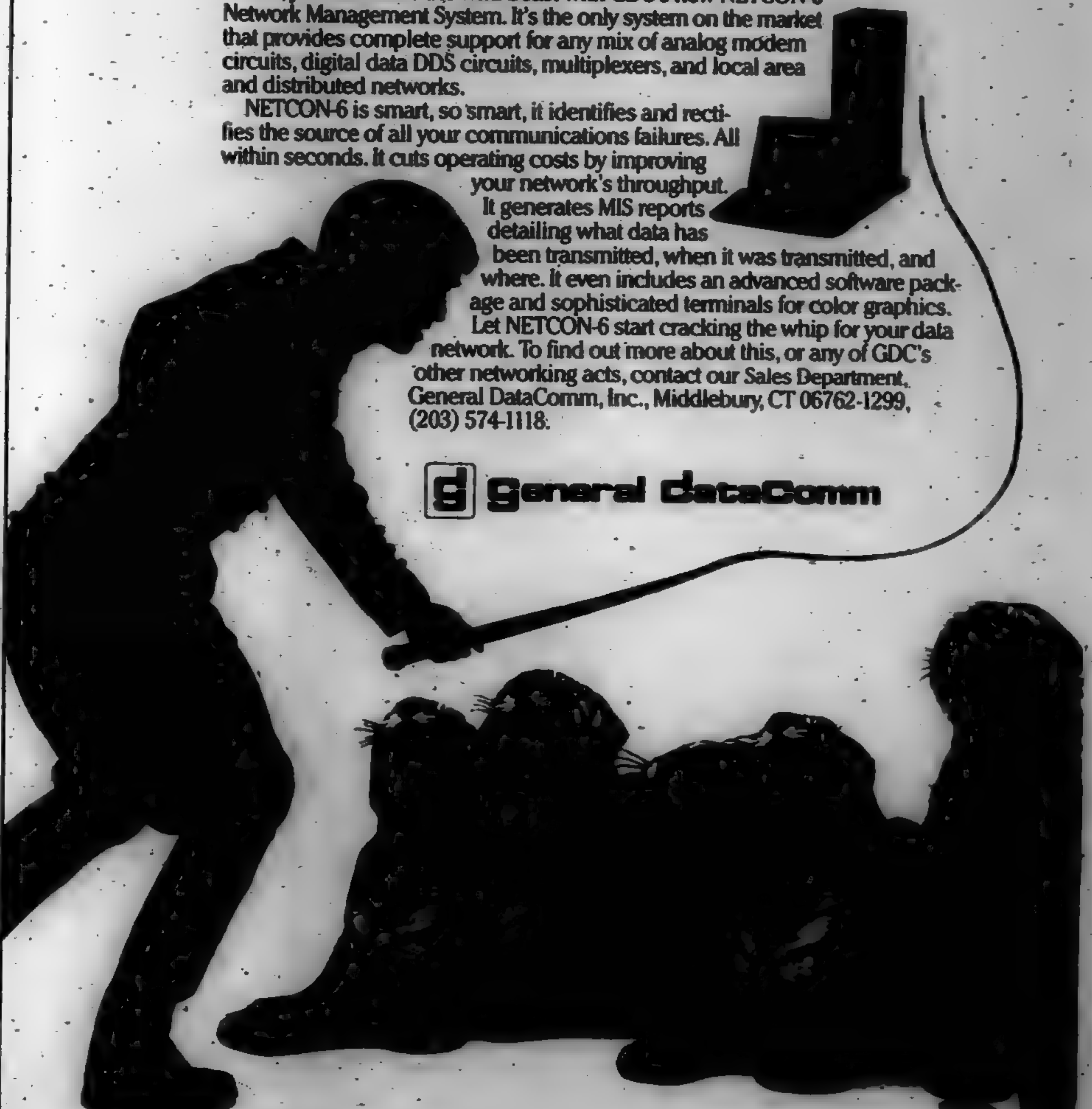

Special Report

Integrated network management required to satisfy

By Dean Sarff
Special to CW

> ”
> *The building blocks for network control systems are intelligent modems with diagnostic sensors that continually monitor the condition of the network.*

In today's complex network environments, an integrated network management system is not a luxury, it is a necessity, unless you have money to burn on downtime and haphazard network growth.

There are five irrefutable principles of data communications. These principles have always driven data communications users into a panic, while driving data communications vendors to develop network control and network management products. The five principles are as follows:

- Networks obey the law of gravity; that is, they tend to go down.
- Networks always grow faster than expected.
- Networks seldom grow in the direction planned.
- Price dictates technology.
- There is no such thing as state-of-the-art technology, at least not for more than 10 minutes. These principles have always been true. They are just truer now.

The handwriting is on the wall for the traditional technical control center. Networks and network problems have simply become too diverse to be controlled manually. The solution is to automate the technical control functions, providing control from central nodes and data collection thoughout the network.

Today's networks require uptime figures that 10 years ago were considered unrealistic. Network managers and users are now demanding uptime above 98%. The dream of 100% uptime can only be accomplished through a total systems approach. What is needed is an integrated system that is flexible enough to be tailored to individual management styles. Such a system will provide the information necessary to make fast, accurate decisions under the enormous pressure associated with running a network.

The building blocks for network control systems are intelligent modems with diagnostic sensors that continually monitor the condition of the network. All changes affecting transmission quality are reported back to the central site by the modems using either an out-of-band side channel or by multiplexing so that diagnostic information does not interfere with main channel data. Since the modems are monitoring the network 24 hours a day, problems are detected before the users are even aware a problem exists.

Isolating problems

If a problem is detected, a network control operator from the central site can perform tests to isolate the difficulty. Dial backup, switching in a hot spare modem or reconfiguring lines are all methods for temporarily maintaining the flow of data. The network manager then calls the vendor with test results. With the test results in hand, the vendor is able to give the manager a realistic repair time up front.

Remote site personnel, who perform on-site diagnosis of network problems, are no longer necessary when using a network control system. Network control is now located at the central site where it belongs.

Network controllers automatically perform after-hours tests on the network, reporting the results by printing them in a sorted format. These printouts can be compared daily to look at trends on each line.

Automatic testing is critical, not only because manual testing is impractical, but because automatic testing also reports problems masked by system retransmissions and microprocessor modems that automatically adjust to line problems.

A network management system takes the diagnostic data it collects through the intelligent modems and dumps the information into a central data base. A network management module allows this information to be fetched or sorted in an unlimited number of ways.

Custom reports can be generated either automatically by the system or manually according to specific needs. All the pertinent information that is collected about each piece of equipment at each site can now be entered into this data base for future reference. Even information on the site itself, such as telephone numbers, contacts and special notes, can be

Sarff is the director of marketing development for Infinet, Inc. (formerly Intertel, Inc.), which makes network control and management systems and data communications products.

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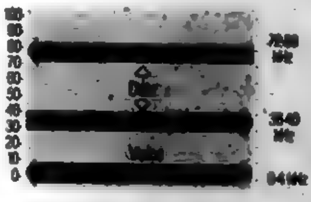

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user uptime

entered into the data base. The data base can also be used to track office equipment, billing, telephone equipment or anything else.

One use for the historical information collected by the management system is problem management. Every problem can be logically tracked from the time it is detected by the network control system to the time it is resolved.

These flexible data bases can be used for individual specifications, such as developing trouble tickets exactly like the ones currently in use. They can also keep track of trouble tickets during the repair process. This is possible because the two systems share a common data base. If the vendor has not closed the call within the specified time, the system reminds the network operator that no action has been taken. As each step is taken to resolve the problem, the open trouble ticket is continually updated. The ticket is closed when the problem is finally resolved.

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>
> *The handwriting is on the wall for the traditional technical control center. Networks and network problems have simply become too diverse to be controlled manually.*

A performance measurement feature can be added to management systems to provide protocol-related information such as response time, line utilization and traffic or error count. Such data is helpful for planning network growth and change. The ability to measure system utilization factors allows the planning division to project a realistic growth pattern for future business opportunities.

Built-in flexibility required

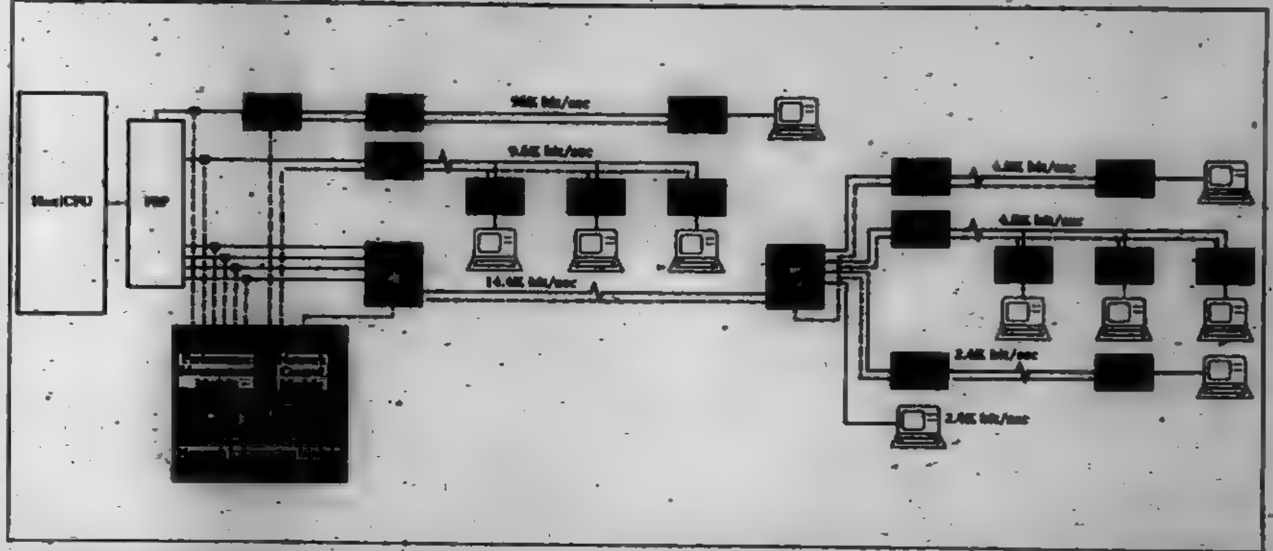
Transmission alternatives have crept into data networks. They include not only leased and dial analog lines but digital transmission, local-area networks, packet switching, satellite, microwave, voice and data private branch exchanges, fiber optics, matrix switches, multiplexers, broadband, videotex, teleconferencing and value-added networks.

Not all of the above technologies will apply to every network, but most networks will most likely be supporting a few of them within the next several years.

This raises two important considerations:

- A network must grow in a controlled way to integrate new technologies effectively. This requires a network control and management system flexible enough to help manage current network problems and growth yet able to accommodate new technologies in the future.
- The integration of new transmission facilities is not a simple matter. In the search for a network data

See INTEGRATE SR/48



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from SR/41

track of how long individual trailers had been in use. After it installed the Apple machines, Intermodal designed programs that allowed employees at the terminals to log in trailer rental records daily and enabled the mainframe at headquarters to capture and compile the information.

After employees log daily rental information into their micros, custom-software resident on the Apples signals an autodial modem to send the data to the Burroughs mainframe over the electronic mail system. The mainframe produces a daily report that shows how long each trailer has been on lease and flags trailers that are approaching top per diem rates, Banks said. "We use it as a management information tool to keep track of people who are getting into that [top category]."

The system of daily reporting on trailer leases has enabled Intermodal to cut more than $100,000 a year from its annual per diem charges.

> *The firm pays an average of 19 cents for each message it sends or receives over the electronic mail system.*

Intermodal's field offices also use electronic mail to send messages to each other, to headquarters and to railroad and shipping firms. The firm pays an average of 19 cents for each message it sends or receives. "What we're getting is instant certified mail at less cost than first-class mail," Banks said.

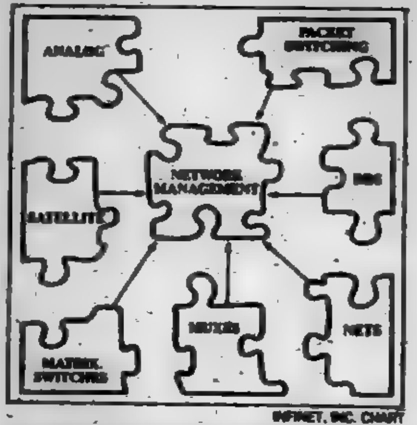
The electronic mail service interfaces with Western Union's Telex and TWX so Intermodal can exchange messages with companies that do not subscribe to Easylink.

Banks said that besides lowering Intermodal's business costs, the communications system has given the firm an immeasurable benefit because it increases employee productivity. Workers at the firm send and receive more than 200 messages every day. "When all that information was handled over the telephone, there was the usual amount of idle chitchat," he explained. "Five minuteq here and five minutes there really added up with that many phone calls."

> *'We're getting instant certified mail at less cost than first-class mail.'*
>
> — Chris Banks
> Intermodal Transportation Services, Inc.

The communications system eliminated the problem, Banks said, "and our workers can concentrate more on their work."

Intermodal plans to write additional custom programs for its network.



INFINET, INC. CHART

Integrate networks with a control and management data base system.

INTEGRATE

from SR/47

base management system, managers must look for a system that operates with hybrid networks. This means that managers are no longer required to distinguish between transmission types in designing their network.

In this way, state-of-the-art technology stays state-of-the-art. If a separate system was needed for each transmission facility, another computer facility would be needed just to manage the subsystems.

Take a Look at all the systems in the marketplace. Comparison shop.

> *Above all, make sure the system is flexible so it can be customized to your organization's management style.*

Prioritize requirements in a formal request for proposals from selected vendors. Give them all a chance to demonstrate their wares, on-site, in a head-to-head comparison.

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Special Report

Virtual networking systems tie micro clusters, giving

By David Mahoney
Special to CW

When and if an ultimate personal computer network standard will appear is a matter that DP managers can only speculate about. However, with the use of a virtual networking system there is little to risk in setting up independent clusters of personal computer users and linking them together using today's local-area network technologies.

The underlying advantage to this system is its flexibility in meeting the needs of tomorrow's network while providing an efficient solution for today.

A virtual networking system provides solutions to both short- and long-term networking problems. Using a combination of existing hardware — in the form of a network server, coupled with sophisticated distributed systems software — it is possible to construct a networking solution that goes beyond the normal tasks of sharing disks and printers.

When building a network using the virtual networking concept, planners can consider not only sharing files and printers but also sharing gateways to other resources. Research indicates that an efficient long-term solution is one in which numerous local-area networks are connected by a virtual networking system. Individual networks are then chosen based on their ability to handle local traffic and serve the needs of individual work groups and departments.

Not every work group will require the same network services at all times. However, every group should have easy access to corporate resources, including other users, applications and data.

A virtual networking system operates efficiently within a multivendor network environment. In addition to the more common network tasks, virtual networks allow users to reach beyond their own network to access other corporate DP resources such as electronic mail, resource directories and gateways.

A virtual networking system has three conceptual elements, identified in Figure 1.

The first element, the front end, uses different technologies to connect personal computers to network servers. These technologies include various types of local-area networks, locally connected asynchronous lines and remotely connected asynchronous lines using modems. To be most effective, the virtual networking system must be independent of any specific networking hardware.

> ”
>
> *Research indicates that an efficient long-term solution is one in which numerous local-area networks are connected by a virtual networking system.*

The second element of a virtual networking system is a comprehensive set of shared services. These services can include base-level services, such as a shared file system and shared print services, or sophisticated services, such as a network time and date facility, electronic mail and messaging, file and record locking, network security and full backup and recovery.

To build and manage departmental clusters of personal computers, the front-end and shared services elements are the only requirements. However, many corporations need to interconnect clusters between departments in the same building using high-speed

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Mahoney is president of Banyan Systems, Inc., a Westboro, Mass.-based manufacturer of virtual network systems.

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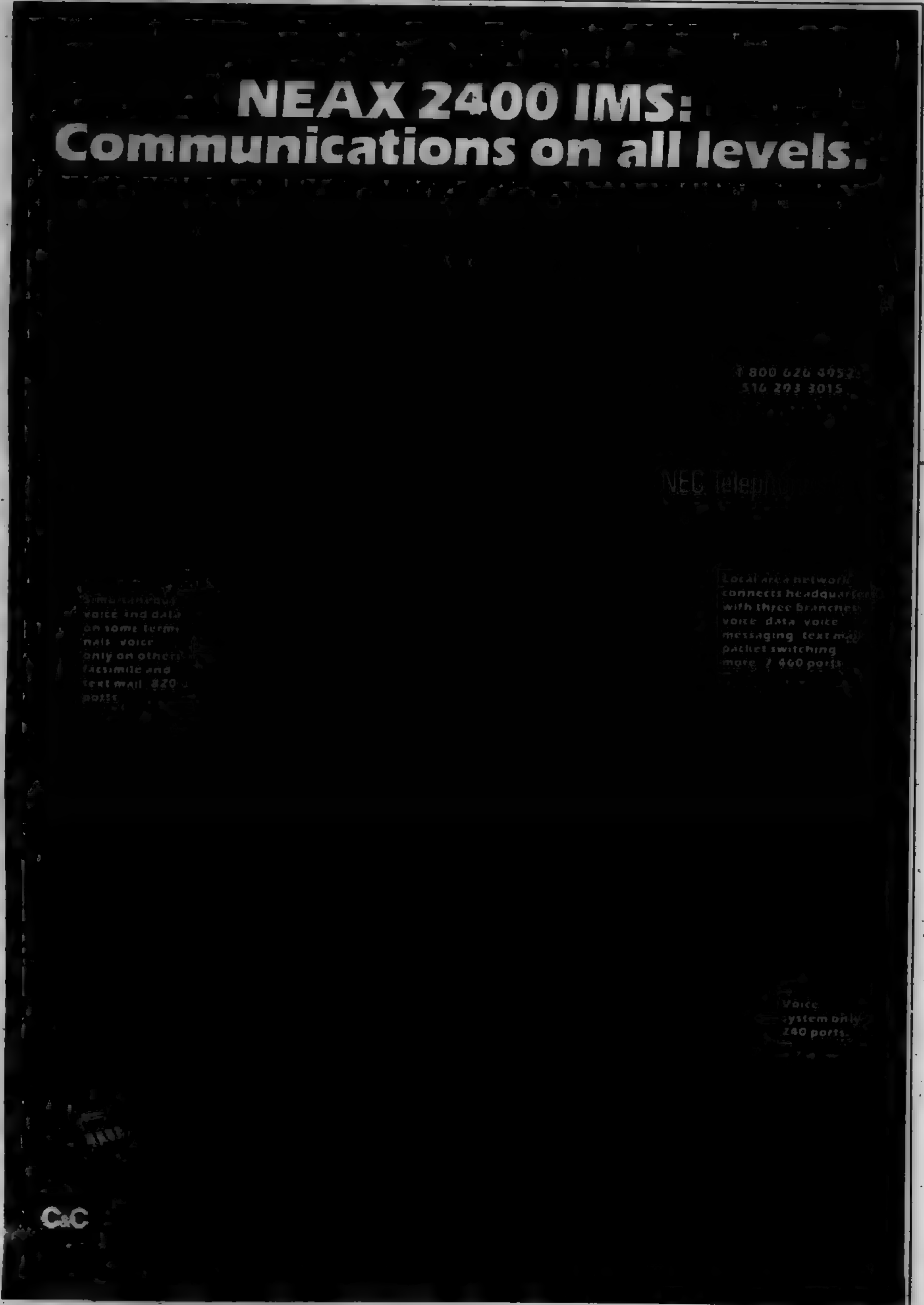
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C&C

short-, long-term solutions

backbone networks or between geographically separate sites using private leased lines or public data networks. In addition, many frequently used resources in the corporate environment, such as data and applications, exist only on a mainframe system. Personal computer users must be able to access these resources effectively.

Therefore, a complete virtual networking system must provide a third element, the back end, to enable personal computer users connected by local-area networks to access these external communications environments through a network server. This back-end capability also accommodates large local systems with hundreds of personal computers at several locations within a single site by supporting the interconnection of multiple servers.

Ease of use

Network users must be able to find, move and use information. In a small network, this is not generally a problem. However, as personal computers are added and independent networks are installed, someone, usually a systems administrator, must keep track of the network resources and the users who need access to them.

The services software in a virtual networking system provides these functions. Using this software, a systems administrator gives each item on the network, including users, file volumes and printers, a unique English name, along with some information about each item.

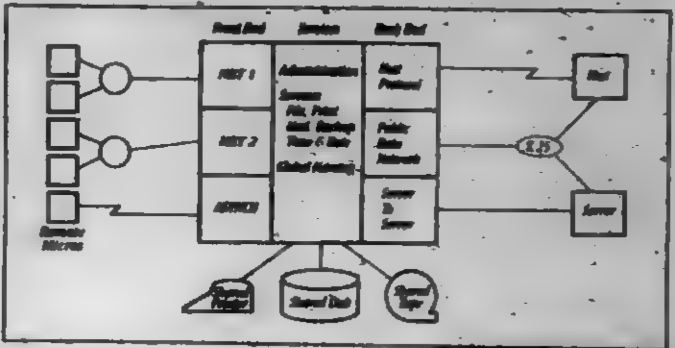
The virtual networking system stores the names and information in a data base where they are easily found. When a user accesses a network resource, it appears as though that resource is resident on the user's own personal computer. If a user is not sure if a certain resource is on the network, a systems-resource directory provides a listing of all available resources.

The services software makes it possible for dissimilar computers to share resources by providing the information and data conversion necessary for the user's personal computer to view data stored on other micros, including incompatible ones. All the user sees is one integrated system.

Once a network environment is established, finding information and resources should be as easy as using the telephone system. With the phone system, a user needs to know only a unique identifier or name to communicate with another party.

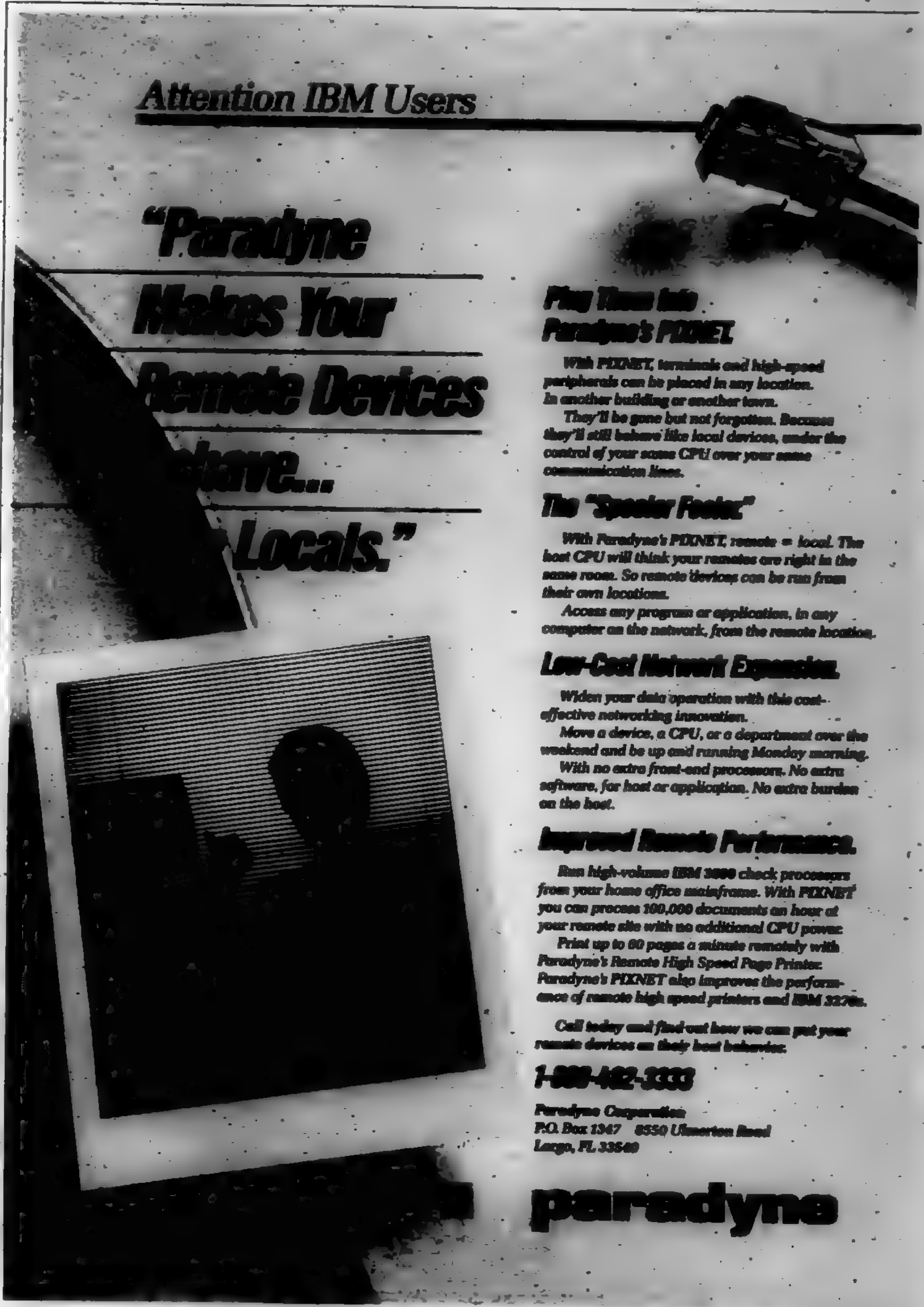
In a virtual networking system, a user should be able to locate a shared resource anywhere on the network simply by using its name. The user should not have to know the resource's precise location and should not be exposed to the complex software processes involved in finding that resource.

With so many corporate computer resources able to communicate, total systems security in a virtual networking system is important. The system has top-level administrators who can add users to, and remove them from, the network. These administrators can assign passwords and configure individual user profiles to control each user's access to specific network information and resources.



BANYAN SYSTEMS, INC. CHART

Figure 1. A virtual network consists of a front end, a back end and shared services.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6AO6401

SOFTWARE & SERVICES

Balanced contract best defense

Lawyer describes software acquisition contract that matches user needs with vendor commitment

By Maura McEnaney
CW Staff

CAMBRIDGE, Mass. — Sloppy administration of a software acquisition contract can cost users valuable time and money.

That was the message of attorney Frank Aiello, a software contract specialist who spoke during a seminar titled "Legal Aspects of the Software Acquisition" held here recently. Aiello, a partner in the New York law firm of Contino Ross & Benedict, said a comprehensive software contract protects users against losses and can actually foster a better relationship with the software vendor.

Aiello said a balanced software contract helps avoid future legal disputes, matches a user's expectations with a vendor's commitments and sets up a time frame in which those commitments are to be met. The attorney outlined several factors to consider during the acquisition process.

For example, while every software vendor goes to great lengths to protect its proprietary interests, there is usually nothing in the software contract designed to protect a user's proprietary information. When negotiating the software contract, companies often reveal to the vendor a great deal about their operations — releasing budgetary information, customer reference lists and business plans that it would not release to competitors. "Challenge the vendor to give you the right to protect your confidential information," he said. Be certain that the contract is balanced, with protection provided for your company, he added.

Before working out contract details, outline your own priorities, Aiello said. Although pricing is an obvious consideration, it may not be as critical to the user as the package delivery date. Large corporations should be sure that they are not charged more for software simply because they are able to afford it, Aiello said. But, he added, "Squeezing a contract so the vendor is going to lose his shirt is not good for you either."

See LEGAL page 70

Support series included in IBM software lineup

WHITE PLAINS, N.Y. — IBM's recent slew of software announcements, headlined by the introduction of several major VM-related products [CW Feb. 18], also contained about a dozen software support packages, including a series of products for IBM's newly announced 3280 Page Printer.

The following packages were among the releases:

■ Engineering/Scientific Support System (E/S3) offering Release 1.1. Designed for the IBM 4300 series mainframes, the E/S3 is said to ease the selection, installation, administration and maintenance of systems and applications software for engineering and scientific problem solving, business tasks, office support and data base support in an IBM VM/CMS environment. According to IBM, the price for a typical configuration for a 47-month rental is $134,285, including an initial charge

See SUPPORT page 66

■ Nastec Corp. has added a development tool kit to its Case 2000 computer-aided software engineering environment/62

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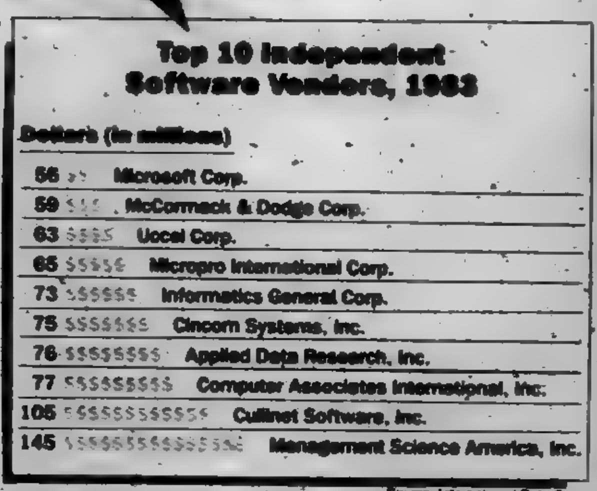
Systems Software/62

Application Packages/62



Top 10 Independent Software Vendors, 1983

Dollars (in millions)	
56	Microsoft Corp.
59	McCormack & Dodge Corp.
63	Uccel Corp.
65	Micropro International Corp.
73	Informatics General Corp.
75	Cincom Systems, Inc.
76	Applied Data Research, Inc.
77	Computer Associates International, Inc.
105	Cullinet Software, Inc.
145	Management Science America, Inc.

Source: International Data Corp.

Total independent packaged software revenue for 1983 — $3,910,000,000

Pondering IBM's plan

SOFTALK
John Gallant
CW Senior Editor

For months industry rumormongers, consultants, vendors and users alike waited for IBM to loose the latest, most powerful weapon in its evolving hardware arsenal.

Sierra — rumored code name for the new high-end mainframes. The word rolled off the tongues of pundits and prognosticators like raindrops off the windshield of a speeding Porsche. Market researchers prepared reports predicting the specifications of the muscle machines to come, consultants conferred with their clients on what would soon be and vendors paused, waiting to learn what new problems or opportunities IBM's strategic hardware moves would pose.

Then, like Christmas morning, came announcement day. The so-called Sierra machines, embodied in the 3090 processors [CW, Feb. 18], were finally formally unveiled, and eager industry observers mobilized to report and analyze the IBM announcements. The months of anticipation were over at last.

See ARSENAL page 63

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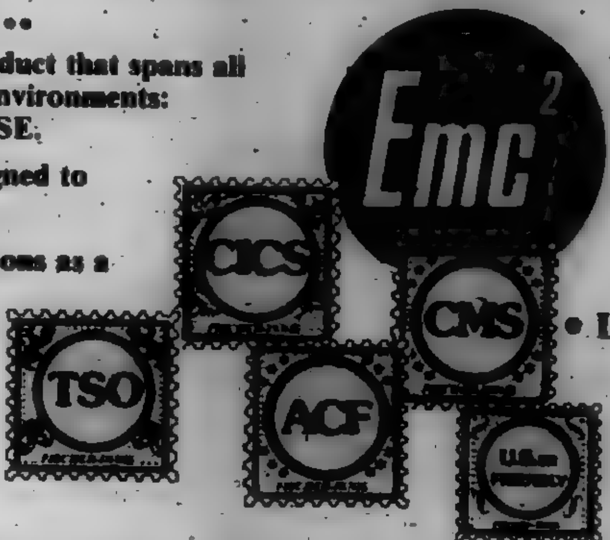

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Nastec offers systems development tool kit

SOUTHFIELD, Mich. — Nastec Corp. has added a systems development tool kit to its Case 2000 computer-aided software engineering environment.

According to a spokesman, the Designaid tool kit includes Graphictext, a full screen editor for documentation and design support; the Design Dictionary containing design and data elements; and Design Analyzer, a validation program for scanning data flow diagrams and Cobol source statements.

Case 2000 is designed to improve productivity in systems development and support.

Integrated tools

The product is a collection of integrated tools organized into three components: a Development series consisting of tools for technical professionals; a Management series of project planning, control and quality assurance tools; and an operating environment consisting of options for workstation type and modes of information sharing.

Nastec also announced that Designaid is available on the IBM Personal Computer XT, Personal Computer AT and 3270 terminals, in addition to Convergent Technologies, Inc.'s workstations. The Designaid tool kit is priced at $6,900.

Nastec is located at 24681 Northwestern Highway, Southfield, Mich. 48075.

SYSTEMS SOFTWARE

■ **Sterling Software Marketing has announced that its Dasd management system, DMS/OS, now supports IBM's 3480 tape cartridge system.**

DMS/OS users are not restricted to the compatibility mode, the vendor said, but may also install and use the device in full function mode. DMS/OS operates under IBM's MVS and MVS/XA and Fujitsu Ltd.'s OSIV/F4 operating systems.

DMS/OS pricing starts at $14,000 for a permanent license, the vendor said.

Sterling Software Marketing, 1097 Seventh St., Sacramento, Calif. 95814.

APPLICATION PACKAGES

■ **Sidereal Corp. has announced an automated bank test key software package that makes it possible to receive, transmit and test electronic funds transfer orders and other messages requiring authentication on the same equipment.**

The package runs on Sidereal's Micronet 8 message communications terminals under the company's proprietary operating system.

The package, which can be customized to include features that individual banks may require, has two modules. The test key module is a series of tables determined by algorithms that also includes a fixed number for each correspondent or branch bank. A five-level password security procedure module can include combinations of message preparation, text preparation, access to operator utilities, transmission of messages and supervisory access to passwords.

The test key module costs $5,000, and the security module is priced at $3,000.

Sidereal, 9600 S.W. Barnes Road, Portland, Ore. 97225.

■ **Datamate Co. has announced Fastfile, a program that uses precompiled code to allow the user to build an information storage and retrieval system quickly by responding to a series of menu prompts. The package is for use on NCR Corp.'s 9300 mainframes under NCR's ITX operating system and on NCR's I-Tower supermicrocomputer under Ryan-McFarland Corp.'s RM/COS operating system.**

According to a spokesman, each system set up with Fastfile includes a customized version of Enquery, Datamate's English-language report writer and query processor. This function allows

Continued on page 66

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ARSENAL

from page 61

But wait.

Sierra was there all right. But the announcement of the top-of-the-line mainframes was piled together with some 25 IBM programming announcements — several of which were among the most significant software introductions the world's leading software company, IBM, has made in the last half decade. On the auspicious occasion of announcing the most powerful computers it has ever deigned to offer, IBM took seers and sages by surprise and loosed a torrent of major software introductions and enhancements on an unsuspecting industry.

IBM

Although industry watchers were quite prepared to dispense their opinions concerning the ramifications of the 3090 series and its bells and whistles, IBM's software moves caught many off guard.

Some other companies, especially those in the software marketplace, spend a great deal of money putting together glossy press packets outlining exactly what their marketing strategies are and how their new products fit into said strategy.

Not IBM. The blue force from Armonk is notoriously tight-lipped about its future plans and sees little need to map out its product strategies. Thus, it will take a fair piece of time for both users and analysts to make some sense of the mass of software announcements IBM rained on the industry mid-month. Indeed, in order to begin that Herculean task, any interested party must first wade through the stack of programming announcements — known as ivory sheets — that IBM unloaded on the world.

But like the quasi-art, demiscience of kremlinology, which has won new converts in light of the recent poor health of top Soviet leadership, decrypting the hidden messages in those software announcements promises a wealth of new insights into the workings of one of the world's largest companies. Surely, amidst all the product announcement smoke, there is some fire and an IBM software strategy waiting to be unearthed. On the surface, the software announcements seemed to raise a multitude of questions for each one they answered.

For example, why has IBM chosen to go forward so forcefully with VM, an operating system that earned favor among users but was thought by many to be the neglected child among IBM's three major operating systems (DOS, OS/MVS and VM)? And, why did IBM choose to go forward in high gear with VM at this time? What significance do the VM-related announcements, which seem to make VM a viable and attractive alternative across the entire range of IBM's mainframes, hold for the future of DOS? What effect will they have on the flagship of IBM's software world, MVS/XA?

And what about AT&T Unix? For years, users and observers have debated whether IBM would enter the Unix fray. Enter the fight it did, and in a big way. Big Blue's decision to go with its new-found rival, Unix System V, offers some fascinating fodder for analysis. Was it simply a move aimed at saving IBM the cost of developing a new operating system with Unix-like capabilities? Was it simply IBM's concession to the engineering/scientific market and to the growing cadre of die-hard Unix afficionados? Or is IBM hoping to steal AT&T's hole card and, thus, its thunder? Will IBM's large-systems Unix implementation provide a consistent operating environment across the entire range of its hardware, from the Personal Computer — PC/IX and Microsoft Corp.'s Xenix — to mainframes under IX/370? The above are just a sampling of the issues raised by IBM's software ploys of the last couple weeks. And, considering the long lead times before most of the announced software products will actually become available, there will be plenty of time for IBM watchers — a group that includes thousands of users — to ponder IBM's master plan.

Enjoy the puzzle.

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CICS Dynamic File Allocation is a must for effective CICS scheduling. It is the gateway to non-stop, round-the-clock CICS systems. It eliminates batch update constraints. It guarantees bullet proof restarts. It allows you and your batch jobs to add and remove CICS files at will, without disrupting your user community. Site license $4,000.

Read JES Reports from CICS
Give your CICS terminals and PCs access to JES reports. Let end users (1) browse time critical reports, (2) control report distribution; and (3) schedule and submit their own jobs. The CICS Queue Command Facility (CQCF) is an efficient, cost effective tool for previewing and controlling JES II reports. Site license $3,000.

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Netec International, Inc.
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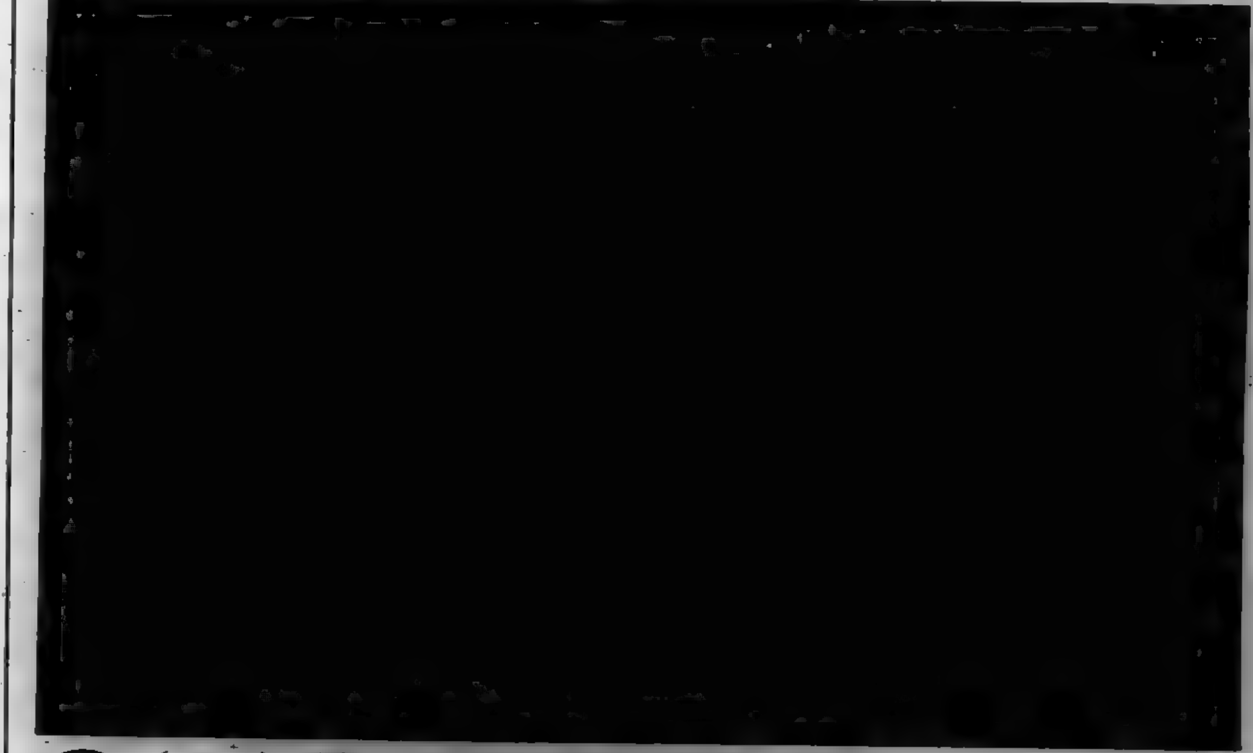

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Acquiring mainframe and micro software that best fits your needs isn't easy. Today's software landscape seems unending. So to obtain software that actually achieves your specific objectives, you need programs with proven problem-solving capabilities. Like software from Boeing.

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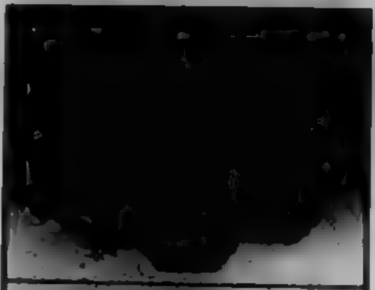

One of the newest relational data base management systems on the scene comes from Boeing. Its cost is low; its function is extensive. It runs on IBM, CDC, DEC VAX, Data General and Prime computers, and interfaces with a micro version.

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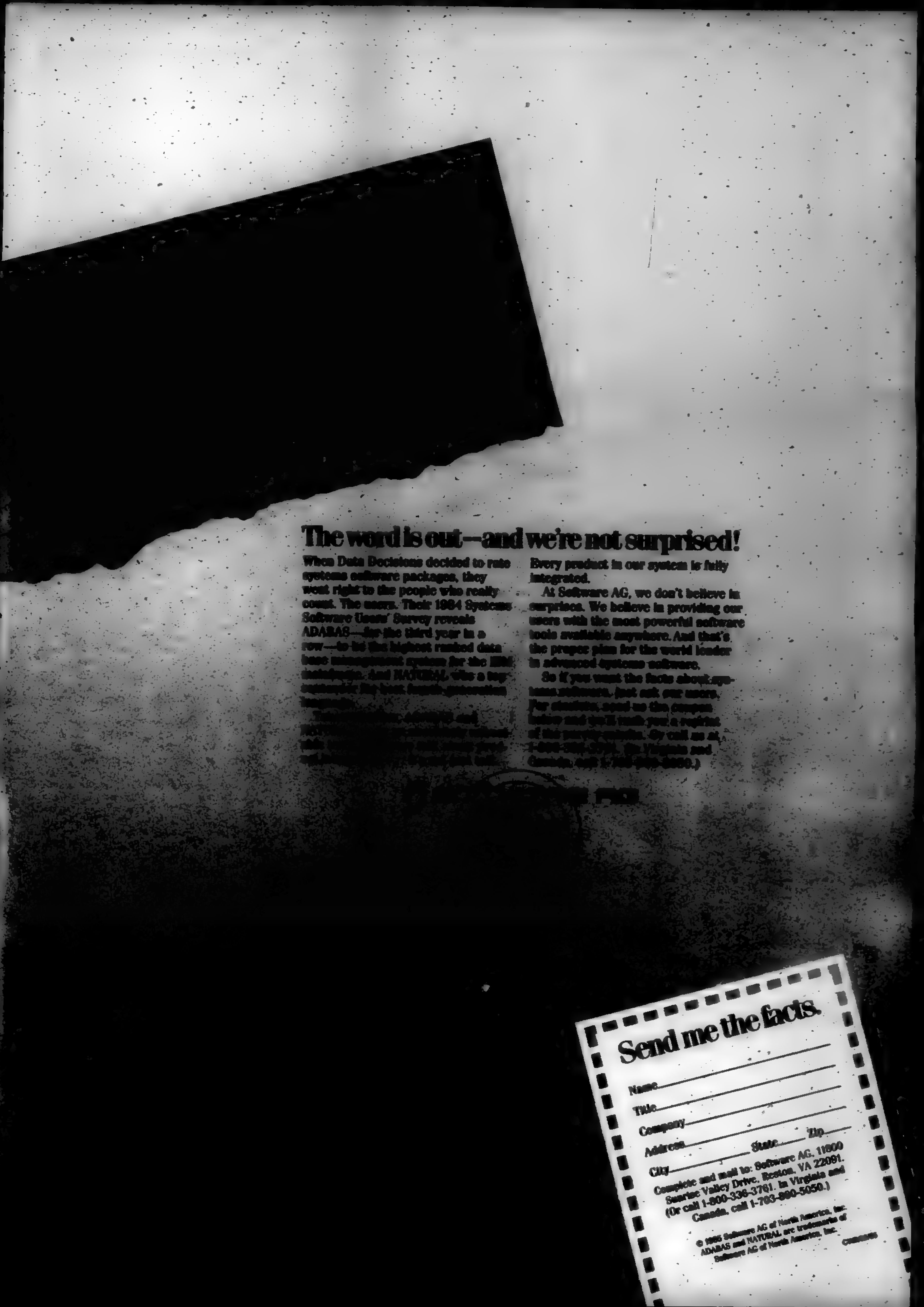
company with top DBMS



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VPS, the VTAM/TCAM Printer Support subsystem places 328X/328X printers, PCs, plotters, 5210s, and word processors directly under JES. These non-dedicated devices become JES II/III print stations. VPS expands JES's local and remote hardcopy alternatives as it reduces real network costs and complexity. Ask our 400 users and their 20,000 printers.

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SOFTWARE & SERVICES

SUPPORT

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and some monthly licensing charges. The product will be available in mid-March.

- The E/S3 Productivity Facility (PF) Release 1.1. E/S3 PF provides help for users of the E/S3 facilities through dialogues and examples on installation, administration maintenance and applications-oriented tasks.

A spokesman said E/S3 PF dialogues lead the user to the appropriate application programs and can be tailored to specific users. The one-time charge for the E/S3 PF, available in mid-March, is $2,000, and the monthly license charge is $100.

- The E/S3-Entry program is designed for configurations of the IBM 4300 series mainframes supported by the newly announced VM/Entry [CW, Feb. 18]. E/S3-Entry is an interactive IBM CMS engineering support system. Task-oriented dialogues present a view of applications programs to the user. Four optional packages provide applications support for problem solving, professional text processing, data base management and presentation graphics. E/S3-Entry carries a one-time charge of $40,000 for the VM/Entry. Additional software is optional.

- IBM announced Release 3 of its System Modification Program/Extended (SMP/E). SMP/E runs under MVS/XA and MVS/SP. Dialog extensions, zone editing capabilities, extended zone descriptors and processing improvements have been added to the product. SMP/E carries a base license charge of $1,800 and a monthly charge of $300.

- Resource Measurement Facility (RMF), Version 3, Release 3 for MVS/XA users features ease-of-use enhancements, expanded storage support for the recently announced 3090 processors and support for I/O configurations on the 3090 processors. The product's initial license charge is $2,100, with a $700 monthly charge.

Other announcements

Additional printing support facilities included the following:

- Print Services Facility/MVS, Release 1.1 provides device and resource management support for the recently announced IBM 3820 Page Printer and the 3800 Printing Subsystem. The Print Services Facility/MVS performs page processing that organizes data based on page formatting instructions. New page/report formats can be created independently of the applications program. The base license charge for the Print Services Facility/MVS is $4,260, and the monthly license charge is $200.
- Print Services Facility/VSE Release 1.1 for the 3820 printer is designed to provide device and resource management support operating under VSE in a VSE/Power environment. The Print Services Facility/VSE 1.1, available in the third quarter, has a $2,000 initial license charge and a $100 monthly license charge.
- Print Services Access Facility/MVS, which is an interactive, menu-driven system that simplifies the selection of printing parameters used to print data on the IBM 3800 printing subsystem Model 3 and the 3820 printer. It operates under MVS/SP or MVS/XA environments. The product will be available in the second quarter and has an initial license fee of $700 and a monthly charge of $120.
- Print Management Facility/MVS Release 1.1, which provides menu-driven utilities and 67-char. sets to support the capabilities of the 3280 Page Printer. The product will be available in the second quarter and is priced at $825, with a $275 monthly license charge.
- Page Printer Formatting Aid/VSE Release 1.0 is a product that allows the user to define format and page definitions for use with the 3820 printer. VSE Release 1.0 will be available in the fourth quarter. The release carries an initial license charge of $250, and a monthly license charge of $75.

The National Accounts Division of IBM's Information Systems Group is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

OUTDRAW THE COMPETITION FOR ONLY $500

Extend the capabilities of your IBM PC. With DFDdraw from McDonnell Douglas Automation Company, you can now draw and edit Data Flow Diagrams, using DFDdraw's automated template of all data flow diagram graphics symbols and its comprehensive diagram manipulation features.

DFDdraw features include scaling and sizing for changing diagram dimensions, and pan and zoom for easy editing and viewing. DFDdraw simultaneously moves data flows and text. Hardcopy can be provided on both the Epson FX80 or FX100 printer and Hewlett-Packard desk plotters.

DFDdraw operates on an IBM PC, XT or AT having at least 256K memory, with standard IBM color monitor and color graphics monitor adaptor. Compatible products are also supported.

The price is impressive, too—just $500. So expand your PC. Order DFDdraw today.

A demonstration disk is available for $15. Send check or money order to McDonnell Douglas Automation Company, Dept. K277, Box 516, St. Louis, Missouri 63166. Or ask us to bill you.

You can also order by calling us at 1-800-325-1087. In Canada, call (314) 233-8997.

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A two-bit hard disk could cost you a million bytes.

[illegible] Hard [illegible] PC.

If your data [illegible] take chances with it. [illegible] be dead on arrival. That [illegible] in the shop. And that [illegible] out the [illegible]

You need one from a name you [illegible] reliability ... NCR.

The NCR 6097 line offers high capacity — from 10 to [illegible] hard disk storage [illegible]

An[illegible] compatible [illegible]

[illegible] the 6097 hard disk — and [illegible] software on your PC. [illegible] benefit comes from NCR's tradition of quality. Like the sophisticated [illegible] that enabled the 6097 system to meet the FCC Class B standard for radio interference emissions. And the 24 hours of error-free operation that every single unit must pass before it leaves the factory with the NCR name.

[illegible] for you, you [illegible] 6097. Call [illegible] on [illegible]

SOFTWARE & SERVICES

Continued from page 62

the user to perform comparisons and print or display a sorted report. Enquery will format multiline reports automatically. Fastfile is priced at $1,495 until March 31.

Datamate, Suite 128, 4135 S. 100th East Ave., Tulsa, Okla. 74146.

■ **Software Concepts, Inc. has announced that it will market the Online Reconcilement Banking System (Orbs) developed by Chemical Bank in New York to other banks.**

Reportedly, the Orbs system runs on the IBM 4341 model under IBM's MVS operating system and was designed to operate with IBM's check capture system. The reconciler can scroll through magnetic ink character recognition detail or search for specific data, find and identify single, free items, out-of-balance deposits, batches and blocks.

The price of Orbs is $60,000.

Software Concepts, Suite 1450, 250 Piedmont Ave. N.E., Atlanta, Ga. 30308.

■ **Hewlett-Packard Co. has introduced three text and graphics software packages for its Series 200 engineering workstations.**

Text Editor/200, which sells for $275, reportedly provides users with the capability to write and edit memos, letters and reports. The product is said to include electronic cut-and-paste capabilities, recall of up to 10 lines of deleted text from memory and a key redefinition function.

Graphics Editor/200, which sells for $445, reportedly is a drawing program for creating presentation graphics including flowcharts, process-flow diagrams, organizational charts and block diagrams. The product is said to include a menu-based command system, on-line documentation and a windowed screen.

Data Grapher/200, available for $295, is said to automatically perform calculations and plotting. The product includes curve approximation, pie charts and bar charts, automatic data entry from data files and output options. Each of the three packages requires a minimum of 512K bytes of memory.

Hewlett-Packard, 3000 Hanover St., Palo Alto, Calif. 94304.

■ **Radian Corp. has announced CPS Graphic Editor, which allows users of the company's CPS series of contour mapping software to create and edit maps interactively.**

CPS Graphic Editor is said to run on Digital Equipment Corp. VAX series computers under VMS operating system and on IBM computers under MVS and CMS. The package is written in Fortran and incorporates Precision Visuals, Inc.'s DI-3000 core graphics software interface.

The package also allows users to generate new maps or to modify existing maps created through another CPS product or through the user's own applications program. The user can copy, move, change or delete items that appear on the map and can add such elements as title boxes, text notation, surface features and graphics symbols and other artwork.

The price of the system is $27,000.

Radian, P.O. Box 9948, 8501 Mopac Blvd., Austin, Texas 78766.

■ **List Processing Co. has announced a software package said to perform name and address processing functions on IBM computers running under IBM's OS or DOS operating systems.**

Finalist reportedly affixes five-digit Zip codes, carrier route codes and Zip + 4 codes to mailers. The package also features street address verification capabilities, including the ability to correct incomplete addresses and typographical errors, truncations and misspellings.

The price of the package ranges from $14,900 to $49,600, depending on the type and size of the user's data base.

List Processing, 555 Waters Edge, Lombard, Ill. 60148.

■ **Execucomp, Inc. has introduced a marketing-oriented software system written in Cobol that runs on Data General Corp.'s MV series superminicomputers under DG's AOS/VS operating system.**

The integrated order entry processing system consists of modules for marketing, product and financial control. Each software module is priced at $30,000. The system can be ordered as a complete turnkey system with prices starting at $175,000.

Execucomp, P.O. Box 24428, Indianapolis, Ind. 46224.

■ **Computer Consoles, Inc. has introduced BRS Search, software for use with its Officepower office automation system. BRS Search reportedly permits full text information retrieval.**

BRS Search is said to permit users to electronically skim private and public data bases and to retrieve free-form and structured text or data. Officepower, an integrated WP and DP package, is said to offer file management, electronic mail and decision support functions.

BRS Search, which runs with Officepower on Computer Consoles' Power 6 minicomputer, reportedly permits captured text to be retrieved on-line and displayed, edited, filed, printed or electronically mailed. It is priced at $45,000.

Computer Consoles, 97 Humbolt St., Rochester, N.Y. 14609.

■ **Vector Automation, Inc. has announced a three-dimensional wireframe geometry product that is an add-on to its Vadds 2D drafting**

Continued on page 70

The TI 855 microprinter.
No other printer says better
so many ways.

Feature for feature, no other microprinter can match the versatility, compatibility, reliability and productivity of the OMNI 800™ Model 855 microprinter. Here's why.

Two Printers In One. With the TI 855 you get the speed of dot matrix draft copy. Plus the precise clarity of the most advanced matrix technology for letter-quality print. It's two printers in one — at one low price.

A Great Family Name. Texas Instruments is known for providing the world with the industry standard for printers — the TI 810. TI builds the same reliability into every 800 series microprinter. Both the 855 and the data processing Model 850 are part of the expanding TI line of high-performance, low-cost microprinters.

Hardware Compatible. The TI 855 microprinter is compatible with all major PC hardware. And it provides both serial RS232C subset and "Centronics-type" parallel as standard interfaces.

Software Compatible. The TI 855 uses industry standard escape sequences for compatibility with virtually all third-party software. And for those with proprietary software needs, a model is available with ANSI standard escape sequences.

Tough Font Modules For Quick Character Change. Three font modules can be inserted into the front of the printer at one time, and are accessed individually. Each contains both draft- and letter-quality character sets. They're easier to use, more reliable and more durable than traditional metal or plastic daisy wheels.

More Productivity Than Any Other Microprinter. The 855 offers both friction and tractor paper feed, to handle all types of word and data processing applications. A quick-change snap-in cartridge ribbon. Raster and mosaic graphics. And intelligent printing which maximizes document throughput — regardless of format.

Get the printer that makes for better information systems. For more information visit your nearest TI authorized dealer or write Texas Instruments Incorporated, P.O. Box 809063, Dept. DPF-00000, Dallas, TX 75380-9063. Or call toll-free: 1-800-527-3500.

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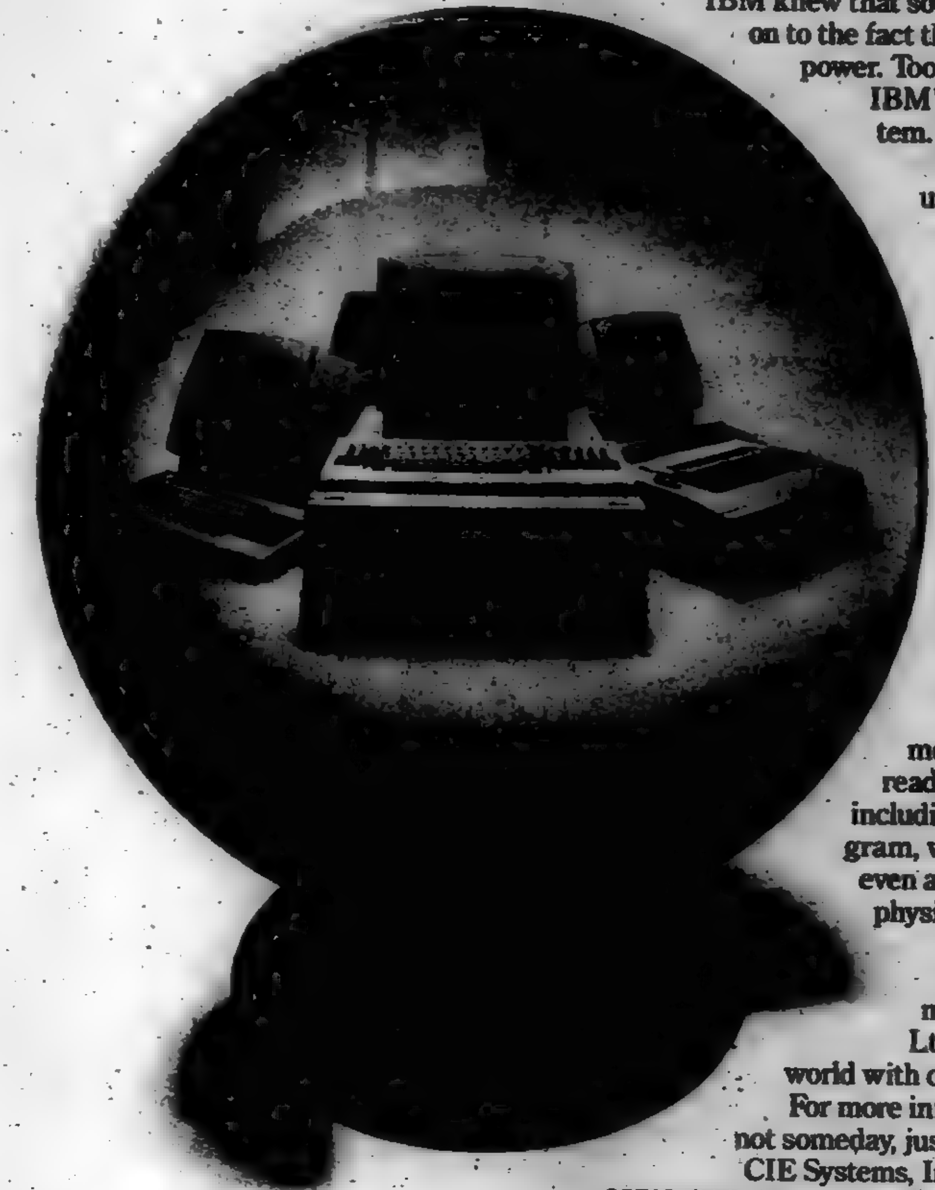

IBM knew that someday even small businesses would catch on to the fact that PCs just aren't enough. Too little power. Too little memory.

IBM's solution: a UNIX-based multi-user system. Someday.

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They're here with multi-user expandability of from one to 40 users, doing different jobs simultaneously.

They're here with up to 2 Megabytes of memory.

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For more information on the system you need today, not someday, just call or write.

CIE Systems, Inc., 2515 McCabe Way, Irvine, CA 92713-6579. (714) 660-1800. Call toll free 1-800-854-5959. In California, phone 1-800-432-3687.

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LEGAL

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When negotiating payment schedules, be sure to examine the software company's financial information, Aiello advised. A small software house could be relying on a single buyer's contract to stay solvent. If the vendor runs out of money halfway through the project, the buyer will lose not only the software but valuable applications use time.

Payment upon delivery is the traditional reimbursement method for most customers. But when working with a small software house that may not be able to afford project carrying costs, it might help to make several "progress payments" — payments made over a period of time — withholding the vendor's profit until the software is tested and accepted.

Overall, Aiello said, software documentation is the key to the acquisition process. "If I were a DP manager, I would make sure that my lawyer understood documentation." Aiello said to instruct counsel to spend several hours on the documentation section or face the risk of future complications. "When the software is not working, you have to find out what's not working," Aiello said, adding that documentation is the first place to look.

When it comes to documentation, make no assumptions, Aiello cautioned. Buyers must make sure to know what kind of documentation the vendor will provide. Thus, the software contract should outline what methodology will be used by the vendor in drawing up the documentation. "People assume that the documentation they will be provided will be the type of documentation they are familiar with," Aiello said.

Negotiating the software acceptance testing process, Aiello said, is "the most important concept in the contract, outside of the warranty and liability sections." Vendors and users should make sure the contract includes criteria for the acceptance test and the procedures to be followed. The test guidelines should be in place when the contract is signed, he said.

"Be leery of acceptance test clauses claiming that after so many days of use you have automatically accepted the software," he said. These so-called free use periods are sometimes a "seductive method" to get users to accept the software, he noted.

Finally, Aiello said, "If you encounter a vendor who is recalcitrant about negotiating a contract, don't do business with that vendor."

Quick Study!

New UDS 9600 bps Fastpoll Cuts On-line Training Time 33%

The new 9600 bps fastpoll modem from Universal Data Systems means extra throughput for your polled multipoint network! Until now the fastest on-line training time available anywhere has been 12 milliseconds. Since training time is non-productive time, UDS has increased system throughput by trimming the training cycle to 8 ms, producing a corresponding increase in overall system efficiency.

The device is suitable for operation over unconditioned four-wire leased lines in either fastpoll or conventional CCITT V.29 mode. Integral test features allow for system performance evaluation and fault isolation within the communications link.

The UDS design incorporates LSI and microprocessor technologies to achieve significant size and power consumption advantages. For detailed specifications, contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Phone 205/837-8100; Telex: 752602 UDS HTV

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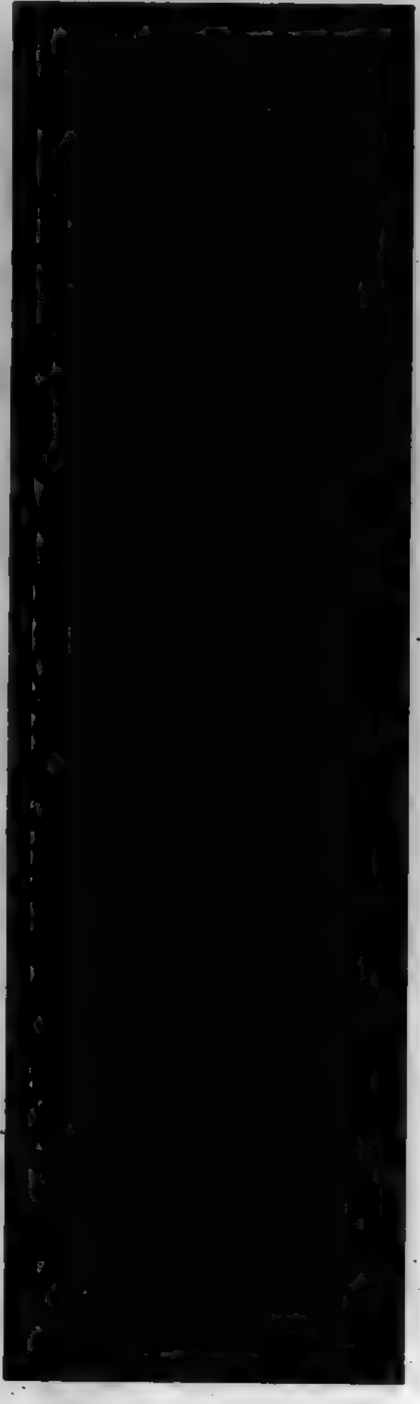

Continued from page [illegible]

software. The package runs on Vector's Cadmax-II and Cadmax-M computer-aided design and drafting systems, which run under Vector's proprietary operating system.

The 3D Wireframe Geometry software module allows the construction, editing and viewing of three-dimensional geometry with the same menu format used in the Vadds 2D software.

The 3D Wireframe Geometry package provides full-function three-dimensional design capability which permits up to 100 user-defined views of a model with all view directions, scale factors and layouts under the operator's control.

The price of the 3D Wireframe Geometry module is $6,000 per workstation.

Vector Automation, Village of Cross Keys, Baltimore, Md. 21210.

LAST CHANCE COMPUTERS

COMMUNICATIONS

Honeywell unveils MAA

Architecture links factory automation products

By Edward Warner
CW Staff

NEW YORK — A communications architecture that reportedly could be used to interconnect all of its factory automation products, from sensors to minicomputers, was announced here last week by Honeywell, Inc.

Honeywell said its Manufacturing Automation Architecture (MAA), available in late 1986, will consist of several local-area networks, the main two of which will use General Motors Corp.'s Manufacturing Automation Protocol (MAP). MAP, a protocol being developed by GM and several of its factory automation vendors, will allow the products of different vendors to communicate over a token bus local-area network.

According to William W. George, Honeywell's executive vice-president of control systems, the top-most network in the MAA will provide broadband communications between the various minicomputers in use at the plant management level for such functions as engineering and production scheduling. A mid-level, baseband local-area network will allow supervisory workstations to communicate with sensing and control devices on the factory floor.

The two local-area networks roughly encompass the systems of information and control in a factory, systems that Honeywell President Edson Spencer said must be integrated in order for manufacturing automation to take place. "By integration we mean the ability not only to supply the major pieces but also to get all the pieces to work together — whether we supplied them or not," he said.

Most of the hardware to make the MAA a reality already exists, according to Charles Johnson, Honeywell's group vice-president for large computer and manufacturing systems. Still needed, however, is the network communications software and a universal controller that will connect shop floor networks of sensing and control devices to the supervisory-level local-area network, he said.

Two new products to support the MAA, the Work Center Controller 1250 and the Plant Management System, were also un-

See FACTORY page 72

Net management system flags, bypasses failed components

ROCKVILLE, Md. — Ocean Data Systems, Inc. has announced a network management system that can be used to identify, isolate and bypass failed network components and lines.

The Medius Network Management System is based on a Digital Equipment Corp. VAX-11/725 for low-end systems that support a network with at least 96 circuits and a VAX-11/750 for larger networks. This centralized processor interacts with devices in the field called Network Diagnostic Units (NDU).

The Zilog, Inc. Z80-based NDUs wrap around remote data communications equipment, providing monitoring functions for both the analog and digital side of network devices. The NDUs, which can only be used with analog network circuits, are monitored by the central VAX using side-band signaling at 75K bit/sec.

The NDU's intelligent analog or digital interfaces permit diagnostic tests to be carried out under central control for any type of terminal, modem or line. The digital interface operates at speeds up to 19.2K bit/sec, enabling the monitoring of multiple data circuit conditions such as receive-carrier status, terminal streaming, signal quality and modem and terminal power failure. Tests include analog-to-digital interface monitoring, on-line error rate testing, polling and loopback tests for analog and digital interfaces.

The product features fault detection and analysis and offers a color graphics option to illustrate network status and condition changes, the vendor said. Three levels of graphics detail are supported, including a full geographic user-definable overview of the network, schematic repre-

See OCEAN page 72

Harris offers tandem switch to link PBXs

NEW YORK — Harris Corp. recently announced a tandem network switch that can be used to interconnect multiple types of private branch exchanges (PBX) and — where corporations interconnect separate switches with private lines for intracorporate calling — reduce networking costs by up to 30%.

The Harris 20-20 Integrated Network Switch is a digital switch that can be configured with up to 1,920 fully nonblocking ports (each port rated at 36 hundred call seconds or 36CCS). Each port reportedly has a 64K bit/sec communications channel for pulse code modulated (digitized) voice or data and another 64K bit/sec channel for signaling.

Harris reported that the 20-20 ports can be software-configured to accommodate 255 trunk groups, with a maximum of 127 trunks per group. The switch is said to be compatible with the routing and billing protocols used in the PBX products of AT&T Information Systems, Northern Telecom, Inc. and Rolm Corp.

The tandem switch can be used with supercarriers, tie lines, Wats and private lines so that the most economical routing patterns can be established between switches, the company claimed.

In application, a large dispersed corporation would use two 20-20s linked together in a tandem fashion with a high capacity intermachine trunk such as T1. Each 20-20 would be located to support geographical concentrations of PBXs used within corporate affiliations, according to Harris.

When a person in one office wanted to call someone in a branch office, he could place the call by keying in what amounts to an extension number instead of having to place it as a local call. The cost of the dedicated trunk between the 20-20s is thus used to best advantage because of heavy loading.

Because a large percentage of a company's calling is done internally, tandem switching over dedicated facilities is generally preferable to having the calls placed through the local telephone company under tariffs that may be usage-sensitive.

But the 20-20 goes that ability one step further.

See SWITCH page 73

- Vitalink Communications Corp. has added Ku-band satellite support to its line of private satellite network offerings/72
- NCR Corp. has introduced three communications programs for its Tower 1632 and Tower XP superminicomputers that provide access to SNA nets/73
- Case Rixon Communications, Inc. has introduced a statistical multiplexer designed for Hewlett-Packard Co., Wang Laboratories, Inc. and Tandem Computers, Inc. minicomputers/73
- Comdesign, Inc. has announced two enhancements for its TS-600 Switching Statistical Multiplexer: Synchronous Channel Option and Dual Link Option/74

INSIDE

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Auxiliary Equipment/74

AT&T, telecom firms OK draft pact to construct undersea Pacific cable

KAUAI, Hawaii — AT&T, 21 other telecommunications companies and telecom agencies from several countries took the first steps toward construction of a $593 million transoceanic communications system at a meeting here late last month.

The companies and agencies approved a draft agreement to construct and maintain the first undersea cable to span the Pacific Ocean with a laser-powered, digital light-wave communications system. The Hawaii 4/Transpac 3 fiber-optic system is tentatively scheduled to begin service on Dec. 31, 1988.

The light-wave system will stretch nearly 7,200 nautical miles across the Pacific. It will include nearly 250 undersea regenerators located approximately 30 nautical miles apart. The cable system reportedly is designed to operate at 280M bit/sec. Hawaii 4/Transpac 3 will be able to transmit digital voice, data and video signals at a rate reportedly equivalent to approximately 37,800 simultaneous telephone calls.

More information is available from AT&T, Basking Ridge, N.J. 07920.

AT&T muxes tie data channels into single transmission facility

MORRISTOWN, N.J. — AT&T Information Systems has announced three products designed to combine multiple data channels into a single transmission facility for use with AT&T's Dataphone II Level IV network: the 718 Stat Mux, the 719 Networker and the 735 T-Mux.

The 718 Stat Mux reportedly is a statistical multiplexer that supports four to 32 channels of asynchronous and synchronous data. Individual channel speeds can range up to 9.6K bit/sec. On the link side, the device can be used with coaxial, fiber-optic, satellite or metallic transmission facilities, according to the vendor.

The 719 Networker is said to be a statistical multiplexer and data packet switcher that provides an intelligent link to Dataphone II Level IV. It can be used as a stand-alone 32-channel computer port concentrator or, using its packet-switching capabilities, can be used to tie 718 Stat Muxes together. In the latter configuration, the 719 Networker can be used to reconfigure other network multiplexers and send error conditions to a

See CHANNELS page 73

Ku-band satellite support added to Vitalink networks

MOUNTAIN VIEW, CALIF. — Vitalink Communications Corp. has added Ku-band satellite support to its line of private satellite network offerings.

Called the K-Series, the new series uses Ku-band satellite communications frequencies, which reportedly enable the services to be used even in terrestrial microwave congested areas.

According to Vitalink, the K-Series is sold as a turnkey service that includes customer-owned, on-premises earth stations; on-demand satellite transmission and 24-hour network management and technical support. Applications such as point-to-point computer links, local-area network interconnections and modular videoconferencing systems are also included.

Vitalink also offers satellite services that use C-band satellite frequencies.

K-Series earth stations range in price from $40,000 to $50,000. Monthly usage fees range in price from $300 to $1,600.

Vitalink Communications is located at 1350 Charleston Road, Mountain View, Calif. 94043.

OCEAN

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sentations of user-specified subnetworks and a site context view that can be used to show configurations of individual devices such as modems, switches and control cards.

When the system is first installed, the network and its various components are identified. This network definition cycle includes when and from whom network devices were purchased, what kind of warranties are carried on network equipment and who services the units.

In operation, network alarms are filtered by the system so that only important problems are forwarded for actual diagnosis. Once the problem is flagged, the operator intervenes to perform tests or to switch, where possible, backup devices into operation. At this point in the "incident-handling" mode, incident reports are created.

Data compiled while the failure is being handled can be later accessed in the "statistics" mode, enabling the operator to request and generate, in either chart or tabular form, summaries of incidents and reports on network reliability, availability and performance.

Medius reportedly can handle synchronous and asynchronous networks, independent of media and components used, at speeds from 50 bit/sec to 19.2K bit/sec. It can support up to 16,000 test points.

Pricing for Medius averages $1,200 to $1,400 per circuit. A 96-circuit system costs approximately $135,000.

Ocean Data Systems is located at 6000 Executive Blvd., Rockville, Md. 20852.

FACTORY

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veiled at the architecture's debut.

The WCC 1250, a microcomputer being manufactured by Honeywell's Datacom, Inc. subsidiary, can reportedly automate collection and processing of work-in-progress data and other production information and act as a decision support system for shop floor supervisors.

It reportedly will also operate as a stand-alone unit or, depending on its capacity, support anywhere from two to 32 users under either AT&T's Unix System V or a Honeywell proprietary multiuser operating system.

Plant Management System

Also announced was the Honeywell Plant Management System, a system based on the Honeywell DPS 6 minicomputer that can reportedly be used to capture and manipulate data from process controllers. As such, it will have applications mainly in the process industries, such as refining and chemical and power production, according to Honeywell.

The WCC 1250 is based on the Motorola, Inc. 68000 processor and will be priced starting at $10,000 with rack-mounted systems. Those for large shop floors will cost between $30,000 and $100,000. Software is priced separately, with licenses ranging from $20,000 to $100,000.

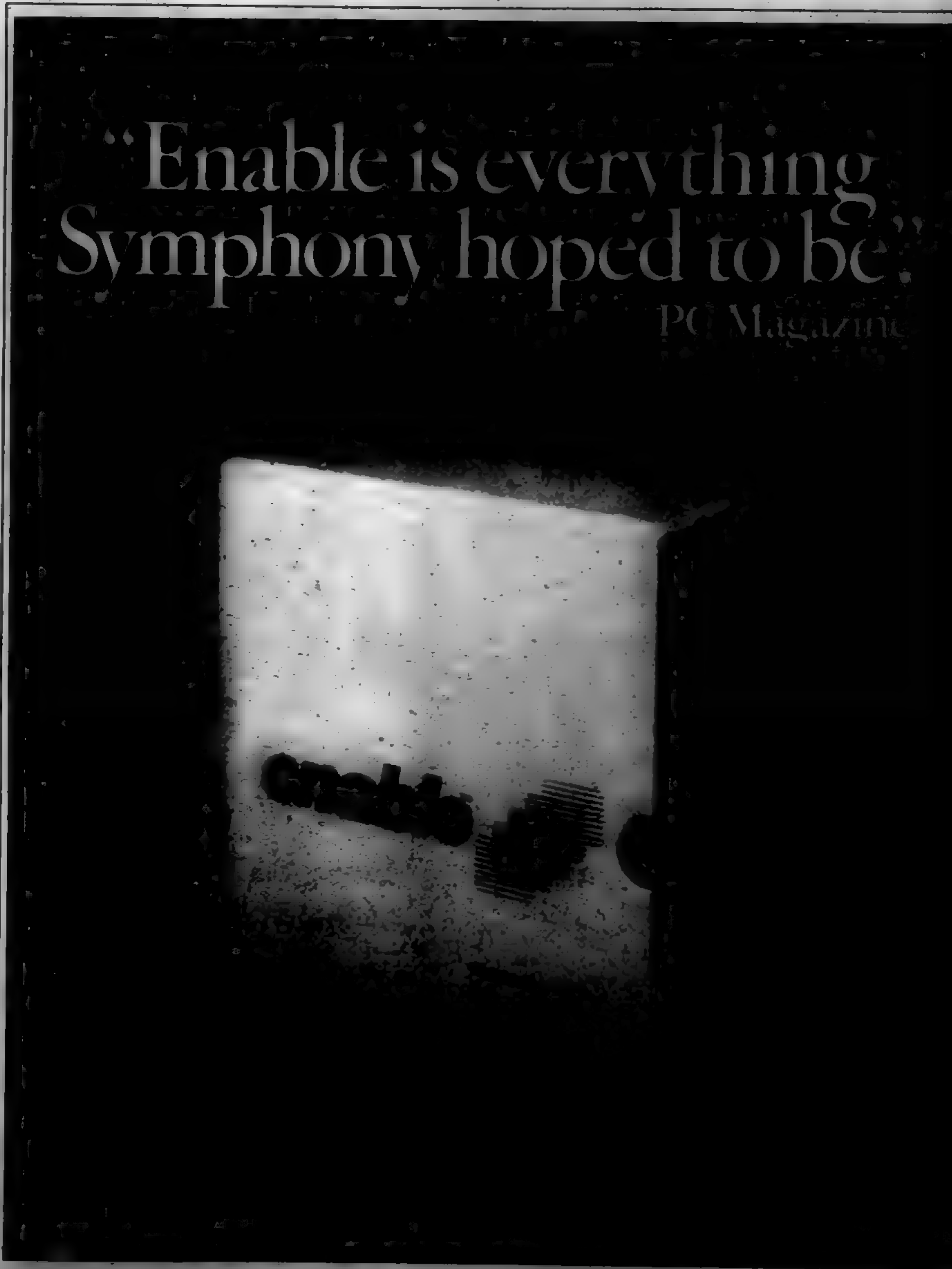
The Plant Management System will be priced at approximately $80,000, with full systems ranging in cost from $750,000 to $1 million.

Statement of support for MAP

Honeywell's announcement of its MAA also marked its first statement of support for MAP, a spokeswoman said. Though it is not one of the original seven factory automation vendors who in 1984 announced support for MAP, the spokeswoman said Honeywell has long supported the International Standards Organization Open Systems Interconnect guidelines, on which MAP is based.

The MAA will not totally implement MAP on all of its local-area networks, however. The Local Control Network, a separate branch of the architecture for plants that use process controllers, will not use MAP, at least at present, and would therefore require Honeywell-compatible equipment, according to Honeywell's George.

Process controllers are used in industries that do both manufacturing and processing, such as the food and pharmaceuticals industries.



CHANNELS

from page 71

central diagnostic system, AT&T reported.

The 735 T-Mux is a time-division multiplexer for use with T1 digital communications facilities.

The product is said to be able to accommodate a maximum of 64 channels at speeds from 1.2K to 768K bit/sec.

The 718 Stat Mux and the 719 Networker will be available generally beginning in March. The 735 T-Mux is slated to be available in April. Price ranges are $3,200 to $9,000 for 718 Stat Mux, $5,000 to $19,000 for 719 Networker and $11,000 to $72,000 for 735 T-Mux, depending on configuration and options.

AT&T Information Systems is located at 100 Southgate Pkwy., Morristown, N.J. 07960.

VOICE/DATA COMMUNICATIONS

■ **Hadax Electronics, Inc. has announced Network Control Switching System, capable of switching out faulty lines or modems.**

With a dumb terminal, a user can access, switch and monitor 1,024 channels, the vendor said. A monitor bus provides a user with monitoring and testing access to any RS-232 card in a network.

In case of a power failure, magnetic latched relays lock the system into the last switched position, and a battery backup will continue operation when power is restored.

The switching system is menu-driven and has report writing capabilities.

The package costs $200 per channel. Models range in size from 16 to 1,024 channels.

Hadax Electronics, 79 Hazel St., Glen Cove, N.Y. 11542.

SOFTWARE

■ **NCR Corp. has introduced three communications programs for its Tower 1632 and Tower XP superminicomputers: SNA Physical Unit Type 2 (SNA/PUT2), SNA Remote Job Entry (SNA/RJE) and SNA 3270 Data Stream Capability (SNA/3270 DCS).**

SNA/PUT2 allows one of the NCR computers to act as a Systems Network Architecture (SNA) cluster controller and communicate through an SNA network as an IBM SNA/PU Type 5 product, the vendor said.

SNA/RJE, which works with SNA PUT2, enables a user to submit jobs to an IBM host and route the output to a computer running AT&T Unix.

SNA/3270 also works with SNA PUT2 DCS and provides IBM 3270 series terminal emulation capability for NCR 7900-1 or 7901 stations.

SNA/PUT2 costs $1,350, and SNA/RJE and SNA/3270 cost $900.

NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479.

MULTIPLEXERS/ MODEMS

■ **Case Rixon Communications, Inc. has introduced DCX812, a statistical multiplexer designed for Hewlett-Packard Co. HP 3000 series, Wang**

Continued on page 74

SWITCH

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When all dedicated trunk routes in a network are busy, the 20-20's Extended Software Defined Network least-cost routing capability allows calls to be routed around the leased facilities and into the public switched network.

While this capability might seem, at first glance, to end up costing the user more per month, it can in fact lower the user's monthly costs by up to 30%.

This is achieved by enabling networks to be designed without the need to accommodate peak traffic volumes. By designing the network to support less-than-peak traffic loads, fewer dedicated lines are needed between tandem hubs, resulting in savings. The 20-20 handles peak-hour traffic by automatically routing it over a dial-up service such as Wats.

In a cost-benefit analysis of the 20-20 performed by Telco Research, an independent consulting firm in Nashville, this capability resulted in savings that ranged from 19% to 30%.

Savings vary with traffic

The results varied by the amount of intracompany or on-net calling specified in each scenario, hours of usage and the number of nodes and locations considered. Companies with a higher percentage of on-net traffic generally enjoyed the highest savings.

The switch architecture is said to be modular and available in a fully redundant configuration providing automatic switchover in case of system failure.

Other features of the 20-20 include up to 100,000 security codes of up to 15 digits each, any nine of which are actually analyzed, and support of both direct inward dialing, which permits incoming calls to be routed directly to a specified station, and direct inward system access, permitting off-net users to access tie lines or Wats facilities, the vendor said.

Call detail recording software is said to be able to collect billing and usage data for more than 25,000 calling records, which can be stored on disk and output to an external processing system when polled.

Scheduled for delivery in March, the Harris 20-20 will range in price from $68,000 to $100,000, depending on size and software options desired.

Harris' Digital Telephone Systems Division is located at One Digital Drive, Novato, Calif.

"Enable may legitimately claim to be the only package you'll ever need."
Computer Buyer's Guide and Handbook
November, 1984

"...if an office is looking to step up to across-the-board integration with a multitude of functions...this is the one program to seriously consider."
Personal Computing
March, 1985

"Offering true integration among all of its applications modules...[Enable is] a powerful production tool that can serve everyone in the office, from data entry personnel to the vice-president of marketing. Each module could stand as a full-powered application in its own right."
PC Magazine
February 19, 1985

"Enable, a five-function integrated system from The Software Group, merits a close look by any individual or organization interested in a solid package that is well balanced in all of its applications."
Popular Computing
March, 1985, Paul Goldner, Raymond Hand, Yvon Lirtzman, Michael Wilding

"Quite simply, this package has so many outstanding attributes that even the worst skeptics of integrated software have to be impressed. The spreadsheet is very close to 1-2-3; the word processor combines the best thinking of WordStar, MultiMate, Volkswriter, and EasyWriter; the data base offers the functionality of dBASE II, but with many of the ease-of-use features of PowerBase; and the program offers business graphics and telecommunication. Taken as a whole, Enable surpasses the functionality of Symphony, Framework, Aura and Open Access."
IBM PC Update
December, 1984

Enable first in "Performance" rating—including speed and capacity of all modules tested. Enable first in "Versatility" rating—including power and functionality of all modules tested. Enable rated first in overall evaluation of the word processor module.
Software Digest Ratings Newsletter
Rating of 15 Integrated Products
December, 1984

"Enable welds its five applications together with outstanding integrity—yet each is exceptionally full-functioned in its own right."
Business Computer Systems
January, 1985

"Enable is one of those programs that can be up and running with most of the features you need in a few hours. As you need more, you can get deeper into the program and learn at your own pace."
Infoworld
January 21, 1985

"...a birdlike appetite for RAM keeps this virtual-memory system sprightly, even in stock MS-DOS machines."
INC.
February, 1985

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Continued from page 73

Wang Laboratories, Inc. 2200 series and Tandem Computers, Inc. TPOS minicomputers.

The product attaches to these minicomputers via an RS-232 port and supports eight asynchronous terminals, the vendor said. DCS812 has a maximum transmission speed of 9.6K bit/sec with an aggregate rate of 19.2K bit/sec.

The product's supervisory port automatically detects speed and parity of supervisor's terminals and leads a user through the steps necessary to configure and test a system.

DCX812 costs $15,000 for a four-port model and $19,000 for an eight-port model.

Case Rixon Communications, 2120 Industrial Pkwy., Silver Spring, Md. 20904.

■ **Comdesign, Inc. has announced two enhancements for its TS-600 Switching Statistical Multiplexer — Synchronous Channel Option and Dual Link Option.**

The Synchronous Channel Option allows up to four of eight input channels to operate synchronously or asynchronously, handling some protocols in transparent mode and statistically multiplexing selected protocols in a nontransparent mode.

Channels with synchronous capability support asynchronous, Synchronous Data Link Control or bisynchronous protocols. Full- and half-duplex transmissions are supported at speeds from 1.2K bit/sec to 9.6K bit/sec. Dual Link Option permits TS-600 units in a point-to-point application to be connected with two links, the vendor said. Links can be individually configured and operate at speeds up to 19.2K bit/sec.

Synchronous Channel Option costs $600, and Dual Link Option is $500.

Comdesign, 751 S. Kellogg Ave., Goletta, Calif. 93117.

■ **Digilog, Inc. has announced its Network Diagnostic and Test System (NDTS) that overlays existing networks, uses an IBM Personal Computer as the system controller and accesses RS-232C and V.35 interfaced circuits. Up to 256 lines can be monitored.**

The operator has control for monitoring fault alarms and network status, testing system circuits and performing A/B switching from the Personal Computer console. NDTS uses a data base that identifies circuits and equipment with user-defined names. NDTS also provides a series of test buses and a test equipment access matrix.

It costs between $400 and $500 per line for digital only; between $700 and $800 per line for digital and analog, depending upon options.

Digilog, 1370 Welsh Road, Montgomeryville, Pa. 18936.

■ **Communication Networks International has introduced a communications system that includes an intelligent storage buffer, an autodial AT&T 212-type modem, a printer and a CRT.**

QWK Messenger reportedly is intended for applications such as electronic mail store and forward and credit reporting. Messages are stored and edited off-line and transmitted via the modem. The system has a standard 16K bytes of random-access memory (RAM) but is available in customized versions with varied types of RAM, read-only memory (ROM) and electrically programmable ROM. Message format, prompting and handshaking protocols can also be customized for applications.

QWK Messenger is available now and costs $2,995.

Communication Networks International, 2929 N. 44th St., Phoenix, Ariz. 85018.

■ **Poseidon Systems has announced a communications protocol handler for retail automation applications. Called the PAC, the device contains firmware that supports the protocols used by most popular electronic cash registers and point-of-sale devices. Commands from the computer select the appropriate protocol and handle the data exchange.**

The PAC hardware connects to a host and the terminal devices via RS-232 interfaces. The connection can be locally hardwired or be made over phone lines via a modem at speeds from 300 to 9.6K bit/sec.

The PAC handles the entire overhead of both the host and cash register protocols. This includes initializing the communications operation, commencing data transfer, polling, performing error recovery and correction, pausing where appropriate and disconnecting the communications link as governed by the rules of the protocol. One PAC costs $5,400.

Poseidon Systems, 223 Crescent St., Waltham, Mass. 02154.

■ **Viasyn Corp., formerly known as Compupro Systems Corp., has announced networking boards designed to provide its System 816 and Compupro 10 Plus minicomputers with mainframe communications capabilities.**

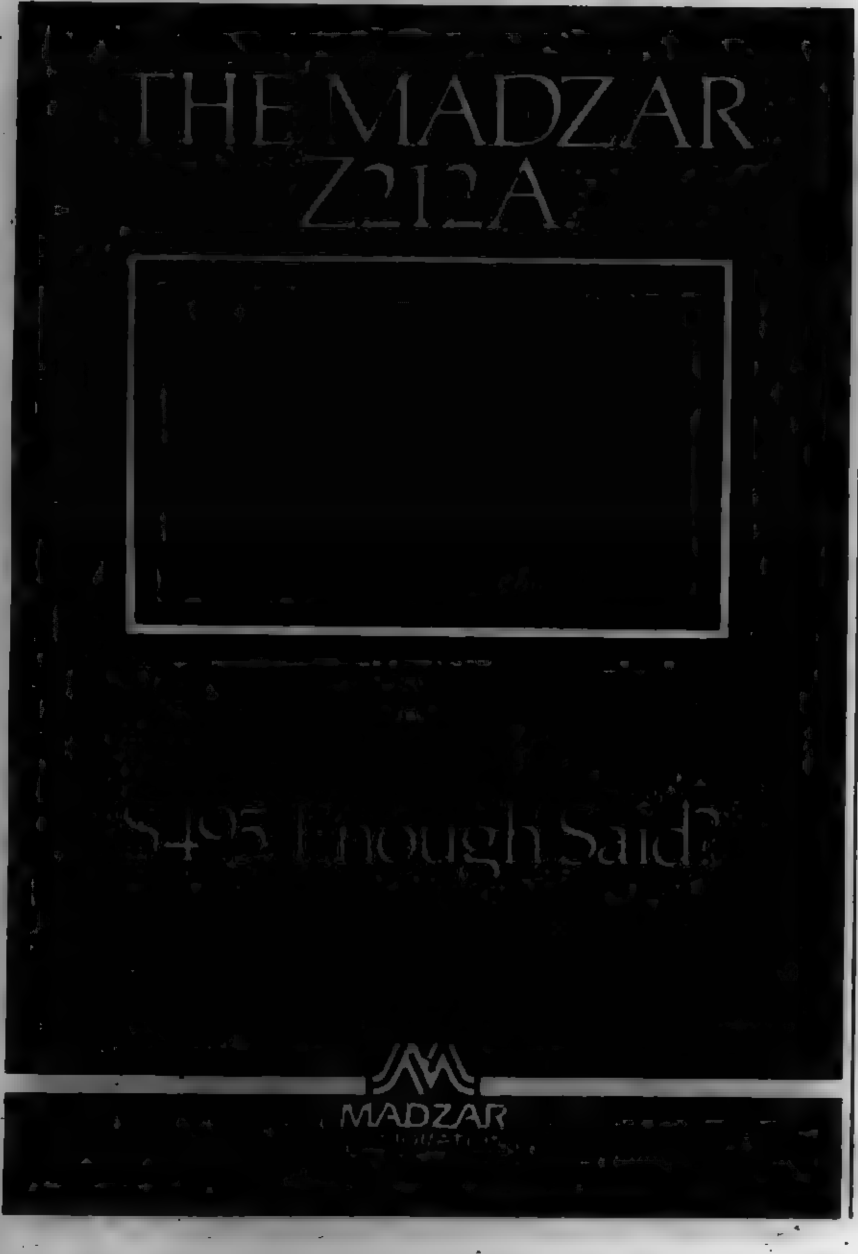
The NET 101 was designed for use with Viasyn's System 816 and the NET 11 for use with Viasyn's Compupro 10 Plus. They reportedly let software developers communicate with mainframes using Synchronous Data Link Control, High-Level Data Link Control, bisynchronous and asynchronous protocols.

The products are said to support Datapoint Corp.'s Arcnet protocol under Digital Research, Inc.'s DRNET and require a passive hub and RG62 coaxial cable to network up to four nodes to a mainframe. According to the vendor, other microcomputers that support Arcnet can be integrated into the network.

The boards use Intel Corp.'s Multi-Protocol Serial Controller and feature asynchronous communications up to 50K bit/sec and bit- and byte-synchronous communications up to 880K bit/sec.

Scheduled for shipment in February, the boards cost $595 each.

Viasyn, 3506 Breakwater Court, Hayward, Calif. 94545.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	IBM	5152	36	494
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	C. ITOH	A10-20S	20	$ 699
	QUME	LP20	20	799
	NEC	2010	20	950
	DIABLO	620	20	995
	C. ITOH	F10-55	58	1,449
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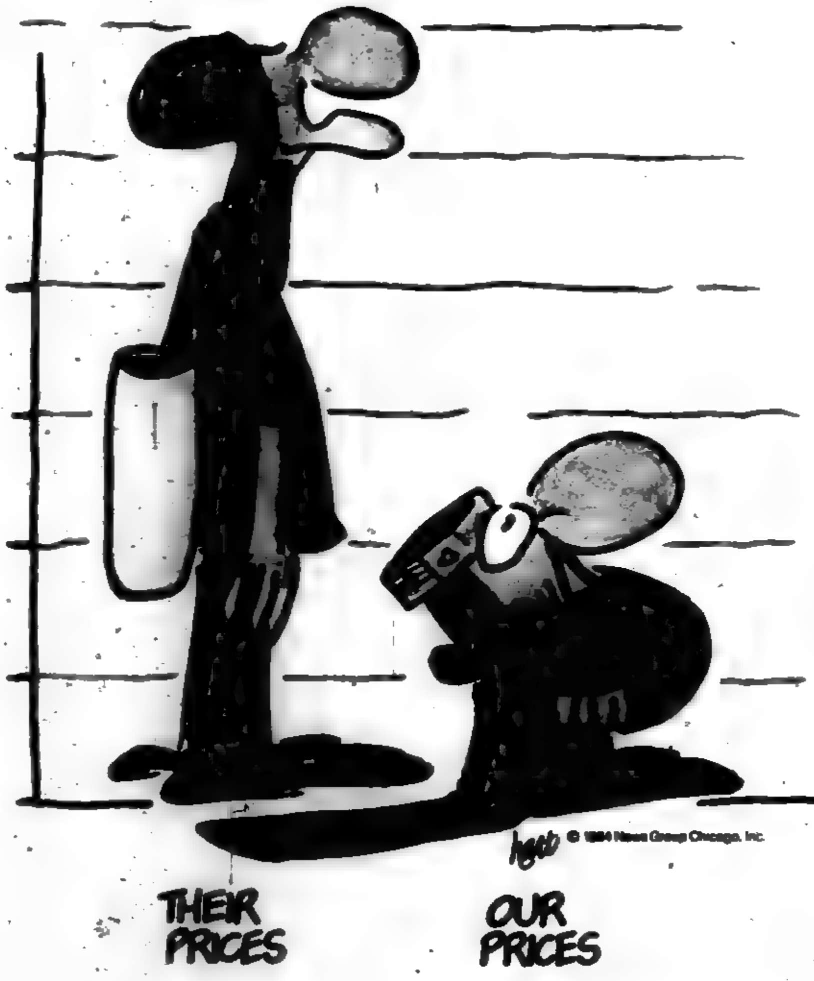

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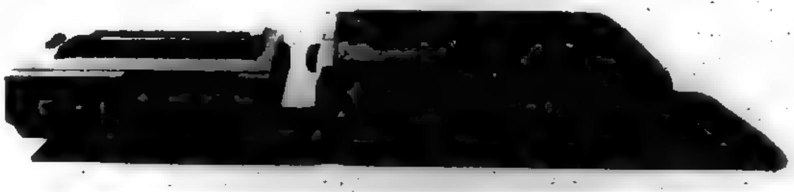

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SYSTEMS & PERIPHERALS

DEC offers packaged Vaxclusters

By Donna Raimondi
CW Staff

MAYNARD, Mass. — Digital Equipment Corp. has released its first packaged Vaxcluster System configurations, the VAX-11/750 Minicluster and a dual VAX-11/785-based Vaxcluster. The systems run under DEC's VMS operating system.

The VAX-11/750 Minicluster — which sells for $213,530 — consists of two VAX-11/750 processors, each with 4M bytes of main memory, a four-node star coupler, a DEC HSC-50 hierarchical storage controller subsystem, computer-interconnect interfaces and 70M bit/sec buses. The configuration is targeted toward users who want to separate applications on different central processors. The price is $10,000 less than the same system parts bought separately, the vendor said.

The dual VAX-11/785 configuration — priced at $509,000 — consists of two central processors, each with 8M bytes of memory and a floating-point accelerator, an eight-node star coupler, HSC-50 storage controller subsystem, computer-interconnect interfaces and 70M bit/sec buses. This configuration is said to deliver 3.4 times the performance of the VAX-11/780 and was designed for users who need extensive system availability and data sharing in a high-performance computing environment. The price reportedly is $70,000 less than the same parts bought separately.

One of the features of the clustered systems is that if one processor fails or has to be shut down for some reason, the other processors will continue to operate, the vendor said. Users may add any VAX-11/750, 11/780, 11/785 or other Vaxcluster elements, including the 8600 central processor, to either of the announced systems as needed.

More information can be obtained from DEC, Maynard, Mass. 01754.

■ First Computer Corp. unveiled a 22-bit multiuser microcomputer called the Spirit 68/80

■ Raster Technologies, Inc. enhanced its Model One/80 graphics terminals with a video output capability/81

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DG unveils graphics system for high-end Eclipse

WESTBORO, Mass. — Data General Corp. has announced the GW/10000 SX graphics cluster system, based on its high-end Eclipse 10000 SX superminicomputer that was released recently [CW, Feb. 4]. The company has also introduced the GDC/2400 graphics display controller and a display for its GDC/1000 and GDC/2400 graphics controllers.

Users of the GW/10000 SX graphics cluster system may select from DG's AOS/VS, AOS/RT32, DG/UX or MV/UX operating systems.

The system costs $283,300 for a typical configuration that includes a 354M-byte disk and dual-mode tape drive.

The graphics system is said to include more than 130 graphics commands. Two display monitors allow users to simultaneously view graphics outputs as well as alphanumeric data and instructions. The unit is available with up to 32M bytes of memory and supports up to four users simultaneously.

The GDC/2400 graphics display controller has four 15-in. printed-circuit boards — one to control graphics processing and video timing generation, the others to manage video output and memory. Its 24 bit/pixel capability is said to allow simultaneous display of 1.3 million colors from a total palette of 16.7 million colors. The unit costs $44,000.

The company also announced a noninterlaced 60Hz option for its 1,280- by 1,024-pixel GDC/1000 and GDC/2400 graphics display controllers. The monitor is said to produce a flicker-free image. The unit costs $6,500.

More information can be obtained from DG, 4400 Computer Drive, Westboro, Mass. 01581.

DPS 6/22 mini from Honeywell hits marketplace

WALTHAM, Mass. — Honeywell, Inc. has introduced an entry-level multiuser minicomputer, the DPS 6/22, which was designed for small business, departmental or branch office systems.

The DPS 6/22 runs under Honeywell's Gcos 6 MOD 400 operating system and can communicate with other systems as part of Honeywell's Distributed Systems Architecture or IBM's Systems Network Architecture.

The unit's central processor is augmented with a Commercial Instruction Processor, which is said to increase the throughput of Cobol programs by executing instructions in firmware rather than software routines, the vendor said.

A Scientific Instruction Processor is said to enhance Fortran, Basic and Pascal performance and to extend performance of Honeywell's Infocalc electronic spreadsheet package.

The main memory capacity of the DPS 6/22 is 1.75M bytes and the unit comes with a five-port workstation controller. Up to two 512K-byte memory expansion boards and a 256K-byte memory board can be added. Additional options include a second five-port controller and a two-slot chassis extender.

The price of the DPS 6/22 basic unit with a 40M-byte hard-disk subsystem is $17,000. The unit with a 28M-byte fixed disk costs $12,995.

More information is available from Honeywell, 200 Smith St., Waltham, Mass. 02154.

IBM users face field-upgrade dilemma

HARD TALK
Tom Henkel
CW Senior Editor

Makers of IBM-compatible mainframes and peripherals are going to be pushing the field-upgradable features of their products as a result of recent IBM product announcements that limit users' field migration paths.

This month, IBM has unveiled two high-end products, the 3380 Extended Capability disk drives and the 3090 Model 200 and 400 mainframes, that incorporate technological changes that prohibit current IBM users from field upgrading to the newly announced devices. IBM's 3380 Extended Capability disk drives, for example, can be used on the same controller as the older versions, but users cannot mix new and old drives on the same string. Buyers of 3090 mainframes will maintain IBM system software compatibility but will not be able to upgrade current 3080 series processors to the newly announced mainframes.

The makers of IBM-compatible mainframes and peripherals are clearly viewing these recent IBM products as weak links in what, for the past two or three years, has been an almost unbreakable chain of IBM products.

Companies like National Advanced Systems Corp. (NAS), Amdahl Corp. and Storage Technology Corp. (STC) freely admit that they plan a big push to emphasize the field-upgradable capabilities of their products, as opposed to the box-swapping strategy used by IBM.

Will this purported tactic work? It may not rebuild the IBM-compatible business to its once mighty state, but it clearly offers the potential of improving it.

See IBM page 82

Harris adds file server, control unit to repertoire

NEW YORK — Harris Corp. has introduced the 9300 file server that ties together microcomputers and mainframe terminals in an integrated work group.

The company also released the Lanier Concept 6000 control unit that ties together up to 28 Lanier workstations and the Concept 4000 control unit that supports up to six Lanier workstations. Two workstations were also introduced.

The Harris 9300 system, running under Harris' Network Operating System, functions as a file server, a network integrator for distributed data processing and a communications gateway to mainframe computers.

The 9300 system is compatible with the Harrisnet local-area network, the vendor said. Work group members can share information, files and system resources, including hard-disk storage, printers and other peripherals.

Work groups of up to 16 IBM Personal Computers, Harris Personal Computer workstations or IBM 3270-type terminals can be connected via coaxial bus access using token-passing (IEEE 802.4-compatible) technology. Harris provides a network interface card to connect personal computers to the bus.

A sample configuration, including a 9300 processor with 1M byte of main memory, 37M bytes of virtual-address storage and hardware connections to the Harrisnet local-area net is approximately $11,000.

See HARRIS page 82

SYSTEMS & PERIPHERALS

PROCESSORS

■ First Computer Corp. has introduced its Spirit 68 32-bit microcomputer that runs under AT&T's Unix System V.

Spirit 68 — the third model in the Spirit series — supports up to 12 users and addresses up to 4M bytes of parity MOS memory. The basic system contains 40M bytes of on-line disk storage, comprised of a 20M-byte removable disk cartridge for data file and software transportability, plus 20M bytes of fixed storage.

The system comes in two styles: a clamshell pedestal cabinet and a standard rack-mountable unit. Both styles accommodate three models of field-installable expansion modules, increasing disk storage with 40M bytes of fixed/removable storage and either 72M bytes or 142M bytes of fixed storage.

Prices range from $16,200 to $19,500, with quantity discounts available.

First Computer, 645 Blackhawk Drive, Westmont, Ill. 60559.

■ Symbolics, Inc. has announced the 3640-1711 processor — an addition to its 3640 processor line — and an 8M-byte add-in memory board for the processor. The company has also announced price cuts for two of its products.

The 3640-1711 processor is equipped with two 140M-byte, 5¼-in. Winchester disk drives and is priced at $71,800.

The 8M-byte add-in memory board, Model MEM2, uses 256K-bit random-access memory chips and has been designed for large-system users of symbolic processing. It is priced at $35,000.

The company has cut the price of its 3640-1611 processor with one 140M-byte disk from $69,000 to $65,900. The price of Symbolics' MEM1 2M-byte add-in memory board has been reduced from $11,000 to $9,900.

Symbolics, 11 Cambridge Center, Cambridge, Mass. 02142.

TERMINALS

■ AW Computer Systems, Inc. — in an agreement with IBM — has introduced a point-of-sale (POS) reporting system for retail applications. The AW software and communications hardware bridges NCR Corp. POS cash registers to IBM's Personal Computer AT under Venturcom, Inc.'s Venix operating system.

Features include price look-up, credit/debit card authorization, in-store cash audit and in-store department/class totals. Expanded back office capabilities, including price markdown, inventory control and electronic mail, are optional.

Prices depend upon configuration and user needs. In a 100- to 200-store environment, hardware and software may cost between $15,000 and $16,000 per store.

AW Computer Systems, 9000A Commerce Pkwy., Mount Laurel, N.J. 08054.

■ Ann Arbor Terminals, Inc. has introduced the user-definable Genie XL terminal with a 96 Ascii character set and Digital Equipment Corp. private-use (non-Ansi) features that is said to permit use with standard DEC VT100/52 software.

The Genie XL display ranges from 18 to 30 lines by 80 characters on a nonglare amber screen. The terminal has multiple page and windowing capabilities and can create forms with protect, guard, numeric, justify and security areas, according to the vendor.

The Genie XL has two independent cursors that reportedly allow complete control of cursor location while the host writes in another area of the screen.

Features include slow scrolling and a zoom mode. It has a 15-in. diagonal display and incorporates an integrated tilt/swivel mechanism.

Price of the unit is $1,395.

Ann Arbor Terminals, 6175 Jackson Road, Ann Arbor, Mich. 48103.

■ General Business Technology, Inc. (GBT) has released a display station, featuring a 14-in. screen and IBM 5291 terminal compatibility, for the IBM System/34, 36 and 38.

GBT 7700 features include zoom control, scrolling, multidirectional cursor control and light pen function. Options include a three-button mouse for $150 and individual plug-in printer controller modules, which support GBT letter-quality, dot matrix and laser printers, for $975.

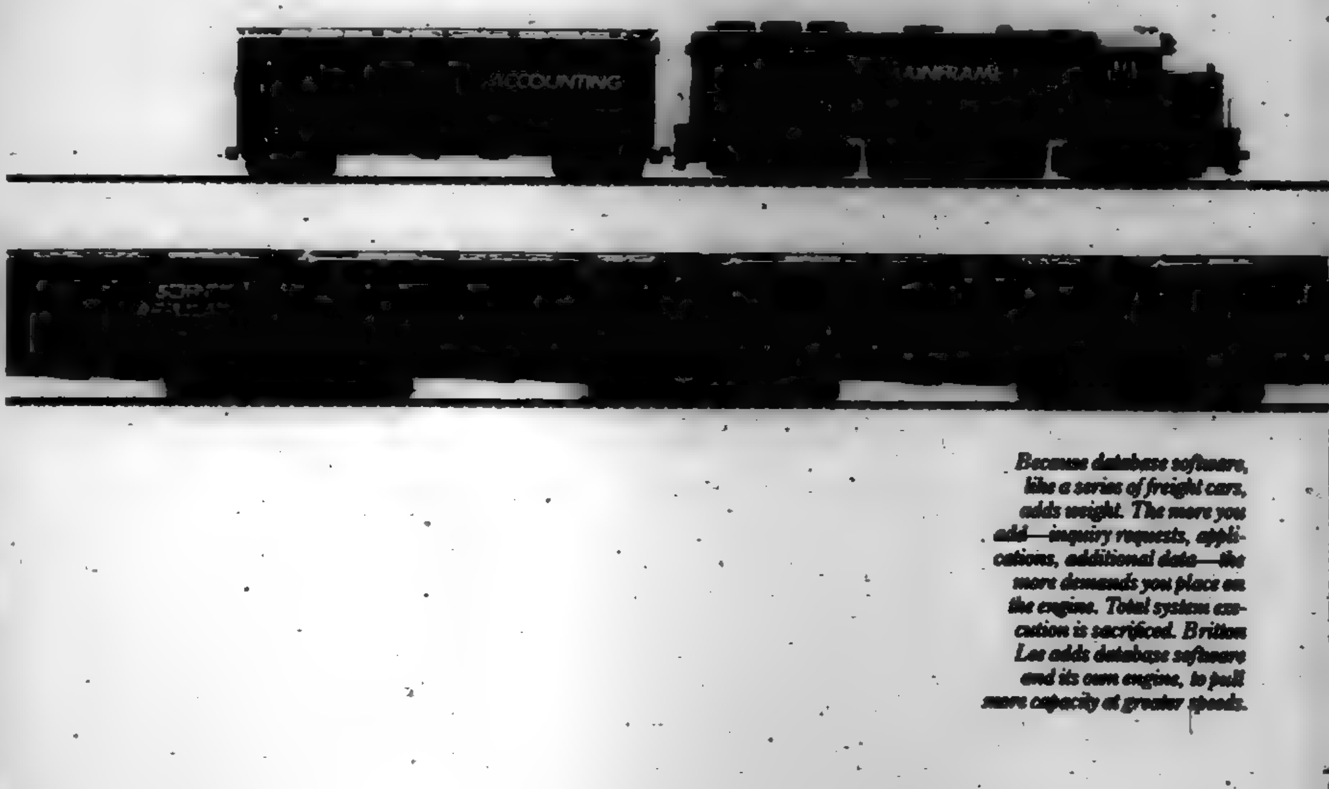
The price of a single GBT 7700 unit, which will be available in the second quarter of 1985, is $1,650.

General Business Technology, 1891 McGaw Ave., Irvine, Calif. 92714.

■ Davox Corp. has announced two controller systems — the Series 5000 and the Series 3000 — which allow access from Davox workstations to host computers.

The Series 5000 dual-host controller system is IBM 3274-compatible and reportedly permits a user at any Davox workstation to switch communication paths logically from one IBM mainframe to another in any combination of 3270 Systems Network Architecture or Binary Synchronous protocols at speeds to 56K byte/sec.

The Series 3000 asynchronous controller is said to establish an asynchronous communications path from the workstation to an asynchronous host through Davox's 3270 local-area network at speeds up to 19.2K byte/sec. The 3000 has eight ports and connects directly to a Davox System Controller. Additional



Because database software, like a series of freight cars, adds weight. The more you add—inquiry requests, applications, additional data—the more demands you place on the engine. Total system execution is sacrificed. Britton Lee adds database software and its own engine, to pull more capacity at greater speeds.

SYSTEMS & PERIPHERALS

3000 controllers can be daisy-chained or connected to a master or expansion controller to provide up to 32 asynchronous ports.

The Series 5000 dual-host controller system, available in May, costs $11,225; a version with an optional RS-232C to V.35 adapter for high-speed communications costs $12,215. The Series 3000 asynchronous controller, available in June, costs $2,295.

Davox, Four Federal St., Billerica, Mass. 01821.

■ Atlantic Research Corp. has introduced its Xpert Packet Terminal System, which was designed for X.25 networks; an option to its data recorder that allows the recorder to be left unattended to monitor digital communication lines; and a CRT-controlled fallback switch system.

An Xpert terminal can interact with up to four different host systems at the same time. It emulates IBM's 3270, Digital Equipment Corp.'s VT100, graphics and Ascii devices while attaching directly to an X.25 network. The X.25 and terminal emulation functions reside in the terminal.

The Interview 20R Data Recorder with the "unattended remote" option is said to address the problem of repeat service calls for erratic problems on digital communications lines. The option allows the Interview 20R Data Recorder unit to be left unattended at a remote site and accessed through a dial-up modem, thereby freeing a technician to proceed to the next service call. When used with Atlantic's Network Test System, the Interview 20R Data Recorder may access any remote circuit.

The CRT-controlled fallback switch system for data communications networks allows the user to reconfigure up to 1,500 circuits per site with both local and remote control. The system is a step between Atlantic's manual patch/switch systems and fully automated Network Test Systems. Typical applications include local or remote front-end switching or modem substitution.

The price of the Xpert Packet Terminal System is $2,995, and the remote option for the Interview 20R is priced at $500. The CRT-controlled fallback switch system costs $8,000 for a configuration of 100 circuits, with prices varying depending upon the number of circuits and the equipment already in place.

Atlantic Research, 5390 Cherokee Ave., Alexandria, Va. 22314.

GRAPHICS SYSTEMS

■ Raster Technologies, Inc. has enhanced its Model One/80 color computer graphics system with a Genlock generator-locking option card and a multiheaded configuration.

The Genlock option provides video output that is compatible with the American National Television Standard Code (NTSC) and the European Phase Alternator Line/Systeme Electronique Coleur Avec Memoire (PAL/Secam) standards and allows the Model One/80 to be locked to a master synchronization source.

The option is available on the Model One/80 for $2,500 for the NTSC version and $3,000 for the PAL/Secam version. A dual-headed configuration of the Model One/80 costs $27,100 for the system alone or $36,500 packaged with two monitors, a keyboard, libraries and drivers. A tri-headed system costs $35,400 alone or $47,950 packaged.

Raster Technologies, 9 Executive Park Drive, N. Billerica, Mass. 01862.

OFFICE SYSTEMS

■ Syntrex, Inc. has added the Virgo electronic file server and the Leo workstation to its line of office automation products.

The Virgo file server accommodates up to 12 users and stores more than 28,000 pages of shared information. Available in 10M-, 30M- or 60M-byte versions, it connects to both Syntrex and IBM microcomputers.

The Leo workstation can be configured with either the DIN standard keyboard or an electronic typewriter. It supports multiwindow concurrent tasking.

Both systems support a range of data communications capabilities, including IBM, Digital Equipment Corp. and Hewlett-Packard Co. terminal emulations.

Virgo prices start at $6,500, and Leo is priced at $3,300.

Syntrex, P. O. Box 657, 246 Industrial Way W., Eatontown, N.J. 07724.

POWER SUPPLIES

■ The Precision Materials Group of GTE Products Corp. has added three new Rural Electrification Association-approved surge protection products designed to protect telecommunications equipment from lightning strikes and sustained contact with power lines.

The CA8B gas-tube surge arrester was designed for telephone ciruit protection. It is Underwriters Laboratories, Inc. (UL)-approved. The CP-508 single-pair station protector features a design that internally grounds the tip-and-ring terminals when the arresters are removed.

The UL-approved indoor/outdoor protector comes with two CA8B surge arresters, wiring hardware, and a tamper-resistant cover. The CP-523 universal central office gas-tube protector is a replacement for carbon-air gap discharge blocks.

The CA8B is priced at $1.03/unit, the CP-508 at $5.24/unit and the CP-523 at $1.69/unit.

GTE Precision Materials Group, 1000 Hugler St., Teterboro, N.J. 07608.

Why Britton Lee's relational database software comes with its own hardware.

Relational database management systems provide the outstanding tool for easy-to-use, high level inquiries, for fast applications development, and for creation of an information resource for improved productivity.

Unfortunately, a software-only DBMS running on a host extracts a performance penalty.

The heavy CPU demands and storage requirements can reduce general purpose mainframes (and all the applications running on them) to a crawl.

Britton Lee offers this economical, proven alternative:

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The Intelligent Database Machine (IDM) is the integration of relational database software with a specialized hardware processing and storage environment.

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To find out how you can benefit from the Britton Lee solution, please contact Chris Merritt at (408) 378-7000.

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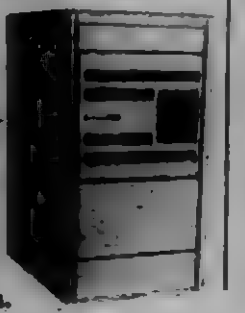

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The Intelligent Database Solution.

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HARRIS

from page 79

The Lanier Concept 6000 control unit is a file-server that can tie together up to 28 Lanier workstations or Concept 4000 control unit. Resources that can be shared using the 6000 include printers, disk drives, data communications services and applications processor attachments.

Software options

Software options include Lanier's line of office automation software, the Library Services archival retrieval service and the Xenix Applications Library written by Lanier and third-party software developers.

The Concept 6000 system is compatible with the Harrisnet local-area network. A fully configured network — using Concept 6000 and 4000 systems — is said to accommodate more than 1,000 workstations.

A 6000 processor with 1M byte of main memory and 96M bytes of storage costs approximately $22,000. The system will be available in April.

Concept 4000 control unit

The Lanier Concept 4000 control unit runs under Harris' H-DOS operating system and supports up to six Lanier workstations, providing access to data base management, file and peripheral resource sharing and word processing.

The Concept 4000 will be available in April. A configuration that includes a processor, 256K bytes of main memory and 10M bytes of storage costs approximately $6,500.

The Concept 1200 and 1400 workstations were designed for use in a resource-sharing network or in a standalone configuration. The 1200 uses a dual-processor design that allows it to use both 8-bit and 16-bit programs. An Intel Corp. 8088 microprocessor runs the 16-bit Microsoft Corp. MS-DOS operating system, and a Zilog, Inc. Z80-B microprocessor runs Digital Research, Inc.'s CP/M packages.

Aimed at WP, clerical tasks

The Concept 1400 is targeted for intensive word processing tasks and clerical functions. Two microprocessors, an 8086 and a Z80-B, allow use of all Lanier office automation packages. The 1400 can also use the CP/M operating system.

The Concept 1200 costs approximately $3,200, and the Concept 1400 costs approximately $4,500. Both workstations will be available in April.

More information is available from Harris, Melbourne, Fla. 32919.

IBM

from page 79

The big reason users buy IBM-compatible products is that they offer a significant difference — a faster delivery date, higher performance, reduced floor space requirements or a better price than IBM machines. While all four elements have been available from the IBM-compatible vendors in recent years, IBM has done a much better job of providing those elements as well.

Consequently, the lure of IBM-compatible products has apparently not been strong enough to get IBM users to leave the fold in droves. Or to put it another way, perhaps the IBM-compatible products have not been different enough to attract user attention.

Technological changes

Frequent technological changes by IBM have also made some IBM users leery of straying too far from the IBM flock. But those same technological changes also make it impossible to field upgrade older products. For example, the newly announced 3090 mainframes use emitter-coupled logic circuits, as opposed to the transistor-transistor logic circuits previously used by IBM. Likewise, the newly announced 3380 models have different read/write heads and internal circuit design that prohibit users of older 3380s to upgrade to the newer units.

Remaining on IBM's technological edge can be a rewarding yet expensive proposition. Many users, especially those with rapidly growing demands for computing power, said they feel the benefits of sticking with IBM exceed the cost of buying the latest IBM products. For users who prefer the stability of field upgradability, the IBM-compatible vendors may have hit on an ideal marketing tactic.

Some users whose computing needs are not as volatile as the leading-edge shops resent that IBM seems deliberately to make products obsolete. For them, the promise of continued field upgradability from a third party may clinch the deal.

Can vendors make good on promises?

But can the IBM-compatible vendors make good on their promises of future field upgradability? It may be difficult. Virtually all IBM-compatible vendors admit the days of offering reverse-engineered versions of IBM products are gone. Today's mainframes and peripherals are just too complex to develop look-alikes and still offer viable products in the ever-narrowing window of profitability allowed by IBM.

Instead, companies like Memorex Corp., STC, NAS and Amdahl have been developing products that offer compatibility with IBM's systems but employ a unique architecture. But as IBM changes technologies in its machines to make them faster, more reliable and less expensive to manufacture, it seems reasonable that IBM-compatible vendors' products may be forced to make similar technological changes.

After all, there is a finite number of proven technologies that can be used to improve a product dramatically. As a result, the promise of perpetual field upgradability could wind up being an issue of postponed nonupgradability. For the user, that could translate into pay now or pay later.

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MICROCOMPUTERS

Topview hits the stores

Some praise multitasking software's features but question strength of demand among users

By Eric Bender
CW Staff

BOCA RATON, Fla. — IBM's Topview operating environment software, described by IBM at its introduction as "a key foundation for future applications," began shipping to computer dealers this month.

Topview integrates Personal Computer applications under a common, multitasking environment that offers menus, windows and other ease-of-use features. The package has remained basically unchanged since its August debut, an IBM spokeswoman said.

The $149 product will run on most members of the Personal Computer line with at least 256K bytes of random-access memory (RAM). Most observers expect a Personal Computer XT with 512K bytes of RAM to be a useful minimal configuration.

Topview is offered with a 90-day limited warranty, and two compatibility booklets for IBM and third-party applications are available. The $395 Topview Programmer's Tool Kit, meanwhile, was scheduled for delivery in mid-month.

Few users have examined Topview yet, but the early reaction among dealers was largely favorable. "It's slick, it's nicely implemented, it's colorful, and it's inexpensive," said Ralph Wagner, president of Microsource Financial, Inc. in Watertown, Mass.

However, like several microcomputer managers who said they had not yet seen Topview, Wagner said, "It's far from clear at this time" who really needs this type of operating environment. "Is there really a need to have multiple screens open at one time?" he asked.

Two other major microcomputer operating environments besides Topview are scheduled to ship by midyear — the Graphics Environment Manager (GEM)

See **TOPVIEW** page 87

SMALL TALK
Edward Warner
CW Staff

A tool that's unusually fun

Mind Prober, a personality analysis program for the IBM Personal Computer from Human Edge Software Corp., may be either the hottest application of an expert system for nonexpert users or a parlor game on the order of the Ouija board. After several days of rigorous testing in this newspaper's office, controversy still surrounds its usefulness.

There is no question about one thing, though: It stimulates use of the personal computer. Reporters flocked around the microcomputer to analyze a coworker or

See **ANALYZE** page 84

- Tallgrass Technologies introduced a series of personal computer storage systems, all featuring a type of cartridge tape drive said to simplify backup operations/**84**
- Core International released a line of hard disk drive upgrade kits for the IBM Personal Computer AT, and Iomega announced a Personal Computer AT version of its Bernoulli Box removable-cartridge storage system/**85**

MICROBITS/THOMAS MADRON

Statistics needs unmet

Whiz-bang graphics are all the rage in the microcomputer marketplace — occasionally with good reason — but graphics is only a display tool, not an end in itself. Statistics are among the things graphics can display, but there is still a gap between programs that can display statistics and the programs that generate the statistics. Many business statistics packages have only primitive statistical capabilities, while those with strong statistical abilities provide few graphics — and then only character graphics.

But good statistical systems can be important in many business environments, and modern microcomputers are making the concept of a statistics workstation a reality.

In the days when statistics were computed either on a calcula-

See **STATISTIC** page 88

Madron is manager of computer services at North Texas State University in Denton, Texas.

Wang enhances micro

Office Assistant upgrades include increased memory, spelling checker

LOWELL, Mass. — Additional communications capabilities, a spelling checker and a model with 512K bytes of internal memory have all been added to Wang Laboratories, Inc.'s Wang Office Assistant line.

The Wang Office Assistant, a combination word processor, personal computer and typewriter, is based on the Intel Corp. 80186 microprocessor and runs a Wang multitasking operating system.

The 512K-byte Office Assistant reportedly increases to five the number of tasks that users can run simultaneously.

The new model is said to offer a nonglare, 12-in. monochrome monitor with a tilt-and-swivel stand, detached keyboard, power supply and one 5-¼ in. 360K-byte diskette drive. It comes bundled with Wang's WP Plus text editor and forms processing capability.

The 30,000-word Spelling Verification program reportedly allows users to create personal dictionaries of up to 300 words

See **ADDITIONS** page 87

Where Giants Fear To Tread

For five years NESTAR has ventured where giants have feared to tread—local area networking. In fact, NESTAR has installed more large local area networks in large institutions than any other manufacturer.

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Disk drive subsystems out for IBM micro

OVERLAND PARK, Kan. — Tallgrass Technologies Corp. has introduced a series of hard disk drive subsystems with integral cartridge tape backup for IBM Personal Computers and compatible systems.

The Tallgrass 5000 and 6000 series include four models with between 25M bytes and 80M bytes of hard-disk storage, all featuring an integral 60M-byte cartridge tape backup subsystem. The vendor also announced the 4060 model, a 60M-byte tape storage subsystem.

The products incorporate a Personal Computer Tape format developed by Tallgrass, the vendor said. This format reportedly allows users to employ commands for both hard disk and tape similar to those of standard PC-DOS. Each tape volume has an individual directory, and system booting can be done directly from the hard disk, the company said.

According to the vendor, the storage systems use Ansi-standard DC-600A or DC-615A ¼-in. tape. Error correction features can correct up to 4K bytes per 8K-byte block of data on the tape.

Other storage system features

Other features of the storage systems reportedly include the ability to overwrite the tape without prior erasure and single- and multiple-file backup and restore functions.

The Model 4060 tape system costs $1,995. The 5025 Hardfile system with 25M bytes of disk storage and the 60M-byte tape drive is priced at $3,495. The Model 6135 Hardfile with 35M bytes of disk storage and the tape drive costs $4,495.

The Model 6050 Hardfile with 50M bytes of disk storage and the tape drive is priced at $5,495. The Model 6180 Hardfile with 80M bytes of disk storage and the tape drive costs $7,495.

More information on the disk drive subsystems is available from Tallgrass Technologies, which is located at 11100 W. 82nd St., Overland Park, Kan. 66214.

ANALYZE

from page 83

a friend.

The software asks those under scrutiny their sex and age (over or under 18). It then provides a list of 66 adjectives and asks which apply. The adjectives arise out of the personality evaluation research done by James Johnson, a clinical psychologist and one of the program's three developers.

Applying adjectives

Deciding whether the adjectives applied appeared to be almost as much fun as reading the reports that the software produced.

"Meek? Him? Outrageous, maybe; not meek."

"Fun Loving? No question. A party animal."

The Mind Prober personality profile covers such topics as how the subject relates to work, life stress and sexuality. What was more remarkable was that people actually crowded around a personal computer to use it.

True, they were not entering high-level PC-DOS commands or writing programs in Basic. But they were learning how to load a program and execute simple commands in a non-threatening environment.

Not without flaws

Mind Prober, available at $49.95 from Human Edge Software, Palo Alto, Calif., is not without flaws. Its greatest drawback is that it apparently does not allow users to go back and change their decisions on adjectives. If you say your test subject is "yielding," for example, the label sticks until you start a whole new analysis.

On the whole, though, Mind Prober is the equivalent of a video game for adults. It is the kind of lightweight software that a microcomputer manager might want to turn loose among a group of office workers who are getting their first exposure to personal computing.

But unlike a video game, Mind Prober has a utilitarian value that could have real meaning for an organization. Mind Prober, you see, works.

Not too sophisticated

It does not give as sophisticated an analysis as a clinical psychologist might. In fact, the descriptions sound accurate about 80% of the time, a figure that Human Edge said is approximately consistent with its own testing.

But how often can we say that about our own character judgments, particularly when we make them in five minutes, roughly the average time it takes to do a Mind Prober assessment?

Mind Prober forces us to organize our thinking about another person — remember those 66 adjectives? — and then applies the judgment of experts to its evaluation.

Invaluable assistance

For a sales representative dealing with a recalcitrant prospect, a lawyer facing an unpredictable judge or an executive with a key position to fill, such assistance could be invaluable.

So, say what you will about Mind Prober; it is either untrustworthy and shallow or thought provoking and likable.

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Iomega introduces storage system for AT

ROY, Utah — Iomega Corp. has introduced a version of its Iomega Bernoulli Box for the IBM Personal Computer AT.

The Bernoulli Box reportedly offers 20M bytes of storage on a removable cartridge and can interface with the standard version of the Personal Computer AT.

The product is said to have a data access speed of 35 msec and reportedly can copy a 10M-byte file in 1.72 minutes when attached to the Personal Computer AT running Iomega 2.3 software. Users with the enhanced Personal Computer AT, which comes equipped with a 20M-byte internal hard-disk unit, can add the 10M-byte Bernoulli Box to their systems.

The 10M-byte Bernoulli Box for the Personal Computer AT is priced at $2,695; the 20M-byte unit is priced at $3,695.

Iomega is located at 1821 W. 4000 S., Roy, Utah 84067.

Five AT upgrade kits available

DELRAY BEACH, Fla. — Core International, Inc. has announced a line of hard-disk upgrade kits for the IBM Personal Computer AT. The AT Plus upgrade kits are available in capacities of 20M, 30M, 40M, 56M and 72M bytes. An AT Plus 72 upgrade kit would reportedly provide a standard Personal Computer AT with 512K bytes of dynamic random-access memory and 72M bytes of on-line data and program storage.

Programmable read-only memory chips are included for the 40M-byte to 72M-byte drives. Optional 150 nsec memory chips that boost the 256K-byte memory of the low-end model to 512K bytes are available.

The hard disks are said to feature a data transfer rate of 5M byte/sec and a rotational speed of 3,600 rpm. Prices for the disk upgrade kit only range from $1,595 for a 20M-byte capacity to $5,990 for a 72M-byte capacity. The 512K-byte memory option ranges in price from $2,090 to $5,990.

Core International is located at 542 S.E. 5th Ave., Delray Beach, Fla. 33444.

Government security manual out

WASHINGTON, D.C. — The National Bureau of Standards has published a manual designed for managers to use to strengthen personal computer security.

The manual examines the range of physical threats to personal computers, such as theft or fire, and also looks at the risks faced by a system's data.

In addition, methods for providing software integrity, data backup and user accountability are discussed.

The manual, "Security of Personal Computers: A Management Guide," also reportedly offers a plan of action for management and contains references to additional information and security products. A self-audit checklist is included.

The price of the manual is $3, and it is available from the U.S. Government Printing Office, Washington, D.C. 20402.

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Curtis 1000

1000 DIFFERENT PRODUCTS TO MAKE BUSINESS WORK

[illegible]

TeleVideo

TOPVIEW

from page 83

from Digital Research, Inc. of Monterey, Calif., and Microsoft Windows from Microsoft Corp. in Bellevue, Wash. — and these packages also have their champions.

Topview gathering support

But recent interviews confirmed that Topview has gathered the most recruits from the independent software vendors whose support will make or break a standard.

"Everyone in the IBM environment has to be able to run under Topview," said Susan Luster, marketing vice-president at Powerbase Systems, Inc. in New York.

"The only one that's going to make it is Topview," agreed Richard Rabins, president of Alpha Software Corp. in Burlington, Mass. As a software developer, "you have so many things to worry about with the product," he added. "What will it look like? What will it run on? You don't have time to spend [worrying about] what operating environment is going to work out, so you go with the safest thing."

Other vendors will hold off on customizing their software for a given environment until they see how their customers react. "There's a lot of 'wait and see' in the industry," said Wayne Erickson, president of Microrim, Inc. in Bellevue, Wash.

Harvard Software, Inc. in Littleton, Mass., also intends to wait on the market, Harvard Software President Richard Wolfson said. "It's not clear what problems [the operating environments] are solving," he said. "If anything happens suddenly [in the market], I'd be surprised."

The three candidates all promise to make life easier for end users, particularly those with little or no computer expertise. Most important, each will provide a common user interface for all sorts of applications, which could shorten training time and simplify jobs that require moving back and forth between tasks.

All three also will look best on micros with a lot of memory and computing horsepower. "No one is going to run any of those products in the [personal computer] environment unless they're loaded memory-wise," Erickson said.

Luster predicted that Topview will arrive in force only when the IBM Personal Computer AT is available in high volume. "Running on smaller machines, it doesn't make much sense," she said.

In prototype form, Topview "runs like a dog," commented Harvey Jeane, vice-president for product development at Ashton-Tate in Culver City, Calif.

Another limitation, unlike the cases for GEM and Windows, is that graphics-oriented packages cannot take advantage of windowing and other features under Topview. This has led to speculation that IBM is planning a second bit-mapped graphics version, noted Chris Christiansen of the Yankee Group in Boston. "I think Topview 1.0 will be obsolete by the end of the year."

Differences in tasking

Another crucial difference between environments is that Topview and Windows will be multitasking, but the first version of GEM will not.

GEM is scheduled for late-February delivery, and a GEM seminar was expected to draw about 60 developers and 20 OEMs this month, according to Digital Research.

GEM's biggest advantage for users is its Apple Computer, Inc. Macintosh-like user interface, said Peter Pirner, executive vice-president of Lifetree Software, Inc. in Monterey, Calif. Lifetree is adapting its Volkswriter Deluxe word processing program for GEM and expects to deliver a version by the second quarter.

"Not everyone wants to type in commands," Pirner said. Among Lifetree's corporate customers, a certain number of users are asking for Macintoshes, "but the corporation doesn't want to support another machine," he said. GEM provides a low-cost answer, and while the Personal Computer will not run at blinding speed, "it's powerful enough," he added.

The third contender, Microsoft Windows, boasts its family ties to the standard PC-DOS and MS-DOS operating systems, and Windows still gets considerable support, although it holds down the longevity record for micro vaporware.

Announced in November 1983, Windows is now scheduled to ship this summer.

ADDITIONS

from page 83

and will be available in May.

The added communications capabilities are said to include Wang-to-Wang File Transfer and Wang Virtual Storage (VS) Terminal Emulation. File Transfer will permit Wang Office Assistant users to store files on the VS and receive files from it. Using VS Terminal Emulation, users will be able to run Wang Office software on the VS and to perform VS DP functions, Wang said.

File transfer and VS Terminal Emulation will be available in March in one package, priced at $250. Spelling Verification is priced at $150. The 512K-byte Office Assistant is priced at $2,849.

Wang Laboratories is located at One Industrial Ave., Lowell, Mass. 01851.

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STATISTIC

from page 83

tor or on a mainframe, it was often time-consuming and arduous to produce significant analyses. The arrival of relatively friendly and powerful mainframe statistical packages improved the ability to do studies with significant statistics. However, even today in many installations, only the systems programming staff knows about the uses of packages like SAS Institute, Inc.'s Statistical Analysis System (SAS) or SPSS, Inc.'s Statistical Package for the Social Sciences (SPSS).

Both SAS and SPSS, along with several other widely used mainframe software systems, were first developed for mainframe computers. The advent of the Intel Corp. 8088 and other 16-bit microprocessors made it possible for the mainframe programs to be ported to desktop machines. In addition, packages written originally for micros are appearing with greater frequency.

In a computing center, statistics frequently are used for analyzing and evaluating computer performance data. Some data is best analyzed on the mainframe systems it was collected for, simply because of the volume — for example, the various systems available for reducing performance data from IBM's Systems Measurement Facility to understandable terms.

Detailed analysis suited to micros

Even with mainframe systems available, however, it is sometimes useful to take a subset of the data and do further detailed analysis and to produce graphics for presentation. Here the micro-based statistical programs, along with appropriate graphics packages, can be helpful after the data is downloaded to the micro.

Market analysis, personnel studies, various forms of operations research and related activities are much easier to accomplish on a desktop computer than on a mainframe system. If a micro is equipped with a hard disk drive, micro-based systems can perform impressively and can handle a relatively large data set. Survey analysis, in particular, can be handled easily and in a straightforward manner not previously possible.

In many large organizations, data entry groups are now using micro-based workstations to capture data that was once obtained with traditional keypunch or key-to-disk systems. Often it is possible for a researcher to obtain a data set without ever going close to a mainframe system.

The good statistical package

What should we look for in a good statistical package?

In the micro world, as with mainframes, more time is often spent putting the data in some reasonable order than in analyzing the data. Good data management facilities are a must in a decent statistical package.

The data management facilities should include the ability to import and export data into and out of the system in a wide variety of formats, including "flat" or rectangular files with specified and variable formats, files formatted in Software Arts, Inc.'s Data Interchange Format and as many others as possible.

We should be able to take data files from Lotus Development Corp.'s 1-2-3 or a mainframe or other source and read them with some ease. Likewise, when the analysis is finished, we should be able to export the results to other programs for graphics presentations or other forms of analysis. Currently, no one program will satisfy all our analysis needs.

In addition to importing and exporting data with ease, we should also be able to manipulate the data to create new or altered variables, such as fields or values, by combining several values, by recoding or rearranging the numbers for a specific variable and by transforming the data. These operations should be made as easy as possible.

Other data management capabilities

Other data management capabilities might include sorting, deleting fields or records, adding fields or records, rank ordering the data, aggregating data according to some specified criterion and leading and lagging the data for some types of time-series analysis.

The statistics provided should include univariate and multivariate statistics as well as various forms of inferential statistics. For forecasting purposes — an important element in many business situations — a rich variety of time-series statistics will be valuable. One of the primary deficiencies in many micro-based statistical packages is the lack of adequate multivariate statistics functions ranging from multiple regression to far more esoteric procedures.

Finally, the documentation should be adequate or the package should be sufficiently friendly to use without printed documentation. The printed documentation should include not only explicit descriptions of how to use each and every procedure, but also a technical appendix with the mathematical algorithms used in calculations.

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COMPUTER INDUSTRY

Firm tightens belt, looks ahead

Computer Devices exec shifts firm's course

NUTTING LAKE, Mass. — Robert J. Moore, president, chairman and chief executive officer of Computer Devices, Inc., kicked himself out of his office last year because he thought a newly hired marketing executive needed it more than he did.

Moore moved his office to a chilly conference room — the building's heating system is faulty — where he now directs efforts to guide the company through a Chapter 11 bankruptcy reorganization. Because the building's heating system is faulty, Moore and his secretary, on a recent cold winter morning, took turns sharing a portable electric heater that they placed by their desks.

Computer Devices has been a no-frills operation since it scurried for protection under the Federal Bankruptcy Act in October 1983, its losses mounting from an untimely and ill-conceived entry into the IBM Personal Computer-compatible market. The Dot, the personal computer introduced by the company in 1982, used a 3½-in. disk, which made it incompatible with IBM's 5¼-in. disk.

Moore

Moore, a former executive at IBM, Xerox Corp. and Bunker Ramo Corp., came to Computer Devices from Babson College in Babson Park, Mass., where he had been acting dean of the school of management education. In mid-1983, he said, some of

See MOORE page 102

Disk pact OK'd

Merger of Dysan, Xidex begets biggest storage firm

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — Shareholders of Dysan Corp., which boasts a 30% share of the hard disk market, and Xidex Corp., the nation's No. 2 floppy disk maker located in Mountain View, Calif., recently approved the merger of the two companies.

The union, valued at approximately $250 million, makes the resulting company, Xidex Corp., the largest data storage products manufacturer in the world and the second largest floppy disk maker (behind Verbatim Corp. of Sunnyvale, Calif.), said Gary B. Filler, a Xidex executive vice-president, and one of three men who will make up Xidex' "office of the president" management team. Other members of Xidex' presidential staff will be Bert L. Zac-

See XIDEX page 100

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

DEC micro moves continue to puzzle

"Yes we did." "No, we didn't." "Well, we did and we didn't."

So continues Digital Equipment Corp.'s quixotic journey through the dusty plains of the low-end microcomputer business.

Within the space of a few days, DEC conceded it had halted production of its Rainbow micro and would revamp its production lines for new products. Then DEC turned around and objected to char-

See DEC page 96

Firm succeeds by seeking out non-IBM areas

By Charles Babcock
CW New York Bureau

NEW YORK — "Don't do what you know IBM will do," said Stanley Adelman, president of a small software and consulting firm here, in explaining his company's path to success.

Since 1976, Adelman's company, Systems Strategies, Inc., has exploited niche markets that IBM and other large manufacturers ignored. Now Systems Strategies is prospering by duplicating what IBM does but doing it for other vendors.

Adelman's firm has specialized in supplying corporations and vendors with communications packages that allow them to connect their non-IBM terminals, computers and other devices to IBM's Systems Network Architecture (SNA). Manufacturers who thought they had been shut out are finding that they, too, can be painted blue.

Having only a handful of competitors with similar expertise, Systems Strategies has grown from an initial $10,000 investment to $10.6 million in annual sales. It was acquired Dec. 26 by AGS Computers, Inc., a Mountainside, N.J., software company with $225 million in annual revenue.

"My partner [Franklin P. Silver] and I cashed in very favorably," said the deliberately unhurried Adelman. Now he finds himself being encouraged by AGS to develop new products and continue Systems Strategies' rapid growth.

"[AGS'] approach is very entrepreneurial. We are supposed to have completely independent management," he said.

Customers include Gould, Inc., Siemens AG, NEC Corp. and AT&T Information Systems.

In a typical request, Marlboro, Mass.-based Sequoia Systems, Inc. wanted to make its transaction processing computers appear as remote terminals to mainframes and related devices in an SNA environment.

Among other things, Strategic Systems offers the following:

See AGS page 100

■ Columbia Data Products, Inc. recently announced an executive reorganization and said it is negotiating to convert some of its debt to equity/93

■ Rapid changes in the market for microcomputer storage media caused Tandon Corp. to write down inventory and take a $15.3 million loss for the quarter just ended/94

■ Despite a continuing legal battle, Paradyne Corp. reported an [illegible] 1 million profit for 1984/96

Contempt charges in Mitsubishi-Leading Edge case settled

By Donna Raimondi
CW Staff

BOSTON — Leading Edge Products, Inc. and its supplier, Mitsubishi Electronics America, Inc., recently settled contempt charges brought against Mitsubishi in January by U.S. District Court Judge Robert Keeton.

The contempt action was lodged during proceedings in a suit filed last year against Mitsubishi in which Leading Edge claimed the California-based subsidiary of the Japanese company was damaging Leading Edge by trying to cut off its supply of components. Judge Keeton had ordered Mitsubishi to continue supplying Leading Edge pending a full trial and in January ruled that Mitsubishi had violated his order.

In its suit, Leading Edge contended that Mitsubishi wants to break the contract with Leading Edge so that it can market its equipment in the U.S. under its own name.

"We have reached an interim agreement that provides for a consistent supply of products," Bill Sellars, a Leading Edge spokesman, said. As part of the settlement, which did not resolve the original lawsuit, Mitsubishi has reduced its prices to Leading Edge by 15%, a published report said. Neither company would comment on details of the settlement.

Mitsubishi had been ordered by Judge Keeton to show cause why it should not be found in contempt of court and be subjected to appropriate civil sanctions on several grounds, according to a Show Cause Order dated January 10. The order stated the following:

- ■ That Mitsubishi failed to deliver products to Leading Edge in compliance with the federal court's December temporary restraining order.
- ■ That the supplier, at a January 1985 hearing, misrepresented to the court its expectations with respect to deliveries of products in 1985.
- ■ That Mitsubishi violated contractual obligations by tendering to Leading Edge products that representatives of Mitsubishi knew were substantially incomplete because they lacked monochrome controllers and memory expansion boards.
- ■ That the supplier willfully misled the court and Leading Edge at the January hearing by stating that it would tender products to Leading Edge in January, when in fact representatives of Mitsubishi knew that the products would be substantially incomplete.

The $350 million lawsuit that Leading Edge has filed against Mitsubishi is still pending, a Leading Edge spokesman said. Under Massachusetts law, if Leading Edge wins the lawsuit, it is entitled to treble damages, or $1.05 billion, the spokesman said.

The Mitsubishi suit filed in California is also ongoing, said Ric Fochtman, executive vice-president at Mitsubishi.

That suit is said to seek termination of the agreement between the two companies.

In the meantime, Fochtman said, "We're doing business on an amicable basis."

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Macs, Apple come to terms on trademark

VALLEY FORGE, Pa. — Management and Computer Services, Inc. (Macs) and Apple Computer, Inc. recently announced they have agreed to settle a suit filed by Macs last September disputing Apple's use of the Macs acronym for its Macintosh personal computer.

Macs, a division of Pentamation Enterprises, Inc., asserted it had been using the trademark and service mark "Macs" since 1966 and began in 1969 to use the acronym as part of the product names of several of its software products. The company, based here, produces quality-assurance and productivity tools for use on mainframes as well as Apple and IBM microcomputers.

Under the terms of the settlement, Macs and Pentamation received an undisclosed sum of money from Apple and agreed to dismiss the litigation without prejudice. The settlement provides that Apple may use the trademark "MAC" or "Mac," standing alone or as a prefix on computer hardware manufactured or marketed by Apple and and that it may use those trademarks combined with at least two following letters on software. To refer to more than one Macintosh, Apple must add an apostrophe and the letter "s" to form the plural Mac's. Management and Computer Services will continue to use Macs as a suffix on its products, such as Paintmacs.

Columbia picks chief executive

COLUMBIA, Md. — Columbia Data Products, Inc. recently announced that the chairman of its executive committee has been named chief executive officer and that the company has initiated discussions about converting a portion of its debt to equity.

The company announced that Samual Irwin, former chairman of Sycor, Inc., was named CEO, replacing Robert Cross who remains as president of the IBM-compatible microcomputer manufacturer.

Irwin said Columbia began discussions with its suppliers and commercial banks about a recapitalization plan that would include providing debtors with equity in exchange for a portion of its indebtedness. Irwin said the company has also talked to potential investors about raising additional funds for working capital purposes. He also said the company has abandoned plans to sell its manufacturing operations to Evergreen Technologies, Inc., a plan that would have resulted in Evergreen assuming Columbia's manufacturing liabilities, including cash owed to Columbia's suppliers.

The company said that William Diaz, chairman of the board, had assumed primary reponsibility for marketing efforts as vice-president of marketing.

Victor to transport operations overseas

By Kathleen Sullivan
CW West Coast Bureau

SCOTTS VALLEY, Calif. — Victor Technologies, Inc., which recently emerged from bankruptcy after a year of court proceedings, announced it would close its manufacturing facility here and transfer production to the Far East — most likely Japan. The plant closure will affect approximately 110 employees, said Eric Hass, Victor Technologies' newly appointed president and chief executive officer.

Explaining that the firm was bowing to "the economic reality of today's economy," Hass said Victor Technologies will phase out production in California over the next six months. The company has not yet decided on an overseas location for the plant.

To illustrate the nature of the problem, which he described as "an unfortunate fact of life," Hass cited the production costs of one of Victor's products. He said it would cost the company $1,350 to build the product in the U.S., while the same product could be purchased in Japan for less than half that amount.

Labor not prime consideration

According to Hass, labor costs were not the primary consideration in the firm's decision to relocate offshore, because labor accounted for only $200 of the product's total price tag. The cost of parts made up the bulk of the American production figure, totaling $1,160 out of the $1,350, he said.

Victor Technologies, now a subsidiary of Datatronic AB, a Swedish software firm, will maintain its corporate headquarters here, Hass said. When asked if the firm would continue new product development in California, Hass said such research will probably continue there but added that the firm "doesn't care where its new products come from." The company, which now sells the Victor 9000 and the transportable Vicki, plans to introduce a number of new computer systems and office products this year.

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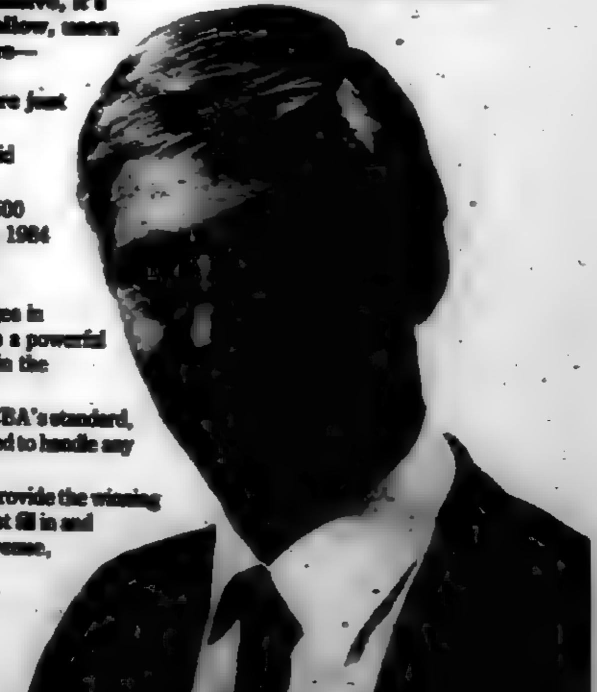

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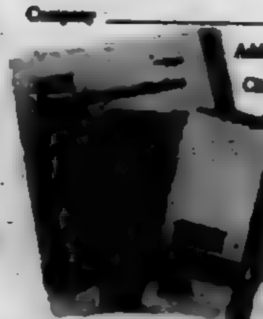

Fortune up 29% but out $21.9 million

By Kathleen Sullivan
CW West Coast Bureau

BELMONT, Calif. — Although Fortune Systems Corp. recently reported a 29% increase in revenue for 1984 to $70.1 million, compared with $54.4 million in 1983, the company also announced that its year-end loss was larger than originally anticipated, reaching $21.9 million.

For the fourth quarter ending Dec. 31, Fortune reported revenue of $18 million, a 42% jump over last year's fourth-quarter revenue of $12.6 million. Fortune's 1984 fourth-quarter losses widened to $14.9 million, compared with the same period last year when the firm lost $6.5 million.

James S. Campbell, Fortune's president and chief executive officer, said the bulk of the fourth quarter's losses could be attributed to $13 million in reserves for write-downs of inventory, excess facilities and receivables.

The total loss per share for the year was $1.02, while the loss per share for the fourth quarter was 70 cents, Campbell said.

Fortune, which sells AT&T Unix-based multiuser microcomputers, has been trying to regain a foothold in the market since 1983, when performance and reliability problems plagued its systems. Although the company said (and analysts agreed) that it has successfully addressed those issues, Fortune's reputation has suffered.

Faced with financial troubles and a more competitive market in 1984, Fortune undertook a number of measures to strengthen its position. The company reorganized its management team, streamlined its operations and abandoned the retail market, turning to value-added resellers to market its systems.

Campbell predicted that the company, now armed with a conservative financial plan, will turn a profit in 1985. The company plans to increase its revenue by at least 20% in 1985, he said. He noted that the firm has cut its 1985 break-even point in half to $17 million, from last year's $34 million.

Tandon loses IBM contract, reports loss

CHATSWORTH, Calif. — Microcomputer disk drive manufacturer Tandon Corp., which recently acknowledged the early termination of a contract to supply IBM, reported a first-quarter loss of $15.3 million, or 30 cents per share, compared with year-earlier profits of $9.3 million, or 18 cents per share. Revenue for the quarter was $90.6 million, down from $93 million a year earlier.

Tandon announced recently that its largest customer, known to be IBM, which accounted for 58% of 1984 sales, had discontinued purchases of full-height, 5¼-in. flexible disk drives. It also announced unspecified commitments by that customer to purchase new products.

The company said shipments of the newer products have begun, but significant volume shipments will not occur until later in the year, and the remaining quarters of 1985 will be affected by the shift.

The financial results were adversely affected by additional inventory reserves and price adjustments charged off for the quarter, Tandon said. The company said this was due primarily to reductions in the net realizable value of inventory for the 5¼-in. drives and lower capacity Winchester disk drives "in light of recent events confirming a rapid and broad-based industry trend toward half-height, 5¼-in. flexible disk drives and higher capacity Winchester disk drives."

According to Sirjan Lal Tandon, president of the company, "We were able to maintain a stable operating environment despite the difficulties that currently exist in the peripheral and microcomputer industries. Our operations would have been profitable except for those reserves."

Compaq sees 196% increase

HOUSTON — Compaq Computer Corp. last week announced that revenue for 1984 increased 196% to $329 million, compared with $111.2 million in 1983. Profits for the year were $12.9 million, or 47 cents per share, compared with 1983 profits of $2.6 million, or 13 cents per share.

During the fourth quarter, Compaq posted revenue of [illegible]12.7 million, compared with $52.2 million in the same period of 1983. Quarterly profits were $6.8 million, or 25 cents per share, compared with year-earlier profits of $3.2 million, or 15 cents per share, not including a $2.1 million extraordinary item in the 1983 quarter.

The year just ended was only the company's second full year of operations. Rod Canion, president and chief executive officer of Compaq, said the company expected 1985 to be another good year, but that a lower first-quarter revenue [illegible] expected because of industry anticipation of a seasonal slowdown.

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COMPUTER INDUSTRY

MCI posts fourth-quarter plunge

WASHINGTON, D.C. — MCI Communications Corp. recently reported sharply reduced profits for the fourth quarter and fiscal year just ended compared with 1983. The company attributed the expected decline to access charges and said strong revenue growth is expected to continue.

For the 12-month reporting period, the company posted profits of $59.2 million, or 25 cents per share, compared with $202.9 million, or 89 cents per share, for 1983. Revenue for the year increased 22% to $1.96 billion, from $1.52 billion in 1983. The results for the year included a previously reported pretax write-down of $49.8 million, or 11 cents per share, for telex equipment.

The fourth quarter resulted in profits of $13.2 million, or 6 cents per share, compared with $43.5 million, or 19 cents per share, in the fourth quarter of 1983. Revenue increased to $521.4 million for the quarter just ended, compared with $430.1 million a year earlier.

MCI Chairman William G. McGowan noted that the company had met its forecast of quarter-to-quarter improvement in profitability as high fixed costs continue to be spread over a growing revenue base. In the fourth quarter, MCI's call volume showed an 11% increase over the previous quarter.

"We expect strong revenue growth to continue with the increasing number of telephone customers who will have the opportunity to select a designated long-distance carrier through the equal-access process during the next two years," McGowan said.

Paradyne profits hit $11 million

LARGO, Fla. — Paradyne Corp. recently reported 1984 profits of $11 million, or 49 cents per share, compared with year-earlier profits of $3.6 million, or 16 cents per share.

Revenue for the year just ended was $289.9 million, compared with $208.9 million in 1983.

For the fourth quarter, the company posted profits of $2.6 million, or 12 cents per share, compared with a year-earlier loss of $1.7 million, or 8 cents per share. Revenue for the quarter was $82.6 million, compared with $55.3 million in the last quarter of 1983.

Robert S. Wiggins, president and chief executive officer, said recent expansion of its marketing and services organization was a major factor in the 1984 revenue increase.

According to Wiggins, "The other primary reason for the increase was the acceptance of the newer company products in the marketplace, especially the MPX modems and DCX multiplexers."

Additionally, Paradyne reported that the continuing defense of a suit brought against it by the Securities and Exchange Commission resulted in payments totaling $1.1 million to outside counsel during 1984.

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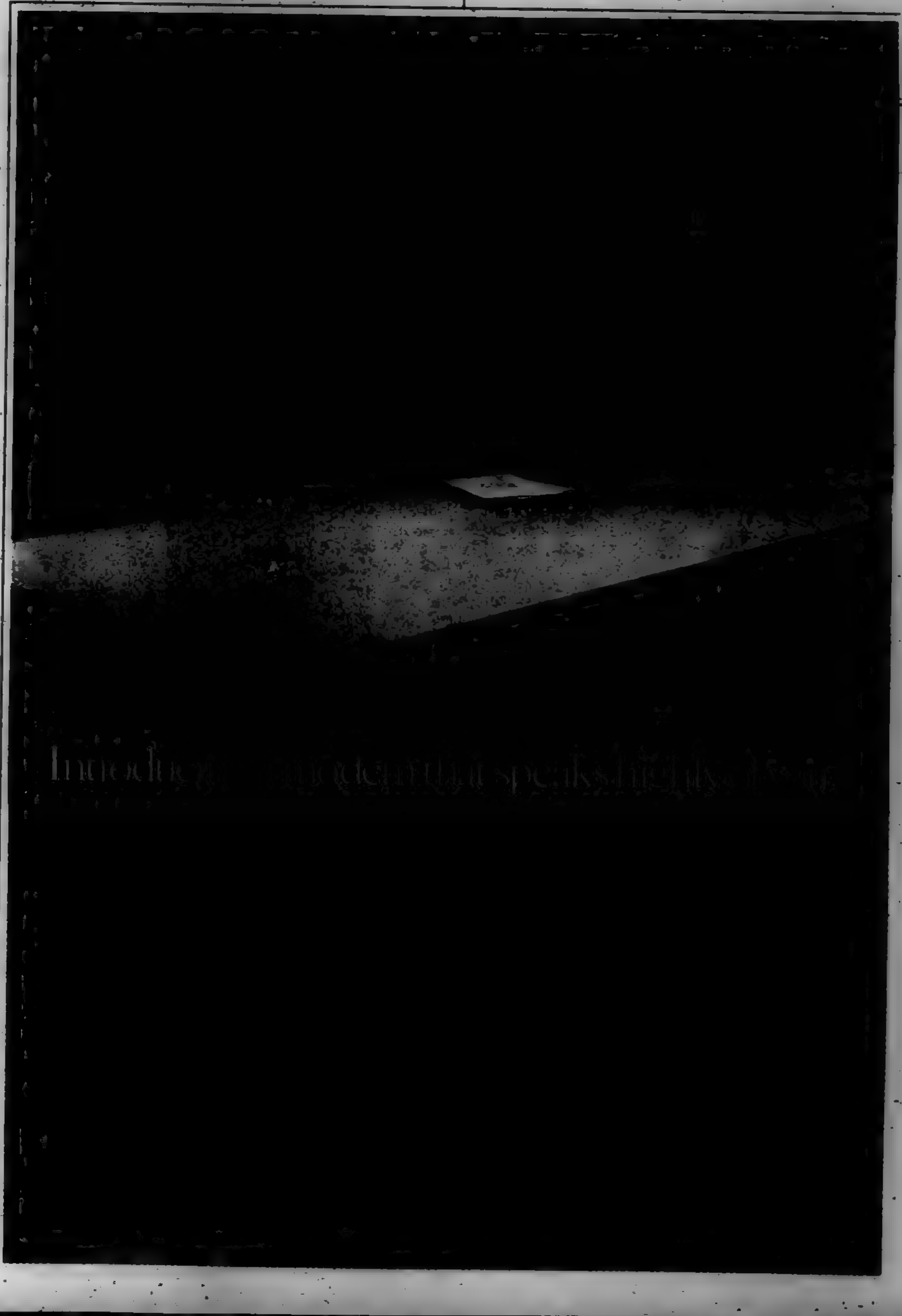

VG Systems of Woodland Hills, Calif., said it has entered into a long-term contract with **Fujitsu Ltd.** of Japan for the joint development of a next-generation computer-aided design and manufacturing (CAD/CAM) system. The multiyear contract extends current ties between the two companies. VG Systems currently supplies its display stations to Fujitsu for integration into its CAD/CAM-based systems.

■

GTE announced that Judge Harold Greene of the U.S. District Court in Washington, D.C., has conditionally approved the company's consent decree regarding its acquisition of **Southern Pacific Communications Corp.** and **Southern Pacific Satellite Corp.**, now called GTE Sprint Communications Corp. and GTE Spacenet.

■

Delphax Systems announced a joint development agreement with **Xerox Corp.** to produce a 60 page/min ion deposition printer for worldwide distribution. The terms of the contract have not been disclosed.

Xerox recently acquired Canada Development Corp.'s interest in Delphax.

■

Sperry Corp., Blue Bell, Pa., has signed an agreement with **Intermetrics, Inc.**, Cambridge, Mass., to develop an Ada programming language processor for use with Sperry series 1100 mainframes.

Intermetrics, a large independent supplier of data processing compiler programs, will develop the Sperry 1100 Ada compiler system (1100 ACS).

■

Data Securities International, Inc. announced it has reached an agreement with the **Association of Data Processing Service Organizations** (Adapso) to provide two new software-protection services to Adapso members.

As part of an overall strategy to meet the emerging software-protection needs of the DP industry, the Adapso-sponsored program will grant association members direct access to Data Securities International proprietary deposit and post software-development services.

■

Waferscale Integration, Inc. (WSI) and **Sharp Corp.** have signed a multiyear cooperative agreement involving WSI's patented Cmos erasable programmable read-only memory (Eprom) technology.

Under the terms of the agreement, WSI will supply Sharp with its proprietary 2-micron Cmos Eprom technology that Sharp will use to manufacture high-density, high-performance 64K- to 256K-byte Cmos Eprom products.

In return, WSI will obtain product manufacturing capacity for the Cmos Eprom products marketed by WSI and an undisclosed sum of money in royalties.

■

Priam Corp. announced it released approximately 60 employees, principally in the indirect area. Additionally, the company recently transferred approximately 30 employees to work at Vertex, a peripherals manufacturer.

In November, Priam and Vertex announced a definitive agreement to merge.

■

Wang Laboratories, Inc. has signed three joint venture agreements with China. The agreements, covering three different locations in the northern, central, and southern regions of China, were finalized at the end of December 1984. The first agreement with the ministry of electronics industry in Beijing establishes a joint venture to produce low-end VS computer products including software development. The second agreement calls for the manufacture of 50,000 units of the Wang Office Assistant in Shanghai over the next five years. The third project includes the assembly of the Wang Professional Computer in Xiamen.

■

Gould, Inc. has formed, as part of its corporate structure, two new business sections to better serve key high-growth markets in the electronics industry: industrial automation systems and information systems. The two sections were established from the company's former electronics systems business section, which addressed the computer systems and computer-integrated industrial automation markets. Divisions within that section have been assigned to the new business sections.

■

United Telecommunications, Inc. and **General Electric Co.** have reached agreement on the amount of the final payment by General Electric to United Telecom for Calma Co., purchased from United Telecom in 1981 for $100 million, plus a subsequent payment to be made in 1985 dependent upon Calma's cumulative 1981-1984 sales. General Electric has made a final payment of $50 million, settling all pending litigation related to the amount of the 1985 payment.

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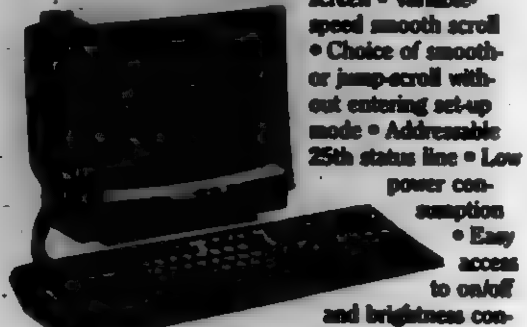
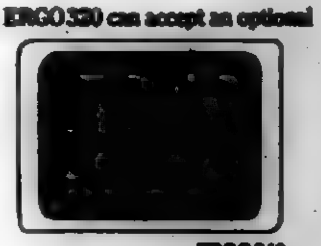
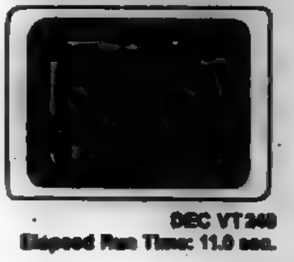


Design
The ERGO 320 is ergonomically designed and housed in an attractive, compact case with an adjustable monitor and smaller footprint than the DEC VT220. The detached, low-profile keyboard, is shorter than the DEC VT220 keyboard, and has an easy-tilt adjustment to provide ease of use for all users.

Graphics
Upgradability. The ERGO 320 can accept an optional graphics board ($595) which will perform all Plot-10 and ReGIS functions. The graphics board, which turns an ERGO 320 into an ERGO 340, can be added to existing ERGO 320s. The small footprint is maintained when adding graphics to an ERGO 320 but must be forfeited when purchasing a VT240. Fast, too. In addition, our graphics offers significant speed advantages over a VT240— as much as seven times faster. (See an actual comparison above.)



ERGO 340
Elapsed Run Time: 11.0 sec.



DEC VT 240
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Verdix Corp. announced that it has validated the first in a series of compilers for the Ada programming language. Ada is the programming language recently mandated by the U.S. Department of Defense for use in all mission-critical systems.

■

Computer Automation, Inc. announced that it has dropped its Intel Corp. 186-based product line and discontinued its efforts to sell to the commercial small business computer market.

The company also announced that it is reducing the work force of its computer products division by approximately 130 employees and that it anticipates lower revenue and a pretax loss of about $2 million for the second quarter of fiscal 1985, ended Dec. 31.

■

Fortune Systems Corp. and **Computerland Corp.** announced that the two companies have reached a settlement of pending litigation. Spokesman for both companies termed the settlement an amicable one and said that the two firms look forward to a healthy working relationship in the future.

Sperry Corp. has paid **Mnemos Ltd.** $800,000 with provision for an subsequent $200,000 payment for exclusive rights to Mnemos' optical image disk-based technology for all U.S. military and Coast Guard automated test applications for the next five years.

■

Compupro Corp., Hayward, Calif., officially changed its name to **Viasyn Corp.** on Jan. 2.

■

Amdahl Corp. announced that it has entered into an agreement with **Oracle Corp.** whereby Oracle will make available its Oracle relational data base management system under UTS, Amdahl's version of the AT&T Unix operating system for large mainframes.

■

Walker Interactive Products and **Applied Data Research, Inc. (ADR)** announced a complementary development and marketing agreement under which both companies' staffs will provide mutual clients with integrated support for ADR's relational data base and Walker's application software.

In addition, both firms are committed to maintaining the compatability between current and future releases of their respective companies' software.

■

T-Bar, Inc., Wilton, Conn., and **Thomson-TITN** of **Thomson-Telecommunications**, France's major electronics corporation, jointly announced a working agreement whereby T-Bar will incorporate the TITN real-time network performance monitoring system and its associated analytical and reporting software into T-Bar's product line. Thomson-TITN will similarly incorporate T-Bar's VSM data communications matrix switching products into their product line.

■

Apollo Computer, Inc. announced the addition of four subsidiaries to its international organization, opening direct operations in Sweden, Norway, Denmark and Finland. The activitites of these subsidiaries, will be coordinated by a newly formed regional office headquartered in Copenhagen.

MERGERS AND ACQUISITIONS

Computer Network Corp. (Comnet), Washington, D.C., and **National Systems Laboratories, Inc.** (NSL), Naperville, Ill., announced the execution of an agreement for the acquisition of NSL by Comnet, subject to NSL shareholders' approval.

■

McDonnell Douglas Corp., St. Louis, and **Applied Research Ltd.**, Cambridge, England, announced an agreement in principle for Applied Research to be acquired by McDonnell Douglas. The agreement is subject to the approval of both boards of directors, and the approval of Applied Research's shareholders. No terms were disclosed. Applied Research, once acquired, will be operated in the UK as part of McDonnell Douglas' information systems group.

■

Lockheed Corp. and **Inference Corp.** have announced an agreement by which Lockheed will assume a minority equity position in Inference. In addition, the two companies will cross-license some artificial intelligence technology. Through the agreement, Lockheed and Inference will work jointly to further AI technology in products for both the defense and industrial markets.

■

Interactive Data Corp. and **Western Union Corp.** have signed a letter of intent for Interactive Data to acquire **Telstat Systems, Inc.**, a Western Union subsidiary that provides securities pricing data to financial institutions. Interactive Data plans to merge Telstat with its subsidiary, Interactive Data Services, Inc.

■

Software Design Associates, Inc. has acquired **Systems Strategies, Inc.**, a firm providing professional services and products to the data processing community in the metropolitan New York area. Terms of the acquisition were not available.

■

Data Card Corp., Minneapolis, announced it has entered into an agreement with **Mohawk Data Sciences Corp.**, Parsippany, N.J., to acquire the assets of Mohawk Data's DEK identification systems division for an undisclosed amount of cash. The transaction is subject to the approval of both companies' boards of directors.

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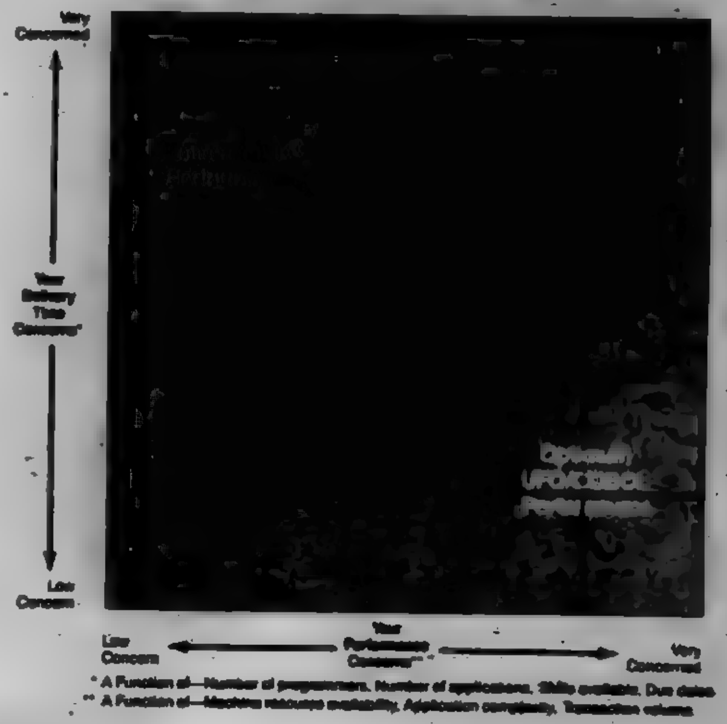

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COMPUTER INDUSTRY

EXECUTIVE CORNER

Jacob F. Vigil has been appointed president and member of the board of directors and **Dr. Thampy Thomas** has been named vice-chairman of the board at Elxsi Corp.

■

Roger W. Johnson, president and chief executive officer of Western Digital Corp., was elected chairman of the board.

■

Tren Systems, Inc., a Control Data Corp. company, announced that **David Kniffen** has been promoted to the position of president and chief operating officer.

■

Jim Busby has been elected president of Datasouth Computer Corp.

■

Robert Gehlert has been appointed president of Wangtek.

■

Murray Robinson has been named to the post of senior vice-president, operations at Atari Corp.

■

Gerald Kovach has been named senior vice-president of regulatory and public policy at MCI Communications Corp.

■

Lee Hargrave Jr. has been appointed to the newly created position of executive vice-president and chief operating officer at Computer Automation, Inc.

■

Stephen Schmidt has been appointed to vice-president, operations at Tandem Computers, Inc.

■

Jerry Aster has been appointed vice-president and general manager at the Consumer Electronics Division of Hattori Corp. of America.

■

Raymond Sims has been appointed vice-president, finance, administration and chief financial officer at Relational Technology, Inc.

■

Raymond Pease has been named vice-president of U.S. Telephone, a division of United Telecom Communications, Inc.

■

Jacqueline Parkarinen has joined Zitel Corp. as executive vice-president and general manager of the company's recently acquired Gifford Computer Systems, Inc.

■

Larry Holswade has been named vice-president and general manager of the newly formed federal systems division at Data General Corp.

■

Jeanne Wohlers has been promoted to vice-president and controller and **Richard Lamb** to the position of treasurer at Tandem Computers, Inc.

■

Christian Hoebich has been appointed chief financial officer at Xebec Corp.

■

Frederick Wang has been elected treasurer of Wang Laboratories, Inc.

DEC

from page 89

acterizations that it had abandoned the product — of course, if I had up to a year's inventory sitting on the shelf, I also would object to such characterizations. Finally, the company said that next month it will offer enhancements to the Rainbow and other micro products.

Conclusions reached

From such definitive statements, two conclusions naturally present themselves: DEC is intent on proving yet again that it hasn't the foggiest notion of how the micro market operates; or, the company's public relations arm wanted to show the nation's press that it is quite capable of kicking itself in the shin; or both.

On more than one occasion, Ken Olsen, DEC's founder and president, has publicly scorned the retail micro market and low-end computing in general. This despite DEC's since-abandoned goal of gaining a good piece of that market.

At periodic intervals during the past two years, the company has shifted strategies for selling micro products or shifted executives saddled with the responsibility to sell a product to which Olsen clearly has no commitment. The company has gone from selling quantity to selling quality to selling vertically to . . . who know's what next?

Any computer marketing executive with even the slightest bit of savvy certainly should realize by now that you do not kill off version one before at least announcing version two if you have any hope of selling off inventory at above cost.

Killing the Rainbow

Perhaps next month there will be some type of add-on to make the Rainbow compatible with the IBM Personal Computer. But unless it is given away free, it is not going to sell new Rainbows. No, for all intents and purposes, DEC has effectively killed the Rainbow, at least perceptually.

Certainly the Microvax II — when it ever gets to market — will be a different story; it has a guaranteed base of VAX owners to sell to.

But between now and then, DEC's latest stumble may reflect problems. A DEC competitor, Data General Corp., recently stunned the investment community with the news that it will have difficulty showing any profit increase for the current quarter compared with a year earlier; even IBM said the year is off to a very slow start.

Bad news

If Big Blue is frowning, the industry is in a depression. This is not good news for an industry that has built up huge inventories while other industries have been rapidly depleting inventories.

Given the downturn, the news that DEC's latest VAX is yet to ship and its low-end operations are in disarray may indicate that DEC is in for a crunch over the short term.

The No. 2 computer company may show yet again that it is big enough to shake the ground when it takes a tumble.

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It's a machine that gives up to twelve users a lot more speed, memory and storage than a personal computer. For a lot less money.

The new Tower XP on the right, on the other hand, can cure even bigger headaches. Because it's an even more potent computer.

It can handle up to sixteen users simultaneously. It is powered by blindingly fast Motorola 68010 microprocessors. It offers up to eight megabytes of memory. Up to 260 megabytes of disk storage. It has the same operating system as the regular Tower: UNIX SYSTEM V*. And, like the regular Tower, it can stand alone or as part of a large DDP network via SNA, X.25 and other industry standard protocols.

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XIDEX

from page 89

caria, who will serve as executive vice-president, and Lester L. Colbert Jr., who will be the company's chairman and president.

As a result of the merger, Dysan shareholders will receive 87¼ shares of Xidex stock for every 100 shares of Dysan stock they own, Filler said.

C. Norman Dion, Dysan Corp.'s founder, will be the largest individual shareholder of Xidex, with 3% or 1.6 million shares of the company's stock. Dion said he turned down Xidex' offer to stay on its board and will take a two-year vacation from business. Company officials said, however, that William Harry, Dysan's president, will continue with Xidex as vice-president of its hard-disk operations.

The staffs of the two firms combined would have numbered 6,200, Filler said. However, because of a 600-person Dysan layoff last August and subsequent attrition, the surviving company's work force will total only 4,700 employees, he said.

Due to efforts to consolidate duplicate facilities in West Germany, Great Britain and Canada, other layoffs will occur later this year, Zaccaria said.

Zaccaria said Xidex expects to save $38 million by these work force reductions and another $15 million by consolidating facilities. He said Dysan's Santa Clara headquarters would be closed, as well as one million square feet of owned and leased office and manufacturing space here and in other locations.

Savings critical

The savings are critical, Zaccaria said, because the merger brings Dysan's $65.6 million long-term debt to Xidex, on top of its own $7.7 million debt. Zaccaria said Xidex has $39.5 million in current assets, compared with Dysan's $6.2 million. Earnings for the next two quarters will be affected by the merger, Zaccaria said, but not significantly.

Xidex' future strategy will target floppy disks, hard disks and duplicate micrographics for mainframes, its original business, according to Zaccaria.

Following the acquisition, Xidex will hold 18% of the $1.1 billion floppy disk market, 30% of the $400 million hard disk market and 70% of the $125 million duplicate microfilm business, Zaccaria said. Xidex plans to maintain its Fremont, Calif., factory to manufacture its own disk products. Dysan's plant here will continue operations, making Dysan floppy disk products under its own name, Zaccaria said.

Filler said Xidex' sales for fiscal year 1986 will reach $200 million for floppy disks, up approximately 40%; $135 million in rigid disks, up about 20%; and $140 million in micrographics, representing a 5% increase.

Dysan ran into financial difficulties last year after investing in a number of unprofitable seedling companies and after backing a 3½-in. floppy disk format that proved unsuccessful in the marketplace, Filler said.

Xidex currently plans to keep its investment in six of the companies it inherited from the merger, including five million shares of Seagate Technology, Inc., a disk manufacturer in Scotts Valley, Calif.

Additionally, Zaccaria said, the merger will not affect an earlier Dysan agreement to make floppy disks for the Eastman Kodak Co. of Rochester, N.Y.

AGS

from page 89

- A CSNA/3270 package said to allow a mini or micro system with standard Ascii terminals and printers to emulate an IBM 3274 cluster controller operating in SNA/Synchronous Data Link Control mode with attached IBM 3278 terminals and 3287 printers.
- An Applications Program Interface said to allow a program on a mini or micro system to appear as a 3278 remote terminal to a host application on a mainframe.
- A CBSC/RJE package said to emulate any IBM 2780, 3780 or Hasp workstations and protocols. It communicates over a Binary Synchronous Communication network to perform batch file transfer functions emulating remote printers and card equipment.

Each of the packages is written in the C language. Systems Strategies said it was able to produce these products because 90% of the necessary source codes are available in IBM manuals. The remaining 10% must be derived by trial and error, he said.

The 125-employee company has been listed on *Inc.* magazine's Inc. 500 list of fastest growing small companies for three years in a row and now ranks 463rd.

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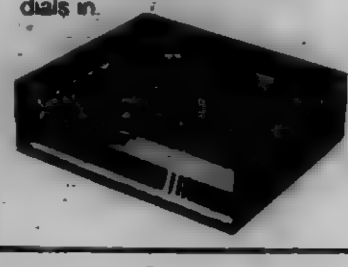

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THE 8TH NATIONAL COMPUTER CONFERENCE

The Eighth National Computer Conference will be hosted by ARAMCO in Al Khobar, Saudi Arabia, on 17 Muharram 1406H, October 1, 1985. This will be a continuation of seven national computer conferences since 1394H (1974).

The National Computer Conference will be sponsored by ARAMCO as an industrial representative for the first time following successful conferences sponsored by academic representatives in the Kingdom. Never-ending development in computer technology, its effect on managing computer resources and wide-spread computer use in industry suggests the following appropriate theme:

'COMPUTERS IN MANAGEMENT AND INDUSTRY'

1. Computer Management and Utilization
2. Computer Graphics
3. Office Automation
4. Computers in Education
5. Data Security
6. Centralized vs. Distributed Systems
7. Computers and Simulation
8. Computers in Industrial Processes
9. Other (Specify)

The conference will include working sessions on the following key issues:

1. Computer Industry in Saudi Arabia
2. Automation of Industry
3. Computer Literacy and National Concern
4. National Computer Data Communications Requirements

The deadline for receipt of paper topic abstracts (minimum 250 words, maximum 700 words) is March 6,1985. The notification date for acceptance of abstracts is April 15,1985. The full text of papers accepted by the selection committee is to be submitted by July 17, 1985. Abstracts and papers should be mailed to the following address:

CHAIRMAN, Paper Selection Committee
8th National Computer Conference
ARAMCO P.O.Box 1748
Dhahran 31311, Saudi Arabia.

(PR – 1 – 85)

[illegible] Dhahran [illegible] [illegible] Riyadh [illegible]

MOORE

from page 59

Computer Devices' board members asked him to join the firm. Moore's mission, as the board members described it, would be to manage the explosive growth the firm believed its newly launched Dot would generate. But the Dot did not make a dent in the burgeoning micro market.

"I started to look into the situation, and I found the Dot," Moore recalled in a recent interview. "It was very apparent to me, because of my own background and work, that the Dot wasn't going to fly." With IBM compatibility starting to become an important factor in the marketplace, Moore believed that the Dot's 3½-in. disk drive would be its death knell.

Shortly after its initial personal computer fiasco, the company unveiled the Dot 2, an IBM Personal Computer-compatible machine that, despite its compatibility, floundered in a market already flooded with IBM clones.

Although he knew the company was headed for rocky times, Moore nevertheless decided to join Computer Devices as executive vice-president in August 1983.

While some would have steered clear of such circumstances, Moore said he was "intellectually hooked" and believed the company's basic business — manufacturing and selling portable terminal/printers — was a sound one. "By that time, the assignment had changed from managing explosive growth to seeing if I could turn around a difficult situation," he explained.

When 1983 ended, the company had reported a $20 million operating loss, had slashed its work force from more than 400 to 100 and shut down two of its three buildings. In addition, Computer Devices was slapped with a class action suit brought by shareholders who claimed they were defrauded when the company made an $11 million public offering three months before its bankruptcy.

Moore said the New York court in which the class action suit was filed has agreed to dismiss the company from any liabilities. That action relieves the company from paying up to $11 million in damages sought by the shareholders.

The shareholders' suit was followed in 1983 by a Securities and Exchange Commission (SEC) investigation into possible illegalities involving the stock offering. That investigation is continuing, Moore said. An SEC spokesman in Boston said that the agency does not comment on such legal investigations.

The company's reorganization efforts have not only involved a sharp reduction in staff and facilities but also a renewed emphasis on its traditional business — a portable computer terminal/printer called the Miniterm 2000 series. More than 44,000 Miniterms have been sold since the product was introduced in 1969.

"What had happened was the [Computer Devices] management team had opted to build a personal computer business on top of this base business — and it failed," Moore said. "I did the obvious thing. I stripped it back down to the basic business that had been historically successful."

Moore acknowledged that the bankruptcy has had a negative effect on the company's sales to new customers. The General Services Administration, for example, denied Micro Devices a contract last year because the company was operating under Chapter 11.

Although the company is not yet out of the woods, it is making some strides. Last summer, it paid off about $1 million in secured debt owed to the Bank of New England.

> *Moore said he was "intellectually hooked" and believed the company's basic business was a sound one.*

The company reported a net income of $423,000 for the nine-month period ended Sept. 29, 1984, on revenue of $5.1 million. That compared with a loss of $11.6 million on revenue of $13 million during the comparable period in 1983.

If Computer Devices does emerge from Chapter 11 — a milestone Moore expects to reach this summer — it still faces claims totaling nearly $7.5 million from 600 unsecured creditors. Moore estimated that the company will end up having to satisfy only between $5 million to $6 million in claims under the reorganization plan.

Besides continuing its Miniterm business, the company hopes to raise additional capital through licensing its Dot-related technology. Moore said "low-level" talks are taking place with some parties, which he declined to identify.

Computer Devices raised $200,000 last year when Prime Computer, Inc., a Natick, Mass.-based minicomputer manufacturer, purchased nonexclusive rights to certain parts of the Dot technology, including the circuit design, circuit prints and a copy of the machine's basic I/O system source code.

The company is also considering handling other vendors' products on an OEM basis. Additionally, the company is considering exploiting its existing field service network by entering the third-party maintenance field. Moore said the firm is "studying gingerly" the possibility of providing maintenance for the Personal Computer. That area may not prove promising, however, due to the competition that would come from such established players as Sorbus, Inc., TRW, Inc. and Control Data Corp.

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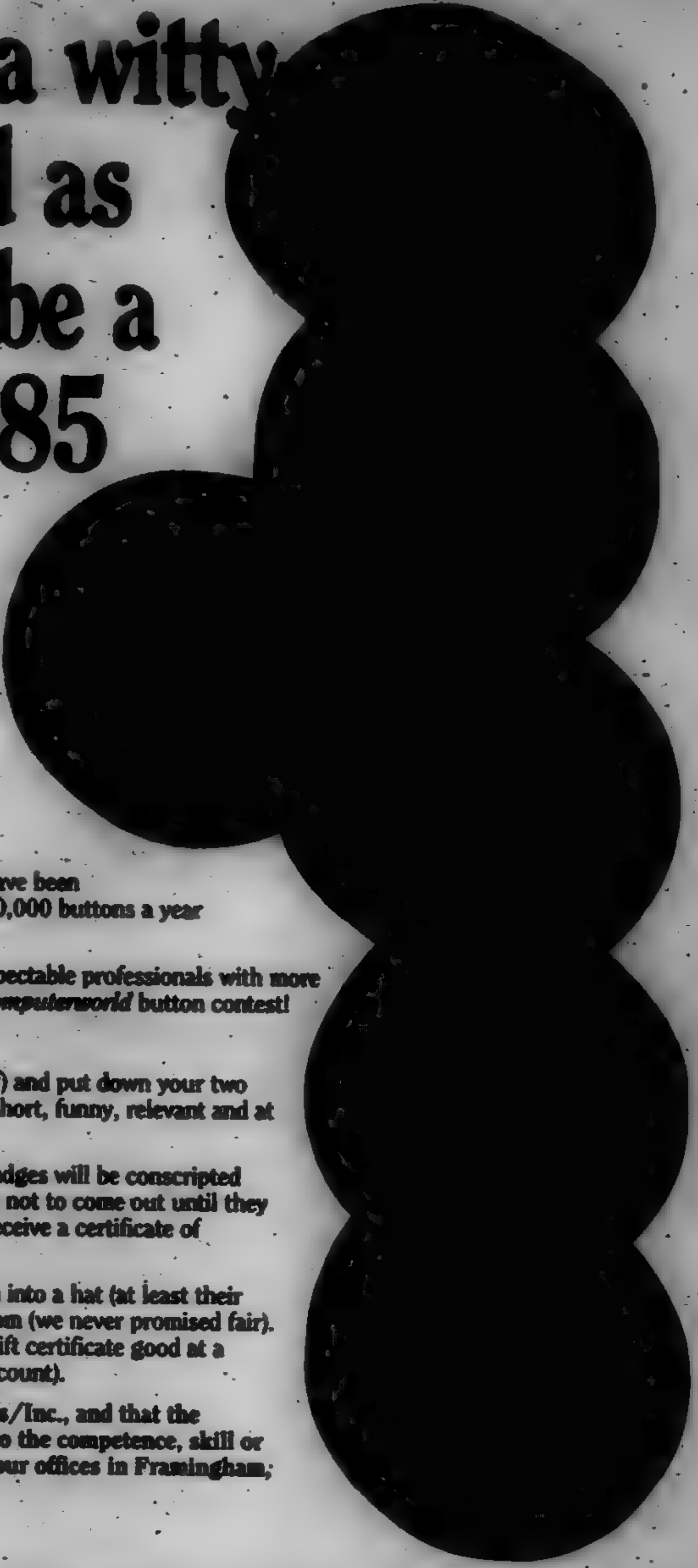

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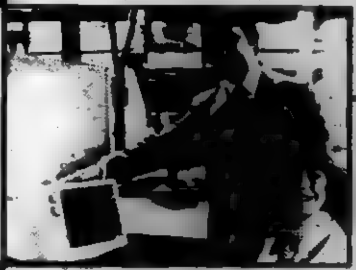

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EOE M/F/H

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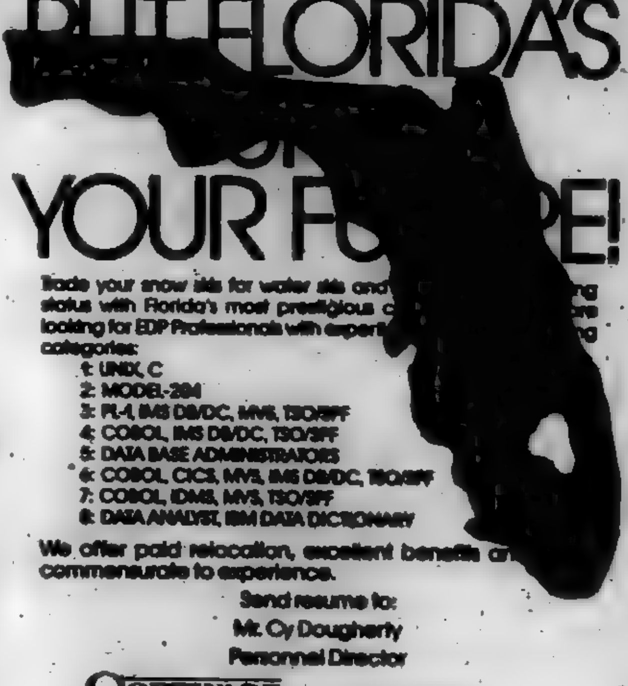

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Personnel Director

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Attn: Michael Robinson
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Chicago, Illinois 60611

SEI information technology

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CORPORATION
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Qualifications for this position are a minimum of 3 years of data processing experience with a working knowledge of COBOL and System 2000 involvement in data base design or senior programming responsibilities. A college degree in mathematics or computer science is preferred. Experience working in a clinical setting is desired.

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Employment Manager
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Data Processing

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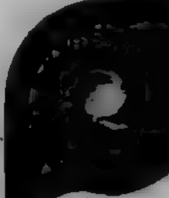

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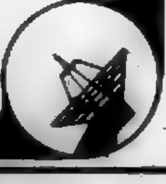

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EOE M/F

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EOE M/F/H/V

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We offer a professional working environment, competitive salary/benefits package and excellent opportunity for advancement. Only resumes stating salary history and requirement will be considered. Please forward to: Manager-Employment and Staffing, Dept. CW2255, DURACELL, INC., 4261 Communications Drive, Norcross, Georgia 30093. An equal opportunity employer M/F/H/V.

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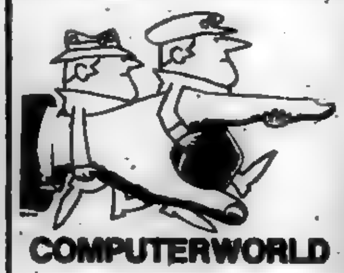

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We are seeking a Sr. Systems Programmer to support VM/SP and related software. If you have a minimum of 4 years VM systems programming experience, including installation, maintenance, VM internals, and strong diagnostic skills, plus experience in Assembler language coding, you may qualify for this position.

Staff MVS Systems Programmer

Perform problem determination, installation and maintenance activities for a JES2 MVS operating system as well as propose and implement state-of-the-art software enhancements to improve service and productivity. Provide technical leadership in software-related projects and planning efforts in the Corporate Computer Center. 7 years MVS systems programming experience with in-depth knowledge of at least one major subsystem and strong diagnostic skills may qualify you for this position.

Product Development

Amdahl continues to expand performance and productivity with forward-looking products for customers dealing with large-scale data processing.

Sr. Systems Programmers

Participate in the design, development and testing of current and future products. May assume responsibility for source control systems. Requires 5 plus years in support or development of 370 operating systems. Assembler language coding experience mandatory. Experience with VM/SP systems desirable.

Staff Systems Programmers

Responsible for implementing enhancements to a highly modified VM operating system which will be used to simulate future products. This position could also involve building a new simulator. Requires 5 plus years VM experience to include internals, externals, and maintenance. Assembler language coding experience mandatory.

Staff Systems Programmer

Play a major role in a key development project, including development of Multiple Domain Facility and related functions for future products. Requires 8 plus years experience in systems development with in-depth knowledge of 370 architecture.

Staff Systems Programmers

Participate in the design, development and testing of a key development project. Assume responsibility for existing code for 370 and XA mode recovery. Design and implement recovery enhancements for future products. We require 5 plus years experience with IBM 370 Architecture, Assembler language, thorough knowledge of MVS Recovery, channel and machine check handling.

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Sr. Microprocessor/Microcode Design Engineer

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Or send your resume to Kim or Bob at Amdahl Corporation, Dept. 12-803, MS-360, P.O. Box 3470, Sunnyvale, CA 94088-3470. We are an equal opportunity employer through affirmative action.

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Computing facilities include the Department's own VAX 780 and business mini-computer systems - there are plans to at least triple the total CPU power. In addition, the Department is a major user of the 12-MIPS, 16 megabyte IBM 3081GX mainframe computer system of the University's Computer Centre. The office of each academic staff is equipped with an IBM PC-based workstation which is connected to both the IBM 3081GX and the VAX 780 systems. Computing laboratories that are currently being set up include Logic Lab, Micro Lab, Information Systems Lab, Graphics Lab, Data Communication and Computer Networks Lab. Current research interests include: artificial intelligence, local area networks, software engineering, database management, microcomputer applications, office automation and theoretical computer science. Other areas are being developed. Research grants for fundamental as well as applied research are available. The Department currently has 45 academic staff members and will expand to 82 by 1988. The Department is accommodated in a new 5-storey building in the heart of the Science Complex.

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PROGRAMMER/ANALYST—To design logic, code, test and debug programs, you must have 3+ years programming experience including COBOL, CICS and MVS.

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Interested candidates should submit a confidential resume and salary requirements to:

Ms. Clarie K. Smith
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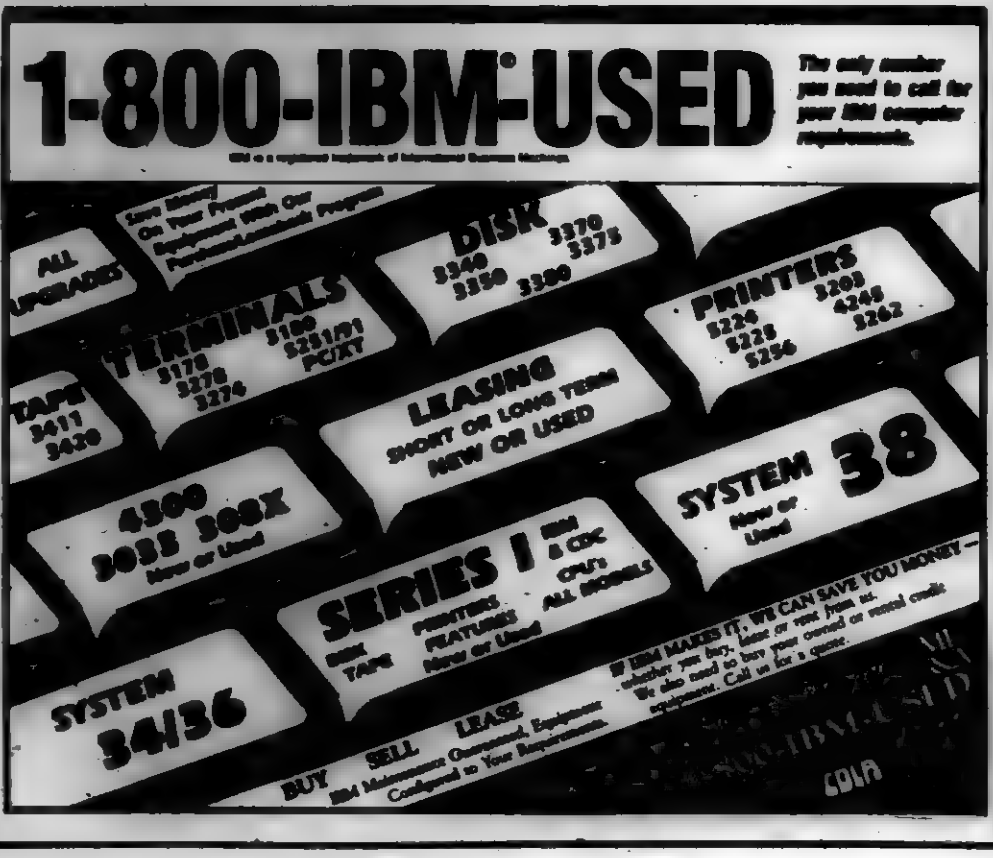
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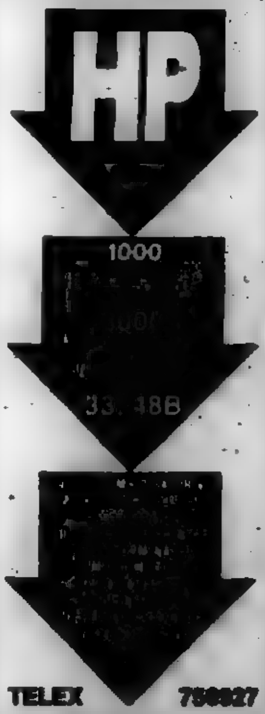

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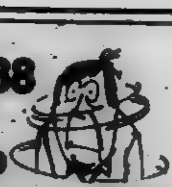

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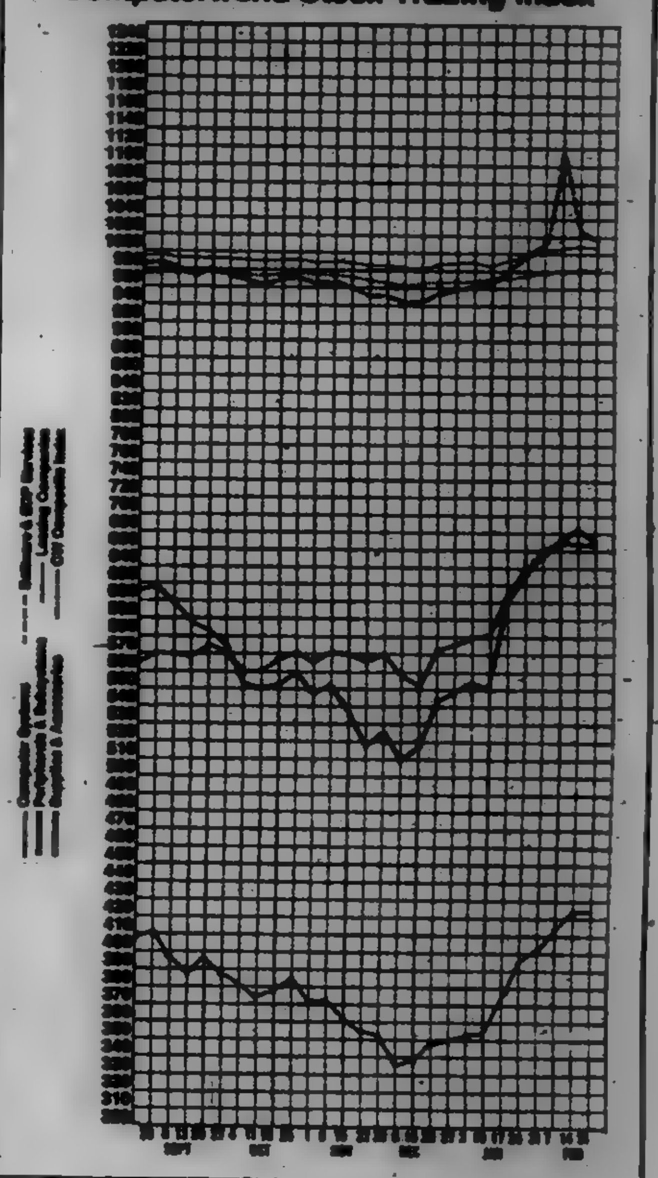
Computerworld Stock Trading Index



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CLOSING PRICES WEDNESDAY, FEBRUARY 20, 1985

EXCH	COMPANY	1984-85 RANGE (1)	CLOSE FEB 20 1985	WEEK NET CHANGE	WEEK PCT CHANGE
	COMPUTER SYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	LEASING COMPANIES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SOFTWARE & EDP SERVICES				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	PERIPHERALS & SUBSYSTEMS				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	SUPPLIES & ACCESSORIES				
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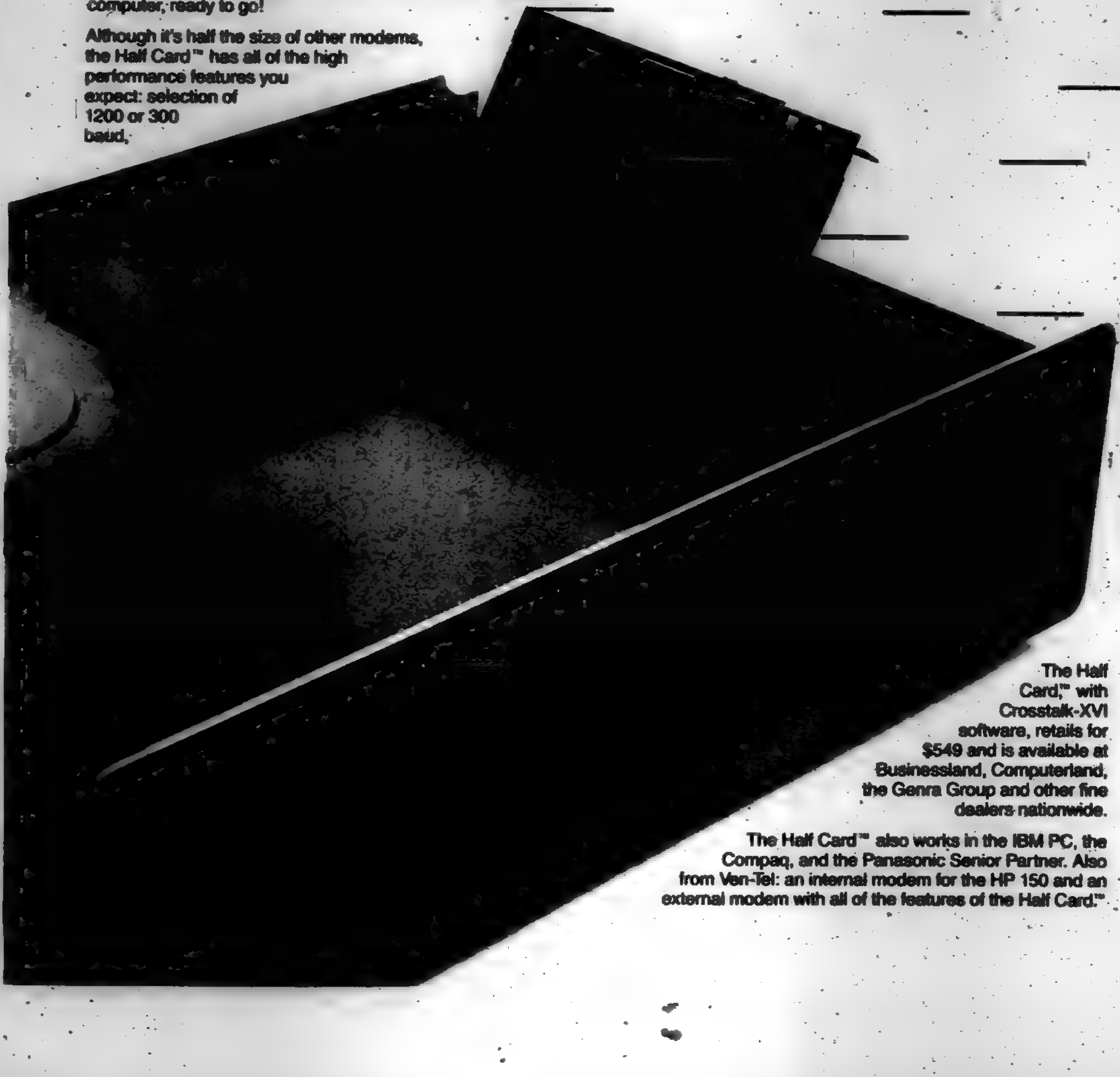

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ISSUE 9

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relational run?
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Jury finds Burroughs defrauded B800 user

Company will appeal costly B800 verdict

By Tom Henkel
CW Staff

SAN FRANCISCO — A jury here has determined that Burroughs Corp. committed fraud and breach of contract when it leased a malfunctioning B800 minicomputer to a local insurance company in 1978.

Beaver Insurance Co. was awarded $785,300 in actual damages on the fraud charge and $14,000 on the breach of contract charge. The combined award of $799,300 is said to be the largest judgment to date in an ongoing string of lawsuits filed by unhappy users of Burroughs' B80, B700 and B800 systems.

James W. Olson, associate general counsel for Burroughs, said the firm hopes to have the verdict overturned in the Beaver Insurance case, claiming "the jury returned two confused and contradictory verdicts on two successive days."

Olson explained that on Feb. 21 the jury determined that Burroughs had committed fraud and awarded Beaver Insurance $872,555 in punitive damages. It did not award actual damages, however. Burroughs maintained that this was illegal, and the jury was instructed to reconsider its verdict. The jury returned Feb. 22 and awarded Beaver Insurance $785,300 in

See **FRAUD** page 4

AT&T 'orphans' coming of age

By James Connolly
CW Staff

First in a three-part series

The dust is settling out there behind the new AT&T homestead, back where old Ma Bell left her seven orphans to build their own lives.

Now, out of the cloud of dust that has swirled for 14 months, seven new homes have emerged, and they are more luxurious and expansive than most people thought the orphans were capable of constructing.

The seven regional holding companies divested from AT&T are clinging to some of the familial ways while building their own independent structures. Their first year of independence was one of turmoil — for them and for their customers — but also one of success.

Although these companies may seem like shoeless waifs compared to the predivestiture Bell family and although they face troubles en route to long-term success, the holding companies had revenues in excess of $7 billion and profits exceeding $800 million in 1984. As a group, the seven had revenue exceeding IBM's $46 billion sales by about $12 billion.

Whether the seven offspring succeed may depend on one's viewpoint. To make

See **OFFSPRING** page 8

Planned merger challenges oil firms' DP staffs

Chevron, Gulf form task forces with eye toward easing MIS integration

By Jeffry Beeler
CW West Coast Bureau

SAN RAMON, Calif. — Although the proposed merger of Chevron Corp. and Gulf Oil Corp. has yet to win formal approval from the Federal Trade Commission, both companies are already busily laying the groundwork for joining their sprawling MIS organizations.

The two petroleum industry giants have formed approximately 30 in-house task forces to study the merger's long-term implications and to formulate plans for integrating Chevron's and Gulf's main operating disciplines, including MIS.

Most of the task forces, which consist of two or three representatives from each company, have already completed preliminary sketches of their final merger plans and are now beginning to fill in the broad outlines. For the next several months, the process of fleshing out the bare bones will continue, according to Chuck Oldenburg, general manager of Chevron's Computer Services Department. In the end, the study groups expect their collective efforts to result in a set of comprehensive blueprints that will guide the two corporations through key facets of their overall merger, the largest in U.S. corporate history.

Implementation of the plans, however, will require the consent of the FTC, which is expected to approve the proposed merger either this month or in April, according to Oldenburg.

As it applies to the two firms' MIS organi-

See **MERGER** page 14

TOP OF THE NEWS

AT&T proposed a 56K bit/sec service it claims will provide low-cost, high-speed data transmission to business users. Page 2.

■

Hewlett-Packard Co. added 282 packages to its microcomputer line, including software that strengthens integration between HP and IBM micros. Page 4.

■

Topview is riddled with problems. That is what early users and analysts of the IBM microcomputer operating environment said. Page 5.

■

Chip manufacturers continue to suffer profit and order declines and are reacting with mass firings. Page 10.

■

NCR Comten, Inc. unwrapped a low-end processor that can be used in both IBM Systems Network Architecture and non-SNA environments. Page 77.

PRODUCT SPOTLIGHT

Releases boost IBM Dasd line

Compatible disk makers' prospects appear grim

By Tom Henkel
CW Staff

In the past year, IBM made the most dramatic and sweeping changes to its top-end mainframe lineup in five years. Along with announcing a well-documented list of mainframes, IBM has virtually replaced its large-scale Dasd product line with units using newer technology. The combination of important IBM announcements promises to have a significant impact on mainframe users and may spell trouble for makers of IBM-compatible products.

The list of IBM mainframes announced in the past year is impressive. They range from the recently announced high-end 3090 models to enhanced models of the entire 3080 line and to additional models in the 4300 series of midrange systems.

If the mainframe announcements were not enough to keep DP executives up late at night peering over new product literature, IBM has also spent the past year making significant, and in some cases long-awaited, changes to its Dasd family. These changes range from the recently announced double-capacity 3380 disk drives and cache memory enhancements

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NEWSPAPER

AT&T proposes high-speed service

Would yield 'economical' 56K bit/sec transmission

WASHINGTON, D.C. — AT&T last week filed tariffs at the Federal Communications Commission proposing a high-speed switched 56K bit/sec digital service as part of its Accunet family of services.

Accunet Switched 56 Service, AT&T said, will offer business customers an economical alternative to dedicated private lines for sending voice, data and video signals at high speeds.

The proposed service, which will become available April 12 if the FCC approves it, differs from the existing family of Accunet services. Customers would be using a digital network with shared switched facilities rather than using a dedicated private-line service such as Dataphone Digital Service. Thus users would pay only for actual transmission times as opposed to fixed private-line tariffs incurred in point-to-multipoint configurations, AT&T said.

AT&T Communications said it saw the predominant use for Accunet Switched 56 Service in the transmission of large blocks of data, the expansion of existing private-line networks without additional add-on costs of private lines and the transmission of graphics, high-speed facsimile and full-color video teleconferencing.

The rates AT&T proposed for Accunet Switched 56 Service range from a minimum of 33 cents for the first 30 seconds, plus 6 cents for each additional six seconds, to a maximum of 45 cents for the first 30 seconds, plus 8 cents for each additional six seconds. AT&T said that the proposed service would require the customer to have either a 56K bit/sec or a 1.54M bit/sec local access channel to connect from the local exchange to the AT&T switch, the rates for which vary from state to state.

AT&T said that an initial 34 cities would have the service available in 1985 and that another 36 cities would be serviced in 1986.

FCC delays switched access charges

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The Federal Communications Commission said it will delay the scheduled implementation of annual switched access charges of local telephone companies from June 1 until Oct. 1. The FCC also said it will order reductions in Message Toll Service (MTS) and Wats rates to take effect June 1 to reflect the collection of $1 end-user charges.

The delaying action, which will affect carriers more than communications users, came after Bell Atlantic and Nynex Corp. petitioned for a delay of implementation of switched access charges. Switched access, as opposed to special access, involves switching publicly tariffed services through the facilities of the local telephone companies. On March 1, the FCC was slated to take up the issue of special access cost rates [CW, Feb. 25].

The primary reason for delaying the June 1 date for switched access charges, the FCC said, was to avoid "confusing revisions to pending proposals" affecting switched access, proposals now awaiting FCC action.

Bell Atlantic, citing the proposed AT&T private-line tariff restructuring [CW, Jan. 28], said the tariffs raised problems "by inviting connection to the AT&T private-line network through nonexchange carrier facilities . . . [and] would exacerbate bypass of both switched and special access facilities."

Projected to raise $2 billion annually

The collection of the $1 monthly access charge to residential customers, slated to start June 1, is projected to raise up to $2 billion annually, which will be transferred through dollar-for-dollar rate reductions in MTS and Wats. The FCC suggested that this could mean reductions averaging 6.5%.

A $6 monthly access charge on multiline businesses has been in effect since last June.

Meanwhile, an informed source within the FCC said the scheduled March 4 implementation of planned revisions to AT&T Communications private-line rates will be postponed.

The planned revisions to AT&T's private-line rates would mean an average 8.6% hike in costs for private-line users, raising fees for voice-grade use but dropping them substantially for T1 facilities and data communications services such as Dataphone Digital Service.

Court finds remote DP usage taxable

Firm's interstate processing denied tax exempt status

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Supreme Court has sustained a state court decision that an Ohio insurance company must pay state tax on its use of remote data processing services, even though the computer services are conducted in another state.

The justices rejected an appeal by Union Central Life Insurance Co. of Cincinnati, which contended that its contract with Electronic Data Services Corp. (EDS) of Dallas is a transaction in interstate commerce and thus not subject to state taxation.

Ohio tax authorities decided to impose the state's use tax on the monthly fee that Union Central paid EDS for programming services, computer time and use of equipment. The Ohio Supreme Court upheld the tax assessment over Union Central's objections.

Ohio imposes the use tax on the "storage, use or other consumption of tangible personal property [in the state]," and state courts have ruled that it applies to data processing services.

In asking the Supreme Court to review the case, Union Central urged the court to provide guidance to states on the taxation of interstate data processing services, including access to on-line data bases. The firm noted that a new Ohio law explicitly taxes data processing equipment and that 44 other states and the District of Columbia impose sales and use taxes. The Ohio officials, however, said the matter was properly handled by the state and was not subject to federal jurisdiction.

Since 1969, Union Central has had a facilities management contract with EDS. VDTs, hard-copy terminals and high-speed printers were placed in Union Central's offices in Forest Park, Ohio, and were linked by telecommunications lines to EDS computers in Dallas, court documents said.

In 1983, Ohio tax authorities ruled that because the ultimate object of the transaction was to obtain processed data — in the form of VDT screens or hard-copy printouts — for use in Ohio, the transaction was subject to the state's use tax.

The fact that data was processed in Texas and retrieved over interstate telephone lines does not preclude state taxation, Ohio's filing said, because "this was a data processing transaction and the use tax was on the appellant's receipt and use of the printouts in Ohio."

NEWS SUMMARY

Hewlett-Packard Co. has introduced a wide array of personal computer software/4

Despite a lot of preshipment hype, IBM's Topview operating environment looks like a dud, according to early users and industry analysts/5

IBM has announced increases in the rental, lease and monthly maintenance fees on virtually all of its hardware and program products/6

Although the divested Bell operating companies are trying to upgrade their networks and improve their responsiveness, service remains a headache/8

The semiconductor industry slump has resulted in more layoffs and reduced workweeks/10

The Institute for the Certification of Computer Professionals is still struggling with the effects of a printer error that switched the covers on two of its certification booklets/12

The National Science Foundation has announced that four supercomputer centers will share $200 million in government grants/13

If the proposed merger of Chevron Corp. and Gulf Oil Corp. becomes a reality, Gulf's computing operations and credit card processing activities will eventually be disbanded/14

CW at Info/Central: Micro-mainframe links, local-area networks and communications software were hot topics here . . . Prototyping can be an invaluable aid in the development of high-quality applications, but it should not be an excuse to abandon traditional techniques and methodologies . . . The proliferation of micro-mainframe links means increased demands for MIS managers. . . Careful planning and management involvement was crucial to automation at Metropolitan Life Insurance Co./**17-22,36**

Product Spotlight: Direct-access storage devices/**24-27**

Salaries for programmers and data base administrators will be among the fastest growing wages for DP personnel in 1985, a recent study revealed/**33**

A magazine subscription marketer is using computer-based instruction software to create on-line tutorials for its customers/**34**

Managers at RCA Corp. are using SCA Products and Services, Inc.'s Gateway to gain access to the corporate data base/**35**

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Apologies for the delay

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HP doubles micro software lineup, adds 282 products

NEW YORK — Hewlett-Packard Co. doubled the number of software programs available for its personal computer line in the U.S., announcing an additional 282 products here last week.

The announcement featured the HP-developed Graphics Gallery and Executive software lines, designed to work together on the HP Touchscreen Personal Computer to produce merged text and graphics, HP said.

HP also introduced IBM Personal Computer versions of four popular software packages that, according to HP, give users the ability to share data files and reports between HP and IBM microcomputers over HP's electronic mail network.

Graphics programs available in March

The Graphics Gallery programs, all available this month, are reportedly optimized for text and graphics output on HP plotters and printers. Users may employ either the touchscreen or the new HP Mouse, which will cost $210 and will ship this month. The three applications can be bought separately; they are also available bundled for $585.

Charting Gallery, priced at $265, reportedly takes data from programs such as Lotus Development Corp.'s 1-2-3 and produces pie, bar and line charts. Solid-fill characters can be generated, the company said.

Drawing Gallery, which costs $345, is said to allow users to create a wide range of presentation visuals and to edit and embellish visuals for reports. The package also includes a library of shapes and pictures.

Gallery Picture Library, Volume II, is priced at $95 and makes available an additional 200 ready-made drawings.

Two members of HP's new Executive family also will be offered this month. Executive Memomaker, an enhanced version of Memomaker, will cost $245. The program can take output from the Graphics Gallery packages and insert them into letters, memos and reports. Executive Memomaker features single-screen editing, enabling users to see the merged text and graphics page as it will appear on the output, and includes a 53,000-word spelling checker, according to HP.

Execudesk, priced at $95, is said to act as an environment that provides quick switching and data sharing between HP-developed Touchscreen applications.

Personal Computer programs out

The four new HP applications for the IBM Personal Computer are said to permit the IBM micro to act as a workstation in HP's Personal Productivity Center.

The packages include the Personal Card File, which emulates a Rolodex card file, priced at $160; Memomaker, priced at $160; Advancelink, a file-transfer package, priced at $295; and Textcharts, a program designed to create large presentation-quality text output, priced at $200. All will be available this month except for Textcharts, which is scheduled for April delivery.

HP also introduced a Human-Interface Loop (HP-HIL) card for the Touchscreen Personal Computer. Priced at $155 and available this month, the HP-HIL board connects a variety of input devices (including keyboards, a mouse and graphics tablets) to the Touchscreen computer.

More information on the new products is available from HP, Inquiries Manager, 1020 N.E. Circle Blvd., Corvallis, Ore. 97330.

FRAUD

from page 1

actual damages, this time without punitive damages. Claiming the jury may have been confused, Olson said, "Burroughs will file a motion asking the court to enter a judgment in favor of Burroughs notwithstanding the verdict. Or, [Burroughs will] request a new trial because of the jury's inconsistent verdicts."

Beaver Insurance charged that Burroughs overstated the capabilities of its B800 system and failed to explain that there were unresolved technical problems with the system when the insurance company signed a three-year lease with Burroughs in March 1978. The suit also charged that Burroughs deliberately misled Beaver Insurance into believing the B800 had interactive, multiprogramming capabilities. The firm charged that those multiprogramming capabilities were greatly limited by a file lockout feature that prohibited more than one user from opening a B800 file simultaneously.

Beaver Insurance filed suit in May 1981 in the U.S. District Court for Northern California, charging fraud and breach of oral and written contracts for both the B800 system and Burroughs' maintenance of the system. The company also charged that Burroughs was negligent in providing adequate preventive maintenance on the B800 system and failed to deliver a vital software package.

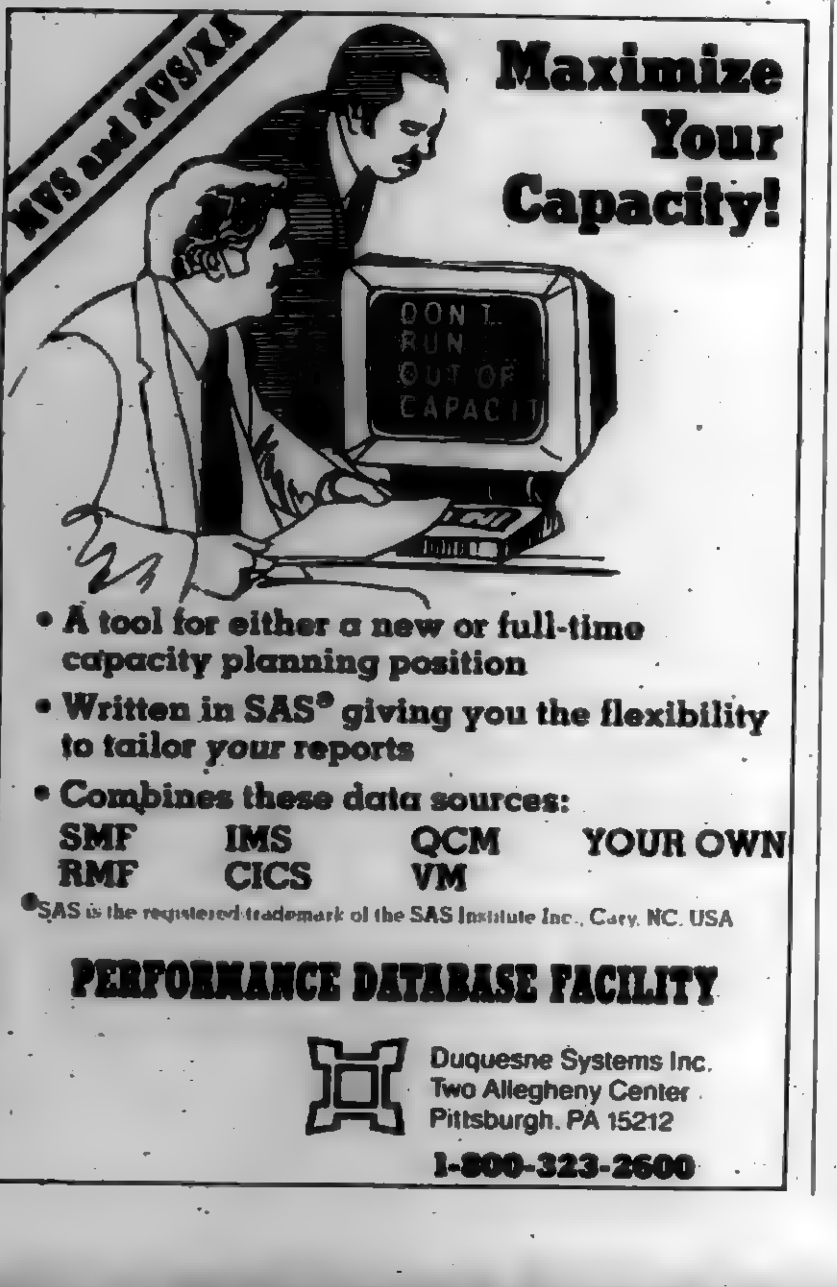
The jury ruled in favor of Beaver Insurance on the fraud and breach of contract charges but ruled for Burroughs on the breach of warranty and negligence complaints.

According to attorney Richard Perez, of Perez, McNab & Cook, the Orinda, Calif.-based law firm representing Beaver Insurance, the case focused on two basic issues: The B800's reliability and deficiencies in the system's multiprogramming capabilities. The suit charged that Burroughs told Beaver Insurance the B800 could perform multiprogramming functions similar to those found in larger computer systems. Namely, Perez said, Beaver Insurance believed that multiple users would be able to open a file, as long as they were accessing different records stored within that file. The file lockout feature, Perez maintained, prohibited more than one user from opening a file at one time.

Beaver Insurance also charged that the B800 system was unreliable and was subject to frequent, unexplained system crashes, which caused Beaver Insurance to lose data and perform frequent cold starts or system generation.

The insurance company charged that the B800 system was inoperative roughly 40% of the time during its first two months of use. The company also said it continued to have problems with the system until 1980. The B800 system was removed from Beaver Insurance's offices in June 1981. Perez said Beaver Insurance is now using a Hewlett-Packard Co. HP 3000 CPU, Perez said.

The insurance company claimed the frequent system failures were a result of internal memory problems on the B800, which Burroughs corporate management knew existed before it signed the three-year lease. The insurance company also charged that by not informing its maintenance personnel of the memory problems, Burroughs took longer than necessary to identify and repair system problems. This, Perez said, was the result of allegedly defective diagnostic tools used by Burroughs maintenance personnel. Perez said it often took two or three visits by Burroughs maintenance people to identify and repair a problem.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IBM's Topview plays to poor reviews of early users

Limited RAM, software undercut usefulness

By Paul Korzeniowski
CW Staff

Analysts and early users report that IBM's Topview is riddled with problems.

Although Topview may eventually become IBM's most significant microcomputer software package, the product seems to be following the path of the PCjr, which was deemed a flop in its first year but appeared to rebound upon entering its second year.

"I was not very impressed with Topview," noted John Oski, an analyst at Bank of New England NA. "It is limited, and I just do not see a real need for the capabilities it provides."

Topview provides a number of windows into which a user can load applications programs, switch from one application to another by pressing a key or clicking a mouse and move data between applications.

Even though the product theoretically allows users to switch between a number of programs, the actual number with which they can work is rather limited, according to Oski, who evaluated a beta test copy of the program.

RAM need creates limitations

Limitations arise from Topview's random-access memory (RAM) needs, he said. To run Topview, 167K bytes of RAM are required, and for each application that is loaded, more RAM is needed — the exact amount depending on the function a program is performing. The maximum amount of RAM that Topview can address is 640K bytes.

"If you load Topview with [Lotus Development Corp.'s] 1-2-3 and a large spreadsheet, the 640K bytes are gone, and you can't load a second or third program," Oski claimed. "Then, what's the point of using the product?"

In addition to the RAM problem, Oski noted that right now there are few packages tailored to run under Topview. "If you run 1-2-3 or [Multimate International Corp.'s] Multimate, it takes up the whole screen and does not allow you to call up various windows," he said. The 1-2-3 and Multimate packages would have to be rewritten to solve this problem.

Program parameter change required

IBM provided a list of approximately 70 programs that could run under Topview. The list includes Ashton-Tate's Dbase II, Dbase III and Framework and Microrim, Inc.'s Rbase 4000. For these programs to run, a user must change a program's parameters, a task that novices may be unable to complete, Oski said.

Richard Strauss, vice-president of products at Corporate Software, Inc., a Waltham, Mass., value-added software distributor, claimed that no windowing package can efficiently run on an IBM Personal Computer.

"Windows were originally designed for use on a [Xerox Corp.] Star," he said. "That machine had a larger screen than the [IBM] Personal Computer. If one works with windows on an IBM Personal Computer, one can effectively use only two windows. As one adds windows, applications shrink, and windows become too small to see. Also, when one calls up a window, often it covers the information you were going to compare it with."

Another Topview weak point that Oski listed was the inability to use some IBM PC-DOS operating system commands. "For one printer function, Topview required 13 steps compared with a single PC-DOS command," the analyst said.

Unlike Apple Computer, Inc.'s Macintosh, Topview was not designed to support elaborate graphics capabilities. Topview is character oriented rather than graphics oriented, which means that users enter commands rather than point at icons. Also, Topview does not easily work with stand-alone graphics programs that run in a manner similiar to 1-2-3 and Multimate.

Lack of graphics support not deterrent

Yet analysts did not judge the lack of graphics support to be a serious deterrent. "Most users work with letters rather than pictures," Strauss said. "People who work in art departments may need graphically oriented interfaces. But most users only require the graphics capability provided in a product like 1-2-3."

Robert Lefkowitz, director of microcomputer software research at Infocorp, a Cupertino, Calif., market research firm, added, "When a first-time user looks at Macintosh's menu, he has to consult a manual to determine what the icons mean."

One positive Topview feature is its ability to move data between different applications. "Topview moves data between applications much better than the conversion routines available in most programs," Oski noted.

Despite Topview's flaws, analysts and early users agreed that the product could play an important role in the future. "IBM is committed to making Topview work. IBM will take whatever steps are necessary to make the product work, just like it did with the PCjr," Lefkowitz said.

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Fee increases of 5% to 7% affect most IBM merchandise

RYE BROOK, N.Y. — IBM has increased the rental, lease and monthly maintenance fees on virtually all its hardware and program products by 5% to 7%, effective June 1.

The across-the-board increases affect almost all IBM products, except IBM's Personal Computer line and other products that have experienced price changes in the past six months, an IBM spokeswoman said. IBM also increased its systems engineering service fees by 8% and boosted its per-call maintenance fees by 10%. Those price changes became effective in late February.

Equipment, lease and rental fees and most program product licensing charges were increased by 7%. Monthly contract maintenance charges on some products were increased by 5%, 7% or 10%, depending on the product, the spokeswoman said.

As examples of the increases, the spokeswoman said the monthly rental fee on a 3083 Model B processor with 32M bytes of main memory was increased from $102,380 to $109,538. The monthly lease fee was increased from $81,900 to $87,630 for a four-year lease plan. Likewise, the monthly rental fee for a 3084 Model QX processor with 64M bytes of main memory was increased from $402,630 to $462,625, and the monthly lease rate was hiked from $345,900 to $370,100 for a four-year lease agreement.

Monthly maintenance charges were unchanged on the two products. The monthly rental charge on IBM's 3480 tape drive (Model A) was increased from $3,630 to $3,880, and on the unit was increased from $360 to $385.

The spokeswoman said the 7% software price increases will not affect products distributed by IBM but manufactured by another vendor and sold under the vendor's label. In addition, IBM program products that have been subject to recent price increases will not be affected by the 7% program product price hike. The increase in licensing fees applies to IBM's initial, monthly and basic license fee arrangements and the Distributed Systems Licensing Option (DSLO).

To illustrate the pricing change, the spokeswoman said the initial license fee for IBM's MVS/SP-JES3 Version 3 Release 2 will increase from $13,500 to $14,430. DSLO pricing for the same product will increase from $10,125 to $10,821.

"Program products are becoming increasingly important to our customers," the spokeswoman said. "IBM is being asked to provide additional [software] features and support. We have increased our resources to do that, and the price increases reflect that."

More information on the price increases is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

DEC to unveil office wares

MERRIMACK, N.H. — Digital Equipment Corp. today will announce a number of office systems products, including enhancements to the Rainbow personal computer series, the company said.

DEC acknowledged last month that it was shutting down production of the Rainbow at its Westfield, Mass., assembly plant, but the company maintains it is not abandoning the microcomputer line.

During today's announcement, DEC President Kenneth Olsen and other senior executives are scheduled to describe DEC's views on how micros fit within an overall office workstation strategy. Upgrades to the Decmate line of word processing micros will be unveiled, DEC said.

The new offerings will provide "important price/performance improvements in environments where users interface with larger systems through personal computers," according to the company.

Datapoint posts loss, files suit to halt takeover

SAN ANTONIO — Datapoint Corp. has posted a $15.9 million, or 79 cent/share, loss for its second quarter, down from the $1.45 million profit it posted the previous quarter.

Revenue for the quarter declined 8% to $130 million, compared with revenue of $140 million the same quarter a year ago. Datapoint Chairman Harold O'Kelley last week attributed the profit decline to drops in domestic orders primarily owing to "recent speculation and uncertainty of the future ownership" of the company.

In a related matter, Datapoint last week filed suit in both U.S. District Court and state court in San Antonio, seeking to enjoin investor Asher Edelman of New York from further pursuing a bid for control of the company through the removal of its board of directors. The suit alleges that Edelman and others involved in a group of partnerships that he controls would violate federal antitrust statutes if they proceeded with the takeover attempt.

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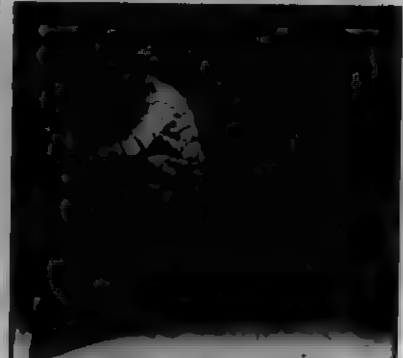

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Telecom managers: Divestiture hassles unresolved

By James Connolly
CW Staff

Telecommunications managers interviewed recently concurred that some divestiture-related problems have abated, but this does not translate into satisfaction.

"Certainly, anything would have been easier than [Jan. 1, 1984]. Our local company, New England Telephone Co., was totally unprepared for divestiture in terms of dealing with the large corporate user," reported Len Dorrian, manager of telecommunications for Raytheon Co. in Lexington, Mass.

Dorrian, whose 77,000-employee firm is New England Telephone's largest customer, cited some of the problems experienced and progress made since divestiture. His observations echoed the complaints and occasional commendations of telecommunications managers served by the 22 divested Bell operating companies. For example, New England Telephone took five months to set up a central service bureau and to designate a Raytheon account representative to coordinate the company's service, Dorrian said.

"There are still an awful lot of service problems. We've found that most of our network problems have been New England Telephone's fault. In terms of new services, the companies still haven't straightened out in their own minds their network offerings. You'll get two sales reps trying to sell you the same circuit. [Nynex Corp.] wants you to [buy from] them, and New England Telephone wants you to [buy from] them. I don't blame the sales reps; they want the commissions, but they [represent] the same company. We end up going through New England Telephone, because even if we go to Nynex, it's New England that installs the circuit," Dorrian said.

'I don't see any improvement'

In Bell Atlantic Corp.'s territory, "with regard to service, it's getting worse," said David Culen, manager of network services for Blue Cross/Blue Shield's Washington, D.C., headquarters. "I don't see any improvement. You read a lot about reduced backlogs for private lines, but I haven't seen it." He said that with luck, a digital circuit takes six months to install and an analog circuit takes 12 to 14 weeks.

"They [the operating companies] appear to be trying, but there were times early on when I don't think they were, although that's not true of the service people who work here in the building. They have been just super," Culen added.

According to Culen, the service problems appear to be a lack of coordination among the operating companies and AT&T. He advised managers to be persistent in making contact at the right level, not at the clerical level where workers might be content to let a problem sit unresolved, and he stressed the importance of being specific about the problem.

However, Robert Bennis, telecommunications director for Westinghouse Electric Corp., defended the regionals and the divested Bell operating companies. "On the balance I think the [holding companies and Bell operating companies] have come on really aggressively. My most direct experience has been with Bell Atlantic and [Bell Telephone Co.] of Pennsylvania, and I am fairly [pleased with] the way they have responded to this divestiture. They are doing a good job and are receptive to new ideas. There were bound to be glitches, but it's better today than it was six months ago, even if there are still soft spots," Bennis said.

OFFSPRING from page 1

such a judgment, user, investor, regulator or competitor must consider the following:

- Complaints continue about poor service and confusion about who can provide a given service, product or answer — the 22 local operating companies, AT&T or a new regional subsidiary.
- Most of the companies have attacked new markets, reselling communications and office equipment and branching into fields like real estate, consulting and publishing.
- The companies are continuing efforts to digitize their systems in anticipation of futuristic integrated services digital networks (ISDN).
- The seven are subject to the whims of federal and state regulators and the divestiture court, all of whom may hold against them the companies' first year financial successes when deciding whether to allow new ventures and new rates.
- A monster called bypass still lurks in the shadows.

W. Page Montgomery, vice-president of Economics and Technology, Inc. consulting firm, said the regional holding companies must do two things to succeed.

"With respect to plain old telephone service, they need to find new ways to avoid the loss leader they have now, which is home telephone service," Montgomery said. "They have to find new ways to get the average customer to cover his cost. Most people can afford this.

"The second thing is they have to find ways to add value to business communications. One way to look at the cost of transmission is [as though it were] computer memory. On a cost-per-transaction basis, it's going down continually. The holding companies have to eliminate the restriction on enhanced services, and they have to look first to enhanced Centrex and protocol conversion."

Throughout the U.S., the regional holding companies are installing fiber-optic cable, some between central offices and some directly to customer sites, and are replacing electromechanical central office switches with digital switches.

For example, Pacific Bell Telephone Co., the Pacific Telesis Group operating company in California, used the 1984 Summer Olympics in Los Angeles and the 1984 Democratic National Convention in San Francisco as opportunities to install fiber-optic cable in those cities. Pacific Bell ran 300 miles of fiber-optic cable among Olympic sites and 110 miles of fiber-optic cable to serve convention facilities in San Francisco. After the events, the cable was turned over to general service uses.

A Pacific Bell spokesman said 55% of the circuits between the company's central offices are now digital and that the figure will be 93% in 1992. He said 60% of Pacific Bell's 10.9 million access lines are served by software-controlled, computerized switches and that the number exceeds 90% in urban areas.

Pacific Bell, like other divested Bell operating companies, wants to offer switched digital service at 56K bit/sec in addition to dedicated digital services up to 1.54M bit/sec.

In the nation's growth belt, the regions served by Bell South and Southwestern Bell Corp., the divested Bell operating companies have found that if they must wire new developments, they might as well run fiber-optic cable at a cost 10% below the cost for copper cable and offer bandwidths of 135M bit/sec.

Bell South is promoting services such as Lightgate, a fiber-optic service installed directly into a customer site for integrated voice, data and video services.

Meanwhile, in the more mature areas in the Northeast and Midwest, there is less demand for new lines, so regional holding companies such as Nynex Corp. are installing some fiber-optic cable, particularly among central offices, but are concentrating more on upgrading their switching facilities to increase the functions those central offices can offer.

Going with digital switches

New England Telephone Co. reported that it is replacing its central office switches with digital switches. A spokesman said only 13 of 685 New England Telephone switches were digital on Jan. 1, 1984, but that 56 will be digital by the end of 1985, with most of the new installations concentrated in population-intensive and business-intensive eastern Massachusetts and Rhode Island.

In the Midwest, American Information Technology also has a limited growth problem on its hands. There, too, much of the effort has been placed on upgrading the switching capability, with the apparent goal not only the ISDN that all of the regional holding companies and AT&T discuss so frequently, but also a new generation of Centrex services.

New Centrex, with the functions of a private branch exchange or other enhanced services such as protocol conversion or Pacific Bell's proposed Intellicom customer-controlled network may be to some regional holding companies a key to stopping bypass moves as large and even medium-size companies look for savings and new features in private links to long-haul carriers — all at the expense of the operating companies.

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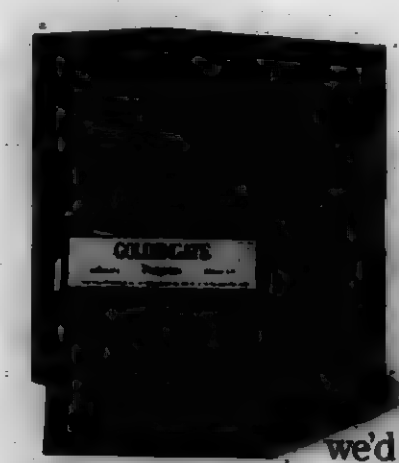

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Chip industry slump brings on layoffs, workweek cuts

Intel anticipates plummeting profits; Micron fires 600

By Kathleen Burton
CW West Coast Bureau

The dismal beat of the semiconductor industry slump droned on last week as Intel Corp. announced it might not earn any profit for the first three months of 1985.

In addition, Texas Instruments, Inc. said it is extending a reduced workweek at its domestic and international semiconductor plants through mid-1985. And Boise, Idaho-based Micron Technology, Inc., a specialty memory chip maker, said it will fire half of its 1,250 employees in reaction to softening market demand.

Lack of chip demand causes slump

Intel, which last quarter earned $23 million on sales of $416 million, cited continued weakness in semiconductor demand for its anticipated depressed results this quarter. The company recently laid off 900 workers in a cost-cutting move, its first layoff in 10 years.

A TI spokesman would not reveal which installations would be affected by the extension of a shortened workweek, but said the workweek reductions would primarily be overseas.

The cost-cutting measure was due to weakened orders and intensified pricing pressures, the spokesman said, and the company would make no predictions about when the market would improve. The company laid off 2,000 workers in October.

More layoffs expected

Industry watchers said more layoffs are expected among Silicon Valley semiconductor firms as the volatile semiconductor market corrects itself after a period of soaring and then plummeting chip demand that began in 1984. After ramping up capacity early last year, integrated circuit manufacturers now face high personnel and equipment overheads, with minimal cash infusions to correct the situation, they said.

Jan Lewis, a semiconductor industry analyst at Infocorp, a market research firm in San Jose, Calif., said that industry improvements cannot be expected until the second or third quarter. Lewis echoed other analysts, who blamed the weak market on end users working off excessive semiconductor inventories and a general market contraction due to the sluggish personal computer market. "It's a famine and a glut mentality we're seeing in semiconductors," Lewis said, "but the worst is almost over."

U.S. stalking Japan's telecom mart

WASHINGTON, D.C.— A high-level tug-of-war between Japan and the U.S. over the ability of U.S. exporters to enter Japan's soon-to-be-deregulated telecommunications market may affect the availability of Japanese goods in the U.S.

Last week U.S. Commerce Department Secretary Malcolm Baldrige called off at the 11th hour a planned visit to Japan by Lionel Ulmer, the department's Undersecretary for International Trade, in an apparent effort to put pressure on the Japanese government to guarantee U.S. firms access to Japanese markets when the state telephone monopoly, Nippon Telephone & Telegraph Corp. (NTT), is deregulated April 1.

Baldrige said the talks on opening Japanese telecommunications markets to U.S. companies have the highest priority with the U.S. government. He said it appeared the Japanese wanted to set up a special technical review committee to handle certification of U.S. telecommunications products for use in the NTT system and would require individual certification seals for each shipment of goods to Japan. Baldrige said this position is unacceptable to the U.S.

Meanwhile, the Federal Communications Commission has quietly begun a staff investigation to study options for using the FCC's Part 68 equipment registration rules for certifying telecommunications equipment imported to the U.S. as a means to help ensure similar equal treatment in foreign markets.

The FCC has made clear that the study is not solely aimed at Japan but at all foreign markets where U.S. goods face trade barriers.

The impetus for increasing the trade pressures on Japan has been prompted by the growing dollar volume of that country's imports into the U.S. since the divestiture of AT&T.

The value of Japanese telecommunications imports has jumped from $600 million to $2 billion since the divestiture, while U.S. exports remain at $300 million, according to Commerce department figures.

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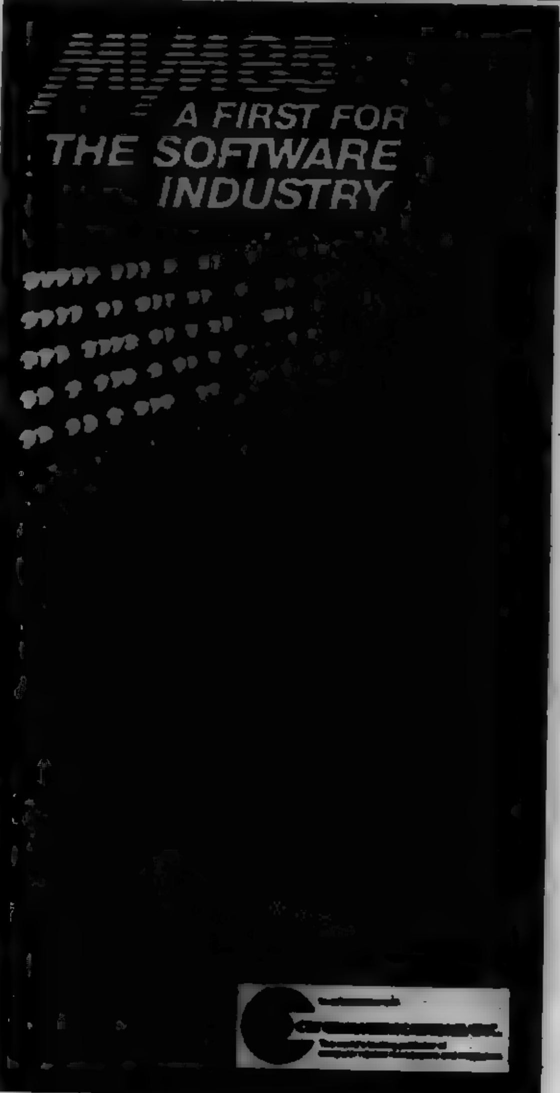

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WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

GSA aims to lessen agency system tests

WASHINGTON, D.C. — The U.S. General Services Administration (GSA) plans to discourage federal agencies from conducting costly and troublesome benchmark tests to evaluate computer systems.

"Benchmarks shall not be used unless the requiring agency determines that there is no other acceptable means of performance evaluation," said the GSA's proposed rule, issued Feb. 22.

The GSA said it will amend its procurement regulations to allow agencies more freedom in selecting and using computer evaluation techniques, such as the review of technical literature, simulation and benchmarking. The evaluation technique should be chosen on a case-by-case basis, weighing the "risks of adverse impacts on agency missions" of acquiring undersized or oversized computers, the GSA said.

The GSA's action was prompted by a 1983 U.S. General Accounting Office report, which urged the GSA to give agencies better guidance about benchmarking. The report said benchmarks typically cost between $50,000 to $200,000 and are frequently criticized because they can be manipulated to limit competition.

Trainee feedback called key to CBT

ROSSLYN, Va. — Computer-based training (CBT) software products should have interactive features that give feedback to trainees about whether they are learning the lessons, a training expert told the Association of Federal Computer Users (AFCU) last week.

Lori Gillespie, vice-president of Instructional Communications, Inc., a Baltimore-based consulting firm, provided that and other tips for attendees at the AFCU's Information Center Special Interest Group meeting here. The information center directors sought advice on how to select off-the-shelf products that train novice computer users.

At the forum, the information center directors complained that some CBT packages are inaccurate, too easy and merely provide on-screen text with no user interaction. Gillespie suggested several guidelines for evaluating CBT products, including the following:

- CBT software should provide documentation that describes the overall course, its training objectives, target users, prerequisites and the time needed to complete the course.
- The product's content should be accurate, current, logically sequenced and modular (so users can review course segments without reviewing the whole course).
- The CBT software should provide "frequent and meaningful interaction" with the trainee and give students feedback on whether their responses are right or wrong. "The student's interaction should be more than just hitting the key for the next screen," she said.

SR to target shop floor automation

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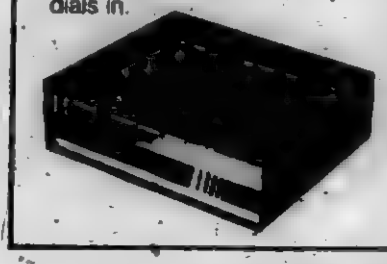

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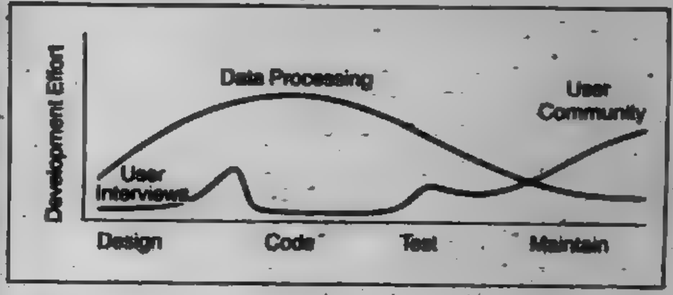

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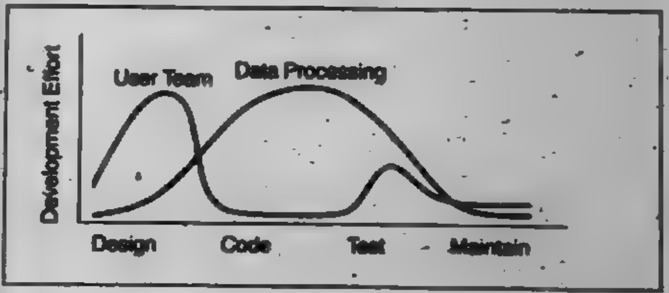

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ICCP attempts to rectify certification exam mix-up

By Donna Raimondi
CW Staff

CHICAGO — The Institute for the Certification of Computer Professionals (ICCP) is still struggling with the effects of a printer's error that switched covers on two of its exam booklets.

Applicants for the Certificate in Computer Programming (CCP) who last Dec. 8 took either a business test or a systems test were given exam books with covers that did not correspond to the inside sections, said George Eggert, executive director of ICCP. Approximately 130 people took the faulty versions, he said. Some of the applicants caught on, and others did not, he added.

Some of the test takers in Chicago and Los Angeles reported the error to their proctors, who, in turn, called the testing company and received instructions on reversing the covers, Eggert said. The mistake did not get caught at several smaller testing sites, he said.

James Means of the Computer Task Group of Cleveland said he took the test in Akron, Ohio, and flunked. He said he waded through scores of tough questions, wondering why the ICCP would throw in so many hard ones, and then he came across an insert that pointed out a flowchart error. On the instructions for fixing the error, the insert mentioned question numbers in the different versions of the test, which led Means to discover he was taking the wrong exam. Following the test proctor's advice, he finished the test and called the testing company the following Monday.

The insert sheet explaining the flowchart error also clued in a data dictionary administrator in Rochester, N.Y., who passed the systems test, even though he thought he was taking the business test. "I felt kind of stupid, thinking, 'Do I really know as little as I seem to know?' " he said.

The first half of the CCP exam asked general questions that apply to all test takers, the Rochester programmer said. The second 60 questions related specifically to a specialized field, such as systems or business, with the systems portion applying heavily to operating, telecommunications and paging systems and the business section asking Cobol-oriented questions.

"The ones who passed were very knowledgeable about programming in general," Eggert said. ICCP has arranged for those who did not pass to take the exam again. "Most people were nice about it, but we had a few chew us out," he added. For the 12 or so people who wanted it, ICCP refunded money, he added.

Taking the test the second time is not that easy, Means said. He said he called Educational Services for the Professions in Kentucky, the testing company for ICCP, about 12 times trying to set up an appointment. After several weeks of calling Kentucky and one call to Eggert at ICCP headquarters here, Means said he finally received a letter last week that he had flunked the test, along with an invitation to take another one.

In the meantime, he found his own proctor and set up his own second exam. He is now waiting for the Kentucky firm to send the exam to his proctor so he can continue on with the certification process. "This [certificate] was on my personal goal sheet for 1984 — now it is pushed up until halfway through 1985," he said.

ACM conference to cite systems' human factors

SAN FRANCISCO — The Conference on Human Factors in Computing Systems is scheduled for April 14-18 at the Hyatt Regency Hotel at Embarcadero Center here.

This conference is sponsored by the Association for Computing Machinery's (ACM) Special Interest Group on Computer and Human Interaction.

The meeting will consist of presentations of papers, panel sessions and users group sessions.

There are 31 papers scheduled to be presented at the following 10 sessions: System Response Factors, Touching and Seeing, Psychology of Programming, Menu Systems, Design and Evaluation, Naming, User Assistance, Managing the User Interface, Speech I/O and Cognitive Issues.

Seven panel discussions are planned: Utility of Natural Language Interfaces, Psychological Research Methods in Human Use of Computers, Interfaces in Organizations, Supporting Group Work, Social and Cultural Impact of Technology, Communicating with Sound and Human Factors in Systems Design.

Scheduled interest groups consist of Technology Transfer, Role of Human Factors Specialists in Computer Companies and Interactive Aids for Problems Formulation.

Registration fees range from $120 to $180, and tutorial fees vary from $65 to $110.

ACM Conference Management is located at 11 W. 42nd St., New York, N.Y. 10036.

NSF picks sites for supercomputer funding

WASHINGTON, D.C. — The National Science Foundation (NSF) last week announced that four supercomputer centers will receive a total of $200 million in government grants spread over five years.

The winners from among 22 applicants in the competition were the following schools: the University of California at San Diego, the University of Illinois at Urbana-Champaign, Cornell University in Ithaca, N.Y. and Princeton University in New Jersey.

The supercomputer centers at the University of California at San Diego and the University of Illinois at Urbana-Champaign will receive Cray Research Corp. Cray XMP supercomputers. The Cornell center, called the Center for Theory and Simulation in Science and Engineering, will receive an IBM 3084 Model QX mainframe attached to Floating Point Systems, Inc. FPS 164 and 264 scientific processors.

The Princeton supercomputer center, called the John von Neumann Center, will receive a Control Data Corp. Cyber 205, which will be upgraded to an ETA Systems, Inc. ETA-10 in 1987. CDC is a part owner of ETA.

Consortium members

The University of California at San Diego and Princeton centers will be members of consortiums that will include other universities and institutions. The Princeton consortium will include 12 members, and the San Diego consortium will have 18 members.

The centers are scheduled to be operational in late 1985 or early 1986. Congress authorized funding for the grants to spur the availability of advanced scientific computing resources for research scientists and engineers.

In a separate announcement from the government grants, IBM said that it will contribute $30 million in software, hardware and services to the Cornell supercomputer center, including a 3084 Model QX mainframe along with service and maintenance.

Study cites need for U.S. R&D funding

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Major advances in the fields of computer architecture, AI and fiber optics will require increasing financial support from the U.S. government for basic research, according to a major study by Congress' Office of Technology Assessment (OTA).

The National Science Foundation's supercomputer program to give researchers greater access to supercomputers is a step in the right direction, the OTA report said. Last week, the foundation announced it would place supercomputers at four universities (see story left).

Steps like this will be necessary to respond to aggressive, government-coordinated research efforts in foreign countries, such as Japan's Fifth-Generation Computer Project, according to the OTA. Foreign competition and the growing importance of computers and communications technology to the U.S. economy and security "suggest that more attention should be paid by policymakers to the needs for [research and development] in information technology," the OTA concluded.

In response to these new pressures, industrial support is growing for short-term applied R&D, the congressional agency noted, but industry still looks to the academic community to perform and to the U.S. government to fund the long-term basic research that will underlie future technological advances.

For example, basic research on fiber optics is needed to increase the information-carrying capacity of the fibers, to increase the transparency of the fibers, to allow longer distances between repeaters and to improve processes for manufacturing fibers, according to the OTA.

"Increased federal funding of research in universities would achieve the dual objectives of stimulating fundamental research and training people at the [doctoral] level in fiber-optics technology," the OTA said.

In the AI field, the agency cautioned against engaging in research designed to achieve quick, exciting results, noting that "much basic science remains to be learned in AI, and steady, long-term support is required for that learning."

The AI field is experiencing an acute shortage of researchers as university faculty members are drawn off campus by industry, the agency added, just at the time when demand for newly trained graduates is growing rapidly.

The Department of Defense is responsible for nearly 80% of the federal support for R&D, but according to the OTA, many science policy specialists question this dominance. Specialists interviewed by the agency said they were very concerned that military work is siphoning off too much talent from civilian applications and that much of the military research in information technology does not have commercial applications.

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Merger with Chevron would obsolete Gulf's DP center

Shutdown could force 900 workers to relocate

By Jeffry Beeler
CW West Coast Bureau

If the federal government formally okays the proposed merger of Chevron Corp. and Gulf Oil Corp., Gulf's two main computing operations and its credit card processing activities will cease to be necessary and will eventually be dismantled.

In the resulting data center shutdowns, much of Gulf's current applications portfolio will be transferred to Chevron. The rest will go to Standard Oil Co. of Ohio (Sohio), which hopes to acquire Gulf's business in the Southeastern U.S.

Framel

The closings will also force the nearly 900 computing professionals now employed in Gulf's MIS organization either to relocate thousands of miles to Chevron or to look for work elsewhere.

Oldenburg

Within Gulf, reaction to the potential shutdowns and job transfers "runs the full gamut from excitement to disappointment," according to John Framel, executive director of the company's Information Resources Department. "Some people believe the combined Chevron-Gulf organization is going to be a tremendous place to work. Others [said] their professional ambition lies in another direction and are unwilling to leave their current homes."

Jim Gerhardt, executive director of Gulf's Information Services Division, painted a fairly pessimistic picture of the mood among the firm's systems staff. According to Gerhardt, the majority of the staff has greeted news of the proposed merger somewhat negatively. Many Gulf employees — both DP personnel and non-DP personnel alike — feel "let down by upper management. They never imagined that anything like this merger, which is the largest in corporate history, would ever occur," he said.

Gulf currently operates a large data center in Houston, a smaller center in Pittsburgh and a credit card processing installation in Atlanta. In all, the three sites employ 765 MIS specialists in the company's Information Systems Division and another 130 or so in its Information Resources Department.

If the proposed merger is approved by the Federal Trade Commission as expected, most of those employees will eventually be asked to transfer to Chevron's two main data centers in the Northern California communities of San Ramon and Concord. Staff members who comply with the request will be guaranteed new jobs in any combined Chevron-Gulf computing organization, Framel said.

However, not all of Gulf's systems personnel will be so lucky. A substantial minority, especially those at the very highest and very lowest rungs of the MIS ladder, may not be offered any new jobs at all, Gerhardt said.

Moreover, even some of the employees that do receive such offers may decide for one reason or another not to accept them. Either way, at least a portion of Gulf's current MIS work force will almost certainly fall

See CLOSING page 16

[illegible]

CHEVRON CORP.

Corporate headquarters - San Francisco
Processing centers - San Ramon, Calif.; Concord, Calif.
Mainframe models - 12 IBM 3081s
Annual MIS budgets* - $140 million
Number of MIS employees - 1,300
Processing style - Highly centralized
Nature of typical systems - Interactive with integrated data bases

GULF OIL CORP.

Corporate headquarters - Pittsburgh
Processing centers - Houston, Pittsburgh, Atlanta
Mainframe models - IBM 3033s, 3083s, 3081s
Annual MIS budgets* - $120 million
Number of MIS employees - 900
Processing style - Highly centralized
Nature of typical systems - Batch

*Excluding data entry and scientific processing

MERGER from page 1

zations, the Chevron-Gulf merger will consist of at least the following three major elements:

- The transfer of Gulf's information systems personnel from their Houston, Pittsburgh and Atlanta workplaces to Chevron's two Northern California data centers.
- The gradual assimilation of many of Gulf's existing applications into their Chevron counterparts.
- The marriage of Gulf's Information Services Division and Information Resources Department with the corresponding sections of Chevron's Computer Services Department.

"Most of the integration will probably be completed within about two years, but we may need as long as five years to finish the last 10th of a percent," Oldenburg predicted.

By the time the union of Chevron's and Gulf's MIS organizations is finally consummated, Oldenburg said he expects the Computer Services Division's processing volume to grow from 250,000 to 350,000 transactions per day and its IMS data base capacity to double. To the credit card side of Chevron's existing applications, meanwhile, acquiring Gulf's computing operations will add roughly three million new customers.

As a crucial component of the merger, the fusion of the two oil companies' MIS operations will undoubtedly be no organizational picnic. On the other hand, the process will have a number of important factors working in its favor.

Stroke of sheer good fortune

By a stroke of sheer good fortune, announcing the two firms' desire to merge preceded by only a few months the Computer Services Division's recent move into a new, greatly modernized data center here. Occupied last July and situated in the newly constructed Chevron Park office complex, the data center forms half of the company's MIS nerve center. The other half lies a few miles away at Chevron's existing computing facility in Concord, Calif.

Two or three years ago, when Chevron Park was still on the drawing board, the two Northern California data centers were projected to meet the Computer Services Division's growth needs for the next 10 years. Since then, the news of a possible merger with Gulf and its internal systems organization has necessarily forced Chevron to downgrade its original estimate. Even so, the San Ramon and Concord installations are thought to be large enough to hold a combined Gulf-Chevron MIS operation at least through the end of the decade, Oldenburg said.

"The decision by Chevron and Gulf to combine their operations

See MERGER page 15

Acquisition to require 25% hike in computing power

By Jeffry Beeler
CW West Coast Bureau

Recent projections concerning Chevron Corp.'s proposed acquisition of Gulf Oil Corp. have reaffirmed Chevron's faith in centralized processing and its attendant economies of scale.

Federal approval of the takeover bid would set into motion the largest merger in U.S. corporate history. In one fell swoop, the proposed deal would combine the companies' work forces, each of which numbers more than 40,000 employees, and would swell Chevron's annual revenues, now about $27 billion, to more than $55 billion.

But even though Chevron's overall business may nearly double overnight, the firm fully expects to be able to meet all its future service needs with just a 25% increase in mainframe processing power, said Chuck Oldenburg, Chevron's general manager of computer services. The company will also be able to limit to 20% the foreseeable growth in its MIS [illegible], he added.

What [illegible] the companies' strong, long-standing biases toward centralized processing. Both Gulf and Chevron have consciously steered clear of distributing large amounts of their mainframe computing power, Oldenburg said. Instead, the firms have concentrated the bulk of their CPU capacity in a handful of large corporate data centers.

[illegible] favorable economies of scale

This MIS centralization, in turn, has yielded extremely favorable economies of scale, as the proposed Chevron-Gulf merger graphically demonstrates. When the expected takeover is complete, Chevron will be able to satisfy completely both its own and Gulf's information processing needs from its two existing data centers in Northern California, Oldenburg predicted.

In other words, even though user demand for its services may soon mushroom, Oldenburg's department [illegible] of the major processing centers currently operated by Gulf.

"I was really flabbergasted," Oldenburg recalled, when he sat down recently to study the proposed merger's impact on Chevron's MIS organization and arrived at the above projections.

For Oldenburg, Chevron's ongoing bid to acquire Gulf provides an object lesson in the inherent strengths of centralized processing. "A lot of the people who believe in decentralized data centers fail to appreciate the real virtues of centralization and economies of scale," he said.

Between its two corporate data centers, Chevron currently operates a total of 12 IBM 3081s, some running under MVS/XA and others under VM. Six of the 3081s form the hub of what Oldenburg described as perhaps the world's largest in-house timesharing network. [illegible] as many as 1,500 of its [illegible]

[illegible]

MIS execs' jobs caught in squeeze

Chevron Corp.'s disclosure that it intends to acquire most of Gulf Oil Corp. casts a shadow of uncertainty over the immediate career outlook of Gulf's two top systems executives.

Despite Chevron's assurances that they run no risk of displacement, both managers are not optimistic about their chances of landing top positions in the combined MIS organization that the proposed takeover would inevitably create.

Possibly caught in the squeeze between the two converging oil industry giants are Jim Gerhardt and John Framel, who serve as executive directors of Gulf's Information Services Division and Information Resources Department, respectively.

At the moment, Framel heads an operation that identifies key business needs and serves as an intermediary between the corporation's end users and its technical support staff. Gerhardt, on the other hand, currently oversees an organization that embraces all of Gulf's applications development activities and most of its central systems resources.

But if the two firms and their MIS operations someday merge, both Gerhardt and Framel might suddenly find themselves cast by the wayside as Chevron and Gulf consolidate equivalent functions to avoid duplication.

In that event, the pair would lose not only their current positions at Gulf but also an opportunity to seek substitute employment with Chevron, where most of the top MIS management slots are already filled.

"Obviously, there would be no need [in a consolidated systems organization] for two heads of data processing," Gerhardt said.

Framel's and Gerhardt's pessimism over their near-term job prospects puts them somewhat at odds with recent statements by Chevron's chief systems officer, Chuck Oldenburg, who expects the proposed merger to create major openings for both Gulf executives.

"The titles they would hold and the roles they would play might be different from what they have now," the general manager of Chevron's Computer Services Department (CSD) conceded. "We won't know for sure until we complete a new organizational chart.

In all likelihood, Gerhardt would be assigned a management position somewhere in the CSD, while Framel would go into Chevron's finance department, , Oldenburg said.

Both Gerhardt and Framel stop short of contradicting Oldenburg's forecasts and have yet to abandon entirely their hopes that Chevron somehow would make room for them in its postmerger executive ranks. But each seems to be hedging his bets.

"I think Gulf's senior management pretty well recognizes that in a merger of this size, the opportunities at the top are limited," certainly much more so than among middle-level computing professionals, Framel said.

MERGER

from page 14

came at a very propitious time," Oldenburg said. "We were just lucky that it didn't happen two or three years earlier when we were still in very cramped quarters and had no plans to move."

Another factor that promises to aid the merger of Chevron's and Gulf's MIS organizations is their high degree of systems compatibility. Both are confirmed IBM shops (see chart page 14), operate extensively — although not exclusively — in an MVS environment and liberally use large IMS data bases, Oldenburg said.

In other important respects, however, the two MIS organizations differ substantially. Chevron's operation, for example, is characterized by a heavy emphasis on online, interactive applications and integrated data bases. Gulf, by contrast, still relies primarily on antiquated batch systems, according to John Framel, executive director of Gulf's Information Resources Department.

One of the main missions of the Chevron-Gulf task forces, therefore, will be to evaluate the two competing sets of applications "with an eye to ultimately having only one application to support a given area of business," Oldenburg said.

Once the evaluation process is complete and the two sets of applications have been merged, the results more often than not will look far more like Chevron's current systems than Gulf's. Payroll, credit card processing, purchasing and oil field accounting are only a few of the many existing Gulf applications that are earmarked for updating and subsequent inclusion in their Chevron counterparts, Oldenburg said.

Not all of Gulf's current systems, however, are smaller or technologically inferior to the Computer Services Division's. Nor are Gulf's applications universally destined to be swallowed up by their nearest Chevron equivalents. On occasion, exceptional circumstances might prompt opposing pairs of Computer Services Division and Gulf applications to reverse their usual roles, with the latter side assuming the dominant position in a systems merger.

Gulf's terminal data automation system, for example, "is probably more advanced than anything that Chevron has" and will likely emerge from the integration process greatly expanded but basically unchanged, according to Jim Gerhardt, executive director of Gulf's Information Services Division.

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CLOSING from page 14

by the wayside in any upcoming effort to transplant the firm's data center activities to Chevron.

An exact timetable for the planned merger of the two companies' computing operations has yet to be finalized.

"According to the latest information that has come to my attention, the Chevron data center in San Ramon is tentatively scheduled to be processing Gulf's applications by the end of the year," Gerhardt said.

One factor that might delay a possible marriage of the two companies' MIS activities is an existing service agreement that obligates Gulf to supply Sohio with six month's worth of information processing assistance, he added. When the service period expires, the two parties can exercise an option to renew their agreement in three-month increments.

The way in which the proposed divestiture to Sohio ultimately resolves itself is expected to have a direct bearing on both the substance and timing of Gulf's prospective union with Chevron and its main systems group, the Computer Services Department.

Once the proposed merger is under way, the final fate of Gulf's MIS employees will hinge in large measure on their current rank in the professional pecking order, Gerhardt said.

Operations specialists' prospects dim

Job opportunities appear least promising for the company's lower echelon systems employees, like operations specialists, who are unlikely at this point to find a place in Chevron's soon-to-be-expanded computing operation.

Somewhat brighter are the short-term career prospects of the professionals at the opposite end of Gulf's MIS job spectrum, the top systems managers, whose possible futures with Chevron will be decided "case by case," Gerhardt said.

Without question, the workers who stand the best chance of emerging from the proposed merger unscathed will be Gulf's intermediate-level MIS employees, such as programmers, almost all of whom are expected to be offered comparable positions in the Computer Services Department.

"We need all the Gulf systems people we can get," said Chuck Oldenburg, general manager of Chevron's Computer Services Department. Oldenburg's sentiments apply particularly to Gulf's IBM JES3 specialists, who almost certainly will play an important role in the integration of the two companies' MIS operations.

> ***Within Gulf, reaction to the potential shutdowns and job transfers runs the gamut from excitement to disappointment.***

As a consequence of the expected merger, Chevron will inherit many of Gulf's JES3-oriented systems. The problem with such an acquisition is that no one in the Computer Services Department, a JES2 shop, knows very much about JES3, Oldenburg said.

So Chevron is working hard these days to try to persuade as many of Gulf's existing JES3 experts as possible to relocate.

Among its various inducements, Chevron recently introduced a program in which the company agrees to cover most of any loss stemming from the sale of a transferred employee's house, Oldenburg said.

In the end, the firm is expected to offer new jobs to 75% or 80% of Gulf's current MIS work force. But despite Chevron's efforts to make relocation relatively painless, only an estimated 30% or 35% of the employees are likely to accept their offers, Framel said.

The reason for the predicted low acceptance rate has to do partly with California's astronomical housing costs and with the highly favorable MIS job markets in the three cities where Gulf currently maintains processing sites.

For the Gulf MIS workers who the impending merger will leave unemployed, the company will provide severance pay and establish a job-placement service, Framel said.

CENTRAL from page 14

to raise its total mainframe count to 15, Oldenburg said.

At the same time, the firm plans to enlarge its number of terminals by 50% and its Dasd capacity by 70%, he added. Compared with the projected increase in the size of Chevron's applications, neither predicted growth rate is particularly startling, Oldenburg said.

On the other hand, installations of both Dasd and terminals are expected to grow at a far brisker clip than the company's mainframe processing power.

The reasons for the disparity are fairly straightforward, Oldenburg said. First, Chevron will need a substantial increase in storage capacity to absorb the large volume of historical records it will undoubtedly inherit from Gulf, he said.

Second, the firm will have to expand its networking capabilities to encompass "all of Gulf's oil fields and marketing facilities in Texas, where Chevron currently has none of either," he added.

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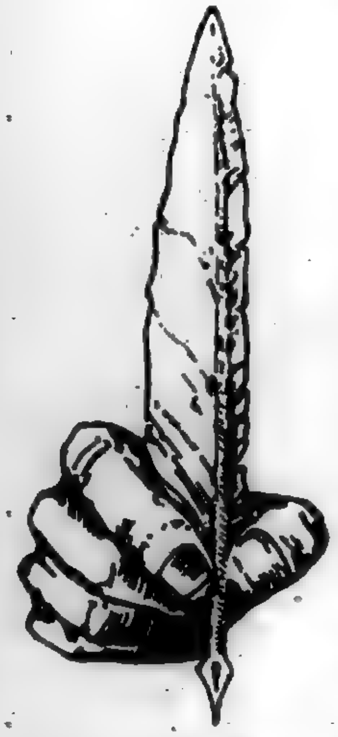

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Cost-effective links, nets top conferees' wish lists

CW AT INFO/CENTRAL

By John Gallant
CW Staff

CHICAGO — The computing power is in place, but the means by which to tie disparate processing environments together was on the minds of visitors to the recent Info/Central: The Information Management Exposition & Conference and Info/Software conference held here.

While the buzzwords "microcomputer-to-mainframe link" and "local-area network" are currently in vogue, attendees at the joint conference told *Computerworld* they have seen little in the way of cost-effective implementations of those emerging technologies.

Larry Pollard, systems analyst with 3M Corp. in St. Paul, Minn., said one of his company's most pressing concerns is the vertical integration of its computing resources.

According to Pollard, who evaluates micro hardware and software and communications links from those systems to 3M's host processors, the current generation of link products is too costly and too difficult to implement.

"We want to be able to talk transparently from the micro to the host," Pollard said. "Right now, I can write a program for that type of data transfer. But that manual process takes too much time. Software that would allow us to do that in a flexible manner would be a real boon to productivity."

Pollard works primarily with the cost accounting organization within 3M. The group currently maintains a fleet of about 330 IBM Personal Computers, including roughly 50 IBM 3270 Personal Computers. Pollard said 3M's goal is to tie those micros to the company's IBM 370 series hosts.

"We are committed to the idea of micro-mainframe links," he said. "But we do not want a link that becomes just another operational or cost center. We are hoping to find a transparent, flexible, inexpensive link. We have not seen that type of product yet."

H.G. Sachleben said his company, Trailmobile, Inc. of Chicago, also hopes to find a viable micro-mainframe link. As director of information systems for the tractor-trailer manufacturer, Sachleben's aim is to link the company's 24 IBM Personal Computers to an IBM 3033 host. Trailmobile's link difficulties are exacerbated by the fact that the micros are spread throughout the country.

"The big issue for us is the micro-to-mainframe link for integrating our systems," Sachleben said. "It seems there has been a real proliferation of links lately, but all of them are new and have not yet been tested or proven. We just do not know how they work in a production environment. In addition, many of the links are only to the vendor's own data base [management system]."

'Buyer beware situation'

"Lots of vendors are saying they have a better mousetrap," he continued, "but for the prospective link user it is a 'buyer beware' situation."

The issue of local-area networks seems to have spawned as much user concern as that of micro-mainframe links.

"The cost-effectiveness of local-area networks is a real issue for us," said Paul Ansfield, professional staff consultant with the Oshkosh, Wis.-based Kane Institute for Information Systems and Automation. "So much about local nets is unclear to users, yet they have to make intelligent decisions on that rapidly moving technology."

Ansfield serves as a management trainer and consultant in the selection and installation of micro applications for business, finance and industry. Because local-area network technology is so new, Ansfield said, in most cases management cannot simply rely on the data processing department for guidance.

Future dependent on war between IBM, AT&T

"Some local nets are too costly, others do not deliver what they promise," he said. "Standardization is also a big concern. What the future holds depends in large measure on the war between IBM and AT&T.

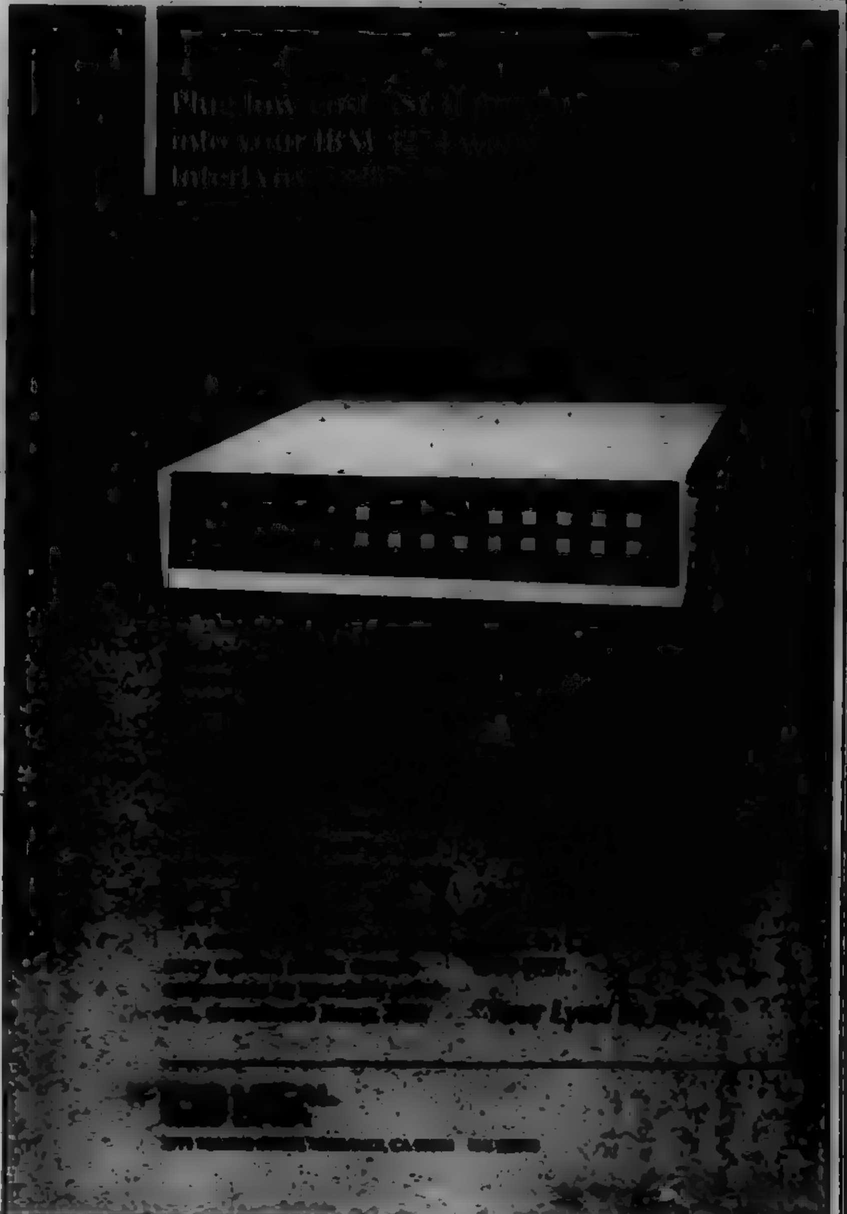
"The technology requires a great deal of understanding for the average businessman. But you cannot rely on the DP manager alone for information and to make the hard choices that have to be made. This is all new technology."

Networking, on a much wider scale, was also the concern of Jerry Kenney, a telecommunications specialist with Electronic Data Systems Corp. (EDS), the recently acquired subsidiary of General Motors Corp.

Based at Fort Sheridan, Ill., Kenney is involved in EDS' efforts to develop a worldwide computer network for the recruiting services of the U.S. Army. To support the proposed network of Prime Computer, Inc. processors, Kenney said, EDS is researching available third-party networking software.

"We are looking for information on how best to network — literally worldwide," Kenney said. "EDS is studying what is available in the way of networking software or services. Compatibility is the big problem.

Incompatibility of different systems makes it so difficult to choose products. I know standards are coming, but they are just not coming fast enough."



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Prototyping seen as tool for applications refinement

CW AT INFO/CENTRAL

By John Gallant
CW Staff

CHICAGO. — In Lee Adamski's opinion, developing a good quality application that meets user requirements is similar to drawing a beer from a tap — it is nearly impossible to do it right the very first time.

According to Adamski, manager of consulting and education for Applied Data Research, Inc.'s Ideal product line, that insight into human nature is one of the basic rationales for prototyping during the design phase of the applications development life cycle. Adamski spoke on prototyping during a session at the recent Info/Software and Info/Central: The Information Management Exposition & Conference held here.

He explained that the term prototyping has come to represent diverse techniques ranging from designing a hard-copy sample of a report to creating full-blown systems with I/O, reports, screens, programs and populated data bases. Prototyping lately has come to be known by a variety of names, including iterative enhancement, heuristic development, evolutionary design, throwaway code, pilot software systems and planned applications evolution.

Prototyping not new idea

Whatever the label, Adamski said, prototyping serves to refine applications functions, I/O during the design phase and allows end users to work with and evaluate a system before the development process is complete. While user awareness of prototyping has increased in the wake of so-called fourth-generation programming tools, the idea is certainly not new.

"Years ago, designers were creating mock-ups of reports, card layouts and, more recently, screen designs," Adamski said. "The idea of 'throwaway' code is certainly not new. We have all seen our share of programs, design specifications and even full systems end up in the trash basket. We have been building prototypes ever since we started building systems. The prototypes were called failures."

To understand fully the role of prototyping in the applications development life cycle, Adamski said, it is important for MIS/DP professionals to know what prototyping is not. Prototyping is not a substitute for careful requirements analysis and applications design, nor is it an excuse for a development shop to abandon traditional structured design methodologies, thorough documentation and good, accepted programming techniques. More important, prototyping is not a magical solution to developing useful applications.

'Gives users something to work with'

What prototyping can do, he explained, is make it easier for developers to modify or improve an application before the complete system finally reaches users. "The prototype gives users something to work on with developers. Users have trouble expressing their needs without something to see," he noted.

"Currently, we ask users to review a complex [specifications] document and appraise the proposed system on paper. It is much easier to provide them with a working model because users cannot accurately assess a system until they have actually used it."

According to Adamski, some applications are more suitable for prototyping than others. Applications that are intended to be interactive and predictive — involving a constant set of requirements — and to employ a high degree of data manipulation and record management are good candidates for prototyping. Batch systems, applications that are nonpredictive, such as ad hoc query systems, and applications that rely heavily on algorithmic processes and extensive procedural logic are poor candidates.

A controlled process

Despite the value of prototyping, he warned, its use must be tempered with discipline in a controlled process. That process should consist of an initial user/designer confrontation, a "first-cut" output phase in which the analyst builds initial system output models and a user review of the sample outputs that allows the user and analyst to refine the model.

The next phase involves additional prototype modification, which may be repeated several times within reasonable time constraints. Finally, after the data structures needed to support the proposed application are built, high-level program coding can begin.

After that? "Once the prototype is complete and the analyst and user have come to a reasonable agreement regarding system requirements, the more traditional activities of the system development life cycle — those not resolved by the prototype — are undertaken," Adamski said.

"The prototyping phase was only concerned with system functionality, with the [I/O] of a system. The less visible aspects of the application must still be dealt with and documented," he concluded.

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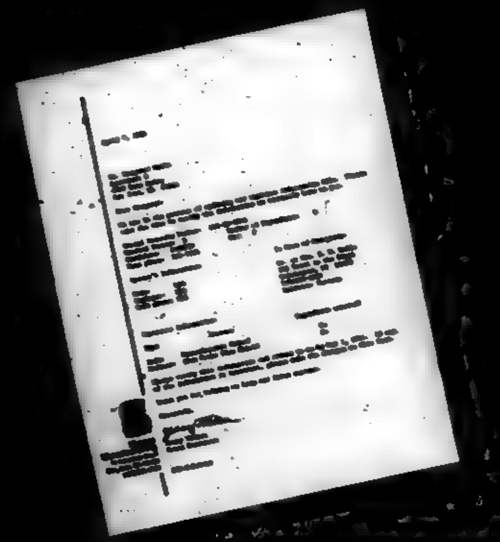

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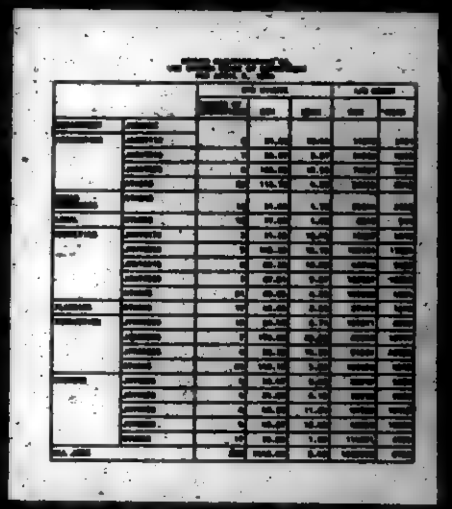

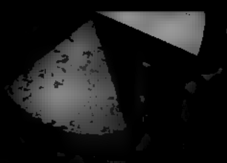

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Volume of micro-mainframe links raising MIS demands

CW AT INFO/CENTRAL

By [illegible]
CW Staff

CHICAGO — Managers must be prepared for the increased volume of transactions created by the proliferation of micro-mainframe links, said analysts and vendors at a conference here recently.

"We have only seen the beginning" of micro-mainframe links, Thomas Willmott, vice-president at International Data Corp. (IDC), told a group of attendees at Info/Central: The Information Management Exposition & Conference.

Although most personal computers in the marketplace today are operating in a stand-alone environment, that environment is quickly changing, Willmott said. A recent IDC survey found that 92% of IBM Personal Computers used in the office are stand-alone models using Lotus Development Corp. 1-2-3 spreadsheet packages, he said.

'Be careful when buying'

Maintaining data integrity is the most important micro-mainframe issue facing managers today. Willmott advised managers to "be careful when buying" software packages and make sure security functions are included.

Data processing departments are not prepared for the volume that will surface once mainframe links are installed, Willmott said. Before buying the packages, managers should take a serious look at capacity planning, he noted, particularly because implementation of micro-mainframe links chews up much of the mainframe's resources.

Attention must also be paid to data administration — what shape the data should take with a micro-mainframe link and how that information will be transferred. "Most [companies] don't have an active data dictionary," he said.

A company's staffing needs will also increase as a result of the pending micro-mainframe explosion, according to Willmott. More end users means an increase in support and training, he explained. With more training, users can do more for your system. "A programmer can build interfaces in your shop," he said.

Micro-mainframe links draw a range of end users accessing mainframe data, including novices who query existing files and create simple transactions, intermediate users who want to build their own applications and expert users working with fourth-generation languages, said Don Wszolek, director of marketing for Information Builders, Inc.

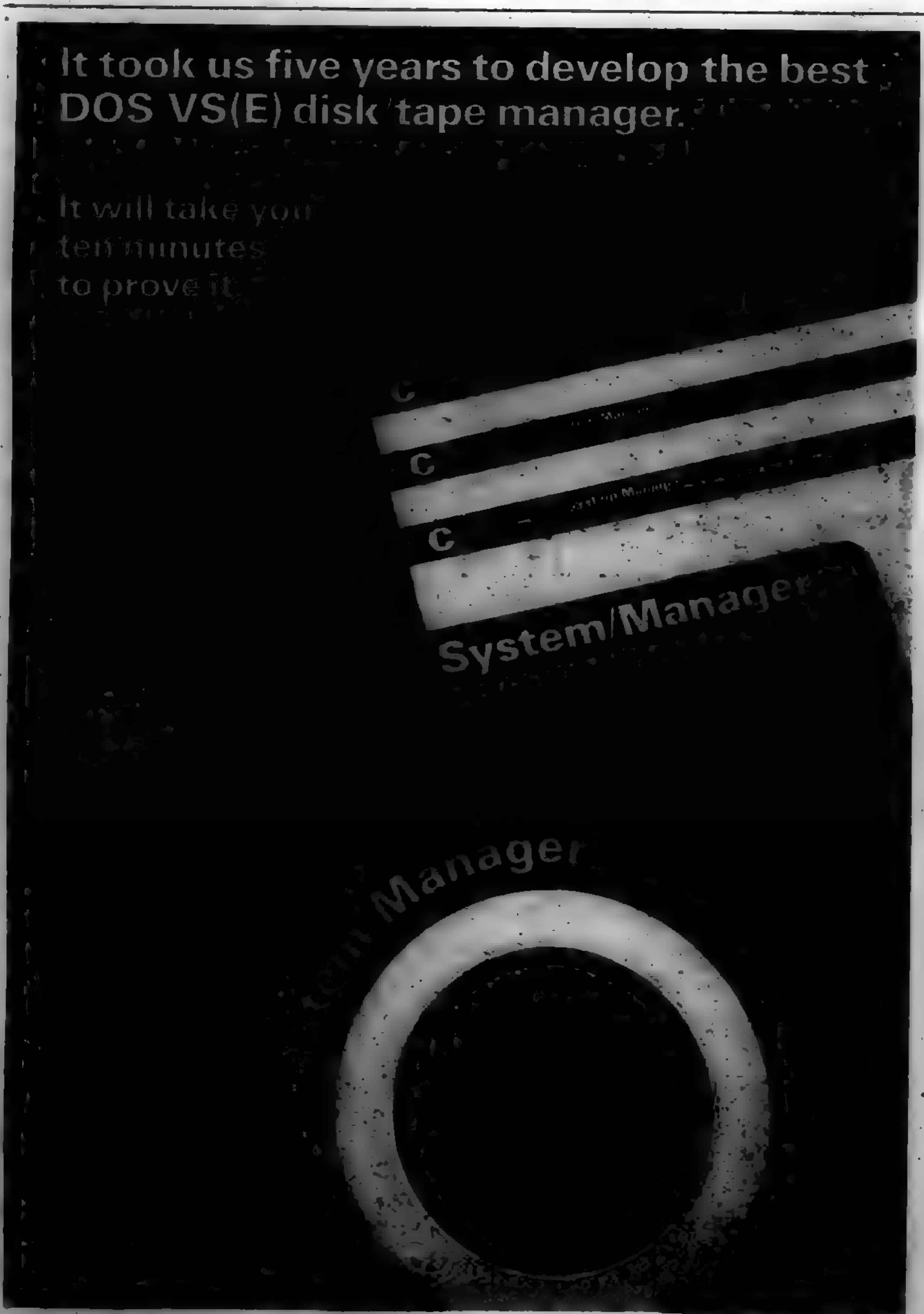
The selected solution must address this issue, he told the group, and management, too, must be aware of the problem. "Top management may not understand why they can access one file but not another," he said.

Security issues still unresolved

Micro-mainframe security is a latent issue, according to Wszolek, who said he believes companies should undertake a range of forecasting plans, taking security issues into consideration. "Security issues have not been resolved," Wszolek said, and will continue to be a major problem "until we hear why a company's five-year plan was blown out of the water because someone didn't take care [while using] the Lotus entry spreadsheet."

Wszolek said the variety of users also affects data security. "Novice users won't care about data security," he said. To protect data integrity best, "Security has to happen at the mainframe level, not the [personal computer] level," Wszolek said. "That at least will protect you in terms of what data comes down."

For most companies interested in the micro-mainframe issue, "1985 will be seen as the year in which the decision will be made, and '86 will be the year of implementation," Willmott said.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Registration fees for members are $365 before April 26, $415 after April 26; and for nonmembers the fees are $415 before April 26, $465 after April 26.

For more information, the Association for Integrated Manufacturing Technology is at Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

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NEWS

PRODUCT SPOTLIGHT

DASD from page 1

to the 3880 disk control unit to the evolutionary 3480 cartridge tape unit announced by IBM last March.

IBM Dasd offerings cause concern for competition

IBM's Dasd announcements appear to have caused more concern (to both users and vendors of competing products) than some of the newly announced mainframe processors the devices were designed to support.

For makers of IBM-compatible disk and tape drives, the pace has clearly accelerated in the expensive and demanding technological race with IBM. For users, uncertainty has invaded the once highly stable IBM Dasd marketplace.

The first casualty of the most recent technological race with IBM was Control Data Corp., which, after months of nagging problems with its 3380-compatible product, decided that keeping up with IBM was too much of a strain. The company opted out of the end-user, IBM-compatible Dasd business in late September [CW, Oct. 8] and decided to focus on selling its disk and tape units to the OEM market.

> *'Right now I wouldn't touch one [IBM-compatible Dasd] with a 10-ft pole.'*
>
> **— Andrew F. Haiduck**
> **Spartan Stores, Inc.**

The well-publicized financial troubles of Storage Technology Corp. (STC), caused by the high financial drain of a failed Cmos mainframe project and development costs of a 3380-compatible disk drive, forced STC to file for protection under Chapter 11 of the Federal Bankruptcy Act in October [CW, Nov. 5]. It is still unclear whether STC will fully recover from these financial hard times, but industry observers agreed that the firm's recent cash problems have imperiled its ability to foot the high R&D costs necessary to compete with IBM.

One thing appears certain to industry watchers: If STC fails, Fujitsu Ltd. and Hitachi Ltd. will wind up struggling to compete to sell additional products to STC's installed base. Some analysts believe that the two firms will also compete to take over the service of STC products if that company fails.

Some view Memorex Corp. as a weakening contestant in the IBM-compatible race. International Data Corp., a market research firm based in Framingham, Mass., maintains that Memorex has managed to keep peripheral sales to its parent company Burroughs Corp. fairly constant, while sales to the IBM mainframe community have dipped significantly. Other industry analysts, such as James Porter, president of Disk/Trend, Inc. in Los Altos, Calif., believe that Memorex still has the opportunity to rebound in the IBM-compatible disk and tape business. Porter, however, maintains that much depends on Burroughs' willingness to keep short-term pressure off Memorex to produce financially.

While it must be noted that Memorex and STC still have an opportunity to turn around what analysts view as slumping sales, many see the two developing front-runners in the IBM-compatible Dasd marketplace to be Amdahl Corp. and National Advanced Systems Corp. (NAS). Each company has strong backing from Japan: Fujitsu owns half of Amdahl and Hitachi supplies NAS with its hardware for sale in the U.S. This gives the two firms an open line to peripherals developed in Japan to compete with IBM products, noted Ray Freeman Jr., president of Freeman Associates, Inc., a management consulting firm in Santa Barbara, Calif.

The uncertainty that currently surrounds some IBM-compatible disk and tape drive manufacturers appears to have caused some users to shy away from buying non-IBM gear altogether.

"Right now I wouldn't touch one [IBM-compatible Dasd] with a 10-ft pole. This shop is not going to do anything with compatibles," noted Andrew F. Haiduck, DP manager for Spartan Stores, Inc. in Grand Rapids, Mich.

Haiduck explained he is more concerned about maintaining top-notch service and support for his IBM 3083 Model JX and 4341 Model Group 12 processors and channel-attached peripherals than he is about reaping the benefits of a better price/performance ratio.

Haiduck explained he is more concerned about maintaining top-notch fred Colby, senior vice-president of information services with John Hancock Mutual Life Insurance Co. in Boston. Colby noted that while his firm has used and has been pleased with STC disk and tape drives, STC's future appears to be too uncertain at this time to justify additional purchases.

Willing to buy certain non-IBM products

Both Colby and Haiduck agreed that their bias toward buying solely from IBM applies only to processors and the large peripherals that attach directly to them. Both admitted they often select non-IBM products when buying less strategic peripherals such as printers, plotters and terminals.

"It looks to me as if IBM's got the market just where they want it," Colby said, noting that IBM's recent dual-capacity 3380 appears to widen further the gap between IBM and competing products.

"There has been a chilling effect with regard to users' openness to go with [plug-compatible manufacturers]," admitted Frank Gens, an industry analyst with the Yankee Group, a market research firm in Boston. But Gens contended that the coolness may be a passing phase brought on by IBM's recent onslaught of product announcements.

Gens believes users will gradually regain confidence in IBM-compatible disk and tape drives as the marketplace stabilizes.

IBM 3480 drive promises to stave off competition

[illegible]

TAPE DRIVES — IBM 3420 AND COMPATIBLES

Vendor	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Model	IBM 3420-8	7420-88	3228, 3281	3630, 3650, 3670	3430, 3440, 3450, 3470	4670
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Controller Used	IBM 3803	NAS 7803-21	Memorex 3221 or 3222	STC 3800-4	STC 3800-3	Internal
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Rewind Time (2,400 ft)	45 sec	Not available	45 sec	50 sec	50 sec	50 sec
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price	$19,880	$19,250	$19,880 (3228) $73,000 (3281)	$16,600 (3630) $19,100 (3650) $21,000 (3670)	$14,520 (3430) $17,710 (3440) $18,490 (3450) $20,380 (3470)	$46,800 (Model A) $20,850 (Model B)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1. For a control unit plus one tape drive.

IBM 3480 TAPE DRIVE

[illegible]	[illegible]
Model	3480 Models A, B
[illegible]	[illegible]
Controller Used	Internal
[illegible]	[illegible]
Tape Type	Cartridge
[illegible]	[illegible]
Availability	Not available

CW CHARTS

Thriving IBM 3380s paint grim picture for competition

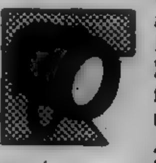
By Tom Henkel
CW Staff

In March 1981, IBM admitted it had made an embarrassing mistake. Deliveries of its innovative 2.5G-byte 3380 disk drive, announced several months earlier, were being suspended indefinitely because of problems in the unit's head disk assembly. Six months later, things got worse. IBM said it had fixed the problems with the 3380, but that deliveries of the units would be 14 months late.

The delay caused a near panic among memory-hungry users. Complacent that they would soon be receiving 2.5G-byte disk drives from IBM, many IBM mainframe users found themselves thrust into a crisis — they had to find a short-term memory alternative to wait out IBM's 3380 delay.

The best bet was the older 3350. Even though it took four 3350s to equal one 3380, users ordered 3350s in droves. It got to the point where IBM, which industry analysts said had already ramped down 3350 production in lieu of the 3380, sent out a plea to its users to defer 3350 deliveries if possible.

— Computerworld, Oct. 5, 1981



Although 1981 was a year IBM would probably rather forget, a look at the IBM mainframe disk drive marketplace four years later shows that Big Blue bears few scars from its early 3380 problems. If anything, IBM appears to have emerged from one of its lowest moments in perhaps its strongest position ever in the mass-storage market.

According to the Framingham, Mass., market research firm, International Data Corp. (IDC), IBM swamped the competition in the 500M-byte and larger disk drive marketplace in 1984. In the 3380 market alone, IDC said IBM sold nearly six times as many 3380 spindles in 1984 as did all of its competitors combined. In 1983, IBM did an even more lopsided business, selling nearly 35 times as many 3380 spindles as all of its competitors. Furthermore, in the 500M-byte and larger disk drive category, IDC contended that IBM holds a 70% share of the market — not just among IBM and compatibles but among all vendors.

What has happened since the IBM 3380 delay typifies the profound force IBM has wielded over its competitors. IBM gave the competition a rare gift of 14 extra months to develop a 3380-compatible product, but

See 3380 page 27

DISK DRIVES — IBM 3370 AND COMPATIBLES

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Model	3370	3375	3690	3695
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price	$35,480 (Model A) $26,600 (Model B)	$38,040 (Model A) $28,770 (Model B)	$35,480 (Model 3693) $26,600 (Model 3690)	$38,040 (Model 3697) $28,770 (Model 3695)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Controller Required	IBM 3880	IBM 3880	Memorex 8880-3 IBM 3880-3	Memorex 8880-3 IBM 3880-3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average Access Time (in msec)	20	19	20	19
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DISK DRIVES — IBM 3350 AND COMPATIBLES

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Model	3350	7306 (dual-density)	8650	6280
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price	$32,030 (Model A) $25,380 (Model B)	$54,000 (Model A4) $39,000 (Model B4)	$46,875 (Model A2) $39,540 (Model B2)	$49,200 (Model AA4) $35,800 (Model B4)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Controller Required	IBM 3880	NAS 7880	STC 8880-2 STC 8890	Amdahl 6880
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average Access Time (in msec)	25	25	25	18
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1. Available in limited quantities.
2. For an eight-channel switch controller.

DISK DRIVES — IBM 3380 AND COMPATIBLES

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Model	3380	3380 Extended Capability Models	7380	8380	3680	6380
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price	$88,780 (Model A) $64,440 (Model B)	$88,780 (Single capacity Model AD4) $64,440 (Single-capacity Model BD4) $134,740 (Dual-capacity Model AE4) $110,400 (Dual-capacity Model BE4)	$85,500 (Model A4) $58,500 (Model B4)	$76,130 (Model A4) $87,225 (Model AA4) $53,150 (Model B4)	$88,780 $64,440	$71,200 (Model AA4) $49,700 (Model B4) $38,950 (Model M4)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Controller Required	IBM 3880	IBM 3880	NAS 7880	STC 8880 Model 2; STC 8890	IBM 3886 Model 3	Amdahl 6880
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Average Access Time (in msec)	16	15 (single-capacity) 17 (double-capacity)	16	16	16	15
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

1. Includes 4M bytes of cache memory.
2. For an eight-channel switch controller.
3. For a Memorex 3883 head-of-string control unit and two 3680 disk drives with 1.25G bytes of storage.
4. For two 3880 disk drives with 1.25G bytes of storage.

CW CHARTS

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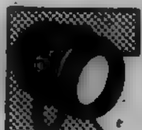
TAPE

from page 24

reels, the 3480 does not offer the simple solution of bringing in a new box that offers better performance.

Many companies have amassed warehouses full of 10½-in. tape reels. For them, total conversion to the 3480 cartridge format is flatly impossible. Analysts said they believe that most large mainframe shops will ease in the 3480 over a period of years, starting with one specific application and gradually expanding.



Market for 3420 remains

The expected paced migration to 3480s also means that the market for older 3420 disk drives will not dry up overnight.

James Porter, president of Disk/Trend, Inc. in Los Altos, Calif., noted that the demand for new 3350 disk drives virtually vanished after IBM got its 3380 production into full swing because there were plenty of used 3350s on the market at agreeable prices.

Consequently, although IBM and most of its competitors said they still offer a 3350-type unit, Porter contended that none are actually still manufacturing the device.

Porter maintained that the market for 3420s will not show as dramatic a drop-off. But he admitted that as more used 3420s appear on the market, there will be a continuing decline in demand for new 3420-type devices.

IBM's 3480 offers some dramatic improvements over the 3420. The unit can transfer data at IBM mainframe channel speeds of 3M byte/sec and can store up to 200M bytes on ½-in., chromium dioxide, 18-track tape. The unit has a recording density of 38K bit/in.

> ”
>
> *To back up a 1.2G-byte 3380 spindle requires an operator to change the 3480's 200M-byte tape cartridges six times.*

The 3420 can store 160M bytes of data on ½-in. iron oxide 9-track tape and can only transfer data at IBM's old channel speed of 1.25M byte/sec. It has a recording density of 6.25K bit/in.

Disadvantages to the 3480

There are also some disadvantages to the 3480. International Data Corp., a Framingham, Mass., research firm, noted in a recent report that what IBM terms "full function support" mode of the 3480 is only available under IBM's MVS/SP ad MVS/XA operating systems.

Furthermore, in its current state, the 3480 requires significant operator intervention. For example, to back up a 1.2G-byte 3380 spindle requires an operator to change the 200M-byte tape cartridges six times. That means it requires 12 cartridges to back up one 3380 and 24 cartridges to back up IBM's new double-capacity 3380 model.

Industry watchers said they believe IBM will soon unveil an automatic loading feature for the 3480 to handle this problem.

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3380

from page 25

none were able to do so. Carol Lerner, a researcher at IDC, explained that although IBM managed to get the 3380 back on the market by early 1982, Hitachi Ltd., which sells its products domestically through National Advanced Systems Corp., was the first IBM-compatible vendor to have its disk subsystem on the market. Hitachi put its 7380 on the market in late 1982, nearly a year after IBM began volume shipments. The other competitors, Fujitsu Ltd. (domestically Amdahl Corp.), Storage Technology Corp. (STC) and Memorex Corp., did not start making significant shipments of their products until 1983.

Control Data Corp., which was plagued by problems with its 3380 compatible, bailed out of the end-user, IBM-compatible business after delivering only a handful of 3380-type drives.

"The competition shot itself in the foot," noted James Porter, president of Disk/Trend, Inc. Porter maintained that IBM achieved its current position of dominance not because it has been using its massive size and financial resources to kill off the competition, but because the competition has been unable to keep up.

> ”
>
> *The days of a free ride for makers of IBM-compatible equipment are over, because any attempt to improve 3380-like products represents a monumental physics problem.*

A classic example, Porter said, is STC, a company that had been IBM's toughest competitor in the mainframe-compatible disk and tape drive business and that is now struggling for its life.

"IBM got lucky on this one," Porter said, noting that STC's attempt to enter the IBM-compatible mainframe business, followed by technical problems with its 3380-compatible product, drained its resources and taxed its ability to compete with IBM.

But underlying specific vendors' problems, Porter said, is a broader problem of diminishing advantages of IBM-compatible products.

Porter explained that, traditionally, three factors have drawn users to IBM-compatible peripherals: a better price, an earlier delivery date or special features that IBM does not offer. Porter contended that IBM's newest high-end peripherals, the 3380 disk drive and 3480 tape unit, appear to limit the ability of competing vendors to take advantage of at least two of those selling features — early delivery and special features.

With the 3380, IBM has jumped to an early lead in delivering more units than the competition did. IDC figures say that in 1983, IBM shipped 29,200 3380 spindles, compared with 400 from Memorex, 300 from Hitachi, 100 from Fujitsu and 35 from STC. For 1984, IDC estimated a similar lopsided advantage for IBM. The market research firm estimated that IBM shipped 60,000 3380 spindles vs. 4,000 from STC, 3,000 from Hitachi, 2,000 from Fujitsu, 1,500 from Memorex and 700 from CDC.

On the extra features front, Disk/Trend's Porter said that the technical complexity of devices like the 3380 and 3480 make it increasingly difficult for competitors to add special features not already offered by IBM.

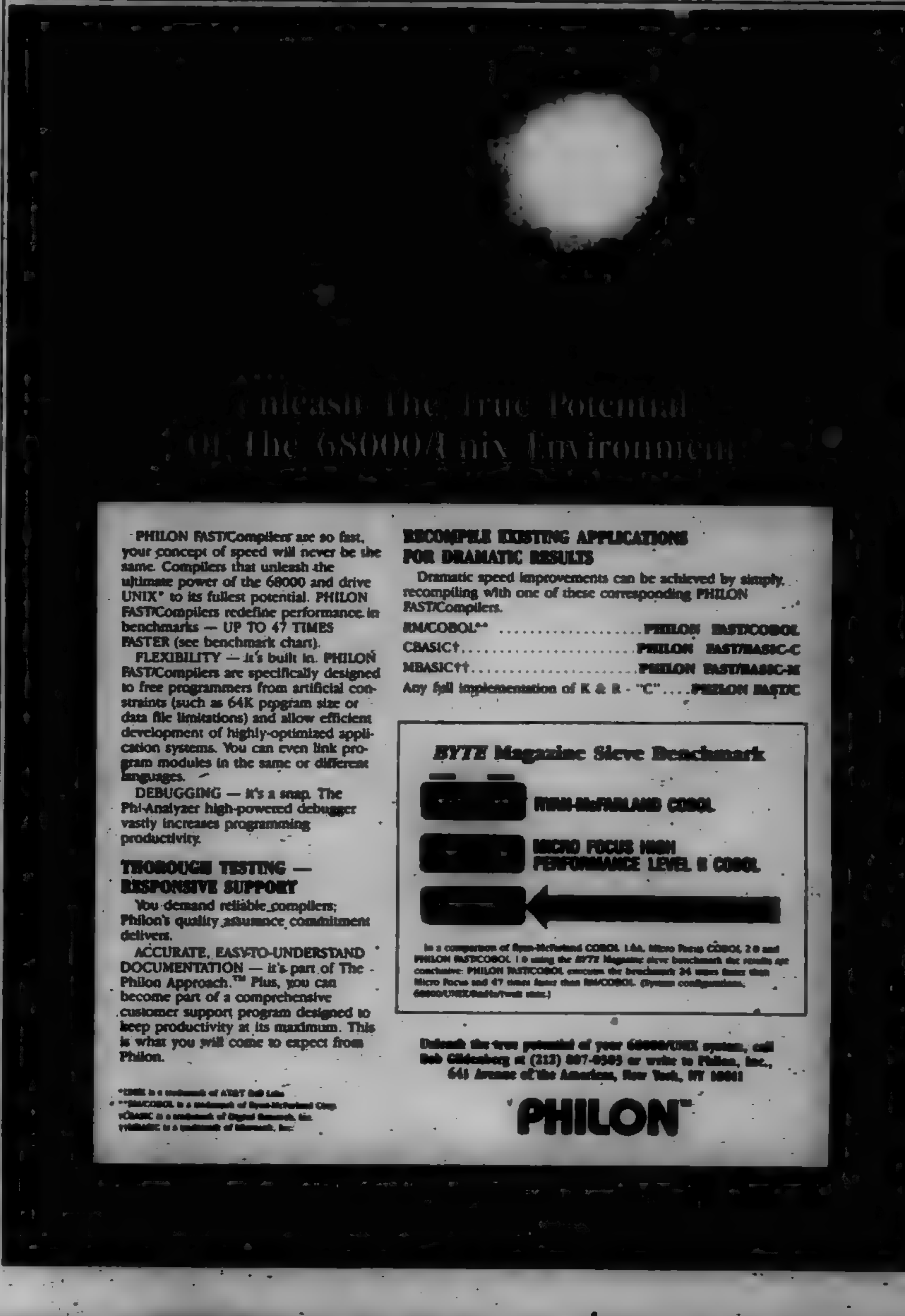
Consequently, vendors of IBM-compatible hardware may have to settle on significantly underselling IBM in efforts to attract IBM mainframe users. Unfortunately, Porter noted, that tactic means the competition must also settle for smaller profits on units sold.

A case in point is Amdahl. The company cut the price of its 6380 disk subsystems by roughly 12% in September [CW, Sept. 10]. A 6380 subsystem — including 6880 disk controller — that sold for $148,030 last March, was cut to $130,170. In late February [CW, Feb. 25], Amdahl lowered its 6380 prices again, unveiling a 6380 Model M4, which functions the same as the firm's Model B4 but costs about 20% less. The M4 can be used as the third and fourth drives on a 6380 string consisting of a Model AA4 and B4. Although the future for makers of IBM-compatible disk drives currently appears somewhat grim, one cannot overlook the possibility that IBM's heavy advantage may be a temporary situation brought on by the switch to the new, complex thin-film, read/write head technology used in the 3380.

Most industry analysts agree that the days of a free ride for makers of IBM-compatible equipment are over, because any attempt to significantly improve 3380-like products represents a monumental physics problem and a high R&D investment.

Frank Gens, an analyst with the Boston-based Yankee Group, said the physical barriers to improving the 3380-type disk drive may lead to a period of stability, which could give the makers of compatible products an opportunity to recover from IBM's recent fast-paced product upgrades.

Furthermore, Gens said, most IBM mainframe users are not as interested in the technology used inside a disk subsystem as they are in its performance and floor space requirements. Consequently, Gens said he sees brighter days ahead for the survivors of the current cool period of interest in IBM-compatible products.



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NEWS

Insurance firm automates system one step at a time

CW AT INFO/CENTRAL

By Maura McEnaney
CW Staff

CHICAGO — For Metropolitan Life Insurance Co., automating its group insurance administration area is a six-year job. According to Metropolitan's John Zeitler, assistant vice-president for administrative planning and policies, it has meant phasing out a system that originated in the 1960s and creating and installing application programs that would, among other things, automate customer lists, bill collection and premium processing.

Batch processing, magnetic tape and card input were headed out the door; a data base management system (DBMS) and information center to support the program were on their way in.

Zeitler described the new system, called Metropolitan's Financial and Administrative Customer Services System (Metfacs), at Info/Central: The Information Management Exposition & Conference here recently.

Last November, Zeitler said, Metropolitan implemented the first of the Metfacs application packages, known as Metfacs Administration. Two other application projects are in the development stage — a premium accounting project will be installed in 1986, and a claims accounting package will be established in 1987, he said.

Prior to the implementation of Metfacs, the availability of information at Metropolitan was very limited, Zeitler said. "This started to perpetuate itself," he said, adding that this created poor communications with sales offices and a lack of confidence in the company. The objective of the Metfacs system, Zeitler explained, was to tie together information processing at 40 sales offices in four zones around the country.

Selecting the DBMS was not an issue for Metropolitan, Zeitler said, because the company already used Cullinet Software, Inc.'s IDMS in several locations.

Senior management involvement

The first step in the project, he said, was the formation of a conceptual design team. Composed of representatives from several areas of the company, the team was responsible for identifying data relationships, Zeitler said, which involved "looking beyond the operations and organizational boundaries." More important than the design team, however, was senior management involvement, he noted.

"We sold our senior management on the need for the system," Zeitler said. Metropolitan management was aware of a general lack of confidence throughout the company and of the potential for savings through automating several processes. Representatives from various business groups throughout the company were also involved in the planning. "Steps were taken to get them involved and keep them interested," he said.

The conceptual design team consisted of one senior staff member, two managers, a corporate planner and two DP representatives. Each person was critical to the project, Zeitler said. "If we did not get the business people, I think we would have stopped."

To identify data entities and relationships for that data, more than 100 workers were interviewed. From those interviews, the group identified 88 data entities and 112 relationships for that data, paring down the list from 270 identities and 300 relationships, Zeitler said.

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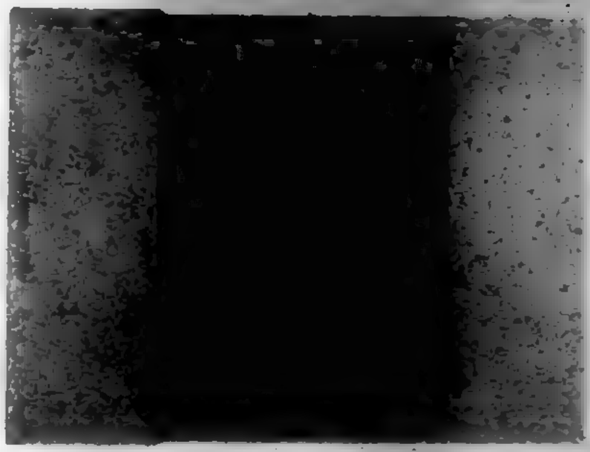

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Migration without converting up to 192 users	Yes	No
32-bit Architecture	Yes	No
Cache	Yes	No
Object Code Compatibility	VS 15, 25, 45, 65, 85, 100, 300	36 only
Virtual Memory Operating System	Yes	No
Removable Storage Options	Yes	No
Local Area Networks	Yes	No
Architectured for OA/DP	Yes	No
Relational Data Base	Yes	No
Industry de facto Standard Word Processing	Yes	No

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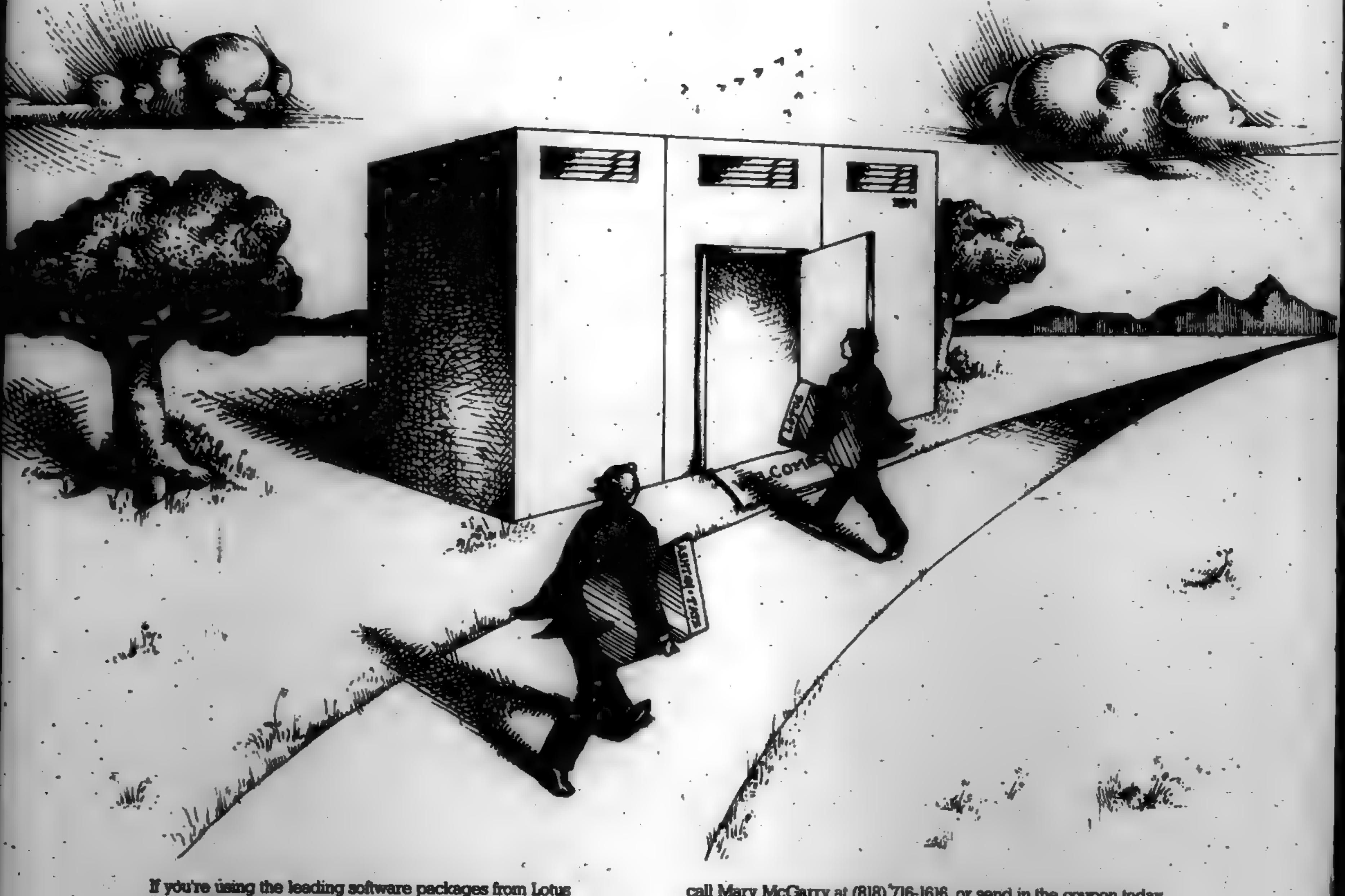

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The Answer Series™

New York library gets computers

By Donna Raimondi
CW Staff

NEW YORK — Patrons of the venerable New York Public Library here will soon shift from chaos to order in their search for materials in Public Catalog Room 315. The room was shut down in January — for the first time since its opening in 1911 — for conversion from an obsolete cataloging method to a contemporary bibliographic and computerized catalog system.

When the room reopens in the fall, more than one million records that were located in at least four different places will be available to users on a computerized system, said Rodney Phillips, chief of the library's general research division.

"The technology will not jump out at you," Phillips said. The room's basic architecture will be the same but the dilapidated card catalog boxes, of which there are more than eight thousand, will be gone and new shelves for books and terminals will be in place.

If a researcher wants to look up six writers on one subject using the new system, Phillips said, he will merely type FIND, the subject and the writers' names, all strung together. In five seconds, the researcher could have 79 items to choose from. Previously, researchers would have had to look in 18 different places for the six writers and would have had to know their exact names or the exact titles of wanted books, he added.

Volumes from the time the library opened to 1971 were catalogued in card form in drawers that were falling apart from age and use, Phillips said. From A to E of the old card catalog has been photographed, microfilmed and made into books, he said. When the room reopens, all the old volumes, from A to Z, will be in book form placed along one wall. Volumes since 1972 have been cataloged in book form and archived on machine-readable tapes. The archive tapes of those records are being reprocessed by Carlyle Systems, Inc. of Berkeley, Calif., to run on Carlyle's On-Line Multiuser System, Phillips said.

The parallel processing system that Carlyle designed for the library is composed of a remote processor to handle terminals and validate user inquiries, a data base processor that works around the variable length records of the library's Machine Readable Catalog system and an interface processor that acts as a traffic cop between the remote processor and the data base processor. The three processors are built around Intel Corp. 80286 chips.

Thirty-five to 50 terminals will be in place when the room opens again, Phillips said, and eventually there will be approximately 100 terminals in the library. Patrons already have access to four terminals, he said, and they want more. "They want the old catalog in there. . . ." he said. At this point, 3½ years of titles are on-line, and by December, 1.8 million records should be computerized, Phillips added.

DP salaries up 5.9%, study reports

NEW YORK — Salaries for programmers and data base administrators will be among the fastest growing wages for data processing personnel in 1985, according to a study released earlier this year by Robert Half International, Inc., a DP and financial executive recruiting company.

The annual study — based on analyses of position requests that employers have submitted to Robert Half offices — covers the major data processing categories and is broken down into large, medium and small companies.

Overall salary increases across all DP professions averaged 5.9% over salaries paid in 1984, according to the study.

Programmers in large installations showed a 9.1% increase over 1984 salaries, according to the study, while programmers in medium installations reflected a 7.1% increase. Salaries for programmers in small shops increased by 8.3%.

The study showed that salaries for data base administrators, a category not applicable in small installations, increased by more than 9% in large as well as medium installations.

Starting wages in Alaska and Hawaii were 18% and 15% higher than the national average, respectively, the survey revealed. Starting DP salaries in California, Nevada and Connecticut were 5% higher than the national average, while in Maine, New Mexico, Florida and West Virginia, starting salaries were 9% to 10% lower.

Managers for systems and programming fared poorly in small installations, according to the study, with an average increase of 3.1%. This contrasts with a 9.5% increase for managers' salaries at large installations and a 7.9% upgrade in medium installations.

The survey booklet, which contains starting salaries for financial executives as well as for data processing personnel — may be obtained free of charge from Robert Half International, 522 Fifth Ave., New York, N.Y. 10036.

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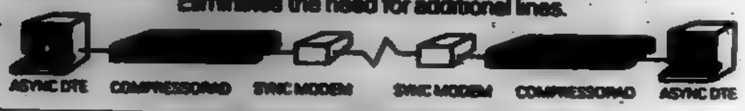

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NEWS

On-line courses help users access subscription service

WESTWOOD, Mass. — The Faxon Co., a magazine subscription provider serving 25,000 corporate and university libraries in 92 nations, is developing on-line courses for its employees and customers by using software for authoring computer-based instruction.

Faxon customers use the on-line courses to learn how to access Faxon's Linx remote subscription management service. Using Linx, customers can access lists of their magazine holdings and the facility's records. The Linx Datalinx option can be used to place orders for any of 115,000 available magazines or to send messages to Faxon management.

Approximately 50 on-line tutorials have been developed using the software, Scholar/Teach 3 from Boeing Computer Services Co. All are available on the same terminals customers use to connect to Linx.

"People need to know how to access the system, update their files and retrieve information," said Dennis Corcoran, Faxon's supervisor of education and training.

"Our own people are always adding, changing and maintaining data. We have created an on-line training system [that] is menu-driven and very easy to use. Every new employee spends a week with us, and they go through their departmental training on [computer-based instruction]," Corcoran said.

In all, Faxon has developed 117 on-line courses using the software, which runs on an IBM 3081K mainframe. Other courses are used for in-house training and are accessed by employees using IBM 3270 terminals.

Corcoran said Faxon selected Scholar/Teach 3 for its easy authoring capability. According to Corcoran, "Faxon evaluated the available [computer-based instruction] software and concluded that Scholar/Teach 3 was best suited to meet its needs.

"One of the big competitor's training systems is very hard to use, very difficult to program. You really need a programmer to make it work, and sometimes even programmers have difficulty," he said. "Other [computer-based instruction] software is oversimplified. They bring you through menus all the time. Menus are nice in the first few weeks of use, but you get tired of them very quickly."

Faxon sells its services by system, so the training for a given application begins with a main menu citing the systems available. After the user selects the desired system, a submenu lists the courses associated with that specific application. Courses run from 20 to 30 minutes.

Nancy Robison, an assistant training specialist at Faxon who had no prior DP experience and has now written several of the computer-based instruction courses, said, "Scholar/Teach 3 software made it easy for someone without programming experience to convey that knowledge in the form of a [computer-based instruction] course."

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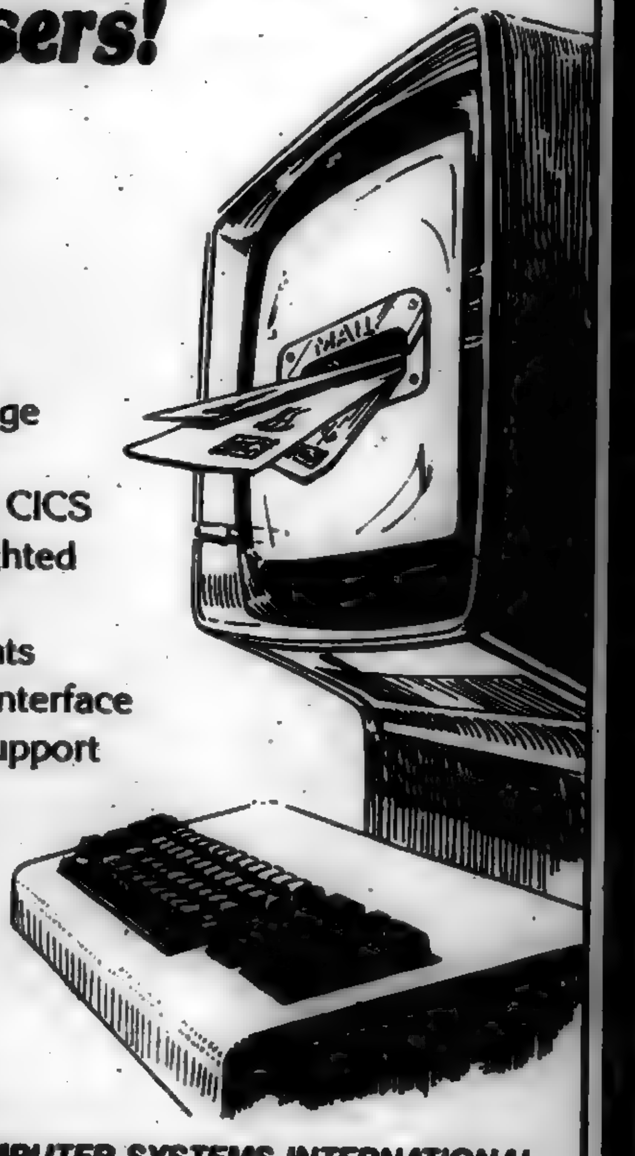

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Dema seminar set for March

CAMBRIDGE, Mass. — The Data Entry Management Association (Dema) will host a seminar March 11-12 at the Hyatt Regency Hotel here.

Topics will include management's failure to provide a proper working environment for its data entry staff, how managers can improve their skills and stress management. The seminar will also be offered in Dearborn, Mich., April 30 to May 1.

The price of admission is $525 for members of Dema and $575 for nonmembers. The nonmember price includes membership for one year.

More information is available from Dema, P.O. Box 16711, Stamford, Conn. 06905.

NEWS

RCA managers extract data with common access product

CHERRY HILL, N.J. — When managers at RCA Corp.'s Information Systems and Services division were unable to attain access to data located in the corporate data base, the communications conglomerate was stuck in a productivity bind.

"We had many pieces of information that weren't being shared," said Len Hirschfield, manager of information systems. "This created confusion and wasted a lot of time. In some cases, people were even getting bad data — information that was out of date or incomplete."

RCA uses an IBM 3081 Model K and IBM's Professional Office System (Profs), which provides office automation functions to users of IBM's VM operating system. Programming languages used include Information Builders, Inc.'s Focus; Mathematics Products Group, Inc.'s Ramis II; Issco, Inc.'s Tell-A-Graf; and SAS Institute, Inc.'s SAS/Graph. However, Hirschfield said, often the complexity of the languages can discourage managers, who are often computer novices, from turning to the system for information.

> ”
>
> *'Fourth-generation products didn't give our managers a standard, easy way of getting information. Gateway does.'*
>
> — Len Hirschfield
> RCA Corp.

"The person looking for information would often start by making a phone call. The person who owned the data would then run a special report or send a copy of a file already on hand. "Sometimes you had to go through three or four levels of people before you got the information — information that could have been made available directly to the user because it was on-line somewhere," Hirschfield explained.

Hirschfield began looking for a solution to solve his integration problems: "We were looking for a way to bring all the pieces together in one common access method, one common set of instructions," he said.

SCA Product and Services, Inc.'s Gateway was one of the products on the market that was able to meet his needs, Hirschfield said. The product was designed to provide an integrated environment for the Information Center, combining fourth-generation products for reporting, graphics and financial modeling. It can also provide an interface to the languages used at RCA.

Hirschfield said he selected the product because it shields the user from the complexities of the programming languages and makes information available through menus, screens and prompts.

Since Gateway was introduced at RCA, 50 high-level managers and professionals have been introduced to the system, with 40 others using the product as a front end to Profs only, Hirschfield said. He said he expects another 40 managers to go online by the end of 1985. "Fourth-generation products didn't give our managers a standard, easy way of getting information," he said. "Gateway does."

A Gateway capability used by RCA's managers is its custom reports for designing graphics packages. The company also plans to use Gateway's customizing capabilities to broadcast updated company information such as organization charts and phone directories.

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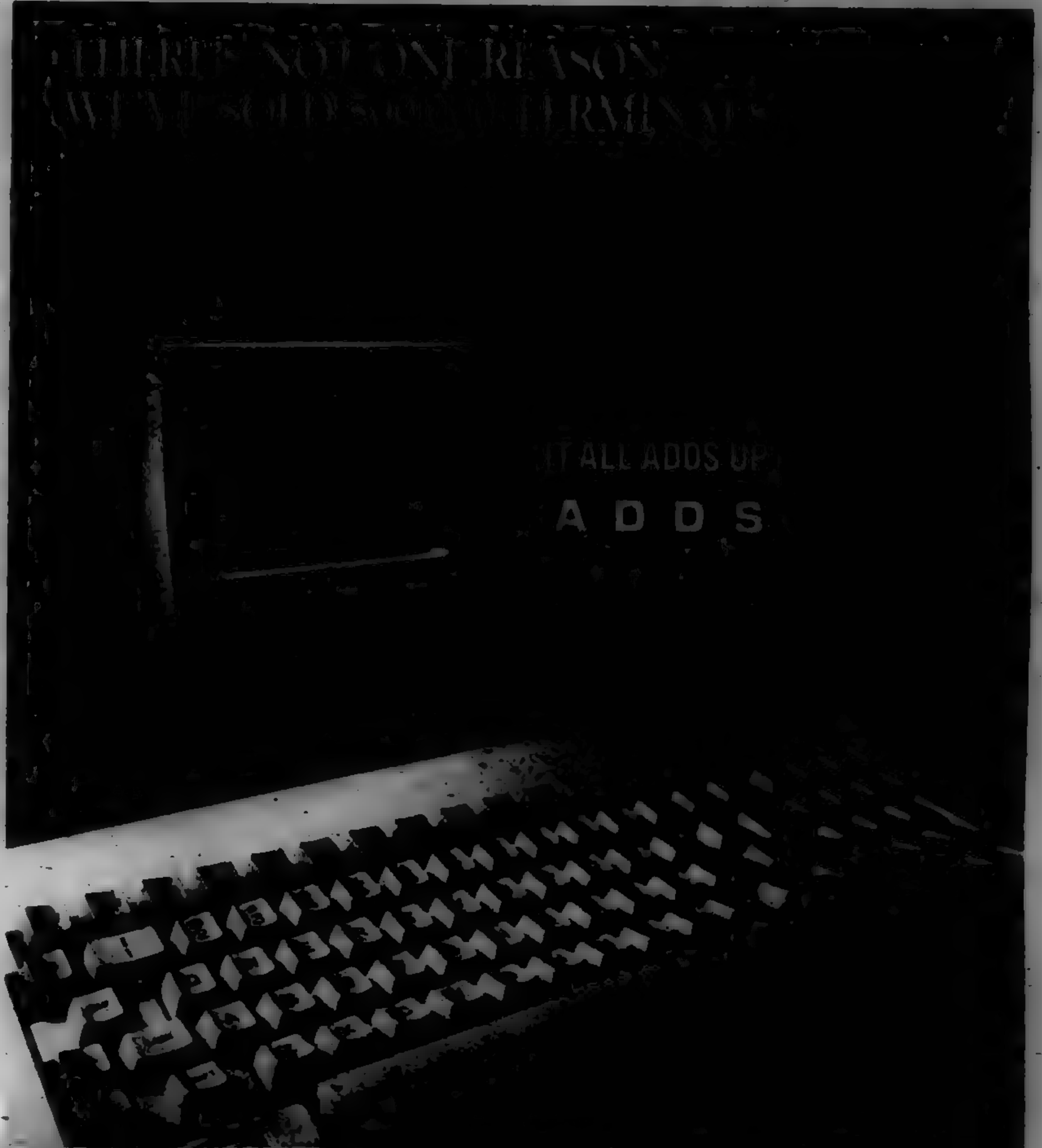

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NEWS

INTERNATIONAL REPORT
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ENGLAND

LONDON — The British Post Office is looking for IBM experts to go along with its planned purchase of several IBM mainframes, sources said. The post office has not updated its equipment since its split with British Telecom three years ago, a spokesman said. To update operatons, the post office will replace equipment from Burroughs Corp., NCR Corp. and ICL Co.

■

LONDON — The U.S. government is requiring Inmos Ltd., the UK's flagship semiconductor maker, to get government permission to transfer to Britain its own technology developed at its Colorado design center. The British Parliament is reportedly not pleased with the U.S.' control.

■

CAMBRIDGE — Acorn, the financially troubled British microcomputer maker, has been rescued by Olivetti Corp., which scooped up the majority of the UK company for $10.4 million. The company's remaining stock is now valued at $21 million, compared with a high of $135 million just eight months ago. Acorn produces the microcomputers commissioned by the British Broadcasting Corp. for a series of television programs intended to boost national computer literacy.

FRANCE

PARIS — Six European manufacturers — Bull, ICL, Siemens AG, Nixdorf AG, Olivetti Corp. and Philips, Inc. — have joined together to develop a standard, portable European AT&T Unix operating system. The group is reportedly holding detailed discussions with AT&T and other major Unix vendors, including Microsoft Corp. as well as user organizations, to ensure product consistency and active cooperation.

The group plans to establish a common software applications environment based on Unix and will publish its definition of Unix in phases throughout 1985, a spokesman said. The resulting software will not be proprietary and will be made available to all vendors.

JAPAN

TOKYO — Hitachi Ltd. has unveiled two 3½-in. hard disk drives and a 5-in. hard disk drive. The 3½-in. drives, called the DK 301 series, are available in two versions with memory capacities ranging from 12.7M bytes to 19.1M bytes. They are priced at $720 and $880, respectively. The 5-in. DK 505 series is said to have two times the capacity of the existing Hitachi 5-in. model and costs $1,120, according to the vendor.

■

TOKYO — Fujitsu Ltd. has enhanced its M-342 mainframe series with the addition of M-340U, which reportedly features 1.71 millions of instructions per second and 1.3 times the functionality of the existing M-340 system. The system is slated for delivery in September. Fujitsu also announced enhancements to its low-end Model R system and to its OS IVB/XB FSP operating system for mid-range machines.

SWEDEN

STOCKHOLM — The National Swedish Telephone Agency claimed to have set a world record when it recently transmitted information over normal telegraph wire composed of coaxial and optical cables at speeds of 2M bit/sec. The transmission was part of an experimental project with Sweden's Volvo Flygmotor AB to sell Volvo's data-intensive computer-aided design and manufacturing services outside the company over high-speed communications lines, a spokesman said.

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CALENDAR

WEEK OF MARCH 31

MARCH 31-APRIL 3, ATLANTA — **The International Conference and Trade Fair for Software Merchandisers, Publishers and Corporate and Institutional Users (Softcon).** Contact: Softcon, c/o Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

MARCH 31-APRIL 4, ATLANTIC CITY — **The 1985 Microprocessor Forum.** Contact: N. R. Kornfield, Widener University School of Engineering, Chester, Pa. 19013.

APRIL 1-2, BOSTON — **Using Dbase III.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

APRIL 1-2, STAMFORD, CONN. — **Structuring and Negotiating Hardware Contracts, Software Contracts and DP Service Contracts.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held April 8-9 in Detroit and April 22-23 in Baltimore.

APRIL 1-2, FORT LEE, N.J. — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held April 8-9 in Atlanta.

APRIL 1-3, SAN DIEGO — **Lotus 1-2-3 Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

APRIL 1-3, CHICAGO — **Purchasing Management and the Computer.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

APRIL 1-3, NEW YORK — **IMS Utilities.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 1-3, NEW YORK — **Data Analysis and Logical Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 1-3, WASHINGTON, D.C. — **Strategic Data Planning '85.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 1-3, WASHINGTON, D.C. — **National Conference on Using Ada: Getting Results.** Contact: Conference/Event Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

APRIL 1-4, FORT LEE, N.J. — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held April 1-4 in Atlanta and April 8-11 in San Francisco.

APRIL 1-4, SAN ANTONIO — **CICS/VS Applications Design.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held April 8-11 in Denver.

APRIL 1-4, SAN ANTONIO — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

APRIL 1-4, SAN FRANCISCO — **Fifth International Conference on Decision Support Systems (DSS-85).** Contact: DSS-85, Third Floor, 290 Westminster St., Providence, R.I. 02903.

APRIL 1-4, LOS ANGELES — **IMS/DB (DL/1) Applications Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

APRIL 2, ROCHESTER, N.Y. — **The 20th Annual Upper New York State Systems Seminar.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 2-4, LOS ANGELES — **Corporate Personal Computer Expo.** Contact: National Institute for Management Research Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

APRIL 2-4, NEW ORLEANS — **Gulf Computer and Office Show.** Contact: Show Management, c/o Avant Garde Circle, Kenner, La. 70065.

APRIL 2-4, CHICAGO — **Fifth National Conference on DP Quality Assurance.** Contact: Conference Manger, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

APRIL 3-4, FORT LEE, N.J. — **Recovery/Restart.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

APRIL 3-5, ANAHEIM, CALIF. — **Texpo '85.** Contact: Karen Westlund, Pacific Bell, 500 E. Main St., Alhambra, Calif. 91801.

APRIL 4-5, ORLANDO, FLA. — **Successful Software Management.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Department SSM, P.O. Box 3606, Torrance, Calif. 90510.

WEEK OF APRIL 7

APRIL 8-10, NEW YORK — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 8-11, SAN ANTONIO — **IMS/DC (Data Communications) Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Data Design's Financial Software Tops Datamation Survey.

[illegible] To Rea[illegible] A [illegible] Software Ad.

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EDITORIAL

Those soaring telecom salaries

Are you worth $100,000?

A few classified advertisements in *Computerworld* and in large metropolitan daily newspapers are hawking salaries for senior telecommunications executives in precisely that range: $100,000 and up. Corporate recruiters are offering even more — $150,000 and up — on behalf of their multibillion-dollar clients. Compensation packages can include medical, dental and life insurance; training programs; bonuses; stock options; relocation reimbursement; and other undisclosed fringe benefits.

What's behind these soaring salaries? Obviously, a bidding war for top-level telecommunications executives is raging among large corporations, fueling the demand for management talent already in short supply. Several other factors are at work here, too. They include the following:

- Banks, financial service companies and insurance firms are competing fiercely via networks to supply products and services to their clients — and to lock out competition.
- The recent rash of corporate mergers and acquisitions requires the integration of huge, previously separate voice/data communications systems.
- Corporations demand quicker access to their cash, forcing banks to move rapidly from batch processing of money transfers to on-line, real-time networks.

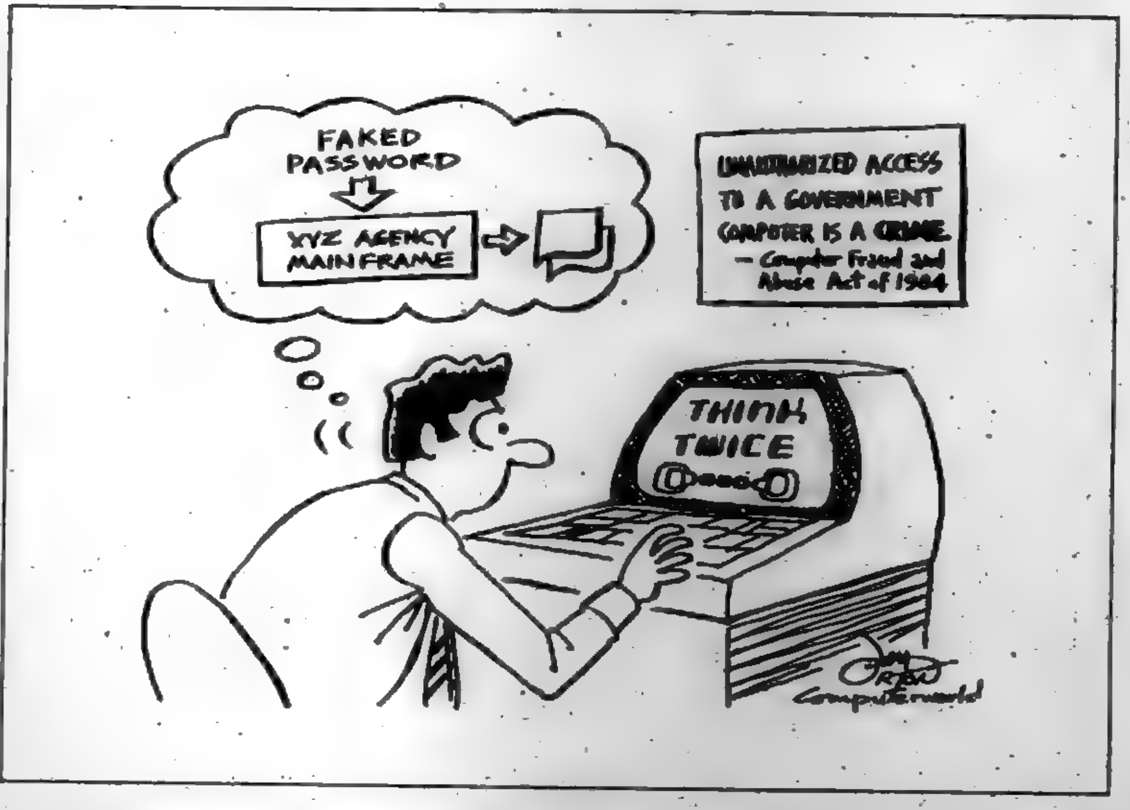
These and other business requirements put a premium on shrewd management of the delivery system, which is telecommunications. The opportunities and rewards — financial and otherwise — over the next three to five years for those who qualify promise to be extraordinary.

You won't qualify, however, unless you can deal with the fallout from the AT&T reorganization, the integration of voice and data transmission, the emergence of new equipment and vendors, unpredictable levels of service, technological breakthroughs, international communications and the explosion of personal computers. But configuring, maintaining and managing the network and its human resources are only half of it.

General business management skills ranging from strategic planning and risk assessment to profit-and-loss forecasting and bottom-line decision making are the other half. Telecommunications departments have usually been viewed as a drain on corporate revenue, ill-equipped to make efficient use of the technologies at their disposal — "an unwelcome and unmanageable expense," in the words of one observer. No more. The refreshing realization is that savvy telecommunications managers can trim costs and perhaps even enhance corporate revenue through such means as capacity resale operations and shared-user systems.

"When telecommunications managers talk to me about increasing the [bit/sec] rate or tripling the number of [automated teller machines] in service, I don't care," stated the president of a major executive search firm.

"The more critical thing is that [the manager] increased uptime from 86% to 99.8% and dropped the per-transaction cost from 6 cents to 3.2 cents. When a guy talks to me that way, I listen, because what he's talking about relates to the guts of the business."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THINK TWICE
Orr
Computerworld

LETTER

Free software philosophy refuted

The letter "Case against free software" [CW, Jan. 21] was well-deserved. I had the misfortune last year to hear Richard Stallman, the subject of that letter and advocate of "free software," speak at a seminar on, of all things, computer ethics. In the course of lawfully expending his views, to which he is constitutionally entitled, he also managed to accuse computer business managers of being thieves and further showed his ignorance by stating that patent law principles ("to encourage invention") should be interpreted as prohibiting software copyright ("to encourage everyone to write software").

Stallman then had the gall to say that he expected reputable firms to hire him as a consultant. Believe me, I heard this with my own ears.

It is hard to judge how much of a threat Stallman really is. He gives the appearance of being a vintage flower child of the '80s. Still, I would not sell him short. He is, at the very least, quite bright and professes antagonism to laws respecting property rights.

Incidentally, the program of the seminar I attended listed Stallman as associated with the MIT Artificial Intelligence Laboratory. Stallman said nothing during his talk to counter this. One could get the impression that he was professionally employed there, but that turned out not to be the case.

Michael H. Agranoff
Hartford, Conn.

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VIEWPOINT

Japan brings world to gigantic science fair

LECHT ON SCIENCE
Charles P. Lecht

The Japanese government will officially open Expo '85, the international science fair, on March 17. It will be a momentous occasion — the opening of the largest such fair the world has ever seen. Fifty countries from all major political blocs are participating. The U.S. will be there, along with its friends from the Common Market, Soviet Union, China, the Organization of Petroleum Exporting Countries and other nations and organizations. The U.S. pavilion is one of the fair's largest: Some 75 trade organizations and numerous companies will participate.

Expo '85 will be held in Tsukuba, about 60 kilometers northeast of Tokyo. Being called "science city" by the Japanese government means exactly what it sounds like: Many educational and research facilities dedicated to scientific pursuits are located in Tsukuba and scientists make up most of its population.

If you love the idea of roaming about a world-class science fair, you may want to figure out how to make it to Tsukuba around cherry-blossom time, but you've got from March 17 to Sept. 15 to do so. I can't think of anything more exciting to do, except perhaps taking a ride on America's space shuttle, going to the moon or spending a month looking through the telescope at Mount Palomar, Calif. Thinking of the fair as a kind of "scientific olympics" (with the understanding that the very best each country can create may not be there for reasons of national security), we can expect what is there to to present a pretty reliable picture of each country's vision of science — and, in many cases, their achievements. In particular, the East-West comparisons should be fascinating.

Official fair literature tells its theme: "man, his dwellings and his surroundings." Michiyuki Isurugi, Japan's minister of state for science and technology and state minister in charge of Expo '85, said, "The goal of this exposition is to give the people from all parts of the world — particularly the younger generation — visions of the benefits to be derived in the next century from the scientific and technological studies undertaken in the waning years of this one. . . . We are striving to create a futuristic atmosphere full of hope and happiness promised by the 21st century amalgamation of science and technology into the dwellings and surroundings of mankind."

> **99**
>
> ***'We are striving to create a futuristic atmosphere full of hope promised by the 21st century amalgamation of science and technology.'***
>
> **—Michiyuki Isurugi**
> **Japan state minister of Expo '85**

We can do nothing but admire the aspirations expressed by Isurugi. The idea of creating a fair dedicated to peaceful pursuits in science in the only country in the world that experienced its fullest meaning in war is inspiring. The fact that the fair has attracted participants from just about all geopolitical camps may give it miracle status. The timing of the Japanese government in sponsoring Expo '85 is perfect; world scientific interest is at an all-time high.

As it is at any fair in large, developed countries, local pavilions will dominate the fairground. In some countries this would ensure a boring uniformity, but this will not be the case in Japan. Competition there is as fierce as it is here — how else did they make all that progress? Each pavilion will vigorously compete for visitor interest by offering extraordinary cultural and entertainment experiences. A few representative examples follow.

Sony Corp. will present the world's largest television, 25m by 40m, appropriately called the "Jumbotron" (in the country of micro miniaturization yet). IBM Japan's pavilion is dedicated to the "Spirit of Science"; it was designed under the supervision of Leo Esaki, 1973 winner of the Nobel Prize in physics, a director of IBM Japan and an IBM fellow at IBM's Watson Research Center in the U.S. It will invite the visitor to explore the environment we live in, from galaxy to elementary particle, and to conduct experiments on interactive displays in an environment that promises breathtaking surprises. Nippon Telegraph & Telephone Corp. (NTT) will provide a dazzling show with a futuristic vision of emerging information network services. Using personal communications and VDTs, the audience will participate in an event that combines state-of-the-art live communications to locations all over Japan, beautiful digital graphics and original choral music composed for the event.

The TKD pavilion was designed to enable humans to experience sight and sound as if they were birds and other animals. Nippon Electric Co. will provide a space show on 27 video screens, each measuring 133 in. diagonally. The audience sits at terminal devices and may participate in the ensuing events. Matsushita Electric Industrial Co.'s pavilion will include a robot artist that draws a picture of a visitor in less than two minutes, a true holographic image of a clay doll floating in the air

See FAIR page 44

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Computing's 'local' needs often overlooked

HUMAN CONNECTION
Jack Stone

The industry's current preoccupation with increasingly complex, more advanced functions and higher capacity personal computers has tended to divert attention from the elementary but significant processing needs that remain unsatisfied for the vast majority of business users. The term "local" seems an appropriate description of these basic needs, which I will later distinguish from those of a "global" character.

These local needs are part of every business manager's administrative data processing repertoire, but they have been handled on a manual basis for so many years that the thought of automating them has been largely ignored, at least until recently. Of course, the most fundamental set of these local functions are the name and address file, calculator, telephone dialer, notepad, standard data functions or tables and similar routine tasks.

Some of the common characteristics of local functions are small-size files, variable data supplied by the personal computer user and little or no data transmitted to and from other machines. It may come as a shock to many, but these functions constitute a large part of the "real world" of personal computing that has yet to be automated.

Global functions antipodal

"Global" processing functions are antipodal: Large files are typical, variable data is supplied from sources other than the user, and data is regularly transmitted to and from other systems. Not too surprisingly, the global functions — and extensions of the same into every larger hardware system — are currently in vogue.

Now obviously, the automation of these activities is hardly within the purview of data processors or large systems users who have their hands full with the galactic problems associated with grand-scale applications. But they have been of great interest to the purveyors of several high-performance utility packages who have discovered a gold mine in a new software market.

Why have these packages been rapidly accepted? In a nutshell, users have come to realize that automating even the most prosaic of processing activities is justified on the basis of improved individual work performance — as long as the cost and benefit factors are present. It turns out that, for example, autodialing does save substantial time for the heavy user of the telephone; the capability of storing calculated data for later display and/or printout is advantageous for many; and preparing error-free memos and notes that may be automatically retrieved is an attractive feature for a large population of users.

Local function considerations

There are, however, additional system considerations that can further enhance the performance — and hence, the appeal — of automated local functions. They are the following:

- Rendering invisible, or nearly so, the operating system and all of the complexities associated with it. A user shouldn't have to deal with a host of ancillary commands to execute elementary applications.
- The use of a standard, common file design using American Standard Code for Information Exchange data codes to facilitate the use of a single editor for all data files and file interchangeability among various applications programs.
- The elimination of all but the truly significant processing options to simplify the system operation and reduce the learning time to the absolute minimum.
- The availability of more advanced, but local, processing functions for those users who have the need but whose designs are based on a minimum set of operating capabilities — for instance, a spreadsheet with only a couple dozen rows rather than a couple thousand rows; a word processor with editing and formatting features suitable for letters and memos but not acceptable for 100-page reports; a modest generalised data base management facility to keep track of small-volume business records; and special-purpose packages such as expense accounting for business trips.
- Finally, a hardware package that fits inside a briefcase and is truly of small volume and low weight. After all, the business manager takes the notepad and calculator wherever he or she travels, and the computing facility should be just as transportable. ‡

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specialising in DP human communications and personnel development.

The be storehous

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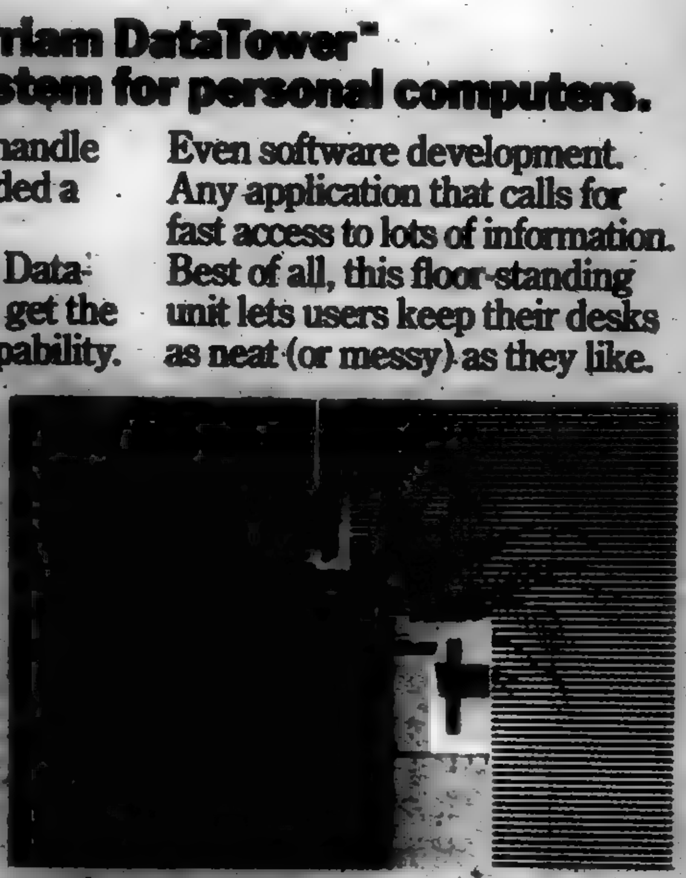

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[illegible]

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FAIR

from page 41

and a three-dimensional television that can be seen without special glasses.

The Fuyo robot pavilion will present a theatrical performance by robots. A robot will read Bach piano scores with its video eye and will play the music with its artificial fingers while sitting at a standard piano. A vacuum-cleaner robot will help care for the place, and other robot types will be on hand.

The U.S. theme is artificial intelligence. With a panoramic display of high-tech creativity in computer and communications systems, it will present a history of chip development and will demonstrate how far man has come in the development of machines that can think. Whoever conceived of its theme should be congratulated; AI is where it's at these days.

It's hard to tell exactly what is to be shown in the Soviet pavilion, except for the usual, boring report of Soviet domestic progress and progress in space. But I wouldn't bet on it; the Soviets have been known to give us a surprise or two, like the first artificial satellite and the first man in space. I hope they don't do it again by communicating with the first man on Mars (conditions were right for a launch last year) or providing a life-size hologram of the kremlin.

Noteworthy forum fare

In addition to fare of the kind described above, Expo '85 will provide an opportunity for scientists and others concerned with science to meet in special forums or celebrate important events. Noteworthy in the forum category is International Symposium '85 in Tokyo May 20 and 21. Sponsored by NTT, its theme is "Telecommunications — Today and Tomorrow."

It will be opened by Hisashi Shinto, NTT president, and its lineup of speakers represents a top-flight cross-section of today's "who's who" in telecommunications and computer technology.

Attending the NTT symposium will be John R. Opel, IBM chairman; Koji Kobayashi, NEC Information Systems, Inc. chairman; Louis Mexandeau, minister of Postal Telegraph and Telephone (PTT) authorities, France; H.E. Schwartz-Shilling, PTT minister, West Germany; Megamu Sato, PTT minister, Japan; George Jefferson, president of British Telecom; Ian M. Ross, president of Bell Laboratories; and many others.

In the celebration category, I note America's planned Fourth of July festivities. According to sources, it will be complete with politicians, fireworks and hot dogs. I wouldn't miss it or the fair for that matter. I confess that the enjoyment of seeing the fair's scientific stuff is my overriding motive to go there.

I'm the type who's kept his bag packed for months waiting for a call from the National Aeronautics and Space Administration for a small, bald, bearded guy over 50 who'd like to ride the shuttle.

However, I also wouldn't want to miss being an American at a fair that will focus on what Americans do best — and on the Fourth of July, no less!

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer; they may be edited for clarity and brevity.

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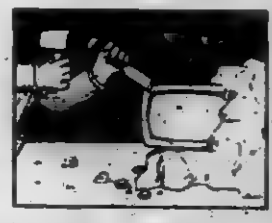
SOFTWARE & SERVICES

Bernard H. Boar

Applications prototyping: Trades guesses for experience

Applications prototyping has been touted as the answer to everything from whittling down applications backlogs to better satisfying end-user requirements. It is a method for identifying and refining user needs that has been made possible by advances in software technology. But some have questioned whether prototyping is adequately supported by the current generation of applications development tools and whether it unnecessarily extends the development life cycle. Others ponder prototyping's usefulness in maintaining existing applications.

One man who spends a lot of time thinking and talking about prototyping is Bernard H. Boar, author of Application Prototyping: A Requirements Definition Strategy for the '80s. *Boar is national director of Software Resources, Inc. of Wayne, Pa., a consulting firm specializing in prototyping and in Cullinet Software, Inc.'s IDMS/R. He was interviewed recently by* Computerworld *staff writer John Desmond.*



Q ***When did applications prototyping become practical and why?***

It became practical because of the shift in technology. Historically, you could not do prototyping because the tools available to build and refine something quickly did not exist. Integrated data dictionaries, screen generators and fourth-generation languages have only come on [the market] in the last three or four years.

Q ***How does the prototype life cycle differ from the typical applications development life cycle?***

It really does not differ much at all. In the traditional life cycle, you do some rigorous or structured analysis, then you design, implement, test, convert [and so on]. But in prototpying, you explode the analysis step into its own miniature life cycle. When you've completed prototyping, you then have to consider a number of options. One is to leverage or refine the prototype itself into the real system,

See **BOAR** page 56

SOFTALK
John Gallant
CW Senior Editor

IBM code rules stir user wrath

Sometimes the thunder is loudest before the rain starts to fall.

Such is the case with IBM's policy regarding restrictions on source code availability for a growing number of its systems software products [CW, May 14].

When IBM made public its intentions to withhold the source code on selected software packages two years ago, many users — especially those in the largest data centers — complained loudly and bitterly about IBM's unilateral decision to alter radically its own standard operating procedure of supplying the valuable source code material to its customers.

Users who were required to make modifications to IBM's systems software in order to tailor it to their own needs

See **CODE** page 54

SOFTLINE/WILLIAM INMON

Systems tools: Let buyer beware

Software development tools for the programmer have been in existence for a number of years. Tools exist to help in debugging, documentation, performance monitoring and even in the initial generation of code. The track record of these programming tools, for the most part, has been good.

There is currently an explosion of tools aimed not at the traditional activity of coding but at activities that occur in the earlier, conceptual stages of de-

See **INMON** page 51

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

- Information Builders, Inc. has announced the Foccalc mainframe spreadsheet for its Focus data base management system/**46**
- Pansophic Systems, Inc. has included a batch report facility in an enhanced version of its Telon application development system/**46**
- IBM has moved up the delivery date for three System/36 software packages/**46**
- IBM's newly announced System Control Programs will be supported on Amdahl Corp.'s 580 series large-scale processors/**46**

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Information Builders announces Foccalc spreadsheet

NEW YORK — Information Builders, Inc. has introduced Foccalc, an optional, integrated mainframe spreadsheet for its Focus fourth-generation language and data base management system. The company also unveiled an IBM SQL/DS interface to Focus.

Foccalc is an on-line spreadsheet for IBM mainframes that reportedly allows users to populate one or more spreadsheet cells with data from Focus report requests against a variety of files and data bases.

Foccalc can load data automatically from a Focus report, according to the vendor, and the spreadsheet's data is available to Focus' reporting, graphics, statistical and financial modeling facilities.

A spokesman said Foccalc can access files and data bases, including IBM's Isam, Vsam, Osam, DL/1, SQL/DS; Cullinet Software, Inc.'s IDMS; Cincom Systems, Inc.'s Total; Software AG of North America, Inc.'s Adabas; Computer Corp. of America's Model 204; Intel Corp.'s System 2000; and Information Builders' Focus.

Foccalc spreadsheets reportedly can be downloaded from the host directly into Lotus Development Corp.'s 1-2-3 through any asynchronous or IBM 3270 Systems Network Architecture/Synchronous Data Link Control link, including Information Builders' PC/Focus and Foctalk links.

Operates in MVS/TSO and VM/CMS environments

Foccalc operates in either an IBM MVS/TSO or VM/CMS environment. It is not available as a stand-alone product.

Foccalc also includes the following features: goal-seeking capabilities, graphics facilities, four methods of depreciation calculation, an internal-rate of return function, time-charting and project-scheduling capabilities and windowing facilities for displaying alternate Foccalc modules.

The VM/CMS version is scheduled for release in May and the MVS version in July.

Foccalc can be purchased for $12,000 or leased for $400 per month.

In addition to Foccalc, Information Builders also unveiled a Focus interface to IBM's SQL/DS. The interface enables Focus to process SQL/DS tables and file views.

It also allows users to join relationally multiple SQL/DS tables as well as join SQL/DS tables to other files, including IBM's Vsam, IMS, Qsam and Focus, according to the vendor.

The spokesman said the first release of the Focus SQL/DS interface operates under IBM's VM/CMS against CMS SQL/DS tables.

The product is scheduled for release in April and can be purchased for $8,500 or leased for $240 per month.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

Pansophic Systems offers batch report facility for Telon system

OAK BROOK, Ill. — Pansophic Systems, Inc. has announced that a batch report facility is included in an enhanced version of its Telon applications development productivity system for IBM's IMS-DC and CICS environments.

Telon 1.3 comprises the following three software components: the Telon design facility for providing interactive and rapid screen designs; an applications system generator for generating structured Cobol or PL/I code from design-level source statements; and a modeling and testing facility for interactive testing and debugging.

A spokesman said the batch report facility extends the interactive design savings of Telon IMS-DC and Telon CICS into the batch environment. The facility generates either Cobol or PL/I source programs.

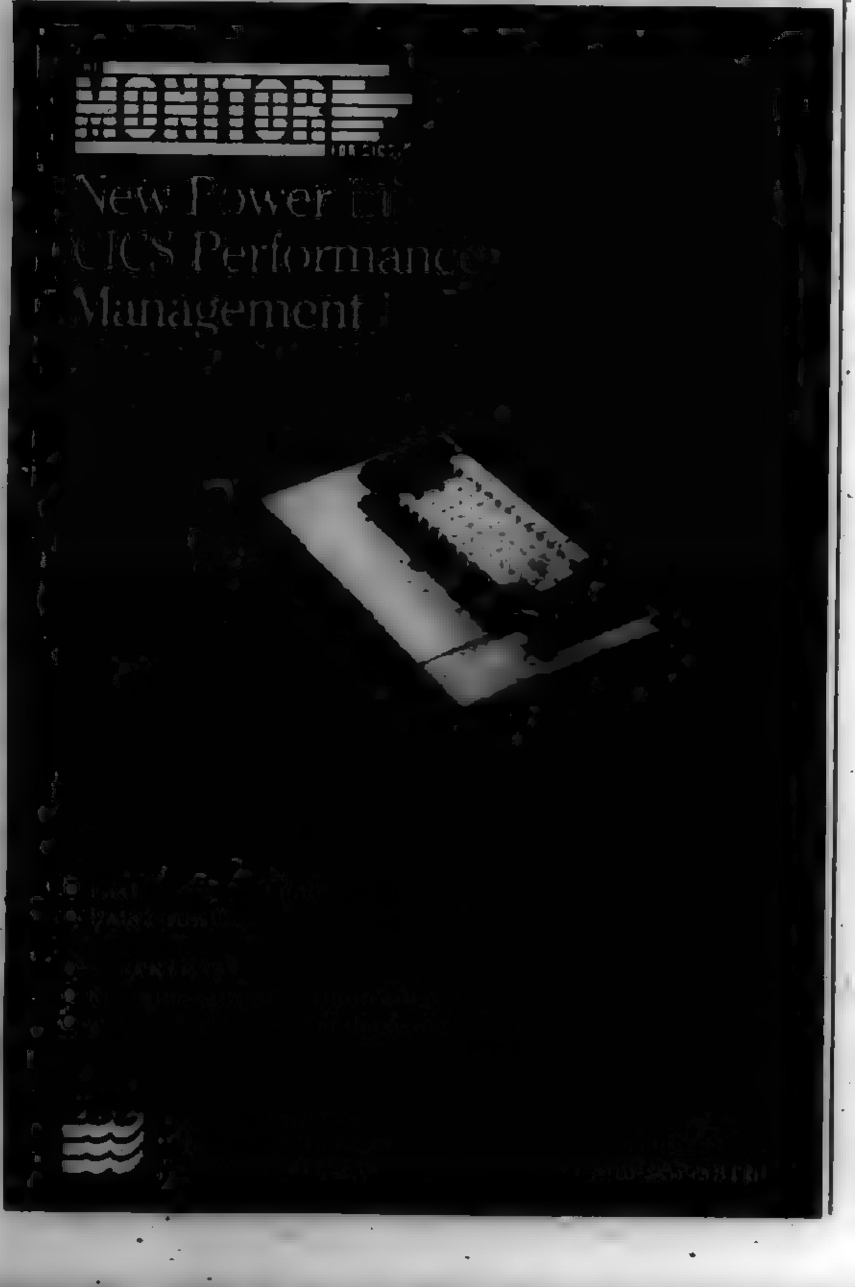
The same data base definition techniques used by the Telon on-line products are used in the batch facility. Additional Cobol or PL/I logic can be provided to give the flexibility and functionality required in production systems.

The batch feature of the release is an extension of Telon IMS-DC and CICS products.

Other enhancements in Telon 1.3 include the following: generation of on-line optimization routines as an option; performance improvements for CICS programs, including the Telon design facility when running under CICS; easier definition and control of IMS-DC options; and panel swapping within the Telon design facility.

Telon 1.3 is priced at $115,000 for IMS-DC. The CICS version is priced at $80,000.

Pansophic is located at 709 Enterprise Drive, Oak Brook, Ill. 60521.



IBM moves up delivery date for three System/36 packages

RYE BROOK, N.Y. — IBM Information Systems Group has accelerated the delivery schedule for three System/36 software packages.

Release 3.0 of the System/36 SSP operating system, Displaywrite/36 and Query/36 will ship in April, rather than the July time frame announced when the programs debuted in October, a spokesman said.

The release of the SSP operating system reportedly will provide distributed data management capabilities, allowing one System/36 application to access files stored on another. Release 3.0 of System/36 SSP also will support IBM Office Systems Family packages for the System/36 announced in October. It carries a one-time charge of $4,000. The distributed data feature costs an added $2,500.

Displaywrite/36, priced at $2,000, is a text editor that offers interfaces and functions similar to those of the IBM Displaywriter. Seven language dictionaries for the program also will be offered in April, IBM said.

Query/36 is a menu-driven information retrieval package that carries a one-time license fee of $950.

IBM Information Systems Group is located at 900 King St., Rye Brook, N.Y. 10573.

Amdahl 580s to support IBM tools

SUNNYVALE, Calif. — Amdahl Corp. has announced that its 580 series mainframes will support System Control Program (SCP) software recently announced by IBM (CW, Feb. 18).

A spokesman said the Amdahl processors will support the following IBM software: Version 2, Release 1.3 of MVS/SP, which provides support for IBM's 3090 processors in Extended Architecture (XA) mode; Version 1, Release 3.5 of MVS/SP, which provides support for the 3090 in 370 mode; and VM/SP HPO Releases 3.6 and 4.2, which support IBM's 3090 Model 200 in 370 mode.

The spokesman said Amdahl does not plan to support the VM/XA Systems Facility, which supersedes Release 2 of IBM's VM/XA Migration Aid.

Amdahl said the 580's architecture allows the company's 580/Multiple Domain Feature to control more efficiently the execution of multiple SCPs on a single processor. The spokesman said this feature provides the benefits of the VM/XA Systems Facility.

More information is available from Amdahl, which can be reached through P.O. Box 470, 1250 E. Arques Ave., Sunnyvale, Calif. 94086.

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INMON

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sign. Today's system development tools do such things as aiding in functional decomposition, automating data modeling, assisting in abstraction analysis, normalizing data and a whole host of related tasks that are germane to the early analysis and design of a system.

Analytical tools attempt to automate — with a certain amount of discipline — the activities of the system developer, and these tools hold a great deal of promise.

But there is danger in the use of these analytic tools and the expectations many developers hold. The danger lies in the way the tools are being sold and in the buyers' perception of what it is that the tools will do for them. Vendors who wish to express the power of their tools paint them in the very best light.

While there is no harm in this perception, many customers look at tools as the sole answer to proper analysis and design, rather than as aids to enhance analysis and design. Given marketplace hype, it is very easy to confuse tools that can be used to produce a proper solution with the proper solution itself. In other words, the customer believes that all that is needed to produce a design is to acquire and install an analytical tool.

> ”
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> *It is very easy to confuse tools that can be used to produce a proper solution with the proper solution itself.*

As one example, consider the data dictionary. Data dictionary software is used to hold an inventory of a shop's data. The need for data dictionaries became apparent when the industry progressed from having a few applications systems to many. Many shops approached the data dictionary as the means to control data.

However, some of the major shortcomings of the data dictionary as the ideal solution to controlling data began to appear in short order. Those problems included the following:

- The same data element was defined in multiple ways.
- Whole systems were not put up on the data dictionary.
- Private libraries and dictionaries were kept, causing the data dictionary to be only another source of information.
- Programmers built dummy data descriptions that were understandable to them but to no one else.

The data dictionary as a technical tool to solve administrative data problems was an unequivocal failure. But those shops with discipline and an administrative approach to DP's problems enjoyed success with the dictionary. Those shops that relied on the dictionary to instill discipline where previously there was none wasted manpower and machine resources and ultimately were as undisciplined after the dictionary installation as they were before. The point is that the data dictionary is only a tool, not a solution.

The same can be said for today's analytical development tools. Even the best analytical tool is no better than its designer's skills. A designer who does not understand system fundamentals will create failures even with the best analytical tools. A designer who understands the fundamentals of good design will produce good designs, even with crude tools.

Today's analytic tools do have some significant advantages when used properly. They can do the following:

- Speed solutions.
- Help the designer recognize and manage complexities.
- Document solutions.
- Be used to point out discernible errors and inconsistencies.

But today's tools are not solutions in and of themselves, however strong the vendor hype. Any designer who thinks tools alone will produce sound designs is in for a shock.

Factory system enhanced

BEDFORD, Mass. — Computervision Corp. has enhanced its Factoryvision factory-floor management information system to provide direct access to machine tool and automated work center control on a shop floor.

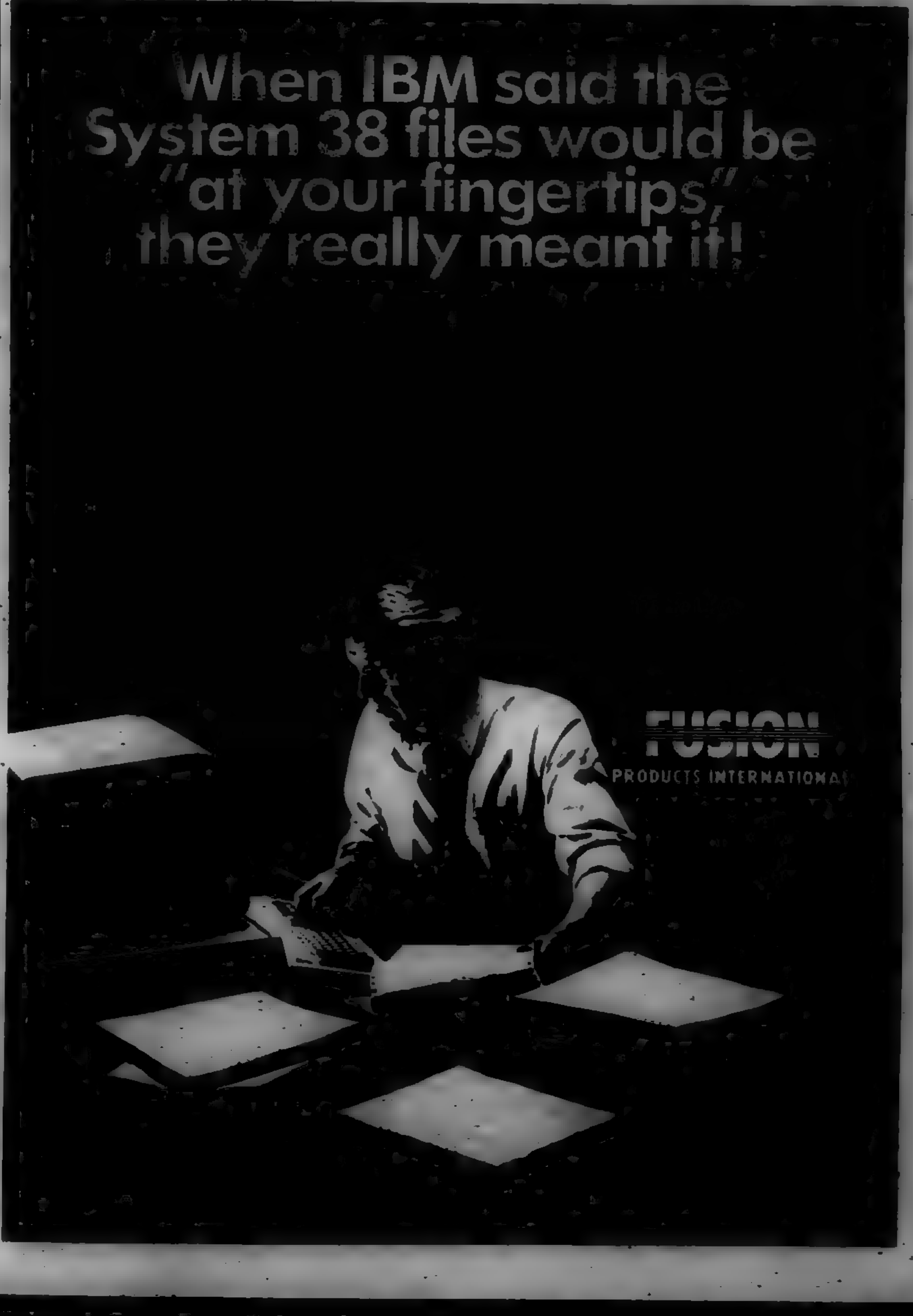
Machine Tool Management system is integrated with the Planning and Production modules of the Factoryvision system. Factoryvision is a 32-bit microcomputer-based system for distributing and controlling graphics, text and numerical control information created on a computer-aided design and manufacturing system.

Data required to control machinery is distributed through a Machine Interface Device (MID) at each automated work center. The machine control file, accessed locally from the interface device or the central distribution center, passes the information to the machine tool through an RS-232 interface or by emulating a tape reader.

The MID also provides local data storage and functions, including the ability to load, edit, verify and send machine instructions to tools for execution in a stand-alone environment.

The Machine Tool Management software and the MID will be available in the second quarter. Cost of a fully configured Factoryvision system for 16 full-time users is approximately $13,000 per seat.

Computervision is located at 15 Crosby Drive, Bedford, Mass. 01730.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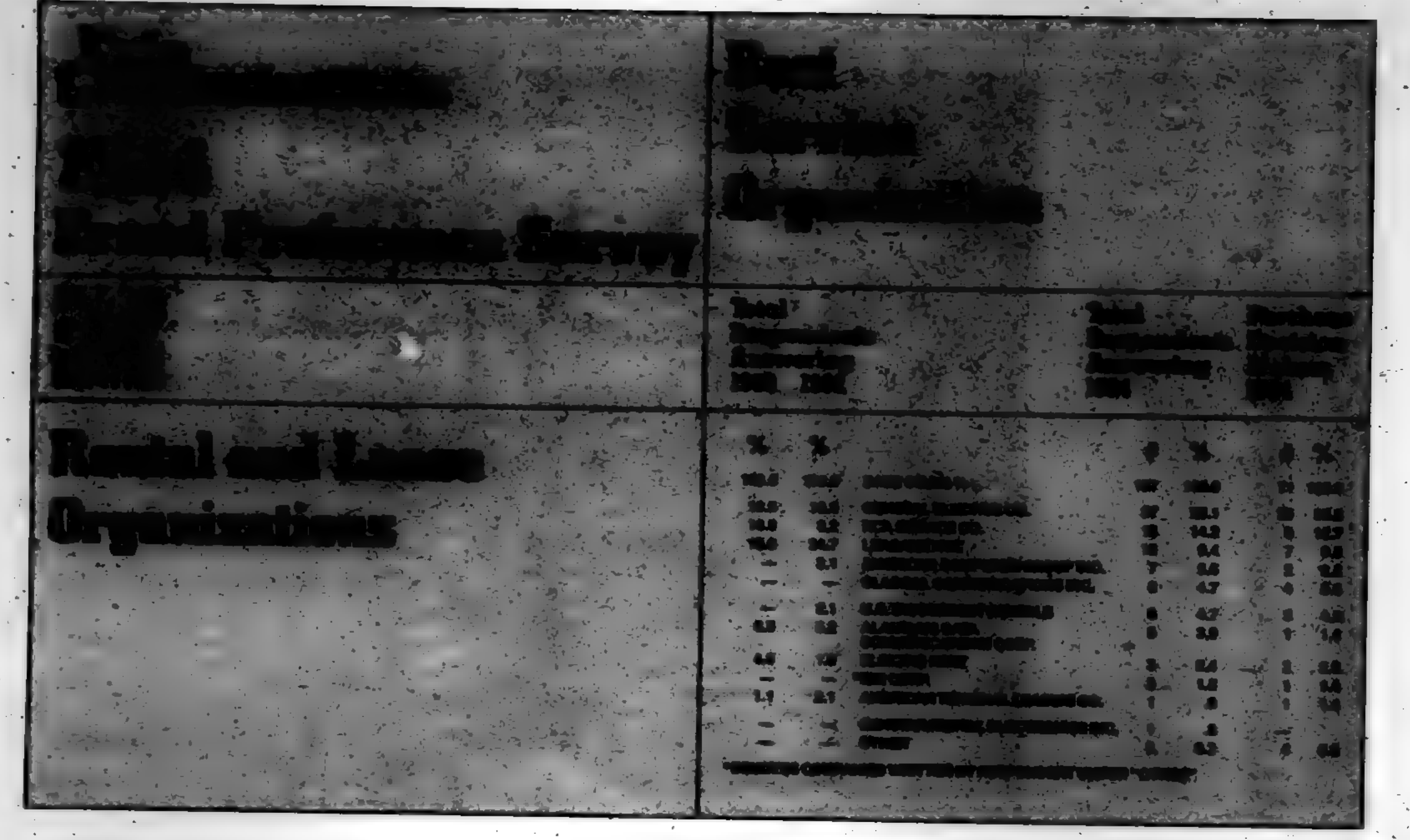

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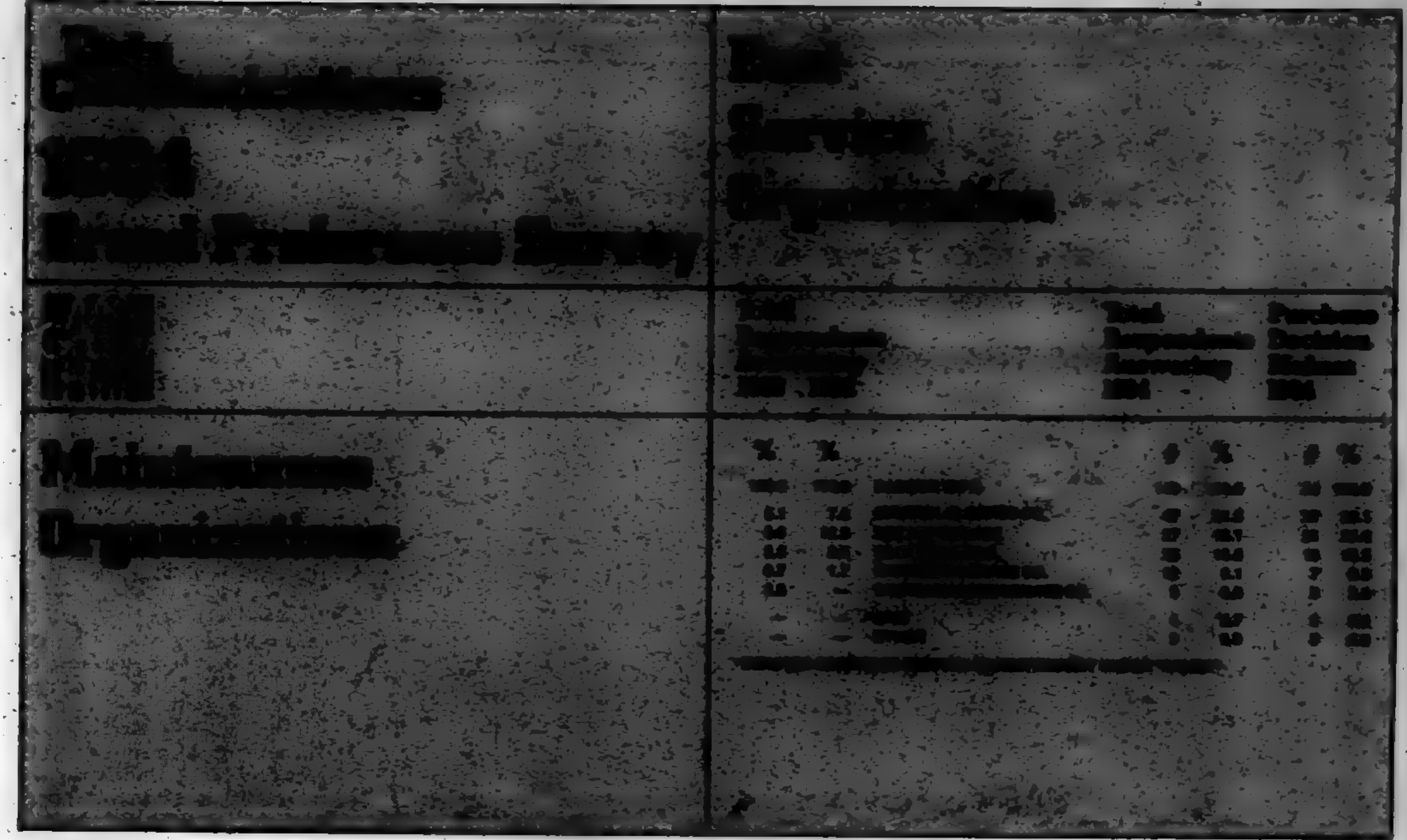

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CODE

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were vehement in their protest against what has come to be known as IBM's "object-code-only" policy. Other users, typically those in smaller MIS departments, who saw little need to modify or enhance the "vanilla" software Big Blue supplied, were less affected and, thus, less vocal about the change in direction.

IBM's object-code-only policy was a defense mechanism, a move designed to combat a perceived threat to its software market position from other vendors and the Japanese. The software giant rebutted user complaints by saying that the policy lessened the number of problems it faced in trying to install enhanced versions of its software at sites where numerous user modifications had been made to systems software.

Users, on the other hand, said that IBM had reversed its long-held course with little warning and with little concern for the effect the new policy would have on them. Some said IBM was displaying supreme arrogance in attempting to protect them from having to modify its software.

But perhaps the most outspoken group was users who complained that the absence of source code would make it extremely difficult, if not outright impossible, to determine the causes of software problems. Without the source code map, users lamented that they would be helpless in the face of a software problem until the IBM service representative arrived.

It has been quite awhile since IBM announced its object-code-only intentions, and much of the thunder that rumbled throughout the user community has died away. Now, however, the rain has started to fall. The products first placed under the source code restrictions are beginning to make their way into DP shops, and users are being forced to cope with the inclement weather for the first time. One prime example of the uneasiness the object-code-only policy has spawned involves IBM's VS Cobol II compiler, a blending of mainly Cobol-74 standards and some Cobol-80 extensions outlined in an early draft of that standard.

Trans World Airlines, Inc. (TWA) in Kansas City, Mo., is one of the early users of IBM's VS Cobol II. TWA's relationship with IBM is clearly not an adversarial one; in fact, the airline undertook field testing of the compiler and participated in IBM's Early Support Program (ESP) evaluation of it. Indeed, TWA has had nothing but praise for the capabilities of the product and was even willing to relate its favorable experiences with VS Cobol II to the press. Consider the words of Rex Widmer, technical specialist in applications development support.

"VS Cobol II, as far as I can tell, is the most thoroughly tested language product IBM has ever brought to market," he said. "To my knowledge, field tests and [the ESP evaluation] were not used for language products in the past. But IBM put a large effort into getting quality into this product."

Thus, while Widmer's words of praise ring true, so also do his words of concern about IBM's object-code-only policy regarding VS Cobol II, which he said is one of the first such source-code-restricted products to hit the market. (VS Cobol II went into general release earlier this year.)

Widmer's worries are based not on the absence of source material for the compiler itself, but on the nonavailability of source code for the associated runtime package vital to the applications developed via VS Cobol II. "VS Cobol II is object-code-only," Widmer explained. "With every previous IBM Cobol product we could always get, if we asked, source for the compiler, which nobody cared about, and for the runtime package, which a lot of people cared about. Those object-code-only runtime packages are embedded in our applications. If, say, our payroll application blows up at three in the morning, how are we going to get diagnosis or service to bypass that problem, whether it is user or system caused, in time to make our payroll?"

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> *[Users] said IBM was displaying supreme arrogance in attempting to protect them from having to modify its software.*

Although Widmer expressed no complaints about IBM's service capabilities, he lamented the need for his DP staff to rely solely on IBM in times of need.

"In the past, larger customers could use the runtime source to diagnose problems. We are now much more dependent on IBM for service, diagnosis, bypass and repair," he said.

Widmer said he is certain IBM can step up to the responsibilities involved in servicing such an object-code-only product. But it remains to be seen how the policy will affect his shop and others like it. Widmer's concerns are real, and it is clearly IBM's responsibility to see that the policy it has developed to protect its interests does not have a detrimental effect on the interests of its customers, which are no less important.

Perhaps it is time for IBM to sit down with concerned users and work out an equitable method for ensuring that the object-code-only policy does not come to represent just another headache for its customers.

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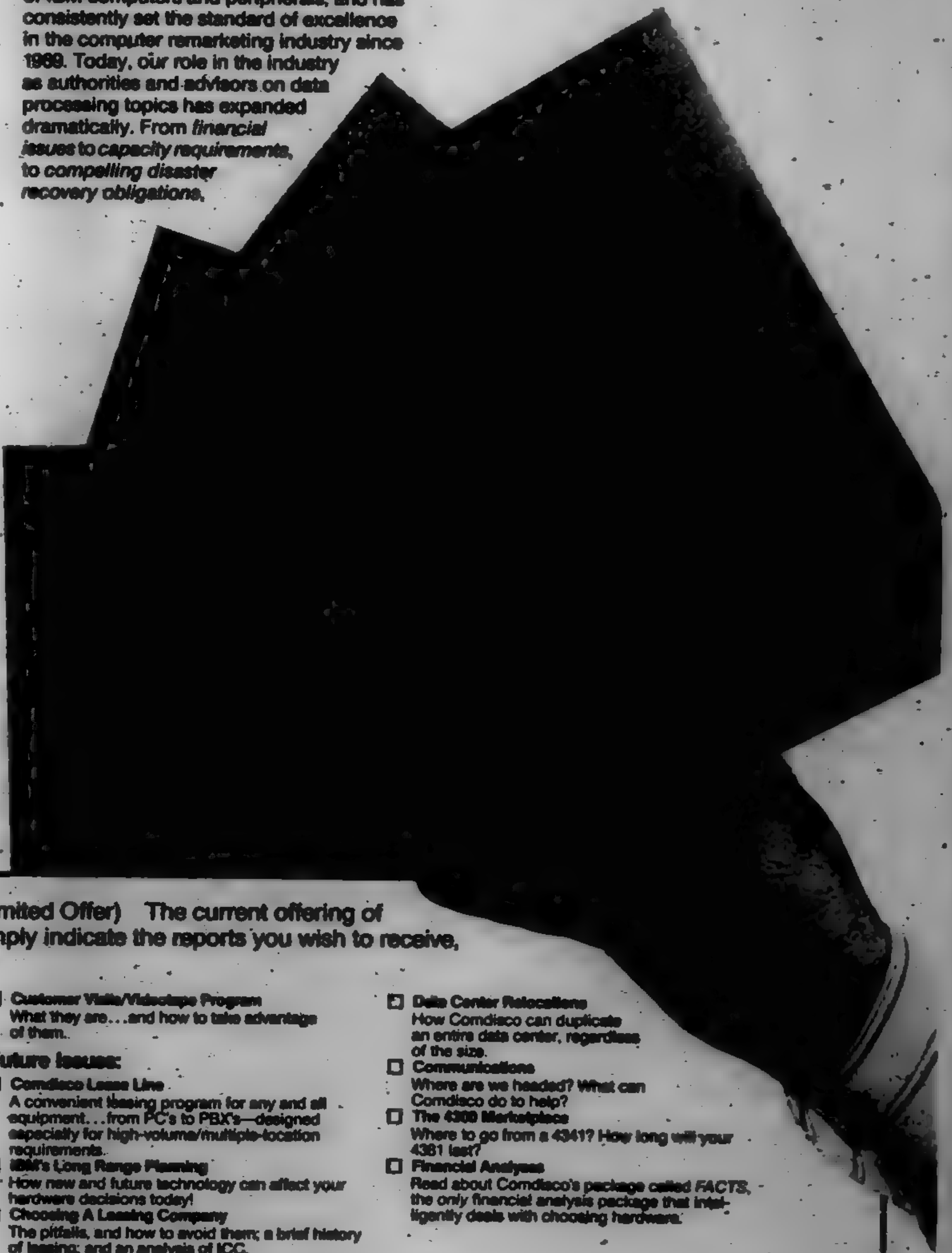

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CW

BOAR

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taking into account all operational constraints.

Q ***When you add the prototyping stage, do you run the risk of adding too much time to the development life cycle?***

No, it's just the opposite: you shorten it. There are two types of implementation dates. Most systems have a political implementation date. When the system is first implemented, the developers then have another date, maybe nine months or a year later, when after all the rework the system actually works the way the user wants. With prototyping, those two dates coincide. It is meaningless to talk about implementation dates when you're delivering something that fundamentally does not meet user requirements.

Q ***What can prototyping do to reduce an applications backlog?***

Like all productivity techniques, prototyping is geared to doing things correctly in the first place and to doing them more quickly. Most people agree that the cost of changing a system during the analysis phase is 50 to 100 times less expensive than changing it after implementation. It's my belief that you're better off building a model to get a better set of requirements.

Q ***To prototype effectively, do companies need a prototyping specialist or can any programmer do the job?***

When you introduce any new technology or approach, it helps to have specialists in the beginning. Over time I believe that the ability to do prototyping will become just another skill of a project leader. The senior people today who make the current procedures work are the same people who can make prototyping work in the beginning.

Q ***Is prototyping also good insurance for the data center, meaning that users cannot come back and say the applications do not meet their requirements?***

If you are the user's manager or the software development manager, you will reduce your exposure to failure by having users verify a working model sooner. If users see the working model, and after iteration they cannot reach agreement, it doesn't pay to devote 30 people to building the system. So I think it's an insurance policy for everybody.

In the engineering world, including mechanical and electrical engineering, building models and verifying models is the accepted way to do things. All I am suggesting is that the same approach used in other engineering disciplines be used for software design.

Q ***How does a development center decide what is to be prototyped if a center cannot prototype all applications?***

There are certain applications that lend themselves better to prototyping. In general, transaction processing and record management systems and systems where a great number of users are spread over a wide geographic area are good candidates. It's a matter of which systems offer maximum return or which have the greatest risk of failure. For systems in which prespecification would work better, I think you should proceed with that.

Q ***What are some examples of those?***

Heavy algorithmic systems. If the system has a lot of mathematical formulas, computations and heavy calculations, there's no leverage in that. An algorithm is correct or wrong. Batch updating portions of systems are also not very good candidates for prototyping. I have not seen technology in the batch [processing] world that really lets you do a "quick-build" well. Also, the nature of batch [processing] is that users do not get as involved as they do with real-time systems. That could be something for psychologists to study.

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The Smart Desk from IBM

Q ***You make the analogy in the book between prototyping and a child's Playdoh, Tinker Toys and Erector Sets. Can you explain that?***

Children's toys like those are very modular technologies that let somebody build something quickly, show it to others and ask them what they think.

If someone criticizes it, they can unplug the pieces and plug them back together in another way. The same thing is happening with some of the fourth-generation software technologies. One piece will be a screen; another piece will be a field edit; another piece will be a functional module.

The emerging software technology lets users change their minds. The experience of seeing what they asked for causes users to evolve their thinking.

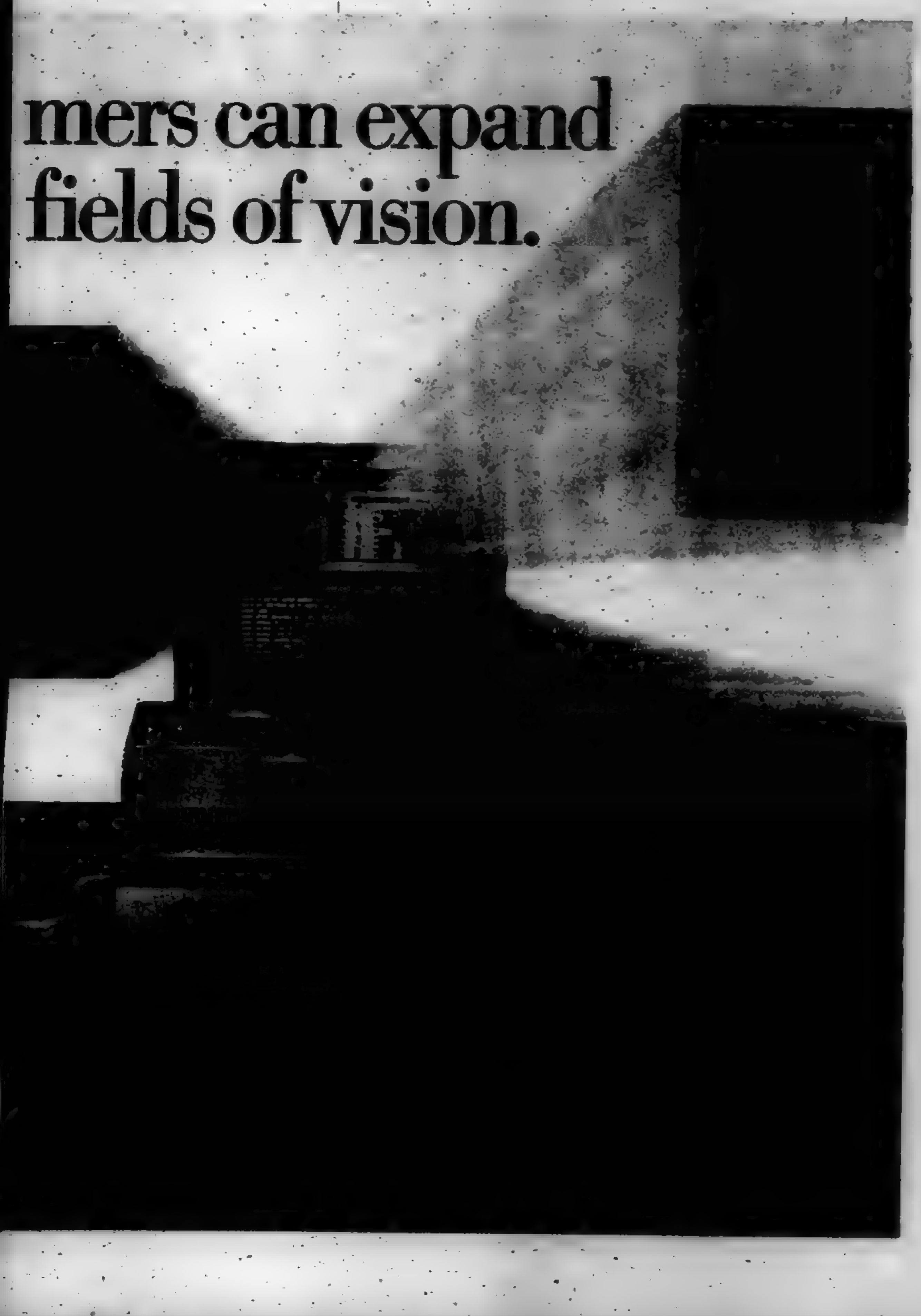
Q ***Is prototyping useful at all for maintaining or enhancing older or existing applications?***

One could argue that existing systems can be viewed as a prototype, as a baseline set of requirements. You apply a bunch of changes from the user or wherever and apply them to the test version of the system and get users to verify that it is what they want.

Q ***Does the current generation of applications development tools, as opposed to fourth-generation languages, adequately support applications prototyping?***

I see four types of prototyping: screen only, screen with literals and flow, screens with editing and full-function screens. A lot of technologies can support the first two types. For the last two, the number of technologies is limited. The key thing that makes prototyping possible is not fourth-generation languages; it is integrated and active data dictionaries.

An active dictionary system will automatically maintain documentation about a prototype, elements, records and where they are used. The trick I found with building prototypes was really not building the original model. The trick was changing it. And to change [that original model], you needed automated documentation. An active dictionary-based system can do that.



Interfaces for Focus announced

NEW YORK — Information Builders, Inc. has announced Release 2.0 of the Focus IMS/DB Interface and Release 3.0 of the Focus IMS/DC Interface, both of which allow users to execute reporting, financial modeling and data analysis functions against IBM's IMS data base.

A spokesman said IMS/DB Interface 2.0 now provides full support for IMS data bases that use the Hierarchical Direct Access Method and have group key fields, segment redefinitions or variable length segments. It also supports IMS key fields and search fields composed of elementary data items of the same or different formats. IMS data base segments that have multiple definitions can now be described to Focus via the field name Rectype.

The IMS/DB Interface 2.0 supports variable length segments, repeating fields or repeating groups of adjacent fields in the same segment.

Focus IMS/DC Interface 3.0 provides users with a full-screen data entry facility. The IMS/DB Interface allows Focus to access IMS data bases from multiple environments, including IBM's TSO, CICS, IMS/DC or batch submission. IMS/DC enables users to access IMS data bases, Focus data bases and other existing OS files from an IMS/DC terminal.

IMS/DB and IMS/DC each sell for $8,500; each can be licensed for $240 per month.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.

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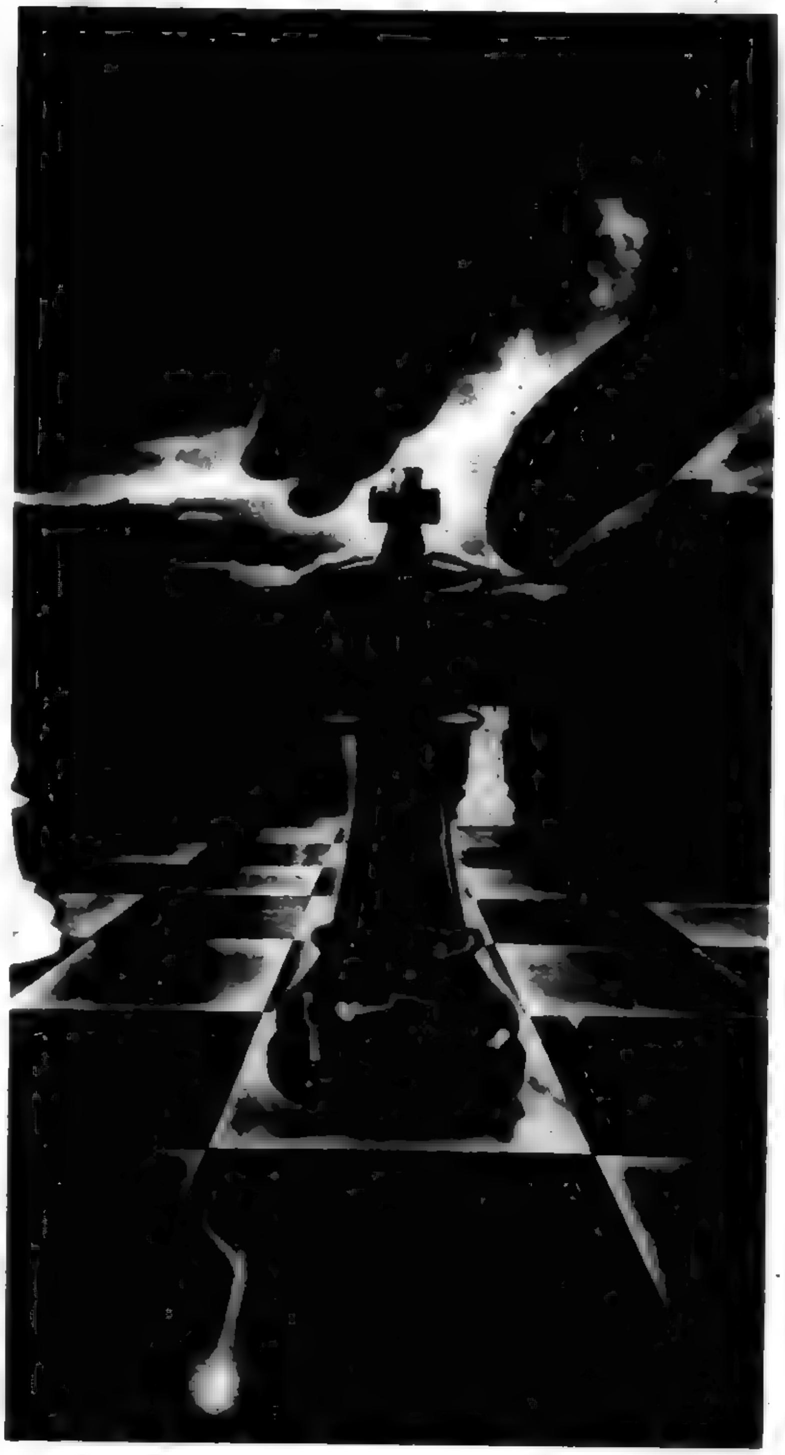

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June 11
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Baltimore, MD
April 18
Hyatt Regency

Boston, MA
April 17
Boston Marriott Long Wharf

Calgary, AB
May 1
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Chicago, IL
May 8
The Westin Hotel

Cincinnati, OH
April 30
The Westin Hotel

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May 30
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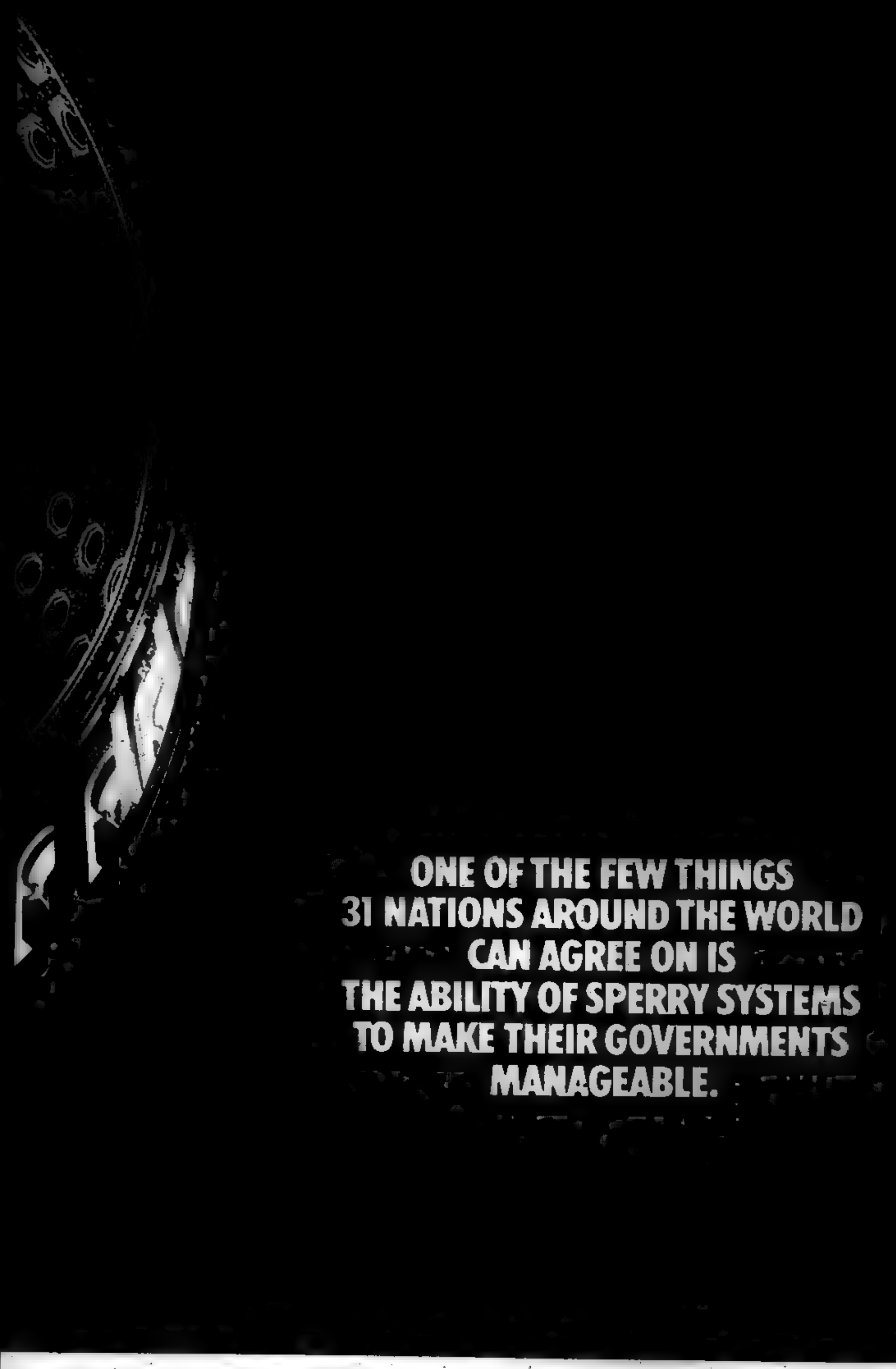
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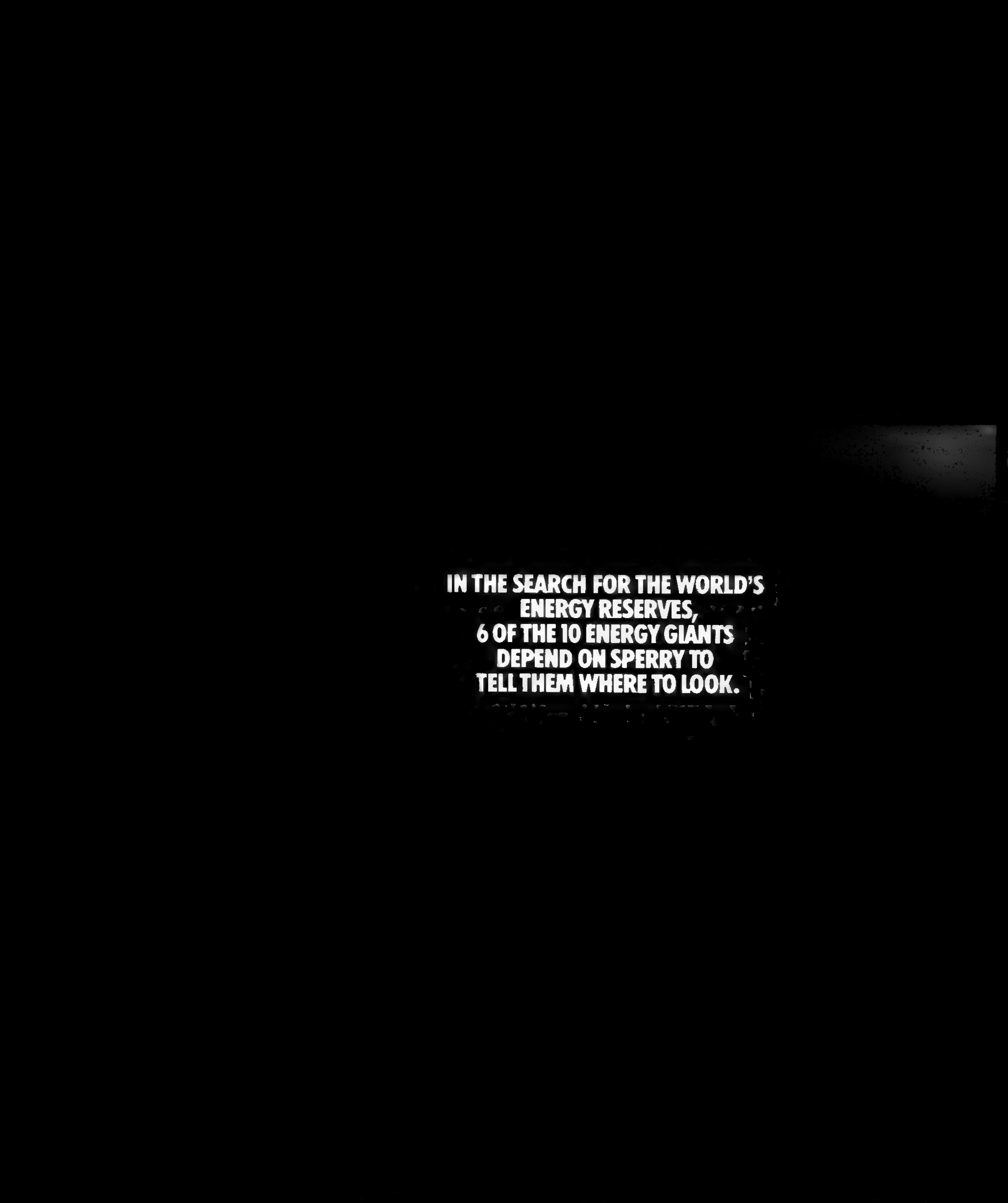
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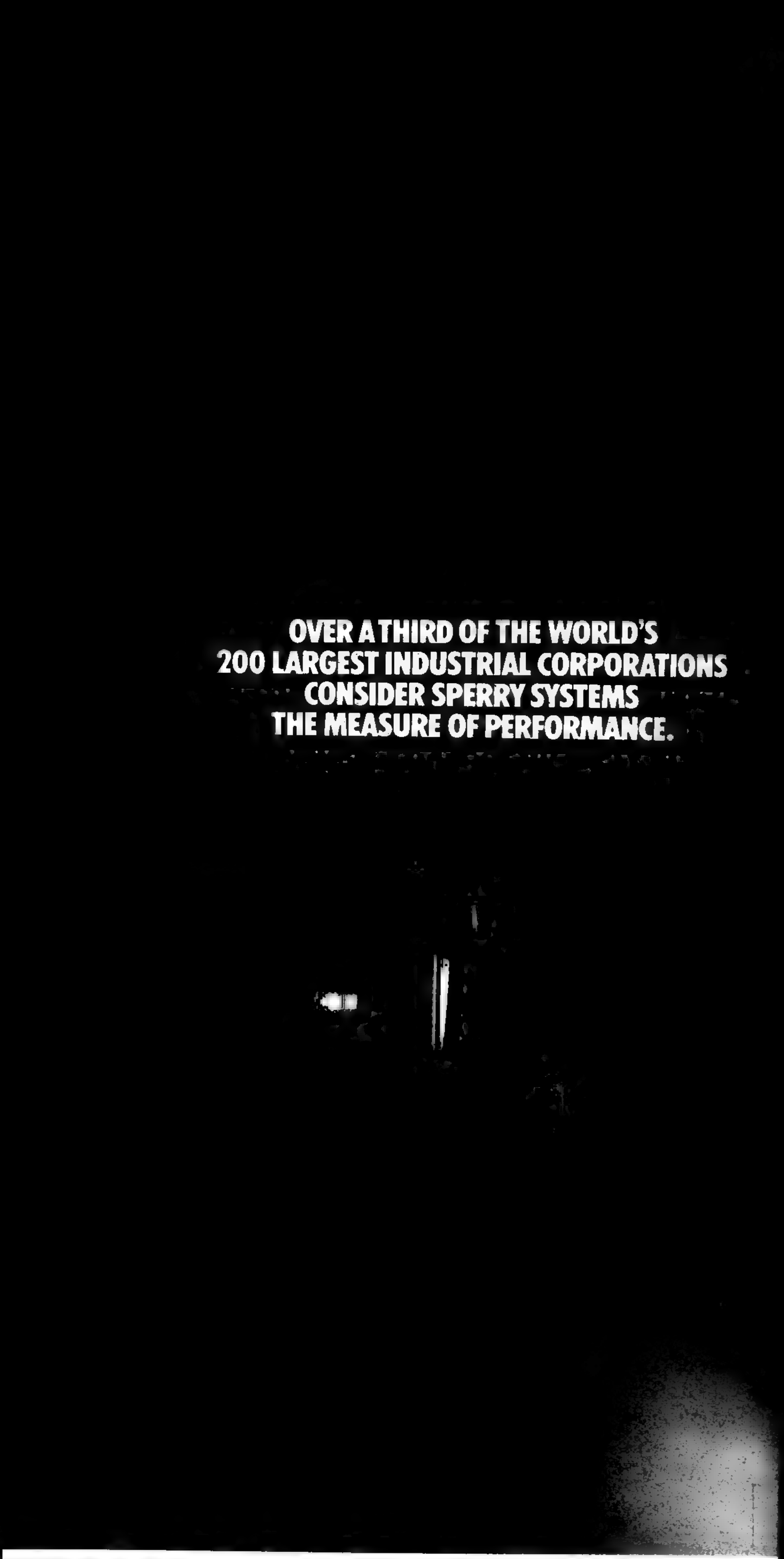
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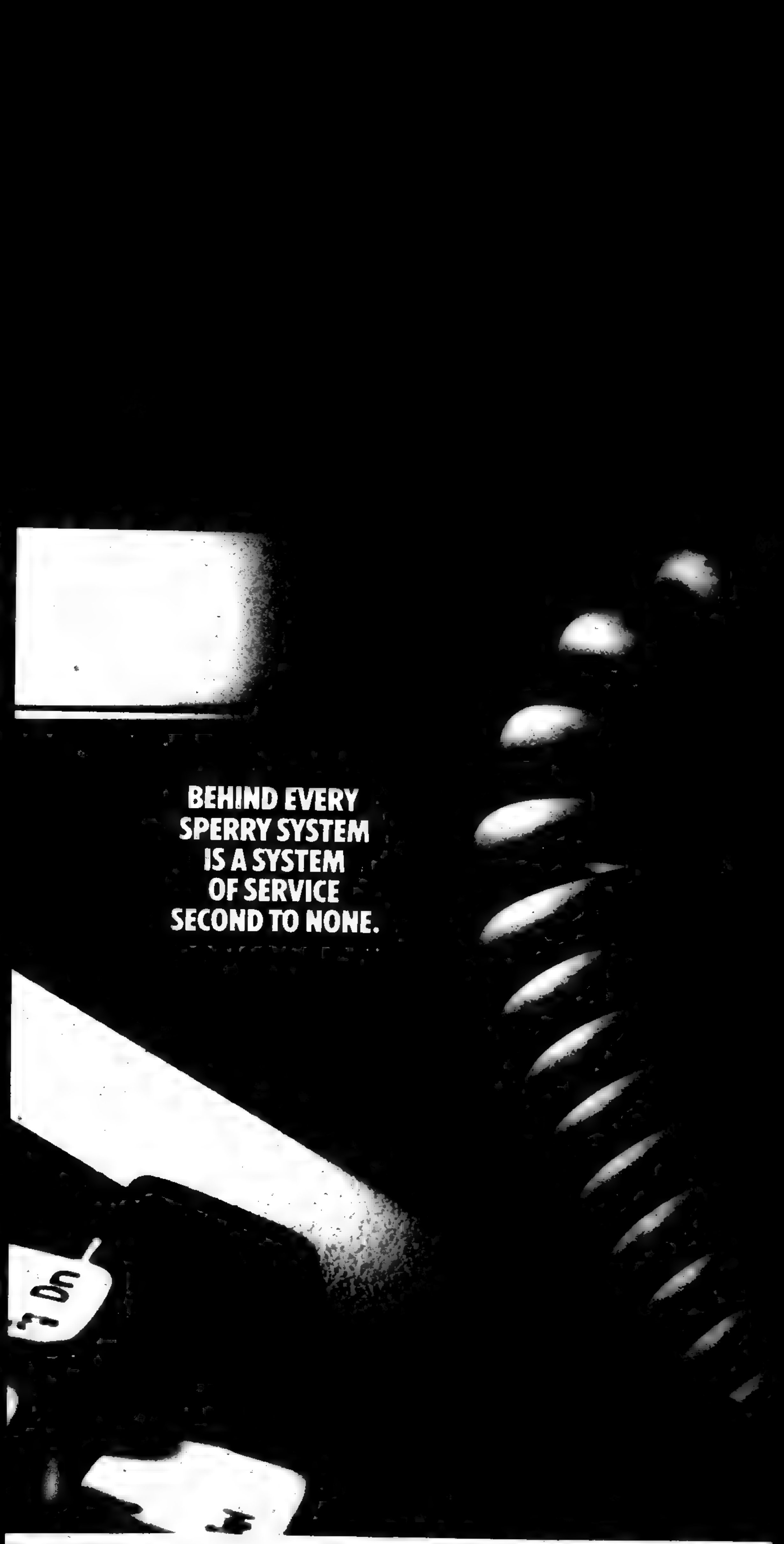
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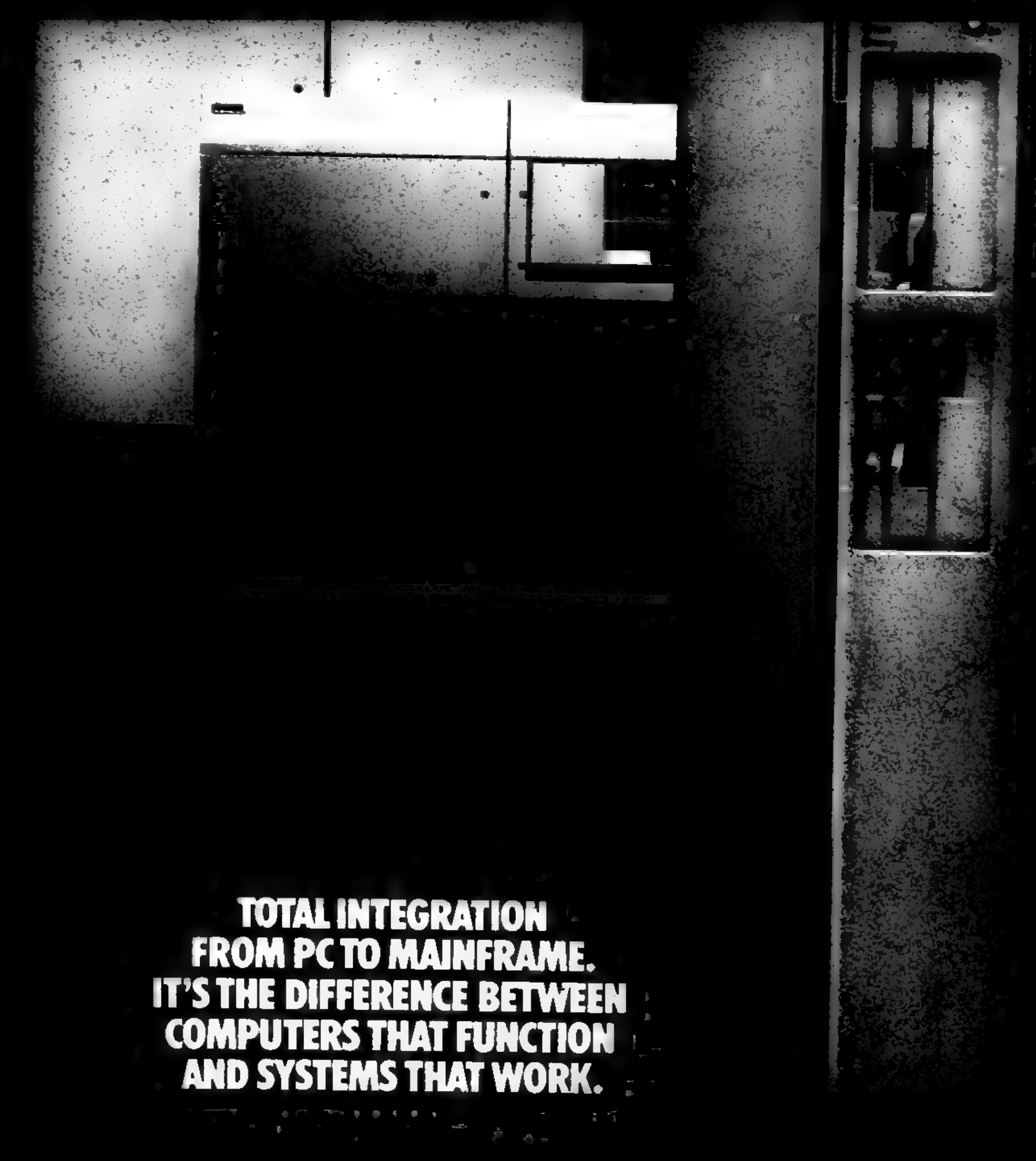
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Relational DBMS

By Ed Millsap,
Ken Sloan and
Steve Gerrard

They can run faster than you might think

Computer science has offered the golden apple of relational data base technology for more than 15 years. The promises of less data redundancy and increased accessibility in a production environment, a query situation and in development have been overlooked by a segment of the data processing industry still operating with inflexible structures, fragmented files and duplicate data storage.

Some organizations are too eager to believe that relational data base management systems (DBMS) can be used only for small-volume applications or only in the information center.

Relational DBMS have proven their worth in ease of use and flexibility. They can form the basis for much greater application development productivity than can ever be achieved with older DBMS approaches. Don't we want to achieve those benefits for all applications? Are data processing professionals doomed to sit on the sidelines while end users enjoy the power and productivity of the relational approach? Are relational systems too slow for high-volume business applications?

The relational performance controversy certainly is not new. But the true significance of the performance question is often not fully appreciated. Simply put: If relational DBMS can prove themselves in high-volume production applications, then no single reason remains for implementing any other

Relational DBMS can meet and even exceed the performance demands of high-volume applications. Will DP sit on the sidelines while end users enjoy the power and productivity of relational systems?

Figure 1

kind of DBMS.

The performance question is vital. Even proponents of older DBMS have gradually given the edge to relational DBMS in virtually every other facet except performance. If relational systems are much easier to use, more flexible and more productive for everyone, no overriding reasons exist for continuing with the previous generation of DBMS technology.

Why not Roman numerals?

The reluctant progress of many network and hierarchical DBMS champions toward a half-hearted embrace of relational technology is no doubt reminiscent of the introduction of Arabic numerals into the unwilling Roman Empire.

Can you imagine what it must have been like to have been a guru in Roman numerals at that time?

Your expertise is Roman numerals. Nobody can do long division in Roman numerals like you (you're so good you may even have a consulting practice — people seek your organization out for Roman numerals project implementation guidance). But all of a sudden, people are beginning to get excited about this new concept — Arabic numerals. Your reaction goes through the same stages as the network and hierarchical DBMS proponents of today:

1. Denial. First, you simply deny that the new technology is good for anything. You contend that it "may be an interesting academic theory," but it's simply not practical. After all, the whole empire — its tax rolls, markets and business — runs on Roman numerals. And besides, Roman numbers are often easier. One plus one equals two, *literally*, in Roman numerals.

But the ground swell for Arabic numbers becomes too much — people are discovering that they really can be useful — so you move to the next stage, which is:

2. One foot in the boat. You contend that Arabic numbers "are good, but only for certain things." They may be great for multiplication and division, but you just can't beat Roman numerals for addition and subtraction (the high-volume applications in the empire).

This is where most supporters of older DBMS are today. Relational DBMS are now admitted to be good — but only for certain things. And, just as with the Roman numerals guru, this contingent will ultimately arrive at the third stage.

3. Grudging acceptance. Arabic numerals finally demonstrate that they are just as good (even better) than Roman numerals for any operation. At this stage, like many DBMS experts of today, you attempt to point out that you were really behind the Arabic numeral movement all along and that you are, in fact, the world's leading expert in this new technology.

When reality sinks in, the attention of the world focuses on the new issue of how to convert the empire from one system to the other. Likewise, in the late '80s and early '90s, the preeminent technical DBMS issue will not be the debate over the usefulness or performance of relational DBMS but the monumental conversion problems faced by organizations that will be forced to modernise their DBMS approach in order to avoid drowning in a sea of low productivity and inflexibility.

DBMS performance has become the last stand for older DBMS. We are asked to believe that DP organizations simply have to accept and live with all the overly complex and limiting DBMS technologies of the past. Not only that, but in order to support the information center, they must invest additional hardware and human resources in attempting to manage dual DBMS environments, complete with redundant extract files, differing approaches to data administration, different methods and different procedures.

Indeed, early academic implementations of the relational model did exhibit poor performance. But research and development have marched ahead.

Relational DBMS are indeed being used for high-volume production applications today (see examples in Figure 1). And every day, more and

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ChannelNet Overcomes the Constraints You've Always Lived With in the IBM Environment

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- Do you have equipment redundancies that could be eliminated by the ability to extend the channel?
- Are your space requirements, both in your physical plant and under your computer floor, at odds with your needs for additional equipment and cabling?
- Would you like to reduce the complexity of host-to-host links over distance without sacrificing the data transfer speed or transparency?
- Do you need tools to provide more control over your computing environment?

ChannelNet alone answers these challenges.

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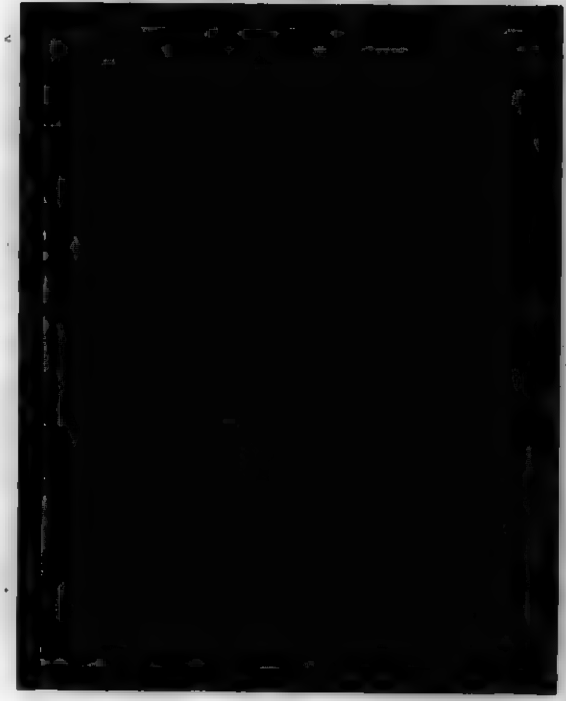

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more organizations are applying relational DBMS technology to the demanding business applications that formerly were considered the exclusive realm of network and hierarchical DBMS.

Comparing more with less

One problem in comparing relational DBMS with their older counterparts is simply that relational DBMS are capable of much more. They can support more powerful, more complex data base searches, they support much higher level query expressions, and they are capable of representing more complex data relationships. As E.F. Codd pointed out in his Turing Award acceptance lecture, comparisons often are made between a relational system doing a complex operation and a nonrelational system doing something relatively simple.

Relational DBMS certainly are powerful, and they do support conceptually very complex operations (the kind of operations that traditional high-volume production applications do not). In addition, a relational DBMS will allow a user to search the DBMS without regard for the access paths defined to it. In fact, a true relational DBMS hides indexing or access path information from the average user; all data operations are expressed in a pure logical form.

But are we comparing apples with apples? High-volume production applications most often perform relatively simple, straightforward data base searches and updates. They almost always use a very common access path to the data, such as an account or customer number. We need to ask whether relational DBMS can achieve comparable performance levels in these simple operations and then ask whether the more complex operations not supported by other DBMS have an unduly negative impact on production system performance.

Relational DBMS are successful today in the production arena. A number of technical advances enable relational DBMS to support these applications.

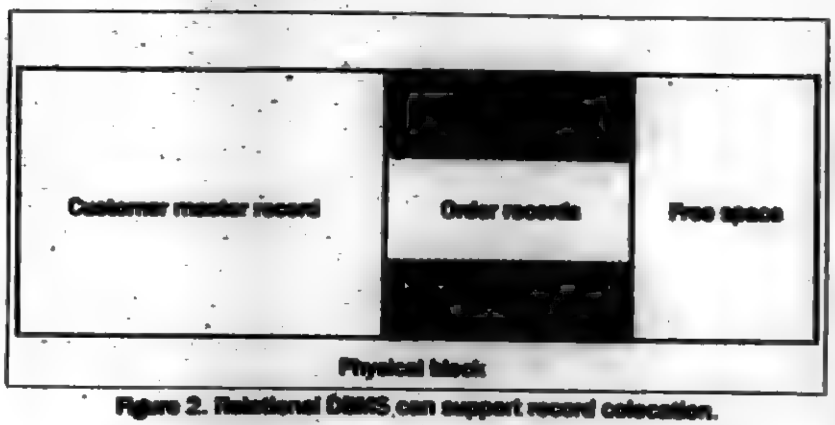

Figure 2. Relational DBMS can support record colocation.

Record colocation

Traditional DBMS have long provided the ability to store related records together in the same physical data block — for instance, store a customer's order records next to the customer's master record, as in Figure 2. Thus, when the application needs to find orders for a given customer or add a new order, disk I/O events are few.

Early academic implementations and a number of contemporary commercial implementations of relational DBMS suffer because customer master records and customer order records were stored in separate, individual tables. This arrangement resulted in more I/O events when the records were processed together. But newer relational DBMS now permit records (tuples) from different logical tables to be stored together in the same data block — in other words, exactly the same benefit as older DBMS. Yet this result is accomplished without the use of embedded pointer techniques, which would seriously compromise relational DBMS flexibility and benefits.

Tables do not have to be physically separated at the disk storage level; they only need to be independent from the standpoint of logical DBMS operations. Just this one improvement of allowing records from multiple tables to coexist at the disk storage level greatly narrows the performance gap between older DBMS and relational DBMS. Other performance enhancements discussed below close the gap completely.

Pipeline technique

Another improvement in commercial relational DBMS technology has allowed production updates to be logically grouped. The relational DBMS can treat many updates as a single unit and thus eliminate redundant I/O events by combining them. For example, if an order contains numerous line items, all those records can be added to the line item table with just one I/O event to the data area instead of an individual I/O event for each line item in the order.

This performance feature was designed especially for high-volume production applications. I/O events can be combined not only for data records themselves, but also for the associated log records and index entries. This technique is not always found in older DBMS.

Relational DBMS can actually offer more sophisticated performance options for managing data space on disk than older DBMS. These options allow the data base administrator to vary the approach to space management at the table (or individual record type) level, not at the overall data base level. This gives the data base administrator greater freedom to establish space management

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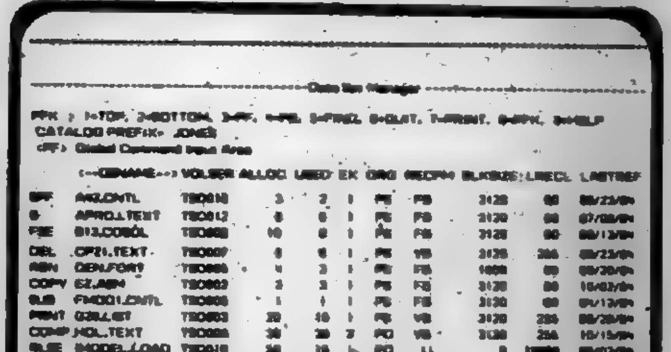

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------------------------------Data Set Manager------------------------------
PFK > 1=TOP, 2=BOTTOM, 3=PF, 4=PB, 5=FIND, 6=QUIT, 7=PRINT, 8=RPK, 9=HELP
 CATALOG PREFIX> JONES
 <PF> Global Command Input Area
      <--DSNAME--> VOLSER ALLOC USED EX ORG RECFM BLKSIZE LRECL LASTREF
SPF   A42.CNTL     TSO010     3    2  1  PS  FB     3120    80 08/23/84
B     APROJ.TEXT   TSO012     6    6  1  PS  FB     3120    80 07/08/84
FSE   B13.COBOL    TSO008    10    6  1  PS  FB     3120    80 08/13/84
DEL   CP21.TEXT    TSO007     6    6  1  PS  VB     3120   256 08/23/84
REN   DEN.FORT     TSO006     4    3  1  PS  FB     1600    80 09/20/84
COPY  EZ.ASM       TSO002     3    3  1  PS  FB     3120    80 10/02/84
SUB   FMOD1.CNTL   TSO008     1    1  1  PS  FB     3120    80 01/13/84
PRINT G30.LIST     TSO003    20   10  1  PS  VB     3120   256 08/20/84
COMP  HOL.TEXT     TSO008    30   20  7  PO  VB     3120   256 10/15/84
RLSE  IMODEL.LOAD  TSO010    36   16  1  PO  U         0 19069 08/02/84
LM    JCL1.CNTL    TSO002    20   16  1  PO  FB     3120    80 08/15/84
FREE  KA.COBOL     TSO004     6    5  1  PS  FB     3120    80 08/20/84
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procedures that are oriented to the needs of individual applications.

Examples of application-oriented space management techniques include the following:

Linear space. Used for nonvolatile tables, linear space simply places new records into the next available position when added. This approach gives the highest add density, requires very little processing to search for free spaces and executes fast. It is an option not supported by older DBMS.

Revolving space. Revolving space management was designed for applications that add new records in some ascending sequence and remove older records from the bottom of the list. Rotating data space management algorithms optimize record additions and treat the data space as a revolving file. Space from deleted records is automatically reclaimed and reused when appropriate.

> ”
>
> *It is important to examine the whole issue of index management, because it is an area in which great performance variations between relational systems will be found.*

Random space. For work records or transactions processed in random order that do not require sequential processing, random space management provides a fast method of placing records on disk. Any available data block currently residing in memory will be used to hold the record; no I/O is needed to find free space.

Cluster space. Cluster space management combines random space with a clustering of related data records. This technique is optimal for applications that must combine random and sequential processing services. This option supports rapid, grouped additions, updates and deletes and continues to optimize the placement of records for high-speed retrieval and processing.

A common argument against the viability of relational DBMS is the old saying, "You just can't afford the overhead for the index." Benchmarks in recent years, in which index-based systems have equaled link-list systems in virtually every area of performance, have largely disproved this argument. But it is important to examine the whole issue of index management, because it is an area in which great performance variations between relational systems will be found. Rapid index management is the key to providing a truly high-performance relational DBMS.

One important distinction cannot be overemphasized: In all other DBMS, predefined access paths must exist in order to do any processing against the DBMS. These access paths will usually be indexed or "hashed." But in a relational DBMS, no access paths need to be predefined. The index is invisible to the user of the DBMS.

In a relational system, the index becomes a powerful tool that the data base administrator can use to optimize production processing. At the same time, the absence of a specific index does not prevent an end user from accessing or processing against the data base. The end result, as has long been recognized, is a substantial increase in productivity, ease of use and the ability to change DBMS access paths without modifying existing applications. Those benefits can now be achieved without a major performance sacrifice.

Combined index techniques

A major improvement in index management technology began to appear in 1982 with the advent of combined indexes.

Many relational systems employ separate, individual indexes for each and every table in the data base. Thus, if a data base contains customer records, order records and payment records in three different tables — and if "customer number" is to be an indexed access path to each table — then most index-based systems (relational or otherwise) would generate three sets of indexes, one for each table. In addition, the same customer number, say 1382, would appear redundantly in each table's index (see Figure 3).

Worse yet, if a program needed to examine the orders and payments for a given customer, many I/O events would be necessary to access each index and assimilate all the records.

Figure 4 shows how a combined index solves these problems. A relational DBMS with a combined index will have only one index for the entire data base. Following the example above, there would be only one index for all customer numbers, and a given customer number would appear in the index only once, followed by all record addresses for that customer number. With only one probe to the combined index, all records for a given customer and their exact disk locations can be known. This situation allows the relational DBMS to optimize the joining of any two or more records based upon a common index value.

For production applications, which process a known set of transactions based upon known access criteria, a combined index approach will easily permit high-volume processes to be optimized. And, when used in conjunction with the cluster space, colocation and pipeline data management techniques described

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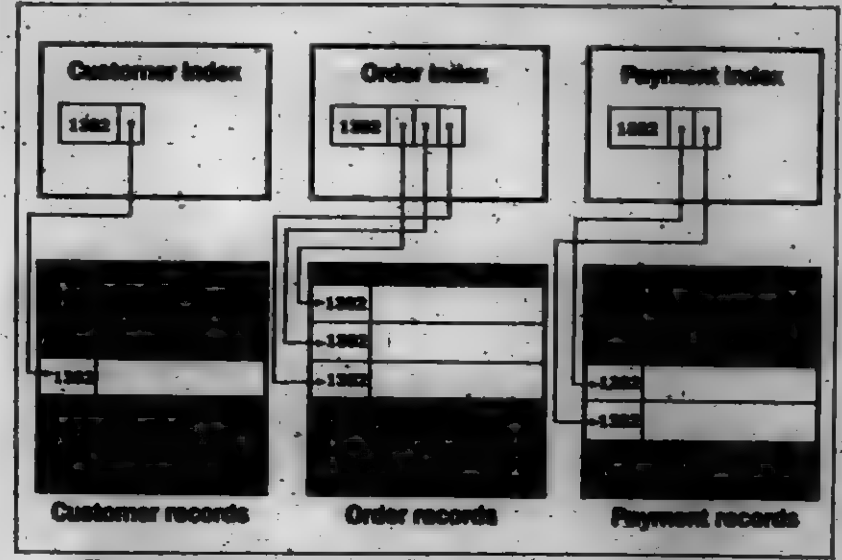

Figure 3. Separate indexes cause redundancy and excessive I/O.

above, the combined index approach results in a DBMS architecture that can support extremely demanding applications.

The combined index has performance attributes that even exceed those of older DBMS. For instance, because each payment record is reflected in the index, a program can go directly to a desired payment record without having to locate the customer master record first and then "chase chains" throughout a disk pack in order to locate the desired payment record.

Optimum secondary access

Another performance benefit of the combined index approach is that it applies across the board to all data items the data base administrator decides to include in the index. That is, it is just as fast to find a customer based upon his name as it is to use the customer number. This setup contrasts with older DBMS in which there is one best way to enter a data base, and all secondary access paths must resort to much slower, higher overhead operations involving secondary indexes, special sets or one-of-a-kind records.

In addition, the relational DBMS permits fast entry to any indexed record. The application is not forced to read a master, root or owner record first and then navigate to the true record of interest. This is another performance improvement of relational DBMS (with a combined index architecture) over traditional DBMS.

One performance comparison between relational and older DBMS that is often not made is the speed of performing complex (compound Boolean) selections. Older DBMS are incapable of performing these selections directly, so I/O events are needed to read records, and selections must be hard-coded into production programs. Relational DBMS allow such selections to be specified as an integral part of the data manipulation language.

As shown in Figure 4, a combined index contains all the identifiers (addresses) of records containing a particular domain value. When more than one field is used in a data base selection, the system is able to perform conjunctions across these values.

Thus, a request for all parts used in a particular assembly having current status can, with the appropriate index definitions, be answered by simply intersecting the values in the index to determine the exact set of records before doing any I/O to read the records. A similar conjunction between different domains is impossible in any predictable amount of time in a network or hierarchical DBMS because the relevant data base records are not identified in any combined index approach — thus, the records must be individually read.

This scenario makes clear that network and hierarchical DBMS have no strategy for addressing the kinds of relational processing required by today's user — and, more important, today's new class of production applications. Because no combined index exists (often fields that should appear in such an index do not appear in all applicable underlying records, so such an index cannot readily be built) the performance

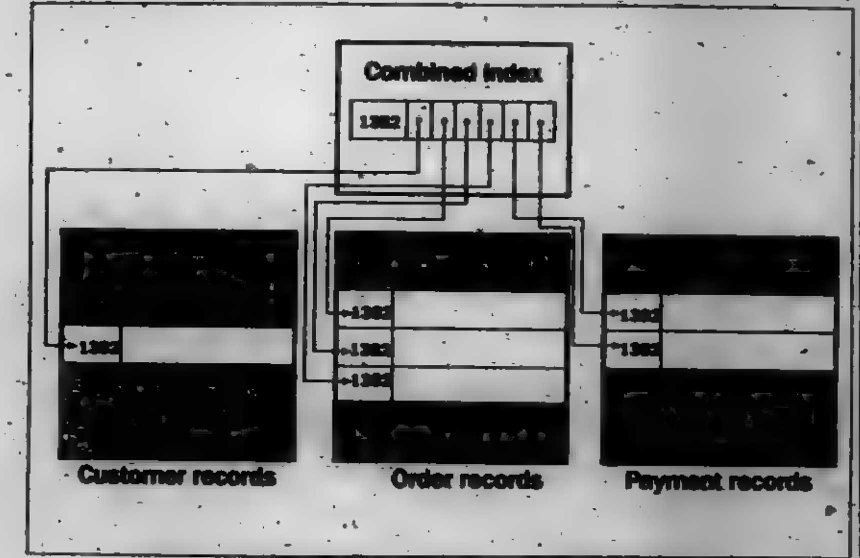

Figure 4. Combined index eliminates redundancy and I/O.

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of "logical views," which often attempt to compensate for the nonrelational structure of these DBMS, is simply not good enough for production use.

Index-only processes

Another performance achievement of relational DBMS is the delivery of index-only processing capability. Remember, the index is always hidden from the user — it is strictly an optimization tool.

But also consider the fact that index entries are data — customer numbers, order numbers, dates and so on that have been selected by the data base administrator to optimize production applications.

Often, certain production inquiries will happen to ask only for data that has been indexed. In this case, a relational system can easily return the desired information without reading any data records. This is a function that cannot be achieved without I/O to data records in older DBMS.

Queued index balancing

One concern relative to index systems is the amount of work necessary to balance the index and optimize its performance. Some relational systems have developed asynchronous balancing techniques that permit transactions to always complete immediately.

In these cases, the relational system heuristically determines the changes in the index to improve its performance and places those changes into a queue to be processed asynchronously as a low-priority task by the DBMS nucleus. All DBMS threads in a complete multithreading mode are allowed to run without interruption, locks or enqueues while the index structure is being changed.

This important innovation provides high-performance, nonstop index capabilities. Other index systems gradually degrade or require periodic reorganization; asynchronous balancing has none of these drawbacks.

Disk space requirements

Another common argument against relational DBMS is that the same field will be stored in more than one table, thus requiring more disk space than older DBMS. Although on the surface this appears true, actual comparisons have resulted in disk space usage being a nonissue. This can be attributed to several factors:

- Although relational DBMS will repeatedly store certain fields, nonrelational DBMS must compensate by storing embedded pointers with every data base record. There are often forward, backward and other kinds of pointers. These chains may take between 12 and 36 information characters per record. In most cases, a good relational data structure will use less actual disk storage.
- Many older DBMS require that extra large amounts of disk be allocated to the data base. This allocation is necessary to accommodate randomizing routines (to ensure that not too many records will randomize to the same block, thus degrading search times) and to accommodate growth.

Relational systems that do not rely upon randomizing techniques can afford to store data more densely. They do not require the same percentage of excess free space in order to achieve fast search times or accommodate new records. Additional disk extents can be dynamically allocated when necessary to accommodate growth.

- Older DBMS often must redundantly store data in secondary indexes or special sets in order to provide alternate access paths to the data. Relational DBMS do not need to employ these techniques and thus can support alternate access paths with less disk space.
- In addition, some relational DBMS employ compression techniques, both for data and index areas, which significantly reduce disk space requirements.

For a given data base, the actual difference in disk storage between a relational and an older DBMS implementation will depend upon several variables: the specific DBMS being compared, the data base design, what storage options are chosen and so on. Experience has shown, however, that the differences, if any, are not a significant factor.

Multithreading techniques

Relational DBMS have included multithreading techniques to improve transaction throughput. In fact, index-based DBMS systems pioneered DBMS multithreading — a facility that was added to older DBMS as an extension.

Multithreading makes it possible for one task to proceed while another is still in process. It should be possible to multithread many DBMS operations — reads, additions, updates, deletes and rollbacks. In addition, in a good relational DBMS, the entire index is never enqueued.

Relational DBMS also have implemented sophisticated buffer management techniques, which permit index and data blocks to be reused while in memory. In a system that is multithreaded, no I/O events will be performed to read an index or a data block that is already in memory. Thus, a given block can be reused by many users.

This technique results in the DBMS automatically retaining the most active parts of the index and data base in memory. This, in turn, eliminates I/O events that otherwise would have been issued in order to access this data — I/O events that are executed in systems not using such buffer management techniques.

One important aspect of performance that is often overlooked is sequential processing. Yet sequential processing is extremely important to production applications because

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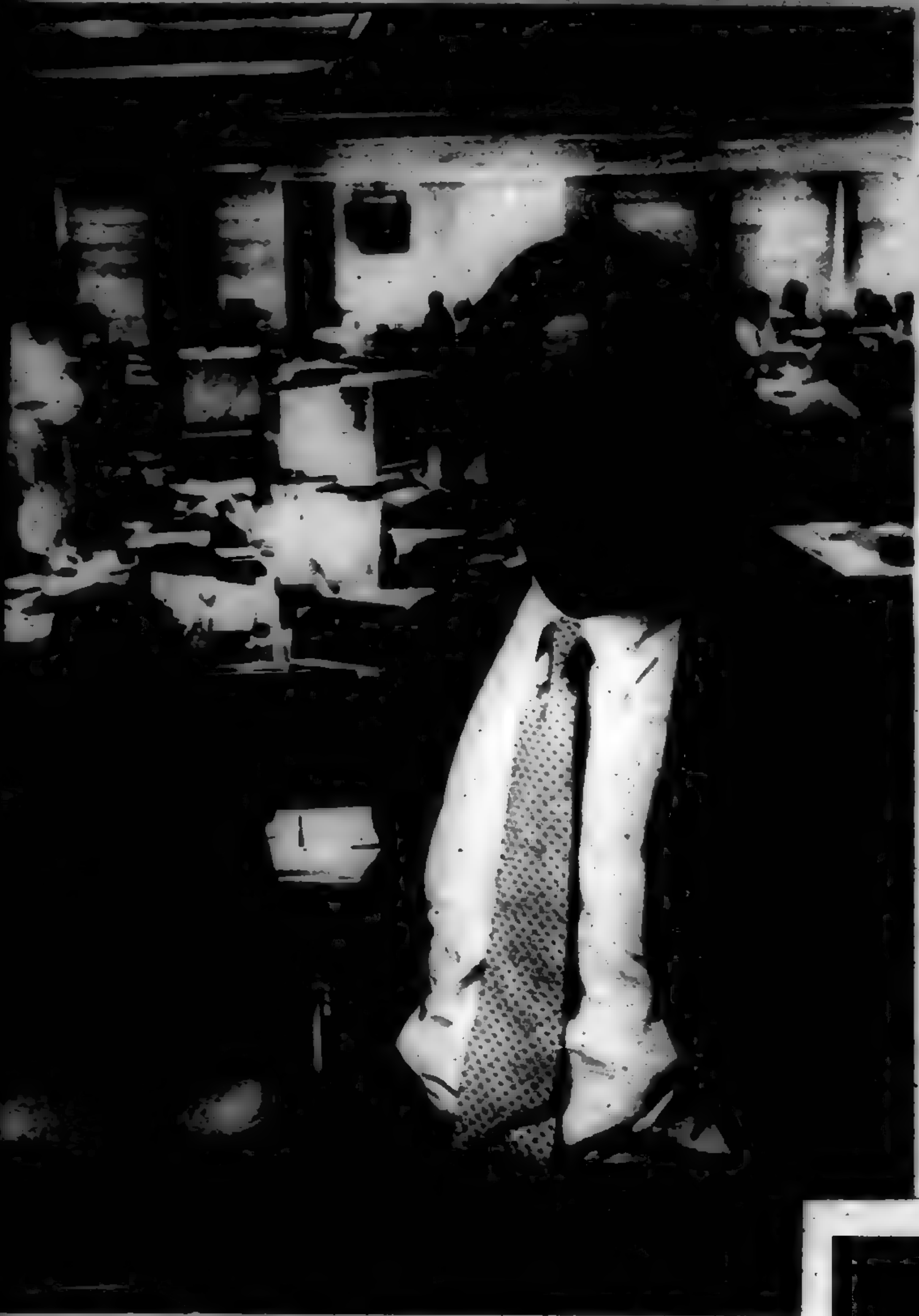

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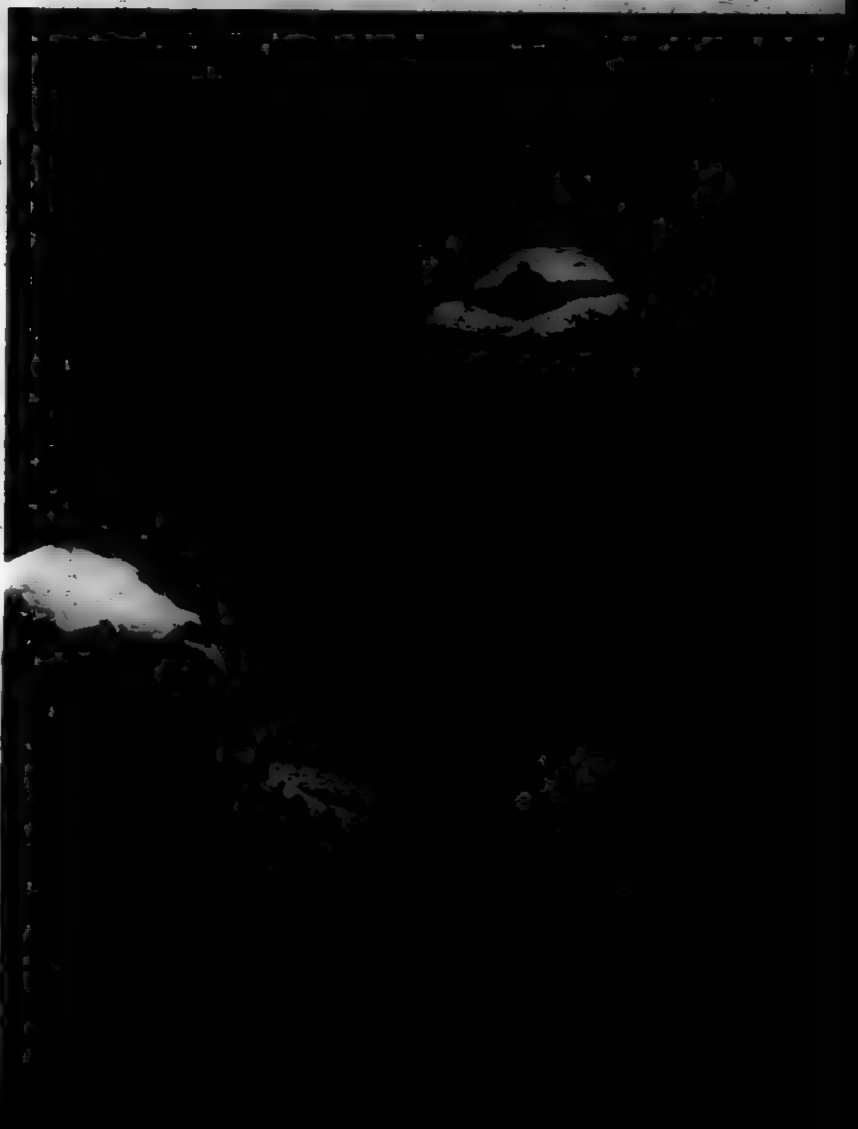

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there is so much of it being done. In this area, modern relational systems can beat older hierarchical and network systems hands down.

Many older DBMS store data in a hashed or random fashion. This way, records that are logically next to each other are in reality dispersed over a disk area. This is all right for random processing, but it really hurts sequential processing.

Relational DBMS, on the other hand, store data in tables. And although in relational theory the order of records in a table is unimportant, the fact is that almost always, in production applications, the records will actually be in some foreknown order. So, although a relational DBMS does not require a specific ordering of records on the disk, it is not restricted from capitalizing on this ordering if it happens to exist.

This is indeed what some relational systems do. When a program begins to process one or more tables sequentially, the system checks to see whether the order of processing happens to match the actual order of records on disk. If it does, then the system can automatically boost performance by executing multiple-block read operations. In addition, special buffering techniques allow large amounts of data to be moved from the DBMS nucleus to the user's address space, eliminating many cross-memory service requests that are executed by older DBMS.

Sequential processing requirements do not just magically disappear when an organization implements a DBMS. And in this important sphere of DBMS performance, relational DBMS can be implemented that are significantly faster than traditional DBMS.

All-or-nothing syndrome

An unfortunate, but often unstated, pillar of the argument against the use of relational DBMS is the all-or-nothing syndrome. When confronted with all of the additional operations, flexibility and capabilities of a relational DBMS, too many have jumped to the conclusion that surely there must be no way to control the use of these additional facilities.

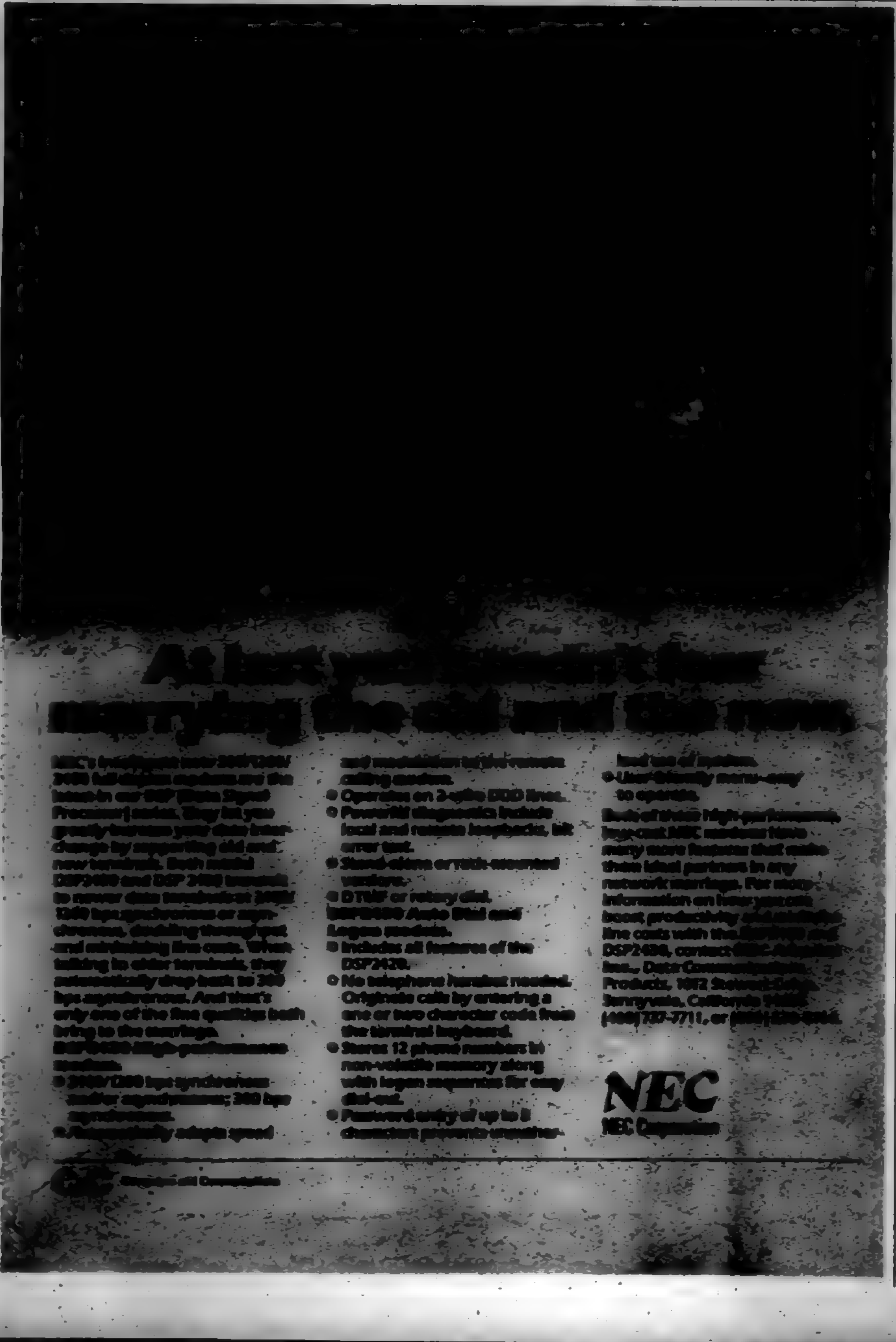
In other words, it's all or nothing. We're forced to live with all the possible searches and operations that any old end user may see fit to submit to the system. Although we may be able to optimize production applications, the end users will submit massive scans of the data base, which will wipe out any hope for good production performance.

Fortunately, this argument is not true today. Existing relational systems contain comprehensive administrative controls that allow performance of production applications to be protected.

However, the controls do not eliminate the power and flexibility offered to end users (in other words, end users are still able to submit the same searches and operations, in the same terms, as before).

Some systems, in order to protect production performance, actually introduce embedded pointer architecture into the data structure under the euphemism "predefined joins." This is not the approach to use: It effectively pours concrete over the data base design and actually inhibits productivity and prevents flexible new uses of the data involved. Also, numerous complex relational operations are no longer possible upon the modified data base structure.

Several methods exist whereby performance of



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production systems can be protected while still giving end users — and production applications, too — the full benefit of the relational DBMS.

Task priorities. Some relational DBMS are fully multithreaded for all operations. Further, some have the capability to assign priorities to different tasks within the system. It is possible, for example, to maintain very high priorities for important production jobs while supporting certain end-user queries with lower priorities. In this way, the system will favor production while still accepting and processing end-user queries.

If end users have a cadre of oft-repeated queries, a special task identification can be assigned to them to give them equal priority with production work. That way, only the unoptimized and unplanned requests would have a lower priority.

Anytime an organization has more than one person or group trying to use the same computer, it must either give everyone the same priority or make trade-offs. Unplanned queries should not necessarily be given a lower priority than production work. It depends upon what is important to the individual organization.

Many who claim that relational DBMS cannot be used for practical data processing have implied that relational DBMS have no mechanism for making distinctions in priorities — and that capability does exist in relational systems.

Operation analysis. Relational DBMS often support the ability to analyze the impact of an operation before it is attempted. For example, a relational DBMS can detect that a given query does not specify an indexed field and that it will therefore scan a table containing millions of records.

In such a situation, feedback can be given to the user before the search commences. The user can then restructure the query (coached by the system) to narrow the search boundaries. If the query must stand as submitted, the user can direct that it be performed in batch at night instead of on-line during the day.

User resource limits. As a refinement of the point above, a user can be assigned a predefined limit of I/O events, data records, CPU or elapsed time. This limit could vary by user.

If, in the scenario above, the user decided to submit the query on-line during a busy day (even knowing the resource implications), then the limitations established by site management will automatically prevent an unauthorized scan encompassing millions of records.

Avoiding arbitrary limits

The goal of relational DBMS must be to provide an organization with administrative tools that allow the preservation of production application performance without arbitrarily limiting the flexibility of the relational model. By imposing controls such as those described above, a relational DBMS still delivers all its benefits: The users are not prevented from asking any questions about the data base; knowledge of access paths is not strictly required; and production systems receive high priority and are not unpredictably devastated by some ad hoc query.

Where are we today in regard to relational DBMS technology? Must data processing professionals just sit, wringing their hands, waiting for the higher productivity and flexibility of the relational model or some new hardware miracle? Are relational DBMS good "only for certain things"?

Absolutely not. Just like the Roman numerals expert who is watching the emergence of a better system, so the industry today is beginning to witness the first practical high-volume implementations of the relational DBMS. Arguments put forth in this article will soon be considered self-evident, because everyone will be using relational DBMS and will be quite happy with their performance.

About the authors

Ed Millsap is a vice-president of Applied Data Research, Inc. (ADR) in Princeton, N.J., and director of the ADR/Datacom Product Group.

Ken Sloan is a divisional vice-president of ADR and manager of research and development for the ADR/Datacom Product Group.

Steve Gerrard is director of product marketing for ADR.

SCIENCE/SCOPE

Two communications satellites rescued by NASA's space shuttle in November are being refurbished to be launched again. The spacecraft were brought back to Earth after shooting into wayward orbits nine months earlier when their rocket motors misfired. Spacecraft controllers at Hughes Aircraft Company spent months taming the satellites and bringing them into orbits low enough that they could be reached by the shuttle. Their efforts were the most sophisticated series of orbital maneuvers ever attempted. In addition, Hughes and NASA engineers worked tirelessly to develop hardware that permitted the actual recovery. The satellites emerged in good condition. Most of the electronics were never turned on, but certain items—batteries, thermal blankets, and thrusters—are being replaced.

Pilots of future aircraft may rely on artificial intelligence systems to help them assess combat situations and take appropriate offensive or defensive actions. Hughes engineers are conducting studies for the U.S. Air Force on potential uses of artificial intelligence for fire control and battle management. One focus is how to identify targets automatically and present this information for a pilot's use. Another aspect involves tactical analysis, including decision-making that advises a pilot whether to attack, flee, apply electronic countermeasures, or fly low-altitude routes. New automation techniques may be necessary for pilots to cope with the fire control systems now being designed for the next generation of military aircraft.

The feasibility of turning sea water into electricity is being studied in fusion energy experiments at Kyoto University in Japan. The studies involve a Hughes gyrotron, a microwave tube that uses a spiraling stream of electrons to produce extremely high power microwave frequencies. Fusion energy holds tremendous potential because its source of fuel (hydrogen) can be extracted from sea water. It could produce large amounts of power with little or no radioactive waste and no threat of meltdown or explosion. In fusion energy research, the gyrotron's high-power radio waves heat hydrogen particles (plasma) to temperatures of tens of millions of degrees. These particles fuse under pressure, causing a thermonuclear reaction that provides energy for driving steam turbines.

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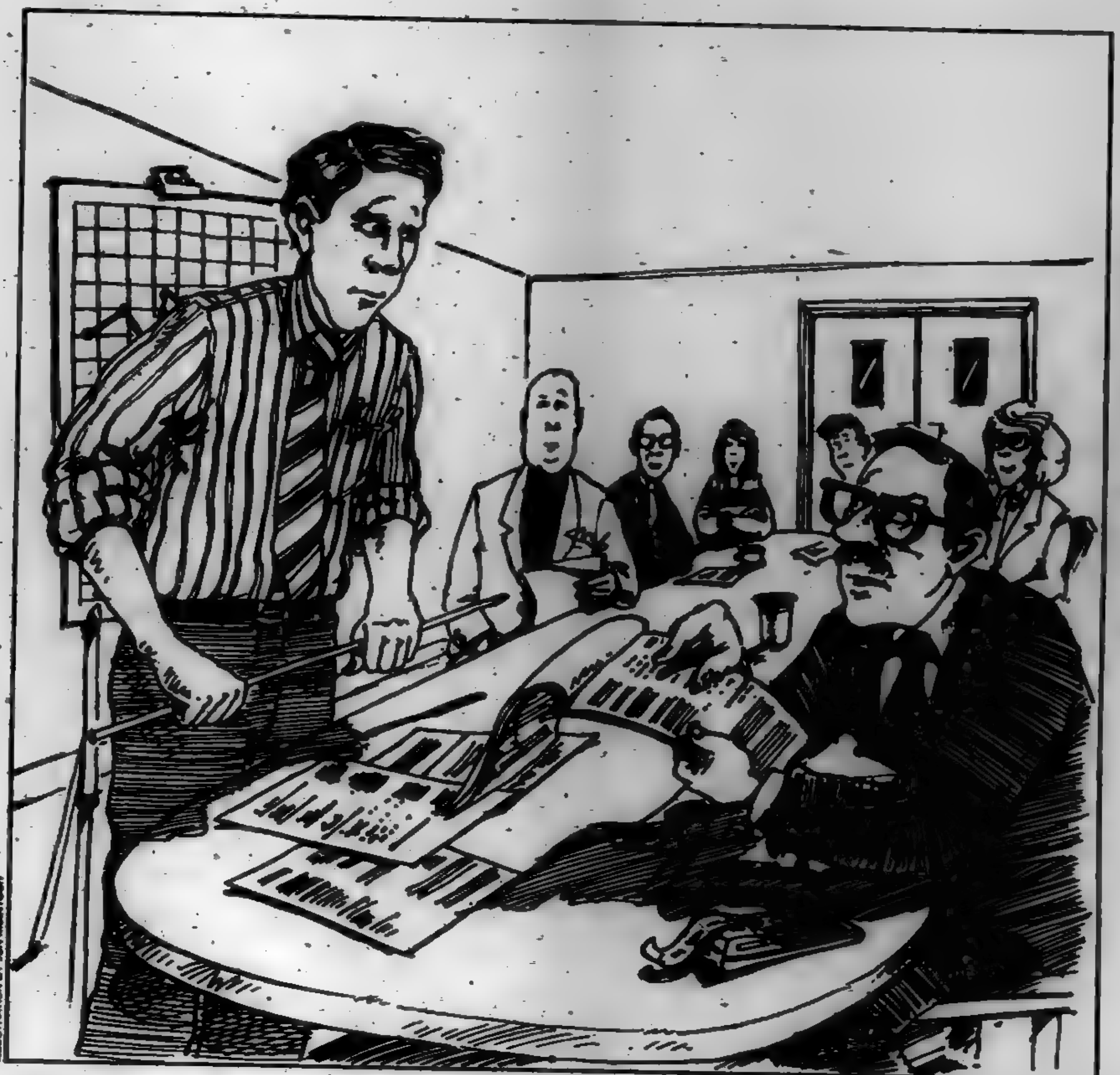

ILLUSTRATION BY JON McINTOSH

Scene: Monthly project review meeting. The project manager is reviewing cost-to-date and estimate-to-complete figures when the financial analyst interrupts: "Why should anyone believe your estimates when the cost to date bears no resemblance to the cost accounts?"

How to account for project planning

By Arthur Buonamano and Robert Jones

Cost discrepancies haunt a wide variety of companies involved in projects. The problem is distressing — both to project managers and those responsible for finance.

The frustrating scene above should alert both managers to an ongoing problem affecting their functions. Resolving the situation can also be frustrating: The project manager and financial analyst must isolate their differences by painstakingly — manually — reconciling all costs to date with the plan records. This continuing exercise can absorb far too much of a project manager's time. It is particularly dangerous because his attention focuses on the past, not the future. The result can be a smooth project review meeting but bad estimate to complete.

One solution is an integration of project management and accounting. The integration process assumes that you start with two points of view:

- The planning control view.
- The accounting view.

Both views may be supported by an automated system. Generally, each view has a structure reflecting the informational requirements of its function. For example, a project management (or planning) system will have a project-phase-task hierarchy related to resources. An accounting system will be based on a general ledger hierarchy and will be concerned with expenditures.

Integrating project management and accounting means linking the two systems (and viewpoints) so that reconciliations and disagreements over cost to date are eliminated.

The informational lowest common denominator between these two views, in all likelihood, is the project level. Below that, no common information is available. In fact, some accounting systems do not have a project hierarchy level at all.

In basic terms, therefore, integrating project management and accounting can be described as linking the two systems (and viewpoints) so that reconciliations and disagreements over cost to date are eliminated.

Why integrate?

The scenarios above indicate why you should integrate:

- To save project management and accounting time.
- To focus on the future.
- To improve estimates of cost to complete.
- To improve communication between project management and financial management.

The success of any program depends, in part, on the clarity with which its objectives are stated. Before investing too much effort in an integration project, top management ought to decide on objectives. The following three should be included:

Initiate cost entries to one system, which will then feed the other. This

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IN DEPTH/PROJECT PLANNING

objective addresses both the inefficiency of two systems of collecting actual cost data and the exposure to reconciling items when two systems are recording the same economic events. The product is one "labor ticket" only — not one for the accounting system and one for the project manager.

Most useful areas

Of course, labor is only one source of cost on most engineering or construction projects. Accounting integration is most needed and most useful in those environments in which vendor charges, corporate cross-charges, internal labor, internal inventory relief and other sources of accumulating costs are all available to the project manager.

If one entry is going to drive two systems, the planning and the accounting system, then the system with the most discrete data informational need should be the driver or feeder to the system with the less discrete need. In general, therefore, it will be the planning system, with its precise tasks, that will drive the accounting system, with its more global discriminations. This leads to the second objective:

Let the project planner determine the basis for classifying actuals against project tasks.

This objective simply means that the planner should be able to describe his plan in terms of tasks and milestones meaningful for operational management of the project. Within the project, the planner should be able to determine his own "chart of accounts."

> *Given a working planning system and a working accounting system, there will be great resistance to making radical changes to either.*

Make the project plan system (which has the actual cost data applied to it) become a subsidiary ledger of the company. That is, make it the source of authoritative accounting costs on projects.

When these three objectives are met, an accounting integration is achieved. Meeting these objectives generally involves an administrative and MIS project. A look at the constraints that bound the design possibilities will reveal the scope of such a project.

Design constraints

Given a working planning system and a working accounting system, there will be great resistance to making radical changes to either. This is particularly true if either or both is a vendor-supplied package. In fact, if either is vendor-supplied, there may be license limitations that preclude any changes to the system at all.

A related constraint has to do with the existing information flows. For example, it is unlikely that major changes can be introduced into corporate purchasing, accounts payable, raw materials inventory and corporate cross-charge systems and procedures to enhance an engineering department's planning and control system.

This limitation, of course, will vary from company to company and industry to industry.

Given the objectives and the framework of constraints, we can progress to a set of design considerations and decisions. The most important relates to the basic flow of information between the planning systems and the general ledger. Essentially, there are three possibilities:

- The planning system collects actual cost data, which is summarized for posting to the general ledger.
- The general ledger collects the cost data, retaining sufficient detail to pass it to the planning system.
- A collection system assembles all cost data and routes it to both systems.

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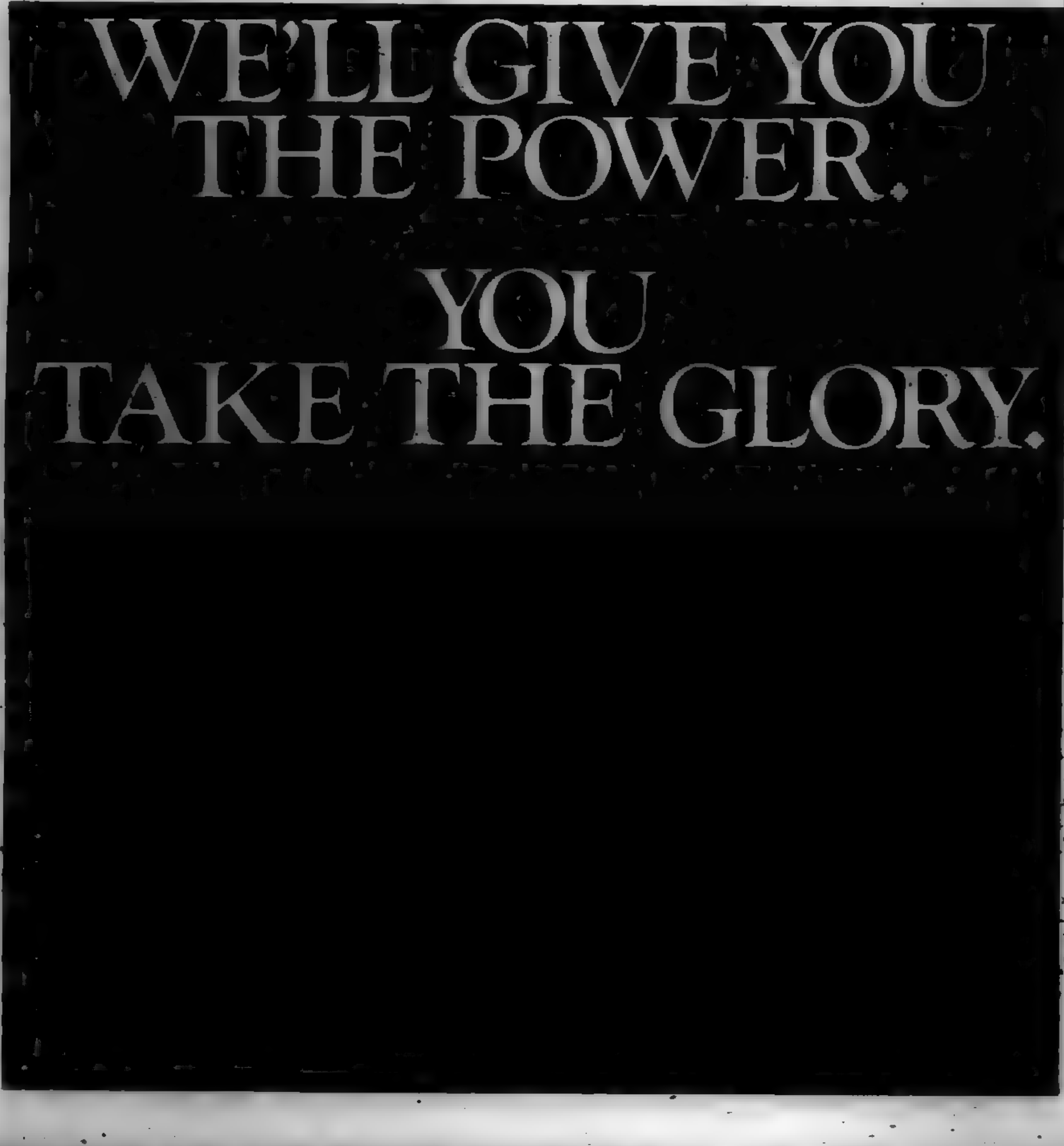


The first method most naturally will meet the objective of allowing the planning system to be the authoritative source of accounting data on projects.

However, the other approaches can be considered as a possible solution if sufficient controls are designed into the systems and procedures. The first approach is clearly the best if you consider the following arguments pertinent to your company:

A prime reason for integrating is to eliminate differences between the planning system actuals and the accounting system actuals. Since the planning system is the more demanding validity screen, it makes sense that only transactions that have passed through the planning system are posted to the general ledger. Any invalid charges will be trapped between the systems. Suspended items trapped between systems would result in reconciling items and communications problems — exactly what integration is attempting to avoid.

Because the above argument would apply to most cases of integration, the first design alternative is the preferred approach and will be assumed for the remainder of the article.

Requirements analysis

The functional requirements of the integration should be developed by both planning and accounting representatives. However, the objectives and constraints essentially preserve the full functionality of the planning system and related conventions.

It is the accounting world that needs to specify requirements so that accounting integrity and ability to audit will be maintained. Some key areas of concern are the following:

Suspended (error) item processing. Any cost transactions that are rejected from the planning system need to be detailed for correction activities. The cost involved needs to be held in a suspense account on the ledger. Accounting and reporting procedures must be adopted to handle the new suspense account.

Accounting controls. The planning system, now that it will become an accounting system as well, must be subject to vigorous controls, including run-to-run controls, month-to-month controls and ledger tie-outs.

In this context, a run-to-run control means that the dollars sent to the planning system must be shown to equal the dollars posted to the general ledger from the system plus or minus the effects of suspended-item dollars.

A month-to-month (or week-to-week) tie-out will involve checking that cost to date on the planning system at the prior month-end plus current month activity on the planning system equals current cost to date.

Project cost to date (or current-year costs for period-costed projects) from the planning system must be agreed to account balances in the general ledger.

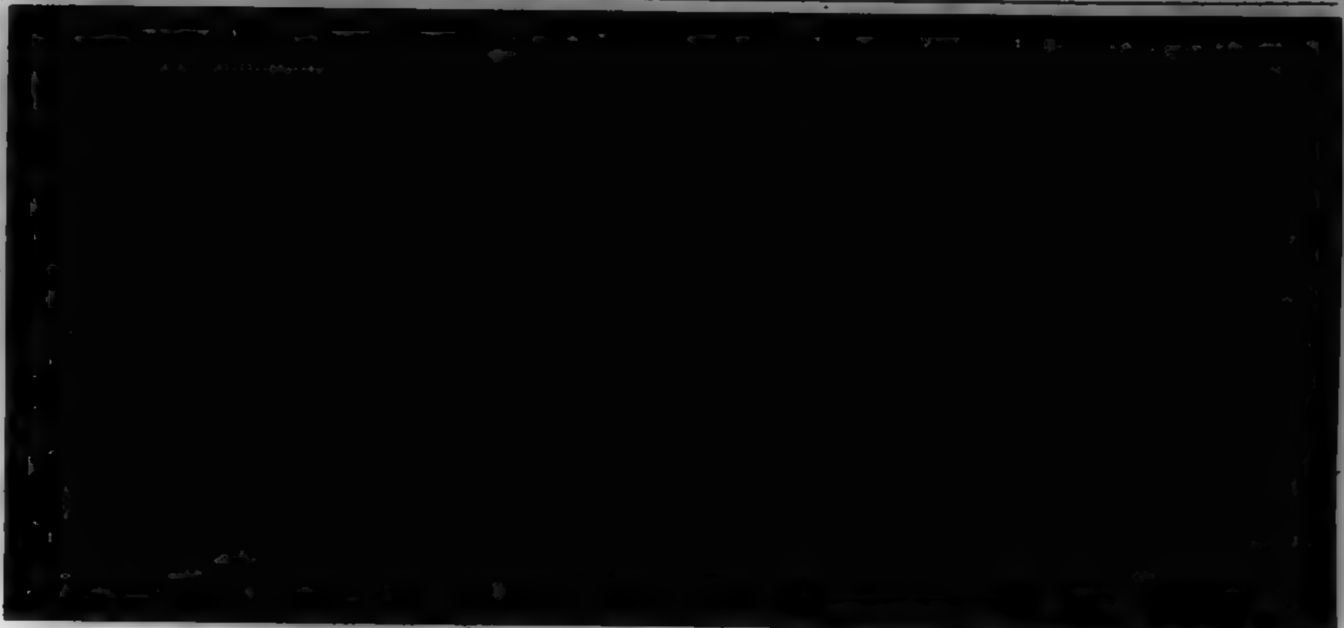
Labor costing requirements. Most planning tools will cost (extend) labor hours or days that are passed to them by applying a labor rate from a rate file. It may therefore be necessary to suppress the action of this costing and permit the corporate labor costing calculations to be passed to the project planning system. This would be necessary if the planning system permitted only one actual rate per individual when in fact a burdened or an unburdened rate might both be appropriate to the same individual, depending upon the nature of the projects he was charging.

Audit trail. Most planning systems do not retain transaction history or do not retain it in a form suitable for management or audit trails. It may be necessary to specify the need for additional software to maintain such a file.

Even if the planning system has such a file, it will not likely carry feeder system data such as voucher numbers, storeroom designators, labor week-ending dates and so forth.

Project cross-reference files. Because the purchasing or accounts payable systems (or other cost transaction feeder systems) may not recognize the coding conventions of the project planning system, automated cross-referencing may be required to translate an account number-based charge into a project-phase-activity code charge to the planning system.

After these and perhaps other requirements are



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established, the detailed functional specification and design of the integration system can proceed.

A typical design would include:

- Data collection and reformat.
- Edit modules.
- History (transaction file) module.
- The planning system.
- Ledger interface module.
- The ledger system.

Here are some of the functionalities of each (these functionalities, of course, are based on the requirements analysis, which drives the design in the first place):

Data collection and reformat. The data collection and reformat module must take in transactions from all cost feeders and produce transactions acceptable to the planning system.

The data collection module would also add feeder system-specific data to be retained by the transaction history module. For example, the reformatted cost output record might have trailer information stored on it identifying the voucher number from the accounts payable system.

Edit modules. Each planning system has edit modules built into it to screen out improperly coded transactions. However, the efficient disposition of invalid transactions depends on an error-handling system that mirrors the organizational structure. If several business units share the project planning system, it would be advantageous to report errors by business unit. This reporting may be impossible to do directly from the planning system. In addition, if automated error circulation is required by the users, this facility may have to be added to the planning system.

Since the planning system should be immune to programming changes, what could be required is a front-end edit module that mimics the planning system edits but provides additional reporting, access, error-correction and error-circulation facilities.

History (transaction) file module. This module maintains a transaction history with full audit trail capability. It will most likely provide extract, sort and report functions.

Planning system. This system, the project planner's tool, is probably vendor-supplied. It is the system to be integrated with the accounting system.

At a minimum, it contains a project planning facility — meaning that it can schedule projects based on task information, including network dependencies and resource availability. In addition, it must contain some facility for recording actual costs as they occur against planned activities. It must also permit the encoding of a project with its general ledger account classification.

Ledger interface. The ledger interface collects costs for the month (or week) that have been added to the planning system and sorts and summarizes them into journal entry transactions. This can be a simple extract and sort module.

Planning systems often provide a report writer program that can support this functionality. The key element is that the extraction is performed directly from the planning system, thus ensuring that the ledger posting is synchronized with the planning system's actual dollar activity for the period.

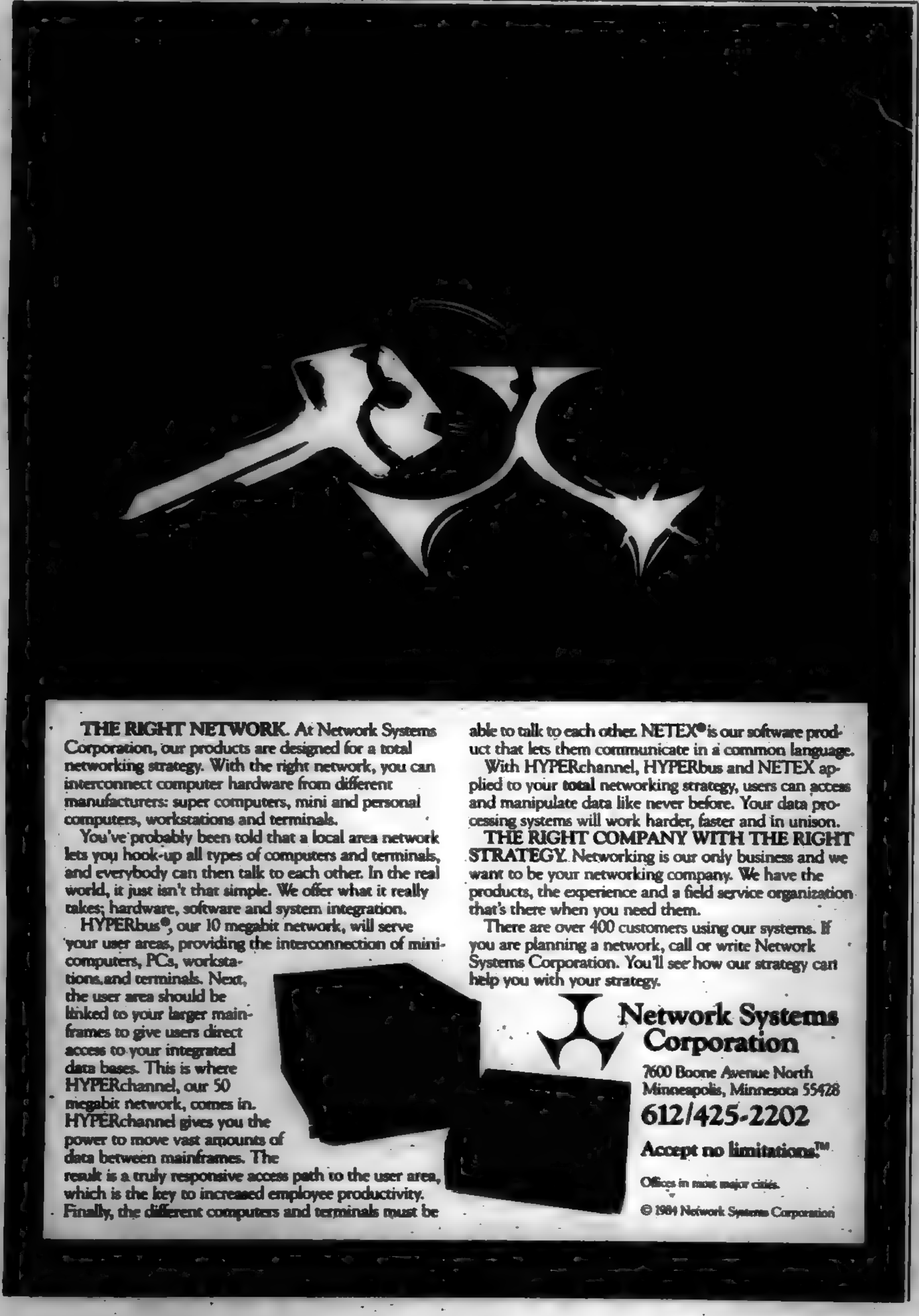
The ledger. This is the corporate or plant ledger system. It could be vendor supplied. The accounting integration is transparent to this system if appropriate controls and procedures have been included in the integration.

An integrated system. Once an integrated planning and accounting system is developed, the efforts of planners and financial managers alike can be directed to assessing the project status and affecting its future course rather than on reconciling differences between conflicting views of the current project cost status.

About the authors

Arthur Buonamano is currently a budget and planning manager at Digital Equipment Corp.'s Computer Special Systems (CSS) Group. Previously, as program manager, he planned and led the integration of a project planning system in engineering with the accounting systems at CSS.

Robert Jones consults for AGS Management Systems, Inc. in King of Prussia, Pa. He works with a number of Fortune 500 companies on project management issues.



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COMMUNICATIONS

NCR Comten rolls out processor, tools

By John Dix
CW Staff

ST. PAUL, Minn. — NCR Comten, Inc. last week unwrapped a low-end communications processor that can be used in IBM Systems Network Architecture (SNA) and non-SNA networks, as well as two software products aimed at increasing network connectivity.

The products announced concurrently with the Comten 5620 were the Comten Network Gateway, a software product used to interconnect IBM SNA networks, and the Comten Advanced Communications System, a hardware and software product used to interface Comten's 3600 series front-end processors with the VRX hosts of Comten's parent company, NCR Corp.

NCR Comten also announced that it will market the Comten 2200 Matrix Switch, an electronic switch manufactured by Dynatek Corp.

The low-end modular communications processor, the Comten 5620, supports up to 32 full- or half-duplex lines and one or two channel-attached local hosts. Based on a Comten-programmed proprietary NCR 32-bit very large-scale integration microprocessor, the 5620 is said to be compatible with, and run the same software as, the company's 3650 and 3690 communications processors that support, respectively, a maximum of 220 and 512 lines.

The 5620 can be configured as a remote concentrator or as a front-end processor for local IBM (370 architecture) and compatible systems, NCR hosts or for a combination of the two. System components include a CPU, a host channel interface unit, a communications subsystem, a fixed disk drive for loading and restarting and an optional system console.

When configured as a remote concentrator, a 5620 would include the CPU, disk drive and desired communications subsystem line components. The communications subsystem consists of two cabinets, each capable of supporting up to 16 lines, for a total of 32 lines. The ports can be software configured to support speeds from 50 bit/sec to 64K bit/sec and protocols that include Synchronous Data Link Control, High Level Data Link Control, Binary Synchronous Communications and start/stop.

By adding a channel interface unit, the 5620 can be channel-attached as a front-end processor to one or two local IBM or NCR hosts. The system's remaining line capacity can be used locally or to provide access to remote computer systems.

When used remotely as a nodal processor in a pure SNA network, the 5620 is said to function as a Type 4 SNA physical unit using standard SNA trunk protocols, the company reported. For mixed SNA and pre-SNA network environments, the 5620 attaches to the network through NCR Comten's proprietary Communications Networking System procedures.

The 5620, which can be operated in an

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■ Emerald Technology Group, Inc. has announced two communications expansion devices for IBM's System/34, 36 and 38/78

■ Micom Systems, Inc. has introduced an IBM Gateway Module that allows terminals on a Micom Micro600 Data Private Branch Exchange Network to access IBM hosts/78

■ Innovative Electronics, Inc. has announced MC 80/700, a protocol conversion unit that provides IBM 3287 printer emulation/78

■ Votrax, Inc. has announced a modem which enables Votrax's LVM Communicators to synthesize Touch-Tone telephone signals into voice output/78

INSIDE

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Protocol Converters/78
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Auxiliary Equipment/78

Datapoint adds software that runs under RMS

SAN ANTONIO, Texas — Datapoint Corp. has announced three communications software packages that run under Datapoint's RMS operating system.

The products include RMS3274, Uniterm and Virtual Communication Facility (VCF).

RMS3274 provides IBM 3274 cluster controller, 3278 workstation and 3287 printer emulation for terminals running on Datapoint's Attached Resource Computer local-area network. With the product, a user can access information on an IBM host, output the information to a local printer or disk and integrate information with Datapoint files, according to the vendor.

The product works on switched or leased lines, supports from one to 32 terminals and transmits data at speeds up to 19.2K bit/sec.

Uniterm reportedly lets a Datapoint terminal emulate a teletype device and access information services such as Dow Jones and Co.'s News/Retrieval; Information Services, Inc.'s Dialog and West Publishing Co.'s Westlaw. The product supports transmission speeds from 300 to 4.8K bit/sec, asynchronous communications and file transfers.

VCF, structured in accordance with the International Standards Organization's Open Systems Interconnect model, supports 1980 CCITT X.25 as a transport mechanism from Datapoint devices to packet-switched networks, the vendor said. It supports transmission speeds from 1.2K bit/sec to 9.6K bit/sec. VCF works with point-to-point switched, half-duplex with automatic dialing lines and point-to-point leased, full-duplex lines, according to Datapoint.

RMS3274 and VCF 1.1 cost $1,500, and Uniterm sells for $1,000.

For further information, Datapoint is located at 9725 Datapoint Drive, San Antonio, Texas 78274.

NCR Comten modems out

Series 7160 models provide 32-char. LCD display

ST. PAUL, Minn. — In a barrage of recent announcements that included a low-end communications processor, NCR Comten, Inc. unveiled models of the NCR Comten 7160 series of diagnostic modems.

The models in the 7160 Commander series are functionally equivalent to current Comten Models 7164-0100, 7164-0200 and 7165. Like the older models, the Commander series high-speed synchronous modems can be used in point-to-point or point-to-multipoint applications.

New to the 7160 models is a 32-char. LCD front panel display that is said to provide IBM Systems Network Architecture (SNA) and non-SNA network users with on-line diagnostic information.

Eleven message types are available through the display that indicate modem and line characteristics, status, signal quality and configuration details, the company reported. Local operators are said to be able to isolate line and system failures locally and remotely and measure the quality of a communications line for both transmission and reception.

Diagnostics at the control modem include transmit level, receive signal level, hit count, receive signal quality and data terminal equipment activity and configuration. The tests can be initiated through host-based diagnostic software or through a switch on the modem's front panel.

The 7164-0100 is a 4.8K bit/sec leased line modem for point-to-point and multipoint configurations. The 7164-0200 is a 4.8K bit/sec switched line modem used in

See MODEM page 82

IBM CPUs get access to Western Union mail

UPPER SADDLE RIVER, N.J. — Western Union Corp. has announced three interface products that will provide IBM System/34, 36 and 38 computers with access to Western Union's Easylink electronic mail service and to Telex systems.

The products, developed by Orion Software, Inc., are available as stand-alone communications programs or as modules for Network Orion.

The product reportedly converts asynchronous protocols into bisynchronous and Synchronous Data Link Control protocols. The product handles logon, password and communications exchanges.

The communications software allows users to create, address, transmit and receive electronic mail files, according to the vendor. Users can compose text and data messages with Orion's text editing function. After a user enters address and delivery data from a menu, messages are sent to the appropriate receiver.

The price of the service for System/38 ranges from $5,100 to $6,300 and from $3,400 to $4,200 for System/34 or System/36.

Western Union is located at One Lake St., Upper Saddle River, N.J. 07458.

Visa credits Compuserve for quick authorization

PHOENIX — With the increasing use of credit cards, banks and merchants are continually attempting to speed the credit card authorization process.

Visa U.S.A., Inc.'s electronic authorization activities began in the late 1970s when it developed magnetic stripe and point-of-sale (POS) terminal systems.

In 1980, Visa distributed POS terminals to member banks. The terminals are connected to Visa's network through an interface at each bank. The banks sell or lease the POS terminals to area merchants, and interfaces serve as conduits between the merchants' terminals and the Visa network.

Although the original system was successful, it was limited to interface-equipped member banks. Several national retailers have stores that are not located near the retailer's bank. In 1983, Visa interviewed several telecommunications firms with established packet networks in an effort to broaden its POS authorization system.

"We examined systems from AT&T, [Tymshare, Inc.] and [Compuserve, Inc.]," said W. Thomas Castleberry, president of point-of-transaction systems.

See VISA page 82

COMMUNICATIONS

VOICE/DATA COMMUNICATIONS

■ Micom Systems, Inc. has introduced Micro7400 IBM Gateway Module that allows terminals on a Micom Micro600 Data Private Branch Exchange Network to access IBM hosts.

The product reportedly lets asynchronous devices emulate Systems Network Architecture, Synchronous Data Link Control or bisynchronous devices. Network devices can appear as IBM 3278 or 3279 terminals or an IBM 3287 printer. It reportedly supports 16 users and features a command port for keyboard configuration of the gateway, automatic logon to a host application, password protection and automatic host logoff.

An eight-user version of the gateway costs $3,600; and a 16-user model sells for $5,400.

Micom Systems, 4100 Los Angeles Ave., Simi Valley, Calif. 93063.

■ Emerald Technology Group, Inc. has announced two communications expansion devices for IBM's System/34, 36 and 38.

Multiliner DP280 enables one synchronous port to support up to eight switched or dedicated lines at speeds up to 19.2K bit/sec. This product, which supports Systems Network Architecture and bisynchronous protocols, may be used as a remote concentrator.

Multiliner DP280 costs $1,595; Remote Multiliner is priced at $1,795.

Emerald Technology Group, Suite 102, 1601 116 Ave. N.E., Bellevue, Wash. 98004.

PROTOCOL CONVERTERS

■ Innovative Electronics, Inc. has announced MC 80/700, a protocol conversion unit that provides IBM 3287 printer emulation.

The product is said to be linked to an IBM 3274 or 3276 controller through a Type A coaxial cable.

A spokesman said that MC 80/700 runs under bisynchronous, Systems Network Architecture and Synchronous Data Link Control protocols. Output can be formatted with 40, 64 or 80 char./line or in an unformatted mode with 132 char./line.

MC 80/700 costs $1,495.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

SOFTWARE

■ VM Personal Computing, Inc. has released Version 2.1 of Relay/3270, an asynchronous communications package that runs under IBM's VM/CMS operating environment.

A spokesman said that the enhancements compare old and new screens and pass only changed portions. The product, when coupled with the company's Relay communications software for the IBM Personal Computer and compatibles provides IBM 3278 and 3279 terminal emulation and file transfer capabilities.

Relay/3270 costs $6,995.

VM Personal Computing, 475 Fifth Ave., New York, N.Y. 10017.

AUXILIARY EQUIPMENT

■ Votrax, Inc. has announced the Dual Tone Multifrequency (DTMF) modem, which enables Votrax' LVM Communicators to synthesize Touch-Tone telephone signals into voice output.

DTMF can be used for order entry, inventory status, cash management, directory assistance, insurance quotes and paging systems. The product costs $700.

Votrax, 1394 Rankin, Troy, Mich. 48083.

PROCESSOR

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office environment, is said to provide applications switching and routing functions, polling to save line overhead, improved error control and recovery and the ability to support multiple types of communications facilities including X.25 packet networks and satellite links.

Depending on loading, a 5620 could be configured to support — through terminal controllers — up to 300 or 500 terminals, according to Rene E. Van der Haeghen, manager of product management.

A two-line 5620 with the main processor, 1M byte of memory and integrated disk costs roughly $22,000, Van der Haeghen said. A full system capable of supporting two hosts and 32 lines, with 2M bytes of main memory and the integrated disk, costs $54,000. It is scheduled to be available in the fourth quarter.

The Comten Network Gateway (CNG) is a software package that runs on the company's 3600 family of communications processors and reportedly enables up to eight independent SNA networks to be interconnected. CNG runs on Comten processors under Comten Communications Operating System Release 3 or above and Comten's Advanced Communication Function/Network Control Program (ACF/NCP) Release 3E. It supports communications with other Comten processors and IBM 3705 and 3725 front ends.

The CNG automatically translates addresses that it passes from one NCP to another and accepts, processes and translates SNA commands to establish and terminate sessions between interconnected networks, the company reported. CNG only supports sessions with hosts that support IBM's Multiple Systems Network Facility. No host software changes are said to be needed. The initial license fee for CNG is $2,200, and monthly fees are $400. It will be available in the second quarter.

NCR Comten also announced the release of the Comten Advanced Communications System for NCR hosts (NCR/ACS). This product can be installed in a Comten 3600 communications processor to make that system compatible with NCR's 8500 and 8600 VRX processors while retaining IBM host support.

A 3600 series Comten front end with NCR/ACS reportedly enables users to share IBM and NCR host applications between terminals, which is said to reduce line costs and eliminate terminal duplication.

NCR/ACS is composed of hardware and multiple software components with a combined initial cost of just over $11,000 and monthly software license fees of $550. It is scheduled for delivery in the second quarter.

Finally, NCR Comten said that it is now selling the 2200 Matrix Switch, a product manufactured by Dynatek. A maximally configured switch has 512 input ports and 512 output ports and can be used in front of multiple communications processors to configure or reconfigure the routing of lines into these processors.

The switch costs $300 to $380 per pair of ports. The smallest configuration would probably be roughly a 64- by 64-port model, the company said.

NCR Comten is located at 2700 Snelling Ave. N., St. Paul, Minn., 55113.

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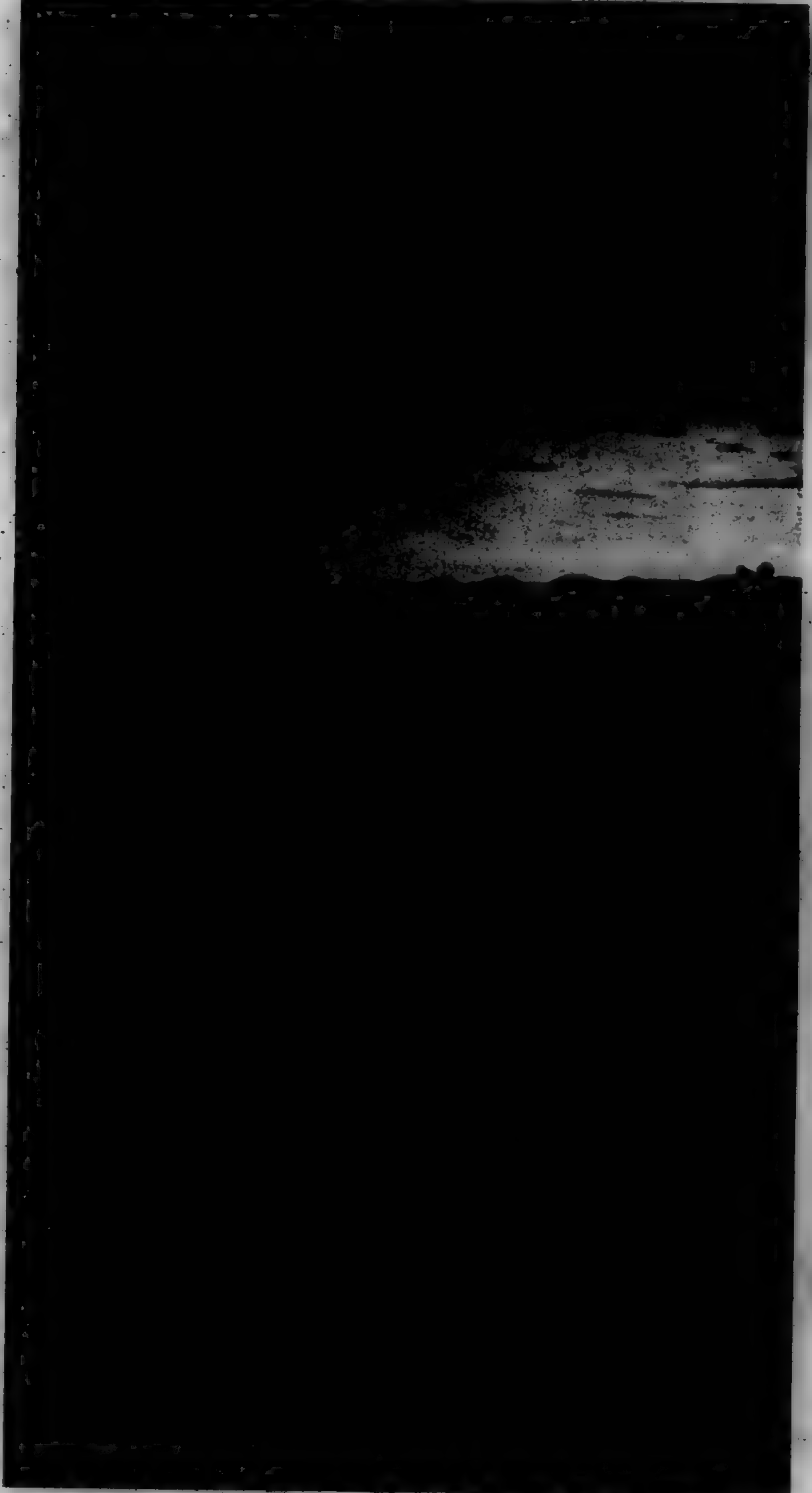

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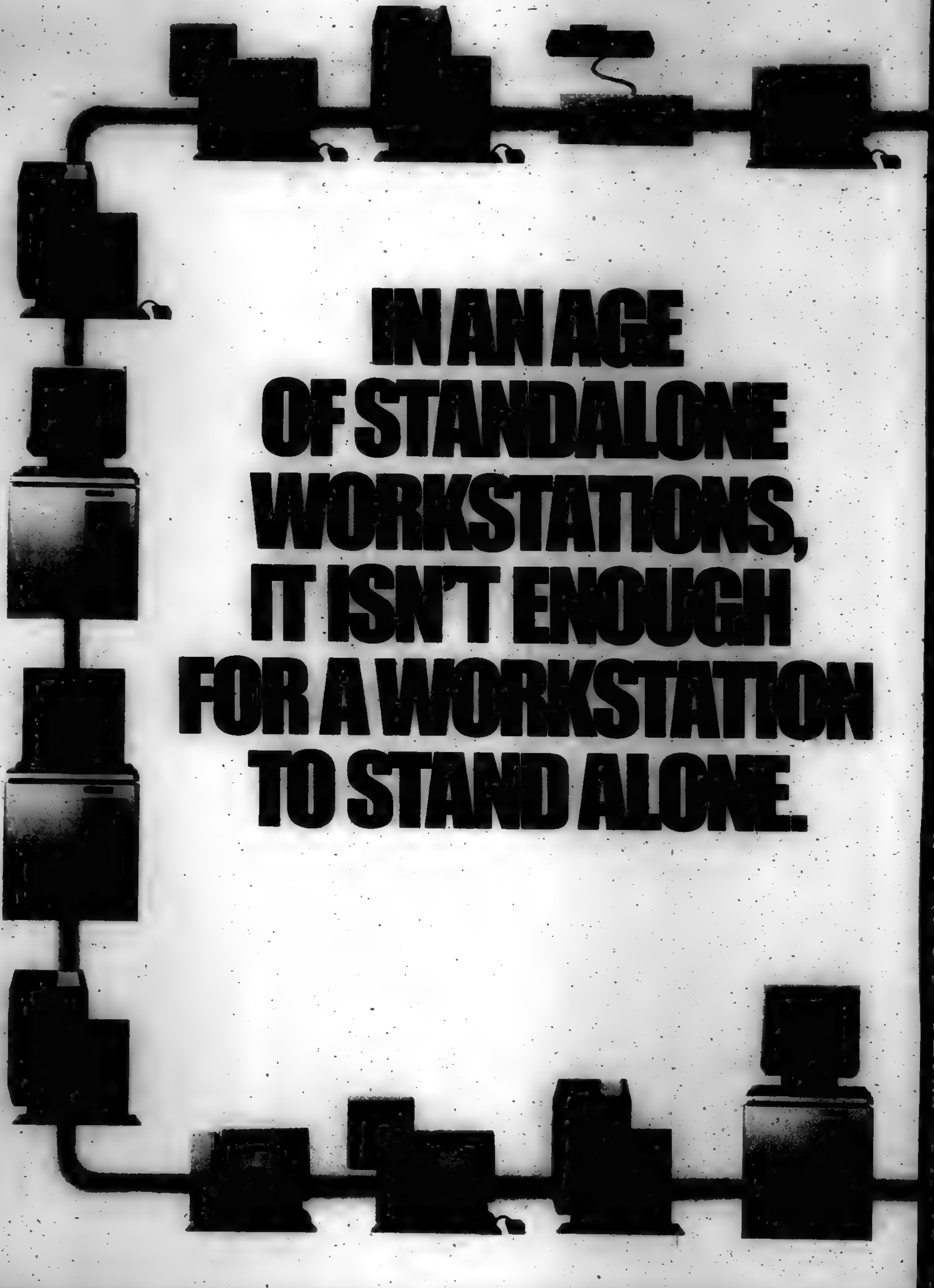
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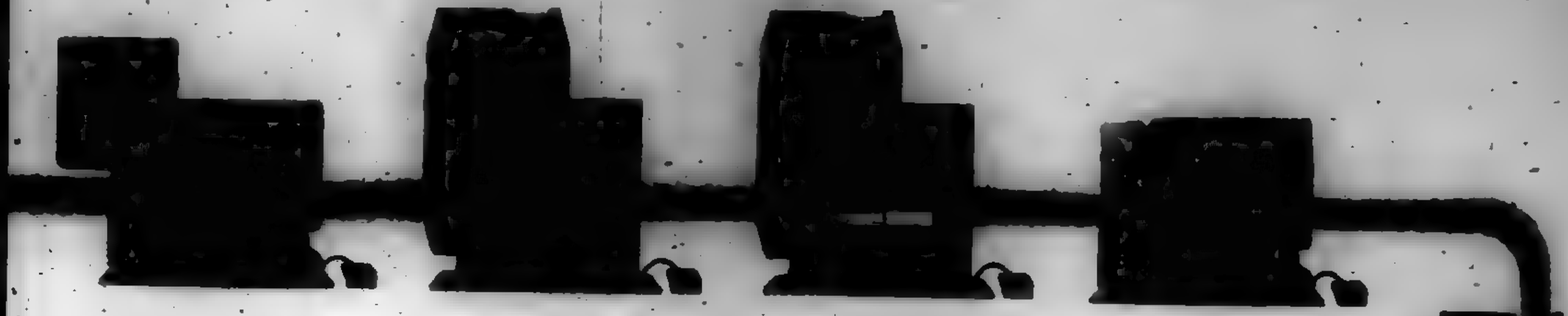

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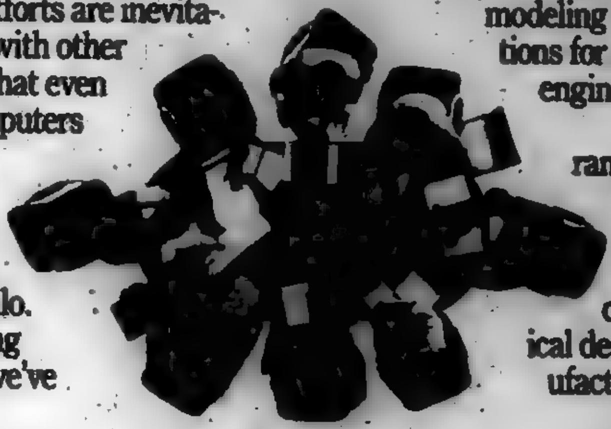

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While these facts no doubt attest to the efficacy of DOMAIN processing, it's also reassuring to know that the DOMAIN network even connects to other computer systems via industry standard protocols such as X.25 and ETHERNET.® Of course DOMAIN supports the UNIX® software environment as well.

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MODEM

from page 77

point-to-point applications. The new 7165 is said to combine the capabilities of the current 7165-0100 and 7165-0200 9.6K bit/sec modem for point-to-point and multipoint network configurations into one unit. The 7165 can be reconfigured with a front panel switch.

Prices for the 7164 series start at $3,700, and prices for the 7165 start at $5,800 in single quantities. Quantity discounts are available.

A fan-out option for both modems — essentially enabling up to four terminal devices to share a remote modem — costs $750. A multiplexer option for the 7165 costs $870.

All new models are reportedly available now. The company is located at 2700 Snelling Ave. N., St. Paul, Minn. 55113.

VISA

from page 77

"We selected Compuserve because . . . [it] was willing to give us private ports on its access points at competitive prices," Castleberry noted. Having a private or dedicated access port is comparable to having a reserved space in a crowded parking lot, he added.

"One advantage is that the merchants don't have to compete with Compuserve subscribers to access the network," Castleberry said. "Another is that the POS terminals, which are made for Visa by various manufacturers, don't have to be reprogrammed or retrofitted in order to access the Compuserve network."

In addition to establishing private ports for Visa on selected access points, Compuserve altered its network software to streamline the POS operations. The changes provided routing to multiple Visa host computers, decreased the response time and eliminated some of the steps commonly required in using a dial-up network, such as entering a user ID number and password.

> ❞
>
> *More than 5,000 POS terminals in more than 100 markets operate through the Compuserve network.*

According to Castleberry, the system works in the following manner: To obtain approval, a merchant enters the amount of the purchase and passes the credit card through a special POS computer terminal that reads the magnetic stripe on the back of the card. The terminal automatically dials either the Compuserve network or a computer at the merchant's bank, both of which are linked to Visa's own network.

Through electronic routing, the card is checked against computer records of lost and stolen cards — records provided by the bank that issued the card. The response — approval or decline of the purchase — is immediately transmitted back to the merchant's terminal. Criteria for authorization are established by the card-issuing bank; for example, authorization may be denied because the cardholder is over the credit limit.

Slower system replaced

The new system replaced a slower method of authorization. In the other system, merchants either called or checked the card number against a printed bulletin of lost and stolen cards. The process took at least two minutes to complete.

"Electronic authorization greatly reduces the chances that a bad card will be approved," Castleberry said. "First, reports of stolen cards are entered by the Visa member bank into the computer system immediately, whereas a bulletin is updated only once every 10 days. And because a terminal reads the magnetic stripe rather than an embossed card number, altered cards can be detected."

The Visa-Compuserve pilot project was tested in 50 markets. Currently, more than 5,000 POS terminals in more than 100 markets operate through the Compuserve network.

Feature being tested

A feature being tested on special POS terminals is data capture, or storage of the credit card transactions in the merchant's terminal, according to Castleberry.

"Currently, the merchants collect paper slips from credit card transactions, add them up and send them to the bank for credit to their accounts," Castleberry said. "That process can take seven to 10 days. With electronic data capture, the transactions could be transmitted to the bank within hours.

"The entire process, involving the merchant, the merchant's bank and the card-issuing bank, can be completed within one or two days," he said.

"The book I'm writing is titled *Transistors, Volume 1.*"

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April 12 Washington D.C.: Stouffers Concourse Hotel — Arlington
April 16 Detroit: Pontchartrain Hotel
April 18 Toronto: Park Plaza Hotel
April 24 Chicago: Westin — O'Hare

Seminar Agenda

8:30-9:00 a.m. Registration and Continental Breakfast
9:00-9:15 Welcome
9:15-9:45 Personal Computing 1985: User Presentation on Recent Trends in Corporate Personal Computing
9:45-11:00 Spreadsheets and Financial Modeling for Organizational Productivity: Using Lotus 1-2-3™ and IFPS/Personal™
11:00-11:30 Managing Spreadsheets and Financial Models: A Case Study
11:30-12:00 noon EXECUCOM: Meeting the Challenge of Productive Organizations

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SYSTEMS & PERIPHERALS

Vaxstation 500 out

DEC offers CAD, modeling graphics

MAYNARD, Mass. — Digital Equipment Corp. has introduced Vaxstation 500, a graphics workstation designed for computer-aided design, cartography, molecular modeling and research applications.

The product consists of a DEC Microvax I supermicrocomputer and the newly released Tektronix, Inc. 4125 color terminal. A basic system features 1M byte of random-access memory, two 400K-byte floppy disk drives, a 31M-byte hard disk, DEC's Microvms operating system and a graphics subsystem, the vendor said. Vaxstation 500 can be linked with other VAX computers through Decnet or Ethernet local-area networks.

The graphics subsystem consists of a 19-in. color monitor, Intel Corp. 80286 and 80287 microprocessors, 256K bytes of display list memory, a 16-million color pallette and a keyboard. The terminal can simultaneously display 256 colors and has a resolution of 1,280 by 1,024 pixels, the vendor said. The terminal employs convergence correction techniques to maintain a convergence accuracy of 0.3mm over the display area.

Options include a three-dimensional wire-frame option that allows a user to pan, zoom, rotate or replicate an object. A solid shading feature supports hidden lines, surface removal and up to 16 translucency patterns. A user can work with up to 1,024 colors when shading an object.

Vaxstation 500 costs $36,735, and the graphics subsystem is available for $19,950.

DEC is located at 146 Main St., Maynard, Mass. 01754.

Accel introduces data base sorter

SAN DIEGO — Accel Technologies, Inc. has unwrapped a sorting unit designed to accelerate data base sort-intensive operations at speeds in excess of 1M byte/sec. The Data Base Accelerator (DBA) 1000 works by off-loading a host computer's data sequencing overhead.

The peripheral processor — priced in the $23,000 to $51,000 range — serves a single host or a network of hosts via the Ethernet local-area network and is said to be initially targeted to Digital Equipment Corp. and Data General Corp. superminicomputers in the $100,000 to $200,000 range with software data base packages in the $25,000 to $50,000 range.

In benchmark tests against an unloaded DG Eclipse MV/8000 superminicomputer with 2M bytes of random-access memory and 200M bytes of disk storage, the company claims the DBA 1000 performed a sort in 10 to 20 seconds vs. the DG supermini, which took 12 to 16 minutes. The benchmark test was run with a simulated 18,000 item, 4.6M-byte typical inventory file, consisting of 260-byte records sorted across three fields: part number, vendor and purchase date.

The machine is said to manipulate data in much the same way that a floating-point processor manipulates numbers. The unit consists of a front-end processor, memory control unit and from one to five self-sorting memory modules. It receives data from the Ethernet local-area network, passes it on to the sorting system,

See SORTER page 87

■ McDonnell Douglas Computer Systems Co. has announced two systems aimed at users of Microdata Corp.'s Reality data base management system/84

INSIDE

Processors/84
Terminals/84
Power Supplies/84
Board-Level Devices/84
Auxiliary Equipment/87

HP laser printer provides IBM mainframe link

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a laser printer subsystem that links its HP 2680A laser printer with IBM mainframes. The subsystem can be used as an IBM 3211 printer replacement.

A spokesman said the subsystem, called HP 2689A, prints at 45 page/min, or 3,000 line/min, using 8½- by 11-in. paper. Paper sizes ranging from 3- by 6½-in. to 11.7- by 17-in. can also be used.

Other printer features include the use of electronic forms and signatures and multiple character fonts. Electronic forms can be designed off-line and transferred to the controller via a 3½-in. floppy disk.

The 2689A can be used with IBM's 370, 4300 and 30 series mainframe block multiplex channels. The subsystem's hardware interface provides interpretation of channel commands, status request information and transmission of status information. Print data is formatted and merged with the appropriate form for printing. A control program running on the device controller correctly formats the data for printing on the laser printer.

The 2689A is intended for use in applications requiring 100,000 to 800,000 page/month. For outputs exceeding 800,000 page/month, multiple HP 2689As can be added to the mainframe.

Ascii, foreign language fonts

Standard environment files specifying character fonts, forms and vertical forms control commands are provided with the 2689A. Each environment file contains Ascii and foreign language character fonts, as well as horizontal and vertical print orientation.

The HP 2689A laser printer subsystem costs $99,950.

HP is located at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Can Amdahl continue to cut prices and not cut profits?

HARD TALK
Tom Henkel
CW Senior Editor

Amdahl Corp. was first to respond to IBM's recent 3090 mainframe and 3380 disk drive announcements by cutting purchase prices 6% to 12% on its 580 series mainframes, 20% on special configurations of its 6380 disk drives and 23% on main memory.

If Amdahl's move smacks of deja vu, you're right. The company, along with National Advanced Systems Corp. (NAS), made almost identical price cuts less than six months ago [CW, Sept. 10] in reaction to IBM's price cuts on the 3080 mainframes and 3380 disk drives [CW, Sept. 3].

Swift action is an admirable trait, but you have to wonder how long Amdahl can keep it up and still turn a profit.

To realize the impact IBM's agressive mainframe pricing is having on compatible vendors, one must look beyond the percentages and talk about dollars.

In March 1984, an Amdahl 5880 processor with 64M bytes of main memory and 48 I/O channels cost $5.66 million. On Sept. 5, Amdahl cut that price to $5.04 million. Two weeks ago, the 5880 purchase price was cut to $4.59 million. That means Amdahl has been forced to shave the purchase price of its 5880 CPU by $1.07 million in the past six months.

> ”
>
> *Amdahl twice has been forced to lower significantly the price on its 5880 before the machine ever hit the street in volume shipments.*

Even more interesting is the fact that International Data Corp., a Framingham, Mass., market research firm, contends that Amdahl has only recently begun shipping its 5880 systems. That means Amdahl twice has been forced to lower significantly the price on its 5880 before the machine ever hit the street in volume shipments.

Similar cuts for other 5880s

Other members of the 5880 line have experienced similar cuts. For example, a 5860 processor with 32M bytes of main memory and 24 I/O channels listed for $3.04 million in March 1984.

That price was lowered to $2.69 million in September and $2.48 million last month. In all, the purchase price was cut by $560,000. Likewise, a 5840 processor that listed for $2 million last March was cut to $1.7 million in September and now costs $1.55 million — a $450,000 price cut.

In this round of price reductions, Amdahl took a more subtle approach to lowering the purchase price and maintenance charges on its 6380 disk subsystem — its answer to IBM's 3380.

Instead of announcing a price cut per se, Amdahl unveiled the 6380 Model M4. The unit appears to be virtually identical to the 6380 Model B4 but costs $9,700 less.

See CUTS page 87

SYSTEMS & PERIPHERALS

PROCESSORS

■ McDonnell Douglas Computer Systems Co. has announced two computer systems series designed to make the Microdata Corp. Reality data base management system more readily available to small businesses or large business branch departments.

The Microdata 6500 has 512K bytes of memory, upgradable to a maximum of 1M byte. The system offers disk storage from 40M bytes to 640M bytes. The Microdata 6300 features modular memory growth from 256K bytes to 1M byte of main memory and from 40M to 120M bytes of disk storage capacity. Both series systems incorporate an asynchronous communications capability that permits up to eight terminals to be connected via a single cable.

Prices for the 6500 series range from $38,800 to $110,000, depending on the system's configuration, and prices for the 6300 series range from $23,500 to $60,000, depending on configuration.

McDonnell Douglas Computer Systems, 17481 Red Hill Ave., Irvine, Calif. 92741.

TERMINALS

■ Texas Instruments, Inc. has announced two additions to its Silent 700 series of portable terminals, the Model 703 receive-only (RO) and the Model 707 RO terminals.

The Model 703 RO was designed for direct connection to a host via a 300 bit/sec RS-232C interface. The Model 707 RO can be plugged into telephone and ac outlets. The Model 707 RO is Bell 103-compatible and features a direct-connect interface, an integral modem, an on-line switch and an autoanswer modem.

TI's suggested price is $495 for the Model 703 RO and $595 for the Model 707 RO.

Texas Instruments, Data Systems Group, P. O. Box 809063, Dallas, Texas 78350.

POWER SUPPLIES

■ General Power Systems has added a 2 kVA standby uninterruptible power supply (UPS) to its Memorygard II series of UPS for customers using minicomputers and microcomputers.

Model 2K126R features 115V and 60 cycles; Model 2K236R provides users with 230V and 60 cycles; Model 2K125R features 115V and 50 cycles; model 2K235R provides 230V and 50 cycles. All four units have eight minutes of battery back-up time. The units will be available in mid-March. The 2 kVA UPS are priced starting at $1,995.

General Power Systems, 1400 N. Baxter St., Anaheim, Calif. 92806.

■ Solidstate Controls, Inc. has released the Powerbase 1000 line of uninterruptible power supply (UPS) units for use with all sizes of computer systems.

The Powerbase 1000 UPS comes in 750 VA, 1.5 kVA and 3.0 kVA sizes. The units are said to protect against blackouts, brownouts, electrical noise, voltage transients, voltage instability and frequency deviation.

Prices are $2,500 for the 750 VA model, $5,100 for the 1.5 kVA unit and $6,200 for the 3.0 kVA model.

Solidstate Controls, P.O. Box 1216, Columbus, Ohio 43216.

■ Pulizzi Engineering, Inc. has added a three-phase, four-pole, five-wire grounding power controller to its Z-Line power controller series for use in disk drive systems that use three disk drives or more.

The Power Controller 881 (PC 881) 120/180 Vac, 30A unit includes electromagnetic interference and radio-frequency interference filters and multistage spike and surge suppression. There are three switch receptacles allotted per phase as well as one utility outlet. The unit has four filtered sequenced power remote I/O control bus connectors on the front panel that are activated with a local/remote on-off switch.

The price of the PC 881 is $1,200.

Pulizzi Engineering, 3260 S. Susan St., Santa Ana, Calif. 92704.

BOARD-LEVEL DEVICES

■ Network Systems Corp. has introduced two microprocessor-based interface boards designed for minicomputers and workstations on Network Systems' Hyperchannel or Hyperbus networks.

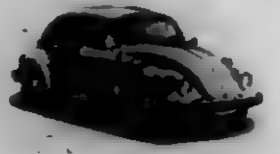
Each Intelligent PI board contains Network Systems' Network Executive (Netex) software, which allows the system to function as a coprocessor that performs data communications tasks between different types of systems. supported by Network Systems. The software facilitates such applications as file transfer, job transfer and transaction processing in either single or multivendor environments on a real-time basis. The price of the boards starts at $6,000.

Network Systems, 7600 Boone Ave. N., Minneapolis, Minn. 55428.

■ Augat, Inc. has introduced its Unilayer II board, which is compatible with Intel Corp.'s Multibus.

The Unilayer II board can accommodate up to 144 16-pin dual in-line package equivalents. The I/O supports a general header area accommodating 222 I/O connections in addition to the Multibus standard P1 and P2 edge connectors.

Continued on page 87



On March 4, Datagram is going to do to data communications what the Beetle did to the automotive industry.

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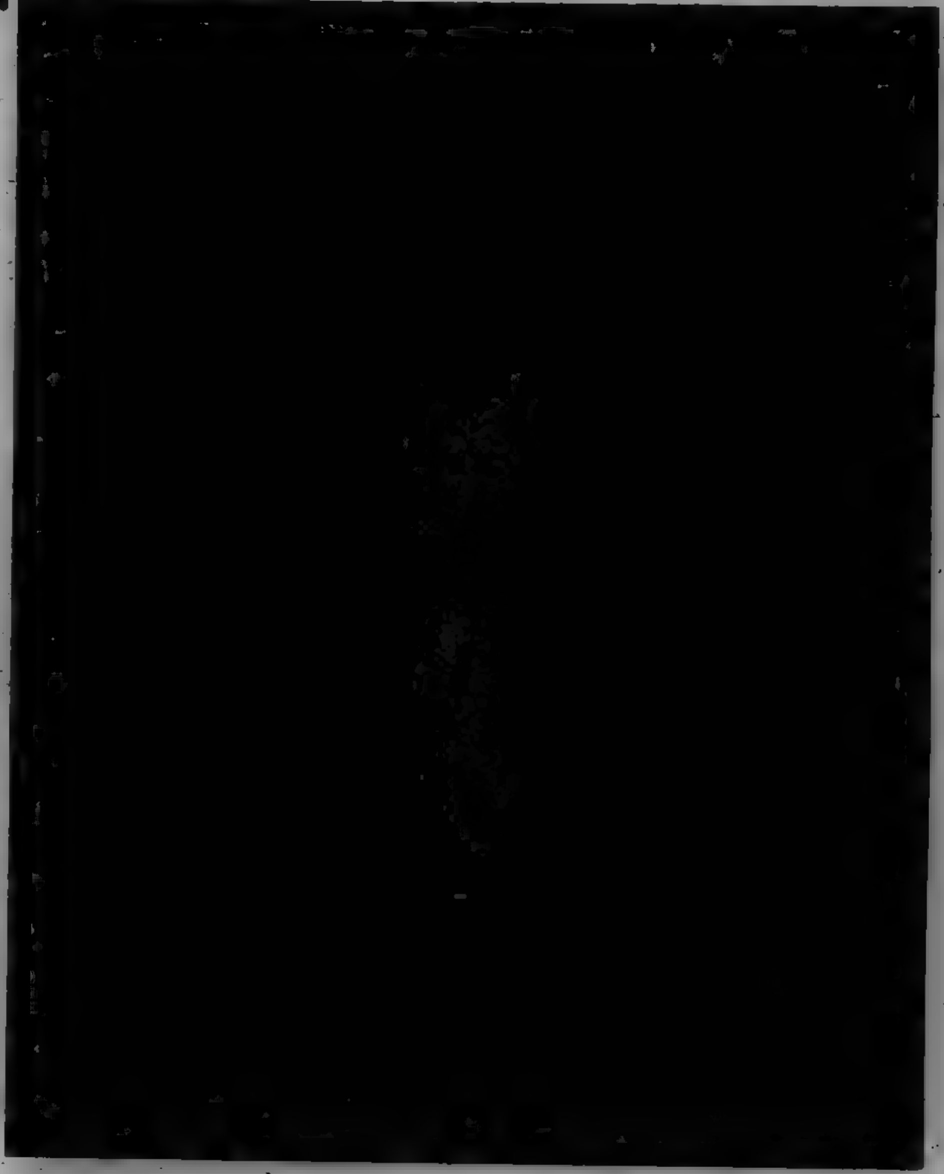

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Continued from page 84

The board costs $222.50.

Augat, Systems Division, P.O. Box 1037, 40 Perry Ave., Attleboro, Mass. 02703.

■ **Gould, Inc. has introduced the Gould 984 Programmable Controller, which includes a power supply, communications processor, central processing unit and I/O processor.**

The product works with systems supporting Gould's Modbus host software, which controls CRTs, a data access panel and an Ascii output device.

The Gould 984 Programmable Controller features a segment scheduler, an I/O service scheduler, 16K bytes Cmos random-access memory with battery backup and bipolar programmable read-only memory, the vendor said.

It includes three Modbus ports, a remote data access panel and a report generation port.

The product costs $6,200.

Gould, Programmable Control Division, P.O. Box 3083, Andover, Mass. 01801.

■ **Data-Sud Systems U.S., Inc. has announced two models of its DSSEDPDX, a dual-ported random-access memory (RAM) expansion module that supports computers using the VME-bus or VMX-bus architectures.**

The DSSEDPDX-1 features 512K bytes of RAM, and the DSSEDPDX-2 comes with 1M byte of RAM.

The products are said to allow jumper-selectable VME-bus memory access times to be set between 150 and 300 nsec and VMX-bus access times between 180 and 330 nsec.

The product's default base memory address is selectable by a jumper whenever the system is reset, the vendor said. Its base memory address reportedly can be modified to allow dynamic allocation of memory resources.

DSSEDPDX-1 sells for $1,595, and DSSEDPDX-2 costs $2,695.

Data-Sud Systems, Suite J, 2219 S. 48th St., Tempe, Ariz. 85282.

AUXILIARY EQUIPMENT

■ **RO Associates, Inc. has announced the Model 713 550W triple output switcher, which uses a magnetic reactor control in the primary and secondary circuits.**

The Model 713, packaged in a 360-cubic-in. box, delivers 5V at 50A and is adjustable ±12V to ±15V at 10A, the vendor said. The unit has 115 Vac or 220 Vac input selectable on the barrier strip.

Alternative secondaries providing 12V at 12A with a 14A surge; 24V at 4A with a 6A surge are available to power both 5¼-in. and 8-in. disk drives.

The Model 713 costs $750.

RO Associates, 246 Caspian Drive, Sunnyvale, Calif. 94088.

■ **Leemah Datacom Security Corp. has introduced the Secure Access Multiport (SAM) System 351 — an updated version of its SAM 350 callback security equipment.**

The SAM System 351 is said to use programmable nonvolatile memory and callback to prevent dial-up access from unauthorized locations. It provides protection for up to 128 ports, the vendor said. The system features an audit trail and an expandable callback directory.

The price of the system is approximately $500 per port.

Leemah Datacom Security Systems, 3948 Trust Way, Hayward, Calif. 94545.

SORTER from page 83

brings the data back through the memory and in a sorted fashion, sends the data back to the place it originated, the vendor said. An additional five slots have been left on the chassis reportedly to allow tailoring of the device to the needs of particular vertical markets and applications.

DBA 1000 can sort files larger than 5M bytes by creating sorted strings of data and storing them on two closely coupled 5¼-in. Winchester disks. The disks — located within the accelerator's chassis — accept files up to 640M bytes.

Accel's DBA 1000 does not house the data base but receives a copy of the data file. The file itself remains stored in the host circuitry, so that in the event of failure the sort can be accomplished in the host software.

A spokesman said that any type of computer can use the accelerator, but the technology is particularly useful with relational data bases. The DBA 1000 will be available in quantity in June.

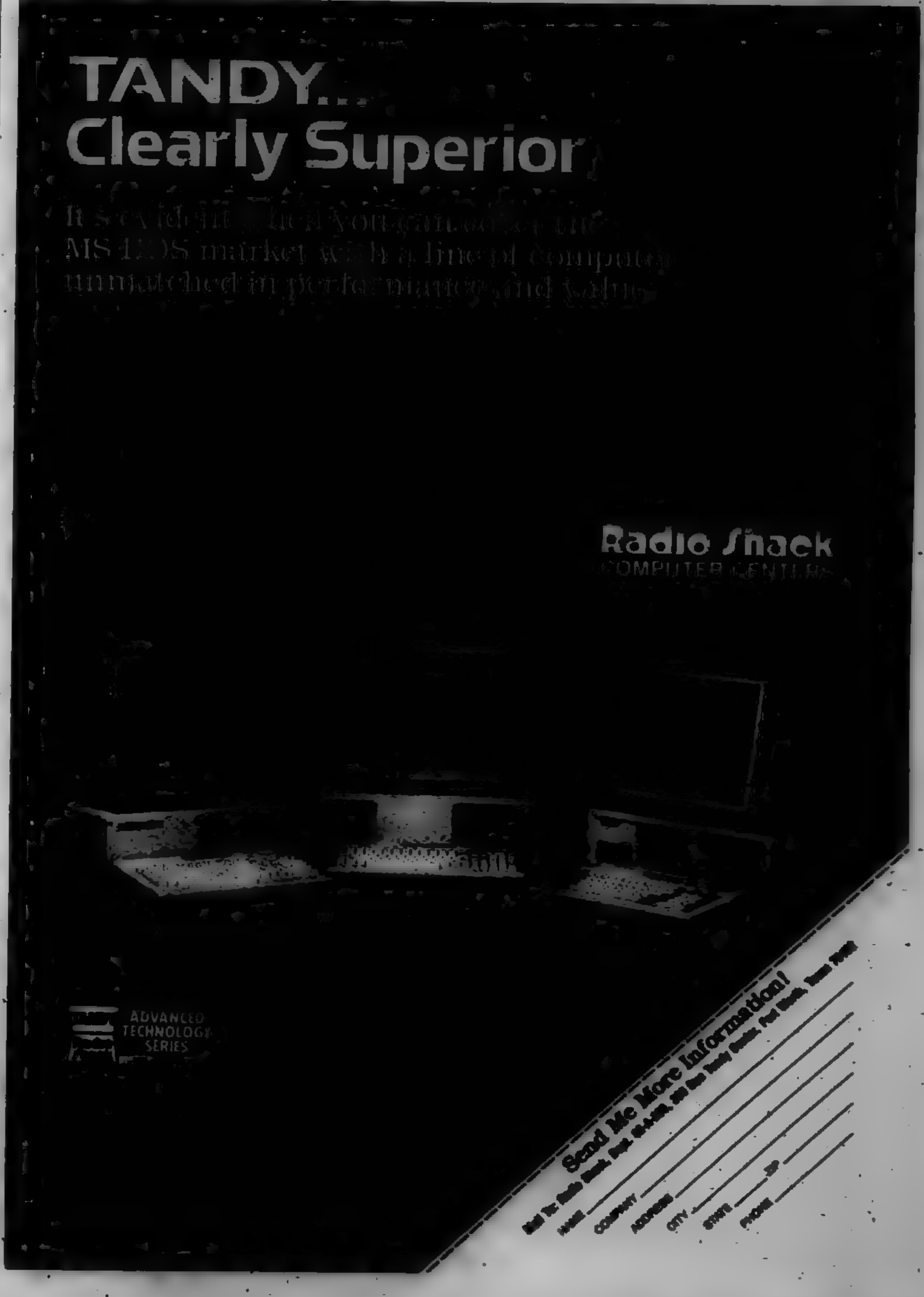
Accel is located at 7358 Trade St., San Diego, Calif. 92121.

CUTS from page 83

The catch is that users can only take advantage of the Model M4 as the last two members on a string made up of an Amdahl 6380 Model AA4 head-of-string unit and a Model B4.

Herein lies the problem for makers of IBM-compatible hardware. IBM is increasing the power and complexity of its new high-end systems and peripherals while at the same time significantly cutting the price of its current systems lineup. Consequently, companies like Amdahl and NAS — or more appropriately, Fujitsu Ltd. and Hitachi Ltd. — are being backed into a corner.

These companies have to spend more money on research and development to keep pace with new IBM products but are being forced into taking smaller profits per unit sold.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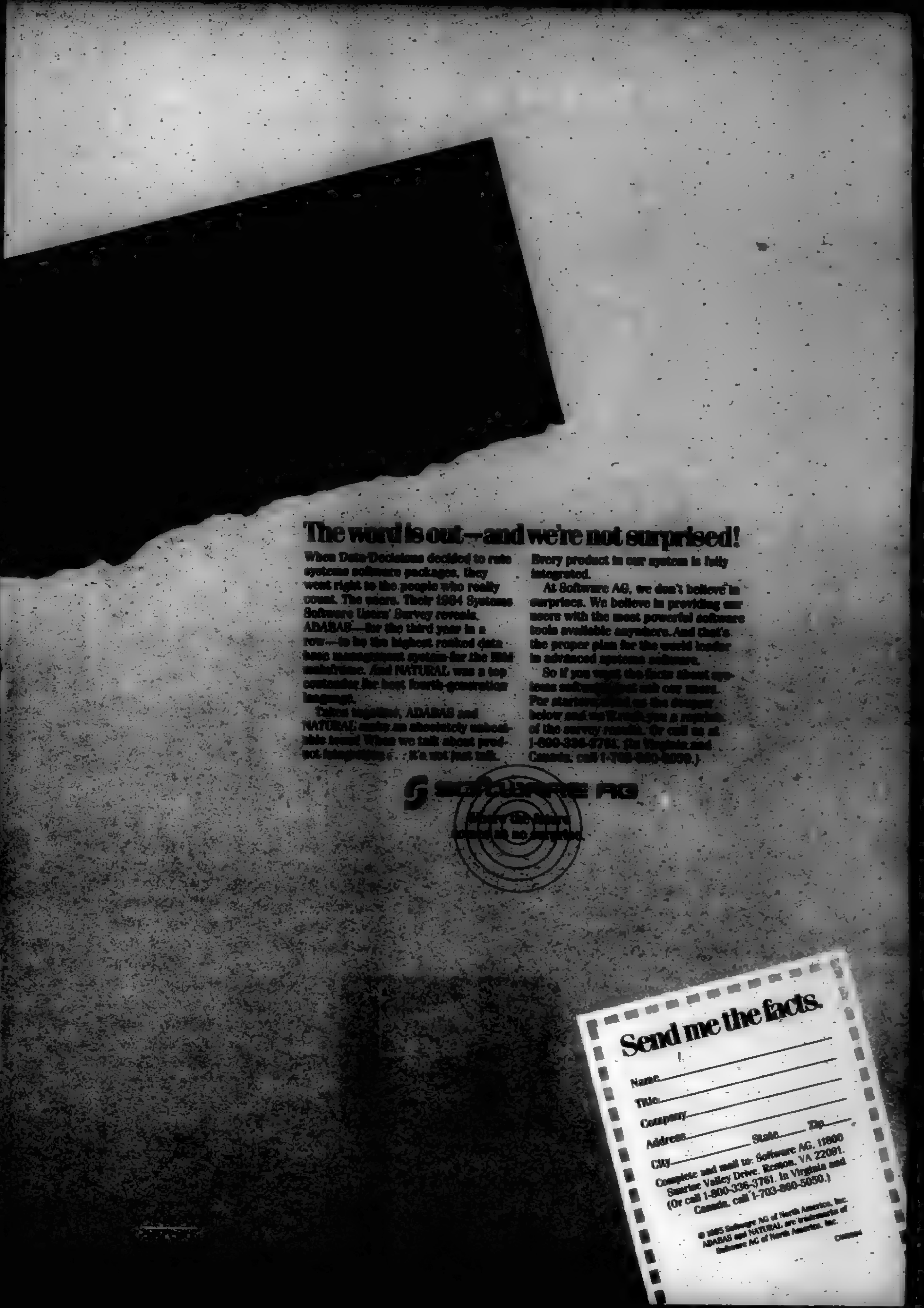

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When Data Decisions decided to rate systems software packages, they went right to the people who really count. The users. Their 1984 Systems Software Users' Survey reveals ADABAS—for the third year in a row—to be the highest ranked data base management system for the IBM mainframe. And NATURAL was a top contender for best fourth-generation language.

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MICROCOMPUTERS

Kaypro releases 512K-byte AT clone

SOLANA BEACH, Calif. — Kaypro Corp. has become the first U.S. manufacturer to introduce an IBM Personal Computer AT clone.

Priced at $3,995 and scheduled for early March shipment, the Kaypro 286I costs the same as the base model Personal Computer AT. However, it comes with 512K bytes of random-access memory and two 1.2M-byte floppy disk drives, compared with the IBM system's 256K bytes and single 1.2M-byte disk drive.

The 286I will run Microsoft Corp.'s MS-DOS 3.0 and will take advantage of MS-DOS 3.1 when that software is available. The computer reportedly will be able to use the same PC-DOS software that runs on the Personal Computer AT.

Like the Personal Computer AT, the 286I, or Kat as the company has dubbed it, uses a 6-MHz Intel Corp. 80286 chip and offers a socket for an 80287 math coprocessor for high-speed computations.

The Kaypro 286I comes with a color video card, two parallel ports and one serial port. It has eight internal bus slots — four occupied by the video and port cards and four available for other uses. The IBM system has a total of seven slots and does not come with video or port cards.

The Kaypro micro does not come with a monitor; the company will offer a color monitor separately that will cost $595.

Kaypro does not now plan to offer a 20M-byte hard disk drive for its AT clone. Third-party vendors will meet that need, according to Marketing Vice-President David Kay. The Kaypro 286I comes with a series of applications from Micropro International Corp., including Wordstar.

Kaypro's AT look-alike is only the first of at least 10 such systems industry observers expect to roll out this year. Hewlett-Packard Co., Corona Data Systems, Inc. and Compaq Computer Corp. are expected to launch AT compatibles soon.

Kaypro is located at 533 Stevens Ave., Solana Beach, Calif. 92075.

This story first appeared in Infoworld, *a* Computerworld *sister publication based in Menlo Park, Calif.*

- Control Data Corp. has introduced a 30M-byte internal hard disk drive for the IBM Personal Computer AT/**95**
- Software Publishing Corp. has upgraded its PFS:Access communications software package for the IBM Personal Computer/**95**

INSIDE

Software/**96**

IBM offers graphics tool

RYE BROOK, N.Y. — IBM's Information Systems Group has introduced PC Storyboard, a graphics package designed to create screen-display presentations on the IBM Personal Computer line.

PC Storyboard reportedly allows users to create professional-looking presentations with special effects without requiring programming. The package consists of four modules: Picture Taker, Picture Maker, Story Editor and Story Teller, IBM said.

Picture Taker coresides in memory with other applications and captures screen images for inclusion in a presentation.

Picture Maker creates and modifies screens of text, figures and graphs in medium-resolution graphics mode. The module offers the ability to cut and paste from one picture to another. It also provides a library of symbols and four text-type styles in five sizes. In addition, Picture Maker uses halftones extensively to extend the number of colors and includes a composite mode to create pictures for composite or television monitors, IBM said.

See **STORY** page 96

MICRO BITS/THOMAS W. MADRON

Note statistical software limits

Once convinced that you need a statistical system, the next step is to obtain software that correctly provides the statistics you need, within the limits of your hardware.

For significant statistical analyses, you may wish to enhance your hardware, although some, especially statistical software manufacturers, contend that bells and whistles are not necessary.

If you have a micro based on one of the processors in the Intel Corp. 8086 or 8088 families, you will be able to obtain a numeric coprocessor that extends the instruction set to provide hardware floating-point capabilities, which allow computational software to run faster. A minimum of 512K bytes of memory and a

See **STATISTIC** page 96

Madron is manager of computer services at North Texas State University, Denton, Texas.

Digital's GEM deliveries to begin

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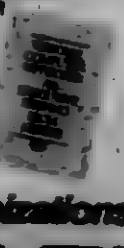

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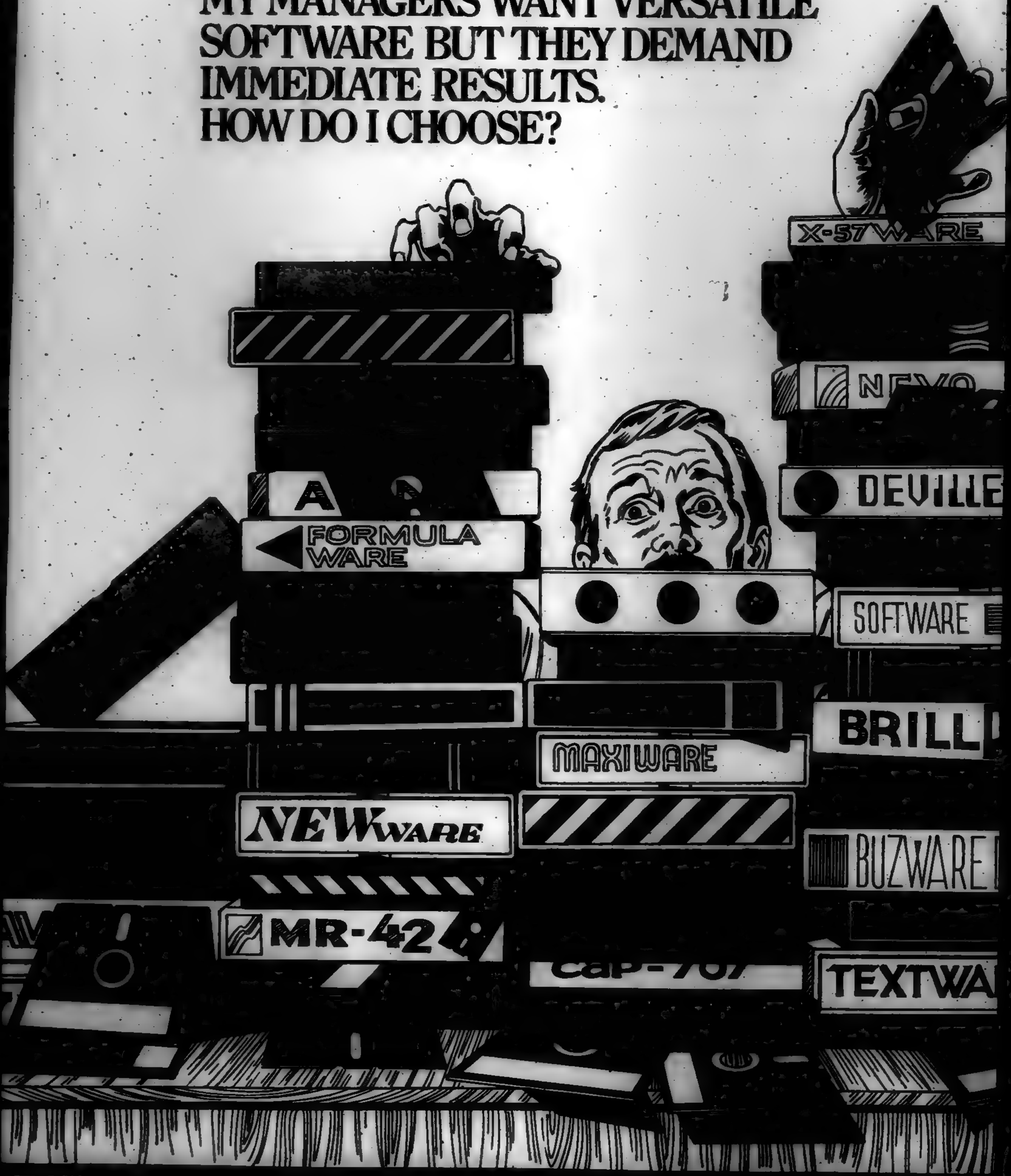
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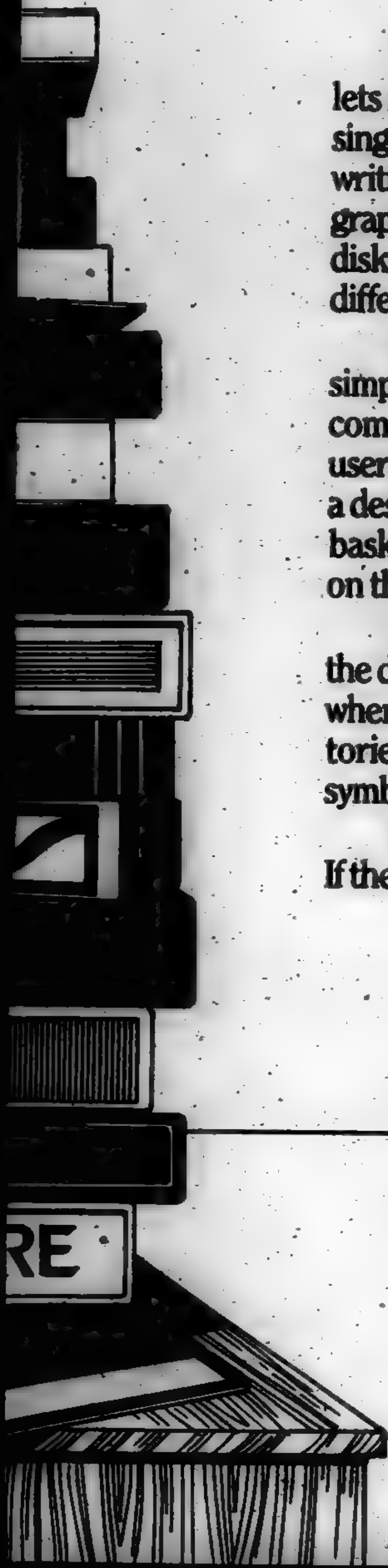

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Framework saves time because it lets managers work efficiently using a single program. They can change from writing to data management or even graph creation without switching disks or having to flip-flop between different command languages.

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Users can "see" a file moving from the desktop to the file cabinet (disk) when they store it, and the file directories "zoom" out of the disk drive symbol when they're called up.

Framework works like you do. If there are three files open, they're organized on the desktop with the current open file on top. It's design like this which makes Framework intuitively easy, even for beginners.

Framework is versatile enough for serious spreadsheet or data management work, and its graphics capabilities can bring a little bit of "Star Trek" to even the most routine business report.

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MICROCOMPUTERS

Micros help filmmakers create images of outer space

MARINA DEL REY, Calif. — A microcomputer-based solid modeling system played a major supporting role in Metro-Goldwyn-Mayer/United Artist Entertainment Co.'s (MGM/UA) motion picture *2010*, which opened late last year in the U.S.

The Cubicomp Corp. Polycad/10 system, which generates three-dimensional shaded images, was used with an IBM Personal Computer and proprietary software, plus software designed by John Wash and Richard Hollander of Video Image, the production company responsible for the video display images. Wash said the system produced nearly all the video display images that filled the interior of the film's major set — the *Leonov* space ship on its voyage to a rendezvous near Jupiter.

Video Image used the system to develop an hour of computer animation at its shop near the MGM/UA soundstage where much of *2010*, the sequel to the 1968 film *2001: A Space Odyssey*, was filmed, Wash said. The company later fed those images to CRT displays on the set of both the *Leonov* and its mission target, the *Discovery*.

Computer-generated image of the *Leonov* spaceship in flight.

Video Image chose the Polycad/10 system about 1¼ years ago, Wash said. "We did not want to support a VAX or something that big," he said. The system's 512- by 512-pixel resolution was adequate for what the company wanted, and other systems the company looked at did not have as much software support, he said.

Images on the system can be rotated, rescaled and repositioned interactively using the keyboard and graphics tablet with no programming knowledge required, Wash said.

The system produces three-dimensional solid models on a microcomputer, creating a skeletal system that costs about $20,000, but the skeletal system is not nearly adequate for movie-making, Wash said. "We developed our own package of software for puposes of color mapping automation and some facilities to help us animate the Cubicomp data bases," he said.

Video Image combined the Polycad/10 system with Cubicomp's two-dimensional computer paint program and its own animation master-control package, aptly named HAL after the HAL 9000 computer that "starred" in both films, Wash said.

The system's chief benefit to Video Image, according to Wash, is that the company can create data bases for the spacecraft, planets and other structures used in a movie and then use the data bases a number of times and from different angles to animate the objects. Wash said he is pleased with the ease of making changes.

Because Video Image bought one of the first systems delivered, it had to work around limitations in the available software, Wash said. The system's software does not allow for changing camera viewpoints, he said. It has a fixed viewpoint that Video Image has to work around, he added.

"If you want to fly around an object and see it from the viewer's point of view, you can't do it," he said.

Wash and Hollander, an engineer and programmer with Video Image, created sequences that were integral to the plot of *2010*, as well as generic material shown in the background, Wash said. Among the more spectacular footage was a sequence depicting a computer flyby of Europa, one of the moons of Jupiter, which duplicates film footage taken of a model of the moon's surface using single-frame animation, he said.

Background sequences ran the gamut of what might be expected on an interplanetary space flight: navigation readouts, status reports, radar sweeps, crew schedules and medical reports, Wash said. Video Image performed its own art direction for these sequences, working directly with Peter Hyams, director and producer of the film.

Wash said that *2001: A Space Odyssey* used only a couple of computer-generated sequences, produced on a pen plotter and photographed on a display screen. The remainder were created using traditional animation techniques with no computer involvement, he said.

By comparison, Video Image produced virtually all its display sequences on its computer system, Wash said. Hence, the computerized images were generated by a computer and displayed on actual video monitors, rather than being projected from the rear of the set.

Prime introduces more bang for the buck.

PFS:Access gets IBM additions

MOUNTAIN VIEW, Calif. — Software Publishing Corp. has enhanced its PFS:Access communications software for the IBM Personal Computer.

Enhancements include the ability to set up a Personal Computer's files so that they can be accessed by another Personal Computer.

PFS:Access now also offers support for the Xmodem protocol method of error checking and can store and automatically execute all dial-up and sign-on procedures.

PFS:Access is priced at $140.

Software Publishing is located at 1901 Landings Drive, Mountain View, Calif. 94043.

Graphics program introduced for IBM micros lacking adapters

ARLINGTON, Mass. — Analytics International, Inc. has introduced Monografx, a graphics program designed for IBM Personal Computers lacking graphics adapters.

Monografx, which costs $49.95, reportedly allows users to create free-form drawings such as organizational charts, calendars, bar charts, schedules and flow diagrams. The package can also generate common forms such as expense reports.

The package was designed for users who are unable or unwilling to spend more money and time on complex graphics offerings, said Ming Lee, the firm's product manager.

Monografx features pull-down menus, an on-line Help function, an Undo command and an on-disk tutorial. Nineteen fill patterns are provided for painting picture areas.

The program requires an IBM Personal Computer or compatible machine with 128K bytes of random-access memory and PC-DOS or MS-DOS 2.0 or higher. An 80-page user's guide is included. Monografx supports about 50 dot-matrix printers, the vendor said. It also supports most color/graphics display adapters.

Analytics International is located at 17 Oakland Ave., Arlington, Mass. 02174.

CDC cuts prices, announces drive

PLYMOUTH, Minn. — Control Data Corp. has released a 30M-byte hard disk drive that can be housed inside the IBM Personal Computer AT. The company also announced price cuts on its external Storagemaster 5¼-in. disk systems used with various IBM Personal Computers.

The CDC Storagemaster 630 disk drive's access time of 30 msec is reportedly 25% faster than the drive IBM supplies for the AT. The price of the drive is $2,145, with volume discounts available.

The price of the 30M-byte Model 530 Storagemaster disk system was cut from $3,390 to $2,795; the 18M-byte Model 518 was decreased by $300 to $2,295; and the Model 301 Universal Single-Board Controller (which handles two drives) was decreased from $599 to $495.

More information can be obtained from CDC, 2200 Berkshire Lane N., Plymouth, Minn. 55441.

Hayden unwraps productivity tool for Macintosh

LOWELL, Mass. — Hayden Software Co. has introduced Ensemble, an integrated productivity package for the Apple Computer, Inc. Macintosh.

Ensemble supports word processing, information management, report generation, calculations, decision analysis, graphs and mail and list management, Hayden said.

The package, which costs $299.95, runs on both the 128K-byte and 512K-byte models of the Macintosh. "Ensemble makes the 128K-byte version of the Macintosh a serious business computer for the first time," claimed Bruce Twickle, president of the Lowell, Mass.-based software firm.

Ensemble is the first integrated software developed specifically for the Macintosh and the only integrated program to run on the low-end Macintosh, the vendor said. Shipments are scheduled to begin March 11.

Hayden Software is located at 600 Suffolk St., Lowell, Mass. 01853.

GEM

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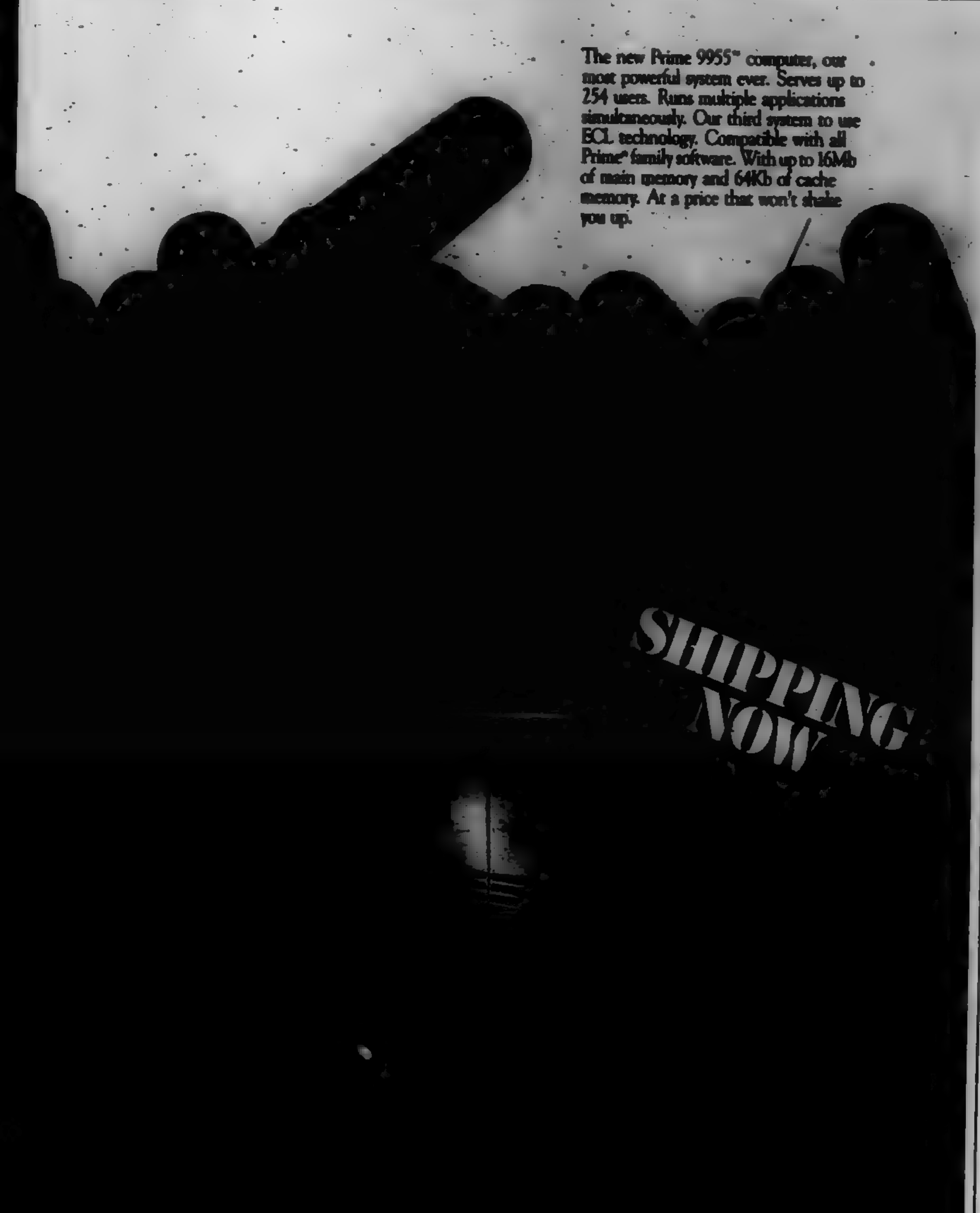
Inc. Macintosh.

Nine OEMs have indicated some level of commitment to GEM, the most prominent of which are Applied Computer Techniques Ltd., Contel Cado, Epson America, Inc., Northern Telecom, Inc. and Texas Instruments, Inc. Twelve independent software vendors also have announced support for GEM, including Lifetree Software, Inc. and Thorn/EMI. Digital Research itself plans to offer GEM Draw, a retail graphics package bundled with GEM and a GEM desktop application, by April.

Digital Research can be reached through P.O. Box 579, Pacific Grove, Calif. 93960.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SOFTWARE

■ **Software Consulting Service, Inc. has introduced Series/1 data entry software for the IBM Personal Computer (S1DES/PC), a version of the vendor's IBM Series/1 S1DES data entry software.**

S1DES/PC is written in assembler and allows the Personal Computer to act as a high-volume data entry station. Features are said to include a Help facility, menu operation, checkbox field edit options selection, operator statistics, integrated high-level language and functions for file handling, reporting and keyboard reassignment.

The software can create files on the Personal Computer that can be used for other Personal Computer applications or transmitted to a host for processing, the vendor said.

S1DES/PC licenses for $995.

Software Consulting Service, Suite 231, 8930 Fourwinds Drive, San Antonio, Texas 78239.

■ **P-Stat has introduced a version of its P-Stat mainframe statistical analysis software for the IBM Personal Computer XT and Personal Computer AT.**

The new P-Stat version reportedly is provided with the same functions as that of the P-Stat version for mainframe computers. It is said to offer interactive data management, data display, statistical analysis and report-writing capabilities.

Also included are an on-line Help facility, interactive data entry, relational data base capabilities, macros

Continued on page 96

STATISTIC

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Winchester disk drive also may be in order.

Looking next at the software, one serious issue is the language chosen by the developer of the microcomputer statistical package.

For example, if the package is written in Microsoft Corp.'s GW-Basic, then the additional memory is worthless and the numeric coprocessor may be useless as well.

Interpreted Basic is too slow and even compiled Basic programs may be laggard on large-scale problems. Pascal, while used for some systems, is a poor choice for statistical software since it lacks some appropriate arithmetic operators.

The workhorse languages for statistical and mathematical systems are Fortran and micro-based subsets of PL/I.

Fortran and PL/I have the requisite computational abilities and can often make use of expanded memory and numeric coprocessors.

Another potential problem is inconsistent quality control for the different packages: This can be particularly vexing in statistical analysis, where debate continues on what algorithms provide the most accurate results.

Another issue concerning potential users of the statistical software programs described below is that while they all offer some data management capabilities, they suffer from insufficient flexibility in importing and exporting data to and from other software.

If you use more than one package, which may be necessary since they do not all cover the same range of statistical functions, or move data from a spreadsheet like Lotus Development Corp.'s 1-2-3 or from a mainframe, it is likely that you will have to write one or more simple programs to reformat your data.

Some current offerings

Northwest Analytical, Inc.'s NWA Statpak, Jerry L. Hintze's Number Cruncher and DBI Software Products' Trajectories are examples of interpreted Basic systems. NWA Statpak appears to be the best and certainly has the most comprehensive documentation, but these programs all provide a wide variety of statistical procedures.

However, they suffer from the problems associated with interpreted Basic statistical packages: speed and memory limitations.

One distinct advantage of these packages is that they should run under most or all versions of MS-Basic running under MS-DOS (rather than requiring an IBM Personal Computer running under PC-DOS).

Microstat from Ecosoft, Inc., Abstat from Anderson-Bell, Human Systems Dynamics' PC Statistician and the Statistical Analysis System from Statistical Consultants, Inc. are all examples of modest but useful statistical systems. From the standpoint of ease of use and printed documentation, Microstat is the best of this group.

The version of PC Statistician that I reviewed ran only on an IBM Personal Computer or a compatible.

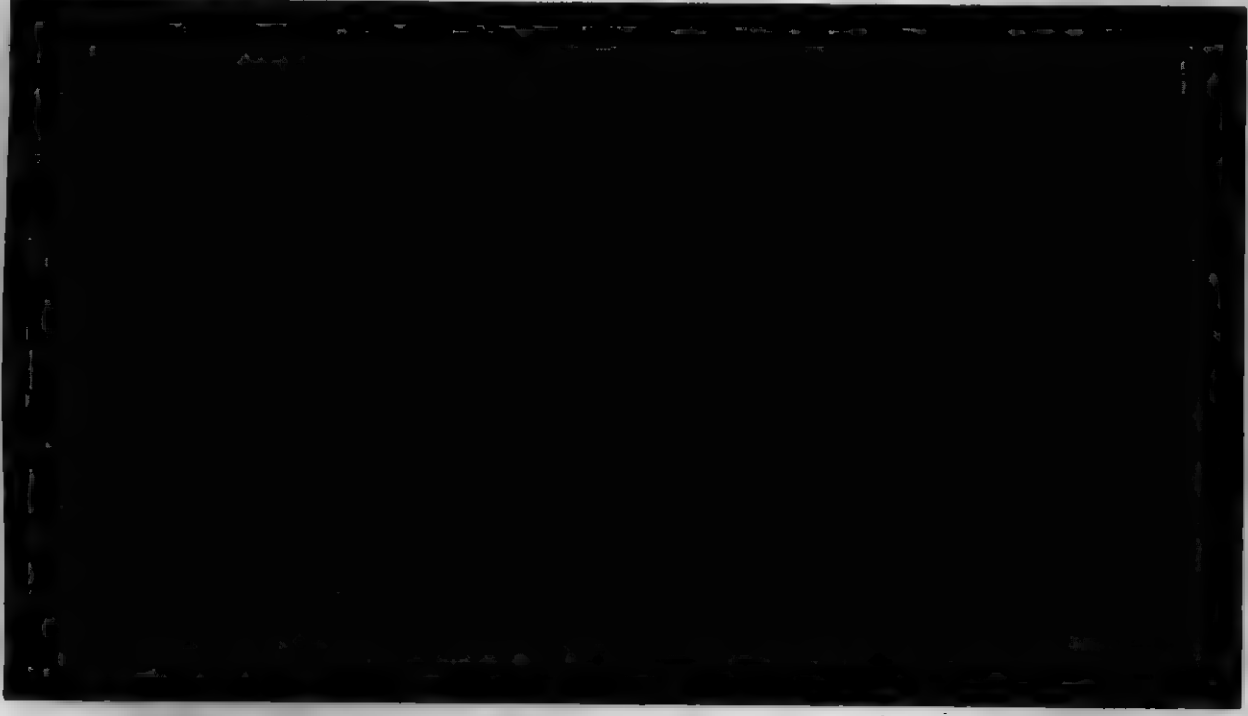
The third group of statistical packages, which includes the Statistical Package for the Social Sciences (SPSS) from SPSS, Inc.; ABC from the Inter-University Consortium for Political and Social Research at the University of Michigan at Ann Arbor; Systat, Inc.'s Systat; and Statpro from Wadsworth Professional Software, Inc. all attempt to be more expansive in conception and variety of procedures.

Most like mainframe systems

Of this third group, the SPSS and ABC packages are most like mainframe systems, although ABC has a restricted set of statistical procedures and was designed primarily for instruction.

SPSS is probably the best of the group, implementing most of the procedures found in the mainframe version. Systat is good with multivariate analysis.

SPSS, ABC and Systat will all run on most MS-DOS machines, while Statpro will run only on an IBM Personal Computer.



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Continued from page [illegible]

and several statistical commands.

P-Stat requires a Personal Computer with 640K bytes of memory, Microsoft Corp. MS-DOS 2.1 or higher and the Intel Corp. 80287 or 8087 math coprocessor.

It is priced at $695.

P-Stat, P.O. Box AH, Princeton, N.J. 08542.

■ Syscomp has announced a conversion utility program for the IBM Personal Computer XT and compatible microcomputers that is said to translate Ashton-Tate's Dbase III data base files to Lotus Development Corp.'s 1-2-3 or Symphony programs.

During a conversion to a Symphony worksheet file, the Dbase III Translate program will automatically set up Symphony data base ranges and generate a form window, allowing the user immediate control over the Symphony data base, according to the vendor.

The program costs $75.

Syscomp, Suite 210, 8825 Aero Drive, San Diego, Calif. 92123.

■ Software Research Technologies, Inc. has introduced Smartpath utility software, which reportedly permits Micropro International Corp.'s Wordstar to run from any directory or subdirectory, including the diskette drive.

Smartpath, which runs on the IBM Personal Computer, is said to permit Wordstar users to group letters, documents and programs in separate directories and subdirectories without having to keep copies of Wordstar on each one.

Smartpath is priced at $29.95.

Software Research Technologies, Suite 211, 3757 Wilshire Blvd., Los Angeles, Calif. 90010.

■ Software Building Blocks, Inc. has released the source code of Version 3.0 of its SBB Pascal compiler so that users may customize the compiler for their particular applications.

The compiler runs on micros under IBM's PC-DOS or Microsoft Corp.'s MS-DOS operating systems.

The $2,500 license price for the source covers the complete commented source code of the compiler, the SBB Pascal editor and updates and support for one year.

Software Building Blocks, P.O. Box 119, Ithaca, N.Y. 14851.

STORY

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Story Editor organizes images into presentations. Features include full and partial picture displays, zooming, shadowing, 10 picture-to-picture dissolve techniques, variable picture timing and other special effects.

Story Teller shows the presentation on a variety of output devices. The module gives runtime flexibility to start or stop at any point, along with branching ability. It also minimizes presentation program space with a stand-alone runtime program. Users may copy Story Teller to distribute their programs if each reproduced diskette is marked with IBM copyright information, according to the company.

Compatible packages

IBM cautioned that Picture Taker may be unable to capture screens from user programs that modify the interrupt table or bypass the Personal Computer's Binary Input/Output System to program the graphics adapter directly. While IBM has not tested third-party applications, a spokeswoman said that Lotus Development Corp.'s 1-2-3 does work with Picture Taker and indicated that most other popular packages also are expected to be compatible.

PC Storyboard runs on the Personal Computer, Personal Computer XT, Personal Computer AT, Portable Personal Computer, PCjr, Personal Computer XT/370 and 3270 Personal Computer (with the model 5272 color display and graphics extension). All systems require a color monitor and 80-col. monitor — a red-green-blue (RGB) color monitor satisfies both requirements — and an IBM Color Graphics Adapter, Enhanced Graphics Adapter or equivalent.

Memory requirements are 256K bytes with PC-DOS 2.0 or 2.1 and 320K bytes with PC-DOS 3.0. The PCjr requires 384K bytes of memory.

Output devices supported

Supported output devices include an RGB monitor; a composite monitor; a standard TV; a large-screen projector; a videocassette recorder; an IBM Personal Computer Graphics Printer, which can produce seven shades of gray; and an IBM Personal Computer Color Printer, which can produce 16 of 91 different colors.

The PC Storyboard, available in March, is priced at $250.

More information is available from IBM Information Systems Group, which is located at 900 King St., Rye Brook, N.Y. 10573.

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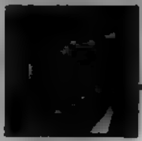
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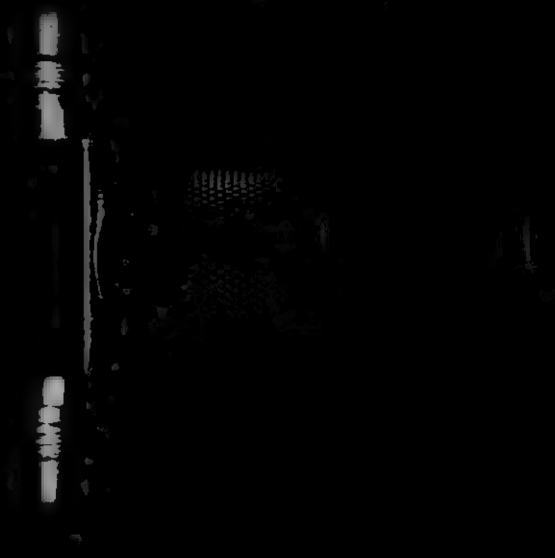

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The presentations will be held at the following locations:

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COMPUTER INDUSTRY

Intel to sell micro add-ons to end users

By Peter Bartolik
CW Staff

HILLSBORO, Ore. — Intel Corp. recently announced a program to develop and sell microcomputer add-on products to business end users, signaling a new direction for a company whose revenue has soared to $1.6 billion through sales of components and systems to OEMs.

Intel's Personal Computer Enhancement Operation is part of the Intel Development Operation, an "incubator" of new business ventures, according to the managers of the division.

The new organization began shipping Intel's 8087 and 80287 math coprocessors to computer retail outlets in December, according to Richard Bader and James B. Johnson, operation managers for the venture.

Additionally, the organization plans to announce in May several products it jointly developed with other companies.

Intel's push to capture end-user sales will be directed through retail chains, accompanied by national advertising aimed at "power users and decision makers," according to Bader, who handles marketing and strategic planning.

Johnson, who concentrates on engineering, said the operation was formed one year ago with a charter from Intel to investigate the market for add-ons to IBM's Personal Computer line and compatibles. He said $1 billion in sales of add-on products for IBM and compatible machines and a 30% to 50% growth rate are projected this year in offices industrywide.

During development of a business strategy, Intel realized that its name had become an asset in the end-user market in addition to the OEM market where it had previously concentrated. "People associate Intel with innovation and technology," Johnson said.

See INTEL page 109

Exxon quits office mart

Harris division acquires Exxon technology rights, intends to continue service and support

By Peter Bartolik
CW Staff

MELBOURNE, Fla. — Harris Corp. announced recently that its Lanier Business Products, Inc. division has agreed to acquire the customer base and product technology rights of Exxon Corp.'s Exxon Office Systems Co. Terms of the cash transaction were not revealed.

The announcement marked Exxon's retirement from a decade-long battle to carve out a share of the office systems market. A number of ventures were formed by the oil company in the early 1970s to develop and market products aimed at the office market. Those ventures were combined in 1981 and the company continued to market the Qyx electronic typewriter, the Qwip facsimile machine and word processing equipment.

Peter Carney, a Harris spokesman, said Lanier will extend employment offers to Exxon Office Systems' domestic field service and sales force. A spokeswoman for Exxon, Ann Frechette, said about 1,000 people are employed in the field group.

Carney said Lanier will assume all service and support activities for existing Exxon customers and will acquire existing inventory to service the installed base of Exxon equipment, which is estimated at about 60,000 customers. The company intends to provide full service, spare parts and support to users of Exxon equipment.

Lanier also will acquire the technology rights to Exxon products. Carney would not reveal specific plans for use of that technology. "We have a lot of options and right now we want to keep those options open," he said.

Frechette said Exxon currently plans to

See HARRIS page 109

■ Convergent Technologies, Inc. recently reported an $18.9 million pretax loss for the fourth quarter and a $14 million loss for the year/**104**

■ Hewlett-Packard Co. experienced stronger growth in orders in January than the 7% pace previously reported for November and December; but the 15% increase for the quarter still lagged the pace of a year ago/**104**

Lotus takes aim at gray market

By Edward Warner
CW Staff

CAMBRIDGE, Mass. — Lotus Development Corp. struck a blow against the gray market for its software last week, unveiling a system that would let it determine which of its authorized dealers were selling Lotus products to gray-market price-cutters.

The system will place a bar code on the package of each Lotus software product. Lotus will record the bar code when the software is shipped to its distributor, and the distributor will record the bar code when each product is shipped to an authorized Lotus dealer. The distributor will upload its bar code records to Lotus daily.

When an advertisement appears from a gray marketer offering a Lotus product, Lotus will buy a sample and use the bar code to determine its source. "We are fully prepared to terminate anyone within our distribution network [who] we find supplying our products to unauthorized sources," warned John Shagoury, Lotus sales operations manager.

The unauthorized dealers, many of which are mail-order firms, sell far below list price and have become a burden to authorized Lotus dealers, asserted Steve Crummy, Lotus' director of sales. The authorized dealers lose customers to those dealers and still end up providing after-the-sale service to gray-market shoppers.

"To a large extent, the success of our products depends on trained, dedicated dealers," he said. "We can't stand by and let the gray market erode their share of the business."

See LOTUS page 106

R&D tax credit extension backed by government, industry reports

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — In the continuing scramble to obtain tax breaks from the U.S. Congress, the computer industry's effort to keep the 25% research and development tax credit was bolstered recently by three separate reports supporting permanent extension of the credit, which otherwise will expire at the end of 1985.

The R&D credit received support from the Congressional Research Service, the analytical arm of the U.S. Library of Congress; the President's Commission on Industrial Competitiveness, chaired by Hewlett-Packard Co. President John A. Young; and the industry-backed Coalition for the Advancement of Industrial Technology (Cait). Cait, based here, is a single-interest lobbying group consisting of 52 corporations, 15 universities and nine trade associations, including many representatives from the computer, electronics and semiconductor industries.

All three studies, released during the last few weeks, said the credit has boosted R&D expenditures since enacted in 1981 and that extension is needed to help U.S. high-technology companies stay competitive with foreign rivals, particularly government-subsidized Japanese firms.

Politically, the studies may enhance the chances of extension bills (S. 58 and H.R. 1188) recently introduced in Congress at a time when many industry tax breaks are targeted for elimination. A three-year extension of the R&D credit was included in the U.S. Department of the Treasury's controversial tax reform proposal, which calls for termination of most other tax credits.

Referring to the studies by the

See BREAKS page 106

Industry downturn looms

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

After leading the U.S. economy for more than a year, the computer industry is faced with an unexpected downturn that will bear close scrutiny during the next six months.

Exclusive of the many one-product microcomputer vendors that had already fallen on hard times and ebbing semiconductor industry fortunes, the mainstream participants in the computer equipment and software industry had been riding a heady wave of increasing orders and booming profits.

That wave abruptly crested recently when IBM announced it expected great difficulties in showing any profit increase for the current quarter, compared with the profit it posted one year ago. Data General Corp. also weighed in with an announcement of expected flat profits; Hewlett-Packard Co. said the last two months of 1984 were off, although January was somewhat better, according to the company's latest quarterly report; and Digital Equipment Corp. apparently told Wall Street analysts not to expect too much this quarter.

Much of the problem stems from the tremendous value of the U.S. dollar in the international currency market. The low valuations of foreign currencies has cut much of the profits out of overseas sales by U.S. vendors. This problem has been going on for some time.

However, the indications are that domestic orders have also trailed off

See INDUSTRY page 109

HP reports 20% revenue increase, 15% order growth for quarter

PALO ALTO, Calif. — Hewlett-Packard Co. recently reported a 20% increase in revenue for the first quarter ended Jan. 31 and said orders picked up in the final month of the quarter.

A month earlier, HP executives said the company experienced only a 7% increase in orders for November and December. In the report for the quarter, however, HP said orders for the quarter overall were up 15%.

The company reported revenue of $1.53 billion, up from $1.27 billion a year earlier. Profits for the quarter were up 17% to $116 million, or 45 cents per share, compared with $99 million, or 39 cents per share, in the first quarter of 1983. The 1983 figures do not include an extraordinary gain of $118 million, or 46 cents per share, because of elimination of taxes owed by domestic international sales corporations.

The 15% gain in orders for the quarter reflected a 10% rise in domestic orders and a 21% rise in international orders.

HP President John A. Young said he was pleased with the pickup in orders for January but remains cautious. "For the near term, we expect to see only a moderate growth in our domestic business, largely because of a slowing in the U.S. economy," he said.

Convergent posts 1984 loss

SANTA CLARA, Calif. — Convergent Technologies, Inc. recently reported a loss of $13.8 million, or 38 cents per share, for 1984, including a loss of $14.5 million because of discontinuance of its Workslate laptop computer operations. The company also posted a fourth-quarter pretax loss of $18.9 million.

Excluding discontinued operations, the company posted a profit of $687,000 or 2 cents per share. That figure reflects a pretax operating loss of $2.7 million that was offset by tax benefits of $3.3 million.

In 1983, the company posted profits of $14.9 million, or 40 cents per share, which included an after-tax loss of $2.4 million for the Workslate operations.

In the fourth quarter ended Dec. 31, the firm posted a loss from continuing operations of $9.3 million — reflecting an operating loss of $18.9 million offset by tax benefits of $9.5 million.

Including a $2.6 million loss for the Workslate operations, the total fourth-quarter loss was $11.8 million, or 33 cents per share. In the year-earlier fourth quarter, the company had posted profits of $3.9 million, or 10 cents per share, which included a Workslate-related loss of $2.1 million.

Revenue for the quarter just ended was $115.4 million, compared with $45 million a year earlier. Revenue for 1984 was $361.7 million, compared with $163.2 million in 1983.

Cullinet Software continues 50% growth rate for 1985

WESTWOOD, Mass. — Cullinet Software, Inc. continued its 50% growth rate for 1985 with a recent third-quarter report showing both revenue and profits increasing in line with the previous two quarters.

The company reported revenue of $47.4 million for the quarter ended Jan. 31, up 51% from $31.3 million in the third quarter of 1984. Profits rose 50% to $6.3 million, or 21 cents per share, compared with year-earlier profits of $4.23 million, or 14 cents per share.

For the nine months ended Jan. 31, Cullinet posted revenue of $131.3 million, up 55% over the year-earlier period, and profits of $17.8 million, or 59 cents per share, up 53% over the year-earlier period.

MSA announces sale of divisions

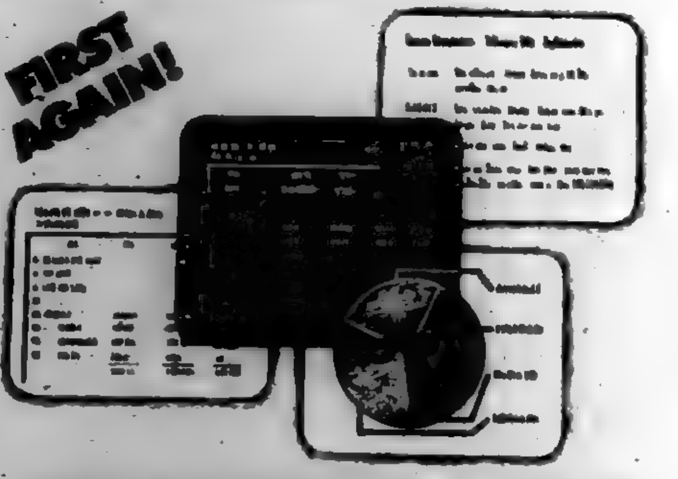
ATLANTA — Management Science America, Inc. (MSA) recently announced that it had reached an agreement to sell two of its retail microcomputer software subsidiaries to Encyclopaedia Brittanica, Inc.

MSA, which announced last October its intention to sell its retail software divisions, said it had agreed to sell its Designware and Eduware subsidiaries.

Still up for sale is the company's Peachtree Software, Inc. subsidiary.

An MSA spokesman confirmed published reports that the company had conducted negotiations to sell Peachtree to Microcomputer Corp., a Florida-based chain of retail computer stores.

The spokesman said those negotiations had not been successful but added that MSA is continuing to negotiate to sell the Peachtree subsidiary.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Bell South subsidiary to begin marketing DEC office systems

BIRMINGHAM, Ala. — Bell South Advanced Systems, Inc., a subsidiary of Bell South Corp., a regional telephone operating company, announced last week it will market a complete line of Digital Equipment Corp. office systems products beginning this spring.

The company said it had reached agreement with DEC to market DEC's All-In-One Office and Information System to large users and DEC's A-To-Z Integrated System for small users.

Mike Harrell, president of Bell South Advanced Systems, said, "[DEC's] systems will complement our existing line of voice and data communications equipment.

"We are adding an extensive line of office systems products to enable us to become a leading source of integrated office systems," Harrell continued.

According to Harvey Weiss, DEC vice-president and area manager for the Mid-Atlantic and Southern states, the agreement will benefit Southeastern businesses seeking to automate operations.

The companies together "can offer one source for a total solutions package of office systems equipment," Weiss said.

Honeywell reshuffles execs

MINNEAPOLIS — Honeywell, Inc. recently announced an executive reorganization with Vice-Chairman and former Honeywell Information Systems President James J. Renier joining with Edson W. Spencer, Honeywell's chairman and chief executive officer, to comprise the company's executive office.

Spencer said the reorganization will enable Renier to manage both the computer and controls divisions of Honeywell.

Named to the new position of executive vice-president for information systems was William N. Wray, formerly group vice-president of the commercial buildings group and communications divisions.

The executive vice-presidents of the company's five major divisions and all of the firm's corporate executives will report to the new executive office.

Commenting on the realignment, Spencer said, "In addition to meeting the future needs of our long-standing computer customers, information systems will be a central part of the company's plans to provide integrated systems using computer, communications and controls for key industrial, commercial building and government markets."

Wray will continue as chairman of the Honeywell Ericsson Development Co., a joint venture with L.M. Ericsson Co. of Sweden.

Intecom posts 1984 revenue growth of 65%

ALLEN, Texas — Intecom, Inc. recently announced 1984 revenue of $131.6 million, up more than 65% from $79.3 million in 1983.

The communications products vendor posted profits of $11.7 million, or 37 cents per share, for 1984. In 1983, the company posted profits before extraordinary items of $10 million, of 33 cents per share; including net operating loss carryforwards, the company posted total profits of $13.4 million, or 44 cents per share, in 1983.

For the fourth quarter ended Dec. 31, Intecom reported revenue of $42.3 million, up 73% from $24.4 million a year earlier.

Profits for the fourth quarter were $4.4 million, or 14 cents per share, compared with $4.5 million, or 14 cents per share, for the fourth quarter of 1983.

C. Michael Bowen, chairman and chief executive officer of Intecom, said the company was "pleased with the increased penetration that Intecom achieved in the market for advanced communications products . . . and [looking] forward to further improvements in 1985."

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Investor buys MAI's systems division

TUSTIN, Calif. — Bennet S. LeBow, a private investor, recently announced the completion of his purchase of the worldwide operations of Management Assistance, Inc.'s (MAI) Basic Four Information Systems division. LeBow formed MAI Basic Four, Inc. to continue those operations.

Additionally, Bell Atlantic Corp. said it had completed its acquisition of MAI's Sorbus Service division and MAI Canada Ltd. subsidiary. In another aspect of MAI's liquidation, former employees of an MAI subsidiary acquired the rights to sell and service MAI's micro software tools.

LeBow's company will continue to manufacture and market the Basic Four line of computer systems, including the recently introduced Series 2000 and Series 8000 systems. The company, headquartered here, will design, develop, manufacture and market business management systems and related products, the announcement said.

LeBow said that Canadian operations of the former division had been sold and that MAI Canada Ltd. will be the exclusive distributor for Basic Four systems in Canada. The sale was made to reduce debt and increase the capital of the new company, LeBow said. Bell Atlantic said it paid $23 million for the Canadian operations.

The former Sorbus Service division was incorporated as Sorbus, Inc. in Frazer, Pa. Sorbus will continue to offer maintenance services for Basic Four systems in the U.S.

Promark, Ltd. of Albuquerque, N.M., acquired the rights to continue sales, maintenance and support of the MAI series of integrated accounting applications and Business Basic/Micro language, originally created and marketed by MAI/Basic Four Business Products Corp.

Promark is owned by former employees of the micro subsidiary and headed by Patrick Riley, who was president of the subsidiary. The company said it will continue support of joint-labeled MAI software products provided under contract to Tandy Corp. The versions marketed for IBM microcomputers and compatibles will continue to bear the MAI trademark under a royalty arrangement with LeBow's company, Promark said.

BREAKS from page 103

Congressional Research Service and Cait, Rep. Robert T. Matsui (D-Calif.) said the reports will "help significantly" the chances of Congress passing the extension bill. Matsui and other supporters of the credit said that it is more than a special-interest tax break because industrial R&D helps the whole U.S. economy.

The Cait study projected that a permanent R&D credit would add between $2.9 billion and $17.1 billion annually to the gross national product (in constant dollars) by 1991. In the high end of this range, the study said, the extra revenue would more than offset the tax credit's cost to the Treasury Department.

"While it is difficult to predict the amount exactly, it's easy to see that R&D in our industry increases productivity in other business sectors through the invention of new equipment and processes," said Vico E. Henriques, president of the Computer and Business Equipment Manufacturers Association and secretary of Cait.

The Cait study concluded, "The U.S. relies primarily on private companies to undertake R&D, yet there is strong evidence that, without additional government support, private companies will spend less on R&D than is socially optimal."

The study was prepared by Martin Neil Baily and Robert Z. Lawrence of the Brookings Institution based in Washington, D.C., with assistance from Data Resources, Inc. "It would be extremely foolish to end this tax credit at a time when we are trying to increase the growth of the economy," Baily said at a press conference on the Cait study.

LOTUS from page 103

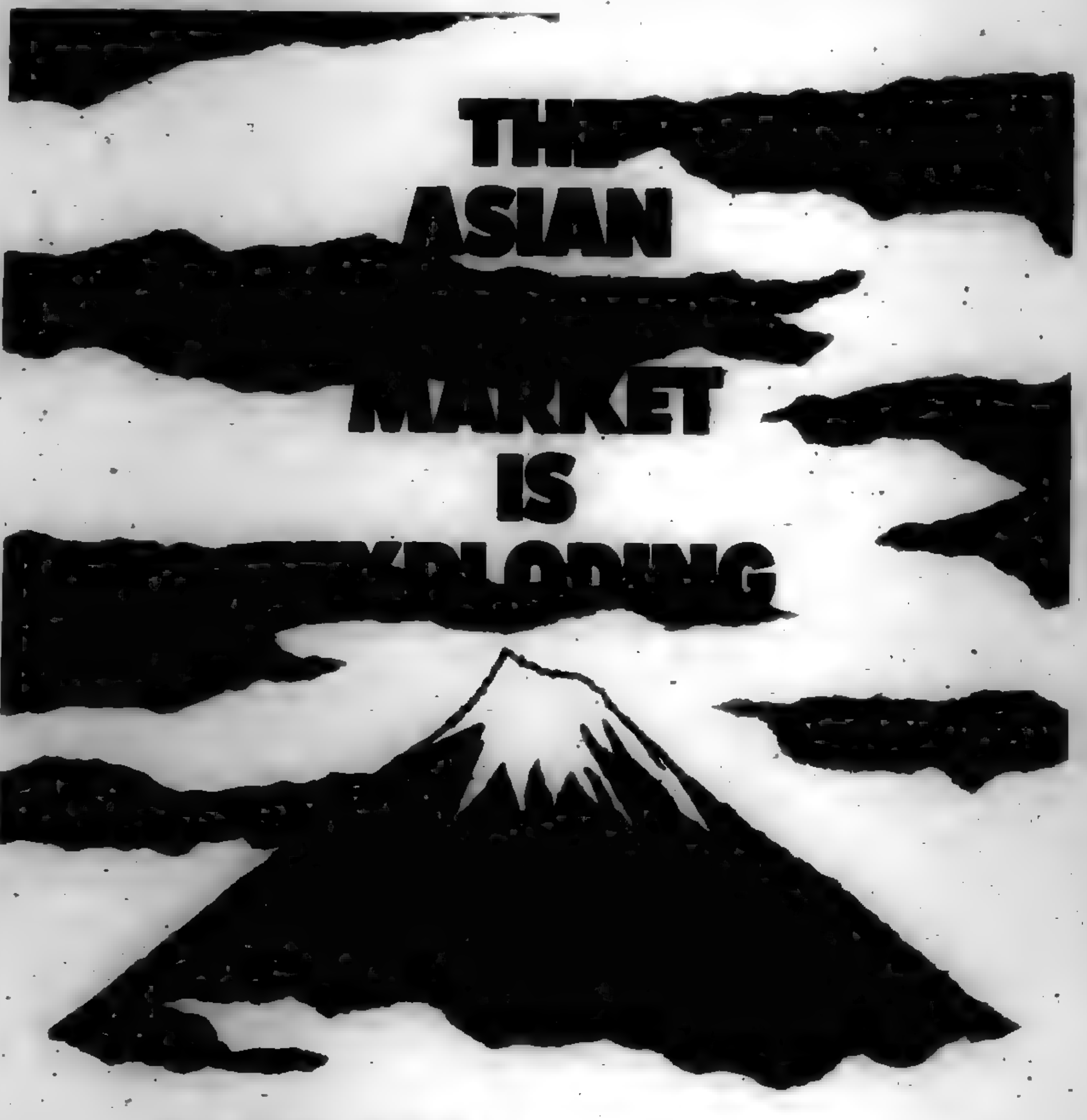
Lotus' action, announced last month, comes on the heels of a federal court decision in California last month that said Apple Computer, Inc. was not acting in restraint of trade by prohibiting mail-order sales of its products. The plaintiffs in that case, however, were six authorized Apple dealers.

Pointing to the Apple case, attorney Stephen R. Steinberg said Lotus is on firm legal ground in taking action against gray marketers. Steinberg, computer law specialist with the New York law firm Reavis & McGrath, said Lotus has a right to control its distribution.

Attorney Barry D. Weiss of the Chicago law firm Lurie, Sklar & Simon, Ltd. also said that a reasonable "nonprice restriction" on distributors would likely be upheld by the courts and added that Lotus' position is buttressed by the fact that "the courts have ruled that a discounter is taking a free ride on the advertising of the manufacturer."

Ken Carpenter, president of First Software, a Lawrence, Mass., authorized Lotus dealer, said Lotus "is in a unique position to take this needed step to eliminate the gray-market problem."

One admitted unauthorized dealer, Compuclassics of Reseda, Calif., saw things differently. Jimmy Valena, Compuclassics support service manager, said Lotus has requested that his firm voluntarily quit selling Lotus' Symphony. "[Lotus] has no legal right to stop us from selling it," Valena claimed.



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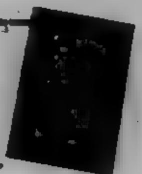

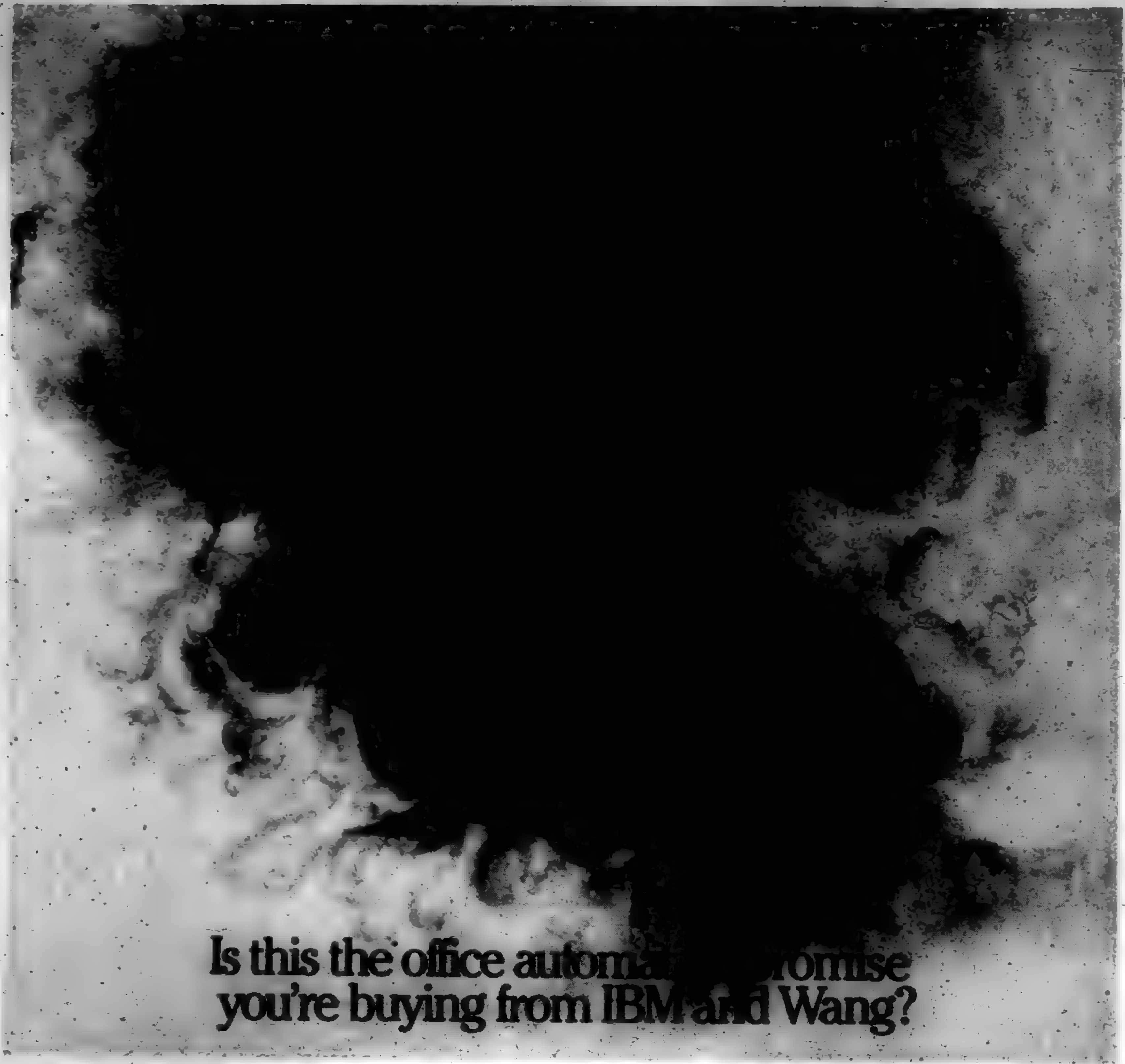

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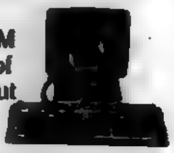

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Vendor Supplied Features	Data General MV Family	IBM System/36 Family	WANG VS Family
Integrated Office Product	CEO	Personal Services	WANG Office
First volume delivery	7/82	7/85	4/85
Integrated Spreadsheet	yes	no	promised
Integrated Graphics	yes	no	promised
Integrated Query	yes	promised	promised
Consistent User Interface	yes	promised	promised
Database			
Relational	yes	no	promised
Codasyl	yes	no	no
UNIX	yes	no	promised

Vendor Supplied Features	Data General MV Family	IBM System/36 Family	WANG VS Family
Integrated with laptop	yes	no	no
Integrated with IBM PC	yes	promised	yes
32 bit architecture	yes	no	yes
Supports 100+ users	yes	no	yes
Electronic Mail between peer systems	yes	promised	yes
SNA Networking	yes	yes	yes
X.25 Networking	yes	yes	promised
IEEE802.3 LAN support	yes	no	no

Data General delivers today what IBM and Wang promise tomorrow.

Data General
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INDUSTRY

from page 103

significantly. That leaves vendors with few options available to squeeze out the increased profit rates that Wall Street incessantly demands.

Perhaps it is just coincidence that the equipment vendors are experiencing problems just six months after the semiconductor industry problems became serious. Perhaps most analysts are correct in believing the problem is short-term and should evaporate in the second half of the year. Certainly the economic indicators give little reason for a negative outlook.

But maybe things are not so rosy.

William Zachman, vice-president of the Framingham, Mass.-based International Data Corp. market research firm, offered a gloomy outlook at the end of January, before most of the bad news had surfaced. Zachman, admittedly not a macroeconomist, nonetheless said that "having a strong recession soon may be the best we can hope for."

Zachman theorized that current economic indicators may not truly reflect the increased role the information industry plays in the general economy. He also said that large buyers seem to be far more cautious and cost-conscious for 1985 than 1984.

We hope that we are just going through a minor economic glitch and the situation will not further deteriorate.

But there is another factor too much ignored these days. Because of the incredible stability of the economy and the continuing battle to control inflation, the nation's gross national product is projected to have a very low growth this year. If there is very little growth in the national economy, one has to wonder just where the money is going to come from to keep computer vendors booming along at growth rates of from 15% to as much as 50%.

INTEL

from page 103

Bader said the operation functions independently of Intel's other divisions and intends to develop the end-user market with "finesse and subtlety," rather than trying to bulldoze its way in.

Half of the operation's staff was hired from outside Intel — primarily personnel with the retail experience Intel never had the need to acquire.

A number of products were under consideration for the operation's first release, Bader said, "but what all the retailers were telling us was that they had all kinds of customers coming in and asking for the 8087." Previously introduced by Intel to speed numerical processing, both the 8087 and 80287 can be snapped into an empty socket on the IBM Personal Computer and Personal Computer XT for the 8087 and on the Personal Computer AT for the 80287. While the 8087 has been available for some time through IBM, "What we heard was that availability from IBM was spotty and inconsistent," Bader said.

By focusing initially on existing products, the new division has an opportunity to "learn how to do business with the dealers" before bringing out entirely new products, according to Johnson and Bader.

Intel has signed up a total of 400 retail outlets, including several major retail chains and independent retailers, and has set a goal of 1,500 outlets by the end of 1985. Dealers will be served by independent sales representatives and Intel will promote a corporate accounts marketing program to send Intel personnel into Fortune 1,000 firms to assist dealers, Bader said.

HARRIS

from page 103

continue to provide service and support for authorized U.S. dealers of Exxon equipment.

Lanier, an Atlanta-based vendor of office automation equipment, was acquired by Harris in a 1983 stock exchange valued at more than $300 million.

Exxon announced its intention to sell the office systems division last November and had subsequently taken measures to pare down its operations. In January, the company sold its European sales and service operations to Ing. C. Olivetti, spun off its manufacturing facility in Lionville, Pa., as a separate subsidiary [CW, Jan. 21] and halted product development at its Forrestal Center in Princeton, N.J.

Frechette said the transaction with Lanier will leave some 200 employees in administrative positions in Stamford, Conn., and New Jersey, and those employees will be phased out over the next few months. Frechette said it could take two months or more to complete the transfer.

Rectifier settles Siliconix suits

EL SUGUNDO, Calif. — International Rectifier Corp. and Siliconix, Inc. recently announced the settlement of three lawsuits concerning Siliconix's use of alphanumeric part numbers containing the letters "IRF" for certain metal-oxide semiconductor field-effect transistors.

The dispute began when International Rectifier filed suits in England and Germany seeking to prohibit Siliconix's use of part numbers containing the letters. Siliconix, in turn, filed suit in San Jose, Calif., seeking a declaration that its use of the part numbers did not violate International Rectifier's rights and alleging that International Rectifier was trying to monopolize the market for certain semiconductors.

The companies said no payments were included in the settlement, and neither party admitted any liability.

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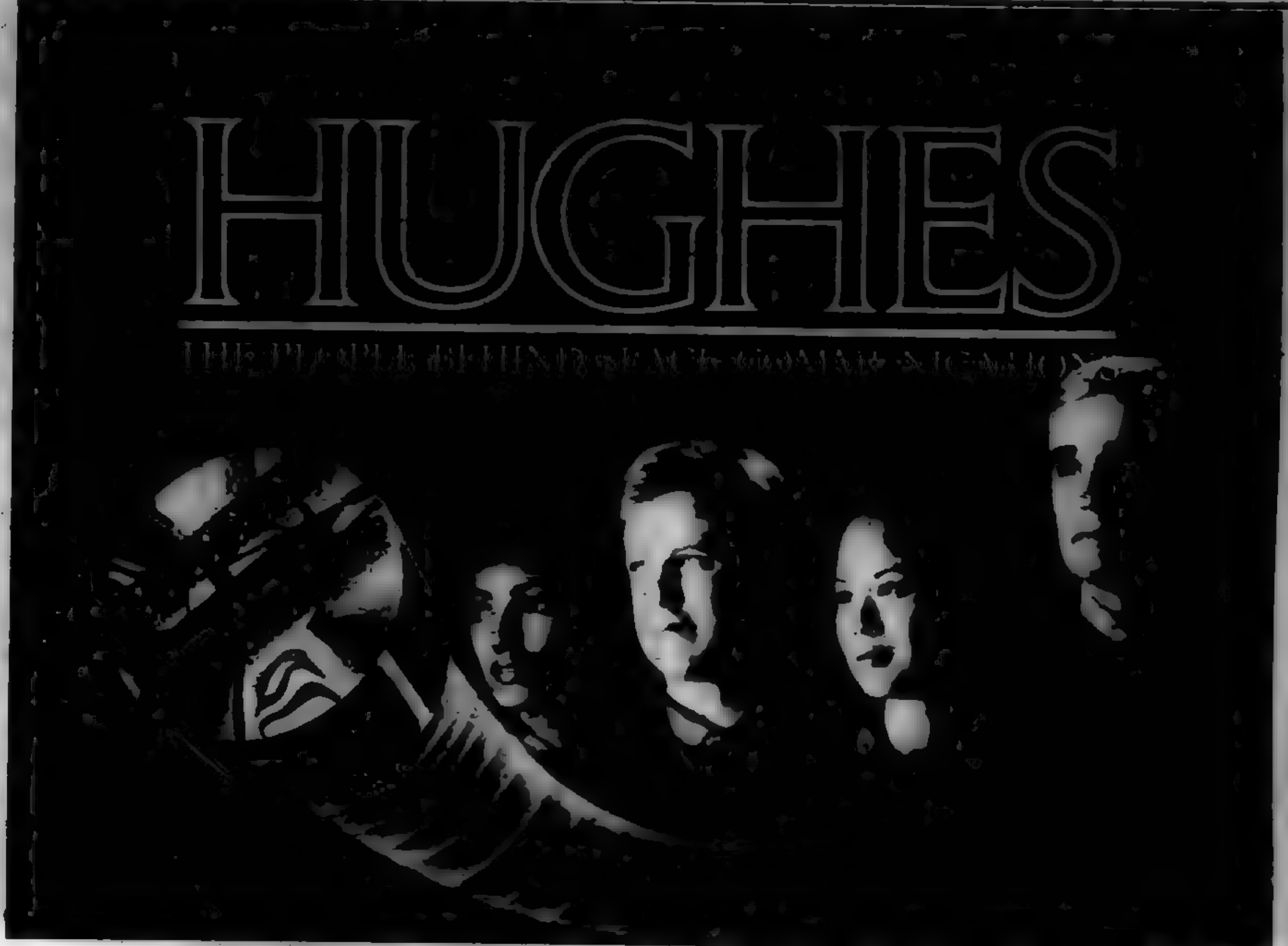

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Quality Assurance System Specialist will test SAS software and coordinate software testing by other Institute employees on minicomputers. Applicants must have three years' programming experience and a bachelor's degree in a quantitative field. Knowledge of SAS software and experience with VMS are required. Knowledge of other operating systems is a plus.

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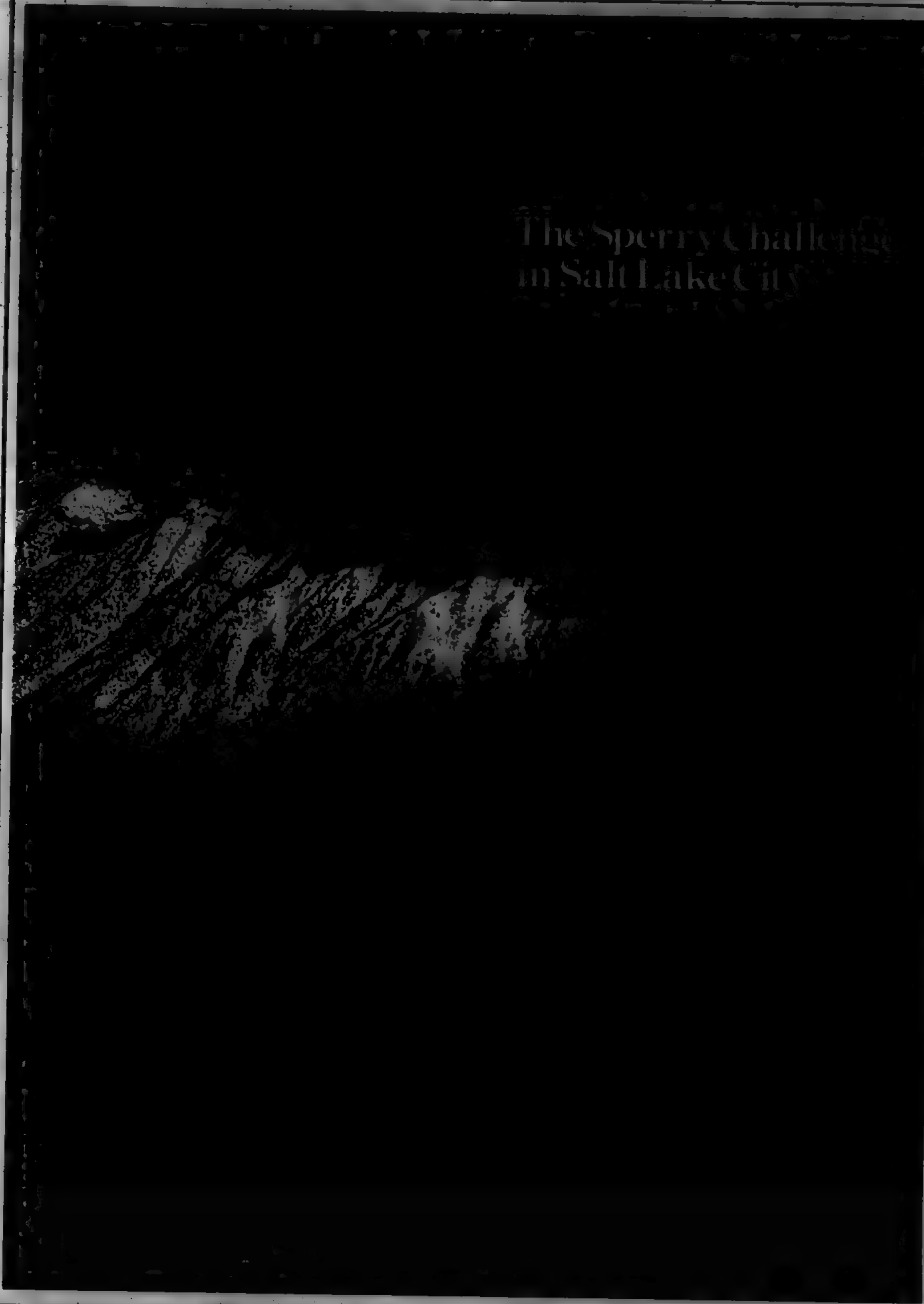

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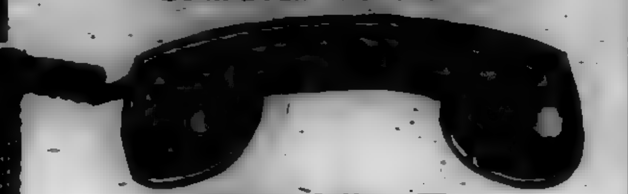

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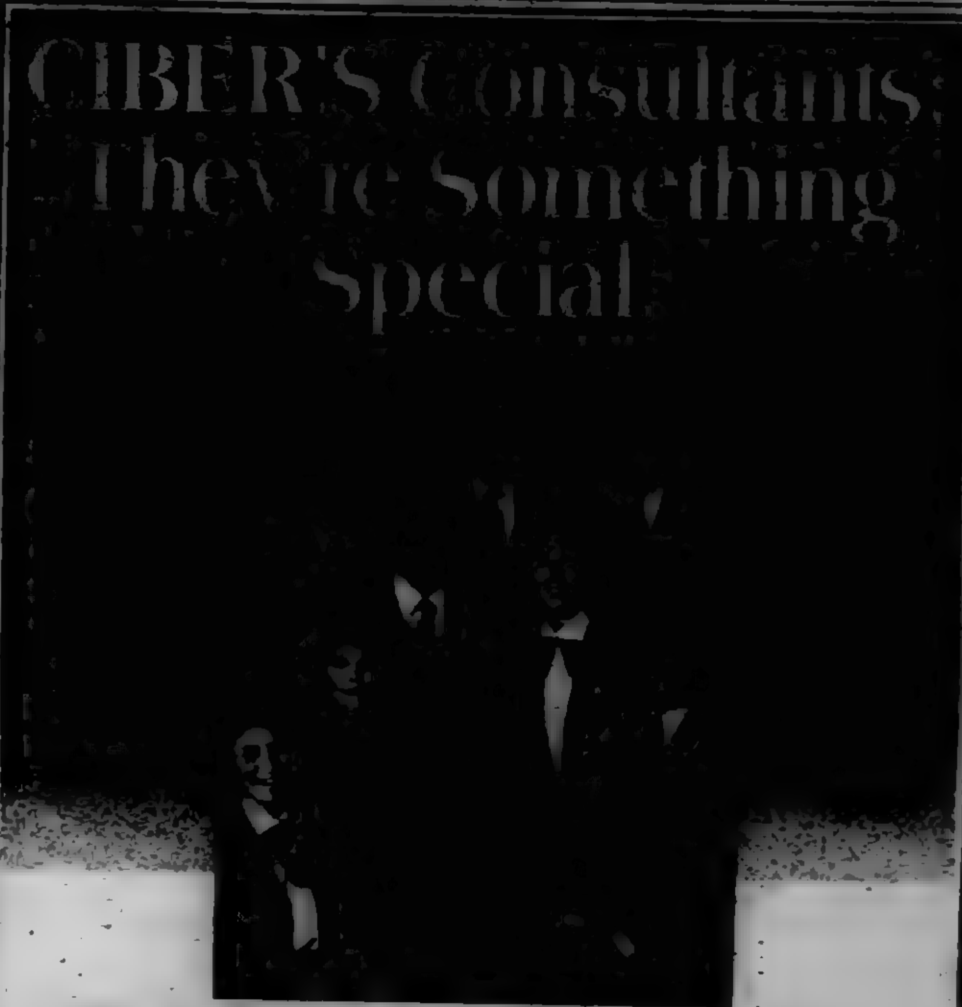
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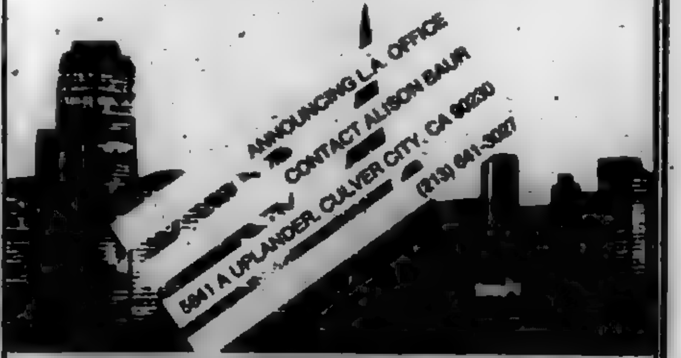

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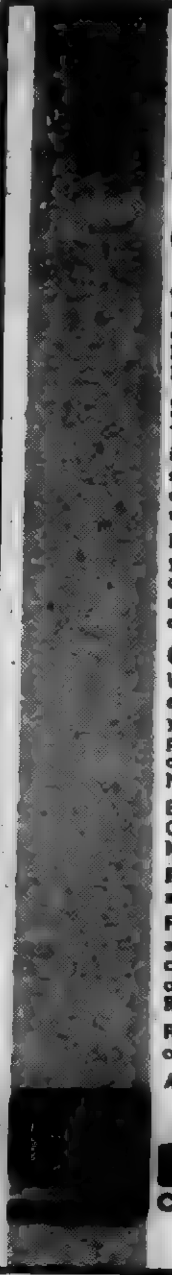

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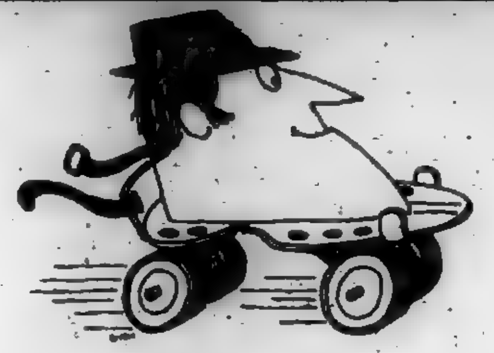

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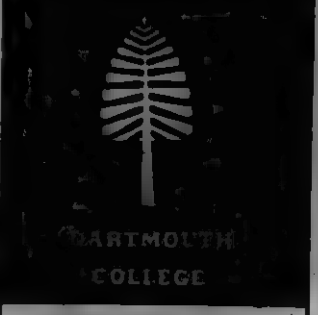

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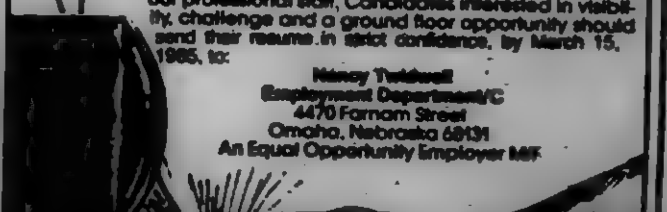

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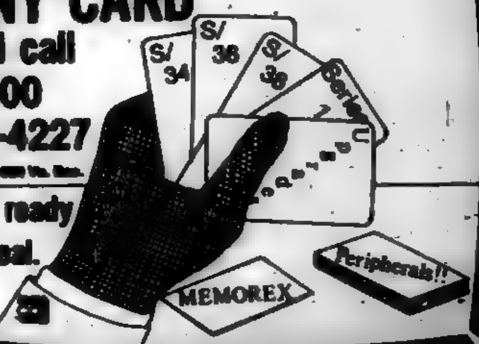

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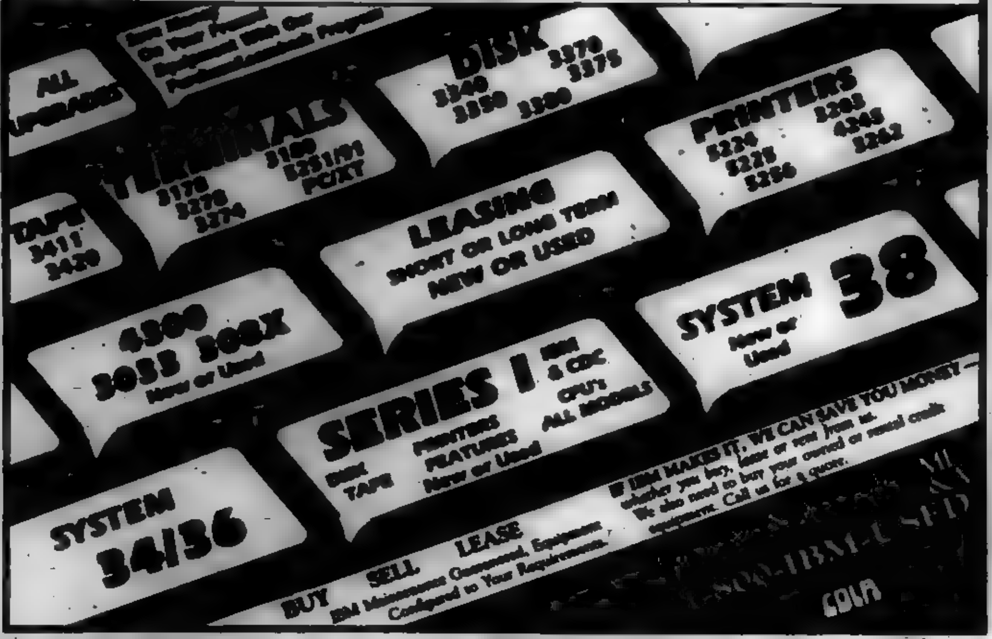
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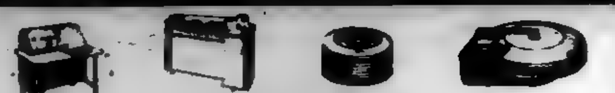

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SYSTEMS	MIPS (Millions of Instructions Per Second)	MEGABYTES	SYSTEMS	MIPS (Millions of Instructions Per Second)	MEGABYTES
4321	0.25	1	•4381-3	[illegible]	[illegible] to 32
4331-1	0.25	0.5 to 1	3083E	[illegible]	[illegible] to 32
4331-11	0.38	1 to 2	3033N	[illegible]	[illegible] 16
4331-2	0.50	1 to 4	3083X	[illegible]	[illegible]
4341-9	0.52	1 to 4	3033UP	5.0	[illegible]
4361-3	0.70	2 to 4	3083B	[illegible]	8 to [illegible]
4341-10	0.75	2 to 4	3083BX	[illegible]	[illegible] to 32
4341-1	0.88	2 to 4	[illegible]	[illegible]	[illegible] to 32
4341-11	1.1	2 to 8	[illegible]	8.5	[illegible] to 32
4361-4	1.15	2 to 12	[illegible]	[illegible]	4 to 24
3031	1.2	2 to 8	[illegible]	[illegible]	8 to 32
4361-5	1.46	2 to 12	[illegible]	[illegible]	16 to 32
4341-2	1.5	2 to 16	[illegible]	[illegible]	16 to 48
4341-12	1.65	2 to 16	[illegible]	[illegible]	16 to 64
3031AP	2.0	2 to 8	[illegible]	[illegible]	16 to 48
4381-1	2.1	4 to 16	[illegible]	15.5	16 to 64
3032	2.5	2 to 8	[illegible]	26.6	32 to 96
4381-2	2.7	4 to 32	[illegible]	28.7	32 to 128
3033S	2.9	4 to 16	[illegible]	29.4	64 to 192
•3083CX	3.3	8 to 32	[illegible]	52.9	128 to 384

• First installation [illegible] installation 1987

AMDAHL

SYSTEMS	MIPS	MEGABYTES
470V/7A	4.5	[illegible]
470V/7	5.5	[illegible]
470V/8	6.5	[illegible]
5840	[illegible]	[illegible]
5850	[illegible]	[illegible]
5860	[illegible]	[illegible]
[illegible]	22.0	[illegible]
[illegible]	[illegible]	[illegible] to 128
5870	[illegible]	[illegible] to 64
5860	[illegible]	32 to 128

NATIONAL ADVANCED SYSTEMS

SYSTEMS	MIPS	MEGABYTES
AS/6650	2.4	4 to 16
AS/8023	2.9	4 to 32
AS/8043	5.2	8 to 32
AS/8053	6.5	8 to 32
AS/8083	8.4	16 to 32
AS/9040	7.2	8 to 48
AS/9050	9	8 to 48
AS/9060	11.2	16 to 64
AS/9070	16.2	16 to 64
AS/9080	20	16 to 64

The [illegible] information is intended as a gu[illegible] for computer users on relative [illegible]puter system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based upon hardware/software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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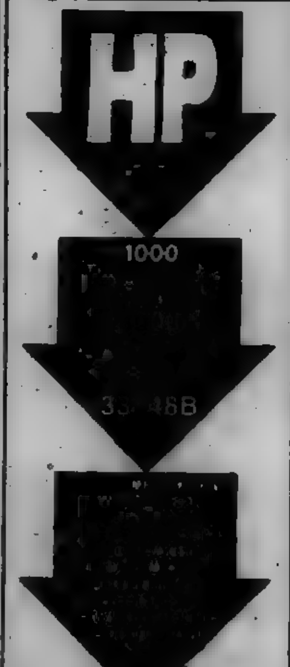

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- April 29 - **Micros In Big Business**
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- July 15 - **NCC Show** (early close July 3rd)
- July 22 - **NCC Wrap-Up**
- August 26 - **Software Productivity Packages**
- September 30 - **Minis & Small Business Systems**
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- December 30, 1985 & January 6, 1986 - **Forecast '86**

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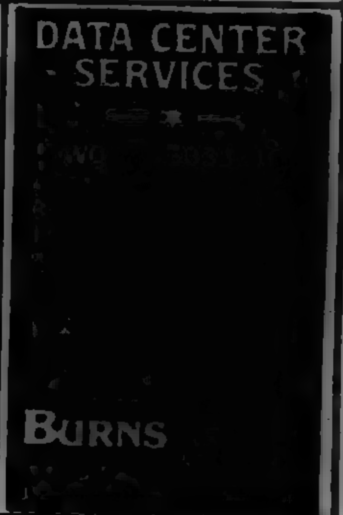

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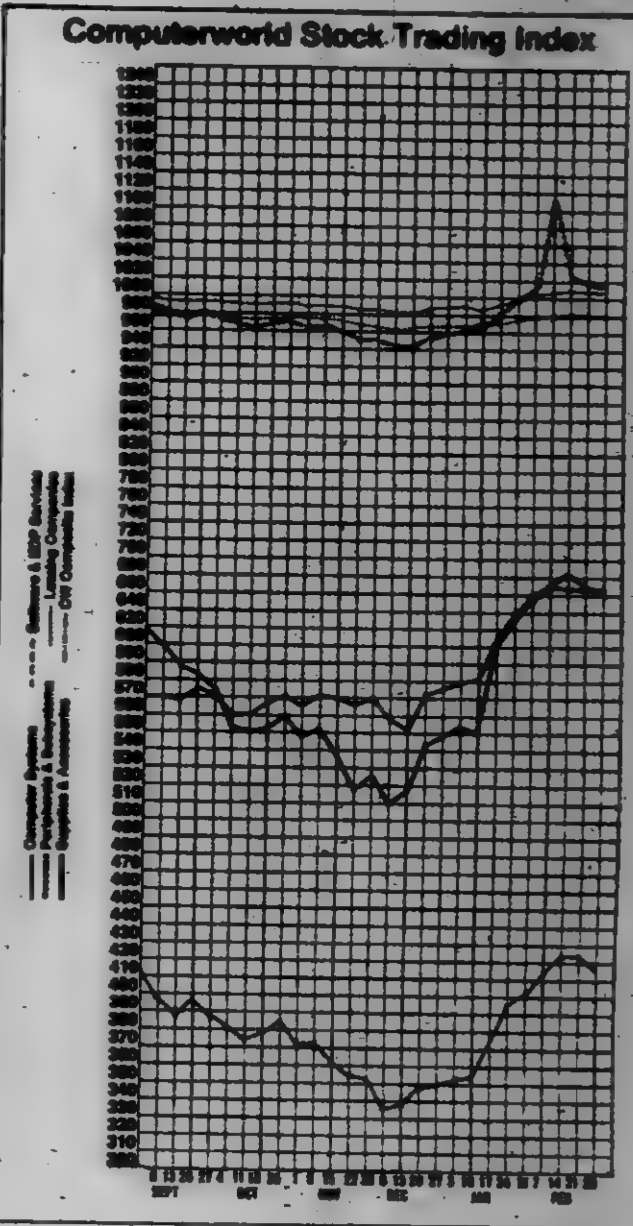
Computerworld Stock Trading Index



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 27, 1985

All statistics compiled
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COMPUTER SYSTEMS

EXCH		1984-85 RANGE (1)	CLOSE FEB 27 1985	WEEK NET CHANGE	WEEK PCT CHANGE
[illegible]	ALPHA MICROSYSTEMS	6- 24	7 3/4	- 1/2	-6.2
[illegible]	ALTOS COMPUTER SYST	7- 21	12 1/2	- 1/8	-0.9
[illegible]	AMDAHL CORP	10- 30	16 1/8	- 1/2	-3.0
[illegible]	APPLE COMPUTER INC	16- 35	29 1/8	-1 1/4	-4.7
[illegible]	AT&T	15- 23	21 1/8	- 3/8	-1.7
[illegible]	BURROUGHS CORP	46- 64	61 3/8	0	0.0
[illegible]	COMPAQ COMPUTER CP	4- 15	9 1/2	+ 1/8	-1.2
[illegible]	COMPUTER AUTOMATION	3- 17	8	+ 1/2	+6.6
[illegible]	COMPUTER CONSOLES	8- 28	9 1/8	-1 3/8	-13.0
[illegible]	CONTROL DATA CORP	25- 62	35	-1 1/8	-3.2
[illegible]	CONVERGENT TECHNOL	9- 41	16	- 1/2	-3.0
[illegible]	CRAY RESEARCH INC	38- 79	72 3/8	+2	+2.8
[illegible]	DAISY SYSTEMS CORP	14- 38	25 3/4	+ 3/4	+3.1
[illegible]	DATA GENERAL CORP	37- 74	57	-1 3/4	-2.9
[illegible]	DATAPOINT CORP	14- 23	19 3/8	- 1/2	-2.4
[illegible]	DIGITAL EQUIPMENT	84-129	113 1/2	- 3/8	-0.3
[illegible]	[illegible] INC	13- 36	14 1/2	- 3/8	-2.5
[illegible]	ELECTRONIC ASSOC.	3- 15	5 1/4	- 1/8	-2.3
[illegible]	FLOATING POINT SYST	13- 44	30	- 1/2	-1.6
[illegible]	FOXBORO	28- 47	28 1/8	-1 3/8	-4.6
[illegible]	GENERAL AUTOMATION	3- 10	6	- 3/8	-5.8
[illegible]	GOULD INC	20- 44	23 1/8	+ 1/2	+2.0
[illegible]	HARRIS CORP	23- 40	30 7/8	-1 3/4	-5.3
[illegible]	HEWLETT-PACKARD CO	31- 48	35 3/8	-1	-2.8
[illegible]	HONEYWELL INC	46- 65	63 7/8	+1 1/8	+1.7
[illegible]	IBM	103-137	133 1/8	- 3/8	-0.3
[illegible]	IPL SYSTEMS INC	1- 14	3 1/2	0	0.0
[illegible]	ITT CORP	21- 47	29 3/8	-2 1/8	-6.9
[illegible]	M/A-COM INC	13- 30	20 1/2	+ 1/8	+0.6
[illegible]	MANAGEMENT ASSIST	1- 3	2 3/8	- 1/8	-5.0
[illegible]	MATSUSHITA ELECTRONI	35- 60	51 1/8	- 1/8	-0.2
[illegible]	MODULAR COMPUTER SYS	6- 16	7 1/2	- 1/8	-1.6
[illegible]	MOHAWK DATA SCI	8- 17	11 1/4	+ 1/8	+1.1
[illegible]	MOTOROLA INC	30- 48	35 7/8	-1 1/2	-4.2
[illegible]	NAT'L SEMICONDUCTOR	11- 20	11 3/8	- 7/8	-7.0
[illegible]	NBI INC	13- 28	17	- 3/8	-2.2
[illegible]	NCR	21- 30	29 3/8	- 1/8	-0.4
[illegible]	PERKIN-ELMER	18- 37	28 1/2	-1 1/4	-4.3
[illegible]	PRIME COMPUTER INC	11- 26	18 3/4	+ 3/8	+2.0
[illegible]	SPERRY CORP	35- 54	53 3/8	+5 3/8	+11.1
[illegible]	STRATUS COMPUTER INC	9- 17	14 3/4	+ 1/4	+1.7
[illegible]	TANDEM COMPUTERS INC	15- 40	24 3/8	- 7/8	-3.4
[illegible]	TANDY CORP	24- 62	31 1/2	+ 1/2	+1.6
[illegible]	TELEVIDEO SYSTEMS	3- 41	3 1/4	- 1/8	-3.7
[illegible]	TELXON CORP	8- 20	10	-1 1/4	[illegible]
[illegible]	TEXAS INSTRUMENTS	101-148	112 3/4	-8 1/8	[illegible]
[illegible]	ULTIMATE CORP	10- 24	13	+1 3/8	+11.8
[illegible]	VECTOR GRAPHICS INC	0- 9	7/8	0	0.0
[illegible]	WANG LABS "B"	23- 42	25 1/8	+ 1/4	+0.9
[illegible]	WANG LABS "C"	23- 42	25 1/2	+1	-0.8
[illegible]	XEROX CORP	35- 52	45 1/8	- 3/8	-0.8

LEASING COMPANIES

EXCH		1984-85 RANGE (1)	CLOSE FEB 27 1985	WEEK NET CHANGE	WEEK PCT CHANGE
[illegible]	[illegible] FINANCIAL CP	10- 22	21 3/8	+ 3/4	+3.6
[illegible]	CIS CORP	4- 10	8 7/8	+ 1/8	+1.4
[illegible]	COMDISCO INC	9- 42	16 7/8	- 1/2	-3.0
[illegible]	CONTINENTAL INFO SYS	3- 10	9	- 1/2	-5.2
[illegible]	DPF INC	10- 17	16 1/8	- 3/8	-2.7
[illegible]	FINALCO GROUP INC	4- 12	4 1/4	- 1/8	-2.8
[illegible]	PHOENIX AMERICAN INC	3- 17	3 7/8	+ 1/8	[illegible]
[illegible]	[illegible] INC	8- 21	11	+ 1/4	+2.3
[illegible]	U.S. LEASING	25- 44	41 3/8	- 3/8	-0.9

COMPONENTS

EXCH		1984-85 RANGE (1)	CLOSE FEB 27 1985	WEEK NET CHANGE	WEEK PCT CHANGE
[illegible]	ADVANCED MICRO DEV	28- 41	30	- 3/4	-2.3
[illegible]	[illegible] SEMICONDUCTOR	13- 30	16 1/8	-1 1/8	[illegible]
[illegible]	ANALOG DEVICES INC	20- 32	27 1/2	- 1/2	-1.7
[illegible]	ANALOGIC CORP	10- 31	14 3/8	- 3/8	-2.5
[illegible]	APPLIED MAGNETICS CP	8- 37	13 3/8	+ 3/8	[illegible]
[illegible]	[illegible] CORP	3- 12	5	0	0.0
[illegible]	MICRO MASK INC	8- 18	8 1/4	0	0.0
[illegible]	TERADYNE	22- 38	27 5/8	+ 5/8	+2.3

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
[illegible]; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		1984-85 RANGE (1)	CLOSE FEB 27 1985	WEEK NET CHANGE	WEEK PCT CHANGE
[illegible]	ADVANCED COMP TECH	2- 6	2 3/4	+ 1/4	+10.0
[illegible]	ADVANCED SYSTEMS INC	8- 22	11 7/8	0	0.0
[illegible]	AGS COMPUTERS INC	10- 22	15 1/8	- 3/8	-2.4
[illegible]	AMERICAN SOFTWARE	13- 51	18 1/8	-1	-5.1
[illegible]	ANACOMP INC	2- 10	3 3/4	- 3/8	[illegible]
[illegible]	ANALYSTS INTL CORP	9- 17	8 1/4	- 1/2	[illegible]
[illegible]	APPLIED DATA RES	18- 30	27 1/2	- 3/4	-1.8
[illegible]	ASHTON TATE	6- 19	8	+ 1/2	+6.6
[illegible]	ASK COMPUTER SYSTEMS	13- 30	21 1/2	0	0.0
[illegible]	[illegible] CORP INC	1- 3	1 7/8	+ 1/8	+7.1
[illegible]	AUTOMATIC DATA PROC	30- 45	40 1/8	- 7/8	-1.8
[illegible]	COMPUTER ASSOC INT'L	18- 38	35 3/4	+1 1/2	+4.3
[illegible]	COMPUTER HORIZONS	8- 20	9 1/8	+ 1/8	+1.3
[illegible]	COMPUTER NETWORK	8- 13	9 1/2	- 1/8	[illegible]
[illegible]	COMPUTER SCIENCES	11- 21	15 3/8	- 3/8	-2.3
[illegible]	COMPUTER TASK GROUP	15- 26	20 3/8	+ 3/8	+1.8
[illegible]	COMPUTER USAGE	1- 10	1 3/4	- 1/8	-6.6
[illegible]	COMPUTONE SYSTEMS	6- 23	8 7/8	+ 1/8	+1.4
[illegible]	COMSERV CORP	1- 10	4	- 1/8	-3.0
[illegible]	COMSHARE	6- 14	7 3/8	- 1/8	-1.6
[illegible]	CULLINET SOFTWARE	12- 33	31 1/8	+1 1/8	+3.7
[illegible]	CYCARE SYSTEMS INC	10- 23	24 1/4	+1 1/8	+4.8
[illegible]	[illegible] SYSTEM INC	6- 27	6 1/4	- 1/2	-7.4
[illegible]	GENERAL ELECTRIC CO	48- 65	62 7/8	+ 3/8	+0.5
[illegible]	GTE CORP	35- 45	42 3/4	+ 3/8	+0.9
[illegible]	INFORMATICS GENERAL	14- 32	17 3/4	- 1/8	-0.6
[illegible]	INFORMATION SCIENCE	4- 17	4 1/4	0	0.0
[illegible]	[illegible] SYSTEMS CP	19- 43	25	-1 1/8	-4.3
[illegible]	KEANE ASSOCIATES	8- 19	12 1/2	- 3/4	-5.6
[illegible]	LOGICON	18- 34	32 3/8	-1 5/8	-4.7
[illegible]	LOTUS DEVELOPMENT CP	19- 40	31 1/2	+1 1/2	+5.0
[illegible]	MCI COMMUNICATIONS	6- 20	8 1/2	+ 3/8	+4.6
[illegible]	MGMT SCI AMER INC	8- 23	12 3/8	0	0.0
[illegible]	MATHEMATICAL APP GRP	6- 10	6	0	0.0
[illegible]	MICOM SYSTEMS INC	27- 50	29 1/4	-2	-6.4
[illegible]	MICROPRO INT'L CP	2- 10	2 3/4	- 1/8	-4.3
[illegible]	NATIONAL DATA CORP	8- 28	14 1/2	- 3/8	-2.4
[illegible]	ON-LINE SOFTWARE INT	4- 20	6 1/8	- 1/2	-7.6
[illegible]	PANSOPHIC SYSTEMS	11- 30	20	-1 5/8	-7.5
[illegible]	PLANNING RESEARCH	10- 21	13 3/4	+ 1/2	+3.7
[illegible]	POLICY MGMT SYSTS CP	22- 28	23	-1 1/2	-6.1
[illegible]	PROGRAMMING & SYS	4- 8	4 3/4	- 1/8	-2.5
[illegible]	REYNOLDS & REYNOLD	30- 45	41 1/2	-1	-2.3
[illegible]	SEI CORP	11- 26	17 3/8	+ 1/8	+1.4
[illegible]	SHARED MEDICAL SYST	23- 40	33 1/8	+ 1/4	+0.7
[illegible]	SCIENTIFIC COMPUTERS	3- 14	5 3/4	- 1/2	-8.0
[illegible]	SOFTWARE AG	8- 23	10 3/8	- 1/8	-1.2
[illegible]	[illegible] CORP	14- 18	13 3/4	+ 1/8	+1.0
[illegible]	UCCEL	7- 17	10 3/8	- 1/4	-2.3

PERIPHERALS & SUBSYSTEMS

EXCH		1984-85 RANGE (1)	CLOSE FEB 27 1985	WEEK NET CHANGE	WEEK PCT CHANGE
[illegible]	AM INTERNATIONAL	3- 7	3 3/8	- 1/8	-3.4
[illegible]	ANDERSON JACOBSON	3- 10	4 1/2	+ 1/8	+2.8
[illegible]	AST RESEARCH INC	7- 26	20	- 3/8	-1.8
[illegible]	AUTO-TROL TECHNOLOGY	8- 21	11 3/4	-1	-7.8
[illegible]	AVANT-GARDE COMPUTING	10- 33	13 1/8	-5	-27.3
[illegible]	BANCTEC INC	9- 22	19 1/8	+ 1/2	+3.1
[illegible]	BEEHIVE INT'L	1- 7	1 1/8	+ 1/8	[illegible]
[illegible]	BOLT BERANEK & NEW	17- 30	26 1/2	+ 3/8	+1.4
[illegible]	CAMBEX CORP	1- 3	2 1/4	0	0.0
[illegible]	CENTRONICS DATA COMP	4- 20	8 3/8	- 7/8	-9.4
[illegible]	[illegible] CORP	7- 12	7 3/8	- 1/8	-1.6
[illegible]	[illegible]	6- 26	9 7/8	0	0.0
[illegible]	COMPUGRAPHIC CORP	20- 40	23 5/8	+ 1/8	+0.5
[illegible]	COMPUTER TRANSCEIVER	1- 10	1	0	0.0
[illegible]	COMPUTERVISION CORP	30- 57	35 3/8	-2 3/8	-6.3
[illegible]	CONRAC CORP	11- 20	13	+ 1/8	+0.9
[illegible]	DATAPRODUCTS CORP	14- 30	17 1/2	- 1/8	-1.4
[illegible]	DATARAM CORP	6- 12	8 1/8	- 1/8	-1.8
[illegible]	DATA SWITCH CORP	5- 41	7 3/8	0	0.0
[illegible]	DATUM INC	6- 17	7 7/8	+ 3/8	+5.0
[illegible]	DECISION DATA COMPUT	9- 18	10 1/8	+ 1/8	+1.2
[illegible]	DOCUTEL-OLIVETTI	4- 20	2 7/8	+ 1/8	+4.5
[illegible]	ELECTRONIC M & M	3- 11	4	0	0.0
[illegible]	ENDATA INC	8- 18	3 3/8	0	0.0
[illegible]	EVANS & SUTHERLAND	31- 50	44 3/8	- 3/8	-0.8
[illegible]	[illegible] TECHNOLOGIES	8- 10	8 3/8	- 3/8	-4.2
[illegible]	GEN'L DATA COMM IND	10- 20	17 1/8	- 7/8	-4.8
[illegible]	HAZELTINE CORP	16- 33	30 1/2	-1 3/8	-4.3
[illegible]	[illegible] CORP	3- 9	3 3/8	0	0.0
[illegible]	INFORMATION INTL INC	10- 16	12 1/2	- 1/8	-1.0
[illegible]	[illegible] INC	7- 21	8 3/8	- 1/8	-1.4
[illegible]	[illegible] CORP	27- 40	27 1/2	-1 1/8	-4.3
[illegible]	LUNDY ELECTRONICS	7- 16	11 7/8	0	0.0
[illegible]	MEGADATA CORP	3- 8	7 3/8	0	0.0
[illegible]	MSI DATA CORP	9- 23	11 1/8	- 1/2	-4.3
[illegible]	[illegible] CORP	18- 37	28 3/8	- 3/8	-1.3
[illegible]	NETWORK SYSTEMS CORP	20- 34	30 1/8	+ 3/8	+3.0
[illegible]	NO AMERICAN PHILIPS	35- 48	43 1/8	-2	-4.4
[illegible]	NORTHERN TELECOM LTD	30- 40	37 3/8	- 3/8	-1.0
[illegible]	[illegible]	1- 3	1/8	0	0.0
[illegible]	PARADYNE CORP	11- 33	19 7/8	-1 1/8	-5.6
[illegible]	[illegible] CORP	8- 14	13 3/8	+ 1/8	+0.9
[illegible]	[illegible] CO (ADR)	20- 40	21 1/8	+ 1/4	+1.1
[illegible]	PRINTRONIX INC	13- 30	16 3/8	+ 3/8	-2.5
[illegible]	[illegible] CORP	4- 23	9 3/8	-1 1/8	-17.3
[illegible]	RECOGNITION EQUIPMT	10- 17	10 3/8	- 1/8	-1.5
[illegible]	SANDERS ASSOCIATES	28-120	42 1/8	+ 7/8	+2.1
[illegible]	[illegible] CORP	8- 18	13 3/8	+ 3/8	+2.8
[illegible]	SCIENTIFIC ATLANTA	8- 23	13 1/8	+ 1/8	[illegible]
[illegible]	SEAGATE TECHNOLOGY	6- 20	8	- 1/8	-1.5
[illegible]	STORAGE TECHNOLOGY	2- 20	3	- 1/8	-7.6
[illegible]	SYKES DATATRONICS	1- 10	1 1/8	- 1/8	-6.7
[illegible]	T BAR INC	7- 17	8 3/8	- 3/8	-4.3
[illegible]	TAB PRODUCTS CO	13- 20	18	+ 7/8	+5.1
[illegible]	[illegible] CORP	8- 20	9 7/8	+ 1/8	+0.7
[illegible]	[illegible] INC	8- 12	11 3/8	+ 3/8	+3.4
[illegible]	[illegible] INC	50- 87	60	0	0.0
[illegible]	TELEX	40- 95	45 1/8	+ 1/4	+0.3
[illegible]	[illegible] SYSTEMS CP	2- 17	2	0	0.0
[illegible]	TIMEPLEX INC	13- 32	19 1/8	-2 3/8	-11.5
[illegible]	[illegible]	2- 38	1 1/8	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1984-85 RANGE (1)	CLOSE FEB 27 1985	WEEK NET CHANGE	WEEK PCT CHANGE
[illegible]	AMERICAN BUS PRODS	17- 34	26 1/8	+1 1/8	+4.6
[illegible]	BARRY WRIGHT	21- 30	28 1/8	- 5/8	-2.5
[illegible]	DUPLEX PRODUCTS INC	22- 28	28 7/8	0	0.0
[illegible]	ENNIS BUS. FORMS	30- 37	34 7/8	-1 1/8	-3.1
[illegible]	3M COMPANY	69- 90	82 3/8	- 1/2	-0.6
[illegible]	MOORE CORP LTD	20- 32	31 1/8	+ 1/8	+0.4
[illegible]	STANDARD REGISTER	27- 35	33 3/8	+1	+3.0
[illegible]	WALLACE COMP SERVICES	25- 35	27 1/8	- 1/8	-0.4

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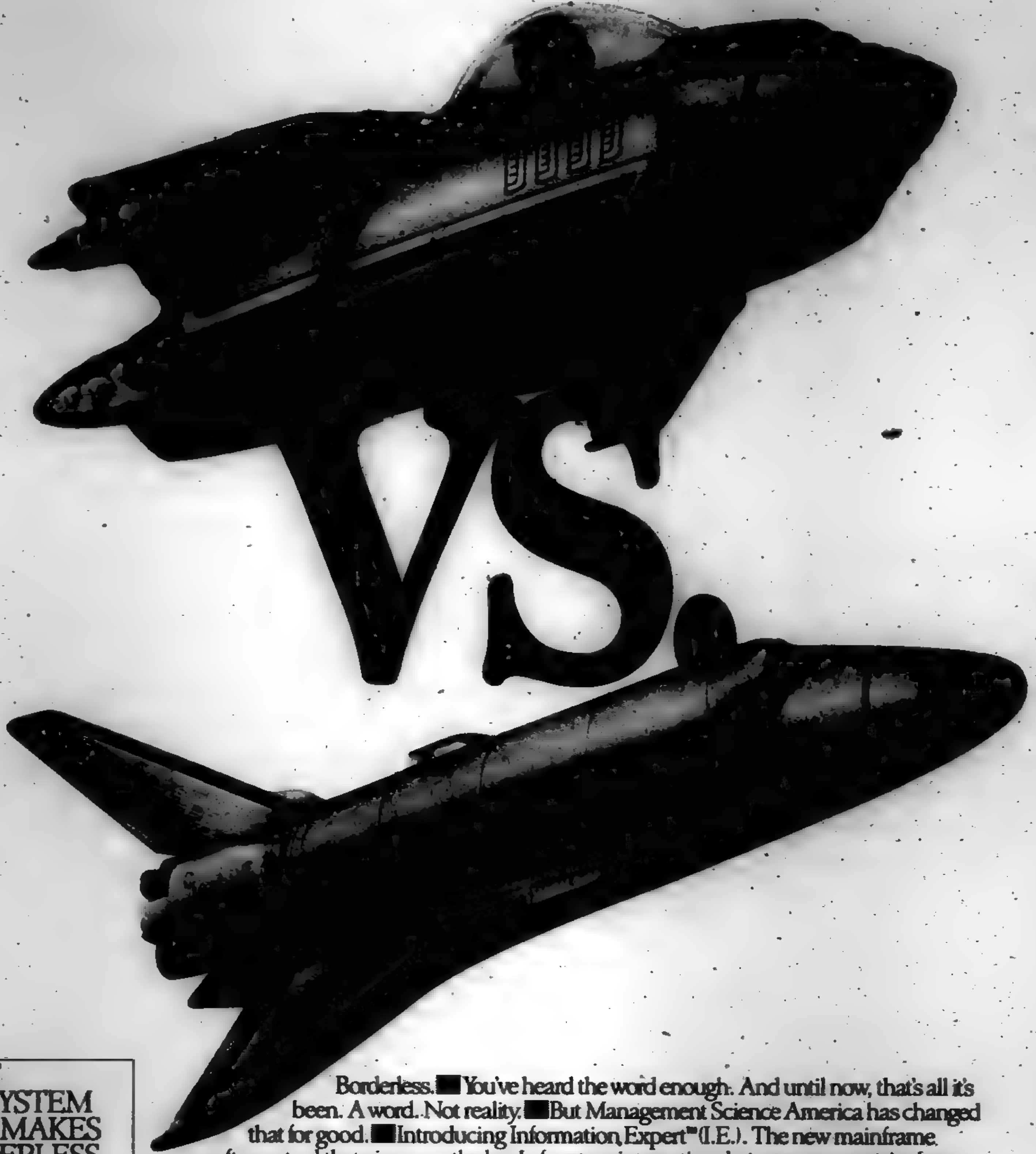

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VOL. XIX, NO. 10

Broken Bell
Regionals ringing in new money/**123**

In Depth
Balderdash! Nonsense! Right on! Readers react
Follows 80

In Depth
Can MIS lead the push for productivity?
ID/25

IBM seeks to end antitrust ruling

By Peter Bartolik
CW Staff

WASHINGTON, D.C. — IBM confirmed last week that it is seeking to terminate a 30-year-old antitrust settlement. Portions of the settlement required that the company halt its lease-only equipment practices.

IBM's action will be opposed by the Computer Dealers and Lessors Association, the trade group representing third-party dealers and lessors who deal primarily in IBM equipment. The members of the CDLA depend on another settlement provision that effectively requires IBM to sell maintenance for used and new IBM machines sold through the third-party market.

Two analysts who closely follow IBM's actions speculated that the company may be pressing the issue to forestall any possibility of a challenge to IBM's practice of not selling large-systems software.

Bob Djurdjevic, president of Annex Holdings Corp. and publisher of the "Annex Computer Report," said IBM's insistence on software licensing, rather than on direct selling, "may lead some parties to conclude that IBM's software practices are in violation

See ANTITRUST page 6

Adapso plan nixed

Micro managers reject software lock-and-key protection proposal

By Edward Warner
CW Staff

NEW YORK — The Microcomputer Managers Association, a group whose members claim to have spent $100 million last year on software for their corporations, has voted to oppose the software copy-protection proposal that the Association of Data Processing Service Organizations, Inc. announced in January.

The Adapso proposal would encourage its member software vendors to use a method of software protection involving a hardware lock and key that would need to be inserted in a personal computer's RS-232 port for the software to run. In a two-page letter sent last week to Adapso, MMA President Alan Gross said, "The MMA outright rejects Adapso's proposal as an infringement on our right to conduct our businesses in a manner we see fit."

The following are among the specific complaints the MMA made against the Adapso proposal:

- "Repeatedly, vendors have modified standards for their own marketing benefit and, in doing so, have introduced considerable incompatibility among systems." Adapso Senior Director

See NO page 6

Execs cite shortage of communications pros

By Paul Korzeniowski
CW Staff

ATLANTA — MIS managers are struggling to handle rapid growth in communications applications with a limited pool of communications technicians.

A random sample of MIS managers delivered that message at Interface '85 here last week.

Wayne Clifton, assistant vice-president at Mellon Bank in Pittsburgh, said, "It is difficult to find employees who understand hardware and software well enough to feel comfortable working with communications protocols."

The communications manager at a Canadian division of a U.S. firm said, "There are plenty of headhunters walking the floor at this show, so there must be a demand for communications professionals."

The chief reason for the shortage of qualified workers is the rapid emergence of the technology. "The technology is so new that few workers have received enough on-the-job training to make them effective communications technicians," reported a communications manager at a Pennsylvania telephone company.

[illegible]

He said there are few places a manager can send an employee for training that substitutes for experience. "The only place where a manager can send an employee for system-level training is to IBM," the manager noted.

Faced with a limited number of qualified employees, data processing managers often rob Peter to pay Paul. Most managers claimed to look first inside rather than outside their companies for communications employees. "We only look outside when we can't find someone in-house," said Clifton, who manages a

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PRODUCT SPOTLIGHT

Micro nets: The next hurdle

Complex connections hinder wide acceptance

By John Dix
CW Staff

Though personal computers are relatively easy to use, interconnecting them in a local-area network can be a laborious task requiring the user to dive in up to his elbows in bits and bytes. This is a task, however, that an ever-increasing number of stand-alone microcomputer users are finding necessary.

The unending arguments about local network access methods, signaling types and network topologies are outmoded, replaced in the personal computer network industry by a new, more important set of problems. These include concerns about server implementations (disk or file, dedicated or nondedicated), file structures and controls that ensure data integrity, security, program sharing and software networking.

The complexity of interconnecting personal computers — in contrast to the ease-of-use features that made micros popular — contributes to the limited acceptance of micro nets. Less than 5% of all microcomputers in business today are networked, according to Kim Myhre, director of communications industry research at International Data Corp., a research firm in Framingham, Mass.

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TOP OF THE NEWS

American Brands, Inc. and Wilson Jones Co. flatly denied charges of software piracy brought by the Association of Data Processing Service Organizations, Inc. and Micropro International Corp. Page 2.

■

No way. That's what Digital Equipment Corp. said to IBM compatibility with its relaunch of the Rainbow personal computer as an office workstation. Page 7.

■

AT&T has targeted large businesses with its Software Defined Network Service. The service will allow portions of a long-distance switched network to be used as part of dedicated internal voice/data systems. Page 10.

■

Accent on icons. Torus Systems, Inc. unveiled its Tapestry software environment as an alternative to IBM's still unshipped PC Network software. Page 100.

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Xerox slapped with second fraud suit in six months

By [illegible]
CW Staff

MILWAUKEE — Two corporations are suing Xerox Corp., charging misrepresentation, fraud and breach of contract.

In the second of two separate suits filed in U.S. District Court here, the Wehr Corp., a Milwaukee-based manufacturing concern, is seeking $10 million in punitive and compensatory damages for what it alleges was intentional fraud and misrepresentation by Rochester, N.Y.-based Xerox regarding the cost and time needed to install a Xerox integrated software system.

A similar suit seeking $4 million in compensatory and punitive damages was filed in October by Polar Ware Co. of Sheboygan, Wis., regarding the purchase of Xerox's Remote Computing Services.

Xerox has filed a written response to the Polar Ware complaint, denying the allegations. A spokesman for Xerox last week said the company was in the process of responding formally to the Wehr complaint.

Filed last month, the Wehr suit stated that in December 1983, Xerox submitted a three-pronged proposal for the installation of an integrated software package on Wehr's IBM 4331 Model Group II. The complaint stated that Wehr specifically required the project to be completed within one year from the date of the contract. Xerox reportedly priced the the software license and design of custom subsystems at $992,875.

No systems implementation

According to the complaint, "not one business application system and necessary custom subsystems [has] been completed and implemented at all Wehr companies, and only 1% or 2% of the entire software system [has been] implemented to date."

Xerox billed Wehr $918,569 for its services and later told Wehr "there was no way in which the Wehr data processing system could be implemented — both in terms of cost and time," the suit said.

A Xerox spokesman said, "The allegations are without merit." Xerox has 20 days from the filing of the suit to respond to the charges.

Specifically defined time frame

The Polar Ware suit filed against Xerox in October centers on the stainless steel products manufacturer's acquisition of an integrated financial and manufacturing control system. According to the complaint, the Xerox proposal specifically provided for the installation and implementation of its Remote Computing Services system and 12 software subsystem applications at the Polar Ware site by Oct. 1, 1983.

Xerox priced the Remote Computing Services system, including hardware, transaction costs and support personnel, at $15,752 per month, according to the complaint. To complete the transaction, it continued, Xerox had said limited peripheral devices would be needed, data on an existing data base would be automatically loaded to the Xerox system and software modification would not be required.

Among its charges, Polar Ware maintained that Xerox is one year late in delivering the system, the average monthly cost has escalated to $22,000 and software is "far from being satisfactorily installed."One year after the agreement was signed, the complaint said, a Xerox representative told Polar Ware "there was no way in which the Polar Stainless data processing system could function as proposed by Xerox — both in terms of cost and type of service."

In its written response to the suit, Xerox said Polar Ware's problems were "caused by [its] own negligence or misuse of the Xerox system." A jury trial has been set for mid-July.

Piracy defendant to challenge 'shrink-wrap licensing'

By Mitch Betts
CW Washington Bureau

CHICAGO — American Brands, Inc. and its subsidiary, Wilson Jones Co., in a filing in U.S. District Court here, denied all charges of software piracy as alleged by the Association of Data Processing Service Organizations, Inc. (Adapso) and Micropro International Corp.

In another development, an Adapso legal memo indicated that negotiations for an out-of-court settlement have begun.

The Adapso suit, part of a software industry battle against illicit software copying [CW, Jan. 21], charged the New York-based American Brands and Wilson Jones, based here, with 20 counts involving copyright and trademark infringement and with breach of licensing agreements from the unauthorised copying of three Micropro products: Wordstar, Mailmerge and Spellstar.

Answering the complaint late last month, American Brands and Wilson Jones denied each charge with little elaboration. The filing did hint that the defendants plan to challenge the software industry's practice of "shrink-wrap licensing," where users purchase software and, by the action of tearing open the package, agree to a license agreement that forbids copying.

American Brands and Wilson Jones argued that Micropro's "purported license agreements ... were not agreed to by Wilson Jones, ... are not enforceable because Wilson Jones was the owner of the subject computer programs and instruction manuals ... [and] ... are null and void as contrary to public policy."

In the suit filed by Adapso and Micropro, the complainants said that upon acquiring and opening the software packages, Wilson Jones became bound by the terms of Micropro's End-User Program License Agreement printed on the packages.

Apple calls one-week halts

CUPERTINO, Calif. — Apple Computer, Inc. announced last Thursday it will halt manufacturing operations for staggered one-week periods this spring to reduce an inventory backlog.

The company said it will shut down its three Apple II facilities March 18-22 and will shut down its Macintosh facility April 8-12. The company in January had warned of increasing dealer inventories and last week reported that sales continued to be soft.

Apple said it will ask employees to use accrued vacation time during the shutdown.

[illegible]

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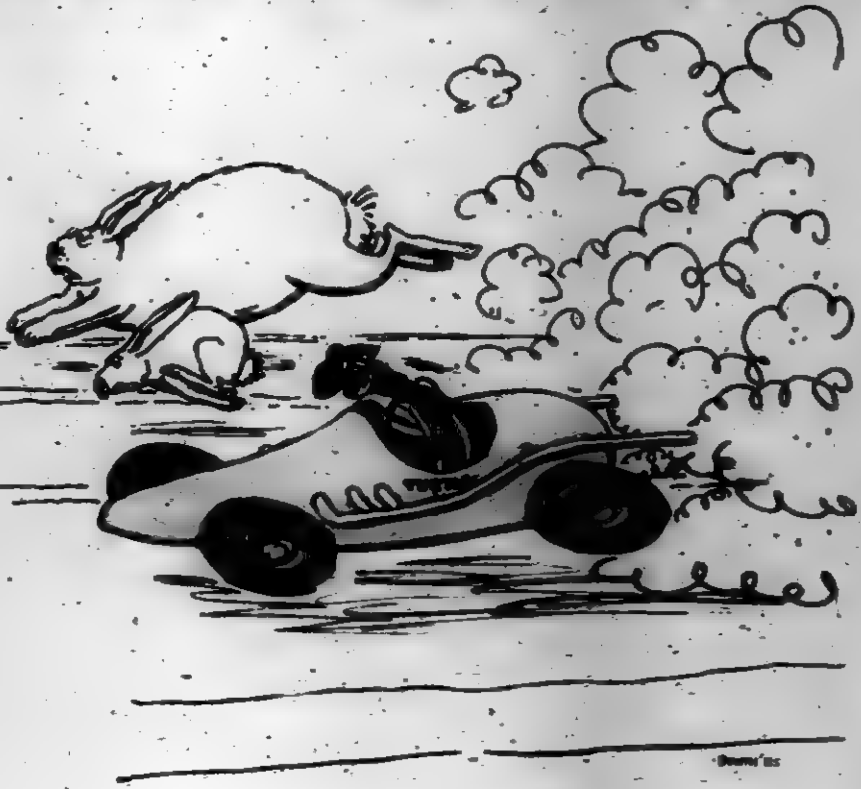

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CW 3/11/85

*IBM Software Environment/CICS Marketplace Study, September 1984.

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IBM offers dual-processor desktop models of Series/1

By Eric Bender
CW Staff

RYE BROOK, N.Y. — IBM last week unveiled two desktop models of its Series/1 minicomputer — dual-processor systems that also run IBM Personal Computer programs.

The new systems will run existing Series/1 applications and can support up to four IBM 3101 terminals and two printers or operate as micros after restarting, IBM said. They combine a CPU card built around a Series/1 microprocessor and an attachment card with either a Personal Computer AT or modified Personal Computer XT.

The IBM Series/1 5170 Model 495 processor is based on a Personal Computer AT and features 512K bytes of random-access memory (RAM), a 20M-byte hard disk drive, a floppy disk drive that stores 1M byte of Series/1 files and 1.2M bytes of PC-DOS files, four RS-422 ports and two RS-232 ports. Limited shipments will be made in November, but general availability is not scheduled until the first quarter of 1986. With monochrome display and adapter, the system costs $9,420.

Scheduled for July delivery, the Series/1 4950 is built around a Personal Computer XT modified to meet greater cooling requirements. It comes in two models, both with 256K bytes of RAM and four peripheral ports, IBM said.

The 4950 Models A, B

The 4950 Model A has a 10M-byte hard disk drive and a floppy disk drive, which handles 320K bytes of Series/1 files and 360K bytes of PC-DOS files. It costs $8,130 with monochrome display and adapter. The 4950 Model B provides one floppy disk drive. Options include a second floppy disk drive and the IBM 5161 Model 3 expansion unit with two 10M-byte hard disk drives. A 4950 Model B configuration with monochrome display and adapter plus the expansion unit costs $10,420.

The machines run under versions of EDX and RPS, the two main Series/1 operating systems. All Series/1 applications written for those operating systems execute on the desktops, subject to memory requirements and support of specific peripherals, an IBM spokesman said.

EDX Version 5 is priced at $750, and RPS Version 7 costs $2,800. Programs for the 4950 will be available in July; 5170 Model 495 programs will be offered in the first quarter of 1986.

A separate Series/1 I/O Executive program controls I/O when the systems are in Series/1 mode. Available in May, the program costs $650.

Switching between Series/1 and Personal Computer modes requires rebooting the computer, IBM noted. Users are able to partition the hard disk drives to store both Series/1 and Personal Computer files, but no facilities have been added to convert files between the two environments.

IBM also introduced a dot matrix printer, the Model 4971, for the new desktops. The system, which offers bidirectional printing with a maximum speed of 120 char./sec, costs $700 and will be delivered in July, the company said.

IBM Information Systems Group is located at 900 King St., Rye Brook, N.Y. 10573.

Series/1 software debuts

IBM also bolsters existing packages

By John Gallant
CW Staff

RYE BROOK, N.Y. — In conjunction with the introduction last week of two desktop versions of its Series/1 processors, IBM announced additional software packages and enhancements to existing software for the Series/1.

The software introductions include the following:

- The Series/1 IX, an AT&T Unix System V-based operating system designed to allow users of the IBM 4956, the largest Series/1 processor, to run Unix applications.
- The Transaction Processing System, which includes programs for medium- and large-scale Series/1s that are said to simplify the development of transaction-oriented applications.
- Enhanced versions of the two main Series/1 operating systems, EDX and RPS, which support expanded capabilities announced earlier for IBM's high-end 4956. IBM also announced versions of the enhanced operating systems designed to run on the desktop Series/1 processors.

An IBM spokesman described the Series/1 IX as a multiuser, time-sharing operating system featuring a flexible command language, device-independent I/O, a hierarchical file system, program development and document preparation tools and file and source code controls. Series/1 IX also features file and record locking and a file protection system. Because the product is based on System V, it is compatible with the recently announced IX/370 VM implementation of Unix.

The EDX and RPS versions of IBM's Transaction Processing System are said to be applications development systems that provide programming tools to assist in the development of transaction-oriented end-user applications.

Version 5 of EDX and Versions 7 and 7.1 of RPS support the expanded processing and partitioning capabilities announced last year for Series/1 high-end 4956 Models E and 60E. Version 7 is said to support a uniprocessor Series/1 configuration, and Version 7.1 supports multiprocessor configurations.

Separately, IBM announced products that will permit larger Series/1 systems to act as gateways for the IBM PC Network, according to the vendor. The products, a pair of IBM Series/1-to-Personal Computer channel attachment cards and a Series/1-PC Connect program, reportedly will allow Personal Computers on a PC Network to use the 4954, 4955 and 4956 Series/1 processors to communicate with other PC Networks or with IBM mainframes.

Data can be transmitted from Personal Computers on the local-area network to the Series/1 at speeds of up to 400K bit/sec, according to IBM. Combined with IBM's PC Network Systems Network Architecture 3270 Emulation Program, the offerings will permit a Personal Computer on the network linked through a Series/1 to appear to a host computer as a 3270 terminal, an IBM spokesman said.

Version 5 of EDX for the desktop processors has a one-time charge of $750, and Version 7 of RPS for the same systems has a one-time charge of $2,800. Both will be available in July for the IBM Series/1 4950 desktop unit and in the first quarter of next year for the Series/1 5170 Model 495.

Both the EDX and RPS versions of the Transaction Processing System have a one-time charge of $2,950. The former will be available this month and the latter in April. Series/1 IX will be available in September at a one-time charge of $6,500. Version 5 of EDX, with a one-time charge of $2,200, and Version 7 of RPS, with a one-time charge of $10,000, are scheduled for shipment this month. Version 7.1 of RPS will be available in July at a one-time charge of $12,500.

Price of the Series/1-to-Personal Computer cards and connecting cable is $3,700. The Series/1-PC Connect program will cost $400. Both will be available in July, IBM said.

IBM is located at 900 King St., Rye Brook, N.Y. 10573.

Options spur Series/1 appeal

By Tom Henkel
CW Staff

An attractive option for current users of IBM's Series/1 line of processors — that is how industry analysts viewed last week's desktop Series/1 processor announcements. The additional software capabilities and the ability to link full-size models of the Series/1 processor with the IBM PC Network indicate IBM's intent to keep the Series/1 viable as a distributed processing product, industry watchers said.

IBM said the desktop models were designed mainly for current Series/1 users with small satellite offices where the $30,000-plus, full-size Series/1 processors could not be justified.

The newly announced systems have some limitations, however. An IBM spokesman explained that although the Series/1 5170 Model 495 and Series/1 4950 are capable of running applications developed for larger Series/1 processors, users of the desktop models are limited to applications capable of running with less than 512K bytes of main memory. The full-size Series/1 models can accommodate up to 2M bytes of main memory. Furthermore, the spokesman said, the desktop models cannot be used for the sensor-based applications commonly used in factory automation.

For current Series/1 users, the desktop models may be attractive, said Sandy Gant, an analyst with Infocorp, a market research firm in Cupertino, Calif. Noting that the desktop models cost roughly a third of the price of the full-size Series/1 models, Gant said the significant communications software offered on the Series/1 will be attractive.

Further use of the board-level Series/1 processor that IBM introduced with the announcement may develop from the desktop Series/1 models. Noting that IBM already has a strong OEM clientele for the Series/1, Peter Lowber an analyst for the Boston-based Yankee Group market research firm, said an OEM board-level version of the product could prove to be a hot seller.

Lowber said the software enhancements for the larger versions of the Series/1 are keeping with IBM's apparent intent to boost the transaction processing capabilities of the Series/1 line and provide IBM microcomputer users with as many interfaces to larger systems and communications environments as possible.

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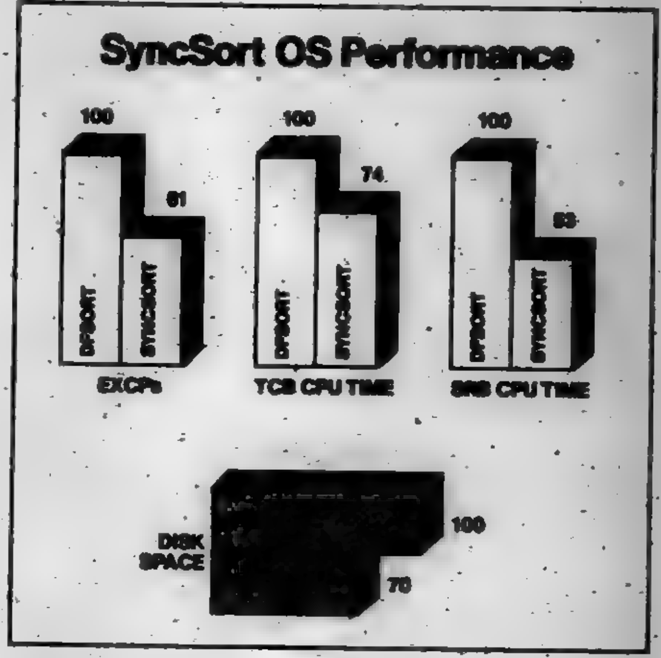

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of the consent decree," he said.

Frederick T. Withington of Arthur D. Little, Inc. said systems software is increasingly important to IBM and generates more than $3 billion in revenue. "A lot of people have noticed they are effectively tied in or locked in. . . . They are obligated to pay but still [do] not own the product," he said.

CDLA representatives are expected to meet with Justice Department officials possibly as early as this week to voice concerns over the issue, according to CMI Corp. President Edward Cherney, chairman of the CDLA's IBM Relations Committee.

At the center of the developing controversy is the judgment commonly known as the 1956 Consent Decree. The decree ended a government antitrust suit against IBM and, most significantly, included IBM's agreement to stop its lease-only practice and to sell computer equipment outright at terms no less favorable than in leases.

Kurt Shaffert, an attorney with the Justice Department's Antitrust Division, said the division is reviewing two IBM antitrust settlements. He said a formal program was initiated two years ago to reevaluate a large caseload of civil judgments to determine "if they make sense in light of current circumstances to remain in effect or whether to recommend to the court that they be modified or terminated." It would be up to IBM actually to request court action.

The Antitrust Division is reviewing a 1936 decree barring IBM from discriminating against equipment customers who bought tabulating cards from companies other than IBM. The division is also reexamining the 1956 decree that requires IBM to sell equipment and to adhere to a number of other provisions.

Shaffert said the division welcomes comments from interested parties on the impact of modifying or terminating the consent decree.

IBM spokesman Lyle Maguire said the company believes that the 1956 judgment "is totally outdated and totally irrelevant." He said IBM has been providing information to the Antitrust Division for some time.

Additional decree provisions

In addition to the requirement that the company sell machines outright, Maguire said the consent decree also requires IBM to provide equipment purchasers with services similar to those received by equipment lessees. The consent decree also calls for IBM to provide repair and replacement parts at reasonable prices. Some provisions of the agreement were only in effect until 1961, he added.

The CDLA, whose members participate in the thriving industry of buying, leasing or reselling IBM equipment, is attempting to determine exactly what elements of the 1956 decree were permanent, Cherney said last week. When that is accomplished, "we will try to analyze why IBM is trying to overturn it," he said. Cherney said he had specific concerns but did not want to voice them until obtaining clarification of what provisions would remain in effect.

CDLA members were briefed at the association's spring meeting held last month and received a report on a meeting CDLA officers held with IBM in late January. Sources said the CDLA told IBM it will vigorously fight any attempt to terminate the consent decree and that the association is particularly concerned about the issues of nondiscriminatory maintenance and pricing.

Annex Holding's Djurdjevic said the decree required IBM to continue offering maintenance for its equipment for a number of years after certain products are discontinued. He claimed that eliminating the provision would boost marketing of newer IBM products and would also add to IBM's profits. The ability to obtain IBM maintenance of used equipment is a vital asset to lessors and dealers in the reselling of used equipment.

IBM in recent years has discouraged direct leasing or rental of hardware and, with approximately 90% of hardware revenue generated through sales, it seemed unlikely to revert to an aggressive rental policy.

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of Public Communication Dave Sturtevant, said, however, that no Adapso member would be required to use the protection scheme if Adapso was to approve it.

- The installation of hundreds of thousands of hardware keys on systems around the country "would be a logistical nightmare, costly and time-consuming."
- Employees using the same software on several personal computers — when permitted by copyright — would be forced to carry several hardware keys with them or purchase duplicate keys for each computer.
- "The proposal does not address multiuser systems."

The letter also called "grossly overstated" Adapso's claim that half of all software in use is bootlegged and charged that those truly interested in breaking the protection scheme would eventually be able to do so.

Should the Adapso proposal be approved, Gross said it would be "up to individual members to speak with their purchasing dollars. And they intend to." Gross said the MMA members represent a group of Fortune 500-size firms that will spend a total of $200 million on software this year.

The letter, sent to Adapso's Sturtevant, requested a meeting be set up between the two groups to work out their differences and also suggested the use of site licenses as a copyright protection alternative for corporate users.

Versions of site licenses permit users to pay a flat fee for unlimited copies of a program or to use the program on a local-area network.

Sturtevant, meanwhile, called the MMA's decision "somewhat irresponsible," adding, "I think it's kind of interesting that [it] gave [the proposal] such short shrift." Sturtevant said Adapso had sent the proposal to the MMA hoping that it would review it and send back comments. "It appears [that the MMA has] decided to short-circuit that process," he said.

Will MMA members refuse to buy?

As to whether the MMA members might refuse to buy software incorporating the proposed protection scheme, Sturtevant he said, "Corporate America would find it difficult to turn its back on the best solutions these [vendor] companies are providing."

Adapso is a trade organization representing service bureaus and the vendors of computer products, training, turnkey systems and software. Sturtevant said approximately 120 personal computer software vendors hold Adapso membership, including Lotus Development Corp., Ashton-Tate, Micropro International Corp. and Microsoft Corp.

The letter, Gross reported, is the outgrowth of two MMA meetings on the proposal. The 40 members of the MMA voted 39 to 1 to oppose the proposal at a meeting last month, he said.

In the letter, one unidentified MMA member was quoted as having expressed the opinion of the organization when he said, "Adapso's proposed software protection, if adopted, would certainly have a negative impact on the way in which we do business."

The MMA is one of 10 independently managed associations of corporate microcomputer managers in the U.S.

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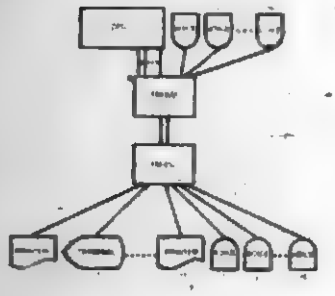

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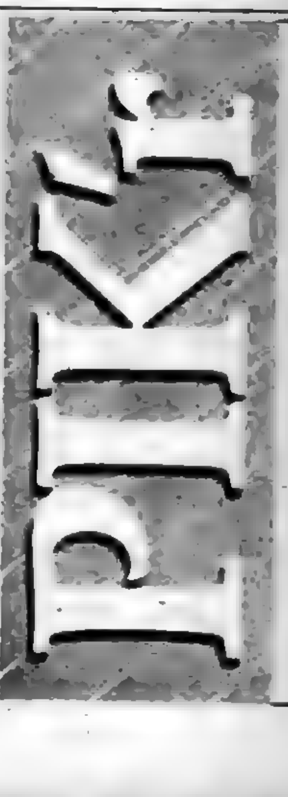

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DEC relaunches Rainbow as office workstation

Firm rolls out tools for desktop micros

By Eric Bender
CW Staff

MERRIMACK, N.H. — Three weeks after acknowledging that demand for its Rainbow personal computers was so weak that production lines were being shut down, Digital Equipment Corp. has reintroduced the high-end Rainbow as an office workstation.

DEC also unveiled a common suite of word processing and other office packages for its three desktop microcomputer lines, designed to boost links between those machines and VAX superminicomputers, and launched Decnet communications software for the Rainbow.

While approving these efforts to boost common office functions across DEC's product family, analysts generally paid more attention to DEC's continuing refusal to introduce a microcomputer compatible with the IBM Personal Computer.

"Anyone can make an IBM-compatible machine," DEC President Kenneth Olsen insisted at last week's presentation here. "A harder job is integrating personal computers into an organization to do useful work."

> *'[DEC is] not accepting that there is a de facto standard. The game is over, and the customer wants an IBM [machine].'*
>
> **— George Colony**
> **Forrester Research, Inc.**

Integrating the Rainbow more tightly with other DEC systems represents a good move for DEC, but the overall announcement "reiterated the strategy of three years ago," commented George Colony, president of Forrester Research, Inc. in Cambridge, Mass. "They're not accepting that there is a de facto standard" for personal computers, Colony said. "The game is over, and the customer wants an IBM [machine]."

Michael Geran, vice-president for research at E. F. Hutton & Co. in New York, agreed that the lack of an IBM-compatible personal computer will limit sales, particularly outside DEC's existing customer base. The office software enhancements represent "a step forward but not a major step," Geran said.

Priced at $6,495 and scheduled for July shipment, the Rainbow 190 combines DEC's existing Rainbow 100+ — with 640K bytes of random-access memory (RAM), 10M-byte hard disk drive, keyboard and monochrome monitor — with Rainbow Office Workstation and WPS-Plus/Rainbow software packages.

Rainbow Office Workstation, available separately for $495, reportedly provides user menus consistent with DEC's VAX/All-in-One Office and Information System. The package also gives an interface for word processing and electronic mail functions, according to DEC.

Among its features are VAX/VMS mail system capabilities, including automatic mail notification, pickup and delivery; the ability to back up Rainbow files on the VAX automatically; and conversion of data downloaded from the VAX into Data Interchange Format and Sylk formats. The package requires 256K bytes of RAM, a hard disk drive and Microsoft Corp.'s MS-DOS 2.11.

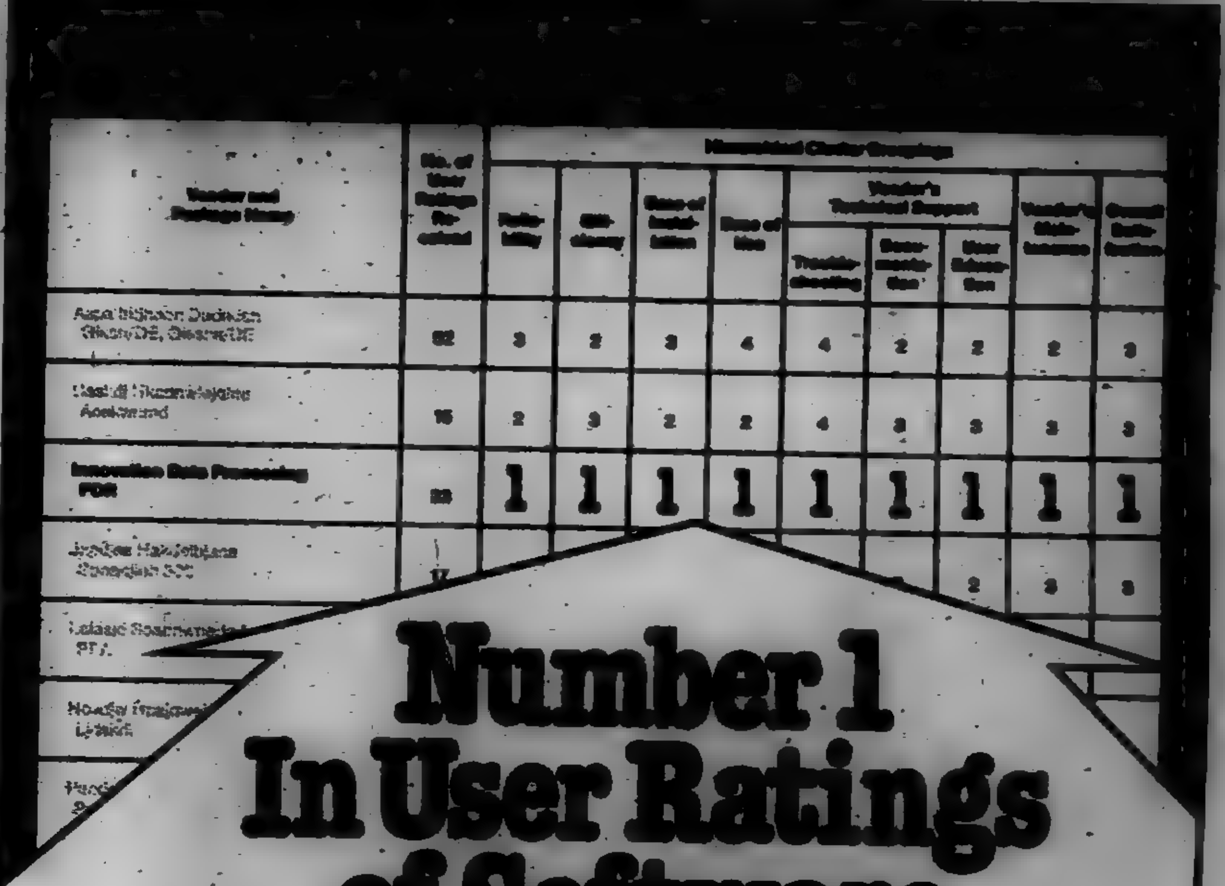
The WPS-Plus/Rainbow word processing package is compatible with the Decmate WPS and VAX WPS-Plus/VMS word processing applications and offers menus consistent with All-in-One, DEC said. WPS-Plus/Rainbow documents can be interchanged with Decmate WPS documents via floppy diskette. Other features include the ability to transfer data from third-party applications to WPS-Plus/Rainbow and to convert WPS-Plus documents to MS-DOS files. The program, which requires 384K bytes of RAM and MS-DOS 2.11, will be available in June for $595.

Decnet-Rainbow is a $295 communications software package giving Rainbow users access to most Decnet functions, according to the company. Connected to the network via a VAX multiplexer or Decnet router, the Rainbow can act as a Decnet end node, company officials said. Scheduled for September shipment, the package will support remote file procedures, resource sharing and VT100 terminal emulation.

DEC also announced enhancements of Office Workstation software for the Decmate and Professional. Decmate Office Workstation, Release 2.0, will be available in July for $395. Pro/Office Workstation, Release 1.4, will be priced at $995 and shipped next month.

In addition, DEC introduced third-party applications for the Rainbow. Lotus Development Corp.'s Symphony and Ashton-Tate's Dbase III are both priced at $695 and scheduled for March 18 availability.

DEC is headquartered in Maynard, Mass. 01754.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IBM offerings sidestep DOS, but users sticking with it

By John Desmond
CW Staff

CHATTANOOGA, Tenn. — All that IBM's recent blizzard of software announcements [CW, Feb. 18] did for one die-hard DOS/VSE user here was to increase the pressure to move to MVS/XA, an operating system it does not want.

Olan Mills, Inc. of Tennessee, a national chain of portrait photographers based here, runs DOS under VM on its 3083 and 3033 mainframes. Like many users of DOS, IBM's most popular mainframe operating system, Olan Mills finds the business case for converting to MVS/XA hard to justify, according to Peter Clark, systems programming administrator at Olan Mills.

Clark said in a recent interview that for the same functionality he has now, it would cost $2 million for him to convert to MVS/XA. He added that his monthly software costs would triple. "You're losing as much as you're gaining, and you pay significantly more for it," he said of a DOS-to-MVS/XA conversion. "The announcements don't do much for the DOS user except allow a better [less expensive] migration to MVS/XA."

The absence of any mention of DOS in the recent IBM announcements has reinforced the view of industry watchers who believe that IBM cannot continue to commit resources in support of more than two major operating systems. The analysts say IBM is subject to the same pressures that are pushing companies like Sperry Corp. and NCR Corp. away from proprietary operating systems and toward an industry standard such as AT&T's Unix.

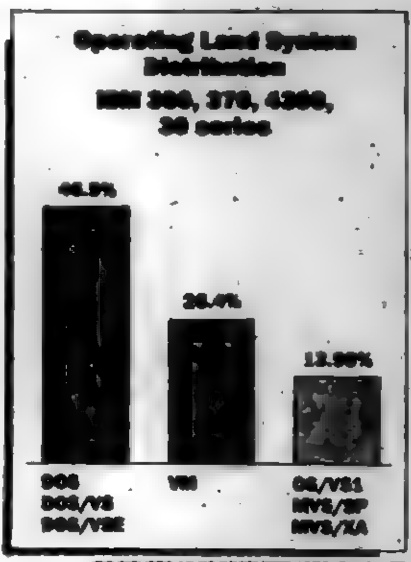
"It comes down to pure economics. It costs a bloody fortune to do the maintenance for an operating system," said Marc Butlein, a vice-president with Gartner Group, Inc., a consulting firm in Stamford, Conn.

"I think IBM believes VM will eventually be the operating system that goes from the bottom to the top," Butlein said. "VM would represent a migration path for current DOS/VSE users. I think by the end of the 1980s we will see the end of support for DOS/VSE. The DOS users of the [1980s] will be the VM users of the [1990s]."

But DOS has not been left entirely out in the cold yet. A new version of DOS, VSE/SP Version 2.1, was announced a year ago and is scheduled to begin shipping next month. The new version answers user demands by increasing virtual address space from 16M bytes to 40M bytes.

"That should confirm our commitment to DOS," an IBM spokesman said of the new release, adding that DOS "is still one of our largest installations, is growing and will continue to grow."

The big growth years for DOS were from 1979 to 1984, when the number of processors running it increased by 800%, according to International Data Corp. (IDC), a Framingham, Mass.-based market research firm, DOS, DOS/VS and DOS/VSE are used by 46.9% of IBM 360 and 370, 4300 and 30 series users, in IDC's estimation (see chart).



IDC FIGURES AS OF DECEMBER 1984; CW CHART

Totals do not include operating systems running as guests under VM

But the big growth years have passed. As companies using VSE grow in size, the demand for virtual address space and more efficient I/O increase. Many users upgrade to VM and run DOS/VSE as a guest, and some upgrade directly from VSE to MVS, IDC said. In a 1984 survey of 217 IBM 4331, 4341 and 30 series users who upgraded operating systems, IDC found that 49.1% chose VM, 20.3% chose MVS/XA, 11.4% chose MVS/SP and 8.1% chose DOS/VSE.

DOS is popular because it requires less hardware and less training and costs less than MVS or VM with guest operating systems, observers said. DOS does not have all the facilities of MVS, such as built-in Dasd management, but according to Philip Dorn, president of New York-based Dorn Computer Consultants, Inc., "DOS/VSE runs like a bat out of hell."

In native mode, VSE runs only on machines up to and including the IBM 3033. On the 3081s, 3084s and now 3090s, VSE is supported only under VM, because those processors use a 4K-byte memory page instead of the 2K-byte memory page used by VSE. IBM has not indicated whether it will announce 4K-byte paging for VSE on the larger processors.

Software tides over DOS user in meantime

WAUKESHA, Wis. — One DOS/VSE user at a municipal service agency, who believes that IBM will eventually merge the capabilities of DOS and MVS, satisfies 250 users in the meantime with the help of third-party data base software.

John Ernst, data processing director at the Southeast Wisconsin Regional Planning Commission here, runs DOS/VSE under VM on his IBM 4381 Model 1.

Ernst's problem is keeping his 250 on-line users happy within the 16M-byte virtual address space of DOS/VSE until the dust settles. His strategy is to buy Applied Data Research, Inc.'s (ADR) Datacom/DB data base to free virtual storage space.

Ernst now has 650 Vsam files on-line, each defined to CICS and each consuming virtual storage. With the data base, all Vsam files can be defined to the data base, and the data base manager controls access to the 650 files. Thus 3M bytes of virtual address space will be freed. "I can hold out for another 18 months," using the ADR data base, he said.

When VSE/SP 2.1 ships, Ernst said he plans to buy it to obtain a 40M-byte virtual address space, even though, he said, the new release will have slower performance beyond 16M bytes. "With 250 terminals, I can't afford to lose performance," he said, but other advantages of VSE/SP 2.1, like a conditional capability in JCL and a new system library structure, make it attractive.

With MVS, he conceded, "I would get more work out of my machines because I'm at the limit of what DOS can handle."

DOS' future may include MVS merger

Where does DOS fit into IBM's future plans?

Mark Combs, vice-president of development at software vendor Computer Associates International, Inc. of Jericho, N.Y., said he believes the role of DOS will be to complement MVS.

The area of overlap is getting smaller between the two systems, so much so that DOS is seldom run on a 3083 mainframe or above, and MVS is seldom run on a 4381 or below, he said. Rapidly growing shops will have to move to MVS eventually to support a larger configuration, but for entry-level and distributed processing systems, "DOS is the perfect solution," he said.

DOS is strong in the marketplace, and one indication of that strength is the greater availability of DOS third-party software, according to Gordon Thomas of Davis, Thomas and Associates, a Minneapolis-based consulting and contract programming firm.

"I've been working with DOS since 1972, and there's more [third-party software] available now than there's ever been," both in utilities packages and business applications, Thomas said. "I don't see it diminishing," he said.

Analyst Bennett I. Moyle, president of B. I. Moyle Associates, Inc., a systems programming and consulting firm in Minneapolis, said when VSE/SP 2.1 ships and VSE users gain their 40M-byte address space, the migration to VM will slow down. VM does allow systems programmers and production workers to work side by side without interfering with each other.

See DOS page 9

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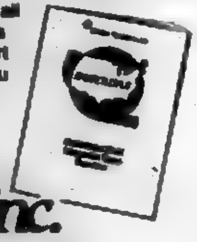

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VDT shield introduced

Industry association questions necessity

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — A VDT radiation shield, said to block 98.5% of low-frequency electromagnetic waves emitted from VDT screens, was introduced in the U.S. last week.

A computer industry group immediately called the product introduction "very irresponsible," charging that scientists have not proven that such low-level radiation is harmful to humans (see story on right). Sentinel Biotech Products of Hyannis, Mass., a division of Packaging Industries Group, Inc., demonstrated the Sentinel VDT Bodyguard at a news conference here, featuring the product's Japanese inventor Kenichi Noda and a nuclear chemist at the University of Waterloo in Ontario, Hari D. Sharma.

The VDT Bodyguard is an acrylic screen that is attached to the VDT. It contains wire mesh connected to a ground wire "that continually drains the electrical charges collected by the system," the vendor said.

The product is now available directly from Sentinel, a spokesman said, and will be available in retail computer stores by this summer. Mitsubishi International Corp. has been selling the product in Japan since October 1984. The shield costs between $160 and $260, depending on the size and quantity purchased.

Sentinel is located at One Sentinel Plaza, Hyannis, Mass. 02601.

DOS from page 8

However, for users looking for minimum systems programming and hardware to solve business programs, VM is inconsistent with DOS, Moyle said.

IBM has stated that while it will enhance DOS virtual address space, it does not intend to provide DOS with the 31-bit addressing capability of its Extended Architecture.

In a statement issued in February 1984, IBM reported, "MVS provides the facilities for the exploitation of large-systems hardware technology, including 31-bit addressing."

IBM continued, "IBM does not intend to implement these facilities in a VSE product. VSE customers experiencing high growth rates should plan to migrate to MVS."

The latest IBM emphasis on VM and MVS/XA should serve as a warning to DOS users, according to Shaku Atre, president of Rye, N.Y.-based Atre International Consultants, Inc. "If I had DOS installed in my environment, I might be a little worried about support from IBM," she maintained.

Atre added, "If IBM could have its way right now, I think it would love to get rid of DOS. Maintaining three operating systems is expensive for IBM."

Notwithstanding the incentive to buy MVS/XA, an IBM spokesman said DOS users "really don't have anything to worry about."

[illegible] 'irresponsible'

[illegible] radiation is very [illegible] for manufacturers."

Cbema has [illegible] that dozens of studies by public and [illegible] have found no link between health problems and VDT radiation.

Cbema cited a [illegible] report by Canada's Minister of National Health and Welfare that stated, "On the basis of the available scientific data, the [extremely low-frequency] emissions from VDTs are unlikely to be of any [illegible] health implications.

The report also added, "This is because the [illegible] of the magnetic field are [very] low, well below the [illegible] that have been shown to produce biological effects."

A spokesman for Sentinel said the firm acknowledges that scientists have not proven that low-level electromagnetic radiation is unhealthy but said that labor unions and media reports continue to raise questions about the radiation hazards of VDTs. Referring to the new shield, he said, "The product is there for the people who want to buy it.

"We don't claim VDTs are a health hazard. It's up to other people to decide that. We're promoting a product to the market," the vendor spokesman said under questioning.

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AT&T sets net service

Charges based on usage, local rates

By James Connolly
CW Staff

WASHINGTON, D.C. — AT&T Communications has announced a voice/data network service designed to let large-business customers establish 9.6K bit/sec links on a switched as-needed basis rather than through dedicated lines.

The company filed a tariff last week with the Federal Communications Commission to offer its Software Defined Network Service beginning in the third-quarter of this year.

Customers with geographically dispersed operations reportedly can use a dumb terminal on their premises to control call routing through the service. A spokesman said customers would first order lines from their facilities to any of 600 AT&T offices. He said digital and analog links would be switched through the more than 100 AT&T No. 4 Electronic Switching Systems running the service in AT&T offices nationwide.

Customers would pay only the existing monthly cost of the local switched or special access connections and AT&T long-distance charges according to usage rather than by the full monthly rate for a Dataphone Digital Service private line.

Proposed business-day charges for a 292-mile connection begin at 21 cents for the first 30 seconds and 0.8 of a cent for each additional six seconds plus local-access charges. Maximum charges, for links of 4,200 miles, would be 45 cents for the first 30 seconds plus 4 cents for each additional six seconds, including local-access charges.

Other features, chosen from a menu at additional cost, include authorization codes allowing special calling privileges for selected employees, call screening, network intercepts, call reporting and a gateway providing private network access using seven digits rather than 11 digits.

AT&T is located at 295 N. Maple Ave., Basking Ridge, N.J. 07920.

Networking tools steal show

CW AT INTERFACE '85

By Paul Korzeniowski
CW Staff

ATLANTA — Networking product debuts stole the show at Interface '85 here last week.

Proteon Associates, Inc. introduced Pronet-80, a token-passing, star network that connects up to 240 Digital Equipment Corp. Unibus or Intel Corp. Multibus processors. Processors can be connected through shielded twisted-pair or fiber-optic cable.

The product, which features a transmission speed of 80M bit/sec, could be used as a backbone for several local-area networks, a high-speed graphics data transmitter or a host-to-host transmission system, the vendor said.

Problem detection scheme

The network is software compatible with Proteon's Pronet-10, a 10M bit/sec network. Pronet-80 features a problem detection scheme that bypasses a failed node.

The product's error-detection scheme corrects parity errors. It inserts a format error message in a host interface so that by polling the network, an operator can determine where the error has occurred.

The network costs $8,000 per node. Proteon is located at 4 Tech Circle, Natick, Mass. 01760.

Infotron Systems Corp. unveiled Infostream 1500, a T1 multiplexer that interfaces with the company's IS4000 matrix switch to supply networking functions with a transmission speed of 1.544M bit/sec.

The time-division multiplexer can be used in single- and dual-link point-to-point, drop-and-insert or ring configurations, according to the vendor.

With IS4000, Infostream provides a multinode network capable of integrating 30 multiplexers at each node. The product handles up to 128 voice/data channels.

Supports 24 voice channels

Infostream 1500 supports multiple-node voice multiplexing through either Pulse Code Modulation (PCM) or Adaptive Differential Pulse Code Modulation (ADPCM).

PCM supports 24 voice channels and can be used to pass high-speed analog modem signals through a system. ADPCM supports 44 voice channels, according to the vendor.

A vendor spokesman said that the product works with high- or low-speed data transmission. At low speeds, channels are provided for asynchronous or synchronous data transmitted at rates from 50 to 19.2K bit/sec.

The product supports asynchronous data with code structures of five, six, seven or eight data bits and one, 1½ or two stop bits. Up to four duplex control signals per channel can be passed through the T1.

For high-speed transmission, the product supports 56K, 112K, 224K, 448K, 672K and 768K bit/sec transmission.

Infostream 1500 is software controlled through a central console and provides remote channel monitoring. If a link fails, a user can dynamically reallocate bandwidth, the vendor said.

A 64-channel system costs $45,000 and a 128 channel system sells for $78,000. Infotron is located at Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

Avatar Technologies, Inc. has added MPA 6000 to its line of protocol converters. The product links up to 28 asynchronous devices to either IBM or Sperry Corp. mainframes.

MPA6000 can be configured to support IBM Systems Network Architecture and Bisynchronous or Sperry Uniscope protocols, the vendor said.

Provides terminal emulation

The converter supplies six asynchronous and two synchronous ports, each capable of operating at a speed of 19.2K bit/sec.

The ports can be configured to provide terminal emulation, printer mimicking or asynchronous access to a minicomputer or public data network.

DEC, Televideo Systems, Inc., Lear Siegler, Inc. and Hewlett-Packard Co. Ascii terminals can be used to emulate IBM 3278 or a Sperry UTS 20 or 30 terminal. A printer can mimic an IBM 3287 printer.

MPA6000 costs $5,000. Avatar is located at 99 South St., Hopkinton, Mass. 01748.

Automation viewed

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Special Report [illegible] take one of two forms: [illegible]

[illegible]

Net management, control a growing business concern

CW AT INTERFACE '85

By John Dix
CW Staff

ATLANTA — "The network is a key element in business today. Without it you often don't have anything to process. If your network goes flaky, you're in trouble."

That statement was made by the manager of internal communications for an East Coast telephone company, who wished to remain anonymous. He was responding to an informal survey conducted by *Computerworld* at Interface '85 here last week.

Networks are becoming as important a strategic business asset as the computing resources they interconnect, a fact that is spurring a great deal of interest in network management and control, attendees said.

The strategic importance of networking seems to be growing in proportion to the growth in network complexity — which drives interest in net management and control.

"Networks are getting tremendously complicated, with great numbers of devices and types of devices all trying to talk together," said David Butler, manager of data communications for R. J. Reynolds Tobacco Co. in Winston-Salem, N.C.

Today, there are three main schools of thought on how to manage networks: using host-based software facilities such as IBM's Network Communications Control Facilities (NCCF); using network add-on systems such as those marketed by companies like Avant-Garde Computing, Inc. of Mount Laurel, N.J.; or using a combination of these approaches.

The problem is that today's host-based software facilities are cumbersome, and network add-on products — while user-friendly — are expensive, according to communications managers.

> ”
>
> *Nets quickly are becoming as important a strategic business asset as the computing resources they connect.*

All users contacted were universal in their dissatisfaction with IBM's NCCF products. "It's good software, but it needs improvement," said Dick L. Watson, data communications manager for R. J. Reynolds Industries, parent company of R. J. Reynolds Tobacco.

"When an alert comes up, it takes expensive man-hours to go look for the actual problem," Watson said.

Butler agreed. NCCF "provides you with tons of information, but the problem is picking out the significant data. I'd like to see more graphics," Butler said.

Even applications under NCCF, like IBM's Network Problem Determination Application (NPDA), which provides diagnostic information for remote devices, are time consuming to use.

"NPDA is [very] menu-driven. You are constantly stepping through menus all the time," according to the telephone company communications manager.

While this type of sentiment is turning attention to network add-on devices that provide control and management functions, the price is still too high today for many users.

"Box-based solutions are expensive and hard to cost-justify," the phone company representative said. "How do you cost-justify equipment to monitor a network that is supposed to run efficiently anyway?" he asked.

But those prices are dropping. One user said that where it would have cost nearly $250,000 for an add-on net management solution a few years ago, that same system can often be purchased today for $20,000 to $70,000.

Because of the absence of any one adequate solution, some users have taken to building their own systems that combine network control characteristics of existing hardware with homegrown network management software.

Data communications analysts at a petroleum corporation in the Midwest use a matrix switch manufactured by Dynatech Data Systems of Springfield, Va., to control their network.

The switch, which is outfitted with the Dynanet 200 alarm function, sounds audible alarms when network components fail. Because it is a matrix switch, test equipment can be patched into the troubled line for testing.

For network management, however, the company uses data gathered by the switch on an in-house management system it developed in Cobol. Information compiled with this management package is studied weekly.

It provides information on response times, failure rates and even histories outlining vendor response time to repair, among other things.

This last item is leading the company to abandon use of ITT Courier Terminal Systems, Inc. terminals in favor of IBM equipment.

While approaches to net control and management differed, most managers conferred that network control is still only a form of reactive management. Network management that overlays a network control system is what is ultimately needed, enabling problems to be dealt with before they happen, users said.

CW photo by P. Kocianowski

Users discussed the value of nets at Interface '85.

SHORTAGE from page 1

50-person communications staff.

When Clifton looked outside the company, he found fierce competition. "More and more companies are competing for the few available employees," he noted.

The Canadian manager added, "It is almost impossible for a data processing department manager in a rural area to find communications workers."

Smaller companies seem more able to meet their communications personnel needs. Don Kute, data processing manager at Magnavox in Fort Worth, Texas, claimed, "I haven't had a problem finding communications professionals. We have the people we need."

William Long, MIS director at Allen Industries, Inc. in Troy, Mich., added, "There is a lot of talk about a shortage of workers, but I don't think a shortage really exists. Managers have to learn to use their resources [effectively]."

"Vendors can be an excellent resource. They can help a manager stay abreast of the communications market and can supply a clear understanding of different choices," Long added.

Dema Service Bureau Directory out

STAMFORD, Conn. — The Data Entry Management Association (Dema) has published its 1985 Dema Service Bureau Directory listing data entry service bureaus by size, equipment and services.

The directory lists service bureaus alphabetically and geographically and also lists its advertisers. It was published to help answer the questions posed to the organization by firms seeking the aid of service bureaus, a Dema executive said.

The directory costs $24.95 and is available from Dema, P.O. Box 16711, Stamford, Conn. 06905.

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NEWS

Codex, Case Rixon unveil central site net control wares

CW AT INTERFACE '85

By John Six
CW Staff

ATLANTA — Capitalizing on the confusion created by the AT&T divestiture and the escalating need to manage networks better, two companies introduced products here last week at the Interface '85 communications conference that are designed to allow central site control and management of networks.

Codex Corp. of Mansfield, Mass., announced a system for managing and controlling large networks and Case Rixon Communications, Inc., of Silver Spring, Md., announced a product aimed at users of mid-range and smaller nets.

The Codex 4800 series, including Models 4850 and 4860, can centrally control networks with up to 756 lines, the company reported. Major system components include 32-bit Data General Corp. MV8000 minicomputer- and microprocessor-based line support modules called Distributed Network Processors (DNP). Each DNP can support up to 124 lines.

The 4850 comes with 2M bytes of main memory and 50M bytes of disk storage and can support up to four DNPs. The high-end 4860 comes with 4M bytes of main memory and 73M bytes of disk storage and can support up to six DNPs. Both models also support Network Control Terminals — up to six on the 4850 and 10 on the 4860 — and multiple printers.

Network control functions include the monitoring and testing of local and remote modems and facilities, including point-to-point and multipoint lines. The 4800 series can reportedly be used with Codex modems as well as diagnostic modems from other manufacturers. Nondiagnostic modems can be accommodated with wraparound devices that tap the line on the analog and digital side of the modem.

Network condition monitoring

Network conditions are monitored using a 150 bit/sec out-band signaling technique. When user-defined operation thresholds are exceeded, an audible alarm is sounded and the alert is logged onto a system terminal as well as printed locally. The menu-driven system enables users to perform a number of analog and digital tests, Codex said.

Additionally, the 4800 series enables the user to reconfigure the network from the central site by lowering modem transmission speeds or swapping in hot standby components.

To help work the data collected in network control into reports that can be used in network management, the company also announced Codex Management Applications (CMA) software.

CMA features are said to include equipment management reports, an inventory file system; problem management reports, a trouble-ticket system that provides on-line access to problem histories; and alarm management reports, which can be used to perform analysis on alarms.

Available 90 days after receipt of order, the 4850 costs $84,400, and the 4860 costs $156,400. CMA costs $2,000.

Small nets targeted

Case Rixon's Series 5000 network management products announced here include the Case 5200, a system targeted at smaller networks.

The Case 5200 is based on a 32-bit central site controller that performs diagnostic tests by interacting with probes installed in the network. These probes include diagnostic cards for modems, wraparound units for nondiagnostic modems and network control and management modules for Case DCX multiplexer and switching products, Case Rixon said.

The 5200, which is administered from a color graphics display, is said to provide trouble ticketing and have the ability to set up and test remote locations from the central control site.

The 5200, which supports 0.5M to 2M bytes of main memory and 10M to 80M bytes of disk storage, can reportedly support up to 240 lines, monitor a maximum of 2,000 devices and support a total of four operator consoles and two printers. Diagnostic tests supported include testing at the digital interface between terminals and modems and end-to-end bit error-rate tests.

Case also announced the Case 4000 series of diagnostic modems. The synchronous modems operate at 4.8K, 9.6K and 14.2K bit/sec over dedicated lines and offer switched line fallback.

The modem series features a touch-sensitive front panel for configuring, testing and for performing low-level diagnostics of remote modems, the company reported. The modems can be used in point-to-point or multipoint configurations. Sideband or out-band signaling at 75 bit/sec is used for diagnostics with the 4000 series and the 5200. To monitor nondiagnostic modems, Case offers wraparound devices that use in-band signaling.

The Case 5200 will be available in June for $12,000 to $60,000, depending on memory and disk storage required. The 4000 series modems, available in April, cost $1,995 for the 4.8K bit/sec, $2,995 for the 9.6K bit/sec and $7,995 for the 14.2K bit/sec. The diagnostic card option costs $995. The wraparound devices cost $450.

Multiplexer cards for the modems, which enable a modem to be configured with a combination of ports, will cost $695 to $1,295, depending on whether it is a two-, four- or six-port model.

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Management system pilots Delta's nationwide net

CW AT INTERFACE '85

By John Dix
CW Staff

ATLANTA — Delta Air Lines, Inc. has installed what may be the largest central site network control and management system in use today at its headquarters here.

The system is used to control and manage the airline's nationwide network, which includes 400 leased lines and more than 3,000 modems, according to Paul Cornwell, a Delta communications data analyst who spoke at a press briefing sponsored by Delta and Codex Corp. at the Interface '85 communications conference.

Delta is not only the first and largest user of Codex's newly announced 4800 network management and control system, it also cooperated in the system's design.

Network uptime is a serious concern in the airline industry, where reservation systems like Delta's might handle 11 million messages a day. Delta's reservation system includes, among other things, three IBM 9083s and seven IBM 3705 communications processors.

Travel agents and other ticketing establishments are supported with multidropped, 4.8K bit/sec leased lines, each of which supports 10 to 12 sites, Cornwell said. Additionally, 11 IBM Series/1 minicomputers are strategically located throughout the country and are used as remote concentrators. Each Series/1 is supported from Atlanta with two 9.6K bit/sec leased lines. The Series/1s support 16 multidropped lines that, in turn, support roughly 12 sites each. One Series/1, for example, can support up to 192 sites.

> *When a terminal, modem or line fails, business is dead in the water.*

The network uses the airline industry standard Programmed Airline Reservation System (Pars) protocol, which is a 6-bit protocol designed for the transaction-intensive reservation application.

Dead in the water

Pars or no Pars, when a terminal, modem or line fails, you are dead in the water, Cornwall said. To minimize downtime from such failures, Delta does all of its own maintenance on network terminal and communications equipment, he said.

To aid its maintenance efforts, Delta installed a Codex DNCS 300 Distributed Network Control System in 1982. At about the time of that system's purchase, however, the airline industry was deregulated, and Delta launched an aggressive marketing program to place travel agent terminals, Cornwell said. This served to increase network requirements — at one point 38 travel agent terminals per week were being installed — and soon made the DNCS 300 obsolete, Cornwell said.

"We needed a system that would be capable of handling rapid growth and future expansion," the analyst explained. Additionally, it was important that the system provide a user-friendly human interface that would simplify and expedite control of a network that was constantly growing in size and complexity.

No commercially available products fit the bill, Cornwell said, so the airline decided to work with Codex to help in the development of what is now the Codex 4800.

Delta's 4860, the high-end system in Codex's 4800 series, is configured with 4M bytes of main memory and 1G byte of hard disk storage — a capacity that is needed to log up to 2,000 alarms per hour. Several distributed network processors are used to provide the needed line capacity.

All trouble calls are registered with a preliminary group of attendants who determine if the problems are valid. If they are, a trouble ticket is opened, preliminary checks are performed, and corrective action is initiated, Cornwell said.

More extensive testing

If needed, the trouble ticket is passed to diagnostic attendants who, along with the maintenance technician group, perform more extensive testing and monitoring.

The first thing operators reportedly check when troubles occur is the circuit status and the status of the signals between the remote modem and its attached terminal. This is achieved by pushing a single function key.

Use of other function keys reportedly enables the operator to tell if the remote terminal's power is on and if it is receiving good data. If that is the case, further tests can be initiated, including poll testing, line testing and device testing, according to Cornwell.

Ideally, the network management and control center will enable system attendants to observe alarm information and rectify problems before users detect problems, he concluded.

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Consultant predicts demise of micro-mainframe link

CW AT FOSE

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — In the next few years, microcomputer users will have mainframe software capabilities to replace current micro-mainframe link technology, a consultant predicted.

John McQuillan, a Cambridge, Mass., consultant, told attendees at the Federal Office Systems Expo (Fose) here that links between micros and mainframes, commonly seen in such products as the IBM 3270, 3278 and 3274, "at best have only a few more years left."

McQuillan argued that minicomputers are assuming an important place in the hierarchy of end-user computing, serving as key links between the mainframe and the micro user. Software now under development will reside on minis to help end users negotiate their way through mainframe data bases, retrieve the data needed and transport it to the micro, where it can be transparently adapted to micro speadsheet packages such as Lotus Development Corp.'s 1-2-3, he added.

McQuillan said that current methods of sharing data between micros and mainframes work adequately, but he listed numerous disadvantages, including limited throughputs, response time delays, inaccurate and incomplete conversion from mainframe formats to micro formats and the obsolesence of the technology.

Looking for permanent solutions

For example, protocol converters are becoming integrated with end-user micros or are built into local-area network servers rather than existing as stand-alone devices for each terminal. While the costs of protocol converters can be a big advantage, users are looking for more permanent solutions, McQuillan said.

IBM 3274 emulation packages, which can link up to 12 micros that then appear as IBM 3278s to the mainframe, have advantages in that the software routines to the mainframe are easily accessible. However, each terminal must be hard-wired to the mainframe, there is little sharing of resources, such as modems, and the cost per connection averages $2,500 per micro.

Terminal emulation packages are the most popular way to enable micros and mainframes to share data resources, McQuillan said, and are cost-effective, averaging about $1,200 per micro. But this micro-mainframe solution requires both hardware and software add-ons to the micro and depends on coaxial cable for transmission, which is expensive to install.

A mainframe software system that permits micros to access information is the next evolutionary step, he predicted. However, available products that perform as advertised are few and far between, McQuillan said. Different mainframes use different data base constructions, such as request syntaxes and dictionary formats, and use different micro download links.

McQuillan, however, believes the majority of independent mainframe software companies are trying to produce packages that will enable end-user integration into the mainframe system with their micros. The common functions of their packages consist of converting between Ascii and Ebcdic formats, converting between flat files and structured data, linking the mainframe data base management system to the micro spreadsheet, canning responses for command sequences, automating a series of steps, constructing menu-based queries and securing passwords at both the mainframe and micro level.

HP introduces networking products for HP 3000 minis

CW AT INTERFACE '85

By Paul Korzeniowski
CW Staff

ATLANTA — Hewlett-Packard Co. unveiled at Interface '85 here last week three networking products that run on HP's 3000 line of minicomputers: an Ethernet local-area network, an IBM 3270 emulation package and network services software.

The local-area network package, HP LAN/3000 Link, contains the hardware and software needed to connect an HP minicomputer to an Ethernet network and is a full implementation of an Ethernet carrier-sense multiple access with collision detection baseband network, according to the vendor.

Each mini on the network requires only one connection, and LAN/3000 Link connects up to 100 HP minicomputers. This capability eliminates the need for point-to-point connection schemes, the vendor said.

The product includes node management software, a screen-driven system of utilities that allows users to configure new network nodes. The network transfers data at a speed of 10M bit/sec.

The IBM 3270 emulation software, HP Systems Network Architecture Interactive Mainframe Facility (HP SNA IMF), permits HP 3000 users to access IBM 3270 series applications through IBM's SNA. The product works with HP's SNA Link, which provides the physical connection to a mainframe. HP SNA IMF enables an HP 3000 series minicomputer to emulate an IBM 3274 or 3276 control unit and provides emulation of physical unit Type 2 or logical unit Types 2 and 3 devices. For example, with HP SNA IMF, terminals or printers can mimic IBM 3278 terminals or 3287 printers. HP SNA IMF supports up to 64 devices, according to the vendor.

The network services software, HP Network Services 3000, allows a user to access remotely a number of services, including files, peripherals, process management facilities and data bases. A file transfer facility moves files between systems.

A LAN/3000 Link, including software, firmware, digital controller, transceiver and cables, costs $5,000 for HP 3000 Models 39, 40, 42, 44 and 48. The price is $6,000 for 3000 series Models 64 and 68.

SNA IMF costs $6,000 for one license and $3,000 for each subsequent license, except for the HP 3000 Model 39 version, which costs $3,500 for one license and $1,750 for each additional license.

HP Network Services 3000 package costs $4,000 for one license and $2,000 for additional licenses when purchased for HP 3000 Models 39, 40, 44, and 48. For Models 64 and 68, the cost is $5,000 for one license and $2,500 for additional licenses.

Hewlett Packard is located at 3000 Hanover St., Palo Alto, Calif. 94304.

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ICCA meeting slated for May

ST. LOUIS — The Independent Computer Consultants Association, (ICCA) will hold its Interconnections '85 conference on May 15-17 at the Bonaventure Hotel in Los Angeles.

The topic of the conference is "Consulting: A Business and a Profession." The featured speaker will be Kerry Johnson, an industrial psychologist and consultant to Fortune 500 companies.

Registration is $195 for ICCA members and $165 for each additional member from the same group or company. Registration for nonmembers is $295 and $265 for additional attendees from the same group or company. Those registering before April 25 will receive a $25 deduction.

ICCA can be reached through P.O. Box 27412, St. Louis, Mo. 63141.

Speakers say computerization eroding privacy rights

CW AT FOSE

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. is losing its battle against the invasion of privacy in the computer age, according to speakers at last week's Federal Office Systems Expo (Fose) here.

CW photos by M. Betts

Trilling

Robert Ellis Smith, publisher of the "Privacy Journal" newsletter here, told about two dozen attendees at Fose's "Technology and Privacy" session that citizens have lost the "first one-and-a-half rounds" in the privacy battle because large data bases of private information have already been created, and they are being shared between the public and private sectors without the consent of the individuals the information involves.

For example, Smith noted, credit bureau information is being shared by federal agencies to collect overdue federal loans and bills, an activity that was authorized by the Debt Collection Act of 1982.

Another privacy problem is the electronic monitoring of employees in automated offices, Smith said. He cited a recent study by Columbia University professor Alan J. Westin that found only one-third of the organizations studied had fair monitoring standards that avoided employee feelings of "Big Brother surveillance" [CW, Dec. 24].

Washington, D.C., attorney Barry J. Trilling said that computer "hacking" crimes pose an alarming threat to privacy, for example, when hospital records are accessed or sensitive information kept in data bases is released to the public.

Commenting on the recent allegations that San Francisco police had access to the city public defender's confidential computer files [CW, Feb. 25], Trilling said, "You couldn't have a more serious violation of privacy for a defense attorney."

The good news, Smith said, is that the U.S. Congress is taking some steps to protect privacy. Laws that forbid illegally accessing the federal government's computers and that prohibit operators of two-way CATV systems from disclosing information about subscribers were enacted last year.

In addition, Smith predicted that Congress may pass legislation this year to punish unauthorized access to electronic mail and data communications. Smith noted that there also is talk of broadening the scope of the 1984 computer crime law [CW, Oct. 15] to cover private-sector computers, but he doubted that Congress would reopen that issue so soon.

Smith

"Usually, once Congress tackles an issue like that, it doesn't do so again for a few years," Smith said.

Trilling asserted that many privacy concerns cannot be legislated away but require ethical, educational and technological solutions. "In defense of the Congress, it is on top of this issue as much as it is on top of any other issue," said another session speaker, Benjamin I. Berman, attorney-advisor to the secretary of the Federal Trade Commission.

Pay cut proposal undermining morale in federal DP shops

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Morale has hit rock bottom in the data processing offices of U.S. agencies principally because of a Reagan administration proposal to cut federal salaries by 5%, according to several DP workers interviewed at the Federal Office Systems Expo here last week.

"Morale is the lowest it's ever been," said Tyna Coles, an office automation specialist at the U.S. Department of Labor. "You don't get any respect anymore, from the top — the chief executive — on down," she said, adding that many federal employees are looking for work in the private sector.

CW photos by M. Betts

Josephs

Coles and others said it appears that the government work force is being asked to make a greater sacrifice than other sectors of the economy in an effort to cut the federal budget.

"The timing was bad. The country's not in desperate straits — the proposal would have gone over better during the 1982 recession — and we're in the midst of a military buildup," Coles said.

Coles

The Reagan administration's fiscal 1986 budget asks for a 5% pay cut or the alternative — the firing of 125,000 government workers to produce the same budget savings. The U.S. Office of Personnel Management recently stated that government workers are overpaid, citing a study that said the annual "quit rate" for federal workers is 3.8%, compared with 13% in private industry.

Joseph Myers, an evaluator for the U.S. General Accounting Office, said the Reagan proposal is not likely to be approved by the U.S. Congress but rather is viewed as a ploy to get Congress to accept a pay freeze for federal workers. "Either way, it hurts morale," he said.

D. E. Josephs, a member of the radio frequency management staff at the U.S. Department of the Treasury, said the federal work force should not be the scapegoat for the federal deficit. "We don't mind taking a 5% cut if everyone else does, too. But when other workers are getting 8%, 9% or 15% raises, it makes it a bit difficult to digest," he said.

Josephs said he generally supports the Reagan administration's budget-cutting efforts, and he hopes for a pay freeze. "No one in government does it for the money, anyway. There's a certain amount of patriotism to working for the government," he said.

Stephen G. Fox, computer equipment analyst for the U.S. Department of State, said he finds government work challenging, rewarding and secure. But he acknowledged that a pay cut would reduce morale and prompt high-level DP employees to leave for the private sector. "Low-level employees don't have the leverage, such as [postgraduate] education, to leave the government," he said.

Fletcher V. Martin, a computer specialist for the U.S. Department of Agriculture, agreed. "Top-notch people are leaving the government and going to private industry," he said, which leaves less experienced DP workers in government service.

Martin said he is particularly upset that the Reagan administration has proposed raising the age for full retirement benefits from 55 to 65.

If Congress approves that change, Martin said, he would have to work 10 more years to retire, ruining his postretirement plans to teach computer science.

"It's a broken promise," Martin said of the proposal.

For many years, Martin said, the policy has been that federal workers can retire on full benefits (56% of salary) at age 55 with 30 years' service. Under the new plan, employees could still retire early but would have to take a 5% annuity reduction for each year they are under age 65. Workers who are 55 or older at the time of enactment of the legislation would continue under the present system.

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TELECOM BRIEFS

Nata lodges complaint over restricted PBX use

WASHINGTON, D.C. — The North American Telecommunications Association (Nata) last week charged Southwestern Bell Telephone Co. and Southern Bell Telephone Co. with unlawfully prohibiting, restricting and discriminating against customers who want to share the common use of private branch exchange (PBX) communications equipment that performs functions such as least-cost routing, call forwarding and local-area networking.

Nata, which represents 700 vendors of the telephone interconnect industry, charged that both Southern Bell and Southwestern Bell have tariffs preventing the connection of shared tenant service equipment to the local exchange and asked the Federal Communications Commission to intervene and order the tariffs struck down.

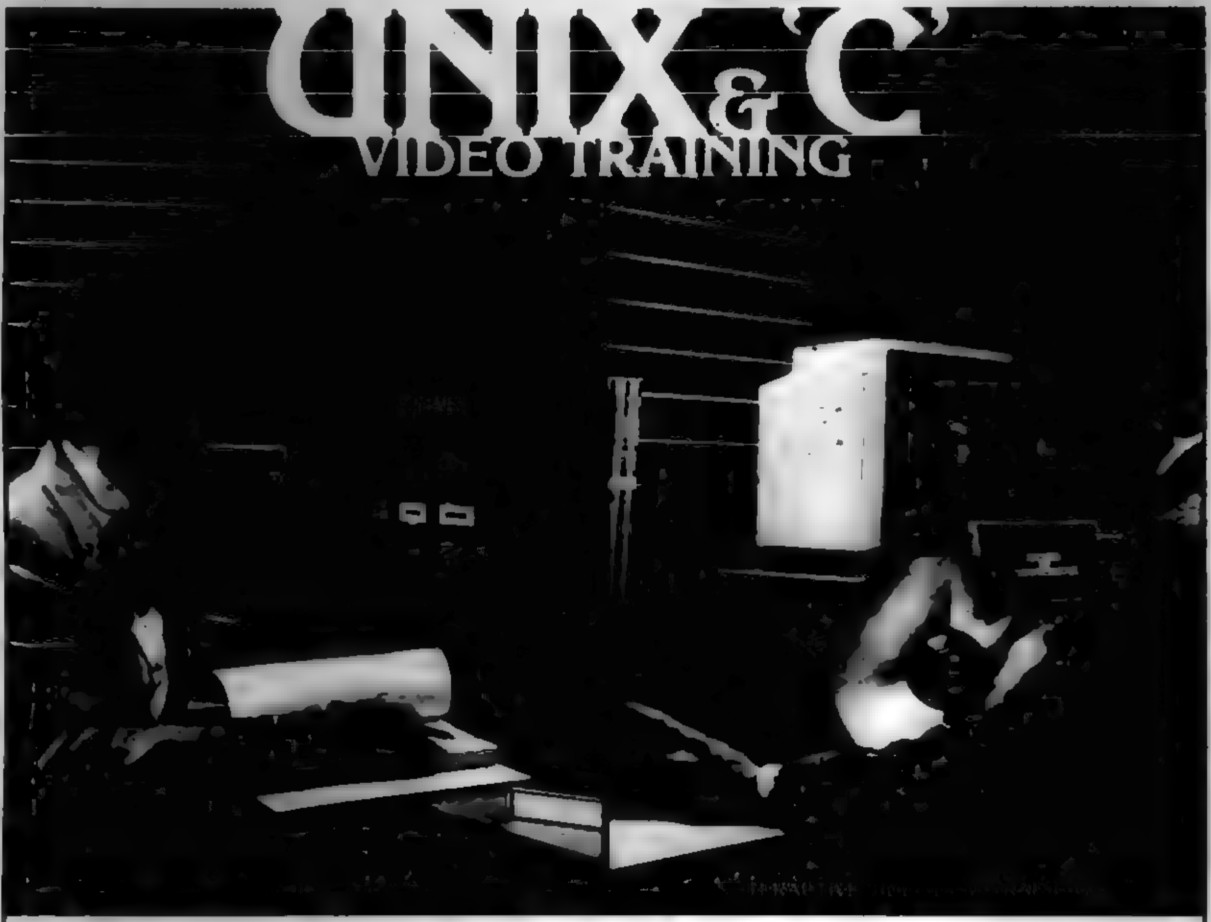
The Nata complaint cited as examples tariffs by Southwestern Bell on file in Arkansas that defined the shared and common use of customer premises equipment (CPE) as the provision of local exchange service and that "severely restricted the subscriber's right to interconnect and use its [own] CPE."

In South Carolina, Nata said tariffs on file by Southern Bell give the telephone company "sole discretion over when and where subscribers will be allowed to use their CPE in shared and common use configurations."

Additionally, Nata said Southern Bell tariffs can "unreasonably and discriminatorily refuse service to any subscriber and provide no objective basis for the exercise of Southern Bell's discretion to deny interconnection."

According to Nata, the FCC had jurisdiction over the tariffs. Even though all CPE has been deregulated by the commission, the restrictions on shared and common use CPE "substantially affect the interstate telecommunications system," Nata said.

It also argued that competition in the CPE market was being restricted and bundling of local exchange service was occurring, with users being forced to acquire redundant local exchange service.



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Fiber-optic system pending State Department approval

WASHINGTON, D.C. — The Federal Communications Commission said it is prepared to favor the construction of a privately operated fiber-optic submarine cable system in the North Atlantic, providing the policy obtains the approval of the U.S. State Department.

Two applications by private concerns, Tel-Optik Ltd. and Submarine Lightwave Cable Co. (SLC) requested permission to establish landing spots in the U.S. The FCC said the Tel-Optik application contained the information necessary to link North America to England, while the application of SLC to link the U.S. to Europe was insufficient.

The two firms said they intend to sell or lease blocks of transmission capacity and therefore would not qualify as common carriers for tariff regulation. The FCC officials noted the impact that private cable systems might have on the International Telecommunications Satellite Organization satellite consortium.

FCC asks local Bell firms to refile special access

WASHINGTON, D.C. — The Federal Communications Commission ordered local telephone companies to refile their special access tariffs by March 15 (to go into effect April 1), to reflect an overall 7% reduction in exchange rates that were set too high in some instances by some Bell telephone companies. In other cases, special access rates were filed that were probably too low, the FCC said.

Observers predicted that the long-distance carriers whose connection costs to the local exchanges will go up with the implementation of special access will most likely take their case to the courts to halt the effective date.

AT&T Communications deferred the March 4 effective date of its own planned private line rate restructuring to reflect the new April 1 implementation of special access charges by the local telephone companies. AT&T Communications asked the FCC to let the tariffs go into effect March 19.

Education group open to DPMA

PARK RIDGE, Ill. — The Special Interest Group for Education (Edsig) recently became affiliated with the Data Processing Management Association (DPMA) International.

Edsig was reportedly formed to gather data on information systems education techniques and topics and to promote the development of the DPMA Model Curriculum for Computer Information Systems Undergraduate Education, a spokesman said.

Details on the Edsig are available from Georgia Miller, Assistant Dean, School of Business, Indiana University, 801 W. Michigan St., Indianapolis, Ind. 46223.

PRODUCT SPOTLIGHT

NETWORKING

from page 1

Physically interconnecting microcomputers is not the problem. Typically, a board, generically referred to as a network interface unit, is installed in each computer. The network cable or wire is generally run directly from one computer network interface unit to the next. Some network interface units have integrated signaling hardware, while others use a separate outboard device, called a transceiver in baseband networks or a modem in broadband implementations.

Network companies typically specialize in supporting a single computer brand, according to Bill Driscoll of LAN(West) in Carefree, Ariz., but most at least cater to the installed base of IBM's Personal Computer. Networks, such as Corvus Systems, Inc.'s Omninet, that support different types of micros typically require the machines to have similar operating systems.

Whether networking homogeneous or heterogenous machines, wiring them together is the easy part.

Configuring the machines with the proper software and enabling each station to share network resources and exchange data is where the fun begins. According to Dave Ferris, chairman of Ferrin Corp., a San Francisco-based personal computer services company, maintaining micro nets involves embracing "traditional systems issues that any minicomputer manager would be aware of."

These often-overlooked issues end up requiring inordinate amounts of personnel time — a major hidden cost. Ferris said flatly, "Someone will have to administer the network," an ongoing job that includes the design of security environments, management of user identification, definition of file structures and time spent tweaking the network to keep it running properly.

It is for this reason that Ferris advises users to think twice about micro nets if all they are interested in is sharing peripherals. "If you're talking about sharing $15,000 worth of peripherals, it may make sense to use a local net," he said. "Otherwise, we recommend avoiding them and pursuing cruder solutions." Sharing a laser printer, for example, can be done simply by swapping diskettes from one machine to another or by using a data switch.

Micro nets facilitate data sharing

Micro networks come into play in sharing secondary storage and information. Secondary storage can be a stand-alone, network-specific hard disk to which all the micros are attached, like Corvus Systems, Inc.'s Omnidrive line or Nestar Systems, Inc.'s Plan 3000 and 4000, or an integral hard disk in an expanded micro that can be shared with other processors. For example, Corvus' Omninet enables networked machines to access up to 20M bytes of the hard disk on an IBM Personal Computer XT.

A microcomputer with an internal hard disk can be set up as a dedicated server and do nothing but [illegible] disk I/O for other network nodes or be configured as a nondedicated node and still be used as a workstation. Because the sole purpose of dedicated servers is to locate and retrieve information on the disk, they typically allow greater network performance than nondedicated server implementations, according to Eric E. Killorin, president of market research firm [illegible] Research Corp. in Andover, Mass., and publisher of "PC Netline," an industry newsletter, and the "Executive Guide to PC Networks," a report that analyzes micro networks.

Still another variation on the theme is virtual servers. According to [illegible] "Executive Guide to PC Networks," with products like Nestar's Plan 2000, "personal computers on the network designated as server units can have their storage and printer ports accessed by other personal com-

See [illegible] page 18

Nets allow multiuser program access

But users should be aware of vendors' lease policies

When implemented properly, microcomputer networks can do away with both the need to load the operating system from a diskette when the machine is turned on and the need to load program diskettes for each application. They also may allow a pool of users to share programs.

In operation, "When you turn on a workstation, there is an internal booting from [read-only memory] or from a local diskette that sets up connections with the network, and then you can go into further booting from a common server," said Dave Ferris, chairman of Ferrin Corp., a personal computer services firm in San Francisco.

Once the operating system is booted, the desired application can be pulled down from a library stored on the disk of a network server.

A disk volume on a network hard disk may, for example, contain all the programs that are going to be used on the network in a shared mode, and everyone would have read/write access to that volume, according to Bill Driscoll, founder of LAN(West), a network reseller and consulting firm located in Carefree, Ariz. One copy of MicroPro International Corp.'s Wordstar, for example, can be shared among multiple users.

But software sharing creates its own problems. Some software vendors do not have multiuser contracts for their products. Whereas Mi-

See [illegible] page 18

A SAMPLING OF MICROCOMPUTER NETWORKS

[illegible]	Product	Maximum number of stations supported	Network speed (in bits/sec)	Access method	Network topology	Media supported	Maximum cable length	Server implementation	Print spooling	Gateways provided	Average cost per connection
Corvus Systems, Inc. San Jose, Calif.	Omninet	63	1M	CSMA/CA	Bus	Twisted-pair	4,000 ft with active junction every 1,000 ft	Dedicated	Yes	SNA[1] Gateway, providing IBM 3278 terminal emulation	$682[3]
[illegible]	[illegible]	[illegible] 1,000 with [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,000 ft, up to 3.25 miles with [illegible]	Dedicated or nondedicated	Yes	IBM 3270 emulation program	[illegible]
Nestar Systems, Inc. Palo Alto, Calif.	Plan 2000	500	2.5M	Token	Star	Baseband coaxial	5 miles	Dedicated or nondedicated	Yes	SNA emulation of a 3274	$20,000 for eight to 16 stations
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Dedicated or nondedicated	Yes	[illegible]	[illegible]
Ungermann-Bass, Inc. Santa Clara, Calif.	Net/One	Baseband, 1,024; Broadband, 300	Baseband, 10M; broadband, 5M/channel	CSMA/CD	Bus	Baseband or broadband coaxial	Baseband, 1.75 miles; broadband, 5-mile radius	Nondedicated	Yes	TTY	$880[3]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[1] Systems Network Architecture (IBM)

[2] Binary Synchronous Communications (IBM)

[3] Based on CW estimated cost of eight-station network

CW CHART

SERVER

from page 17

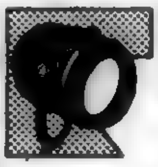
puters while still acting as workstations."

Server implementations vary by product line, but according to Killorin, the industry trend is toward dedicated servers. In this case, dedicated does not always mean that the unit has to be a personal computer. 3Com Corp. recently announced the 3Server, a 36M-byte stand-alone server that can, by daisy-chaining disk drives, support up to 250M bytes. The 3Server also acts as a print server and can support modems for off-network communications.

More important concerns than the physical location of the disk are the level at which the server provides access to data and the way the network enables multiple users to update data contained in the same volume.

Disk servers — whether they are implemented in a dedicated or nondedicated machine — permit access to volumes of files, analogous to accessing a floppy drive in a personal computer, Killorin said. File servers, on the other hand, provide direct access to files.

The advantage of file serving, according to Bill Driscoll of LAN(West) in Carefree, Ariz., is that "you have a traffic cop that is intelligent enough to eliminate the problem of users trying to update the same record at the same time." File servers can provide locking at the volume level, file level and record level, Driscoll said.



Locking is used to ensure data integrity, particularly in networks where many users need to read and annotate the same data. For example, file locking prevents two users from simultaneously calling up the same file from a server. This prevents one user from writing his file back to the disk over a file that is being concurrently updated by another user, which would wipe out any changes made to that copy.

Considerations like data integrity are more important in micro network evaluations than crude price comparisons. According to Killorin, price should be a secondary consideration to function and performance. "Network acquisition should be based on application needs, today's needs and the perceived needs of the next two to three years," Killorin noted. "Price should only be used to differentiate implementations that appear similar."

Acquisition itself presents a problem in large corporations in that many network products are sold, like personal computers, through retail outlets. MIS is frequently not consulted about the purchase of the network.

New hurdles

Because of this, the user may not end up with the system he wants or thought he was buying. And sprouting multiple independent micro networks presents a new hurdle for MIS. According to Kim Myhre, director of communications research at Framingham, Mass.-based International Data Corp., "Part of the challenge facing MIS is the task of integrating departmental personal computer networks."

When all is said and done, however, users who err on the side of caution may miss the boat. For users who want to share a printer and can get by with some rudimentary disk sharing, "in some cases it makes sense to pick up something quick and dirty," Killorin said.

"It costs users a few hundred dollars per node, and they get a solution in hand immediately. It doesn't even matter if it's going to be obsolete in two years, because by then, their whole environment will have changed anyway."

SHARING

from page 17

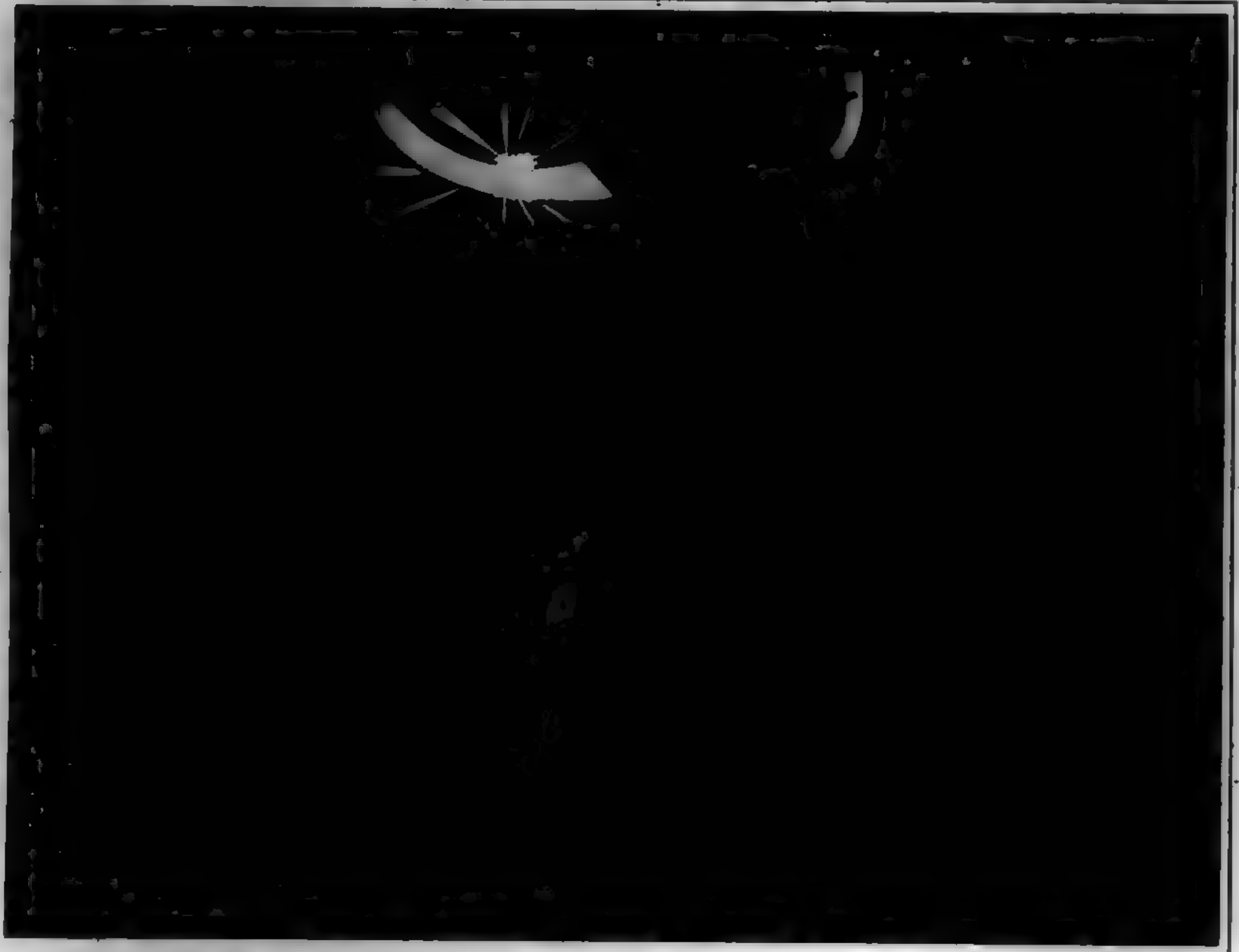
cropro International will license its Wordstar package for a given site, for example, Lotus Development Corp. requires one copy of its 1-2-3 package per machine.

A few vendors safeguard against program sharing with local networks by requiring use of boot disks. According to Driscoll, users can store a single copy of a program like Ashton-Tate's Dbase II on a hard disk, but when they execute the program, they must insert a separate boot disk with a hidden passkey in one of the workstation's floppy disk drives.

Driscoll recommends to his clients that they pay no attention to contractual stipulations that require one copy of a program for each workstation on a network, saying such stipulations would make sharing applications on a network less appealing. "I recommend that users buy a number of copies to be consistent with the largest simultaneous user base they'll have using the product at any one time," he said.

For programs that require them, boot disks can be handed from user to user as needed, which, while inconvenient, is possible given the close proximity typical of workstations in micro networks, others noted.

Software restrictions may be hindering acceptance of micro networks. "The main reason that local network acceptance has been slow is because of the lack of networking versions of powerful, commonly used applications software," said Eric H. Killorin, president of Hyatt Research Corp., a firm in Andover, Mass., that tracks the personal computer network industry.



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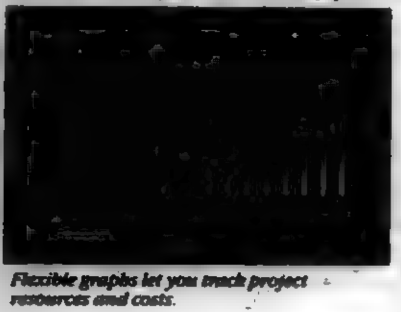

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FCC OKs protocol conversion for phone companies

WASHINGTON, D.C. — In a further relaxation of regulatory rules, the Federal Communications Commission will conditionally permit former Bell operating companies to perform asynchronous-to-X.25 packet-switching protocol conversion at their central office facilities.

The FCC action means that the millions of asynchronous terminals and microcomputers that are incompatible with the X.25 protocol will be able to communicate data over local telephone lines and through packet assemblers/disassemblers to be located at telephone company central offices.

The X.25 protocol has been adopted by international standards groups for formatting data into packets to be transmitted in short bursts that use a fraction of the transmission bandwidth, as opposed to conventional circuit-switched voice-grade telephone calls.

The FCC noted that the growth of data communications over the telephone network was putting pressure on circuit switches constructed to handle voice calls and that placing packet switches nearby could offer economical service.

The FCC action grants the requests of the American Information Technology regional holding company and the following divested Bell operating companies: Pacific Bell, Southern Bell, South Central Bell, Southwestern Bell, New Jersey Bell, Pacific Northwest Bell, New York and New England Telephone companies.

The FCC waived the requirements of the Second Computer Inquiry policy on providing the enhanced service through a separate subsidiary. The companies had argued that separate subsidiaries would duplicate existing switches and would be too costly if the companies wanted to offer the service to the public.

Companies with existing value-added networks performing X.25 protocol conversion for customers at their own switch sites, such as McDonnell Douglas Automation Co.'s Tymnet division, GTE Corp.'s Telenet subsidiary and other value-added carriers, opposed the grant of the waiver and lobbied the FCC heavily.

GTE Telenet President J. David Hann said following the FCC action, "GTE Telenet has not sought to impede the [divested Bell operating companies] from entering this market, but has expressed concern that [the operating companies'] packet services must stand on their own without cross-subsidization from [operating company] monopoly revenue and without discriminatory access to underlying [divested Bell operating company] transmission facilities."

GTE Telenet urged the FCC to require the separate subsidiary provision of the service consistent with the FCC's Computer Decision II policies.

John McQuillan, a Cambridge, Mass.-based consultant in micro-to-mainframe subjects, said the FCC action was "extremely significant for the future." McQuillan said the entrance of the local telephone compa-

See FCC page 20

AT&T links its Datakit switch and DEC minis

MORRISTOWN, N.J. — AT&T Technologies said last week that it had developed a hardware link between its Datakit Virtual Circuit Switch and Digital Equipment Corp.'s PDP-11 and Vax family of computers.

The initial application for the hardware link is slated for use in internal telephone company applications where the DEC equipment is widely used, AT&T said.

The link is an interface module called the KS11-K Unibus, a microprocessor-controlled parallel bus interface. The product was developed by AT&T Technologies and will be manufactured by DEC and sold by AT&T Network Systems.

The Unibus establishes a multiplexed high-speed channel, ranging from 320K bit/sec up to 1M bit/sec. It joins the Datakit VCS interface that already links AT&T's 3B computer line.

The Datakit VCS data communications network reportedly was designed to handle large-volume communications between dissimilar computer systems and to enable local-area networks to grow into wide-area nets. An AT&T spokesman said the agreement with DEC to manufacture the Unibus product can be seen as part of AT&T's development of the Universal Information Services, its version of an Integrated Services Digital Network.

"Operations support systems are a vital part of the Universal Information Services, and our agreement with [DEC], coupled with the already integrated systems approach with our AT&T 3B line of computers, brings us another step closer to reality," said Jim Wilson, manager of product planning and marketing in data communications at AT&T Network Systems.

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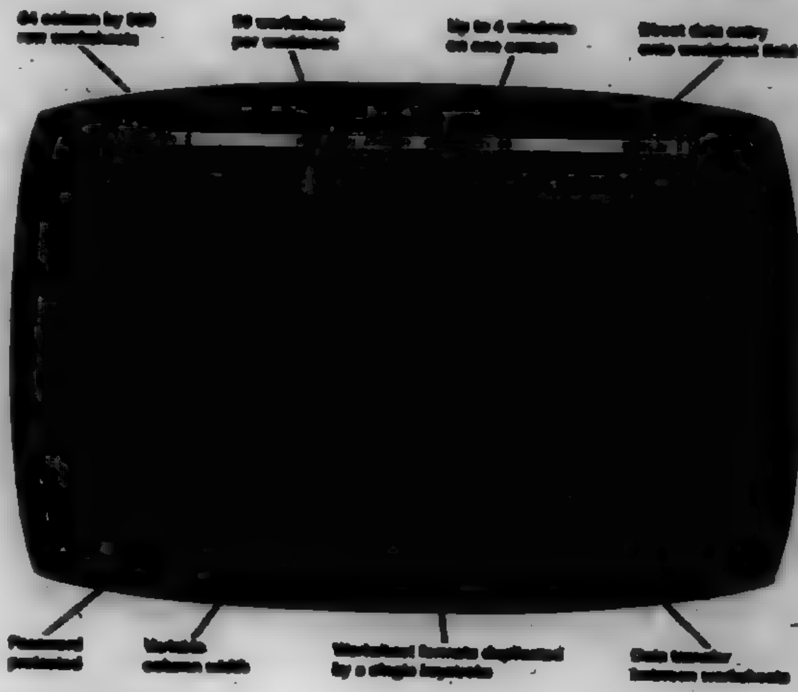
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DP spending focus shifting to software, study finds

CW AT IDC BRIEFING

By [illegible]
CW Staff

BOSTON — MIS managers will be spending more money on off-the-shelf software this year, a survey from International Data Corp. (IDC) predicted.

The annual study on DP spending conducted by the Framingham, Mass., research firm also found that standardizing data, maintaining control over data output and providing communications capabilities among a host of systems are some of the most important issues facing MIS managers today. Preliminary results of the survey were announced here at Directions '85, IDC's 20th Annual Information Industry Briefing Session.

"Software [expenditures are] growing at an incredibly rapid rate, while hardware [expenditures have] actually slowed down," according to Hank Janson, IDC's director of information systems services.

'A buy decision'

Although hardware expenses historically grow 15% annually, this year the MIS managers interviewed expect only a 13% growth in hardware expenditures and a 30% increase in software expenditures, up from approximately 25% in years past, Janson noted. Preliminary findings also indicated that more companies are buying off-the-shelf software, according to Janson. "The old make-or-buy decision is becoming [strictly] a buy decision," he said.

The emergence of departmental systems is boosting software purchases, which only increase end-user independence — a sore spot among MIS managers — Janson observed. "Frankly, software is the key to end-user independence," he said. "A number of people who I have talked to will go out and shop for software to do their jobs. After they have selected a software product, they will ask what kind of hardware it runs on. The hardware is not dragging along the software, the software is pushing the hardware."

According to the survey, DP spending continues to grow but at a slower pace. Last year, IDC estimated DP spending reached $99.2 billion. This year, the survey said, spending will grow 12% to $111 billion, down from a 15% growth rate in 1983.

Communications will be the other major purchasing area for DP managers, Janson said. MIS managers said they expect to spend 25% more on communications equipment this year, the IDC survey said.

But the plethora of communications options can create problems for the MIS manager, Janson noted. "He is faced with the situation that he is now not only the data processing manager but also the communications manager," Janson said. "On one hand, he's losing authority, but he's going to rise in responsibility," by providing communications links among departments.

While providing the communications links to mainframe data, MIS managers are struggling to maintain control over that data, he noted.

"Program accuracy is totally out of the control of the DP manager right now," he said, adding, "If they are able to keep corporate control over the information ... and have consistent data used throughout the organization, I think they will be applauded." Enforcing a self-checking method by end users could be one solution to that problem, Janson said.

More than 40% of the respondents said they had 100% control over the purchase of micros. However, Janson said, many in that same group said they did not have 100% control over the purchase of word processors and some minicomputers.

FCC from page 19

ny into communications for data processing functions would be economical because the colocation of protocol conversion devices with central office switches is advantageous. However, he predicted the ruling would have little immediate effect on in-house micro-to-mainframe architectures.

Three conditions were attached to the FCC's waivers. First, the circuits used by both the divested operating companies' central offices and existing value-added networks cannot be used by the divested operating companies at lower rates. The operating companies had proposed to use them at net book cost, with the value-added networks continuing to pay a private-line rate.

Second, the FCC said the operating companies must charge differently for asynchronous-to-X.25 protocol conversion and the X.25-to-X.25 service, where no conversion is required. The FCC said a specific usage-based network rate element must be included in the carriers' tariffs for X.25-to-X.25 service that will be invoked when asynchronous-to-X.25 conversion is in progress at a port.

Third, end-user access to the conversion facility at the central office cannot be bundled with transmission rates for switching the data, and that access must be tariffed.

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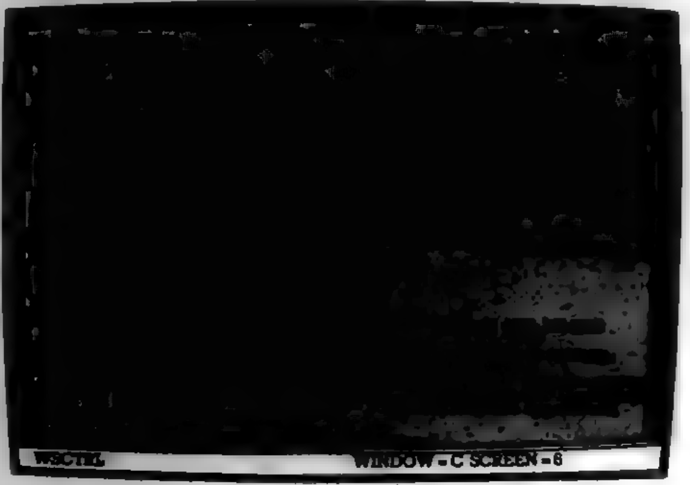

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Consider minis for departmental needs, analyst says

CW AT
IDC Directions

By Edward Warner
CW Staff

BOSTON — Corporate MIS managers increasingly must consider whether to meet departmental computing needs with more personal computers or to adopt multiuser systems, including minicomputers, according to computer industry analyst Aaron Goldberg.

That question's importance, Goldberg said recently, is highlighted by the declining price of minicomputers. Like personal computers before them, he said, minis are now coming into use in corporate departments — whether MIS management likes it or not.

Goldberg made his comments in a wide-ranging speech on the future of the microcomputer market to a group of about 300 attendees at Directions '85, International Data Corp.'s (IDC) 20th Annual Information Industry Briefing Session for information industry executives, held here early this month.

Disguising computer purchases

Referring to a reportedly popular method for disguising personal computer purchases, Goldberg warned, "Instead of $5,000 pieces of office furniture, you'll see $25,000 pieces of office furniture" on departmental purchasing requests.

Goldberg suggested that MIS managers should consider implementing departmental minis themselves, both as a means for gaining control over departmental data processing and because the minis promote a flexible approach to networking. He pointed out that minicomputers can be hardwired to a mix of both personal computers and terminals or linked to a group of personal computers via a local-area network.

While acknowledging that "it is arguable whether the networked personal computer or the shared-logic minicomputer provides more utility," Goldberg added, "The myth of [the personal computer] as panacea is not only costly but may hinder future upgrade paths."

CW photo by E. Warner

Goldberg

To buttress his case for the multiuser system as an alternative, Goldberg totaled the costs of a system of four networked IBM Personal Computers, including network cards and printer, and compared that with the total cost of a multiuser Altos Computer Systems, Inc. 586 series-based system with four terminals and a printer. The cost per user of the Personal Computer-based system would be $3,325, he said. The multiuser system, meanwhile, would cost $2,700 per user or $625 less for each user.

Goldberg, IDC's director of microsystems services, also made several observations about personal computer software during his presentation. He said he found Digital Research, Inc.'s Graphics Environment Manager, a windowing environment, far superior to IBM's new offering in that genre, Topview.

Better product from independent vendor

But, he wondered, "Will the industry go with the better product from an independent vendor or the [worse] product from IBM?"

Goldberg also predicted a rise in the use of artificial intelligence in applications programs, including software to "prevent users from deleting all their files."

He said software incorporating AI principles would "make every user a power user," and thus address the needs of what he called the "new group of end users," those with little computer experience.

Net users meet set for March

ARLINGTON, Va. — The Network Users Association (NUA) will hold its spring meeting from March 27-29 here at the Stouffer Concourse Hotel, Crystal City.

Topics to be discussed include micro-mainframe user experiences, voice/data private branch exchanges, user and vendor perspectives on building and operating wide-area networks and a user forum on the problems and pitfalls of local-area networks.

Organizations to be represented include Dow Chemical Corp., the Mitre Corp., Ford Aerospace & Communications Corp., Grumman Aerospace Corp., Harris Corp., California's Stanford University and Litton Systems, Inc.

The conference costs $125 for NUA members. The nonmember registration fee is $275.

More information is available from Diana Simmons, NUA, Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

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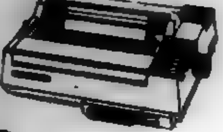

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NEWS

Police cleared of access charges

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — A preliminary investigation by the San Francisco Police Commission has cleared the police department here of wrongdoing in the recent controversy over a breach in computer security [CW, Feb. 25].

By late last week, no evidence had been uncovered to substantiate charges that a police lieutenant used a specially designed menu to gain access to Public Defender Jeff Brown's confidential files, which are stored in a shared computer system in the city's Hall of Justice building.

Although the lieutenant admitted that he was given an access level usually granted only to system administrators to conduct an internal police probe, he has denied allegations that he read confidential files stored by other agencies. The commission is continuing its inquiry, a spokeswoman said.

The system — a Wang Laboratories, Inc. VS100 minicomputer used primarily for word processing — is operated by the police and shared with the public defender, coroner, district attorney, sheriff and the Office of Civilian Complaints. As a result of the incident, the city is exploring ways to provide better security for its criminal justice computer system.

Last week, the Electronic Information System Priority Committee (EISPC), which oversees the city's data processing functions, forwarded a number of recommendations to Mayor Dianne Feinstein for review. According to Peter Henschel, chairman of EISPC, the committee suggested that the city evaluate off-the-shelf software packages that could solve the security problem.

The committee also suggested that the city move the system's central processing unit out of the police department and into the main data processing center. EISPC recommended that the city appoint an independent system administrator to oversee the system. Finally, the committee agreed to review a recent report by the controller's office that analyzes citywide computer security concerns.

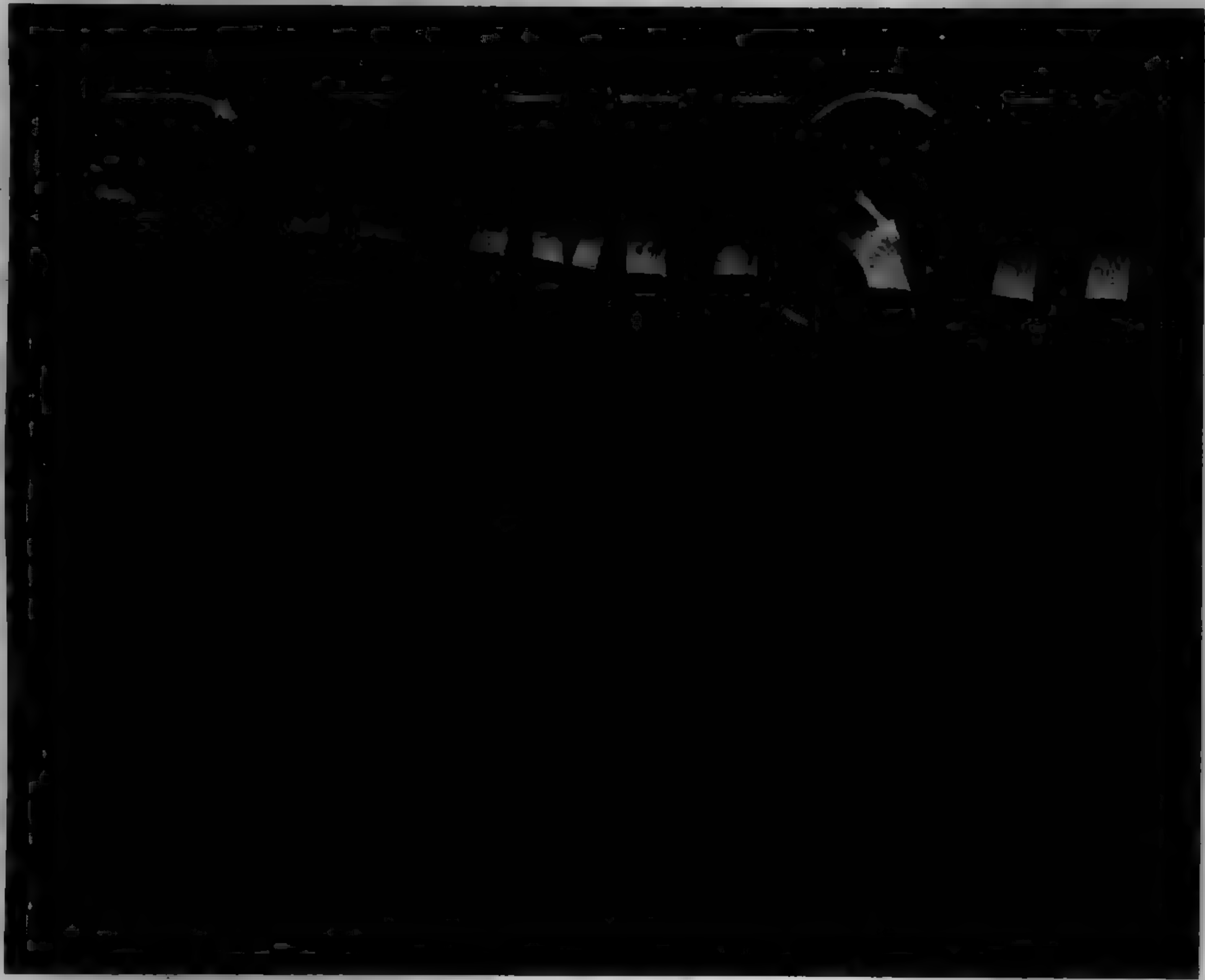
Off-line storage

Until final steps are taken to address the security gaps, Feinstein has told the agencies that share the system to store their confidential files off-line.

Still to be resolved are the legal issues raised by the computer security controversy. Originally, the public defender estimated that the prosecution of up to 1,500 cases had been affected. Last week, however, Brown said the office had exaggerated the number of cases that might be jeopardized.

As a result of the police department's actions, the public defender had asked a San Francisco court to dismiss murder charges filed against one man, saying that the security breach had violated his right to attorney-client confidence. The judge ruled against the defense's motion.

Kathleen Lucey, a senior management systems consultant at Menlo Park, Calif.-based SRI International, Inc. said the city's Wang users were "very naive" to assume that sufficient security measures were already in place.



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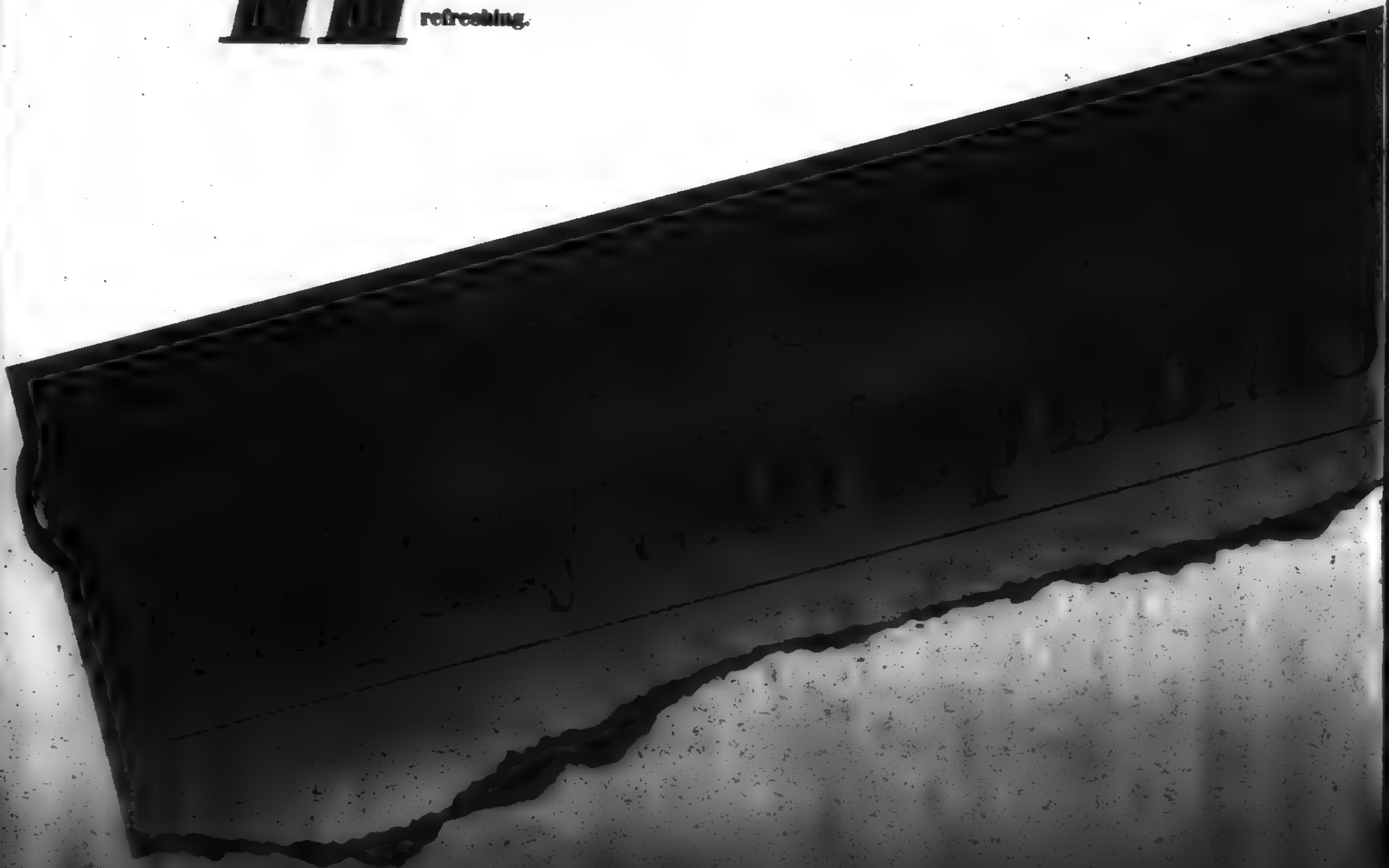

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NEWS

Outdated MIS curricula at core of graduate drought

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — According to several DP directors and MIS corporate recruiters from around the nation, there will be severe shortages of qualified MIS graduates by 1990 if university MIS departments do not update their curricula to keep pace with rapidly changing industry needs.

"Large academic institutions are very slow to change," said Jim Sutter, vice-president of information systems at Rockwell International Corp. in Seal Beach, Calif. Academia has been slow responding to several problem areas within DP curricula, Sutter said, citing a lack of telecommunications, factory automation and manufacturing courses. These, Sutter said, are fast-growing industry segments that will explode within the next five years.

University MIS departments are not giving students experience at the leading edge of technology because of a chronic lack of funds and the ongoing problem of professorial "brain drain," said Fran Hildebrand, director of MIS and management recruiting for Pacific Bell Telephone Co. in San Francisco. Because of this, Hildebrand said, "Basic computer literacy on current hardware is all we can expect from MIS graduates right now."

Hildebrand added that Pacific Bell is becoming active in the academic community because it wants more input into the curriculum decision-making process. Pacific Bell's MIS employees are encouraged to teach DP courses at local junior colleges, she said, and DP professors are increasingly doing part-time consulting at Pacific Bell, supplementing their incomes and communicating Pacific Bell's needs back to the academic community. "It's a win-win situation for [all] of us," she said.

IBM to give $24 million in funds, grants

MIS curricula today are not current because of shortages of teachers, equipment and R&D funds, according to John Nadin, university relations director at IBM headquarters in Armonk, N.Y. IBM is tackling the problem by awarding $24 million next month in funds and equipment grants to 12 university MIS departments, based on each school's creative proposals for improving the management of information systems, he said.

"We hope that the best proposals will leaven the entire business school environment over time," Nadin said. IBM decided to award the grants because technical breakthroughs in networking, personal computers and high-performance software are filtering into the business world, giving future MIS managers increasingly complex decisions to make, he said.

A recent study by a technology education task force of 69 corporations in the Dallas area concluded that industry should increase its R&D support of universities by providing seed money, matching funds, loaned professors, endowed faculty chairs, equipment and more information about the $5 billion available in annual government R&D grants. Otherwise, according to Michele Scott Tucker, project manager for the study at Texas Instruments, Inc., computer science departments will fall behind industry's needs by the decade's end.

Tucker said the 1984 Dallas-based Metroplex study found that increasing R&D grants to universities will help attract talented MIS and computer science professionals to teaching by alleviating the lure of corporate salaries that often run to six figures. Tucker said TI designates approximately 1% of its annual budget ($4 million) to university R&D projects.

The lack of sufficient numbers of qualified entry-level MIS graduates in the Dallas-Fort Worth area exists because students are being siphoned off by start-up companies and because there are not enough MIS teachers to keep sufficient numbers of new graduates in the pipeline, said John V. Roach, chairman and chief executive officer of Tandy Corp. in Fort Worth. To alleviate the problem, Roach said, industry and government agencies must pool their resources, designating additional funds to university R&D and attracting more top-level graduates to enter academia.

Universities in losing struggle to stay timely with DP

By Kathleen Burton
CW West Coast Bureau

University MIS professors and department chairmen around the nation attribute the MIS curriculum's lack of timeliness and breadth to administrative lassitude and a chronic lack of space, funds and qualified teachers.

C. Medley, chairman of the Computer Information Systems Department at California Polytechnic State University at Pomona, Calif., said today's MIS requirements are outmoded five years by the time graduates enter the work force. There is a curriculum timeliness problem, Medley said, because curriculum changes suggested today must go through a rigorous university approval cycle before they are implemented in the classroom.

Medley said today's curriculum changes won't get into the curriculum catalog until 1986, and students affected by the changes won't graduate and enter the work force until 1990. "By then, you're looking at a five-year lag time," Medley said, "and the changes will be out of date."

Medley said his department is prevented from expanding MIS courses by insufficient funding from the state of California. Medley said his department's annual budget, excluding faculty salaries, is $23,000, supplemented by private industry grants totaling $100,000 to $200,000 a year.

Today's MIS curricula are out of date because it takes about five years between the time MIS requirements are voiced and their subsequent implementation at the university level, said Gordon Davis, a Honeywell, Inc. Honeywell professor of MIS at the University of Minnesota at Minneapolis St. Paul. Davis attributed the delay to the long (three-year) publishing cycle for new DP textbooks and the university's failure to recognize changes in the MIS "real world."

Mark Garman, associate dean for the School of Business Administration at the University of California at Berkeley, said his department lacks microcomputers, equipment and space, all necessary components to bring MIS classes into the business school mainstream at Berkeley. Approximately 100 business school students now use one microcomputer, Garman said, rather than the acceptable five-to-one ratio standard at most schools.

Garman said Berkeley's business school recently had to turn down 10 personal computers because there was no space to put them. "It's a vicious circle," Garman said. "We can't get off the ground this way. Maybe students should be required to buy their own [micros as they would] textbooks."

Jeffrey Moore, assistant dean of computing at the Stanford University Business School, said his department is being pressured by industry to increase personal computer literacy among Stanford's MIS-oriented master's in business administration students. Moore said Stanford has not reacted to this need yet because "[personal computer] literacy is a management education vs. a vocational training issue."

'Basic computer literacy'

With space, mainframe capacity, micro and staff support so tight, Moore said, "We feel we can only afford to teach our [graduate students] basic computer literacy." Moore said that because master's degree students are only in the program two years, the school's philosophy has been to concentrate on other business areas besides MIS and DP.

Over the last two years, Moore said, Apple Computer, Inc., IBM, Digital Equipment Corp. and Hewlett-Packard Co. have made "aggressive" offers to donate personal computers, but there is no space or staff to teach students how to use them.

Ilker Baybars, associate dean for the business school at Carnegie-Mellon University in Pittsburgh, said that although the university is well funded, private and research rich, his department still faces serious financial problems and a chronic shortage of teachers. In spite of this, Baybars said, Carnegie-Mellon tries to keep pace with changing MIS environments.

To remain current, the university's business school will introduce several new

See SCHOOL page 27

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Colleges having trouble retaining entry-level MIS faculty

By Kathleen Burton
CW West Coast Bureau

Because of competitive industry salaries, obsolete hardware and software at universities and dwindling research money, there are five times as many openings for teachers in MIS business schools today than people to fill them, said Gordon Davis, Honeywell professor of MIS at the University of Minnesota at Minneapolis St. Paul.

According to Davis, the problem is that DP and business undergraduates, lured by high salaries and other perks, are being siphoned off by industry before they can begin graduate study. Universities are consequently unable to recruit sufficient doctorate recipients to fill entry-level teaching positions, he said. "In effect, we're eating our seed corn."

According to Davis, other incentives besides salary make teaching an attractive profession, however. "Professors are a different breed," Davis said. "They become teachers because they love research and teaching, not because they want to get rich."

Love of profession

Davis said that because of this love, the University of Minnesota's MIS department can still attract qualified assistant professors, despite the university's scant $300,000 research budget and its $35,000 to $60,000 average faculty salary, which is not competitive by industry standards.

Minnesota offers a five-week MIS certification program that qualifies professionals in related fields to teach MIS courses at the university level — a solution that, if widely implemented, could solve the teacher shortage, Davis said. The certification program, sponsored by the American Assembly of Collegiate Schools of Business, boasts approximately 100 graduates in the two years it has been operating, Davis said.

Wally Wadycki, acting head of the quantitative methods department at the University of Illinois at Chicago, said, "It's very difficult to hold MIS [faculty] who are besieged with offers."

Incentives other than salary

With a starting entry-level salary of $35,000 for a nine-month teaching contract for those with a doctoral degree, and with only $100,000 in research grants offered annually by the MIS department, Wadycki said the University of Illinois was forced to add other incentives to attract teachers. For example, in their first summer of teaching, MIS professors now receive a private research stipend.

In addition, all full-time faculty members now have access to networked terminals on their desks, and the department will reduce the DP teaching load for the upcoming year from six to five courses, allowing professors more time for research and consultation.

> ”
>
> *'People who teach must make fundamental decisions about . . . the [kind of] things, like higher salaries, they're willing to give up.'*
>
> — Randy Gerard
> University of California at Berkeley

The teacher turnover in the MIS department at the University of California at Berkeley is an acute problem, said Randy Gerard, MIS director at the university. A state-funded institution, the University of California at Berkeley cannot compete with the industry either in competitive salaries or research budgets, Gerard said.

Faculty salaries at the university range only from $31,800 to $70,000, according to Gerard.

However, "teaching is a lifestyle. People who teach must make fundamental decisions about the kind of lives they want to lead and the [kind of] things, like higher salaries, they're willing to give up," Gerard said.

The situation will improve slightly in 1985, Gerard predicted, because California Gov. George Deukmejian recently increased the budget for faculty salaries and for instructional use of computers by students.

Gerard said the difficulty in keeping talented teachers is not unique to MIS but plagues other areas like engineering, computer science and bioengineering.

SCHOOL from page 26

MIS courses over the next two years that will focus on such areas as expert systems, manufacturing cost accounting and computer-aided design and manufacturing. The course changes resulted from industry feedback through Carnegie-Mellon's Business Advisory Council, an industry liaison, Baybars said.

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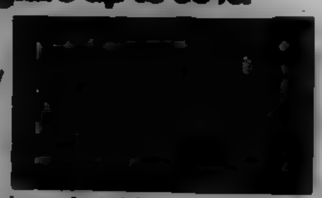

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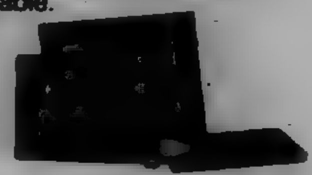

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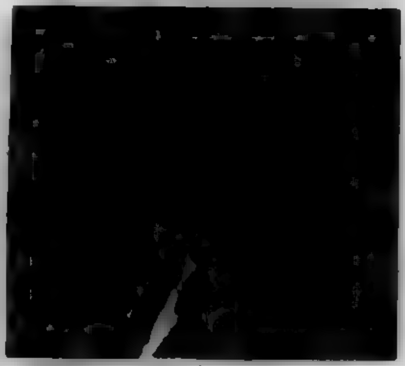

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Mark is CEO and president of NCA Corporation, a leading software developer and marketing company that's helping manufacturers stay competitive with a manufacturing resource planning (MRP II) system called MAXCIM.™

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"Digital has a solid reputation among manufacturers," Mark states. "After all, they're the leader in distributed processing and are committed to CIM with dedicated resources. And the VMS operating system provides an unparallelled path for growth."

In fact, Digital anticipates and meets manufacturers' needs so successfully that NCA developed MAXCIM to run exclusively on Digital systems.

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Micros, minis keep maple syrup production flowing

By [illegible]
CW Staff

ST. ALBANS, Vt. — When the night temperature slides to 20 degrees Fahrenheit and the day temperature warms up to 40 degrees Fahrenheit, sap flows from the sugar maple trees here and is soon boiled down to make Vermont maple syrup. At each step of the sugaring process, micro- and minicomputers aid the producers and distributors who move the syrup from vats to the nation's pancakes.

George Dunsmore of Sunset View Farm in St. Albans — a former Vermont commissioner of agriculture — has 600 acres of farmland. Dunsmore uses an IBM Personal Computer to track the business end of his farm, he said. His business includes 3,000 taps (buckets on the maple trees) that produce 800 to 1,000 gallons of maple syrup a year, he said. "I use the [Personal Computer] for payroll, profit and loss, depreciation scheduling — all of my finances," he added.

For many farmers, maple syrup is an enterprise that is conducted in addition to other businesses, Dunsmore said, and the personal computer is a good management tool for such farming practices. Dunsmore, for instance, milks 60 cows and farms half of his 600 acres — the remaining half is rented to other farmers — in addition to his sugaring operation, he said.

Sunset View Farm has seen many changes in maple production since its beginnings in the 19th century, Dunsmore said, with much of the change occurring in the last five years. Because maple producers now market their product at food shows around the world, demand for maple products has caused rapid growth in the methodology and business of producing syrup, he said.

The methodology of extracting sap and producing syrup had changed little until recently, Dunsmore said. Buckets in the sugar bush (an orchard of sugar maples) are being replaced with plastic tubing and vacuum pumps; the tractor has preempted the horse-drawn wagon, and fossil fuels are used more widely than wood under the evaporators, he said.

Many producers sell 30-gallon barrels of their finished syrup to larger companies, such as American Maple Products Corp. and Maple Grove Farms of Vermont, he said.

Roger Ames is president of American Maple in Newport, Vt. He is also chief software writer, head accountant and sales manager, he said. American Maple uses an IBM System/32 for tracking its maple syrup inventory and for administrative purposes, he said.

The company distributes empty drums to syrup producers, who boil their sap and fill the drums with syrup, Ames said. He pays cash to the producers for the filled drums and tracks the ins and outs of the inventory with software he designed, he said.

Implementing similar program

Maple Grove in St. Johnsbury, Vt., is in the process of implementing a similar program, said Jeff Donley, the company's programmer. "We're probably behind most companies in computer implementation, but in the next two years we'll catch up," he said.

Maple Grove has been a maple syrup producer for 70 years and bought its first computer — a Prime Computer Inc. Prime 2250 running under the Primos operating system — two years ago, he said. The company uses financial systems from Avent & Associates of White River Junction, Vt., and an order entry and mail order system from Datamann, Inc., also of White River Junction.

Donley is looking toward a near future that includes a materials requirement planning package, and further down the road he plans to include a sales analysis program to help the company expand and analyze sales of its maple products.

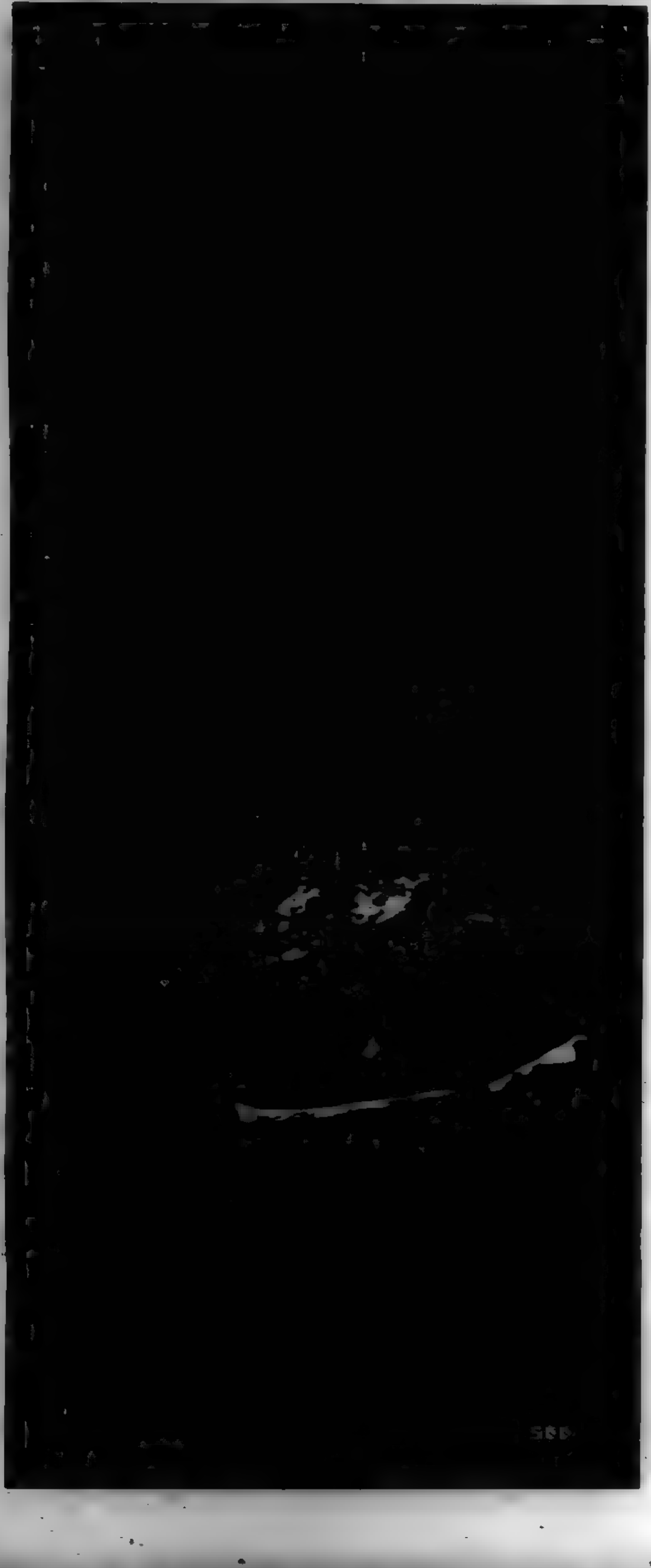
NBS report now available

GAITHERSBURG, Md. — A publication is now available from the U.S. Department of Commerce's National Bureau of Standards (NBS) that describes how to measure the vulnerability of electronic equipment to interference from electromagnetic radiation in the environment.

Working with the U.S. Army's Communications Electronics Engineering Installation Agency, NBS has developed a procedure for computing approximate building attenuation values over the frequency range 10 kHz to 10 GHz.

The 310-page report, titled "Building Penetration Project" (NBSIR 84-3009), offers computations of electromagnetic properties of various building materials, the theoretical basis for calculating building shielding effectiveness and descriptions of computer programs used to calculate shielding effectiveness.

The report can be ordered by specifying number 85-126001. It costs $25. More information is available from the National Technical Information Service, Springfield, Va. 22161.



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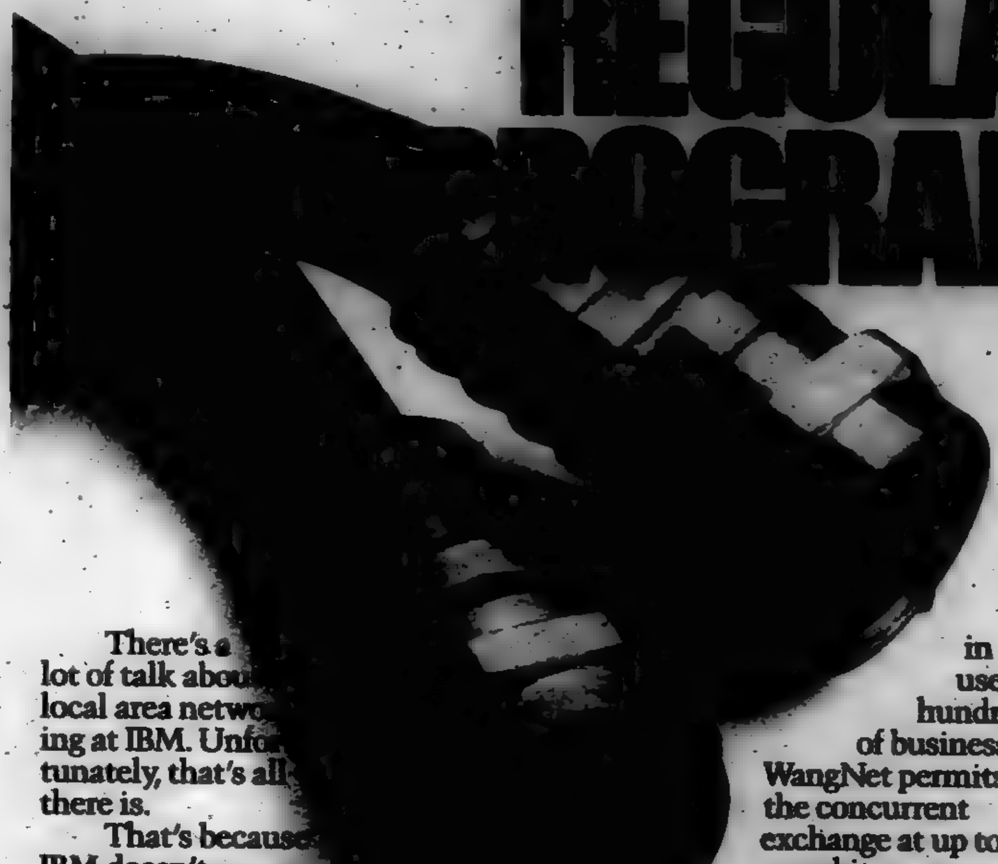

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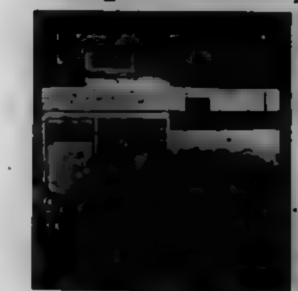

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Levi Strauss outfitting U.S., foreign offices with micros

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — Two years ago, it would have been hard to find any personal computers at Levi Strauss & Co.'s corporate headquarters in downtown San Francisco. Today, the clothing company best known for Levi's blue jeans has installed 300 personal computers in its home office and an additional 100 micros in field locations across the country.

But the company's plans do not stop there, said James Wilson, Levi Strauss' manager of microcomputer support. Sometime this year, Levi Strauss said it hopes to distribute portable computers to its traveling sales representatives. In addition, the company plans to establish a system that will support the transfer of data from textile factories in the Far East to the firm's corporate offices, Wilson said.

Levi Strauss, which relies on a variety of IBM mainframes for its data processing needs, has also designated IBM as the standard bearer for its personal computer users, Wilson said. The majority of Levi Strauss users have IBM Personal Computer XTs; the most common software package in use is Lotus Development Corp.'s 1-2-3, Wilson said.

Sales reps use micros

The company has also distributed IBM Personal Computer XTs to approximately one-third of its sales representatives who use custom software developed by Levi Strauss to manage retail inventory records. Wilson estimated that approximately 125 members of its sales team are using the software to keep track of what products are moving and which sizes are most in demand.

About five months ago, Wilson said, Levi Strauss rolled out a second custom application for its sales force — an on-line order entry system. The system is now being used by 25 members of the sales team. It allows them to create order entries off-line, dial into GTE Telenet Communications Corp.'s Telenet and send the orders to the firm's IBM 3081. The information is then routed to IBM 4341s in distribution centers across the U.S., where orders are filled. The system has replaced what had been a completely manual operation. "They used to have to write out orders by hand and mail them in," Wilson said.

The system has received a positive response from sales representatives because it gives immediate confirmation that orders have been received and booked, he explained. Wilson said the firm intends to extend the system to other members of the sales force. "It's just a matter of training at this point," he said.

Orders received and processed faster

According to Wilson, the primary benefits can be measured in "hard dollars," because a greater number of orders have been received and processed in a shorter period of time. Additionally, the system gives Levi Strauss the chance to "predict [better] where the market is going" because the data can be used in historical analysis and in forecasting trends, Wilson said.

Levi Strauss is also setting up a system to communicate with four textile manufacturing plants in the Far East, Wilson said. By the end of February, contractors will be using Personal Computer XTs to record the status of work in progress — when they receive, cut and sew the fabric and ship the garments — and will use a dial-up line and satellite communications to reach an IBM Personal Computer AT located in Levi Strauss' headquarters.

But there is a large group of Levi Strauss employees who are still waiting to realize the benefits of computers — they are the traveling sales representatives who typically work on the road for up to 10 days at a time. These representatives need an IBM-compatible, briefcase-size portable system, Wilson said. But Levi Strauss has not yet found the computer that meets its needs, he said.

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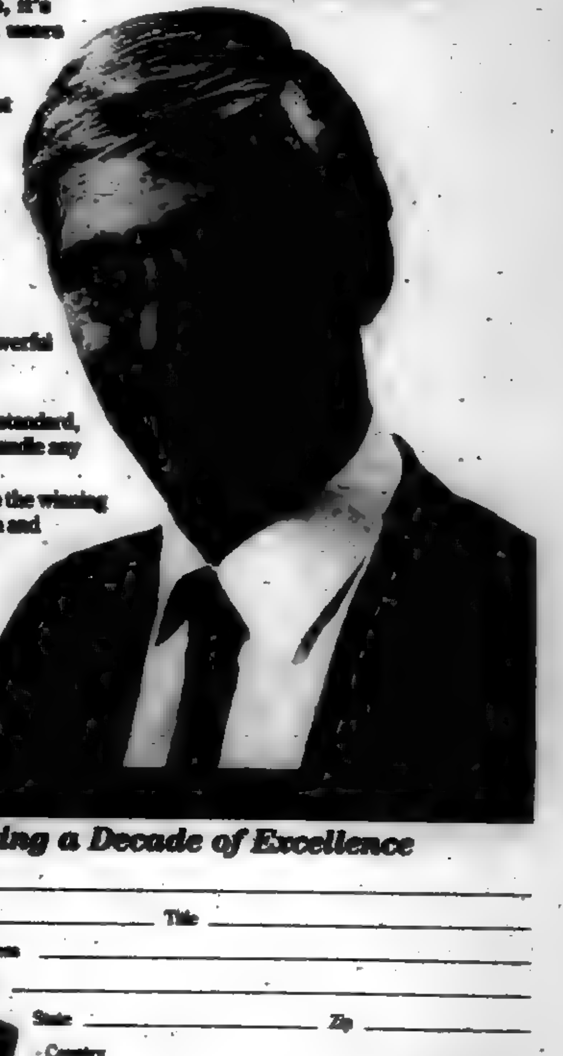

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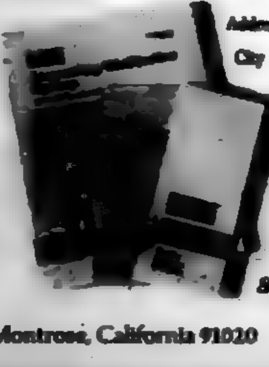

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Building design topic of Ibis' spring meeting

FORT LAUDERDALE, Fla.— The Intelligent Buildings/Information Systems (Ibis) spring conference will be held at the Pier 66 hotel here on March 18-19.

The conference, sponsored by Barry University of Miami Shores, Fla., and Cross Information Co. (CIC) of Boulder, Colo., will cover topics related to incorporating new technologies into buildings design.

The conference's theme is "Intelligent Building Blocks," and there will be sessions on planning, design, systems and networks in intelligent buildings, as well as management and sales sessions.

Participation in the Ibis conference costs $795 and includes all meals and a copy of "The Orbit Study Summary Report." More information is available from CIC, Suite C, 934 Pearl, Boulder, Colo. 80302.

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Columbus may have changed the way people thought about the shape of the world. But we've changed the way the world thinks about data compression.

Proprietary compression algorithm: the heart of the matter,
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Because the type and volume of data transmitted on a typical port in one direction on a link may be very different from the data transmitted in the other direction, or on other ports, STEAMER analyzes the data in each direction on a port-by-port basis and builds entirely independent compression tables. That ensures that maximum compression efficiency is obtained.

In fact, the STEAMER compression routine is so efficient, it virtually guarantees no additional delay added to response time. Our compression algorithm can compress or decompress 3,000 characters per second. That's the equivalent of a 14,400 BPS circuit operating at an 83% saturation rate in both directions simultaneously!

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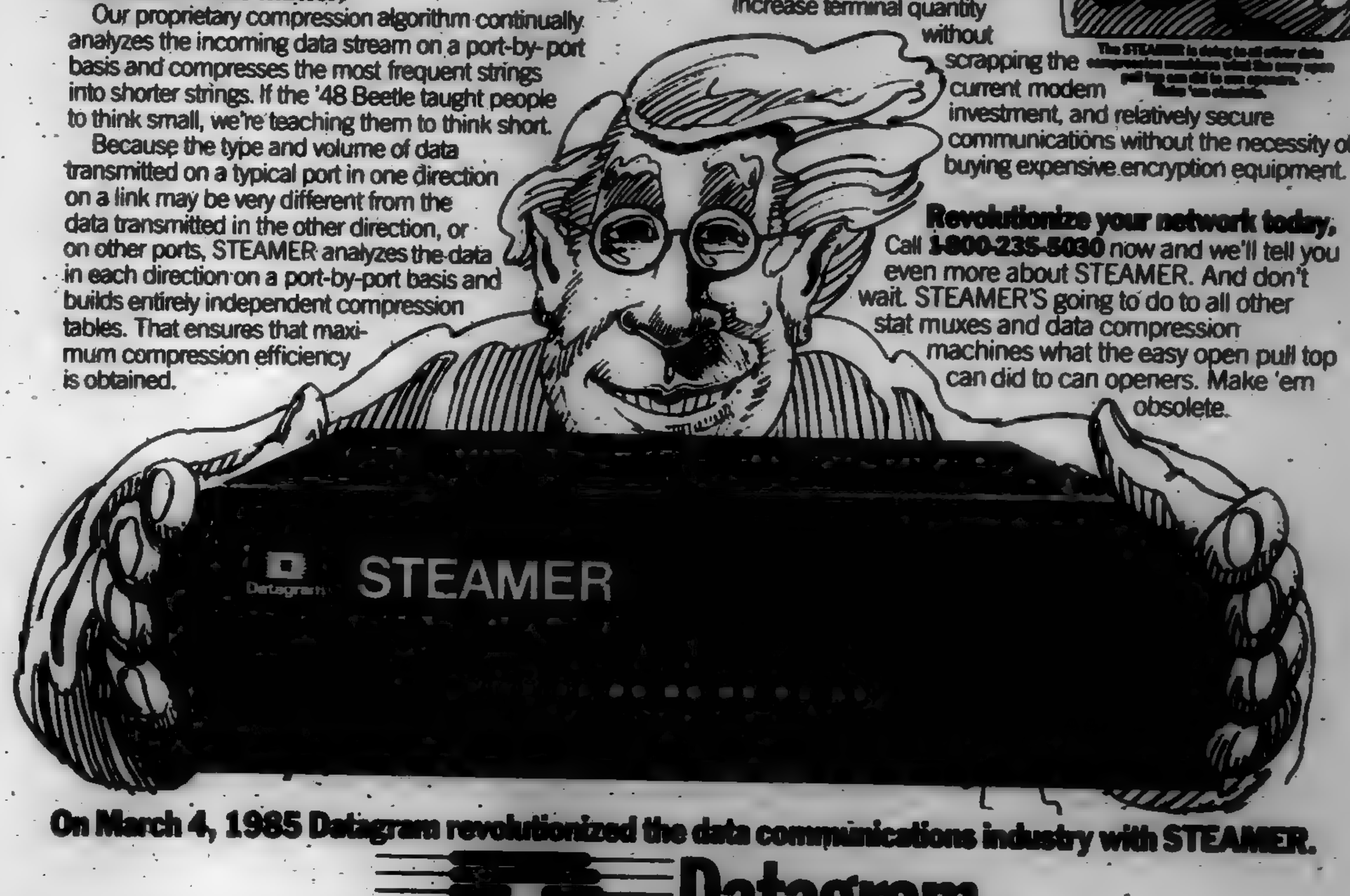

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INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

MELBOURNE — Control Data Australia Pty. Ltd. will discontinue its Cybertel videotex bureau service as of March 19. Reportedly, the firm will withdraw from the market due to the rapidly changing business environment for videotex services.

BRAZIL

BRASILIA — As of March 15, control over Brazil's Special Department of Informatics will change hands. The department, which controls the information processing industry in the South American nation, will no longer be under the direction of the military's National Security Council. It will instead be administered by the yet-to-be-formed Ministry of Science and Technology.

FINLAND

HELSINKI — IBM has purchased $30 million worth of Finnish-made color display monitors from Salora AB, intended for use in IBM's own product line. The color display monitors were designed for advanced graphics applications, according to a spokesman for the Finnish company. Salora is a division of the privately held Nokia conglomerate, which posted 1984 revenue of $250 million.

FRANCE

PARIS — Groupe Bull showed a 16.8% growth for 1984, with consolidated revenue of $1.2 billion. Capital contributions from the French government, the main shareholder in the company, amounted to $90 million. The infusion of cash was used to revamp the company's computer hardware lineup and operating systems. For 1985, the company has projected a continued growth rate of 17%.

JAPAN

TOKYO — Claiming to have developed "the fastest mainframe in the world," NEC introduced its answer to IBM's 3090 Sierra system: the Acos 1500, a high-end, air-cooled line of mainframe processors. The series consists of four models — the uniprocessor Acos 1510, the dual-processor 1520, the triprocessor 1530 and quad-processor 1540. The systems offer between 128M and 256M bytes of main memory.

The Acos 1510 is said to offer internal throughput of roughly 37.5 million instruction/sec (Mips), and the 1540 reportedly performs at roughly 135 Mips — more than double the performance of IBM's recently announced 3090 Model 400 processor. NEC has also enhanced releases of its Acos operating system, including the Acos-4/MVP XE, designed for the newly announced mainframe processors.

Deliveries of the Acos 1500 reportedly will begin in June. The machines, which are not expected to be made available in the U.S., will lease for between $164,000/mo and $588,000/mo.

NETHERLANDS

UTRECHT — The Dutch government has contributed $2.5 million to a Dutch software house, the Bureau for System Development (BSO), to help the company continue R&D efforts on a computerized translation system. By the end of the decade, the company expects to have ready a French-English/English-French translation system, with other languages to follow.

SWITZERLAND

GENEVA — Copyrights and international protective agreements for software programs were two main topics of discussion at the recent World Intellectual Property Organization and United Nations Educational, Scientific and Cultural Organization meeting here.

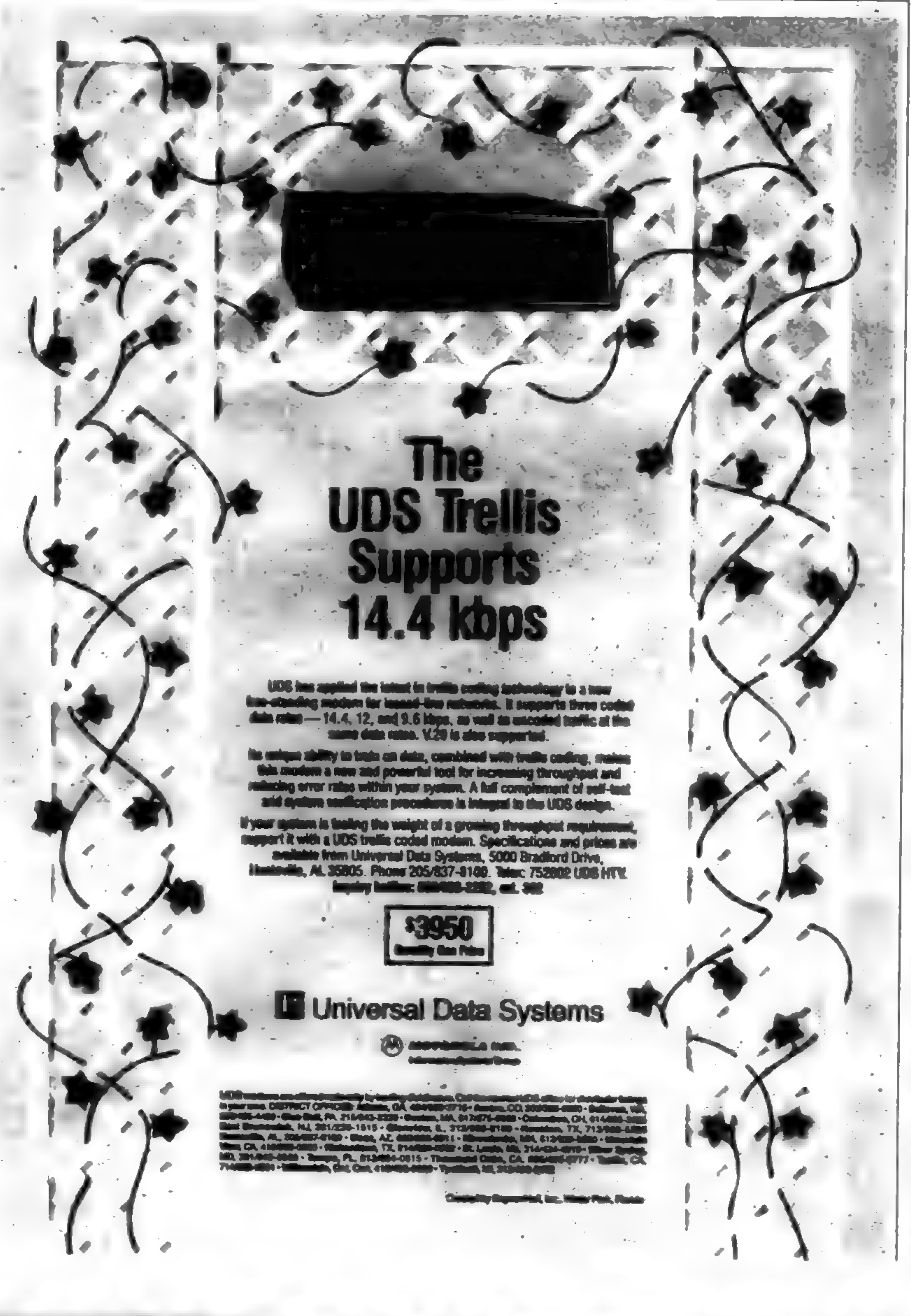
Legal experts from nine countries conferred on the issue, discussing existing national policies in the U.S., India, Australia and in Scandinavian and other countries, as well as pending legislation in West Germany and France.

WEST GERMANY

HANNOVER — The upcoming Hannover Fair is expected to showcase five newly developed communications systems, sources indicated. Preshow announcements include Integrated Services Digital Networks systems and digital private branch exchange systems from companies including Siemens AG, Nixdorf Computer Co. AG, Philips Information Systems, Inc., Standard Elecktrik Lorenz and the Frankfurt, West Germany-based Telenorna.

■

FRANKFURT — Battelle-Institute E.V. is conducting research on inhouse networks in office automation. The study will focus on U.S. and German companies using local-area networks and will include technical aspects as well as the ergonomic impact of local-area networks on the organization. Companies interested in participating in the international research are invited to contact Battelle's Udo Frenzel at Postbox 900 160, D-600 Frankfurt 90, West Germany.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UDS has applied the latest in trellis coding technology to a new free-standing modem for leased-line networks. It supports three coded data rates — 14.4, 12, and 9.6 kbps, as well as uncoded traffic at the same data rates. V.29 is also supported.

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In-house DP setup saves city money, increases efficiency

FRIDLEY, Minn. — When this northern suburb of Minneapolis decided to bring its municipal data processing in-house, it turned to a system from a local vendor that city officials say has improved the city's utility billing and other functions.

Fridley, with a population of 30,000, had previously belonged to a regional municipal computer consortium that provided financial computing services such as payroll and utility billing for its 24 member cities. Those services alone were fine, city officials said, but additional user-designed programs were not available.

In 1984, after looking at the offerings of four or five vendors, Fridley purchased and brought on-line an alternative to the consortium's services — a turnkey system from Tele-Terminals, Inc. in nearby Brooklyn Park, Minn. Included was the Non-Profit Management System (NMS), software developed by Tele-Terminals that processes financial data and also serves the data processing needs of Fridley's fire department, public works department, city assessor and other departments.

In addition, city officials said the new system's hardware and software cost less in a five-year term than the consortium's services, despite the $20,000 penalty that the city will have to pay the consortium for its early exit.

Flexibility is best feature

According to Fridley's director of central services, Sid Inman, the best feature of NMS is its flexibility. NMS consists of 12 independent software components, including payroll, utility billing and liquor store management subsystems. All 12 modules will be used by the city and will run on a Texas Instruments, Inc. 990 computer system that was also part of the Tele-Terminals package. The system is linked with 28 terminals and 15 printers.

City employees, who had first feared the in-house system was a threat to their jobs, have not been replaced by the system and have found, according to Inman, that "there's nothing fancy about it. In fact, their jobs have been simplified."

In addition, the city has begun to use the system for cross-training employees who are working with the same data base so that they can learn each other's tasks — ending the disruption caused by vacations and leaves.

Software simplifies work

Finance Officer Rick Pribyl said he has found that the software simplified his work. In the job costing area, for instance, the consortium could only give calendar year data, despite the fact that most projects take several years to complete.

"We spent numerous hours manually searching in vaults for stored records recounting other years," Pribyl said. NMS, he said, can accumulate years of data and allows compilation of cost centers for nearly any activity.

One NMS component, the Fire Information and Reporting System, has assisted the city's fire department. When firefighters receive an emergency call, they enter information into a terminal, and a printout showing exactly where a fire is occurring as well as what type of structure is involved is available immediately. Printout information also includes how many people live at the residence, whether a resident is disabled or handicapped and whether hazardous materials are present.

On-line in Fridley, Minn.

Fire Chief Bob Aldrich said the system is easy to operate. "All the [computer] experience I've had is a five-week course in Basic at a technical school, and that course was very, very basic," he explained.

Data stored and retrieved by the system helps in the administrative tasks of the department as well as in firefighting. Aldrich recently used the system to compile a report for the city council that include the types of fires, losses involved and value saved by firefighting. The report, which in the past took him three weeks to complete, was ready in two days.

Another NMS component, liquor management, allows the transfer of data from the cash registers at municipal liquor stores directly to the city's data base. The software's utility billing program lets the city set its own billing cycles, including the number of grace days it wishes.

The in-house system, Inman said, has increased savings and services over that of the consortium. It may also have helped improve employee morale and the city's image in the eyes of taxpayers, Inman said. "NMS has improved our image," said Inman. "If cities ever needed good PR, they need it now."

Taylor and the 16-bit Grid Systems Corp. 1109 portable personal computer

Portable micro broadens firm's office boundaries

SAN MATEO, Calif. — John Taylor's heavy travel schedule as general manager for an equipment leasing company forced him to spend more time working during non-office hours.

When he is out of the office, Taylor uses a Grid Systems Corp. 1109 portable personal computer to write memos, prepare charts and graphs, do financial projections and analyses and work out budgets for USL Data Systems, a division of U.S. Leasing International, Inc.

The Grid computer is a 16-bit Intel Corp. 8086 microprocessor-based system with an 80-bit arithmetic coprocessor and up to 1.4M bytes of built-in memory and storage capacity. It has a flat-panel electroluminescent screen that displays 25 lines by 80 characters. Speed of communications, IBM compatibility and full screen capacity were of particular importance in Taylor's selection of a portable micro.

Using standard telephone lines and the Grid's built-in 1.2K bit/sec modem, Taylor and other USL Data Systems executives can exchange information with one another from remote locations. While attending a board meeting in Boston, Taylor hooked the Grid up to the telephone in his hotel suite and accessed information from USL Data System's headquarters in San Mateo. He then prepared drafts of a board presentation, transmitted them to headquarters for comments and integrated those comments into a 10-page report illustrated with financial projections and graphs.

Taylor

USL Data Systems is networking its Grid server, which supports 48 local and 10 remote computers. Staff members at the San Mateo headquarters and 10 national sales offices will be able to share information and peripheral devices while in the office and on the road, he said.

The company also served as a test site for Gridflex, a time management tool. Gridflex includes a calendar and time-of-day display, an appointment schedule with a week-at-a-glance feature and an automatic appointment alarm.

With Gridflex, Taylor said, executives enter appointment times that are then displayed graphically both on the monthly and the week-at-a-glance calendars.

An automatic alarm serves as a reminder of appointments and meetings throughout the day. "You can do all those things without going to computer school for five years," Taylor said.

A computerized business card file that automatically dials telephone numbers is also part of the Gridflex package. Taylor refers to the business card file as his "mini data base." When he wants a particular number, he electronically locates the appropriate business card and presses the telephone function key. The computer automatically dials the telephone number for him. "Grid has taken the grunt and drudgery out of my work," Taylor said.

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MIS team pieces together networked data facility

TULSA, Okla. — When Southland Corp. decided to purchase Cities Service Gas and Oil Corp.'s oil refining, marketing and transportation assets in 1983, the executive in charge of Southland's MIS gave the newly created company 90 days to build an operational data center and communications facility.

Renamed the Citgo Petroleum Corp., the former Cities Service division actually accomplished the task with three days to spare. "We had our data center, our private branch exchange and all our communications geared up and running production work 87 days after the sale to Southland," said Tom Shull, Citgo's manager of network services. Shull, along with data communications manager Alan Ezarik, was responsible for the communications aspects of the project.

Citgo's data communications system for net management

The directive from Southland's vice-president of MIS to move quickly on the center and facility left no time for a formal request for proposals. Shull and Ezarik compiled a list of components for the system and began contacting vendors.

Despite this hurried approach, Shull and Ezarik came up with a data communications system that moved Citgo from technical control — simply finding an error and fixing it — to network management. The network had the potential for capacity planning because it incorporated a digital matrix switch with a management reporting system that tracked recurring problems, according to Shull.

Prohibited from hiring staff and ordering equipment until Citgo actually became part of Southland on Sept. 1, 1983, Shull and Ezarik busied themselves "looking at where we were and where we wanted to go." Early in the summer they studied the data processing operations the network would serve and put together a list of prerequisites for the monitoring, testing and switching devices they needed.

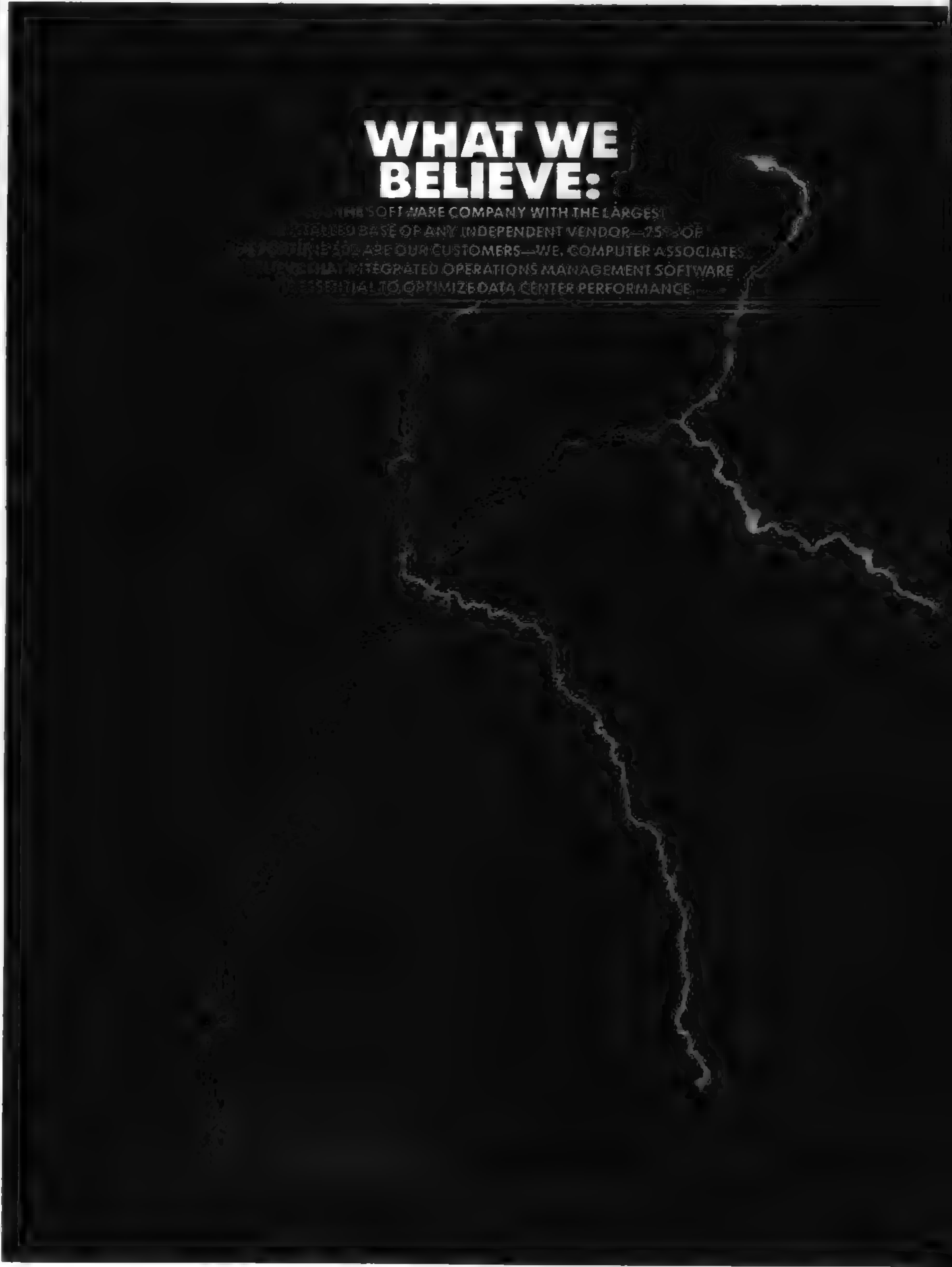
The data center today includes four host computers: an IBM 3033 and a 4381, an Amdahl Corp. V7 and a Digital Equipment Corp. PDP-11/45. Of these, the 4381 and PDP-11/45 are essentially stand-alone processors; the IBM CPU runs marketing and manufacturing models, permits time-sharing and links to an IBM 3705 front-end processor as well as three leased lines and 27 terminals. The DEC machine is used to receive information from 26 light oil terminals scattered throughout the Eastern part of the country.

Data center's main units

The IBM 3033 and the Amdahl V7 constitute the main components in the data center. Both use IBM's MVS operating system, and the two computers are tied together with IBM's JES software. The 3033 runs an in-house time-sharing system called TSO for 368 users, as well as the main JES software, which includes IBM's Remote Job Processing (RJP) software. With RJP, a variety of remote devices can access the 3033.

Meanwhile, the Amdahl V7 handles several on-line applications. IBM CICS is used by approximately 112 users in credit card/cashier and human resources operations. Another 111 users employ IBM's IMS cost center accounting and inventory management functions.

Two Amdahl 4705 front-end processors sit between these two CPUs and the data



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with three days to spare for newly formed oil firm

network. They run software that takes much of the load of managing a data network off the main data center.

Ninety-five percent of the users who access the main data center — chiefly programmers and others doing development work — employ data communications, which at Citgo means working in an IBM Systems Network Architecture environment. The remaining 5% have access in local mode to a processor channel.

Vtam support

Citgo uses IBM Vtam, and all of the on-line applications that run in the main data center — TSO, CICS and IMS — support Vtam. The company has approximately 300 IBM 3270-type terminals on 34 leased lines that can access these applications through Vtam at 9.6K bit/sec. Citgo has another 65 asynchronous terminals that operate at the lower speeds of 300 and 1.2K bit/sec and are limited to the data center's two time-sharing options — TSO and CMS.

Located between the user terminals and modems and the network's front-end processors is the 70- by 140-line digital switch. This device, a Dynatech Packet Technology, Inc. CTM-1000 matrix with Dynanet 57 controller and Dynanet 200 alarm system, provides diagnostic fall-back capabilities that Shull and Ezarik consider invaluable for the data center.

The ability to monitor lines when problems occur, to sound the alarm when lines fail, to switch either production front-end processor from spare to on-line with one command and to track problems through a management reporting system were all on Citgo's list of musts when it went looking for a system in 1983, Shull said.

Time constraints, along with the desire for a switch with a manual override in case the computerized control failed, narrowed the field to one vendor.

Because it included integral patching from the start, Dynatech's matrix became Shull's switch of choice.

A management reporting system tracks problems.

Shull said he believes that the Dynatech switch eventually will make it easier for the company to absorb the growth it has planned. Citgo has already ordered another cabinet and 32 more ports. Beyond that, Citgo management is considering automation of all the firm's field locations.

In the months ahead, Ezarik and Shull said they would like to see Dynatech add to the management reporting functions the switch already offers. They said they also look forward to a larger storage capacity for the operational data the matrix generates and the ability to transmit this information to a host CPU for safekeeping. They both said they would benefit from a history of the network's performance on tape or disk.

When coupled with additional software, Citgo said it looks forward to using the matrix switch as an integral part of its capacity planning.

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Report writer assists Cobol shop with 20% of programming

DALLAS — A Cobol shop here has discovered that a report writer could be used for as much as 20% of its programming tasks.

The Southland Life Insurance Co., headquartered here, provides life, accident and health insurance nationwide. According to Tom Johnson, second vice-president and manager of information services, all of the data processing for the corporate office and its sales agencies is performed by approximately 30 programmers in the Dallas data center.

On an IBM 3033 attached processor mainframe running under IBM's MVS operating system with TSO and CICS, the data center maintains all policies currently issued, informs agents of policies due for renewal and performs general financial reporting, Johnson said.

In January 1984, after a year as a beta-test site for DYL-280 II, a product of Granada Hills, Calif.-based Dylakor, Inc., Johnson made the decision to use the package — a report writing language with utility and programmer aid features and data analysis functions — in a production environment. Johnson, who is in charge of the programming and system design departments, said he had been using earlier versions of Dylakor's report writers since 1977, but their use was relegated to quick reports and utility needs.

DYL-280 II has now been in production since June 1984, and approximately 10 new programs are generated every week, Johnson said.

For production jobs, company policy had dictated that Cobol, Fortran or assembly language be used, Johnson said, and the shop used approximately 95% Cobol. The theory was that these standardized languages offered consistent documentation for update and maintenance, and they fit reliably into proven security procedures, he said.

DYL-280 II rated better than Cobol

Johnson concluded after trying DYL-280 II that the package was easier to maintain than Cobol and more cost-effective for straightforward reporting and data extraction. "We don't use it for complicated functions because it doesn't have the organizational capabilities of Cobol. For example, you can't call subprograms the way you can in Cobol," he said.

The package is much faster than Cobol for simple reports partly because it does formatting, such as titles and centering, Johnson said. He added the package to the list of languages and tools authorized for use in production, and it is now used for about 20% of the company's programming needs, he said.

The data center has clearly defined procedures that ensure data security and efficiency of the center's operations, Johnson said. All modules must be stored and maintained permanently in such a way that a history of updates is on record.

The Freeze Option feature in DYL-280 II suits this requirement because it prevents changes in the source code and creates a permanent module that is placed in the protected operating system load library, he said. It also saves execution time because it can be run "load-and-go" without translating the source code, he said.

New DYL-280 modules go through a series of tests, Johnson said. When they pass these, they are authorized for production, put into the daily cycle and watched closely for a period of time, the length of which depends on how critical the package is.

When it is determined that a module works well in actual production, it is absorbed into the system and copied onto the production libraries, he said. This process from beginning to end takes approximately two to four weeks for an average module.

Package's other uses

The package is also used as a tool for quick reports and special programs, Johnson said. The systems design department works with end users to define the kinds of reports each new insurance product requires to manage issuance of the policy, to value it, to issue bills and to collect premiums and agency commissions, Johnson said. Much of this group's documentation is generated using DYL-280 II, he added.

The systems design group also does a good deal of testing and cross-checking to ensure companywide accuracy, Johnson said. DYL-280 II has sampling and analysis capabilities that are used in numerous ways to confirm that operations are functioning, he added.

In one example of a search for errors, a DYL-280 II program is used to compute the correct interest paid, he said. Reports are then run to compare the amounts actually paid with the amounts that should have been paid, he added, and records with discrepancies are sorted out for further analysis.

So far, 80% of the programmers have picked up the use of DYL-280 II themselves or with the help of trainers, Johnson said. Training takes place in-house using manuals and documentation developed by Dylakor.

"There is a natural resistance on the part of our Cobol programmers to learn another language, but once they have used it a few times, they like it because of its simpler operations," Johnson said.

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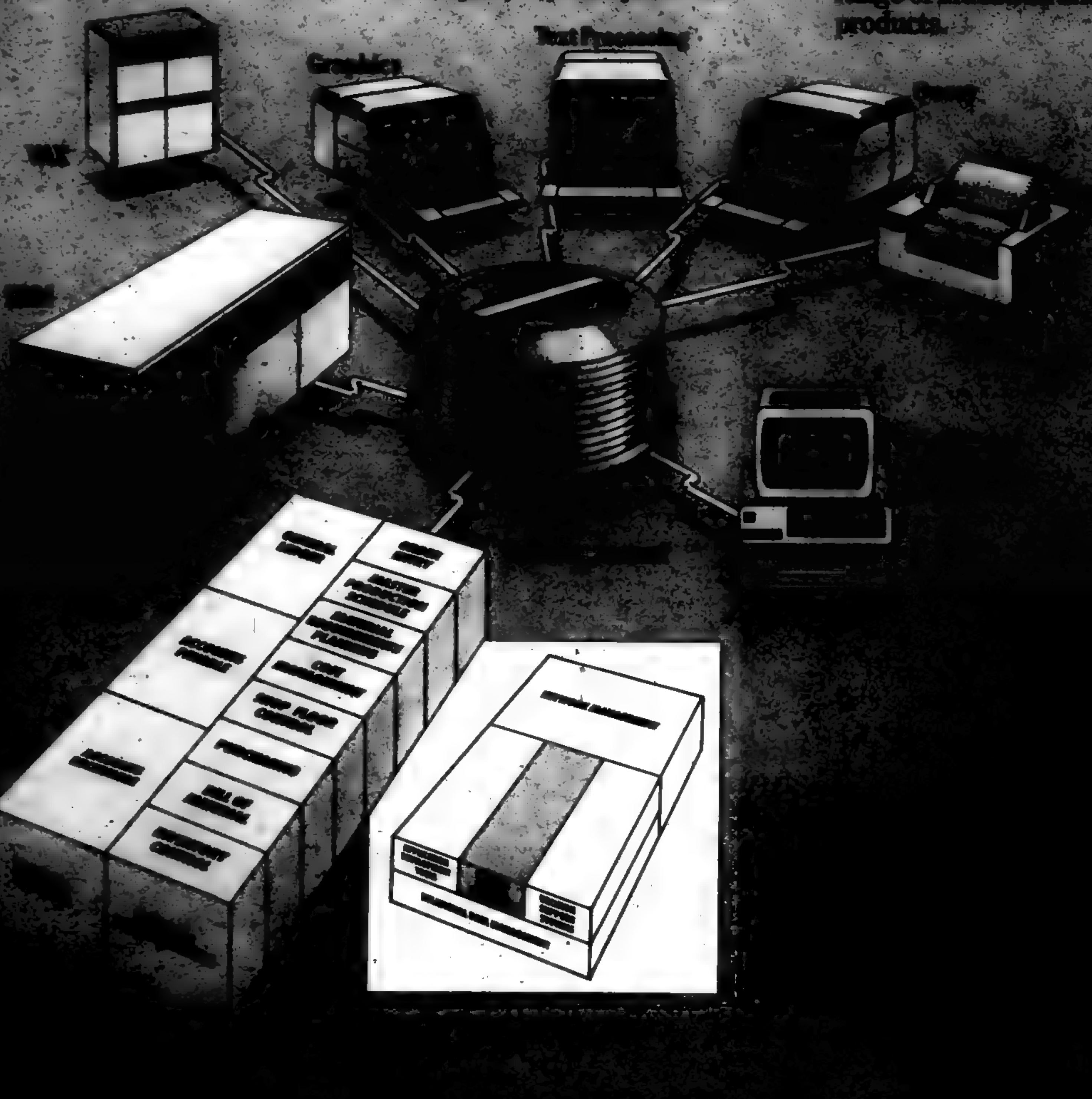

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Spreadsheet maximizes public utility's resources

Mainframe package fulfills sundry duties

EPHRATA, Wash. — In an effort to meet the needs of its expanding customer base, a major public utility here is using a mainframe spreadsheet package.

Grant County Public Utility District owns and operates two hydroelectric generating plants on the Columbia River. The utility serves more than 30,000 customers, including an increasing number of energy-hungry industries. According to Jerry Burke, the utility's business systems coordinator, its performance in generating power is a major factor in Grant County's future growth.

Burke said the utility's data processing department operates an IBM 4341 mainframe under DOS/VSE with CICS. The IBM mainframe is the core of an on-line network consisting of 83 terminals and 14 printers. The department also operates an IBM 4331 mainframe dedicated to computer-aided drafting applications, allowing engineers to keep up with design demands for substations and distribution systems.

To make its workers more productive, the utility wanted to give end users the ability to develop their own applications. "We wanted to give end users the tools and resources they needed to solve their own business or technical problems," Burke said.

User requests

Thus, the data processing center began a search for a generalized business tool that would fit into the utility's IBM CICS environment. A common user request was for spreadsheet capabilities to help in forecasting, budgeting, "what-if" planning and solving problems requiring iterative calculations.

After comparing three electronics spreadsheet products designed for mainframes, the Grant County Public Utility District selected Maxicalc from Hasbrouck Heights, N.J.-based Oxford Software Corp. Maxicalc is an interactive, nonprocedural management planning system that provides IBM 3270 terminals with on-line electronics spreadsheet capabilities. It allows CICS terminals to emulate a microcomputer with spreadsheet capabilities.

According to Burke, end users wasted no time in finding creative ways to apply Maxicalc to solve time-consuming problems. One such problem involved the analysis of the number of fish traveling up and down the Columbia River past the utility's dams.

"Because we have dams on the river," Burke explained, "we address a number of environmental concerns, including ensuring that fish successfully migrate past the dams. To support this effort, every season the utility's environmental people perform a number of studies involving massive amounts of fish passage data."

With Maxicalc, Burke said, environmental data analysts designed a mathematical model that demonstrates how the movement of different species of fish can be optimized by increasing or decreasing the volume of water spilled from the dam to aid fish passage. The model allowed the environmental analysts to predict the success of fish passage based on volumes of water.

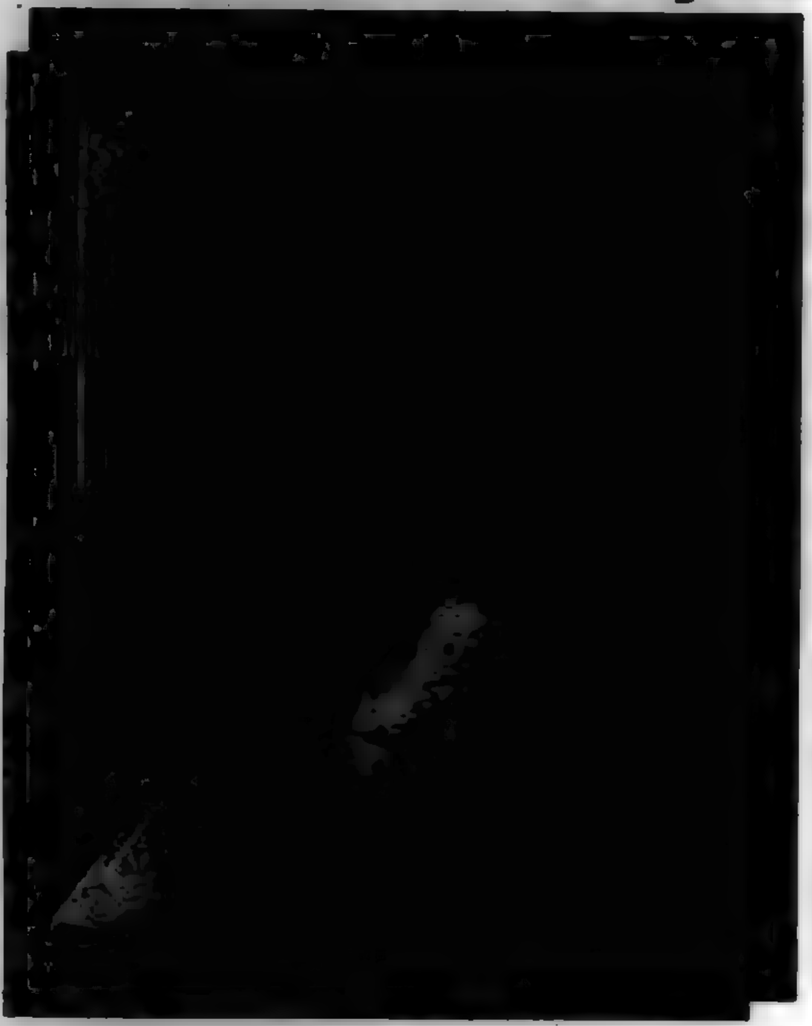
> ”
>
> *Before the utility implemented the spreasheet, calculations often required weeks to perform.*

Also, according to Burke, there are real economic incentives for the utility to optimize the amount of water diverted through spillway gates as opposed to spinning turbines for power generation.

"Stored water is energy," Burke said. "Any water that is spilled from a dam without going through the turbines is essentially lost revenue. Using Maxicalc, we can perform 'what-if' analyses to determine impacts in terms of lost, new or retained revenue."

Burke said that before the utility implemented Maxicalc, those kinds of analyses were performed with programmable, hand-held calculators. The iterative calculations often required weeks to perform, and the reliability of the results could not easily be tested or demonstrated. Now, he said, the spreadsheet permits analysts to generate calculations with a high level of confidence in a matter of hours.

Approximately 100 people in the utility now use Maxicalc on a routine basis — and that number is growing. Responding to a detailed questionnaire prepared by Burke, users in the controller's and the treasurer's offices and in the engineering, environmental and fisheries areas were able to identify significant time savings gained through use of the mainframe spreadsheet. Some users even demonstrated that the increased productivity helped the utility avoid the cost of hiring consultants.



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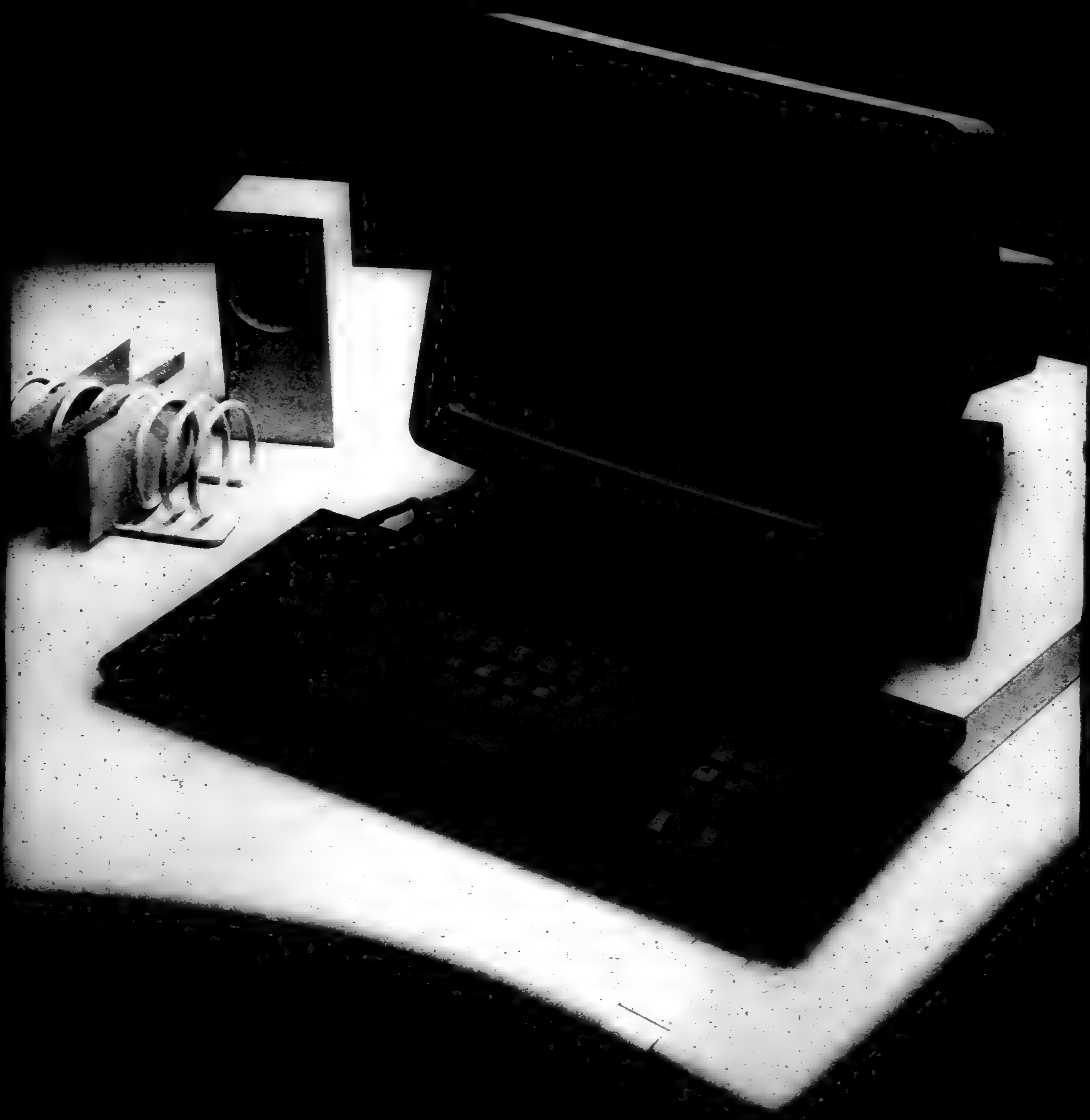

Givens (right) and Phal inspect Komstar 200 processor.

GTE Sprint cuts turnaround time with on-site microimage system

BURLINGAME, Calif. — When customers call a long-distance telephone company here to question charges on their invoices, they expect quick answers.

GTE Sprint Communications Corp., which mails millions of invoices each month, has found that paper records are impractical and on-line computer storage of massive amounts of invoice data becomes increasingly less cost-effective as the information gets older. As a result, GTE Sprint uses micrographics — storing document images on microfilm — as a solution to the problems of archival storage and retrieval.

Michael A. Givens, the DP department's manager of production control, said that until mid-1981, GTE Sprint used a local service bureau to prepare microfiche records of invoices. The billing computers created magnetic tapes that generated the revenue-generating invoices and were then used to produce microfiche at the service bureau. Each of the service bureau's microfiche held 270 invoice pages.

At that time, the department's programmers had not yet brought up the billing system's current-month, on-line retrieval capability, so all customer billing inquiries were answered by referring to microfiche.

Unhappy with time delay

However, Givens and William Phal, GTE Sprint's director of data processing, were not comfortable with the time delay involved in having the microfiche produced off-site or with the computer tapes, which contained sensitive information, not always under their full control.

In a cost study Givens prepared in early 1981, he determined that the monthly charges of the service bureau were slightly more than it would cost to make monthly payments on the purchase of a computer output microfilm device. As Givens recalled, "It wasn't the dollar differential that sold us; it was the improved turnaround time that was made possible by bringing the computer output microfilm function on-site."

GTE Sprint decided to install Eastman Kodak Co.'s Komstar 200 microimage processor. Givens said the Kodak product was the only one given serious consideration because, at the time, it was the only such system the company was aware of from a major vendor with an adequate installed base.

According to Givens, the system initially fulfilled all of GTE Sprint's microfiche needs while working at only 21% of maximum capacity. He estimated that for an arbitrarily selected increment of growth, GTE Sprint's on-site equipment would cost 62% less than at the service bureau.

Over time, that excess capacity became useful. By September 1982, the microimage processor was operating at 59% of capacity. A year after that, GTE Sprint acquired a second unit, and the pair was operating at 64% of total capacity. Hidden

See INVOICE page 51

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WASHINGTON, D.C. — The Federation of Government Information Processing Councils is sponsoring a three-day conference, titled "Using Ada: Getting Results," April 1-3 at the Shoreham Hotel here.

Public and private sector Ada experts will present case studies and examples of how a company can use Ada.

Featured speakers include Robert deCosta, chairman of the board of Rush Franklin Publishing Co. and U.S. Army Lt. Gen. Emmett Paige Jr., commanding general, information systems command, according to the sponsor.

The conference is divided into three tracks: Ada in Department of Defense Applications, Ada Applications and Education and Ada Technology.

Three one-day workshops

Three one-day workshops, Ada Software Engineering, Introduction to Programming with Ada and A Manager's Introduction to Ada, are scheduled for April 3.

The conference registration fee is $775 for private industry employees and $565 for employees of the government.

More information may be obtained from Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

Common to celebrate 25th anniversary at spring meet

LOUISVILLE, Ky. — Common, an IBM users group that claims to be the world's largest, will celebrate its 25th anniversary at its Spring '85 conference, planned for April 27 to May 1 at the Galt House here.

Included among the more than 275 scheduled presentations are sessions on multisite/CPU quality assurance, IBM System/34 and 36 operator aids and structured analysis methods. Also to be discussed will be IBM Personal Computer connectivity and Personal Computer clusters vs. Personal Computer networks.

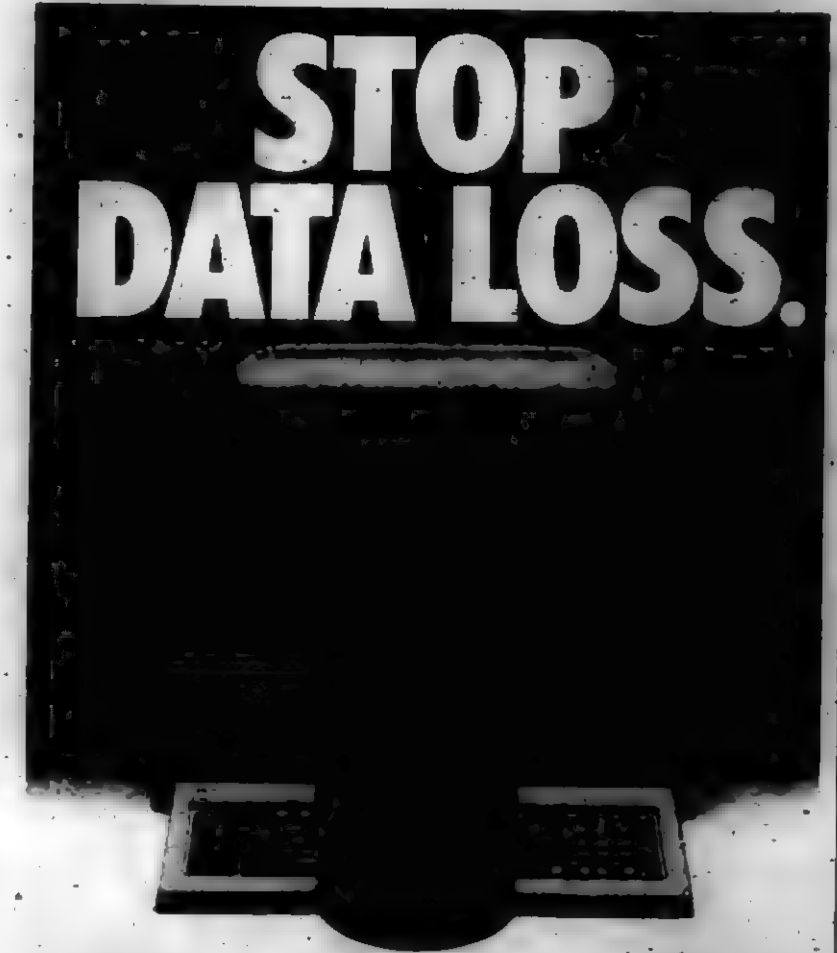
Common's membership is said to comprise users of IBM's System/34 and 36, Series/1, 4300, 1800, Displaywriter and the Personal Computer.

A number of special management sessions at the conference will reportedly offer continuing education unit credits from Northwestern University.

Conference registration for members costs $130 in advance and $165 at the door.

For nonmembers, registration costs $200 in advance and $225 at the door.

More information is available from Common, which is located at 435 N. Michigan Ave., Chicago, Ill. 60611.



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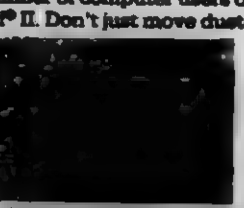
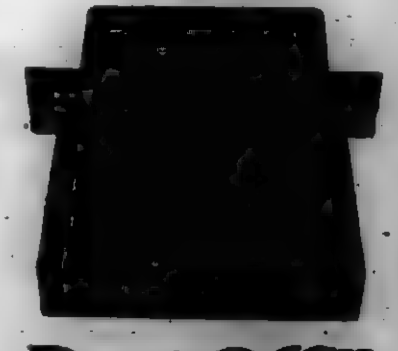


Stat-Off II® neutralizes dust-holding static electricity from media and machines.



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INVOICE

from page 50

in those capacity figures, Givens said, was the ability of the on-site machines to operate 24 hours a day, seven days a week, compared with the service bureau's five-day week.

Another advantage has been that the Komstar processor can be customized under software control to fit particular applications. By selecting the optimum character font and invoice image size, GTE Sprint was able to place 1,067 invoice pages on each 4- by 6-in. microfiche, compared with the 270 pages it was getting from the service bureau. In the August 1983 benchmark month, invoices filled some 5,300 microfiche. Output on the units is 10,000-plus invoice pages per hour.

Givens said he was somewhat skeptical of the manufacturer's claim that the device would not require additional personnel, but that has proven to be the case. Because the Kodak unit uses no chemicals — instead, it utilizes a laser to expose a special dry-process film — it could be installed in the computer room adjacent to the main console.

The system operator has found it to be no burden to load film about once a day and remove exposed microfiche from the output hopper during breaks from his other duties, Givens said.

'Needs very little attention'

"Compared with a high-speed paper printer, it needs very little attention," he noted. A separate operator is required for GTE Sprint's microfiche duplicator, which is located in another room, but the company was already using that machine and operator while it was still getting its microfiche from the service bureau.

Currently, about 70% of the computer output microfilmer's production is used for invoices. The bulk of the remaining 30% is taken up by accounts receivable reports.

GTE Sprint is anticipating continuing growth and is planning additional data processing centers. A new data processing center recently opened in Sacramento, Calif., with a pair of Komstar 200 processors sharing the invoicing load with the Burlingame DP center. Other centers are scheduled to open in Dallas and in the Washington, D.C. area.

Encourage move to microfiche

Phal said that if a switch to cyclic billing and the new data processing centers help to even the load on GTE Sprint's micrographics equipment, he will encourage people within and outside his department to move more batch output jobs to microfiche.

The first candidate, he said, is the production job control listing, which he would like to see produced early in the morning and distributed to all interested parties by 8 a.m.

"Such time-sensitive applications are ideal for microfiche," he observed. "The advantage of micrographics is that instead of worrying about who has the [job control language], or whether it's been mislaid, you can package the entire large listing in a small volume and provide everybody with his or her own copy."

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NEWS

CALL FOR PAPERS

THE INTERNATIONAL TEST CONFERENCE 1985

Philadelphia, Oct. 1-3

The theme of the 1985 conference will be "The Future of Test." Appropriate topics for paper submissions may include but are not limited to testability measures and fault analysis; computer-aided test generation and design validation; microprocessor and very large-scale integration test; wafer scale integrated test; test equipment and methods; design for testability; analog and hybrid test; test software; surface-mounted component and assembly test; built-in self-test; test economics; quality and reliability; systems, memory and board tests; process and test data management; artificial intelligence applications to test; and future trends.

To have a paper considered for presentation at the conference, authors should submit a 35-word abstract and minimum 500-word paper outline of a manuscript suitable for a 20-minute presentation. The outline must be submitted in 10 copies to one of the following locations: in Europe — A.B.M. Elliot, Research Laboratory, British Telecom, Martiesham Heath, Ipswich, England IP5 7RE; in Asia — Tsuneta Sudo, Atsugi Electronics Communications Laboratory, Nippon Telegraph & Telephone Corp., 1839 Ono, Atsugi, Kanagawa 243-01, Japan; in India — Nripendra N. Biswas, Department of Electronic Communications Engineer, Indian Institute of Science, Bangalore 560 012; in the U.S. and elsewhere — Rudy Garcia, International Test Conference 1985, P.O. Box 264, Mount Freedom, N.J. 07970.

Deadlines for submissions are March 1 in Europe, Asia and India; March 15 for the U.S. and elsewhere. Authors of accepted papers will be notified in June and will, at that time, receive a kit of preparation instructions. Final typed manuscripts must be at least 1,500 words and must be received in the U.S. no later than Aug. 1.

Late submission of papers will be cause for rejection.

For additional information, contact International Test Conference 1985, P.O. Box 264, Mount Freedom, N.J. 07970.

11TH INTERNATIONAL CONFERENCE ON VERY LARGE DATA BASES (VLDB CONFERENCE)

Stockholm, Aug. 21-23

The 11th VLDB Conference will emphasize the contribution of data base technology to evolving areas such as artificial intelligence, software engineering, computer-aided design and manufacturing, graphics, office information systems and the challenges interaction with those areas presents to data base management.

Papers and proposals for panel sessions are also solicited. Each proposal subject should address specific issues and include potential participants and a panel chairman. Original papers in English of up to 5,000 words should be submitted before Feb. 18. Each paper will be received by at least three program committee members. Send five copies to either of the Program Committee Chairmen: Alain Pirotte, Phillips Research Laboratory, 2 Avenue Van Becelaere, 1170 Brussels, Belgium or Yannis Vassiliou, Graduate School of Business Administration, New York University, 100 Trinity Place, New York, N.Y. 10006.

URISA '85 (COMMUNICATIONS OF THE URBAN & REGIONAL INFORMATION SYSTEMS ASSOCIATION)

Ottawa, July 28-Aug. 1

This is the last call for papers for this conference, which seeks encouraging papers that highlight applications benefiting an identified organization. The Conference Committee is also encouraging poster sessions depicting an application.

For information regarding submission of abstracts or poster sessions, contact D. David Moyer, URISA '85 Program Cochairman, U.S. Department of Agriculture, 320 Henry Taylor Hall, 427 Lorch St., Madison, Wis. 53706.

A DECADE OF PROFESSIONAL GROWTH

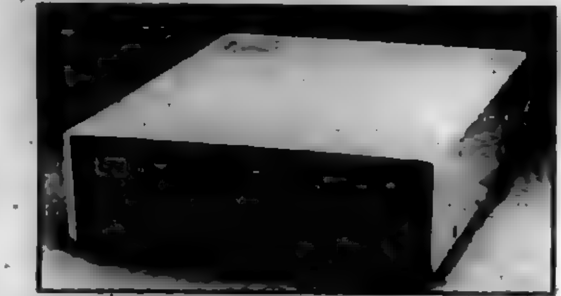
Philadelphia, Sept. 19-22

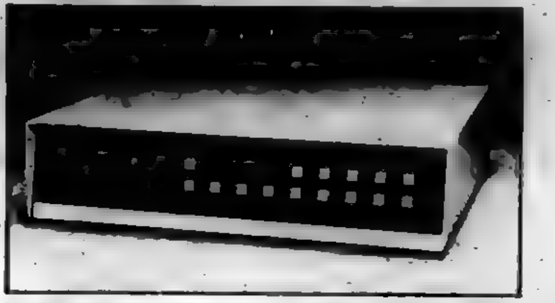
Authors are invited to submit papers and panel session proposals describing management/technological advances that have a profound effect on the future of information technology. Papers on research of, use of or experience with the following are desired: micros, micro-mainframe connection, capacity management, fault-tolerant systems, fourth-generation languages, MIS planning, local-area nets, privacy and security, software and hardware engineering, contracting, human factors in engineering and computers in education. Four copies of not more than 15 double-spaced pages must be submitted no later than March 15 to Allen E. Ware, Conference Chairman, Black Data Processing Associates, P.O. Box 2254, Philadelphia, Pa. 19103.

The first page must include the title and a 250-word maximum abstract; all authors names, affiliations, mailing addresses and telephone numbers. The following signed statement should be included: "All appropriate organizational approval for the publication of this paper has been obtained, and this is a commitment that one of the authors will present the paper at the conference if it is accepted."

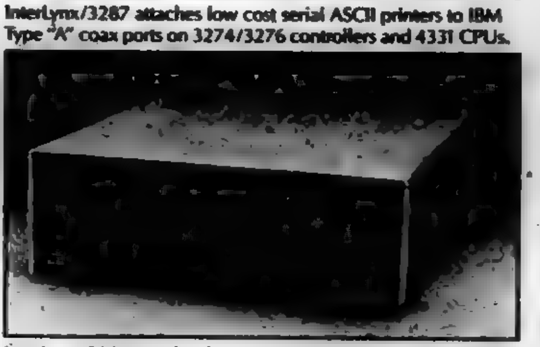
Local Data Protocol Converters

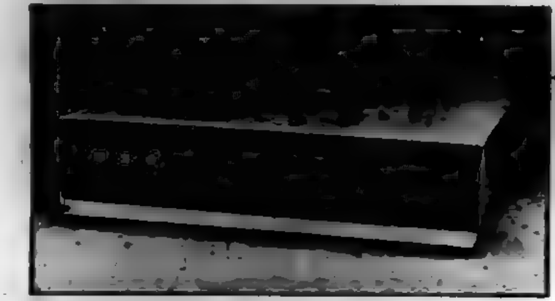
DataLynx/3274 connects 1 to 9 async CRTs and printers to a 3270 multipoint network, SNA or BSC.


VersaLynx/3278 allows an IBM 3178/3278 terminal to access ASCII systems using asynchronous protocols.


InterLynx/3287 attaches low cost serial ASCII printers to IBM Type "A" coax ports on 3274/3276 controllers and 4331 CPUs.

DataLynx/5251 connects 1 to 9 async CRTs and printers to a system/3X host.


InterLynx/3278 attaches low cost ASCII CRT terminals or PCs to Type "A" ports.


DataLynx/3780 connects asynchronous devices or minicomputers to 2780/3780 BSC networks, and has CRT and printer port and file transfer utility.

InterLynx/3287 NP is the InterLynx/3287 packaged in a smaller unit with the security of tamper-proof, no panel construction. Options are set by the portable plug-in panel.

Local Data manufacturers and markets worldwide state-of-the-art remote and local IBM protocol converters. Over 6,000 systems are now installed and supported by a network of manufacturer's representatives and international distributors in 20 countries. *Call (213) 320-7126 for a complete information package. In Canada, call (613) 748-9751 or 1-800-267-1821.*

LOCAL DATA

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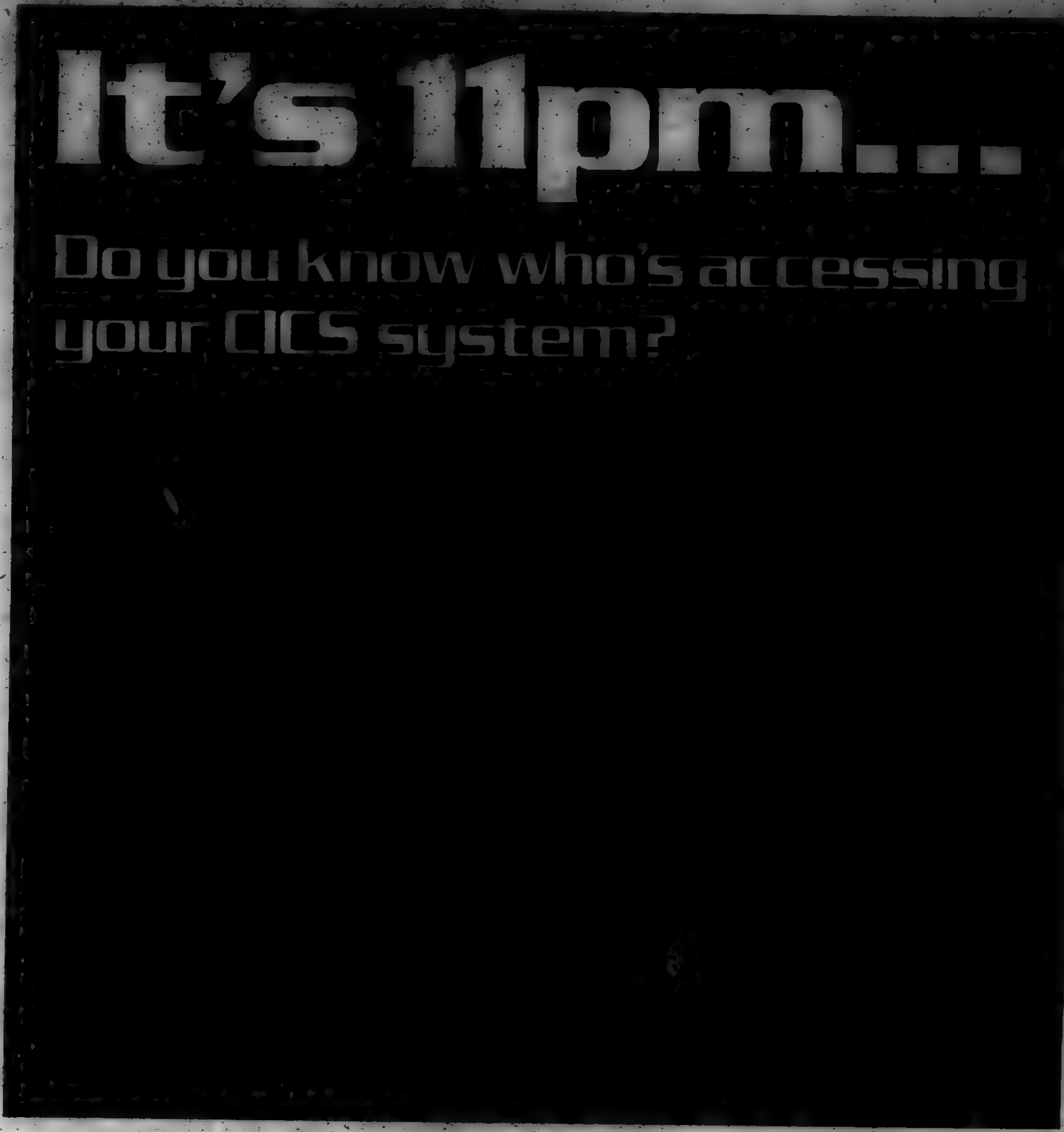

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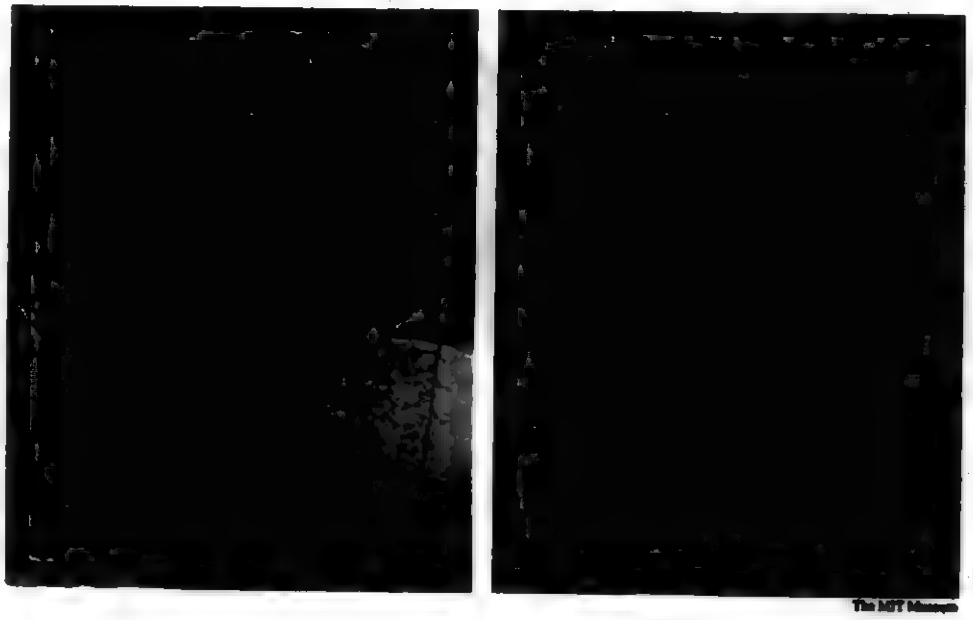
[illegible] small concession [illegible]

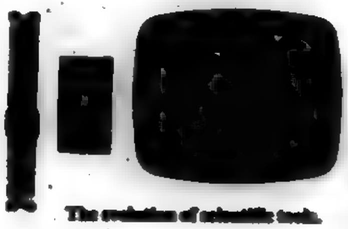
Oddly enough, most offices are better equipped for the future than the people who will create it.



The MIT Museum

According to recent reports, this last year, businesses spent over $10.5 billion successfully automating America's offices.

Meanwhile, do you realize what many of the scientists and engineers are using to design and develop America's new products?



The evolution of scientific tools.

Hand calculators.

Which is just preposterous.

Especially now that there's computer-aided analysis software designed specifically to do what all technical professionals spend most of their time doing: analyzing data.

It's called RS/1™. And it's from BBN Software Products Corporation.

RS/1 is fully capable of making technical professionals 4-5 times more productive. Which in turn, will allow them to create considerably better, considerably more reliable new products. In a fraction of the time it now takes.

And it will do so without turning them into hackers. RS/1 works like a research assistant. Not a computer.

Lest you doubt the significance of RS/1, we would hasten to point out that a single copy of RS/1 running on a single computer has already saved one company over $7 million. In one plant. In one year. Without any additional investment in new equipment. They did it simply by allowing their technical professionals to explore alternatives they never had the time to before.

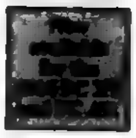
And if you think RS/1 may be something you should look into in the future, you should know that many leaders in American industry are already using it to get their new products out into the marketplace faster.

This one's for the VAX and PDP-11.

Don't expect them to tell you about it, though. They'd just as soon you continue spending your money only on getting your letters out faster.

For information on RS/1, call toll-free 1-800-251-1717.

This one's for the PRO 350/380.



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Firm cuts inventory with resource planning package

BURLINGTON, Iowa — A manufacturer of television antennae, amplifiers and receivers has reduced its inventory, cut purchasing and freight costs and realized inventory turnaround improvements since installing a manufacturing resource planning package.

According to Dennis K. Krieger, director of materials at Winegard Co., a supplier of television reception products, his firm gained the following benefits in one year's time after the implementation of the package:

- A 29% reduction in inventory.
- A cut in the cost of purchased materials.
- A 14% savings in freight costs.
- A 25% improvement in inventory turn rates.

Winegard — founded in 1954 — builds a wide variety of television reception products, including television antennae for most major recreational vehicle manufacturers, outdoor TV antennae and accessories, CATV amplifiers and satellite antennae and receivers, Krieger said.

The company implemented the MRPS Manufacturing Resource Planning System from Cincom Systems, Inc. of Cincinnati to coordinate inventory and production information for electronic assembly facilities and fabrication plants here and in Chariton, Iowa; Matamoros, Mexico; an R&D lab in Colorado; and a finished goods distribution warehouse in Los Angeles, Krieger said.

> *The inventory control module has eliminated obsolete and excessive inventory.*

This multiplant environment was a major reason for installing MRPS, he said. "We wanted to be able to develop a single game plan, coordinating all of our locations together in a comprehensive manner," he said.

Production planning and inventory control changes at Winegard forced changes in the data processing department, according to Krieger. Since the MRPS decision was made in the spring of 1979, the hardware environment has had to upgrade, he said. The company changed from a Sperry Corp. 90-40 to an IBM 4361 running under DOS/VSE with CICS/VS, Vtam/E and Vsam, he added. Currently, the system supports 45 terminals.

The company did not expect to have to upgrade its equipment so soon, but Krieger is not unhappy that the firm had to increase power. Since Winegard now has a bigger computer and more storage, it has been able to cut back from a round-the-clock operation schedule to one of 16 hours a day, eliminating one shift, he said.

System software includes Cincom's Total 8.0 data base management system and Cincom's Mantis fourth-generation applications development system, Krieger said. Winegard's teleprocessing network uses fiber-optic data transmission with IBM's Systems Network Architecture/Synchronous Data Link Control network protocol, he explained.

"In the past, we had to rely on history and educated guesses to determine quantities and delivery dates for component parts," Krieger said. "We now make intelligent decisions based on solid information."

According to Krieger, the inventory control module of MRPS has effectively eliminated obsolete and excessive inventory. He said he can plan engineering changes so that inventories of potentially obsolete parts can be consumed.

By being able to order the right quantities of parts at the right time, the company has improved its annual inventory turn rate from 3.62 to 4.51, Krieger said.

An additional benefit was a reduction in the cost of purchased materials, Krieger indicated. The system gives advance notice of what parts will be needed, he added. This gives the purchasing department the opportunity to shop for the best price.

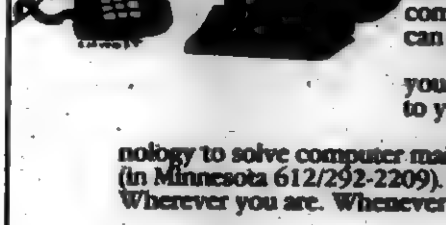
Freight costs have also been reduced at Winegard, Krieger said. "Previously, it seemed as if we were always in a back-order situation. We have a regular delivery schedule with our own fleet of trucks. If a shipment somehow missed the schedule, we had to send it out with a common carrier," Krieger said. "With improved planning, we can meet our schedules and avoid extra freight costs. That saved us 14% in the first year alone," he added.

MRPS was used in a batch mode until August 1983, and with the installation of MRPS 4.0 at that time, Winegard went on-line, Krieger said.

Data entry work has been cut substantially, he indicated. Prior to the installation of MRPS, there were seven people working with data entry. Today, he explained, there are only two data entry people, one of whom works part time.

Winegard has recently installed a purchasing module — the Vendor Analysis and Purchasing System — Krieger said. The company was selected as a beta test site last July, and so far the purchasing module is working well, he said.

HOW TO SOLVE THE PROBLEMS PCs CREATE IN TWO WORDS.



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TURNAROUND TIME

Larry Long

***Q** My company has finally decided to make a commitment to education for MIS personnel. I've been asked to do some research and make recommendations for the training budget. The budget is to include a full-time MIS training director. Are there any budget guidelines that others have followed in setting up an education program?*

Because the scope of the training budget varies so much from organization to organization, I'll speak in terms of education-weeks per year. Keep in mind that your choice of educational delivery systems has a major impact on a training budget. A week of self-paced video instruction is less costly than sending someone across the country to a seminar.

A surprising number — at least one-third — of MIS departments have no policy on education. In these cases, education is ad hoc, provided on an as needed, as available, basis. For those companies with an education policy, the average commitment is around two education-weeks per year per person.

This figure is a bit misleading because many of these policies are not backed with implementation. I consider two weeks per year woefully inadequate.

On the high end, it is not uncommon for some companies to fund eight to 10 weeks of education for their technical people.

Practically speaking, I don't see how any computer professional can hope to keep pace with the technology without devoting six to eight weeks a year to educational pursuits. I would recommend a policy that identifies a certain number of weeks, perhaps four, that would be dedicated to structured, interactive learning situations.

This is to avoid the overused rationalization of on-the-job training. On-the-job training is fine when properly administered and controlled, but most on-the-job training is really on-the-job work. Another couple of weeks should be set aside for individual learning that meets the company's immediate needs for specialized expertise.

I recognize that many readers will pass this recommendation off as economically not feasible. But before you do, consider the potential for increased productivity (perhaps 100% or more) and the opportunities for a more effective use of the technology.

***Q** I am now a business student finishing my second year toward a degree in finance. Several other business students and I are debating whether or not to take an elective programming course. Will we need programming in our careers?*

With so much user friendly financial software currently available and in development, you and your fellow students may never need to write a program. Nevertheless, I feel that business students should have some exposure to programming.

My rationale for this would also invite students to study Latin or trigonometry.

The process of learning to program provides a perspective that will have some meaning as you work with computers and programmers in your chosen career.

Programming knowledge can be translated into a hundred business situations, from formulas in electronic spreadsheets to learning query languages.

***Q** I am a senior programmer/analyst. I have worked for five different companies since graduating from college eight years ago. Each job change offered a new opportunity and included a salary increase. I have been with my current employer for about two years.*

Another company has just offered me what appears to be a good opportunity with a substantial salary increase. Should I consider making another job change? Would another job change at this point in time damage my credibility in the long run?

As a rule of thumb, it is a year before a new programmer/analyst hire, even one with experience, begins to make a net positive contribution. Your current employment record has you leaving just after you start to have an impact on the bottom line. Because of this, your tenure with previous employers will overshadow your technical capabilities in future job searches.

If you take the new position, make certain that it is all that you anticipate. Plan on staying for at least three years so that you can reestablish your credibility as an employee. A prospective employer can only conclude from your current employment history that you may not be part of the head count in a couple of years.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

"He's a hard one to figure out — his coffee cup doesn't say anything."

Uptime

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CICS Dynamic File Allocation is a must for effective CICS scheduling. It is the gateway to non-stop, round-the-clock CICS systems. It eliminates batch update constraints. It guarantees bullet proof restarts. It allows you and your batch jobs to add and remove CICS files at will, without disrupting your user community. Site license $4,000.

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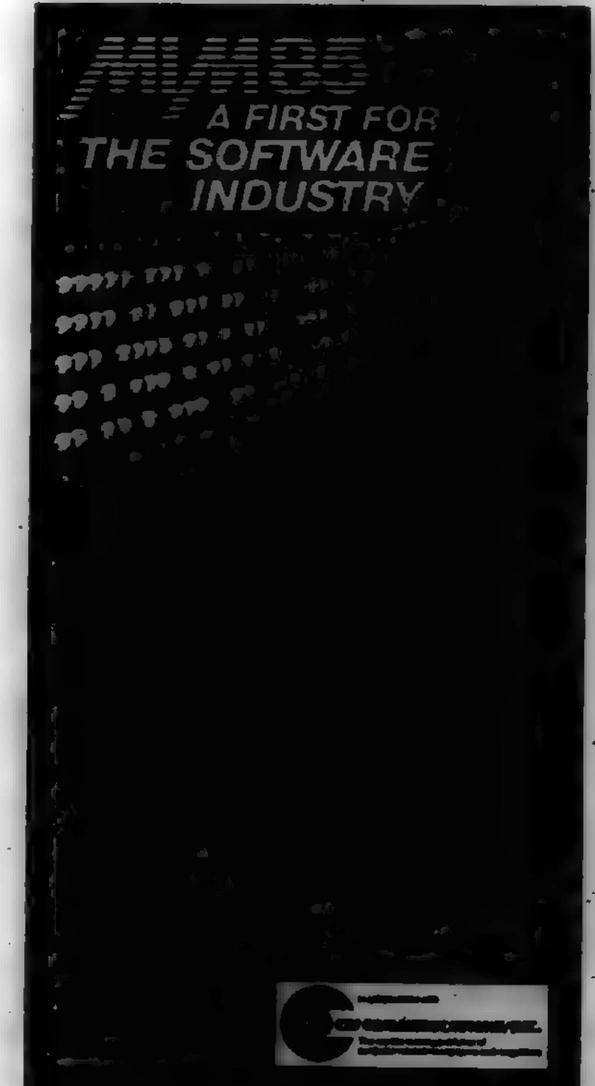

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Naval analysts search for answers with statistical tool

ALEXANDRIA, Va. — A new computer system and an updated version of a statistical software package have made life easier for a group of research analysts here.

At the Center for Naval Analyses (CNA), 200 research analysts work every day on a variety of questions that range from the exotic to the mundane, said Lisa Greisen, a statistical applications consultant for the center. While one group may be figuring out possible uses for high-energy laser weapons, another may be studying the problem of how to get more enlisted personnel to reenlist for another three or four years, she said.

Researchers at the CNA now delve into such topics with the help of three Digital Equipment Corp. VAX-11/780s and SPSS Inc.'s SPSS-X, an information analysis software package for statistical applications, Greisen said.

Ninety-five percent of the CNA's research contracts are carried out for the Navy, but CNA staff also perform research and policy analyses for groups such as the National Science Foundation and other government agencies, Greisen said. Many of the applications involve data sets that contain enormous numbers of cases, such as the Enlisted Master Record (EMR), which includes demographic and categorical information on thousands of people either currently or formerly enlisted in the Navy, she said.

"I don't think we've ever been able to process the whole EMR," Greisen said. "What we do is work with subsets of the data file."

Greisen said that with the CNA's earlier Burroughs Corp. computer system and an early version of SPSS-X, she could not process more than 30,000 or 40,000 records. The VAX/SPSS-X combination allows her to process from 600,000 to one million records with no hardware problems, she said.

The center converted to the VAX/SPSS-X combination in October 1983, Greisen said. The hardware choice was dictated by software availability and ease of use, she added. The center has a growing library of software packages for various applications, ranging from word processing to discrete system simulation.

SPSS-X is in constant use by some 30 to 40 researchers, Greisen said. The computing services staff uses the package's Frequencies and Condescriptive functions to ensure that data is clean by making preliminary runs through large data sets that come in from outside sources, she said.

In a study of the reenlistment bonus program, SPSS-X was used to check the effects of the Navy's reenlistment policy on different categories of personnel, Greisen said. "We were developing a model that would predict what kind of people would reenlist with a bonus or what kind of bonus program would attract what kind of people," she said.

'Chronic shortage' of programmers

CNA faces "a chronic shortage" of people who can program, Greisen said, so a package that quickly leads researchers into handling their own applications is popular. Greisen conducts courses and seminars for an hour to an hour and a half over one to three days. In that time, she can provide new users with the basic tools to get on with their own work, she said.

"SPSS-X trainees fall into three groups," Greisen said. "One group is people who are new to the organization and who may or may not know anything about statistical packages. Then there are people who have been working here a while and now have an application for the first time. They have a specific project and come to Computing Services to find out how to do it."

"And then there are always people who just want to see if something's new, something they're going to be able to use somewhere down the line."

Greisen reported that the SPSS-X documentation is clear and readable. "If I sit down and write a few applications for new users, then they know enough to go ahead on their own," she said.

Info conference slated for April

NEW YORK — New Opportunities in Management Information, a conference for senior management and information executives on the policy issues surrounding management information, will be held here April 17-18 at the Waldorf-Astoria Hotel.

The conference is sponsored by the Conference Board, Inc. Speaking will be John G. Sifonis, national director for strategic information systems planning at Arthur Young & Co.

Conference registration is $475 for Conference Board associates and $575 for nonassociates.

After Feb. 18, the rates rise to $535 for associates and $635 for nonassociates.

For more information, the Conference Board may be reached through P.O. Box 4026, Church St. Station, New York, N.Y. 10249.

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CALENDAR

WEEK OF APRIL 7

APRIL 8-10, NEW YORK — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 8-11, SAN ANTONIO — **IMS/DC (Data Communications) Programming.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

APRIL 8-12, NEW YORK — **IMS Data Base Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 8-12, LOS ANGELES — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 8-12, NEW YORK — **Vsam.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 8-12, BOSTON — **The James Martin Seminar.** Contact: Technology Transfer Inistitute, 741 10th St., Santa Monica, Calif. 90402. Also being held April 15-19 in San Francisco.

APRIL 8-12, NEW YORK — **X.25 Packet-Switching Networks and Network Protocols and Standards.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

APRIL 8-12, NEW YORK — **Analysts Skills Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 9-10, WASHINGTON, D.C. — **Managing Visual Displays in the Workplace.** Contact: Computer and Business Equipment Manufacturers Association, Suite 500, 311 First St. N.W., Washington, D.C. 20001.

APRIL 9-10, DALLAS — **Harnessing Lotus 1-2-3 to Solve Your Business Problems.** Contact: Professional Development Institute, North Texas State University, P.O. Box 13288, NT Station, Denton, Texas 76203.

APRIL 9-12, NEW YORK — **CICS Applications Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 10-12, SEATTLE — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held April 17-19 in Atlanta.

APRIL 10-12, AURORA, COLO. — **Eighth Annual Rocky Mountain Data Processing Exposition and Conference.** Contact: Industrial Presentations West, Inc., 12371 E. Cornell Ave., Aurora, Colo. 80014.

APRIL 10-12, NEW YORK — **Data Base Administration and Data Resource Development.** Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

APRIL 10-12, BELLEVUE, WASH. — **Hands-On Unix for Programmers.** Contact: Kathy Howard, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

APRIL 10-12, ARLINGTON, VA. — **The IBM Personal Computer.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

APRIL 11-12, COLUMBUS, OHIO — **Using Dbase III: Its Techniques and Its Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held April 18-19 in Oklahoma City.

APRIL 11-12, SUNNYVALE, CALIF. — **Software Configuration Management.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technical Training Corp., Department SCM, P.O. Box 3608, Torrance, Calif. 90510. Also being held April 15-16 in Anaheim, Calif.

WEEK OF APRIL 14

APRIL 14-18, SAN FRANCISCO — **Conference on Human Factors in Computing Systems.** Contact: Donald Patterson, Lawrence Livermore National Laboratory, L-85, P.O. Box 808, Livermore, Calif. 94550.

APRIL 15-16, WASHINGTON, D.C. — **Successful Software Management.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technical Training Corp., Department SCM, P.O. Box 3608, Torrance, Calif. 90510.

APRIL 15-17, NEW YORK — **Workshop for the Newly Appointed Data Security Officer.** Contact: Marjorie Glazer, Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

APRIL 15-17, WASHINGTON, D.C. — **Systems Network Architecture.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 15-18, CHICAGO — **Data Base: A Builder's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 15-18, WASHINGTON, D.C. — **Intelexpo '85.** Contact: U.S. Telecommunications Suppliers Association, 333 N. Michigan Ave., Chicago, Ill. 60601.

APRIL 15-19, HOUSTON — **Structured Analysis and Design Techniques Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

See APRIL page 63

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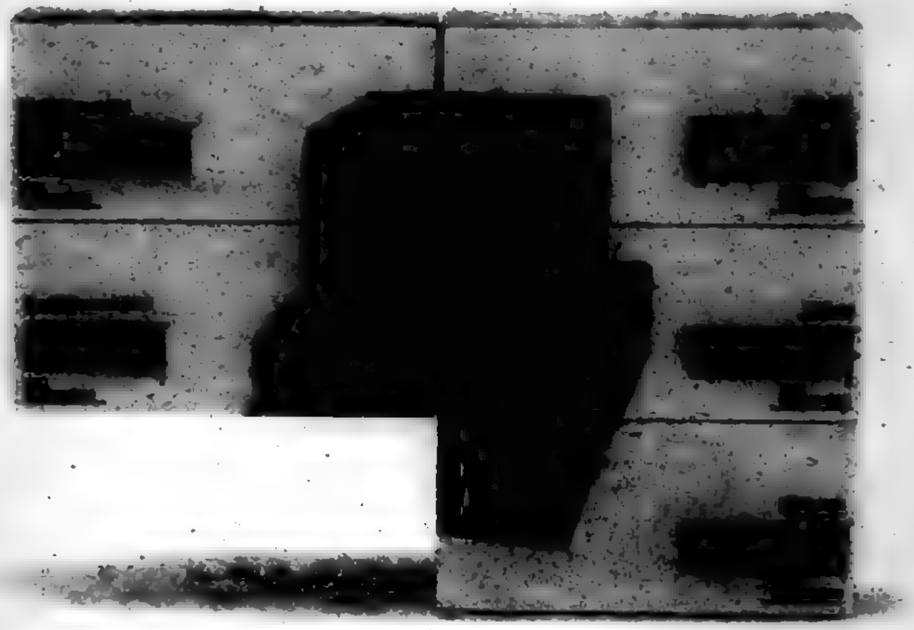

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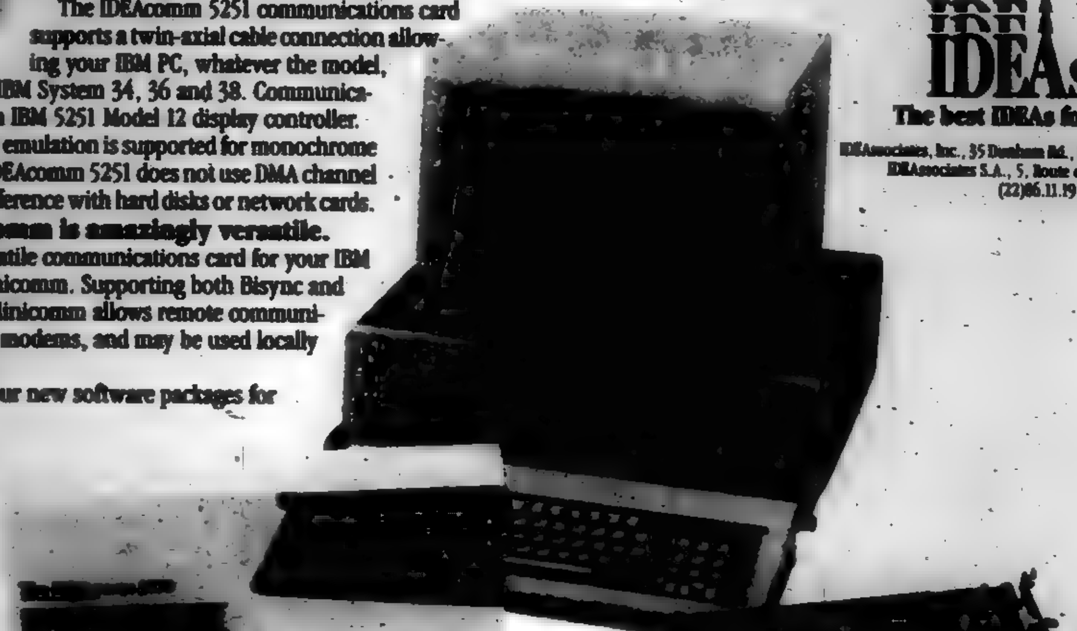

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APRIL

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APRIL 15-19, NEW YORK — **CICS Command-Level Programming.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 15-19, WASHINGTON, D.C. — **Knowledge Acquisition for Expert Systems: An Applications Perspective on Planning and Developing the Prototype.** Contact: M. James Naughton, Expert Knowledge Systems, Inc., 6313 Old Chesterbrook Road, McLean, Va. 22101.

APRIL 15-19, SAN DIEGO — **NCR Comten, Inc. User's Exchange Spring Conference.** Contact: Anne Madison, NCR Comten, 2700 Snelling Ave. N., St. Paul, Minn. 55113.

APRIL 15-19, ROCHESTER, N.Y. — **Advanced Systems Analysis.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 15-19, SAN FRANCISCO. — **CICS Internal Architecture.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 15-19, WASHINGTON, D.C. — **Managing Computer Professionals.** Contact; Compumetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

APRIL 16-17, DALLAS — **Advanced Lotus 1-2-3.** Contact: Professional Development Institute, North Texas State University, P.O. Box 13288, NT Station, Denton, Texas 76203.

APRIL 16-18, ANAHEIM, Calif. — **Computer-Integrated Manufacturing and Communications Industrial Software Conference and Exposition.** Contact: The Computer & Automated Systems Association of the Society of Manufacturing Engineers, Public Relations, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

APRIL 16-19, BOSTON — **Network Management/Technical Control Conference and Exposition.** Contact: Conference Management Group, CW Communications, Inc., P.O. Box 880, Framingham, Mass. 01701.

APRIL 17-18, NEW YORK — **New Opportunities in Management Information.** Contact: The Conference Board, Inc., P.O. Box 4026, Church Street Station, New York, N.Y. 10249.

APRIL 17-24, HANNOVER, WEST GERMANY — **Hannover Fair '85.** Contact: Hannover Fairs Information Center, P.O. Box 338, Whitehouse, N.J. 08888.

APRIL 18-19, NEW YORK — **Security in the Electronic Office.** Contact: Computer Security Institute, 43 Boston Post Road, Northborough, Mass. 01532.

WEEK OF APRIL 21

APRIL 21-24, NASHVILLE — **The 1985 Annual Conference of the Association for Systems Management.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 22-23, WASHINGTON, D.C. — **How to Manage Data and Information as Resources.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 22-24, LOS ANGELES — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 22-24, NEW YORK — **Speech Tech '85 Voice Input/Output Applications Show.** Contact: Media Dimensions, Inc., P.O. Box 1121, Gracie Station, New York, N.Y. 10028.

APRIL 22-25, CHICAGO — **CICS Applications Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 22-25, WASHINGTON, D.C. — **National Conference on Decision Support Systems.** Contact: Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

APRIL 22-26, SAN FRANCISCO — **The International Conference on Information Management.** Contact: The Institute for Information Management, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

APRIL 22-26, CHICAGO — **CICS Applications Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 22-26, WASHINGTON, D.C. — **Design of Computer Operating Systems: Concepts and Principles.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

APRIL 22-26, NEW YORK — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 22-26, NEW YORK, N.Y. — **MVS JCL.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 23-25, NEW YORK — **Teleprocessing Fundamentals.** Contact: Amdahl Corp., National Education Center, M/S 302, P.O. Box 3470, 1250 E. Arques Ave., Sunnyvale, Calif. 94088.

APRIL 23-25, LOS ANGELES — **Effective Management Techniques For Data Processing Managers and Project Leaders.** Contact: Abbott, Galvani Associates, 1850 Union St., San Francisco, Calif. 94123.

APRIL 24-26, BOSTON — **X.25 and Packet-Switching Networks.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

APRIL 24-26, WASHINGTON, D.C. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 24-26, SAN FRANCISCO — **Unix Systems Expo '85 — Spring.** Contact: David Small, Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

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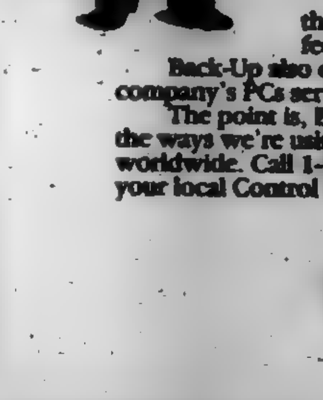

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EDITORIAL

Let's just play by the rules

The world of international athletic competition — preeminently the Olympics — has long recognized the importance of standardized rules of play to ensure that all teams can compete on an equal footing, the home field advantage notwithstanding. It has typically been the more prominent, industrialized nations that have been foremost in setting these rules.

Today, the world's industrial superpowers, the U.S. and Japan, are jockeying for position in the game of international trade. Japan, which long ago discarded the economic book of rules governing international trade, now finds that its chief rival is getting sick and tired of Japanese protectionist policies — and it's about time.

Consider that, since the government-ordered breakup of AT&T, the value of Japanese telecommunications exports to the U.S. has more than tripled, going from $600 million to $2 billion, according to the U.S. Department of Commerce. The value of U.S. telecommunications exports to Japan in that time have remained flat at $300 million.

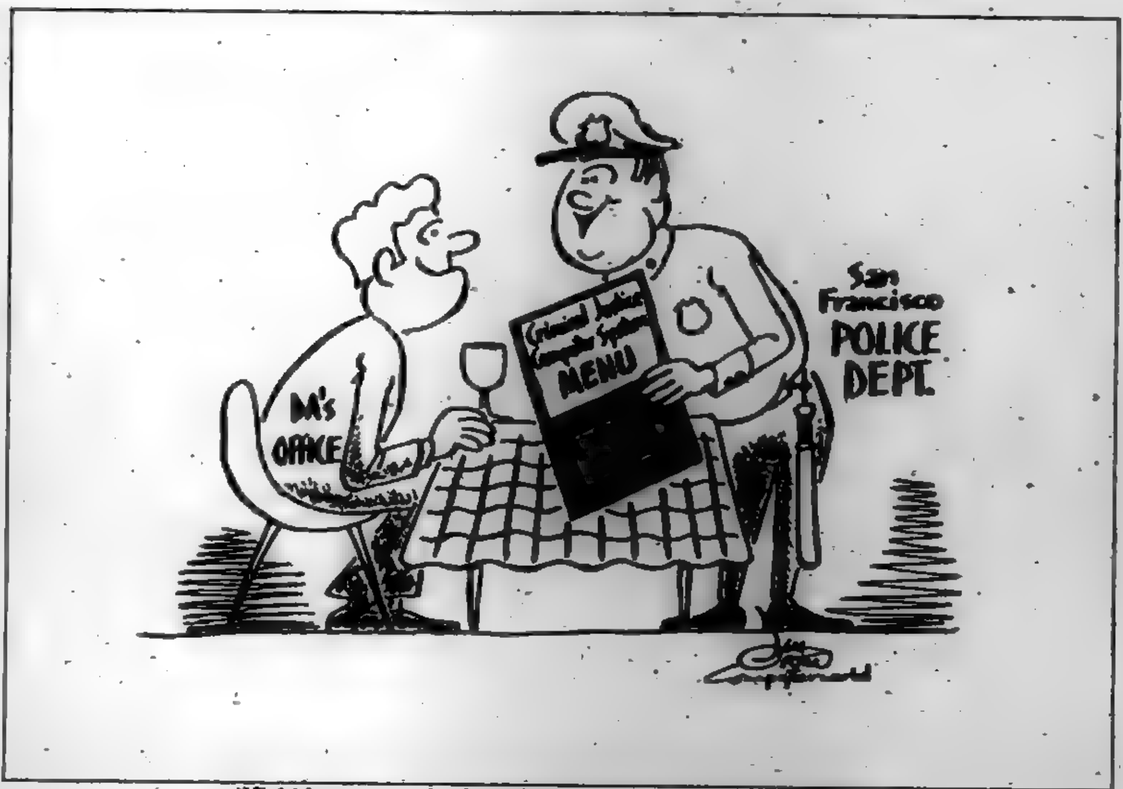
In that time, *Japan, Inc.* has made many a public pronouncement of its intention to open up its multibillion-dollar telecommunications equipment market to foreign suppliers, a market dominated outside Japan by the U.S. Clearly, the rhetoric has not resulted in positive action, at least not as far as Commerce Department figures indicate. Meanwhile, the U.S. trade deficit owed to Japan has skyrocketed, and that has attracted the politicians' attention.

Commerce Secretary Malcolm Baldrige recently canceled a visit to Japan to discuss the telecommunications trade issue when the Commerce Department discovered that the Japanese wanted to establish technical review committees to screen U.S. telecommunications imports. Instead, the U.S. will be reviewing its options to screen Japan's telecommunications exports to the U.S.

The rule makers decide they can't decide, and telecommunications equipment users in both countries face the prospect of limited suppliers and, ostensibly, the higher prices that oligopolistic competition brings. Consider that hard talk persuaded the Japanese to "voluntarily limit" auto exports to the U.S., and the price of American-made cars shot up along with U.S. automaker profits.

But until the Japanese start paying more than lip service to some hard trade figures, there seems little else the U.S. can do. Earlier this year [CW, Feb. 4], U.S. Sen. Frank R. Lautenburg (D-N.J.), founder of Automatic Data Processing, Inc., introduced retaliatory legislation aimed at combating Japanese attempts to eliminate conventional copyright protection for U.S. computer software. The bill states, essentially, that if the Japanese do it to us, we'll do it to them. The problem is that Japanese software isn't exactly a hot item in the U.S. market.

Telecommunications products are a different story. It is here that the Japan government's subtle and overt actions are clearly stifling the free flow of trade. No, one bad turn does not deserve another. But a little friendly persuasion, a la Lautenburg's tactics, that would cast our threats in law, just might get the ball rolling closer to mid-field, where everyone has an equal shot at it.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'Might I suggest, sir, the public defender's files under glass?'

LETTER

Software vendors: Back to basics

As I read the "Seeds of growth" software vendor article [CW, Dec. 31/Jan. 7] with its implications of the single software vendor for a company, I was reminded of those days — almost 20 years ago — when most companies were served by a single software vendor: IBM.

Although IBM just about gave its software away, the little guy with the good product, good service and some marketing skills was able to unseat this single software vendor in many companies around the world. In fact, the little guy did such a good job he created a new industry — the independent software product industry. Now it appears that the major players in this industry are all fighting each other to become a firm's single software vendor.

Perhaps you can be all things to all people; perhaps you can be a master at systems software, cross-industry applications, vertical markets, micro-mainframe links and other functions. The same issue of *Computerworld* featured an article on one independent vendor that went this route. In 1984, its profits dropped 87% and now, in the words of its chairman, it's "getting back to basics." Does that provide a message for the other major players in the software arena?

Al DeVito
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VIEWPOINT

One year between CPU failure within reach

THE DATA CENTER
John P. Murray

When my company considered options for the replacement of our then-installed IBM 4300 CPUs, I became skeptical when one of the IBM managers working to move us to a 3083 said he felt the technology of the 3083 series had been brought to a performance and reliability level that would, in the not-too-distant future, provide the environment for a CPU mean time between failure of one full year (perhaps not on the 3083 series machines but probably on the follow-up series).

Now I do grant that significant strides have indeed been made in terms of reliability, availability and serviceability in information processing hardware. When you compare 4300 series CPUs with their predecessors, the performance improvement can only be described as very good. By comparison, those earlier CPUs, even though they may have seemed fairly reliable at the time, cannot compare with the performance level for uptime provided by the 4300 series.

Even given the improvements of the 4300 processors, claims of one year between failure on a CPU do indeed seem extravagant. One year? Come on, IBM.

Anyone who suffered (as many of us did) with tri-lead problems on those earlier CPUs has first-hand experience with examples of performance improvements that could not be described as "really good." Many of us are also on intimate terms with CPUs that, if they went for as long as three weeks between failure, we would begin to wonder if the computer operators had put power to the box.

We once had to give the CPU up for four hours of preventive maintenance every week (on the prime shift, of course) in order to keep it functioning. And even with that effort, the CPU failed with what often appeared to be sinister alacrity.

Downtime a recurring problem

Many of us spent much of our young adulthood in three-way phone conversations in the middle of the night with a computer operator and vendor support representative attempting to bring a somnolent, if not comatose, CPU back to life. As we worked to bring renewed vitality to the CPU, we would also be mentally revising production schedules to determine how we were going to recover the lost time when the system was made available.

So much for the trip down memory lane. Those who have endured or are experiencing such situations know the frustration associated with CPU failure and the often considerable strain involved in getting back on track, particularly in the event of a prolonged siege of downtime. I experienced almost three full days of total downtime, which was a most traumatic experience!

The latest generation of IBM mainframes illustrates that vendors have made progress in terms of their ability to provide information processing hardware — particularly the CPU, which has a high performance level.

Our experience with our 3083 Model E supports that statement. On Dec. 30, 1983, we installed our CPU, and as of September 1984, we have yet to experience any CPU failure. We did experience a problem the second day we had the CPU: A circuit breaker tripped, and it took the customer engineer, working over the phone with one of the computer operators, 15 minutes to locate the problem and rest the system. But since then, we've had no problems.

Records will probably be broken

I don't know if approximately 4,500 hours without a CPU failure is a world record (I will claim it until someone says he's done better), but it certainly is a most welcome experience for us. We may indeed be on our way to one-year periods between failures — only time, I suppose, will tell. There is, however, one caveat: This record claim is based upon a single, stand-alone processor, not on a fault-tolerant, redundant hardware configuration. This is not, even though it may appear to be, an endorsement for IBM hardware. The point is that hardware performance is getting better. We often take the same approach to the vendors who serve us as do the MIS clients we serve: We tend to forget the progress made over a period of time, and we focus on the immediate irritations, whatever they may be.

This is simply one more indication of the advantage to be found in moving to more advanced information processing technology. With the myriad problems MIS managers face, being able to rely upon a more stable CPU environment must be viewed as a real plus.

See DOWNTIME page 66

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Time estimates oblige project adjustments

MANAGEMENT MATRIX
Walter F. Cuirle

The time management gurus recommend that we make up a list every day, then set priorities for the items on the list. That seems easy enough. One list I remember has an extra step for managers. Before you set the priorities, put each item into one of four categories: delete, delegate, delay and do.

It sounds so simple. Until you're sitting there at 9 a.m., usually on a Monday, and get this call. "Ah, we'll need a revision on those budget figures for the 1 p.m. meeting today. Sorry to give you such short notice; ballpark figures will do." And people wonder why you're surly.

In situations like this, there's often only one person who has even half a chance to do the job in time — you. Delegation would be oh, so nice, if only there was somebody to whom you could delegate this sort of thing. Actually, there is. You probably couldn't have done it the morning of the telephone call, but with proper advance planning and delegation of budget preparation, you could have collected what you needed to know in a form that let you do that revision by the time of the meeting.

At this point, some managers would object that budget preparation cannot be effectively delegated, contending that going over the figures to make sure they are right takes almost the same amount of time. This is true if you try to pass the entire job on to subordinates.

> ”
>
> *Many managers say the weak point in estimates prepared by subordinates is the money. Yet, for a DP operation, dollar estimates are secondary to reliable time estimates because skilled time is what you really sell, and that drives everything else.*

Look at it this way — preparation of estimates for the entire department is made up of estimates for the individual projects. If you delegate full preparation for a project, you'll get back a bottom-line figure for the project and some breakdowns. But when you submit it, you are accountable. So the tendency is to go over the delegated areas with a fine-tooth comb; some people will do this to the point where they say they could have done it just as fast themselves.

Many managers say the weak point in estimates prepared by subordinates is the money. Yet, for a DP operation, dollar estimates are secondary to reliable time estimates because skilled time is what you really sell, and that drives everything else. You may not feel entirely comfortable turning a complete work-up over to one of your project leaders, but you should be able to get a reliable time estimate there.

Your position, in part, requires that you make the department come out on budget. Project leaders' positions, in part, require that they make a project come out on time — an ability that gives the position strength for delegated responsibility, but one that is also a potential pitfall in the estimates you will get back.

Good project leaders tend to squeeze and trim. That's why they are good. If you have a scheduling crunch, one of them can usually shift something from one person to another in the project group and free up a few hours here and there to put the fire out and still get the current job done. This strength in supervisory skills — knowing specifically who does what and how well — is the potential weakness in preparing time estimates. The project may get done on time because the supervisor knows the programmers and support staff personally, but time estimates done for budget or cost estimate purposes really require looking at programmer resources as job descriptions.

First, ask for those time estimates in some common format. If your staff has fairly well-defined job descriptions, ask for the estimates in terms of hours in each category. Then, to avoid problems, your supervisors might attach one person's abilities to each of those categories, make the supervisor accountable for time estimates in the same ways you are accountable for time estimates and for the overall budget. They must justify the time resources they say they need. Once the estimate is justified, the supervisors get it, but no more. Of course, you'll need to know where they spend the allocated time, but your accounting system is probably already set up for charge backs by account number or job code or something of the sort.

Now, instead of a list of projects on which you must hang numbers, you have a list of projects and estimated hours needed to complete them. Let's say you have it broken down by job levels A through F. You

See PROJECT page 66

Cuirle is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

VIEWPOINT

LETTERS

Legal remedies encouraged

I would like to comment generally on the article "Don't rely on the law to stop computer crime," [CW, Dec. 17]. The specificity of legislation to define computer-related crimes is not the primary difficulty in isolating and prosecuting this type of white-collar crime. Reliance upon the mistaken belief that nonlegal remedies are the primary defense against computer-related crime is dangerously naive.

As long as high technology is a predominant factor in business and industry, there will be computer crime. Like a bank safe, any computer system that can be legitimately accessed can be illegitimately accessed. Denying this fact will not make this real possibility disappear.

The problem begins with computer-dependent businesses and industries and their naive reliance upon self help. When faced with potential adverse publicity, high-tech-oriented companies are notorious for their unwillingness to prosecute criminal activity, even under traditional embezzlement and theft statutes. The fear of jeopardizing the secrecy of valued trade secrets is another reason for this apathy. Some companies even hire or promote criminal violators in an effort to correct or conceal vulnerable security systems. The bottom line is this: even armed with perfect computer crime laws, no able prosecutor can win a case if the victim is unwilling to admit the crime has occurred.

This leads to the next problem of prosecuting computer-related crimes, the prosecutors. A prosecutor may not take the time to understand the complex technology necessary to prove a computer crime because he can bring to trial several more "mundane" cases in the same amount of time. The situation may be even more perplexing to a prosecutor when the victim is just as reluctant to have the case heard.

The article states that only 21 states have enacted specific computer-crime legislation. This means that 29 states do not even acknowledge a problem. What deterrence can there be if computer abuse is not a recognized crime? The lack of comprehensive federal or state legislation is not the fault of any legislature but rather that of the computer-oriented businesses and industries.

I offer the following laws to show what business and industry in Louisiana have done to fill this void:

- **The Uniform Trade Secrets Law** defines criminal misappropriation of trade secrets and provides civil remedy for violations.
- **The Software Licensing Enforcement Act** provides civil remedy for violations of "shrink-wrap" or "box-top" licensing agreements commonly found in off-the-shelf software packages.
- **The Computer-related Crime Act** defines computer-related crimes and provides penalties for violations. Unlike the "innovative" Florida statute mentioned in the article, this act excludes "computer-driven devices" where the components have the sole function of controlling the device for the single purpose for which the device is intended, such as digital watches, microwave ovens and air-conditioning thermostats.

Instead of burying their collective heads in the sand, companies should be taking an active part in the legislative process to develop practical and enforceable laws.

Kaliste J. Saloom III
Lafayette, La.

PROJECT

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have, or can easily figure out, the per-hour cost of each resource. You have numbers for overhead. You have the information you need for estimating programming and supervisory resources for the budget.

With a reliable estimate of the time required, you can now play believable spreadsheet games. You know the total hours you need in different categories for the coming period and how many you have available. Suppose you need more than you have. The time estimates are pretty much insensitive to overtime, new hire and contract programmer options, even though the money is not.

Now, you not only have options, but you can offer them as well. You can outline different mixes of resources; study the impact of the delay or the deletion of some projects; recommend a course of action; and handle the whole thing much more comfortably. If a request for, say, new hires is turned down, you can quickly come back with revised numbers for departmental costs or recommendations for projects to be cut out altogether.

Best of all, when you get one of those Monday morning telephone calls you can answer, "No problem" and mean it.

DOWNTIME

from page 65

So I have become somewhat less skeptical of the claim of the IBM manager about the improved performance than was the case in the fall of 1983. One year mean time between failure may indeed be attainable. After we get used to that level of service, the occurrence of a failure once each year will seem just as traumatic as once every few weeks as it was in the past.

But despite the cause for optimism in hardware reliability, there are still some issues with the operating software!

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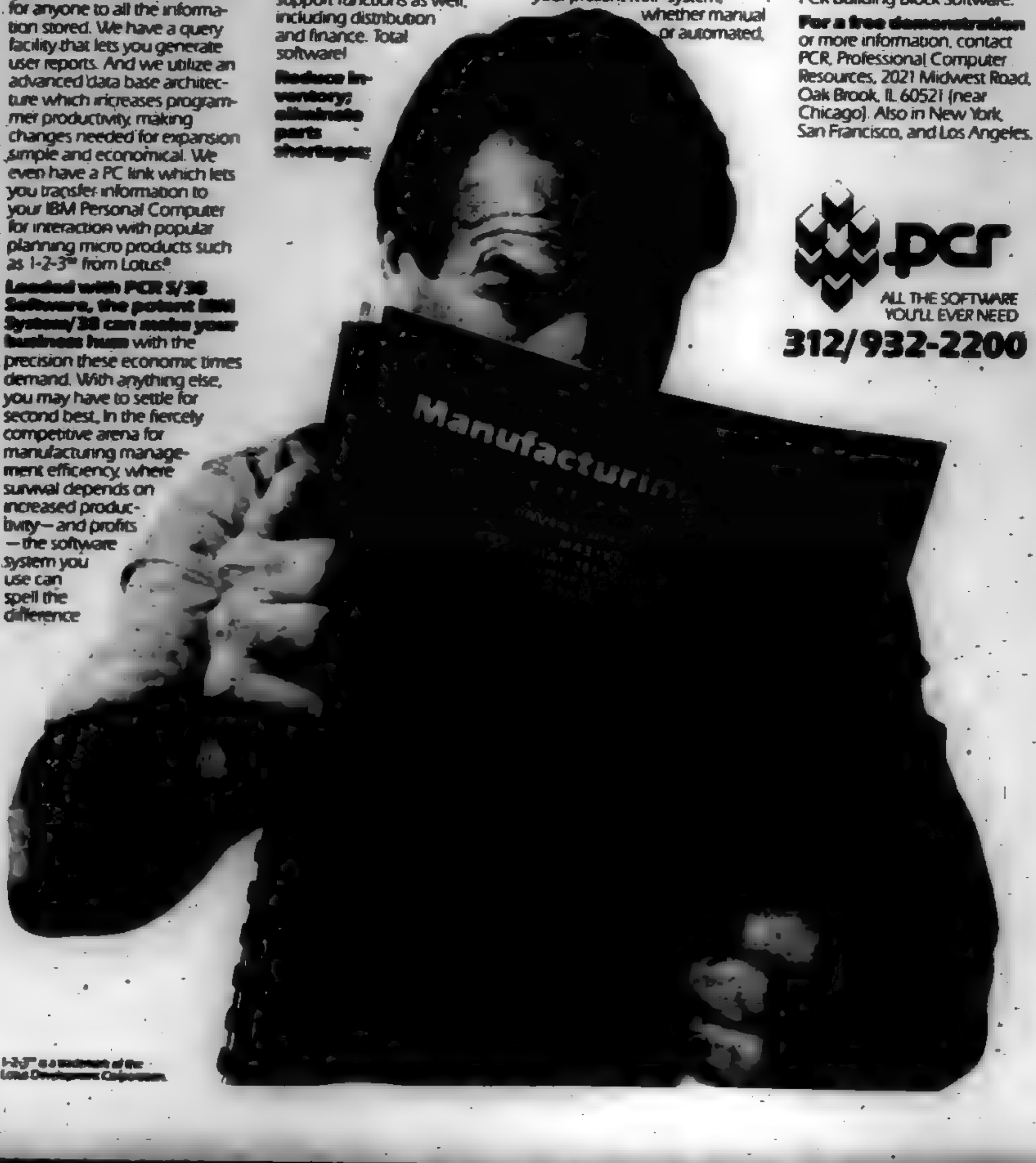

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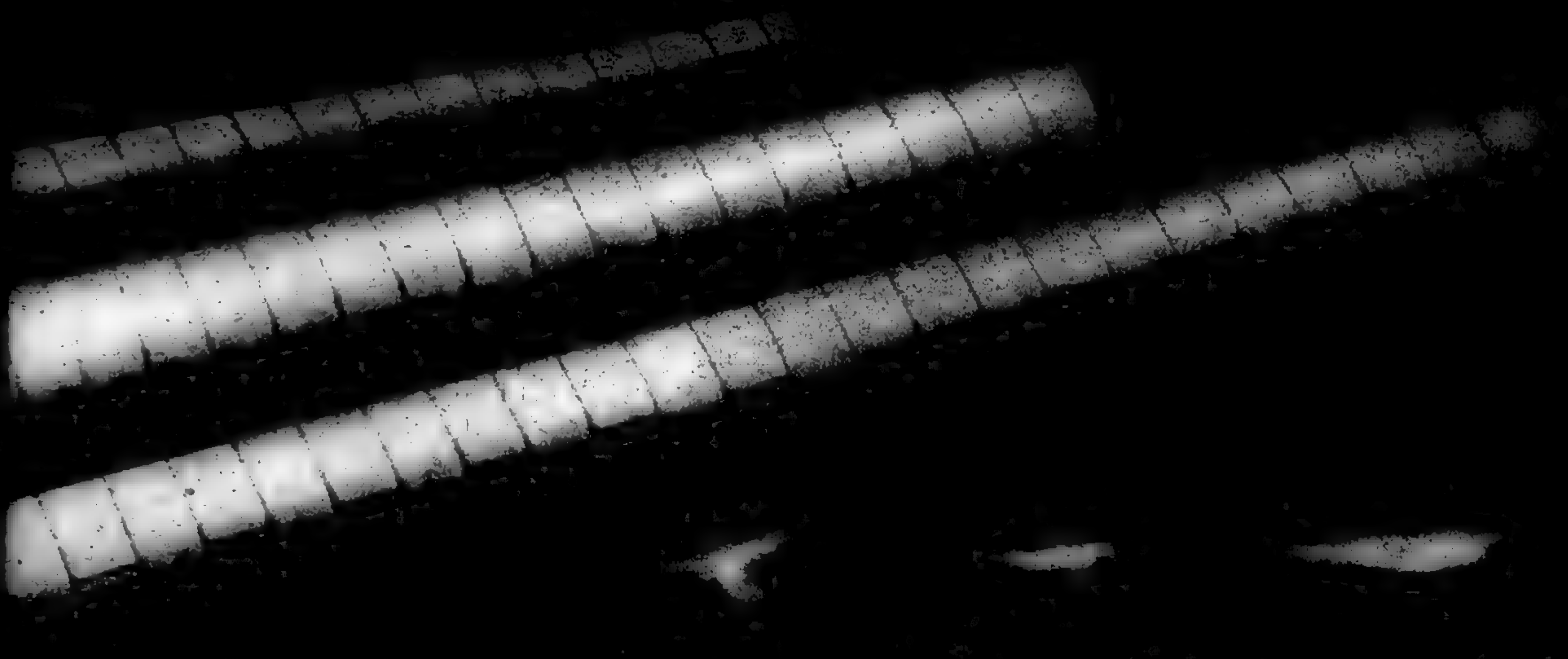

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SOFTWARE & SERVICES

Uccel still banking on systems market

By John Gallant
CW Staff

"You oughta dance with the one who brung ya."

That Texas-style aphorism, according to Paul Newton, Uccel Corp. senior vice-president, says a great deal about the future of the rapidly growing Dallas-based software and services company. "I am not a native Texan, but I think that expression is relevant to Uccel," he said.

For those who wonder whether Uccel plans to diminish its efforts in the systems software arena in the wake of its announced intention to mount a vigorous assault — based on a $20 million development project — on the emerging banking applications market, the answer is clearly "no."

"The most profitable and successful business within the company is systems software," said Newton, who is responsible for mainframe software operations at Uccel (formerly University Computing Co.) "While we are definitely committed now to Leap [Uccel's Leading Edge Applications Project] and the banking marketplace, there is a balance, and the first priority remains systems software."

Indeed. Systems software has come to represent the longest prong in the trident-like mainframe software strategy Uccel has evolved. In a recent interview with *Computerworld*, Newton said Uccel earned some $75 million last year from combined sales of its mainframe applications and systems software and from the sale of its software products internationally. Uccel garnered a very sizable chunk of that revenue from its widely installed systems products, such as the UCC-1 and UCC-3 tape and disk management systems and the UCC-7 production work load management system.

CW photo by M. McGregor
Newton

Having earned a solid reputation in the DP community through such products, Newton said, Uccel plans to introduce further systems software offerings aimed at data center management. "Through internal development and external acquisition, we intend to introduce products targeted at capacity planning and performance measurement," he said. "We are also working on security and networking products and, finally,

See UCCEL page 96

Maintenance protects assets

By John Gallant
CW Staff

> *"Maintenance started one minute after the first application was developed. The problem of maintaining existing applications affects a wide variety of organizations, no matter what size staff they maintain or the nature of their operations. Everyone has this problem of what to do with the systems their predecessors left them."*
>
> — Nicholas Zvegintzov,
> Editor, "Software Maintenance News"

To understand the importance of software maintenance, it is necessary to understand the importance of software to an organization.

Consider this. A software library consisting of 3,000 programs, each containing 2,000 lines of code, would cost at least $150 million to replace. That replacement value, according to Mary Kay Kluge, senior manager with the Catalyst Group of Peat, Marwick, Mitchell & Co. in Chicago, is based on an average develop-

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Applications upkeep full-time DP job

[illegible]

Amdahl nixes IBM extension

VM/XA support plan for 580 series scrapped

By Jeffry Beeler
CW West Coast Bureau

SUNNYVALE, Calif.— Amdahl Corp. will continue to supply its own version of IBM's VM Migration Aid rather than support a recent extension to that Big Blue offering.

During a briefing session at corporate headquarters here last month, David Anderson, Amdahl's director of program products, vetoed the idea of making IBM's VM/XA System Facility available to users of Amdahl's 580 series CPUs.

Instead, Amdahl intends to continue offering users its Multiple Domain Feature (MDF), which reportedly still boasts performance advantages over IBM's recently enhanced VM Migration Aid [CW, Feb. 18], Anderson said.

Announced alongside industry giant IBM's Sierra series processors, the VM/XA System Facility reportedly extends the VM Migration Aid, which allows multiple operating systems to run on the same machine. In particular, the VM/XA System Facility is said to improve the perfor-

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- Digital Equipment Corp. enhanced the applications integration capabilities of its All-In-One office software/72
- A high-volume data entry system for IBM mainframes was introduced by Applied Data Research, Inc./72
- Datapoint Corp. unveiled communications and emulation software for its 8800 and 8600 processors/76
- NEC Information Systems, Inc. announced a microcomputer-mainframe communications link for its Advanced Personal Computer series/77

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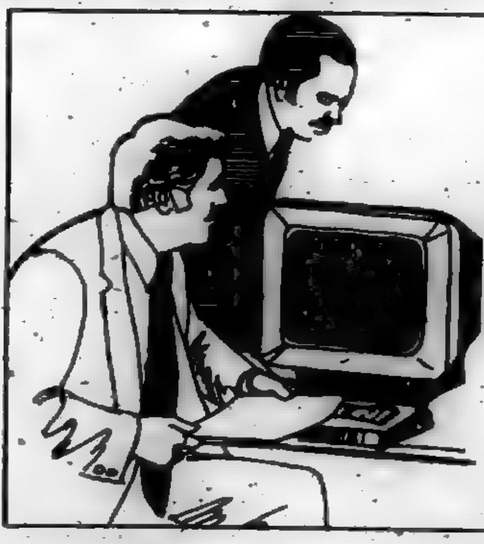

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ADR offers production data entry system

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced the ADR/DE-II high-volume production data entry and distributed data source capture system, running under IBM's CICS.

A spokesman said ADR/DE-II allows data to be entered directly from on-line display terminals. ADR/DE-II features include interactive services for data entry definition and maintenance, entry and verification and control over the production environment. It supports on-line administrative, maintenance and inquiry facilities, as well as data extraction services and the company's Datacom/DB file backup and recovery utilities, according to the spokesman.

ADR/DE-II is compatible with the ADR/Datacom System. Interactive on-line functions that include a full screen painting mode and require no programming and compilations define and maintain data entry applications.

ADR/DE-II provides interactive entry, verify and paging facilities for production terminal operators. Data stacks are created dynamically under operator commands and are associated with individual data entry applications.

Selected data can be retrieved from the ADR/DE-II data base, reformatted to reflect applications requirements and used by batch applications. Data can also be transferred directly into a user's Datacom/DB data base.

ADR/DE-II is available under OS/VS1, MVS and MVS/XA environments on the IBM 370, 30 series and 4300 processors and their plug-compatible equivalents. The product's scheduled availability for DOS/VSE environments is in the second quarter of 1985.

The permanent license price for ADR/DE-II is $24,500 for OS environments, $19,500 for DOS environments and $16,600 for IBM Models 4321, 4331, 4361, 370/115, 370/125, 370/135, 370/138 or plug-compatible equivalents.

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DEC tools enhance All-In-One

MAYNARD, Mass. — Digital Equipment Corp. recently introduced an applications integration standard, an integration kit and a package for sales and marketing support for its All-In-One office software.

A company spokesman said the All-in-One Integration Kit documents DEC's All-In-One integration standard and allows departmental applications from DEC, its customers and third-party vendors to be integrated with All-In-One, providing consistent menus, interfaces and shared data and text files. The integration standard is the design of the file and human interface architecture built into the second version of All-In-One, announced by DEC in December [CW, Dec. 17].

The spokesman said DEC's All-In-One system for sales and marketing consists of three components: a base system for tracking account information, a field reporting module and a lead management module. The field reporting module includes expense tracking to determine sales profitability, facilities for monitoring sales activity and call reporting capabilities. The lead management module provides forms for listing and routing sales leads and for creating sales and marketing reports.

Other DEC office products, such as the All-In-One voice system, can be integrated with the sales and marketing system. The All-In-One system for sales and marketing is priced between $6,600 and $12,650 depending on the VAX system configuration. The All-In-One Integration Kit is priced at $150. Both products will be available in June.

DEC is located at 146 Main St., Maynard, Mass. 01754.

Burroughs adds finance tools

DETROIT — Burroughs Corp. has announced real-time data base applications software called Global Financial System (GFS) designed for financial institutions. The package runs on the company's B2000 through B7000 CPUs and the Burroughs' A9 series.

A spokesman said the system includes two sets of support and accounting modules, each with access to Burroughs' Data Management System II data base management system. The Financial Access Control and Transaction Systems set of modules was designed to collect and route customer information, gather and store data, manage system operations and handle customer service tasks.

The Accounting Applications modules perform financial and accounting functions. Variable features and values of the software can be altered.

Monthly license fees for GFS begin at $4,300. The product is scheduled to be available in the second quarter.

Burroughs is located at Burroughs Place, Detroit, Mich. 48232.

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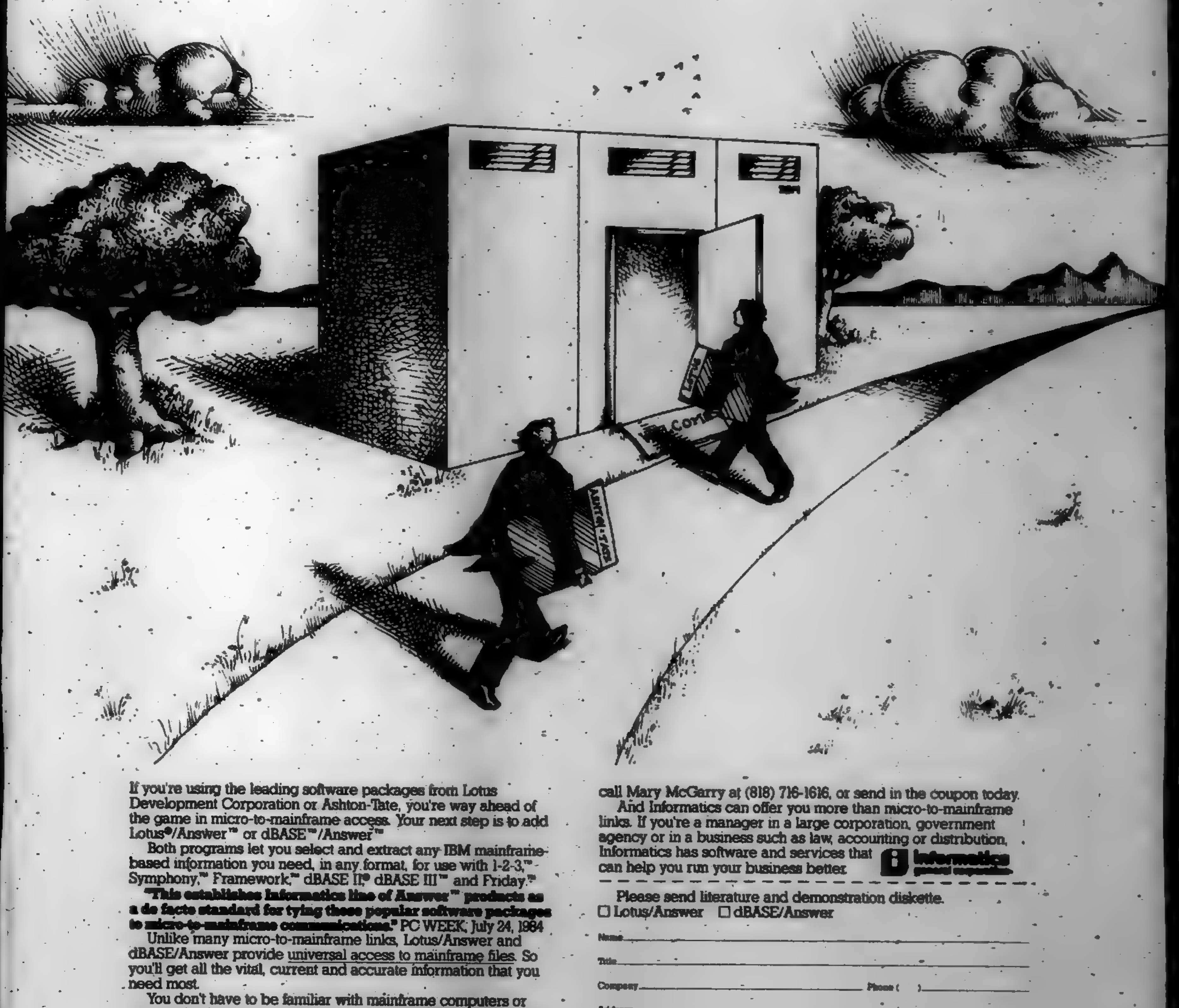

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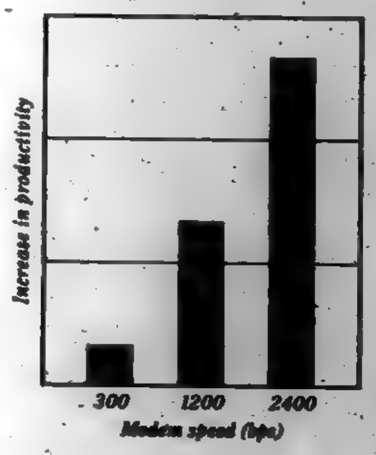

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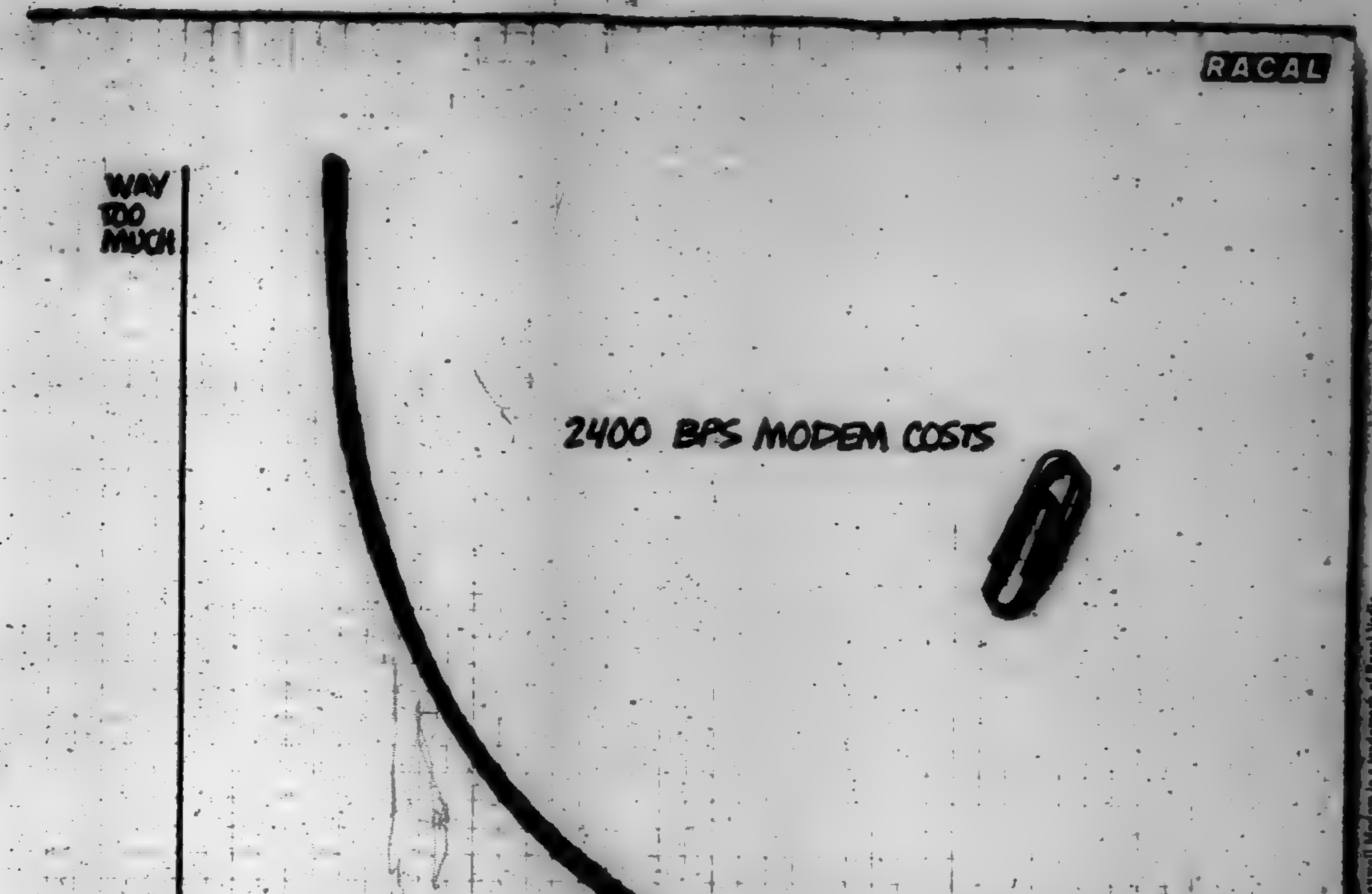

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Para Research unveils financial tools for IBM CPUs

GLOUCESTER, Mass. — Para Research, Inc. has announced three products for the IBM System/34 and System/36 processors: Accounts Receivable 2.0 for the company's set of integrated accounting packages, Release 1.2 of its Easy Calc Financial Modeling System and Release 1.4 of its Fixed Assets Financial System.

A company spokesman said Accounts Receivable 2.0 allows users at any terminal to track receivables. The product's Search feature enables users to find accounts without an account number and with an approximation of a name. The system displays open invoices and enables users to book checks received or to bill a customer on a balance-forward basis. As an update, Accounts Receivable 2.0 is priced at $500, including a year of maintenance; for new users, the package costs $2,500.

Easy Calc Financial Modeling 1.2 features "if-then-else" logic and job streaming for applications such as sales commissions, tax calculations and volume discounted prices. Other 1.2 features include a command key that moves one screen in one jump and job streaming for calculating several models at once and consolidating them into one for printing. As an update, Easy Calc 1.2 is priced at $200; for new users, the package costs $1,500.

Fixed Assets Financial System 1.4 permits users to depreciate an asset using the accelerated cost recovery system with a reduced basis. It also offers a choice of 12 asset depreciation methods and allows depreciation of any asset by any three methods, producing a report for each. The asset description field has been enlarged two times to 40 characters, and two user-defined fields have been added to the asset master file. As an update, Fixed Assets 34/36 is priced at $200; for new users, the package costs $2,000.

Para Research is located at 85 Eastern Ave., Gloucester, Mass. 01930.

Datapoint offers 3270 gateway

SAN ANTONIO — Datapoint Corp. has announced an IBM 3270 gateway for users of its RMS operating system, a teletype communications gateway for access to information networks and a virtual communications facility supporting the X.25 protocol.

According to a spokesman, RMS3274 is an IBM 3274 Systems Network Architecture interactive cluster controller, 3278 workstation and 3287 printer emulation package. The product allows RMS users to access information on the IBM 3270, output information to a local printer or disk and integrate the information with Datapoint files. The 3274 emulation is supported on Datapoint 8800 and 8600 processors.

Datapoint's Uniterm software integrates data accessed from information networks such as Dun & Bradstreet Computing Services and Dow Jones Information Services. Uniterm allows a multifunction 8600 processor to emulate a standard teletype device to access information sources and communicate with IBM, Sperry Corp. and Burroughs Corp. mainframes.

VCF 1.1 is a virtual communications facility for the X.25 protocol. Structured according to the Open Systems Interconnect reference model, it supports 1980 CCITT X.25 as the transport mechanism for Datapoint-to-Datapoint communications. The software operates on a Datapoint 8600 processor.

RMS3274 and VCF 1.1 are priced at $1,500 per copy. Uniterm is licensed for $1,000.

Datapoint is located at 9725 Datapoint Drive, San Antonio, Texas 78284.

We are the only people in the business who can, in fact, do it all for you. Regardless of what your networking requirements are. Regardless of which combination of networking media you go with. Regardless of the kind of equipment you're hooking up now or in the future. And regardless of how many sites, how many hundreds or thousands of nodes are involved.

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NEC adds Acculink to its micro software

BOXBORO, Mass. — NEC Information Systems, Inc. has announced the addition of the Acculink asynchronous communications package to its library of software for its Advanced Personal Computer and Advanced Personal Computer III.

A company spokesman said the Acculink package, developed by 1E Systems, Inc., allows users to exchange data between the micros and minicomputers or mainframes. The package works with processors from IBM (units operating under CMS); Digital Equipment Corp.; Data General Corp.; Honeywell, Inc.; Prime Computer, Inc.; Hewlett-Packard Co; and Control Data Corp.

Acculink also permits local and remote communications between the micros. Interactive terminal emulations include Digital Equipment Corp.'s VT100 and VT52 and IBM's 3101-C. Acculink's data link mode permits transfer of Ascii and binary files to and from other micro, mini and mainframe computers. The NEC 16-bit Advanced Personal Computer runs Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CPM 86 operating systems. The Advanced Personal Computer III is packaged with MS-DOS 2.11 and Microsoft's GW Basic.

Acculink is priced at $245, the vendor said.

NEC is located at 1414 Massachusetts Ave., Boxboro, Mass. 01719.

Mainframe graphics package out

BOULDER, Colo. — Precision Visuals, Inc. has announced Picsure, an interactive graphics software package for IBM mainframes under VM/CMS or MVS/TSO and Digital Equipment Corp. VAX processors under VMS or AT&T's Unix System V.

A vendor spokesman said Picsure features include online tutorials, screen prompts and more 50 predefined layouts of pie charts, bar charts and X-Y plots. Using the predefined layouts, users enter data, titles and appropriate labels.

Picsure is said to adjust the axis on plots and bar graphs to accommodate the data and select colors and patterns to distinguish segments.

Windowing available

A windowing feature permits the display of two or more graphics on specified areas of the same screen or sheet.

Text alternatives include 24 fonts and four text qualities of filled, outline, stroke and hardware. Picsure data sets can be entered from the keyboard or accessed from data files.

Picsure uses the same device drivers used by the vendor's DI-3000 and GK-2000 graphics tools packages and consumes approximately 750K bytes of disk storage.

The price for Picsure ranges from $6,500 to $25,000, depending on CPU, the vendor said.

More information on Picsure is available from Precision Visuals, which is located at 6260 Lookout Road, Boulder, Colo. 80301.

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Ungermann-Bass, Inc., 2560 Mission College Blvd., Santa Clara, CA 95050, (408) 496-0111.

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SYSTEMS SOFTWARE

■ Highlander Systems, Inc. has announced CICS/Replay, a tool for automated regression testing of applications, automated stress testing of upgrades to IBM's CICS and tuning and capacity planning for CICS.

According to a spokesman, applications screen images, captured from the user's test or product CICS system using the company's CICS/Common, can be automatically reexecuted under CICS using CICS/Replay.

In applications development, captured screen images can be used as a test set after changes or enhancements are made. Any differences between reexecuted screen images are automatically compared with the original test set.

In the technical support area, a test set of screen images can be used by systems programmers to stress test CICS after maintenance upgrades have been applied, or new releases installed.

CICS/Replay operates under CICS Release 1.5 or later, or IBM's DOS/VSE, VS1 and MVS operating systems. The perpetual license fee for CICS/Replay is $5,000 for OS and $4,000 for VSE installations.

Highlander Systems, 335 S. 100 E., Orem, Utah 84058.

■ Nittany Systems, Inc. has announced Version 2 of its Softbox-W software, which allows users of Westinghouse Electric Corp.'s Westi teleprocessing monitor to convert to IBM's CICS without rewriting or recompiling applications programs or running two teleprocessing monitors. The package runs on IBM mainframes in the CICS environment.

A spokesman said Version 2 of Softbox-W supports subtasking of applications under CICS. Applications, including those that perform their own nonstandard file access, which would normally cause the CICS partition to wait until completion of applications execution, may now be run in a subpartition to free the CICS partition and to enhance execution time.

A perpetual license for Version 2 of Softbox-W is priced at $20,000, according to the vendor.

Nittany Systems, P.O. Box 452, Boalsburg, Pa. 16827.

■ Candle Corp. has announced the Performance Reporting Option for its Epilog/MVS Installation Performance Management System for IBM's MVS.

A spokesman said the PRO/MVS option provides access to Epilog degradation and resource data via SAS Institute, Inc.'s SAS and SAS/Graph. PRO/MVS provides degradation data in pie and bar charts, line graphs and tabular formats showing the impact of wait reasons on system performance. Available in hard copy or via TSO, the reports describe batch and TSO performance trends.

PRO/MVS is scheduled to be available in the second quarter of 1985.

The permanent license fee for PRO/MVS is $3,500; additional processors can be supported for $2,500 each.

Candle, Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

■ Optimation, Inc. (OI) has announced a Hewlett-Packard Co. 2623 graphics terminal emulator that provides a link between the HP 200 series desktops and the HP 3000, HP 1000 and HP 9000 processors.

According to a spokesman, the OI 2623 Terminal Emulator enables an HP 200 user to operate the workstation as an HP 2363 terminal and to log on to a host computer via RS-232 communications lines.

The product is said to support both text and graphics modes, as well as Ascii file transfers to and from the host. OI's terminal emulator supports the Remote Terminal Emulator full screen editor and command stack features, as well as most of the utilities on the host machine.

The OI 2623 costs $550.

OI, 81 Faxon Road, Atherton, Calif. 94025.

■ Calview Management, Inc. has announced VM/DMR software, which provides information and analysis designed to aid in managing Dasd space in an IBM VM environment.

A spokesman said VM/DMR creates a systemwide data base of Dasd usage statistics and then produces a hierarchical series of summary and detail reports on Dasd space use.

The permanent license price for VM/DMR is $4,000.

Calview Management, Suite 378, 560 S. Hartz Ave., Danville, Calif. 94526.

■ Computer Associates International, Inc. has announced a disk space accounting (DSA) option to its Ca-Jars job accounting package for IBM OS/MVS users.

A spokesman said the DSA component adds to Ca-Jars a chargeback mechanism that monitors all disk usage in several cycles: initial; enable; update; and billing. During the initial cycle, the volume table of contents of every Dasd volume participating in disk space billing is scanned to create a DSA master file, representing all permanent data sets in the Dasd configuration of a selected subset of volumes.

During the enable cycle, every event processed by the Dasd space management component of MVS is recorded by DSA, capturing changes to every volume table of contents on the system.

In the update cycle, a file of DSA transactions is used to update the DSA master file. The billing cycle applies the charging algorithms to the records on the DSA master file and creates a report of the charges incurred by each user.

The Ca-Jars DSA component supports MVS/SP 1.3.3 or above, including MVS/XA. The price for the Ca-Jars DSA option is $7,500.

Computer Associates, 125 Jericho Tpke., Jericho, N.Y. 11753.

■ SCA Products and Services has introduced its Gateway PC communications software, which allows IBM Personal Computer users to access mainframe computers running under IBM's VM operating system.

Gateway PC is said to allow the IBM Personal Computer to emulate an IBM 3270 terminal using a Digital Communications Associates, Inc. Irma board or an IBM 3101 terminal using an asynchronous communications protocol.

It automatically uses mainframe data to build formatted spreadsheets under Lotus Development Corp.'s 1-2-3.

Gateway PC is said to offer full screen file selection, keyboard redefinition and keyboard shorthand. The software consists of a Gateway module on the mainframe and a corresponding module for the Personal Computer.

Gateway PC is priced at $18,000 for each mainframe module and between $200 and $350 per Personal Computer module.

SCA Products and Services, 353 Lexington Ave., New York, N.Y. 10016.

■ Versatile Technologies Corp. has announced MVS/Ware productivity enhancement tools for IBM OS/MVS users, consisting of 42 products in categories of IBM TSO commands, utility programs and a subroutine library.

According to a spokesman for Versatile Technologies, products in the TSO command category include: MWDASDL, a Dasd volume contents list featuring selection criteria, TSO foreground/batch processing and a data set listing to a terminal or output file; MWINVCP for command development and testing; and MWADV for clearing the IBM 3270 display on any terminal type, allowing a full page of data on the screen at one time.

Continued on page 80

CGA introduces security system for IBM's VM

HOLMDEL, N.J. — CGA Software Products Group has announced a stand-alone security system for IBM VM environments.

According to a vendor spokesman, Top Secret/VM uses the standard VM Access Control Interface and incorporates features of CGA's Top Secret/MVS IBM MVS security product. An administrator can identify an unlimited number of users to the system, which controls access to host facilities and resources.

The product provides a utility program that examines historical access to system resources and associates users and owners with data sets and resources. A four-tiered hierarchy separates users, profiles, departments and divisions. Each hierarchical level can be assigned a level of authority to control or audit system resources and is automatically activated when the system is loaded.

All Top Secret/VM files can be shared across multiple VM systems or throughout a mixed VM/MVS environment.

Top Secret/VM will be available in the third quarter. The introductory lease price will be $5,000 per year.

CGA Software Products Group is located at 960 Holmdel Road, Holmdel, N.J. 07733.

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SOFTWARE & SERVICES

Continued from page 79

Products in the utilities category include MWECODE+ for generating assembler language source code from Cobol, assembler, Fortran and PL/1-coded programs; MWSCHED, an automated job scheduler; and MWPGMMON, a program execution monitor.

Products in the subroutine library include MWINCORE, a table sort for sorting fixed or variable-length records without work file I/O; MWBSRCH, a binary table search for finding records from fixed or variable-length entry tables with a binary search; and MWBLKLET, for printing block letters and user-defined logos.

Permanent license fees or MVS/Ware products range from $200 to $3,000.

VTC, P.O. Box 20987, Orlando, Fla. 32814.

■ **Marathon Software & Services, Inc. has announced its A Procedure Editor/Extended (APE/X) software utility, available for users of Oxford Software Corp.'s UFO/CICS software running on IBM mainframes under IBM's DOS/VSE or OS/VS1/MVS.**

A spokesman said APE/X includes full-function editors for UFO procedure, display definition and Help modules and enhanced development and debugging features.

A permanent license for APE/X, available for UFO/CICS Releases 2.4 and 2.5, is priced at $1,250 for a single CPU or $2,250 for a site, according to the vendor.

Marathon Software, 145 Porter Ave., Bergenfield, N.J. 07621.

■ **Kisco Information Systems has introduced a utility package for the IBM System/36 minicomputer that extracts a report from the System/36 print spool, converts it into a format compatible with most computer output microfilm (COM) processors and writes the report to tape.**

COM-X/36 allows the IBM 8809 tape drive to produce reports on microfilm. The system allows for variable blocking on the output tape and can create either standard labeled or nonlabeled tapes, a spokesman said. The output tapes are ready for direct processing on most COM processors.

COM-X/36 is priced at $125.

Kisco Information Systems, Suite 18, 120 Beverly St., Mount Kisco, N.Y. 10549.

■ **Gejac, Inc. has announced that Hasp+, its communications package utility for Digital Equipment Corp.'s VAX-11 series CPUs, has been updated to run on Version 4 of DEC's VMS operating system.**

VAX/VMS Hasp+ is a communications protocol intended for bulk transfer of data or performing remote job entry (RJE) to mainframes. According to a spokesman, jobs may be exchanged with the batch queue of any VAX/VMS system running Hasp+ with the RJE Host Functionality Option. The features allows RJE users to access the batch capabilities of a VMS system acting as the mainframe in an RJE entry network.

Version 4 also provides support for DEC's DMF-32 multifunction board for VAX/VMS systems, allowing users to use direct memory access (DMA) capabilities at speeds up to 56K bit/sec. DMF-32 also provides eight DMA asynchronous lines and a DMA line printer interface. Automatic dialing is also provided.

VAX/VMS Hasp+ can be licensed for $5,500.

Gejac, P.O. Box 188, Riverdale, Md. 20737.

■ **Help/38 Systems, a division of Advance Circuits, Inc., has announced an updating of its Fastcode shorthand version of IBM's RPG-III programming language for IBM System/38 minicomputers.**

Fastcode II can be entered in free format using IBM's Source Entry Utility, unlike the fixed-format Fastcode I. After entry; the program is automatically converted into formatted RPG-III source code which can be reviewed or compiled.

Help/38 developed the product after a study of RPG-III programmers showed that in 90% of cases, the same pattern of coding was used to write programs. With the patterns incorporated in the program's structure, one character of Fastcode II typically generates five characters of RPG-III. Fastcode II also replaces more than 65 RPG-III operations.

Fastcode II costs $1,495 per CPU.

Help/38 Systems, 15102 Minnetonka Industrial Road, Minnetonka, Minn. 55345.

■ **Rapitech Systems, Inc. has announced the Fortrix family of Fortran translators for allowing applications programs written in Fortran to move into an AT&T Unix operating environment or to upgrade to C language in a non-Unix system.**

Fortrix-C translates fundamental Fortran code to C code. Input data files remain compatible with the new C program and all internal documentation is retained. Fortrix-C is priced at $2,750.

Fortrix-C+ includes the ability to handle Common and Equivalence statements as required by C language, and it provides for character and direct I/O handling. Fortrix-C+ is priced at $4,200.

Fortrix-C' includes Common and Equivalence statements handling and character handling, but it is configured for use on non-Unix systems. The price for Fortrix-C' is $4,700.

Rapitech, 565 Fifth Ave., New York, N.Y. 10017.

■ **Eaxel Systems has announced Univault, a file archiving system for Digital Equipment Corp.'s VAX**

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Here's what's on your mind

We asked what was on your mind, and you told us.

The end-of-the-year Forecast issue presented seven statements to provoke reader response.

For argument's sake, we said: End users should be kept far from the mainframe data base; micros threaten the control of DP; Cobol is out of date but worth keeping; micro-to-mainframe links are more wish than reality; systems that can't keep out kids playing with computers deserve to be penetrated; senior management treats DP like a back-room service; and Unix is kept alive only by vendor and media hype.

Below is a sample of comments. On the inside pages, read more of our readers' responses to each of the seven statements.

— **George Harrar**
Senior Editor, Features

If someone other than DP can do the job, let them! It's not DP that must run the show, but management.

Unix might go places if it was given a simple rewrite so that the commands appeared to make sense.

Cobol equals job security to throngs of mediocre, complacent DP 'professionals.'

We in DP can only change senior management's attitudes by demonstrating the power of DP in the use of profit-generating activities.

Think about this: If you can't keep kids out, how do you keep Russians, industrial spies and adult criminals out?

Is Unix alive yet? I thought the world was still using DOS. IBM didn't develop it, so it can't be that good.

Many large companies are criminally negligent in that they make no sincere effort to safeguard the confidential information they maintain.

If IBM had gone with the Ansi (Ascii) standard in the first place, we wouldn't need all this protocol conversion. We DEC owners have been transferring data since 1981.

1. The further I keep end users from the mainframe data base, the better.

Wrong! I've recently seen the kinds of behavior changes that good, clean, unbiased information can make, and it's awesome. Our medical staff has significantly altered its utilization of hospital services when presented with its individual practice patterns and peers' experience. It has made for stronger hospital-medical staff relations and enhanced our ability to succeed in the changing medical reimbursement environment.
Maureen Fera
Assistant director, DP
Little Company of Mary Hospital
Evergreen Park, Ill.

Yes, for their sakes. Micro front-ends with local storage save the mainframe, give the users a better data base interface and get them all the other goodies a micro can have. (Also known as: Let the crunchers crunch!)
Fairfax, Va.

End users are my reason for being. If I have to keep them away from the data base (which *they* own and I am just the custodian of), they are incompetent, and it's my job to let management know it.
Margaret Rutledge
Mesa Consolidated Water District
Costa Mesa, Calif.

DP departments all believe that the computer is *theirs*, and they are really just being nice when they let outsiders (that is, the rest of the company) use it. The closer someone is to the hardware, the more pronounced this tendency (systems programmers are worse than application programmers and so on). The rest of the people in the company recognize this, and a major impetus in acquiring a micro is to bypass the control and authority of the DP department.
William Turner III
Consultant
Elmira, N.Y.

In the banking industry, the more information end users have to use, the better they can help themselves and their customers. In our case, the end users use all the information we provide them and are constantly trying to come up with new ways of getting more information to do their jobs more efficiently. Except for states where all the customer service personnel are in one location, which ours is not, getting this information to them is a much bigger problem than letting them have it.
Chris Cox
Systems analyst
First NH Banks
Manchester, N.H.

Translated, this means: Central DP wants to grab power at my expense; now that minis exist, I can tell them to drop dead.
Edward Rawson
Data base designer
U.S. Postal Service
Washington, D.C.

If there weren't any users, there wouldn't be a mainframe data base in the first place. Why run a DP department merely for the convenience of its own personnel?
Jim Stanton
Senior systems analyst
Anoka County
Minneapolis, Minn.

Keeping them away from *all* of it, yes; from the part they can use — no, no, no!
W.B. Helgeson
Owner
Viking Consulting Services
Gig Harbor, Wash.

Yes, because users should have their own local data base that satisfies their operational requirements. Data from the local data bases should be uploaded to the central data base as needed and semitransparent to the local user.
Supervising development engineer
Rochester, N.Y.

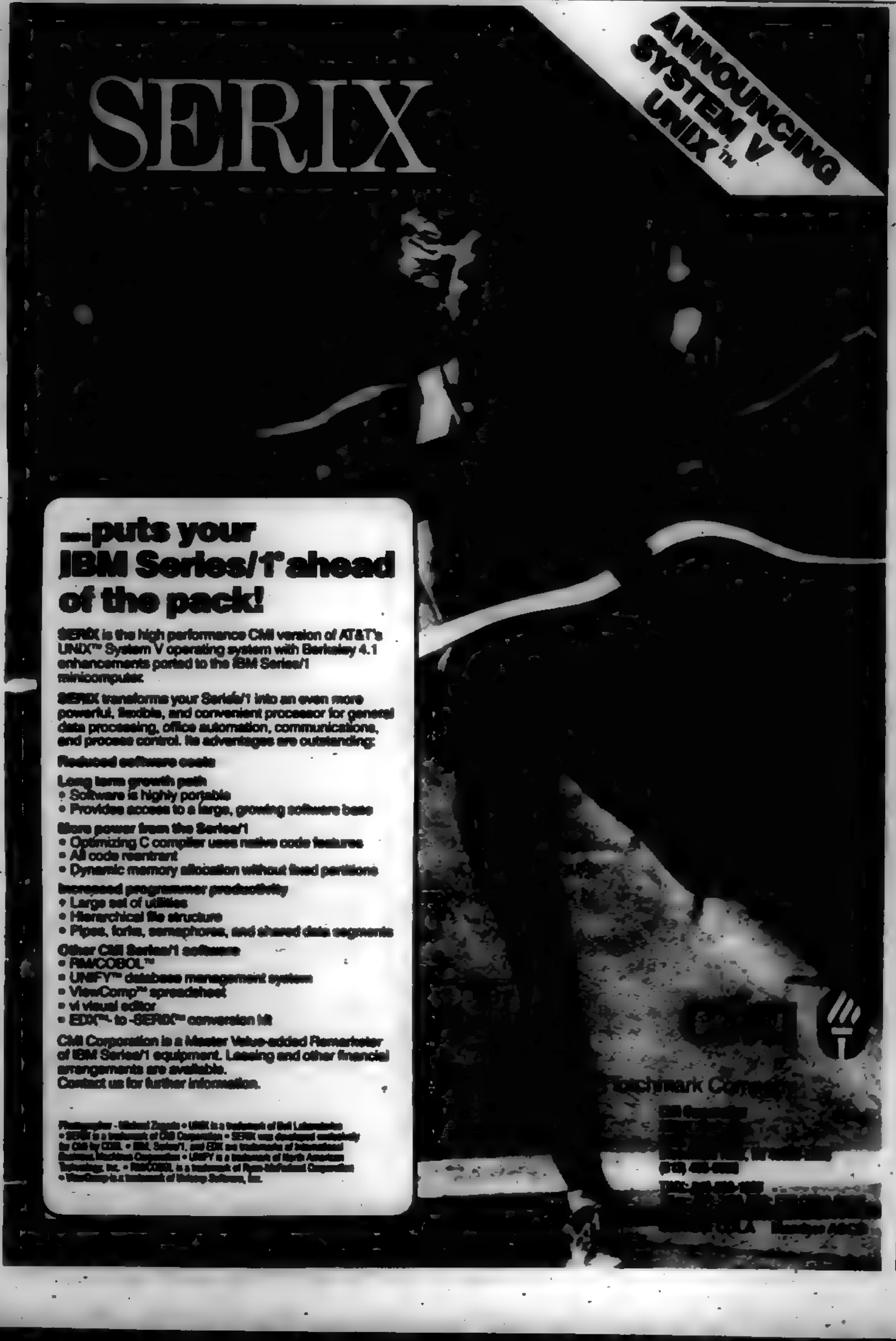
The more "hands on" they get, the more they want. I think it's great, except I have to support them and that puts a real drain on me.
Kevin Rostenbach
Data processing coordinator
American Institute of Commerce
Bettendorf, Iowa

Some of them, yes! Like the ones who won't read the manual or follow any kind of instructions. The ones who bother to look in the book (few as they are) are great.
Amy Parker
Vice-president,
information systems
Arthritis Foundation
Atlanta, Ga.

The end user is the justification for my job and salary. Without the end user, there would be no need for the computer. The more I can interface with the end user and the more he understands, the easier my job becomes.
Michael Hubschman
Senior programmer
Eastern Airlines
Miami, Fla.

Not necessarily. Some of our end users are very sharp and have been successful doing their own thing. On the other hand, some of them are computer morons. We take away their terminals and give them pencils.
D. Lee Dorsey
Director of data processing
Steuben County, N.Y.

I disagree. Having brought up a new data base system for our circulation department, the ownership of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the data has shifted from DP back to the users. With safeguards and edits of data input, the users have been able to catch and fix their errors, and the data has become far cleaner than it was in the past under their old batch system. The users have discovered new uses of the data and have been able to request many new and better reports.

With proper systems analysis and development, programming has become easier and faster with the data base system, allowing me to spend less time doing maintenance and more time developing new programs.

David Dusek
Programmer/analyst
Augsburg Publishing House
Minneapolis, Minn.

Correct. And if I don't tell my daughters about sex, they won't get pregnant.

Guido De Angelis
DP manager
Augat, Inc.
Mansfield, Mass.

End users, who ultimately own corporate data, should have the responsibility and accountability for reporting the data and providing the means for DP to maintain that data.

The key issue is control. DP, in conjunction with user owners, must establish procedures that determine specific access authorizations. Once these procedures are in place, program maintenance becomes the responsibility of the user, and data maintenance becomes the responsibility of DP.

Users then have the flexibility of ad hoc or standard reporting, and data processing has the available resources for large project development.

William Rider
DP auditor
Blue Cross/ Blue Shield
Towson, Md.

Trying to keep end users away from the mainframe data base is rather like King Canute commanding the tide not to rise. The challenge is to make central data more accessible to the end user, not less so.

Senior data processing professionals and managers are abdicating their responsibilities when they reject end-user computing in its many emergent forms. As our user communities become more familiar with the opportunities for enhanced effectiveness and efficiency that information technology can offer, their clamour for facilities will continue to escalate.

Some swift planning is needed by MIS to identify the common data domains that service the communities of interest within their organizations and to devise practical data regimes that reconcile all the conflicting requirements. Identifying and implementing unifying policies on microcomputers, applications software, fourth-generation languages, parochial data bases, communications and system architectures and security and audit requirements are becoming the new core MIS functions.

Unless MIS can provide the solutions, it and the organizations it services will have to endure the looming problems.

Dennis Biseray
Assistant director, MIS
Nova Scotia Power Corp.
Halifax, N.S. Canada

> ”
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> ***This statement best describes the typical data processor's paranoic need for absolute authority and control over everything in the organization that relates to information processing. Without the end users and their information requirements, there would be very little reason for the mainframe.***

This statement best describes the typical data processor's paranoic need for absolute authority and control over everything in the organization that relates to information processing. Without the end users and their information requirements, there would be very little reason for the mainframe and/or data base — and even less need for data processing.

Systems analyst
Tulsa, Okla.

This attitude is archaic, divisive and destructive. When the first computers were introduced into businesses, records were removed from the hands of their rightful owners. This stimulated an opportunity to foster an "It's not my job" attitude. For two decades, management has worked to restore primary influence over data to the end user, where it rightfully belongs.

Adrian Hollander
President
Compins, Inc.
Hickory Hills, Ill.

Balderdash! It is part of my job to educate as many users (especially managers) as humanly possible as to 1) semantics of company data; 2) how information can be obtained; and 3) how information is integrated for an intended business purpose.

Thomas Ardell
DP manager
John Deere Co.
Portland, Ore.

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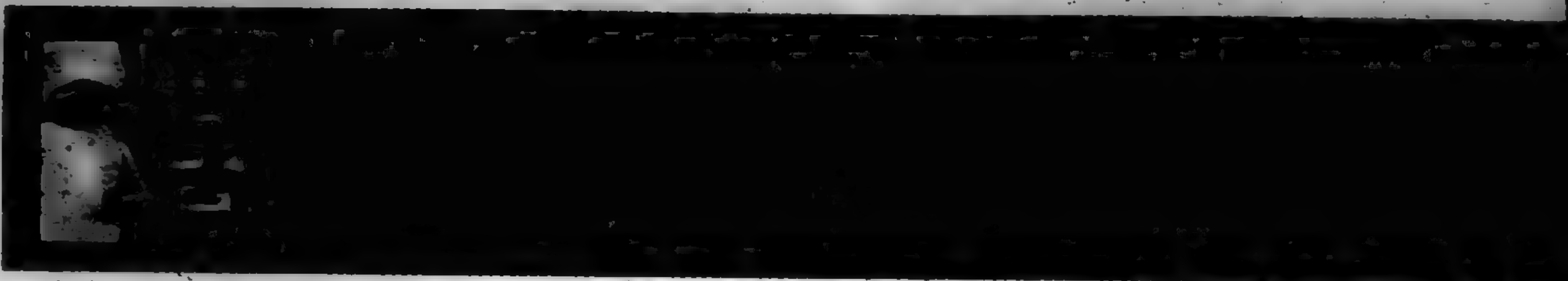

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3. The spread of micros threatens the control and authority of the DP department.

Enlightened DPers realize that, with a few well-publicized exceptions, if DPers are bad systems developers, then end users are worse. One end user planned to train his engineers in Cobol to program in their spare time; another group was going to have its statisticians start using SPF in place of SAS!
Edward Rawson
Data base designer
U.S. Postal Service
Washington, D.C.

We stopped micro proliferation before it got started. We have installed AT&T 3B2/300 multiuser 32-bit supermicros. Each system has six to eight terminals and three printers. That is cheaper than dumping an IBM Personal Computer on everybody's desk and then trying to network them together as an afterthought. We will link the 3B2 systems together with 3BNet (Ethernet). We will link the AT&T supermicros to our DEC mainframe with Ethernet or RS-232 async. Too much of the trade press is mesmerized by the IBM Personal Computer and its clones.
Computer specialist
Federal government
Washington, D.C.

The unmonitored, uncoordinated and uncontrolled spread of micros threatens the DP department's very reason for being. If everyone is going to do his own thing, then why have a mainframe and a centralized staff of DP workers at all? On the other hand, if DP takes the lead in micro implementation by providing guidance and support to users in their micro-related endeavors, both DP and the users will be better able to contribute to the well-being of the company as a whole. The users can get the computing power they desire, while DP's traditional backlog can be greatly reduced by helping the users to help themselves.

Let's face it: Users are much more able to help themselves with computer matters now. In fact, many of our users will go (or have gone) ahead without us! DP should guide the spread of micros, using a heavy hand when necessary, but more often a lighter touch. Then the ultimate goal of all components making a maximum contribution to the company will be more readily attainable.
John Rowland
Micro specialist
North American Royalties
Chattanooga, Tenn.

The spread of micros poses no threat to the control and authority of the DP department. In my firm, we service many major New York hospitals. We allow them the use of our computers in a time-sharing situation.

We have also experimented with downloading several of our programs to micros. We have so far been able to utilize Apple Computer, Inc. Apples and IBM Personal Computers, which will enable us to give our clients a choice. They can gain access to our computers by phone lines and use our data bases, buy their own mainframes or buy micros, and we will supply the programs. This allows each individual hospital to decide what would be most cost-effective.
Cheryl Schaeffer
Assistant DP manager
Rockville Centre, N.Y.

> ”
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> *The bottom line is that each person in the organization is doing the job he knows best, and each machine is devoted to the tasks that it does most efficiently. That absolutely has to show up positive in the company coffers.*

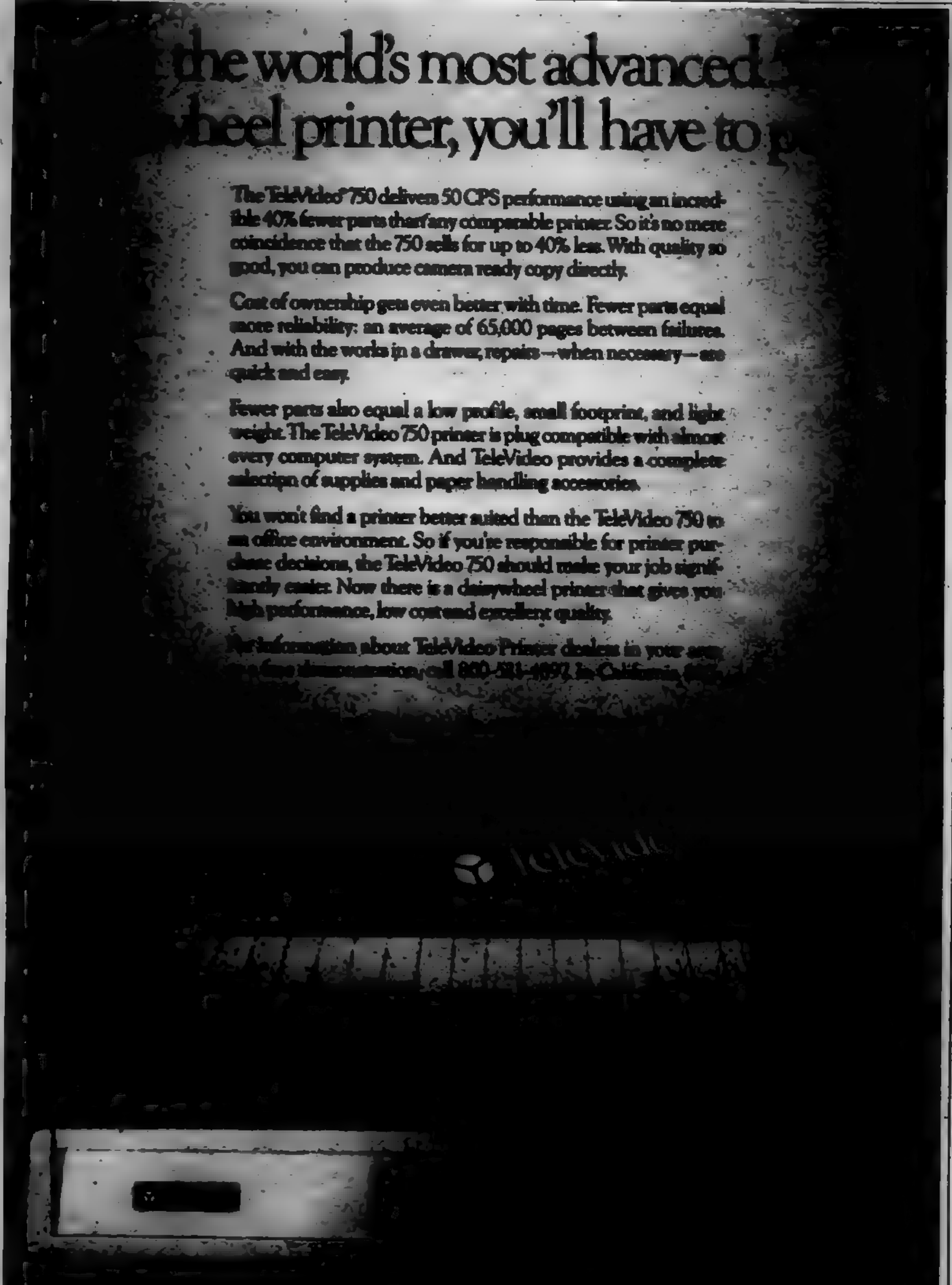
Balderdash! The proliferation of micros is the best thing to have happened to the DP department since the demise of paper tape. If a user is plugging away on a micro he is *not:*

- Tying up vital machine resources.
- Wasting programmer time.
- Crashing the mainframe.
- Saturating the print or job queue.
- Screwing up the data base.

But most importantly, he is being productive. There are really neat things that can be done on a micro that eat mainframes alive (word processing, spreadsheets) and really neat things that have to be done on mainframes because they are too big for micros (corporate budget, payroll).

If the whole effort is properly planned, orchestrated and conducted by the DP department, things like departmental budgets, inventories and customer lists can be processed by the user in his own department on micros, and the essential corporate information pertinent to the ledger — cost centers, cost allocations, billing — can be downloaded to the corporate data base on the mainframe.

The bottom line is that each person in the organization is doing the job he knows best, and each machine is devoted to the tasks that it does most efficiently. That absolutely has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to show up positive in the company coffers.
Emily Johnston
President
Carroll Computer Consultants, Inc.
Westminster, Md.

Certainly DP departments may view it as such, evidenced by policies springing up stating that any future micro purchases must first be approved through them — an effort at control and perhaps a masked statement of threat. It is, at the same time, unrealistic and unfair to saddle DP with the support of micros and their application without being included in the justification process. This is an issue to be tackled, not at the department level, regardless of the department, but rather at the corporate/policy level.

Information centers, generally housed and staffed within DP departments, are a good first step in the massive educational effort that must take place in order to achieve a cohesive and productive micro (and mainframe) environment. No one is exempt from this learning process, neither DP nor user areas, and perhaps the most significant knowledge to be acquired is the user vs. DP interaction and what it takes to get both sides talking and accomplishing common goals. Education and a phased, sometimes painful approach is the key to controlling micros and their proliferation.
Janet Mushrush
Marketing representative
Com Tech Systems, Inc.
Columbus, Ohio

If so, then it ought to be threatened. DP departments don't exist as ends in themselves, but to accomplish valid, cost-effective solutions for the people who do real work — getting dollars into the bank account for all salaries and so on. If someone other than DP can do the job, let them! It's not the DP department that must run the show, but management. We should convince management to give us whatever control and authority we need to do what they want, not what we want.
DP manager
Dallas, Texas

Not so, say I. Properly implemented, micros give an individual complete freedom in his own environment, yet with interfacing allow him controlled access to global company files. This gives the DP department more control over I/O and removes the headache of setting up individual environments.
Tom Newell
Software engineer
Systems Industries
Milpitas, Calif.

No. We find a surprising degree of resistance to micro use. Those over 30 don't want to learn or, more accurately, teach themselves.
Michael Beache
President
Beache Oil Co.
Waldorf, Md.

The spread of micros does not threaten the control and authority of the DP department in the manner that the micro user sometimes views things. The major concern of the professional DP manager is the lack of understanding, disregard for security and, oftentimes, total disrespect for the disciplines that are inherent in the DP community. This does not imply that all the red tape and standards imposed in a large organization are necessary overhead but that some of that structure is necessary for the long-term survival of the organization.

Unfortunately, too many professional data processing managers do not know enough and care enough

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> ***We find a surprising degree of resistance to micro use. Those over 30 don't want to learn or, more accurately, teach themselves.***

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> *We are hoping that micros linked to a mainframe will aid in structuring financial reporting procedures to the point of gaining both speed and accuracy.*

about microcomputing to really deal with it, and too many micro developers view the present DP department as antiquated methods that they will replace. Consequently, the two factions exist, and the organization suffers.

John Glatz
Programming manager
Firstmark Standard
Life Insurance Co.
Indianapolis, Ind.

Micros are being used throughout the business office, and so it takes the control and authority and puts it in the hands of people who are not qualified or as qualified as the DP manager. What really gets me is that when a problem arises, then they call on the DP manager. The DP department must have set standards for these stand-alone units, only for the fact that it's easier to trace one standard problem than to try to trace a wide variety of problems. The control is gone.

Daniel Baran
Computer center manager
Northwestern Business College
Chicago, Ill.

We feel to the contrary. We at Instantwhip Foods are hoping that the spread of microcomputers will help us in our control. At present, we have 40 locations throughout the country who report various financial information to us centrally for compilation and analysis.

Our biggest difficulty is in timeliness and reliability. Either the information is getting to us too late to make an important decision or the information is not accurate enough to make a proper decision. We are hoping that micros linked to a mainframe will aid in structuring financial reporting procedures to the point of gaining both speed and accuracy.

Christopher Berner
DP coordinator
Instantwhip Foods, Inc.
Columbus, Ohio

I'm not so worried about the authority of the DP department over micros as I am about duplication of effort and control of data. It's hard enough to control data and source code with a development group, let alone a group of nontechnical users. I think local-area networks are going to be the only way to help keep some semblance of control of data/resources with micros. I don't think stand-alone micros have a place in large businesses.

Information systems
group manager
Buffalo, N.Y.

I don't want authority. I want to supply answers to my users' problems.

If micros can bring this about through packaged software, all the better. (Besides, it'll keep 'em away from my machine!)

Chuck Strain
Programming manager
Claremont, Calif.

The spread of micros helps increase the level of computer literacy of all users. Their expectations of DP departments is increased accordingly.

I welcome this change. Who would want to continue to deal with "dumb" users? There will always be a need for the DP department for various reasons.

Wei-Tih Cheng
Manager, IS&CG I/S
Planning Systems
IBM
White Plains, N.Y.

I believe that the use of micros and access to the mainframe data base can provide benefits not only to the end user but to the DP department as well.

The crucial point to be considered is that adequate control be maintained over who has access to the information and what functions they are allowed to perform. I would be opposed to micro users having update capabilities over the mainframe data base, but I would favor giving access to the data for purposes of analysis, spreadsheets and report writer types of functions. The end user then benefits by having the most current data available, along with the ability to utilize that data in ways which best suit the needs of the user department.

What is overlooked is the fact that DP also stands to benefit. It is true that micros tend to remove some of the control and authority of DP, but I feel these people are really more fearful that by removing some of the mystery associated with DP and lessening dependence on the centralized DP function, their security and prestige is somehow threatened. I believe that providing the use of these capabilities will free DP from much of the mundane maintenance that has historically been required to provide cosmetic changes in report formats.

Let DP control the updates and let the users format their own reports using the data. This will enable DP to emphasize new development, which

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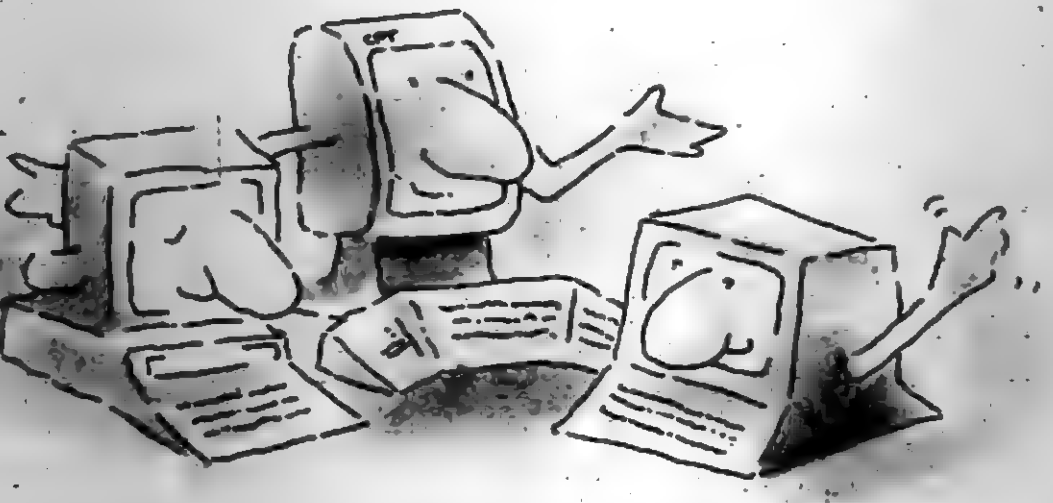

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will lead to greater benefits for all involved.
Joe D'Alaisio
EDP audit manager
American Cyanamid
Clifton, N.J.

The spread of micros is a golden opportunity for data processing to move into the mainstream of an organization. It is time for DP to recognize that it exists to assist an organization in meeting its operational, tactical and strategic objectives. Micros can be the methodology by which DP can truly contribute to the bottom line.
Marvin Golland
Principal
Management Consulting
Peat, Marwick, Mitchell & Co.
New York, N.Y.

The spread of micros creates the need for a cohesive policy in distributed processing. With an integrated information management policy, the micro-mainframe tie could further elevate both the end users' and systems groups' understanding of the computer industry. The demand from knowledgeable end users will drive software development in the right direction and thus help the computer industry in general. There is definitely no threat from the spread of micros. Actually, it should further help the direction of software development.
James Jen
Senior consultant
General Electric
Information Services Co.
Schenectady, N.Y.

Superminis can accommodate work groups — micros can't. If one gets away from depending on the obsolete approach of trying to do everything on mainframes, one does not need many micros. Single-user processing is necessary whenever a single user would create too much load on a multiuser system. Mainframes have a much greater ratio of storage to processing power than minicomputers; mainframes use the processing power that they have to manage large organizational data bases.

Mainframe processing power costs more than supermini processing power and shouldn't be diverted from its primary function. By providing users with their share of supermini power, users can satisfy their requirements without being forced to be administrators for their own micros. Micros make reasonable work-at-home terminals and remote processing sites.
John E. Schulte
IGP/Environco
Wall, N.J.

The DP manager must learn to share the responsibility and authority related to the spread of microcomputers. Instead of being the ultimate decision makers in the mystique-ridden world of data processing, we must learn to function as expert advisers, providing professional guidance on the application of fast-developing technology to meet corporate requirements.

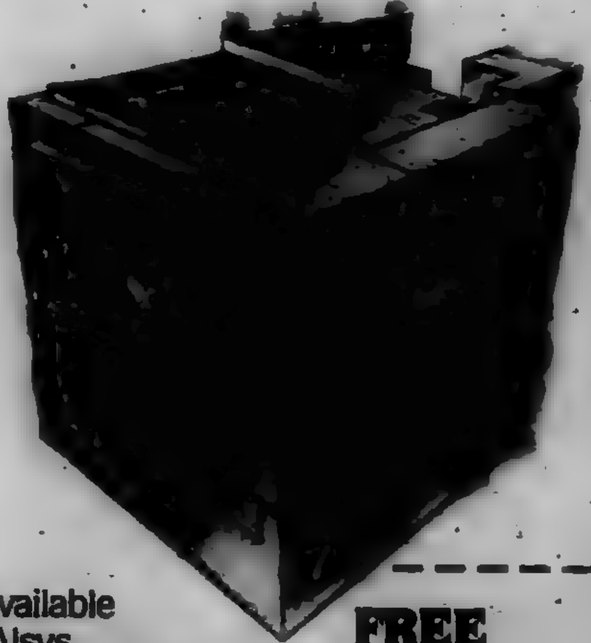
Micros can be either a formidable, divisive force driving a wedge between the user community and the data processing department or can function as a catalyst to raise the level of cooperation and effectiveness between these groups. A large part of the blame (or credit) for which path a company follows depends upon the attitudes and actions of the DP manager.
Richard Fox
Data center manager
Providence, R.I.

Terrific. It is high time that this control and authority was threatened and questioned. I am a systems analyst in the DP department and own my own IBM/XT. I am appalled at the opinions of fellow DP employees who feel that the users are not "competent" enough to learn to use micros.

Quite frankly, I feel that most DP people are not competent, ethical or professional enough to work on the mainframe. Don't the users also deserve the right to learn and make mistakes, as we in DP have?
Systems analyst
Tulsa, Okla.

That is like saying the spread of calculators threatens the control and authority of the accounting department. Baloney! Who is running the organization, anyway?

Management that allows one of the staff departments to rule its organization deserves the mutiny that will occur.
Adrian Hollander
President
Complus, Inc.
Hickory Hills, Ill.



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3. Cobol is an out-of-date language, but we're sticking with it.

"Cobol may be out of date, but it represents a staggering investment in production software. Surely it will die a slow, natural death."

The beauty of Cobol is that anyone can pick up a program and figure out what's going on. Our investment in Cobol is huge, and for our bread-and-butter applications, I'm very happy with it.
Gary Smith
Director, MIS
Pitney Bowes Credit Corp.
Norwalk, Conn.

We don't use it — thank God — but I teach it at our local junior college. If people want to be novelists, they should enter a literary profession. Cobol is a language for low-ambition people who can't think logically, and structured Cobol is the bible that attempts to turn even those people into coders.
Assistant vice-president,
systems planning
Chicago, Ill.

Cobol is an out-of-date language; however, it is the staple of business computing. It's wordy and was originally structured for some antiquated operating system. It has been abused badly, spinning off of languages like Autocoder and BAL, which have no structuring verbs. In the last decade, the so-called sloppy coding techniques have been identified and new training developed to rectify some of Cobol's inheritance.

PL/I, Fortran, Pascal, Basic and so on also have the capability of abuse, but with good training, installation standards and code walk-throughs, we try to eliminate the bastardization of any language.
Robert Boyd
Information resource
management consultant
Simi Valley, Calif.

[We are sticking with Cobol] for 10% of our programming efforts. We are finding that 90% of most any application can be implemented with fourth- and fifth-generation tools, with the user implementing much (20% to 30%) of the system for himself.
Benjamin Yarber
Director, computer services
James Madison University
Harrisonburg, Va.

In 1968, Cobol was a revolutionary boon to application development. But, in 1985, Cobol equals job security to throngs of mediocre, complacent DP "professionals." Like the keypunch machine, Cobol served valiantly and now deserves a place of honor in the DP museum.
Henry Meyer
Consultant
Norwalk, Conn.

I didn't think it was out of date. It's the only language on our VAX. We can easily read all of the code, which is a lot more than I can say about the Fortran on our micros. (We also bought Cobol Level II for the micros.)
Amy Parker
Vice-president, Information Systems
Arthritis Foundation
Atlanta, Ga.

Cobol is not out of date. There are many practical uses for this powerful language. People who keep downgrading it don't understand or don't know the correct way to use it. Many programs today are written in fifth-generation languages. This is good, but Cobol is still very useful. It will never be completely eliminated.
Daniel Boran
Computer center manager
Northwestern Business College
Chicago, Ill.

[If Cobol is] the most wonderful thing ever to evolve, why are aids like UFOCobol and Cobol XT needed? And why is it that every piece of mail I get with my name on it is my last name first and my first name last? (Strange progress.) Why is assembler (the most powerful tool ever) ignored by management and the programming community? Surely they understand that all meaningful code is written in assembler, including their glorious compilers.
Houston, Texas

Our Wang VS 85 runs with approximately 300 Cobol and 50 RPG programs. I still find that Cobol is most easily modified by programmers with less than five years' experience. Also, Cobol programmers are easy to find.
Marvin Weintraub
DP manager
Erlanger, Blumgart & Co., Inc.
New York, N.Y.

The issue of whether or not Cobol is out of date is not as critical as an evaluation of the needs it serves in the individual company. If a company finds that it is cheaper and more efficient to use Cobol because of its overall familiarity, it should be used. The fact that it may or may not be obsolete does not prohibit its use or lessen its capabilities.
Arnold Gladson
Data management analyst
TCC
Austin, Texas

Lotus™ on a VAX?

dBASE II on a VAX?
Friday! on a Micro VAX?
Condor on a PDP-11?
PFS:File on a PRO?
Personal Pearl on a VAX?
QuickCode on a Micro VAX?
Spellbinder on a VAX?
WordStar on an MV/10000?
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PL/M on a VAX?
SuperCalc 3 on a PRO?
T/Maker Integrated on a VAX?
MS BASIC on a Micro VAX?
Milestone on a PDP-11?
Palantir on a PDP-11?
SpellStar on a PRO?
MailMerge on a PDP-11?
PMS II on a VAX?
dBASE II on a PDP-11?
Lotus 1-2-3 on a PDP-11?
Open Access on a PRO?
MS FORTRAN on a VAX?
Condor on an MV/10000?
Multiplan on a PDP-11?
WordStar on a VAX?
SuperCalc 2 on an Eclipse?
PertMaster on a PRO?
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[illegible]cro VAX?

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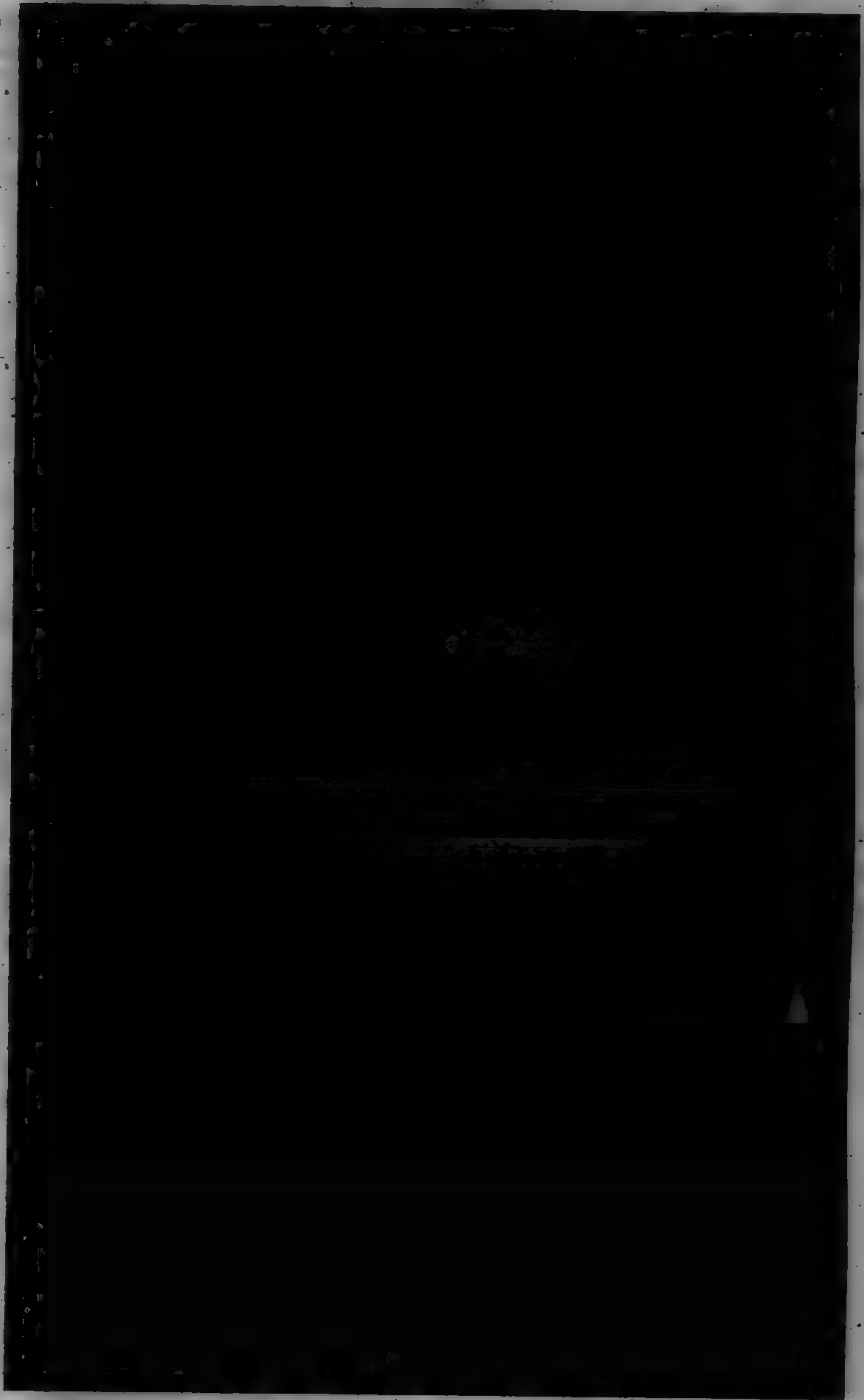

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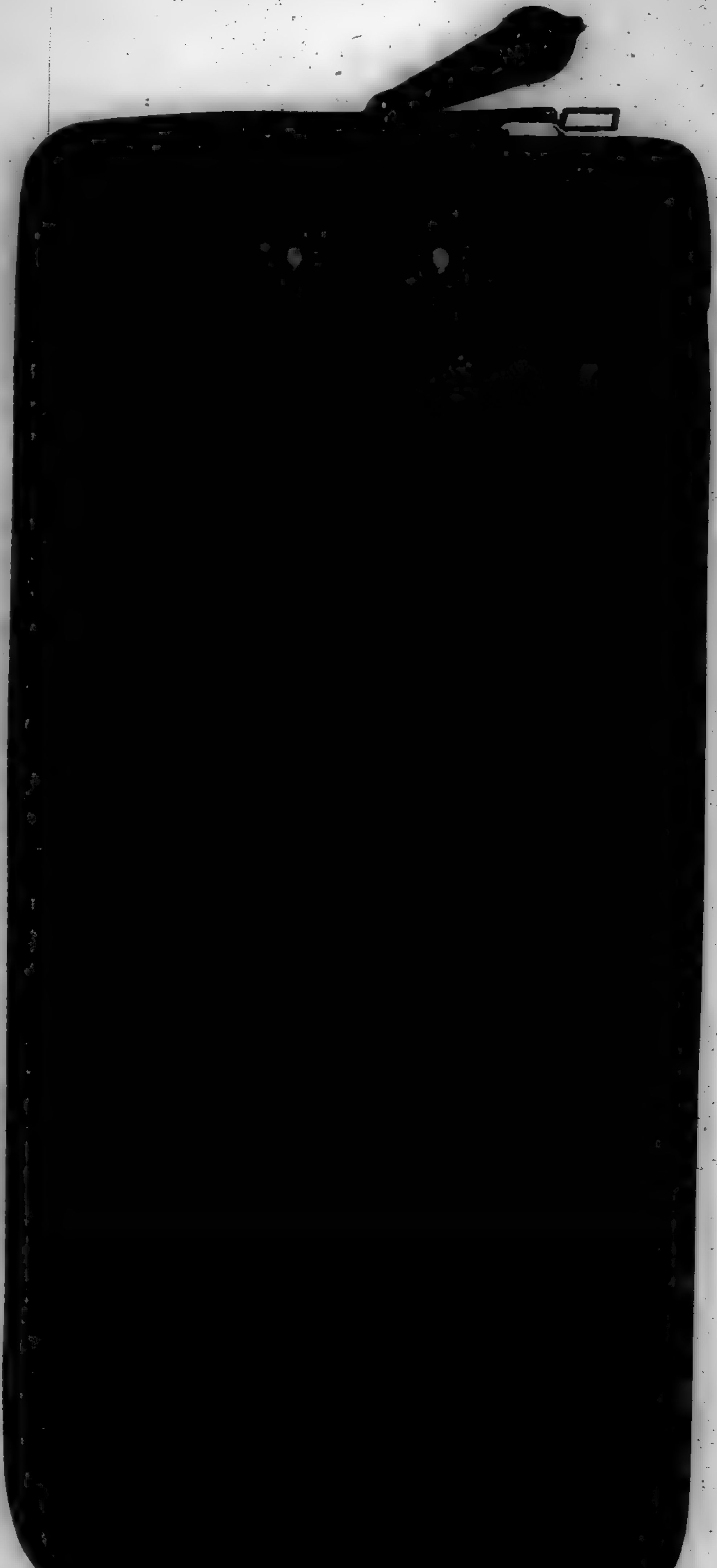

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IN DEPTH/COBOL

> ***Cobol has been the mainstay for most of my last seven years' experience. The previous 13 years, I used numerous other languages but could never realize the productivity, maintainability and readability of Cobol. It's easy to convert, transport and interchange with other developers and projects.***

Cobol may be out of date, but it represents a staggering investment in production software. Surely it will die a slow, natural death. As we get better productivity tools for software development, abandonment of good Cobol coding technicians and techniques would be foolish. The installed base of production software will be viable, both functionally and economically, for a long time to come. Also, much of the existing Cobol software could potentially be retrofitted at a significant cost advantage over developing from scratch.

Ultimately, the fourth-generation languages with their productivity gains will dominate the business software development world. That future dominance doesn't preclude effective utilization of an "out-of-date" language in the medium- to far-term software development horizon.

Incidentally, we use Cobol and Applied Data Research, Inc.'s Ideal.

Guido De Angelis
DP manager
Angst, Inc.
Mansfield, Mass.

Cobol is not out of date! It is the language of choice for most of the independent software programmers I run into. It has been very nicely augmented on many machines, such as the DEC VAX. It keeps showing up in new places, such as a recent announcement about a Cobol for IBM Personal Computers.

[This statement] should have said, "Cobol is not out of date, therefore, we would be fools not to stick with it." Cobol has been the mainstay for most of my last seven years' experience. The previous 13 years, I used numerous other languages but could never realize the productivity, maintainability and readability of Cobol. It's easy to convert, transport and interchange with other developers and projects.

Richard Bater
Software consultant
Bater Associates
North Andover, Mass.

Different languages were designed to emphasize different features, and as long as they are used to serve those purposes that they serve best, they perform satisfactorily. The addition of bells and whistles only dilutes their efficiency. Tinkering, rather than time, is their enemy. This is not to say that we do not need new languages and approaches — we do — only that we would probably be better off to leave the "old" ones alone and conceive new ones.

Brian Le Bert-Francis
Falls Church, Va.

. . . not to mention verbose and clumsy. A lot of DP management types seem to think their programmers are so dumb that they could never learn anything else.

Jim Stanton
Senior systems analyst
Anoka County
Minneapolis, Minn.

Cobol serves its purpose. It is not elegant, and my only work with Cobol was to specify and compile for it. It was never intended for systems work and should not be judged for that. Cobol, to the credit of its supporters, has evolved and is useful for day-to-day applications.

Joseph Petrosky
Computer consultant
Bolton, Mass.

The problem we experienced on the IBM System/36 is that RPG is an out-of-date language. We recently obtained Cobol; compared with RPG, it's state of the art.

Chuck Lundgren
Programmer
Caribou Mountaineering
Chico, Calif.

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True, our installed software base is too large to convert to something else. Either we need automated converters (a dream) or a means to combine modern language products with old Cobol programs.
Carl Vigit
Associate director,
production services
San Jose State University
San Jose, Calif.

Cobol, PL/I, assembler, Basic — who cares? It all gets loaded into the computer in machine code anyway. The faster it can be coded and tested, the better.
Michael Hubschman
Senior programmer
Eastern Airlines
Miami, Fla.

Cobol-60 is out of date. Cobol-81 (if we ever get it) incorporates most of the advances in programming of the past 20 years and will be one of the best procedure-oriented languages around. What we need now is for a few publicity seekers to butt out of the standards-making process.
Bob Brown
Manager, systems
and programming
DeKalb General Hospital
Decatur, Ga.

Cobol has been bad-mouthed since the early '70s. I'm not ready to give up on it.

There is no other language that is as machine-independent and universally used.
Dale K. Kodama
Executive vice-president
On-Line, Inc.
Bellevue, Wash.

> ”
>
> *Cobol will eventually wear out under the weight of its maintenance requirements and backlog. Fourth-generation languages are too fast and will take over more and more. Structured languages that turn computers into near life forms will really move things along.*

It still has many uses. Soon, fourth-generation languages for programmers (with emphasis on structured design) will provide excellent performance in heavy-duty, on-line transaction processing systems. There is too much code out there to be maintained to drop Cobol completely.
Manager
Product planning and integration
Princeton, N.J.

Yes, unfortunately. It will eventually wear out under the weight of its maintenance requirements and backlog.

This decline will take a while, however (on an industrywide scale). Fourth-generation languages are too fast and will take over more and more. Structured languages that turn computers into near life forms will really move things along.

First: A standardized generalized download needs to be developed with interfaces to the data base at the mainframe (with a way to access more than one type of data base) and accessibility programs that will load a standard file into a particular application as desired at the personal computer.
Carlton G. Lamb
Owner
Customware Atlanta
Atlanta, Ga.

Yes, theoretically, but as long as programmers and managers continue to think in Cobol logic when solving problems, Cobol will never be out of date. However, the advent of expert systems will change this situation.
Christopher Caroza
Manager of corporate
information system
Manning & Napier Advisors, Inc.
Rochester, N.Y.

For an out-of-date language, Cobol seems to be thriving. It's too entrenched to disappear like *Silas Marner* in high-school literature classes. Personally, we hardly use it, preferring retrieval and query languages.
Margaret Rutledge
Mesa Consolidated Water District
Costa Mesa, Calif.

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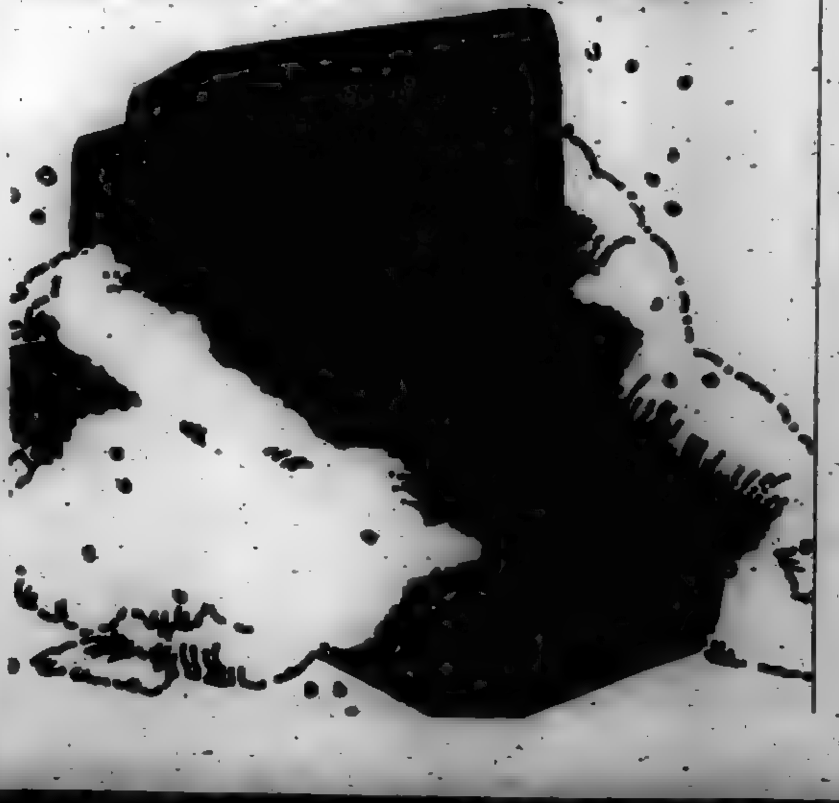

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4. Vendors keep announcing micro-to-mainframe links, but I haven't found one available right now that works for my company.

Yes, but the problems are in data reduction, not file transfer. Micros are not yet powerful enough to process really big data bases, so data reduction has to be done on the mainframe. This task has not been successfully generalized yet.
Bob Brown
Manager,
systems and programming
DeKalb General Hospital
Decatur, Ga.

With 75,000 IBM System/34s, System/36s and System/38s sold, you would think that Lotus Development Corp. or Microsoft Corp. would develop a decent link between them and personal computers . . . (sigh) . . . No accounting for market savvy.
Chuck Landgren
Programmer
Caribou Mountaineering
Chico, Calif.

That's funny. Our micros already talk to our VAX and have for years. Matter of fact, our oldest (1979) micros have bisync communications.
Amy E. Parker
Vice-president,
information systems
Arthritis Foundation
Atlanta, Ga.

If IBM had gone with the Ansi (Ascii) standard in the first place, we wouldn't need all this protocol conversion. We DEC owners have been transferring data since 1981.
Chuck Strain
Programming manager
Claremont, Calif.

Whoever [made this statement] wants a complete solution from a general application. Links are hardware connections between computers. The software, other than drivers, is a very specialized thing that must be designed and custom fit to each implementation.
Tom Newell
Software engineer
Systems Industries
Milpitas, Calif.

Vendors will continue to announce products before they really work as long as it continues to take several months from first contact to sell the product. I would not worry about links until the intended users demonstrate the skill to use stand-alone micros. When we are ready, we will define a performance condition and demand a guarantee from the vendor as a condition of full payment.
Adrian Hollander
President
Compins, Inc.
Hickory Hills, Ill.

Keep looking. What are your company's needs? There may be nothing out there to satisfy the linkage between a large number of points/environments. You don't have to buy anything.

Don't blame the vendors. If there were a market of any size for what you need or if it were technologically possible, it would exist.
Manager,
Product planning and integration
Princeton, N.J.

I just bought a package that links IBM Personal Computers or compatibles to an HP 3000. It works!
Programmer/analyst
Rolling Meadows, Ill.

We are going to try this on a very small scale, but it will be a first for us. I'm willing to predict only a 30% chance of making the connection without any serious time delay problems.
Sam Ashenberner
Director of data processing
Pacific University
Forest Grove, Ore.

And I don't think I ever will. Vendor announcements belong in Ripley's *Believe It or Not* as far as I'm concerned.
D. Lee Dorsey
Director of data processing
Steuben County
Bath, N.Y.

Maybe there is one — we have it on order for our Decsystem-10/IBM Personal Computer environment. I've seen it demonstrated; I have to get my hands on it to know if it really does work. Within two months I'll know. (I've always been an optimist!)
E.E. Jackson
Manager,
Technical Computer Services
Griffith Laboratories
Toronto, Canada

There are so many types of links available: dumb terminal emulation, simple file transfer, application-intelligent file transfer and others. I think it is important to evaluate what is to be accomplished with a link prior to researching products available on the market. Application vendors (such as Management Science America, Inc.) are hitting the closest on intelligent links, because

> ”
>
> *With 75,000 IBM System/34s, System/36s and System/38s sold, you would think that Lotus Development Corp. or Microsoft Corp. would develop a decent link between them and personal computers . . . (sigh) . . . No accounting for market savvy, I guess.*

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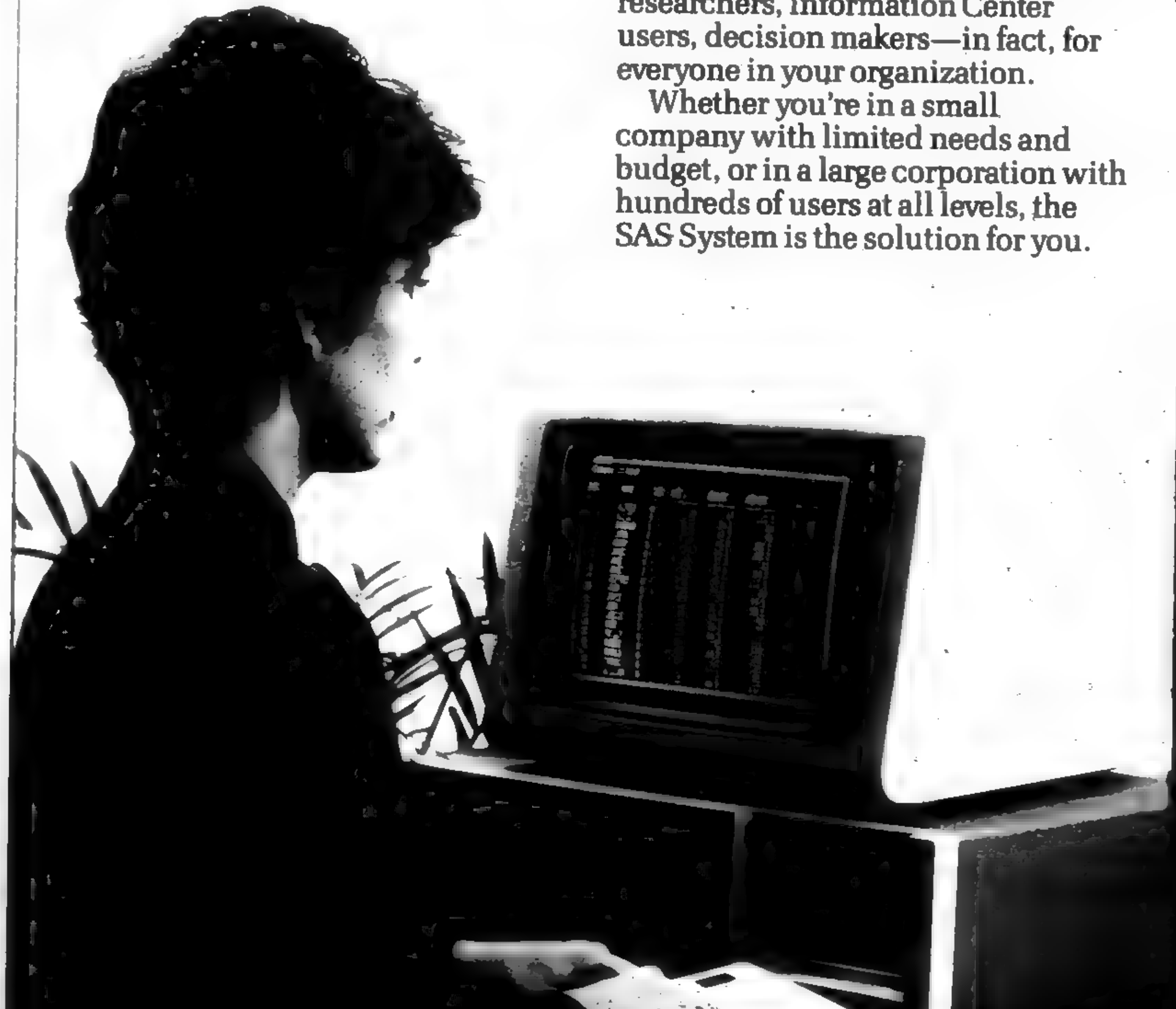

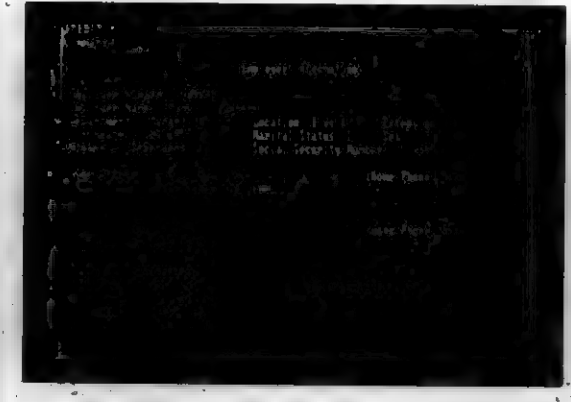

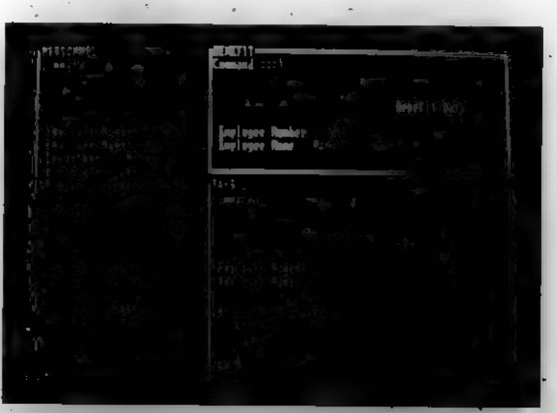

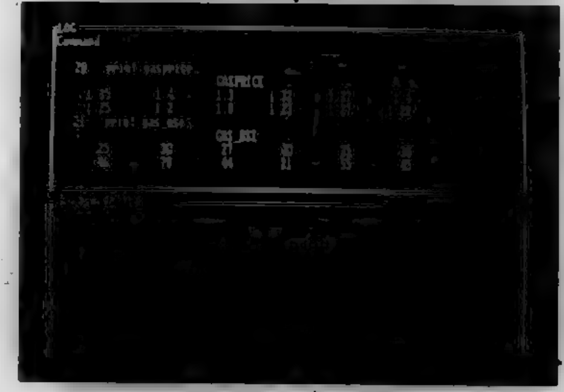

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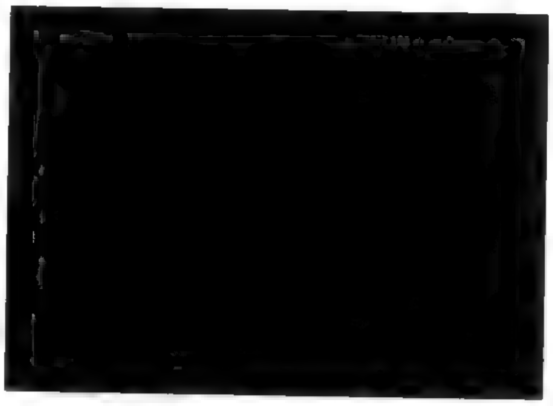

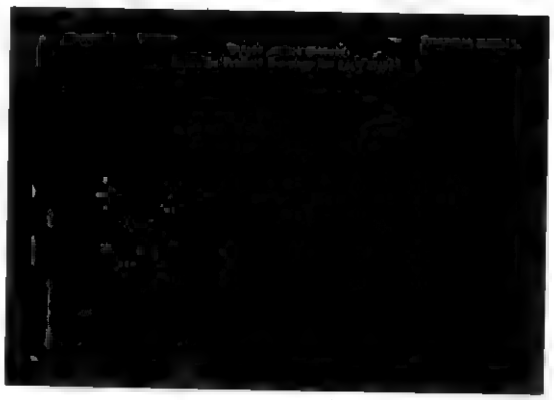

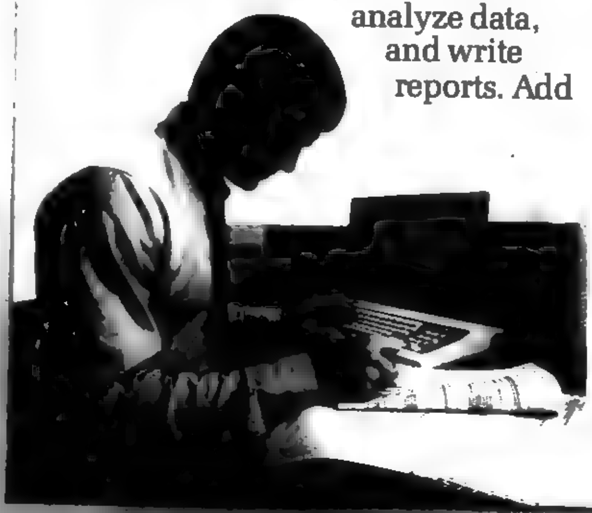

The SAS System goes everywhere your PC/370 goes—from the data center, to the applications development staff, to your office.

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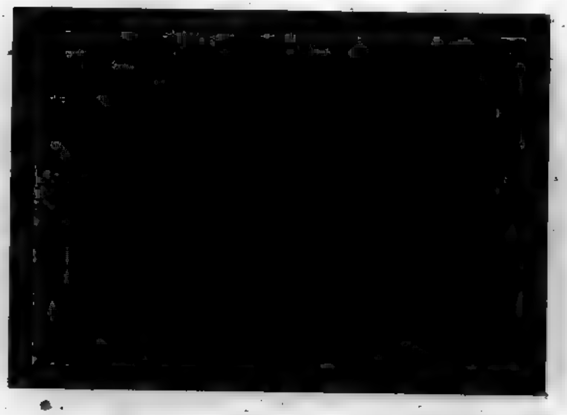

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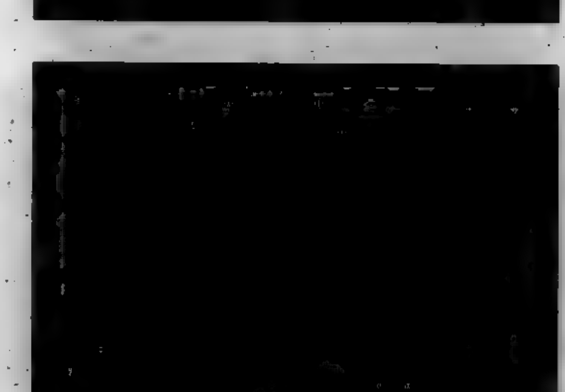

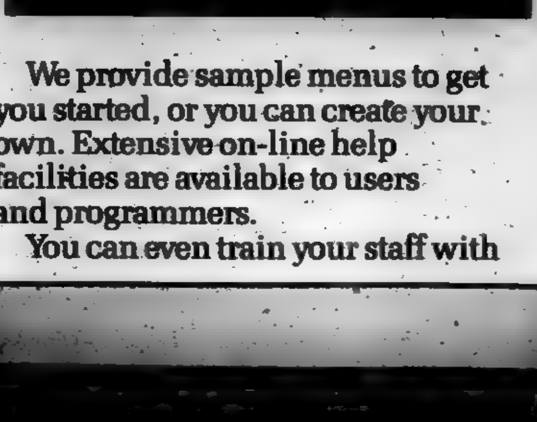

We provide sample menus to get you started, or you can create your own. Extensive on-line help facilities are available to users and programmers.

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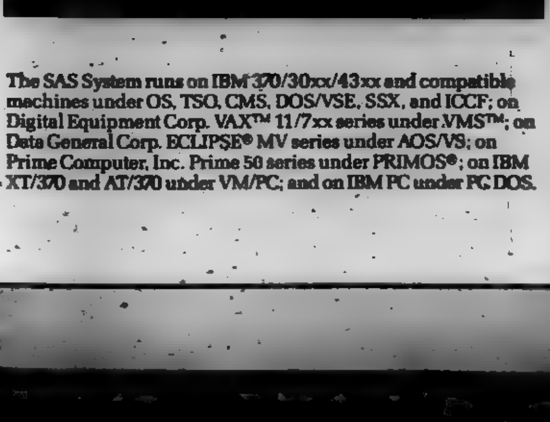

The SAS System runs on IBM 370/30xx/43xx and compatible machines under OS, TSO, CMS, DOS/VSE, SSX, and ICCF; on Digital Equipment Corp. VAX™ 11/7xx series under VMS™; on Data General Corp. ECLIPSE® MV series under AOS/VS; on Prime Computer, Inc. Prime 50 series under PRIMOS®; on IBM XT/370 and AT/370 under VM/PC; and on IBM PC under PC DOS.

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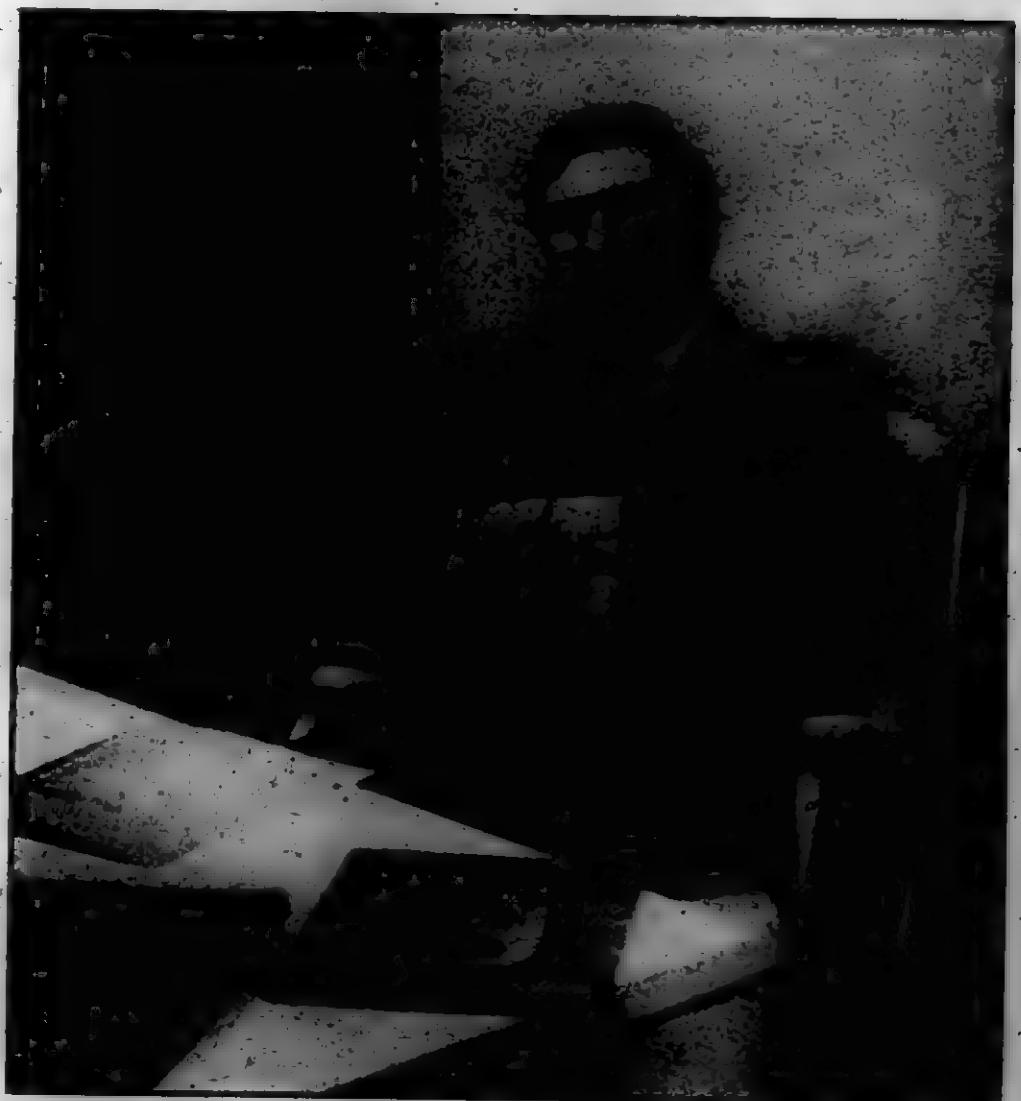

Bob Gildenberg, Vice President, Marketing, Philon, Inc., NY, NY

Bob Gildenberg is Vice President of Marketing for Philon, Inc. He is responsible for marketing fast-executing compilers for UNIX-based microprocessors. To sell his product, PHILON FAST/Compilers, he has to talk to executives at hardware manufacturers, software houses, systems integrators and VAR's, as well as government and selective end-user organizations.

He has found, through experience, that even though Computerworld is primarily positioned as an MIS/DP publication, it does the job for him.

"We didn't have as much money as we would have liked when we started, and rather than spreading our ads throughout several books, giving us a weak presence in each, I chose to concentrate in Computerworld. It was my sense that it reached most of the people I needed to talk to. And its weekly frequency would allow us to roll out faster than we could have with most other publications. The results have shown that judgement to be accurate.

"More than 30 major hardware manufacturers have already signed up to distribute PHILON FAST/Compilers. In addition, many software companies will be using our compilers to speed development of their own products. So far we have exceeded our sales forecasts and have increased next year's forecast by over 300%."

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"

Either you haven't looked in the right place or your requirements aren't realistic or you don't need a link or you're a perfectionist. In this last case, you'll just have to do it yourself or wait a while (along with me).

they integrate micros with a specific application. If any link does not support the application goals of the user, it is not accomplishing its purpose.
Systems analyst
Tulsa, Okla.

There is no easy or generic answer to the micro-to-mainframe problem. Each micro-to-mainframe application will require considerable custom programming in order to handle the different types of data formats involved.

Users can stop waiting for a micro-to-mainframe cure-all and should start developing these connections with existing products.
Chris A. Kantack
Systems analyst/
programmer
Todd Building Co.
Roseburg, Ore.

I have not found an application on the Personal Computer that can justify the cost of creating a micro-to-mainframe link.

The link is good in theory, but there is no real need identified yet.

We are using Personal Computers to emulate the IBM 3276 in remote locations and then switch back to Personal Computer mode for local use.
Gary Dyer
MIS director
Blue Cross
Boise, Idaho

Either you haven't looked in the right place or your requirements aren't realistic or you don't need a link or you're a perfectionist. In this last case, you'll just have to do it yourself or wait a while (along with me).
J. Grabowski
Corporate DP consultant
Sandoz Pharmaceuticals
Basle, Switzerland

Polygon Associates' TRM works beautifully between Digital Equipment Corp. micros and PDP minis.

We used it solidly for a year to print things from a DEC VT180 because I refused to invest any money in a printer for these obsolete machines.
Margaret Rutledge
Mesa Consolidated Water District
Costa Mesa, Calif.

The true micro-to-mainframe links are all "vaporware."

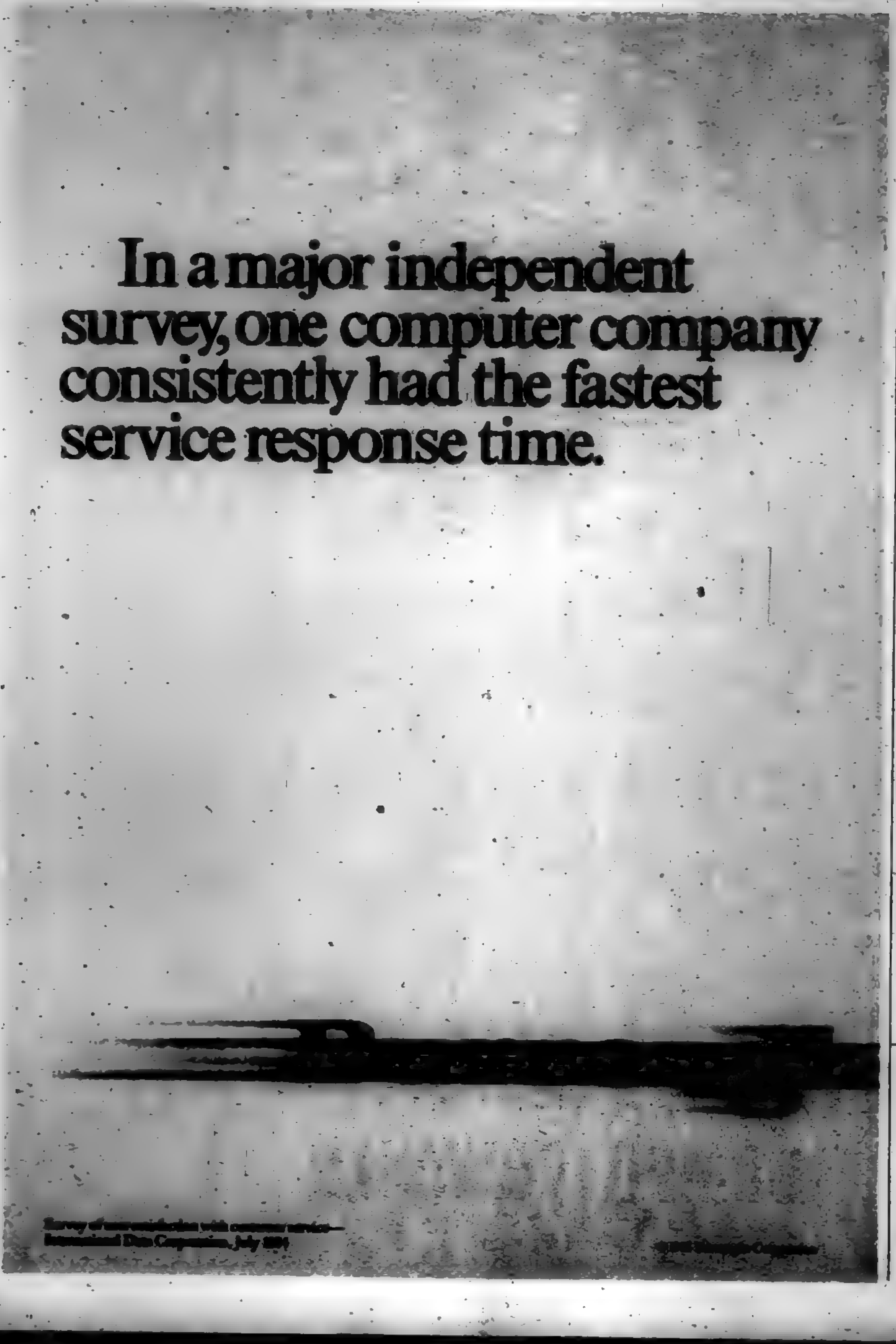
In my opinion, they are all quick fixes. Our company is doing just fine without a micro-to-mainframe link.
Programmer
Natick, Mass.

Both buyers and sellers of micro-to-mainframe links need to ask themselves what purpose they are attempting to serve in each case.

To require or establish linkage for its own sake seems pointless.

Given a clearly stated need, however, there is usually a satisfactory solution.
Brian Le Bert-Francis
Falls Church, Va.

Look not to the vendor, nor even to the hardware. Look, rather, to the data highway that de facto exists between the host and the remote terminals. The link is already there.
Vice-president
Tampa, Fla.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5. Hackers are just kids playing with computers. Any system that can't keep them out deserves to be infiltrated.

Fortunately, we have a closed system, but security has always been designed into it. If we can't hurt it on purpose, no hacker can either. Filters that limit the entries to the system are easy to write and should be used.
Michael Bobochmost
Senior programmer
Eastern Airlines
Miami, Fla.

False. Hackers are not just kids, and given time, they can break into almost any system. It is my job to make it difficult for them, to try to ensure that what they find is worthless and to be able to recover from their activities.
Carl M. Vigil
Associate director,
Production services
San Jose State University
San Jose, Calif.

This is largely true. Although the popular press describes "break-ins," this actually seems to be simple theft of passwords.

I believe that many large companies are criminally negligent in that they make no sincere effort to safeguard the confidential information they maintain. My experience is that most DP installations do little to make their systems secure; rather, they hope that making an example out of the occasional person who knows so little that he gets caught will scare off other violators.
William R. Turner III
Consultant
Elmira, N.Y.

This statement bothers me because it tacks a negative label on all hackers regardless of how they behave. It also tends to trivialize the matter of system security. In the first instance, a distinction should be drawn between legitimate inquiry by nonconforming individuals and unethical actions on the part of a few delinquents (not all juvenile).

There are good hackers and bad ones. In the second instance, security is a trade-off between user needs and the cost effectiveness of responsive controls. The potential for intrusion is determined by the attractiveness of the bait for all would-be intruders and the difficulty of penetrating the shields. Unfortunately, hard puzzles attract inquisitive minds.
Brian Le Bert-Francis
Falls Church, Va.

I think it's going to take a hacker breaking into a computer system to make people expend the money to protect a system from illegal access. A secure system requires a strong, intelligent person to push a company to protect its system. Currently, our company is paying token respect to security, but it has a long way to go. How does one secure 100 micros?
Systems manager
Buffalo, N.Y.

> ”
>
> *Currently, our company is paying token respect to security, but it has a long way to go. How does one secure 100 micros?*

Hackers used to be users trying to find out more about their own or others' systems. Before users, systems people used to be hackers. The problem isn't a new one, just more widespread than it used to be.

Passing laws against computer crime is not preventive and is worth little as a deterrent. If data is misused by an unauthorized user, the system's designers are at fault for designing and installing an unprotected system.

Data is to a corporation what cash is to a bank. A bank wouldn't like to leave millions in cash out in an unprotected environment where people could grab whatever they wanted, but little is done to protect data.

Software and hardware vendors should be faulted for allowing this unprotected environment to be marketed as it has been over the years.
DP auditor
Florida

Hackers are not necessarily kids. A new name [should be found] for honest hackers, but terrorists may be a good name for destructive hackers. I totally agree that "any system that can't keep hackers out deserves to be infiltrated." The [security] problem has been ignored too long.
W.B. Helgeson
Viking Consulting Services
Gig Harbor, Wash.

Hackers who "trespass" know they are trespassing. Some may naively think they are only breaking a small law (like telling only a little white lie), but the damage some have done is real. Any house without locks "deserves" to be broken into? Not really, but with increasing crime, a wise manager is prepared.
DP manager
Dallas, Texas

Hackers probably just aren't kids, but any system that lets hackers in deserves it!
Thomas Ardell
DP Manager
John Deere Co.
Portland, Ore.

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IN DEPTH/HACKERS

knowledgeable people follow the idiot press in degrading a good word. Hackers are not necessarily kids (the best ones aren't) and are not computer infiltrators as such. A hacker is a person of any age who "plays with computers" in a knowledgeable, technical way — someone who loves the complexities of systems for their own sake. The use of "hacker" as a term for computer bandits stems, I suspect, from fear of anyone who doesn't go by the book and who has fun with what he's doing.
Gary McGath
Software consultant
Hollis, N.H.

> ,,
>
> *Muggers are just kids playing with knives. Anyone who can't defend himself deserves to be robbed.*

Well, the system doesn't "deserve" to be infiltrated any more than an unlocked house "deserves" to be burglarized. But most hackers are inept at computing and related disciplines. Deterrence via example is a good preventive, along with others.
Richard Conner
Lawyer
San Francisco, Calif.

A teenager steals/vandalizes products in a stereo store. Do we blame the store owner? No. Let's try to find more effective ways of enforcing this crime.
Christopher Seker
Programmer/analyst
Richard S. Carson
& Associates
Bethesda, Md.

Think about this: If you can't keep kids out, how do you keep Russians, industrial spies and adult criminals out?
William L. Smith
President
Silent Partner Systems
Clearwater, Fla.

If you have your car unlocked, does it deserve to be stolen? It boils down to a sense of values — right vs. wrong. Anyone who can't determine that it's wrong to steal computer resources or damage others' data probably thinks shoplifting would be acceptable — if it were as easy as hacking. But just as a shop owner can't leave the door unlocked, DP managers can't leave their machines unlocked either.
Information systems
manager
Chicago, Ill.

Muggers are just kids playing with knives. Anyone who can't defend himself deserves to be robbed.
Roger M. Firestone
Blue Bell, Pa.

Computer security should not be that hard to set up. Cut the phone line if you have to.
Don Davis
Software consultant
Houston, Texas

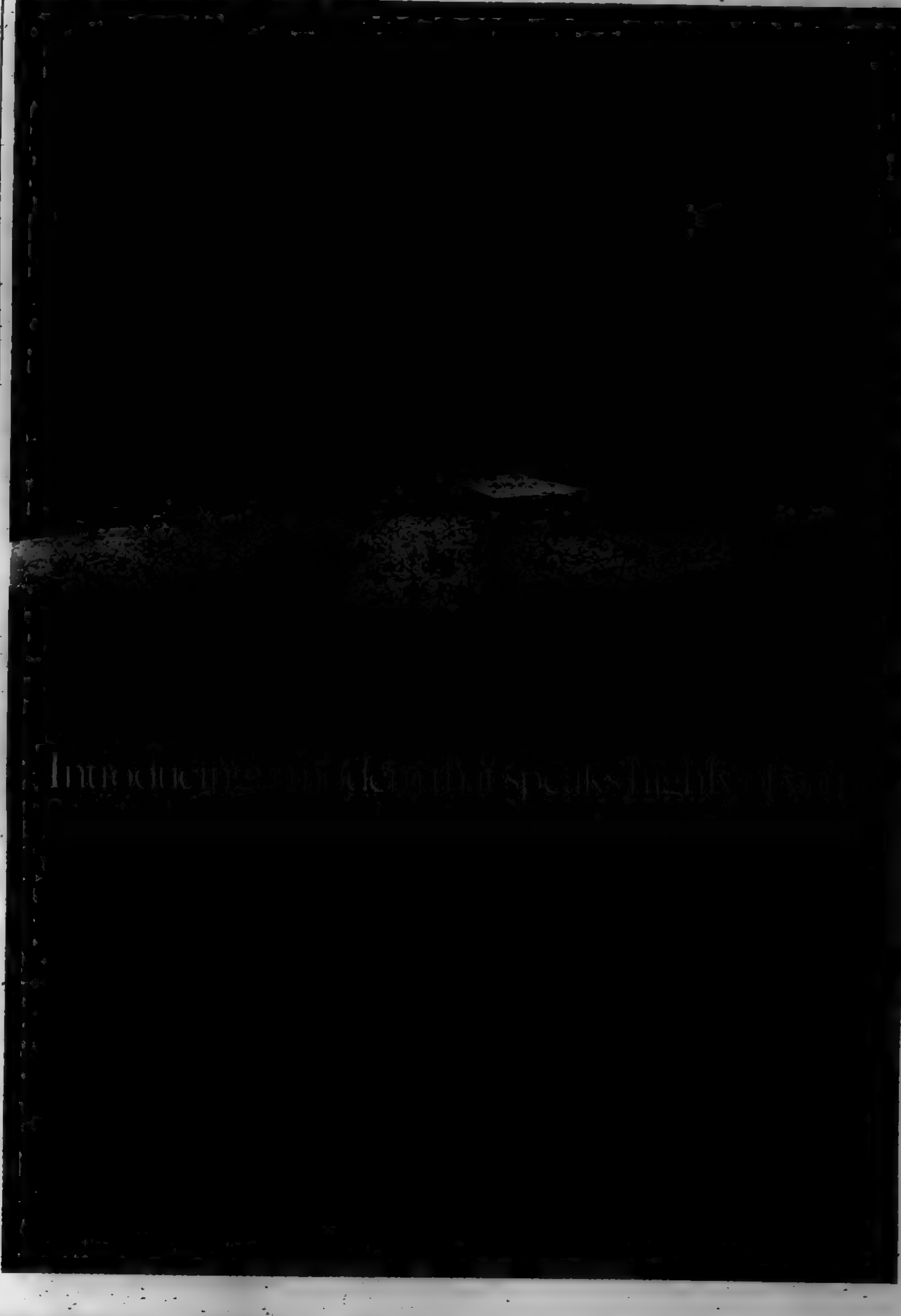
Our system and local-area network get sufficient use that they are becoming vital to the company. Yet security and administration have not caught up to recent growth.
Financial systems manager
Minneapolis, Minn.

Prognosticators keep saying that we will soon have personal banking on home and personal computers. Looks to me that it would be a hacker's paradise.
How could you possibly devise a security system that would be "hacker-proof" but allow home computers easy access to your banking accounts?

I have never seen this subject addressed in any article or publication. Can it be done? I doubt it!
M.D. Emel
Senior systems analyst
Omark, Inc.
Portland, Ore.

Too much is made about these attempts when there are several really simple solutions: like dial in/call back and password control/ID control a la ACF2.
Donald Weimer
Senior systems programmer
Grumman Data Systems
Bethpage, N.Y.

Hackers are crooks and should be tried as such. I keep our modems disconnected — they get hooked up only when necessary.
Margaret Rutledge
Mesa Consolidated
Water District
Costa Mesa, Calif.



6. Senior management still treats DP as a back-room service.

Not so. We've been delegated the responsibility to teach computer literacy courses to all staff, from presidents to groundsmen, not just micro, but mainframe.
Benjamin Yarber
Director, computer services
James Madison University
Harrisonburg, Va.

Well, isn't that what it is? It's a tool. Just because accounting and law have become two tails that wag the dog, does anybody need a third?
Lewis Gulick
Senior scientific
programmer/analyst
Monterey, Calif.

> ”
>
> ***There is still a feeling that all use of technology must generate cost savings. We in DP can only change senior management's attitudes by demonstrating (prototyping) the power of DP in the use of profit-generating activities, for example, marketing.***

If you want Ralph Nader to forget the 55 mph speed limit, give him a Volvo or Thunderbird turbo.

Get the "head-shed" involved. Walk them through the shop, let them see all those lights flashing on the master console, the tape drives spinning — better yet, their paychecks being printed. Take them on a few days' seminar; tell them what your organization does for the company and what your long-range plans are. Give them personal computers for their home or office and some training (no technical talk or buzzwords).
Robert Boyd Jr.
Information resource
management consultant
Simi Valley, Calif.

In many situations where this problem exists, the "bottom-rung" image can be altered through diplomatically and gradually educating senior management. In other situations, the senior managers will always look upon DP personnel as mere button pushers and reward them commensurately. My opinion as to the reasons for this type of attitude would consume much more space than available here.
Tom Young
Assistant controller
Salt Lake County
Water Conservancy District
Salt Lake City, Utah

There is still a feeling that all use of technology must generate cost savings. This attitude is supported the most by accountants and financial types. It's not surprising — it's their job. We in DP can only change senior management's attitudes by demonstrating (prototyping) the power of DP in the use of profit-generating activities, for example, marketing.
Jess Ray
Vice-president, business systems
Associates Bancorp, Inc.
Chicago, Ill.

Organizational charts generally show DP reporting through administrative services or financial services: the service organization. Its purest function is to address an organization's informational needs, be that reporting on past performance or forecasting future activity. More companies, although not making public statements in this vein, are viewing good information as the life blood of a well-run organization, not merely servicing. Certainly, if budget ratios (the percentage of the DP budget to the total picture) and salaries in the marketplace (entry-level positions are higher than they've ever been) are indications, the "back room" is not an appropriate adjective.

If DP is treated as a back-room service by senior management, it could very well reflect the accuracy and timeliness of data it produces, which could also relate to the spread of micros. In order to turn this situation around, DP must first determine and justify the tools it needs to be responsive and, once acquired, put them to use quickly and efficiently. To ensure success in this endeavor, the planning and justification needs to be a joint venture between senior management and DP with appropriate accountabilities communicated up front.
Janet Mushrush
Marketing representative
Com Tech Systems, Inc.
Columbus, Ohio

Only sales, probably because they're not in often enough to realize that I haven't shaved because I haven't been home.

The other departments are very nice. They say, "Why don't you grab a cup of coffee and sit in my chair awhile?"
Michael De Tomaso
DP manager
Watercloud Bed Co., Inc.
Santa Ana, Calif.

This attitude is being overcome by those MIS managers who learn to address the business issues and strive to demonstrate MIS value in terms of net worth, profit

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Honeywell, I said, tell me the secret to getting bigger returns on my information investment.

It's no secret, they said.

Please, I said, I just want to know what the insiders know. I'll never tell another soul. Promise.

There is no secret, they said. All you have to do is increase the accessibility of your online information while decreasing the cost of producing and maintaining that information.

It's all very easy when you use our Solution Center and Development Center tools.

Actually, I knew it all along.

Let's begin with a definition.

Return on Information Investment (ROII) means the degree to which an organization benefits from its investments in information resources. This includes computer equipment, software, and manpower.

How can ROII be improved? In large part this is a function of how information is used by your organization and how that information is created.

But for general purposes, ROII can be improved by increasing the accessibility of your information while decreasing the cost of producing and maintaining that information.

By increasing accessibility, we mean letting more people use more information more easily. By decreasing costs, we mean letting program developers, system administrators, and operations people make more efficient use of the system.

At Honeywell we've developed strategies just to help you achieve these objectives:

The Solution Center enables you to offer your end users special GCOS 8 software packages to aid in decision-making, planning, forecasting, and creating reports. All capable of concurrent operation with your production applications with little or no dependence on your DP department. The result is improved self-sufficiency, productivity, and performance.

The Development Center is a collection of GCOS 8 based software tools designed to permit your program developers to design and test applications more quickly, assist system administrators in providing better performance and control, and to assist operations in managing daily computer room activities.

And, Honeywell's design strategy for cohesive micro-through-mainframe software, networking, and computing equipment affords the long-range investment protection growing organizations need in order to keep ROII healthy in the years ahead.

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>
> ***When DP can't design and support the newest system to beat out the competition, some high-level executive (with demonstrated money-making skills) is brought in to run DP. After all, being an executive means you can manage anything, despite ignorance about the subject.***

orientation and a key contribution to business improvement.
Robert Trapp
Director of MIS
Bi-state Development Agency
St. Louis, Mo.

I have 12 years of solid DP experience. If I were the vice-president of finance and marketing, would the president and board of directors wonder why they were going broke? Does any industry outside the DP industry employ a vice-president of information services? If companies fail to take a bite out of this reality sandwich, someone else will do it for them. I hope it's not the competitors.
Manager, Technical programming
Calgary, Alta., Canada

Yup — fer shur! At best we are a necessary evil, and I suspect they debate the degree of necessity from time to time.
E.R. Jackson
Manager
Technical Computer Services
Griffith Laboratories
Toronto, Canada

Despite the growing use of third and fourth-generation hardware and software, the major problem in data processing today is (and always has been) poor managers and technical personnel. Many Wall Street firms continue to treat DP as a simple, back-office tool. When DP can't design and support the newest system to beat out the competition, some high-level executive (with demonstrated money-making skills) is brought in to run DP. After all, being an executive means you can manage anything, despite ignorance about the subject.

This leads to the next round of personnel movement. The qualified people leave because of frustration with the latest corporate know-it-all and the remaining yes-men and women prepare for their next move up the corporate ladder based solely on the ability to be inconspicuous.
Project manager
New York, N.Y.

This situation certainly depends on the type of company involved. Ours is a successful, conservative Midwest distribution company that has used DP as a tool to help get us where we are today.

To our company, DP is a service department to manage the high volume of information required in our business. As long as that job is being done, it would be out of character for our company to look to us to do any more. I believe that there is a lot more we could be doing, and someday we will. It's difficult to argue with senior management's success.
Michael Wagner
Director of data processing
Nasco
Fort Atkinson, Wis.

DP is a tool. It is a back-room service. DP is necessary and important but is not the company itself.
Roger Boese
Consultant
Insurance systems
Tokyo, Japan

Yes! Yes! We see this particularly in the engineering field, where archaic manual methods of testing and data recording are so entrenched. Automation of data collection is commonly regarded as a frill.
Ann McCormick
Manager, Test data handling
Comsat General Corp.
Washington, D.C.

Quite often the case, but whose fault is that? DP has experienced rampant growth in the last four decades. Many managers have been promoted with little regard for their lack of qualifications for management. At the same time, senior management outside DP has not kept itself informed as to how DP should operate.

What is the answer? Get an education program for both sides. Improve ability to communicate. Make the DP manager accountable for every dollar spent. Both the DP manager and those to whom he is accountable should be able to answer questions like the ones in this survey. Credibility has to be earned.
Eric Wieler
North American Representative
Softlab GmbH
Tampa, Fla.

I think this will always be true. Senior management is the head of the user groups and is never satisfied with the schedules or budgets of its DP shops. It seems to be a matter of lack of understanding. How does DP explain to a user that the investment of time and money usually results in quality, and very quick turnaround of projects usually results in high maintenance costs?
Information systems group manager
Buffalo, N.Y.

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7. Unix is an operating system kept alive only by vendor and media hype.

Nope. The value of Unix is in its portability. Now that Unix has proven it can be done, we need a *good* portable operating system.
Bob Brown
Manager, systems
and programming
De Kalb General Hospital
Decatur, Ga.

Many of our users want to try it, but I've never seen it work in an administrative office.
Carl Vigit
Associate director,
Production services
San Jose State University
San Jose, Calif.

Is Unix alive yet? I thought the world was still using DOS. IBM didn't develop it, so it can't be *that* good.
Chuck Strain
Programming manager
Claremont, Calif.

Unix might go some place if it was given a simple rewrite so that the commands appeared to make sense (that is, use mnemonics).
William Turner III
Consultant
Elmira, N.Y.

Software and hardware vendors should be faulted for allowing this unprotected environment to be marketed as it has been over the years.
DP audit consultant
Longwood, Fla.

In my world of multimegabyte mainframes, Unix is theory only.
Michael Hubschman
Senior programmer
Eastern Airlines
Miami, Fla.

Unix has its place in universities, in program/system development. Its popularity is causing use in areas where it is not the best choice. I think use will either decline, or Unix will be modified to fit these other environments. But the hype is not just because of familiarity, it's also because of usefulness and power.
Tom Newell
Software engineer
System Industries, Inc.
Milpitas, Calif.

Not true. Unix is becoming available on single-user micros, multiuser micros, minis and mainframes. There is a lot of good software for Unix, such as Unify DBMS, Quadraton office automation and Access Technology, Inc.'s 20/20 electronic spreadsheet.
Computer specialist
Federal government
Washington, D.C.

Right on! Unix is this year's Cabbage Patch doll of operating systems.
Chuck Lundgren
Programmer
Caribou Mountaineering, Inc.
Chico, Calif.

Unix is an operating system I would like to understand, but every article I read is written in "Unix-Greek," and I can't begin to decipher what it is. If someone knew what a shell or kernel did, they could decide if they needed one.
DP manager
Dallas, Texas

Wrong. Unix serves as one of the very few available options for portability and protection of software investment.
W.B. Helgesen
Owner
Viking Consulting Services
Gig Harbor, Wash.

As a software developer, definitely not. Unix is beyond state of the art.

If there is any problem with the acceptance of Unix, it's because no one knows (or few) know of its technical prowess. (This may be blind adulation, but I don't think so.)

Unix results in a tremendous

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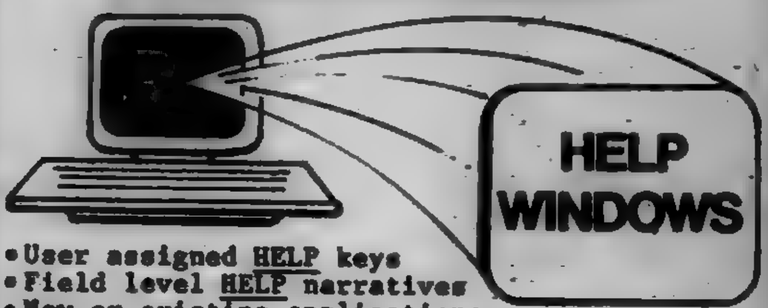

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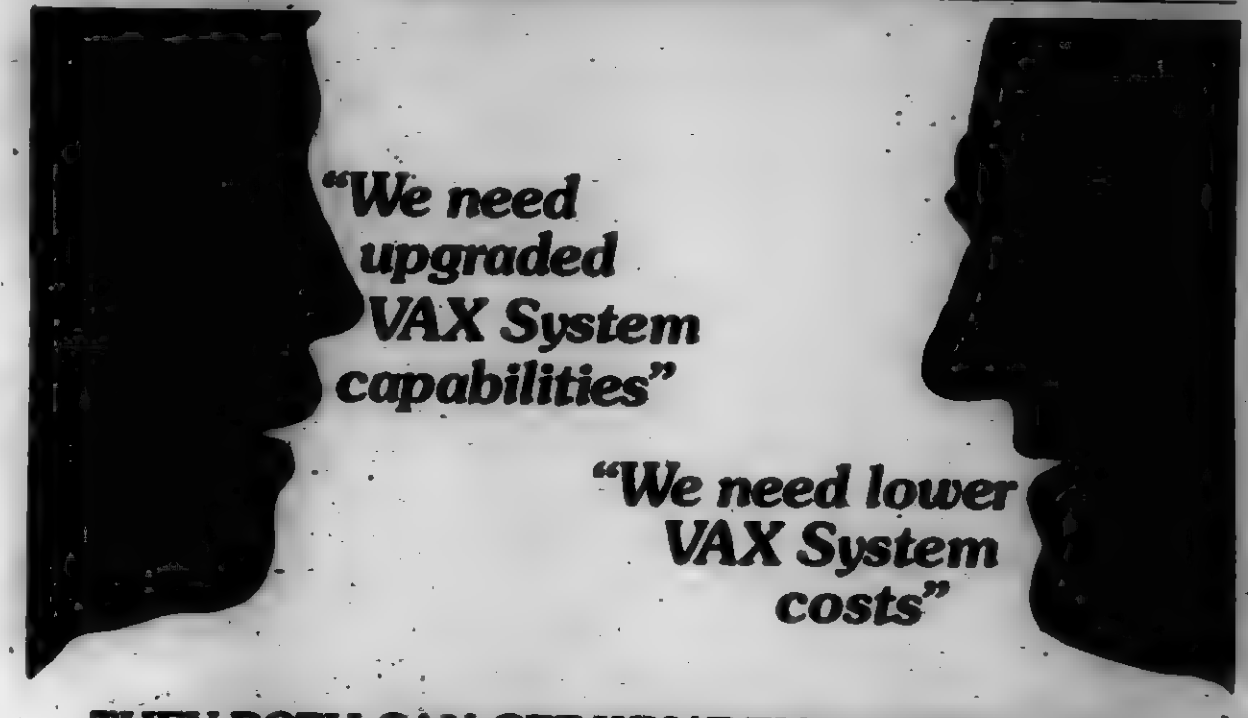
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> ”
>
> *The world needs more visually oriented systems (a la Apple Computer's Macintosh) for the good of its users than more Unix, which only serves the pleasure of its wizards.*

release of hardware usage and greater software capability. "C" is rampant in the development world right now and will be the most effective utilizer of Unix.
Carlton Lamb
Owner
Customware Atlanta
Atlanta, Ga.

Unix is kept alive by people who graduate knowing it and have the natural desire to use it rather than having to learn a different system for doing the same thing. It will, of course, have to be replaced soon to support a new round of theses.
Lewis Gulick
Senior scientific
programmer/analyst
CTB/McGraw-Hill
Monterey, Calif.

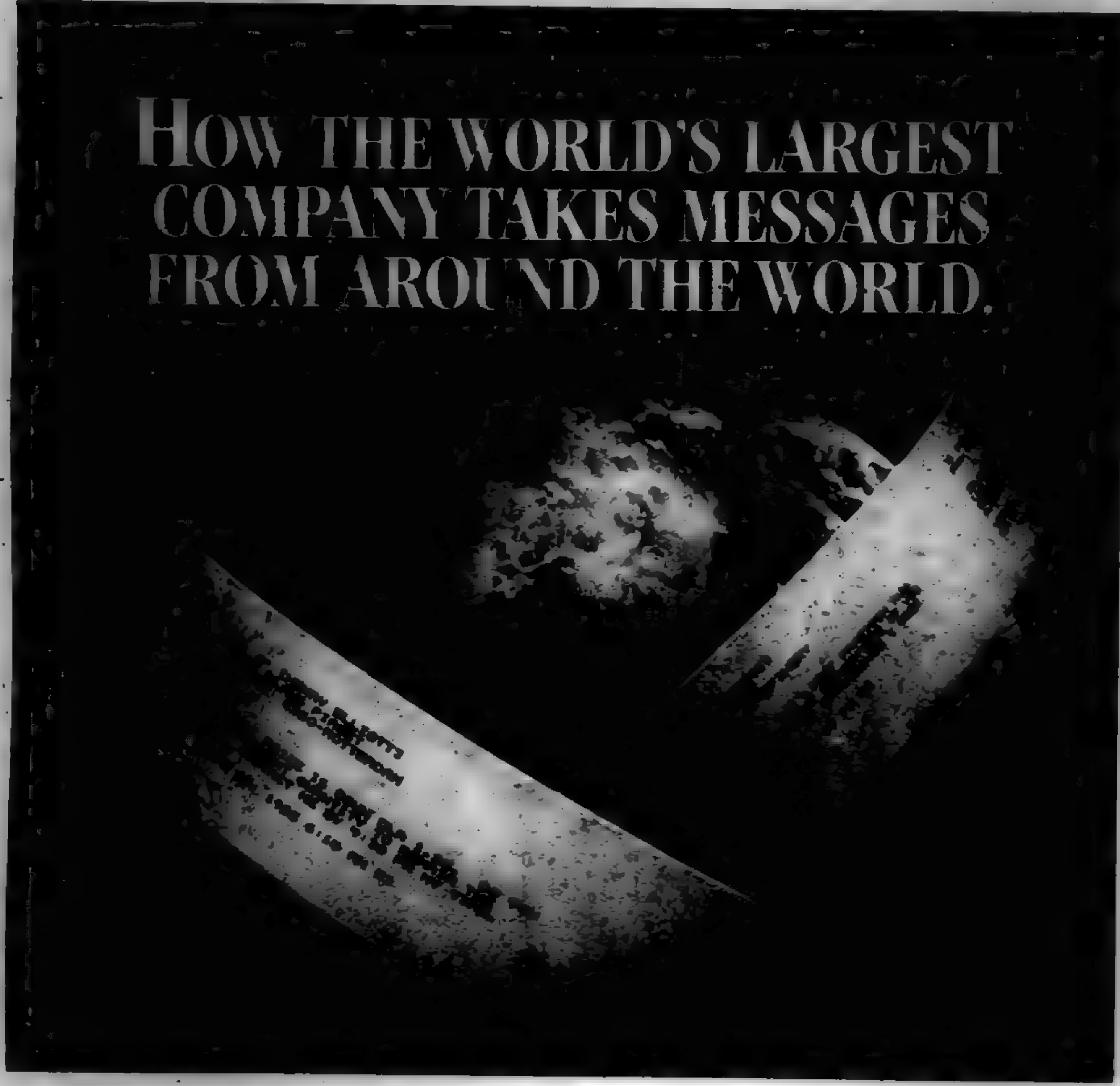
No. The specter of Unix scares many people. Unix seems to gain more acceptance every day. One of the keys is the number of programmers and nonprogrammers who are familiar with Unix from college.
Michael Isaacs
Systems manager
IMR Systems Corp.
Leavenworth, Kan.

A solution for which there is no known problem!
James Shanahan
DP auditor
San Jose, Calif.

While my Unix experience is only hearsay and thus not highly reliable, my considered opinion is that Unix is a dead-end operating system at best, and the hubbub over its eventual accession will earn authors more income than the sale of Unix operating systems will ever earn AT&T. The world needs more visually oriented systems (a la Apple Computer's Macintosh) for the good of its users than more Unix, which only serves the pleasure of its wizards.
Thomas Osgood
Director of
computing services
Indiana University East
Richmond, Ind.

The appeal of Unix seems to be its capacity to run multiuser applications. Unix demands a much more powerful computer than those typically found in the $5,000 to $10,000 category today, but I expect to see several inexpensive computers that can support Unix in the next computer-model year.
Adrian Hollander
President
Complus, Inc.
Hickory Hills, Ill.

With AT&T and Bell Labs behind it, Unix has spread enough to be a near-standard language. Although vendor and media treatment surely has provided tremendous exposure, the proof is in the pudding — the number of years. Whether it becomes a true standard will depend on the same factors that made IBM and its products standards: sufficient, sustained market share, including support, improvement and a satisfied customer base.
Gary Whitney
Systems analyst
New England Telephone Co.
Boston, Mass.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Can MIS lead the push for PRODUCTIVITY?

By Dave and Pat Ackley

More than 90% of U.S. companies today have some type of productivity improvement effort under way. Often, a productivity improvement department coordinates performance improvements and tracks results in each organizational unit throughout the company. The goal is to improve efficiency in both blue- and white-collar areas of the business.

Such widespread efforts converge on the MIS user community, which is being served by the development of data and information systems. In fact, a major objective of these MIS projects is to improve user efficiency through the availability of more complete and accessible company data.

Most large companies have begun to apply quality-of-work-life programs, such as quality circles, team building and sociotechnical systems design. The objective of these programs is to improve user efficiency. Although the methods are totally different, these are also the objectives of the MIS organization in providing better data and information services.

To complicate the situation further, industrial engineering takes an active role in many U.S. companies. It is no longer just a tool for improving efficiency on the factory floor. We now see industrial engineers performing

MIS is only one part of the corporation trying to coax productivity gains from end users. The uncoordinated overlap of effort confuses the object of all this attention and breeds inefficiency. The need for an integrated approach is becoming apparent. But which department should lead?

work-flow analysis and applying work simplification techniques in white-collar and office areas of the business. And one of the key tools in an industrial engineer's analysis kit is the application of computer technology to the work being examined.

This uncoordinated overlap of services, with their differences in approach to addressing user needs, is beginning to confuse the user and is leading to suboptimization and inefficiency. Soon the need for an integrated approach will become apparent, raising obvious questions about priority and jurisdiction.

Need for coordination

To illustrate the need for coordination of user services, the following composite scenario was assembled from company experiences. It depicts a week in the life of a typical purchasing department sometime in the not-too-distant future:

Monday morning: The purchasing department buyers hold their weekly quality circle meeting, where they continue analyzing ways to improve their efficiency in evaluating vendors and implementing purchase requests.

Monday afternoon: An industrial engineer begins his series of interviews with purchasing department supervisors to prepare a work-flow analysis of the procurement cycle.

Tuesday (all day): MIS systems analysts meet with representatives of the purchasing and materials management departments to review specifications for the new material control system development project.

Wednesday morning: The purchasing manager attends a workshop off-site with the other administrative services managers. The workshop is led by a consultant who trains them in techniques for mission clarification and objective setting. The intent is for each manager to then apply the techniques to improve his own department's effectiveness.

Wednesday afternoon: Inputs are due from the purchasing manager and supervisors on their monthly performance measures. This is part of a companywide program to develop a productivity measurement system.

Thursday: The office services analyst meets with various members of the purchasing department clerical staff to discuss their paperwork requirements and investigate ways of introducing a local network of intelligent workstations.

Friday morning: The purchasing manager attends the monthly administrative services planning meeting, where the morning is spent brainstorming ways to support a major increase in work that will result from several new company contracts.

Top management has decreed that the additional work will be accomplished within the existing head count, so the managers are looking for ways to increase throughput and efficiency.

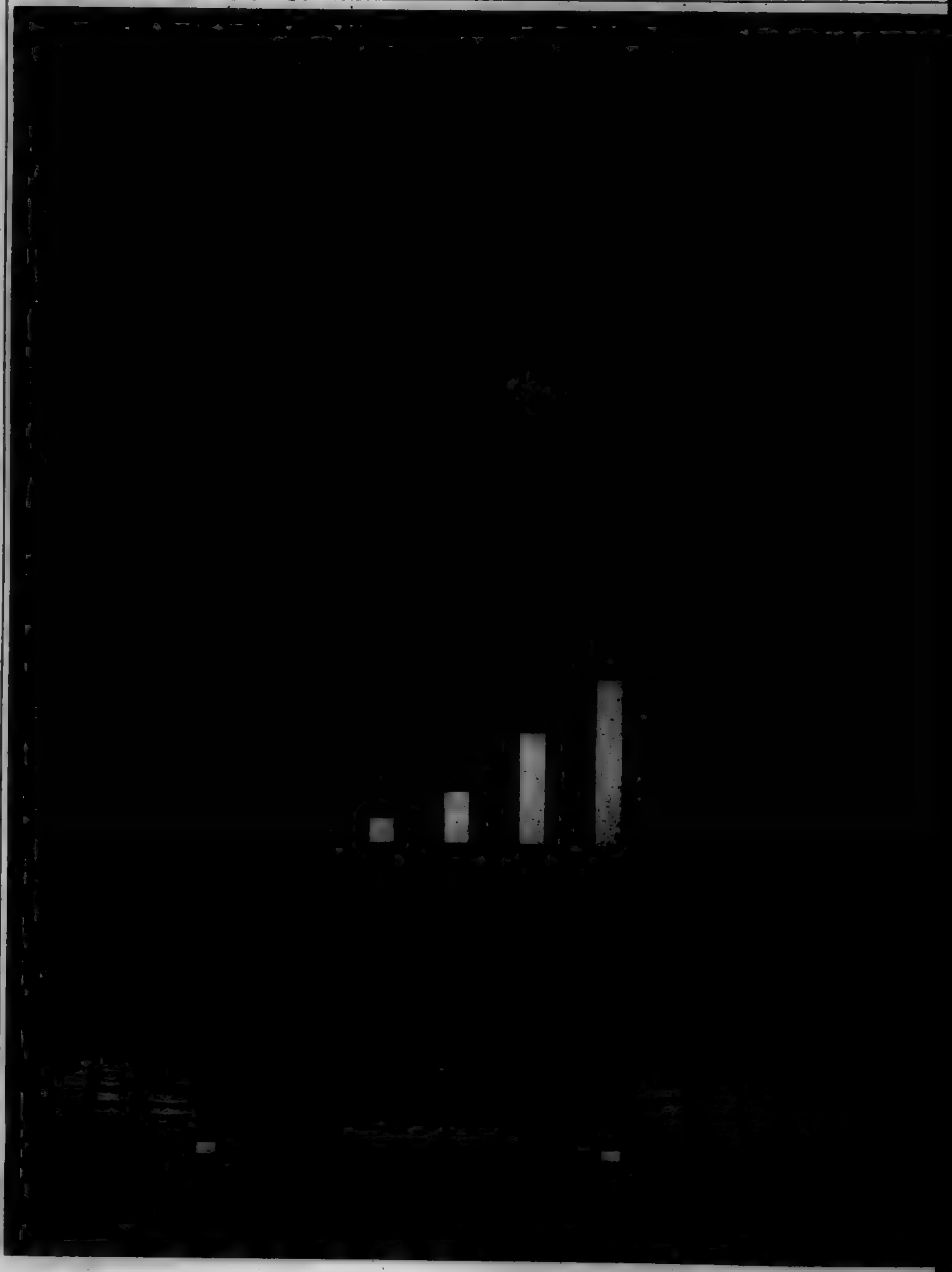
Each of the above activities relates to improvement in the way users perform their work. Taken individually, each represents a worthwhile endeavor. But taken collectively, from the using organization's point of view, are all of these individual activities necessary? Which approach should take priority? Which ones are redundant, and which are complementary? To what extent should they be synchronized?

To address these questions, a common frame of reference or conceptual theme is needed that can be applied over the entire range of user assistance efforts.

To develop a unifying theme that can be applied to sort out the various user assistance efforts, it is necessary to identify what they have in common. In each case, the primary goal is to improve productivity by applying computer technology to provide the worker with better access to required data and information. That goal may involve automating some aspect of the work, reorganizing and redefining the work structure or measuring the worker's results and providing feedback on performance.

Productivity improvement is the common theme that can bring out the similarities and relationships among the multiple programs and services that address workers' needs.

Most U.S. companies began their productivity improvement efforts outside of the MIS department, starting



with fragmented programs such as performance measurement, statistical quality control, work simplification, quality circles and others. Later, as practical experience was gained, the need for coordination of such individual activities became obvious.

Coordinated approach

Today, many large companies are moving toward integration of the fragments into a coordinated productivity approach. In many cases, integration has led to establishing the new position of corporate productivity director, whose goal is to pull together the disjointed productivity-related activities.

So far, however, most of these coordination efforts have excluded the MIS function. A critical element still missing from productivity management is an awareness of the extent to which MIS data and systems development projects are also productivity improvement efforts.

Part of this lack of awareness of the MIS productivity improvement role is because of the narrow way productivity is currently defined.

The following definition is well-accepted by most practitioners of productivity improvement programs but has yet to be applied to MIS systems development projects: Productivity = output/input = results achieved/resources used.

Currently, MIS people typically relate the idea of productivity improvement to software tools aimed at increasing MIS internal efficiency — for example, by producing more code with fewer programmers or by employing higher level languages that require fewer statements.

However, the same definition of productivity applies equally well to MIS external efforts. After all, the purpose of organizing company data into data bases or developing information systems is to enable users to perform their jobs more productively by providing better access to more accurate and complete data.

In many cases, the use of computer aids allows the user's work to be streamlined and even automated, but the end goal of MIS services is still the same.

In its broader interpretation, productivity improvement can thus be seen to encompass virtually all of the services provided by the MIS department.

By applying the same theme of productivity improvement to the collective efforts of MIS, organizational development and industrial engineering, their inherent similarities are more easily recognized.

It also provides a common frame of reference for understanding their differences, which relate not to the purpose of the efforts but to the field of discipline and methods being applied to carry out those efforts.

How to coordinate

The disciplines involved in each of these productivity improvement approaches are fundamentally different. Most practitioners become expert in only one field of study, remaining relatively ignorant of the others. Having separate educational roots, practitioners from these different disciplines have found no common frame of reference or language for communication. Their individual productivity improvement efforts have been initiated independently of each other, with uncoordinated use of resources and a resulting tendency toward suboptimization.

This is illustrated by the different focus of interest by practitioners from MIS vs. those of organizational development vs. members of industrial engineering. For example:

- In its normal course of business, today's MIS department deals primarily with computer and data technologies, and its members concentrate on the application of computer-based techniques to a given user's job.
- In contrast, organizational development practitioners emphasize the application of human motivation factors and group process techniques to improve worker efficiency.
- Still different are members of industrial engineering, who focus their efforts on work-flow analysis, work measurement and work simplification.

All of these approaches are aimed at helping the user/worker become more productive, but each discipline approaches the situation with a different set of analytical tools. Given that

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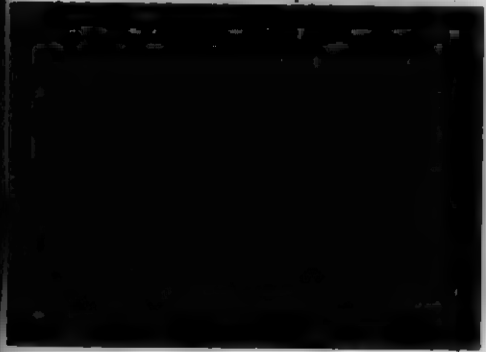
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productivity improvement is the common theme needed to encompass these different disciplinary approaches, how can coordination be accomplished across the fragmented efforts?

Coordination might come from the productivity department, since its charter seems to lie in that direction. But could its practitioners appreciate the technical complexities of systems development projects well enough to integrate them with organization development and industrial engineering approaches?

What about the industrial engineering organization? Although its members often make use of some systems analysis tools, it typically remains aloof from both MIS and organizational development.

Coordination might come from the MIS organization. MIS is typically much larger than either the productivity or industrial engineering departments. It has traditionally been the leader in introducing and managing complex new concepts, from computer technologies to data management methodologies. Could MIS managers learn to appreciate the subtleties of the other productivity-related disciplines?

A recent poll of major U.S. corporations indicates that leadership for productivity improvement coordination actually resides in a variety of organizations, including human resources, quality assurance and MIS. The viability of MIS as the productivity coordinating function seems to depend upon the type of business, the perceived role and reputation of MIS and the extent to which MIS has a track record of being proactive in company business affairs.

Wider understanding

Whether it takes a leadership position or not, the MIS organization must undergo a growth in understanding about the need for interaction with other productivity improvement efforts. The convergence of other work improvement efforts on the MIS user community can only lead to questions about how all of these projects and programs relate to each other and the need for coordination of planning and implementation.

An examination of companies at various stages of dealing with productivity improvement convergence indicates that there is an evolutionary cycle in process. The cycle begins with initial awareness of the situation and proceeds eventually to formalized integration of all productivity improvement efforts.

To highlight the evolutionary process, it has proven helpful to categorize the evolutionary stages into five levels of development. Evidence to date indicates that each company is proceeding along roughly this same sequence, level by level. The examples that follow illustrate cases where MIS is not only involved but is actually taking the lead in bringing about coordination and integration of productivity efforts:

Level 1: Awareness that MIS is in the productivity business. Members of the MIS department of a government contractor have recently become aware that there is an overlap between their information system development projects and productivity improvement efforts being conducted for the same users by the human resources department. In comparing and contrasting the two kinds of effort, they have come to realize that both have the purpose of improving user productivity, even though they apply completely different approaches. They are now beginning to refer to their own MIS system development projects as productivity improvement projects.

Level 2: Familiarity with other groups also in the productivity business. The MIS director of a large semiconductor company has asked representatives of other productivity-related groups to attend its monthly staff meetings to provide a show and tell of their methods and services. At each staff meeting, a representative from one of the groups presents an overview of his group's methods and scope of work. To date, there have been reports on statistical quality control, industrial engineering, employee involvement teams and value engineering. The MIS director has asked each of his managers to determine which of these non-MIS methods and services may be related to work performed by his department.

Level 3: Sharing of ideas

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between MIS and the other productivity groups. The director of an insurance company's MIS organization has begun including the corporate productivity manager in some of his data and information planning efforts. Both the MIS director and the productivity manager recognize that there are relationships between the systems development and productivity improvement projects, and they are exploring ways to coordinate them.

Level 4: Collaboration on joint productivity improvement efforts. The MIS organization of a utility company has established a technology consulting function to provide front-end coordination of all productivity-related user services, including those of MIS, industrial engineering, human resources and so on. They employ a matchmaker strategy to assemble an ad hoc team of representatives who can deal with a given user organization's people, data and technology issues in a coordinated way. Currently, this coordination is performed on a voluntary basis, aided by the fact that all user service functions report to the same vice-president of the company, who sponsors the idea.

Level 5: Full coordination of all productivity groups. An eastern bank has formed a new corporate resource division to encompass its MIS, industrial engineering and organizational development functions. All responses to requests, projects and other contacts with company personnel and organizations are orchestrated under a common frame of reference.

Cross-training has made all analysts of all disciplines aware of the total spectrum of methods available, whether they are primarily specialists in systems analysis, work-flow analysis or employee motivation techniques.

Planning of service begins with an interdisciplinary approach, with subsequent specialized application of methods taking place only after the true nature of the user situation has been ascertained.

In each of the examples shown above, the MIS organization has taken a very proactive role in dealing with the convergence issues. Its members have embraced productivity improvement as a concept that will help them provide better service to the user community. Unfortunately, there are many other cases where members of MIS have remained uninvolved, and productivity improvement has grown in size and importance to the company under the leadership of some other company function.

Taking the lead

The trend toward coordination and eventual integration of all productivity improvement efforts (including those of MIS) must be taken seriously. The question of turf must sooner or later be addressed. Within each company, some organization will end up being responsible for leading and coordinating the integration of productivity improvement programs:

Some group will end up taking responsibility for solving the problem of communication among the multiple disciplines associated with the user productivity situation.

Will it be an enlightened MIS organization that demonstrates the necessary leadership and vision? Or will the integration effort come from outside of MIS, perhaps from industrial engineering, human relations or the productivity department? In companies that are now experiencing multiple, fragmented productivity improvement efforts, the MIS organization is facing a fork in the road.

One path leads to an expanding leadership role with greater involvement in company affairs; the other leads to a diminishing role as another organization begins to call the shots. MIS can wait passively on the sidelines or it can rise to the occasion and take the lead.

About the authors

Dave Ackley is a senior consultant with Holland Systems Corp., Ann Arbor, Mich., which specializes in methods and software for planning of company data and information systems. He has more than 20 years of experience in computer-related planning.

Pat Ackley is corporate productivity manager for National Advanced Systems, Inc. in Mountain View, Calif. Her experience includes productivity management and consulting.

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SOFTWARE & SERVICES

CPUs running DEC's VMS operating system.

A spokesman said Univault chronicles only those files that have been updated or created since the last archival and provides a record of all archived files. Univault also saves all directory structures and files for each volume as a backup utility.

Univault is priced at $3,000 per CPU or $5,000 per cluster.

Enzed Systems, 336A Village Lane, Los Gatos, Calif. 95030.

■ **J & H Software, Inc. has introduced a Screen Format Utility (SFU) for the IBM System/34 and 36 minicomputers.**

According to a spokesman, SFU gives users the ability to design screen layouts interactively, using word processing functions such as text centering or moving lines. SFU automatically generates screen and data specifications with user-defined attributes.

A one-time, object-code-only license fee for SFU is $450.

J & H Software, Suite GL-7, 2993 S. Peoria St., Aurora, Colo. 80014.

■ **Boston Systems Office has introduced a relocatable assembler for Intel Corp.'s 8096 microprocessor.**

The BSO/Assembler II is designed for Digital Equipment Corp.'s VAX and Microvax computer systems. The 8096 assembler is written in VAX native code and supports the Intel instruction set with mnemonics and syntax. All executable instructions and addressing modes correspond to the Intel-defined assembly syntax. The assembler supports data storage directives, including real-number constants and 32-bit expressions.

BSO/Assembler II reportedly provides full relocation facilities, conditional code and unlimited symbol storage. Its base price is $3,990.

Boston Systems Office, 469 Moody St., Waltham, Mass. 02254.

■ **Wizard Computer Products has introduced an on-line facility that allows authorized users to monitor simultaneously the material on terminal network users' screens.**

Wizard View reportedly is designed for applications running under IBM's DOS with CICS. A signal notifies the user that the screen is being monitored. If used with the company's Wizard Mail electronic mail system, an electronic mail message can be sent to a user-defined list of management personnel.

Wizard View costs $500.

Wizard Computer Products, P.O. Box 1867, Greenville, S.C. 29602.

■ **TMM Systems, Inc. has announced two added features for its Tmmsorts Parent Product sorting system for IBM Series/1 users.**

A spokesman said the Performance Plus feature results in faster throughput than the 84 logical records per second achieved by Tmmsorts Parent Product. The Random Record Locator feature, combined with Parent Product, provides users with access to single logical records or record groups directly by sort-key specification.

The price for Tmmsorts Parent Product begins at $549 and will increase to $689 April 1; Performance Plus is available for an additional $279; and Random Record Locator is priced at $425.

TMM Systems, 1014 S. Beacon Blvd., Grand Haven, Mich. 49417.

PRODUCTIVITY AIDS

■ **Greene Software has announced 2.0 versions of its Queue/34 and Queue/36 productivity tools for IBM System/34 and System/36 minicomputer users.**

A spokesman said Queue/34 and Queue/36 now establish up to 100 auxiliary batch job queues, which allow user jobs to run independently and concurrently with jobs in the System Job Queue. Features of the 2.0 versions include programs to automatically convert multiple libraries to call any queue. Through the use of interactive screens, users have control of their job's position in the queue, status, start time, execution priority and completion messages.

Queue/34 and Queue/36 are available for a one-time license fee of $395 each per CPU.

Greene Software, P.O. Box 23, Victor, N.Y. 14564.

APPLICATION PACKAGES

■ **Management Decision Systems, Inc. (MDS) has introduced an expert system for promotion analysis on IBM mainframes under VM/CMS and Prime Computer, Inc. superminicomputers.**

Designed for marketing and promotion managers, Promoter is said to measure incremental sales and profits from past promotions and to determine the best allocation of resources for future promotions. It is menu-driven and evaluates the incremental sales resulting from various promotional efforts.

Promoter costs $25,000.

MDS, 200 Fifth Ave., Waltham, Mass. 02254.

■ **CAE Systems, Inc. has announced that its CAE 2000 design automation tools are now available for Digital Equipment Corp.'s Vaxstation I under Micro VMS and DEC's VAX 8600 superminicomputer under VMS Release 4 and Decshell.**

A spokesman said CAE 2000 software running on a Vaxstation can op-

Continued on page 82

They're keeping RCA Cylix a secret because they don't want their competition to hear about our value-added data communications network. They know that control of fast, accurate data communications is vital to keeping ahead of the pack. And they're delegating the details to us because we assure them better control.

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Protocols currently used (including [illegible])
☐ IBM 3270 Bisynch
☐ Burroughs Poll/Select ☐ Asynch
☐ SDLC ☐ X.25 Other ____
How many of your sites are 300+ miles
from your host computer? ____
Type of Network: ☐ Start-up ☒ Existing

RCA Cylix Communications Network
Dept. MC
[illegible] Ridge Lake Boulevard
Memphis, TN [illegible]
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Why key DP/MIS managers are keeping RCA Cylix a secret.

SOFTWARE & SERVICES

Continued from page 61

erate in a stand-alone configuration or as a node in a CAE Worksystem distributed network environment. CAE 2000 is set for shipment beginning in July. CAE 2000 for the Vaxstation costs between $22,000 to $50,000. An entry-level CAE 2000 for the VAX 8600 costs $124,000.

CAE Systems, 1333 Bordeaux Drive, Sunnyvale, Calif. 94086.

■ Santa Monica Software (SMS) has announced an electronic mail system for Hewlett-Packard Co.'s HP 3000 superminicomputer.

SMS Mail runs on a single HP 3000 and can be accessed through any standard Ascii terminal, according to a spokesman. Through SMS Mail, users can send and receive messages after entering system identifications or user-defined names. Users are notified when they have messages waiting to be read, and they can verify if messages have been received.

Messages or files can be reviewed, printed, deleted or copied onto a separate disk file. Messages can also be reviewed or deleted after being sent. An on-line Help facility explains each command, and a distribution list allows users to maintain public or private mailing lists for messages.

SMS Mail costs $995.

SMS, Suite 700, 11355 Olympic Blvd., Los Angeles, Calif. 90064.

■ Data 3 Systems, Inc. has unveiled a financial accounting package for its MRPS 38-A MRP II manufacturing software for IBM System/34, 36 and 38 minicomputers.

A spokesman said MRPS 38-A Financial Package adds general ledger, accounts payable, payroll, fixed assets and accounts receivable to the MRP II program. Written in RPG-III, the MRPS 38-A uses System/38's data base management features. Using an open-coded data base, the user can define data fields within the system's master files. The variable list Reportwriter allows the user to define report formats.

Transactions can be deferred daily from manufacturing to accounting and are then immediately available for reports or screen inquiries. Data entered is automatically validated and posted to applications ledgers and to the general ledger every day, not at the end of the period. Established accounting structures, style and procedures can be maintained in changing over from existing accounting methods.

MRPS 38-A Financial Package, scheduled to ship in July, costs $94,000 for System/38 and $50,000 for System/34 and 36.

Data 3 Systems, P.O. Box 441, Santa Rosa, Calif. 95402.

■ Business Controls Corp. (BCC) has announced VAX Fortran Report Builders-1 (RB-1), a Fortran version of its RB-1 common data dictionary, Cobol and Basic report writer for Digital Equipment Corp. VAX CPUs.

The product reportedly allows Fortran users to join Cobol and Basic users in automating the production of optimized report code. RB-1 works with all standard RMS data files and uses the common data dictionary for definitions.

RB-1 generates a source program by combining the user specification file with either a BCC-supplied template program or a user-customized template. Maintenance of RB-1 report programs is accomplished with the RB-1 menu, general specification maintenance screens and the RB-1 Report Painter.

RB-1 costs $4,500 for the first system and $3,000 for each additional system.

BCC, 3-7 W. First St., Clifton, N.J. 07011.

■ DeCarlo, Paternite & Associates, Inc. has announced a version of its General Ledger software package for the Hewlett-Packard Co. HP 3000 minicomputer.

A spokesman said the General Ledger package, written in Cobol, features a user guide supported by on-line Help screens, 18-digit account ability, two-year budget history and an on-line report writer.

The General Ledger package for the HP 3000 is priced at $11,000.

DeCarlo, Paternite & Associates, P.O. Box 22276, 3777 S. Green Road, Cleveland, Ohio 44122.

■ Outlook Software, Inc. has announced an updated version of its Outlook/GL General Ledger System for the IBM System/38 minicomputer.

A spokesman said Outlook/GL Version 2 enhancements include on-line inquiries, immediate user access to account balances and activity reference numbers. On-line search capabilities during data entry and data maintenance have also been added.

Enhancements to the Outlook/GL Report Write portion of the system include the ability to perform calculations at report print time, basic spreadsheet capabilities and a feature allowing column calculations to be executed between columns and between a column and a user-specified constant.

Outlook/GL Version II costs $10,000.

Outlook Software, Suite 117, One Woodfield Lake, Schaumburg, Ill. 60195.

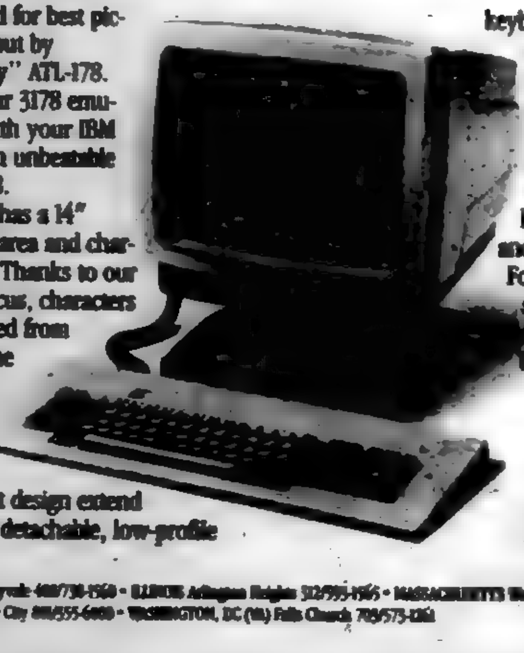
■ System Support Products, Inc. has announced an updated version of its System/34-System/36 Spreadsheet software for IBM's System/34 and 36 minicomputers.

A spokesman said features of the release include replacement of the Copy Cell Formula function in the spreadsheet enter/update program.

Continued on page 64

Terminal/System Architecture in Data Processing

Beehive Challenges You To Take The 3178 Screen Test



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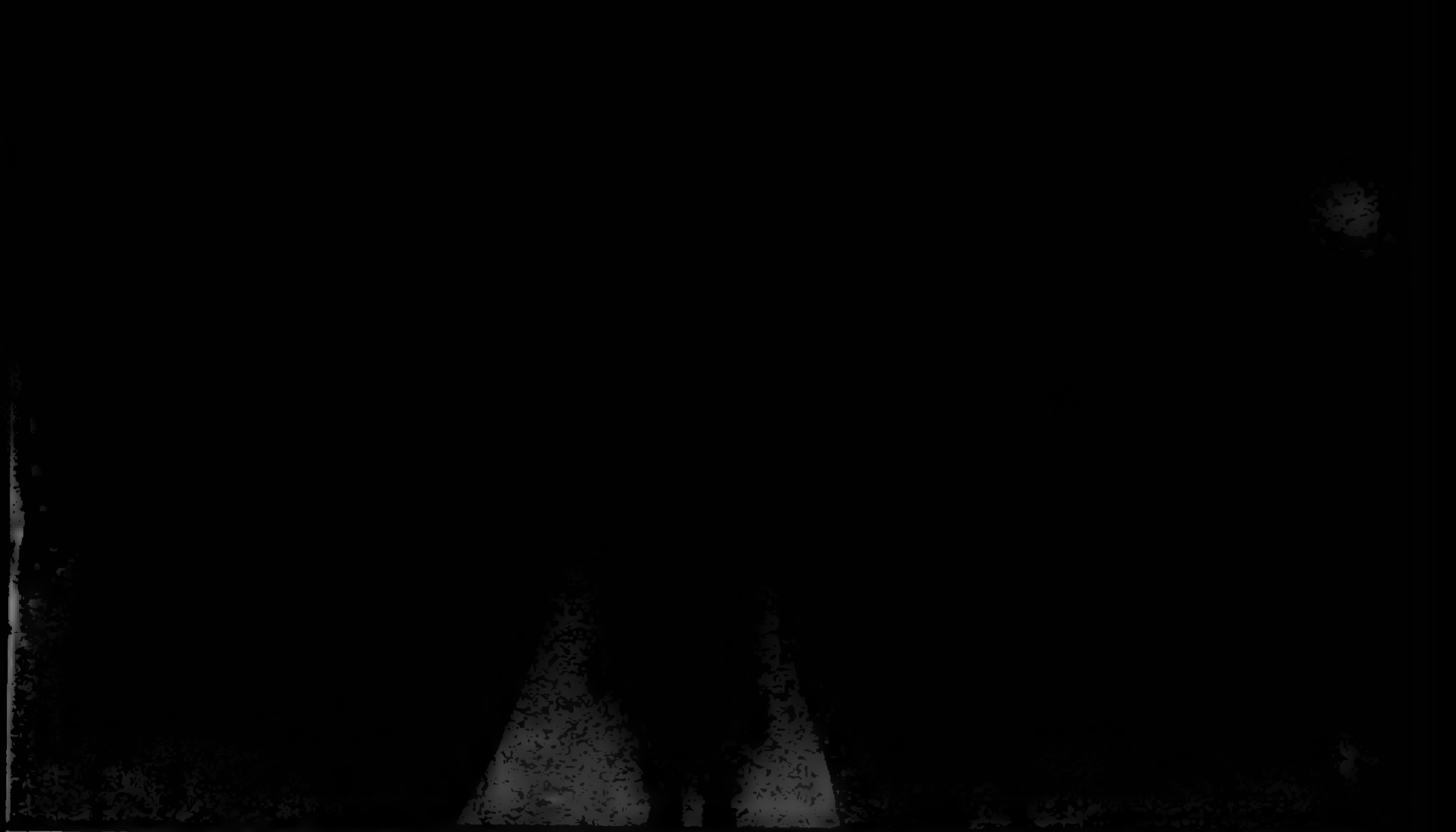

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4/9 Seattle, WA
4/16 Los Angeles, CA
4/18 New York, NY
4/24 Chicago, IL
5/14 Indianapolis, IN

DISTRIBUTION REQUIREMENTS PLANNING (8:30 AM - 3:30 PM)

4/2 Dallas, TX
4/16 Cleveland, OH
4/24 Montreal, Quebec
5/7 Philadelphia, PA
5/15 Detroit, MI
5/16 Boston, MA
5/29 Greensboro, NC

CUSTOMER ORDER PROCESSING (8:30 AM -12:00 Noon)/ ACCOUNTS RECEIVABLE (1:00 PM - 3:30 PM)

4/25 Atlanta, GA
5/8 Chicago, IL
5/22 Toronto, Ontario
5/30 San Francisco, CA

FIXED ASSET ACCOUNTING/CONTINUING PROPERTY RECORDS (8:30 AM - 12:00 Noon)

4/12 Philadelphia, PA
5/7 Chicago, IL
5/9 Atlanta, GA
5/23 New York, NY

PURCHASING & MATERIALS MANAGEMENT (8:30 AM - 12:00 Noon)/ ACCOUNTS PAYABLE & PROCUREMENT MATCHING (1:00 PM - 3:30 PM)

4/3 Dallas, TX
4/9 San Francisco, CA
4/11 Philadelphia, PA
4/17 Cleveland, OH
4/23 Charlotte, NC
4/25 Montreal, Quebec
4/25 Detroit, MI
5/8 Philadelphia, PA
5/14 Boston, MA
5/15 Indianapolis, IN
5/16 Detroit, MI
5/23 Salt Lake City, UT
5/30 Greensboro, NC

MANUFACTURING RESOURCE PLANNING (8:30 AM - 3:30 PM)

4/4 Dallas, TX
4/10 San Francisco, CA
4/18 Cleveland, OH
5/9 Chicago, IL
5/9 Philadelphia, PA
5/14 Detroit, MI
5/15 Boston, MA
5/16 Indianapolis, IN
5/23 Toronto, Ontario
5/29 Somerset, NJ

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CW

Continued from page 92

with a Replicate Cells function, allowing cells to be copied to another range of cells, and a Delete Row/Column function, an Insert Row/Column function and a Global Options function for the spreadsheet program.

Other features reportedly include an Average Value Cell command for a row or column of cells, a Count command for the return of filled cells in a row or column and a Maximum Value command for returning the maximum value in a row or column.

A permanent license for System/34-System/36 Release 3.0 is priced at $295.

System Support Products, 7650 Arlen St., Annandale, Va. 22003.

■ Inter-Systems Corp. has announced the Universal Tracking and Mailing System for Wang Laboratories, Inc.'s VS series minicomputers.

Unitrac reportedly can be used in any applications that require the categorization and tracking of individuals and organizations, including sales prospect tracking and vendor tracking.

The system supports multiple projects, allowing different departments in the same organization to create, maintain and track different groups of individuals and organizations.

It includes a selection module that is said to allow selection by city, state, zip code and other keys, which can include date and number ranges. Unitrac can print mailing labels and index cards and provides an interface to VS word processing for letter writing and envelope printing, the vendor said.

Unitrac is priced from $2,500 for the VS 15 to $6,000 for the VS 300.

Inter-Systems, 259 E. Michigan Ave., Kalamazoo, Mich. 49007.

■ REM Associates and Deloitte, Haskins & Sells accountants have announced an agreement to include REM's Remdoc documentation package for IBM System/34 and 36 minicomputers as an optional module provided with software from the accounting firm.

Remdoc is included in Deloitte, Haskins & Sells' S/PM-System/Process Manufacturing package.

The Remdoc package costs $1,250.

REM Associates, 207 Virginia Ave., San Francisco, Calif. 94110.

■ Cerner Corp. has announced that its Pathnet Laboratory Information System is now available for Digital Equipment Corp. VAX series CPUs.

The product had previously been available only for Texas Instruments, Inc. hardware.

A spokesman said the VAX version of Pathnet can operate in hospitals with 300 to 1,800 beds. Pathnet uses DEC's Vaxcluster capabilities, allowing multiple VAX CPUs to access shared disk storage devices and to be linked by an Ethernet local-area network.

Pathnet applications include order entry, results entry and reporting, inquiries to patient test results, collection lists and worksheets as well as management tools such as quality control, financial operating statements and performance reports, the vendor said.

The price for Pathnet for the VAX series ranges from $180,000 to $2.5 million, depending on the number and size of hospital processors.

Cerner, Suite 106, 2800 Rockcreek Pkwy., Kansas City, Mo. 64117.

■ Wizard Computer Products has announced Release 3.0 of its electronic mail system, Wizard Mail, for IBM's CICS, including a feature that automatically notifies the sender when the mail has been read by the recipient.

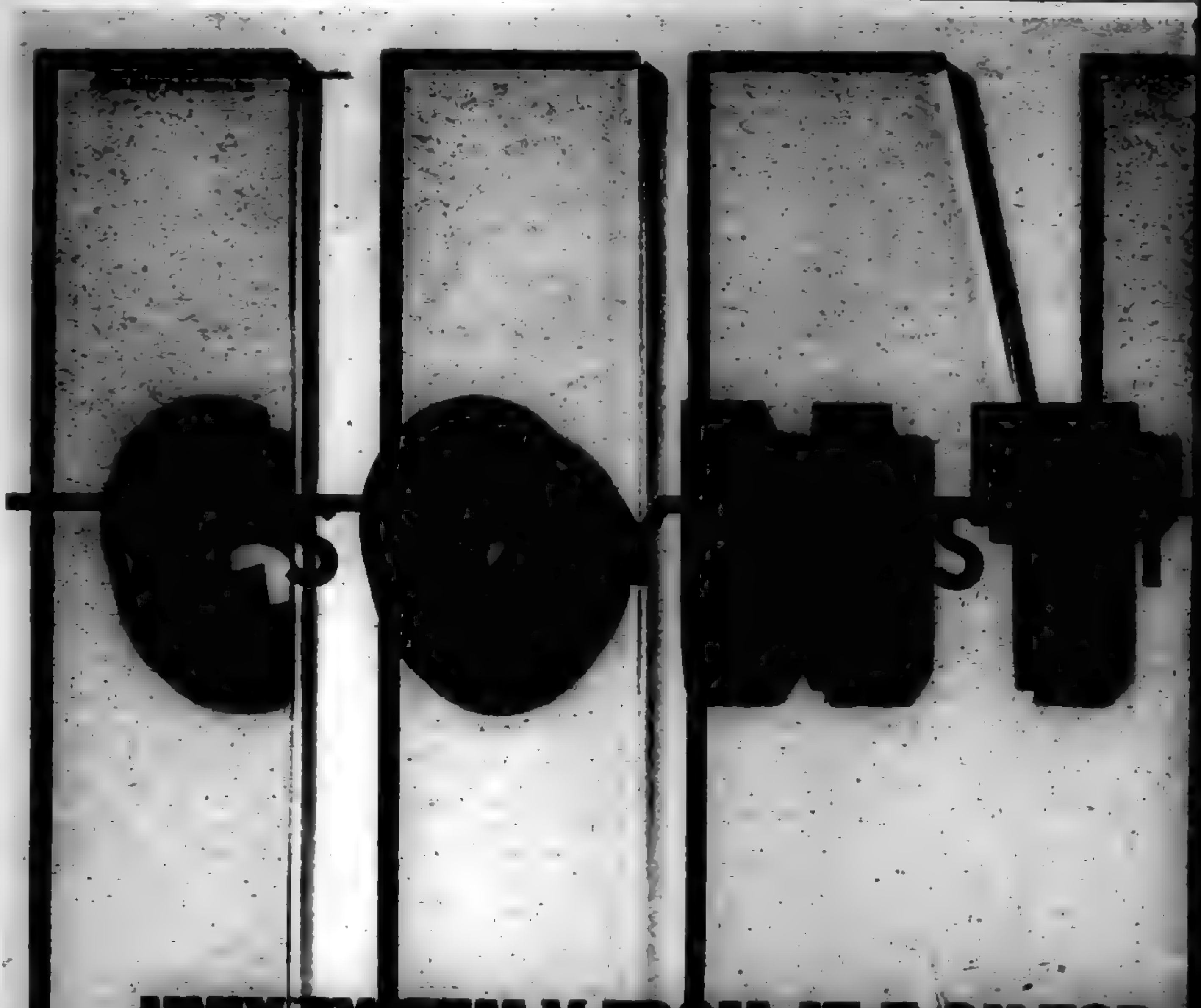
A spokesman said a group distribution feature allows mail to be automatically sent to departments or divisions of Wizard Mail users, and a directory feature lists messages by subject and sender.

Wizard Mail requires IBM's Basic Mapping Support and Vsam.

Wizard Mail Release 3.0 costs $995.

Wizard Computer Products, P.O. Box 1867, Greenville, S.C. 29602.

■ Tesseract Corp. has offered Profile, a data base report function for its Claims Processing System (CPS) health care administration program for IBM and compatible mainframes.



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A spokesman said Profile allows users to report on any data element in the CPS; up to 10,000 report options are available. Available reports reportedly include baseline information that identifies where funds are spent, exception information that identifies abnormally high or low use and ranking information that shows highs and lows in both dollars and numbers of procedures.

CPS costs from $100,000 to $300,000; the Profile function is included at no additional cost.

Tesseract, 101 Howard St., San Francisco, Calif. 94105.

■ **Henco Software, Inc. has announced that its Info-Versagraph relational graphics management package and Info-Text document retrieval system are now available on Harris Corp. computers.**

Info-Versagraph and Info-Text are integrated with Info, Henco's relational data management system and fourth-generation language. Info-Versagraph reportedly allows users to plot graphs from ad hoc figures, existing data files or both. Info-Text includes a query facility that is said to allow information retrieval by word combinations or conditional logic.

Info-Text costs $14,300, and Info-Versagraph costs $10,000.

Henco Software, 100 Fifth Ave., Waltham, Mass. 02154

■ **Computer Consulting Center, Inc. has introduced distribution and financial software packages for IBM's System/36 minicomputer. Modules for warehouse receiving and inventory control were also added to the company's System/38 applications series.**

The System/36 Distribution/Financial Software includes modules for entry/invoicing, inventory control, purchasing/warehouse receiving, accounts receivable, accounts payable/check writing and general ledger. All six modules were originally developed in RPG-III for the System/38.

System/36 modules are priced from $4,000 to $6,000. System/38 modules cost from $10,000 to $20,000.

Computer Consulting Center, 575 Eighth Ave., New York, N.Y. 10018.

■ **Access Telecom has announced the Sales Order Entry system for its Access/34/36 asynchronous communications software for IBM System/34 and 36 minicomputers.**

A spokesman said the package allows interactive sales order entry through microcomputers, teleprinters and terminals directly into the minicomputer. The system is an extension of IBM's Distributor's Management Accounting System software, allowing order entry from distributors, customers or sales representatives.

Access/34/36 supports up to eight users simultaneously and can be expanded to 32 users. The Sales Order Entry system costs $2,450.

Access Telecom, Suite 600, 200 W. Madison, Chicago, Ill. 60606.

■ **Dataplotting Services, Inc. has announced Integrated Petroleum Data Systems (IPDS) software for the acquisition, storage, retrieval and processing of oil and gas well data for use on Digital Equipment Corp. VAX superminicomputers.**

IPDS consists of a group of applications programs integrated with Advanced Data Management, Inc.'s DBS data base management system, the evndor said. The system is said to process management information, drilling data, production statistics, logging, analyses and geological data. It reportedly facilitates data entry and verification, report generation, chart production, well location and contour mapping and perspective views of geological formations.

IPDS software costs from $50,000 to $100,000.

Dataplotting, 255 Duncan Mill Road, Don Mills, Ont., Canada M3M 3K9.

■ **Qtech Associates has released an enhancement of its Qplot/VAX device-independent graphics software.**

Qplot/VAX, written in Fortran, runs under Digital Equipment Corp.'s VMS operating system. Enhancements to Qplot/VAX provide for the interchange of source files between Qtech's Qplot/PC and Qplot/VAX. The Qplot library includes routines for two-dimensional rectangular and polar plotting, three-dimensional rectangular plot-

Continued on page 87

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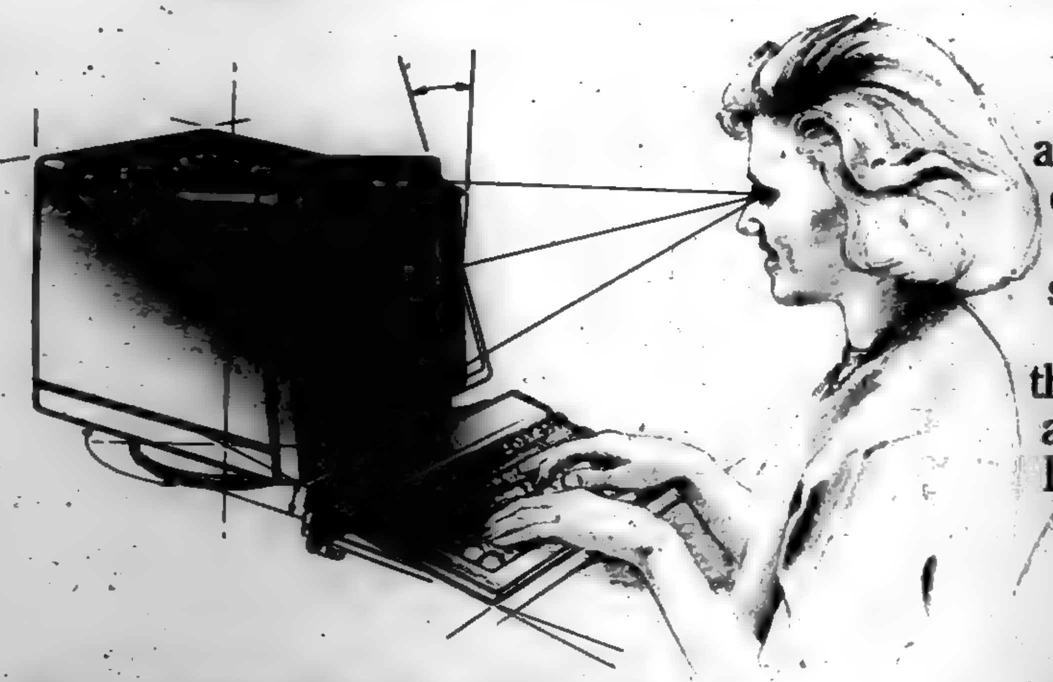
We couldn't improve on you. So we improved on your terminal.



You're as good as you can be, just the way Nature made you. Unfortunately, Nature doesn't make computer terminals. So at Hewlett-Packard, we've been making improvements on terminals, to make them work more agreeably with you.

Our newest display terminal, the HP2392A, is a case in point. It has an adjustable keyboard, a screen with an integral tilt, and a monitor that can revolve.

So your people won't have to adjust, tilt, or revolve to use it.

The keyboard can be angled to lay flat on a desk, and it has contoured keys arranged in clusters, to sit easily beneath the hands. We also made it detachable, to sit easily in the lap.

And all that is just with the unit turned off. Turn it on, and you'll see the famous HP display screen, with characters that are sharp, clear, and distinct.

What's more, the HP2392A has ANSI, so it's DEC-compatible.

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Find out more. Just call your local HP sales office, listed in the white pages. Or write to Terry Eastham, Hewlett-Packard, Dept. 003215, 8020 Foothills Boulevard, Roseville, CA 95678.

HEWLETT PACKARD

DEC is a registered trademark of Digital Equipment Corporation. *Suggested U.S.A. price.

PG02507

SOFTWARE & SERVICES

Continued from page 86

ting with hidden line removal, flow charting, mapping and typesetting.

A one-time, single-CPU proprietary license agreement for the Qplot/VAX package costs $3,000.

Qtech Associates, P.O. Box 952, Old Lyme, Conn. 06371.

■ **Harris Data Service, Inc. has announced Release 1.2 of its System/38 Fixed Assets software for the IBM System/38.**

Release 1.2 reportedly can maintain a third set of books for state tax reporting purposes. The release has also been updated to reflect new Accelerated Cost Recovery System (ACRS) guidelines on real property and straight-line ACRS recovery periods.

System/38 Fixed Assets Release 1.2, with source code, costs $3,500.

Harris Data Service, 11629 W. Dearborn Ave., Milwaukee, Wisc. 53226.

■ **Computervision Corp. has released the Machine Tool Management (MTM) module for its Factoryvision factory floor management information system.**

The MTM module directly accesses and controls machine tools and automated work centers on the shop floor, the vendor said. It complements the Planning and Production modules of Factoryvision.

Factoryvision runs on Sun Microsystems, Inc.'s micros, which are based on Motorola, Inc.'s 68000 microprocessor. The system is used to distribute and control graphics, text and numerical control information created on a computer-aided design and manufacturing system. The MTM module allows workers to control machining centers locally without tape handling. The data required to control machinery is distributed through a Machine Interface Device (MID) at each work center.

A Factoryvision system supporting 16 users includes a Computervision Distributed System 3901 CPU, an MID, production and MTM software and 16 alphanumeric graphics terminals. The price per user for this configuration is approximately $13,000.

Computervision, 15 Crosby Drive, Bedford, Mass. 01730.

■ **Hewlett-Packard Co. has announced HP FE finite-element software for the HP 9000 engineering desktop CPUs.**

HP FE is aimed at small- and medium-size companies to be used as an alternative to mainframe-based or time-shared finite-element analysis, a spokesman said.

Design capabilities of the product reportedly include a library made up of springs, beams, shells, plates, membranes, solids and boundary heat-transfer elements. HP FE is also said to provide automatic mesh generation for models with complex geometry, allowing a design engineer to choose parameters at the keyboard.

HP FE software costs $14,000.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

■ **A spelling checker and search and retrieval capabilities have been added to Datapoint Corp.'s Pro-Vista series of office automation products for its RMS operating system.**

Vista-Spell II is an interactive spelling checker for 71,000 words in the Houghton Mifflin Co. lexicon of English. Users can create personal dictionaries of up to 1,500 words, according to a spokesman. The program highlights potential misspellings during editing. Vista-Spell II is available for a one-time license fee of $1,500.

The Vista-Finder filing and retrieval tool allows a user to search for, locate and retrieve electronically stored information from Datapoint's Vista-Word or text file-formatted documents. Searches can be limited to predefined documents or can be based on results of preliminary searches. Vista-Finder is licensed for $1,000.

Datapoint, 9725 Datapoint Drive, San Antonio, Texas 78284.

■ **Auto-Trol Technology Corp. has announced the addition of the A-Frame drafting package to its Series 5000 Advanced Graphics Software series for computer-aided design and manufacturing applications running on Auto-Trol workstations.**

A spokesman said A-Frame can be used as a stand-alone package or with the company's Steel-3D structural steel analysis and design systems.

As a stand-alone package, A-Frame enables the drafter to generate framing plans, elevations and column schedules by defining member end points and by picking the number designation from a menu. When used with Steel-3D, a structural engineer can extract plans and elevations from the structural model, add comments for the drafter and pass the data to A-Frame.

A-Frame and Steel-3D work on Auto-Trol's Advanced Graphics Workstation, a 32-bit distributed processor.

A-Frame costs $5,000.

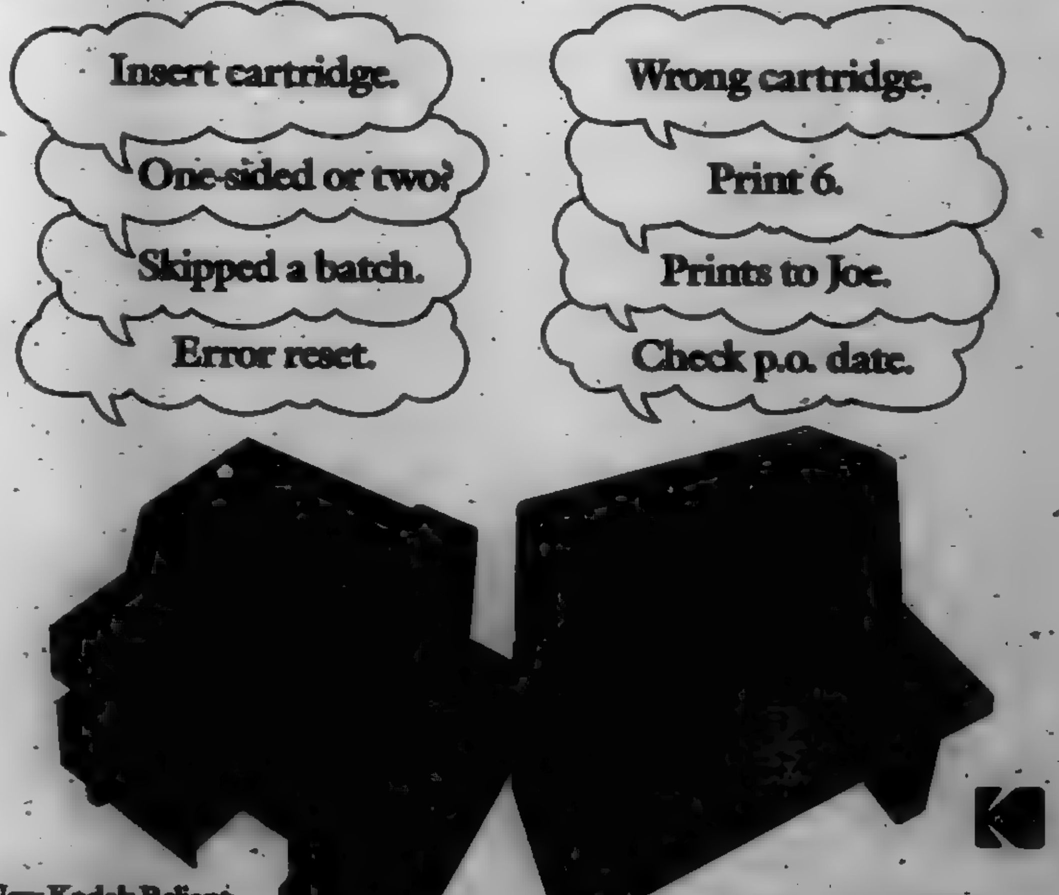
Auto-Trol, P.O. Box 33815, 12500 N. Washington St., Denver, Colo. 80233.

■ **Honeywell, Inc. has announced the Tracts Tumor Registry system for use by hospitals in organizing and analyzing tumor registry data. The package runs on Honeywell's DPS 6 line of minicomputers.**

Reportedly, the software complies with cancer program guidelines established by the American College of Surgeons. Tracts Tumor Registry is available as a stand-alone product or

Continued on page 90

Kodak presents intelligent conversation.



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Eastman Kodak Company, Business Systems Markets Division, Dept. DP5521, Rochester, NY 14650.

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To meet the varied needs of your end users, you don't need more software. You simply need the one software that does more. Symphony™ from Lotus®

With Symphony users get a comprehensive software program with five basic functions—spreadsheet, database management, graphics, word processing and communications. These five functions can be used alone, together or in any combination. And with Symphony, users can start with one function and grow into others as their needs change.

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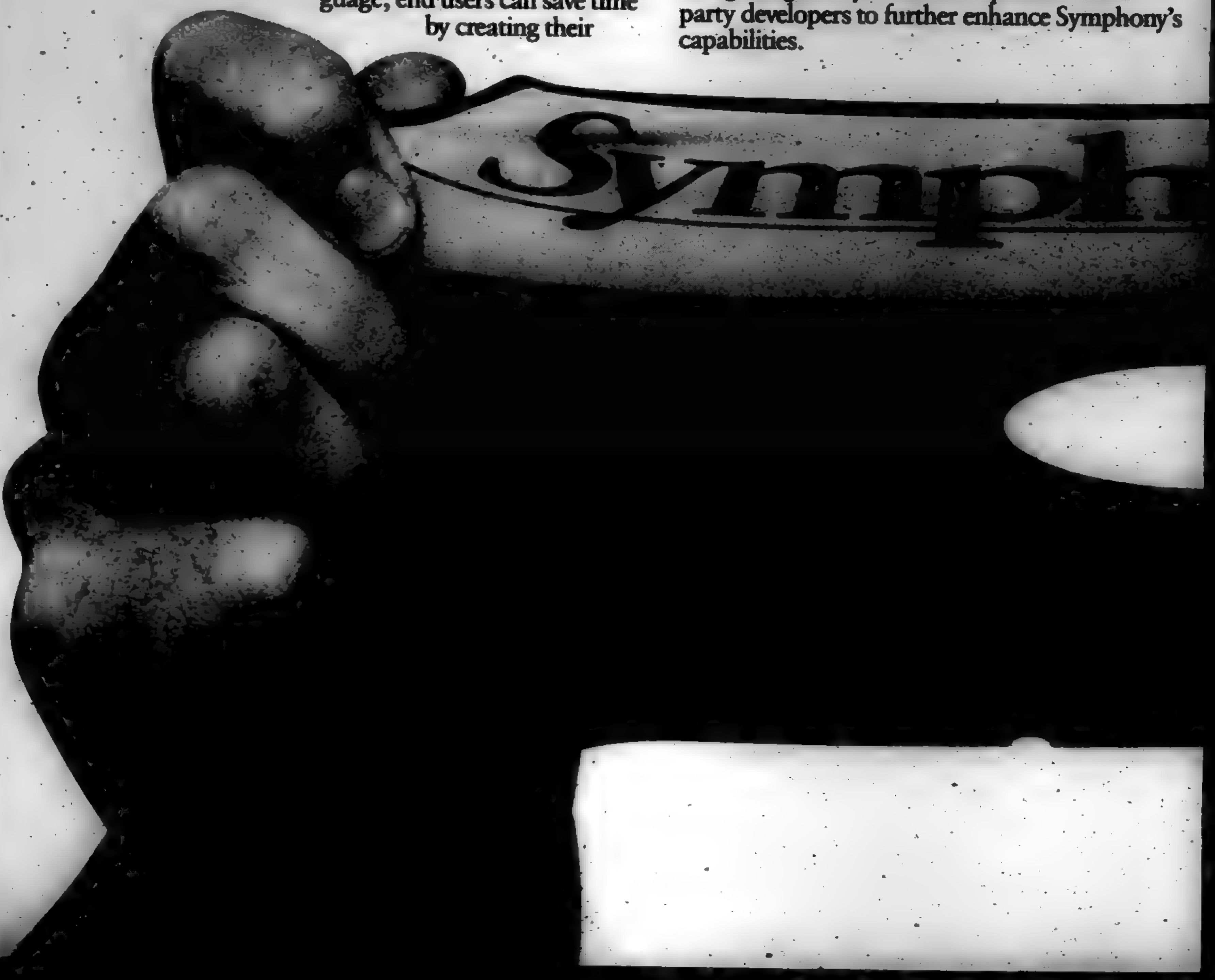
Symphony's unique open-ended architecture allows you to expand the functionality of the basic program with Add-In products. These Add-Ins work like Symphony—and with Symphony—so users don't have to learn a new language. Spelling Checker and Text Outliner are already available. And a variety of future Add-Ins and industry specific applications are now being designed by Lotus and qualified third-party developers to further enhance Symphony's capabilities.



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Our micro-to-mainframe link will tie Symphony to your existing environment.

Later this year, Lotus will introduce a new micro-to-mainframe Add-In product. Developed jointly by Lotus and DCA®, this new link will allow designated PC users to transfer data to and from your mainframe computer. Mainframe data will be available on their PC spreadsheets in useable form, eliminating the need for retyping.

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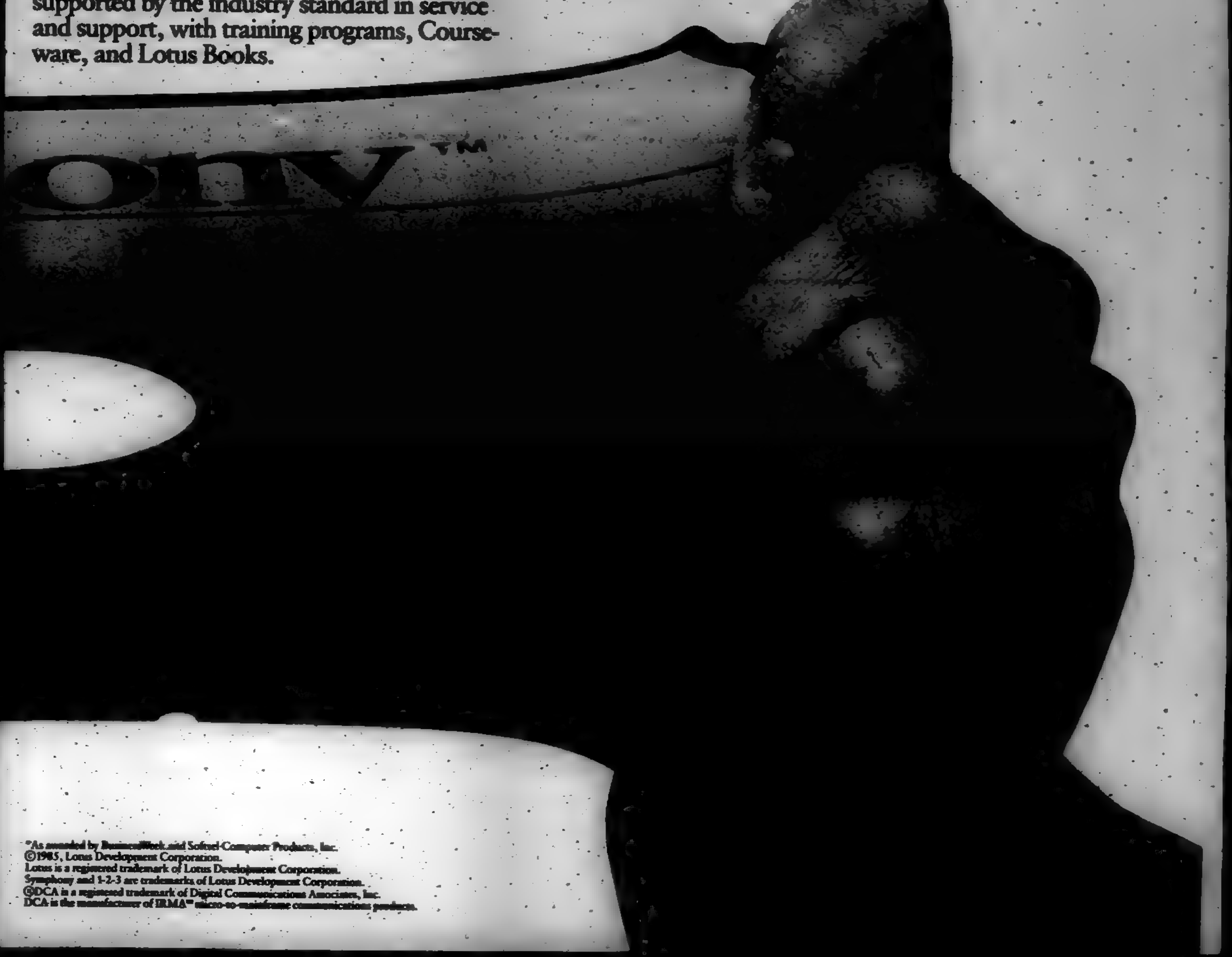

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DCA is the manufacturer of IRMA™ micro-to-mainframe communications products.

SOFTWARE & SERVICES

Continued from page 87

the same data base as the company's Tracts Medical Record Management System.

The price for Tracts Tumor Registry alone is $2,500; the price with DPS 6/10 hardware is $16,000. The price when integrated with Tracts Medical Record Management System is $4,000.

Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

■ **Additional signal processing commands and a prompting feature have been added to Signal Technology, Inc.'s Interactive Laboratory System (ILS) signal processing software package for Digital Equipment Corp. VAX and PDP-11 processors, Data General Corp.'s Eclipse-MV and Masscomp Co.'s MC500 series minicomputers.**

ILS 5.0 is an integrated set of approximately 90 Fortran programs that offer waveform display and editing, digital filtering, spectral analysis, speech analysis/synthesis and pattern analysis capabilities, a spokesman said. The software is designed for speech analysis, noise and vibration seismology acoustics and radar applications.

The price of ILS 5.0 ranges from $4,500 to $14,800.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117.

■ **The Board of Realty Information Systems (Boris) has announced two imaging packages for the real estate industry. The packages are available as additions to Boris' turnkey real estate industry systems based on Prime Computer, Inc. computers under Prime's Primos operating system.**

According to a spokesman, Photo-List is an integrated information system, multiple listing service and photo previewing system. The on-line photo-imaging process allows the user to call photos up on a dumb terminal. Photos and listing data can be called up on remote terminals in individual realty offices.

The spokesman said Laser-List provides full-color documentation of properties in metropolitan areas. Color video images are permanently stored on a laser disk in a real estate office and may be accessed via an in-house terminal and color monitor.

Photo-List and Laser-List are priced at $30,000 each.

Boris, 111 Hollister Building, Lansing, Mich. 48933.

■ **Continental Healthcare Systems, Inc. has announced a patient control software package for hospitals that runs on Texas Instruments, Inc. computers under TI's DX-10 operating system.**

The Patkon package is made up of modules such as electronic mail, ancillary department support, food services, pharmacy management and radiology with a financial system interface. Patkon reportedly features automatic patient admission, transfer and discharge, as well as automatic charge capture and processing of all orders. All printed requisitions and reports can be custom-designed, according to the vendor.

Other Patkon functions include on-line input of standing orders, on-line screening of allergy and diagnosis information and a feature that automatically warns of potential hazards, such as drug or food allergies, for improved patient safety.

The price of Patkon is approximately $200,000 for the stand-alone package, including all modules. The price of a turnkey system, with hardware and support, starts at $300,000.

Continental Healthcare Systems, Suite 550, Building 6, 8900 Indian Creek Pkwy., Overland Park, Kan. 66210.

■ **Berne Electronics, Inc. has released its Interactive Circuit Analysis Program (Icap), for Digital Equipment Corp.'s PDP-11 computers running under DEC's RSX-11M and RSX-11M+ operating systems.**

The package allows users with little computer-aided design experience to perform AC/DC and transient analysis, the vendor said. Features include 50-node 200-branch capability, selective parameter output control, macro command for subcircuit models, a built-in text editor and conversational free-format input language.

Icap costs $7,000.

Berne Electronics, 120 Dartmouth S.E., Albuquerque, N.M. 87106.

DATA BASE MANAGEMENT SYSTEMS

■ **Frey Associates has announced that Version 1.1 of its Themis package now supports Oracle Corp.'s Oracle relational data base management system running on Digital Equipment Corp.'s VAX superminicomputer series.**

The Oracle support is in addition to support for DEC's VAX Datatrieve. Additional Themis 1.1 enhancements reportedly include graphics capability, on-line Help screens, English language rephrasing of the data base query, an on-line dictionary and the ability to delete the meanings of previously defined words.

Themis Verson 1.1, scheduled to be released this month, costs $24,000.

Frey Associates, Chestnut Hill Road, Amherst, N.H. 03031.

■ **Software House has announced Version 4 of System 1032, a relational data base management system running on the Digital Equipment Corp. VAX series under DEC's**

Continued on page 92

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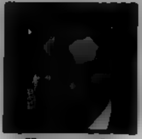
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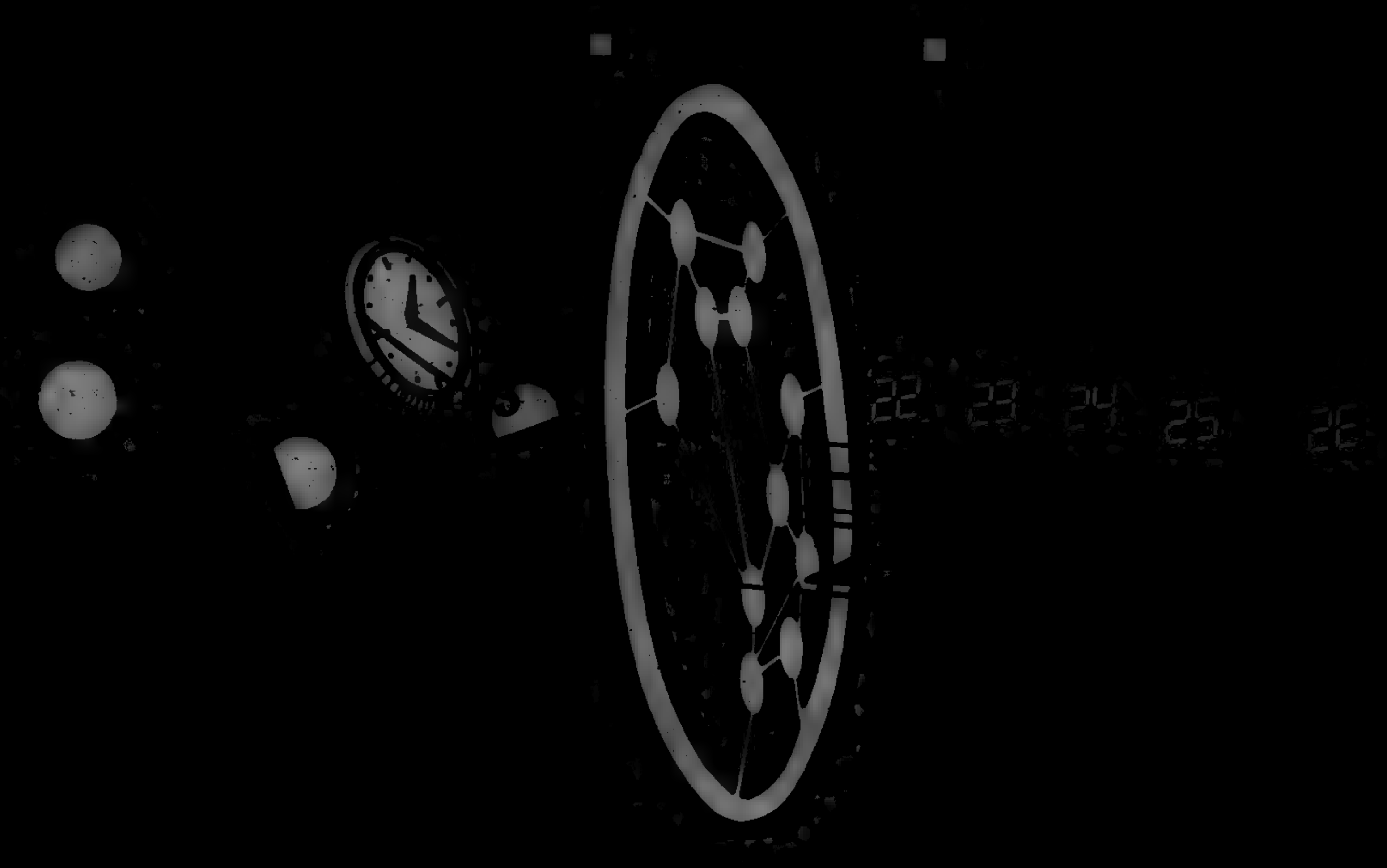
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Continued from page 90

VMS operating system.

Version 4 is said to manage data bases shared on multiple processors in Vaxclusters. The latest release supports Vaxcluster features, including shared disk storage devices. Proprietary algorithms control multiple-CPU updates. The software uses the VAX/VMS Distributed Lock Manager and an internal lock management module to aid reliability.

System 1032 Version 4 costs $85 for a 60-day evaluation. First-copy licenses range in price from $8,000 for a Microvax I to $60,000 for the VAX 8600.

Software House, 1105 Massachusetts Ave., Cambridge, Mass. 02138.

■ **Systems Programming Ltd. has announced that its Adaprep preprocessor for Software AG of North America, Inc.'s Adabas data base management system is now available for Digital Equipment Corp. VAX series superminicomputers running VMS.**

Adaprep previously had been available only for IBM mainframes.

A spokesman said Adaprep is a data dictionary-driven, high-level data management language intended to cut programming effort by eliminating the need for direct call programming and by supplying procedures to build a data dictionary.

Adaprep integrates the data dictionary by using the file and field attributes to generate executable code. In additional, the preprocessor updates the data dictionary with field and file information to produce reports on data base usage.

Adaprep for VAX costs $8,500.

Systems Programming, 131 Steuart St., San Francisco, Calif. 94105.

REMOTE COMPUTING SERVICES

■ **General Electric Information Services Co. has announced that Leading Software Technologies Corp.'s The Intelligent Assistant (TIA) applications development system is now available on GE's processing network.**

TIA operates on IBM's OS, MVS and DOS/VSE operating systems. It is available through GE Information Services' Mark 3000 service. TIA reportedly is designed to create and document application systems from the definition of inputs and outputs. The product creates on-line and batch systems, can be used for prototyping and generates data base management system interfaces.

Use of the TIA through GE Information Services is priced at approximately $100 per 1,000 lines of generated Cobol code. The product is also available on a perpetual license for installation on in-house computers at $350,000.

General Electric Information Services, 401 N. Washington St., Rockville, Md. 20850.

■ **National Data Corp. has announced software enhancements to its Time-Sharing Service and its Cash Management Datastream Service time-sharing services that allow for the creation of charts and graphs that can be downloaded to the IBM Personal Computers.**

Called its Decision Display System, the software reportedly runs on the vendor's mainframe and uses client data to produce the charts. Its output on a Personal Computer is displayed through user-defined menus.

At multiuser locations, graphics produced under Decision Display System reportedly can be transmitted to several Personal Computers at once. Each graph downloaded is priced between $5 and $20, depending on its size and complexity.

National Data, One National Data Plaza, Corporate Square, Atlanta, Ga. 30329.

ON-LINE DATA BASES

■ **Compuserve, Inc., the videotext information and communication service provider, has announced the electronic mail feature of its Consumer Information Service has been upgraded and simplified.**

A spokesman said the upgraded system, called Easyplex, replaces Compuserve's Email service. Features of Easyplex include an address book with the names and user ID numbers of up to 50 persons; menu, prompt and command modes for various operating speeds and functions; automatic numbering of lines; and on-line instructions within each menu area.

Other features includes two methods of retrieving mail from other subscribers and numbering of incoming messages.

Subscription fees for Consumer Information Service include a one-time charge of $39.95, and connect charges at 300 bit/sec of $12.50/hr. in prime time and $6 per hour on evenings, weekends and holidays.

Compuserve, P.O. Box 20212, 5000 Arlington Centre Blvd., Columbus, Ohio 43220.

See ON-LINE page 95

"And another thing. It'll never come into your office and ask for a raise."

Breaking IBM's Commandments

In the beginning, IBM told you not to configure host computers more than 400 feet apart. The common way around that restriction was to use communications controllers and telephone lines. But you immediately sacrificed the data transfer speed—reducing it to less than 1% the native speed of the computer channel.

Some sacrifice.

Data Switch Ends IBM's Channel Length Restrictions

Data Switch's new ChannelNet products emulate and extend the IBM channel using fiber optic technology. With ChannelNet you can link mainframes at distances up to 3.4 miles, bypass communications control units, and still maintain full channel speeds. This means increased total system throughput and dramatic response time improvements. And ChannelNet requires no software changes to your operating system, applications software, and access methods.

ChannelNet Overcomes the Constraints You've Always Lived With in the IBM Environment

- Is the security of your database an important issue?
- Do you have equipment redundancies that could be eliminated by the ability to extend the channel?
- Are your space requirements, both in your physical plant and under your computer floor, at odds with your needs for additional equipment and cabling?
- Would you like to reduce the complexity of host-to-host links over distance without sacrificing the data transfer speed or transparency?
- Do you need tools to provide more control over your computing environment?

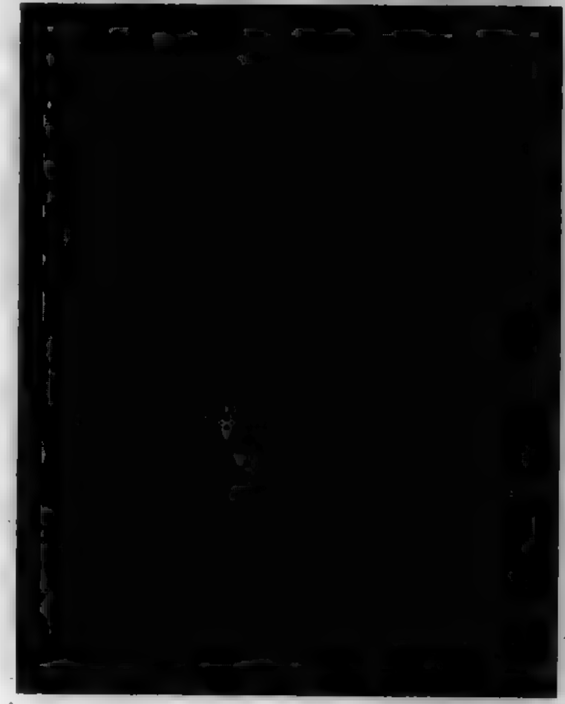
ChannelNet alone answers these challenges.

Faster Access to Applications

Do you want to improve user response time? ChannelNet lets users access applications on multiple distributed computers as if those applications were running on the local computer. In fact, performance improvements of several hundred percent have been recorded. That's performance.

Very-High-Speed Bulk Data Transfer and Security Backup

Could you benefit from accelerating bulk data transfers or database backup to 30 times the speed allowed by communications controllers? ChannelNet lets you transfer data as many times a day as your business demands, without tying up valuable resources or losing computing time.



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Channel extension raises new issues of management and control. To meet these requirements Data Switch provides an integrated system that helps you reconfigure, test, monitor, and back up your computer resources from one central point of control. Now you can control physically distributed resources as if they were one logical data center.

Come See the Light

For the first time, with ChannelNet, you can structure your computer resources around your organization's needs instead of building your organization around your computer equipment.

Need proof? See our revolutionary new system in action. Come to the Data Switch booth at Interface in Atlanta, March 4–7. Or call and ask about our users' experiences.

We'll show you that some commandments were made to be broken.

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When all else fails.

Most diskettes are pretty good.

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We don't expect you to keep all that in your mental note, but we would like you to remember your last diskette failure.

And when your computer products dealer offers you another box of pretty good diskettes, tell him you're ready for something better.

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ON-LINE from page 92

Trans World Airlines, Inc. (TWA) and Compuserve, Inc. have announced that TWA's Fare reservations system is now available via Compuserve's Information Service.

The program, called Travelshopper, allows Compuserve subscribers access to TWA's reservations systems via a microcomputer. The user can determine the lowest fares and can make a reservation. Tickets are either issued by a travel agency, sent to the individual's home or to the airline ticket counter.

A subscription to Compuserve's Information Service is priced at $39.95; standard connect charges are $12.50/hour during prime time (8 a.m. to 6 p.m. weekdays) and $6/hour in non-prime time. Subscribers to Travelshopper must pay an additional $20/hour during prime time and $15/hour during non-prime time.

Compuserve, P.O. Box 20212, 5000 Arlington Centre Blvd., Columbus, Ohio 43220.

METHODOLOGIES

Associated Design Technology Ltd. has introduced Process Architecture Design Technique (Padtech), a system design methodology for automating business processes.

Padtech reportedly works on the University of California at Berkeley 4.2 Unix-based multiple-screen workstations with local data base capabilities connected to data base servers on Ethernet local-area networks.

The product includes activity diagrams that map business activities and communications for establishing contexts for process design. Concept diagrams define process communications to establish logical data base design. Event diagrams specify control structure for operational process for a business activity.

Padtech is priced at $25,000.

Associative Design Technology, P.O. Box 518, 142 Brigham Hill Road, N. Grafton, Mass. 01536.

TRAINING

Comshare, Inc. has announced a microcomputer-based training package for information centers that use IBM's VM operating system with CMS.

The courseware runs on the IBM Personal Computer, Personal Computer XT and 3270 Personal Computer. The basic configuration required is the micro with a 64K-byte memory, single disk drive, color or monochrome monitor, Microsoft Corp.'s MS/DOS 1.1, 2.0 or 2.1 and a videotape player (½-in., ¾-in. or Beta format) with color monitor.

The "Introduction to VM/CMS for Information Center End Users" courseware provides instruction, tests and practical exercises on the basic segments of the VM/CMS system and editor. The course takes six to 10 hours and consists of more than 2,000 color graphics screens.

The price of the courseware is $3,000, which includes three diskettes, 10 course guides, one administrator's guide and a videotape.

Comshare, 3001 S. State St., Ann Arbor, Mich. 48106.

SUPPORT from page 71

dates and enhancements or installing tools like microfiche, aimed at reducing paperwork, he said. Some of the company's older accounting applications cannot be maintained because they are poorly documented and could be jeopardized by maintenance, Miller said.

Because of the amount of maintenance undertaken by the company, enhancements to some existing programs are pushed aside for new applications and revisions to more critical existing systems.

One thing that may ease maintenance problems, according to Miller, is the use of programming aids that generate documentation as changes are made to the code. Union Oil is in the process of evaluating these products, he said. Another obvious solution is an improved development cycle, Miller noted.

At Creative Automation Co. in Hillside, Ill., software maintenance problems are minimized through careful applications planning and design, said Doug Hofbauer, vice-president of systems and software.

Programs developed at the direct mail service bureau have a longer life span than most other applications, he said. Hofbauer attributes that success to meticulous program design. That planning process can take up to two months, which may mean making users wait for their applications, he noted.

But that in-depth planning is well worth it, as a reduced maintenance work load is crucial for Creative Automation's limited staff.

AMDAHL from page 71

mance of operating systems running as guests under VM.

Like the VM Migration Aid, MDF also permits more than one control program to coexist in a single CPU, although the Amdahl product, unlike its IBM counterpart, is implemented in hardware rather than software [CW, Dec. 3].

But whereas the VM Migration Aid consumes 8% to 16% of a mainframe's available processing resources, MDF requires only about 5%. The difference in overhead requirements persuaded Amdahl to maintain support for its own product rather than for the VM/XA System Facility.

EasyPROCLIB gave me an extra half day a week! *

EasyPROCLIB is a unique operating system enhancement that proves that you can please all of the people all of the time.

If you're in charge of your data center's procedure library, it works for you by taking the responsibility for maintaining, controlling and repairing the system PROCLIBs off your shoulders, freeing up time to get other work done.

"We have over [illegible] users. It would be a nightmare to manage without EasyPROCLIB."*

Users like it because it gives them control of their own PROCLIBs, and they can modify them any time without involving the systems staff.

And data center management likes it because it increases overall productivity. If a user crashes his private library, it doesn't affect the system or other users. An EasyPROCLIB diagnostic message notifies the user, and he is responsible for repairing or restoring it.

"What would I do if they told me I had to give up EasyPROCLIB? I'd fight them."*

There's no limit to the number of procedure libraries that may be established with EasyPROCLIB. There can be a private procedure library for each department, each development group, each programmer – for as many different divisions as you need. This means that you don't have to worry about deciding whether a procedure should be included in the installation's procedure library – and users don't have to try to accomplish specific applications using less efficient general purpose procedures.

Because EasyPROCLIB is completely transparent, many users don't know that they have it. But the data center management and staff know – because it simplifies their job, cutting down housekeeping time and giving them more time to manage. Since it was introduced six years ago, EasyPROCLIB has been installed at hundreds of IBM MVS sites, and wherever it's been installed, it's still at work.

"We'll give you thirty days to see what EasyPROCLIB can do for you. FREE!"**

You can try EasyPROCLIB in your own facility for thirty days on us. Installation takes about an hour of system programmer time and fifteen minutes of machine time.

For more information or to set up your free thirty-day trial, call today. **1-[illegible]**

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([illegible])[illegible]

Software Corporation of America

*Comments from interviews with EasyPROCLIB users.
**Comment from Software Corporation of America.
EasyPROCLIB (for IBM, MVS/XA, MVS, SVS, VS1, MVT)

"We put millions of dollars worth of stock transactions on the line every day. That's why we depend on Infinet."

John Faccibene

John Faccibene
V.P. Data Communications
Paine Webber

Every second of every business day, Paine Webber has millions of dollars worth of stock transactions on its data communications lines.

If a line goes down, a lot of important stock deals don't. And a lot of golden opportunities are lost forever. That could really cost Paine Webber, in money and in reputation.

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As a recognized leader in network management, diagnostics and control, Infinet provides Paine Webber with the 99.7% network availability it takes to survive on Wall Street.

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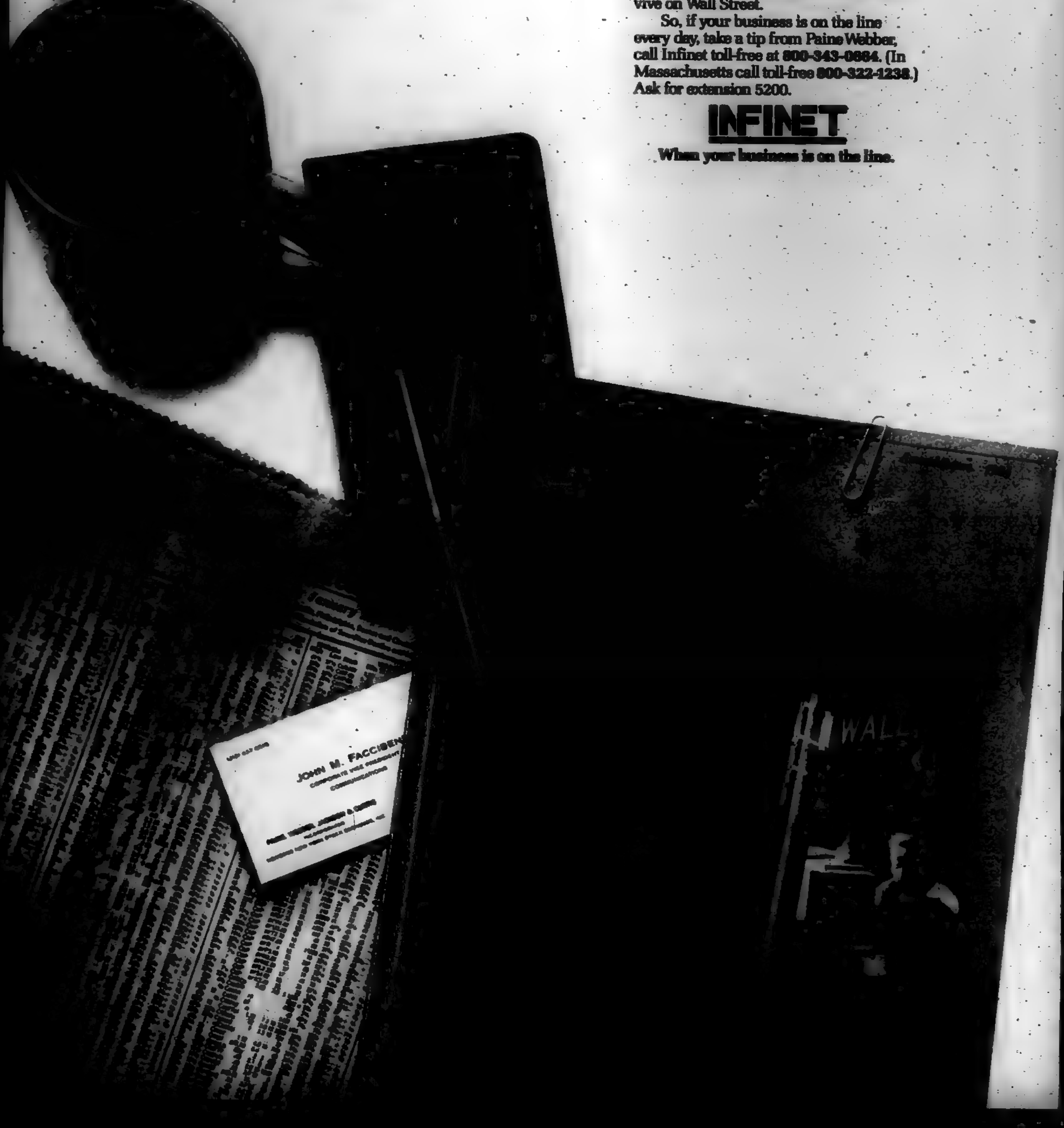

UPKEEP

from page 71

ment cost of roughly $25 per line of code. But that figure alone does not speak to the strategic value of the corporate software asset.

"Software is clearly an asset," Kluge said. "That asset must be protected and enhanced just like the traditional assets of plant and equipment. We have to understand the importance and the impact of the software we protect. Programmers have great power in an organization today. They can really affect whether or not a business goes forward in meeting its goals."

Protecting — or maintaining — software is Kluge's specialty. The Catalyst Group offers the Structured Retrofit service [CW, Jan. 28], which can transform a company's older Cobol programs into efficient, structured code.

Kluge said the Catalyst Group has analyzed more than 100 million lines of code in some 100,000 programs maintained by more than 100 companies. More than 30% of the code the group has worked with has been poorly structured, overly complex and difficult to maintain.

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> *Software . . . must be protected and enhanced just like the traditional assets of plant and equipment.*
>
> —Mary Kay Kluge,
> Peat, Marwick, Mitchell & Co.

Speaking during a session on maintenance chaired by Nicholas Zvegintzov, editor of *Software Maintenance News*, at the recent Info/Software conference in Chicago, Kluge said her work with other companies has shown that most in-house software groups currently allocate less than 20% of resources — money and manpower — to new software development. Only about 20% of the remaining portion targeted to maintenance is spent correcting actual program errors or bugs. The remainder is devoted to enhancing the system with new features and functions or adapting the software to a different hardware environment.

Standards needed

Considering the vast resources most organizations currently allocate to software maintenance, Kluge said, some standards are needed to measure the quality of the software being maintained.

"Excellent software meets an organization's business and technical needs. It satisfies user requirements, and it is functional, accurate and accommodates change," Kluge said. "But how do you measure quality? How do you pinpoint problems in software?"

The answer, Kluge said, is software metrics. She described software metrics as a set of quantitative measures by which an organization can assess such characteristics as the architecture and complexity of software. Among the metrics the Catalyst Group utilizes to measure the complexity of a program are the following:

- The levels of nesting, the inclusion of subroutines within larger routines, in a program.
- The number of program verbs.
- The percentage of control verbs in a program. If more than 35% of program verbs are control verbs, Kluge said, the program may contain too many functions and may be too complex.

The group's metrics for measuring system architecture, the actual paragraph-to-paragraph structure of a program, include the following:

- The number of GO TO statements in a program.
- The number of "perform" verbs in a program. Kluge said perform verbs support program modularity.
- The number of "alter" verbs, which she said obscure the control flow in a program.

To measure the diagnostics — the ease with which program reliability problems can be pinpointed — Kluge's Catalyst Group quantifies the amount of unexecutable or dead code within a program, runaway or open-ended logic paths and the levels of recursion — the repetition of operations.

Using the quantitative results of such program analysis, Kluge said a manager can compare the relative quality of applications and decide where best to allocate maintenance resources. Software metrics also allows a manager to assign experienced staff members to more significant problem areas and helps to identify software problems before they become critical.

In addition, the quantitative results can be presented in chart or graphics format and measured over time. The use of software metrics can also help a software professional better manage programmers. It allows the manager to define and measure compliance with programming standards, provides some objective criteria for evaluating a programmer's performance and supplies a method for measuring improvements in the quality of existing systems over time.

"If we can start to measure the quality of our code, we can better attack the problem of maintenance today," Kluge said. "Software metrics is the key to controlling maintenance. You can identify your worst problems, allocate resources, ensure conformance to standards and deal more effectively with management by helping them understand the problem. It gives us the tools to control the management of the corporate software asset."

"Data Check Recovery saved us $50,000 in billings in two seconds."

Gary Zellweg, Mgr. Worldwide Networking Project, National Semiconductor Corporation, Sunnyvale, CA

"We bought DCR in the first half of 1983 to deal with the moderately large numbers of soft I/O errors we'd been having with our 140-odd disk packs.

"We bill users for the time they use, based on SMF data. In one case, DCR let us recover SMF data representing $50,000 in billings. It only took a few seconds, but in that one use, DCR paid for itself. And we still get other benefits.

"Data Check Recovery probably buys us two or three hours a week of programmer time that would otherwise be spent in reconstruction and recovery.

"It also puts us in a stronger position in dealing with vendors. Data Check Recovery helps us analyze our records to pinpoint where the source of the problem is. When we talk to the vendor, we have ammunition.

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"We're convinced. We're installing it at all DP locations worldwide."

Data Check Recovery is a powerful, dependable utility that recovers data that has become unreadable due to permanent I/O errors – hard data checks, track overruns and several types of equipment checks. Data Check Recovery supports all OS operating systems.

For more information about how DCR can keep permanent I/O errors from turning into permanent disasters, call Software Corporation of America toll-free at **800/368-7638**. In Virginia, call 703/471-1545.

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Software Corporation of America

UCCEL

from page 71

the development of human interfaces that will make it easier for end users to use the systems."

The second prong of Uccel's software strategy is intended to bring the company squarely into the rapidly emerging applications development tools market. Newton said Uccel's development aids are slated for introduction in 1986 and, although they will address code generation, will be primarily aimed at automating the design phase of the applications development life cycle.

Newton said the applications development tools will be a natural outgrowth of Uccel's $20 million Leap, the multiyear project structured as a separate division of the company.

Leap has been charged with three tasks. The first task is that the project is intended to produce a highly integrated set of banking and horizontal market accounting applications for IBM mainframes. It is also geared toward defining an applications development methodology and, finally, it was designed to address improvements in the support of Uccel's products.

Banking applications primary focus

Although banking applications are the primary focus for Leap — and the third prong of Uccel's strategy — the project will have little impact on Uccel's existing 20-module Infopoint banking system, which the company's applications software division will continue to maintain and enhance. Actual Leap-related products, which will include traditional banking applications and a variety of banking-industry-specific decision support tools, will not reach the market until about mid-1986, Newton said.

Uccel is no newcomer to applications, having marketed accounts payable and receivable, fixed assets and general ledger products, among others. So why the major thrust into banking applications?

"It has to do with the competitive situation within banking," Newton said. "We think some of the leading players, such as [Anacomp, Inc.] and [Hogan Systems, Inc.], have had such severe setbacks that we now have a window to be a really dominant player in the banking industry. We feel we have a chance to dominate a particular market segment, the medium- and large-scale domestic banks."

But while Leap and the push into banking may be stealing much of the limelight at Uccel these days, company executives like Newton have not forgotten Uccel's system software roots.

"If you asked the industry consultants five years ago, they would have told you the applications market of today would be many times the size of the systems software market," Newton said. "Today, the same people are saying systems software has the same growth potential as applications over the next five years.

"But systems software has some spectacular advantages," he continued. "I can go to an auto company in Japan, a distributor in Australia or a manufacturer in the U.S., and the systems software runs almost identically. Applications run into differences by geography, by language, by industry and other factors. Systems software is truly a market we can leverage."

Realia COBOL. Migration without migraines.

Until recently, you had to abandon the business computer language when you developed microcomputer application software. The available micro COBOLs were inadequate—too limited, too slow. The best alternative—the XT/370 or AT/370 using IBM's COBOL—was very expensive and still too slow. To get acceptable performance, you had to retrain your programmers in Pascal or C.

Realia COBOL is the cure for such headaches.

Realia's compiler supports most IBM VS/COBOL and VS/COBOL II features, such as:

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Realia COBOL is priced at $995, including one year of maintenance and upgrades. Subsequent maintenance and upgrade contracts are currently priced at $125/year/copy. Available for the IBM PC, PC XT, 3270 PC, PC AT, PC-compatibles, and the TANDY 2000.

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COMMUNICATIONS

Belt-tightening time at AT&T

DATA STREAM
John Dix
CW Senior Editor

Competition in the market for electronic network switches and long-distance telephone services, coupled with higher than expected costs for connecting to local telephone systems, threw off AT&T's revenue forecasts for 1984 by 14%, according to the company's first postdivestiture annual report.

AT&T's total operating revenue was $33.2 billion, down $5.5 billion from what the company projected in its 1983 Information Statement and Prospectus (IS&P), a document that was prepared to show investors how divestiture was expected to effect the company.

The company attributes the revenue slip (if it can be called such, even though the IS&P was based on expectations only) to two main factors: a shortfall in service revenue, which accounts for 47% of the company's total revenue; and softening demand for products manufactured by AT&T Technologies, the old Western Electric Co.

AT&T believes that sales of toll services grew marginally in 1984, but actual data shows that growth has been obscured by the migration from the old Bell System division-of-revenue process — in which AT&T and the now-divested Bell operating companies divided the monthly revenue earned for long-distance and local services provided — and by implementation of the new access charge billing, under which AT&T pays the local phone companies fixed fees for access to their networks.

The growth in toll services was hindered in 1984, AT&T contended, by high local access charges (twice as high as its competitors pay, expenses that consume 60% of AT&T's gross long-distance revenue, the company maintained), increased competition in the long-distance market and an adverse regulatory environment. (AT&T said it is "the only long-distance company whose prices and service offerings are still fully regulated.")

See AT&T page 101

IBM releases line adapter for System/36

ARMONK, N.Y. — IBM has announced a communications line adapter for the System/36 that enables that processor to support twice the number of remote lines previously supported.

The Eight-Line Communications Adapter (ECLA) replaces IBM's Multiline Communications Adapter (MCA) and supports bisynchronous, Synchronous Data Link Control (SDLC), High-Level Data Link Control and X.25 protocols over switched or nonswitched, public or private lines, IBM reported. Proper protocols are loaded at program execution time into the communications adapter microprocessor.

The eight lines are said to support half-duplex, concurrent operations at speeds from 600 bit/sec to 19.2K bit/sec per line. One line may operate at speeds up to 57.6K bit/sec, and the maximum aggregate for all lines is 170K bit/sec.

Available options include an autocall adapter, consisting of a cable and inter-

See IBM page 100

INSIDE
Voice/Data Communications/100
Local-Area Networks/101

Call-monitoring software slashes city's telephone bills

FORT COLLINS, Colo. — Less than two months after the city of Fort Collins installed software to monitor and manage its telephone costs, its Wats bill dropped 53%, and its direct-distance dialing bill dropped 33%.

In less than one year, these and other monthly savings allowed the city to recover its software investment, according to Peter Dallow, Fort Collins' director of information and communications systems.

Dallow said the software, Telephone Management and Accounting (TMA) from Telecommunication Software, Inc., afforded the city a 30% savings from what it would have paid had it relied on its former method of telephone cost accounting. The package cost the city $20,000.

Until it got the software 1½ years ago, Fort Collins relied on inexact budgeting and cost allocation procedures. Every year the city estimated what its total annual telephone bill would be based on the previous year's expenses and on projected rate changes. It then divided the total estimated bill by the number of extensions in its phone system to determine how much it should charge various city agencies for each extension they used.

Each extension cost the same amount, regardless of how often it was used, Dallow said. "That's not a very equitable way to distribute costs."

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> ***Allocating calls back to individual employees and departments has reduced the number of personal calls made on city extensions.***

Fort Collins had a Northern Telecom, Inc. SO1 private branch exchange (PBX) with a call detail recording feature. But city employees made approximately 50,000 calls a month, Dallow said, and the recording tool provided only raw data on each call, rather than formatted reports the city could use to help manage its phone system.

Rising costs were another factor in the city's search for telephone management software. With the breakup of the Bell system, Dallow said, "We were concerned with the costs of the phone system going up." He had received predictions that local rates might increase by as much as 100%.

Fort Collins looked for software that would provide the following:

- An equitable procedure to allocate telephone costs back to each department.
- A method of knowing who made each long-distance call, and how much it cost.
- A method of auditing the monthly telephone bill to prevent overcharging.
- A way to analyze the performance of the telephone system to provide the most cost-effective configuration of long-distance services.

See COSTS page 100

Group seeks to stimulate MIS issue debate via bulletin board

HOUSTON — Information systems executives from 10 companies have reportedly joined a bulletin board and telecommunications network established by the American Productivity Center, a nonprofit productivity measurement organization here.

Firms said to be represented on the Information Resource Management Computer Network (IRMCN) include Brunswick Corp., Lever Brothers Co., Northrup Corp., Sears, Roebuck & Co. and Texas Instruments, Inc. Among the topics to be discussed on the network are data base security, artificial intelligence and the future of information systems, an American Productivity Center spokeswoman said.

The network members use the GTE Telenet Communications Corp. network to connect with the bulletin board, which resides on the Electronic Information Exchange System of the New Jersey Institute of Technology.

Membership in the IRMCN, including Telenet network services fees, is priced at $4,400 per year for American Productivity Center members and $5,000 for nonmembers. The American Productivity Center is located at 123 N. Post Oak Lane, Houston, Texas 77024.

Tandem offers interface option for 6100 front-end processors

CUPERTINO, Calif. — Tandem Computers, Inc. has enhanced its 6100 front-end communications processor by adding a line interface unit, the LIU4, that, according to the vendor, reduces connection costs for asynchronous point-to-point terminals by 75%.

According to a vendor spokesman, the LIU4, a plug-in hardware option, supports up to four asynchronous devices, such as Tandem 6530 series terminals, at no additional cost.

Reportedly, up to 45 LIU4s can be installed in a 6100 cabinet, supporting 180 local or remote asynchronous devices.

Typical applications of the LIU4 include credit authorization, home banking and shop floor control, the vendor said.

The 6100 Communication Subsystem allows Tandem systems to monitor several hundred communications lines at one time, the vendor said. The product is microprogrammable and allows different protocols, lines and line speeds to be mixed in one system.

LIU4 costs $1,940. It requires Tandem's ATP6100 host software, which costs $500 per processor.

Tandem is located at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

COSTS

from page 99

The TMA software the city chose is a Cobol program that runs on Fort Collins' 2M-byte Sperry Corp. 90/40. It matches information from the city's PBX call detail records against bills from Mountain Bell Telephone Co., its local phone company. The phone company sends Fort Collins its monthly phone bills on magnetic tape, and a tape drive hooked to the PBX captures information from the call detail recorder on a separate tape.

When the tapes are run against the software on the 90/40, the system generates three categories of reports Dallow uses to bill user departments, to find incorrect charges and to check the efficiency of the city's telecommunications system.

- Detail reports show all local and long-distance calls formatted by originating extension and by department. Dallow said these reports provide an accurate and equitable way of charging each department for telephone usage.
- Audit reports compare phone bills with data from Fort Collins' PBX call detail recordings and show billing errors.
- Utilization reports show which calls are not being routed over the least-cost trunk group and where calls are routed when the least-cost group is not used. They also record what kind of calls employees make most often, so the city can determine how best to use low-cost services such as Wats and foreign exchange, Dallow said.

Allocating calls back to individual employees and departments has reduced the number of personal long-distance calls made on city extensions, Dallow said. He attributed the reduction to the city's "letting employees know that we had a way to track all these telephone calls."

The audit reports have saved the city from paying for calls it did not make, and the utilization reports have helped it decide what kind of services to use. In one case, the reports indicated that Fort Collins should maintain its Wats service rather than switch to service from MCI Communications Corp. because of the way the city's phone use was distributed.

Dallow said he prefers his software-based call accounting to other options. The city looked at accounting services provided by major telephone companies, but these required investments in microcomputer hardware that Fort Collins did not want to make.

The phone companies' systems rely on micros to capture data from PBX call detail recording and run that information against tarriffs. This procedure allows users to estimate their phone bills.

IBM

from page 99

face, that allows a 600 bit/sec to 1.2K bit/sec modem to be attached to a System/36.

An X.21 adapter provides an interface to either a switched or a nonswitched X.21 interface device, which is used between data terminal and data terminating devices. On switched networks, transmission speeds from 2.4K bit/sec to 4.8K bit/sec are supported. On nonswitched nets, transmission speeds range from 2.4K bit/sec to 4.8K bit/sec for point-to-point operations and 2.4K bit/sec to 9.6K bit/sec for multipoint operations.

A digital data service adapter supports bisynchronous or SDLC protocols at speeds of 2.4K bit/sec to 56K bit/sec over AT&T's Dataphone Digital Services net.

ECLA costs $2,000. Each adapter option costs $1,500.

IBM is located at Old Orchard Road, Armonk, N.Y. 10504.

VOICE/DATA COMMUNICATIONS

- Comsat Telesystems, Inc. has introduced TCS-9000, a portable satellite earth station designed for use by mineral exploration teams, tactical units and emergency response teams.

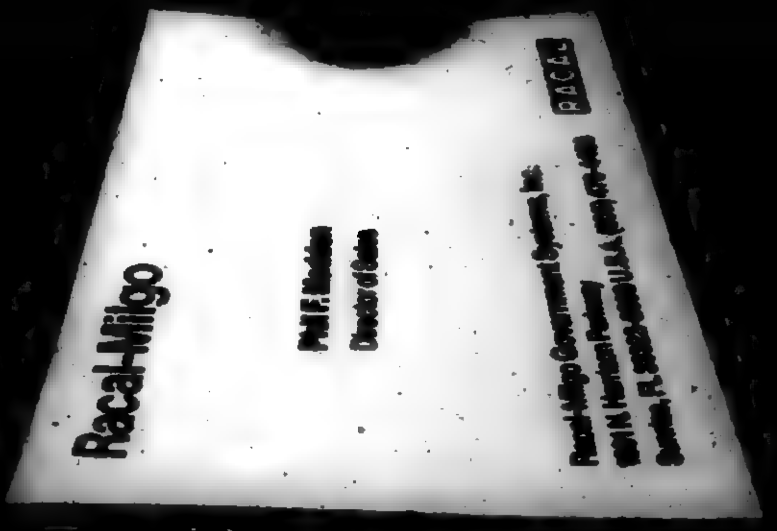
A vendor spokesman said the product weighs 70 pounds, uses 385W of power and is housed in two carrying cases. It is equipped with a compass and a lookup table, enabling users to set up the terminal and connect it to the Inmarsat network of communication satellites in 15 minutes.

TCS-9000 provides long-distance telephone service and telex and data communications to any place in the world, the vendor reported.

TCS-9000 is priced at $35,200.

Telesystems, 2721 Prosperity Ave., Fairfax, Va. 22031.

A LITTLE SOMETHING TO GET YOU THROUGH THE PROBLEMS CAUSED BY DIVESTITURE.



LOCAL-AREA NETWORKS

■ Codex Corp. has added the Codex 4110 Muxport Gateway to its Codex 4000 series local-area network.

The company also announced a series of enhancements provided by Ungermann-Bass, Inc., the OEM for the Codex 4000 local-area network.

The gateway option allows internetworking of local- and wide-area network resources. The option makes possible micro-to-mainframe, terminal-to-host and terminal-to-terminal communications between Codex's 4000 series local-area network and wide-area networks such as Codex' 6000 Intelligent Network Processor, Codex said.

The product comprises a Codex 6002 Intelligent Network Processor and a Codex 4000 series Entryway and serves six to 16 ports.

The Ungermann-Bass enhancements consist of two micro entryways; software packages Disktalk and Printtalk, which allow microcomputers to share disks and printers; a local-area network manager; a radio frequency modem card; and a new release of the network operating system software.

The network processor costs between $3,300 and $3,600, and Entryway costs approximately $450/port.

Codex, 20 Cabot Blvd., Mansfield, Mass. 02048

AT&T

from page 90

Growth or no growth, services are still the company's cash cow, a fact accentuated by the trouble AT&T has had selling communications switching equipment, which accounts for 31% of total revenue. "AT&T Technologies' net income declined sharply during 1983 and 1982, principally due to diminished sales volumes and to costs associated with reorganization and consolidation of manufacturing, distribution and repair facilities," the annual report said.

AT&T blames the slowdown in equipment sales on the influx of foreign manufactured products and product delivery delays due to the component shortages, including silicon chips.

But the company's problems go beyond external market forces, as Charles L. Brown, AT&T's chairman of the board, conceded in his analysis of 1984. "One of the principal adjustments we have had to make is to lower our cost structure and improve our margins. We had to come to grips with the fact that not all of the work done when we were 'the telephone company' has a place in this new business environment — and that we could operate with a much smaller management force."

Excess fat

Evidence of the fat can be found on the balance sheet. AT&T's net income on 1984 revenue of $33.2 billion was a paltry $1.4 billion. By way of comparison, Bell South, which is the holding company for the divested Bell operating companies Southern Bell Telegraph and Telephone Co. and South Central Bell Telephone Co., made $1.26 billion on 1984 revenues of $9.52 billion.

There is also evidence that the company is trying to cut it expenses. Brown said, "Jobs have been eliminated through attrition, voluntary and involuntary retirements and layoffs. Four of our manufacturing plants are in the process of being closed. Salary structures are frozen through 1985 for all management employees."

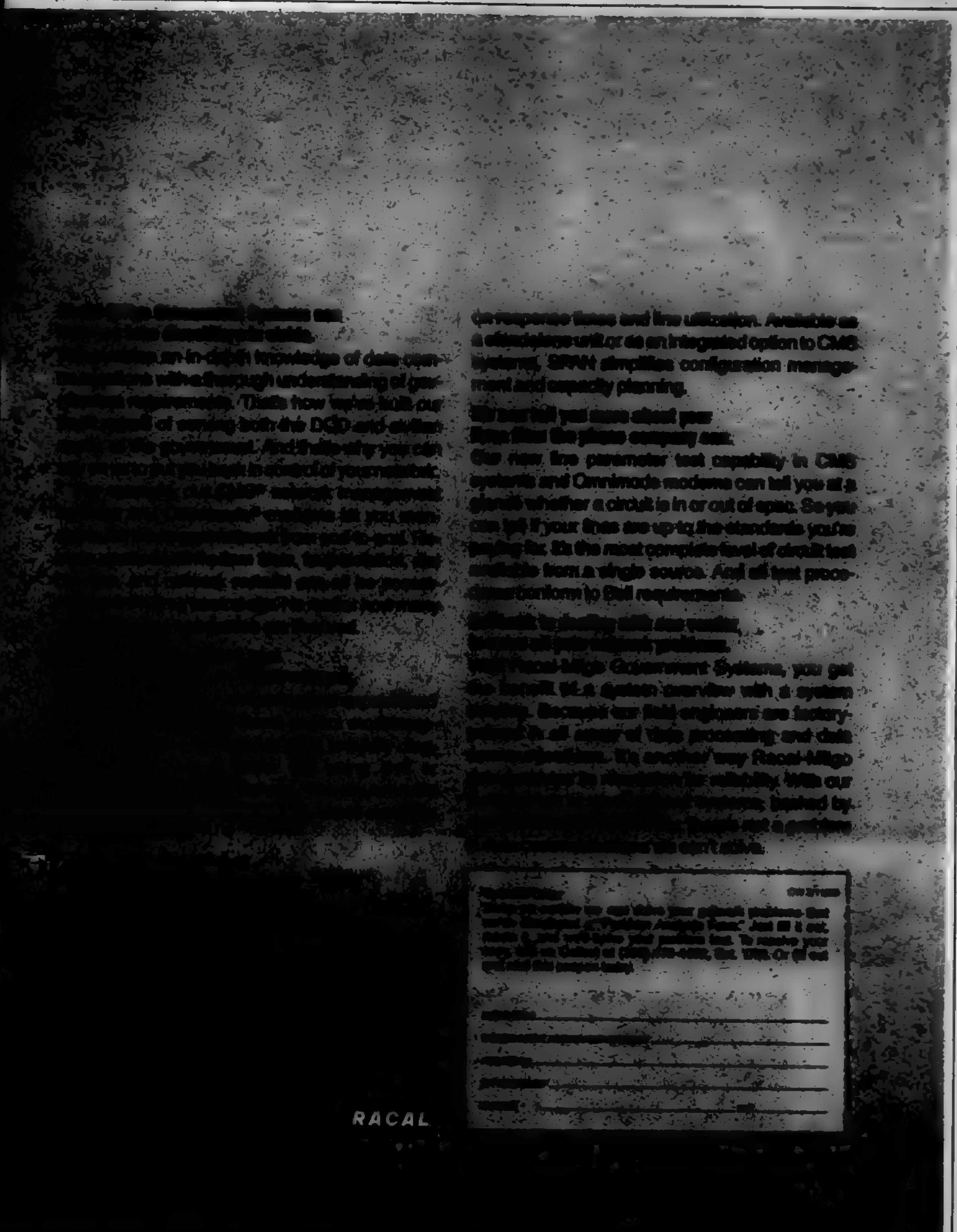
The belt-cinching comes in the face of unprecedented competition, perhaps simply because of it. Research organizations report that, in terms of lines shipped, Northern Telecom, Inc. shipped more private branch exchanges (PBX) in 1984 than AT&T, a watershed given PBXs are one of AT&T's staple products.

The rest of the story

But AT&T's low shipment 1984 numbers do not tell the whole story.

Demand for AT&T PBXs is believed to be high, although the extent of the demand is obscured by delivery delays. The industry has warmed to the high-end System 85 and enthusiastically embraced the low- to mid-range System 75.

Conspicuously absent in AT&T's annual report was any discussion of Net 1000, its beleaguered processing services network. One has to wonder if the service can survive the fat-trimming needed to make the company competitive in the other markets into which it is venturing.



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RACAL

Photo: Ron Kimball

SUPREME

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SYSTEMS & PERIPHERALS

SHOP TALK/KENNETH G. BRILL

Audit confirms backup systems

For data centers with high uptime requirements, just having a disaster recovery plan is not good enough. Management should periodically audit the computer life support systems to confirm that each piece of equipment will operate in an emergency.

These computer room life support systems include air conditioning, humidity control, power conditioners or uninteruptable power supplies (UPS), power distribution units, grounding, physical security and fire suppression systems. Too often, management learns of problems with one or more of these support systems only after a failure has affected computer uptime.

After investing money in a UPS or other types of sophisticated protection hardware, many managers develop a false sense of security. Often, DP executives are surprised to discover, in a support systems audit, that there are serious problems that could affect system reliability.

There are at least five problems that are typically discovered as a result of a support system audit. These include the following:

- Improper reliability engineering in the original facility design.
- Incompatibilities between conditioning systems.
- Improper equipment installation.
- Lack of regular maintenance.
- Failure to test backup systems.

Operating personnel will often know of design, equipment or maintenance deficiencies, but the chain of command is so cumbersome that their concerns or

See UPS page 108

Brill is president of Computersite Engineering, an engineering and consulting firm in Cambridge, Mass.

IBM drops fees for additional use in rentals

Plan A affected

RYE BROOK, N.Y. — IBM has discontinued the additional use charges on selected machines leased under its Rental Plan A. The change went into effect Feb. 25.

The change means customers will no longer be required to submit to IBM billable time authorization forms and maintenance logs for month-ending meter readings on machines leased under Plan A.

Previously, users had to pay an additional charge when they used the hardware for more than 176 hours per month. All affected Plan A machines have been redesignated Plan B machines, which means that users now have unlimited use of the machines in any month. The change does does not affect IBM users involved with rental Plan C or E contracts, the vendor said.

The following machines are affected:

The 1131 CPU; 1133 multiplex control enclosure; 1255 magnetic character reader; 1287 optical reader; 1288 optical reader; 1403 printer; 1419 magnetic character reader; 1442 card read punch; 1443 printer; 2020 and 2022 CPUs; 2203 printer; 2305 fixed-head storage device; 2310 disk drive; 2401 magnetic tape unit; 2415 magnetic tape unit and controller; 2501 card reader; 2520 card read punch; 2540 card read punch; 2560 multifunction card machine; 2671 paper tape reader; 2701 data adapter unit; 2715 transmission control unit; 2821 control unit; 2822 paper tape reader controller; 2826 paper tape controller; 2835 storage control unit; 2860 selector channel unit; 2927 RPQ tape control unit; 3046 power unit; 3047 power unit; 3115 and 3125 CPUs; 3203 printer; 3211 printer; 3410 magnetic tape unit; 3411 magnetic tape control unit; 3420 magnetic tape unit; 3505 card reader; 3525 card punch; 3540 diskette I/O unit; 3704, 3705 and 3706 communications controllers; 3803 magnetic tape control unit; 3811

See RENT page 108

- Martin Marietta Data Systems, Inc. announced the Orlando 400 time-sharing service, which enables use of the vendor's software on a specialized off-site hardware configuration/105

INSIDE

Printers/Plotters/105

LPGA system aces major task of organizing golf tournament

RANCHO MIRAGE, Calif. — It takes more than a scorecard and sharp pencil to put on a major golf tournament these days. Sponsors of the Nabisco Brands, Inc./Dinah Shore Ladies Professional Golf Association (LPGA) Tournament are relying on a series of systems to track the myriad details involved — from keeping ticket records and registration to inventory and badge control.

With nationwide television coverage, prize money of $400,000 and gate receipts from an expected 80,000 people, the Nabisco/Dinah Shore tournament, held each year at the Mission Hills Country Club here, is big business, noted Leslie Langdon, data base coordinator.

The tournament office staff of two full-time year-round people and two part-time employees, located in offices just off the golf course, is responsible for close to 800 invited guests that include staff, Nabisco personnel, representatives from Nabisco's subsidiaries around the world and the players, Langdon said. Nabisco has sponsored the tournament since 1982.

Richard W. Brightman, project leader at the Nabisco headquarters in Parsippany, N.J., is in charge of all the Nabisco/Dinah Shore tournament's data processing. His task is to analyze needs and develop programs that will produce a more efficient operation, he said.

Nabisco selected a Wang Laboratories, Inc. Office Information System (OIS) 105 with three workstations and a printer for the 1983 tournament, Brightman said. The

See GOLF page 106

Cartridge tape unit debuts for DEC minis

COSTA MESA, Calif. — California Computer Group, Inc. (CCG) has introduced 200 in./sec, 500M-byte and 300M-byte cartridge streamer tape subsystems for Digital Equipment Corp. minicomputers.

The MT-500H subsystem is said to back up a 500M-byte disk in 36 minutes. The rack-mountable MT-500H (500M-byte) and MT-300H (300M-byte) magnetic tape transports were designed specifically to back up Control Data Corp. 9715 and 9710 disk drives and similar 9-in. Winchester disk drives.

Users may choose either the 200 in./sec streaming mode for a mirror-image backup or the 50 in./sec start/stop mode for file-oriented backup. CCG uses Emulex Corp.'s TC02, TC12 and TC7000 tape couplers to interface with DEC minis.

The subsystem prices start at $8,000 and include drive, controller and cables.

CCG is located at Suite G-10, 2303 Harbor Blvd., Costa Mesa, Calif. 92626.

Deciphering industry 'acrospeak'

HARD TALK
Charles Babcock
CW New York Correspondent

One of the hazards of reporting about the computer industry is frequent encounters with alien acronyms.

They come in many forms, shapes and sizes — all equally unrecognizable. Vendors thrust their capital letters at us demanding attention, not realizing that some people have trouble remembering what it was that E.T. stood for.

I've hated acronyms ever since I could not recall that Fortran stood for formula translator on a mid-term exam.

Still, some are not as bad as others.

I/O is useful, and VM has a nice ring to it. If you close your eyes and think about it, which not many people have ever done, you can imagine VM being the sound a child makes on a rainy day or perhaps an avant-garde way of saying "very much."

But what is good in small quantities becomes a public nuisance when it gets out of hand.

Software companies of late have been on a rampage, breeding new acronyms faster than we can forget the old ones, combining them in out-of-wedlock unions.

Sometimes a particularly vigorous acronym will take on a life of its own. At a recent conference, the participants sat down to lunch discussing "dasdee" (spelled Dasd) instead of exhausting themselves pronouncing "Direct-Access Storage Device."

There are many perpetrators of this mania, but one of the biggest offenders is a company that has an obvious predilection for acronyms and is

See ACRONYMS page 105

DAVOX

How we helped Security Bank and Trust unlock their collection potential.

Martin Marietta introduces mainframe time-sharing service

ORLANDO, Fla. — Martin Marietta Data Systems, Inc. has announced the Orlando 4000, a time-sharing service that offers users a specialized, localized hardware configuration plus the ability to use software packages developed by Martin Marietta.

The Orlando 4000 is said to offer users access to custom configurations of Martin Marietta's IBM or equivalent mainframes, software and communications capabilities. Specialized personnel support is also included.

The time-sharing service is said to provide applications packages, systems and microcomputer software packages, computing services and large-scale systems integration services, a spokeswoman said.

The service is said to relieve the financial, managerial and technical problems of running an in-house computer facility by configuring a processor complex that suits the user's needs at the Orlando 4000 building.

The service can be purchased in 12-hour increments and is said to be available 24 hours a day. Prices range from $6,000/mo to $172,000/mo.

The company's executive offices are located at 6801 Rockledge Drive, Bethesda, Md. 20817.

PRINTERS/PLOTTERS/ PERIPHERALS

■ **Datasouth Computer Corp. has released its CX3180 medium-speed dot matrix printer, which emulates the IBM 3278 printer without the need for an outboard protocol converter.**

The printer attaches directly to the IBM 3274/3276 (or compatible) cluster controller or 4331 display printer adapter via a standard IBM type A coaxial connector.

The CX3180 is said to deliver bidirectional printing at 180 char./sec. It supports IBM's Binary Synchronous Communications as well as Systems Network Architecture LU1 and LU3 data streams. The CX3180 features a Centronics Data Computer Corp.-compatible parallel interface.

The CX3180 costs $3,195.

Datasouth Computer, 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.

■ **A. B. Dick Co. has announced a graphics plotter that provides six pen stalls and color options for use with its Knowledge Worker desktop microcomputer.**

The PP-2796 graphics plotter allows users to store and use pens of different widths. A view button allows users to eject the chart for review while plotting.

The plotter features a front control panel that provides for color tests before plotting and a paper guide for alignment of sheets or transparencies.

The price of the plotter is $2,135.

A. B. Dick, 5700 W. Touhy Ave., Chicago, Ill. 60648.

ACRONYM

from page 103

known by one — IBM.

Sometimes this tendency gets IBM in trouble.

When IBM wanted to develop the 360 mainframe, it called the project "Spread" for systems programming research, engineering and development. In the 1950s, when it first tried to develop a supercomputer, it called the project "Stretch." And in 1970, when it was concerned about halting inroads by competitors selling cheaper memory for its mainframes, it called the project "Smash," an acronym that took some explaining during the antitrust proceedings. Bob O. Evans, IBM's president of engineering, testified that he coined the word to mean IBM would "put this whole smash, all these products, out at one time."

Easier to speak Esperanto

Recently, IBM unleashed a blizzard of new acronyms through its stepped-up product announcements. It was not so bad when the PCjr made its debut, but what about Systems Network Architecture's DIA/DCA? I always found it easier to speak Esperanto and Inuit dialect than SQL/DS and Disoss.

The Boston-based Yankee Group market research firm tried to fight back against IBM's onslaught of acronyms by publishing its own acronym glossary that it handed out at a recent briefing session. But before the session ended, IBM had announced new disk drives, software and the Sierra series, making the list hopelessly outdated.

The Yankee Group — or YG, if you prefer — did perform one service, however. On the back of the list, it included alternative meanings for selected acronyms, meant in jest, but hinting at the irrationality of the multiple letters.

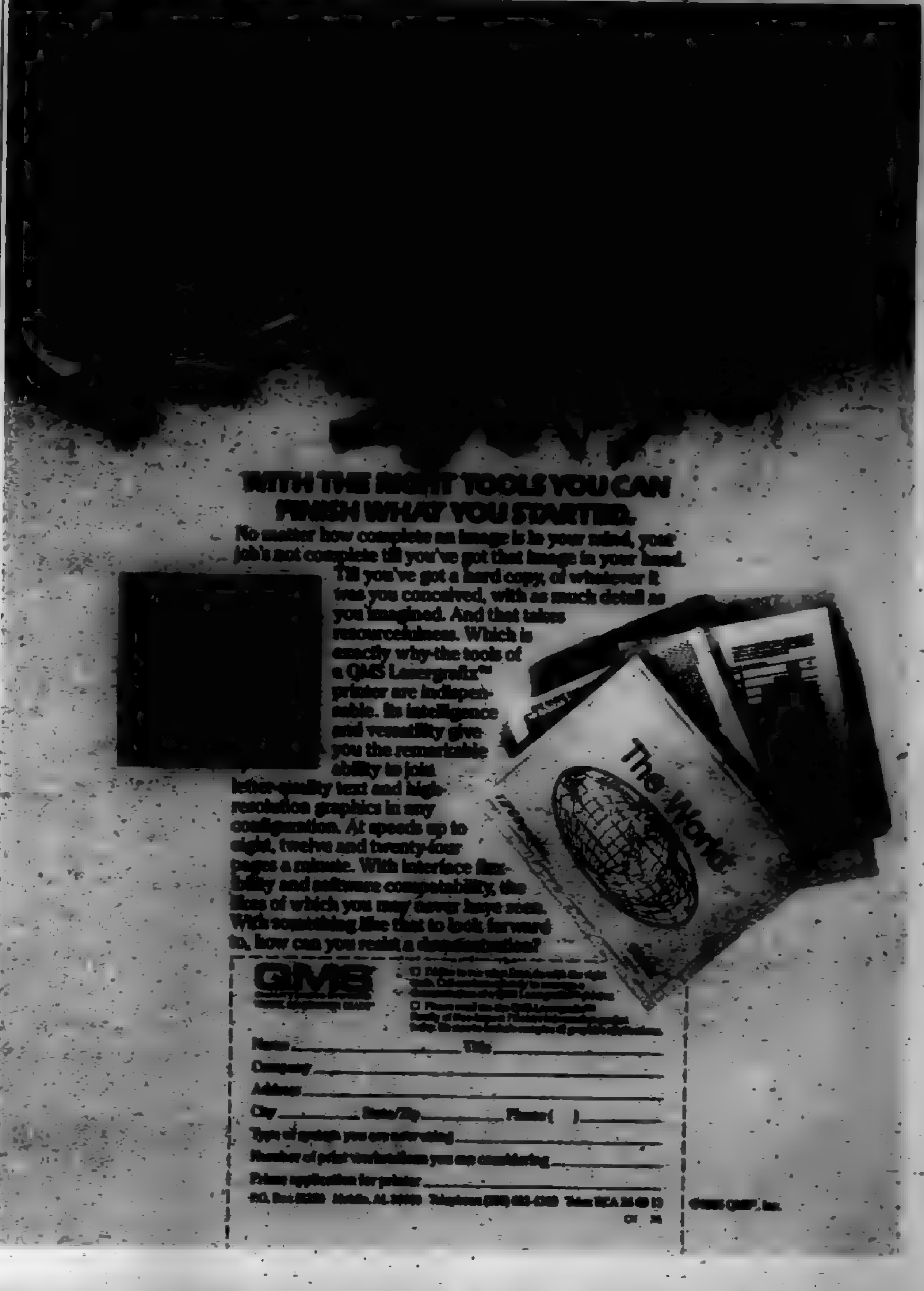
The following is a brief sampling from that list:

■ CMS, the Conversational Monitor System, was renamed the Conversational Madness Syndrome.

■ DB2, IBM's relational data base management system, was dubbed Doubtful Too?

■ A new ingredient in the alphabet soup, the SSCP, or System Service Control Point, part of SNA, was christened the System for Screwing-Up Competent Programmers.

■ Vsam became Very Simple Address Mutilation, and Btam became a piece of good advice: Better Try Again Monday.


WITH THE RIGHT TOOLS YOU CAN FINISH WHAT YOU STARTED.

No matter how complete an image is in your mind, your job's not complete till you've got that image in your hand. Till you've got a hard copy, of whatever it was you conceived, with as much detail as you imagined. And that takes resourcefulness. Which is exactly why the tools of a QMS Lasergrafix™ printer are indispensable. Its intelligence and versatility give you the remarkable ability to join letter-quality text and high-resolution graphics in any configuration. At speeds up to eight, twelve and twenty-four pages a minute. With interface flexibility and software compatability, the likes of which you may never have seen. With something like that to look forward to, how can you resist a demonstration?

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City ________ State/Zip ________ Phone ( ) ________

Type of system you are interfacing ____________

Number of print workstations you are considering ____________

Prime application for printer ____________

P.O. Box [illegible] Mobile, AL [illegible] Telephone [illegible] Telex [illegible]

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GOLF

from page 103

company then purchased Wang's VS80 minicomputer for the 1984 tournament, along with two additional Wang workstations, a second impact printer and a new high-speed laser printer, he said.

Brightman uses the VS80's file management facilities to simulate a data base for managing the tournament, including ledger and record keeping, as well as automatic letter writing to guests and volunteers. The VS80 also permits accurate and current reporting, primarily through use of the report and data entry utilities, he said.

Brightman's first effort was to automate the collection of advance ticket sales orders, he said. Ticket handling for the golf fans is the responsibility of Michelle Byer, the tournament administrator.

Ticket order brochures are mailed out in the early fall and orders start coming in almost immediately, Langdon said. Pertinent information is recorded for each respondent, and confirmation letters and labels are printed on the system, she said. When the tickets are mailed three weeks before the tournament, copies of the confirmation letters are included. Meanwhile, the office has an updated list of collections and individuals to be billed.

Badge control is another of Byer's duties, Langdon said. While some badges can be used during the entire week, others are for limited attendance, she added.

On each day of the two-day professional-amateur tournament preceding the main event, invited guests play with different professionals and have their pictures taken, Langdon said. At least two pictures go to each guest. With addresses available through a label printout procedure, the mailing procedure has been simplified and speeded up, she said.

Planning the seating for the tournament's gala dinner presented even greater difficulties. "Who sits where is important. We can cross-check using a conflict analysis report to make sure that everyone has been assigned a seat and that no individual has been assigned to two or more tables," she said.

Data input

To form much of the data base information, Wendy Morton, the staff data entry person, inputs a list of all qualified professional golfers; information on whether they have their own caddies or will need one supplied; and the golf cart allocations for officials, staff, tournament executives and volunteers that are supplied by the LPGA, Langdon said.

Langdon expects to include additional items in the inventory this summer, such as crowd control ropes, stakes, leaderboards, radios and other equipment required to keep the tournament running smoothly, she said. Such equipment is shared with other golf tournaments, such as the Bob Hope Classic in January and the Vintage Invitational in March, she said, so it is important to keep track of it.

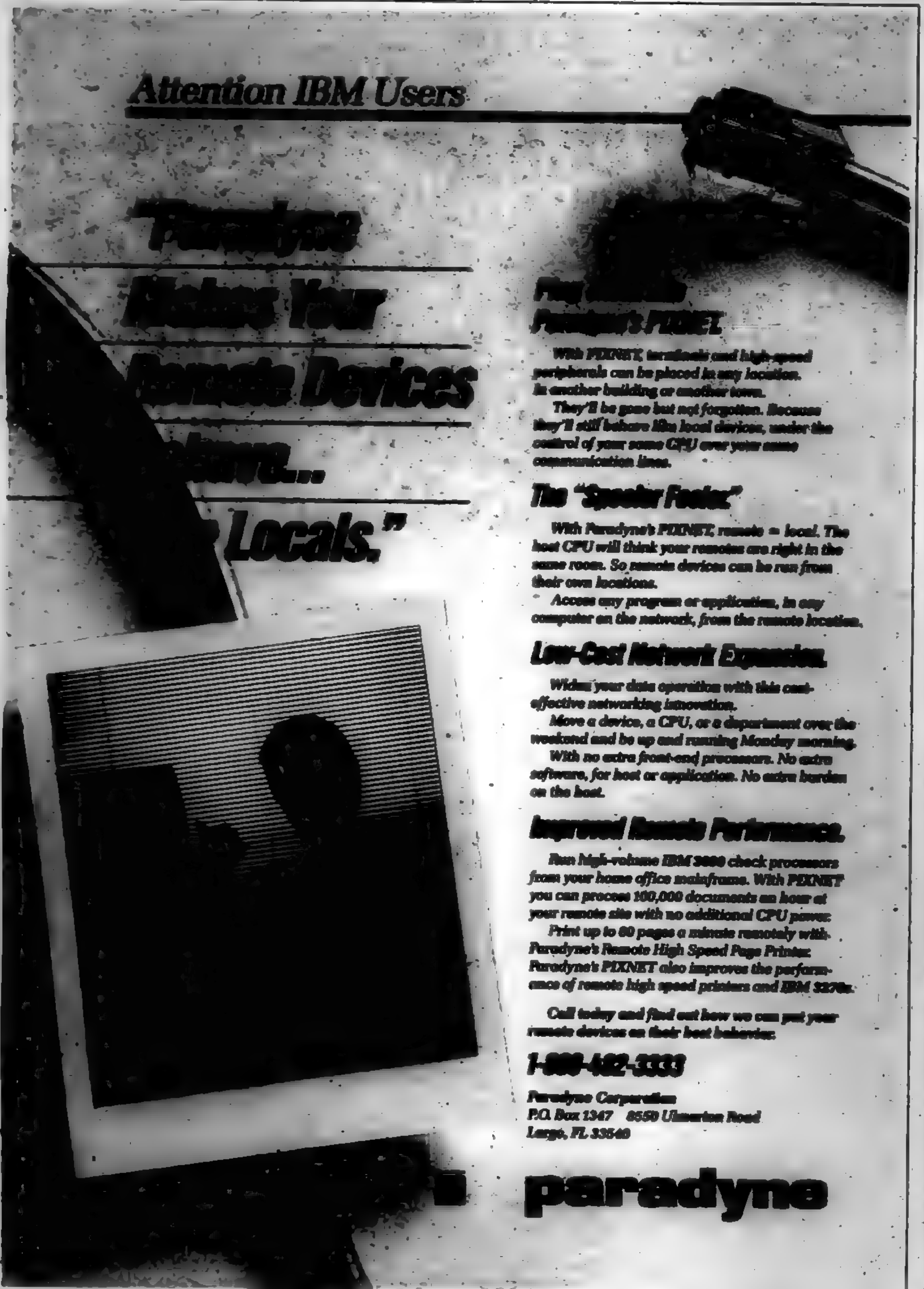
"One of our most critical functions on the system is the two-day pro-am pairing," Langdon adds. "This event involves 300 people. The pairings are handled by tournament executives, and it may take them days to work out the details. We now cross-reference the names and the individuals' handicaps when the acceptances come in. Then we can make sure we have each amateur paired one time per day."

Other uses

Other applications included listing of invitees in categories such as celebrities, customers and executives, maintained in that order and alphabetically; and correspondence.

Correspondence not only includes the questionnaires that provide background and size data but also information for hostess groups, welcome and thank-you letters and their respective labels for mailing.

"This guest information was kept on Nabisco's IBM corporate mainframe in 1983," Brightman said. The move to a minicomputer in the office saved Nabisco $40,000 in leased-line expenses immediately, but the important benefit to Brightman is the timeliness of information. He is able to modify programs at Langdon's request on a Wang system in Parsippany and send the programs back to Ranch Mirage via Wang's Mailway system so that Langdon can be using the modified program in an hour, he said.



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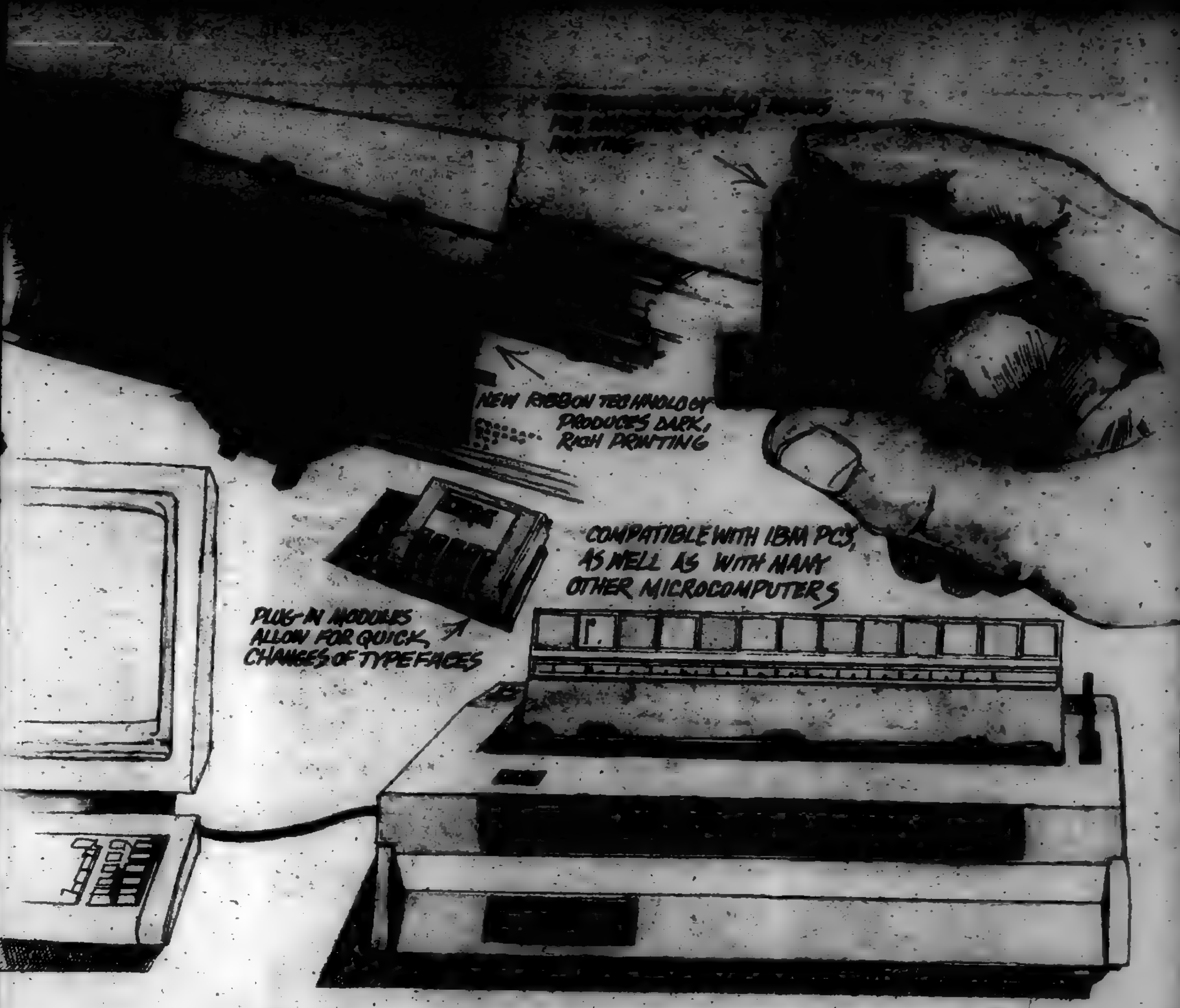
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UPS

from page 103

suggestions never reach top DP management until there is a disaster; then it is often too late. An audit can ensure that all levels know about existing technical problems.

For example, a common problem found during an environmental audit is poor air conditioning redundancy. Many sites have a single temperature control for the entire computer room. Without a backup unit, failure of the temperature controller can force a system shutdown, and the system could remain down until a repair person arrives to fix the broken temperature control unit.

Improper electrical grounding

Consequently, even though a company has made a heavy investment in a UPS system and other sophisticated protection devices, the system can still fail as a result of faulty environmental controls. Air conditioning systems, as well as other subsystems serving the computer room, should meet the same reliability standards as the computer systems they support.

Problems can often be found with Halon fire supression systems. One operations manager, for example, discovered the area under the floor near the Halon system had not been cleaned for some time. If the Halon system were ever activated, it could create a dust storm that could damage disk drive media. In fact, there was a higher risk of disk damage resulting from an accidental discharge of the Halon system than the probability of a fire in the computer room.

Another common problem is improper electrical grounding. Independent, floating or isolated grounds that are not in compliance with the National Electrical Code carry a risk of damaging hardware. Furthermore, improper grounds pose a risk to unprotected computer operators or technicians.

Cookbook approach

The root of many reliability problems in computer rooms stems from a cookbook approach to data center design. Despite good intentions, too many sites have been designed around the following recipe:

Install power distribution modules, one UPS, five redundant air conditioners, one raised floor and one fire supression system. After installation, wait to see what fails. Correct mistakes by the incremental process of trial and error.

Unfortunately, many environmental support product vendors encourage the cookbook approach by claiming their black boxes will solve a particular class of problems. Some of these vendors claim that the only engineering needed is to insert their product into the existing array of systems. This approach does not necessarily result in a high level of system uptime for the customer.

A computer system that truly has a high level of uninterrupted uptime usually involves 10 or more subsystems working in harmony. The weakest often determines overall reliability, so careful attention must be devoted to redundancy to ensure that computer operations continue even when failures occur in individual pieces of support equipment.

A regular, rigorous testing program that simulates an emergency and then tests overall system performance under a full load is the best way to know that each piece of equipment will operate satisfactorily in an emergency. Such a program will often reveal engineering errors and equipment incompatibilities.

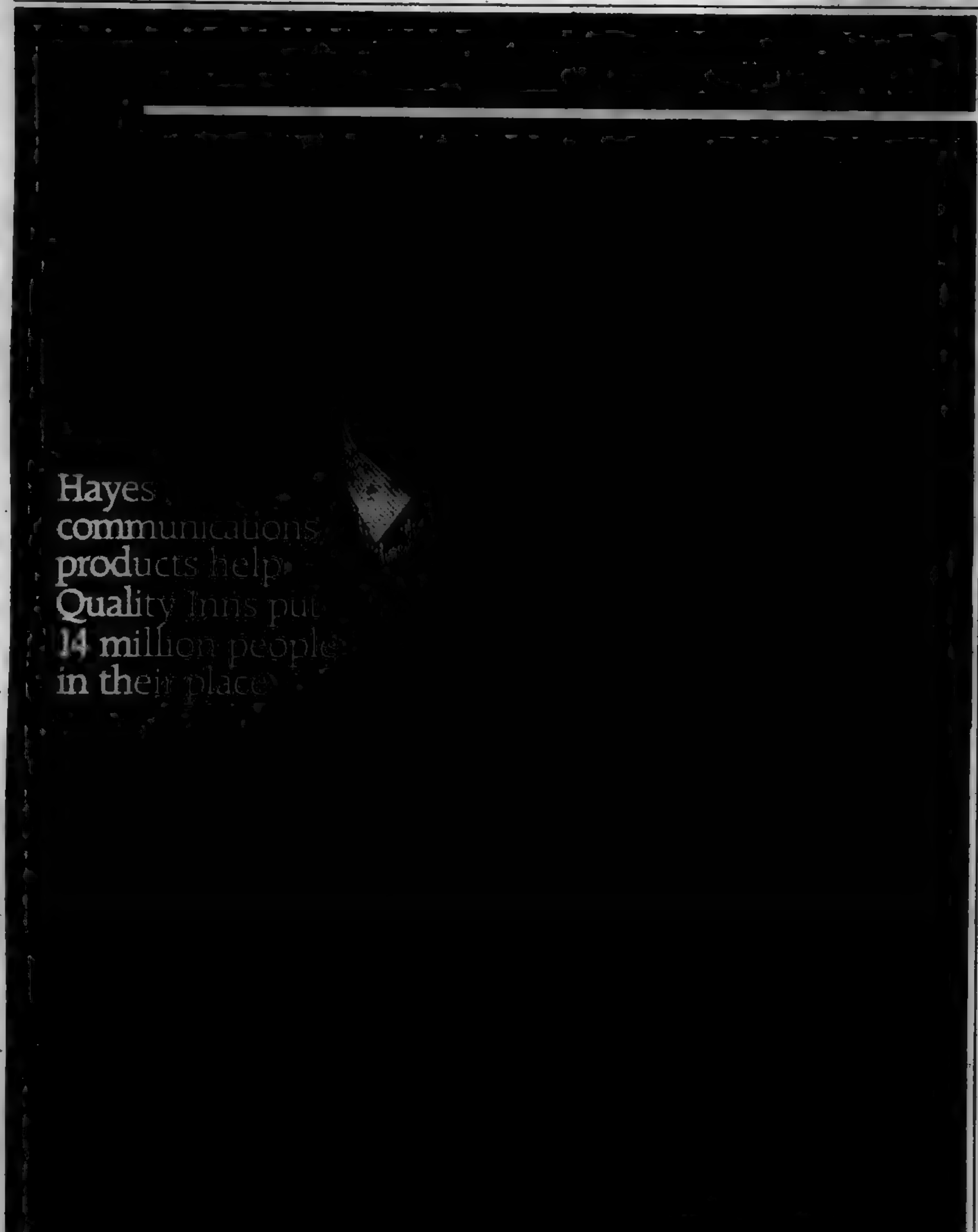
Such incompatibilities almost always exist, no matter how carefully a complex system is designed on paper. Many sites are afraid to conduct tests because any support equipment failure may jeopardize the computer system serving a live load. An environmental audit can identify the need for a testing program by determining how testing can be conducted off-line in ways that limit computer downtime risk.

RENT

from page 103

printer control unit; 3830 storage control unit; 5098 RPQ printer control unit; 5408 CPU (System/3 Model 8); 5410 CPU (System/3 Model 10); 5412 and 5415 CPU; 5412 printer control unit; 5424 multifunction card unit; and the 5444 disk storage unit.

More information is available from IBM's Information Systems Group at 900 King St., Rye Brook, N.Y. 10573.


Hayes communications products help Quality Inns put 14 million people in their place

MICROCOMPUTERS

Icon software environment offered for IBM PC Network

By Eric Bender
CW Staff

REDWOOD CITY, Calif. — Torus Systems, Inc. has introduced Tapestry, an icon-based software environment for the IBM PC Network.

Scheduled for April 15 shipment, Tapestry is the first commercial software offering for the PC Network, Torus claimed. IBM began delivering PC Network hardware in October, but PC Network Program, the network operating system, was still not available at press time.

Priced at $400/network node, Tapestry replaces the PC Network Program and adds other capabilities, the vendor said. A version is also being offered for 3Com Corp.'s Ethernet network hardware.

Tapestry is said to integrate file sharing, print sharing and electronic mail functions. It also offers telephone management, modem sharing, gateways and the ability to install an applications library, from which PC-DOS applications may be downloaded.

Network operations are performed through one common user interface, with most choices presented to users through a series of icons, said Tim Sutton, Torus president. Network configuration and maintenance can be performed through the same interface, allowing nontechnical personnel to carry out those jobs, he said.

See TAPESTRY page 118

DG enhances laptop's screen

WESTBORO, Mass. — Responding to concerns about the readability of the screen on Data General Corp.'s Data General/One laptop portable, the firm has introduced a tilt-mounted version of that machine's LCD that reportedly increases contrast and minimizes glare.

The new LCD may be adjusted to a variety of angles to offset the glare of workplace lighting, the company said. According to DG, the LCD also optimizes screen polarization, substantially improving character-to-screen contrast.

Available by mid-March, the display will be offered as a $350 upgrade to existing versions of the DG/One and will be standard on new models. Upgrades will be done by either DG or its authorized dealers and will take 30 minutes, according to the vendor.

DG said DG/Ones still on dealers' shelves will be sold at a 10% discount, with the new display provided free to those buyers when it becomes available. The DG/One remains priced at $2,895.

DG's Desktop Division is located at 4400 Computer Drive, Westboro, Mass. 01580.

PFS versions available for HP Touchscreen line

MOUNTAIN VIEW, Calif. — Software Publishing Corp. has announced that versions of its PFS series of software products are now available for the Hewlett-Packard Co. Touchscreen personal computers.

The Touchscreen versions of PFS are said to include PFS:Write, PFS:File, PFS:Report and PFS:Graph. All of the packages are integrated at the data-sharing and command levels.

PFS:File reportedly allows users to store, retrieve, update and print information. PFS:Report is said to work with PFS:File to provide tabular summaries of the information in a file.

PFS:Write is a word processor, and PFS:Graph is a graphics package that allows users to create line, pie and bar charts.

PFS:File and PFS:Report are offered bundled for the Touchscreen line at $265. PFS:Write and PFS:Graph are each $140.

Software Publishing is located at 1901 Landings Drive, Mountain View, Calif. 94043.

SMALL TALK
Eric Bender
CW Senior Editor

Macintosh-like software clicks

This week as the first pieces of the Macintosh Office begin to ship, more than a year after the Macintosh's debut, Apple Computer, Inc.'s star personal computer isn't selling in significant numbers to many large companies, and it is far from a corporate machine.

Apple sells *personal* computers, not chunks of corporate resources that happen to sit on a desk, and that personalized approach is a major strength. But the approach has provided an excuse to ignore the gaps in Apple's product line — gaps that corporate America doesn't want to fill with third-party products.

For example, here we have a billion-dollar-plus computer firm that doesn't offer a serious hard disk drive version of its high-end machine.

The Macintosh XL, the Lisa 2/10 in drag, is the result of a clumsy attempt to sell surplus machines designed for another operating system. Users said packages sometimes run faster on the Macintosh than on the Macintosh XL. If a start-up company like General Computer Corp. in Cambridge, Mass., can manufacture a handy internal 10M-byte hard disk drive, why can't Apple?

Another case in point: All the recent hoopla about Applenet ignores the huge steps that must be taken to turn the bare bones, the point-to-point hardware, into a real local-area network with multiuser applications software, development tools, electronic mail and all the other features.

But whether the machine ever makes it in the Fortune 1,000 marketplace, the Macintosh is acting as a showpiece, a kind of icon for some next steps in end-user software. And some of those steps are leading back into the IBM Personal

See APPLE page 120

- SPSS, Inc. upgraded its SPSS/PC analysis software, supporting the IBM Personal Computer AT and other hard disk drive micros/110
- Via Computer, Inc. enhanced its Microprophit financial modeling software for the IBM Personal Computer/110

INSIDE

Software/112
Systems/116
Communications/118
Storage/120

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Local Area Networks For Large Organizations

NESTAR

Cadkey boasts 3-D images

VERNON, Conn. — Micro Control Systems, Inc. has introduced its Cadkey software for creating three-dimensional computer-aided design (CAD) images on the IBM Personal Computer line, including the Personal Computer AT.

Under Cadkey, which costs $1,895, 3-D parts reportedly can be converted to 2-D drawings that meet Ansi and International Standards Organization standards. Users can create an unlimited number of views of the 3-D part once they establish the original image.

Any change within the 3-D part causes all other views of the part to be updated automatically, according to the vendor. Cadkey also uses all English-language commands and prompts that can be selected from a menu by a digitizing tablet or by function keys.

In addition, all prompts and commands under Cadkey can be modified by users with most Personal Computer word processors, Micro Control Systems said. Users also are able to design their own menus and have access to immediate mode commands that can be accessed at any time from within another function. Users are thus able to change a system parameter or view a part differentially from within the original command.

Cadkey is said to feature device-independent plot files and to permit plotting from a separate Personal Computer.

Cadkey will support 640- by 420-line resolution and 16 colors. The package requires a minimum of 512K bytes of internal memory.

Micro Control Systems is located at 27 Hartford Tnpk., Vernon, Conn. 06066.

SPSS upgrades software

CHICAGO — SPSS, Inc. has unwrapped Release 1.1 of its SPSS/PC data analysis software, which expands the range of compatible microcomputers that will support the company's statistical analysis software.

The version makes the software compatible with the IBM Personal Computer AT 5170 Model 99 and the hard disk drive versions of Tandy Corp.'s Tandy 2000 and Texas Instruments, Inc.'s Professional microcomputers.

Enhancements include access to Microsoft Corp. MS-DOS-like commands, analysis of multiple data files within one session, creation of automatic profiles for customizing set options, inclusion of command files with the SPSS/PC command permitting files for batch processing and interruption of processing before a command is executed or during execution or printing.

The package is priced at $795, the vendor said.

SPSS is located at 444 N. Michigan Ave., Chicago, Ill. 60611.

Microprophit upgrades to offer Help screens, program ability

SAN DIEGO — Via Computer, Inc. has announced enhancements to its Microprophit financial planning and modeling system for the IBM Personal Computer.

Microprophit, priced at $695, is the personal computer version of Via's mainframe-based Prophit II modeling system and reportedly has the same capabilities, including 50 prewritten modeling functions. Among those functions are depreciation, loan amortization, simultaneous equations and currency conversions.

Microprophit 3.11 enhancements include such features as customized Help screens and the ability to program several command sequences. Operator intervention with one-time processed reports is said to be eliminated.

Microprophit is said to contain full consolidation and analytical functions, such as goal-seeking, "what-if" scenarios, line-item and base-period ratios. Also included are eight alternative forecasting methods and the ability to produce customized reports.

Via Computer is located at 7177 Construction Court, San Diego, Calif. 92121.

Curtis introduces ROM board

ST. PAUL, Minn. — Curtis, Inc. has announced an accessory card for the IBM Personal Computer and compatible microcomputers.

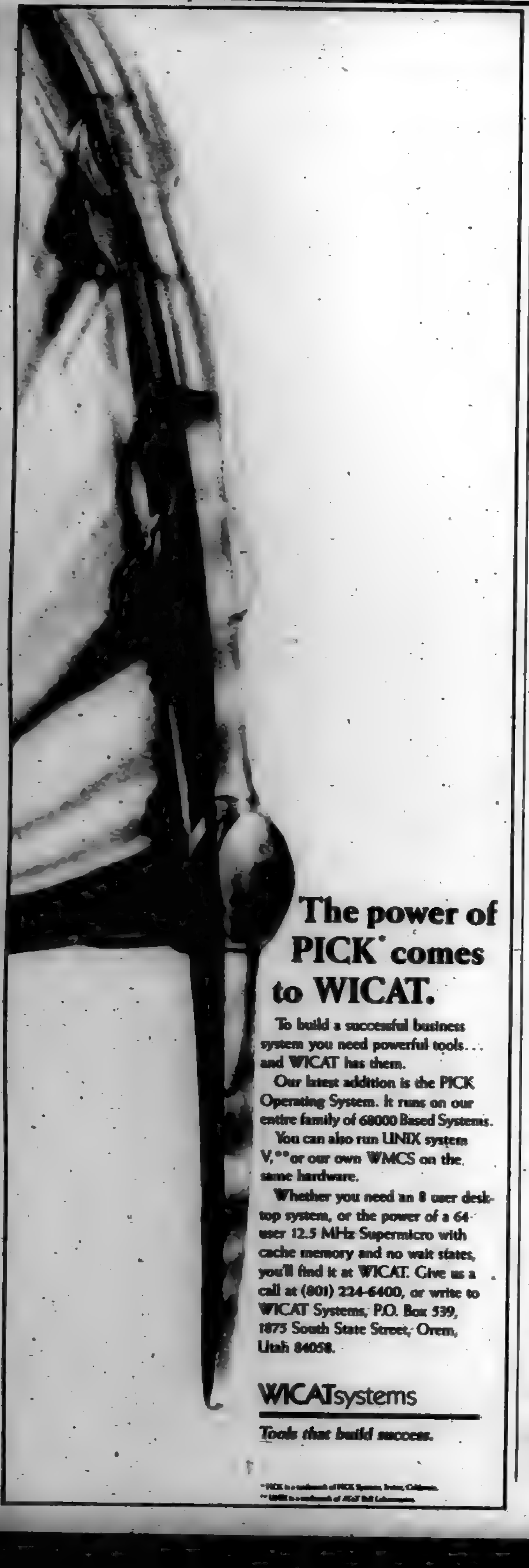
Romdisk PC consists of erasable read-only memory (ROM) and circuitry said to emulate a write-protected diskette and disk drive controller.

Romdisk PC is said to operate with IBM PC-DOS and Microsoft Corp.'s MS-DOS operating systems.

Users can select an operating system, programs or program files and copy them from disk into the ROM with a utility program, according to a Curtis spokesman.

Three models are available. Romdisk PC-0, at $599, is a half-size board with 180K bytes of storage. Romdisk PC-1, also $599, is a full-size board with 180K bytes of storage, upgradeable to 360K bytes. Romdisk PC-2, at $99, is a full-size board with 360K bytes of storage.

Curtis is located at 22 Red Fox Road, St. Paul, Minn. 55110.



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Sperry V.I.P.S. Voice Information Processing System. The intelligent way to use the telephone.

Now you can abolish the wasteful game of telephone tag. And do away with a tremendous amount of costly memo writing.

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As a stand-alone system, V.I.P.S. will store, send, and receive voice messages at your command—to or from any Touch-Tone® phone, anyplace, anytime. You can even integrate V.I.P.S. with the Sperrylink™ Office Information System.

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You can authorize anyone or everyone in your organization to use V.I.P.S. Users can call the system and pick up messages. Leave replies. Even forward someone else's message—with or without comments—to others.

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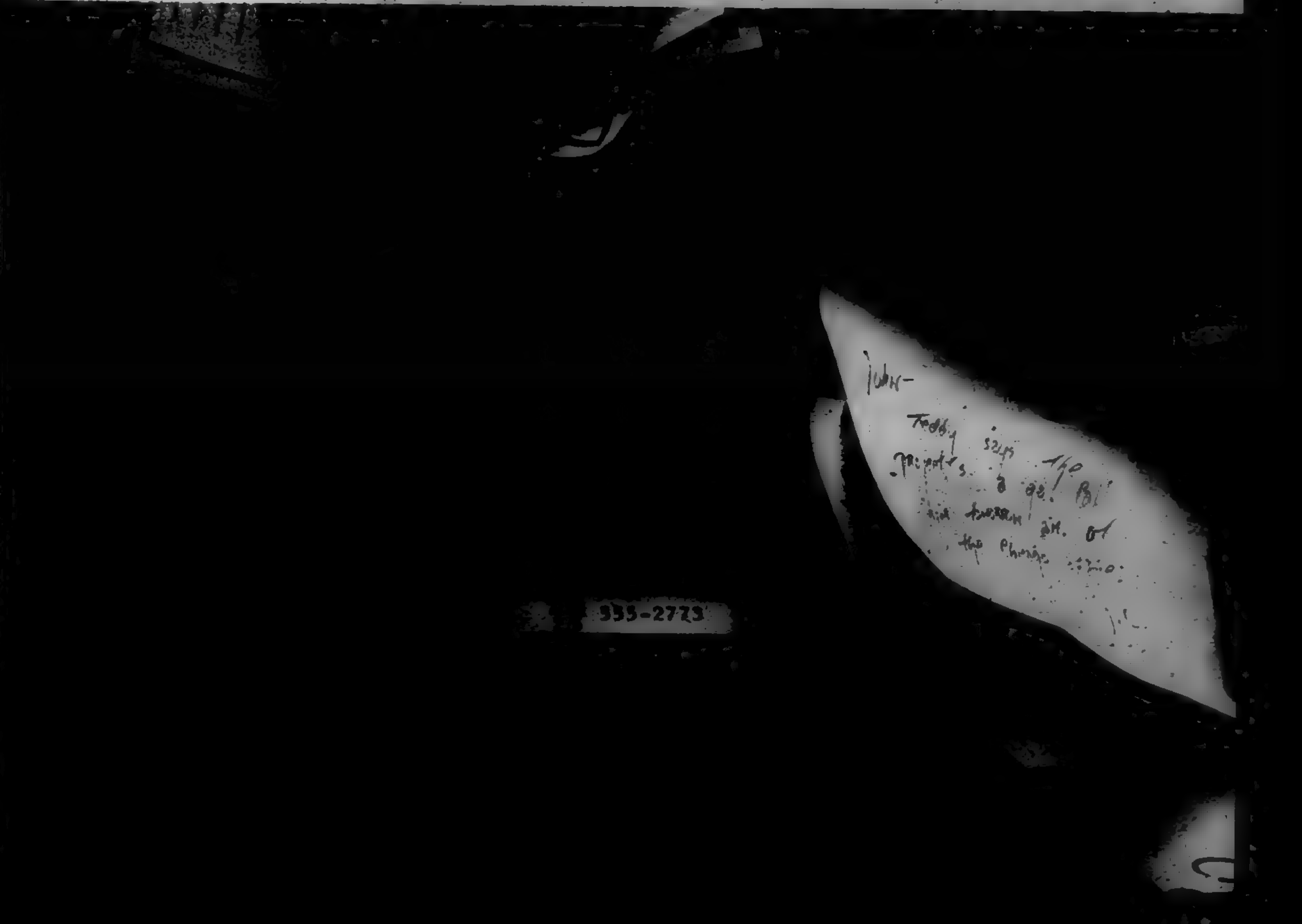


Micro Focus announces Mac Cobol for Apple's Macintosh

By Kathleen Sullivan
CW West Coast Bureau

PALO ALTO, Calif. — Micro Focus Ltd. has introduced Mac Cobol, a version of the Cobol programming language designed for Apple Computer, Inc.'s Macintosh computer.

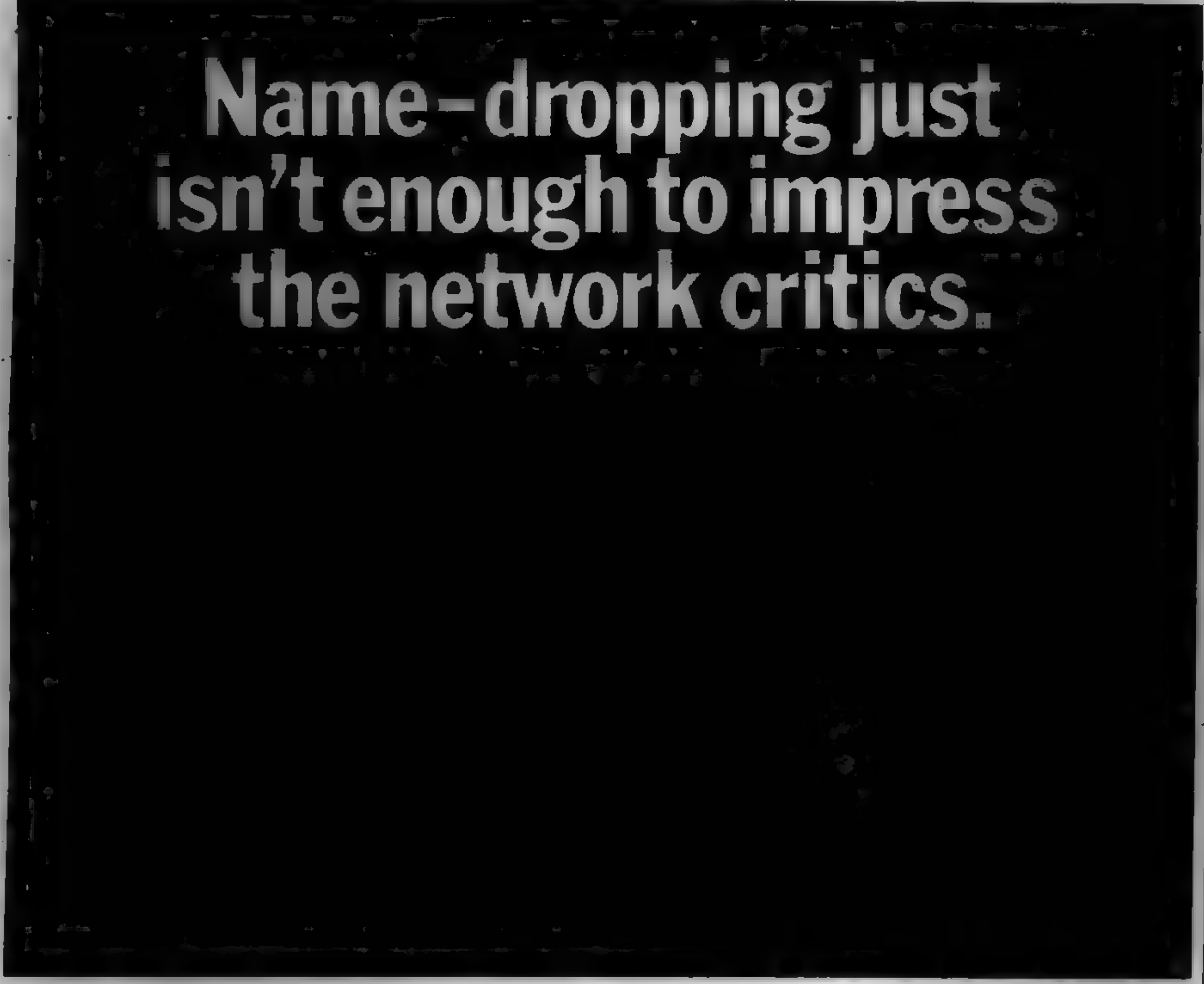
According to Eagle Berns, technical manager of the firm's Mac Cobol group, Micro Focus applications written for the IBM Personal Computer are compatible with Mac Cobol, so existing applications can be ported and then modified to take advantage of the Macintosh's user interface.

Mac Cobol is said to provide access to 386 of the Macintosh's 512 read-only memory (ROM) routines. The Mac Cobol developer can compile calls directly from ROM routines, as well as build windows and menus into the application, according to Micro Focus.

Mac Cobol is said to feature the company's High Performance Level II compiler and to include the following:

- A Cobol source code editor.
- A generate tool that compiles Micro Focus intermediate code into Motorola, Inc. 68000 object code.
- A run tool that allows execution of multiple interdependent programs that have been compiled and generated.
- A build tool creating distributable, executable modules that combine applications programs with Micro Focus Application Support Modules.
- Isam file handling. Mac Cobol can handle up to 12 files using an external disk drive on the Macintosh.

Micro Focus is located at 2465 E. Bayshore Road, Palo Alto, Calif. 94303.



Name-dropping just isn't enough to impress the network critics.

Now that the local area network (LAN) industry is booming, some pretty big names in the computer business are jumping on the bandwagon. Their goal is simple: get a LAN on the market and let all those who pay homage to The Name run out and buy it.

At Novell, we don't have a big name to drop when selling NetWare, our high-performance LAN operating system. So we let our technology do the talking. And the network critics are not only listening, they are taking notice.

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No LAN operating software outperforms NetWare. With speed, flexibility, security and hundreds of multiuser applications, NetWare sets a standard for the entire LAN industry.

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NetWare is more than a LAN operating system. Currently, NetWare software is available for 24 LAN hardware systems. Plus, four complete LAN systems are sold and serviced by Novell.

Compatibility.
Because NetWare is compatible with DOS 3.1, it can run any application written for the IBM PC Network Program. And NetWare greatly increases IBM PC Network performance and applications software usability.

Internetworks.
Using bridges, NetWare can connect separate LAN systems into one large internetwork. In fact, every LAN Novell supports can be interconnected—any number, in any of the various topologies.

Remember the name.
The one LAN system making a big impression on the network critics is the one with the not-so-big name: NetWare, from Novell. Remember it when you want a high-performance LAN instead of a high-powered name.
For more information, call or write:

Novell

Novell, Inc. 1170 N. Industrial Park Drive,
Orem, Utah 84057 (801) [illegible]

SOFTWARE

Smart Software, Inc. has announced enhancements for its Smartforecasts software for business forecasting and data analysis on the IBM Personal Computer.

Smartforecasts 1.1 will accommodate users whose data is reported by accounting month, business week or business day, according to the vendor. Reportedly, it can also accommodate data generated annually, quarterly or monthly.

Another enhancement is the ability to transfer data to other personal computer programs, such as Lotus Development Corp.'s 1-2-3 spreadsheet, Smart Software said.

Smartforecasts is said to feature automatic forecasting, which selects the statistical forecasting method appropriate for the user's data and tunes that method for greatest accuracy.

Smartforecasts 1.1 is priced at $495 and requires 256K bytes of internal memory, a color-graphics adapter and graphics monitor.

Smart Software, 392 Concord Ave., Belmont, Mass. 02178.

Software Studios, Inc. has released Freeware, its PC-Desk program, which features a calendar/reminder, a calculator, an address file, an automatic phone dialer, a word processor, a repetitive letter writer, a label and envelope printing facility and telephone directory.

The program, for IBM Personal Computers and compatibles, requires 64K bytes of memory, a disk drive, a printer and IBM's PC-DOS 2.0 or higher operating system.

A $25 registration fee covers mailing costs, a 21-page user manual and future updates and telephone support. Once the fee is received, the user may freely copy and distribute the software, the vendor said. Registered owners will receive instructions on how to bypass the sign-on Freeware message and how to incorporate a password access system.

Software Studios, [illegible] Sugarbush Court, Annandale, Va. [illegible]

See SOFTWARE page 114

Test Your Microcomputer IQ*

1. Name a totally integrated software package that was rated #1 by *Software Digest*. ____
2. Where can you buy an IBM PC XT or AT, AND have it installed, AND get on-site warranty for it? ____
3. Who will educate IC personnel or end-users at their site or yours? ____
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation? ____
5. What provides a micro software facility that allows you to customize a system to your specific requirements? ____
6. Who are the premier micro consultants to the *Fortune* 1350 companies? ____
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals? ____
8. What is the easiest way for an IC manager to satisfy the many end-user needs in the organization? ____
9. What company's evolutionary approach to software and service (also demonstrated by NOMAD, now NOMAD2, the premier 4GL/DBMS) ensures that they'll be a major force in the micro marketplace for years to come? ____
10. Name the companies that can provide all of the above? ____

*(Turn Page Upside Down for Answers)

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SOFTWARE

from page 112

■ Castec Software, Inc. has introduced solids-modeling software said to allow engineers to configure the IBM Personal Computer XT as a stand-alone mechanical design workstation.

The package, which runs under IBM's PC-DOS 3.0, is said to integrate a three-dimensional solids modeler with automatic finite-element surface mesh generation.

Graphics capability includes three-dimensional color shading, outline views with suppressed hidden lines and two-dimensional and three-dimensional section views. Features include on-line documentation, user-programmable function keys and batch-mode capability.

The price of the software is $9,500 for the solids modeler component, $6,500 for the finite-element modeler component and $2,000 for the analysis interface. Purchased together, the cost is $15,000.

Castec Software, Suite 100, 5 Dunwoody Park, Atlanta, Ga. 30338.

■ Concept Omega Corp. has introduced its Concept G business graphics system for Microsoft Corp.'s MS-DOS and Xenix, AT&T's Unix and SMC Software Systems' Thoroughbred OS operating systems.

Concept G reportedly can automatically generate a graph from data and can generate a horizontal or vertical bar chart from information contained in any Business Basic data file. Its bar charts can be designed to user specifications or automatically scaled to existing data.

Other options are said to include chart labels, value displays, footers, headers and the ability to save and retrieve graph specifications.

Concept G costs $495.

Concept Omega, P.O. Box 6818, Bridgewater, N.J. 08807.

■ Executat, Inc. has introduced its Executat statistical analysis package for the IBM Personal Computer.

Executat reportedly offers the functions of basic plotting, descriptive methods, estimation, time-series analysis, regression analysis and financial calculation.

The package also includes a pull-down calculator, scratch pad and appointment calendar, the vendor said. It reportedly permits graphics editing through interactive cursor movement and can import data from several popular Personal Computer software packages.

Executat requires a Personal Computer with 256K byes of internal memory, two diskette drives, a graphics card and a high-resolution graphics board. It costs $495.

Executat, Research Park, 2 Wall St., Princeton, N.J. 08540.

■ Poseidon Systems has introduced its Pollpac retail data file collection software for use on the IBM Personal Computer and personal computers under Digital Research, Inc.'s CP/M and CP/M 86 operating systems.

Pollpac reportedly can interact with Poseidon's PAC communications hardware to upload data to a micro from electronic cash registers and point-of-sale (POS) terminals. The latter two types of equipment require an RS-232 port and use of a communications protocol.

Pollpac also reportedly allows data to be sent to electronic cash registers and POS systems to set their initialization parameters and alter data in memory.

Pollpac requires a personal computer with at least 128K bytes of internal memory and a real-time clock interrupt. It is priced at $1,500.

Poseidon Systems, 223 Crescent St., Waltham, Mass. 02154.

■ Heuristic Computer Systems has introduced its HCS/Editor, a full screen editor for the IBM Personal Computer and personal computers under Digital Research, Inc.'s CP/M operating system.

HCS/Editor functions are said to include the use of all free memory, a text entry mode, sorted disk directory, file recovery and full disk recovery. Also provided are functions to edit, browse, delete, rename and print.

The package reportedly can copy, create and delete files, and permit users to copy data between two edit sessions. HCS/Editor reportedly is also able to create specially defined function keys, including those for screen refresh, four-way data scrolling and insertion and deletion of characters.

HCS/Editor requires 192K bytes of internal memory under IBM's PC-DOS or Microsoft Corp.'s MS-DOS operating system and requires 64K bytes under CP/M. The price of HCS/Editor is $94.95.

Heuristic Computer Systems, 853 Hickory Drive, Carmel, Ind. 46032.

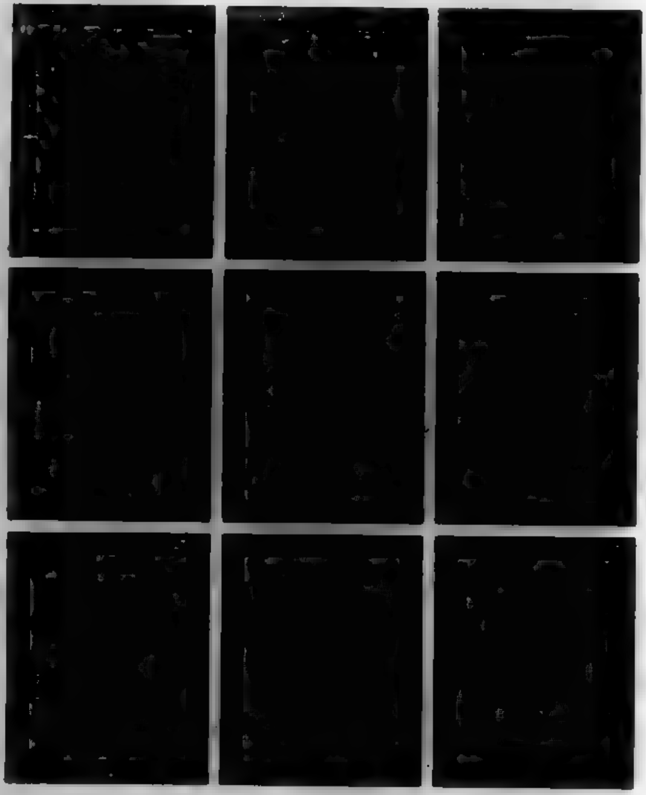
■ Absoft Corp. has introduced Macfortran, a version of the company's Ansi Fortran 77 Compiler for the Apple Computer, Inc. Macintosh.

According to the vendor, Macfortran supports pull-down menus, windows and the Macintosh mouse. The package includes a full screen source-level debugger, linker, library manager, full toolbox interface, Apple's Edit text editor and documentation.

Macfortran is said to be a full implementation of the Ansi Fortran 77 standard, allowing mainframe Fortran programs to be downloaded, recompiled and run without modification.

Macfortran reportedly will run on the single diskette drive 128K-byte version of the Macintosh. The software costs $295.

Absoft, 4268 N. Woodward, Royal Oak, Mich. 48072.



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MICROCOMPUTERS

SYSTEMS

■ **Cromemco, Inc. has introduced its CS-400 line of hard disk drive-based supermicrocomputers, available in models offering 4M, 8M or 16M bytes of random-access memory (RAM).**

According to the vendor, the systems come standard with a 5¼-in., 390K-byte diskette drive and a 32M-byte cartridge tape drive for data backup.

A choice of 140M-byte or 280M-byte hard disk storage units also is offered.

Models in the CS-400 line are delivered with the AT&T Unix System V multiuser operating system. Under Unix, the CS-400 models can utilize 740K bytes of RAM as a buffer area, Cromemco said.

The CS-400 series uses Cromemco's XPU processor. Each CS-400 is said to have a capacity for 21 boards.

The systems are priced ranging from $24,995 to $53,995 depending on RAM, hard disk capacity and other options.

Cromemco, 280 Bernardo Ave., Mountain View, Calif. 94039.

■ **Applied Digital Data Systems, Inc. has released its Mentor 1500 microcomputer system.**

The Mentor 1500 runs as a multiuser system under Applied Digital's enhanced Pick & Associates, Inc. Pick operating system or as a stand-alone IBM Personal Computer XT-compatible under Microsoft Corp.'s MS-DOS.

The Mentor 1500 has a built-in 5¼-in. floppy drive with 320K- or 360K-byte capacity and a 10M-byte capacity hard disk. Its 256K-byte random-access memory is expandable to 640K bytes.

A 12-in. monochrome monitor is included, and a 12-in. color monitor is optional.

The price of the Mentor 1500, including both operating systems, is $4,890.

Applied Digital Data Systems, 100 Marcus Blvd., Hauppauge, N.Y. 11788.

■ **Sony Corp. of America's Information Products Division has unwrapped its Model 10 word processing console and software system.**

The Model 10 word processing system, with 288K bytes of internal memory, is available in configurations with 20, 35 or 55 char./sec printers. In addition to the CPU and 9-in., 80-char. by 25-line black-on-white display, the console includes room for one or two Sony 3½-in. floppy disks.

According to the vendor, the library of software available for the Sony Series 35 system will be available for the Model 10.

The Model 10, with basic word processing software but no printer, costs $2,395.

Sony, Sony Drive, Park Ridge, N.J. 07656.

■ **Microsystems International Corp. has introduced its ME2 and ME5 Executive Workstations, which reportedly allow IBM Personal Computer users to create multiuser systems without the addition of fully configured Personal Computers.**

The ME2 and ME5 reportedly include an IBM Personal Computer-compatible keyboard, an 80-char. by 25-line monochrome monitor, one serial port and an Intel Corp. 8088 microprocessor. The ME2 offers 256K bytes of internal memory; the ME5 provides 512K bytes.

When installed with a Personal Computer, both are said to provide all of the functions of a second Personal Computer, including the use of Personal Computer software such as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase II. Under MSI's RTNX-M software, file and record locking reportedly are provided to the network.

The ME2 is priced at $1,750, while the ME5 costs $2,150.

Microsystems International, 100 Pennsylvania Ave., Framingham, Mass. 01701.

COMMUNICATIONS

■ **Paramis Corp. has introduced a combination file and print server designed for use with Apple Computer, Inc.'s Appletalk local-area network and the Apple IIe and Macintosh microcomputers.**

Called Paraserv, the server is said to include hardware and and software that will allow an Apple IIe or Apple II+ with an Apple Profile hard disk drive to act as a multifunction Appletalk network server. Paraserv enables Appletalk users to share expensive resources, such as disk drives and printers, that are connected to the Apple II, according to the vendor.

The hardware consists of a server processor, a single-board computer in the form of an interface card installable in the Apple IIe expansion slot.

The processor reportedly includes the functions of up to six separate cards: four serial interface ports, one parallel printer interface and a real-time clock, the vendor spokesman said.

The software includes file and print service to both Macintosh and Apple II users.

Paraserv is priced at $595 for the Macintosh. A workstation card for the Apple II costs $249.

Paramis, Suite 101, 1011 Brioso Drive, Costa Mesa, Calif. 92627.

■ **National Information Systems, Inc. has announced that a version of its microcomputer-to-mainframe communications software product**

Continued on page 118

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Continued from page 116

is now available for all Fortune Systems Corp.'s computer systems running AT&T's Unix operating system.

Teleport II is said to provide communications between micros and mainframes and between micros and micros. It is said to offer both local micro terminal emulation and transfer of information between local and remote systems.

The software is said to feature a micro and mainframe server mode that provides automatic file transfer and logout after initial connection is made to a remote system.

Prices for microcomputers range from $150 to $495, depending on the quantity ordered, the vendor said.

National Information Systems, 20370 Town Center Lane, Cupertino, Calif. 95014.

■ **Network Software Associates, Inc. has introduced Adaptsna Pccom, a software package that reportedly permits IBM Personal Computers operating in IBM Systems Network Architecture/Synchronous Data Link Control environments to communicate.**

Adaptsna Pccom reportedly allows communication over the same high-speed lines that connect the Personal Computers to the user's mainframe but requires no mainframe intervention.

The software provides file transfer capabilities and allows the files on the called Personal Computer to be renamed or deleted remotely by the calling Personal Computer.

Using the software, the calling micro is said to be able to change a directory path or display a current directory, among other functions.

Adaptsna Pccom is priced at $475 and requires a Personal Computer with at least 128K bytes of internal memory, an IBM SDLC adapter card and a synchronous modem.

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

■ **Forte Data Systems has introduced its Fortelink SNA remote micro-to-mainframe communications software for the IBM Personal Computer line.**

Fortelink SNA reportedly provides a connection to Forte's file tranafer package, Fortenet, allowing remote micros to obtain infomation in data files and to tap into mainframe application programs. It also allows Personal Computers to emulate remote IBM 3274/3276 controllers, functioning as members of an existing IBM 3270 network.

A fifth session operates in the background to convert the Personal Computer printer into a IBM 3287 printer. Fortelink SNA is priced at $695.

Forte Data Systems, 2205 Fortune Drive, San Jose, Calif. 95131.

■ **Beehive has announced its PC-178 link between the IBM Personal Computer and compatibles and the IBM 3270 network.**

PC-178 allows the microcomputer to display a screen that looks and acts like an IBM 3178 terminal screen. With the aid of a protocol converter, such as Beehive's CC-74, microcomputers are said to be able to talk to an IBM bisynchronous or Systems Network Architecture net.

PC-178 comes in two models. The PC-178 allows a personal computer to work with any protocol converter that is compatible with Beehive's DM-78 or ATL-078 terminals and costs $195. The PC-078 works only with the Beehive CC-74 and is priced at $195 per cluster.

Beehive, 4910 Amelia Earhart Drive, Salt Lake City, Utah 84116.

■ **Telexpress, Inc. has announced that its enhanced Teleterm asynchronous communications package now runs on micros that run under IBM's PC-DOS, Microsoft's MS-DOS, Radio Shack's L-DOS and TRS-DOS and AT&T Unix operating systems.**

Additional features include terminal emulation of Digital Equipment Corp.'s VT100 and VT52 terminals, IBM's 3101 Model 10, Applied Digital Data Systems Inc.'s Regent 25 and Viewpoint terminals and others. An emulation editor can be used to create and/or edit additional terminal emulations.

The Teleterm-EM package is now able to operate in several additional networks, including ITT's Timetrans, Western Union's Easylink, GTE's Telenet, MCI's MCI Mail and RCA's Global Communications, the vendor said. Disk-to-disk file transfer can be performed among all microcomputers equipped with Teleterm-EM, and the package can perform file upload and download procedures with any asynchronous system. Additional features include an unattended operation mode and a transparent print mode.

The price of Teleterm-EM ranges from $195 to $225.

Telexpress, P. O. Box 217, Willingboro, N.J. 08046.

■ **Infoservices, Inc. has announced its IST100 block and character emulation of Prime Computer's PST100 terminal for IBM Personal Computer XTs and compatibles.**

IST100 block and character emulation operates through a model interface or direct connect at transmission rates from 300 bit/sec to 9.6K bit/sec. The package reportedly gives users the capability to use software application programs on a microcomputer without additional software installation or modification to the Prime host computer.

The software costs $295.

Infoservices, Suite 22, 1728 Montreal Circle, Tucker, Ga. 30084.

See TALK page 120

TAPESTRY

from page 109

Five hundred on-line Help screens are also reportedly included.

With Tapestry's icon-based approach, network files are contained in "drawers" within "filing cabinets," Sutton said. Drawers may be shared or private, and drawer space is dynamically allocated by the network. Tapestry provides password protection, with up to five levels of file read/write protection. File- and record-locking reportedly are available for multiuser applications.

The electronic mail system contains a full-feature text editor and the ability to enclose files generated in other applications. Tapestry also supports messages of incoming mail within applications.

The telephone manager stores names, numbers and other information and can search for entries and autodial calls, according to Torus.

Tapestry's communications gateways emulate TTY and Digital Equipment Corp. VT100-type terminals and reportedly can find a free modem on the network and then connect to remote services. Sutton said Torus plans to implement IBM 3270 emulation as well but gave no date.

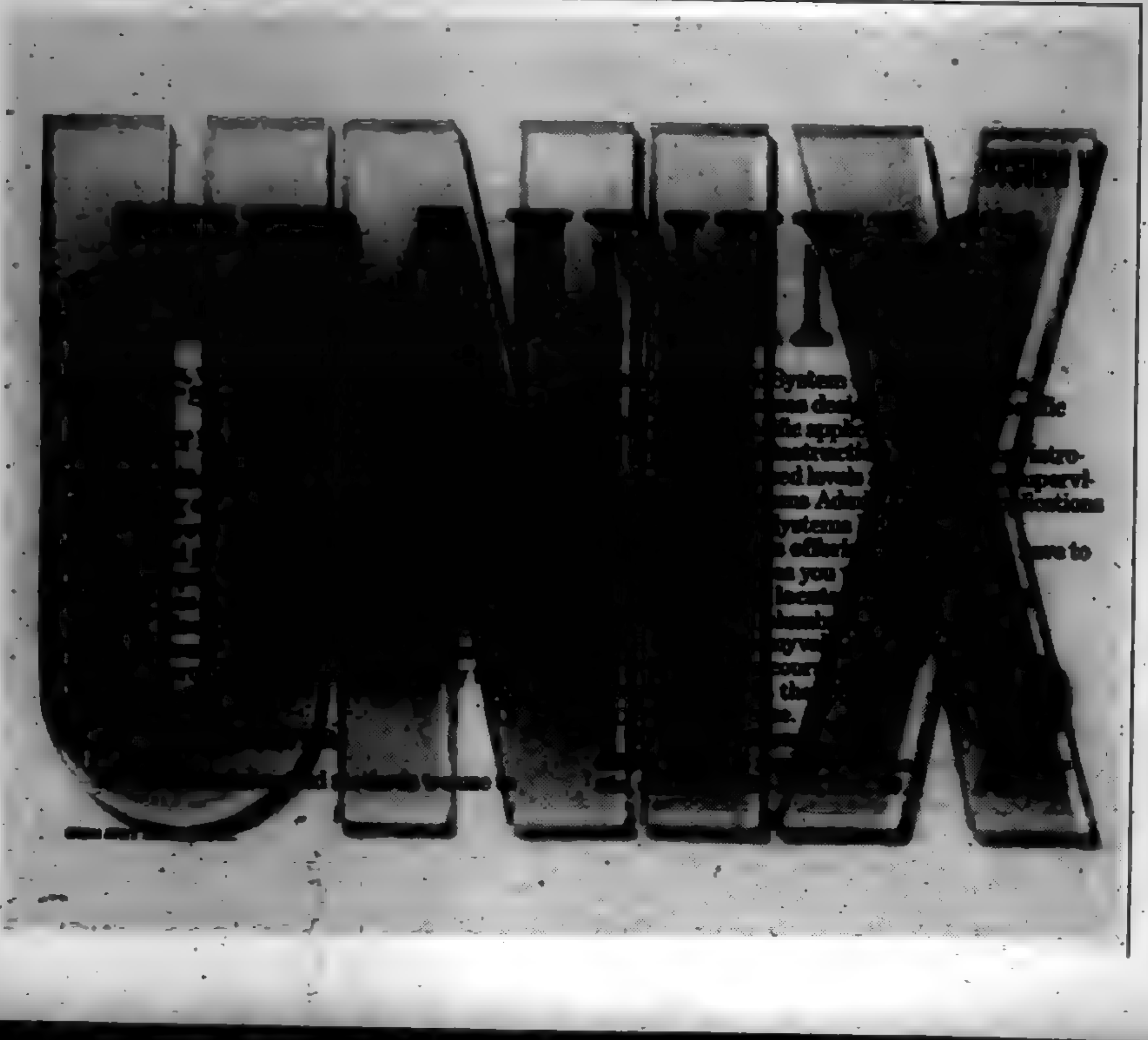
The applications library stores PC-DOS applications and downloads them to network workstations (subject to licensing and technical limitations). Some current applications work imperfectly under this setup, Sutton acknowledged, but Torus provides documentation covering the packages' limitations.

Tapestry runs on the PC Network equipped with IBM Personal Computers, Portable Personal Computers, Personal Computer XTs and Personal Computer ATs. It also may run with some floppy disk drive compatibles, Sutton said.

The network software requires PC-DOS 2.0 and up, with 256K bytes of random-access memory (RAM) for workstations and 320K bytes of RAM for servers. Unlike PC Network Program, Tapestry does not require dedicated network servers. A Personal Computer with a hard disk, Personal Computer XT or Personal Computer AT will act as a server. Tapestry supports mouse products from Mouse Systems Corp. and Microsoft Corp.

Torus Systems is affiliated with Torus Systems Ltd. of Cambridge, England, a computer communications company. IBM recently signed an agreement to distribute Tapestry in Europe, according to Torus Systems Ltd. The English firm developed Icon, a similar network software package for Ethernet hardware, available in Europe since last July.

Torus Systems is located at Suite 103, 485 Seaport Court, Redwood City, Calif. 94063.



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Relative Price Performance Index
**Computerworld, August 20, 1984*

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It is a common and reasonable assumption that because there is redundancy (extra programming, or extra components) in fault tolerant computers, that makes them cost more. Where the redundancy is in expensive software, this is true. But Stratus has hardware-based fault tolerance that takes advantage of the extraordinary advances in chip technology. The result—price drops. The fact of the matter is, our hardware redundancy adds a mere fraction to our cost, and absolutely nothing to your purchase price. What's more, in overall price/performance comparisons against the top computer names, including IBM, DEC, and Hewlett Packard, Stratus was at the front of the pack, despite the fact that it included fault tolerance, while the others didn't.

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Stratus.
CONTINUOUS PROCESSING™
Now that the world relies on computers it needs a computer it can rely on.

MICROCOMPUTERS

APPLE from page 118

■ **Honeywell, Inc. has added a file transfer facility to its PC7800 software linking Honeywell DPS 8 and DPS 88 mainframes with Honeywell Microsystem PC and Microsystem 6/10 micros and certain Microsoft Corp. MS-DOS-based micros.**

The file transfer facility is based on the Columbia University Center for Computing Activities' Kermit protocol.

The extended PC7800 software exchanges files from a Honeywell mainframe operating under Honeywell's GCOS 8 time-sharing system to a Kermit-based program residing on a micro. The software emulates function keys and switches operable on Honeywell VIP7800 series terminals. The package comes on a 5¼-in. floppy diskette and costs $495 per micro.

Honeywell, P.O. Box 8000/A-92, Phoenix, Ariz. 85066.

■ **Bizcomp Corp. has released its Intellimodem EXT stand-alone 300/1,200 bit/sec communications system for use with serial RS232-equipped computers or terminals.**

A voice insert capability allows use of a standard telephone to add integrated voice to a personal computer workstation. For data uses, the modem is compatible with Hayes Microcomputer Products, Inc. modems. A call progress detection feature allows the modem to sense telephone system signals like a busy or dial tone and display these conditions on the computer screen.

Cost of one unit is $499.

Bizcomp, 532 Mercury Drive, Sunnyvale, Calif. 94086.

STORAGE DEVICES

■ **Interphase Corp. has introduced its Maverick Storage Module Device (SMD) PC-80 disk controller for the IBM Personal Computer AT and the AT&T 6300.**

The SMD PC-80 reportedly offers support for SMD disks in capacities up to 800M bytes or more, controls two SMD drives with one controller and supports disk data rates of 20M byte/sec.

The SMD PC-80 for the Personal Computer AT and AT&T 6300 costs $1,295.

Interphase, 2925 Merrell Road, Dallas, Texas 75229.

APPLE from page 109

Computer world.

Just when we are now (finally) starting to get a flood of impressive Macintosh software, we are seeing Macintosh-like, window-oriented software trickle into the IBM world — where it is a welcome change.

Some of these programs, such as Microsoft Corp.'s Word, are commercially successful. Others, such as Digital Research, Inc.'s Graphics Environment Manager or Torus Systems, Inc.'s Tapestry (see story page 109), may or may not carve out a niche.

But these products are all examples of an ongoing revolution in software design. The change is easily seen in a simple experiment: Set up a 512K-byte Macintosh next to a high-end IBM Personal Computer or compatible and watch where those casually interested in new programs end up.

On the Macintosh, beta test programs sometimes can be run happily without any documentation whatsoever. Back in the Big Blue environment, however, the different software environment is like a slap in the face — those hundreds of pages of documentation, all those commands.

Comparisons of the two interfaces themselves are even more dramatic. IBM's Topview, which takes only timid steps toward a graphics-based interface, looks like a sick puppy compared with the Macintosh.

Although good PC-DOS programs today may be more powerful or full-featured than their competitors on the Macintosh, generally they are still stuck with those high learning barriers. People just don't want to make the effort unless there is no other choice.

And there is a choice. The graphics-based user interface did not begin with the Macintosh, of course, and there is nothing about that machine to nail down a monopoly. On the contrary, a Personal Computer AT with a high-resolution graphics adapter and monitor looks very promising. When AT supplies increase and new software hits the street, users may begin to see the best of both worlds.

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[illegible] about their PC network.

But if your plans [illegible]

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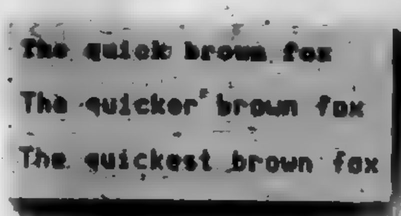

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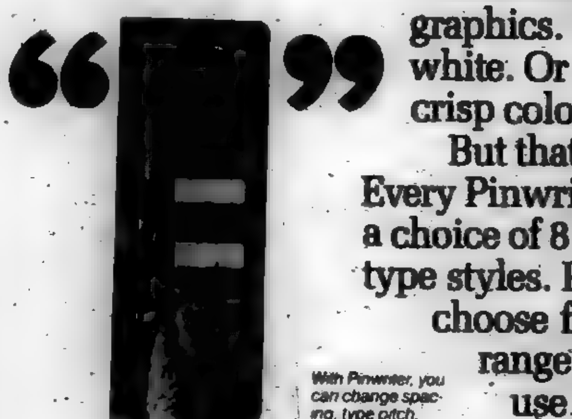

With Pinwriter, you can change spacing, type pitch, and speed with one finger.

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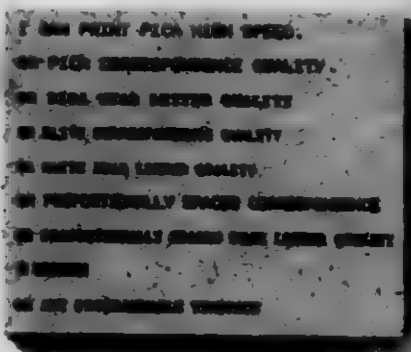

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COMPUTER INDUSTRY

Cultural shift sours former Apple staff

By Kathleen Burton
CW West Coast Bureau

CUPERTINO, Calif. — The recent departures of its whiz kid cofounder and other key engineers and marketing employees from Apple Computer, Inc. highlight the dramatic corporate cultural changes that are sweeping the eight-year-old company.

Wozniak

According to sources, since Apple decided to challenge IBM for the Fortune 1,000 office market last year, its highly distinctive corporate culture has become diluted because of the hiring of consumer-oriented outsiders. These bureaucracy-bound outsiders have narrowly focused on new products and strategies geared for the business market, disillusioned former employees claimed in recent interviews.

The most celebrated departure recently was that of Apple cofounder Steve Wozniak, who left the company earlier this month to work on his own noncomputer projects.

Wozniak said he was disappointed that the Apple IIe, the company's most financially successful product, is being ignored in favor of the Macintosh, the product Apple targeted at the business market.

"There's a lot of Macintosh and Apple II territorialism going on now," Wozniak said, "and it's fragmenting the company." He said the company's decision to focus its energies on business, and away from its traditional educational and home markets,

See APPLE page 132

CDLA to alter tax stance

Depreciation rescheduling effort may be dropped

By Peter Bartolik
CW Staff

BOCA RATON, Fla. — The Computer Dealers and Lessors Association (CDLA) is considering ending a two-year effort to shorten tax depreciation rate schedules for computer equipment and is divided over the U.S. Department of the Treasury proposal to eliminate the investment tax credit.

During a closed-door session at its spring meeting held here recently, CDLA members received a briefing on alternatives to the Treasury Department's flat tax proposal, which would extend depreciation tax reductions for computer equipment over an eight-year period.

Although the CDLA has been lobbying for two years to shorten depreciation schedules from five years to three years, association members were informed that the CDLA board of directors now believes a five-year schedule is most beneficial.

In a statement sent to members prior to the meeting, a transcript of which was made available to *Computerworld*, it also appeared that the directors favored repeal of the investment tax credit.

According to Ken Bouldin, the CDLA's legislative committee chairman and head of Economic Computer Sales, Inc., members were being polled at the meeting and a formal position on tax reform will be formulated in about two weeks. In the statement mailed out prior to the meeting, mem-

See CDLA page 126

- Management Science America, Inc. announced the disposal of its international operations, leaving the domestic portion of Peachtree Software, Inc. as its last retail microcomputer software entity still on the auction block/**126**
- An executive of AT&T Information Systems recently asked an association of dealers and lessors for help in establishing a third-party market for used AT&T equipment/**126**
- The slowdown in the semiconductor industry continued, with Signetics Corp. announcing cutbacks and a shorter workweek/**127**

Sperry, ITT did discuss merger

By Peter Bartolik
CW Staff

NEW YORK — Sperry Corp. and ITT announced recently they had discussed, but were unable to agree on, what would have been the largest merger to date in the information processing industry.

The companies, responding to rumors on Wall Street of an impending merger, announced they had held preliminary discussions on the possibility of ITT acquiring Sperry or a merger of the two companies during the last week in February. Those discussions were terminated after the companies failed to reach an agreement acceptable to both parties.

Analysts said ITT over the past few months had been selling off various parts

See SPERRY page 131

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Can tax revision survive lobbies?

One influential U.S. senator thinks that special interest groups will kill off attempts at tax reform.

Speaking recently to one such interest group — the Computer Dealers and Lessors Association (CDLA), which focused on the tax issue at its spring meeting — Sen. J. Bennett Johnston (D-La.), one of the ranking Democrats in the Senate, scoffed that the so-called "flat tax" pro-

See TAXES page 130

CPE big item on regionals' omnivorous market menu

By James Connolly
CW Staff

Second in a three-part series

Almost as quickly as U.S. District Judge Harold H. Greene could sign the modified final judgment in January 1982 breaking up the Bell system, the seven new regional holding companies started looking for new ways to make money.

In their first 14 months of activity, the regionals have turned to cellular mobile telephones, consulting, leasing, publishing and real estate as revenue sources. But the venture that has caught the public's eye most — and the regionals' marketing fancy — has been customer premises equipment (CPE).

Under the modified final judgment, CPE subsidiaries can account for only 10% of a regional's total revenue. But that 10% can amount to close to $1 billion for a regional with more than $9 billion in revenue, which translates into a CPE subsidiary almost as large as Apple Computer, Inc.

Spokesmen for the seven regional holding companies point to the same goal for their new, unregulated ventures and their traditional carrier service — integrated information transfer. Barred from manufacturing equipment for six more years, they see themselves as agents and planners, offering one-stop shopping for communications customers who need someone to sell them equipment, arrange for dial tones and manage the installed system.

"I think what you are going to see

See CPE page 125

BELL SOUTH CORP. BELLSOUTH

Operating Companies: South Central Bell Telephone Co. (Ala., Miss., Tenn., Ky., La.) Southern Bell Telephone and Telegraph Co. (N.C., S.C., Ga., Fla.)

Subsidiaries: Advanced Systems Division (CPE*); Bell South Mobility (cellular); Bell South Financial Services Corp.

Number of Employees: 96,000

1984 Revenue: $9.52 billion

1984 Earnings: $1.26 billion ($4.28 per share)

Products and Services

Switching and Telephone Equipment	American Telecom, Inc. Focus private branch exchange. Intecom, Inc. PBX. AT&T Merlin telephone system. GTE Business Communications Systems, Inc. Omni series. ITT Business Communications Corp. System 3100. Northern Telecom, Inc., SL-1 and SL-100. Tie Communications, Inc. telephones and keysets.
Office Equipment	Digital Equipment Corp. office computers and software
Multiplexers and Modems	Paradyne Corp., General Datacomm Industries, Inc.
New Ventures	Synchronet digital transmission services for small cities. Lightgate fiber-optic services into customer premises. Pulselink packet-switching data network. Cellular mobile telephone projects in Miami, New Orleans and Atlanta. Touchstar multifeature telephone services.

*Customer premises equipment. Each regional holding company has its own CPE subsidiary.

CW CHART

COMPUTER INDUSTRY

AMERICAN INFORMATION TECHNOLOGIES CORP.

Operating Companies: Illinois Bell Telephone Co.; Indiana Bell Telephone Co.; Michigan Bell Telephone Co.; Ohio Bell Telephone Co.; Wisconsin Bell Telephone Co.
Subsidiaries: Ameritech Mobile Communications, Inc. (cellular); Ameritech Communications, Inc. (CPE*); Ameritech Credit Corp.; Ameritech Development Corp. (venture capital)
Number of Employees: 77,700
1984 Revenue: $8.34 billion
1984 Earnings: $990.6 million ($10.17 per share)

Products and Services

Switches and Telephone Equipment	NEC America, Inc. Neax 2400 private branch exchange and Electra key systems Tie Communications, Inc. PBX, key systems and telephones AT&T telephones and Centrex console Ericsson, Inc. telephones and Autocom answering and switch systems Northern Telecom, Inc. SL-1 and SL-100 PBX
Office Equipment	Davox Communications Corp. terminals Esprit Systems, Inc. terminals
Multiplexers and Modems	General Datacomm Industries, Inc. multiplexers
New Ventures	Agreement to provide Satellite Business Systems Real Estate Communications Corp. with equipment for multitenant services. Ameritech Credit offers financing for CPE, cellular and other contracts. Cellular mobile telephone projects in Cincinnati, Detroit, Milwaukee, Chicago and other cities. Financial interest in slow-scan video system company. International consulting service. Agreements with companies developing fiber-optic and software-based local-area networks.

U.S. WEST, INC.

Operating Companies: Mountain States Telephone and Telegraph Co. (Colo., Utah, Ariz., N. M., Wyo., Idaho, Mont.); Northwestern Bell Telephone Co. (Minn., Iowa, Neb., S.D., N.D.); Pacific Northwest Bell Telephone Co. (Ore., Wash., Idaho)
Subsidiaries: Firstel Information Systems, Inc. (CPE*); New Vector Communications, Inc. (cellular); Interline Communications Services, Inc. (design and installation); U.S. West Financial Services; Betawest (property)
Number of Employees: 71,000
1984 Revenue: $7.28 billion
1984 Earnings: $887 million ($9.24 per share)

Products and Services

Switches and Telephone Equipment	NEC America, Inc. Neax 2400 private branch exchange Ztel, Inc. PBX Tie Communications, Inc. key systems and synthesized voice/digital data system Intecom, Inc. PBX
Office Equipment	IBM Personal Computer Grid Systems Corp. personal computers
Multiplexers and Modems	Not announced
New Ventures	New Vector Communications planning cellular systems for Costa Rica and Gulf of Mexico area. Betawest authorized to provide public real estate development and management. Interline won a $27 million federal contract for communications system serving agencies in the Bell Atlantic region and is pursuing similar contracts in other areas. Firstel markets Centron (Centrex) in addition to CPE and has opened franchised outlets in smaller markets.

PACIFIC TELESIS GROUP (PACTEL)

Operating Companies: Pacific Telephone and Telegraph Co. (Calif.); Bell Telephone Co. of Nevada.
Subsidiaries: Pactel Communications Systems (CPE*); Pactel Mobile Access (cellular service); Pactel Mobile Service (cellular resale); Pactel Publishing; Pactel International; Pactel Properties, Inc.
Number of Employees: 76,881
1984 Revenue: $7.8 billion
1984 Earnings: $828.5 million ($8.46 per share)

Products and Services

Switches and Telephone Equipment	Tie Communications, Inc. private branch exchange Northern Telecom, Inc. SL-1 and SL-100 PBX AT&T Merlin telephone system American Telecom, Inc. Focus PBX
Office Equipment	Data General Corp. personal, mini- and superminicomputers and Comprehensive Electronic Office applications package C. Itoh Electronics, Inc. printers
Multiplexers and Modems	Timeplex, Inc. multiplexers Codex Corp. modems
New Ventures	Pactel International has signed a joint marketing agreement with Spanish National Telephone Co. for international sale of systems and services. Pactel Properties plans real estate development, construction and management. Offering 56K bit/sec Public Switched Digital Service. Seeks to offer Intellicomm, integrated digital transmission of voice, data and video or customer-controlled bandwidth.

BELL ATLANTIC CORP.

Operating Companies: New Jersey Bell Telephone; Bell Telephone Co. of Pennsylvania; Chesapeake and Potomac Telephone Co. (Washington, D.C.); Chesapeake and Potomac Telephone Co. of Maryland; Chesapeake and Potomac Telephone Co. of Virginia; Chesapeake and Potomac Telephone Co. of West Virginia; Diamond State Telephone Co. (Del.).
Subsidiaries: Bell Atlanticom Systems, Inc. (CPE*); Bell Atlantic Mobile Systems, Inc. (cellular); Bell Atlantic Leasing Corp.; Bell Atlantic Ventures, Inc.
Number of Employees: 79,500
1984 Revenue: $8.09 billion
1984 Earnings: $973.1 million ($9.94 per share)

Products and Services

Switches and Telephone Equipment	NEC America, Inc. Neax 2400 private branch exchange Intecom, Inc. PBX Tie Communications, Inc. Delphi series and Datastar Tie and NEC America, Inc. call-accounting equipment Eagle Telephonics, Inc. Eagle/One
Office Equipment	AT&T Datakit local-area network Proteon Associates, Inc. Pronet local-area network NEC Information Systems, Inc. Astra 300 series processors Esprit Systems, Inc. ESP 6310 terminal Digital Equipment Corp. terminals and printers Telex Computer Products, Inc. terminals
Multiplexers and Modems	General Datacomm Industries, Inc.
New Ventures	Bell Atlanticom's Mainwave maintenance service. Acquired Telecommunications Specialists, Inc. interconnect contractor. Acquired A Beeper Co. Associates paging and mobile radio marketing firm. Acquired Sorbus, Inc. computer maintenance firm. Acquired Tricontinental Leasing Corp. third-party leasing firm. Initiated Custom Local-Area Signaling Service, allowing business customers to screen calls, trace calls and return missed calls. Acquired MAI Canada equipment sales and service firm.

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*Customer premises equipment. Each regional holding company has its own CPE subsidiary.

CW CHARTS

CPE

from page 123

is a hybrid organization coming online. It is going to be forced to focus on customer needs. We are going to need solid product lines, but I think packaging and integration are the keys," said Richard J. Santagati, president and chairman of the board of Nynex Business Information Systems Co., the CPE arm for Nynex Corp.

According to Ross Bagully, director of strategic marketing for U.S. West, Inc., one of the seven regionals, "We have been restricted by the court in areas such as data switching, but that is obviously a booming part of our industry. We intend, and have been straightforward about it all along, to be proactive rather than reactive and go to the limits that the court will allow."

In the CPE market, all seven regionals are selling several sizes of private branch exchanges (PBX) and key systems for smaller customers. Most offer modems and multiplexers and some office equipment, ranging from personal computers to superminicomputers.

All seven regional holding companies are involved in the cellular mobile telephone market, while several of the regionals have moved into various types of consulting and services. The latter group includes Bell Atlantic with its purchase of the Sorbus, Inc. third-party computer maintenance operation and Tri-Continental Leasing Corp.

Richard Notebaert, vice-president of marketing for American Information Technology (Ameritech), said, "Three years from now, I see us handling a full array of equipment that provides [for] all of a customer's communications needs."

Notebaert said this array of products will include computers, PBXs and office equipment.

Ameritech, like several other regionals, is marketing Centrex service, in which switching functions for all of an organization's extensions are performed at the central office. The company is also marketing the PBXs with which Centrex competes.

This has led to complaints from other Centrex resellers that the regionals are providing their CPE arms with preferential deals and that salesmen, except those with Ameritech, are promoting PBXs more than Centrex.

> ”
>
> *The move into CPE sales, which most of the seven regional holding companies claim will never include mainframe sales, creates new opportunities for vendors. It also has left one significant vendor largely out in the cold — AT&T.*

For U.S. West, which is considered one of the most aggressive regionals in terms of new ventures, CPE sales have been limited to PBXs and IBM and Grid Systems Corp. personal computers.

But the regional has gone beyond its own boundaries to plan cellular telephone systems in Costa Rica and for companies operating in the Gulf of Mexico area and to install communications systems for the U.S. government on the East Coast. U.S. West also plans to develop and manage real estate nationwide.

Nynex Business Information Systems and Pacific Telesis Group's (Pactel) Pactel Communications Systems are marketing Data General Corp.'s Comprehensive Electronic Office software, paired with DG computers that range from the Data General/One portable computer to the MV10000 superminicomputer.

Nynex has already opened, and Pactel plans to open, retail computer stores, targeting small- to medium-size businesses. But the majority of the regionals' CPE business is through direct sales.

The move into CPE sales, which most of the seven regionals claim will never include mainframe sales, creates new opportunities for vendors. It also has left one significant vendor largely out in the cold — AT&T.

"Our only AT&T product is the Merlin system [an electronic multiline telephone system]. Their other products weren't ready. When we were going through our research for our product line and our pricing structure, AT&T was going through its own decision making," Santagati said.

Some observers perceive the lack of interest in AT&T products — except for, perhaps, a handful of small systems offerings such as Merlin and Bell Atlanticom Systems, Inc.'s offer of the AT&T Datakit local-area network — as an indication that the regionals want to establish their independence.

CPE market winners

Among the winners in the battle for the CPE market, with multiple contracts with the regionals, are DG and multiplexer and modem manufacturer General Datacomm Industries, Inc.

Also included in this group are PBX and telephone equipment vendors Northern Telecom, Inc.; Tie Communications, Inc.; NEC America, Inc.; and Intecom, Inc.

Tie Communications, with a variety of PBX and key system offerings, has marketing agreements with all seven regionals.

MSA unloads international subsidiary

ATLANTA — Only the domestic operations division of Management Science America, Inc.'s (MSA) floundering microcomputer software business remains to be sold in the wake of MSA's recent announcement that it has dismantled its international operations subsidiary.

MSA said that Pinemark Business Systems Ltd. of Maidenhead, England, had acquired the Peachtree Business Management System line of micro software, which had been marketed through MSA's Peachtree Software International Ltd. subsidiary. An MSA spokesman said the move represents a "gradual closing down" of the London-based international arm of Peachtree and the sale of its products. He would not disclose the financial aspects of the agreement.

The termination of the international division leaves only Peachtree's domestic operations division — the Peachtree Software, Inc. subsidiary of MSA — on the selling block. MSA announced in October [CW, Oct. 22] that it would sell all four divisions of its packaged micro software operation. In January, [CW, Jan. 14] MSA, headquartered here, announced the sale of the Microcomputer Distribution Division to Corporate Software, Inc. of Waltham, Mass., for an undisclosed sum. Last month, MSA sold the educational division, made up of its Designware, Inc. and Eduware, Inc. subsidiaries, to Encyclopaedia Britannica, Inc. [CW, March 4].

The spokesman said MSA expects to make an announcement soon regarding the sale of the Peachtree Software subsidiary.

SOUTHWESTERN BELL CORP.

Operating Companies: Southwestern Bell Telephone Co. (Mo., Kan., Okla., Ark., Texas)
Subsidiaries: Southwestern Bell Telecommunications, Inc. (CPE*); Southwestern Bell Mobile Systems, Inc. (cellular); Southwestern Bell Publications, Inc.
Number of Employees: 71,000
1984 Revenue: $7.2 billion
1984 Earnings: $883.1 million ($9.04 per share)

Products and Services

Switches and Telephone Equipment	American Telecom, Inc. Focus private branch exchange Northern Telecom, Inc. SL-1 and SL-100 PBX Tie Communications, Inc. Datastar PBX NEC America, Inc. telephones Intecom, Inc. PBX
Office Equipment	Northern Telecom workstations
Multiplexers and Modems	IBM modems
New Ventures	Southwestern Bell Publications' subsidiaries market Yellow Pages advertising, specialty directories, catalogs, commercial printing and direct-mail service. Three-year, $900 million billing contract with AT&T. Cellular mobile telephone projects in Dallas, St. Louis and Kansas City, Mo. Cellular resale contracts in Houston, Miami and Los Angeles. Digital Link Services marketed to business and residential customers.

NYNEX CORP.

NYNEX

Operating Companies: New York Telephone Co.; New England Telephone Co.
Subsidiaries: Nynex Business Information Systems (CPE*); Nynex Mobile Communications Co. (cellular); Nynex Information Resources Co. (publishing)
Number of Employees: 95,000
1984 Revenue: $9.5 billion
1984 Earnings: $986.4 million ($10.10 per share)

Products and Services

Switches and Telephone Equipment	Intecom, Inc. private branch exchange GTE Business Communications Systems, Inc. Omni Tie Communications, Inc. Datastar, Delphi BK and Delphi BX Standard Telecommunications, Inc. Masterphone AT&T Merlin telephone system Northern Telecom, Inc. Vantage key system
Office Equipment	Data General Corp. personal, mini- and superminicomputers and software, including DG Comprehensive Electronic Office IBM, Wang Laboratories, Inc. and Compaq Computer Corp. personal computers NEC Information Systems, Inc. and Mannesman Tally printers
Multiplexers and Modems	General Datacomm Industries, Inc.
New Ventures	Cellular mobile telephone service in New York, Boston and Buffalo, N.Y. Joint sales force markets for CPE, Centrex and dial-tone. Datago retail computer stores. Nynex Information Resources plans nontraditional directories.

*Customer premises equipment. Each regional holding company has its own CPE subsidiary.

CW Chart

AT&T promotes secondary market for used equipment

By Peter Bartolik
CW Staff

BOCA RATON, Fla. — AT&T Information Systems needs help establishing a secondary market for used telecommunications equipment as it prepares to turn over its large embedded base, a company executive told members of the Computer Dealers and Lessors Association (CDLA) here recently.

Robert J. Casales, executive vice-president of strategic and financial planning for AT&T Information Systems, keynoted the spring conference of the CDLA. An hour later, it was announced that AT&T Credit Corp. had been elected an associate member, becoming the first "captive credit corporation" to join the CDLA.

AT&T Information Systems last year announced an agreement with CDLA member CMI Corp. under which CMI assumed the role of consultant to AT&T in establishing a third-party dealer network.

Casales said AT&T "has a large embedded base of telecommunications equipment that in the next few years will move to new technology." He told CDLA members, "I look to you for help in developing a secondary market for used telecommunications equipment."

'Service capabilities'

He said AT&T will support dealers of used equipment with "service capabilities that can be supplied to their customers."

There are no plans for AT&T's direct sales force to sell used equipment in competition with third-party dealers, Casales said. "If used equipment is sold into an [AT&T] salesman's territory, he will be compensated [by AT&T]," Casales said.

While AT&T Credit poses a potential competitive threat to many CDLA members engaged in financing equipment purchases and leases, Casales pledged that AT&T "will look for the balance" to satisfy both parties.

Casales also pledged that AT&T will not undercut dealers of its used equipment by cutting prices of new equipment.

With CDLA members dealing mainly in IBM equipment at present, IBM price cuts on new equipment are a constant source of anxiety as they drive down the residual, or resale values, of used equipment.

He also predicted that residual values of telecommunications equipment will not experience the "rapid decay" of used computer equipment residuals.

Regarding AT&T Information Systems' product strategy, Casales noted that the market for PBXs and other switches "is fundamentally a replacement market similar to the mainframe market." That reality is driving the telecommunications giant into growth areas, he added. Noting that AT&T has no intention at this time of competing with IBM in the mainframe area, he said that the company will focus on distributed processing equipment and intelligent workstations.

CDLA

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bers were informed that the CDLA's board of directors had not accepted a legislative committee recommendation to continue pressing for a three-year accelerated cost recovery system (ACRS) schedule for computer equipment. Under current ACRS rules, computer equipment is depreciated over a five-year period.

Bouldin said in an interview with *Computerworld* that he met with Treasury Department officials late in February and that they indicated a willingness to modify the eight-year real cost recovery system contained in the flat tax proposal. Treasury Department officials, Bouldin said, "want a fair system that has no tax incentives nor disincentives to do leasing."

The CDLA board has adopted the position that it also wants "a tax-neutral leasing environment" in which tax policy promotes economic development. Current policies concerning leasing have been criticized by government officials as promoting tax shelters, and such tax-advantaged leases are being scrutinized by the Internal Revenue Service.

Bouldin said his committee was not able to make a recommendation on the investment tax credit because the CDLA members are widely divided on the issue.

Some CDLA members who attended the closed-door session said afterwards that both depreciation schedules and the investment tax credit prompted heated discussion from members frustrated by the board's apparent turnaround on tax policy issues.

The statement mailed to members said that the board indicated at a January meeting that neutralizing tax benefits of leasing "would eliminate a lot of unknowledgeable competition from the marketplace."

According to the statement, the board indicated at that meeting that supporting repeal of the investment tax credit and accepting a lengthier depreciation schedule would be in their best interests.

Regardless of what comes out of the Treasury Department, Bouldin said, the final battle will be decided on the floor of Congress.

Berger Lahr files suit charging Seagate with fraud, negligence

JAFFREY, N.H. — Berger Lahr Corp. said it has filed a $10 million suit against Seagate Technology Corp. and one of its executives, claiming fraud, negligence and breach of contract.

The suit, filed in the U.S. District Court for the Northern District of California, stems from a series of contracts between the two companies dating from 1983. Berger Lahr claims that Seagate reneged on agreements calling for Seagate to purchase a specified number of stepper motors at specific prices.

Berger Lahr had been a major supplier of stepper motors — a component of disk drive systems — to Seagate, a Scotts Valley, Calif., manufacturer of computer storage devices.

Seagate had accounted for more than half of Berger Lahr's business, according to William Hutchinson, president of Berger Lahr. Hutchinson said Seagate is now buying stepper motors from a Japanese manufacturer.

A spokeswoman for Seagate said the company would not comment on the litigation.

No estimate of the value of the contracts involved in the suit was available from Berger Lahr.

Signetics to cut work force

By Kathleen Burton
CW West Coast Bureau

SUNNYVALE, Calif. — Reacting to the semiconductor industry's continued slump, Signetics Corp. announced recently it will reduce its 6,300-person U.S. work force by up to 400 employees, adopt a shortened workweek and temporarily shut down some plants by the end of March.

The semiconductor manufacturer said it will use a combination of attrition and layoffs to cut its manufacturing work force at plants here and in Orem, Utah, and Albuquerque, New Mexico.

The company will implement four-day workweeks on alternate weeks from March 16 to June 10 for all nonmanufacturing employees, according to Ron Deutsch, a company spokesman. Employees will have to use 10 vacation days during that period. In addition, the company will shut down some plants for one- or two-week periods beginning April 1, but it has not yet determined which plants will be closed or how many reductions will be layoffs, Deutsch explained.

Overseas layoffs possible

Signetics, with 12,000 employees worldwide, has test and assembly operations in Thailand and Korea. Deutsch said that the possibility of overseas layoffs are also being considered.

Signetics, the sixth-largest U.S. supplier of integrated circuits, said the measures were designed to reduce expenses because of a soft semiconductor market created by excess customer inventory, a shaky personal computer market and excess capacity among semiconductor manufacturers.

Since September, the company has reduced its worldwide work force from 12,600 to 12,000 through rough attrition and layoffs. The latest proposed cutback would leave Signetics, a wholly owned subsidiary of N.V. Philips, with 11,600 employees worldwide.

The move follows similar cost-cutting plans implemented by Intel Corp., Texas Instruments, Inc. and other semiconductor manufacturers.

Bay area water threat cited

SANTA CLARA, Calif. — Silicon Valley environmentalists have charged that a California water board's decision in late February has acted as a signal to IBM and other multinational conglomerates that it is all right to pollute San Francisco Bay area water supplies.

The San Francisco Bay Regional Water Quality Control Board decided not to ask the state's attorney general to prosecute IBM for discharging toxic chemicals at its South San Jose plant.

Several local environmental groups and governments, including the city of San Jose and Santa Clara County, are protesting the decision, claiming that the board's message will give other companies the message that the penalties for toxic spills are lenient.

Ted Smith, chairman of the Silicon Valley Toxics Coalition, one of the protesting groups, said "We are afraid this may start a dangerous precedent." Smith said the board's vote eliminated an opportunity for the state to collect between $8 million and $45 million in penalties from IBM that could have been used to mitigate the effects of the spill.

At the February hearing, IBM representatives said that IBM had spent $34 million on cleanup and preventive measures since the leak was discovered in 1978 and expected to spend $11 million more by the end of 1985.

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U.S. chip makers to save in wake of Japanese tariff lift

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — Following two years of negotiations, Japan and the U.S. are eliminating their tariffs on semiconductor imports, opening the way, officials said, for savings of up to $100 million a year for the U.S. semiconductor industry.

According to Sheilah Sandow, communications manager for the Semiconductor Industry Association (SIA), a trade organization based in San Jose, Calif., elimination of the 4.2% semiconductor import tariff will let U.S. chip manufacturers enjoy large savings. A large portion of U.S.-manufactured integrated circuits, Sandow said, are shipped overseas for assembly and packaging and are taxed on reentry into the U.S. The 4.2% value-added tax generally amounted to about 30% of the chip's total cost, Sandow said.

Sandow said that in 1985, American semiconductor manufacturers will do approximately $9 billion worth of business in the U.S. that, with the tariff in place, would have cost them nearly $100 million in import duties.

Most chip makers view the tariff elimination as a positive first step in lowering trade barriers between Japan and the U.S. "We welcome the tariff reduction," said Linda Baker, a spokeswoman for National Semiconductor Corp. in Sunnyvale, Calif. National Semi, which recently ended a two-week production slowdown, will save several hundred thousand dollars a month under the new system, Baker said.

According to Robert Pearlman, director of tax and customs at Intel Corp. in Santa Clara, Calif., removing the tariff will save Intel millions of dollars each year on chips imported from the company's offshore assembly facilities and on chips exported to Japan. Pearlman said, however, that the tax reduction is not substantial enough for Intel to open more production plants overseas.

Won't help in Japanese market

The deputy director of the U.S. Department of Commerce in San Francisco, George Dolan, said that eliminating the import tariff will not help U.S. chip manufacturers compete in Japan's $8 billion semiconductor market, where the U.S. currently has a 10% market share.

"While this is a step in the right direction," Dolan said, "Japan has many nontariff barriers, which, while less obvious, still serve as barriers to open trade."

Dolan said the Japanese stumbling blocks include a "buy Japanese" mentality promulgated by Japan's influential Ministry of International Trade and Industry and Japan's excessive use of paperwork, import certificates and export licenses to delay chip exports.

NICKELS AND DIMES

Western Digital Corp. announced revenue for the second quarter of $38.4 million, compared with $23.6 million in the same period one year earlier. Profits were $2.8 million, or 15 cents per share, compared with $1.6 million, or 11 cents per share in the like period last year.

■

Quantum Corp. reported revenue for the third quarter of $31.7 million, compared with $17.5 million in the comparable quarter one year ago. Profits were $5.9 million, or 62 cents per share, a 106% increase over $5.9 million, or 30 cents per share, last year.

■

Daisy Systems Corp. announced profits for the first quarter ended Dec. 31 were $4 million, or 25 cents per share, compared with $2.3 million, or 15 cents per share in the like period one year earlier. Revenue was $25.5 million, up from $13.1 million for the comparable quarter last year.

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TAXES

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posals being considered in Congress are "neither fair, nor simple nor flat."

A fiscal conservative who serves on the Senate Budget Committee, Johnston offered his view of attempts to modify the maze of tax laws. "Anytime somebody starts putting 'fair' or 'reform' on a tax bill, it means new taxes," he noted.

Despite the coalition of liberals and conservatives supporting some form of tax simplification, Johnston said, the elimination of various tax incentives will foster too much opposition from groups that benefit from particular incentives. "There will be enough special interests that oppose [the flat tax], that it won't get off the ground," he predicted.

The CDLA spent part of its meeting developing a strategy for approaching the tax simplification proposals. However, recent developments seem to indicate that the governing board of the association sees the tax revision process as an opportunity to deter further competition rather than an opportunity to foster an open economic environment (see related story above).

According to Johnston, who strongly urged cutting Social Security and Defense Department budgets to fight the federal budget deficit, there is a need for tax reform, but it should be a surgical reform rather than a blanket reform. "We need to go about this provision by provision and change those [incentives] that have outlived their usefulness and change those that are too generous," he said.

■

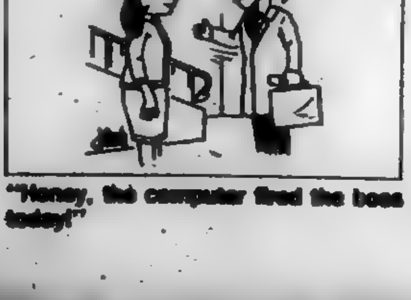
Another third-party market association, the American Society of Computer Dealers (ASCD), had little sympathy for IBM's recent attempts to close down the "gray market" for discounted IBM equipment that reportedly is fed by value-added dealers and resellers unloading portions of their official IBM quotas.

In a recent meeting, the ASCD issued a formal statement charging that the use and marketing of gray market equipment is "a result of IBM's discriminatory policies and/or practices surrounding the selection and approval of firms that are allowed to purchase IBM equipment at a discount from IBM."

■

CDLA sources said that association representatives met with IBM late in January and complained that the Sierra mainframe product line was the "most preannounced, unannounced" product IBM has ever brought to market.

The CDLA also reportedly told IBM that if IBM Credit Corp. is as aggressive in its pricing of the Sierra product line as it has been with leasing IBM 4381 machines, the third-party equipment market would be unduly harmed.



"Honey, the computer fired the boss today!"

Acquisitions, mergers at all-time high

FRENCHTOWN, N.J. — Acquistion and merger announcements in the software, computing services and information industries in 1984 set all-time highs, with more than 10% of the computer industry changing hands, according to the Cerberus Group's annual report.

Acquisitions and mergers soared to 256 transactions, up 80% from the previous year's 142, according to the 1984 "Cerberus Report." The total dollar volume paid for all transactions that provided purchase prices hit $4.3 billion in 1984, an increase of 351% over 1983 — a new record for the industry — the report said.

Of that total, 10 computing industry deals accounted for $3.6 billion, which is approximately 85% of the total value paid for all 1984 transactions, the report said. The General Motors Corp. acquisition of Electronic Data Systems Corp. (a more than $2.5 billion purchase) and McDonnell Douglas Corp.'s acquisition of Tymshare, Inc. (a $307.5 million purchase) represented 78% of the large transactions' value and 66% of the total value paid.

According to the report, the number of transactions in the computing industry decreased from 188 in 1982 to 142 in 1983 and increased to 256 in 1984. The total dollar volume climbed from $660.1 million in 1982 to $956 million in 1983 and jumped to $4.3 billion in 1984.

For those transactions where offer prices were disclosed, the average price was approximately $17 million, a spokesman said. However, if the "megadeals" were removed from the figures, the average would be closer to $7 million, he said.

The "Cerberus Report" is a combination of information garnered by the Cerberus Group and by W. T. Grimm & Co. of Chicago.

The 1984 "Cerberus Reports" which includes a copy of the 1983 report, will be available in late March at a price of $375.

More information can be obtained from the Cerberus Group, Chestnut Ave., P. O. Box 470, Frenchtown, N.J. 08825.

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COMPUTER INDUSTRY

NICKELS AND DIMES

Computer Sciences Corp. reported a profit of $12.4 million, or 90 cents per share, for its third fiscal quarter, compared with $4.2 million, or 30 cents per share, in the same quarter one year earlier. Revenue was $178.7 million, compared with $168.5 million last year.

■

Computer Associates International, Inc. announced revenue of $38.7 million for the third quarter ended Dec. 31, an increase of 49% over the $26 million in the same period last year. Profits were $6.2 million, or 58 cents per share, compared with $4.6 million, or 43 cents per share, in the same period one year ago.

■

Ungermann-Bass, Inc. reported fourth-quarter revenue of $15.2 million, up 83% from $8.3 million in the same quarter one year earlier. Profits were $6.2 million, or 38 cents per share, compared with $1 million, or 6 cents per share, in the corresponding quarter last year.

■

Seagate Technology, Inc. reported revenue for its second fiscal quarter of $51.7 million, compared with $50.6 million in the comparable period one year earlier. Profits were $230,000, or 1 cent per share, compared with $9.5 million, or 22 cents per share, for the same period one year ago.

■

Computer Automation, Inc. reported a net loss for the second quarter of $2.3 million, or $1.16 per share, compared with a net loss of $1.5 million, or 77 cents per share, in the same period one year earlier. Revenue was $12.6 million, compared with $14.7 million last year.

■

NBI, Inc. announced revenue for its second quarter was $49.2 million, up 10% from $44.7 million reported for the comparable period last year. Profits were $3 million, or 33 cents per share, compared with $3.3 million, or 33 cents per share, in the same quarter one year earlier.

■

Printronix, Inc. reported profits of $1.2 million, or 26 cents per share, for the third quarter ended Dec. 28, compared with $1.8 million, or 40 cents per share, in the same quarter last year. Revenue was $40 million, compared with $31.4 million in the comparable period one year earlier.

■

Computer Task Group, Inc. announced revenue for the fourth quarter of $24.7 million, compared with $16.1 million in the same period last year. Profits were $714,000, or 34 cents per share, compared with $379,000, or 19 cents per share, in the same quarter one year earlier.

■

Ask Computer Systems, Inc. reported that profits for the second quarter ended Dec. 31 increased 12% to $2.1 million, or 18 cents per share, compared with $1.9 million, or 16 cents per share, in the same period one year earlier. Revenue increased 41% to $21.2 million, compared with $15.1 million for the same quarter one year ago.

SPERRY

from page 123

of its vast conglomerate in an effort to raise cash to buy into the minicomputer and office automation arenas.

"ITT decided it has to get into the computer market [somehow], and the quickest way to do it was to buy another company," noted Maureen Fleming, an analyst with International Resource Development Corp., a Norwalk, Conn.-based research firm. She said ITT will probably seek another acquisition from among minicomputer firms, which Wall Street analysts said are undervalued on the stock markets.

Bob Djurdjevic, president of Annex Holdings Corp. and editor and publisher of the "Annex Computer Report," said the would-be merger was a "nonevent" for the IBM and plug-compatible systems market, but he added that it would have provided benefits to both Sperry and ITT.

Djurdjevic said ITT would have gained technological benefits, while Sperry, which has a variety of enterprises outside the computer industry, would have gained a larger R&D budget. He noted that IBM spent $3.16 billion on R&D in 1984, a level that would rank just its R&D functions among the revenue scale of the top 10 computer companies.

"Clearly, if [IBM competitors] are to continue to grow, they have to continue to pool resources to match [IBM] strength for strength," he said.

Although neither Sperry nor ITT would comment on the financial terms of the negotiations, published reports said Sperry was seeking a stock exchange valued at $3.3 billion, which would have exceeded by far General Motors Corp.'s $2.2 billion acquisition of Electronic Data Systems Corp. last year.

Peter Hynes, a Sperry spokesman, said that despite the announcement, "there is not a 'for sale' sign up at Sperry." He added that Sperry management had previously indicated interest in exploring opportunities for expansion. The two companies, he said, are continuing discussions on the possibility of joint marketing and technology transfers. Hynes said that discussions of those other possibilities led to the merger talks.

According to Charles Varga, chairman and publisher of the Cerberus Group, which monitors acquisitions and mergers in the information industry, the pace of mergers and acquisitions could pick up this year and next if the economy experiences a downturn or a slight recession.

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APPLE

from page 123

was a major mistake. "It's just not in line with the outside world's thinking," Wozniak said.

David Larson, former Apple IIe and IIc marketing manager, left the company in February after four years. A major factor in his departure, Larson said, was his disenchantment with "Apple's total emphasis on Macintosh and the business market."

According to Larson, it is becoming more difficult for entrepreneurial people to operate in Apple's increasingly bureaucratic structure. Apple is importing consumer-oriented specialists from other companies, which is diluting the culture and narrowing the company's engineering and marketing focus to business-oriented products like the Macintosh, he observed.

Another blow to company morale, according to Larson, is Wozniak's departure. "It'll take the edge off the [Apple IIe] team," he said.

Peter Quinn, hardware design manager for the Apple IIe and engineering director for the Apple IIc, left Apple several weeks ago after four years with the company. Quinn said the company is "deliberately antagonizing its best talent." He said Apple Chairman Steve Jobs and Apple IIc General Manager Del Yocam's orientation on bottom-line profits and low head count are escalating frustrations. "The whole company is a ball of frustration now," Quinn said.

Taylor Pohlman, vice-president of sales at Forethought Corp., a software manufacturer in Mountain View, Calif., was on the ground floor of the Apple IIe project when it began in 1980. Pohlman said that with Apple's new business image, largely a result of trying to meet Wall Street expectations, the entrepreneurially oriented "get-it-done people like Dave Larson" are being pushed out.

"The company is underutilizing and not rewarding the people who've made things happen in the past," Pohlman said. He noted that Apple was built on the premise that individuals can make a difference. "That's not true today," he said.

Matthew Meehan, a computer industry analyst at the investment banking firm Salomon Brothers, Inc. in New York, said the changes at Apple "are what Apple needs; they make sense organizationally." Wall Street is not driving the changes at Apple, Meehan said, because "Wall Street thinks in the short term, and Apple can't afford to respond to short-term needs."

Meehan said Apple's strategy shift to the business marketplace has made the company aware of its need to recruit outside talent and to narrow its product line. "The computer industry is just like the auto industry," Meehan said. "The Henry Fords do well at first, but then you need the Lee Iacoccas to sell the widgets, to use marketing and advertising and to sell to a different kind of customer."

MERGERS AND ACQUISITIONS

QMS, Inc., Mobile, Ala., acquired privately held **Concept Technologies, Inc.**, headquartered in Portland, Ore. Terms of the acquisition were not available.

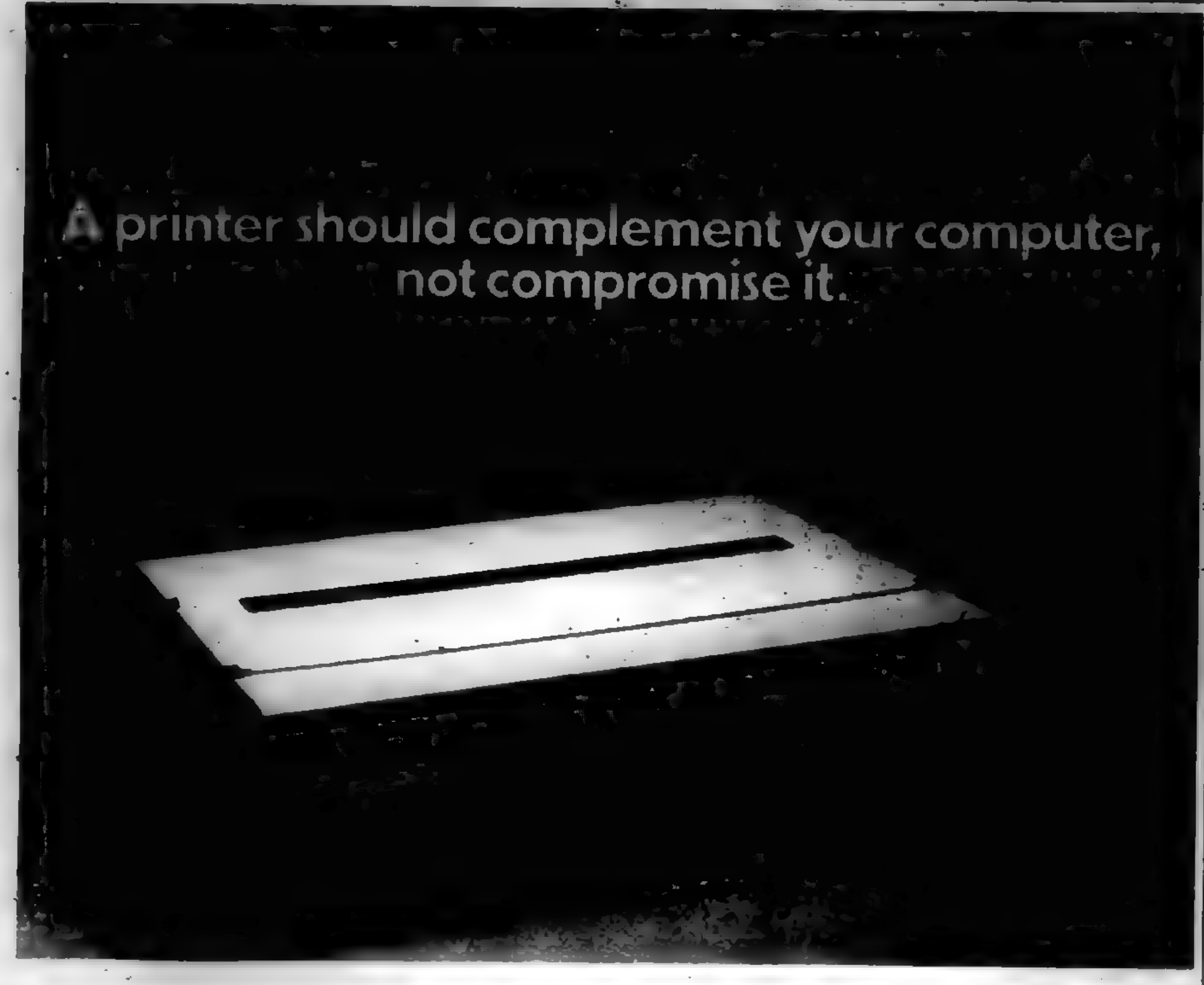
■

BKW, Inc., Nashua, N.H., announced that it has terminated its plan to acquire the **Berton Group**, a California-based resources and technology management company. BKW said the Berton Group had not met all of the terms and conditions spelled out in the original letter of intent between the two companies.

■

Informatics General Corp. acquired the litigation support services business of **Litton's Mellonics Systems Development Division**, Sunnyvale, Calif. Under the agreement, Informatics will assume responsibility for litigation support services contracts and projects currently performed and managed by Mellonics.

Informatics has also acquired **Software Technology, Inc.**, a Portland, Ore.-based software firm. Informatics also sold its life insurance systems business to the **Continuum Co.** The sale includes only the life insurance systems business with a revenue of approximately $25 million for the preceding 12 months.



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Each printer is easy to use, lightweight, functionally styled and attractive. And you can choose options from pedestals and paper racks to document inserters, sheet feeders and 8K character buffer expansion, plus more.

Genicom 3000 PC printers feature switch selectable hardware, dual connectors and dual parallel or serial interfaces. Plus the 3014 and 3024 emulate popular protocols for both Epson MX with GRAFTRAX-PLUS™ and Okidata Microline 84 Step 2™, while the 3304 and 3404 emulate popular protocols for Epson MX with GRAFTRAX-PLUS™. So your current system is most likely already capable of working with these Genicom printers without modification.

Most important, the Genicom 3000 PC printers are quality-built, highly durable printers designed for rapid, continuous duty cycle printing.

So why wait? And wait. And wait. Get a Genicom 3000 PC printer now.

Genicom Corporation, One General Electric Drive, Dept. C411, Waynesboro, VA 22980. In Virginia, call 1-703-949-1170.

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Epson MX with GRAFTRAX-PLUS is a trademark of Epson America, Inc.
Okidata Microline 84 Step 2 is a trademark of Okidata Corporation

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[illegible] multiuser system
for companies
who expect to grow.

[illegible] Mini Family.

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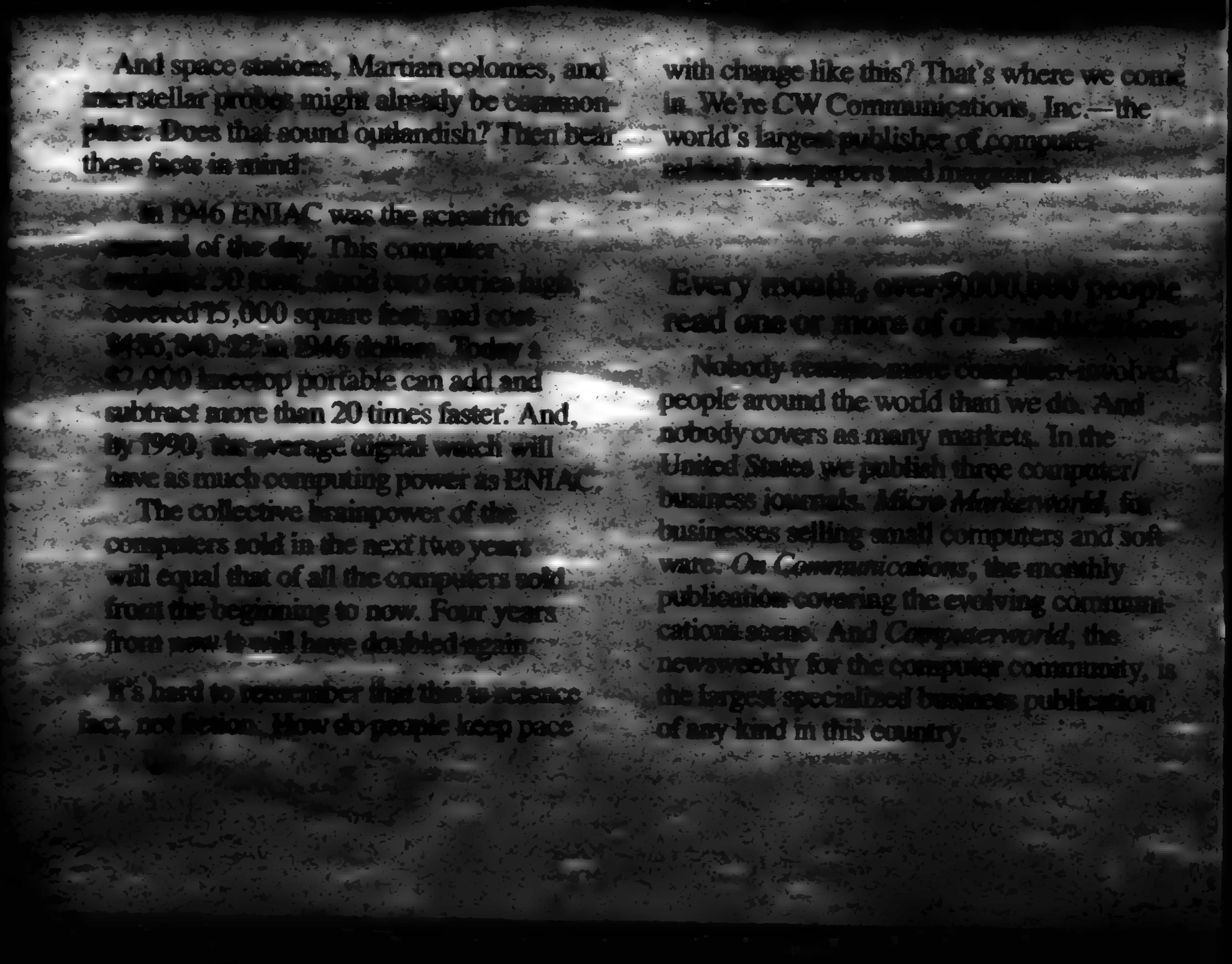
Systems

[illegible]

[illegible]

If the space program had advanced as fast as the computer industry, this might be the view from your office.



And space stations, Martian colonies, and interstellar probes might already be commonplace. Does that sound outlandish? Then bear these facts in mind:

In 1946 ENIAC was the scientific marvel of the day. This computer weighed 30 tons, stood two stories high, covered 15,000 square feet, and cost $486,840.22 in 1946 dollars. Today a $2,000 kneetop portable can add and subtract more than 20 times faster. And, by 1990, the average digital watch will have as much computing power as ENIAC.

The collective brainpower of the computers sold in the next two years will equal that of all the computers sold from the beginning to now. Four years from now it will have doubled again.

It's hard to remember that this is science fact, not fiction. How do people keep pace with change like this? That's where we come in. We're CW Communications, Inc.—the world's largest publisher of computer-related newspapers and magazines.

Every month, over 9,000,000 people read one or more of our publications.

Nobody reaches more computer-involved people around the world than we do. And nobody covers as many markets. In the United States we publish three computer/business journals. *Micro Marketworld*, for businesses selling small computers and software. *On Communications*, the monthly publication covering the evolving communications scene. And *Computerworld*, the newsweekly for the computer community, is the largest specialized business publication of any kind in this country.

We also offer seven personal computer publications. *InfoWorld*, the [illegible] for all personal com[illegible]

The other six are monthly magazines that [illegible]

[illegible]s, Argentina, [illegible]

lic of China, South [illegible]

South Africa, [illegible]

POSITION ANNOUNCEMENTS

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An unchallenged reputation for technical excellence and high reliability telecommunications systems does not come easy. Powered by some of the most creative and talented professionals in the industry, ITT Telecom in Raleigh, North Carolina has consistently met the demanding Telecommunications needs of a fast changing world with some of the most advanced state-of-the-art equipment available today.

In order to insure that we meet this demand, careers are available for the following professionals

PROGRAMMER ANALYSTS

Working in our Applications Development areas would require professional skills with Cullinet Software (IDMS, ADSO, OLM, etc.) plus COBOL, JCL and TSO/ROSCOE in an MVS environment. At least two years experience using the above in marketing, manufacturing or financial applications is required. Appropriate Degree or equivalent required.

SYSTEMS PROGRAMMERS

BSCS Degree or equivalent. Working in our Technical Support areas would require professional skills using CICS, VM, MVS, UNIX*, DATATRIEVE, DECNET, FMS/TMDS, C, PASCAL AND VAX in a VMS environment. At least three years experience using the above in technical/user support activities.

SYSTEMS ANALYSTS

Must have at least five years experience in leading projects and activities in Applications Development or Systems Assurance areas requiring experience in business, manufacturing or financial systems using IDMS, COBOL, ADSO, and CICS. Systems Assurance experience should include experience in quality audits, system security, education/training, policy/procedures and recovery activities. Appropriate Degree or equivalent required.

PERSONAL COMPUTER ANALYSTS

BSCS or equivalent. Provide assistance to our growing community of personal computer users in the design and development of PC software applications. Provides software product training. Requires four to six years extensive PC experience with two to four years experience on IBM mainframe systems using MVS. Should have experience with COBOL, MS-DOS or CPM operating systems, BASIC or PASCAL. Any experience with VAX 11780, LOTUS 1, 2, 3 or D BASE III would be a plus.

MANAGEMENT SYSTEMS OPERATIONS RESEARCH

BSCS or equivalent. Several key positions exist that involve critical planning activities for Management Systems.

LEAD PLANNER

Will lead short and long term MS strategic and tactical planning. Requires ten years experience in responsible planning activities.

IBM PLANNING SPECIALIST

Requiring six years experience, will provide focus for IBM hardware/software planning.

DEC PLANNING SPECIALIST

Requiring six years experience, will provide focus for DEC hardware/software planning.

CAPACITY PLANNING SPECIALIST

Requiring four years experience, will provide focus for all hardware/software performance evaluations and usage reporting.

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Requiring four years experience, will implement, analyze and monitor systems to provide equitable distribution of costs.

In addition to excellent salaries, comprehensive benefits and ample room for career development, our location will make your move to ITT Telecom complete. In Raleigh, you will find a bountiful collection of cultural, educational and recreational pleasures all designed to meet the personal preferences of the community. Relocation assistance will be provided. Please send a detailed resume, indicating position of interest and including salary history in strict confidence to: **Professional Staffing, Department MS, ITT Telecom, 3100 Highwoods Blvd., Raleigh, North Carolina 27604. An Equal Opportunity Employer M/F/H/V.**

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The best ideas are the ideas that help people.

*UNIX is a trademark of Bell Laboratories

NETWORK SYSTEMS PROGRAMMER

If you are a results oriented person looking for a growth opportunity, then our company has an exciting position for you to consider.

Our Information Systems Department has an immediate opening for a Network Systems Programmer. The primary responsibilities of this position include the maintenance and support of our terminal and PDP-11 networks, as well as assisting in planning communication segments of the system.

Qualified candidates for this position should have skills in Macro-11 with RSX along with a working knowledge of network protocol and multiprocessor systems. A working knowledge of Macro-10 is a definite plus.

If you match the above qualifications and have been looking for an opportunity to work in a progressive and highly visible company, with growth potential, and a competitive compensation and benefit program, then we would like to review your resume.

To apply, please send your resume with salary history to:

Chicago Tribune
435 N. Michigan Avenue
Employment Division
Chicago, IL 60611

Chicago Tribune

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DATA RESOURCE CORPORATION, headquartered in Atlanta, is seeking individuals who desire to work in various stimulating Data Processing environments. IMS and CICS skills are of special interest, as is the ability to travel or relocate.

Consulting and Contract Programming throughout the Southeast for nine years, DRC offers competitive salaries including bonuses and overtime pay. If you are searching for a growth opportunity with a dynamic and progressive company that "puts people first" DRC is your answer. Send resume to: 3301 Buckeye Rd., Suite 103, Atlanta, GA 30341, or call: BECKY FINLEY or JIM BARRETT at: 404-455-7260 or toll free 1-800-241-6082

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EOE

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Software Support and Development

We are seeking an ambitious individual for the position of Mortgage Programmer. Applicant must have thorough understanding of mortgage applications and have experience in COBOL Programming. Experience with Burroughs systems a plus.

We are a progressive institution located in the sunny Southeastern city of Savannah, a famous historical city located next to the beautiful Atlantic Ocean.

Compensation determined by experience. EOE/M/F

Send resume to:

M.I.S. Department
P. O. Box 8206
Savannah, GA 31412-8206

Attn: Programming Manager

PROGRAMMING

TRANSAMERICA AIRLINES, a major international air carrier, has two immediate openings for Programmers.

SYSTEMS SUPPORT PROGRAMMER - Must have programming experience on Sperry 1100 series computers. Knowledge of operating systems (OS/1100) internals, CMS, TIP and [illegible] required. Must be able to install and maintain operating system and communication software.

LEAD APPLICATIONS PROGRAMMER - Four-six years programming experience, preferably on Univac 1100 computers. Knowledge of Cobol, ECL, Database DMS 1100 and TIP 1100 required. Must be able to direct various levels of Application Programmers as well as plan, coordinate, design, implement and maintain application programs.

We offer excellent benefits, including travel privileges. Salary is commensurate with experience. Send resume and salary requirements to: Transamerica Airlines, PO Box [illegible], Airport Station, Oakland, Calif. [illegible] Attn: [illegible]

EOE M/F/H

DEPUTY SYSTEMS MANAGER

The Pacific Stars and Stripes, a U.S. Forces newspaper headquartered in Tokyo, Japan, seeks a Deputy Systems Manager, preferably with Wang VS-100 or smaller Wang VS systems experience. Position will involve interfacing with management, end-users and the Systems Automation staff. Individual should be capable of project management from inception to completion. Experience with COBOL, interactive programming, micro-computers, and telecommunications in a distributed processing environment is required. Experience with AP, AR, FA, GL, IC, OE, and productivity tools such as SPEED II in a wholesale/retail business will be considered a plus. Basic pay [illegible] a year, plus a housing allowance or free bachelor's quarters, commissary and BX privileges, group insurance and retirement, furlough after 3 years and every 2 years thereafter, as well as other benefits. Send resume to reach U.S. Army Civilian Personnel Office, Honshu, ATTN: [illegible], APO San Francisco [illegible], no later than 15 April 1985.

EXPANSION OPENINGS

PROGRAMMER/ ANALYSTS

SUNY/Empire State College, a nationally recognized leader in higher education, is seeking programmer/analysts both full & half-time in Saratoga Springs, NY to play a leading role in the continuing development of applications for its statewide communications network. Major new projects planned involve database installation & development of software for an integrated workstation environment.

QUALIFICATIONS: Bachelor's degree, broad background in admin. applications, 3 years programming exp. with CICS & COBOL & systems analysis exp. Working knowledge of microcomputers desirable. Salary to mid-twenties depending on qualifications with excellent benefits. Interested persons should submit letter of application and resume before April 3, 1985 to: Janet Zimmer, Director, Personnel & Affirmative Action, SUNY/ESC, Dept. 601, 2 Union Avenue, Saratoga Springs, NY 12866. An Affirmative Action/Equal Opportunity Employer.

REAL-TIME INNOVATION

Computer professionals work with advanced equipment and technologies at Northrop Advanced Systems Division.

Northrop Advanced Systems Division is advancing aviation into the 21st century by successfully interfacing human creativity with powerful sophisticated computer systems. Here, utilizing latest and often revolutionary equipment and techniques, our innovative Information Resource Management (IRM) organization attracts the nation's finest computer professionals. Join our team and work in one of the world's most advanced high technology environments.

Our facilities are ideally situated midway between Los Angeles and Orange County in Southern California. We have immediate openings for the following:

Data Processing Equipment Configuration Specialists

Responsibilities include equipment evaluation, acquisition recommendations, configuration design, and installation design for all types of central site IBM data processing equipment. Will also monitor site facilities planning and equipment, and facilities inventory tracking.

Database Specialists

Senior-level positions involving IMS DB/DC database systems development for key technical and business organizations within the Division. Will perform data-related activities to develop an integrated database environment. Requires extensive experience with on-line and batch IMS DB/DC database systems. Additional skills and experience in database design methodology as well as logical data analysis and modeling is highly desirable.

IMS Systems Programmers

Involves development, design and use of the IMS on-line systems in our progressive, multi-CPU environment. Will also troubleshoot and tune an IBM (DB/DC) system. Knowledge of IMS (DB/DC) installation and maintenance techniques required. Familiarity with MARK V, COBOL, TSO/SPF, or ADF II is also helpful.

Performance Specialists

Involves Performance Measurement and Tuning of large multisystem complexes. You will utilize such sophisticated tools as the MICS Performance Data Base Manager, SAS and Telegraph for reporting, Omegamon and RMF for monitoring, and Best 1 and CMF for modeling. Requires experience in Measurement and Analysis, featuring TSO and other interactive systems using RMF and SMF Data. Knowledge of MVS/XA, IMS or CADAM is desirable.

Please send your resume to: *Dave Coffey*

Change Management

Provide "subsystem" monitoring and change management to assure minimum exposure to disruption due to change activities. Will establish and publish guidelines for use of on-line change management system and coordinate "subsystem" changes in a dynamic environment. Experience with these activities in a large IBM mainframe environment is required.

Scientific Programmers/Analysts (Engineering Applications)

Develop a variety of challenging aerospace software applications for one or more of the following: radar analyses, structural analyses, aerodynamics, propulsion, materials technology, and other engineering/ scientific applications. You must be able to understand and evaluate engineering requirements as well as develop and/or implement structured software life-cycle plans addressing system design, programming, test, documentation, and implementation. CRAY FORTRAN or IBM FORTRAN software application development experience preferred.

Scientific Programmers/Analysts (Manufacturing Applications)

Involves working on an Automated Manufacturing System Development project. In our Computer Aided Manufacturing (CAM) environment, you will be programming interfaces from mini-computer processors (PC's, Series/1, PDP 11/24, HP's, etc.) to mainframe computers (IBM 4300's, VAX 750 or 780, HP's, etc.). Your technical background should include programming experience in either PL/1, Pascal, FORTRAN 77 or Assembly languages. Knowledge of Structure Analysis/Design and Data Base concepts is beneficial.

Network Design Specialists

Direct the activities of a team of highly skilled communications analysts in designing and maintaining network architectures in a local and remote environment. Leadership skills along with solid background in ASYNC, BISYNC and SNA/SDLC protocol, and local area topology, required. A good understanding of common carrier facilities, as well as satellite communications experience desirable. An advanced degree is preferred, with 6+ years of experience in the Network Communications field.

Sr. Communications Analysts

Requires 5+ years of experience in designing and installing network architectures in a local and remote environment. Must have demonstrated experience with local topologies, common carrier links (terrestrial and satellite), ASYNC, BISYNC, SNA/SDLC protocols, IBM communications and cluster controllers, multiplexing, cross domain, and minicomputer networking (peer style or interconnection). A BS degree is preferred.

Please send your resume to: Dave Coffey

EDP Auditors

Perform examination and/or analysis in assigned areas of the EDP function to assist in evaluating adequacy and effectiveness of internal controls. Plan and execute EDP audits of operating and/or application systems and provide recommendations or corrective actions.

Please send your resume to: Dave Coffey

Sr. Business System Programmers/Analysts

Analyze and develop automated system design solution for Experienced Data Base in support of engineering, logistic and life cycle cost area for Information Resource Management (IRM). While working with the latest IBM hardware, interact with both data processing and user personnel, implementing systems within an integrated database architecture. IMS with emphasis on DB/DC, COBOL and related software experience required. Also requires 3+ years of experience utilizing AFR 66-1 maintenance data, AFR 65-110 operation data, and AFM 66-267 maintenance data collection systems with AF visibility and operating cost a plus. Familiarity with DYL 280, MARK V, Fourth Generation Language, Field Data Analysis, and New International standards definition for reliability and maintainability desired, as is engineering experience.

Business Programmers/Analysts

Analyze and develop systems design solutions to Manufacturing, Engineering, and Cost Schedule business application problems. Interact with both data processing and user personnel while working with the latest IBM hardware, implementing these systems with an integrated database architecture. IMS with emphasis on DB/DC, COBOL and related software experience required. DYL 280, MARK V and any Fourth Generation Language experience desired.

Sr. Business Systems Analysts

Develop, design, install and support packaged manufacturing systems (MRP). Responsibilities to include: implementation of sequence and scheduling; definition of required conversions, interfaces and subsystems; performance of production statusing requirements (PL/MR) and all related technical tasks required to install the system. Work with the latest IBM hardware to support our manufacturing areas. Extensive Manufacturing Systems background including Database, Packaged Code and Project Leadership experience desired. COBOL, IBM mainframe and on-line systems experience necessary.

Please send your resume to: Mary Adams

The involvement, scope and dimension of these career pursuits are further heightened through some of the most tangible, comprehensive personal benefit arrangements available. Please send your resume to the appropriate contact person at: Computer Systems Employment Office, Dept. CW 867, P.O. Box 1138, Pico Rivera, CA 90660-0677.

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The Central Intelligence Agency offers a unique opportunity to Systems Programmers: the chance to use our extensive state-of-the-art resources to realize your ideas.

We are seeking highly talented, highly creative individuals to challenge their abilities by designing and developing custom application and systems software. In our laboratory-like, RESEARCH-ORIENTED environment, you will be able to enhance your systems programming expertise while creating tomorrow's systems.

These one-of-a-kind challenges require the ability to install, enhance, and maintain sophisticated systems and networks, as well as perform configuration management, systems tuning, and performance analysis.

You must have a degree in Computer Science, Mathematics, Engineering, or equivalent experience, and in-depth knowledge of one or more of the following areas:

- **IBM Operating Systems Internals (OS/MVS, JES2/JES3)**
- **VM/370 and CMS System Internals**
- **Computer Systems Measurement and Performance Enhancement**
- **Assembler Language Programming**
- **Minicomputer System Internals (DEC-VAX/VMS, UNIX)**
- **Systems Configuration and Selection**

In exchange for your contributions, you will receive a competitive salary based on your qualifications, excellent benefits, opportunity for foreign travel, and the satisfaction that comes from contributing to efforts of vital national importance. In addition, you will enjoy living and working in the Washington, D.C. area, with its array of cultural, athletic, and historic attractions.

For consideration, send your resume to:

Recruitment Activity Center
Dept. S, Rm. 4N20 (F39)
P.O. Box 1925
Washington, D.C. 20013

Central Intelligence Agency

The CIA is an equal opportunity employer. U.S. citizenship is required.

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This challenging key management position is being created to meld all information resource services (75 plus employees) together under unified supervision. This includes: computer services operating with IBM 43xx environment, IBM/WANG/APPLE P.C.'s; word processing with 3 independent systems (WANG, OIS model 140-3 and OIS model 115); telecommunications utilizing leased Rolm computerized branch exchange (purchase being contemplated); systems/methods analysis, design and documentation; records management; micrographics, reprographics and mail services.

We are the nation's twelfth largest citizen-owned electric utility located 30 miles north of Seattle in Everett, WA. Known for our "quality of life," we are located on beautiful Puget Sound and within easy access to the Cascade and Olympic mountain ranges.

The successful candidate will: possess thorough knowledge of current management theories and practices for information resource services including cost benefit analysis, productivity enhancement techniques and project development and leadership methodologies; have demonstrated ability to direct and manage various complex functions; create an environment which fosters team work; communicate and work effectively with all levels in the organization, consultants and the public; manage confidential information. Minimum qualifications are those usually exhibited by an individual with a BA in Data Processing, Public or Business Administration, with 10 years' progressively more responsible, directly related work experience, 5 of those years in a supervisory capacity. If qualified, submit your resume to: **Snohomish County PUD, Personnel Services Dept., P.O. Box 1107, Everett, WA 98206.** An equal employment opportunity employer.

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United Technologies Communications offers an excellent salary and benefit package, and an outstanding opportunity to advance your career. For confidential consideration, please send your résumé to W.A. Moore, Director, Personnel Resources, 433 East Las Colinas Blvd., Irving, TX 75039. We are an equal opportunity employer M/F/H/V.

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FOX-MORRIS

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Young, progressive Ann Arbor based software company for the health care industry on a national basis, is searching for computer programmers and systems analysts:

Technical and management positions available. Health care applications experience preferred with RPGII language experience. Salary commensurate with experience. Please send resumes to: P.O. Box 3151, Ann Arbor, MI 48106.

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COMPUTER PROFESSIONALS

The Vinnell Corporation is offering generous pay and allowance benefits to individuals who can qualify by education and experience as Computer Programmers, Branch Supervisors, Systems Analysts and EDP Advisors for our contract in Riyadh, Saudi Arabia. One of the Systems Analysts positions requires an extensive military transportation background.

All positions are on one year contracts and are Single Status.

If you are an EDP professional, please send resume (include all software languages in which you are proficient), and supporting documents immediately to: VINNELL CORPORATION, 10530 Rosehaven Street/Suite 100, Fairfax, VA 22030, Dept. PW-85.

VINNELL CORPORATION

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DEPARTMENT OF SOCIAL SERVICE PROPOSALS

Proposals will be received by the Human Resources Administration/Department of Social Services until 5:00 P.M. April 15, 1985, for the acquisition of data communications and data switching hardware and the associated maintenance and installation charges for the development of a Shelter Care Information Management System (SCIMS).

Request for Proposals may be obtained from:

The FAS Bureau of Service Operations
60 Hudson Street, 5th floor, Room [illegible]
New York, New York [illegible]
ATTN: Janice Corre (212) [illegible]

A Proposers Conference will be held at 10:00 A.M. on Monday, April 1, 1985, at the Office of Management Design, 60 Hudson Street, 10th floor, the Red Conference Room, New York, N.Y.

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Programmer Analyst

Design, code, test and implement applications software for an on-line, information management system, batch, terminal simulator and base case testing. Using knowledge of Computer Science (including data base management systems), hardware including IBM mainframe computers, IMS, TSO/SPF, DB/DC packages and COBOL language. M.S. Degree in Computer Science plus four years experience as Programmer Analyst. Knowledge of COBOL, IMS, TSO/SPF and IBM hardware required. 40 hour week. $47,840 per year. Resume to: Job Service Order # NY-0200470/DOT-012, 16 South Avenue, Rochester, New York 14604.

SYSTEMS PROGRAMMERS

Tired of the snow and cold winter? Why not move to work in sunny California. A number of nationally known companies in San Francisco and the bay area are interested in YOU if you have five plus years experience in CICS; IMS; VTAM; or MVS systems programming. Local interviews will be conducted from April 8 - 12 in New York City and Boston. For a scheduled interview, send resume and salary history to:

Anita Ho
On-Line Professional Search, Inc.
[illegible] Capella Lane
Alameda, CA [illegible]

COMPUTER SCIENCE

The Department of Computer Science at the University of Wisconsin-Oshkosh invites applications for two full-time tenure track positions beginning in September 1985. A normal full-time teaching load is three courses per semester. The minimum qualification for an appointment is a Master's degree in Computer Science. In the screening of applicants a Ph.D. in Computer Science is given highest priority; a Master's degree in Computer Science with a Ph.D. in some other discipline is given second priority. Teaching is emphasized; professional activity is required of all tenure-track positions.

The Department offers a BS/BA degree. Courses currently offered include data structures, architecture, artificial intelligence, programming languages, simulation, graphics, databases, operating systems, computer communication, software systems and theory of computing. On-campus computer facilities for academic use include a VAX 11/780, an IBM 4341 and two PDP-11/70's. Currently there are 300 Computer Science majors; there are approximately 11,000 students on campus. The University has a [illegible] fund which is used to support research faculty. There are opportunities for consulting with local industries.

Screening of applications will be carried out continuously until the positions are filled. Applications should include a résumé, transcripts, and three letters of reference with a letter of application. Send applications to: Wayne Wallace, Chairman, Computer Science Department, UW-Oshkosh, Oshkosh, WI 54901. The University of Wisconsin Oshkosh is an Equal Opportunity Affirmative Action Institution.

EDUCATIONAL PUBLISHING

South-Western Publishing Co. is a leading developer of business related educational courseware for secondary and post-secondary institutions. We currently have an immediate opening for an Electronic Publishing Editor. Broadly described, the job involves: (1) planning prior to the development and preparation of manuscript and software; (2) substantive editing in progressing from first-draft manuscript and software to final draft; (3) coordinating plans for the production of courseware with Staff Designers, Photo Researchers, Production Units and Quality Control Assistants; (4) participation in recruiting and selection of authors; (5) participation in developing and securing new product; and (6) engaging in professional activities.

Minimum qualifications include: two years teaching experience at either the secondary or post-secondary levels (preferably in computer science, information systems or computer related subjects), and a Master's degree (preferably in computer science, information systems or MBA). Related publishing experience pertaining to this position would be considered in lieu of teaching experience. Programming knowledge using the BASIC language highly desirable.

For immediate consideration, please forward your resume, including salary history and requirements to:

South-Western Publishing Co.
Dale H. [illegible]
V.P., Director of Electronic Publishing
5101 Madison Road
Cincinnati, OH 45227

Equal Opportunity Employer [illegible]

PROGRAMMER/ ANALYST

We have an immediate opening for a Programmer/Analyst. Responsibilities will include specification, application design, programming and maintenance. Applicants background must include a BS degree, at least 3 years experience in FORTRAN and COBOL languages and data base management. Experience with DEC system 2060, project control systems and micro computers considered a plus. Qualified applicants should forward a complete resume in confidence to:

PIZZAGALLI CONSTRUCTION COMPANY
Attn: [illegible]
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Director, Product Research and Development: Utilizing knowledge of mechanical engineering and manufacturing processes candidate will direct, coordinate and participate in activities of staff engaged in research, development, design, production, implementation and maintenance of 2D and 3D software systems for CAD/CAM applications. Confer with customer's technical staff to draw up proposals to formulate and/or modify software to meet customers' specifications. Participate in preparation of price quotations and cost estimation proposals. Plan all aspects of research and schedule plans to insure goals are met. Supervise a staff of four. Hire, evaluate and discharge personnel as necessary. Requires Master's degree in mechanical engineering and 1 year direct experience. Salary: [illegible] per year, 40 hours per week, 9am to 5pm, M-F. Send resume to: [illegible], Inc., 511 [illegible] Drive, [illegible], IL [illegible], Attention: Michael J. [illegible].

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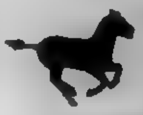

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Systems Analyst Assume total responsibility for designing and developing new data communications network. Solid technical background in developing data transmission networks needed. Houston, Texas. To $55,000.

Programmer/Analyst and Project Leader Leading energy firm is expanding its corporate data center in downtown Houston. Development opportunities exist for person with two or more years of OS/COBOL experience with some exposure to a major DBMS. Energy applications experience is not required. To $40,000.

Systems Analyst, Database Analyst and Sr. Programmer/Analyst Suburban Fortune 500 company in Houston is staffing for mainframe development projects on financial systems using COBOL and IDMS. To $45,000.

Scientific Programmer Excellent development opportunity in an R&D environment in North Houston. Seek FORTRAN experience under RSX or VMS. To $35,000.

HP 3000 Programmer/Analysts — Become a Senior P/A. Multiple positions available with successful manufacturing organization located in southwest Houston. Knowledge of FORTRAN and COBOL on a mini-computer system sought. Manufacturing systems exposure essential. To $37,000.

Systems Engineer — New Product Development New PC product line is being developed by this major hardware vendor in Houston. Experience with hardware/software interfaces, telecommunications and operating systems is vital to this research and development effort. Convenient suburban location. To $40,000.

ORACLE Database Expert Growing energy corporation in Houston is expanding its data processing function to include multiple machines and operating systems. This is an excellent opportunity to broaden your hardware/software expertise. To $42,000.

Software Engineer — Technology Leader Dallas office of Fortune 500 firm, in new facilities on a campus-like setting, seeks Software Engineer to develop microcomputer software on Intel 8085, 8086 and 8088 processors. Real-time operating system and communications software. To $41,000.

Programmer/Analysts — IMS DB/DC Projects Corporate staff of a rapidly expanding Fort Worth Fortune 500 organization has an immediate need for an experienced professional with a strong OS/COBOL background. All application projects are new and involve IMS DB/DC development. To $32,400.

Senior IMS Systems Programmer — New Data Center New IMS development requires IMS Internals Software Programmer with four or more years of experience. Prefer IMS 1.3, MVS and CICS internals. Key position in Dallas. To $48,000.

CAD/CAM Software Developer North Dallas, state-of-the-art manufacturing firm developing VAX and Micro CAD/CAM systems for new products seeks software professional with PASCAL and VAX exposure. To $38,000.

Data Base Analysts — Advanced Technology Headquarters of world-wide high technology firm based in Dallas seeks several IMS DBA's for several applications groups (manufacturing, financial) and the newly formed Central Advanced Technology Group. Will determine data base/communications direction for the next ten years. To $50,000.

Lead Systems Programmer — CICS or VTAM Major Dallas-based distributor seeks OS/MVS Systems Programmer with either CICS or VTAM expertise to supervise small group of technical support software people. New facilities, excellent growth potential. To $40,000.

RPG III Programmers — High Growth One of the top five real estate developers in U.S. will double their data processing organization in 1985. RPG III and Financial applications experience sought. To $34,000.

EDP Auditor — Energy Corporate headquarters of major manufacturer seeks EDP Auditor to be senior person in growing organization. Three years background in EDP or accounting desired. IBM environment preferred. To $33,000.

Banking Programmer/Analyst — Major Expansion Major Oklahoma bank with beautiful facilities needs professionals with a minimum of two years IBM COBOL experience. To $39,000.

Mini-Micro Programmer/Analysts — Major Expansion Prestigious Oklahoma based corporation has embarked upon a major new systems development effort and seeks professionals with a minimum of two years programming experience on HP 3000 with some knowledge of communications. To $33,000.

Minicomputer — Systems Engineer Successful minicomputer vendor in Oklahoma City seeks an experienced VAX VMS COBOL Programmer with three or more years experience. Position provides a dynamic work environment with excellent benefits. To $35,000 + car.

Geophysical Programmer/Analyst — New Development Fortune 500 Company in Tulsa is implementing a major data center expansion. Ground floor opportunity to develop new systems and work with dynamic management. To $39,000.

Major MIS Expansion — All Levels Fortune 200 organization in Oklahoma City has committed to major MIS expansion. State-of-the-art large scale IBM and CICS environment offers exceptional lateral and vertical career growth. Professionals needed at all position levels. To $45,000.

Programmer/Analysts — Learn CICS/DL/I Rapidly expanding Arkansas corporation seeks experienced OS/COBOL Programmer/Analysts. Manufacturing applications preferred. To $28,000.

NEW MEXICO/ARIZONA

Software Engineers — Mini/Micro Stable, growing division of Fortune 500 firm seeks person to lead hardware/software integration projects with DEC PDP11 and Z80 microcomputers using ASSEMBLER and C. Will be heavily involved with hardware interface, design, development, and test. Lead small groups — project start to finish. To $39,000.

Software Engineers/Managers — Will Cross-Train High-tech electronic systems manufacturer is expanding staff for new development in UNIX/C on 808X, M68XXX microprocessors. Real-time operating systems, compilers, hardware control, software tools and application specialists are needed. Can train solid PASCAL/ASSEMBLER experienced on UNIX and C. Prefer BSEE or Technical BSCS degree. Excellent company benefits and relocation. Starting salaries: $31,000 to $65,000.

MVS/XA Systems Programmer Multiple 3084 data center in Phoenix seeks Senior MVS/XA Systems Programmer. State-of-the-art IBM data center with communications to other data centers worldwide. Experience in project management for large systems integration preferred. To $45,000.

Programmer/Analyst Fast-growing, stable company in new Scottsdale, Arizona facility. Design and program using CICS, COBOL and ALC. Minimum of two years IBM sought. IMS Database experience preferred. To $31,000.

Programmer/Analysts — IMS/Training Fortune 100 client has major new development projects. State-of-the-art OS/MVS shop with professional environment, structured methodology. Programmer/Analysts with two years or more experience using IMS DB/DC with COBOL sought. Also have developments with PL/I and CICS for new on-line transaction system. Excellent training programs, benefits and career progression. Starting salaries: $25,000 to $39,000.

Programmer/Analysts — 20 minutes from the Slopes Major services firm needs Programmer/Analysts to support new system upgrades in 1985. OS/MVS, CICS COBOL environment. Opportunity to enjoy the outdoors and live in a low cost-of-living area at the base of the Rockies. Starting salaries: $25,000-$29,000.

Programmer/Analysts — Systems 34, 36, or 38 Exciting opportunities in new development of financial and reporting systems for nine year old Phoenix firm. Professional staff has tripled in the last two years. Multiple CPU's installed migrating from System 34 to System 36 with planned addition of System 38 or 4300 as demand increases. Prefer some communications experience with Remote Systems. Starting salaries: $20,000 to $29,000.

Senior Programmer/Analyst — Banking. Lead installation of new commercial loans package for state-of-the-art bank. Beautiful suburban Phoenix location. Prefer commercial loans experience and/or strong IMS with COBOL. Banking and ALC preferred but not required. Excellent path to Project Management. To $34,000.

COLORADO

OS/MVS — Data Center Expansion Rapidly expanding Denver division of major U.S. corporation seeks individuals with strong exposure to OS/MVS systems programming. Expansion plans for 1985 will create multiple opportunities for rapid career development. To $39,000.

Senior COBOL Programmer — HP New Development Exclusive Source client seeks a COBOL Programmer/Analyst to join a select staff of computer professionals. This is a prestigious Denver firm offering a plush working environment, outstanding benefits and rapid career growth, including a 90 day salary review. One year of HP COBOL applications experience sought. Knowledge of packaged G/L systems helpful. To $33,000.

Assembler Programmer — Learn CICS Prestigious Denver firm with sophisticated network expansion plans for 1985 is seeking IBM Assembler Programmers. Promotion to first line management is attainable in 12-18 months. Two-five years of BAL on large IBM systems sought. On-line training will be provided. To $39,000.

Applications Programmer — Learn CICS Denver-based financial organization is expanding its MIS staff to keep pace with growth. Training in CICS will be provided for candidates with two or more years of COBOL experience on large-scale IBM systems. To $35,000.

Sales Representative — New Branch Leading company in computer services technology is opening a new branch in Denver. They seek a self-motivated senior level sales professional to establish and build the Rocky Mountain market. Package to $50,000.

Programmer/Analysts — Nationwide Travel Major international consulting firm in Colorado offers outstanding opportunities throughout the United States. Training programs are exceptional as are relocation benefits. Benefits include a tuition refund program and a liberal vacation policy. Openings exist at all levels. OS or DOS COBOL or PL/I, CICS, IMS, IDMS, RPG III and Series 1 experience sought. To $35,000.

Applications Programmers — New Systems Development Major insurance organization in Denver has multiple positions open due to expansion. Company is developing a new insurance processing system. Participate in a state-of-the-art on-line development project. Prefer background in insurance and IBM Assembly. To $38,000.

Branch Manager — New District Office Fastest-growing data base software firm in U.S. is expanding into the Denver area. Seeks manager with a solid sales track record in systems software or data base packages. Package to $100,000 plus.

Systems Software Programmer — Foot of Pikes Peak Dynamic Colorado Springs national firm is expanding its Systems Department. Professional with three years OS Assembler sought. Full relocation package. To $42,000.

SOUTHERN CALIFORNIA

PASCAL Programmer/Analyst — Process Control Opportunity for experienced PASCAL Programmer to work on real time process control applications for software development firm in San Diego. To $33,000.

Micro Programmer/Analysts — Leading Firm San Diego-based company, a leader in its field, needs Assembly Language Programmers to work on videographics, real time software and software utility development. To $35,000.

RPG II Programmer — Learn RPG III International transportation company in San Diego seeks an experienced RPG II Programmer. Will gain experience in RPG III on a S/38. To $25,000.

Financial Systems Analyst Rapidly expanding financial institution is seeking a computer professional with solid systems analysis ability who has served as a Project Leader. Experience in on-line systems in IBM COBOL and Assembler environment is highly preferable. Facility is located in one of the most beautiful sections of San Diego. To $38,000.

IBM Systems Programmer — Customer Support A national computer manufacturer is seeking several additional Systems Programmers to staff their growing San Diego facility. Individuals with experience in IBM DOS or OS operating systems preferred. To $35,000.

MVS Systems Programmer Large San Diego-based organization seeks a professional to assist in the upgrade to MVS utilizing multi-CPU's and a large network of terminals. The company is one of the most stable organizations in the San Diego area, yet one of the most progressive in keeping up with state-of-the-art technology. To $55,000.

Graphics Programmer/Analysts One of San Diego's premier graphics software firms has several positions available for individuals with a background in FORTRAN. To $32,000.

MIS Manager Progressive firm seeks a proven Manager capable of building a data processing organization. Will set direction for successful and growing firm. Suburban Los Angeles community. To $42,000.

Senior Minicomputer Systems Programmer Manufacturing company headquartered in San Diego seeks an experienced PDP-11 Programmer who has worked on RSX-11M. Will be involved in a major effort to develop a state-of-the-art real-time system. To $32,000.

On-Line Programmers — OS Environment Major San Diego-based organization has several openings for On-Line Programmers to participate in a system utilizing a large network of terminals tied to one of IBM's latest computers. Selected candidates will work in an OS/MVS CICS, IMS environment. To $35,000.

Minicomputer Programmer — San Diego Suburb Division of a Fortune 500 corporation seeks a Programmer/Analyst proficient in any high-level language (e.g. FORTRAN PL/1, ALGOL, or PASCAL) to work on a variety of minicomputers (including PDP-11 and HP computers). To $32,000.

New Corporate Data Center — Suburban Location Fortune 500 organization, undergoing a major expansion, is in the process of centralizing all systems planning, programming software and computer operations into a new corporate data center. New center in suburbs of L.A. will house the latest in computer hardware and software technology. Openings for Programmer/Analysts, Systems Analysts, System Programmers and Hardware/Software Planners. To $48,000.

Software Development — Minicomputers Successful Orange County minicomputer manufacturer seeks professionals with operating system computer data communications, data base or microprogramming experience. Company is committed to developing and sustaining a complete line of state-of-the-art systems software products. To $60,000.

Programmer/Analysts — San Fernando Valley Major institution located in a desirable suburban setting north of Los Angeles needs both mini and large systems Programmer/Analysts. Organization provides excellent benefits. To $38,000.

COBOL Programmer — South Orange County Well-known, diversified financial services firm seeks professional with a minimum one year COBOL programming experience. Outstanding work environment. CICS, MVS training provided. To $30,000.

Programmer/Analyst — Learn Data Base Growing Los Angeles financial company seeks OS/COBOL Programmers who want to learn IMS. Presently developing new IMS systems for all financial applications. To $42,000.

Sales Representative — High Income Orange County office of a leasing telecommunications manufacturer is seeking a Marketing Representative with a proven track record of selling business systems. Average income of sales force last year was over $90,000.

EPD Audit Specialist — Extensive In-House Training Fortune 500 organization headquartered in Southern California seeks an EDP Audit Specialist experienced in designing accounting applications in an IBM OS environment. Training in auditing techniques and advanced computing provided. To $38,000.

MVS Systems Programmer — Technical Support Premier international hardware vendor located in Southern California has opening for customer support Systems Programmer. Successful candidate will possess IBM MVS systems programming experience and the desire to work in a technical support role at a client site. To $50,000.

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But New Orleans is much more than a great place to live, it's a great place to further your Data Processing career. New Orleans is the home of MIDDLE SOUTH SERVICES, INC., the service arm of the Middle South Utility System.

MIDDLE SOUTH SERVICES is currently involved in several projects including large scale IMS DB/DC systems development. The current hardware environment consists of (2) IBM 3084's, MVS/XA, 4381 VM, and Tandem.

SYSTEMS ASSURANCE ANALYST

Position is assigned to improve the overall service level to computer users through problem and change management. You will recommend procedural policy enhancements through ACF2 and ensure the effective use of the MVS operating system. Position requires three years experience as an Analyst Programmer with extensive large IBM mainframe experience. Excellent communications skills are a must.

FINANCIAL SYSTEMS ANALYSTS

Positions involve systems analysis support in payroll, general ledger, and/or other general accounting systems. Strong communications skills are a must. IBM mainframe experience strongly preferred.

PROJECT LEADER

Requires an individual with strong hands-on management experience with a minimum of three years experience as a first line supervisor. The appropriate candidate will also have four to five years background in coding, design and enhancement of large IBM DB/DC Systems primarily in the areas of Estimating, Bill of Material, Work Tracking and/or General Accounting.

IMS SYSTEMS ANALYST

Position involves systems analysis in a large scale multi-user IMS DB/DC environment, logical Data Base Design, utilization of application generators, testing and debugging of on-line IMS programs. Opening also exists in commercial and engineering applications development.

ANALYST/PROGRAMMER

The position involves working with our applications development staff, providing IMS and ADF technical consultations and services. The position requires previous programming experience in PL-1, Cobol, IMS DB/DC and TSO/SPF. Opening also exists in commercial and engineering applications development.

MIDDLE SOUTH SERVICES' relocation package includes: relocation allowance (one month's salary)...paid moving expenses...paid house hunting trip...mortgage interest differential...plus interim living.

We offer an excellent benefits Program and Compensation Package. For more information contact Joe Hotard, Byron Heath or Gary Silbert:

1-800-231-4481
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MIDDLE SOUTH SERVICES, INC.
P.O. Box 61000, NEW ORLEANS, LA 70161

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WE'RE LOOKING FOR THE BEST FIELD ENGINEERS IN THE BUSINESS!

ECONOCOM MAINTENANCE COMPANY, INC. — a nationally-recognized leader in the field of computer maintenance—is expanding operations. As a result, several positions for highly qualified Field Engineers have become available immediately. These openings are in the following cities: Little Rock, AR; Dallas, TX; Birmingham, AL; Louisville, KY; Miami, FL; Tulsa, OK; Kansas City, MO; Atlanta, GA; and Memphis, TN.

The successful applicants who secure these positions must have 3-5 years of intensive IBM computer maintenance experience and be thoroughly capable of performing all maintenance duties for IBM's System/34-36-38, as well as IBM's 43XX series and associated peripherals.

Salary will be based on the individual applicant's experience and ability. An attractive benefits program will be provided as well.

ECONOCOM MAINTENANCE COMPANY, INC.

SPECIAL IBM SERIES/1 NOTE:

We also have an opening in our Memphis Headquarters for a Field Engineer specializing in IBM Series/1 systems. The same requirements apply as shown above.

Please send your resume with salary history to:

CAROL MENOTTI
ECONOCOM MAINTENANCE CO., INC.
P. O. Box [illegible]
Memphis, Tennessee [illegible]

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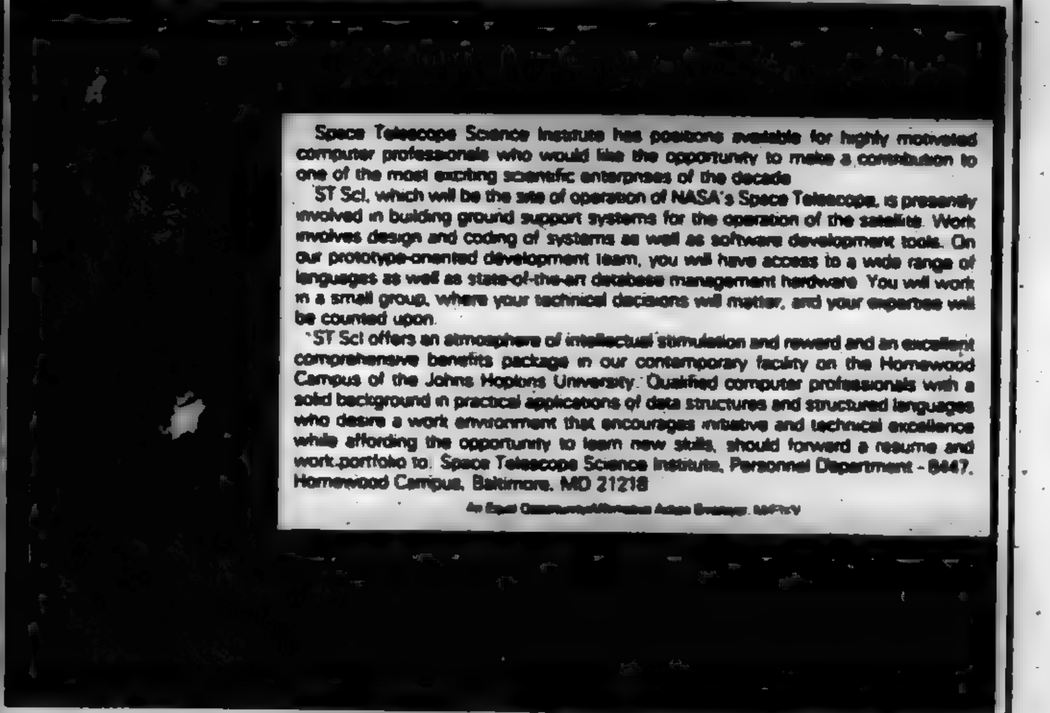

Space Telescope Science Institute has positions available for highly motivated computer professionals who would like the opportunity to make a contribution to one of the most exciting scientific enterprises of the decade.

ST ScI, which will be the site of operation of NASA's Space Telescope, is presently involved in building ground support systems for the operation of the satellite. Work involves design and coding of systems as well as software development tools. On our prototype-oriented development team, you will have access to a wide range of languages as well as state-of-the-art database management hardware. You will work in a small group, where your technical decisions will matter, and your expertise will be counted upon.

ST ScI offers an atmosphere of intellectual stimulation and reward and an excellent comprehensive benefits package in our contemporary facility on the Homewood Campus of the Johns Hopkins University. Qualified computer professionals with a solid background in practical applications of data structures and structured languages who desire a work environment that encourages initiative and technical excellence while affording the opportunity to learn new skills, should forward a resume and work portfolio to: Space Telescope Science Institute, Personnel Department - 8447, Homewood Campus, Baltimore, MD 21218

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DP CONSULTANTS

We are currently looking for dynamic individuals who enjoy the challenge and excitement of new environments and technologies as we meet the needs of our expanding client base. Computer Consulting is a contract programming and consulting firm servicing an established client base in the southeast.

Computer Consulting provides our permanent staff the opportunity and support for personal growth through a variety of assignments, a friendly and professional atmosphere, and an experienced management team. We offer a highly competitive compensation and complete benefits package.

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Computer Consulting
3700 Forest Drive
Suite 405
Columbia, SC 29204
(803) 738-1994
Att: Diane Williams

No Subcontractors Please

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SYSTEMS PROGRAMMERS NORTHEAST - TO $45,000

Several major clients in the Northeast have highly visable career opportunities for telecommunications specialists. Ideal experience: MVS, CICS, VTAM, NCP. Excellent benefits and all hiring expenses paid. Send resume or call immediately.

Ethan Allen Personnel
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Albany, NY 12207
(518) 434-6171

MICRO CONSULTANT TO $35,000

Leading national consulting firm seeks Microcomputer analyst for Minneapolis office to do support/training and provide internal/external support for consultants. Requires heavy accounting orientation and on-staff programming experience in LOTUS, dBASE, and other popular software. Call Mark David or Tim Smith at (612) 339-9001 on Job # 6932.

ROBERT HALF
OF MINNESOTA, INC.
3636 IDS Center
Minneapolis, MN 55402

SYSTEMS ANALYST

The People to People Health Foundation, Inc. (Project HOPE), has a senior level position opening for an experience Systems Analyst. The position reports to the MIS Director. Project HOPE, headquartered in Northern Virginia, is an internationally recognized provider of medical education and health care support throughout the world. The position of Systems Analyst will challenge you to define business and research system requirements, prepare functional and design specifications, project management, and the supervision of the application development staff. Requirements include a Bachelors degree and 4 years directly related experience. Supervisory experience and familiarity with PC and data communications are preferred. Salary is negotiable. Send resume and salary history to: The Personnel Department, Project HOPE, Carter Hall, Millwood, Virginia 22646. EOE.

WANTED: EDP EXCELLENCE

MIS Directors/Managers, Systems Managers, Project Managers/Leaders, Systems Analysts, Programmer Analysts, EDP Consultants, EDP Auditors. Key Positions in Business and Industry available coast to coast. All fees employer paid.

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[illegible], OH 44122
(216) [illegible]

COMPUTER FACULTY POSITION

Computer Faculty Position: Tenure-track position at undergraduate liberal arts college beginning August 1985. Advanced degree in mathematics or computer science required; Master's degree or equivalent in computer science preferred. Ability to teach some upper-division courses in computer science required. Salary and rank based on qualifications and experience. Send letter of application, vita, transcripts, and three letters of recommendation to: Prof. J. S. Mosley, Westminster College, Fulton, MO 65251. Application deadline April 1, 1985.

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MANAGEMENT INFORMATION SYSTEMS (Pos. 204-15)

Teach in one or more of the following: DBMS, Data Communications, Networking, Systems Analysis and Design, Programming or Small Business Systems. Tenure-track require a Ph.D. or active ABD in related discipline. Candidate with masters degree in related discipline considered for term contract. Deadline, April 1, 1985 or until a suitable candidate can be found. Respond to: Dr. William Duff, Jr., Acting Dean, College of Business Administration, University of Northern Colorado, Greeley, CO 80639. More than one position may be filled from applicants responding.

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SENIOR SYSTEMS ANALYST
RPG III PROGRAMMERS
IBM SYSTEMS 38 ENVIRONMENT

Quaker, a prestigious leader in the development and production of quality fabrics, is in the process of installing the largest IBM System 38 in the area. The implementation of this totally integrated manufacturing system has necessitated our search for experienced software professionals capable of supporting this extraordinary state-of-the-art system.

Senior Systems Analyst

Critical position calling for a Systems Professional with a proven track record (6-10 years) in systems development within finance application and order distribution areas. Successful candidate will be a project leader type with in-depth knowledge of IBM System 38. As this is an implementation program you will be involved as a company wide liaison and should be an extremely capable communicator, motivator and leader. You will also act as a systems integrator in defining user application and how they can be addressed with the proposed system software. A BS degree in Computer Science, Business Administration or Accounting desirable.

RPG III Programmers

We are seeking two individuals having 2-4 years of solid RPG III programming experience within an IBM System 38 environment. Duties will include designing, coding, testing and documentation of application programs. You will also be working closely with the user community in order to train and advise during the initial stages of implementation. The fast track situations call for a BS in Computer Science or a related business discipline, with well developed expertise in problem solving, communications, follow through and initiative. Knowledge of teleprocessing and business application desirable. The potential to expand into applications systems are a natural for these positions.

Quaker is a progressive corporation on the move and committed to the development of its employees. We are offering the successful candidates an extremely competitive salary, fringe benefit and promotion from within programs. Our convenient location off Rtes. 195 and 24 is just minutes from the ocean.

If you feel your recent accomplishments are being overlooked and you are seeking a challenge within an enjoyable work environment please submit resume and salary history in complete confidence to, John R. Chabot, Quaker Fabrics, 941 Grinnell St., Fall River, MA 02721. We are an equal opportunity employer.

Quaker
FABRIC CORPORATION

Telecommunications

The Federal Reserve Bank of San Francisco is currently looking for two outstanding individuals to work in our Online Systems Technology Department:

• Communications Systems Programmer

You would support our state-of-the-art multi-site Communications software environment and your experience would include:

- 3-5 years in communications systems programming using ALC and VTAM macros.
- Thorough understanding of SNA/SDLC dataflow, OS/VS macros, DOS/VSE, utilities and JCL dump and trace analysis.
- Familiarity with VTAM/NCP/MSWF installations.

• Data Communications Planner

You would plan and design our Bankwide data communications network and your experience would include:

- In-depth data communicatons experience with emphasis on network planning and design in an IBM SNA network environment.
- Experience in network performance and capacity planning.
- Understanding of cost control and anlaysis.
- Familiarity with communications equipment and major vendors.
- Voice and data integration experience is desirable.

We offer relocation assistance, an excellent salary and benefits package that includes 3 weeks vacation, savings plan, low cost cafeteria and even an exercise facility!

Please send your resume to: Marilyn Stubbs or Valerie Maczek,
The Federal Reserve Bank of San Francisco,
101 Market St., San Francisco,
CA 94105. EOE.

The Federal
Reserve Bank
of San Francisco

FRBSF

Arthur Young is looking for Telecommunications Systems Professionals smart enough to tell computers where to go.

At Arthur Young, we're not looking for professionals who just understand computers. Rather, we are searching for a select few who have the vision to apply today's complex technology to solve the demanding problems of business.

If you are one of these talented individuals, we are offering you the opportunity to utilize your technical expertise, creativity, and business acumen to excel — and to receive rewards directly tied to your performance.

You must be a highly qualified Professional with over 5 years' experience in voice and data Communications System Planning, Design and Implementation. Consulting experience and knowledge of Local Area Networking is desired.

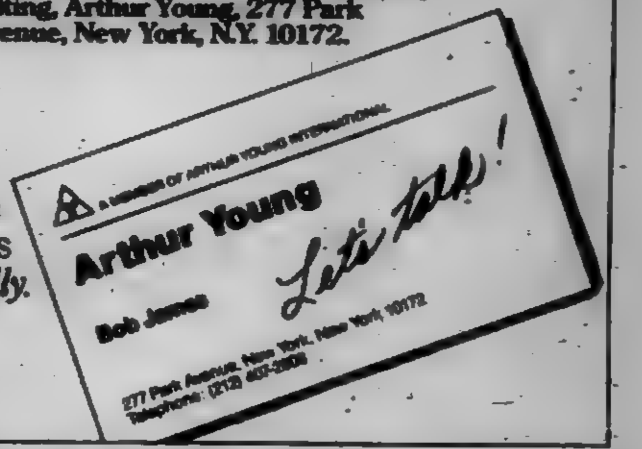
You must be comfortable in a position where you will work with top management in both the private and public sector.

You must demonstrate a talent for leadership, and be the dedicated type of person who attacks goals aggressively.

Positions are currently available at our practice offices in: San Francisco, Los Angeles, Chicago, Dallas, New York and Washington, D.C.

Should you be amongst the five percent who can realistically see your future position in this way, we invite you to send your resume to: Bob James, National Director of Telecommunications Consulting, Arthur Young, 277 Park Avenue, New York, N.Y. 10172.

We take business *personally.*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Bob James
277 Park Avenue, New York, New York 10172
Telephone: (212) [illegible]

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Develop control decisions information systems, artificial intelligence systems and methodologies for incorporating AI into systems that generate options in planning and manufacturing. Development of symbolic processing techniques with application to robotics, learning systems and adaptive systems. Capable of developing the algorithms software and hardware architecture. Ph.D in Computer Science. 5 years experience. Los Angeles area. $30.00 hr.

Send this ad and your resume to:

Job #[illegible]
P.O. Box [illegible]
Sacramento, CA [illegible]
Not later than March [illegible], 1985

Data Processing

SYSTEMS ANALYST

As an industry leader in energy management technology **Sangamo** is on the cutting edge of research, development and manufacturing. We are currently seeking a computer systems professional who wishes to expand his horizons with a company that recognizes and rewards talent, ability and initiative.

Must have a 4 year degree in mathematics/computer science, experience with HP 1000 RTE operating system and skill in use of Fortran. Application software development experience in statistics, data base management or real time programming desirable. The successful candidate will be responsible for developing software and installing revenue and load research data acquisition systems in electrical utilities.

We will reward you with an excellent salary and outstanding benefits that include medical, dental and life insurance as well as growth investment. We believe in advancement based upon achievement and encourage professional and personal growth. Contact us today to learn more about your opportunities. Send your resume to:

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Corporate M.I.S.

SOFTWARE APPLICATIONS MANAGER

ARTIFICIAL INTELLIGENCE SPECIALIST

Harris, a Fortune 200 corporation with sales of $2 billion, is a leading producer of state-of-the-art communication, information processing, and microelectronic products for the worldwide information technology market. The following positions are currently available within the Corporate Management Information Systems Department, located in Melbourne, Florida.

SOFTWARE APPLICATIONS MANAGER

You will manage a staff of 30–40 programmers and systems analysts who are contracted within the company to divisional M.I.S. departments to provide applications project support. You must possess marketing abilities, proposal preparation skills, project management know-how, and a knowledge of systems analysis approaches and the basic software development languages. Good oral and written communications skills are also required. A BA/BS degree and 5–6 years' experience successfully managing people and software projects is required. A Master's degree is preferred.

ARTIFICIAL INTELLIGENCE SPECIALIST

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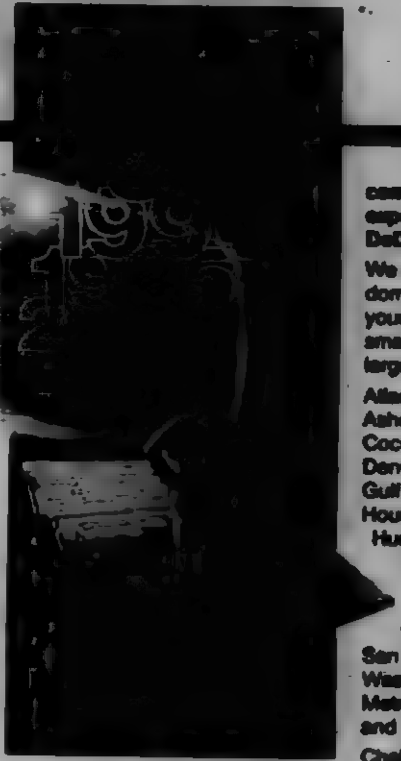

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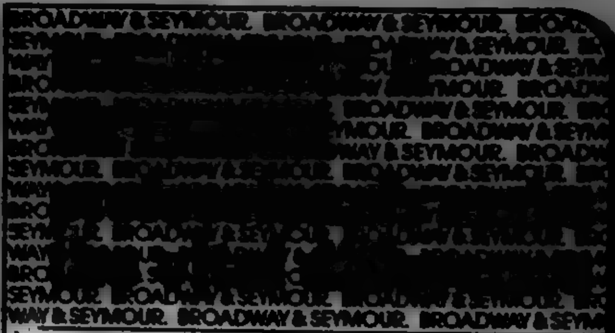
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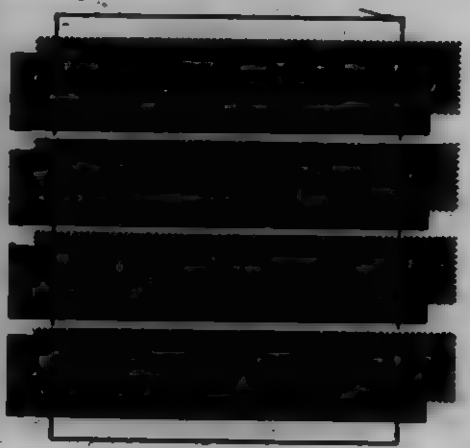

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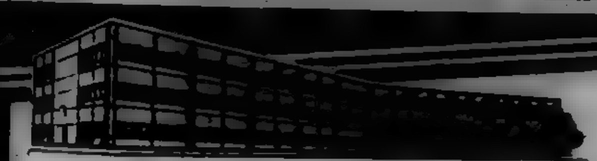

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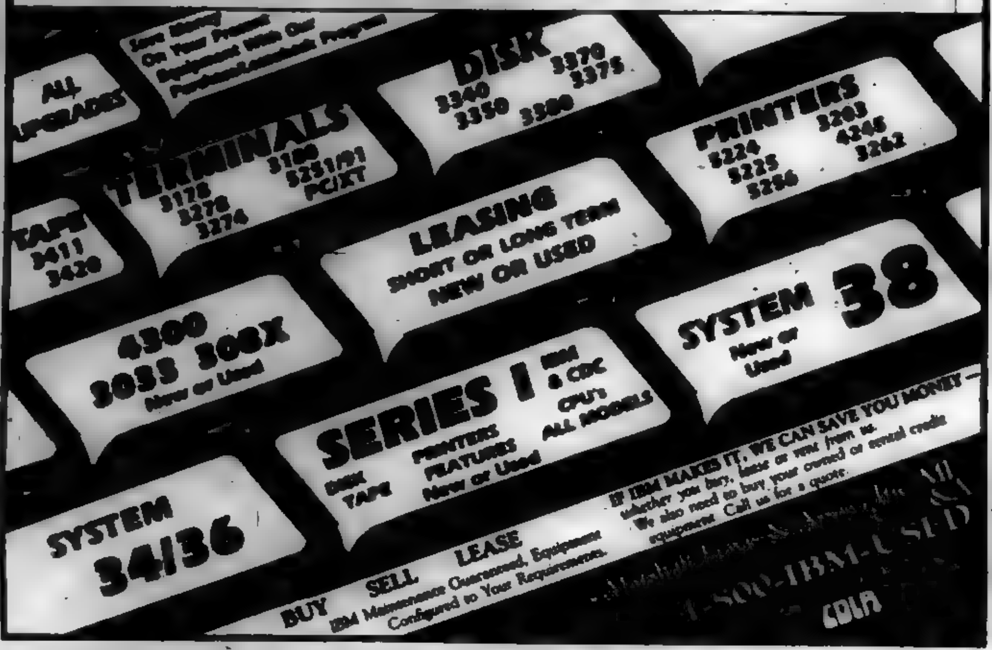
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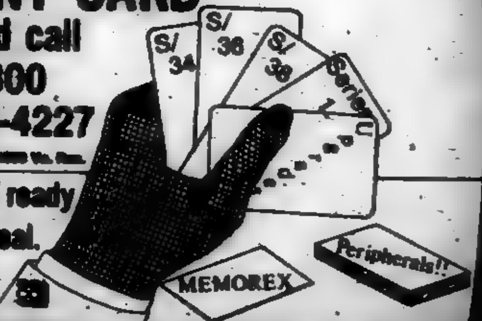

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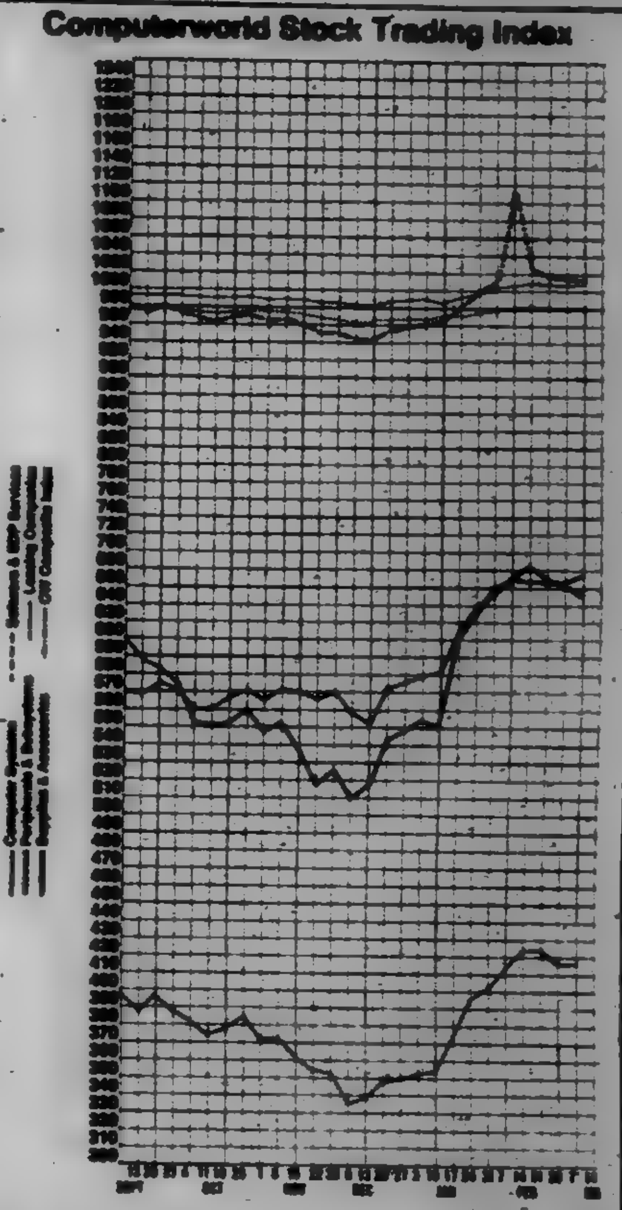

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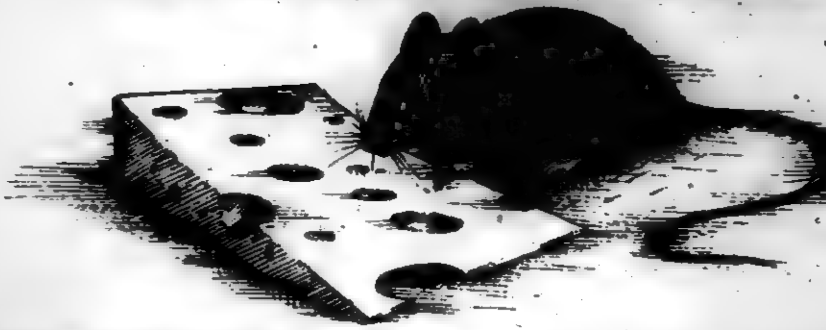

Run their general ledger. Their payroll/personnel. Their entire product line of financial and human resources software. Run the packages on your mainframe and link them to your PC's. Run them together and see if they work together.

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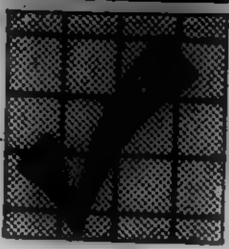

Check this
Yates Ventures evaluates Conetic Systems' Higgins/**11**

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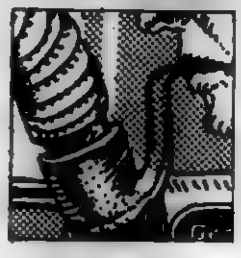

In Depth
Engineering expert systems
Follows 62

IBM policy draws fire

Users say source code rules hamper change

By John Gallant
CW Staff

While IBM's policy of withholding source code for selected software products has already marked its second anniversary, users are only now beginning to cope with the impact of that decision. But whether or not the advent of object-code-only products has affected their day-to-day DP operations, some users remain angry about IBM's decision.

Announced in February 1983, IBM's object-code-only policy has been applied to a growing list of Big Blue systems software products — some of which are just now being installed at user sites [CW, Feb. 25]. The announcement declared that for certain new products and upgraded releases of existing products, source materials would be released on a limited basis or not at all.

IBM said the source code restrictions were intended to serve two purposes: to protect its proprietary programming investment and technology from other manufacturers, notably the Japanese; and to alleviate problems that arose during the installation of enhanced versions of its packages at sites where major modifications had been made to systems software.

For months following IBM's decision to change its long-held policy of making source materials generally

See FIRE page 8

Growth of networks seen boosting allure of micros

By Eric Bender
CW Staff

At a baby food factory that Bristol-Myers Co. opened recently in the Netherlands, a personal computer local-area network handles receiving, purchasing, inventory, stock location, customer information and a host of other manufacturing resource planning tasks. "It's a production system," noted Roy Post, project leader for the installation. "The plant can't run without it."

Another micro network runs spreadsheets, word processing and electronic mail programs at a giant Celanese Corp. polyester fibers manufacturing facility in Salisbury, N.C. Fifty micros — separated by up to a quarter of a mile in the 2¼ million-square-foot plant — may be on the net by the end of the year, according to Matt Mengel, network coordinator at Celanese.

In a high-rise office building in Cambridge, Mass., software vendor Index Technology Corp. is switching its development efforts away from a Digital Equipment Corp. VAX supermini

See NETS page 17

Last week's Product Spotlight highlighted the technology of microcomputer local-area networks. This week, Computerworld *turns to user experiences and expectations.*

NAS unwraps AS/XL family of mainframes

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — Citing an ever-increasing demand for higher throughput, National Advanced Systems Corp. last week rolled out two mainframes designed to compete with the Sierra series IBM announced last month.

Anchoring the company's IBM-compatible AS/XL series is the Model 60, a uniprocessor operating at 28 million instructions per second that reportedly equals the performance of Big Blue's dyadic 3090 Model 200 [CW, Feb. 18].

The AS/XL line also includes a dyadic CPU, the Model 80, that delivers roughly the same computing horsepower as the 3090 family's four-processor Model 400, according to Mitch Schoch, NAS' systems marketing director.

NAS said it will ship both AS/XL machines in the second quarter of 1986 — six months later than the reported shipment date of IBM's Model 200 but a year ahead of IBM's reported shipment date of its larger Model 400.

Both the AS/XL Models 60 and 80 cost 20% less than their Sierra counterparts and require about a third of the floor space, Schoch said. The reduced footprint is attributed to the AS/XL family's emitter-coupled logic chips, which are reportedly 3¼ times denser than the corresponding ECL circuitry in the IBM 3090 series.

In an unprecedented move, NAS timed the AS/XL's debut to coincide with a similar introduction by the company's hardware supplier, Hitachi Ltd. In the past, Hitachi's announcements for the domestic Japanese market have usually preceded its U.S. business partner's product moves by six to nine months, according to Doug Bailey, NAS' vice-president of worldwide marketing. Hitachi quoted a fourth-quarter 1985 delivery date for its systems.

The AS/XL Models 60 and 80 correspond, respectively, to Hitachi's M-680H uniprocessor and M-682H dyadic mainframe, which were announced

See NAS page 9

TOP OF THE NEWS

A federal agency has moved to suspend Paradyne from contracting with the U.S. government after allegations of poor performance on a $118 million Social Security Administration contract. **Page 2.**

■

Running out of steam. Major computer vendors and semiconductor companies continue to report weak sales and profits. **Page 6.**

■

Has DP walled itself off from the corporate mainstream? One consultant thinks so, saying that DP is now paying the price for its isolation. **Page 12.**

■

To err is human. The IRS blamed improper tape handling, not computer error, for a snafu that resulted in mailing 26,000 faulty delinquency notices. **Page 15.**

FYI

DP retrofit keeps Schwinn wheeling toward recovery

By Maura McEnaney
CW Staff

CHICAGO — Water stains are yellowing the raised white floor at Schwinn Bicycle Co.'s computer room, where a plastic cover shields a shelf of newly installed modems. In the hallways of the sprawling brick building in northwest Chicago, stray wastebaskets catch the water dripping from the leaky roof. Downstairs, cars are parked on the factory floor, where machines and bustling workers once hammered out parts for the Schwinn bicycle line.

CW photo by M. McEnaney
Schwinn Bicycle Co.'s less-than-glamorous headquarters

Schwinn's somewhat dismal facility is not a pressing concern for MIS manager Robert Walsh, who over the past five years, has been working to bring DP technology up to speed at the 90-year-old bicycle company.

See SCHWINN page 4

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NEWSPAPER

Arizona charges DEC with rigging bids

By Edward Warner
CW Staff

PHOENIX — The Arizona State Attorney General's office has filed twin antitrust suits against Digital Equipment Corp., alleging that DEC rigged the bidding for a 1983 equipment contract that the Pima, Ariz., county government solicited.

The nearly identical complaints, both filed in Maricopa County Superior Court here on March 8, claim that DEC "contacted and persuaded or coerced its OEM dealers not to submit bids for RFP [request for proposals] 570," an RFP under which the county planned to buy computer equipment.

In addition, the two suits charge that DEC "persuaded or coerced Computer Systems/BFA, a Scottsdale, Ariz., OEM of DEC equipment, into withdrawing its bid after Computer Systems/BFA won the bid for RFP 570."

DEC spokesman Jeffry Gibson responded to the suits by saying that Computer Systems/BFA should not have bid on RFP 570, which he said was a request by the Pima County Sheriff's office to purchase eight DEC Decmate II word processing systems. DEC, according to Gibson, "pointed out that [Computer Systems/BFA] would be violating our OEM contract if [it bids] because there was no added value."

DEC to defend itself 'vigorously'

Gibson maintained that DEC does not believe it has violated the Arizona antitrust law and warned that "we intend to vigorously defend ourselves." He said DEC views the suits as a "dispute over $4,000," the difference, he said, between DEC's bid of $52,295.60 and the bid offered by Computer Systems/BFA.

Computer Systems/BFA President George Aeed said he was unaware that the suit had been filed and denied that DEC had coerced his company into withdrawing its bid. "No, of course not," he said, "DEC doesn't ask us to conspire with them."

Assistant Arizona Attorney General Gary P. Brady, meanwhile, said that DEC and Computer Systems/BFA were the only two vendors to submit bids on RFP 570 by the close of bidding on Aug. 16, 1984.

No choice but to accept DEC bid

When Computer Systems/BFA pulled out, he claimed, Pima County was left with no choice but to accept DEC's bid.

One of the suits was filed by the Attorney General's office on behalf of Pima County, the county in which the city of Tucson is located. That suit asks that DEC be required to either pay the county's cost of having allegedly had to accept a noncompetitive bid or pay the county 30% of the contract's price.

The other suit was undertaken by the state, an option, Brady said, that the state may take in any antitrust action. The state's suit asks that a $150,000 penalty be assessed against DEC.

Both suits ask that DEC be ordered to cease "continuing, maintaining or renewing the combination and conspiracy" that the state claims led to the rigging of the Pima County bid.

Brady, who filed the suits for the attorney general's office, said that the state had the option to bring either a civil suit or a criminal charge against DEC under the state's antitrust law. He refused to say why a civil suit was chosen.

Pima County Purchasing Director William Cox declined to specify the type of computer equipment involved in RFP 570 or how the county learned of the alleged bid rigging.

U.S. agency asks ban on Paradyne pacts

Registers terminal performance glitches

WASHINGTON, D.C. — The U.S. Department of Health and Human Services last week proposed to suspend Paradyne Corp. of Largo, Fla., from contracting with the federal government. The action followed a task force determination that the company "had substantially misrepresented the status and availability" of data communications equipment to fulfill a contract with the Social Security Administration (SSA) worth $116 million [CW, April 4, 1983].

Paradyne immediately denied the charges, saying it was meeting the terms of the contract, and it vowed to fight the proposed suspension, which would last for three years if it were to take effect.

Under the suspension procedures, Paradyne has 30 days to contest the proposed suspension by submitting evidence refuting the claims in the task force report on the company's performance.

SSA officials said that while technically the company was in compliance with the contract, the incidences of performance problems were greater than expected and that the work of the agency was being affected.

Last year, congressional hearings focused on the alleged difficulties that the SSA was having with the performance of terminals supplied to its field offices by Paradyne.

A report issued last year by the House of Representatives Government Operations Committee found that the performance of the terminals had a "detrimental impact" on the agency, and the committee recommended that the company be suspended from renewing the contract, which expires this year.

A U.S. General Accounting Office (GAO) report last year stated that the Paradyne terminals were not functioning as called for in the initial contract. The GAO added that despite the introduction of Paradyne equipment, SSA processing methods had not been upgraded as originally intended. According to the SSA, most of the equipment installed under the contract is operating satisfactorily, and it said that it would not remove the equipment if the proposed debarment takes effect.

However, the SSA said that it plans "[the] replacement of Paradyne equipment, [which] will take place over the coming years . . . to ensure benefits from the advances in data processing technology."

Paradyne has installed most of the 1,800 terminals as called for in the 1981 contract in 1,300 SSA offices across the country.

CORRECTIONS

The network control, integration and printer optimization products announced recently by Comm+ Systems, Inc., a subsidiary of Pacific Northwest Bell Telephone Co. headquartered in Seattle, are available now.

Additionally, the Printed Output Management System is actually capable of routing a message to, and not just addressing, any of 256 printers at one time.

Because of incorrect information supplied by the vendor, a story about Martin Marietta Data Systems, Inc.'s Orlando 4000 time-sharing service [CW, March 11, 1985] said the service includes the firm's micro software. While the Orlando 4000 service can use Martin Marietta's micro software packages, they are not included in the basic price of the Orlando 4000 service.

NEWS SUMMARY

Wang Laboratories, Inc. has become the latest computer manufacturer to reveal that its current-quarter revenue and profits will fall short of its projections/6

National Advanced Systems Corp. complemented the debut of its AS/XL series of mainframes with the announcement of several storage products/9

Software Benchmark: Conetic Systems, Inc.'s Higgins administrative assistant program/11

CW at EDP Performance: The DP department has isolated itself from users and is now paying the price of its isolation . . . A corporation's DP department needs a long-term strategic plan just as much as the corporation does . . . Subsecond response times can greatly boost productivity but can also drive up costs/12-14

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The Internal Revenue Service explained a massive computer tape foul-up at its Philadelphia computer center to the U.S. House of Representatives Ways and Means Committee/15

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A trans-Atlantic shipping firm has incorporated both data and text messaging into a freight tracking network/29

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Schwinn CEO geared up to meet overdue DP needs

Schwinn CW photo by M. McEnaney

By Maura McEnaney
CW Staff

CHICAGO — Convincing top management of computer needs is often an obstacle for MIS managers. But at Schwinn Bicycle Co., little convincing was needed.

"I went to college," said 36-year-old Edward Schwinn, president of the $150 million bicycle company. "If I were 50, I might have a roadblock or two in my mind, but I don't. I used computers to get me out of college."

Schwinn said he was a driving force in the company's automation process. He said he attempted to ease automation fears by working on a terminal within clear view of all who enter the company's headquarters based here.

"We felt quite seriously that if we were going to be competitive in the 1980s and 1990s, [then] we had to support our information systems across the entire country," Schwinn said in a recent interview.

'Our business . . . is bicycles, parts and service'

He added, "Our business is not computers; it's bicycles and parts and service. But we feel very strongly that computers can aid in that and make our life easier all the way around. Keeping track of literally thousands of line items, everything from nuts and bolts to fully completed bicycles, is no easy task, and we did it on a fairly helter-skelter basis before."

Even justifying escalating MIS budgets to the board of directors during times of near-financial crisis was not a problem for Schwinn. "My family owns this company, so it's not necessarily a question of going to your board of directors and pleading for something. Oftentimes it's spoken of around the dinner table, and we go ahead and do it."

From such conversations come rapid decisions on buying equipment like the IBM 5080 series graphics processing system now installed in Schwinn's engineering department. The IBM system is used largely at Schwinn for computer-aided design and manufacturing.

'We're incorporating the tools that best fit our objective'

"In an organization of this size, you could spend a lifetime justifying it," Schwinn said. "You're wasting a lot of time doing a lot of analytical work, when you know you ought to go forward and develop the product and the expertise of the brainpower that you've got in engineering. All we're doing is incorporating the tools that best suit our objective."

He said that expensive tools, such as as Software AG of North America, Inc.'s Natural language, are never purchased before Schwinn has heard a presentation on that product. "Nobody spends that kind of money around here without me knowing about it," he said. "But if you get enough guys to stick their hands up and say 'it's gonna work, chief,' you'd be surprised what a motivator that is," he added.

According to Schwinn, "We were very blessed by being an antiquated computer user. . . . We started from ground next to zero, and we brought more tools and more skills and more equipment and more software to the people who are using them. And people are using them at a ferocious rate. They've all of a sudden discovered they don't have to work as hard anymore."

SCHWINN from page 1

Today Walsh oversees a $1.9 million annual DP budget, a far cry from the situation he encountered when he joined the company in 1980. Like many established U.S. companies, in the late '70s Schwinn found itself plagued with manufacturing, distribution and inventory problems; at the same time, Schwinn was being outdistanced by European manufacturers aggressively chasing the 10-speed bicycle market.

A management change in 1979 returned a Schwinn family member to the president's office and marked the beginning of a series of dramatic changes at the company.

Upon the recommendation of consultants Peat, Marwick, Mitchell & Co., Schwinn began retrofitting its computer department under Walsh's direction. Although an IBM 370/138 mainframe was on order, "I inherited the responsibility of getting the machine features correct, getting the computer room built and upgrading the system," Walsh said. Systems were so archaic, according to Walsh, that the department was still writing programs in assembler.

Over the next five years, Schwinn invested more than $600,000 in applications software, beginning with a payroll package from Management Science America, Inc. (MSA), Walsh said. "We had a very old payroll system that took almost a week to get out."

The system wasn't well documented, parts were written in assembler and, according to Walsh, "if something happened to a couple of key employees, we would not have been able to produce the payroll."

At the end of his first year, Walsh began shopping for a data base management system. He said waiting a year his biggest mistake.

In July 1982, Schwinn installed Software AG of North America, Inc.'s Adabas data base management system (DBMS) and its Natural high-level language. "We looked at all the major products that were available," he said. "We went to a number of [demonstrations], we called up the end users ourselves, took our own credit cards and took them to lunch, leaving the salesmen at home," he said. "Adabas and Natural just kept coming back as meeting our requirements in ease of use, ease of learning and [in the] ability to change [it] once you've got it started."

The two products brought the capabilities for fast implementation of modern-day support services, Walsh said. "We found we were able to design and implement a system in four days or five days," he said.

Foremost among the Schwinn-developed applications was an inventory management system giving employees access to previous-day inventory and previous-day sales figures. "All of a sudden we have a file passing system, a [DBMS] and a screen-writing system that told people things that they could never find out until 45 days after month end. . . . People just went nuts."

Hardware changes in the company included mainframe upgrades: from an IBM 370/115 to the 370/138 in 1980, to an IBM 4331 in 1982 and to a IBM 4361 last May. Singer Co. System/10 minicomputers at the company's four distribution centers were replaced with IBM's System/34 minicomputers, upgraded to System/36 minicomputers, which were installed in December 1983.

With the recent purchase of MSA's general ledger and accounts payable software package, Walsh said, Schwinn is nearing the end of its technology catch-up phase. "We've gone from obsolete, ridiculous technology to almost leading edge, while the business has gone from being complacent and average to catching up on 25 years of neglect," he said.

Yet Walsh is not without his worries. "The biggest single frustration is that we get a number of very valid, very rational, very outstanding requests that we can't get to right now because we've closed this 25-year gap in five years, and we're doing in one year what everybody else is doing in three or four — but we were 25 years behind to start with."

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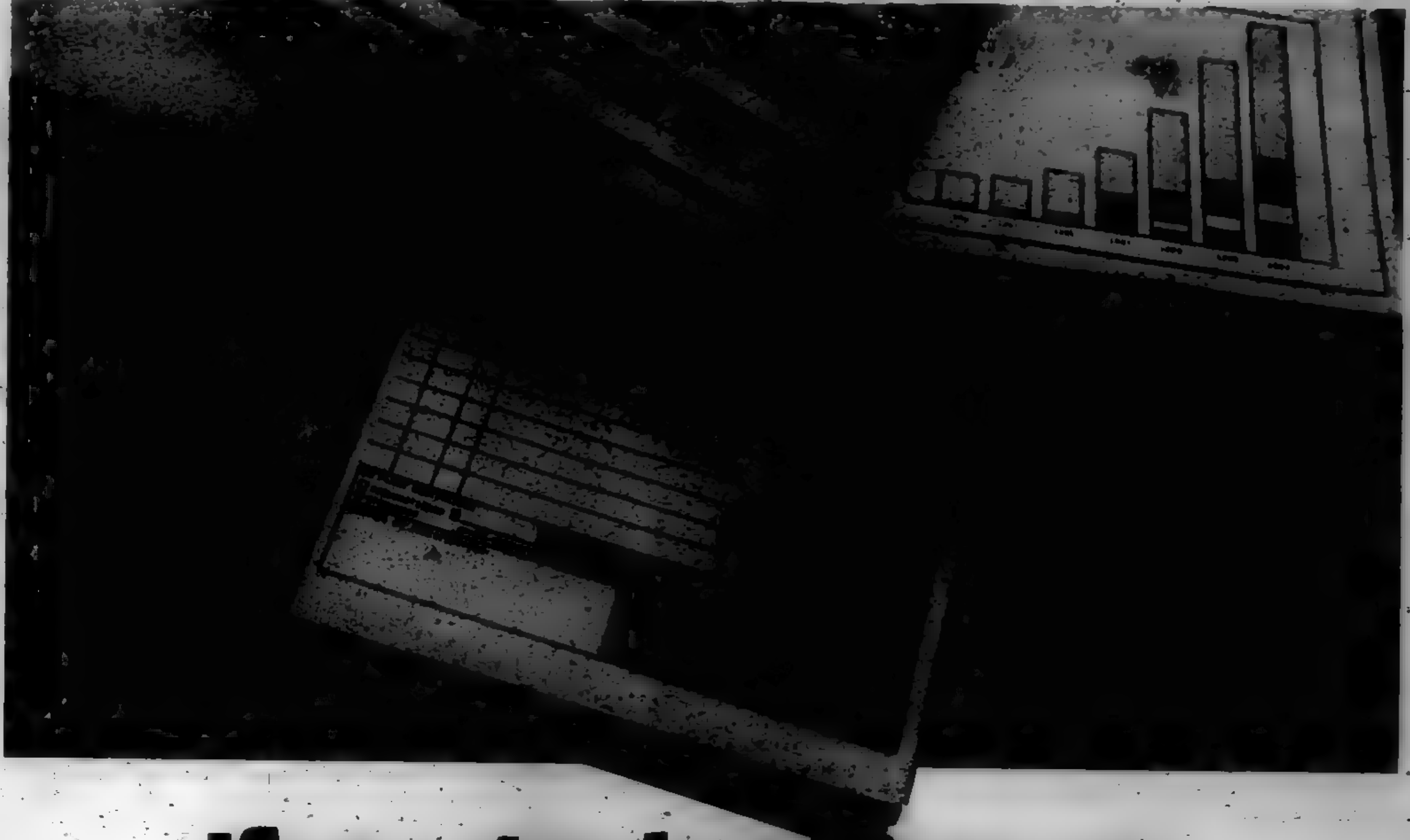

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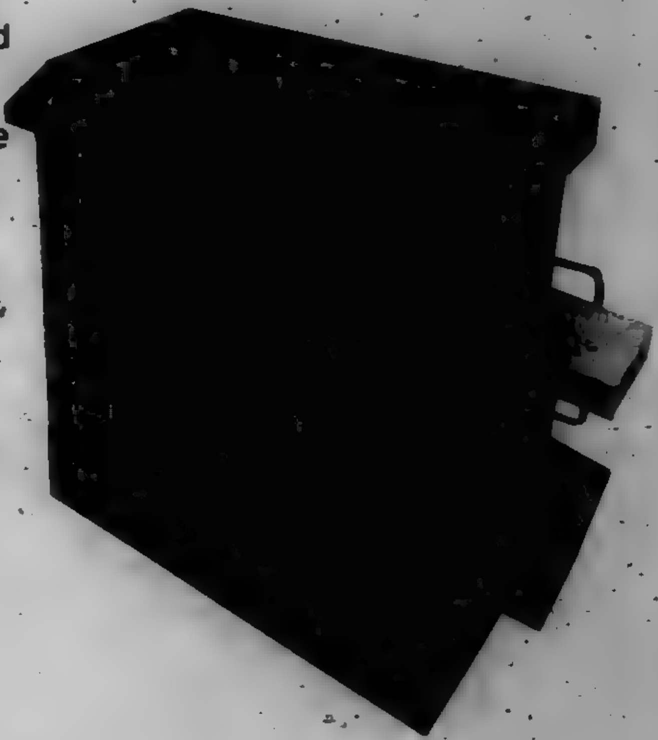

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Slowdown continues to plague computer industry

By Peter Bartolik
CW Staff

LOWELL, Mass. — The computer equipment market continued to show signs of running out of steam last week when Wang Laboratories, Inc. became the latest manufacturer to warn that revenue and profits for the current quarter will fall short of earlier projections. Wang also said fourth-quarter and fiscal year 1985 profits will be less than in 1984.

Wang, which had been rushing ahead at a 30% growth rate in both sales and profits for the past several years, said last week that revenue and orders in the quarter ending March 31 are expected to show growth of only 10% above the same quarter last year. The company said its net profit margin is expected to dip to between 5% and 6%, from 9.2% a year ago, indicating that profits will be 30% to 40% below the third quarter of 1984.

The company said it experienced slower than expected orders growth in December and January and said that was a continuation of the slower growth experienced in the second quarter ended Dec. 31 when revenue growth dipped to 18%.

Several other manufacturers also have reported slower than expected growth.

Computervision Corp., of Bedford, Mass., said it also expected lower revenue growth for the current quarter and anticipates "break-even earnings"; that news came just one month after the company reported a 35% growth in profits for 1984 compared with 1983.

Earlier this year [CW, Feb. 18], IBM said "it will be very difficult to show any growth in earnings" for the current quarter due mainly to the international currency situation.

Data General Corp. also said it expects flat results in this quarter, and Hewlett-Packard Co. reported that orders growth in November and December was much below the pace of the year earlier.

Several Wall Street analysts have lowered their earnings forecasts for Digital Equipment Corp. and have lowered profit projections for the current quarter to slightly below last year's earnings. Apple Computer, Inc. recently announced one-week shutdowns of manufacturing plants due to bloated inventories.

The equipment manufacturing slowdown follows a slowdown in the semiconductor manufacturing industry, which more than six months ago began to realise that orders from equipment manufacturers were dropping off significantly. Semiconductor orders have appeared to stabilise somewhat recently but have not resumed the high growth rate of 1983 and early 1984.

Last week, National Semiconductor Corp. announced third-quarter revenue was just slightly ahead of a year earlier, and profits declined to $1.5 million from $15.4 million in the third quarter of 1984.

Justice Department reports ATM fraud losses exceed $70 million

WASHINGTON, D.C. — The nation's banks lost an estimated $70 million to $100 million during 1983 through the fraudulent use of automated teller machines, according to a report released last week by the U.S. Department of Justice.

The study, "Electronic Funds Transfer Fraud," indicated that, in many cases, ATM fraud involved unauthorized transactions with stolen or lost ATM cards. In 72% of the cases, the authorized user's personal identification number was recorded and kept near the card, typically in the owner's purse or wallet, or written on the card itself.

About 2.7 billion ATM transactions involving $262 billion were processed in 1983, the report said. A sample study of 2,707 "problem incidents" showed that 45% of those involved fraud. Almost two-thirds of the problem incidents involved withdrawals, and nearly one-third of those problem incidents involved unauthorized transactions with stolen or lost cards.

The bureau report describes the findings of the first effort to examine ATM fraud by sampling bank data. Sixteen large commercial banks participated in the study.

The study also analyzed electronic funds transfers but was unable to estimate nationwide EFT fraud losses. The 16 participating banks reported 139 "problem" EFT transactions, involving an average of more than $800,000 each, according to Steven R. Schlesinger, director of the department's Bureau of Justice Statistics. About 56% of these incidents resulted in an actual loss to the bank.

More information on the report (NCJ-96666) can be obtained from the National Criminal Justice Reference Service through Box 6000, Rockville, Md. 20850.

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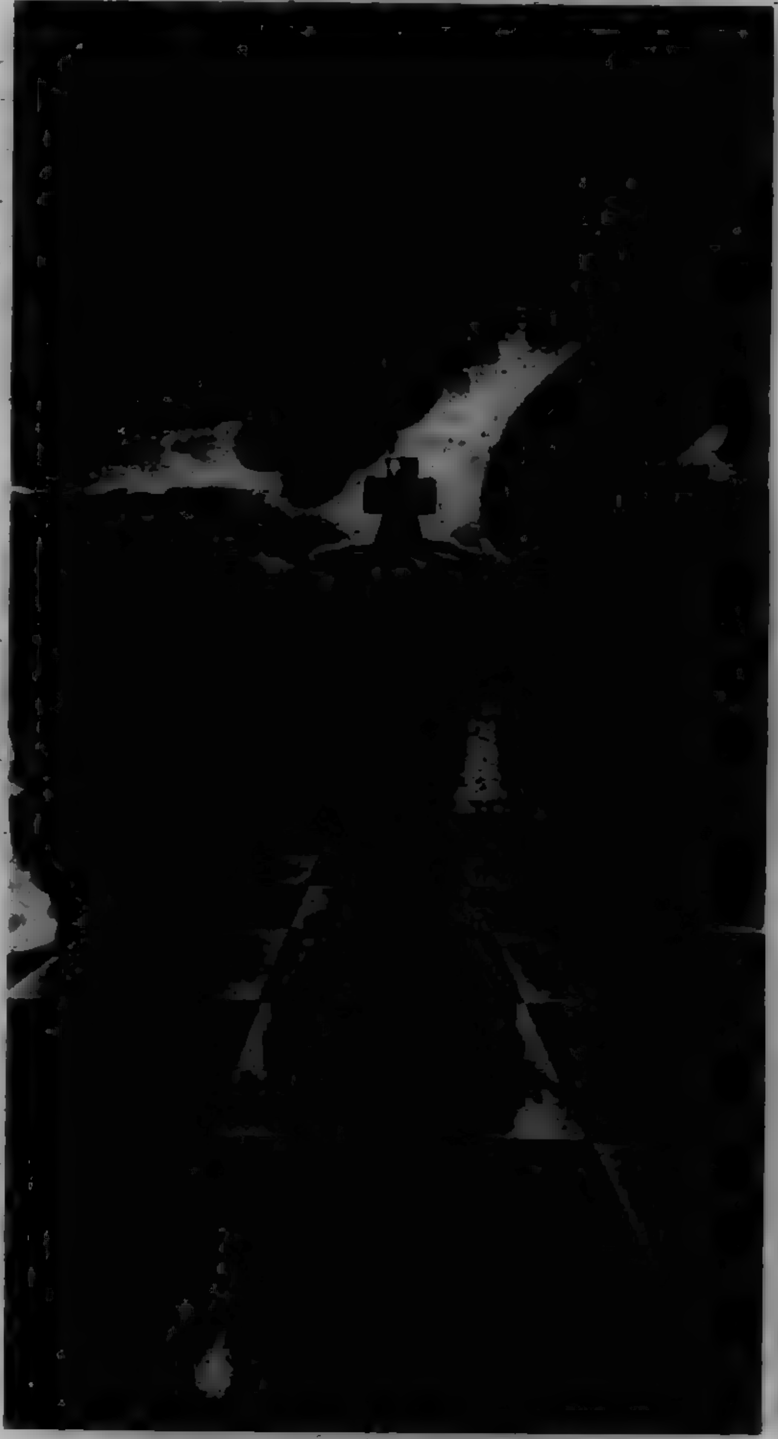

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[illegible] sidesteps IBM policy by banning [illegible]

CORNING, N.Y. — The arrival of IBM [illegible] [illegible] products will have little impact on DP operations at Corning Glass Works, Inc. here. [illegible], according to [illegible] Ray, the company's planned conversion from [illegible] to MVS/XA in May will pose only minor difficulties.

Considering the headaches either of these changes could entail for any DP professional, why is Ray, manager of data and network services for the Corning Glass Works, so confident?

"We recognized several years ago that IBM would adopt the [object-code-only] policy," he said. "So, we eliminated all modifications to our systems software. We realized it was just too easy to enhance or modify the software and, thus, increase the maintenance burden during [upward] conversion. We [illegible] a lot of important changes coming in systems software, and we did not want to be [illegible] [illegible] modification and conversion problems."

Ray admits his shop may be unique in that management has prohibited such systems software modifications. And he said he realizes that other DP organizations may be adversely affected by the object-code-only policy. In fact, he said, a similarly configured DP shop at a nearby company faces a lengthy and costly conversion due to the major modifications that were made to its IBM software.

But Ray feels IBM was justified in adopting the source code restrictions. "It just does not bother me. It was a policy that other vendors held, and it [illegible] as it is for any other [illegible]."

He also said IBM has gone out of its way to accommodate [illegible] modifications by supplying required software exits.

In its February, [illegible] object-code-only announcement, IBM said that products supplied without source code should provide exits to accommodate user extensions.

"For example," he said, "we saw a need to make some modifications to JES2. IBM supplied very rich exits to that system to enable us to do that. IBM has handled this very well."

FIRE from page 1

available, a portion of the user community — most notably those who modified software — spoke out against the theory of object-code-only [CW, May 14]. Now, a growing number of users are being forced to deal with the policy in practice.

Mary Johnston, supervisor of systems coordination for Safeco Insurance Co. in Seattle, said in a recent interview that Safeco's data center management tried for months to obtain source materials for the version of IBM's ISPF the company had acquired.

She said the source code was to be used to add to ISPF an audit trail mechanism Safeco programmers had developed within Tone Software Corp.'s Full-Screen Mode (FSM) IBM TSO screen-editing facility, which Safeco had replaced with ISPF.

Johnston said Safeco tried to modify ISPF without the source code but met only limited success. That, she said, has left some users unhappy. "We are a large organization supporting some very large systems that have hooks into IBM software. We rely on source code, and IBM's policy change has caused a lot of concern about our ability to supply the same level of functions and service.

'We hold IBM responsible'

"For example, the [audit trail] modification was an accepted function that we could not transfer to ISPF. We hold IBM responsible for user dissatisfaction. We will have to put in extra planning and work to maintain the same service levels," she explained.

A potentially more serious problem looms on Safeco's horizon, however. According to Johnston, IBM service representatives have told Safeco that source code for IBM's IMS data base management system will not be fully available in the future. She said IMS supports Safeco's nationwide network of field agents. An IBM spokeswoman confirmed that at least portions of the IMS code already fall under the policy restrictions.

"We have made a lot of modifications to IMS," Johnston said. "If IBM withholds the source code, it would be a grave hardship for us. We are so committed to IBM that we cannot even switch to another vendor's [data base management] system."

Preparing for the impact

Other shops not currently affected by the object-code-only policy, such as the data centers at Westinghouse Electric Corp.'s Buffalo, N.Y., and Pittsburgh facilities, are making preparations to minimize its impact.

According to Annette Gillcrest, manager of distributed systems support at the Pittsburgh facility, Westinghouse is reviewing its modifications to IBM's JES3, scheduled to fall under the source restrictions.

"To date, the policy change has not had any real impact on us," Gillcrest said. "We are keeping close tabs on the matter because we know it will have a serious impact later. We are looking at our JES3 modifications with the intention of eliminating them, getting them out of the in-line code," she added. "Object-code-only will have a tremendous impact on us, and we have to prepare for it."

Gillcrest's colleague Jerome Pogorzelski, manager of technical support at Westinghouse's Buffalo data center, said his organization will face "a sizable chunk of work" in reacting to the object-code-only policy. Pogorzelski said the data center has made extensive modifications to IBM's JES2, including adding non-IBM device support and an in-house-designed tape management system. The absence of source code, he explained, will make it difficult for the DP staff to support those widely used enhancements in the future.

"IBM has said it will provide exits to support modifications," he said, "but there are not enough exits to support the hooks we currently have in the system. I am thoroughly against IBM's decision. I would tell IBM that, at least as far as JES2 goes, we just cannot live with that policy."

Some people — including Pogorzelski — claimed IBM initiated the object-code-only policy with little regard for its impact on users. But other users said IBM has tried to mitigate any hardships that could arise.

"IBM seems willing to work with users," Gillcrest said. "We are involved with Guide [IBM users group], which has sponsored a JES3 project to address the object-code-only policy. IBM is working with that project team to ease any conversion problems."

Duncan Macpherson, director of DP for the New York Department of Motor Vehicles in Albany, N.Y., agreed that IBM is committed to handling any user problems.

"When I first heard of the policy my reaction was that it would have a strong impact," he said. "But IBM has really beefed up its support centers, which, to users, is the only alternative to having the source code available. We were concerned about the effectiveness of that alternative, but it seems IBM has examined the possible impact of object-code-only and has made the necessary commitment to the support centers."

Support centers effective replacement

Macpherson's associate, John Fahey, manager of computer systems software for the New York Department of Motor Vehicles, said that IBM's Support Centers will serve as an effective replacement for the once-available source code.

"It all boils down to what you used the source code for," he said. "If you used it for troubleshooting, then the support center is the solution. If you used it to modify the software, then you will have problems in the future."

Not everyone is optimistic about IBM's ability to respond to user needs in the wake of the object-code-only policy. Glen Deichelbor, director of corporate MIS for Myrtle Beach, S.C.-based AVX Corp., said his programmers have made a variety of modifications and have diagnosed a multitude of systems problems with the aid of IBM-supplied source code.

"I am not pleased with the object-code-only policy at all, given IBM's response to our problems in the past," Deichelbor said. "I do not think the software has ever been stable enough that we can rely solely on the support center for maintenance."

While AVX's data center has not installed any object-code-only products to date, Deichelbor said the company is anticipating problems.

"When the restrictions reach the operating system level, that is when the impact will really be felt," he said.

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NAS from page 1

last week in New York.

In essence, NAS' two latest machines provide a migration path for CPU-bound users of the company's existing AS/9000 processors, which will remain unchanged in price, Schoch said. To expand from a current top-of-the-line AS/9080 to the AS/XL-60, customers will reportedly have to swap boxes because the former top-of-the-line machines are not field upgradable to the AS/XL series.

Like their Sierra rivals, the AS/XL processors were designed expressly to meet the extreme performance needs of the corporate world's largest users. NAS classifies such accounts as "superlarge" installations, typically characterized by a 60% annual growth in processing requirements, Schoch said.

Formed entirely of very large-scale integrated circuitry, the AS/XL family reportedly uses 2,000 and 5,000 gate/chip ECL devices with switching speeds of 200 and 250 picosecs, respectively, Schoch said.

Thanks to the edge in switching speeds, the Models 60 and 80 outperform NAS' AS/9080 by 40% and 150%, respectively, he said.

In addition to implementing its main storage in 256K-bit random access memory chips, the AS/XL machines use 40,000 gate/chip Cmos logic devices in their associated I/O processors.

The logic and memory circuitry's density has reportedly cut the AS/XL line's footprint to just half of the AS/9080's. A Model 60 occupies 90 square feet of floor space, compared with 107 square feet for the Model 80, he said.

Both AS/XL series members are air-cooled and provide at least 32 channels and 64M bytes of main memory, which expand to a maximum of 64 channels and 256M bytes. In data-streaming mode, each channel reportedly transfers up to 3M byte/sec.

A minimally configured AS/XL Model 60 costs $4.8 million, compared with $8.9 million for an entry-level AS/XL Model 80. Volume shipments of both processors are slated to begin during the second quarter of 1986.

NAS is located at 800 E. Middlefield Road, Mountain View, Calif. 94040.

NATIONAL ADVANCED SYSTEMS CORP. (NAS)

System	[illegible]	[illegible]	[illegible]	AS/XL Model 60	AS/XL Model 80
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mips[1]	11.2	16.2	20	28	50
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Purchase Price[3] (Memory Size)	$2,308,000 (16M)	$3,249,000 (16M)	$3,074,000 (16M)	$4,840,000 (64M)	$8,970,000 (64M)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Machine Cycle Time (Nsec)	30	38	30	Not available	Not available
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cache (Buffer) size	256K	128K[5]	512K[5]	256K	512K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Price per 1M byte of main memory[4]	$11,800	$11,800	$11,800	$11,800	$11,800

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. Actual performance can vary with the application, peripherals and software.
2. CW estimates.
3. Includes processor, console, power supply and all prerequisites.
4. Main memory enhancements are available in 2M-, 4M-, 8M- and 16M-byte increments, depending on the model.
5. Cache memory per CPU.
6. NAS offers a vector processor attachment for the AS/9000 models that costs $300,000. When this option is included the AS/9000 series processors become known as AS/9100 models. For example, an AS/9080 with the vector processor option would be called the AS/9180.

CW Chart

NAS storage products join AS/XL debuts

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — National Advanced Systems Corp. (NAS) last week complemented the debut of its AS/XL series mainframes (see page 1) with the announcement of several storage products, including a double-density version of the company's existing 7380 disk unit.

Reportedly costing 27% less per megabyte than its single-density counterpart, the dual-density module counters recent disk-related introductions by IBM [CW, Feb. 11, 1985] and joins two other additions to

See STORAGE page 10

Just published:

MVS TSO

Concepts • Commands • SPF • CLIST

If you're developing programs under OS/MVS, you're probably using some type of time-sharing system. If that time-sharing system is TSO, a new book called *MVS TSO* is for you. It zeroes in on the tasks a programmer has to do most often, so you can master TSO in a hurry.

Here's what you'll learn, whether you're using native TSO or SPF (a menu-driven version of TSO)

- how to create or change a data set or a library member
- how to allocate, display, print, rename, delete, move, or copy a data set
- how to compile, link-edit, and execute a program interactively
- how to debug a COBOL program interactively—that is, how to monitor the program's execution, look at the contents of data fields, watch the order in which subprograms execute, and so on
- how to start and control background processing for batch jobs (a background job doesn't run in your time-sharing region, so your terminal's not tied up as the job executes)
- why you have to use native TSO commands for some functions even if SPF is available on your system

In short, you'll learn everything you need to know to use TSO commands or SPF for program development.

For experienced TSO users: How to use command procedures

MVS TSO will also teach you how to use command procedures, or CLISTs. A CLIST is a series of TSO commands and statements that are executed in sequence (it's roughly equivalent to a JCL procedure). In this book, then, you'll find out:

- how to create and execute a simple CLIST for a specific job
- how to create and execute a generalized CLIST that can be used in a number of situations
- how to write a complex procedure that uses facilities much like those of a high-level language
- when and why you should write a program in a high-level language instead of using a CLIST

2 reasons why this book works

1. A technical subject like TSO is easier to master if you have plenty of practical examples to study. That's why *MVS TSO* is loaded with illustrations. For example, you'll find:

- before-and-after screen images that show you what values to enter into a screen and what the result will be
- TSO command formats that clearly explain each operand
- sample CLISTs
- schematic drawings that show how TSO works and how it relates to MVS

These illustrations not only help you understand TSO in the first place. They also serve as handy references when you're working at your terminal.

What's more, they teach you the basic patterns of TSO commands and SPF options. So you won't have any trouble looking up new features in the IBM manuals or other references when...and if...you need them.

2. This book is organized in a way we've found works well. After chapter 1 (an introduction to MVS and TSO), the book is divided into 3 parts: one each on SPF, TSO commands, and CLIST. So if SPF isn't available at your installation, you can skip that part and concentrate on native TSO. If you already have TSO experience, you can go directly to the part on CLIST.

In other words, you can study the parts you want to, when you want to.

So why wait to become a TSO expert?

Get a copy of *MVS TSO* today. I think you'll be delighted at how quickly you'll master TSO.

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Practical texts on JCL and utilities

OS JCL teaches you how to code job-control language for everyday applications that involve sequential, direct, ISAM, or VSAM files. If you're a TSO user, this book will help you understand why you have to supply JCL for some TSO jobs and what that JCL should be.

Why take the time to write a program in a high-level language when you can use a utility program instead? *OS Utilities* teaches you to use 13 time-saving utilities, including IEBGENER, IEBPTPCH, IEBISAM, IEBUPDTE, IEFBR14, Sort/Merge, and IDCAMS.

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Dear Mike: Please send me the books I've indicated below. I must be completely satisfied, or I'll send them back at any time for a full refund.

____ MVS TSO, 454 pages, $22.50
____ OS JCL, 330 pages, $22.50
____ OS Utilities, 185 pages, $15

☐ Bill me for the books plus shipping and handling (and sales tax in California.)
☐ Charge the books plus shipping and handling (and sales tax in California) to my ______Visa ______MasterCard:
Card number________________ Valid thru (mo/yr)________
Cardowner's signature________________
(not valid without signature)
☐ I want to SAVE shipping and handling charges. Here's my check or money order for full payment. Calif. residents, please add 6% sales tax to your order total. (Offer valid in U.S.)
Name & Title ________________
Company (if any) ________________
Address ________________
City, State, Zip ________________ T1/3

NAS debut puts IBM on the spot in high-end market

By Jeffry Beeler
CW West Coast Bureau

With last week's introduction of high-end mainframes, has National Advanced Systems Corp. (NAS) temporarily put IBM on the defensive in Big Blue's favorite battle zone?

Although IBM continues to hold the all-important high-end processor market in an iron grip, the company will apparently lag behind NAS in bringing its top-of-the-line Sierra-class mainframe to market (see related story page 1).

But whether NAS — and its hardware supplier, Hitachi Ltd. — will be able to exploit its temporary advantage and siphon away large portions of IBM's high-end business remains to be seen. Opinions on the subject differ widely.

On one side stand industry observers like Phoenix-based Annex Research President Bob Djurdjevic, who expects the AS/XL announcement to create a "window of opportunity and allow NAS to gain market share at IBM's expense."

Djurdjevic's opinion is shared by Dave Moschella, a senior industry analyst with Framingham, Mass.-based International Data Corp. (IDC). "Having the fastest machine on the block at any point in time is a clear advantage and does increase a company's market share," Moschella said.

Moschella cited the results of a recent IDC survey in which performance requirements were found to be growing 50% annually among the very largest IBM 3081 and 3084 mainframe users.

Even now, there are signs of an impending capacity shortage. "Many of IBM's largest and most important customers need an [IBM Model 400-class] machine within the next six months," said Frank Gens, information systems research director for the Boston-based Yankee Group.

On the other hand, he added, an abbreviated shipment schedule may enable NAS to "beat IBM to the punch in selling high-end processors to the largest accounts."

Not everyone, however, views NAS' prospects so optimistically. Throughout the years, IBM has demonstrated a knack for "effectively countering the plug-compatible companies' actions," according to Harry Edelson, a managing partner in Edelson Technology Partners, Inc.

Another note of dissent is offered by E. F. Hutton & Co. analyst Michael Geran, who foresees a strong attempt by IBM to accelerate its Model 400 deliveries. "A prototype of the Model 400 is already running in Poughkeepsie, [N.Y.], and IBM indicated at a recent analysts meeting that it is going to do its [best] to improve the product's shipment date," Geran said. If the effort succeeds, the NAS Model 80's head start in availability may shrink from a year to six months.

STORAGE

from page 9

NAS' memory products line. The two newcomers include an expanded cache controller and a 1M-byte dynamic working storage subsystem integrated into the AS/XL.

The double-capacity 7380 disk system boasts twice the track density of earlier 7380 versions, NAS said. The dual-capacity storage subsystems come with four head disk assemblies and an equal number of actuators, each supporting 1.26G bytes for a total of more than 5G bytes.

Like its single-capacity predecessors, the double-density subsystem uses ferrite heads, according to John Williams, manager of the firm's disk marketing. NAS will reportedly continue to supply the older 7380s alongside the enhanced versions.

Compatible with the company's existing 7880 disk systems controller, the double-capacity storage product comes in two models — the AE and BE. Each controller can support strings consisting of one AE and as many as three BEs.

Although single- and dual-density models cannot be intermixed, two strings of unlike capacities can be attached to the same controller, the company said.

The 7380's AE model costs $128,000, compared with $104,880 for the BE.

Taken with the two AS/XL processors, the dynamic working storage subsystem and the cache controller form the first members of NAS' Alliance product family.

With the introduction of its dynamic working storage subsystem, NAS is adding another layer to its memory hierarchy and reportedly boosting the AS/XL's processing and channel speeds by reducing access times for the mainframes' I/O and instruction processors. The dynamic working storage subsystem separates the two AS/XL machines' main memories from their cache buffers and I/O processors, according to NAS.

In a storage-related move, NAS has replaced its existing 7880-13 cache controller with an enhanced model that reportedly provides more functionality and up to four times greater memory capacity than its predecessor. The 7880-3C reportedly expands to a maximum of 64M bytes.

NAS has also provided the 7880-3C controller with a separate cache directory and a cross-coupling feature, the company said.

Prices for the 7880-3C start at $142,500, with volume shipments beginning during the second quarter of 1986. NAS is located at 800 E. Middlefield Road, Mountain View, Calif. 94040.

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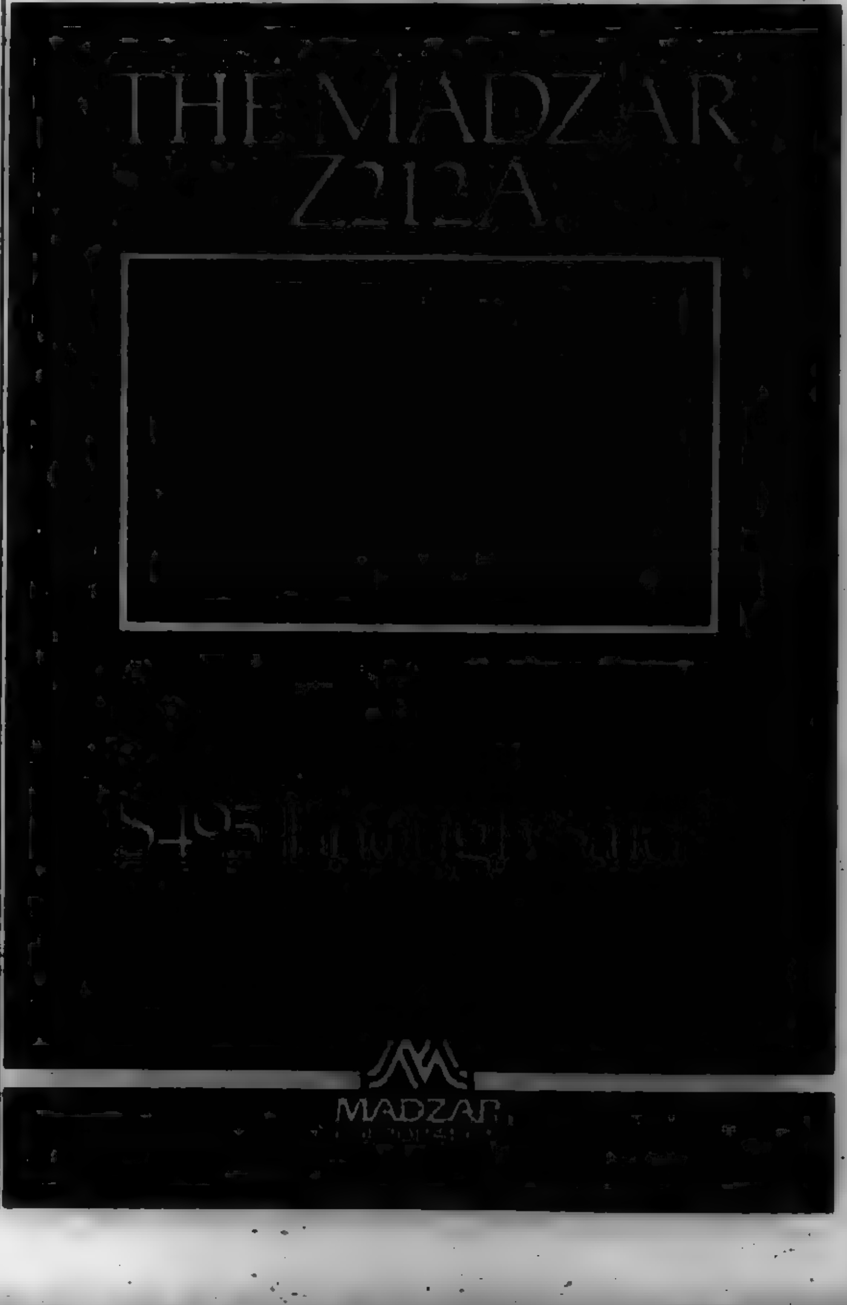


Higgins: Is unique better?

Conetic touts versatility, but tests prove inconclusive

Conetic Systems, Inc. began shipping Higgins, billed as an administrative assistant program, in December 1984. Since then, Conetic has aggressively marketed the product, making several significant claims about its versatility and uniqueness in the administrative software market.

The first claim is that Higgins can interact with some of the more popular programs, such as Lotus Development Corp. 1-2-3, Microsoft Corp. Word and others, by indexing all of these other programs' files, letters and spreadsheets.

Another claim is that Higgins is the only product available that offers expense reporting and multiuser local-area network support, which includes phone messaging and electronic memos.

These claims and the rising interest in administrative software in general have prompted several questions:

- To what extent does Higgins interact with other application programs, and to what extent does "interact" mean "integrate"?
- How well does Higgins' expense reporting module function?
- Since data organization and ease of data retrieval is the heart and soul of administrative programs, how well does Higgins rate on these issues?
- What should Conetic's target audience for Higgins be?
- Could the time spent in entering and updating the information for administrative programs be too costly in terms of opportunity costs, thereby outweighing any benefits to be accrued from the program's use?

Consists of nine modules

By way of explanation, Higgins comprises nine modules (see second table), all of which sit atop Conetic's relational data base system. This data base supports Higgins' capability to retrieve information both from within modules and globally through the use of user-defined keywords.

Installation on an IBM Personal Computer AT was accomplished fairly easily, following the simple instructions provided in the documentation. The documentation itself was found to be adequate for most uses but lacking in some extras that would have helped the user, such as including a function-key overlay.

There was minimal difficulty in learning Higgins' detailed security system of public and private passwords, but Higgins' overall commitment to user privacy throughout the course of review was impressive. Finally, Higgins provides useful, context-sensitive, on-line help simply by pressing one of the function keys.

To test Higgins' interaction with other applications programs, 1-2-3 was loaded onto a Personal Computer AT. The documentation describes how external files generated from within other applications can be retrieved and placed into the current Higgins file, although the user is unable to edit the external file itself from within Higgins' expense reporting feature.

It was not possible to place the 1-2-3 file successfully into Higgins, even after Conetic's technical support personnel went through the entire process. However, it was possible to move easily from Higgins to 1-2-3 and back again. Thus, the tests showed the only interaction with other applications that Higgins provided is with Higgins as an external umbrella, without any real file sharing.

The expense reporting facility was found to be the most impressive and useful element of the program. One of the most dynamic elements of Higgins, this module will be its primary selling point with managers and sales personnel who travel extensively. The user invokes the Expenses command and asks Higgins to assemble an expense report automatically for any user-specific period of time. When this is done, the screen displays the information, including an expense summary.

There is also a window that lists each item in more detail. User-defined expense categories are included in a third window on the screen, including totals for the given time period; any piece of information for each expense item can be easily modified. Even more impressive than the on-screen use of this facility is the quality of the report output. The first page of every report details each expense item. Weekly expense totals are also included, and the user can attach any pertinent explanatory notes to the report.

The second page is the summary report page, which includes first the expenses incurred specifically while traveling and then the total expenses registered during the given period.

Since administrative programs are billed primarily as organizational tools, the internal organization of data and the ease of data retrieval assume a great deal of importance. The structure of the program itself was fairly easy to understand, following the common hierarchical menu system convention.

With Higgins' emphasis on integrating pieces of data between modules wherever possible, a rather intricate web of interrelationships resulted, often confusing the user. However, with intelligent use of the keyword method of data extraction, most pieces of information can be readily retrieved.

Multiplan-like commands

Higgins' overall organization and ease of use benefits greatly from its Microsoft Multiplan-like command line, which appears on the bottom of the screen. Users select the commands by striking the key corresponding to each option's first letter, and the keys are generally easy to understand, even for users who have never worked with administrative programs before.

Higgins' best audiences should be computer-proficient managers, executives and sales personnel who travel a good deal and corporate office users with local-area networks. The tutorial that Conetic provided assumes a fairly high level of computer knowledge, especially when discussing some of the more difficult aspects of the program. It fails to discuss even file transfer with other programs. Thus, a prospective user had better have a good working knowledge of computers and application software in general.

In conclusion, Higgins is one of the best administrative software programs in the micro market. However, after reviewing the program and spending a good deal of time using it, serious questions remain as to whether the time costs incurred in updating the scheduling feature and "things to do list" constantly would justify the time savings gained by its expense reporting and directory operations.

HIGGINS AT A GLANCE

Price	$395 for single-user version $200 per user (average) for local-area network versions
System Requirements	
Computers	IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles AT&T Model 6300
Operating System	PC-DOS 2.0 or MS-DOS 2.0
Memory	256K random-access memory
Display	Monochrome or color
Peripherals Supported	
Printers	Epson America, Inc., NEC Corp., Okidata Corp. and Mannesmann Tally Corp. (includes generic entry for other printers not listed).
Modems	Hayes Microcomputer Products, Inc. and Hayes-compatible modems.
Local-Area Network	IBM PC Network, 3Com Corp. Etherseries and Novell, Inc. Netware

MODULE FEATURES

Time Management (Personal Scheduler)
- Appointment log, including time and description
  - —Tied to detailed appointment log where user can protect listing, add notes or link log to separate phone directory, thing-to-do list or expense report entry
- Monthly calendar highlighting current date
- Bar graph displaying appointments as blocks

Directory
- Telephone directory that lists name, company and telephone number
  - —Tied to detailed directory that can contain full address and personal notes
- Automatic dialing from telephone number entry through a modem
- Can use ascending alphabetical sort on either name or company listing

Things-To-Do List
- Can list things to do by description, priority status and due date
  - —Tied to detailed item list where user can protect entry or link it to a separate phone directory or appointment log entry

Expense Reports
- Accepts user-defined expense categories
- Does automatic subtotaling by categories
- Generates expense summary, listing date, item, category and amount
  - —Tied to detailed expense summary where user can specify purpose of the expense, to whom paid and location as well as link report to appointment log entry
- Generates automatic expense reports, with totaling by categories, and month-end summary reports

Personal Text Files
- Cross-references records stored in other modules
- Can add new file records
- Can search records by key words using logical operators or by starting or ending dates

Clock
- Can set countdown timer to sound alarm between one second and 60 minutes

Tickler/Reminder
- Can set alarm for specific appointment entries to sound between one minute and one hour ahead of the appointment time
- Automatic alarm chimes on the hour

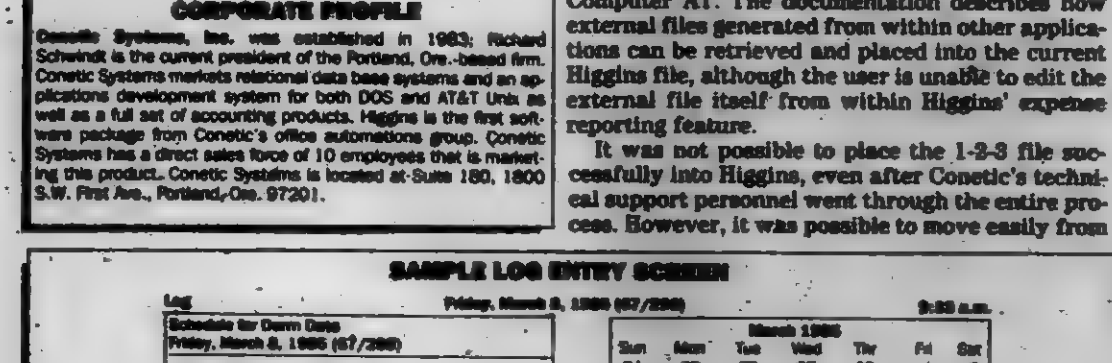
Calculator
- Contains nine memory stacks that will accept user-defined names as well as values
- Floating-point precision accurate to six places
- Supports all standard math functions plus percentage and exponentiation

Scratch Pad
- Supports basic word processing and editing, including insert and overtype modes for up to two pages of text
- Allows automatic dialing from within text

CORPORATE PROFILE

Conetic Systems, Inc. was established in 1983; Richard Schwindt is the current president of the Portland, Ore.-based firm. Conetic Systems markets relational data base systems and an applications development system for both DOS and AT&T Unix as well as a full set of accounting products. Higgins is the first software package from Conetic's office automations group. Conetic Systems has a direct sales force of 10 employees that is marketing this product. Conetic Systems is located at Suite 180, 1800 S.W. First Ave., Portland, Ore. 97201.

SAMPLE LOG ENTRY SCREEN



Log Friday, March 8, 1985 (67/298) 9:30 a.m.

Schedule for [illegible] Date
Friday, March 8, 1985 (67/298)

7a 8a 9a 10a 11a-12p 1p 2p 3p 4p 5p-6p E

APPOINTMENT LOG

Time	Description
9:45 a.m.-10:45 a.m.	Article Organization Meeting
12:00 p.m.- 1:30 p.m.	Lunch with Greg
3:00 p.m.- 5:30 p.m.	Article Graphics Meeting

Select the option or type the Command letter

Log Select Commands: VIEW ADD DELETE [illegible] CALENDAR

March 1985

Sun	Mon	Tue	Wed	Thr	Fri	Sat
24	25	26	27	28	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

[illegible]

DP shops excluding themselves from corporate concerns

CW AT
EDP PERFORMANCE

By Edward Warner
CW Staff

TUCSON, Ariz. — The DP department has built a wall between itself and the business side of its company, and that wall has isolated DP from a role in corporate planning.

So claimed Max T. Horn, a consultant who spoke at Applied Computer Research, Inc.'s Conference on EDP Performance Management here last week. Horn said his recent survey of numerous DP departments found that those departments "had no role in a company's strategic planning."

Horn, president of Minneapolis-based Karlsson Consulting Group, Inc., said the wall could be traced to the historic distinction between companies' DP and business sides but charged that "we in DP are primarily responsible for this wall." The DP department, Horn said, isolated itself with what he called an imperial attitude, weak listening and writing skills and a tendency to offer "guesstimates" instead of concrete answers.

DP's attitude problem, he elaborated, is best illustrated by its use of the term "user" to describe someone who receives its services.

"How dare we within DP have the audacity to call others users?" Horn asked. "This gives the connotation that the company revolves around us."

Put off by this attitude, Horn said, people have lost their faith in the DP department and many haye set about establishing their independence from DP by purchasing microcomputers or minis. Horn said this is bad news both for the in-house clients, who will miss DP's expertise, and for DP, which is letting infomation management get out of control.

To tear down the wall between DP and those it serves, Horn advised that DP staff members become more businesslike both in their way of presenting themselves — their style of dressing and listening — and in their attitudes, which, he said, should reflect the goals of the firm. He also advised DP managers to sharpen their writing skills, asking, "How many people do you know in DP with good writing skills?"

The role of the DP shop, he suggested, should be to provide services; not build systems, and to become more involved with users of its services, particularly at the initial design stages of a project. The projects that result are likely to be more sensitive to clients' needs, he said, adding that "if [clients] are really a part of the project team, they can't sit back and point fingers" at failures.

Horn also urged DP to rebuild its credibility by meeting a series of "small commitments" made to recipients of it services. The guesstimates, too, must go. "We have [to learn] to say no at times, [as in] 'No, I can't give you a number on that,' rather than offer a guesstimate," he said.

AT&T proposes rate revisions

WASHINGTON, D.C. — Responding to directives from the Federal Communications Commission and to comments from users, AT&T Communications has filed revisions to private-line rate restructuring plans that would reduce scheduled increases in voice grade and Dataphone Digital Service (DDS) rates but increase rates for switched private-line configurations.

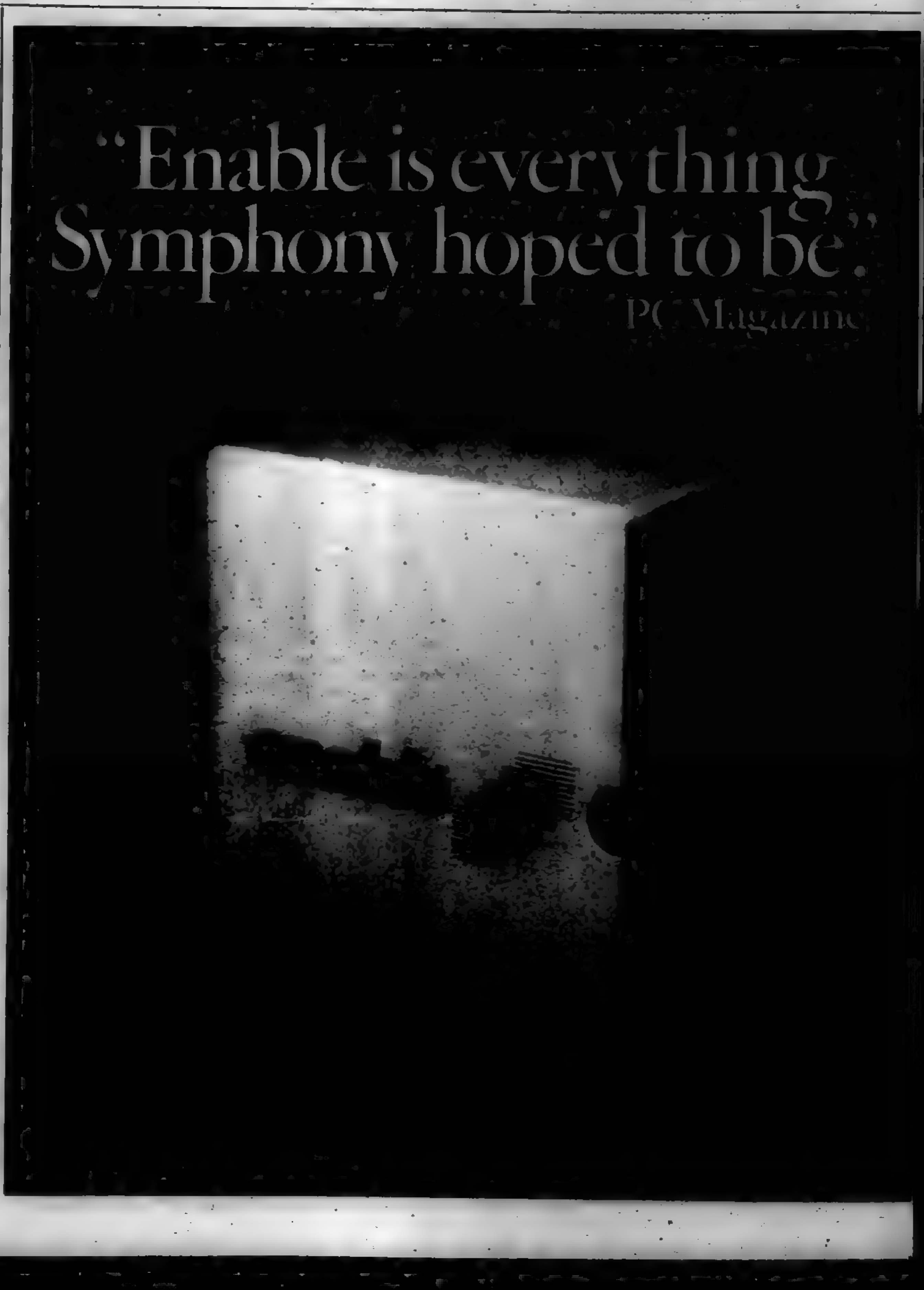
The company said the changes "would mitigate rate impact on multipoint private-line users by reducing voice grade and DDS rates and by providing bridging of voice grade and telegraph local channels at the local exchange carriers' serving wire centers."

AT&T Communications said that the proposed changes, slated to take effect April 6, would result in an average 7.6% increase for private-line customers. It predicted that if the special access rates prescribed by the FCC for the local telephone companies were placed into effect as ordered, AT&T Communications would make further changes to the private-line tariff restructuring and that the increase could be held to 4.6%.

AT&T Communications said that voice grade private-line rates would be reduced by $74 million and that DDS rates would be reduced by $9 million. For voice private lines, the connect rate will be reduced from $20 monthly to $15.45, and the interoffice channel rate will be reduced by 5 cents for connections of more than 500 miles, while the fixed interoffice channel rate will increase by $25.

For DDS service, the central office connect fee will be reduced from $35 monthly to $20 for 2.4K and 4.8K bit/sec transmission, while the interoffice channel monthly rate for 2.4K, 4.8K and 9.6K bit/sec transmission rates will drop by 5 cents for distances of more than 500 miles.

Switched private-line services will face a 19.4% increase above existing tariff rates currently in effect.



Implementation of strategic plan vital to DP survival

CW AT EDP PERFORMANCE

By Edward Warner
CW Staff

TUCSON, Ariz. — A corporation's DP department needs a long-term strategic plan just as the corporation does. But what if the corporation has no written strategic plan for DP to use as a guide?

In that case, according to consultant Barry Wiegler, it may be time for DP managers to sit down with their firm's chief executives and "ask them where they [are] going."

Wiegler, president of Santa Monica, Calif.-based Key Consulting Group, Inc., made his remarks at Applied Computer Research, Inc.'s Conference on EDP Performance Management here last week.

DP managers can expect full cooperation from nearly all executives they approach to ask about the firm's strategic plans, Wiegler said.

Among the questions that Wiegler advised the conference attendees to ask in such cases were the following:

- What is the corporation's mission and philosophy? What business does the corporation see itself in?
- What assumptions about factors such as new laws or changing market conditions underlie the firm's way of doing business?
- Where is the corporation headed, and what new products can it be expected to unveil?

DP shop must gear up to meet needs

Each of these questions, Wiegler explained, has a corresponding meaning for DP. For example, he said, a firm that has the mission of becoming a nationwide corporation must begin now to expand its telecommunications capability.

A firm that expects to release a range of new products in another year, meanwhile, must gear up its DP shop now to meet the expanded needs of supporting those products, he continued.

Wiegler advised DP managers not to let the lack of a corporate strategic plan keep them from developing one for their department's use. "Two to three years from now," he said, "if [the DP department does not] have what [it] should have in place [in hardware and software], people aren't going to remember that it was because [the DP department] didn't have an effective corporate plan to follow."

An informal poll, taken by Wiegler at the end of his presentation, showed at least one-quarter of his audience work in firms where the DP or DP manager's position has been elevated within the last two years to a higher level of authority. In a show of hands, roughly half of Wiegler's listeners also indicated that they worked for DP departments that already had a long-term strategic plan in place.

However, Wiegler said, many firms do not have strategic plans, largely because implementation of these plans does not offer a short-term reward and actually draw top management's attention away from their day-to-day work.

Other factors that work against the adoption of a long-range plan, he said, were executives' disagreements over corporate direction or pessimism about their own ability to predict the future.

[illegible]

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Computer Buyer's Guide and Handbook
November, 1984

"...if an office is looking to step up to across-the-board integration with a multitude of functions...this is the one program to seriously consider."
Personal Computing
March, 1985

"Offering true integration among all of its applications modules...[Enable is] a powerful production tool that can serve everyone in the office, from data entry personnel to the vice-president of marketing. Each module could stand as a full-powered application in its own right."
PC Magazine
February 19, 1985

"Enable, a five-function integrated system from The Software Group, merits a close look by any individual or organization interested in a solid package that is well balanced in all of its applications."
Popular Computing
March, 1985, Paul Goldner, Raymond Heed, Yvonne Lirtzman, Michael Wilding

"Quite simply, this package has so many outstanding attributes that even the worst skeptics of integrated software have to be impressed. The spreadsheet is very close to 1-2-3; the word processor combines the best thinking of WordStar, MultiMate, Volkswriter, and EasyWriter; the data base offers the functionality of dBASE II, but with many of the ease-of-use features of PowerBase; and the program offers business graphics and telecommunication. Taken as a whole, Enable surpasses the functionality of Symphony, Framework, Aura and Open Access."
IBM PC Update
December, 1984

Enable first in "Performance" rating—including speed and capacity of all modules tested. Enable first in "Versatility" rating—including power and functionality of all modules tested. Enable rated first in overall evaluation of the word processor module.
Software Digest Ratings Newsletter
Rating of 15 Integrated Products
December, 1984

"Enable welds its five applications together with outstanding integrity—yet each is exceptionally full-functioned in its own right."
Business Computer Systems
January, 1985

"Enable is one of those programs that can be up and running with most of the features you need in a few hours. As you need more, you can get deeper into the program and learn at your own pace."
Infoworld
January 21, 1985

"...a birdlike appetite for RAM keeps this virtual-memory system sprightly, even in stock MS-DOS machines."
INC.
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Subsecond response time: Productivity boon or bane?

CW AT EDP PERFORMANCE

By Edward Warner
CW Staff

TUCSON, Ariz. — Subsecond system response times can cause dramatic boosts in productivity. They can also increase error rates and drive up system costs.

According to analyst Phil Howard, president of Applied Computer Research, Inc., a Phoenix-based market research firm, those possibilities are chief among the issues raised in what he calls "the great response-time debate."

Howard, who spoke at the Conference on EDP Performance Management here last week, said DP managers should first study the type of work their shops are doing before they decide that decreasing response time to the subsecond range is worth the expense.

"My attitude is," Howard said, "if you can give them good response time, do it. If you can't, take a more reasoned approach." Such an approach would be at least to eliminate the variability in system response times, which he said is worse than a slow but predictable system.

Howard cited studies showing that subsecond response times do yield productivity rewards. "As you get down in the 1 second and below range, [programmer] productivity skyrockets," he said.

That research has also shown a "leverage effect" under which a drop in system response time may produce a cut in user response time that is as much as three times greater. In a shop with several hundred users, he explained, "you may be talking several thousand dollars [in savings] a month."

Research also shows that slow response times cause users to make more mistakes, he continued. The error rate, he said, is about average for a system with a response time between 1 and 12 seconds, possibly because users are "a little bit more careful about their inputs" out of fear of the wait they face if they make a mistake. Above the 12-second level, though, some research shows that "short-term memory is exceeded," and the error rate soars.

Howard argued that there are two sides to the response-time issue. On the unfavorable side, he said, are a host of adverse reactions that users may face under a system with a subsecond response time, including a sense of increased work stress and a greater error rate than in the 1- to 12-second range.

Regardless of whether they choose to pursue faster response times, Howard advised the 150 DP managers and instructors who heard his talk to work to bring consistency to their response times.

Kodak to acquire Verbatim and its 18% share of floppy disk mart

ROCHESTER, N.Y. — Eastman Kodak Co., which last year formed a division to manufacture storage diskettes and other mass media technology, announced last week an agreement to acquire Verbatim Corp. and the 18% share of the floppy disk market held by that California firm.

Kodak and Verbatim agreed to a cash tender offer of $7.55 per share, or approximately $175 million for the entire company.

Kodak, upon completion of the acquisition, will operate Verbatim as a subsidiary, keeping the Verbatim name on products and retaining established dealer and OEM arrangements, according to Kodak spokesman Charles Smith.

J. Phillip Samper, Kodak executive vice-president and general manager of the Photographics and Information Management Division, said acquisition of Verbatim's seven manufacturing facilities will enable Kodak to concentrate "on developing the technologies necessary for future high-density products."

In the fiscal year ended June 30, Verbatim posted profits of nearly $15 million on sales of $170 million.

Kodak announced its move into the storage market in October and one month later formed the Mass Media Products Division to set up manufacturing facilities for diskettes and to explore other technologies, including optical storage. At that time, it contracted for OEM products manufactured by Dysan Corp. and Xidex Corp., firms that have since merged and that represent Verbatim's largest competitor in the floppy disk market. Smith said Kodak will honor those contracts, but he declined to say when the contracts expire.

In addition to the mass media division, Kodak last year invested $20 million for a 7% equity share of Sun Microsystems, Inc. and was also the chief investor in a $5 million funding of Interleaf, Inc., a manufacturer of electronic publishing systems. In 1981, Kodak acquired privately held Atex, Inc., manufacturer of text processing systems for publishing.

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IRS blames computer tax tape snafu on human error

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The ill-fated travels of Internal Revenue Service computer tape reel 301682 came under intense scrutiny by the U.S. Congress last week.

At a hearing of the House Ways and Means Committee's Subcommittee on Oversight, IRS officials admitted to angry legislators that the agency's Philadelphia computer center had badly mishandled that tape, setting off a series of events that resulted in the delivery of dreaded "notice of delinquency" letters to 26,000 businesses in the mid-Atlantic region.

"The basic facts surrounding the Philadelphia snafu are distressingly clear," according to J. J. Pickle (D-Texas), the subcommittee's chairman. "A federal tax deposit tape containing payment information concerning 26,000 taxpayers and nearly $300 million [in paid taxes] was not processed for more than three months," he said. Because the payments were not posted at the IRS, delinquency notices were automatically sent to taxpayers.

IRS Commissioner Roscoe L. Egger Jr. said the episode was the result of many human errors and inadequate management controls. He publicly apologized to the taxpayers involved and said steps have been taken to prevent recurrences.

"The problem was not that the computer broke down. The problem was that the computer worked [by sending the notices]. Unfortunately, the [IRS] individuals involved did not give consideration to the scope of the effects that a tape-posting delay might have," Egger testified.

According to Egger's testimony, the incident began in early October, when quarterly tax payments were processed by the IRS' Philadelphia Service Center and sent to the IRS National Computer Center in Martinsburg, W. Va., for posting on the master file. Because reel 301682 had faulty coding in its header, the national center could not process the tape, so it returned the bad tape and requested a replacement.

Replacement failed to run

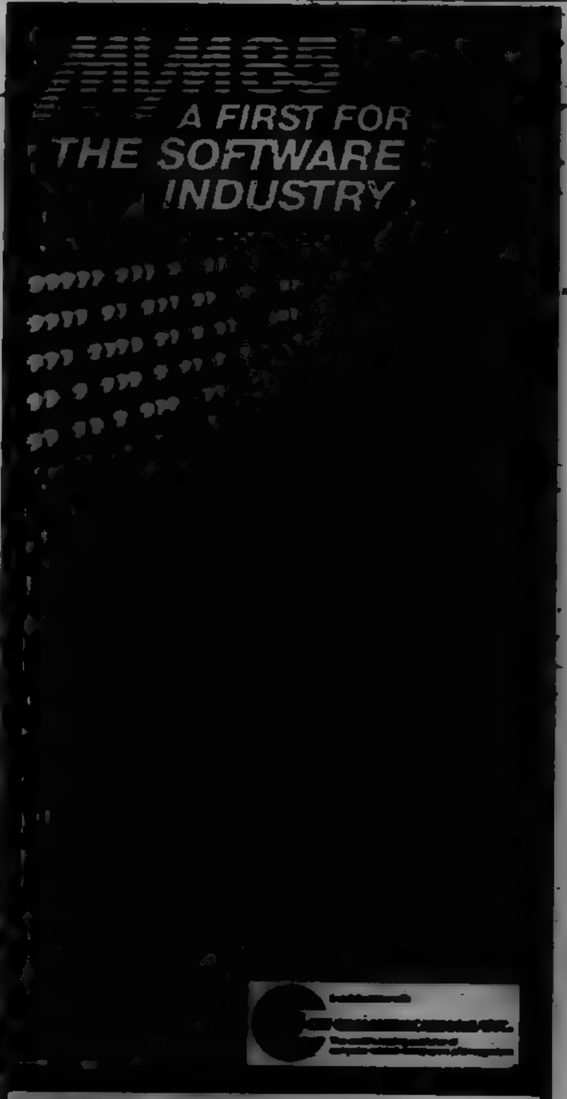
In December, a program analyst at the IRS' Philadelphia office tried to make a replacement by putting a new header on the old tape, but this version twice failed to run at the national center — probably because some data was lost in the process of creating the replacement tape, according to Egger.

Finally, in mid-January, when taxpayer complaints came pouring into IRS offices, the matter was brought to the attention of the Philadelphia center's director. The valid portion of the tape was posted in late January, and the remaining portion was reconstructed from original taxpayer documents and posted by Feb. 9.

In his testimony, Egger outlined several corrective actions taken or planned by the IRS:

- Calls for replacement tapes must be logged and documented. Tapes must be replaced within 48 hours. Posting delays of more than one week will be reported to top management.
- The weekly tape status report will be used to monitor the posting of tapes and will be revised to show the date when a replacement tape was requested.
- IRS management will meet with field executives to increase their sensitivity to the importance of computer center actions on IRS services and taxpayers; provide a handbook on tape management; and study the use of computer-based tracking methods that would automatically hold up delinquency notices when there are posting delays.

Contributing indirectly to the incident, Egger said, was the preoccupation of IRS employees with the Service Center Replacement program, under which virtually all of the hardware and software at the centers was replaced.



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WASHINGTON UPDATE
Mitch Betts
CW Washington Bureau

GAO suggests need for privacy policy

WASHINGTON, D.C. — The increasing use of computer matching to verify data on those who receive U.S. and state government benefits suggests that Congress should consider the need for a new policy for national privacy, according to a major report conducted by the U.S. General Accounting Office (GAO).

"Government policies and procedures to protect privacy and data confidentiality are not uniform, and oversight responsibility is unclear, fragmented or nonexistent," according to the GAO report.

Existing privacy laws provide some protection but may not be adequate, the office said.

The GAO suggested that Congress review such issues as data security and computer crime, the centralization of data bases, the cost-effectiveness of computer matching, the merits of front-end computer matching and the role of the Social Security number as a national identifier.

"Because nearly every American will sooner or later apply for [government] benefits of one kind or another — and will undergo the questioning and data searches related to eligibility decisions — any look at eligibility verification should consider how such efforts do or could infringe on individual privacy," said U.S. Comptroller General Charles A. Bowsher, chief of the GAO.

Weather agency tries automated observers

WASHINGTON, D.C. — Automated systems for collecting surface weather observations are being installed in Kansas by the U.S. Department of Commerce to help modernize the National Weather Service, the department announced recently.

The year-long project aims to demonstrate that a national Automated Surface Observing System can provide essential data for weather forecasts with minimal human involvement, the announcement said.

The units will record hourly measurements of wind speed and direction, temperature, air pressure, sky conditions and precipitation. This information will be relayed in computer-compatible form to National Weather Service offices and will be used to prepare local weather forecasts and warnings.

DP exec defends ICST from hefty budget cuts

WASHINGTON, D.C. — A DP executive from an insurance company recently came to the defense of the National Bureau of Standards' Institute for Computer Sciences and Technology (ICST), a $10 million per year agency whose budget would be cut 50% under the Reagan administration's budget proposal for fiscal 1986.

John A. Gosden, a vice-president and technology officer of the Equitable Life Assurance Society of the U.S., testified before the U.S. House Committee on Science and Technology that the ICST budget should be preserved because the ICST is a "critical national resource for the development of vital, urgently needed federal, national and international standards."

Gosden, a member of the independent ICST Evaluation Panel, said the ICST performs the same function for the federal government that he does for Equitable Life — providing guidance and standards for the use of computer technology.

"An expenditure of $10 million to more effectively utilize $14 billion in federal information technology expenditures would be money well spent even if we ignore the benefits to the private sector," he said.

The ICST, according to Gosden, has developed standards or guidance manuals on computer network protocols, computer security, software development, software maintenance, data base management and computer graphics.

The ICST has been "a leader throughout the development and revision of Cobol," he said.

"While I generally support efforts to reduce the federal budget," Gosden concluded, "it seems [to be] common sense that one doesn't cut a program whose products boast a return on investment of [more than] 25-to-1."

Conference to focus on foreign trade restraints

WILLIAMSBURG, Va. — A conference sponsored by Transnational Data Reporting Service, Inc. on how business can help lower foreign restrictions on high-technology exports, services trade and international corporate communications will be held here Oct. 30 to Nov. 1.

The conference, titled "The International Information Economy, Agenda for Action," will focus on obstacles to expanding U.S. trade and investment.

Topics to be covered at the conference include foreign requirements forcing companies to use locally manufactured electronic data processing equipment, restrictions on using electronic mail systems and prohibitions on exporting certain types of data.

Other topics to be discussed at the Transnational Data Reporting Service conference will deal with incompatible equipment standards, copyright infringement, cultural rules and threats to tax data transmission.

The Transnational Data Reporting Service specializes in advisory and consulting services on international information and communications regulatory developments.

Foreign leaders from 40 countries are expected to attend the conference.

The conference registration fee is $625.

More information is available from Transnational Data Reporting Service, which can be reached through P.O. Box 2039, Springfield, Va. 22152.

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NETS from page 1

and toward various brands of micros on a net. The next step, which Gerald Stillman, the firm's vice-president of product development, expects to be accomplished in the next few months, will be to extend the net throughout the company.

As companies increasingly link their personal computers with networks, the nets provide significant benefits over stand-alone micros. Micro networks can perform jobs — ranging from office automation to transaction processing to software development — that formerly would have fallen to a minicomputer or a mainframe.

Recent interviews with micro network customers found a lot of enthusiasm and differing opinions on a net's pluses and minuses. Index Technology's Stillman said that "We're just scraping the surface with local-area networks."

Advantages over stand-alones

At present, the biggest benefit micro nets offer over stand-alone micro setups is access to hard disk storage and backup, according to John Kane, project manager for marketing and office systems at Rockwell International Corp.'s Automotive Business Group in Troy, Mich., which has about 100 personal computers on a Nestar Systems, Inc. network.

Kane and others also pointed to the potential advantages of shared data bases, although they all mentioned unmet needs in multiuser network operating and applications software.

Celanese's Mengel, however, said that the largest benefit of his network "is the common user interface." Each station on the net provides the same menu, applications and services, he emphasized.

Mengel also underlined the way in which a common software base speeds installations and updates for an entire users group. With Micropro International Corp.'s Wordstar running under a micro network license, if Mengel wants to modify the program, "I go in and patch that area at night and everyone on the net has it the next morning," he said. In addition, backups are simplified.

MICRO NETS

While printer sharing is another highly touted benefit of micro networks, some downplayed the importance of that feature. "We do have a few print servers, but that has not proved to be the most successful use," Kane said. Users with a personal computer on their desk "don't want to chase around the building for that," he added.

Almost all the net users contacted have or plan to install electronic mail, with the biggest holdup being the perceived need to provide each user with a micro. But Mengel felt that "if [personal computers] are in every major area in the plant," they do not have to be on each desk, as electronic mail can be sent to secretaries, who then print it and circulate it within their work groups.

Micro nets also provide a logical gateway to mainframes and external systems, according to Kathy Wilson, manager of systems development for central engineering at Raychem Corp. in Menlo Park, Calif. Her group has put about 20 users on a 3Com Corp. Etherseries network, and she expects to upgrade the net with a new server that will both support additional users and provide a gateway to the company mainframes.

Comparing overall costs for networked micros and stand-alone personal computers is tricky, users agreed. The benefits of some network features, such as electronic mail, are difficult to quantify. Other potential advantages, such as lower cost per user for software licensed for delivery from a network server, have not yet been realized.

The quickest comparison pits the cost of the network storage system against the costs of equipping each personal computer with a hard disk drive. However, some users still equip many machines with local hard disks because network access may be noticeably slower. Loading a large program off the network may take 30 or 40 seconds, so it may make sense for developers to work directly off their own hard disks, Index Technology's Stillman said.

Post cited cost as a prime reason for choosing a micro network for the Dutch Bristol-Myers plant.

Running a manufacturing system on a large time-shared machine at peak hours, Post's firm was "getting slaughtered on time-sharing costs."

A micro network may also offer performance advantages over an overloaded time-shared system or allow quicker updates to data bases.

Another advantage is redundancy. "If you were to lose the network, you still would have the valid stand-alone machines," Mengel remarked. In one case, his network's hard disk drive crashed into scrap metal condition, but he provided all users with backups within an hour and a half.

There is a broad choice of single-user software to run on micros, Mengel pointed out. "Minicomputer software is much more expensive and your choices are limited."

And the computer remains "personal," others said.

Microcomputer network weaknesses

But customers pointed to some weaknesses of micro nets as well. Most important, they said, is that although the technology is evolving rapidly, networks generally do not provide the software choices or the overall polish available with minicomputer systems.

"My first wish would be good multiuser software produced for [micro] network use," Raychem's Wilson said. Micro network versions of development tools, data base managers and other applications now are entering the market, and the industry expects the IBM PC Network and

See NETS page 18

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NETS

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Microsoft Corp.'s Microsoft Networks to provide a standard network environment for software vendors. But network managers said they do not expect any flood of multiuser software.

Current copy-protection and licensing schemes often make it difficult to run popular software packages on a micro network, and users would like vendors to change their policies. "We'd like to see [Lotus Development Corp.'s] 1-2-3 network-approved," Kane said.

Installation, maintenance difficulties

Users said they also had difficulties installing and maintaining their networks. In one case, a network with a grand total of two personal computers bogged down while the three vendors who supplied the system, the network and the applications software squabbled about who was responsible.

Networks "are still in their infancy," and technical expertise is rare, according to one OA manager at a large New England high-tech firm, which ran into serious problems while setting up two networks with a dozen personal computers each. "We just can't get support, and we can't continue that way."

"You still need expertise to set it up," according to Raychem's Wilson. For example, "you're never really sure, until you try it, that an [AST Research Inc.] or [Digital Communications Associates, Inc.] Irma or other third-party board will be compatible," he said.

'Far from an operator-free environment'

Once the micro network is up, it stays up, according to Post, but "it's still far from an operator-free environment." Technical people from his New York-based staff rotate duty at the Dutch plant. Although he would like to see the network run without specialized help, "I can't say we'll ever achieve that goal," Post said. At this point, the net's remote-diagnosis tools are not nearly as strong as those available for time-shared systems, he added.

These are among the reasons why many microcomputer network enthusiasts still see an offering — such as the IBM System/36 or Data General Corp.'s CEO — available as a system from a single vendor as strong competition. Stillman commented that vendors "still have a long way to go to smooth out the network".

But, Post said, "I see a lot of what was done on time-sharing shifting to these networks." Five years ago, many users turned to time-sharing systems for work done once a month, he noted. "I see a lot of that shifting to [personal computers], and where there's shared data involved, shifting to networks," he concluded.

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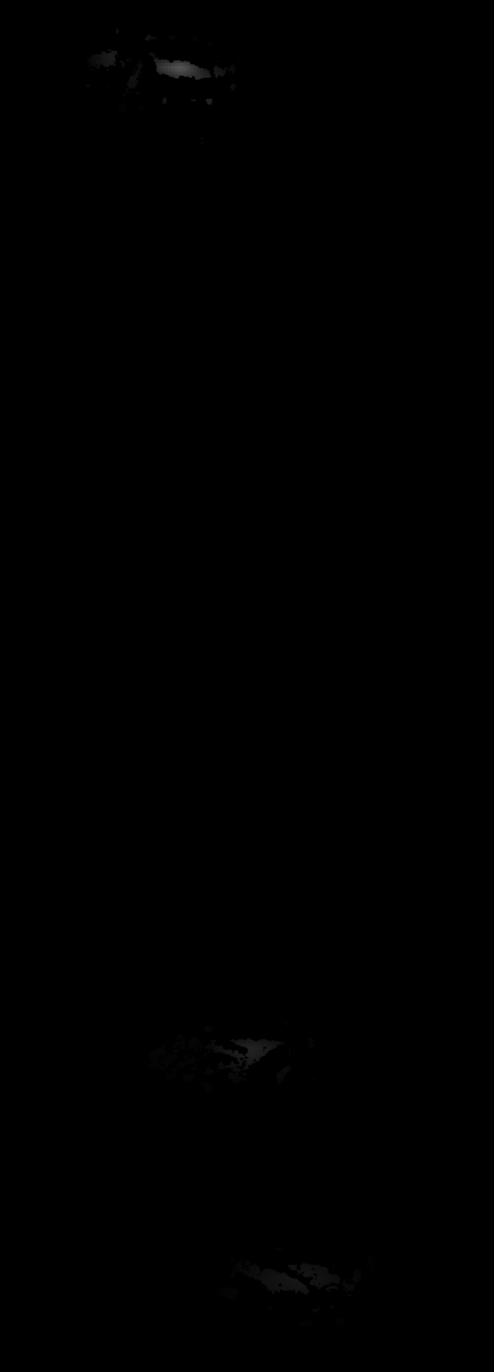

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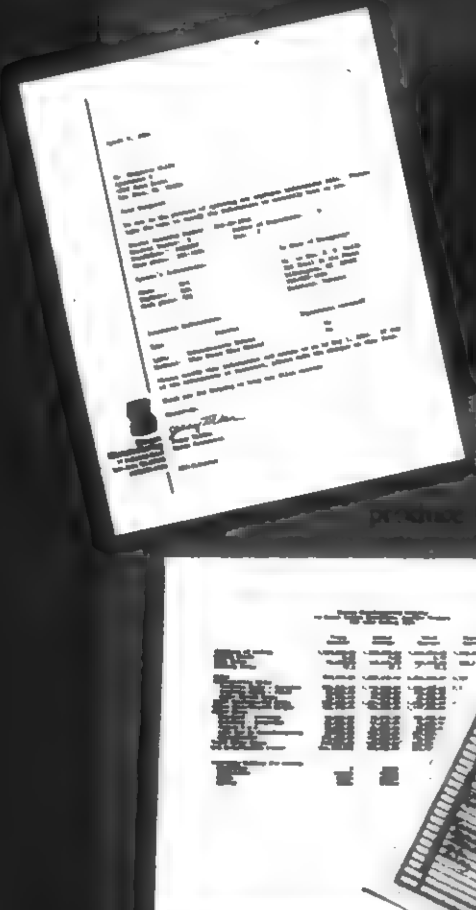

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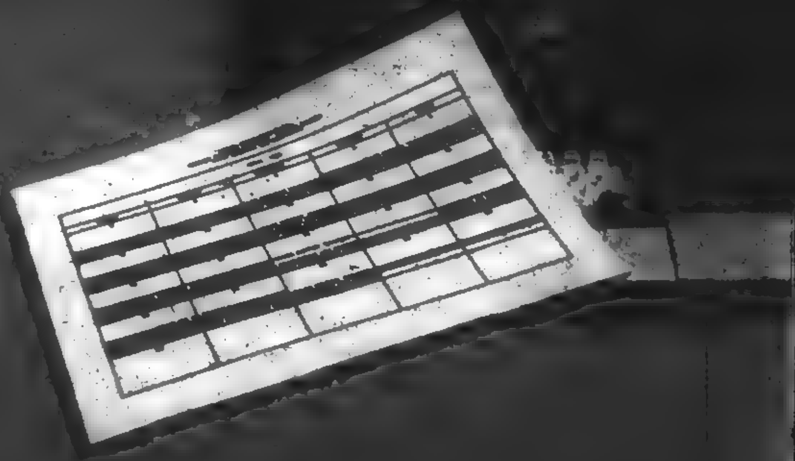

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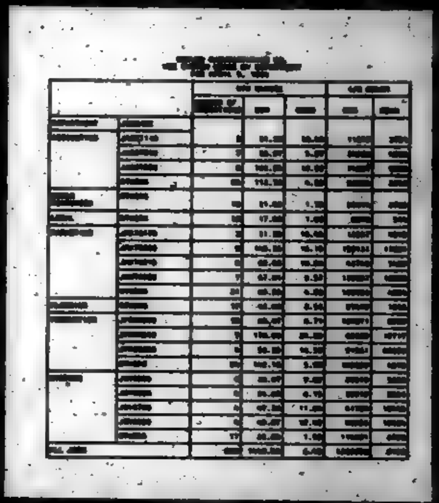

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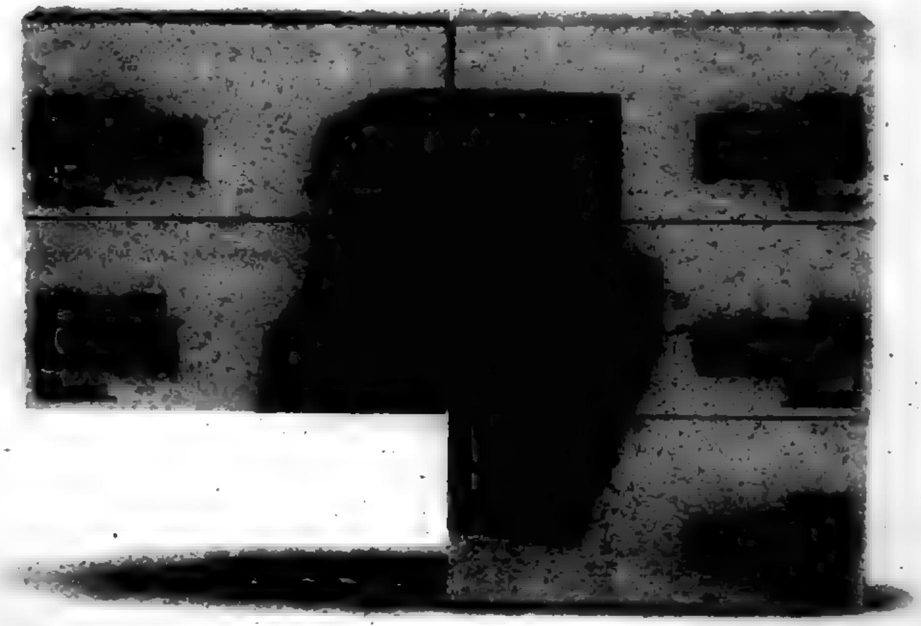

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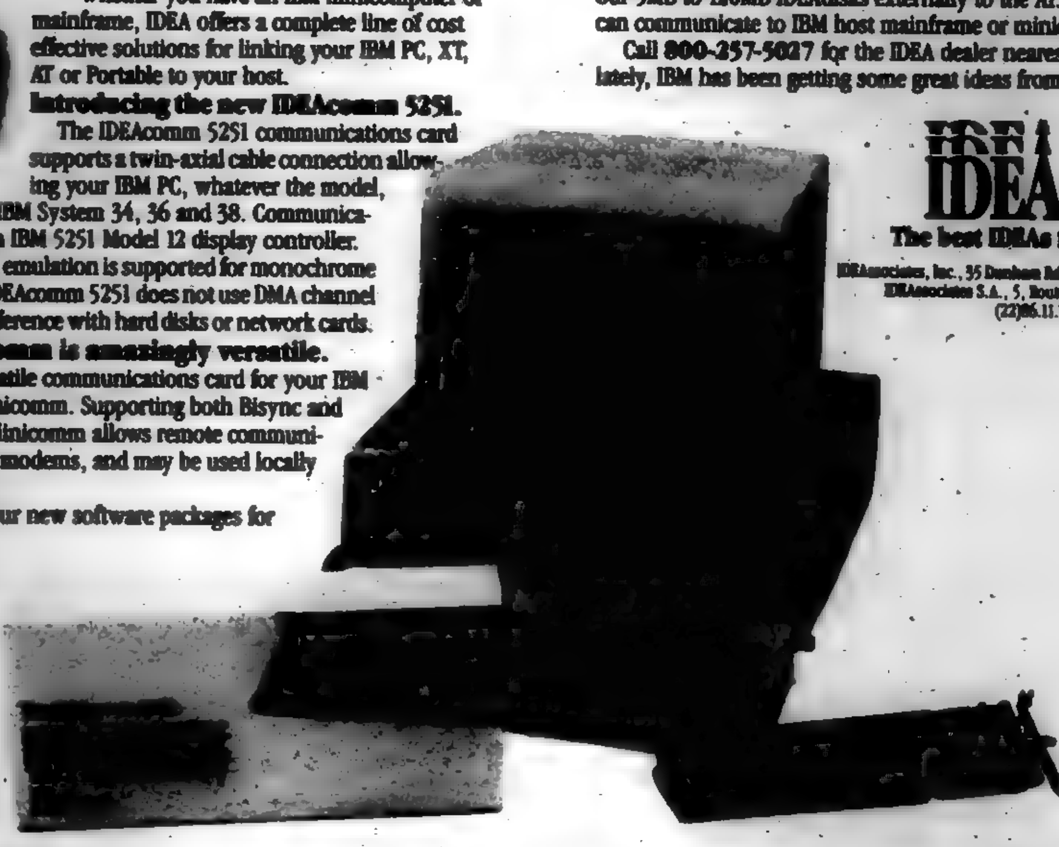

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Software firm uses local net in product development

Plans dial-up access, further applications

CAMBRIDGE, Mass. — Index Technology, Inc. (Intech) here is a 1½-year-old developer specializing in workstation software for computer systems analysts. Its products run on the IBM Personal Computer line. "The initial rationale for buying a local-area network was to improve our development," said Gerald Stillman, vice-president for product development.

Intech programmers work in C language on a remote Digital Equipment Corp. VAX minicomputer until a working version of the software is created. They then transfer the software to personal computers for testing. However, "there's no reason to continue to develop on the VAX," Stillman said, because the time-sharing costs are high and the setup requires another step in debugging.

A programming shop limited to stand-alone personal computers, however, loses the advantages of communications and shared data bases, and "we felt the need for a shared data base," Stillman said. Another motivation was to get the best use from a new $10,000 laser printer, he said.

A net also can act as a test bed for customer installations. Although Intech's Excelerator product runs on a stand-alone micro, the software typically is sold to a company working on large projects involving many analysts, he pointed out.

Intech became a beta test site last fall for a network offered by Banyan Systems, Inc. of Westboro, Mass. Ten programmers now work on six micros running on the net.

Stillman said he expects the network to expand and offer other functions — accounting, word processing, advertising, customer support and others — during the next few months. Employing roughly 60 people, Intech has about 30 micros engaged in a variety of tasks, he said. "Even our assembly people use [personal computers] for testing software and doing quality assurance."

MICRO NETS

As the network turns into a companywide resource, "it becomes the responsibility of the MIS department," Stillman said. However, Intech is just creating such a department.

The Banyan virtual networking system concept, offering the potential of connecting various types of personal computer nets, was a particular attraction, Stillman said. "One of the many reasons people don't jump into networks is that they're afraid to commit to any technology or any company," he said. As one benefit, the virtual network's ability to handle machines and nets from a range of vendors might allow hookup of the several Apple Computer, Inc. Macintoshes in use at Intech, he said.

Another potential benefit is access to a VAX, mainframe or public data base through Banyan gateways, he said. He also expects the company to install dial-up access to the net for micros at regional offices.

As a beta installation, Intech found a number of bugs, but Stillman said the firm was very happy with Banyan's support. Earlier this year, Intech purchased the net.

Among future enhancements, Stillman said, he would like to see improved facilities for data sharing, including record-level locking and exclusive file access.

Intech software engineer Joshua Estrada commented that the network does not give any way to maintain library records. For example, he said, ample opportunities for confusion arise if four users sequentially update a file.

INSTALL from page 18

ing," and his group ended up writing its own print server because Nestar's "was just ugly." Post added, however, that the vendor's offerings have been improved since that time.

Supporting a net at a remote location raised particular difficulties.

"You can't dial into something like Nestar's [local-area network] and act like you're on a [personal computer] on the [local-area network] for quite a number of technological reasons," Post pointed out. "If you access it at [1.2K bit/sec] or even [9.6K bit/sec], it will take a year and a day to load a long program, so dialing into a network straight is unfeasible."

Some packages allow a micro to act as a remote console for a networked personal computer, he noted. "With a slave [personal computer] dedicated to me, any processing could be done in Holland. But there are all kinds of problems with it."

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Net support needs differ

As personal computer networks move into crucial roles for departments or larger organizational groupings, they bring growing requirements for ongoing support — requirements that may or may not end up in the hands of a DP/MIS department.

In many organizations, personal computer networks have evolved, like personal computers themselves, from the bottom up, without any blessing from the computer systems staff, and they are still run by the people who set them up.

Kathy Wilson, manager of systems development for central engineering at Raychem Corp. in Menlo Park, Calif., said her background in management rather than DP probably has been beneficial because "I put myself on the user side."

When her group installed a micro net, Raychem's MIS department "wasn't looking at this as anything very serious," she said. "We were mavericks." However, "now our MIS department is really taking notice." The net often has much better information than the MIS group and sends data to the larger systems, she said.

Although four people now support Raychem's 20-user 3Com Corp. network in one way or another, "if the network ever stopped expanding there wouldn't be much required," Wilson said.

She said she expects the crucial task of backup to be handled automatically when a new 3Com multifunction server is installed.

"We have a network with between 12 and 17 users, and it takes about 10 hours per week in systems management," estimated Bill Driscoll of LAN (West), a network reseller and consultant in Carefree, Ariz. That covers maintenance, upgrades, new installations, backups and other work.

Some smaller network customers do not do all that, he said. "If you don't mess with it and don't put additional products on it, you can get along with doing backup only."

"Any network system with more than 12 users needs at least a part-time administrator," said Matt Mengel, process control and automation coordinator at a Celanese Corp. Fibers Operations plant in Salisbury, N.C.

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WESTWOOD COMPUTER CORPORATION

NEWS

Strategic plan handles change

By Charles Babcock
CW New York Bureau

NEW YORK — If you are in the information services department and your business is undergoing rapid change, you had better hope your department has a strategic plan, according to a speaker at a recent gathering of the Association for Systems Management.

Geri M. Riegger, vice-president of electronic data processing operations at Blue Cross/Blue Shield here, told the New York chapter of the group that information systems are agents of change. In dynamic businesses such as banking, chemicals or health care, the rate of change threatens to undo the department.

"Strategic planning in this era of change is not a necessity; it is the key to survival," she said. Yet, two-thirds of all information systems departments lack a strategic plan, she said.

A strategic plan for information systems is "an extract of the overall business plan," Riegger said. The business plan indicates where the organization wants to go and what it hopes to achieve. The information services strategic plan explains how information systems will help the organization achieve its goals.

"[A strategic plan] is active. It is not a plan that implies to the systems manager 'here is what the environment is going to do to me.' It is a process of defining desired states and developing direction-setting concepts," Riegger said.

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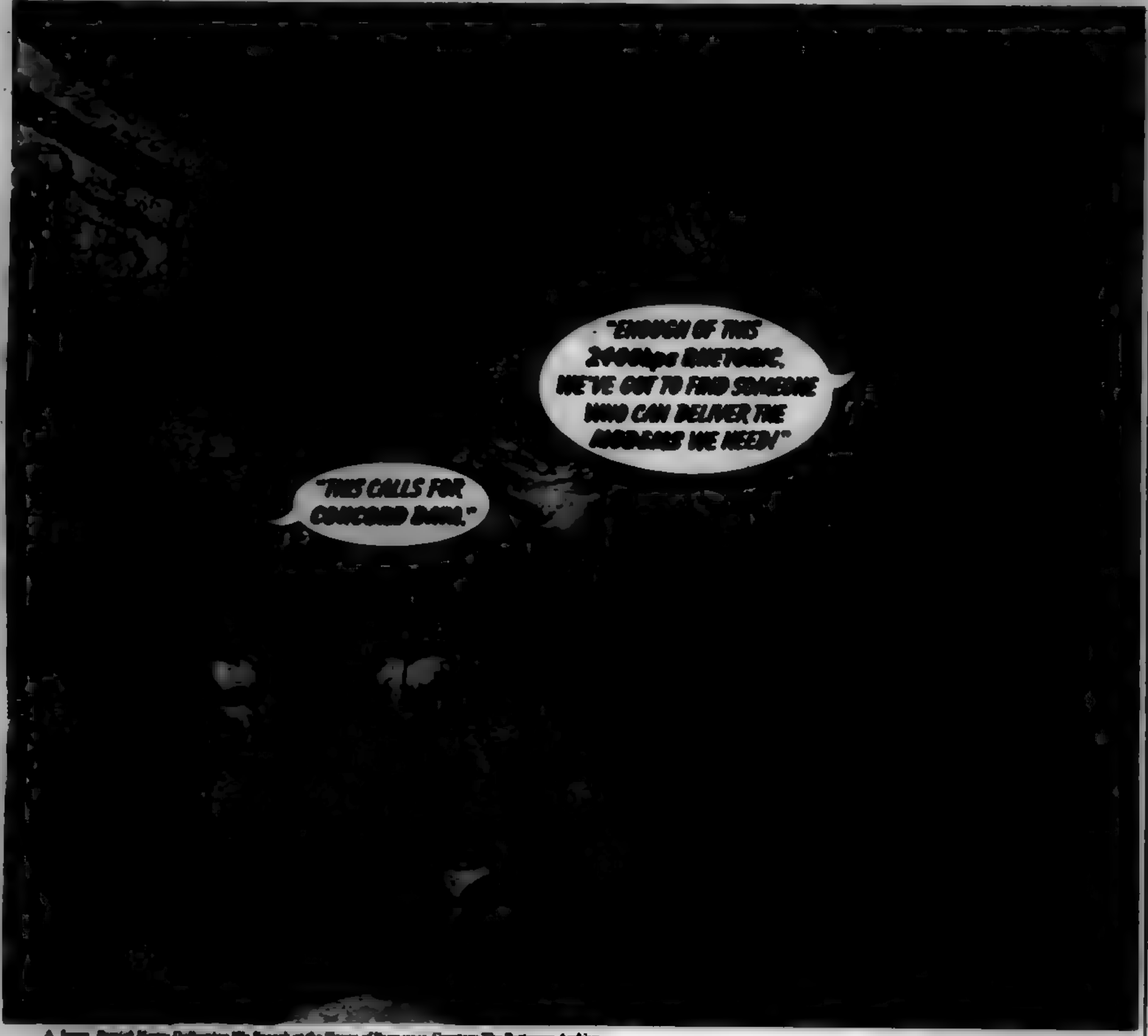
> *'Strategic planning in this era . . . is not a necessity; it is the key to survival.'*
>
> — Geri M. Riegger
> Blue Cross/Blue Shield

The strategic plan for a company with multiple computer networks should address whether the firm will continue to add networks or will merge. It should also determine how important it is to users to communicate with each other on different networks.

Riegger said a strategic plan can also be defined by what it is not:

- An extrapolation of the past. "If that's all you do, you don't need a plan. You'll get that anyway."
- A collection of division or function plans. The U.S. Navy gathered its function plans and stapled them together, calling the result a strategic plan, but it was not, Riegger said. "Strategic planning is not the sum of many parts. It is a high-level plan," she said.
- A replacement for management judgment. Some organizations believe the strategic plan, once it is drawn up, answers all questions, Riegger noted. Changes will occur causing the plan to be modified, and management will still have to decide what the next step is based on current information, she said.

From 1982 to 1984, Riegger was a member of the National Academy of Sciences Committee on Review of the Navy's long-range planning in data processing, and from 1977 to 1982, she guided strategic planning of the Operations Group of the Federal Reserve Board.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A. [illegible]. Patrick Henry Delivering His Speech at the House of Burgesses. Courtesy The Bettmann Archive.

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Naisbitt ties automation, decline of middle management

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — High technology is radically redrawing corporate organizational charts by rendering middle management largely obsolete, according to best-selling author James Naisbitt.

Throughout modern corporate history, middle managers have served primarily as intermediaries through which business information flowed back and forth between senior executives and bottom-echelon support personnel.

Today, however, the same communications tasks are increasingly being shouldered by computers. The result is that, within many large corporations, vast numbers of middle managers are rapidly disappearing, Naisbitt said last week during a gathering of Wang Laboratories, Inc. customers.

Naisbitt

"Computers are replacing middle managers much faster than robots are replacing assembly line workers," the author of *Megatrends* told approximately 500 attendees of Wang's Enterprise West users group meeting.

Naisbitt predicted in the meeting's keynote address that in the end, computing's widespread acceptance in the big-business world will smash the pyramid of the traditional management hierarchy.

In his speech, titled "Reinventing the Corporation," Naisbitt said that market pressure is forcing large companies to transform themselves into "information organizations." He described information organizations as businesses that are fast becoming indistinguishable from their own MIS-related activities. Although the transformation is especially pronounced among banks, no industries are entirely exempt from its influence, Naisbitt said.

Naisbitt noted a fundamental change in the composition of today's corporate work forces, where hired staff members are increasingly giving way to contract laborers.

Naisbitt also noted the unprecedented, breakneck pace at which the U.S. economy is giving rise to start-up ventures. Because the accent in American commerce is increasingly shifting from automobiles to computers, this "explosion of entrepreneurship" is inevitably spawning a profusion of hardware and software vendors, Naisbitt said.

But precisely because of their vast numbers, thousands of the fledgling high-tech enterprises are doomed to go under, he warned.

Systems seminar set to discuss human resources

NEW YORK — The American Management Association will sponsor seminars in Cambridge, Mass., and Washington, D.C., for information systems and human resources professionals on the topic, "Implementing an Automated Human Resource Management System."

The Cambridge seminar will be held May 6-8 at the Royal Sonesta Hotel. The Washington course is scheduled for June 10-12 at the association's Management Center.

The course leader for both meetings will be Marc S. Miller, president of Marc S. Miller Associates, a New York-based consulting firm specializing in the development, implementation and enhancement of human resources information systems (HRIS) and programs.

Topics to be covered include HRIS concepts and objectives, personnel functions, privacy and security issues, data base specifications, cost/benefit guidelines and vendor evaluation techniques. Guest speakers will include administrators of corporate human resource management systems.

Individual registration fees are $695 for each seminar for association members and $800 for nonmembers. Team fees for three or more registrants are $590 per person for members and $695 for nonmembers.

More information is available from the American Management Association, 135 West 50th St., New York, N.Y. 10020.

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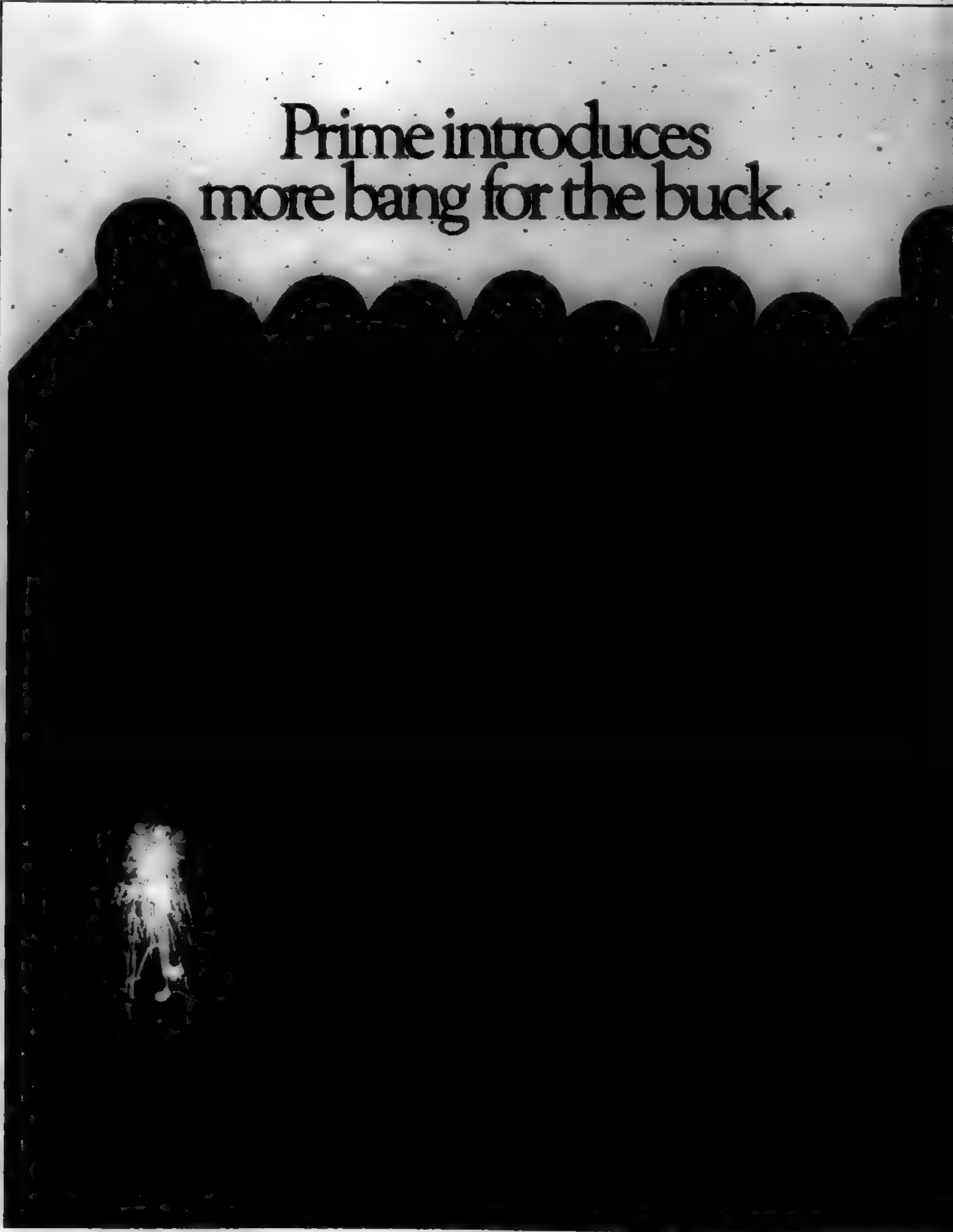
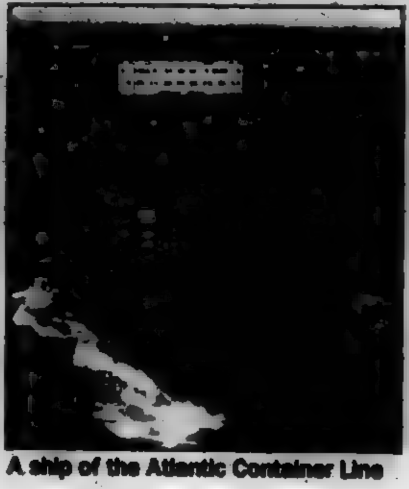


Shipper's freight-tracking net also bears text/data load


A ship of the Atlantic Container Line

By Charles Babcock
CW New York Bureau

NEW YORK — When six European firms formed a container ship company in 1965, they wanted a control system that would track the status of thousands of containers in transit to ports in the U.S.

Executives at the Atlantic Container Line figured that computerized controls would save enough on container costs to pay for their first computer system, said Hans Wieting, general manager of management information services at the company.

But effective container control required more than a central office processor and software. Atlantic Container's 24 district offices, spread across the northeast U.S. and Canada from Baltimore to Detroit and Toronto, needed to be linked with New York in an interactive network to follow the status of each container.

Message sending as well as tracking

Once such a network was established, Atlantic Container found that, in addition to tracking containers, it wanted to send administrative messages giving directions to agents and allowing them to query the home office, Wieting said.

The way the firm built this feature into its container control network put Atlantic Container "in the upper stratosphere of [Burroughs Corp.] mid-range customers," said Stephen P. Baxter, group director of marketing operations at Burroughs. The shipping firm cut its annual telex bill in half once it began sending text messages over its network, according to Wieting.

The network was built on a modest mainframe base, developed by a 17-person department that was trimmed back to 11 as recessions cut profits in the shipping industry in the early 1980s. Since 1975, Atlantic Container found it could meet its needs with medium-size Burroughs computers.

'Bert and Ernie'

The firm currently uses two B3955s, dubbed "Bert" and "Ernie," with one serving for limited applications and as a backup, Wieting said.

From the start, Atlantic Container geared its central processor to serve as the hub of a rudimentary network. Its first machine, a Sperry Corp. 418 II, was formatted to receive container data sent to New York via telex, he explained.

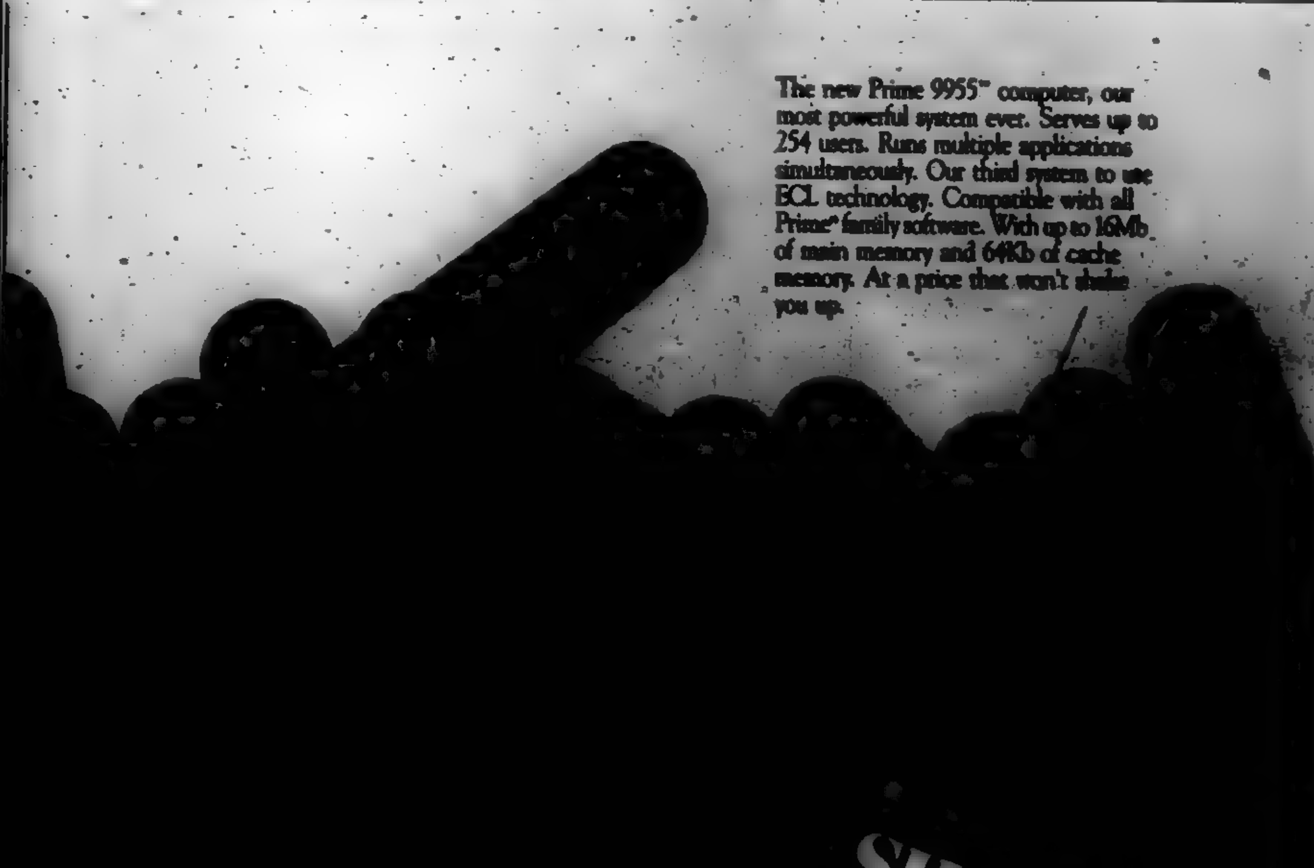
Atlantic Container replaced the 418 II with a Burroughs B4700 in 1975 and established its own leased line network to the district offices. As sending and receiving devices, it purchased 20 Burroughs TC3500 printing terminals. The terminals had no screens, relied on small tape drive memories and required skilled operators, but they made the embryonic network operational, Wieting explained.

Nevertheless, it was a network with severe limitations. The data it transmitted had to be strictly formatted, and only limited forms of information, such as how many containers were at a given location, could be retrieved by it, he noted.

'Tape all over the room'

For that reason, Atlantic Container continued to use telex for text or administrative messages. A telex sent to New York was punched out on

See SHIP page 30



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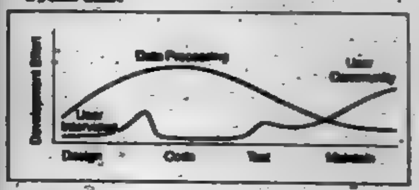

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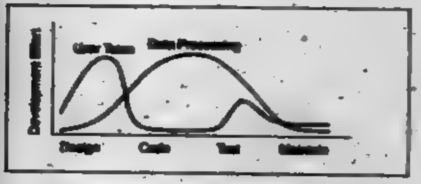

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Houston to host NCR users

HOUSTON — The Federation of NCR Corp. Users Groups will hold its 15th annual international conference called Nucon:85 from April 28 to May 1 at the Westin Galleria here.

The conference will offer more than 60 sessions and is expected to draw 1,000 attendees and more than 40 vendors with booths. The conference theme is "Information Exchange: An Investment in Excellence." The keynote speaker will be Col. James B. Irwin, an *Apollo 15* astronaut, who will speak on how to motivate individuals to new levels of achievement. Also scheduled to speak is NCR Chairman and President Charles E. Exley Jr.

Panel discussions are planned for NCR's ITX, IRX, Imos and VRX operating systems, personal computer links, latest software updates and systems optimization. Other topics will include how to improve programming productivity and how to develop in-house training. An executive program will feature Dr. Gunther Klaus from the Institute for Advanced Planning, who will lead a day-long session on the need for changing management structures in today's business environment.

Conference registration fees are $430 prior to April 6 and $530 after that, the sponsors said. More information is available from Nucom:85, Central Services Office, 1780 Kettering Tower, Dayton, Ohio 45423.

On-line information services meeting set for end of April

NEW YORK — Developments in the on-line information field will be discussed at the sixth annual National On-Line Meeting to be held here at the Sheraton Centre from April 30 to May 2.

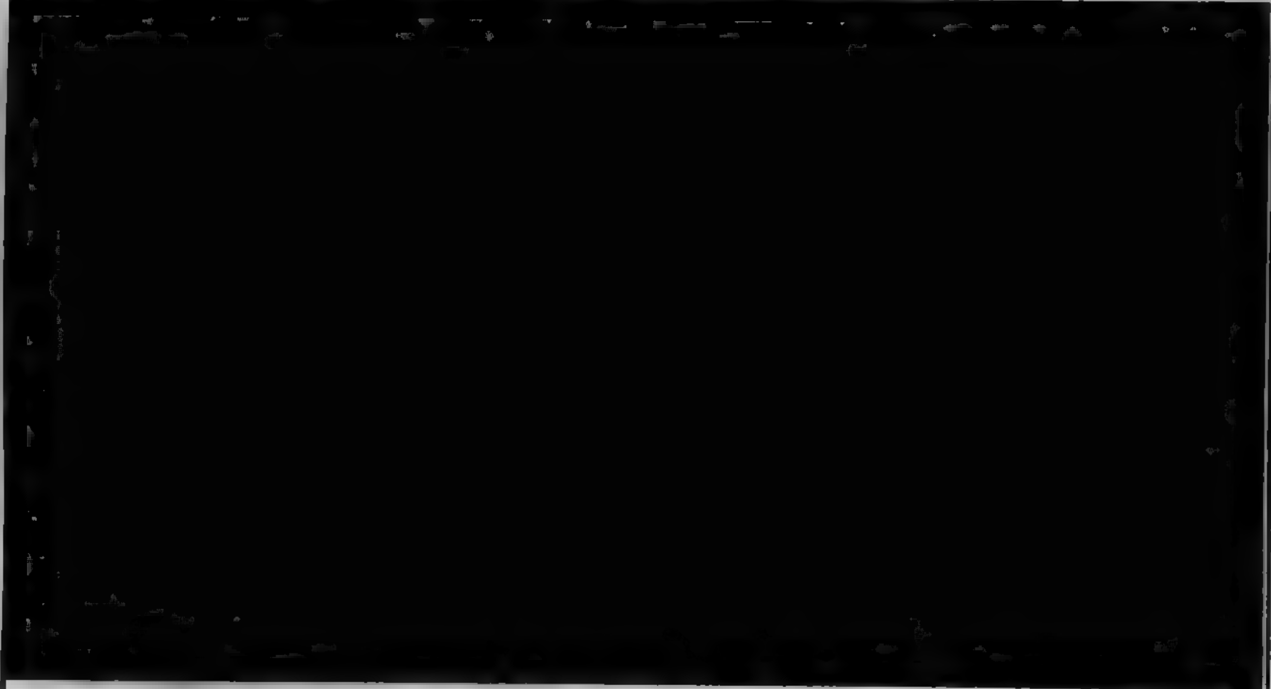
More than 3,000 participants and 120 exhibitors are expected to attend, according to the conference's sponsor, Learned Information, Inc., an on-line information industry publisher.

Learned Information said the conference will focus on the growth of on-line services, especially for microcomputer users, and will also look at the application of such services in medicine, business and finance, engineering and other fields.

Special sessions will reportedly be held on electronic mail and bulletin boards and data base management systems for data base development using on-line services.

The registration fee for the full conference is $220 if received by April 1. After April 1, registration cost for the full conference is $240. The daily registration fee for the conference is $100 before April 1 and $110 thereafter.

Learned Information is located at 143 Old Marlton Pike, Medford, N.J. 08055.



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SHIP

from page 29

tape. The tape was then ripped off by hand and fed into a tape reader to be retransmitted to another district office. A staff of seven was required for the task, and paper tapes "were constantly hanging all over the message room," Wieting said.

The company began to automate this function in 1976 when it purchased a Digital Equipment Corp. PDP-11/40 and installed it as a message switch.

With this system, a telex coming into New York could be automatically rerouted by the PDP-11/40, which would either send it to a printer or dial up a teletype to pass it to its destination. The new system allowed Atlantic Container to reduce its message room staff by three, Wieting said.

Transfer from telex to network

At the same time, he added, Atlantic Container was paying $200,000 a year for telex messages, and "somebody said, 'Hey, we have all these leased lines. Why don't we try to send administrative messages over our own network.'" This was accomplished with an interface that allowed data messages to continue to go into the central processor while text messages were switched to the PDP-11/40, where they would either be printed out or passed on to their destination.

In 1981, Wieting said, the firm replaced the PDP-11/40 with a device designed specifically for the job — a Mercury message switch made by Honeywell, Inc.'s Communications Network Division.

A year ago, Atlantic Container replaced the printing terminals with interactive CRT terminals from Beehive Corp. in Salt Lake City. It then added Burroughs CP9572 communications processors at eight scattered locations. The communications processors concentrate data, sending it in bursts to New York, reducing line overhead and tying up the central processor for a minimum amount of time. The hardware in the network, excluding the central office computers, cost about $1 million, according to Wieting.

Now just over a year old in its latest form, the network saves $100,000 in annual telex bills and pays for itself in ways that are harder to measure, including better customer service, better information and more efficient use of invested capital — ships and containers.

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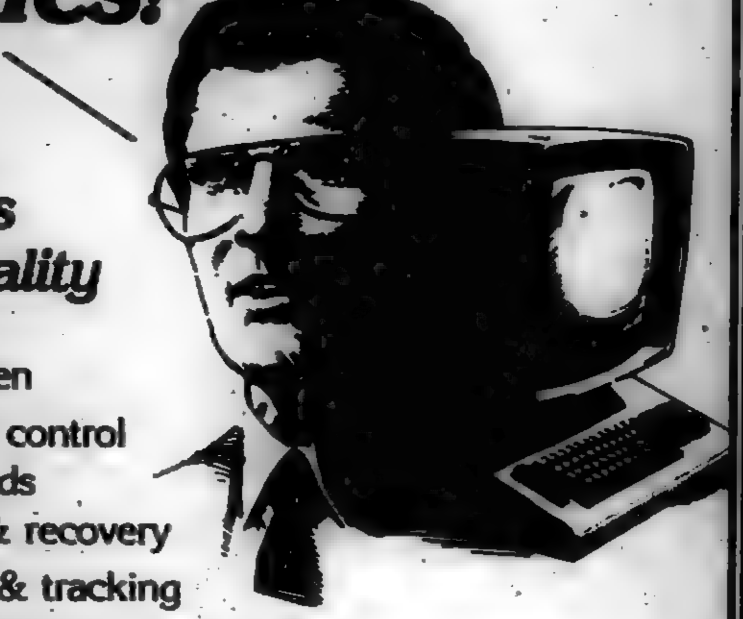

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NEWS

OFF THE PRESS
George Harrar

BOOK REVIEWS

CAD/CAM HANDBOOK
Edited by Eric Teicholz

Here's the accumulated wisdom of 20 specialists on how to acquire and use computer-aided design and manufacturing.

In the last few years, turnkey systems priced under $100,000 have made CAD/CAM available to the 30,000 companies in the U.S. with yearly sales of as little as $5 million. Now personal computer-based systems cost in the range of $25,000.

"Compared to CAD/CAM's virtually phenomenal potential, its current usage could be described as antediluvian," Stanley Klein and Peggy Kilburn write. "In U.S. manufacturing, penetration is variously estimated at between 5% and 10% of potential users."

Once a technology used mainly by the aerospace and automobile industries, CAD/CAM is now within reach of almost any drafting, engineering or manufacturing firm. The starting point of CAD/CAM and its related technologies — computer-aided engineering, computer-integrated manufacturing and so on — is the engineering drawing stored in digital format. "It is this picture data base," Klein and Kilburn write, "that leads to virtually all the benefits that a user can derive from CAD/CAM technology, including such seemingly remote uses as job estimating, inventory control and financial analysis."

Robert Miller's important chapter, "Understanding and Measuring Productivity," cautions that long-term benefits may take from five to 10 years to be realized. "In fact," Miller says, "managers of many companies currently using CAD/CAM systems are still unsure of how they will benefit most from the technology." His advice: Ask the users.

Anthony Horn offers an example of immediate productivity. It takes about 30 to 45 seconds for a good drafter to draw a straight, scaled line. Using CAD/CAM, positioning the cursor and entering direction and time parameters with the stylus takes five to 10 seconds.

Hardcover, 432 pages, $49.95, ISBN 0-07-063403-3. McGraw-Hill, Inc., 1221 Avenue of the Americas, New York, N.Y. 10020.

THE CHIP
By T.R. Reid

Who were Jack Kilby and Robert Noyce?

If you answered 'inventors of the integrated circuit,' perhaps you know much of the history described in *The Chip*. But if author T.R. Reid's contention is correct, "Not one American in 10,000 could name the two countrymen who invented the integrated circuit and launched the Second Industrial Revolution."

Reid, a journalist on the national news staff of *The Washington Post*, was moved to write this history when his malfunctioning VDT came to life again once a *Post* technician replaced — what else — a chip. Some quick research led the author to an inspiring conclusion: "This miraculous chip was a man-made miracle."

Well researched and written, *The Chip* contains little-known facts that dramatize the 25-year history of integrated circuit development. In a discussion of the simplicity of the binary numbering system, Reid states, "The Romans, for all their other achievements, never hit on the idea of zero."

Another fact: In 1961, Fairchild Semiconductor announced the first commercially available integrated circuit. It cost $32. Ten years later, the price of an integrated circuit was $1.27.

The integrated circuit was first used commercially in a hearing aid in 1964. The first consumer application of the chip was in the Texas Instruments, Inc. pocket calculator marketed in 1971. TI sold five million calculators in 1972. In 1976, the nation's premier slide rule manufacturer, Keuffel & Esser Co., went out of business. Intel Corp. sold the first microprocessor in 1971. The personal computer got its start in 1975, when an article in *Popular Electronics* described how to build one using an Intel 8080 microprocessor.

Beyond the facts, the best attribute of Reid's book is the overdue respect it finally pays to the integrated circuit's developers. Incredibly, Kilby and Noyce arrived at the same concept — the so-called "monolithic idea" — working independently of each other. Kilby, an engineer with TI at the time, got the idea in July 1958, about six months before Noyce, who was working at Fairchild. But Fairchild produced a more refined working model of the circuit prior to submitting a patent application, which proved crucial in winning the patent for Noyce.

Development of the integrated circuit came at a crucial time for the electronics industry. Power and heat restraints limited the size of electronic devices built from vacuum tubes. Design limitations were removed when the transistor was invented by Bell Laboratories in 1947; engineers could now draw plans for circuits using 500,000 transistors. But the connections still had to be made by hand, which was an expensive, time-consuming and unreliable process.

Getting the circuit off the ground was not easy. Established companies like GTE Sylvania and Westinghouse Electric Corp. approached the chip cautiously, which paved the way for TI and the Silicon Valley upstarts. Contracts from the National Aeronautics and Space Administration in the early days of the moon race helped the chip manufacturers survive. When designers of the second-generation intercontinental ballistic missile *Minuteman II* switched to integrated circuits in 1962, sales took off and the chip's future was assured.

Reid aims his book at the casual reader by explaining binary code, basic electronics, Boolean logic and how a simple computer works step-by-step. But skip over the basics and there is still much rich history to read.

Hardcover, 243 pages, $15.95, ISBN 0-671-45393-9. Simon and Schuster, Rockefeller Center, 1230 Avenue of the Americas, New York, N.Y. 10020.

— John Desmond
CW staff writer

APPLICATION DEBUGGING
By Robert Binder

This no-nonsense book states a clear problem — application programs that abend while running under IBM's MVS operating system — and offers clear answers for the programmer who must get the program working again.

The premise here is as follows: "Faced with an abend, the immediate need is for a solution, not an education in IBM operating system concepts."

The book grew out of the author's crib notes as a programmer in various MVS installations. Sixty common abends are presented for Cobol, assembly language, PL/I and Fortran programs. Possible causes are listed and possible solutions follow.

In the remaining three sections, the author offers common diagnostic aids, identifies useful information on a dump and shows the procedure for finding source program errors.

Hardcover, 366 pages, $29.95, ISBN 0-13-039348-7. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

BOOKS OF NOTE

INTRODUCTION TO UNIX SYSTEM V, the first in a series geared to those learning AT&T's version of the operating system, by Robert Byers. Paperback, 210 pages, $17.95, ISBN 0-912677-29-5. Ashton-Tate Publishing Group, 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, *P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.*

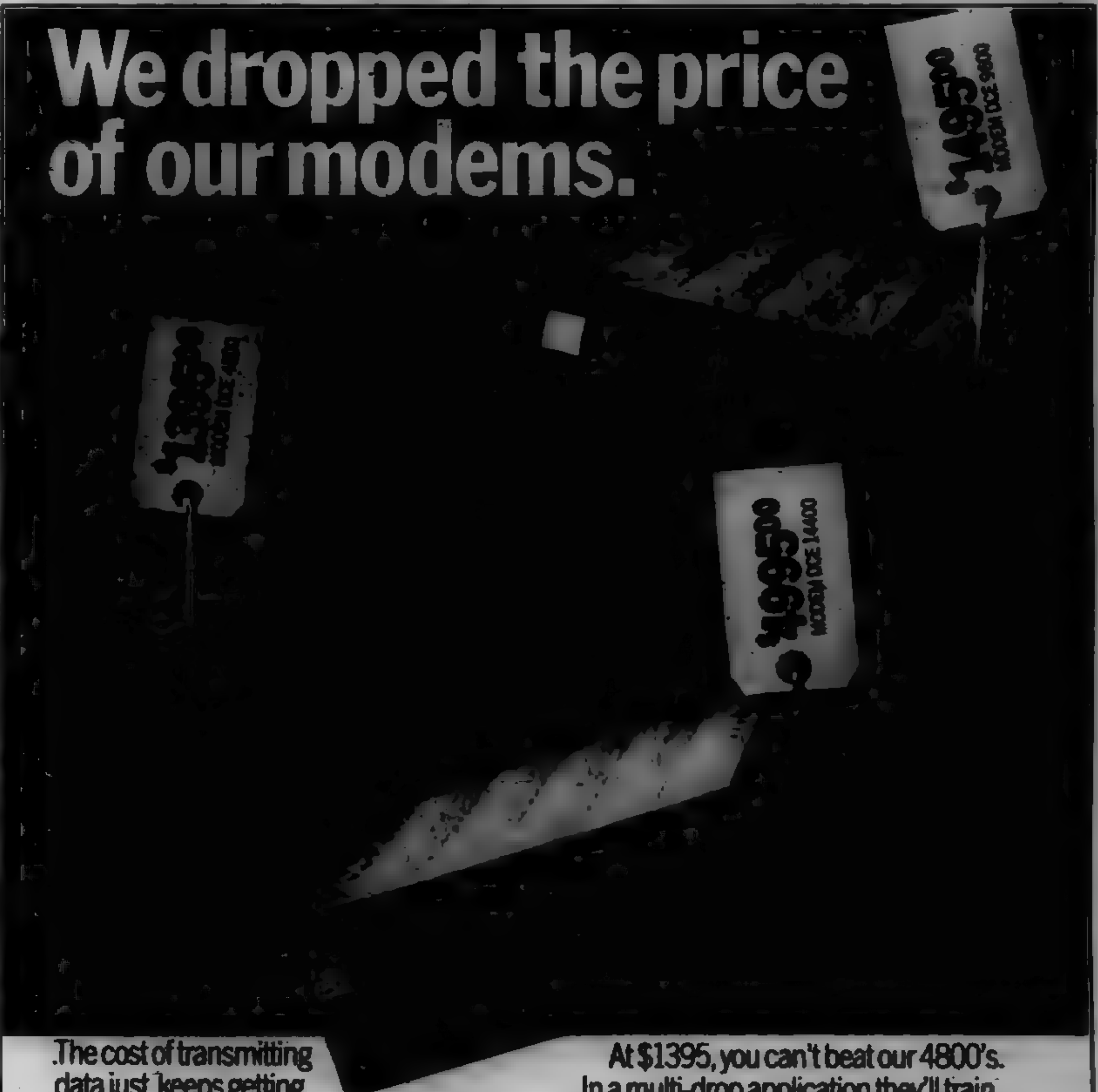
Four systems managers receive ASM professional certification

NEW YORK — Four systems managers here have been designated certified systems professionals (CSP) under a certification procedure of the Association for Systems Management (ASM).

Named were George E. Daus, systems manager at Merrill Lynch & Co.; David Henry, manager of productivity improvement at Manufacturers Hanover Trust Co.; Matthew J. Hierons, informations systems training analyst at Home Life Insurance Co.; and Gerald Rogers, project manager for office automation at IDC Data Services.

The 11-month-old certification procedure attempts to establish knowledge standards and a code of professional conduct for those employed in the information management field.

During its implementation year, which ends May 31, applicants may be certified on the basis of their education and experience. Five years of experience are required with at least one year in management, consulting or project management. After May 31, applicants must pass an examination to be certified. Holders of the CSP designation must undergo periodic recertification through continuing education.



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CALL FOR PAPERS

SECOND INTERNATIONAL PERSONAL ROBOT CONGRESS & EXPOSITION (IPRC)

San Francisco, Sept. 6-8

Papers are being sought by May 1 for this second international exposition. Prospective speakers should submit three copies of an abstract to the IPRC '85 Organizing Committee for its review and approval. The abstract should be detailed enough to allow an assessment of the proposed paper but should not exceed 250 words.

For complete details on submitting abstracts, contact Sharon D. Smith, Chairwoman, IPRC '85 Organizing Committee, 8822 S. Martin Lane, Conifer, Colo. 80433.

THE FIFTH ANNUAL CONFERENCE OF THE ASSOCIATION OF HUMAN RESOURCE SYSTEMS PROFESSIONALS, INC. (HRSP)

Los Angeles, May 14-17

A call for papers has been issued by 1985 Conference Research Chairman E. Phillip Daro. Entries must be postmarked by April 1, and winning papers will be recognized and discussed at the annual HRSP meeting in May.

Papers may be of any length, technical or nontechnical, relating to human resource information systems development or applications to personnel data needs. The papers will be judged for HRSP by an independent panel of magazine editors, educators and personnel systems specialists.

Authors wishing to be considered for an award in a new category for unpublished writers should mention on their papers that they have not previously been published in the field of personnel systems. Address entries to E. Phillip Daro, HRSP Manager, Ebasco Services, Inc., Floor 79, Two World Trade Center, New York, N.Y. 10048.

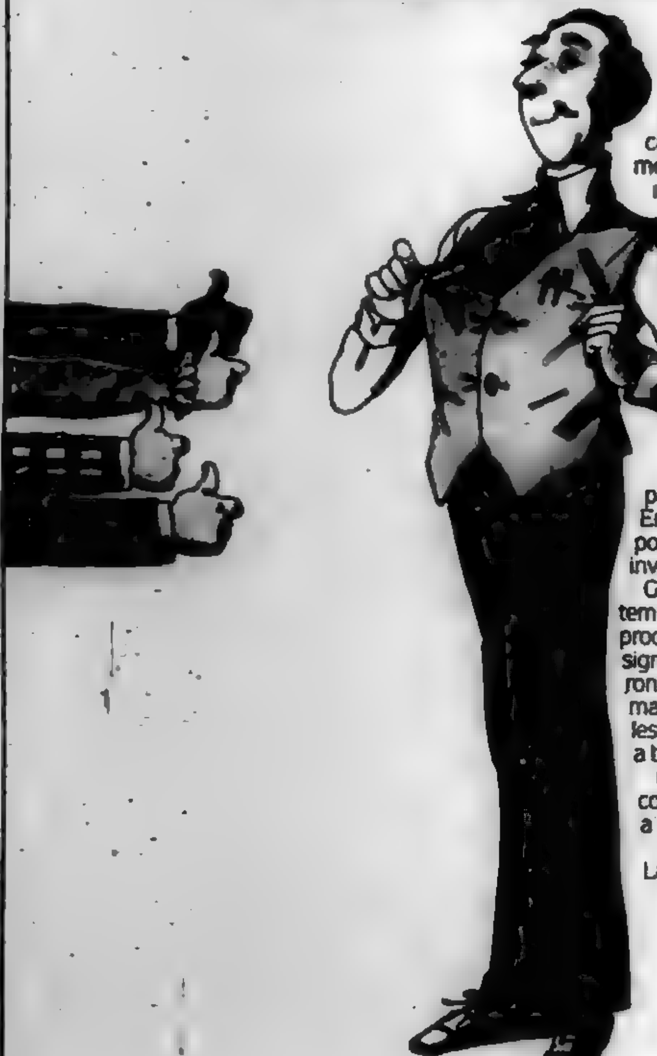
THE THIRD ANNUAL EASTERN AMERICA NCR USERS CONFERENCE

Atlantic City, Oct. 17-18

Abstracts and technical papers are now being sought for this third annual conference. Suggested topics for entries include disaster recovery planning, operating systems tips, multivendor software environments, implementing communications networks, systems applications, data base techniques, personal computers and the mainframe, man/machine interfaces and industry-specific topics, which include the banking, retail, hospital and manufacturing industries.

Abstracts should be 100 words or less and must be submitted along with title, speaker's name, company affiliation, address and telephone number.

All abstracts must be sent by April 5 to Frank Whalon, Tinius Olsen Testing Machine Co., P.O. Box 429, Willow Grove, Pa. 19090. All speakers will be notified of acceptance and schedule by April 15.



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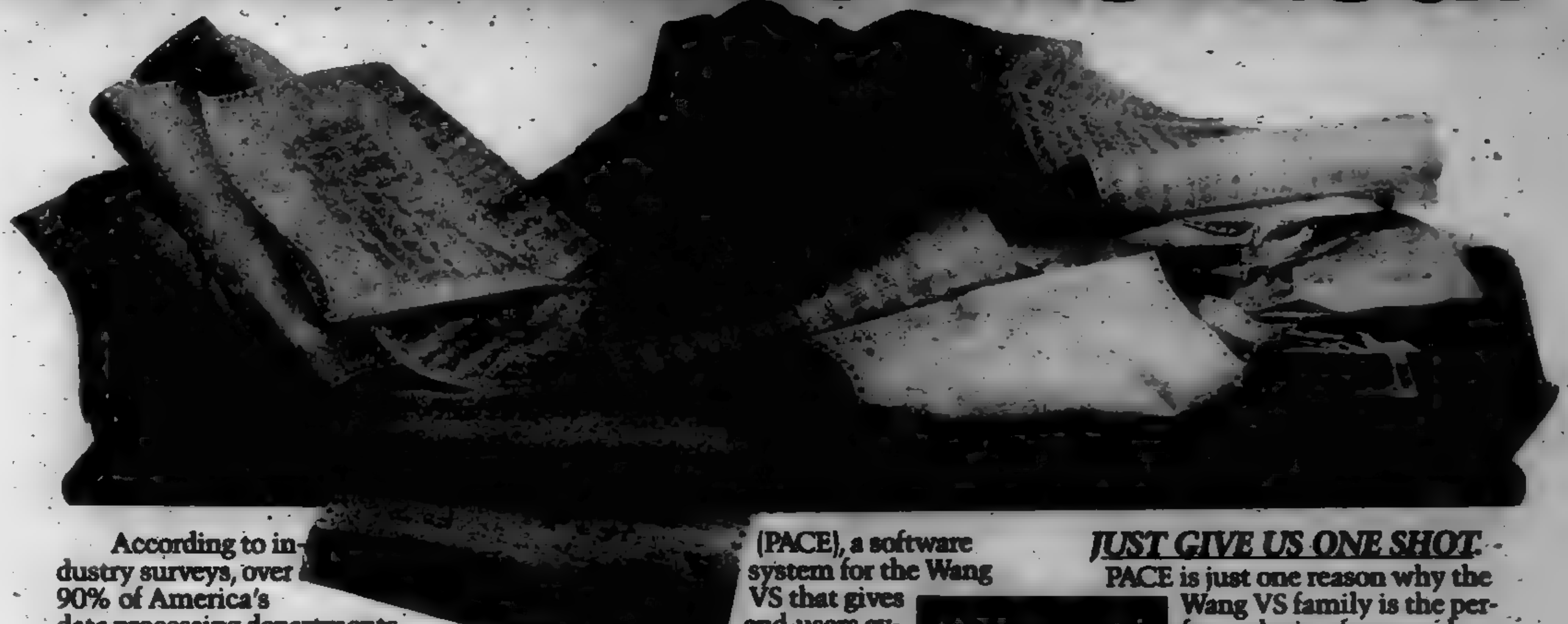

According to industry surveys, over 90% of America's data processing departments have a backlog of applications requests that ranges from three months to three years.

And three years is an awfully long time to wait for anything.

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Migration without conversion up to 192 users	Yes	No
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Object Code Compatibility	VS 15, 25, 45, 65, 85, 100, 300	36 only
Virtual Memory Operating System	Yes	No
Removable Storage Options	Yes	No
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INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

MELBOURNE — The Roy Martin Research Center is switching from its $1 million IBM environment to equipment from Digital Equipment Corp. because IBM's communications do not suit the center's requirements, according to Gary Morgan, company director.

Morgan said the company wanted a multiuser, multidisciplinary environment capable of handling the firm's 300 asynchronous on-line clients with minimum support. "Our users have a whole spectrum of terminals under time-sharing, dial-in and dedicated conduction, and IBM protocols are too demanding," he said.

HONG KONG

HONG KONG — During a recent Far East visit, the senior marketing executive from Digital Equipment Corp. told an audience here that the role of DP managers is changing and evolving away from that of a corporate decision maker. "Business is changing too fast," Mark Roberts said. "DP managers were in charge, but now they are being moved [into] a service role."

FRANCE

PARIS — Users of IBM and Bull equipment can now integrate these systems by using a new series of Bull communications software that interconnects the network architectures of the respective companies, a Bull spokesman claimed. Known as the Open System Facilities, the software reportedly enables workstations in Bull DNC/A networks and IBM Systems Network Architecture systems to access either network.

■

PARIS — Compagnie Generale d'Electricite (CGE) has been discussing joint ventures with Wang Laboratories, Inc. Under negotiation is the interface between Wang equipment and a private automatic branch exchange from CGE's telecommunications subsidiary, CIT Alcatel.

Reportedly, CGE also wants the license to manufacture and sell Wang's office automation equipment in France.

JAPAN

TOKYO — Hitachi Ltd. has unveiled its own answer to the IBM Sierra 3090 series. Hitachi's M-68 processor group comprises the M-680H uniprocessor and the M-682H dyadic processor, a spokesman said. Both machines have a maximum main storage capacity of 256M bytes, according to the vendor, and perform two to six times faster than Hitachi's existing processor lineup.

The systems will be available during the fourth quarter; the M-680H will lease for $196,000/mo, and the M-682H will lease for $312,000/mo, according to the Hitachi spokesman.

Hitachi also announced the H-6585 line of storage units, including a 5G-byte disk unit, which are said to double the capacity of the vendor's previous offerings. Hitachi's storage units will likewise be ready for shipment during the fourth quarter, according to the spokesman.

These products, available only to the Japanese marketplace, were also introduced last week in the U.S., under the National Advanced Systems, Inc. label.

■

TOKYO — Honeywell, Inc. has largely withdrawn from the Japanese computer market and has handed over its systems business to NEC Corp. under the terms of a recent agreement.

The name of the resulting company is NEC Computer Systems, which will sell NEC and Honeywell products with an emphasis on NEC equipment, according to sources.

■

TOKYO — NEC Corp. has unveiled an enhanced version of the company's 20/18 office system. Called NEC System 8, the low-end machine features the vendor's Itos-4 operating system and is compatible with NEC's 100 and 150 series. It can be used in a stand-alone or distributed workstation mode, has a communications facility and can connect up to two units

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of 5-in. hard disk with 20M bytes of memory each. Pricing starts at $8,150, and the product is available immediately.

NETHERLANDS

AMSTERDAM — IBM has terminated the authorization of a Personal Computer dealer here, the Inad Computer Group, alleging that the dealer was selling Personal Computers via unauthorized software houses and other third parties.

At the same time, Xerox Computer Services announced IBM has given it approval to package Xerox manufacturing software with the IBM 4300 series for sale in the Netherlands.

SWEDEN

STOCKHOLM — As of March 4, Swedish Commodore has taken over the sales and marketing here of its Vic and Pet product lines from Datatronic, a Swedish distributor.

Analysts say the move will result in lower prices and enhanced customer support.

■

STOCKHOLM — AU Systems has announced a Swedish network evaluation software system for users of Digital Equipment Corp. VAX-11 VMS systems.

The program, which is called Avinac, is menu-driven and can determine the costs and reply time of the most commonly used computer network structures, according to a spokesman for the vendor.

■

STOCKHOLM — The Swedish Aviation Authority has built a data base detailing all plane crashes in Scandinavia since 1970, which number approximately 2,000, in an effort to improve flight safety. The data base enables flight security analysis, a spokesman said. Copies of the reports can be obtained from the aviation authority.

■

STOCKHOLM — Demand for computer professionals has doubled in the past year, according to recently released figures from the Swedish Labor Market Board. Furthermore, despite laws requiring companies to report all job vacancies to the Board, it is generally held that many companies fail to do so.

ENGLAND

LONDON — British insurance giant Lloyd's of London has unveiled a $15 million computerization plan that spans 10 years. The basic elements of the system will be put into place from 1987 to 1988, according to a spokesman, and will link terminals in approximately 440 insurance offices with Lloyd's data center and central data bases.

The resulting network is likely to incorporate a combination of different network technologies to support a range of personal computers and terminals, a spokesman said.

A number of protocols are said to be vital to support Lloyd's current investment in equipment.

■

LONDON — Five multimicroprocessor systems have been added to International Computers Ltd.'s lineup of DRS 20 office workstations. The 100 Range systems are said to double the performance levels of the DRS 20 line, a spokesman said. The systems are based on Intel Corp.'s 8085 and 8086 microprocessors as well as on a workstation processor featuring 64K bytes of random-access memory.

Pricing on the office system line ranges from $2,890 to $14,145, according to the vendor.

WEST GERMANY

STUTTGART — The University of Stuttgart has joined forces with the Stuttgart System House Ikoss GmbH and Saab-Scandia. Ikoss/Saab will market Aska, the university's finite element method software system.

The software program is used for evaluating and optimizing design and building components primarily in aviation and flight simulation. Aska was used in developing the European Airbus Project, the Spacelab, the European carrier rocket *Ariane* and the American space shuttle. It is being called the alternative to the American Nastram system, according to a spokesman.

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NEWS

CALENDAR

WEEK OF APRIL 14

APRIL 14-18, SAN FRANCISCO — **Conference on Human Factors in Computing Systems.** Contact: Donald Patterson, Lawrence Livermore National Laboratory, L-85, P.O. Box 808, Livermore, Calif. 94550.

APRIL 15-16, WASHINGTON, D.C. — **Successful Software Management.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technical Training Corp., Department SCM, P.O. Box 3608, Torrance, Calif. 90510.

APRIL 15-16, ANAHEIM, CALIF. — **Software Configuration Management.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technical Training Corp., Department SCM, P.O. Box 3608, Torrance, Calif. 90510.

APRIL 15-17, NEW YORK — **Workshop for the Newly Appointed Data Security Officer.** Contact: Marjorie Glaser, Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

APRIL 15-17, WASHINGTON, D.C. — **Systems Network Architecture.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 15-18, CHICAGO — **Data Base: A Builder's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 15-18, WASHINGTON, D.C. — **Intelexpo '85.** Contact: U.S. Telecommunications Suppliers' Association, 333 N. Michigan Ave., Chicago, Ill. 60601.

APRIL 15-19, HOUSTON — **Structured Analysis and Design Techniques Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 15-19, NEW YORK — **CICS Command-Level Programming.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 15-19, WASHINGTON, D.C. — **Knowledge Acquisition for Expert Systems: An Applications Perspective on Planning and Developing the Prototype.** Contact: M. James Naughton, Expert Knowledge Systems, Inc., 6313 Old Chesterbrook Road, McLean, Va. 22101.

APRIL 15-19, SAN DIEGO — **NCR Comten, Inc. User's Exchange Spring Conference.** Contact: Anne Madison, NCR Comten, 2700 Snelling Ave. N., St. Paul, Minn. 55113.

APRIL 15-19, SAN FRANCISCO, — **CICS Internal Architecture.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 15-19, WASHINGTON, D.C. — **Managing Computer Professionals.** Contact: Compumetrics Training Institute, P.O. Box 58383, Houston, Texas 77258.

APRIL 16-17, DALLAS — **Advanced Lotus 1-2-3.** Contact: Professional Development Institute, North Texas State University, P.O. Box 13288, NT Station, Denton, Texas 76203.

APRIL 16-18, ANAHEIM, CALIF. — **Computer-Integrated Manufacturing and Communications Industrial Software Conference and Exposition.** Contact: The Computer & Automated Systems Association of the Society of Manufacturing Engineers, Public Relations, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

APRIL 16-19, BOSTON — **Network Management/Technical Control Conference and Exposition.** Contact: Conference Management Group, CW Communications, Inc., P.O. Box 880, Framingham, Mass. 01701.

APRIL 17-18, NEW YORK — **New Opportunities in Management Information.** Contact: The Conference Board, Inc., P.O. Box 4026, Church Street Station, New York, N.Y. 10249.

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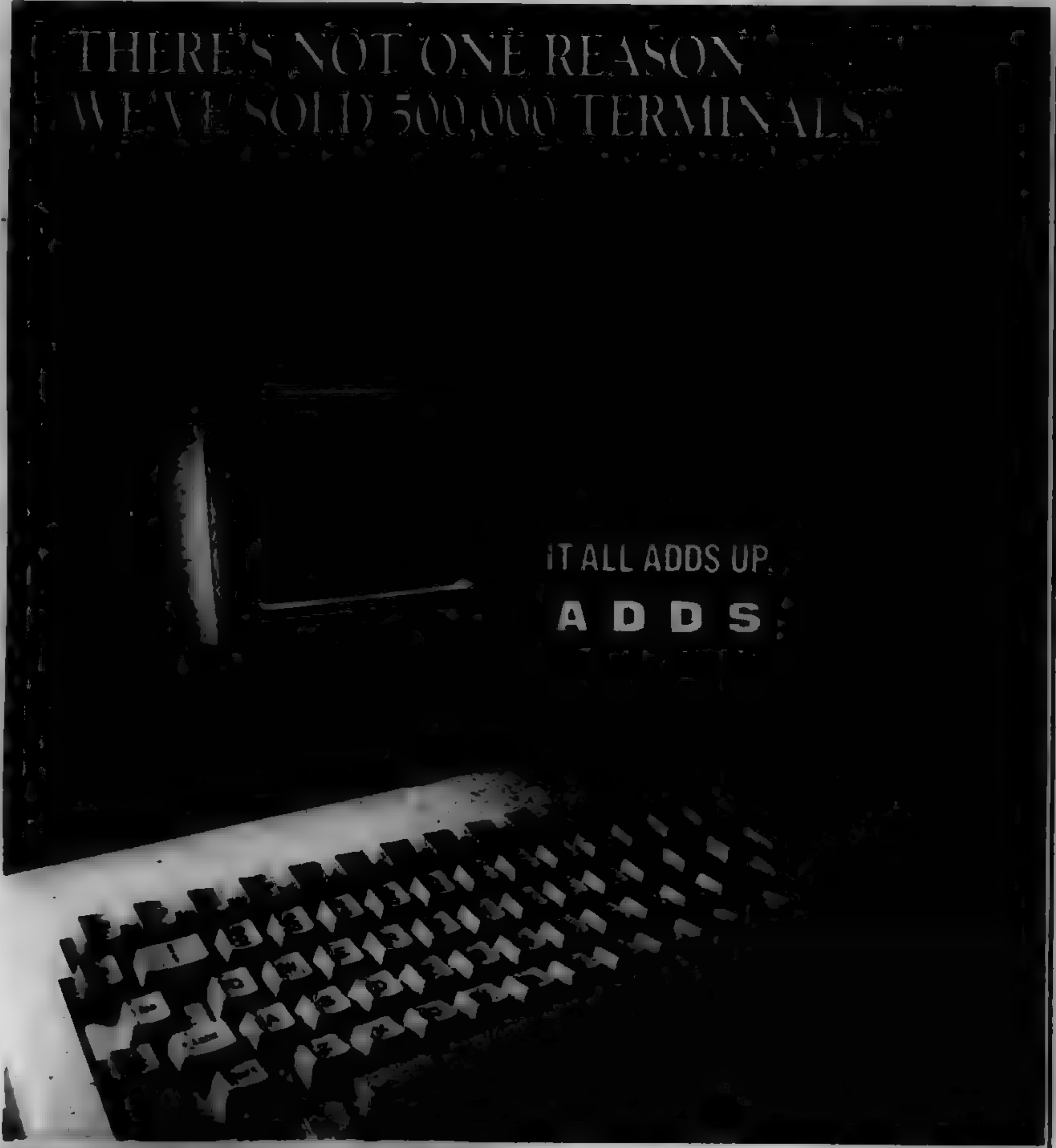

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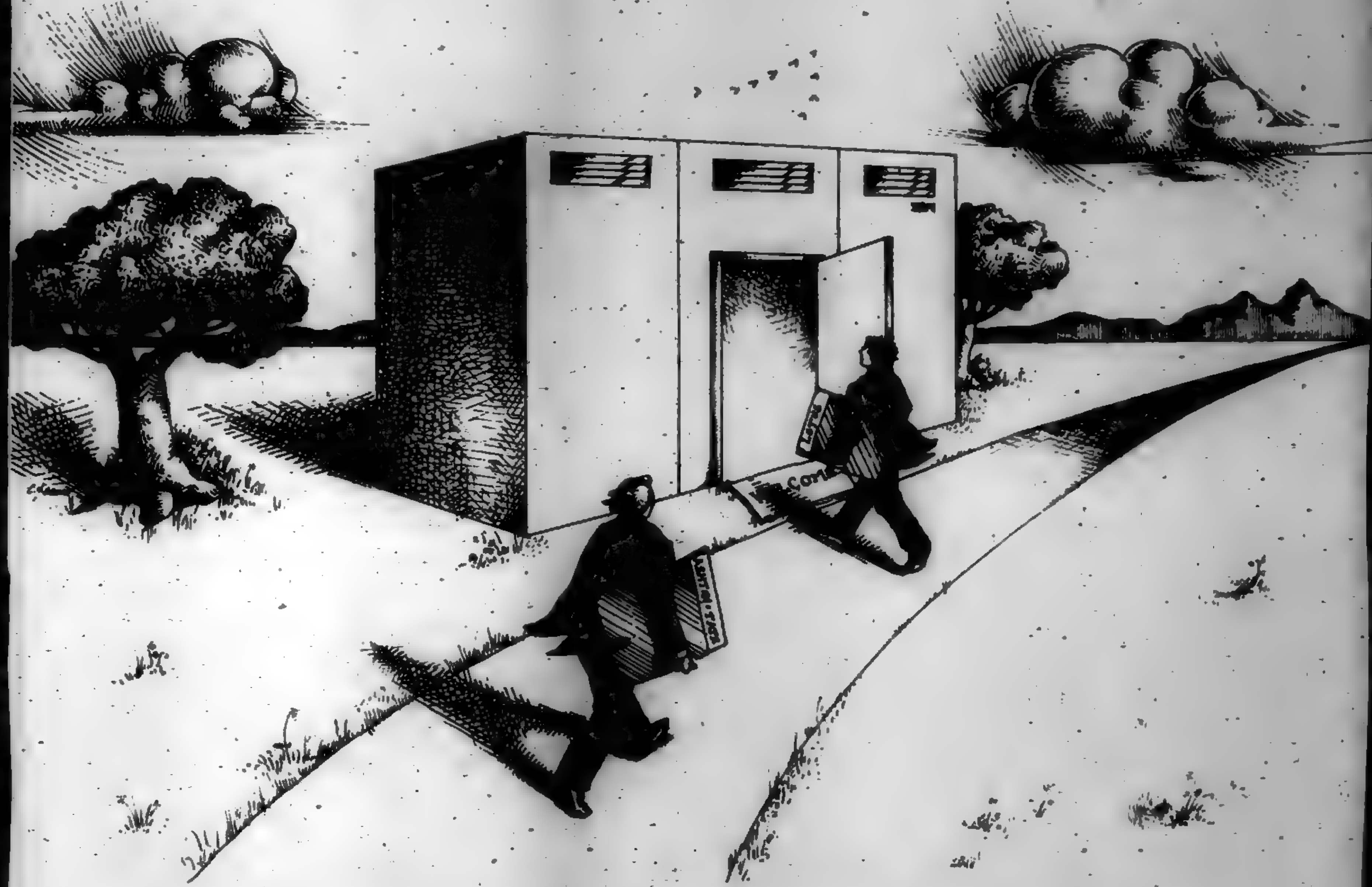

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APRIL

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APRIL 17-24, HANNOVER, WEST GERMANY — **Hannover Fair '85.** Contact: Hannover Fairs Information Center, P.O. Box 338, Whitehouse, N.J. 08888.

APRIL 18-19, NEW YORK — **Security in the Electronic Office.** Contact: Computer Security Institute, 43 Boston Post Road, Northborough, Mass. 01532.

APRIL 20-25, ORLANDO, FLA. — **Bis/Cobol Users Group Annual Meeting.** Contact: Marshall O'Neil, P.O. Box 12424, Jackson, Miss. 39211.

WEEK OF APRIL 21

APRIL 21-24, NASHVILLE — **The 1985 Annual Conference of the Association for Systems Management.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 22-23, WASHINGTON, D.C. — **How to Manage Data and Information as Resources.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 22-23, BALTIMORE — **Structuring & Negotiating Hardware Contracts, Software Contracts and DP Service Contracts.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held April 29-30 in Chicago.

APRIL 22-23, CHICAGO — **Data Communications and Networking for the IBM Personal Computer and Other Personal Computers.** Contact: Dorothy Daly Marshall, Digital Consulting Associates, Inc., 6 Windsor St., Andover, Mass. 01810.

APRIL 22-24, WASHINGTON, D.C. — **Protocols for Message Handling Systems.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 22-24, LOS ANGELES — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held June 3-5 in Toronto.

APRIL 22-24, NEW YORK — **Speech Tech '85 Voice Input/Output Applications Show.** Contact: Media Dimensions, Inc., P.O. Box 1121, Gracie Station, New York, N.Y. 10028.

APRIL 22-25, CHICAGO — **CICS Applications Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 22-25, WASHINGTON, D.C. — **National Conference on Decision Support Systems.** Contact: Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

APRIL 22-25, SAN FRANCISCO — **The International Conference on Information Management.** Contact: The Institute for Information Management, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

APRIL 22-26, WASHINGTON, D.C. — **Design of Computer Operating Systems: Concepts and Principles.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

APRIL 22-26, NEW YORK — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 22-26, NEW YORK — **MVS JCL.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 23, BOSTON — **Seminar on Data Communications.** Contact: Bill Hopkins, Simware, Inc., 14 Concourse Gate, Nepean, Ontario, Canada K2E 7S6. Also being held April 24 in New York and April 25 in Washington, D.C.

APRIL 23-25, NEW YORK — **Teleprocessing Fundamentals.** Contact: Amdahl Corp., National Education Center, M/S 302, P.O. Box 3470, 1250 E. Arques Ave., Sunnyvale, Calif. 94088.

APRIL 23-25, LOS ANGELES — **Effective Management Techniques For Data Processing Managers and Project Leaders.** Contact: Abbott, Galvani Associates, 1850 Union St., San Francisco, Calif. 94123.

APRIL 24-26, BOSTON — **Data Communications Systems & Networks.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

APRIL 24-26, BOSTON — **Local-Area Networks.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held April 29-May 1 in San Francisco.

APRIL 24-26, WASHINGTON, D.C. — **MVS Internals.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held May 8-10 in St. Louis and June 5-7 in Houston.

APRIL 24-26, WASHINGTON, D.C. — **Computer Graphics for Business.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 27-28, NEW YORK — **CICS Command-Level Intensive.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 24-26, BOSTON — **X.25 and Packet-Switching Networks.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

APRIL 24-26, WASHINGTON, D.C. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 24-26, SAN FRANCISCO — **Unix Systems Expo '85 — Spring.** Contact: David Small, Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

APRIL 25-26, WASHINGTON, D.C. — **Dbase III: Its Techniques and Its Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

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EDITORIAL

MIS curricula falling behind

An MIS degree based on skills that can be as much as five years out of date is probably better than no college degree at all. But how much better?

In a time when information executives are fighting a daily battle to keep their technicians and project managers up to date on new technologies, there may be a time lag of up to five years in the implementation of changes in MIS requirements in the curricula for today's MIS students [CW, March 11].

Big deal, you say. Five years isn't that long.

But try to remember what information processing was like in the corporate arena back in 1980, and you can comprehend the usefulness of an MIS degree based on five-year-old requirements:

- IBM had not announced its Personal Computer and legitimized the corporate microcomputer. Until Big Blue put the seal of approval on microcomputing with its August 1981 announcement, most MIS departments simply ignored the possible impact of micros on their own personnel and in user departments. Corporate information centers did not exist.
- AT&T was still Ma Bell. The modified judgment that resulted in the AT&T divestiture took place in January 1982, and the telecommunications explosion had not yet occurred.
- The U.S. v. IBM antitrust suit was in full swing. It would be another two years before the U.S. Department of Justice would drop its charges and the full weight of an unleashed IBM would hit competitors on all fronts.
- Japanese firms were investing heavily in expanded semiconductor plant facilities to advance 256K-bit chips from the laboratory to commercial production. These chips made their appearance in commercially available micros more than one year ago, and AT&T, IBM and others are now concentrating on bringing a 1M-byte chip to market.

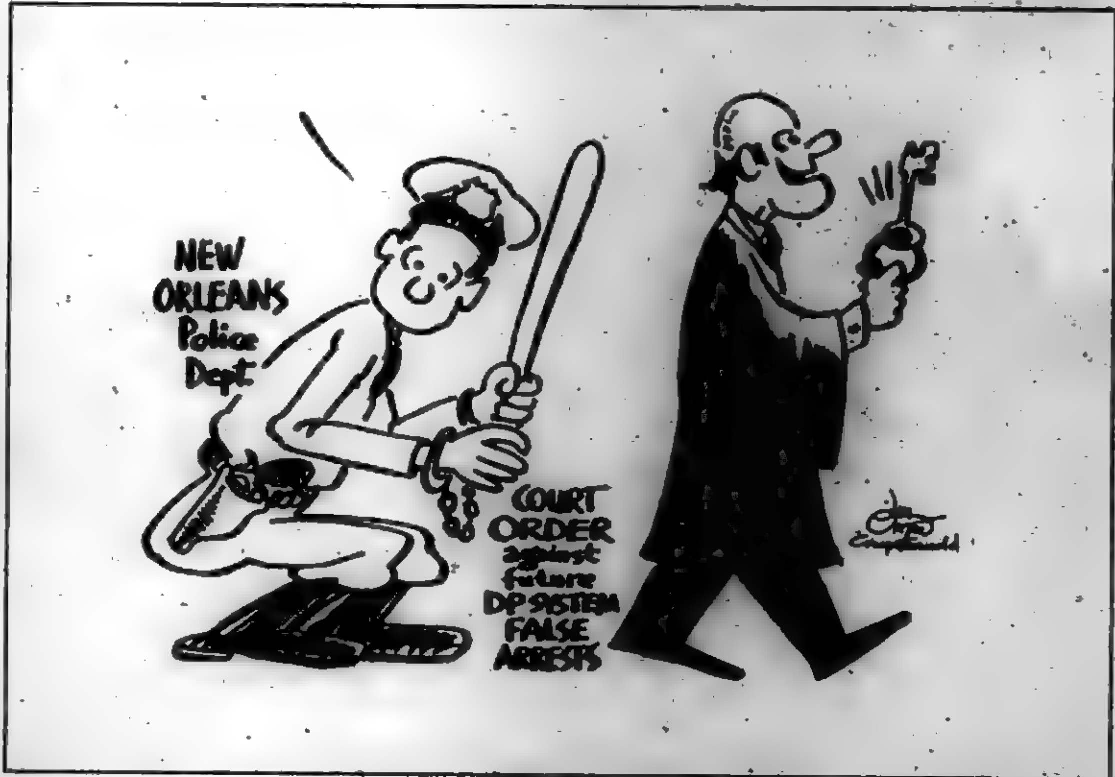
More examples are readily available, but the message is clear: Five-year-old technological expertise is highly suspect in a field where change is the norm and obsolescence must be shunned like the plague for companies to remain competitive.

What MIS departments need is a pool of graduates who are at the forefront of information systems concepts and technologies.The graduates they are getting come from institutions like Stanford (Calif.) University Business School — a school that can only afford to teach graduate students "basic computer literacy" and that turns down personal computer donations because there is no space or staff to teach students how to use them — or institutions like California Polytechnic State University, where today's curriculum changes won't get into the curriculum catalog until 1986, or the University of Minnesota, where one professor acknowledged that the school has failed to recognize changes in the MIS "real world.".

Reasons for the inability of many schools to provide their MIS graduates with up-to-date skills and knowledge range from administrative lassitude, through lack of space and funds, to their inability to compete effectively with the industry in terms of salary for qualified candidates who can teach at a state-of-the-art level.

These may be sufficient reasons, but they are not excuses. The commercial and academic sectors must work together to solve the problem of too few qualified professors teaching outdated techniques and technology to ensure the industry's success.

Five years can be a very long time.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'An ounce of prevention is worth a pound of cure.'

LETTERS

Esperanto: Ideal for translations

I would like to respond to the article "Ancient language may prove key to translation system" [CW, Feb. 25] on the use of the ancient Indian language Aymara in multilingual translation. Not mentioned in the article is the similar use of another logical language, Esperanto. Europeans are working on language translation using Esperanto as an intermediate language. Esperanto is a logical language; it is being used as an international language by several million people worldwide, and it is easy to learn.

It is interesting to learn that a natural language, such as Aymara, has some logical features, but Esperanto should be investigated because it is much more accessible and already in use. People should consider it in deciding which to use as a universal intermediate language for translations.

Fred Pohlvary
Berkeley, Calif.

Software group membership urged

The column "Keeping maintenance minimal" [CW, Feb. 4] suggested that managers, to maintain and to extend existing systems, should converse with other managers, form a special interest group and read about what other companies are doing.

I would recommend joining the Software Maintenance Association, a new independent group concerned with the enhancement, adaptation and correction of computer systems and programs.

Nicholas Zvegintzov
Staten Island, N.Y.

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VIEWPOINT

Graphics harmonizes worlds of art, science

LECHT ON SCIENCE
Charles P. Lecht

It hasn't escaped anyone's attention that the same advanced supercomputer systems mathematicians and physicists need to perform their work are also fantastic picture-making machines — and they move to boot! That's why new film productions are vying for supercomputer time — once considered applicable only to math and physics uses, such as weather prediction, energy production and space travel. The tide of new graphics offerings for all ranges of computer systems is on the rise, and there is beauty and drama in this. The arts and sciences meet on the field of computer-generated graphics to create images of our material and ideological realities, and the payoff is promising.

I always thought it strange that people didn't hoot and holler more about how fortunate we are to be able to generate pictures with computers. The younger generation takes it for granted as just another ho-hum means of drawing, as if it were like a paper and pencil. Even older people, especially those with a lot of television time behind them, seem to have taken its innovation as just another event in an endless stream of electronics that has flowed for some 30 years now.

The sudden appearance of programmable video graphics for all-size systems and its ever-increasing applications on television sets and movie screens seems not to have been recognized as something really special, but this will rapidly change.

Today's graphics "happening" is as important an event as the birth of the digital computer. Its impact will be monumental; with pictures and movies easy to create, we can expect a dramatic increase in their use.

Graphics systems that can store digitized photographs and create photographic-quality reproductions so that the pictures don't always need to be drawn — while allowing the mixture of text with both — generates the material production power of a Walt Disney studio suddenly collapsed into a desktop box. Who would doubt that pictures will soon replace a lot of words in our day-to-day communications and that the words that remain will be greatly clarified?

Prelude to holographic projection

It doesn't take too much imagination to envision today's graphics achievements as a prelude to holographic projection. Holography allows us to create visible graphics etched in otherwise invisible space through the energy released when photons — organized and hurled at each other by powerful laser guns — collide at incredible speeds. The reissued version of the subject we wish to etch — controlled by processors with vast memories containing a pointillistic image of the subject's animation — can appear so real that our senses may tell us the etching has a physical presence. Although plenty of conclusive evidence attests that holography is possible, obvious technological and/or financial constraints have inhibited its development.

Today's graphics environments on computer systems from micro to mainframe and beyond prove, without a doubt, that the benefits of using holography as a practical tool are immense. Think of the benefits the capability to create holograms might yield to information processing, military, education and entertainment industries.

As our leading researchers experiment to improve computer systems performance so that holography might become possible, they work at the frontier of computer and communications science. Here, any kind of picture — however vague it is on what it pretends to show — doubles its value. Pictures of the frontier of our subatomic world are in short supply, and all of them are drawings.

As we go deeper into the structure of matter, previously unseeable objects and processes come into focus. And as they do, the meaning of vision changes to "understanding." The only thing we can hope to see is a scientist's artistic rendition of his understanding in the form of a diagram or chart, if not a mathematical formulation. "Picturing" the realm of the atom and yet further into its electrons, protons and neutrons makes the scientist an artist; his medium is video graphics. Casting the artist as scientist as he experiments with the new media, too, is almost too coincidental.

Images of Seurat and his medium

This conjures for me an image of the entire supercomputing community on a Sunday afternoon in a park with the impressionist painter Georges Seurat and all the pointillist portraits of our universe. Reducing the size of their brush points to out-of-sight proportions where a trillionth is large, they vigorously create ever-new pictures of what is "out there" — or "in there," according to your viewpoint.

Seurat's desire to reproduce what he saw in basic, irreducible points is beautifully paralleled by the work of our supercomputer community. We should not be too upset if an irreducible particle of which all matter is composed is discovered. The world didn't collapse when we discovered other such limits, such as the speeds of light and sound. We could use it as a common "point" with which to paint portraits of all things visible and create models of those things invisible.

See GRAPHICS page 44

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Leading firms notice, cultivate staff loyalty

HUMAN CONNECTION
Jack Stone

Certainly when compared with other operating departments of business and government organizations, the information systems department is perceived as a hotbed of innovation, home of a horde of freethinking high-tech people who thrive on extremely complex processing problems.

As most DP managers have learned through years of hard knocks in the business, getting the job done requires some semblance of order and a corralling of the strivers, such as the work performed by mature veteran analysts — people who have been in the organization a number of years and bring a certain stability and continuity to the development environment.

In a March 3 article in the *Washington Post*, Jeanne Dorin McDowell listed some novel and surprising observations about the effectiveness of certain long-term employees:

"Management psychologists and . . . corporate executives are starting to recognize that loyalty can be highly overrated. They increasingly view the company soldier who blindly follows orders year after year as dull, dependent and a drag on corporate dynamism. . . . The compliantly loyal individual simply cannot contribute much in a business environment characterized by . . . rapid-fire changes in technology. . . . Instead, many chief executives seek underlings who may be short in commitment but long in talent and [their] willingness to take risks."

> ”
>
> *I would judge that the loyal, steady and dependable individual in the DP center, on the average, is much more of a potential asset than a liability. I would search for stability at the possible risk of falling behind in the technology game.*

If this situation is an indication of a growing trend of things to come, senior DP managers have some serious rethinking ahead. After having struggled for years with high turnover rates and the loss of professional employees who are knowledgeable about the detailed operations of the business and after trying desperately to institutionalize a DP organization to set some form of control, DP managers — if they embraced McDowell's philosophy — would have to assume their efforts were in vain and that presumed gains in supervisory effectiveness through employment longevity would be countered by losses in technical leadership.

McDowell is a bit too far on the radical side of the issue; the truth of the matter lies in a somewhat more moderate view. I would judge that the loyal, steady and dependable individual in the DP center, on the average, is much more of a potential asset than a liability. I would search for stability at the possible risk of falling behind in the technology game.

McDowell brought up the related question of the degree of pervasiveness of loyalty in today's business world. McDowell suggested that "loyal employees are a vanishing breed," citing the psychological devastation created by the recent recession, the general thrust in American organizations to slim and trim the work force and the broadly based uncertainty created by the corporate "takeover" movement.

I don't fully agree with her conclusions on this matter — not in our industry, at any rate. We have many organizations — IBM and Hewlett-Packard Co., for example — that have worldwide reputations for loyal personnel who stick to the firm in spite of business adversity. Among the reasons these firms have been successful in this regard is that they reward the staff, in part, for their technological leadership and achievement.

But even more important, employees enjoy working for such leading companies because these firms are successful — highly so and in many dimensions — in the international marketplace, in technology development and, most significantly, in their fair and sensitive treatment of the employees. $

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personnel development.

People's attitudes can make or break DP security plan

READER'S PLATFORM
Matthew E. Murphy

Data processing security plans often fail to focus on the real key to their success — people. Without the support of the people within your organization, technological devices ultimately will fail. Emphasize the role people play, not the security provided by locks, buzzers and vaults.

People's attitudes will make or break a corporation's security plan. But because corporate policy directives governing security are punitive in nature, an individual must think long and hard before believing that a violation is anything but harmless. Because of these circumstances, a person does not feel responsible for anyone else's behavior but his own.

One way to go from a win/lose to a win/win situation is through logical, comprehensive security checklists, which respect the human side of security and recognize the predisposition to give people the benefit of the doubt. As a case in point, let's look at how people answer security checklist questions and how we can reword those questions to avoid the problem. Consider the following question:

- **Are production data sets password-protected?**

A person answering this question who thought that 99.9% of the data sets were protected would feel comfortable answering "yes" because he would think a "no" answer would cast a black mark against someone else. He would think the preponderance of evidence requires a "yes" answer.

The same question could be reworded as follows:

- **Are *all* production libraries password-protected?**

I suspect the same person who would answer "yes" to the first question would feel quite different about the second question. That person would be more inclined to arrive at the truth of the matter and correctly answer "no."

Key words such as "all" and "every" in each question on the checklist help avoid the trap inherent in this example. You yourself may be asking what difference it would make if only a few data sets were not password-protected. The difference could be disastrous. The difference could be that the *only* data set of thousands not protected could be the password data set itself.

Perhaps the best way to question people about security is not to force them to check answer boxes but allow them to use their own words. End your questionnaires with something like, "Are there any areas where security is lax or violated? Are there any suggestions you have?"

Other security issues to be considered from a human point of view include the following:

- **Who has ownership of all security matters?** If the janitor has ownership for physical security, then you will get janitorial service. If a senior vice-president has ownership, then you will get senior vice-presidential service.
- **What is the loss incurred if security is violated?** Make sure the loss, punishment and security are balanced in the eyes of those who work for you. Ask them to help set up this balance. If their jobs are hampered by an imbalance in this equation, people will violate security *in order to do their jobs.*
- **Who audits the security plan?** Internal and external auditors typically audit the security plan, but they are the least likely to uncover violations after the fact and loopholes before the fact. The most successful test programs assign teams to try to break security. Think of it — an audit that uncovers weakness before it is exploited by someone not on your side. Security shortfalls are best pointed out by those who work closely with the systems at hand. Security loopholes need incentive programs to reward individuals who find them.
- **Look for security problems in unlikely places.** Does the holder of a vendor identification card automatically exempt that person from all other security checks? Are DP software security packages verified by those who work closely with the systems for which they are supposed to provide security? How good is your DP password system? Are security systems in place by default?

Putting your emphasis on people will make your security efforts pay off. ‡

Murphy is manager of information management services at Arthur Young & Co.

GRAPHICS

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Think of a world where the arts consume as much of our attention as science does; where theater, music, painting and sculpture become ever-closer companions — the latter two playable on keyboards, as music is, and with all three possessing the potential of instant transformation to one another. A world where these become ingredients in a new medium with which reality may be produced and/or reproduced is like Sunday in the park with George.

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SOFTWARE & SERVICES

Links pose several challenges for MIS

By [illegible]
CW Staff

FRAMINGHAM, Mass. — Meeting high end-user expectations and selecting from the wide variety of expensive micro-mainframe communications products are among the greatest challenges facing MIS directors today, according to a recent report on micro-mainframe links from International Data Corp. (IDC), a Framingham, Mass., market research firm.

To meet the challenge posed by micro-to-mainframe links, MIS managers must identify the end user's functional requirements, conduct careful product analyses and consider growing user demands for such link services when reviewing capacity-planning policies, stated the report, "Micro-Mainframe Communications: Boon or Boondoggle?"

Prepared by IDC's Information Systems Planning Service, the report included preliminary results from the firm's annual user survey. The survey found that 38% of IBM mainframe sites employed some type of micro-mainframe communications software. The results are based on the first 155 responses to IDC's November survey of 13,000 MIS managers nationwide.

MIS managers responding to the survey predicted substantial micro growth within their companies. They said personal computer installations at their companies will increase 70% this year, and they expected that a greater number of those machines will soon be tied to the mainframe.

Last year, 68% of managers surveyed by IDC said that between 81% and 100% of the personal computers in use within their organizations operated as stand-alone units. This year, only 30% of the respondents said that a similar percentage of the micros operated as stand-alone units.

According to IDC, the growth of micro-mainframe links within corporations has been somewhat hampered by a lack of communications between MIS and end users. As a result, MIS managers must concentrate on what IDC identified as eight critical micro-mainframe issues. An expected increase in transaction volume and threats to data integrity arising from micro-mainframe connections make security the MIS manager's top priority, the IDC report said.

"[DP professionals] must be concerned that the large number of new users will cause management nightmares," the report said. Encouraging end users to automate business efforts, assisting with micro systems analysis and providing guidance in security and data recovery procedures will help reduce the security risk, the IDC report said.

Other issues raised by micro-mainframe links, according to IDC, are the allocation of personnel to provide end-user support and product evaluation, data administra-

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SOFTALK/JOHN DESMOND

MVS — to upgrade or not: DOS users still suspicious

You can lead a DOS user to water, but you can't make him drink.

Recent IBM software announcements concentrating on VM and MVS/XA [CW, Feb. 18] clearly indicate the product to which IBM is committing its resources in the operating systems arena. Price incentives such as six months of MVS/XA free for any non-MVS user who converts and statements of direction advising growing DOS shops to convert to MVS make it plain where IBM wants its DOS users to move.

But not all DOS users want to move, and some don't appreciate the pressure being put on them. John Ernst, DP director at the Southeast Wisconsin Regional Planning Commission said, "They force you to make an upgrade when you get to a certain machine." Ernst runs a 4381 Model 1 with DOS/VSE under VM. He needs more room and IBM salesmen have advised him against running DOS/VSE on a bigger 4381

See DOS page 54

SOFTLINE
Thomas O'Flaherty

Software not Japan's forte?

A continuing puzzle to Westerners, and apparently to the Japanese themselves, is the contrast between the enormous success of the Japanese in the manufacturing and electronics industries — including, to a lesser degree, the computer industry — and their failure to become a factor in the production and sale of packaged software.

Is this just a temporary situation that will soon be remedied, perhaps as part of Japan's fifth-generation computing exercise? Or is it a more deeply rooted problem that will take

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O'Flaherty is a principal at Information Service Strategies in Hackensack, N.J., and a regular contributor to Softline.

Pick operating system rewritten with future enhancements in mind

IRVINE, Calif. — Pick Systems has introduced what a spokesman labeled as a completely rewritten version of the portable, multiuser Pick operating system.

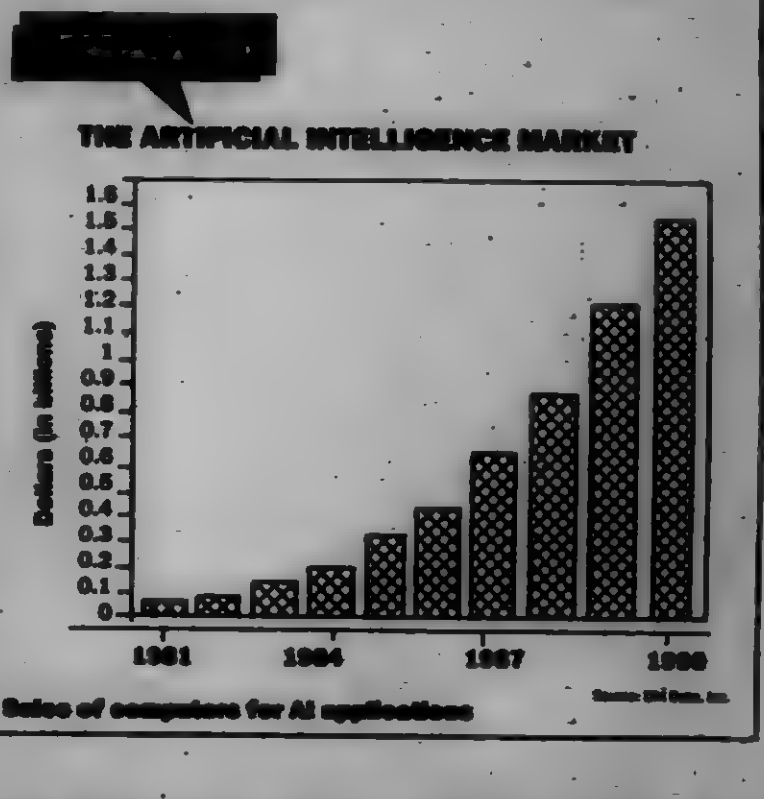
According to the spokesman, the Open Architecture version of Pick was designed to allow Pick Systems to add more easily new functions, such as better communications support, in the future. The restructured version was described as a new foundation upon which such future enhancements can be based. Open Architecture is completely compatible with the previous version of Pick — known as R83 — and provides for applications portability with all the previous implementations of the operating system, he said.

In addition, Open Architecture offers features not contained in R83, including multitasking capabilities, performance enhancements and support for unlimited record sizes. The spokesman said that the system's multitasking ability allows a user to run more than one program at the same time from the same terminal. It also enables a user to execute operating system commands while working within an application program, without exiting that program. Open Architecture's Level Pushing feature, similar to windowing capabilities, allows a user to switch between two or more processes or programs.

Open Architecture is said to feature roughly 30% faster throughput than R83. While the R83 version of Pick provided for a maximum record size of 32K bytes, Open Architecture's record size support is limited only by the storage capacity of the host hardware.

Pick is a multiuser, machine-independent operating system with a built-in data base management system. It is sup-

See PICK page 54



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Sales of computers for AI applications

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Software AG Users spell it out...Datapro™ survey rates ADABAS

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Our proprietary compression algorithm continually analyzes the incoming data stream on a port-by-port basis and compresses the most frequent strings into shorter strings. If the '48 Beetle taught people to think small, we're teaching them to think short.

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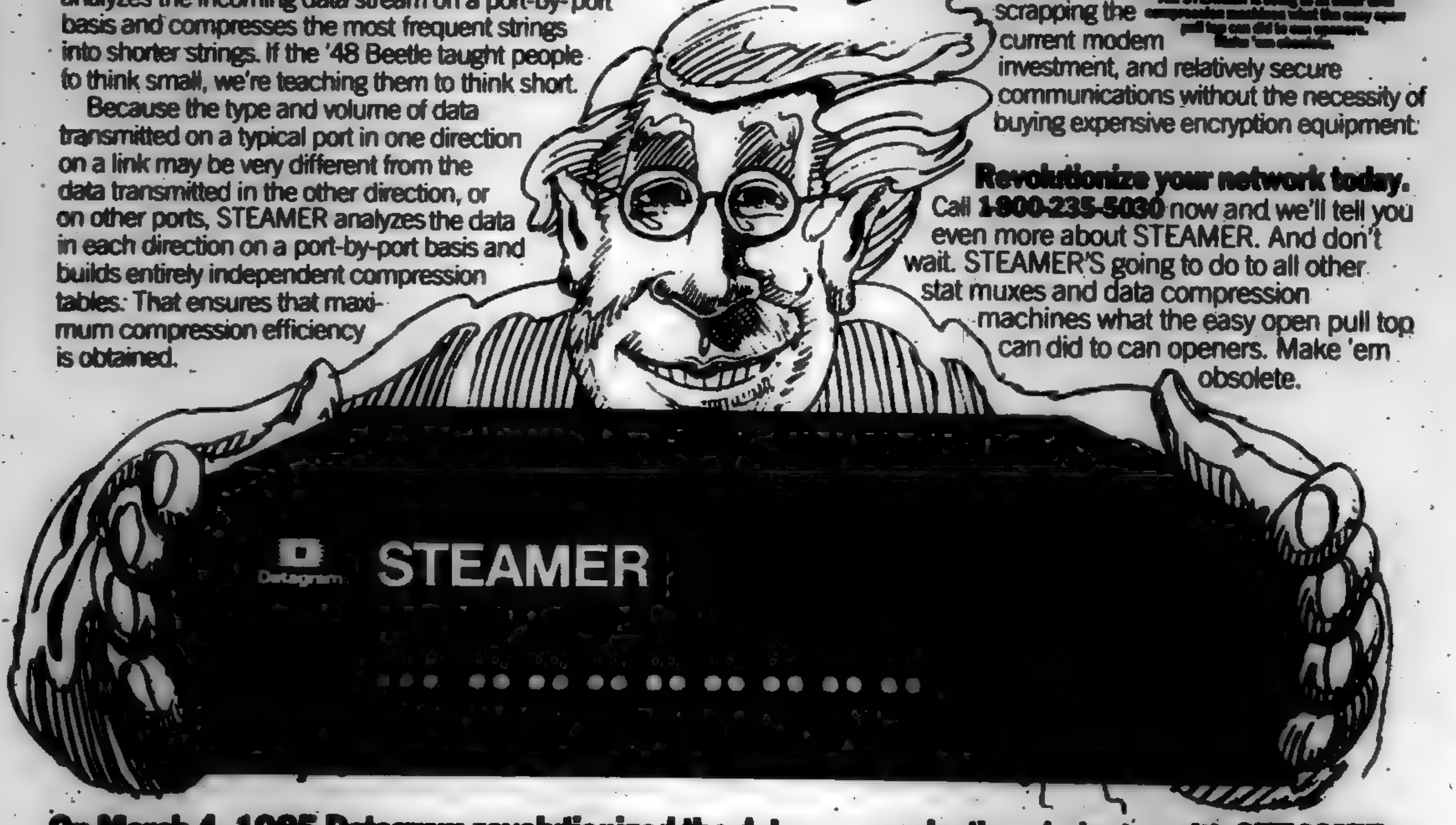

On March 4, 1985 Datagram revolutionized the data communications industry with STEAMER.

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Multilingual software helping break language barrier

By Donna Raimondi
CW Staff

Translators — working to break down language barriers between people and machines — are being aided by multilingual word processing software.

Staff and free-lance translators employed by Berlitz Translation Services in New York are using the multilingual word processing package to localize software for use in foreign countries and to translate user manuals for multinational corporations, said David S. Laube, Northeast sales director for the Berlitz office, one of seven nationwide Berlitz translation centers. The linguists also perform such routine tasks as translating company contracts for foreign affiliates and converting advertising copy and brochures into a variety of languages for their clients.

At Berlitz, a typical linguist's setup includes a Digital Equipment Corp. Microvax with Data General Corp. terminals and keyboards and a Toshiba Corp. dot matrix printer, Laube said. Berlitz uses the ML*WP package from Compulex, Inc. of Lowell, Mass. to perform language translations from English into Russian, Spanish, French and Hebrew and from those languages into English, he said.

In addition to its business applications within Berlitz, the multilingual package is making its mark in academia. Since the fall of 1984, Prof. Robert Szulkin of Brandeis University in Waltham, Mass., has been using the ML*WP system to translate medieval Russian text into modern Russian and English for his students.

"Before, I would write out translations in longhand, then type a first version and then correct it two or three times before doing a final draft," Szulkin said. With the word processing package, he types his translations — for example, from medieval Russian into modern Russian and English — directly into the system, he said.

Language switch with tap of key

The program allows a user to switch from one language to another with the tap of a key, he said. English is the base language on Szulkin's system, in which Help screens and commands are written, but the base language can be changed by the software company to Russian or any other language the user chooses, he said.

The program works with languages written right to left, such as Arabic or Hebrew, as well as languages written left to right, he said. Szulkin's version of the program supports 18 languages, but it is capable of being configured to support as many as 192 languages. He currently runs the word processing package on a DEC Microvax with 1M byte of memory.

Szulkin is currently translating line by line a 12th-century Russian epic poem, "The Song of Igor," into modern Russian and English. He will later add explanatory notes and glossaries with the help of the software.

The resulting text will allow students to focus on the artistic, rather than linguistic, qualities of the literature. "We can concentrate more on the essence of the text rather than spending time on linguistic problems," he said.

Development tool debuts

LOS ANGELES — Inference Corp. has announced the Automated Reasoning Tool (ART) for expert system software development. The product runs on Symbolics, Inc. and Lisp Machines, Inc. workstations and other processors supporting the Lisp programming language.

A spokesman said ART enables programmers to develop commercial expert systems for applications that include resource scheduling, manufacturing planning, aerospace systems, financial planning and military command and control. Features of the system include backward-chaining capabilities, user interface graphics, such as windows and icons and a knowledge-based graphics editor.

The product is offered in two versions: ART and ART/LV. ART/LV is a development environment that supports artificial intelligence techniques such as pattern matching, forward-chaining based on facts, backward-chaining in response to goals, logic programming and production rule transformational programming. ART/LV's knowledge representation capabilities allow a programmer to describe an array of facts and relationships. Its rule compiler allows it to be used for real-time data analysis and decision making.

ART is an extended version of ART/LV that adds a Viewpoint feature, which enables a programmer to compare multiple alternatives simultaneously to select an optimum solution. Viewpoint also allows ART to handle time-modeling and logic-programming tasks.

ART is priced at $85,000 and ART/LV is priced at $60,000.

Inference is located at 5300 W. Century Blvd., 3rd Floor, Los Angeles, Calif. 90045.

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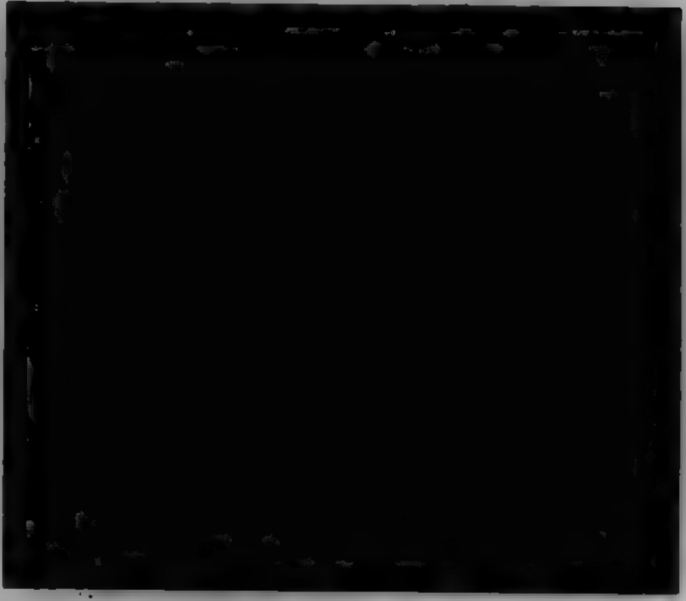

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*VAX and VAXcluster are trademarks of Digital Equipment Corporation

QSM offers assessment service

MCLEAN, Va. — Quantitative Software Management, Inc. (QSM) has introduced a service for evaluating software development environments.

QSM's Software Engineering Assessment Service (Seas) reportedly utilizes software metrics, environmental analysis and graphical industry comparisons to aid in the analysis of an organization's software development costs, problem areas, potential productivity enhancements and return on investment, a spokesman said.

A Seas questionnaire collects data on an organization's completed and in-process software development projects. Questionnaires are reviewed by QSM, and interviews are then held to explore further the organization's development operations. QSM then presents a formal report documenting its findings and recommendations.

Seas is priced from $10,000 to $55,000, depending on the size of the organization.

QSM is located at 1057 Waverley Way, McLean, Va. 22101.

SYSTEMS SOFTWARE

■ National Information Systems, Inc. has announced a new pricing structure for its Teleport II micro-to-mainframe connection.

Teleport II facilitates communications between Digital Equipment Corp. Decsystem-10, Decsystem-20 and VAX series under VMS; Fortune Systems Corp. Model 32:16; DEC Rainbow; IBM Personal Computer, Personal Computer XT and compatibles; Apple Computer, Inc. Apple II and Apple IIe; and Tandy Corp. Models 2, 3, 4, 12 and 16 computers.

Previously, the software was sold bundled for one mainframe and five micros; it is now available on an individual license basis.

Prices range from $250 for a single microcomputer license to $4,000 for a mainframe license.

National Information Systems, Suite 130, 20370 Town Center Lane, Cupertino, Calif. 95014.

■ Software Pursuits, Inc. has introduced a spooling system and Procedure Language Facility (PLF) for users of IBM's DOS/VSE operating system.

According to a spokesman, the Spri Spooling System can be used in place of IBM's VSE/Power spooler. The spooler allows reports to be selected for printing in any sequence and at any time from a variety of report attributes, including form number, report name, department name, customer name and job number. Reports can be automatically routed to multiple locations without any operator intervention and printed simultaneously.

Reports spooled to IBM's VM operating system may be automatically routed to IBM's Remote Spooling Communications Subsystem destinations or printed on local printers. Spri does not require priority over any on-line systems and provides Remote Job Entry support. Spri is priced at $300/mo.

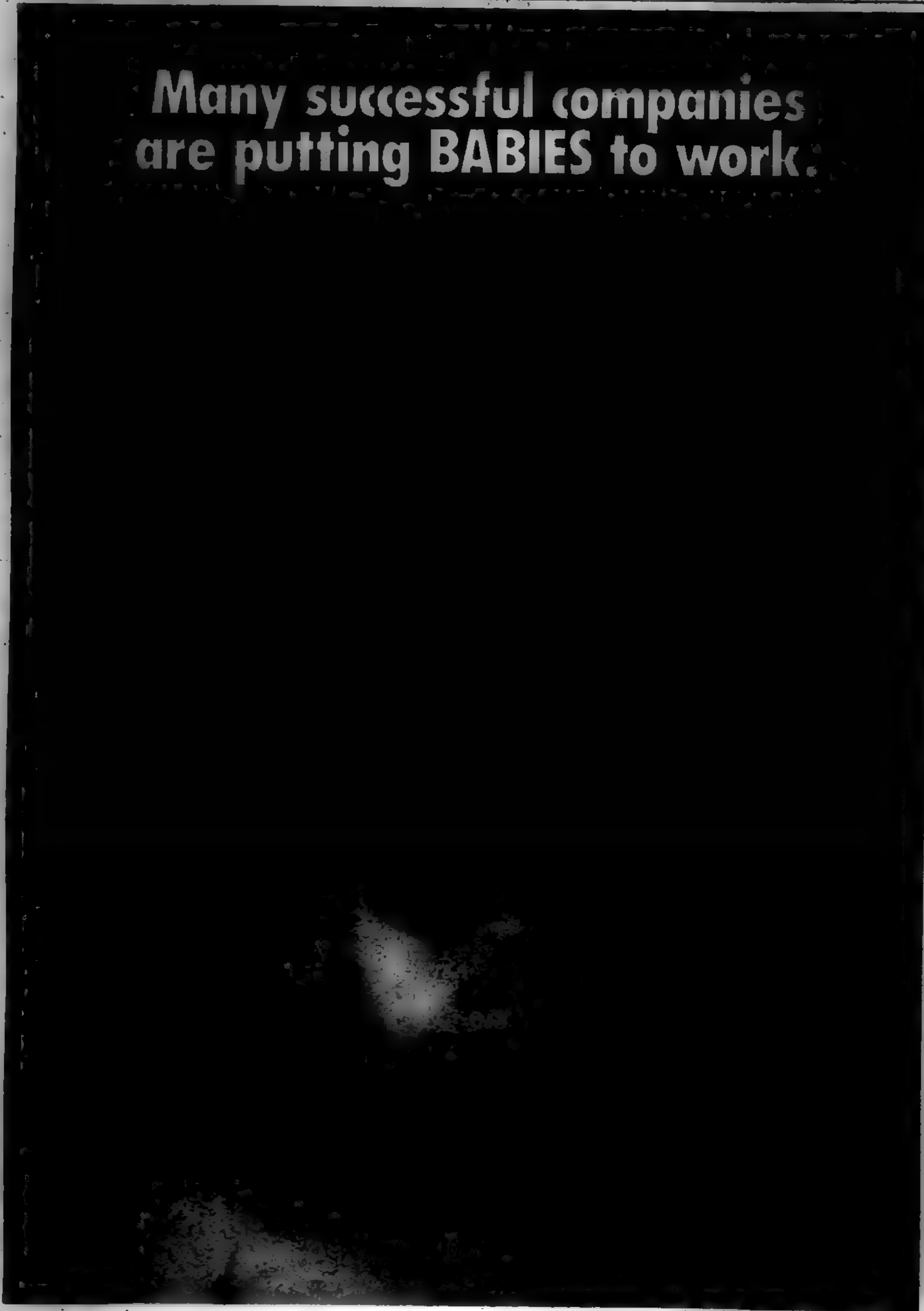
The spokesman said PLF is a preprocessor that allows automatic updating of IBM's JCL. PLF can be used to branch backward or forward within JCL streams, restart systems without operator intervention, control routine updates and insert data. PLF can be leased for $200/mo.

Software Pursuits, Suite 800, 444 Market St., San Francisco, Calif. 94111.

■ Data General Corp. has announced a nearly 70% price reduction on the Ada Development Environment (ADE) for its 32-bit computer systems. The company also announced that ADE is now supported on DG's cluster systems.

An ADE license for DG's MV/10000 SX, MV/10000, MV/8000 II, MV/8000C and MV/4000 systems is priced at $28,000. An ADE license includes an Ada language compiler, program development tools, installation and documentation. An additional ADE extension, which includes a source debugger and a configuration control system, is priced at $9,000 for

Continued on page 52



JAPAN

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much longer to overcome?

The term "packaged software" refers mainly to applications software tools that are aimed at a particular business problem, as well as products with more generic uses such as fourth-generation languages and decision support systems. Applications tools currently account for more than 75% of software package sales by value, and that percentage is increasing.

Explanations

Some Japanese have tried to explain their country's lack of production of packaged software in terms of such things as the early American head start in software technology, IBM's dominance over the Japanese computer industry, the traditional reliance on custom software in Japan and the relative lack of individualism in Japanese culture. However, those explanations are not satisfying.

Japan has become competitive in areas where its competitors had much longer head starts. In addition, IBM is even more dominant in the U.S. — the center of the independent packaged software business — than in Japan. IBM's de facto standards have made the independent packaged software business possible.

The argument that the Japanese reliance on custom software has somehow squeezed out packaged software in Japan is based on two factors.

First, almost half of customized software in Japan is supplied free as an adjunct to a hardware sale. Second, it is argued, custom software will almost always fit an enterprise's needs better than a package.

Lack of understanding

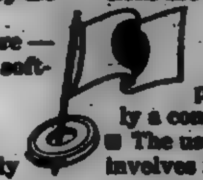
These arguments do not ring entirely true, however. Nothing is free, including the software bundled as part of the sale of a hardware system. Reliance on free software shows a lack of understanding toward software generally rather than a bias against packaged software per se.

The preference to custom as opposed to packaged software is hardly a Japanese phenomenon.

Given relatively high Japanese wages, Japanese businesses should be under the same economic pressure to use packaged software as their counterparts in the U.S.

The prevalence of custom software could be an effect as well as a cause of the lack of packaged software. It certainly does not explain the use of imported packages.

The explanation favored by some Japanese, that Japanese social conformity explains the dearth of software packages, is at first plausible — if we assume that most software is invented by isolated geniuses.



However, much more — and usually better — software is created by small work teams. Such a work environment is quintessentially Japanese; consider the prevalence of quality circles in Japanese industry.

Before an alternate theory can be considered, packaged software's key characteristics should be examined:

■ Even though many options are usually provided by packaged software, any widely used software package is essentially a compromise.

■ The use of most packages involves making changes to an organization's procedures. Even where the new procedures are better, they are often resented.

■ A good package will consume more hardware resources than a good customized program.

'But it works'

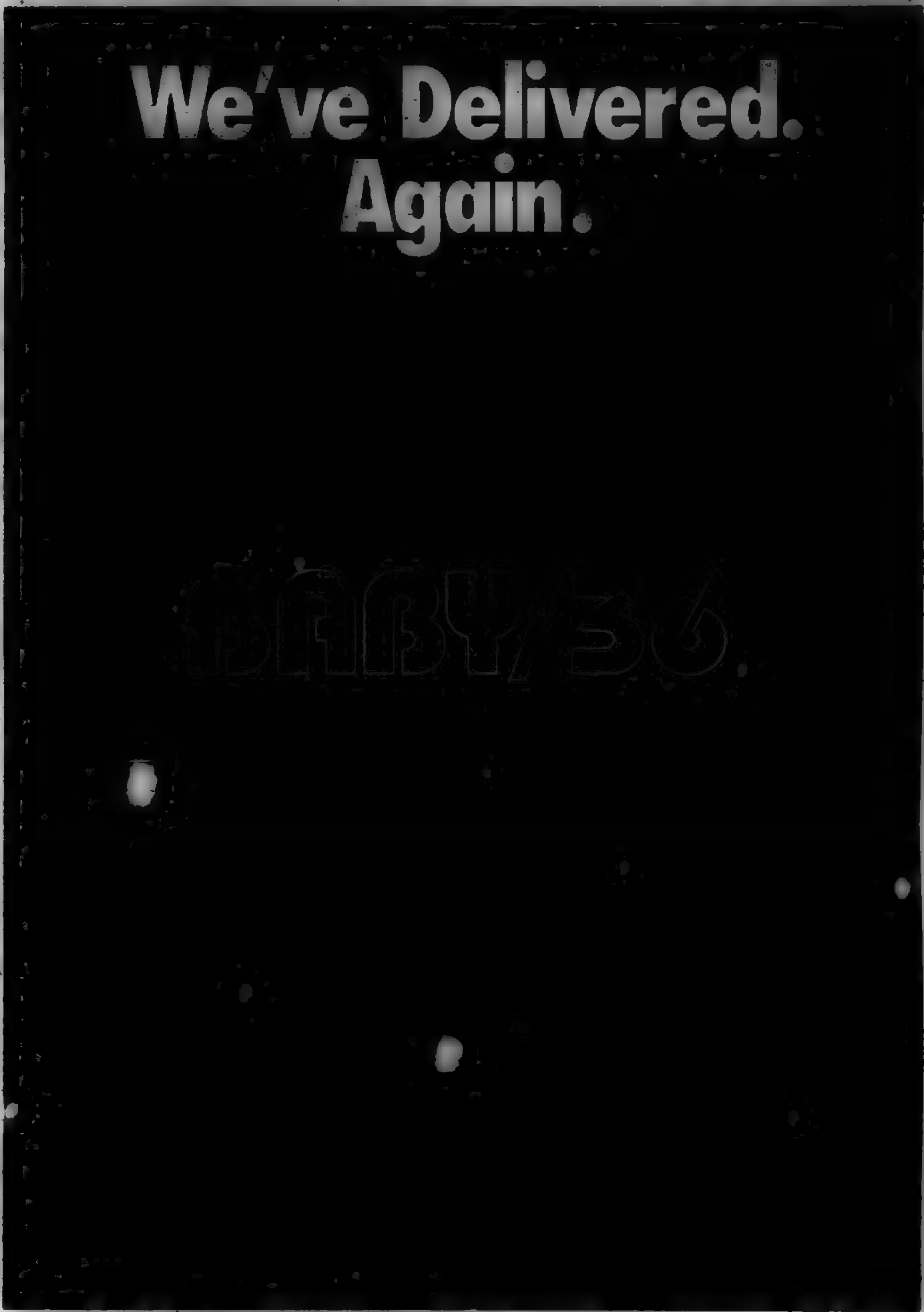
The significant aspect of software packages — including good packages — is their relative crudity. As a knowledgeable technician once said of a very well-known, expensive and widely admired package, "It's kludgy, but it works."

Let's consider for a moment product packaging.

In the West, packages have long been machine-made — most handmade packages were both less attractive and less functional than what has replaced them.

The opposite is true in Japan. Contemporary Japanese machine-made packages are often barely functional. It is hard to square the crudity of Japanese packages with the concern for aesthetic principles that typifies Japa-

See JAPAN page 52



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SOFTWARE & SERVICES

Continued from page 80

an initial license.

ADE software for the 32-bit cluster and distributed workstation systems, including the MV/4000DC, the DS/4200 and DS/4000, is licensed for $7,000; the ADE extension is $5,000.

DG, 4400 Computer Drive, Westboro, Mass. 01580.

■ MacKinney Systems has released a screen generator for IBM's CICS environments.

CICSMapr II is said to include screen painting and copy facilities that allow users to build a new map using an existing map as a base. Screen development is done interactively under CICS. The package supports page building and functions of IBM's Basic Mapping Support product. CICSMapr II is priced at $995.

MacKinney Systems, Box 270-A, Rt. 2, Fair Grove, Mo. 65648.

■ Computer Resources, Inc. (CRI) has introduced a data dictionary for Hewlett-Packard Co.'s HP 3000 series minicomputers.

A spokesman said that the Dataguide data dictionary is available as an option to CRI's Relate 3000 relational data base management system or as a stand-alone program. Dataguide provides documentation for data bases, files, fields, indexes, index types, procedures, passwords and users.

Dataguide is priced at $3,000 for the HP 3000 Model 37 and $5,000 for all other HP 3000 models.

CRI, P. O. Box 58004, 5333 Betsy Ross Drive, Santa Clara, Calif., 95052.

APPLICATION PACKAGES

■ J. D. Edward & Co. has announced its World Systems accounting software, consisting of 712 programs for the IBM System/38, including applications for accounts payable and receivable, general ledger, financial reporting and address records processing.

Reportedly, the company's JDE data dictionary allows nontechnical users to tailor screens, menus, report headings and help instructions. Dictionary definitions and allowed values are displayed by entering a question mark in any input field.

A World Systems package costs $40,000 for a permanent license.

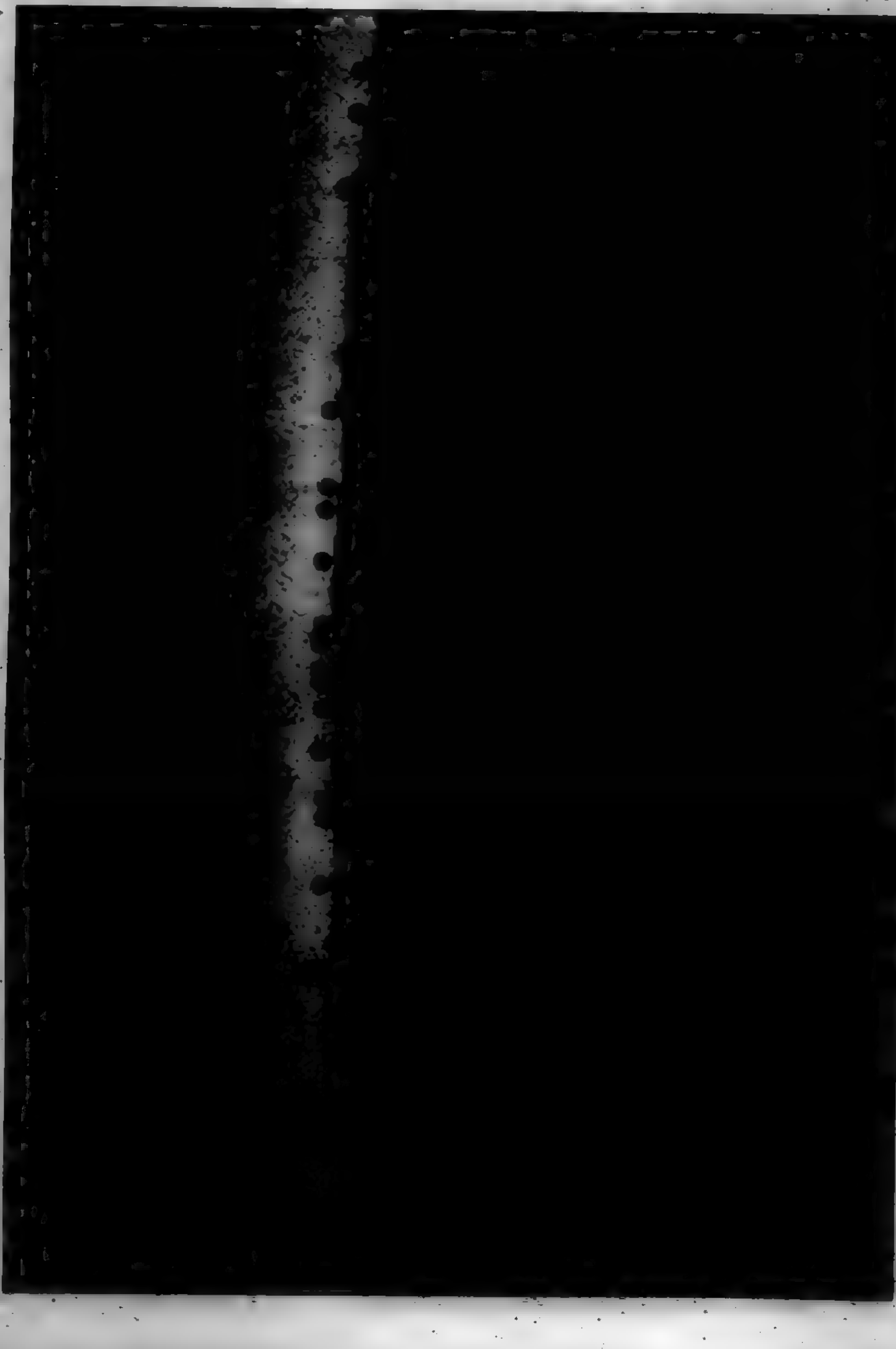
J. D. Edwards, 4949 S. Syracuse St., Denver, Colo. 80237.

■ Computer Solutions has introduced a fixed assets management module for its Growthpower integrated manufacturing, financial and marketing software for Hewlett-Packard Co.'s HP 3000 series minicomputers.

According to a spokesman, the fixed assets module stores financial information about an asset, calculates depreciation and projects future values of property and equipment. Investment tax credits can be calculated and maintained. Fixed assets include provisions for state and local tax reporting systems.

The Fixed Assets module costs $4,500.

Computer Solutions, One Burlington Woods, Burlington, Mass. 01803.



JAPAN from page 51

nese culture.

Traditional Japanese packaging, on the other hand, is another thing completely. Very specific, highly functional and extraordinarily artistic, it is one of the highest achievements of any culture's everyday life. Those who have seen the recent touring exhibition on the Japanese package know this to be true. A scholar said, "Take any traditional [Japanese] packaging and you are sure to find a subtlety of handwork that is uniquely Japanese."

Traditional packaging gave way initially not so much for economic reasons but because Western machine-made packaging must have seemed to contain the essence of Western technology, which 19th century Japan was single-mindedly absorbing. Ultimately there would be economic justifications as well.

Custom software can provide the same individualized functionality typical of old-style packages. A specific program can also be more personalized and, if you will, aesthetic, even if assembled from semistandardized components.

Customized software speaks to a very basic part of Japanese culture. Software can be seen as an area of endeavor where the handicraft tradition gets a chance to live on in modern dress. If this is true, then customized software will be quite hard to dislodge.

This is especially true because an advanced and self-confident Japan will not be likely to automatically take to packaged software merely because it has become a norm in the U.S. There is still a significant number of U.S. enterprises that will argue the benefits of custom software. Given the discipline of Japanese organizations, the customized "software factories" could, in fact, give many run-of-the-mill software packages a run for their money.

A complicating factor in the debate over custom vs. packaged software is the difficulty of trying to determine a winner. This arises out of the confusion over costs and benefits of software production and use, as well as the paucity of useful information on software productivity-related issues. Until these issues are better understood, it will be extremely hard to say that custom software is really that much more expensive than a software package.

So we are left with two conclusions: The Japanese will continue to give more weight to custom, rather than packaged software. And they may not be wrong in doing so.

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DOS from page 45

or a 3000 series CPU.

Ernst is typical of DOS users who, struggling to hang onto DOS, face obstacles and uncertainty. Most DOS shops have only two to three support personnel and perhaps 10 to 20 applications programmers. Converting an operating system is an expensive and time-consuming undertaking, during which systems personnel are not engaged in supporting day-to-day business operations.

Peter Clark, systems programming administrator at Olan Mills, Inc. of Chattanooga, Tenn., which runs DOS/VSE under VM on a 3033 and a 3083, has been resisting IBM's advice to move from DOS for years. "It would be an expensive conversion, and during the effort we would not be making any progress toward meeting our company goals," he said. But the company's needs are growing, and Clark knows he must constantly reexamine his decision to remain with DOS.

With DOS running in 46.9% of all IBM installations, in the estimation of International Data Corp. (IDC) of Framingham, Mass., DOS users are a large and vocal contingent. Through users groups, DOS users can pressure IBM and get answers. Attempts to kill DOS in the past failed after users raised their voices in opposition.

User conversion will be slow

Thus, the process of converting DOS users will be a slow one, with IBM being careful not to alienate its DOS users — even though they may not be the biggest and richest of IBM's customers. Perhaps IBM is paying lip service to its DOS customers by saying DOS/VSE will continue to be enhanced. But IBM is scheduled to ship VSE/SP 2.1 in April, with a major enhancement of virtual memory from 16M bytes to 40M bytes. How it will perform remains to be seen.

The conversion to MVS/XA has been happening at a slow rate. IDC found that 20% of 4331, 4341, 3030 and 3080 series users who upgraded operating systems in 1984 moved to MVS/XA. For DOS users who are converting, it makes more sense to convert to MVS/XA all at once, rather than to MVS initially and then to MVS/XA at a later date, in the opinion of Shaku Atre, president of the Rye, N.Y.-based Atre International Consultants, Inc.

One DOS user is converting directly to MVS/XA in response to his firm's expansion. Bob Heist, manager of technical services at Carpenter Technology Corp. in Reading, Pa., was attracted to MVS/XA by two critical factors: virtual storage constraint relief and an advanced I/O subsystem. The firm has over 500 terminals linked to a 3083 and a 4381 Model 2, which is being upgraded to a Model 3 to run MVS/XA. The firm also has 24 3375 disk drives and eight 3380 spindles.

Drawbacks to the MVS/XA conversion included added demands on the staff of 45 programmers and an increased software budget. "IBM software products are quite expensive," Heist said, inflated even more by the hiring of two systems operators experienced in MVS.

Even though Heist's shop will no longer run DOS, a program called UCC2 from Uccel Corp. of Dallas will allow Carpenter to run DOS object programs under MVS/XA.

It seems the combined opinions of users, analysts and vendors can be summarized in a multiple-choice question: What is the future of DOS?

A. DOS will remain the starter operating system for IBM small systems users.
B. DOS will merge with VM.
C. DOS will merge with MVS.
D. IBM will drop DOS.
E. None of the above.

Anyone with an accurate answer would have the insight of the president of IBM and may drink from the DOS cup.

REPORT from page 45

tion, capacity planning, training, software development and communications.

The IDC report identified three classes of micro-mainframe links: terminal emulation, through which micros can be made to appear as terminals to communicate with the mainframe; virtual systems, where some portion of host storage is reserved for micro user needs; and integrated systems, where the micro can be transformed into an intelligent workstation that can access and manipulate information residing on the host.

Of the 43 survey respondents that identified the source of their linking software in the survey, 28% said they used in-house-developed software links only, while 44% said they used vendor-supplied products. Two respondents said they used two or more third-party products for linking micros to mainframes. The same number said they used a third-party package in conjunction with an in-house-developed link.

Of the companies that employed micro-mainframe links, 7% permitted read-only access via terminal emulation and 29% allowed both read-only access and file download capabilities for data manipulation, IDC said.

The report is priced at $650 and is available from IDC, 5 Speen St., Framingham, Mass. 01701.

PICK from page 45

ported on a wide range of processors, from the IBM Personal Computer XT to IBM mainframes under VM. The Open Architecture version of Pick will be available this month. Product pricing is determined by individual Pick distributors.

Pick Systems is located at 1691 Browning, Irvine, Calif. 92714.

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MICROCOMPUTERS

Wordstar 2000 gets high marks, some criticism

By Kathleen Sullivan
CW West Coast Bureau

PASADENA, Calif. — When Jeffrey Skaletsky first heard that Micropro International Corp. had designed a successor to Wordstar, he was skeptical about the program's chances for success. "I thought the original Wordstar was a flash in the pan," said Skaletsky, a microcomputing analyst at the National Aeronautics and Space Administration's Jet Propulsion Lab here.

Now that he has had a chance to use Wordstar 2000 for about two months, writing memos and letters and preparing documents on an IBM Personal Computer AT, most of Skaletsky's misgivings have faded away. The new program, he said, is much more professional and sophisticated than the original Wordstar.

Like two other early users of Wordstar 2000 interviewed by *Computerworld*, Skaletsky gave the program high marks for its overall design; its mnemonic command set, which all three users described as intuitive; and its intelligent use of function keys.

Yet the program also has shortcomings that need to be improved, the users agreed.

All three criticized the program's performance by saying that Wordstar 2000 was too slow. Skaletsky, the only user running Wordstar on an IBM Personal Computer AT, characterized the program's speed as reasonable on that machine but too slow on the Personal Computer XT. He added that the program was "too cumbersome and large" for a floppy-disk-based system.

Jonathan Marcus, manager of microcomputer technology services at Cupertino, Calif.-based McDonnell Douglas Applied Communications Systems Co., has been running Wordstar 2000 for about three months on his IBM Personal Computer XT.

"Since I only use Wordstar 2000 for preparing memos that are one to two pages long, the speed doesn't bother me," he said. "However, if I were preparing documents that were five to 10 pages long, I would have to agree that the program's performance would have to be seen as an impediment to selecting Wordstar 2000 over an-

See USERS page 61

Photomail hits market

Tool sends images between IBM micro users

MERRIMACK, N.H. — Photomail, an icon-driven software package that allows IBM Personal Computer users to capture images with a standard video camera or videocassette recorder and send them over dial-up phone lines to remote Personal Computers, has been introduced by Chorus Data Systems, Inc.

Photomail supports alternating voice and data operations, allowing users to interact with each other while an image is being displayed on both computer screens, Chorus said. Using a mouse or the keyboard, users can point to a specific area of the picture for highlighting on the other computer's screen.

The package reportedly works with still-frame pictures of diagrams, text, people, products or objects digitized at up to 640 by 400 pixels by 16 colors or levels of gray. Photomail can also capture and send standard IBM screens generated by programs such as Lotus Development Corp.'s 1-2-3, according to Bruce Monk, Chorus' marketing vice-president.

Photomail's interactive features "establish a better reference point in communicating," speeding up jobs and reducing errors, Monk claimed. Potential customers include advertising agencies, service and maintenance organizations, design and engineering firms, security groups, medical organizations, real estate brokers and insurance agencies, as well as many other businesses, he suggested.

The program requires Chorus' PC-Eye plug-in board, which occupies a single expansion slot, connects directly to

See ICON page 60

Osborne foresees price plunge

SMALL TALK
Kathleen Sullivan
CW West Coast Bureau

In microcomputer circles, Adam Osborne is known for his brash style and controversial pronouncements, which are delivered in a precise British accent and seasoned with a heavy dose of bravado. Now president of his own software firm, Osborne recently leveled his sights on the software industry and fired off a few rounds on software pricing.

"The software industry is in for a disastrous change," he warned a group of systems professionals at a meeting of the Association for Systems Management in San Francisco recently. "The companies that are now charging $500 for a software package will only be able to get away with that price for another three to four months." By summer, prices for software will plummet. After that, Osborne predicted, software packages will cost $95 at most.

"People are still talking about perceived-value pricing, a concept that is propped up by a loose confederation of software stores and companies," he continued. But within a short period of time, users will stop buying the notion that a program's worth is reflected in its price tag, Osborne said. No firm will be able to buttress its high prices with a reference to perceived value, he said.

According to Osborne, the software industry will soon resemble book pub-

See PRICES page 60

- DEC has introduced an electronic mail module for its A-to-Z software system on the Micro/PDP-11/57
- Corvus Systems has announced software giving Appletalk network users shared access to Corvus Omnidrive disk drives/57
- Pick Systems has upgraded its Pick operating system for the Personal Computer XT/56

INSIDE

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Dialog manager added to Advanced Productivity System

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — The supplier of the Advanced Productivity System (APS), a software system that reportedly uses IBM Personal Computers to boost programmer productivity, has enhanced its offering with additional features aimed at accelerating applications maintenance, testing and editing.

Arrix Logic Systems, Inc. has added a dialog manager said to aid program maintenance by greatly simplifying screen-panel updating.

The dialog manager divorces screen panels from their associated applications code and thus spares programmers the time-consuming task of revising the latter when they update the former, Arrix Chairman Heinz Buettner said.

APS has also recently been enhanced with a "hex editing" feature that automatically converts Ebcdic text into its Ascii equivalent or vice versa, Arrix system developer Farzad Amin said. Such a capability reportedly reconciles the differences in coding conventions between the Ebcdic world of mainframes and the Ascii realm of micros and permits program editing and testing to be off-loaded from one to the other.

In the wake of its latest enhancements, APS now consists of four integrated program productivity modules, which were described here during a recent press conference. In addition to the dialog manager, the subsystems include the following:

- SPF, which interacts with users through menu screens and allows disk-stored data to be browsed or manipulated.
- Script, a formatting module that aids in the preparation of program documentation and other text.
- A VM Flist module, a user-customizable list of development tools that programmers can invoke without having to leave their current programming environments and then reboot.

Together, the above modules enable the APS to hasten software development by off-loading programming tasks from mainframes to micros, according to Fred Schmidt, Arrix's vice-president of sales and marketing.

The APS has already undergone beta testing at Blue Cross of California in nearby Oakland, according to Ted Case, the organization's information center consultant. Blue Cross expects use of the APS to improve its time-sharing option response times by permitting "trivial" mainframe programming tasks like documentation, flow charting, text editing and syntax checking to be moved to micros, Case said.

Amin said that in designing the APS, Arrix sought to achieve three performance objectives — speed, ease of use and fidelity to IBM's mainframe programming environment, Amin said. Accordingly, the software company has optimized its SPF module to deliver "subsecond" response times — far better performance than programmers would typically encounter with a shared mainframe, Schmidt said.

Arrix has also designed SPF to replicate 90% of the commands found in IBM's widely used mainframe-based development aid, the Interactive Systems Productivity Facility, he added.

When its constituent modules are purchased as a package, the APS sells for $480.

More information is available from Arrix, Box 142, Don Mills, Ont., Canada M3C2R6.

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DEC A-to-Z gets E-mail option

MAYNARD, Mass. — Digital Equipment Corp. has announced the addition of an electronic mail module for its A-to-Z integrated system on the company's Micro PDP-11 multiuser systems.

A company spokesman said A-to-Z electronic mail is designed to work with other A-to-Z business modules, sharing the same menu and user interfaces.

The A-to-Z word processing module can produce electronic mail messages, memos, letters and reports.

Messages can include bar and pie charts, graphics, text and spreadsheet data, the spokesman said.

Users reportedly can interrupt one program to enter another, retrieve data on demand and return to the original program.

A license for the A-to-Z system costs $1,000. The electronic mail module is priced at $600.

Digital Equipment is headquartered in Maynard, Mass. 01754.

Omnitalk out from Corvus

SAN JOSE, Calif. — Users of Apple Computer, Inc.'s Appletalk network reportedly can gain shared access to the Corvus Systems, Inc. Omnidrive disk drives with Corvus's recently introduced Omnitalk software.

Omnitalk is said to allow users to share applications software and to read and write to different files on the Omnidrive. It also permits Omnidrives currently in use with Macintosh computers to become a network resource.

Omnidrives reportedly can be configured on Appletalk by direct connection.

Designed to work with the Apple file retrieval utility program, Omnitalk offers controlled access to the Omnidrive, Corvus said. It lets users divide the Omnidrive into public, private and controlled volumes with password protection at the user, volume and drive levels.

Private volumes allow a single user both to read and write to specific parts of the drive. Public volumes can be read by all users, and controlled volumes can be read by any number of users, but only one user at a time can write to them.

Omnitalk costs $395.

Corvus Systems is located at 2100 Corvus Drive, San Jose, Calif. 95124.

Phoenix offers C language program analyzer

NORWOOD, Mass. — A program analyzer for use with the C language for programming on the IBM Personal Computer line and compatibles has been introduced by Phoenix Computer Products Corp.

Pre-C is said to be a superset of the AT&T Unix system's Lint utility. Pre-C reportedly increases productivity by identifying hard to locate program statement errors, including interface inconsistencies. Pre-C is priced at $395.

Many errors that are difficult to isolate using a debugger can be uncovered using Pre-C, Phoenix said.

While producing a collection of diagnostic messages, Pre-C automatically identifies incorrect subroutine calls.

Phoenix said Pre-C can complement the use of a debugger because it can find statement errors that debuggers do not find efficiently, while a debugger locates dynamic errors that Pre-C cannot.

Pre-C's diagnostics reportedly facilitate the porting of programs written in C to other operating systems.

Pre-C supports several popular C compilers, including Lattice, Inc.'s Lattice C, Mark Williams Co.'s C and Computer Innovations, Inc.'s C86.

Phoenix Computer Products is located at Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

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DECIDEDLY BETTER

SOFTWARE

■ Qtech Associates has released its Qplot/PC graphics package for the IBM Personal Computer.

The Qplot/PC software, written in Fortran, is said to be able to plot on any graphics device that can draw a vector. The package requires Microsoft Corp.'s Fortran runtime library.

The Qplot library reportedly includes routines for two-dimensional rectangular and polar plotting, three-dimensional rectangular plotting with hidden line removal, flow charting, mapping and typesetting. The Qplot/PC package costs $250.

Qtech Associates, P.O. Box 952, Old Lyme, Conn. 06371.

■ Tritek Vision Systems, Inc. has released a version of its Execadd three-dimensional design and drafting software that runs on the IBM Personal Computer, Personal Computer XT or Personal Computer AT under Microsoft Corp.'s MS-DOS 2.0 or higher.

Features include editing that allows surfaces to be extruded, spun or fit manually into a three-dimensional object; automatic rendering of multiple-point perspective views; and the ability to work with a number of objects and create exploded views. The package reportedly is compatible with Autodesk, Inc.'s Autocad and Personal CAD Systems, Inc.'s Cadplan design software.

The software costs 1,500.

Tritek Vision Systems, Suite 1512, 4710 University Way N.E., Seattle, Wash. 98105.

■ North America Mica, Inc. has introduced its GPS-II printer graphics package for the IBM Personal Computer and personal computers under Digital Research, Inc.'s CP/M and CP/M 86 operating systems.

GPS-II is an add-on to PMS-II, the vendor's critical path network analyzer and scheduling package, priced at $1,295. GPS-II reportedly converts PMS-II network diagrams, bar charts, graphs and histograms into graphics presentations without the use of a plotter.

It also provides time-series, time-scaled, network diagrammed and sideways printing of all PMS-II diagrams, graphs and histograms as well as those of the vendor's RMS-II.

Also reportedly included are sort and selection reporting capabilities in daily, weekly and monthly format.

GPS-II is priced at $695.

North American Mica, Suite 110, 5230 Carroll Canyon Road, San Diego, Calif. 92121.

See TOOLS page 50

Pick unveils enhanced system for IBM micro

IRVINE, Calif. — Pick Systems has unveiled an enhanced version of its Pick multiuser operating system for the IBM Personal Computer XT.

Version 1.3 of the Pick PC-XT system is said to include expanded hard-disk storage capabilities and an on-line tutorial.

The Pick PC-XT System 1.3 can be configured to use two IBM 10.5M-byte hard disks for a total of 21M bytes, a spokesman said. The configuration for the additional hard disk can be set up through an option on the installation menu when the user installs the operating system.

The product's on-line tutorial provides training in the use of the Pick operating system.

The Pick PC-XT System 1.3 is identical to Pick's R83 system, which was released to all licensees last autumn, the vendor said. The software is priced at $495.

Pick also has introduced Jet, a $249 word processor for users of the Pick operating system on the Personal Computer XT. With Jet, users can create documents by automatically merging data from any file available on the operating system, the supplier said.

Both the enhanced operating system and Jet will be available this month.

Pick Systems is located at 1691 Browning, Irvine, Calif. 92714.

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MICROCOMPUTERS

TOOLS

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■ **Wicat Systems, Inc. has introduced a version of the Pick Associates, Inc. Pick multiuser operating system for its Systems 150, 155, 160, 200, 220 and 2200 microcomputers.**

The Pick operating system for those Motorola, Inc. 68000-based machines is a standard version, according to Wicat. The package reportedly provides efficient disk I/O and comes bundled with a word processor and spreadsheet, graphics, Help processor, tutorial and high-level applications generator software.

The addition of Pick reportedly brings to three the number of operating systems available for the Wicat micros.

The Pick operating system is priced from $12,000 to $80,000, depending on the microcomputer system.

Wicat Systems, 1875 S. State St., Orem, Utah 84057.

■ **Beaman Porter, Inc. has introduced its Powertext Formatter, a software package to enhance the output of word processing packages on the IBM Personal Computer.**

Powertext Formatter enhances such packages as Software Publishing Corp.'s PFS:Write and IBM's Writing Assistant by enabling users to produce documents with justified and true proportional text, the vendor said.

Also available is the capability to provide footnotes on the same page and multiple columns of text and/or numbers.

Support is said to be provided for wide documents, including schedules, calendars and presentations. The software package features format files that rely on English language commands.

Powertext Formatter is priced at $49.95.

Beaman Porter, 417 Halstead Ave., Harrison, N.Y. 10528.

■ **Forethought, Inc. has introduced its Filemaker single-file data base software for the Apple Computer, Inc. Macintosh.**

Filemaker, priced at $195, reportedly allows users to create custom-designed reports and forms. It permits users to organize and present such information as files, orders, shipments, inventory, project status and personnel records.

The number of records, fields, reports and files in Filemaker reportedly are only limited by disk space, and records may contain any combination of text, number, date, calculation or summary fields. Filemaker allows an unlimited number of report layouts for each file.

The software is said to be compatible with all other Macintosh software using the text, Sylk or columnar file storage methods.

Forethought, 1973 Landings Drive, Mountain View, Calif. 94043.

■ **Datagraphic Systems, Inc. has enhanced its CAD Master computer-aided design software for the IBM Personal Computer line. The enhancement reportedly includes a translator for the National Bureau of Standards' Initial Graphics Exchange Specification (IGES) standard.**

Support of IGES is said to allow drawings stored on mainframe CAD systems to be downloaded to the IBM Personal Computer line. Under CAD Master, the drawing may be displayed, zoomed, edited and enhanced.

CAD Master reportedly can redraw a 1,000-element design in less than three seconds on the AT.

CAD Master is priced at $2,495.

Datagraphic Systems, 9101 General Drive, Plymouth, Mich. 48170.

STORAGE DEVICES

■ **Kamerman Labs has introduced Masterflight, a storage unit including hard disk storage, backup system and power directors for the IBM Personal Computer, Personal Computer XT and Personal Computer AT.**

The unit is 2½-in. high and reportedly integrates a half-height 10M-, 20M- or 33M-byte hard disk; a backup system, including half-height 20M-, 40M- or 60M-byte streamer tape; and five power direction switches, including computer monitor, printer with two auxiliary switches, a locking security key and a surge protector.

Base price for the Masterflight is $3,795.

Kamerman Labs, 8054 S.W. Nimbus, Beaverton, Ore. 97005.

See [illegible] page 62

records received from or destined for the mainframe.

File Exchange™ A file transfer software package that supports bi-directional transfer of data over coax or modem connections between PCs and mainframes running CICS, TSO and CMS applications.

Coax Exchange™ Lets a PC emulate a 3278/9 display terminal via coaxial connection.

Bisync Exchange™ 3270 Allows bisynchronous PC-to-mainframe communications; 3274 cluster controller, 3278/9 terminal and 3287 printer emulation.

Bisync Exchange™ 3780 Allows a PC to emulate a 3780 or 2780 Remote Job Entry workstation. Also provides PC-to-PC 4800-baud communication, with data transparency.

Async Exchange™ An add-on software package for asynchronous communication including DEC™ VT100/52 emulation between PCs and DEC as well as other asynchronous mainframes.

ClusterNet™ 3270 and ClusterNet™ 3278 Allows a master PC to emulate a 3274 cluster controller, and up to 3 additional PCs to emulate 3278/9 terminals via a multidrop twisted-pair cable.

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PRICES

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lishing, "where publishers survive by [taking advantage of] authors." He said the developers who write for his latest venture — Berkeley, Calif.-based Paperback Software International — shoulder all the development risks. "That way, if a software developer picks the wrong program or the wrong machine, it's his nickel," Osborne said.

Once software prices fall below $100, Osborne predicted, applications programs "will cease to be an investment." Instead, like a book that did not measure up to its reviews, software will be seen as an item that is easily discarded if found wanting.

Analysts had strong reactions to Osborne's predictions. These industry watchers said that, currently, programs that cost less than $100 — whether they are compilers, word processing programs or desk accessory packages — provide a limited set of features. While useful, these programs will not replace the recent crop of business software, they said.

> ***Within a short period of time, users will stop buying the notion that a program's worth is reflected in its price tag.***
>
> **— Adam Osborne**
> **Paperback Software International**

According to Robert Lefkowitz, director of software research for Infocorp, a Cupertino, Calif., firm, business software packages priced from $495 to $695 are "holding their prices well" — a pattern that will continue. Rather than expecting falling prices, he said, users should look for "more bang for the buck," with increased functionality and a more user-friendly design.

Support also becomes an issue for users who buy low-price software, the analysts said. Osborne's firm, for instance, actively discourages users' questions by charging $1 per minute for phone inquiries, with a $5 minimum charge.

"That strategy won't fly in the business market," Lefkowitz said.

Andy Seybold, a Torrance, Calif.-based consultant and contributing editor to the "Seybold Report on Professional Computing," characterized Osborne's strategy as a "shotgun approach" to software marketing. "[Osborne] will get 3,000 products out on the market and hope that 100 might sell well," he said. The high-end business market will be fueled not by a plethora of software but by a new emphasis on the integration of software programs under a common operating environment, he said.

In this scenario, users will mix and match software packages, which will run under a transparent user interface, such as IBM's Topview or Digital Research, Inc.'s Graphics Environment Manager, Seybold said. "That will require a higher level of support than what's now available," he said.

"More and more, the push will be toward total integration," Seybold said. "That will cost more money — not less."

Mary Ellen Dick, who manages software research at Software Access International, Inc., a Mountain View, Calif., firm, said Osborne's company is able to charge inexpensive prices because it pays its authors pennies. "Paperback Software is really more of a distributor," she said. By contrast, companies developing their own software have higher overhead requirements that are reflected in software prices.

She also disagreed with Osborne's statement that software will no longer be seen as an investment. "Software is an investment not because of its price but because of the time, training and data it represents," she said.

ICON

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any EIA RS-171 or RS-330 video source and digitizes the video signal. Images are displayed either by the IBM color adapter card (with 320 by 200 pixels by four colors or gray levels, or 640- by 200-pixel monochrome display) or Tecmar Graphics Master card (providing 640 by 400 pixels by 16 colors or gray levels).

Text editing is said to permit users to label areas of an image, type messages and create image descriptions or specifications.

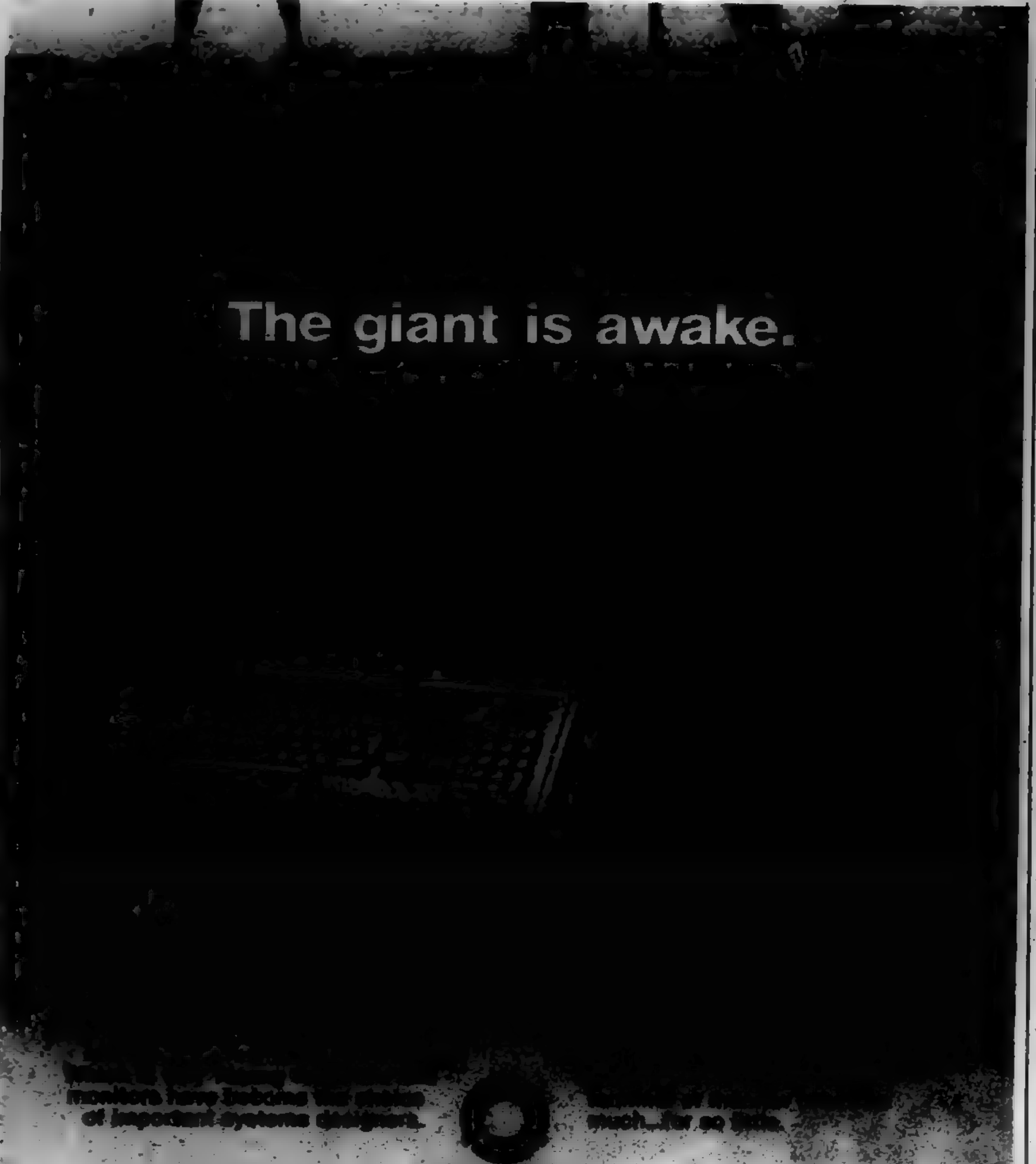
The program supports Hayes Microcomputer Products, Inc. and compatible modems operating at 1.2K bit/sec and 2.4K bit/sec. Full screen images can be transmitted in less than a minute at 2.4K bit/sec, Monk said.

Images taking up one-eighth to one-half of the screen also can be sampled.

The program works with the Personal Computer, Personal Computer XT and Personal Computer AT and compatible systems, Chorus said. It supports the IBM Graphics Printer, Epson America, Inc.'s Graphics Printer and Hewlett-Packard Co.'s Thinkjet.

Photomail software costs $795. A complete kit, including Photomail, PC-Eye, graphics card and Chorus' Screenmaster software package, which provides 16 shades of gray on an IBM color monitor, is priced at $2,495.

Chorus is located at 6 Continental Blvd., Merrimack, N.H. 03054.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USERS

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other program."

Marcus said he is anxiously awaiting Micropro's second release of Wordstar 2000, hoping for a version that makes more efficient use of the machine's resources.

Until then, he said, McDonnell Douglas will adopt a wait-and-see attitude and postpone a decision on whether to give Wordstar 2000 to its employees who are currently using Wordstar.

Jackson Booth, a manager in the financial planning department at Monterey Insurance Agencies in Monterey, Calif., described himself as a fast typist who found Wordstar 2000's slow speed annoying, especially on the occasions when he sat waiting for the cursor to catch up to his typing.

The slowness was not noticeable when he deleted words or blocks of text, Booth said, but it became obvious when he deleted one letter at a time.

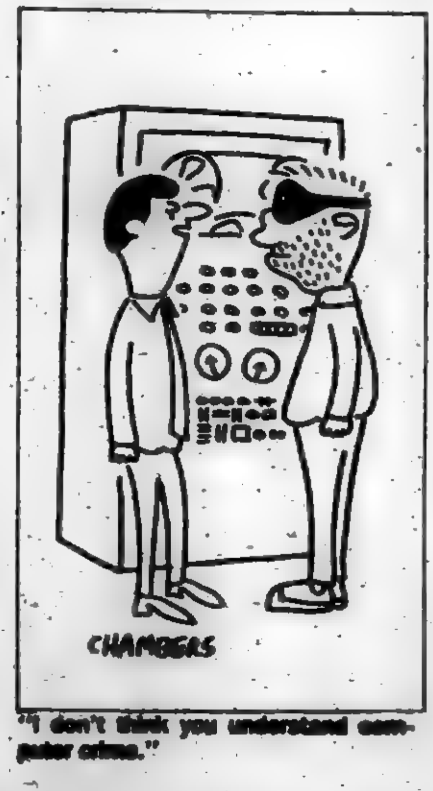
> ”
>
> *Three early users of Wordstar 2000 gave the program high marks for its overall design, mnemonic command set and intelligent use of function keys.*

According to Skaletsky, who purchased Wordstar 2000 Plus, which includes a simple data base manager, indexing and communications functions, the program's telecommunications package was "not the easiest one to configure."

Package 'incomplete, fragile'

He described the program as incomplete and fragile. The package "refuses to dial a modem when you go into even parity," an important feature for mainframe communications, he said.

In addition, he said, there is no easy way to convert a Wordstar 2000 file into straight Ascii code for mainframe transmission. "That's a problem we're still trying to solve," he said. "Micropro should address that issue."



"I don't think you understand computer crime."

Skaletsky also noted that Wordstar 2000 "takes up a horrendous amount of space on a hard disk." The program consumes 2.1M bytes of disk space, including the tutorial. That creates a problem for users with 10M-byte disk drives, since they had to consider kicking off other programs to make room for Wordstar 2000.

Skaletsky also noted that it is "impossible to force Wordstar 2000 to reformat a document" so that it conforms to an individual's sense of aesthetics. "You really need that feature to turn out quality documents," he said.

Booth, on the other hand, enthusiastically called Wordstar 2000 a phenomenal program. He said he decided to try it because of its ability to handle large documents in a single file. He said he was able to transfer a 100-page document from Multimate Corp.'s Multimate to Wordstar 2000 with ease, without consulting the documentation.

Documentation rates highly

Booth was impressed with the program's ability to handle Lotus Development Corp.'s 1-2-3 spreadsheet files and integrate them into a word processing document for presentations. He also gave Micropro high marks for its documentation, which he called "a pleasure to read."

All three users, who have extensive experience with computers, said they seldom need to refer to the documentation because of the program's command set and the extensive help available in the program itself. All three cited the program's on-screen boldfacing and underlining as welcome features.

None of the users cited significant problems in hooking Wordstar 2000 up to their printers. Marcus, who uses an Epson America, Inc. printer, said he liked the printer interface, saying that since the program knows the capabilities of the printer, it is able to produce high-quality documents faster than the old Wordstar.

Marcus' favorite feature, however, was the program's spelling checker, which includes phonetic correction. "I would have converted to Wordstar 2000 for that feature alone," he said. "More than 80% of the time it recognizes what I'm trying to spell," he said.

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STORE

from page 59

■ **Memodyne Corp. has introduced a tape backup system for the IBM Personal Computer XT.**

The Model MS-1000 Tape Backup System is a 10M-byte unit, using a floppy diskette interface, said to eliminate the need for an added controller card that would otherwise be used in an expansion slot. The system reportedly offers a data transfer rate of 31.25K byte/sec and requires eight minutes to save or restore a 10M-byte disk's data.

The MS-1000 reportedly comes complete with the software to back up a hard disk and to restore data onto a hard disk.

The system costs $1,395.

Memodyne, 220 Reservoir St., Needham Heights, Mass. 02194.

■ **Davong Systems, Inc. has introduced enhancements to its Fixed Disk software package, which comes with the Davong Datasystem and Davong Fixed Disk mass storage units for IBM's Personal Computer, Personal Computer XT and Personal Computer AT and compatible computers, to ensure full usage of the disk space on storage systems exceeding 32M-byte capacity.**

The software reportedly allows the creation, deletion, activation and formatting of multiple disk partitions. It also includes support for partitions larger than 32M bytes.

The cost ranges from $2,795 to $4,995 when included in the Datasystem model, which has both tape and disk backup and comes in sizes from 10M bytes to 43M bytes. When included in the Fixed Disk mass storage unit, which has disk backup only, prices range from $1,950 to $6,995, depending upon sizes ranging from 10M bytes to 86M bytes.

Davong Systems, 217 Humboldt Court, Sunnyvale, Calif. 94089.

PRINTERS/PLOTTERS/ PERIPHERALS

■ **Tecmar, Inc. has introduced its Tecmar Color Monitor for the IBM Personal Computer.**

The monitor reportedly was designed to complement Tecmar's Graphics Master enhancement board for the Personal Computer and offers 640- by 480-pixel resolution and 16 colors.

The monitor reportedly can support computer-aided design functions and can also switch to a green screen display for use with text. It also is said to use a long-persistence phosphor, which reduces flicker and stabilizes the image being displayed.

The monitor is priced at $795.

Tecmar, 6225 Cochran Road, Solon, Ohio 44139.

■ **United Innovations has introduced its Mural Plotter, a large-format flatbed plotter for automated drafting that works off any microcomputer with an RS-232 interface.**

The Mural Plotter uses Hewlett-Packard Co. HP-GL graphics control command language and is said to take plotting media up to 27 by 36 in. The plotter reportedly accommodates roll paper as well as standard plotter pens, which can be adjusted to plot on media as thick as poster board. The plotter uses X-Y positioning technology.

The plotter costs $2,495.

United Innovations, 489 Whitney Ave., Holyoke, Mass. 01040.

■ **Toshiba America, Inc. has announced enhancement of its P351 24-pin dot matrix printer.**

The P351, the enhanced version of the Toshiba P1351, reportedly now offers high-speed draft capability and plug-in font cartridges. It is said to operate at up to 288 char./sec in draft mode.

Also offered is a redesigned acoustical cabinet and the inclusion of Qume Corp. Sprint 11 letter-quality emulation, Toshiba said. In addition, the enhanced model now features a forward-stacking sheetfeeder and the ability to use boldface without degradation in speed.

The P351 costs $1,895.

Toshiba America, Information Systems Division, 2441 Michelle Drive, Tustin, Calif. 92680.

■ **Sakata USA Corp. has introduced its SP-1500 printer. The SP-1500 reportedly has a printing speed of 180 char./sec and a maximum printing range of 8 in. It is able to use fan-fold, roll or cut-sheet paper.**

The printer is said to include a parallel Centronics Data Corp.-type interface. A serial interface is optional. Also included are international character fonts, pica, elite and condensed type, double-width printing and underlining.

Also provided with the unit are near-letter-quality fonts, superscript and subscript, italic type, proportional spacing and emphasized printing, the vendor said.

The SP-1500 reportedly has a 3K-byte buffer and is priced at $595.

Sakata USA, 651 Bonnie Lane, Elk Grove Village, Ill. 60007.

■ **Facit, Inc. has introduced its 4550 and 4551 plotters for use in computer-aided design and computer-aided engineering applications.**

The plotters reportedly use vector technology and meet the requirements of Hewlett-Packard Co.'s Graphic Language standard. The plotters also support various paper sizes. The 4550 supports up to 8½- by 11-in. paper, and the 4551 supports up to 11- by 17-in paper.

The plotters feature both parallel and RS-232 serial interfaces and are said to offer removable six-pen cassettes that allow users to change pen types and colors for different plotting requirements.

Both operate by clamping paper transparencies between two rollers and moving the media back and forth to create graphs, plots or drawings.

The 4550 is priced at $795. The 4551 is priced at $995.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

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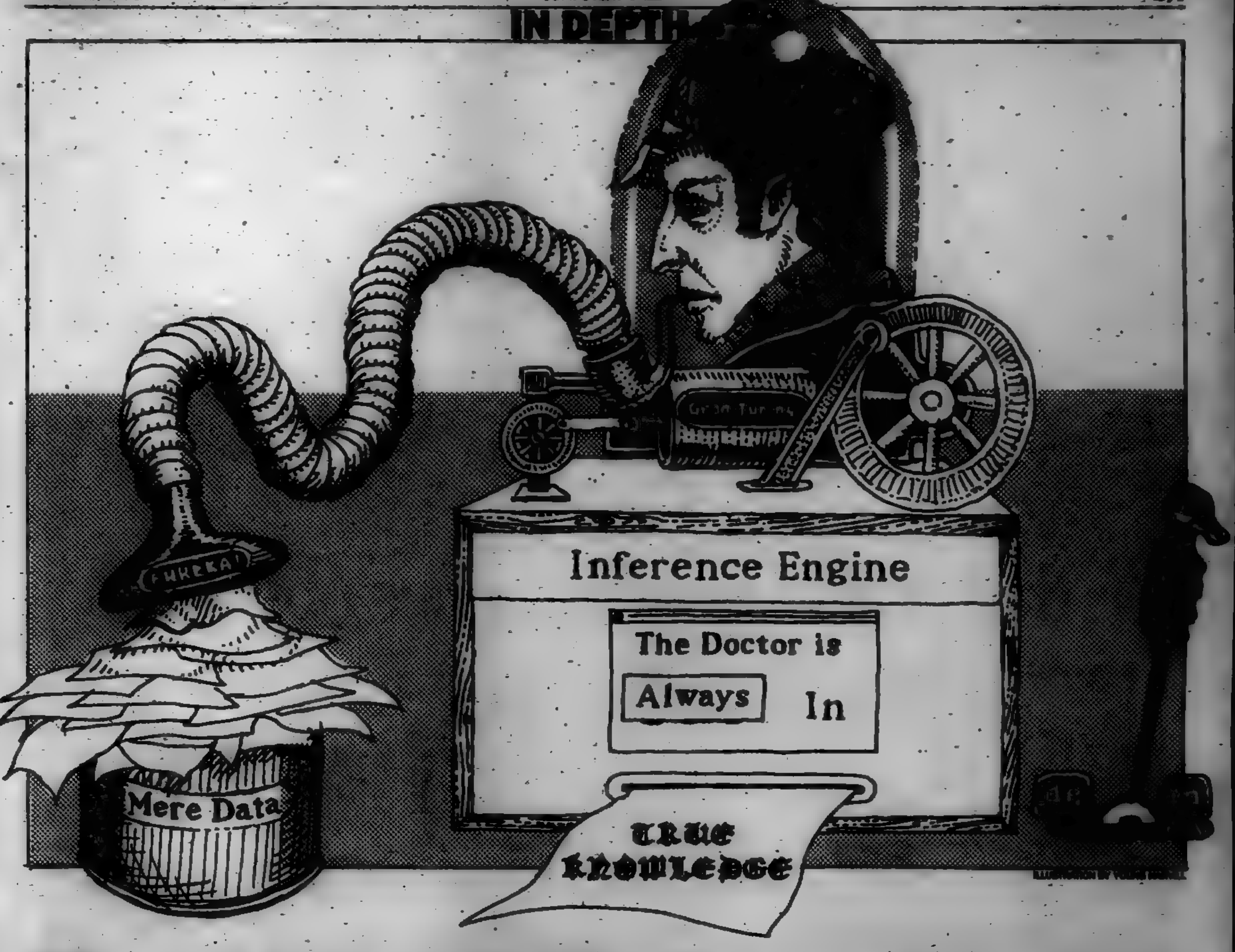

ILLUSTRATION BY [illegible]

The engineers behind expert systems

By Paul Harmon and David King

If performance of a task depends on knowledge that is subjective, changing, symbolic or partly judgmental, that work may well be suited to an expert system. Here's how knowledge engineers build them.

Large-scale knowledge systems are created by knowledge engineers.

Knowledge engineers acquire knowledge from a human expert and then embed it in an expert system. They are specialists in getting the information from the expert, prototyping an expert system that contains that knowledge and then working with the expert to improve the system.

Compared with a conventional software engineer, who also interviews experts and designs and implements a system, knowledge engineers spend much more time with the experts. They are more concerned with the thought processes of the expert. Moreover, they expect to continue to interact with the expert until they can eventually turn over the completion of the system development effort to the expert.

Depending upon the size of the project or the company, there may be more than one knowledge engineer. For example, a senior knowledge engineer may have overall management and design responsibilities, while other knowledge engineers are concerned with day-to-day meetings with the expert. Still other, more junior engineers, are primarily responsible for actually entering code into a machine. We shall speak of a single knowledge engineer, assuming for the sake of simplicity that one individual will perform all the knowledge engineering roles.

Many of the early expert systems were developed from scratch, using either Lisp or some programming environment like Interlisp. Now and in the future, however, most expert systems will probably be developed by means of knowledge engineering tools that will be specifically designed for the rapid development of expert systems. In this discussion, we will assume that this tool-mediated strategy is followed and that our knowledge engineer is well versed in the various expert system building tools now becoming available. We will focus on knowledge system development, the process in which a knowledge engineer and an expert work together to identify and refine a body of knowledge useful for solving an interesting problem.

Development process

Expert systems are developed in six more or less independent phases:

Phase I: Selection of an appropriate problem.

Phase II: Development of a prototype system.

Phase III: Development of a complete expert system.

Phase IV: Evaluation of the system.

Phase V: Integration of the system.

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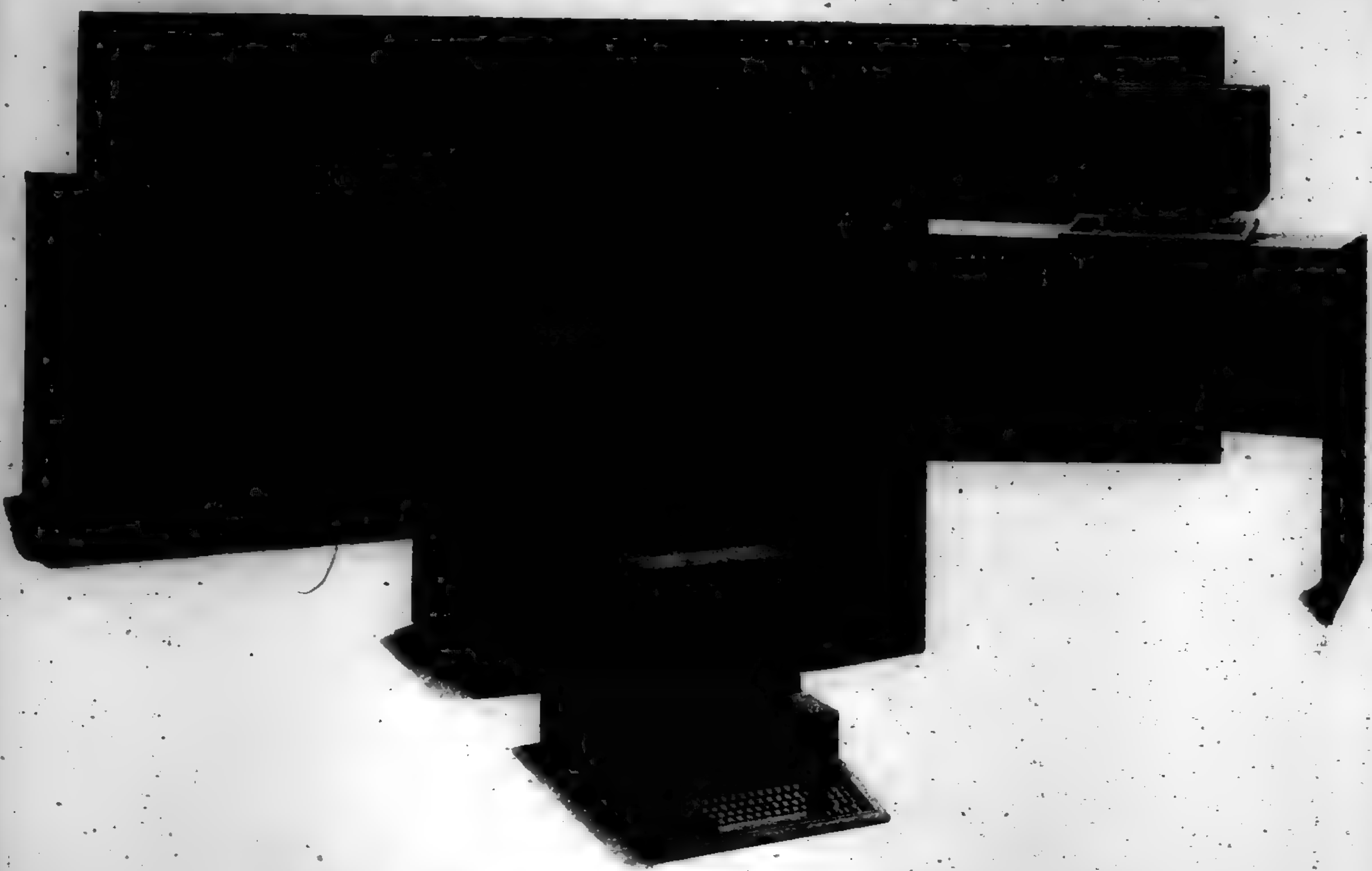

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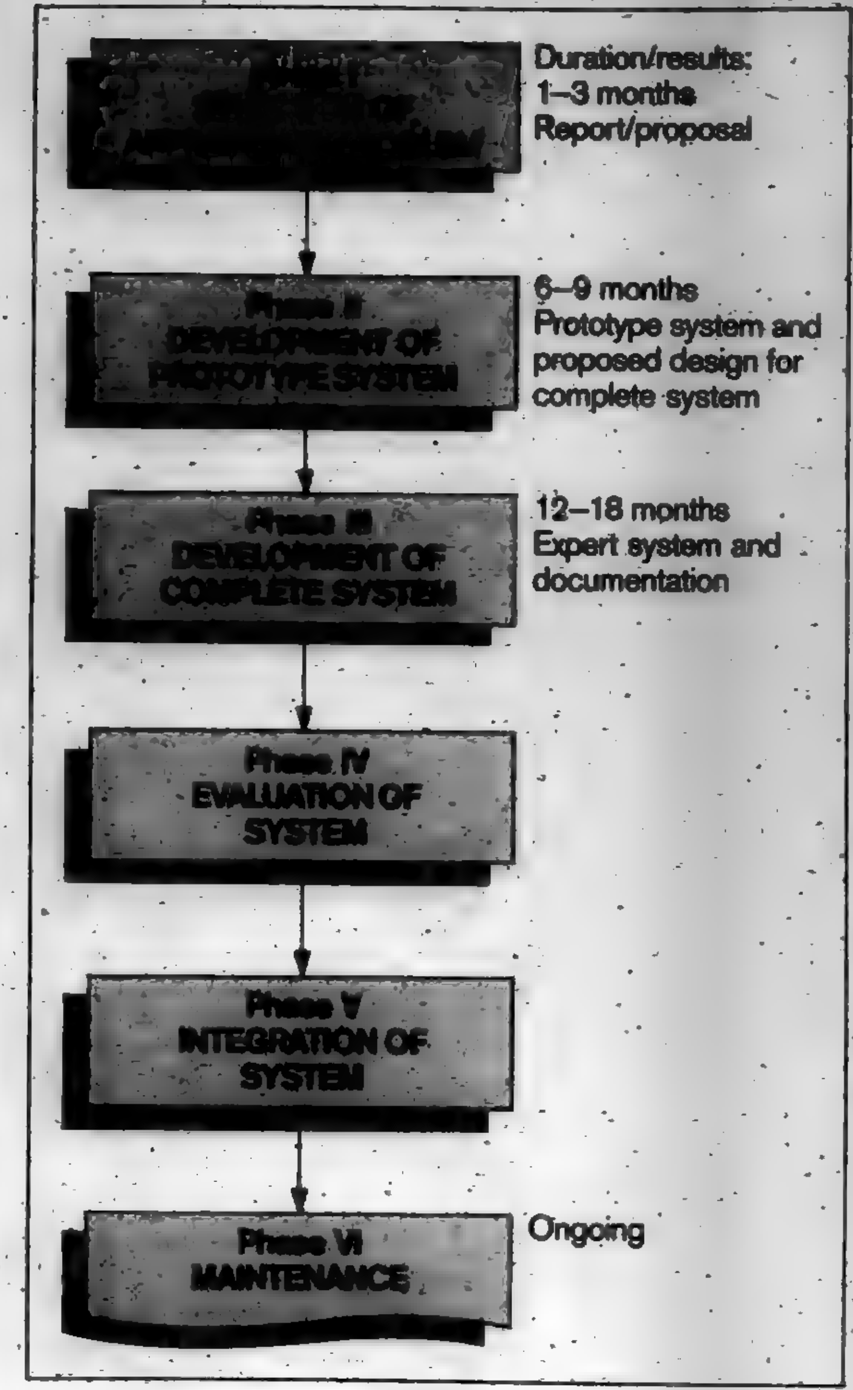


Figure 1

Phase VI: Maintenance of the system.

This sequence is, of course, not entirely fixed. In fact, later developments may yield insights that affect previous decisions, and some previous work may be revised. Similarly, the sharp conceptual boundaries suggested here may be blurred if additional evaluation suggests modifications after the system has been installed. A sequence of phases and activities is only provided to give you an overview of how an ideal project might proceed. Each step will be discussed in more detail below (see Figure 1).

Phase I: Selection of an appropriate problem.

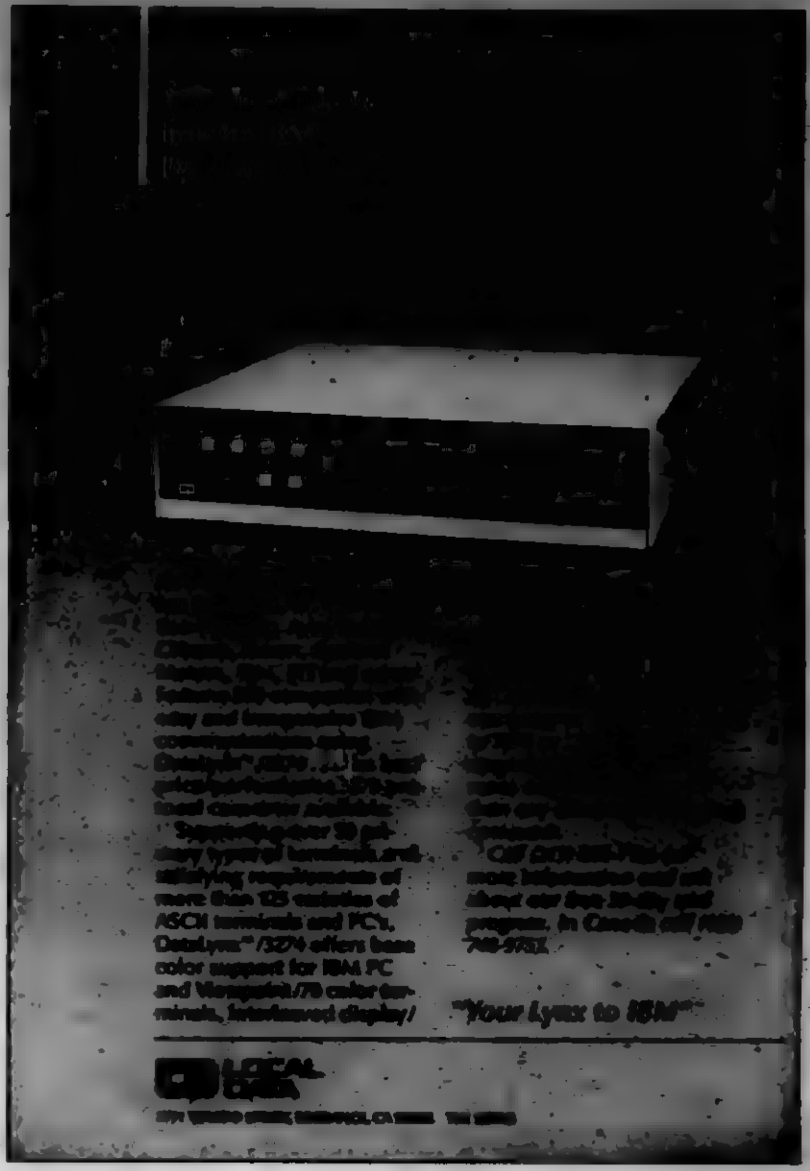
The selection of an appropriate problem includes a number of activities that precede the actual decision to begin development of a specific expert system. It includes the following activities:

- Identifying a problem domain and a specific task.
- Finding an expert willing to contribute expertise.
- Identifying a tentative approach to the problem.
- Analyzing the costs and benefits of the effort.
- Preparing a specific development plan.

Choosing the right problem is perhaps the most critical part of the entire development effort. The technology is still quite limited. If an inappropriate problem is chosen, one may quickly find the entire effort bogged down in design problems that no one knows how to solve. Likewise, an inappropriate problem may result in an expert system that costs much more than it saves. Worse, a system may be developed that works but is unacceptable to users. Even if development is to occur internally, this phase is an especially appropriate time to obtain external advice to ensure that one's initial knowledge engineering project is well-selected and technically-feasible.

The near future will probably witness the development of a few large expert systems designed to solve major problems and many small knowledge systems designed to solve troublesome minor problems. Large-scale systems, because of the very large initial development costs, must necessarily focus on problems that are carefully selected to assure a large and rapid payback for their developers.

Developers of large-scale systems will, of course, be concerned with choosing problems that are amenable to existing tools, but they will also be vitally concerned with the economics of automating a particular type of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expertise. Small-scale systems, on the other hand, can be developed to demonstrate the application of knowledge engineering and the usefulness of tools. Wise developers will choose small tasks that are particularly onerous but quickly amenable to solution by means of a particular tool. Thus, projects for small-scale systems will be selected primarily on the basis of whether or not they can be solved quickly by means of a particular tool.

Many companies will probably choose to undertake small systems problems, using a particular tool, to experiment with knowledge systems before they undertake the development of a larger system.

The selection of an appropriate domain and task begins with a review of the likely domains in which an expert system might be utilized. If the knowledge needed to perform a task is stable, numerical and can be easily aggregated, then conventional, algorithmic computer programs will probably be the best way to solve problems in that domain.

Knowledge systems do not supplant the need for relational data bases, statistical and spreadsheet software or general ledger systems. On the other hand, if performance of a task depends on knowledge that is subjective, changing, symbolic or partly judgmental, the domain may very well produce a good candidate for an expert system embodying a heuristic approach.

Some small systems will be developed to solve problems that are amenable to conventional techniques simply because the users need the systems quickly. They decide that they can develop workable solutions by themselves using small knowledge system-building tools rather than waiting for their data processing groups to help them with their problem.

Each clue is an indicator that knowledge is scarce and that the wider distribution of knowledge would have value (see box). Expert systems distribute knowledge.

You are likely to think of many applications where a wider distribution of knowledge could be useful. The following guidelines help identify the subgroup of tasks that expert systems currently perform proficiently. Appropriate tasks have the following characteristics:

- Focus on a narrow speciality.
- Do not depend heavily on background knowledge or common sense.
- Do not require sensory discriminations. Symbols, not signals, are required.
- Are neither too easy nor too difficult for a human expert. The problem ought to take a human expert anywhere from three hours to three weeks to solve.
- Are defined as clearly as possible. The context in which the task is performed is described, and the user of the system is identified.
- Have outcomes that can be evaluated. That is, the relative success of the system's performance can be assessed.

Currently, commercial expert systems are most successful when they process symbolic information in relatively narrow domains. Like human experts, these systems do not excel on tasks that are poorly defined. Nor do they work well when outcomes cannot be evaluated.

Once a domain and task are identified, the scope is narrowed down further. It is useful to ask exactly what kinds of recommendations the system will make and to whom. Specific goals for the programming efforts must be identified. Some possible goals include formalizing an otherwise informal set of practices, developing a system that will allow the user to distribute scarce expertise, helping experts solve problems better or automating the routine aspects of an expert's job.

Finding an expert to contribute expertise. As we noted earlier, expert systems are developed by taking the specific knowledge of an established expert and putting it into a system. Small systems (and some very large systems) may incorporate the knowledge of more than one expert, but most expert systems reflect the knowledge and strategies of a single individual. Hence, finding the right expert is a key step in building an expert system.

One knowledge engineer we know says that "the expert you want is the one that the company would least like to give you. It's the person the company can least afford to do without." Throughout prototyping and

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Here are some clues to watch for when looking for places in an organization where knowledge systems may be helpful:

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- Performance of a small task requires a large team of people because no one person knows enough.
- [illegible]

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the later expansion of the system, the knowledge engineer and the expert will be working together. The knowledge engineer helps the expert structure knowledge and identify and formalize the important concepts and rules used to solve problems.

The expert should feel comfortable in explaining the nature of his expertise. In initial interviews, both the knowledge engineer and the expert will decide if they can interact successfully. Both parties will probably be working together for at least a year, so it is important that they establish a comfortable rapport.

Tentative approach

As the expert describes how the task is performed, the knowledge engineer will be thinking about various expert system development tools with which he is acquainted. The knowledge engineer characterizes the expertise in terms of a few broad kinds of knowledge representations and inference strategies that have been encountered when developing expert systems.

In this manner, the knowledge engineer begins to formulate an opinion about the likelihood that a particular type of expertise can be captured with an existing tool.

If it sounds as if a new tool will be required to create an expert system incorporating a particular type of expertise, the conscientious knowledge engineer will probably not recommend the project. However, a great many problems are amenable to the generic tools currently available.

Analyzing costs, benefits

Once a task has been identified as appropriate for expert system development, costs and benefits must be considered. Costs include the expert's time as well as the cost of the knowledge engineer. If the problem is a major one, both the knowledge engineer and the expert can be expected to spend at least a year on the effort. Additional costs will include acquiring a computing environment that is expensive in terms of both hardware and software.

Balanced against the cost are the benefits of the knowledge system. Those benefits may include reduced costs, increased productivity, enhanced products or services or even the development of new products and services. The relative costs and benefits of any particular system determine how long it will take for the system to pay back the development expense. Right now, most companies that develop large expert systems are choosing reasonably costly projects with very large benefits and, consequently, with very short payback times.

We can expect a trend toward less expensive products with slightly longer payback times as expert system development tools are refined. Figure 2 shows some of the resources required for various levels of expert system development.

Preparing a development plan

Once the knowledge engineer is convinced that a specific task can be performed by an expert system, the system can be built with an existing tool, an appropriate expert is available, the proposed performance criteria are reasonable and the cost and payback time are acceptable to the client, then the engineer is ready to prepare a specific plan to guide the subsequent development effort. The plan should give the rationale of the system, specify the steps to be taken in the development process and state the costs involved and expected results.

Phase II: Development of a prototype system.

Work on the expert system begins in earnest as the knowledge engineer and the expert work together to create a prototype system. The prototype system is a small version of an expert system designed to test assumptions about how to encode the facts, relationships and inference strategies of the expert. It also provides the knowledge engineer with an opportunity to engage the expert actively in the process of expert system development and, hence, to gain the expert's commitment to expend

Figure 2

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the considerable effort involved in developing a full-scale system.

The development of a prototype system includes the following activities:

- Learning about the domain and the task.
- Specifying performance criteria.
- Selecting an expert system building tool.
- Developing an initial implementation.
- Testing the implementation with case studies.
- Developing a detailed design for a complete expert system.

Learning about domain, task

This phase begins with the knowledge engineer making an intensive effort to learn all he can about the domain and the task of the expert.

> ”
>
> ***The knowledge engineer will ask the expert to think out loud and to explain the reasoning processes behind each decision.***

Usually, the knowledge engineer reviews documents and reads books to become familiar with the problem domain before beginning extensive interaction with the expert.

Once the knowledge engineer feels able to talk with the expert, he initiates a dialogue to define the task more precisely. At the same time, the knowledge engineer attempts to teach the expert to formulate his judgments in terms of heuristics and to elucidate his inference strategies.

The knowledge engineer usually asks the expert to identify four or five typical cases he has solved. The expert assembles all the documentation associated with those cases. The knowledge engineer listens while the expert describes how he approached each case and provides a step-by-step protocol for developing a solution to each particular problem. The knowledge engineer will ask the expert to think out loud and to explain the reasoning processes behind each decision.

In addition, the knowledge engineer may ask the expert to justify the reasoning he used when dealing with particular problems.

When possible, the reasoning processes the expert uses will be reformulated into rules of thumb. This helps the knowledge engineer clarify the expert's problem-solving procedure, and the heuristics will lead the knowledge engineer to identify the facts and relationships that are particularly important to the expert's reasoning.

As the knowledge engineer learns about the expert's problem-solving strategies and heuristics, he will be thinking about how similar heuristics and strategies have been incorporated in other expert systems. The knowledge engineer will ask questions in order to classify the knowledge structures and the inference strategies into one of several broad categories that are well-recognized by knowledge engineers. Among the questions the knowledge engineer will ask are the following:

- Is knowledge sparse and insufficient or plentiful and redundant?
- Is there uncertainty attached to the facts and rules?
- Does interpretation depend upon the occurrence of events over time?
- How is task information acquired or elicited?
- What classes of questions need to be asked to obtain the knowledge?
- Are facts reliable, accurate, precise (hard) or are they unreliable, inaccurate or imprecise (soft)?
- Is knowledge consistent and complete for the problems to be solved?

Specifying performance criteria

In the process of determining exactly what the expert does, the knowledge engineer will begin to refine the performance criteria by which the prototype system is to be judged. The performance criterion should be specified in unequivocal terms.

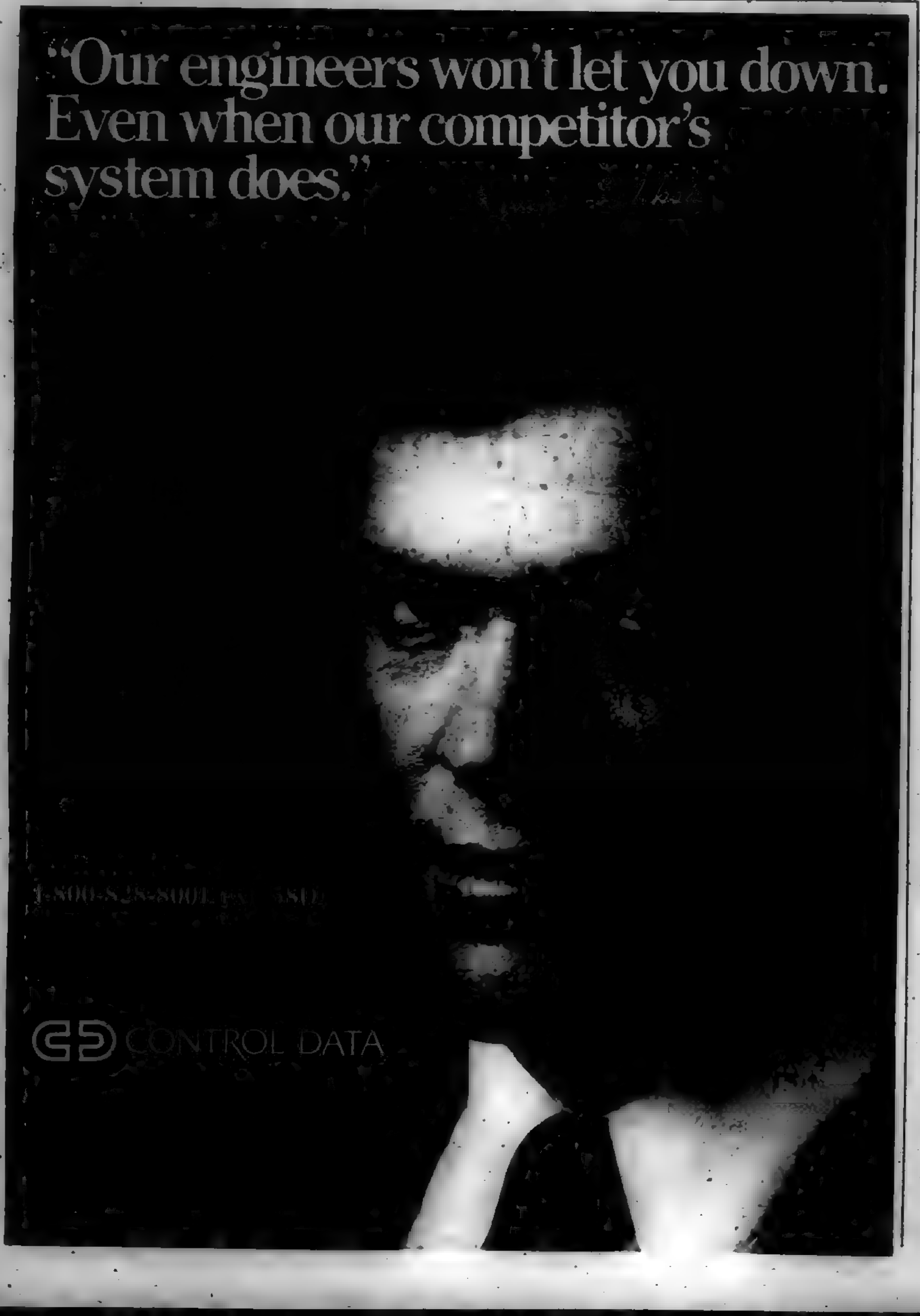
Perhaps the system will be expected to reach the same conclusions that the expert reached on five specific cases. Or, perhaps, the system will be expected to reach the same conclusions as five experts on five as yet unspecified cases under the typical conditions that the experts must work. Whatever the criterion, it must be specified so that a test can be conducted that will prove that the knowledge engineer has successfully completed his work.

At the same time, formulating a specific performance criterion will focus the knowledge engineer's attention on the precise nature of the initial conditions and the final output that the system will need to produce.

Selection of tool

As the knowledge engineer comes to understand the overall knowledge structure possessed by the expert and the inference strategies employed to manipulate the knowledge, he will decide which existing expert system tools will be used to develop a prototype system. The most important result of the prototyping exercise is ultimately a test of the adequacy of the chosen tool.

After choosing a tool, the knowledge engineer begins to develop a prototype version of the expert system as soon as the first case study is reasonably well understood. Subsequent cases are then tested, and as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each case is run, the knowledge engineer and the expert observe the reasoning of the system. They discuss why rules are or are not working as expected. Consequently, the knowledge base is revised in accordance with their refined understanding of the knowledge, heuristics and inference strategies.

Often the knowledge engineer will select a tool that matches the problem, and the prototype will be satisfactory, at least on the general level. The purpose of prototyping, however, is not to arrive at the final configuration for the expert system but simply to establish that a tool, a representation of the expert's knowledge and a strategy for drawing inferences are adequate for a task.

Once the knowledge engineer has built his initial prototype, the knowledge engineer and the expert work together to see how the prototype will function on a variety of case studies. These tests serve two functions. They allow the knowledge engineer to determine whether the formalisms used in representing the expert's knowledge are adequate to the tasks posed by the cases. They also allow the expert to see how an expert system uses the information he is providing.

The goal is for the expert to become more committed to the knowledge acquisition process by taking an active hand in testing the system. This is particularly critical because in the next phase of the development the expert will be asked to interact with the system to tune its performance.

Once the prototype is functioning in a satisfactory way, the expert and knowledge engineer are in a good position to assess what will be involved in developing a full-scale system.

If the original choice of objects and attributes is awkward, it must be modified. Estimates can be made about the total number of heuristic rules needed to create a complete expert system. Performance criteria can be stated with greater precision. All of this information, along with a plan, schedule and budget, is included in a design document that will guide the development of the complete system.

Phase III: Development of a complete system.

Once everyone is satisfied that the prototype system can perform as desired and that the design for the complete system will result in an expert system that will meet the specified performance criterion, the knowledge engineer and the expert are ready to begin the expansion of the prototype into a complete system. The development of a complete expert system includes the following activities:

- Implementing the core structure of the complete system.
- Expanding the knowledge base.
- Tailoring the user interface.
- Monitoring the system's performance.

Core structure

An adage popular among knowledge engineers is that it is usually best to throw away the prototype. Knowledge engineering tools support rapid prototyping with a low investment of time. Thus, at this stage it is common to rethink the basic design of the knowledge base.

By this we do not mean that you abandon a particular tool. We mean that the exact list of objects and attributes to be included in the system will probably change somewhat. Hierarchical relationships may need to be rearranged. The exact way in which inference is handled

> ”
> ***The goal is for the expert to become more committed to the knowledge acquisition process by taking an active hand in testing the system.***

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in the heuristics may be modified as the expert and the knowledge engineer realize how the expert's knowledge and problem-solving strategies can be best represented.

Serious problems during the prototype phase may indicate that a different tool is needed. If so, the prototype phase must be repeated. Ordinarily, however, the prototype succeeds, but the initial representation of the rules and facts needs to be altered.

Consider an example. Imagine that we developed a prototype FACTORY MAINTENANCE ADVISOR structured around one central object: the manufacturing plant. Assume that the plant has several conveyor belts and several large compressor units of different types each needed to be maintained.

In the initial prototype, the knowledge engineer and the expert may underestimate the advantages of keeping general information about the conveyors and the compressors on intermediate objects and instead try to make both the conveyors and the compressors into attributes of the factory. As they work with the problem, however, the knowledge engineer and the expert may discover that conveyors and the compressors also need to be represented as objects.

As a result of prototyping, the knowledge engineer is in a good position to establish a basic framework for the complete expert system.

Tailoring the interface

Once the basic structure of the expert system is established, the knowledge engineer attends to the development and tailoring of the interface with which the system will actually deliver information to the user. Considerable attention is given to introducing phrases and explanations that will make it easy for the user to follow the logic of the expert system. The system should make it easy and natural for a user to inquire about any details he may desire. Graphics representations may be particularly helpful. Likewise, displays that allow the user to follow the system's reasoning process may be a key to selling the system to the users.

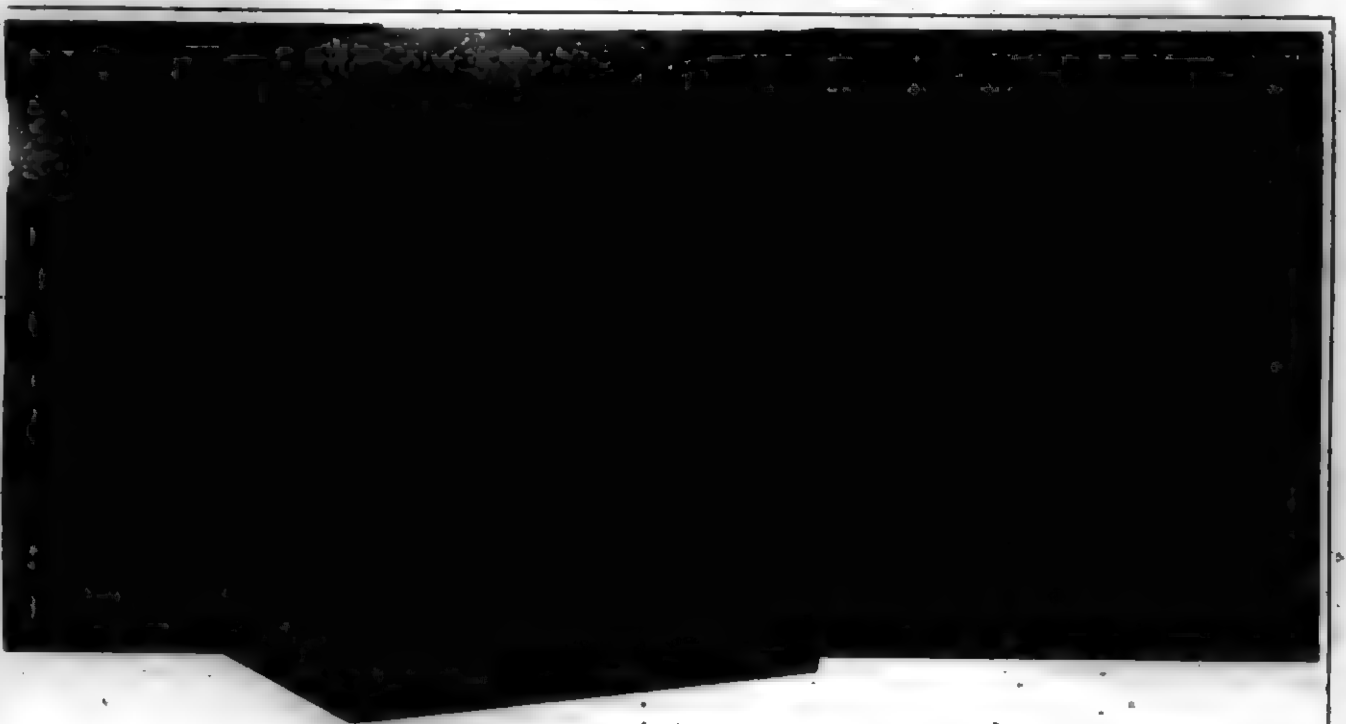
The main work of the third phase is the addition of a very large number of additional heuristics. These heuristics typically increase the depth of the system by providing more rules for handling subtler aspects of particular cases. At the same time, the expert and the knowledge engineer may decide to increase the breadth of the system by incorporating rules that handle additional subproblems or additional aspects of the expert's task.

A good tool provides a knowledge engineering interface that allows the expert to run cases to inspect the system's reasoning. The interface allows the expert to step through a case asking why particular rules were fired or not fired and thereby identifying those points in which additional, specific knowledge is needed to allow the system to reach the appropriate conclusion.

By this point in the process, most experts have learned enough about the entry of rules that they can enter new rules into the system by themselves. Thus, this is the beginning of the process during which the knowledge engineer begins to transfer the ownership and control of the system to the expert to polish, elaborate and ultimately maintain without the support of the knowledge engineer.

Phase IV: Evaluation of the system.

When the expert and the knowledge engineer are satisfied that the expert system is complete, the system should be tested against the performance criteria that were agreed upon at the conclusion of the prototyping phase. This is also the time when other experts are invited to try the system and to present it with new cases.



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Phase V: Integration of the system.

The next phase in the expert system development process involves integrating the expert system into the work environment in which it will operate and providing training for those who will maintain it.

By integration we mean to include all of those procedures necessary to make a new expert system work with the existing systems within a company. We do not mean to include making significant changes in the expert system. If, after the expert system is put in use, it is determined that major changes are necessary, then one must simply go back to the prototyping or the development phases and make those changes. Such changes invariably involve a knowledge engineer or someone else who can change the code of the system. By integration we mean developing linkages between the expert system and the environment in which it operates.

The integration of an expert system is usually undertaken by the expert and systems personnel associated with the users of the system.

Activities during this phase might include:

- Arranging for technological transfer.
- Interfacing the system with other data bases, instruments or other hardware.
- Enhancing the speed or friendliness of the system.

When the expert system is ready, the knowledge engineer must ensure that the experts, users and systems personnel who will use and maintain the system understand it. Once he has accomplished this transfer of information and technological know-how, he is ready to withdraw from the project, leaving the system in the hands of its users.

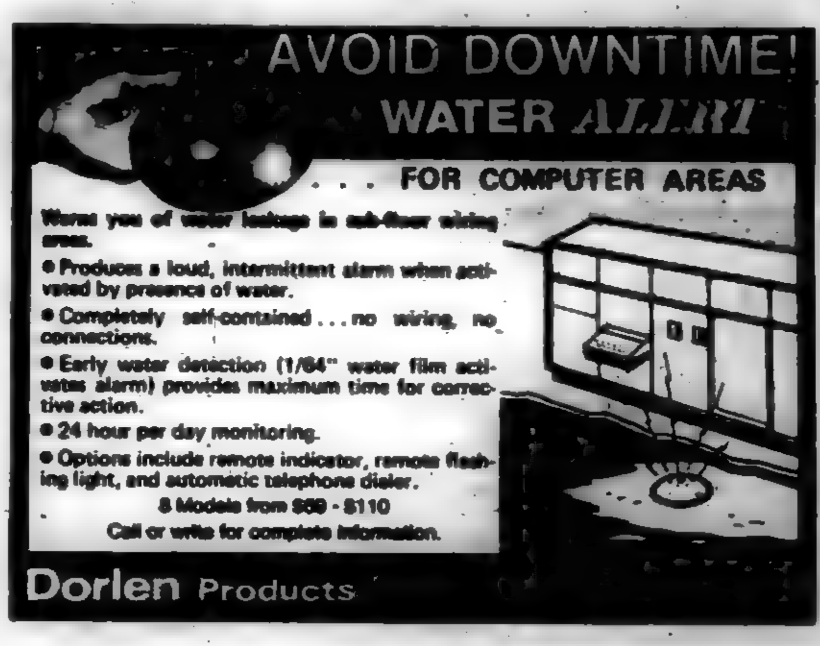
Every company environment will offer a different challenge to those who are responsible for preparing company personnel to accept and use an expert system. Experience to date seems to indicate the experts are quick to accept the system once they are convinced that it will give useful advice. Convincing experts of the system's usefulness involves having each company expert present cases to the system and seeing how the system performs. A critical aspect of acceptance is positioning the system as an aid to free experts from onerous tasks rather than a way of replacing experts.

Convincing nonexpert personnel to accept the system involves all of the problems and challenges associated with the introduction of any new system into a company environment. Success depends on careful planning, lots of communication, appropriate opportunities for all affected parties to talk about the change and good support once the system is in place.

Other goals of an integration effort involve interfacing an expert system with existing data bases and other company systems. An expert system may need to acquire information from instruments or other hardware that will provide input for the system. Still other goals include enhancing time-dependent factors in the system to make it run more efficiently or quickly or enhancing the physical characteristics of the hardware if the system is to run in unusual environments.

Puff, the small pulmonary diagnosis system used at the Pacific Medical Center in San Francisco, is a nice example of a system that has been well-integrated into its environment. After Puff was completed and everyone was satisfied that it performed as it should, the system was recoded from Lisp to Basic. Once Puff had been recoded, it was transferred to a Digital Equipment Corp. PDP-11 computer that was already being used at the hospital. This computer, in turn, was connected to the pulmonary measurement instrument.

Thus, as it now stands, a patient breathes into a pulmonary machine, the data from the pulmonary machine is fed directly into the minicomputer, Puff processes the raw data and prints out a recommendation for the physician. The physician is not required to interact with Puff at all. The system is fully integrated --



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Another system that has been integrated into its environment is General Electric Co.'s Cats-1 expert system for diagnosing diesel locomotive malfunctions. This system was initially developed in Lisp and then translated into Forth so that it could be run more efficiently in various locomotive shops. A repairman can interact with the system to determine probable causes of diesel malfunctions. The system is integrated with a videodisk and a video terminal to provide visual explanations for the repairman about particular checks that he might need to make.

In addition, if the operator is not sure how to fix a problem, the system will locate training materials that have been previously developed by the company and show them on the video terminal. Thus, the repairman can use the expert system to diagnose a problem, to verify the exact test procedure that he should use, to obtain a video display that explains how to make a test or to obtain instruction related to the problem he is diagnosing.

Phase VI: Maintenance of the system.

When a system is translated into a language like Basic to facilitate speed and portability, the flexibility of the system is sacrificed. This is acceptable if the system has captured all of the knowledge in the task domain and if the knowledge is not going to change in the foreseeable future. If, on the other hand, an expert system has been designed precisely because the task domain is changing, you will want to maintain the system in its tool environment and provide for an ongoing maintenance activity.

A good example of an expert system that has been implemented in this manner is Xcon, the expert system that DEC uses to configure new VAX computers. One of the key problems DEC faced was the continuing changes necessitated by new equipment releases, new specifications and so on. Thus, DEC keeps Xcon in the OPS-5 environment. There is an expert whose job involves adding new information and modifying rules in Xcon's knowledge base to keep it current. The highly modularized nature of rule-based systems makes the weekly modification of Xcon feasible and assured DEC that Xcon's recommendations are always current.

This description of developing a large expert system has only begun to describe the process. The keys to the process are the knowledge engineers and the choice of an appropriate problem. The knowledge engineer must understand how to work with one or more experts to identify and formalize their knowledge and inference strategies. The knowledge engineer must also understand the tools and programming environments available in order to select the right match between the knowledge and the implementation tool.

In addition, the knowledge engineer must have the social skills to obtain the active support of the expert and, ultimately, of the users of the system. In most cases, the task is more than one person can handle, and a team of knowledge engineers will need to be assembled.

Since few knowledge engineers have the breadth of experience to determine what problems a company should address first or the organizational insight to understand the politics of orchestrating a major organizational transition, skillful project managers and outside consultants will be necessary for most companies attempting to develop their first large expert system.

About the authors

Paul Harmon is a consultant who specializes in helping companies solve human performance problems. He has assisted Teknowledge, Inc. with the development of workshops to introduce managers and programmers to knowledge engineering.

David King is a senior knowledge engineer at Teknowledge. He teaches clients to use M.1, a personal computer-based expert system building software tool.

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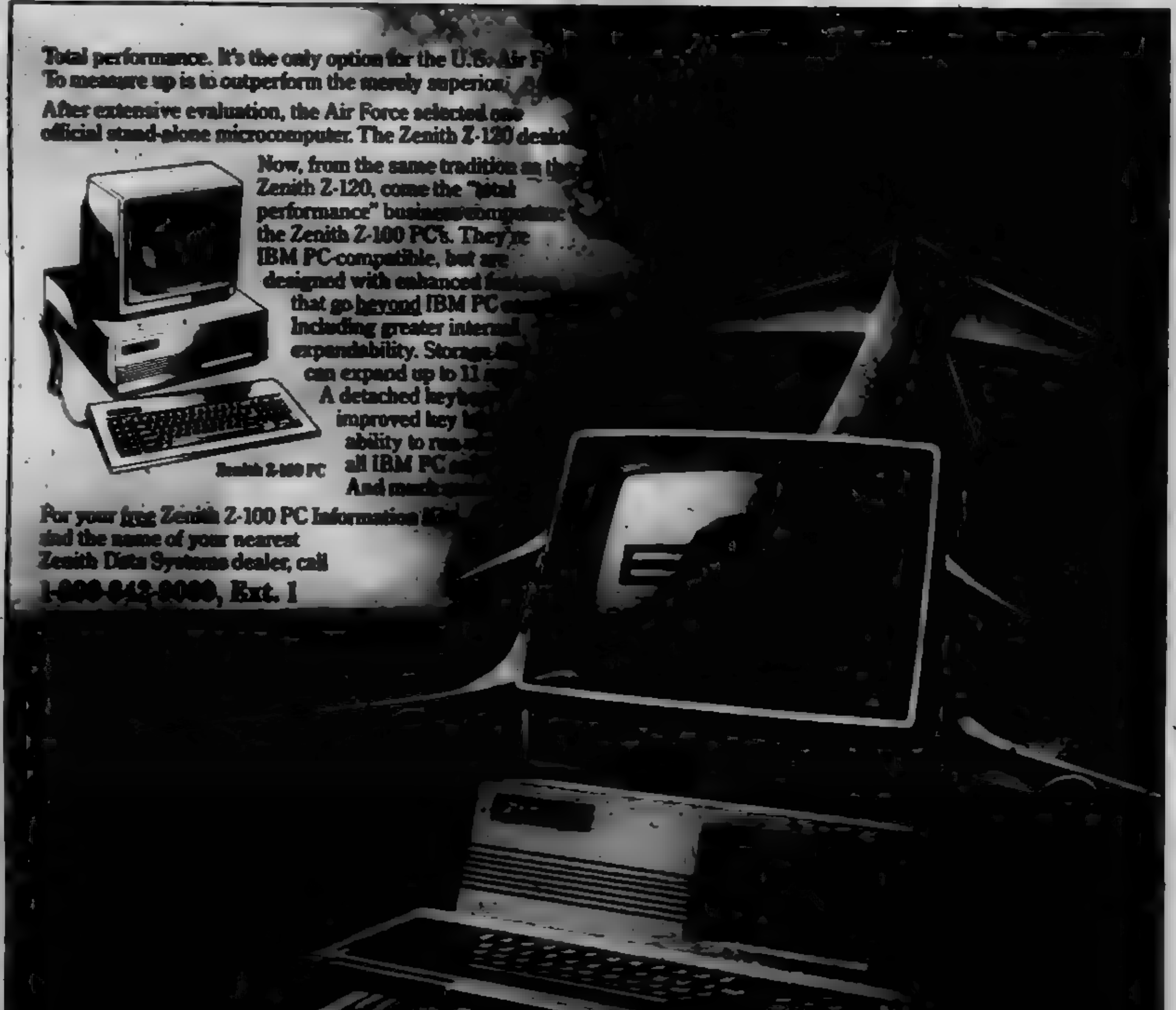

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IN DEPTH

Users talk back

A palatable copy protection scheme, an alternative to Dbase II, transparent interfaces — are they too much to ask of software vendors? Here's what users in an electronics company, a bank and an accounting firm say they're looking for in the marketplace.

Jonathan L. Yarmis

Jonathan Yarmis

I am the personal computer analyst at General Instrument Corp. You might better recognize General Instrument as the company that owned most of Sytek, Inc. General Instrument is the industry leader in cable TV electronics (through its Jerrold division), wagering systems (Amtote) and programmable electronic circuits. The company's primary strategies are directed toward communications systems and computer-related products.

At General Instrument, my duties include maintenance of the corporate recommended software list. While we call it a recommended list, it is tantamount to a corporate mandate. That's because we've proven to our end users that the level of our support and the quality, accuracy and timeliness of our recommendations merit this consideration.

That obviously imposes quite a responsibility on me to be right.

Imagine, if you will, a Fortune 500 company tracking its entire employee stock option system using an IBM Personal Computer AT part-time. The machine is also used for communicating with the mainframe, preparing Securities and Exchange Commission reports and miscellaneous other personal computing activities. Now, imagine a software package whose inadvertent or even — God forbid — authorized use may trigger "booby traps that will make Vietnam look like a birthday party."

Yes, that's utterly absurd, yet that was the claim made by Defendisk Vice-President Craig McClure about an upcoming version of his company's product [*Infoworld*, Nov. 19, 1984].

Those booby traps could have included

(Continued on ID/14)

ILLUSTRATIONS BY HENRY FUNG

Ken Edwards

Ken Edwards

As a management consultant, I welcomed the multitude of innovative microcomputer products that allowed the application of computers to business problems at almost every level. As an information scientist, I have to admit that I was worried about the first generation of hardware, software and documentation to be placed directly into the hands of end users, lest their first exposure to the wonders of computing become their last.

Somehow, despite many individually trying experiences, the group application of personal computing to the knowledge worker's job is now virtually assured. The challenge we now face in the industry is to fulfill the promise of increased productivity and enhanced quality that was used to justify equipment currently in place. Then we can go on to add new systems to the office landscape. Unfortunately, manufacturers and publishers in the industry have not been terribly responsive or, in many cases, even attentive to end-user needs.

To set the stage, we now have a third and largely incompatible sphere of information processors that joins the mainframe and minicomputer-based data processors and office automation systems.

Moving an editable memo from a microcomputer-based word processing program

(Continued on ID/20)

Dennis A. Bradley

Dennis Bradley

The banking industry has undergone major changes as a result of deregulation, with more still to come. Banks, by tradition, are conservative yet very competitive. Deregulation now allows the banking industry to be flexible in the kinds of services that can be provided to meet existing customer needs and attract new customers.

The pressures on banks to deliver new services, coupled with new technology, places a high demand on the kinds of software used by banks. Because of bankers' conservative nature, there is a reluctance to subscribe to new software products that exhibit instability.

Service departments that do high-volume bond trading, electronic funds transfers, cash management and other customer-related services need instantaneous processing and inquiry capabilities. Banking systems require high-volume transaction throughput, which has created a need for relational software systems that are

(Continued on ID/20)

Yarmis

(Continued from ID/13)

modifying the operating system, data — even reformatting an entire hard disk. Similar claims were made for Vault Corp.'s Killer Prolok.

I hope these are only publicity stunts by attention-starved companies. If so, I regret having even graced those companies with my attention. But if they are not stunts, let me categorically state that we will never endorse or purchase a program that employs this form of copy protection.

The stock option scenario I painted is a real application at General Instrument. If we were to miss an SEC reporting deadline because of the accidental erasure of our hard disk, I can only imagine how our lawyers would react! They're probably drooling to be involved in a landmark case like that.

Nor will this system make existing forms of copy protection more palatable. Our hard disk users don't want to be bothered with the nuisance or unreliability of floppy disks. Surely someone can come up with something better than laser-etched master disks, hardware keys or the like. A palatable copy-protection scheme has yet to cross my desk, other than no copy protection scheme. The impending proliferation of local-area networks is going to force changes. But Killer Prolok is not the answer. They're not serious, are they?

How do I evaluate a software package? I'd be lying if I said marketing isn't a major consideration. Lotus Development Corp.'s Symphony, for example, commanded my immediate attention because of TV ads — I said attention, not purchase. We certainly looked at Symphony and even endorsed it — but not as a replacement for 1-2-3. Symphony is not a replacement for 1-2-3 — it's a different category of program, and its market is limited.

Back to marketing, though. Another good example is Enable from The Software Group. Even though the company has done nothing else, to my knowledge, its splashy ads and generous trial offer will result in my looking at the package. Again, though, looking — not necessarily purchasing.

Track record

Another factor that will cause me to look is the track record of a company. Not too many [have a track record yet], which probably serves to magnify the value of it for those that do. When something gets so easy that everybody can do it, everybody usually does. Microsoft Corp.'s track record alone caused me to look at Project, and the product didn't disappoint me. It's a workmanlike package, though far from the ultimate. Again, look — not buy.

So why do we buy? The reason is really quite simple, and it's not "because everyone else is buying" — at least not most of the time. It's because these personal computers and software enable us to do a job or help us do it faster and/or better.

We draft letters — a word processor speeds the revisions. We add columns of numbers — a calculator can do that. But we change those numbers — enter Visicalc. But what about the trusty calculator? Bring on Sidekick [Borland International, Inc.]. These are examples of software that fulfill a need. They're big sellers. Equation manipulation? Not so big. However, some of you might have taken a bit of a bath on TK Solver, Software Arts' successor to Visicalc.

Answer the question, "Who would use it?" and you've gone a long way toward answering the question, "Will I buy it?"

A powerful yet easy-to-use alternative to Dbase II has yet to establish itself. Ashton-Tate's marketing clout and dominant market position continue to reinforce the Dbase mystique.

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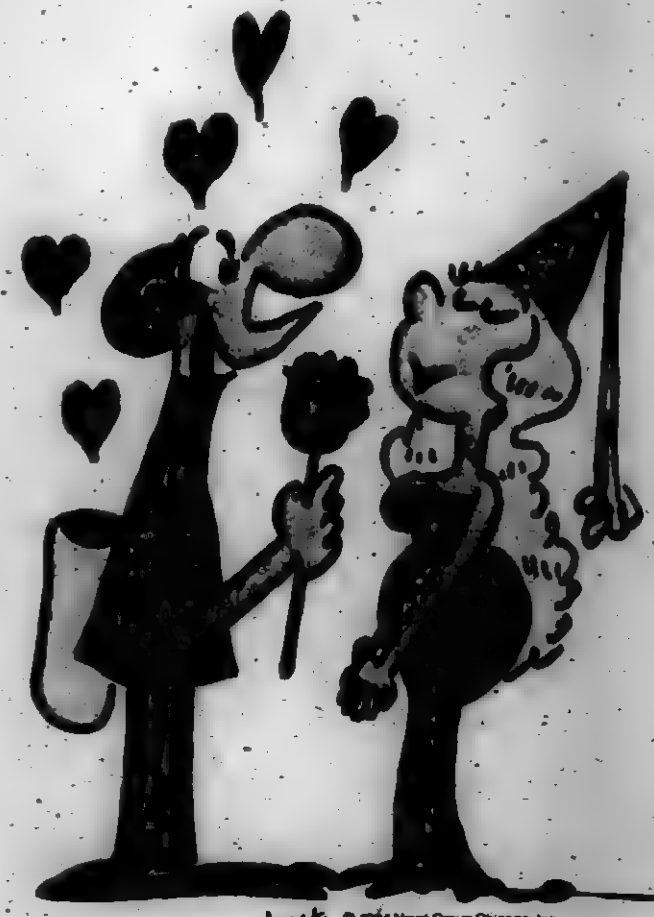

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C.ITOH
Printers

> ”
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> ***The technology for voice isn't there yet, and besides, it requires some attitude adjustments and does not reflect the way we work today.***

But it's kind of like the emperor's new clothes — nobody will point out that Dbase is far from the perfect program for most applications. I dare say, though, that well over half — yes, much more than 50% — of our Dbase users would be better served by another product. For instance, many of our end users have been well served by Datacase [Software Solution].

We're also looking for the ultimate (and reasonably priced) project management package, computer-aided design package and presentation graphics product. But I don't think there's a "next Visicalc" hiding out there. First, I don't see a widespread need that's unaddressed. The technology for voice isn't really there yet, and besides, it requires some attitude adjustments and does not reflect the way we work today.

Also militate against the next Visicalc is the speed with which clones now come to market. Visicalc grew up in a vacuum. But take the desktop utilities such as Sidekick. A year ago — nothing. Now there are at least half a dozen.

Anyone, given a year's lead, could have dominated this potentially large market. But none got that time, and one-sixth or one-tenth of Visicalc's sales, while maybe a success, is not a blockbuster.

Missing the boat

Beyond functionality, users are demanding ease of learning and ease of use to go with their power. I think many market researchers are missing the boat. It is clear to me that the early personal computer users in General Instrument are often the high-tech types — the guys who went out and bought a four-function Bowmar calculator for its original $100. Many of the technologically shy — who can no less benefit from the power of a personal computer — are still waiting on the sidelines.

What do I consider essential in this area? On-line Help is a must. Lotus established a tough standard with its comprehensive, context-sensitive Help screens; it's the standard by which we measure everything. This Help in no way substitutes for a proper and well-indexed manual, but most users will go to Help screens first and may only skim through the manual.

Nevertheless, a well-written manual full of examples and good technical reference is a must. And without a good index, the effort is almost worthless. A disk-based tutorial is nice but not essential; a lot of users ignore them anyhow.

Finally, an easy installation program supporting a wide variety of hardware options is a must. If the only printer you support is an IBM graphics printer, we're not interested.

Another pet bugaboo is those programs that don't support a black-and-green monitor hooked up to the color graphics adapter. Again, that leaves out some users.

On the other hand, users are not idiots. Programs that insult their intelligence or sacrifice functionality for ease of use will not get widespread use. I was discussing this with some people the other day, and none of us could name anyone who uses PFS:Report. I read that Software Publishing, Inc. sells a lot, but I still don't know where.

Vendor, manufacturer and third-party support all are important, too. Part of the success of Dbase vs. several comparable products is in the support it receives from third parties like Fox & Geller and from the way dealers support it. Most

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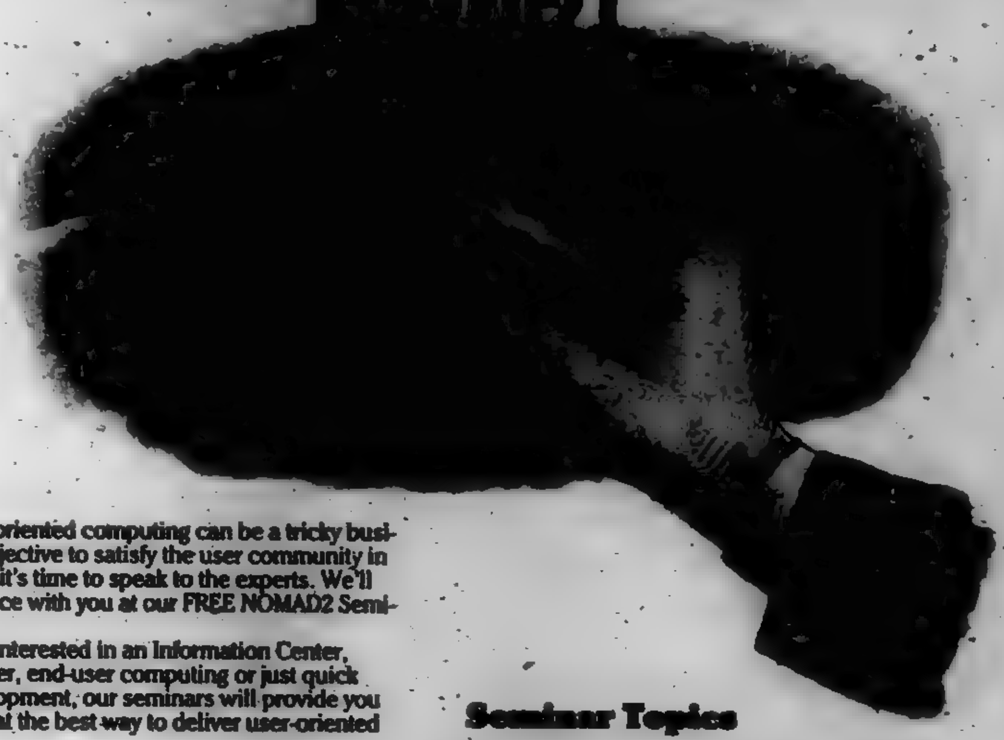

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IN DEPTH/USERS TALK BACK

dealers, it seems, have a Dbase consultant or two on staff. That's good. We corporate users will pay for some levels of support. But keep it reasonable.

In one case, a very large dealer quoted a user $75 per hour to show her how to use a font cartridge for the [Hewlett-Packard Co.] Laserjet printer. We paid a school kid $50, and she wrote a menu-driven program for the whole printer.

> ***When the big story is that Lotus did meet an announced deadline, something is wrong.***

Back to software. Since it seems nine out of 10 software packages are nowhere near final when released, upgrade policy is important. I use a lot of software on a regular basis, and none of it is revision 1. Free or cheap upgrades are a must.

Finally, consider the training element. In the old days of 64K-byte random-access memory [RAM] and 140K disk storage on the Apple II Plus, software authors often had to sacrifice form for substance. Just wait, they said: When we get more memory and more disk storage, we'll have room to build powerful programs so easy to use that even Bonzo the chimp could be a computer expert.

Anyhow, with notable exceptions, this has been slower to develop than I would have hoped. Tempted by the availability of 256K RAM and up, programmers have given us more power but, with it, more complexity. As a result, we are finding enormous demand for formal training from our users.

In recent whistle-stop visits to three of our locations, I was asked to come back — soon — for formal training sessions. Dealers are in a good position to provide this training to us.

Our volume and costs do not yet justify a formal training center. For dealers, it can be a profitable venture — but don't treat it like a golden goose. I've sat in on too many training sessions during which it seems the instructor is only days ahead of his pupils and/or doesn't have a grasp of what businesses use personal computers for. That's about all you can expect from $5-per-hour help, and that won't get you our business.

We *will* pay good dollar for quality. You have to convince us you can do a better job than we can in-house. Mostly, I remain unconvinced. Nevertheless, dealer training programs are a definite consideration, especially in top-end software. Competitors to Symphony and Framework cannot succeed without dealer support — period.

Notably absent from my discussion is any mention of price. As long as individual software packages remain less than $800, price is not a factor.

When you're talking about Primavera Project Planner [Primavera Systems, Inc.] in the $2,500-plus range, it's a definite factor. But we'll pay good dollar for good programs.

While it sounds funny to have to say this, I won't even take into the decision-making process undelivered products or features. When the big story is that Lotus *did* meet an announced deadline, something is wrong.

In this regard, the software industry is an embarrassment, and I refuse to laugh it off as business as usual. In Fortune 500 companies, we want to do business with companies that share our sense of professionalism and proper business conduct.

There is really just one overriding question — the only question I ask myself when I evaluate software: Would I use this product?

About the author

Jonathan L. Yarmis is the personal computer analyst at General Instrument Corp., Clifton, N.J.

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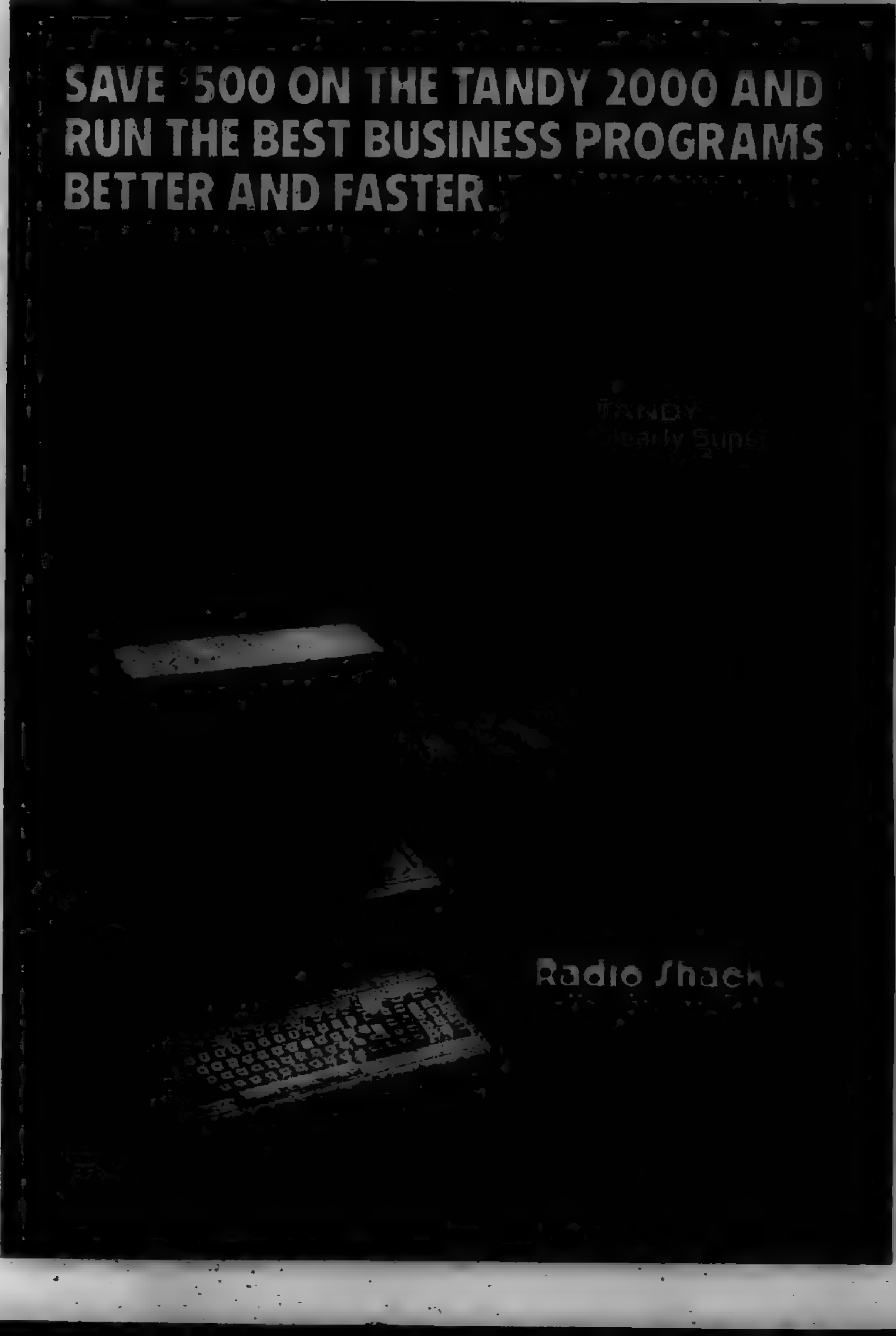
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Edwards

(Continued from ID/13)

to the office information system or trying to extract information from the corporate data base to fill a microcomputer-based spreadsheet is still the subject of articles, not products.

Software products seem to have been used to help define rather than respond to the needs of the knowledge worker. End users and their consultants often think of a business problem in terms of the constraints of microcomputer software they hope can help solve it.

The unsophisticated user's needs have been totally missed. As an example, if, after turning on his micro, a person sits and waits for the system to instruct him in what to do, he will eventually be placed into the Basic interpreter on many systems. This assumption is totally wrong in almost all cases. What could the manufacturers have been thinking?

Some frustration

By and large, product managers and their engineers rather than end users and their consultants are designing microcomputer products. The frustration that has occurred with hardware such as keyboards, monitors, printers, cables and lack of standardization in software has alienated a number of people in the industry.

Some suggestions:

- Be innovative. The industry is tired of product clones. Just because a major manufacturer or publisher has designed a product one way does not imply there are not better ways to design it or that the product will even meet market acceptance. Even if it does, clones generally have a tough time against the competition.
- As soon as a new product idea is born, check it out with focus panels, previous beta test sites, consultants and/or market researchers. You don't have to commit yourself to produce the product at all. People in the marketplace will certainly relate to your interest in their needs, and they may surprise you with their enthusiasm.
- Explore the needs of end users periodically without a product in your hands. Get involved in user groups, host roundtable discussions and attend industry conferences. Invite consultants to hear their product wish lists. They will represent a composite of many clients' needs.

While U.S. firms are not yet particularly impressed with most of the Japanese products to be sold here, their products are improving. What is particularly impressive about the Japanese is their approach to understanding the needs of the U.S. marketplace. They generally come to listen, they take notes, and they earnestly try to respond.

Sooner or later, this is going to make them tough competitors if they begin to read the U.S. marketplace better than U.S. firms have. We have already seen this happen in the dot matrix and now the laser printer industry.

About the author

Ken Edwards is a manager with the executive office of Touche Ross & Co. in New York. He has 15 years of consulting experience and currently oversees the firm's microcomputer support center.

Bradley

(Continued from ID/13)

and can be linked to other on-line data bases.

The pressure users are experiencing results to a degree from the rapid changes occurring in mainframe and microcomputer technology. User support systems must be continuously updated to reflect the current business environment. Traditional mainframe systems that typically took two years or longer to build have a life of approximately five years, if that long.

Businesses, both small and large, are looking at micro or personal computers as a solution to their problems. There is an infusion of supposedly easy-to-use off-the-shelf software that solves these problems.

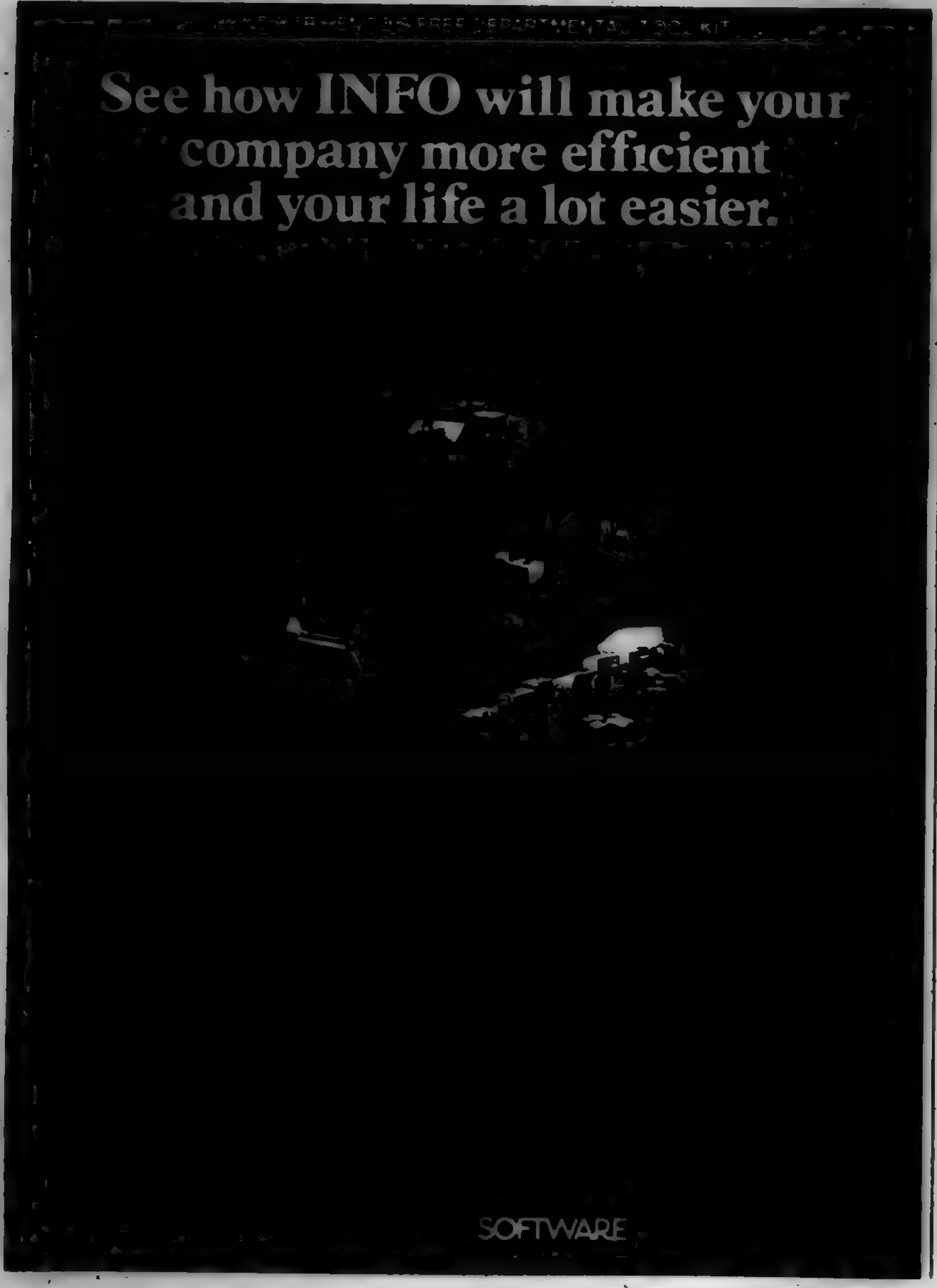
Users are requesting more software flexibility. They want and need the ability to capture and manipulate data easily using user-friendly (menu-driven) software. Users have already been the recipients of significant hardware improvements — more raw computing power, increased storage capacity and faster throughput. But software technology is lagging far behind the productivity advancements made in hardware.

Whether developed internally or attained through second- or third-party vendors, users continue to search for more powerful and efficient software. Even with the gains already made in new software enhancements, there is still a prevailing need for software to become less costly, relatively easy to maintain and able to handle large volumes of data quickly.

There are some vendors who do not thoroughly test their software; consequently, the user has to suffer with unwarranted system problems. This damages vendor integrity, to say the least. Also, accompanying system documentation must be better prepared.

Users with microcomputers often need to access data from the mainframe. But microprocessors are not capable of housing large quantities of data or complex data base structures. Current software packages preclude this from being a trivial task. There are a few software packages that make downloading of data from the mainframe simple. User communication to large data bases additionally requires technical expertise by someone who is familiar with complex data structures.

Microcomputer-based technology is causing the way that we conduct



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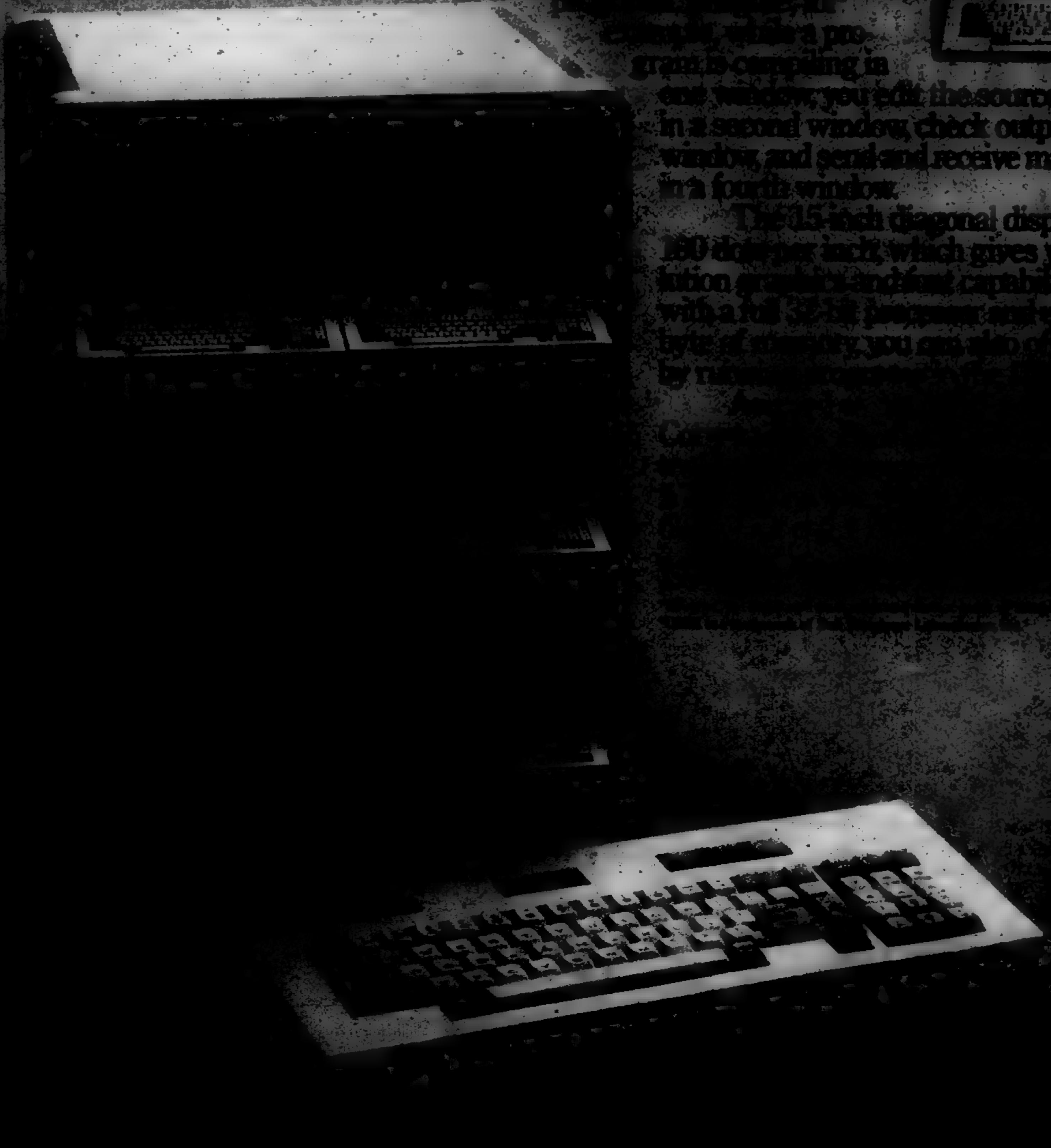

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> ***Anticipating user needs is practically impossible. To lessen the gap, the lines of communication between software developer and user need to be strengthened.***

business to be looked at in a different manner. Software for the micro is relatively inexpensive compared with development costs for mini or mainframe applications.

Micros have created a new perspective on software development. A lot of micro software is being developed in basements or garages. Many of these third-party software entrepreneurs are inexperienced. This is not to say that good software isn't being developed; the point here is that this software tends to be developed from an individual's own concept of a business need rather than against a specific business requirement.

Companies tend to look toward the more established leaders for micro software — Microsoft Corp.'s Multiplan, Lotus Development Corp.'s 1-2-3 and Micropro International Corp.'s Wordstar, for example. Several off-the-shelf micro software packages can be easily customized to the user's needs, but the problem is that many software vendors are incapable of providing support.

More query and fourth-generation languages are becoming available. We are also seeing report generators that are much more powerful and even more user-friendly. But for the more experienced technical user, there is still a need for software that makes data communications across hardware interfaces transparent.

Software vendors are finding it increasingly difficult to hone in on user requirements. Business requirements are changing at such a rapid pace that systems are becoming obsolete soon after they are installed. This is especially true for the banking industry.

Anticipating user needs is practically impossible. The lines of communication between software developer and user need to be strengthened. User group forums provide an excellent vehicle for communication. Examples include Guide, which is geared to IBM products, The IV League (formerly Mark IV Users Group), Tandem Users Group and the American Bankers Association conferences. From forums such as these, new products and product enhancements have evolved. Computer manufacturers such as Digital Equipment Corp. and Tandem Computers, Inc. have found success following IBM's lead.

Enormous gains are being made in the number of application, report and graphics generators and fourth-generation languages being developed. These software aids are employed by nearly everyone — engineers, managers, end users and programmers.

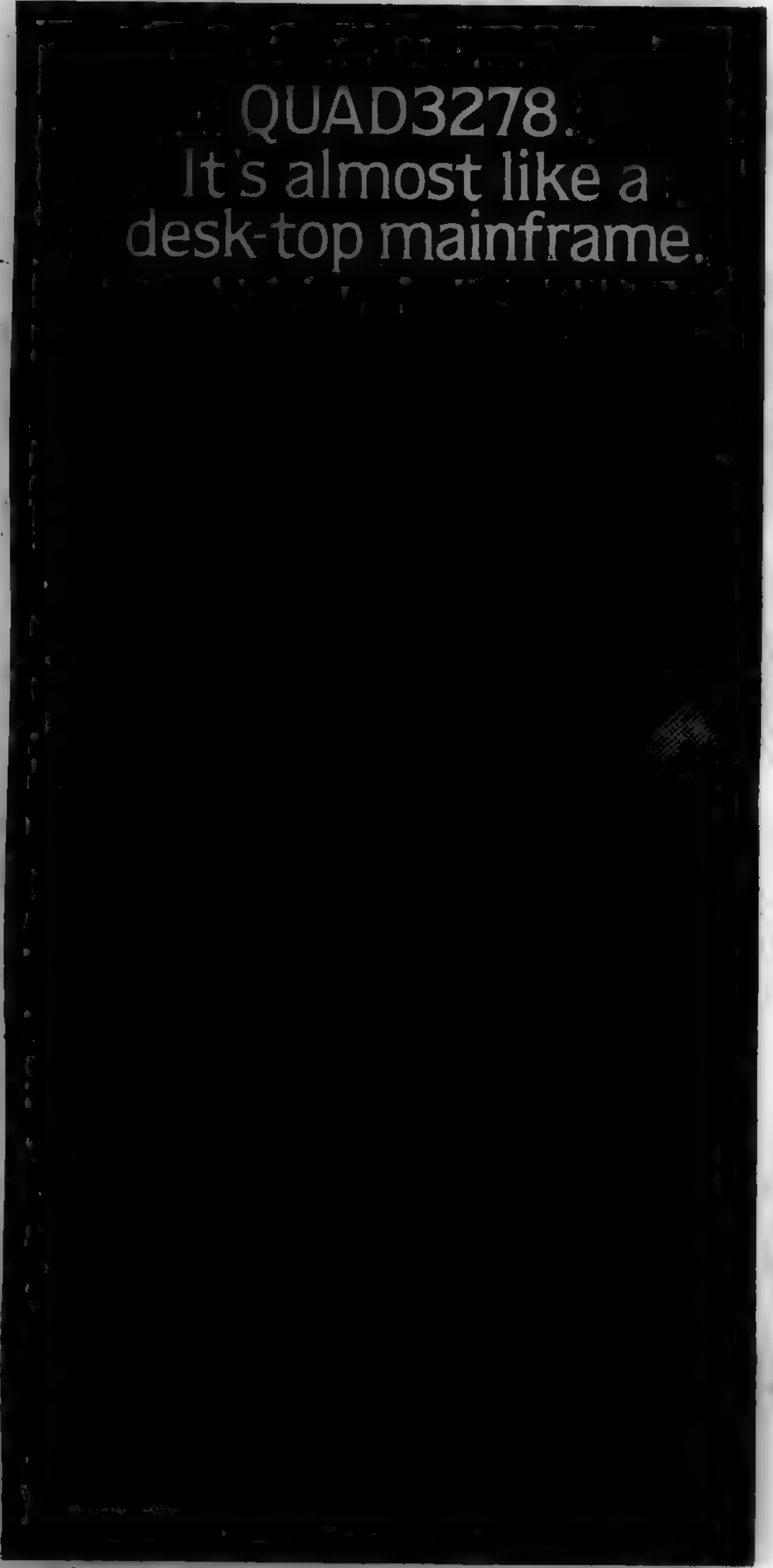
Some of the more experienced software vendors are reaching out to businesses. For example, First National Bank has assisted in beta tests and prototyping projects.

Software integrity is a key element to the bank's acceptance of both software and hardware systems. Software integrity remains a question mark in the eyes of bankers.

The bottom line is that vendors need to be more responsive to user needs. New software is only the tip of the iceberg. Documentation must no longer occupy the back shelf. Developers must develop systems with the user in mind. Development costs must come down as micro and mainframe systems become integrated.

About the author

Dennis Bradley has worked in data processing for 15 years. He currently is systems officer/project manager of the Quality Assurance Program at First National Bank of Chicago.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COMMUNICATIONS

Amdahl lineup grows in spate of unveilings

ATLANTA — Amdahl Corp. unleashed a flurry of products at the recent Interface '85 communications conference here.

The announcements included the following: the Financial Communications System Network Architecture-to-X.25 (FCSTX) support package for financial applications; the addition of remote job entry (RJE) support for its 4460 network concentrator; an entry-level, time-division multiplexer for small- and mid-size networks; multitrunking and hub management enhancements to its line of time-division multiplexers; and upgraded AT&T-compatible data sets.

The FCSTX package is said to enhance the Amdahl 4470 Network Concentrator to provide expanded service to banks and other financial institutions using X.25 networks.

Enhancements enable the 4470, a Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC)-to-X.25 concentrator, to provide network concentration and protocol transformation for both the IBM 3600 and 4700 Financial Communications Cluster controllers, the

See WARES page 66

Industry backs MAP nets

Standards getting support from various parties

By John Dix
CW Staff

ATLANTA — Industry support of standard local-area networks used to implement the Manufacturing Automation Protocol (MAP) factory automation scheme, originated by General Motors Co., is coalescing at an unprecedented rate.

Ralph Ungermann, president of local network manufacturer Ungermann-Bass, Inc., and Joe Schoendorf, president of Industrial Networking, Inc. (INI), a joint venture of Ungermann-Bass and the General Electric Corp., outlined developments and directions in factory automation in an interview at the Interface '85 communications conference held here recently.

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> *Manufacturers have been installing islands of automation. Now these pieces must be woven together.*

To date, manufacturers have been installing islands of automation to address specific problems, Schoendorf said. Now these pieces have to be woven together. "Every company in the Fortune 500 has some automated [manufacturing] systems," Schoendorf estimated, "but less than 1% have tied these together in computer-integrated manufacturing systems. That's where all the action is."

Two new industry standards are responsible for the rapid buildup of factory automation technology and product development. The first is the IEEE 802.4 standard for token bus networks for use in factories; and the second that has gained industry support is GM's MAP specifications, a de facto standard that is modeled after the International Standards Organization's Open Systems Interconnect network reference model, Schoendorf said.

IBM, Digital Equipment Corp. and Hewlett-Packard Co., among other computer manufacturers, have endorsed the use of token bus networks in the factory, as have industrial control equipment manufacturers GE, Allen Bradley Co. and the Modicon division of Gould, Inc., Schoendorf said.

Other parties that have committed to the standards include the following:

■ Motorola, Inc. and Intel Corp., the largest board-level product suppliers to the industry. Schoendorf said both companies will announce products that adopt

See MAP page 67

■ Modemsplus has released a device that converts two-wire dial-up IBM SNA/SDLC to four-wire leased-line SNA/SDLC on IBM communications processors/66

■ Xpoint has announced printer and terminal controllers for the IBM System/34, System/36 and System/38 minicomputers/66

■ Forest Computer unveiled an IBM SNA gateway for non-IBM terminals and printers/67

INSIDE

Protocol Converters/66
Voice/Data Communications/67

Fibercom launches fiber-optic local-area net

ROANOKE, Va. — Fibercom, Inc. has released its Whispernet fiber-optic Ethernet local-area network which uses an active ring topology and which is reportedly competitively priced with coaxial technology.

Whispernet is said to support up to 1,024 nodes with the maximum spacing between any two being 4km. Nodes can communicate with each other within a 50-sq-km area (19-sq-mile) without gateways.

Whispernet consists of Fibercom's TFT-10 fiber-optic Ethernet transceivers, Whisperserv communications servers and low-speed fiber-optic user interfaces. The TFT-10 is used to connect each personal computer or other Ethernet-compatible device to the network while the Whisperserv provides interconnection for nonnetworked terminals and computers.

Interfaces for RS-232, RS-422, bisynchronous, asynchronous, X.25, V.35, Digital Equipment Corp.'s VAX and IBM mainframes are available. Whisperserv supports either the Xerox Corp. Network System protocol or the Department of Defense's Transmission Control Protocol and Internet Protocol. Reportedly, Whispernet can be used to interconnect existing coaxial cable Ethernets.

A typical network could support 32 terminals and microcomputers spaced 100 ft apart in a DEC VAX environment, using two transceivers ($750 each), a communications server ($15,600), 100 ft of fiber-optic cable (60 cents/ft), a VAX server ($13,000) and a unibus card for the VAX interface ($5,000), for a total of $35,160.

Fibercom is located at P.O. Box 7317, Roanoke, Va. 24019.

MCI seeks to double share in long-distance telecom mart

By Charles Babcock
CW New York Bureau

NEW YORK — The next two years offer a rare opportunity for companies in the newly deregulated telecommunications industry, and MCI Communications Corp. plans to capitalize on the times and increase its share of the long-distance market from 4.6% to 10%, according to William G. McGowan, chairman of MCI.

In remarks prepared for a recent meeting of the New York Society of Security Analysts, McGowan said the first year of AT&T divestiture proved to be more chaotic than telecommunications observers had foreseen. Not only was AT&T in disarray after the breakup, but many customers were on the defensive as well.

In Charleston, W. Va., one of the first equal-access battlegrounds where users were asked to choose their primary long-distance carrier, 60% of the 34,000 residents abstained from choosing, despite intensive advertising campaigns by MCI and other carriers. They became AT&T Communications customers by default. MCI plans to appeal to the Federal Communications Commission for a share of the default customers, McGowan said.

MCI gained about 10% of the nondefault long-distance customers in the Charleston contest but acknowledged that they were signed up at a price. Some MCI estimates put the cost per new customer at $2,000, compared to the $30 to $60 that MCI typically spends in a recruitment campaign.

After McGowan's remarks, Bert C. Roberts Jr., president of MCI Telecommunications, which handles the bulk of MCI's long-distance business, listed the following points on how MCI hopes to exploit its position as an AT&T Communications competitor:

■ As the divested Bell operating companies upgrade their central switching offices for equal access, the rotary phone market opens up to MCI. Rotary phones constitute over 50% of the market, but until equal access is put into effect, users of these phones cannot access MCI, Roberts said. All switching centers have to be converted by the end of 1986, he added.

■ An FCC provision has been implemented that requires automatic identification of the telephone number of the caller, which will reduce confusion over bills among MCI customers, Roberts said.

■ Of the 2 million customers who have been faced with choosing a primary long-distance carrier, MCI has gained about 200,000 — or 10% — of them, Roberts said.

■ MCI is just beginning to get the telephone numbers and names of those divested Bell operating company customers eligible for a competing service. The lists are supposed to be made available by the operating companies, and since the start of the year they have been "at a price approaching affordability," Roberts said. MCI wants to start getting the lists 120 days prior to conversion so it can target the customers for special mailings, he added.

■ In many cases, customers have signed up for MCI service, but the divested Bell operating companies have continued to route their calls over AT&T Communications lines. As many as 50% of MCI's signed-up customers continued to be routed over AT&T lines last fall, Roberts said. The number is lower today and he expects the confusion to be eliminated by mid-year, "but AT&T gets the traffic in the interim," he said.

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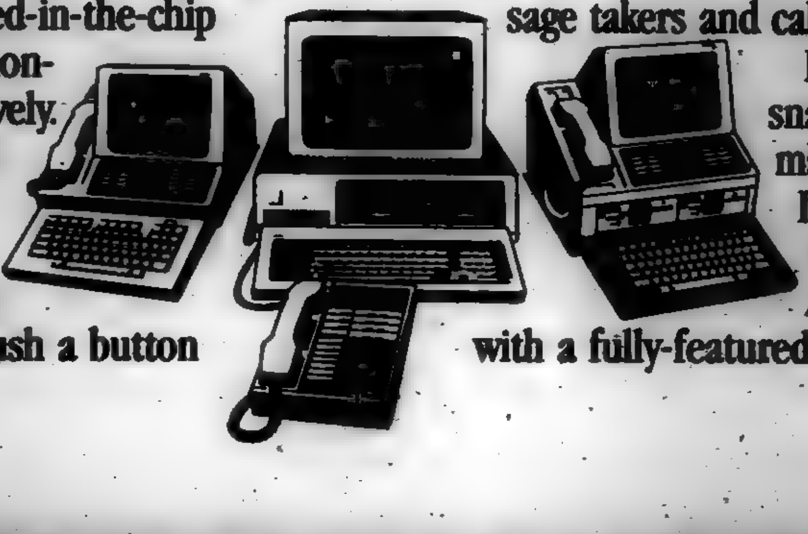

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WARES

from page 63

IBM 3180 display terminal and the IBM 3767 printing terminal. It continues supporting the IBM 3270-type terminals presently handled under SNA/SDLC.

The price of the package is $12,500, and it is available immediately.

Amdahl's announced support for RJE protocols through its 4460 network concentrator enables the unit to support combined asynchronous, bisynchronous and RJE data. The 4460 can now perform simultaneous packet assembly/disassembly (PAD) functions for networking terminals, RJE devices and host computers in mixed asynchronous, 3270 bisynchronous and RJE bisynchronous environments. The PAD allows pre-SNA terminals to emulate SNA features.

The enhanced unit is compatible with 3305 bisynchronous PAD X.25 communications software in the host, the company said. The 4460 is available in eight-, 16- and 24-port versions on the five-board unit. Prices are $15,000, $16,000 and $18,000, respectively. The 4460 network concentrators will be available in the third quarter of 1985.

Also announced was the 2211L time-division multiplexer that is compatible with Amdahl 2211 multiplexers and can be upgraded on-site to provide T1 trunking capabilities.

The 2211L supports Amdahl's voice I/O module, the vendor said. The price begins at $5,700. It will be available in the second quarter of 1985.

Multitrunking and hub management enhancements to Amdahl's line of time-division multiplexers will be available in the third quarter of 1985. Multitrunking will be a field-upgradable modification to the 2211 time-division units and will permit traffic reporting and reconfiguration of multiple T1 links from the central management system.

The hub manager will reportedly permit control of more than 50 T1 links from a central location and will enhance the operator interface and the diagnostic control set.

Multiple trunk enhancements will start at $2,000 and the hub manager will be available as transportable software with a monthly lease fee of $250.

Upgraded versions of Amdahl's Limited Distance Data Sets were also announced. Initial products in the family will support subrate and 56K bit/sec services and handle one synchronous channel and one asynchronous channel.

Subrate channels will support 2.4K, 4.8K and 9.6K bit/sec synchronous channels for primary use. Secondary channels will be selectable at speeds from 75 to 300 bit/sec. The 56K bit/sec units will support a main synchronous channel and an auxiliary channel rated up to 1.2K bit/sec.

The units will cost approximately $1,500, and they will be available in the third quarter of 1985.

More information is available from Amdahl, Communications Systems Division, 2500 Walnut Ave., Marina Del Rey, Calif. 90291.

PROTOCOL CONVERTERS

■ **Modemsplus, Inc. has released its Sna Sna protocol converter that converts two-wire dial-up IBM System Network Architecture/Synchronous Data Link Control (SNA/SDLC) to four-wire leased-line SNA/SDLC on IBM's 3705 and 3725 front-end processors.**

Sna Sna can provide 254 IBM physical unit Type 2 dial-up addresses from a single leased-line front-end processor port, according to a spokeswoman. Each physical unit Type 2 will support the correct number of logical unit addresses required.

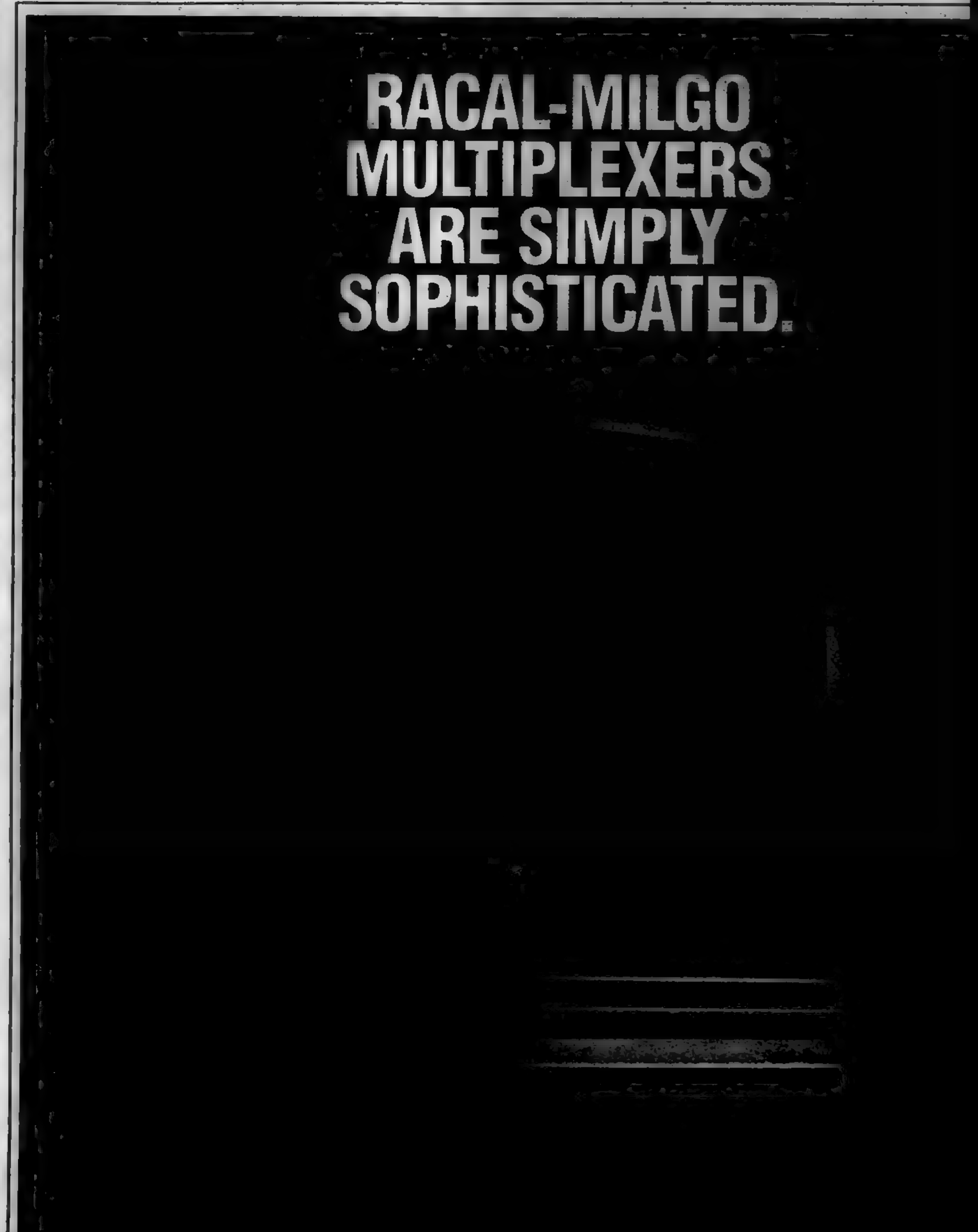
Two-wire telephone dial-in access is allowed from any IBM 3274, 3276 or 3776 SNA/SDLC-type device at any modem speed up to 9.6K bit/sec. Sna Sna can also be placed at a remote node on a multidrop leased line, allowing local SNA/SDLC devices in that node to have dial-up access to a remote front-end.

Sna Sna can be used as an SNA/SDLC backup interface for a multidrop leased line.

A Sna Sna rack-mount configuration of 12 physical unit Type 2s costs $11,900.

Modemsplus, 217 E. Trinity Place, Decatur, Ga. 30030.

■ **Xpoint Corp. has announced printer and terminal controllers for the IBM**



System/34, System/36 and System/38 minicomputers.

According to a spokesman, the 5200-TX controllers allow low-end, asynchronous Ascii terminals, microcomputers and printers to access an IBM host through twinaxial cable.

The Ascii devices reportedly appear to the host as standard IBM workstations and printers.

A 5200-TX Printer Controller allows an asynchronous Ascii printer to emulate IBM 5256, 5224 or 5225 printers.

The 5200-TX Terminal Controller reportedly allows asynchronous Ascii terminals or microcomputers to appear to the IBM host as IBM 5251 Model 11 workstations, and the controller is compatible with IBM 5251, 5294 and 5285 controllers.

Each 5200-TX Controller is priced at $1,545.

Xpoint, Suite 130, 5600 Oakbrook Pkwy., Norcross, Ga.

VOICE/DATA COMMUNICATIONS

■ **Forest Computer, Inc. has announced an IBM systems network architecture (SNA) gateway for non-IBM terminals and printers.**

The 1KS/SNA system is said to allow more than 1,000 terminals of any type to communicate with both IBM and non-IBM hosts in native mode. The hardware consists of a Hewlett-Packard Co. HP 1000 A-Series minicomputer and programmable serial interface (PSI) cards. The software in the A-Series handles SNA control, frame processing and data stream conversion, the company reported. The PSI cards are programmed to handle a variety of protocols. Forest 1KS/SNA software costs $35,000, and the hardware begins at $35,000.

Forest Computer, 1749 Hamilton Road, Okemos, Mich. 48864.

MAP

from page 63

these standards this summer.

■ Robot manufacturers Cincinnati Milacron, Inc. and GMF Robotics (GMF), a joint venture between GM and Fanuc Ltd. of Japan.

■ Computer-aided design equipment suppliers Apollo Computer, Inc., Calma Corp. and others.

According to Schoendorf, major user companies such as Ford Motor Co., McDonnell Douglas Automation Co. and DuPont De NeMours & Co. have sent letters to vendors informing them of their endorsement of MAP and indicating that future equipment purchases will be swayed by that fact.

Today, the automated systems these companies use operate autonomously or with machines and systems doing similar tasks. "Programmable controllers talk to other programmable controllers," Schoendorf said. "The same with robots. Typically you had one type which could do the same thing, like welding."

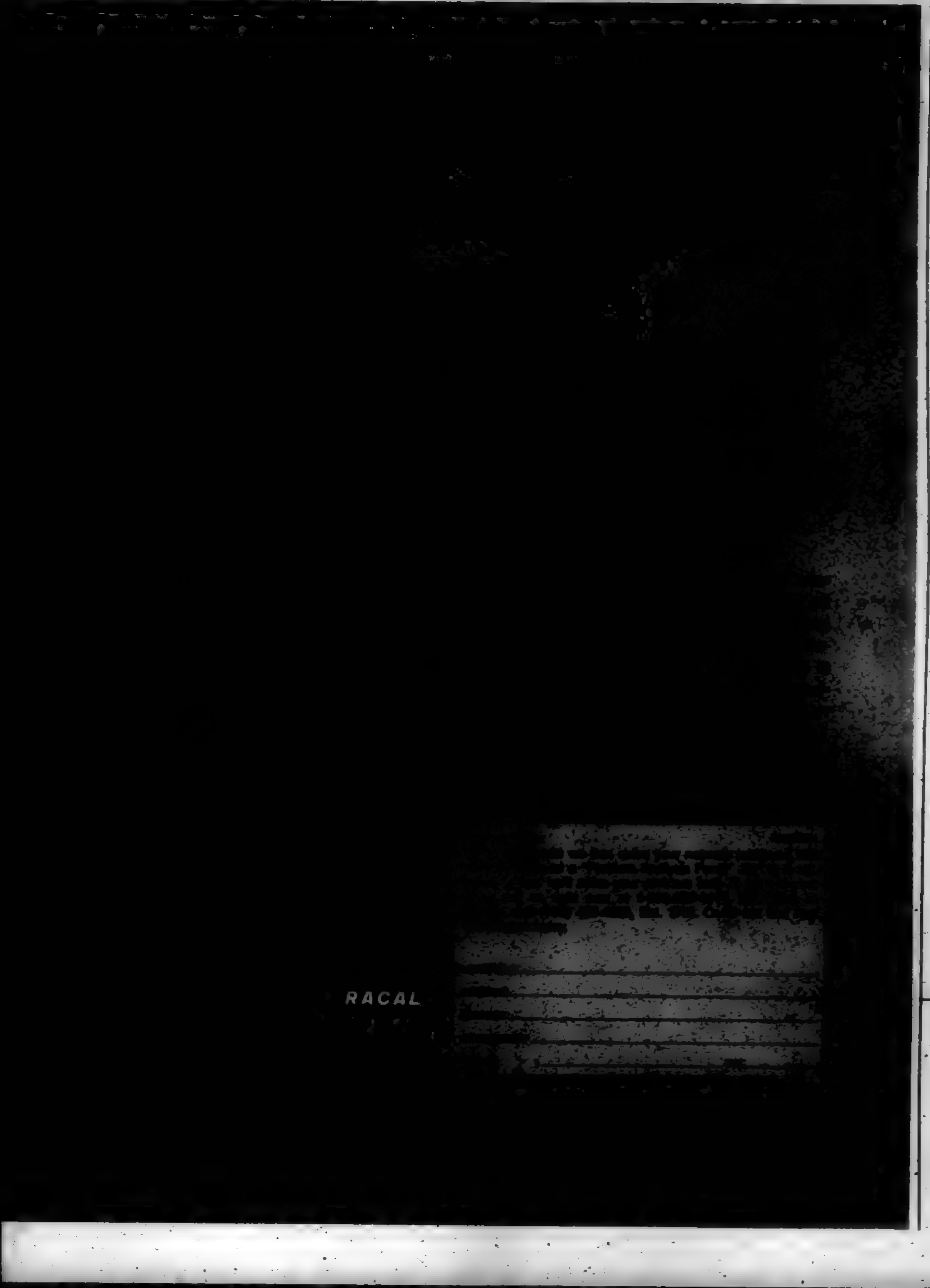
Process becomes complicated

When you try to integrate systems performing different tasks and enter variations into the automation process — for instance requiring robots to paint cars different colors — the process becomes complicated.

Integration gets even more difficult when it becomes desirable to tie together systems used in the various stages of manufacturing given the different computer systems used and the management structure, Schoendorf said.

Schoendorf's Santa Clara, Calif.-based company was formed last October to push local network-based systems that can be used to integrate these systems. The firm was formed as a joint venture between Ungermann-Bass, which provides its networking knowledge, and GE, which put up $6 million in funding.

INI will build board-level products that can be directly integrated into the backplane of IBM Personal Computers, DEC Q-bus processors, Intel's Multibus-based systems and products built on Motorola's VME bus, Schoendorf said. It will also build boards for a standard serial bus as used in products from companies like GMF and HP.



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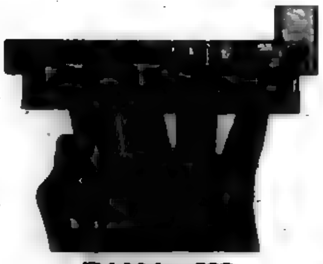

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Programmable Function Keys	15 (30 with shift)	15 (shifted only)
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SYSTEMS & PERIPHERALS

Cash registers to mainframes

The legend of NCR

By John Desmond
CW Staff

Second in a nine-part series

NCR Corp.'s current television commercials emphasize its 30-year involvement in the computer business. Sometimes rocky and disappointing, those years represent about a third of the company's 101-year history.

NCR's dominance in the cash register business is legend — a fact that appears to have had both a positive and negative impact on the company's ability to compete in the mainframe computer business. At the turn of the century, NCR gained a reputation for making highly durable and popular mechanical cash registers. Improvements to that cash register line drew the company into developing electromagnetic business machines.

By the 1930s, NCR was doing electronics research for the U.S. Navy. That research led to development of NCR's line of electromechanical accounting machines that it marketed until the 1950s. These included the NCR Post-Tronic electronic bank accounting machine, which featured a magnetic reading and recording stripe on ledger cards. "But none of the units in the 1940s had anything to do with von Neumann stored logic or Boolean algebra functions. It was all pulse electronics," recalled Carl Rench, a now-retired vice-president of research for NCR.

NCR decided to enter the mainframe computer business in the early 1950s, shortly after Remington Rand, Inc. delivered the Univac I processor to the U.S. Bureau of the Census. "It became obvious to us that computer products were going to give NCR some problems," Rench recalled. NCR threw its hat into the mainframe processor ring with Remington Rand and IBM, the latter company founded by Thomas J. Watson Sr., who was fired by NCR back in 1913.

Although some industry watchers in the early 1950s predicted a limited future for commercial computer systems, Stanly Allyn, president of NCR in 1953, decided to commit the cash register giant to the burgeoning computer business by acquiring Computer Research Corp. (CRC) of Hawthorne, Calif., which was renamed NCR Electronics Division.

CRC had already developed the CRC 102, a data processing system aimed primarily at scientific and military markets, which featured logic geared toward rapid processing. Because the 102 used germanium diodes in place of some some vacuum tubes, it required less power and was cheaper than much of its competition at the time. By 1955, NCR had installed 30 of the CRC 102s, but "it became obvious it wasn't going to crunch information fast enough." If NCR was to penetrate the business market with computers, it needed a product with more efficient I/O. To

See NCR page 73

Wang DP growth seen lacking

User lauds progress but calls products deficient

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — A seasoned user of Wang Laboratories, Inc.'s systems recently commended the vendor for its progress in broadening its product focus to encompass DP as well as word processing.

But in the same breath, independent systems consultant George Gowen tempered his praise with a pointed reminder that, in several important respects, Wang's DP-oriented technology remains markedly deficient.

Speaking at the recent Wang Enterprise West users group meeting, Gowen credited the Lowell, Mass.-based company with substantially improving the ability of its VS processor line to address the needs of the commercial DP marketplace. In particular, during the past three years, Wang has boosted the VS family's processing power, upgraded its customer services and begun adopting firm schedules for correcting operating system bugs, Gowen said.

Although Wang "has come a long way in the DP world, it still has a long way to go," he said. Even today, the firm's VS processors still lack a data base management system comparable to IBM's IMS, and they suffer from operating systems incompatibility with the word processing side of Wang's product line.

Gowen said he based his observations on his personal experience as an independent systems consultant contracted by the locally headquartered Bank of America National Trust and Savings Association. Roughly three years ago, he was hired by the bank to oversee the development of a pension fund administration system.

After evaluating and rejecting various alternatives, Gowen selected Wang as the vendor to supply the system's hardware. He had concluded during his lengthy product evaluations that Wang offered the best combination of price, processing horsepower, growth path and functional flexibility for the application in question. His conclusions soon led him to acquire a

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■ Teradata said it has successfully tested a 60-processor version of its DBC/1012 data base machine for IBM mainframe environments/76

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Memorex dot matrix printer out

SANTA CLARA, Calif. — Memorex Corp. has announced a multifunction dot matrix screen printer that can be attached to the firm's monochrome display stations. The Memorex 2173 screen printer is compatible with applications software supported by IBM 3270 terminals or the IBM System/34, 36 or 38.

The 120 char./sec printer is said to allow Memorex 2051, 2078 Model 82, 2078 Model 2 and 2178 display station users to print screen displays with one keystroke. Typical applications include program listings, financial reports and credit listings, the vendor said.

The printer stores information in a buffer so that the user reportedly can continue using the display station without having to wait for the printer to finish. It operates without intervention of the central processor and does not require additional support programming, according to the vendor.

Standard features include a bidirectional, logic-seeking print head; a cassette-type ribbon; a tear bar; and self-diagnostics. Users can select from 10, 12 or 17 char./in. in standard resolution mode or 10 char./in. or proportional spacing in high-resolution mode.

The Memorex 2173 costs $996 for single quantities, with volume discounts available.

Memorex is located at San Tomas at Central Expwy., Santa Clara, Calif. 95052.

VDT users prefer IBM; rate function over price

By Donna Raimondi
CW Staff

NEW YORK — VDT buyers want increased functionality and feature selection, and the price of what they buy is important, a recent Datapro Research Corp. survey said.

IBM has captured the lion's share — 36% — of the VDT market, according to Datapro's "1985 User Ratings of Display Terminals." Users who buy IBM terminal equipment indicated that features and functions and vendor recognition are more important than price, the survey noted. Digital Equipment Corp.'s 9% share was listed as the next largest portion of the market.

Users rated the overall performance of IBM's VDTs lower than terminals from AT&T or Hewlett-Packard Co., each of which holds 5% of the market to tie for third place, according to the survey. AT&T and HP each received a 3.6 out of a possible 4.0 score for overall performance of all their VDT models. DEC and IBM followed with scores of 3.5, followed by Burroughs Corp., Sperry Corp. and Televideo Systems, Inc., with 3.3 each. ITT Courier Terminal Systems, Inc., Memorex Corp. and Telex Computer Products, Inc. followed with 3.2 each, the survey showed.

CIE Terminals, Inc. rated the highest in ease of use, with a 3.8. Other vendor ratings were as follows: AT&T Teletype and DEC, 3.5; IBM, 3.4; Burroughs, 3.2; and Applied Digital Data Systems, Inc., 3.1. The average for all users was 3.3.

The nearly 900 user responses to the survey included 1,910 individual responses on VDTs, 720 responses covering cluster controllers and 83 responses on voice/data workstations. Several respondents rated personal computers under the VDT category, which, Datapro said, indicates a growing trend toward the replacement of display terminals with micros. Models were rated for overall performance, ease of operation, display clarity, keyboard feel and usability, ergonomic features, hardware reliability and manufacturer's maintenance, Datapro said.

The study — coupled with Datapro's report titled "All About Alphanumeric Display Terminals" — costs $25. It is also included as a supplement to Datapro Reports on Data Communications, an information service that costs $750. More information can be obtained from Datapro Research, 1805 Underwood Blvd., Delran, N. J. 08075.

SYSTEMS & PERIPHERALS

Teradata builds 60-CPU version of DBC/1012

LOS ANGELES — Teradata Corp. said it has developed a 60-processor version of its DBC/1012 parallel processor data base machine that offers processing power equivalent to 24 million instructions per second and storage capacity of 19G bytes.

The configuration was developed as an internal project within Teradata. While the vendor theorized that the maximum number of parallel processors that can be configured in the DBC/1012 is 1,024, the largest unit the company has installed to date is a 20-processor configuration. The 60-processor configuration costs $1,700,000, and the vendor claims the unit offers performance roughly equal to IBM's 3084 Model Q mainframe. Although the vendor said the configuration is available to end users, Teradata has not accepted orders for the 60-processor unit.

The DBC/1012 is a specialized parallel processing system designed to manipulate data base requests in IBM mainframe environments. In the Teradata experiment, an IBM 4341 Model 2 and an Amdahl Corp. 5840 running IBM's MVS operating system were used.

Teradata is located at 12945 Jefferson Blvd., Los Angeles, Calif. 90066.

TERMINALS

■ **Gixi, Inc. has announced an enhancement to its Radiance 2000 terminal, support for an ink-jet printer and its GKS-Gral graphics standard package.**

The Radiance 2000 terminal now offers eight simultaneous colors from a palette of 16 on its 20-in. screen. Single-unit price for the R2000 is $18,000.

The company announced support for an ink-jet printer that will provide eight to 12 dot/mm using the selected formats of ½A4, A4 or A3 (maximum size 400mm by 280mm). This printer uses up to 4,096 colors to capture the images of the R2000 and is switchable in dot/mm, format size and resolution, the vendor said. The printer price is approximately $35,000.

Gixi has also introduced GKS-Gral, its version of a graphics standard package developed by Gral in West Germany. It is currently available in every level of a graphics kernel system and has been ported to most major operating systems.

Source or binary licenses are available. Prices range from $1,000 for a microcomputer binary license to $35,000 for a mainframe source license.

Gixi, 7808 Glenroy Road, Minneapolis, Minn. 55435.

■ **Kel, Inc. has announced product enhancements and price reductions for its J1000 series monochrome and color graphics display terminals.**

Enhancements include color commands for Digital Equipment Corp. VT100 operation; ML and MT Tektronix, Inc. 4105 color commands; a mouse option for control of cross-hair location; an interface for the Diablo Systems, Inc. C150 color ink-jet printer; and rectangle fill, erase and reverse video capability. A dual-plane option for the J1014 that can be used in the terminal's Tektronix emulation mode is also available.

Reductions in price on the terminals, effective immediately, range from 10% to 20%. Current prices for the J1000 series terminals are $2,595 and $4,950 for the J1014 14-in. monochrome and color terminals, respectively, and $3,950 and $6,750 for the J1019 19-in. monochrome and color terminals, respectively.

Kel, 400 W. Cummings Park, Woburn, Mass. 01801.

■ **I-O Marketing has released its I-O 1181 Executive Terminal, which attaches directly to IBM System/34, 36 and 38 systems and supports printers with standard RS-232C asynchronous Ascii serial interface.**

The I-O 1181 features a 13-sq-in. footprint and includes a choice of amber or green screen, detachable keyboard, keyboard selectable terminal and printer setup. The unit can make the printer system addressable. With I-O's Command Pass-Thru communications device, printer control codes reportedly may be passed directly to the printer.

The I-O Executive Terminal costs $1,995 for the system-addressable model and $1,595 for the screen dump model.

I-O Marketing, 3487 W. 2100 South, Salt Lake City, Utah 84119.

■ **Qume Corp. has announced its QVT-101 editing terminal with bidirectional printer port, RS-232 interface, a nonglare green screen, foreign character sets and an adjustable-height keyboard.**

The QVT-101 terminal features block-mode data transmission. Interface options allow the terminal to operate remotely from a micro, mini or mainframe host computer. It offers 16 host or user-programmable functions. Options include current loop or RS-422 interfaces.

The QVT-101 terminal costs $395.

Qume, 2350 Qume Drive, San Jose, Calif. 95131.

PRINTERS/PLOTTERS

■ **Wespercorp has announced the DLP-3800 printer controller in its Datasystems line for IBM System/34, 36 and 38 minicomputers, emulating IBM's Model 5219 daisywheel printer, Model 5224, 5225 and 5256 matrix printers, Model 5211 band printers and Model 3203 train printers.**

The DLP-3800 has two rear-mounted twin-axial connectors and plugs directly into the CPUs. The

Continued on page 72

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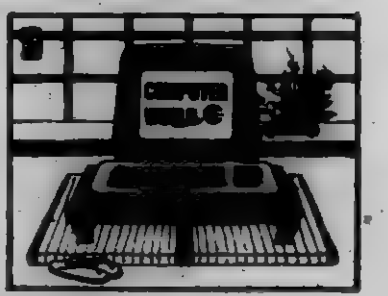

The Japanese computer industry is growing at a rate of 20% per year. There are currenty more than 101,000 installed general purpose computers valued at over $16 billion. This figure does not include minis, micros and personal computers. Small business computers are currently the leading growth sector in the Japanese computer market.

Japan is looking for well-developed technology that will meet their future needs. And with no strong independent software industry of its own, Japan offers great opportunity for U.S. manufacturers in the packaged software market.

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SYSTEMS & PERIPHERALS

Continued from page 70

controller also supports Centronics Data Computer Corp., Dataproducts Corp. and RS-232 interface printers.

The DLP-3600 is housed in a self-contained 11-in. by 13-in. by 4-in. enclosure weighing 12 lbs.

The price for DLP-360-0 is $1,595.

Wespercorp, 14511 New Myford Road, Tustin, Calif. 92680.

■ **Facit, Inc. has introduced two-pen plotter systems that contain RS-232C serial and Centronics Data Computer Corp. parallel interfaces.**

The 4550 and 4551 plotters were designed specifically for the low-end business graphics, computer-aided design and computer-aided engineering markets, the vendor said. The plotters reportedly meet the requirements of the Hewlett-Packard Co. Graphic Language (HP-GL).

The 4550 accepts media sizes up to 8½ by 11 in., and the 4551 accepts up to 11 by 17 in. Both plotters feature removable six-pen cassettes.

The 4550 plotter costs $795 each, and the 4551 costs $995 each.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

POWER SUPPLIES

■ **K/W Control Systems, Inc. has announced that it will distribute Piller of West Germany Uniblock Series II Modular uninterruptable power supply (UPS) for IBM 4300-size CPUs and communications installations.**

The UPS is available in power ratings of 40, 60, 80 and 120 kVA. It is said to ensure a 60Hz output and isolation of the critical load from the utility. The basic module — installed without the inverter and battery — protects against power-line transients such as voltage spikes and undervoltage dips, long-term brownouts, loss of phase and power interruptions of up to 100 msec.

For the stabilizer module only, prices start at $26,000. Prices for the UPS protection modules add $19,000 and up to the stabilizer price.

K/W Control Systems, S. Plank Road, Middletown, N.Y. 10940.

AUXILIARY EQUIPMENT

■ **Tymshare, Inc.'s Computer Systems and Support division has announced the 4060P and 4060D universal disk head testers, said to help reduce downtime from incorrect diagnosis.**

The 4060P is portable, and the 4060D is stationary. Both are intended for use in testing and certifying 100M-byte, 200M-byte and 300M-byte removable read/write disk heads for OEMs, including Century Data Systems, Inc., Control Data Corp., California Computer Products, Inc. and Memorex Corp.

Test data includes readings at highest and lowest write frequencies, resolution percentage and overwrite in decibels.

The price for the testers is said to start at $19,500, including a CRT, printer and eight hours of training.

Tymshare, 20705 Valley Green Drive, Cupertino, Calif. 95014.

■ **The John Fluke Manufacturing Co., Inc. has introduced two new interface pods to support Intel Corp.'s 16-bit 80186 and 80188 microprocessors that are used in personal computer and smart terminal applications.**

The pods are used as an interface between a Fluke 9000 Series Troubleshooter and a unit under test for servicing purposes or can be used in designing products that have microprocessors in them, the vendor said. The pods interface between a board that is being tested and the 9000 Series testing instrument. The pod acts as a microprocessor and the testing instrument checks it to identify problem locations.

The 80186 and 80188 pods are priced at $2,695 each. The 9000 Series Troubleshooter ranges from $3,595 to $4,595.

John Fluke Manufacturing, P.O. Box C9090, Everett, Wash. 98206.

■ **J & W Instruments, Inc. has announced a programmable data logger with a CRT display and printout recording. The Digi/Scan 10C monitors manufacturing processes and has an RS-232C port that allows it to be hooked up to a user's system.**

The Digi/Scan 10C comes with per channel scaling, dual alarms and alarm messages.

Single-channel display shows process value, engineering units, alarm values, alarm messages, print intervals plus channel number, time and date.

The Digi/Scan 10C costs approximately $5,200 for a 16-channel unit and is expandable in 16-channel increments up to 128 channels.

J & W Instruments, 4800 Mustang Circle, New Brighton, Minn. 55112.

■ **Triconex Corp. has announced the Tricon 1 control system featuring a distributed modular processing architecture with triple redundancy for continuous system availability in factory automation and process control applications.**

A spokesman said a single system can perform both sequential and analog control to handle mixed application inputs. Tricon 1 is intended to withstand shock, vibration, noise, electrical emissions and other conditions in harsh operating environments. It features a scan rate of 6 msec to 20 msec for monitoring up to 512 digital points, 256 analog points or 128 loops. An expansion chassis accommodates field terminals

Continued on page 74

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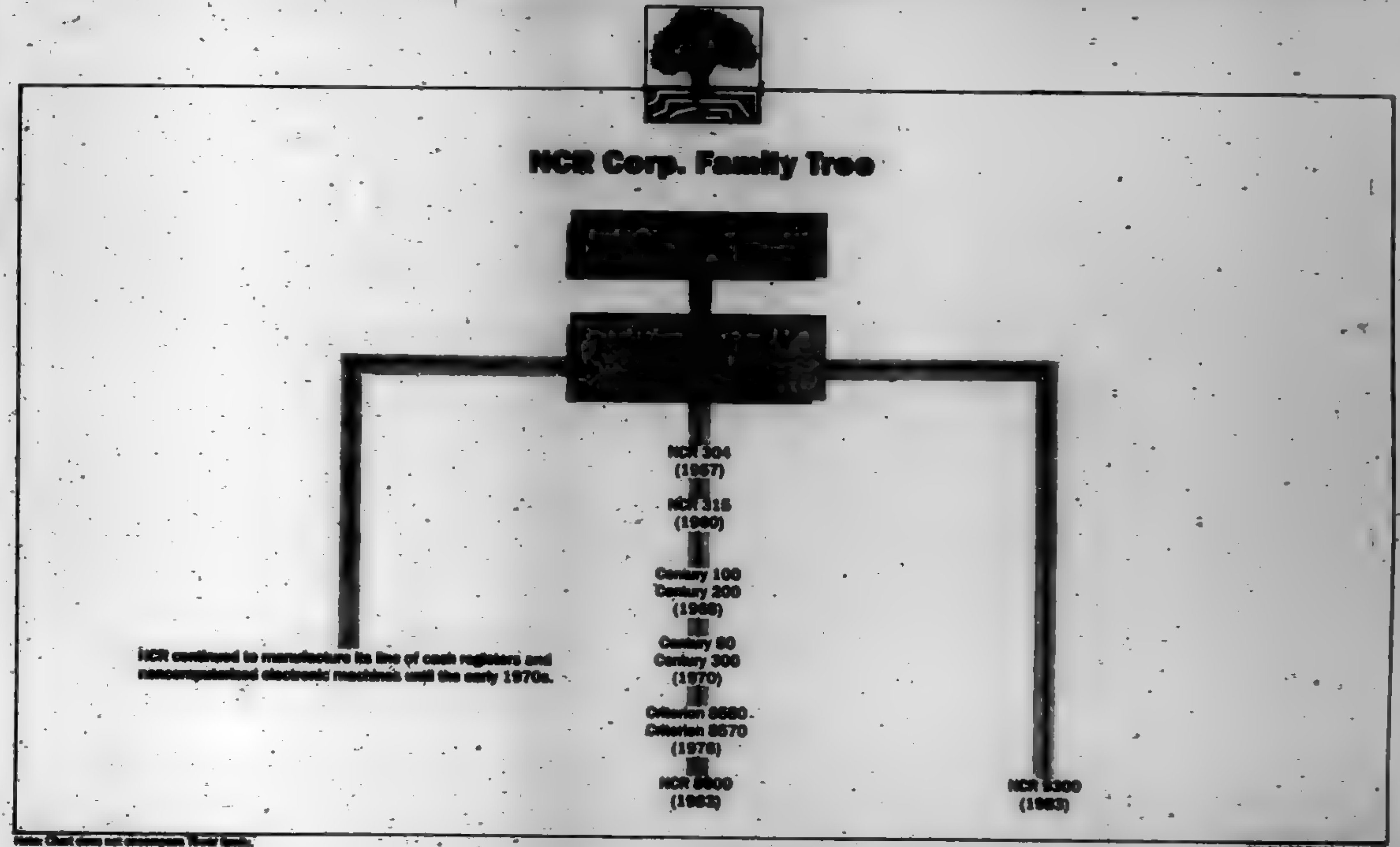

Note: Chart does not encompass [illegible] family.

CW Chart by [illegible]

NCR

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develop such a product, NCR entered a joint venture with Westinghouse Electric Corp. under which Westinghouse would develop the needed processor and NCR the peripherals. The resulting product was the NCR 304, which NCR claimed was the world's first fully transistorized computer.

The 304 was announced in 1957 and first installed in 1959 for the U.S. Marine Corps at Camp Pendleton, Calif.

The Marines used the system to maintain personnel and equipment records. "The 304 had a hell of an I/O capability," Rench said. The 304's high-speed paper tape input could change thousands of numbers each second.

But the 304 was expensive to produce and may have emphasized I/O efficiency at the expense of processing speed. The company sold only about 30 304s, Rench said. In efforts to improve the 304, the Electronics Division went to work again, and in 1960, the NCR 315 was announced.

'Solved I/O constipation problem'

"It solved the constipation [I/O] problem in a properly balanced fashion," Rench said. The 315 processed information in 12-bit slices, which NCR called "slabs." For a bank, the 315 could post 1,500 checking accounts per minute.

The NCR 315 remained the staple of the firm's system lineup for the next eight years, until NCR unveiled its first product to use integrated circuits, the Century line. Developed by the Electronics Division, the Century — which NCR internally called the model 615 — used metal-oxide semiconductor circuits and featured a short-rod memory instead of core memory.

The Century software was written in NCR's Neat language, which had been used in the preceding processors.

Although NCR's mainframe strategy was beginning to take form, its staid mechanical cash register business started to fall apart. The company ranked 89th in revenue but 334th in profits in the 1968 Fortune 500 listing. "It became obvious that integrated circuits of various types were going to zap . . . mechanical cash registers and accounting machines," Rench said.

But in spite of slumping sales, NCR believed it could still make money from electromechanical accounting machines and cash registers, and it continued to produce them. The decision proved costly. By the early 1970s, NCR was forced to write off more than $70 million in mechanical cash registers and electromechanical accounting machines that it could not sell. A new company president, William Anderson, announced in 1972 that all electromechanical products were being phased out.

In the midst of dramatic losses from older technology business machines, Rench took charge of R&D in 1970. One of his first decisions was to concentrate on moving NCR mainframe users from the Neat language to the more popular Cobol. "That was one thing I hit hard on: to make Cobol the international standard and to hell with Neat," Rench recalled.

Just as sales of the Century were starting to take off, NCR hit another stumbling block. Early Century installations had memory reliability and disk performance problems. The Electronics Division had developed an innovative memory disk that featured a cobalt rather than iron-oxide plating.

But the cobalt plating tended to become gouged whenever there was a head crash. This resulted in the destruction of data, Rench said. The company had to retrofit many disk drives with a different head as a result, and the cost to do so was high.

NCR photo

CRC 102-A general-purpose computers in production final test, early 1950s.

As news of the technical problems with the Century spread, orders for the system slumped. Even when the technical problems were overcome, the Century would never be the same. Rench said sales of the system only reached half of the company's original projections.

Computer business operating in black

Despite Century's problems, NCR's computer business moved into the black in 1974 for the first time since the company entered the computer business. In 1976, NCR announced the Criterion Series, featuring a bus backboard, advanced circuitry of NCR's own design and software portability from the Century.

Then, company President Charles Exley Jr., formerly of Burroughs Corp., emphasized in marketing literature the various Criterion model sizes available. The Criterion sold well and met projections, Rench said.

NCR has since announced the 8600 and 32-bit very large-scale integration 9300 to maintain its presence in the large-processor marketplace. A comparison of the NCR 304 and 9300 illustrates how dramatically computer hardware has decreased in size and increased in power over 20 years.

The 304 weighed 3,450 lb; the 9300, 50 lb. The 304 took up 35 sq ft of floor space; the 9300, 4 sq ft. The 304 had the equivalent of 600,000 transistors, all hand-wired; the 9300, 40 million transistors, in a mostly automated production. Finally, in 1983 dollars, the 304 was priced at $1,125,000, and the 9300 costs $23,000.

SYSTEMS & PERIPHERALS

Continued from page 72

located up to 4,000 feet fromthe main system.

Each main processor is a National Advanced Systems, Inc. 32C016 Cmos 16-bit microprocessor with a 32-bit architecture. Each I/O processor is an Intel Corp. 8031 8-bit microprocessor. Each main CPU has 128K bytes of main memory, expandable to 512K bytes, and each has three Ascii ports for connecting printers, disk drives or terminals.

The system operates by exception. Signals are examined at each input processor to determine whether a change of state has occurred, the vendor said.

Beta site installations of Tricon 1 are scheduled to undergo field testing soon. The system is scheduled to be in volume production by the third quarter of 1985, the firm said.

The base price for Tricon 1 is $12,000; a typical fully configured system costs $72,000.

Triconex, 17752 Mitchell St., Irvine, Calif. 92714.

■ Preston Scientific, Inc. has announced a digital I/O option for the GM series data conversion systems, said to enable users to input or output digital data over the same interface used to control the analog to digital converter (ADC). The product can also be used with a digital to analog converter subsystem.

Called Digital I/O Sub System, the product is for use on equipment from Digital Equipment Corp., Hewlett-Packard Co. and Data General Corp. Digital I/O subsystems provide transistor-transistor logic, discrete input lines grouped in 16-bit words as well as the ability to input digital data and intermix the digital data channels with ADC output data and output digital words to the user.

To address digital channels, the GM systems include a channel address memory, said to allow digital input or output data to be inserted randomly in the data stream during any point in the measurement cycle.

The price for Digital I/O Sub System is $850 plus $200 per channel for 16-bit digital inputs and $360 per channel for 16-bit digital outputs, the company said.

Preston Scientific, 805 E. Cerritos Ave., Anaheim, Calif. 92805.

■ Panafax Corp. has introduced the UF-400 digital facsimile machine, which measures 13- by 14-in. and weighs less than 27 lb, according to a spokesman for the company.

Features include line density of up to 391 line/in. and scanning of documents up to 11-in. wide. The unit prints on thermal paper. The UF-400's control panel includes eight displays, including an LCD digital display, resolution and contrast levels and header print information.

Any errors are displayed with a diagnostic code. Up to 30 documents can be accommodated in the machine's automatic document feeder.

The price for the UF-400 is $2,995, the vendor said.

Panafax, 10 Melville Park Road, Melville, N.Y. 11747.

■ MDB Systems, Inc. has announced an enhanced storage module drive (SMD) controller with data transfer rates of up to 2.5M byte/sec.

According to the vendof, the MLSI-DK11 is a 20-MHz quad-size controller for Digital Equipment Corp. Q-bus systems. It reportedly will operate disk drives with SMD interfaces that can operate at 1.2M byte/sec or the 1.8M and 2.4M byte/sec rates of the Fujitsu America, Inc. Eagle and Eagle XP.

The controller features a 22-bit direct memory access (DMA) data transfer addressing range for computer memory and block-mode DMA data transfer capability, according to the vendor.

It reportedly is transparent to most DEC operating system software with RM03, RM05, RM80 or RP06 emulation.

Scheduled for delivery in the first quarter of this year, the MLSI-DK11 is priced at $2,330.

MDB Systems, 1995 N. Batavia St., Orange, Calif. 92867.

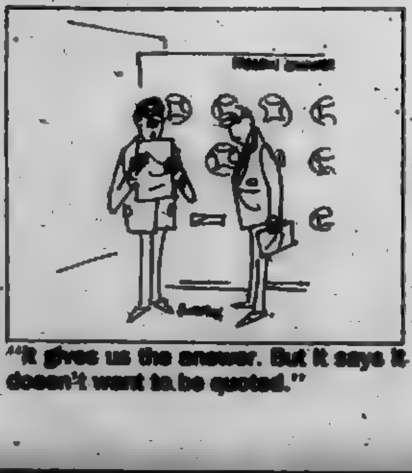
■ Emulex Corp. has announced Decathlon, a packaged subsystem utilizing the small computer system interface (SCSI) bus structure.

Decathlon also supports the IBM Personal Computer XT and compatible CPU bus structures using the vendor's SCSI host adapter. Connection to other CPUs can be made through a manufacturer-supplied host adapter, the vendor said.

According to the vendor, Decathlon comprises a basic chassis with power supply, the appropriate SCSI-compatible disk or tape controller, the user's choice of up to three 5¼-in. form-factor peripherals in either a single rack-mount cabinet or tower enclosure.

Pricing for the vendor's ERS/110-110-T package consisting of two 110M-byte formatted 5¼-in. disk drives with the ¼-in. cartridge tape drive is $15,425. Other prices vary depending on the equipment needed.

Emulex, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.



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3. Who will educate IC personnel-or end-users at their site or yours?
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation?
5. What provides a micro software facility that allows you to customize a system to your specific requirements?
6. Who are the premier micro consultants to the *Fortune* 1350 companies?
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals?
8. What is the easiest way for an IC manager to satisfy the many end-user needs in the organization?
9. What company's evolutionary approach to software and service (also demonstrated by NOMAD, now NOMAD2, the premier 4GL/DBMS) ensures that they'll be a major force in the micro marketplace for years to come?
10. Name the companies that can provide all of the above?

*(Turn Page Upside Down for Answers)

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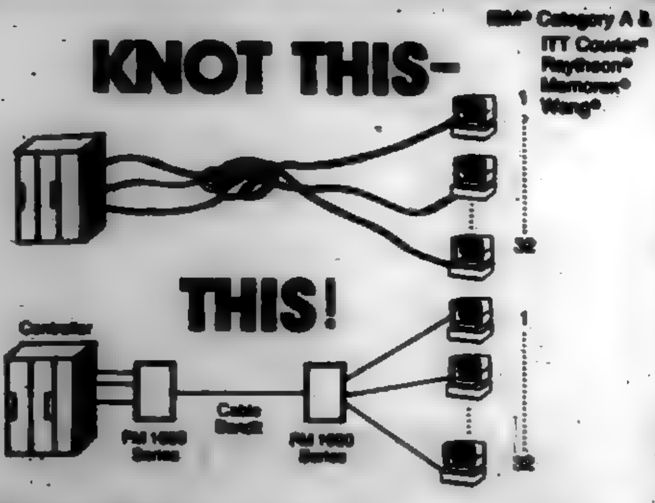

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SYSTEMS & PERIPHERALS

WANG from page 69

Wang system built around dual 2M-byte VS 100s and six 300M-byte disk modules.

At the time, Wang focused much more heavily on word processing than on DP, and the bias was clearly reflected in the VS product family's many shortcomings, Gowen recalled.

Although the bank's VS 100-based configuration worked well overall, he said, its disk switches failed frequently and, in so doing, "brought down the whole system." Other technological drawbacks with the Wang product included the absence of a standard communications protocol, high-speed printer and forms downloading capability.

Wang's defects also reportedly extended to the VS line's customer service and support. When the bank's system encountered a serious problem, support specialists back in the vendor's headquarters office were unable to simulate the customer's configuration and duplicate the breakdown, Gowen said.

To make matters worse, Wang's field support force proved to be woefully ignorant about many facets of DP technology, according to Gowen. Although the support staff members were attentive and diligent, they had clearly been "left out on a limb," he said. "They had come from a word processing background and weren't used to talking to the data processing world."

Since then, Gowen and the bank have reportedly doubled the VS 100 configuration's main memory to 4M bytes, replaced its original disk units with dual 640M-byte modules and added a high-speed communications pipeline between the system's two CPUs.

By chance, the growth in the bank's system coincided roughly with a steady expansion in Wang's product focus, Gowen said. Even though it has continued its traditional emphasis on word processing, the company has gradually intensified its technological assault on DP.

As evidence of his theory, Gowen cited Wang's recent introduction of the VS 300, which reportedly boosts the VS family's raw horsepower by adding a floating binary point. Because the announcement tacitly acknowledged users demand for increased throughput, the independent consultant hailed the VS 300 as a milestone in Wang's evolution as a DP-oriented vendor.

Another purported sign of Wang's expanded commitment to the DP workplace is the firm's emerging tendency to equip its systems with remote diagnostics. "[Wang isn't] just throwing some sand on the table and dancing around anymore," Gowen said. "They're developing the ability to service their systems in real time."

Gowen also sees DP-oriented progress in Wang's growing ability to identify operating systems defects and in its increased willingness to release firm timetables for correcting those problems. In the past, he recalled, customers were often left to guess about when the latest release of the company's VS control program would be debugged.

But for all its recent advances on the DP front, Wang has yet to address its VS users' needs for a high-speed printer or industry-standard communications protocol adequately, Gowen said.

Nor, apparently, has the company done all it should to upgrade its VS customer support. "All their telecommunications courses are still conducted on the East Coast — which isn't a lot of help for those of us in California," Gowen said.

"Are these things supposed to have commercials?"

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COMPUTER INDUSTRY

Retailers say Apple glut not in evidence on store shelves

By Kathleen Burton
CW West Coast Bureau

CUPERTINO, Calif. — There is no inventory glut of Apple Computer, Inc. products at the retail level, dealers and industry analysts said in the wake of Apple's announcement that it plans one-week shutdowns at manufacturing plants in order to correct swelled inventories.

Apple announced recently [CW, March 11] it will close four factories for one-week periods during March and April because of an oversupply of computers brought about by sluggish sales that it claimed are affecting the entire computer industry.

"The Apple dealers I've talked to aren't reporting an inventory overload on Macintosh or Apple II products, and this raises questions about where the excess inventory really is," said Michael Murphy, editor of the San Francisco-based "California Technology Stock Letter."

Murphy said sales of the Macintosh had actually improved during February because of a number of factors: Buyers are anticipating the imminent release of Lotus Development Corp.'s Jazz software program, IBM's discounts on its PCjr have expired, and Apple is now offering dealers a $400 rebate on bundled Macintosh systems.

Murphy said the one-week shutdowns will cut Apple production by 13,000 Macintosh computers, 15,000 Apple IIc computers and 10,000 Apple IIe computers. "It isn't that much considering Apple will sell a million computers this year," he said.

Michele S. Preston, a securities analyst with L. F. Rothschild, Unterberg & Towbin in New York, said the excess Apple inventory is in Apple's warehouses, not on retailer's shelves as the company has implied.

See EXCESS page 88

Regionals seen cultivating diverse styles

By James Connolly
CW Staff

Last of a three-part series

They are still more alike than different, "like the difference between 11 and 12 on the face of a clock," but the former AT&T regional holding companies will drift apart as the years go by, according to an industry research firm.

John Malone, president of the Eastern Management Group, took a look at the regional holding companies as an industry and as individuals and noted, "We find that each one of the holding companies has realized that they don't have to continue the momentum established in the 100 years of the Bell System. They are establishing their own ways, at least in subtle ways, with each company pursuing [its] own direction in areas best suited for [it]."

He offered a capsule summary of each company:

- **U.S. West** — "Clearly the most aggressive at moving into new areas," it considers itself a holding company that happens to own telephone companies, while other regionals see themselves as telephone companies branching out. The attitude is dictated by geography, as U.S. West serves a thinly populated region of the nation. Its various ventures include nationally marketed customer premise equipment (CPE), installation and international cellular telephone deals.
- **Pacific Telesys Group** — "Because of its relationship to the high-tech basin

See SHIFT page 81

- The private investor who bought out the Basic Four computer systems division of Management Assistance recently swept out key executives, but said he plans to keep the new company on its present course/82

- AT&T announced an agreement to buy 10% of software vendor Intermetrics, and the two companies said they will cooperate on opportunities in the U.S. federal-government market/84

- Honeywell announced the sale of its Japanese subsidiary to its former Japanese protege, NEC Corp./86

IBM regroups, appoints execs

ARMONK, N.Y. — IBM recently announced it has replaced its Information Systems and Technology Group with two new organizations and has made a number of related management changes.

According to John Akers, president and chief executive officer of IBM, "The new Information Systems and Storage Group will sharpen our focus on high-performance processors, storage and programming. The Information Systems Technology Group will concentrate on leadership in the semiconductor and packaging technologies that are essential across all areas of our business."

The Information Systems Technology

See IBM page 90

Piracy charged

BPI sues Kwik Kopy

AUSTIN, Texas — BPI Systems, Inc. announced recently it has filed suit in federal court here accusing Houston-based Kwik Kopy Corp. of illegally copying and distributing BPI software.

The suit alleges that since 1981 Kwik Kopy has required an estimated 900 franchises to purchase from the corporation general ledger and accounts receivable software for use on Apple Computer, Inc.'s Apple II+. BPI said those packages were pirated versions of BPI's general ledger and accounts receivable programs.

A spokesman for Kwik Kopy declined to comment.

BPI asked the court for actual damages

See SUIT page 87

Chip book-to-bill slump prompts criticism of figure's worth

INDUSTRY INSIGHT
Kathleen Burton
CW West Coast Bureau

The recent decline in the book-to-bill ratio, traditionally the primary indicator of the semiconductor industry, has prompted criticism from nervous vendors and others who said the figure misleads the general public and Wall Street investors.

Theoretically, the book-to-bill ratio balances the relationship between bookings — the value of chips ordered during a three-month period — and the value of billed, and presumably shipped, semiconductors.

However, the final figure is sometimes confusing. A rising book-to-bill ratio may mean that shipments are rising but not as fast as orders. Or it could mean that orders are falling, but shipments are falling faster.

In theory, a book-to-bill ratio over 1:0 usually indicates a healthy chip industry. A book-to-bill ratio below 1:0 is an indicator of ill health. But those who believe that the number summarizes every force in the industry are like baseball fans who only want to know the final score, said one Silicon Valley chip maker.

A survey of several Valley chip makers revealed several problems with the ratio:

- It is distorted due to the end-of-quarter shipment rushes commonly used by vendors to make sales and quarterly profits look stronger.
- Orders are averaged but shipments are not, and the resulting figure, some said, compares apples and oranges.
- The addition of Japan's semiconductor statistics last July has muddied the data.
- Some chip companies operate on 13-month years (as though every month had four weeks) and some chip manufacturers do not.

According to Gary Arnold, vice-president of finance at National Semiconductor Corp., people are as comfortable with the book-to-bill ratio as they are with the Dow Jones & Co. average, "so it stays." The primary fallacy of the ratio, he said, is that people believe it is a function of the amount of chips that are shipped. "If you closed the back door of an [integrated circuit] company and shipped nothing, you'd have a great number for that month [just as you would] if you shipped one [integrated circuit] and charged $1 for it," he said.

Arnold advocates factoring in several other items, including real dollar bookings compared with prior bookings and current capacity rates. Arnold said he prefers to use an integrated circuit industry computation called the business rate, which indicates orders and shipments over a 16-week time period. "This makes it easy to spot trends and take corrective action," he said.

According to Sheilah Sandow, communications director of the Semiconductor Industry Association, which publishes the book-to-bill figures, some industry observers make the mistake of using book-to-bill as the sole index of the industry's health. Sandow said industry watchers should supplement the book-to-bill with other indicators such as inventory backlog; price fluctuations across product lines; and "phantom bookings" — backlogged orders that will not be filled due to buyer cancellations. Other key statistics presently ignored by the ratio, Sandow said, included hiring trends and spending plans in the industry, new orders, current customer inventories and present capacity.

Analysts said the chip industry is not anxious to change or supplement the book-to-bill ratio, because companies are worried about sharing information with competitors. As long as chip manufacturers maintain secrecy and remain satisfied with the short-term gains made when the market is on a roll, they must live with the flawed book-to-bill ratio.

Regulating the offspring

Bell regionals seen caught in tug-of-war

Whether it is an asset or a handicap, each of the seven regional holding companies must deal with a half dozen or more regulatory bodies, several of which may offer conflicting opinions on the same issues.

Regulation comes into play when a divested Bell operating company wants to increase rates or offer a new service and when a regional wants to spin off a new subsidiary to sell computers.

Those having input into regulation include, at the federal level, U.S. District Judge Harold H. Greene, the Federal Communications Commission and the U.S. Congress, and, at the state level, the legislatures and public utilities commissions.

In a recent speech, Thomas E. Bolger, chairman of Bell Atlantic, charged that the regionals are "caught in the middle of a regulatory tug-of-war" and are "unable to compete under ground rules that don't apply to anybody else."

But according to W. Page Montgomery, a communications consultant at Economics and Technologies, Inc. of Sudbury, Mass., "[The regionals] may say that they are getting conflicting signals, but, on the other hand, it's to their advantage if they don't like the ruling they get from one body."

One federal official noted that it is becoming increasingly common for the regionals to shop for the regulatory forum where they think they have the best chance to win their arguments.

The official cited the example of the regionals asking Greene, rather than the FCC, to order $1 per line single-line access charges.

Greene, who has been bombarded with the regionals' requests for waivers from the Modified Final Judgment that would allow the regionals to enter new lines of business, has ceded authority for initial screening of those requests to the U.S. Department of Justice. Greene then decides whether to accept the department's recommendation.

Meanwhile, the FCC has authority to act on requests for changes in tariffed services, such as the recently approved requests for asynchronous-to-X.25 protocol conversion.

Montgomery said areas to be addressed by the regulators and the regionals are those of cost-based pricing and lifeline service. He noted that the regulators, who make political as well as economic decisions, recognize that most Americans can afford to pay for telephone service according to what it costs to provide that service. But he said the regionals also must take the initiative in developing criteria for determining who needs lifeline service as opposed to basic, subsidized telephone service.

According to Alan Pearce, a regulatory economist and president of Information Age Economics, Inc., in Washington, D.C., the financial success of the regionals in 1984 could cause them problems in 1985. "They did so well in their first year as independent operating companies that I see their financial results causing problems for them with state and federal regulators, even with Congress. For the past two years, all we had heard was [the regionals] crying poor mouth," Pearce said.

"They already have imposition of a $1 access charge in June 1985 for residences and another $1 in June 1986 for residences. The states and the FCC have clearly said they will freeze the access charges [at] $2, and I don't think the operating companies are going to get the increases they would like in 1986 and 1987," he said. "They face enormous, absolutely enormous problems," Pearce concluded.

Regionals' stocks 'neutral'

The numbers at the top say "profit," for the seven regional holding companies, but the bottom line for the investment community remains "neutral."

Like their former parent company, AT&T, which enjoyed an 11.2% stock price gain last year, all seven regionals saw their stocks gain in 1984, with gains in price per share ranging from 15.5% to 37.1%.

But despite the stock gains and earnings ranging from Pacific Telesys Group's $828.5 million to Bell South's $1.26 billion, the newsletter "Notes for Portfolio Managers," published by L. F. Rothschild, Unterberg and Towbin of New York, rates the regionals' stocks as "neutral." Rothschild said several of the regionals have appeal for conservative or income-oriented accounts, noting that fundamental uncertainties remain.

Investors' concerns include whether the regionals, some of which have cut more than 10,000 employees since divestiture, can continue to streamline their operations; the success of various new ventures in the nonregulated arena; the threat of bypass; and regulatory issues, including rate increases pending before state regulators for most of the regionals' 22 divested Bell companies.

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DRIFT

from page 79

in California, it may become the most progressive in terms of capitalizing on new technologies." It appears to be focusing on enhancing Centrex service and integrating data processing with telecommunications. It may venture into the retail telephone and computer arenas, while minimizing its efforts to provide more than dial-tone service to the residential customer.

■ **Southwestern Bell Corp.** — "They may be the most conservative of the regional operating companies in terms of their approach to new opportunities. It may be meaningful that when the other companies were choosing names that sounded like airlines, Southwestern Bell stayed with Southwestern Bell."

The company has concentrated on intra-Local Access and Transport Area call handling, with digitised networks in growth areas of the country like Dallas and Houston, but so have the others.

■ **American Information Technology** (Ameritech) — "With Ameritech we see little differences, No. 1 in terms of dealing with the business customer. Its CPE program revolves around Centrex, while with others, the PBX [private branch exchange] is the flagship." It is pursuing the data processing market and the cellular market, having more cellular experience than the other regionals.

But its network enhancement may lag because it is in a nongrowth area where laying miles of fiber is not easily justified. Its network enhancements will focus more on the central office switch.

■ **Nynex Corp.** — "Nynex has been a real surprise, perhaps the biggest surprise. Twelve months ago, 18 months ago, nobody expected much out of Nynex, but its CPE, its move into the data processing arena and its retail efforts have been surprises." Nynex is investing heavily in its central offices, adding digital switches and making less progress in the network itself.

■ **Bell Atlantic** — "It's a very different type of company. It's pursued some types of business that other companies haven't even thought of. What we see them doing is trying to pick up enough business so they can become a full, turnkey, cradle-to-grave company for not only telecommunications but data processing as well."

Its ventures include third-party maintenance, with the purchase of Sorbus, Inc., from Management Assistance, Inc., and leasing. Like Ameritech and Nynex, its population migration is outward, so fiber installations tend to be on its own equipment, with customer premises wiring only upon request from the customer.

■ **Bell South** — "There is a strong commitment to the telephone company here. It's the only area of the country where people said they would rather buy from the telephone company than from AT&T, so there will be a strong reliance on CPE." Situated in a growth area, Bell South has to do a lot of new wiring and has found it can install fiber for 10% less than cable.

Watch for more movement on the office automation side, because the company has been PBX-oriented and is now looking at PBXs that will require a data application to justify their purchase.

LeBow vows steady course after MAI housecleaning

By Kathleen Burton
CW West Coast Bureau

TUSTIN, Calif. — After recently sweeping out key management executives from MAI/Basic Four Information Systems, Inc., the firm's new owner and acting president, Bennett S. LeBow, said he intends to keep the former computer systems division of Management Assistance, Inc. (MAI) on its current course.

Spun off during the liquidation of MAI, the new company fired Steven J. Keene, long-time MAI/Basic Four president, and Joseph Barsa, international sales vice-president, on March 3, just over a month after the company was purchased by LeBow, a private investor.

LeBow

LeBow said the company's new product strategy and customer base would remain the same and that he is "committed to returning the company to profitability and [correcting] last year's minor mismanagements.

"It was time to make a change," LeBow remarked following the management reorganization. He said the fired executives "had been at the company too long and were set in the old company ways." LeBow and William Weksel, an associate from LeBow's New York-based investment company, LeBow Industries, Inc., will temporarily head MAI/Basic Four until a new president is found.

A week prior to his dismissal, Keene had expressed optimism about the company's future. "We're in excellent shape," he said. "We're really a $300 million start-up with none of a start-up's disadvantages." Keene said the company's business plan would continue to target vertical markets — such as manufacturing and retail — that had made the company successful in the past. "We plugged some of the holes in our product line with the [Series 2000 multiuser microcomputer] introduction last November, and we're committed to getting more new products in the pipeline this year," he said.

LeBow, who said he is the sole investor in the new company, purchased MAI/Basic Four, based here, in January from MAI for $30 million in cash and $75 million in securities.

Although the firm was financially beleaguered last year, with operating losses of $10.2 million on sales of $260.1 million, LeBow said he was attracted to the company because of products under development, revenue potential projected at $280 million for fiscal year 1985, an installed base of 28,000 users, name recognition in the marketplace and a sales and distribution network in 30 countries.

Company officials said 1984's financial setbacks were based on nonoperational factors, including unfavorable foreign exchange rates, legal fees and the cost of advertising to counter the adverse publicity brought on by last year's proxy battle at MAI that resulted in the liquidation of its assets.

But company insiders privately conceded that the company's poor financial showing owed to mismanagement, a new product line that was late getting to the market, corporate headquarters overhead of $9 million and the drain on corporate coffers by a software retail operation in Albuquerque, N.M., that was dissolved in 1984 after losing $13.5 million for the year.

> *'[The fired execs] had been at the company too long and were set in the old company ways.'*
>
> — **Bennett S. LeBow**
> **MAI/Basic Four Information Systems, Inc.**

Elliott Schneider, an analyst with Gruntal & Co. in New York, said MAI's troubles over the last two years primarily owed to management's failure to research new products. "The company was a sitting duck for Edelman," Schneider said, referring to last year's proxy battle begun by arbitrageur Asher Edelman.

LeBow's company will continue to manufacture and market the MAI/Basic Four line of computer systems, including the recently introduced Series 2000 and the Series 8000 multiprocessor business management system. Maintenance of MAI/Basic Four systems will be handled in the U.S. by Sorbus, Inc. — MAI's former Sorbus Service division sold to Bell Atlantic.

According to Fred D. Anderson, MAI/Basic Four's vice-president of finance, the company may take a write-down of noncurrent assets following the recent $24 million sale of its Canadian operation, MAI Canada, Inc., to Bell Atlantic that would reduce LeBow's purchase price by $7.7 million.

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TRW inks pact to buy Ultimate

FAIRFIELD, N.J. — TRW, Inc. recently announced that it has reached an agreement in principle to acquire Ultimate Computer Services, Inc., a supplier of reconditioning and refurbishing services for used IBM equipment.

Under the agreement, Ultimate will become part of TRW's Customer Service Division, a provider of maintenance and repair services to users of computers and related electromechanical systems.

TRW will acquire Ultimate's Rockaway, N.J., and Bensonville, Ill., refurbishing and storage operations and field engineering operations located in New York and three New Jersey locations.

TRW's Customer Service Division, headquartered here, employs 2,800 service professionals and claims more than 100,000 customers throughout North America.

Intel files against NEC

SANTA CLARA, Calif. — Intel Corp. recently announced that it filed suit against Sunnyvale, Calif.-based NEC Electronics, Inc., a subsidiary of NEC Corp., alleging that the company had violated Intel's copyrights on its 8086 and 8088 microprocessors.

Intel claimed that the microcodes on two NEC Cmos microprocessors, the V20 and V30, announced by NEC last April, are duplicates of Intel's 8086 and 8088 microprocessors. Tom Dunlap, Intel's general counsel, said, "We have reviewed the NEC V series microcode and have concluded it is sufficiently similar to infringe the copyrights on our products."

Though NEC's microprocessors were developed overseas, the company recently announced plans to import and market the products in the U.S., according to Bob Hinkley, NEC's legal counsel.

Hinkley said that NEC filed suit in San Jose, Calif., federal court last December, seeking to bar Intel from suing NEC once V series sales began in the U.S. He added that NEC's products are enhanced, yet substantially different versions, of Intel's 8086 and 8088 products.

Hinkley said an investigative period by both companies will be followed by a trial in San Jose federal court.

AT&T agrees to acquire 10% of Intermetrics

BERKELEY HEIGHTS, N.J. — AT&T recently announced it has agreed to acquire a 10% interest in Intermetrics, Inc., a software services and products vendor, and that the two companies have reached agreement in principle on a plan for pursuing mutual business interests in the U.S. federal government market.

Under the agreement, which is subject to approval by the boards of both companies, AT&T would acquire 10% of Intermetrics' outstanding shares at $8.25 a share, or more than $[illegible] million. AT&T would be granted an option to increase its ownership share to 20% in one year for an undisclosed higher price. It also would acquire the right to obtain additional Intermetrics shares in the public market. However, it would be prohibited from acquiring more than 30% of all Intermetrics' shares during a three-year period.

Based in Cambridge, Mass., Intermetrics employs 600 people at 10 locations in the U.S. In the fiscal year just ended, the company was operating at an annualized revenue level of $42 million, based on the first nine months.

The company will pursue federal market opportunities in concert with AT&T's Federal Systems division.

The arrangement is subject to approval by the boards of directors of both companies. The final agreement is expected to be completed by the end of the month.

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NEC to buy Honeywell Japan

MINNEAPOLIS — Honeywell, Inc. announced recently that it will sell its Honeywell Information Systems Japan subsidiary to NEC Corp. Terms of the sale were not disclosed.

Honeywell Information Systems Japan, based in Tokyo, distributes and supports Honeywell's medium and large computer systems in the Japanese market. Honeywell and NEC have had a lengthy relationship that started with NEC marketing Honeywell products.

This relationship has evolved to the point where Honeywell markets NEC's large-scale computer systems in the U.S.

Honeywell said Honeywell Information Systems Japan employees will transfer to NEC, where the business will be operated as a separate subsidiary.

According to the firm, NEC will distribute, maintain and provide support for Honeywell computer systems in Japan as part of a new distribution agreement to be signed by the two companies.

National Semi modifies shutdown; lays off 400

SANTA CLARA, Calif. — National Semiconductor Corp. recently announced it had decided to stretch a scheduled 10-day production shutdown over a 10-week period and said it would also lay off 400 employees because of the retooling of a manufacturing module at its Salt Lake City facility.

The company said it would implement four-day workweeks beginning March 17 at all North American and European operations. In January, the company had announced it would shut down for two weeks in April to keep inventories in balance while the semiconductor industry tries to recover from a severe and prolonged sales slump.

At the Salt Lake City facility, the company said it will shut down one production line for retooling and will be forced to lay off the workers there. When production resumes on that line, the furloughed workers will be given first choice for the new jobs, the company said.

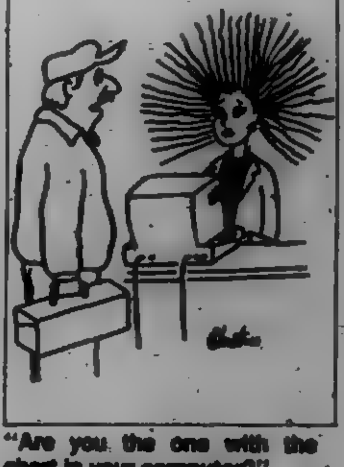
Micro firm's exec hired from DEC

MOUNTAIN VIEW, Calif. — The former group manager for Digital Equipment Corp.'s Rainbow microcomputer product was recently appointed by Sun Microsystems, Inc., to the position of vice-president, East Coast engineering.

Barry J. Folsom led the DEC group that developed the Rainbow 100 models. DEC recently announced a production halt of the Rainbow and later announced a repackaged version.

Sun Microsystems said the appointment represents the company's strategy of establishing a strong engineering presence on the East Coast.

The company said Folsom will be involved in recruiting from the pool of engineering talent graduating from leading East Coast universities and will closely serve Sun Microsystem's East Coast customers.



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Signetics chief resigns

SUNNYVALE, Calif. — Charles C. Harwood has resigned as president and chief executive officer of Signetics Corp. of Sunnyvale, Calif., just days after the semiconductor company announced it will lay off as many as 400 U.S. employees by the end of this month.

Harwood said his decision to leave the firm April 1 is not related to the layoffs.

"I've been thinking about this for two years," he said. Harwood said his decision was based on the fact that he has headed Signetics for more than 14 years. "I felt it was time for a change for myself and for the company," he said.

Harwood said the company is "in good shape and will ride out the semiconductor industry's hurricane."

Signetics' shortened workweek and the layoffs are responses to the semiconductor industry's slump.

No successor to Harwood has been named. Norman A. Neumann, executive vice-president of U.S. Philips Corp., Signetics' parent company, will temporarily take over as CEO.

Harwood will join a new firm, Quality Improvement, Inc., of Palo Alto, Calif., as a partner. The company will offer courses in improving the quality of management and technology. Harwood said this is an area of interest for him, adding that, while at Signetics, he promoted the reduction of chip defects by discovering problems during production instead of catching them during the inspection process.

During his tenure at Signetics, annual sales grew from $31.5 million in 1970 to $720 million in 1984. Signetics is owned by the U.S. Philips Trust, whose beneficiaries are the shareholders of N.V. Philips of the Netherlands.

SUIT

from page 79

of up to $711,000 and punitive damages of $1 million, in addition to an injunction barring Kwik Kopy from making or distributing any additional copies of BPI software.

Peter H. Mills, senior vice-president of BPI, said the alleged piracy was discovered in late 1984 when a BPI salesman was in a Kwik Kopy franchise and was shown the Kwik Kopy software in operation. The salesman recognized that the package was identical to BPI's program, Mills said.

BPI met with Kwik Kopy representatives twice in an attempt to resolve the conflict, Mills said.

"If you ask me, they're nothing but dust collectors."

EXECUTIVE CORNER

Harry Taxin has been named president and chief operating officer of Cubicomp Corp.

■

Michael Hackworth has been appointed president and chief executive officer at Cirrus Logic, Inc. Hackworth was previously with Signetics Corp., where he held management, marketing and sales positions for 13 years.

For the past five years, Hackworth served as senior vice-president in charge of Signetic's MOS and linear marketing, manufacturing and technology programs. Before that, he was in charge of its field sales and bipolar digital marketing.

■

Kenneth Simonds has been appointed president and chief operating officer of Teradata Corp. Simonds joins Teradata from Amdahl Corp., where he left a position as executive vice-president. Prior to Amdahl, Simonds was employed for 18 years by IBM.

■

Jack Noonan has been named vice-president of technical services of the computer services division at Candle Corp. Noonan was vice-president of corporate product support and services for Amdahl Corp.

■

Arthur D. Little, Inc. announced that its board of directors has elected two vice-presidents. The new officers are **Thomas Gunn**, manager of the computer-integrated manufacturing section, and **Arthur Solomon**, manager of the telecommunications section.

■

Roy Wright has joined Corvus Systems, Inc. as chief operating officer.

■

Robert Reiser has been named group vice-president and president of international operations and has appointed **Roger Levien** as vice-president in charge of the corporate strategy office at Xerox Corp.

■

Richard Swee has been named director of software development at Charles River Data Systems. Swee joined Charles River after 14 years with Honeywell, Inc., where he managed network development departments.

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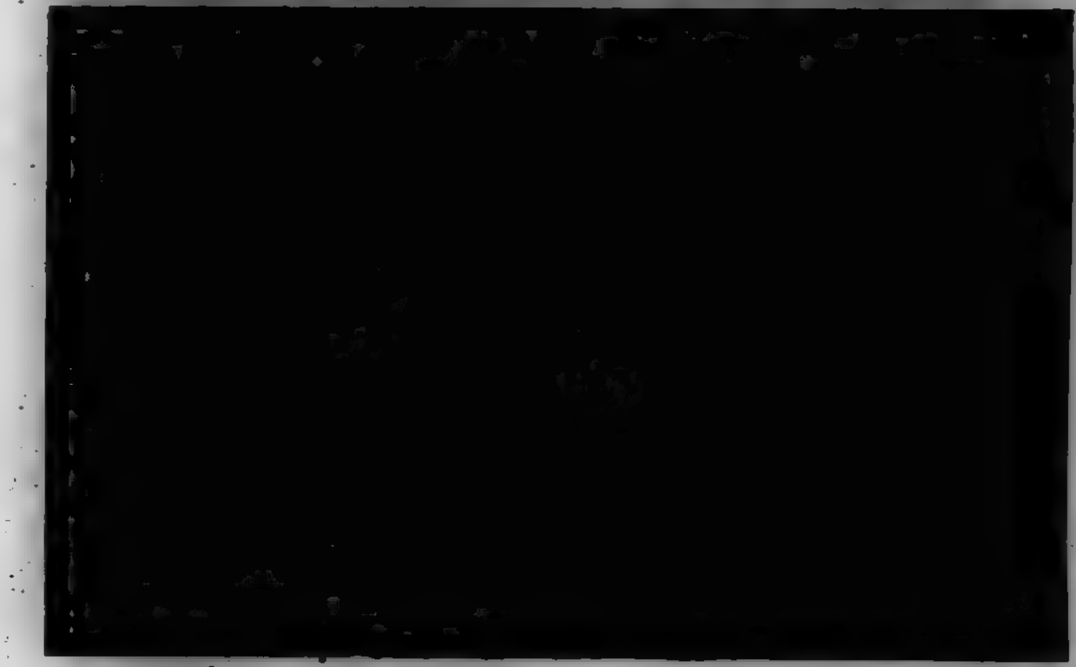

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GTE Data Services, Inc. has established a commercial services division to market products and services to the telecommunications industry. **Richard McMichael** has been named vice-president and general manager of the new division.

The company, which is a subsidiary of GTE Telenet Communications Corp., provides data processing and systems development services to GTE telephone companies through its 10 computer centers located across the country.

■

Northern Telecom, Inc. and Wang Laboratories, Inc. announced the successful completion of tests verifying the compatibility of Northern Telecom's SL-1 digital business communications system with Wang integrated information processing equipment.

The test results represent a major advance in Wang's development of a computer-to-PBX interface (CPI) for use with the SL-1. The CPI development, which is nearing completion, is part of an operating and development agreement that was signed by Northern Telecom and Wang in late 1983.

■

Hewlett-Packard Co. said it will establish a manufacturing operation in Barcelona, Spain, to produce graphics plotters for the European, Middle Eastern and African markets.

The operation is HP's first manufacturing facility in Spain. It will be part of the company's San Diego division where the operation's products, which have business and technical applications, are developed.

HP also announced it has named **Wolf Michel** as general manager of the Spanish operation, which will be called the Barcelona Peripherals Operation.

■

Valid Logic Systems, Inc. of San Jose, Calif., announced an agreement with **Thomson-CSF** of Saint Denis, France, for the manufacture of Valid computer-aided engineering workstations.

This four-year contract authorizes the Centre Electronics de Laval of Thomson-CSF to manufacture Valid computer-aided engineering workstations to be sold in Europe.

More than 50 companies that comprise this country's community of authorized vendors of stock exchange information have announced their decision to affiliate with the Information Industry Association (IIA), a 16-year-old trade group of information companies, rather than form their own association.

The financial vendors include such Wall Street companies as Monchik-Weber Corp., Stewart Data, International Marketnet, Telerate Systems, Inc., Track Data, Trade Center, Inc., The Option Group, U.S. Quotes and Reuters Ltd., among others including companies such as Dow Jones & Co., Quotron Systems, Inc. and Autex Systems.

Taking the name Financial Information Services Division, the stock exchange information vendors add a third division to IIA, along with Videotex and Database Publishing.

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EXCESS from page 79

The industry's seasonal slowdown is not confined to Apple, Preston said, but Apple has been hit harder than rival IBM because of its heavier reliance on the consumer market, which normally slows down after Christmas. Apple straddles the home and business markets, and the home market has been hurt by skepticism about a computer's usefulness in the home, Preston said.

A survey of several computer chains, including Computerland Corp., Businessland, Inc., Gateway Computer and Computercraft, revealed that the Macintosh and Apple II products were selling at anticipated levels following the Christmas season.

Sue Crocker, spokeswoman for San Jose, Calif.-based Businessland, said she did not know why Apple was reporting excess inventory in the retail channel. "This is not the case at any of our franchises," Crocker said, adding that the Macintosh enjoyed strong sales in January and February, and sales are currently brisk in expectation of the Macintosh Office products rollout.

Greg Archer, manager of three Southern California Computerland franchises, said there was no inventory excess of Apple products at any of his stores. "Aside from the seasonal slowdown, sales have been as expected," he said. However, Archer said, sales of Apple products have fallen over the past year because of the abundance of computer outlets, mail-order discounters and independent retailers that compete with the full-service Apple dealers. "It seems like anyone can sell Apple [computers] now — even a kid with a lemonade stand," he said.

Armand Shapiro, senior vice-president of research and development at Houston-based Computercraft, said sales of Apple products at the franchise have been seasonally slow, typical of the after-Christmas period. "But it's not that serious," he said, "and should correct itself."

Aside from the seasonal slowdown, Shapiro blamed flat Apple II sales on pressure from IBM's PCjr; he said Macintosh sales problems owed to competitive IBM pricing and the lack of software available for the Macintosh at Christmas. But more software is available now, he said.

An Apple spokesman said inventory had built up in the company's six regional distribution centers and that dealer orders were weak.

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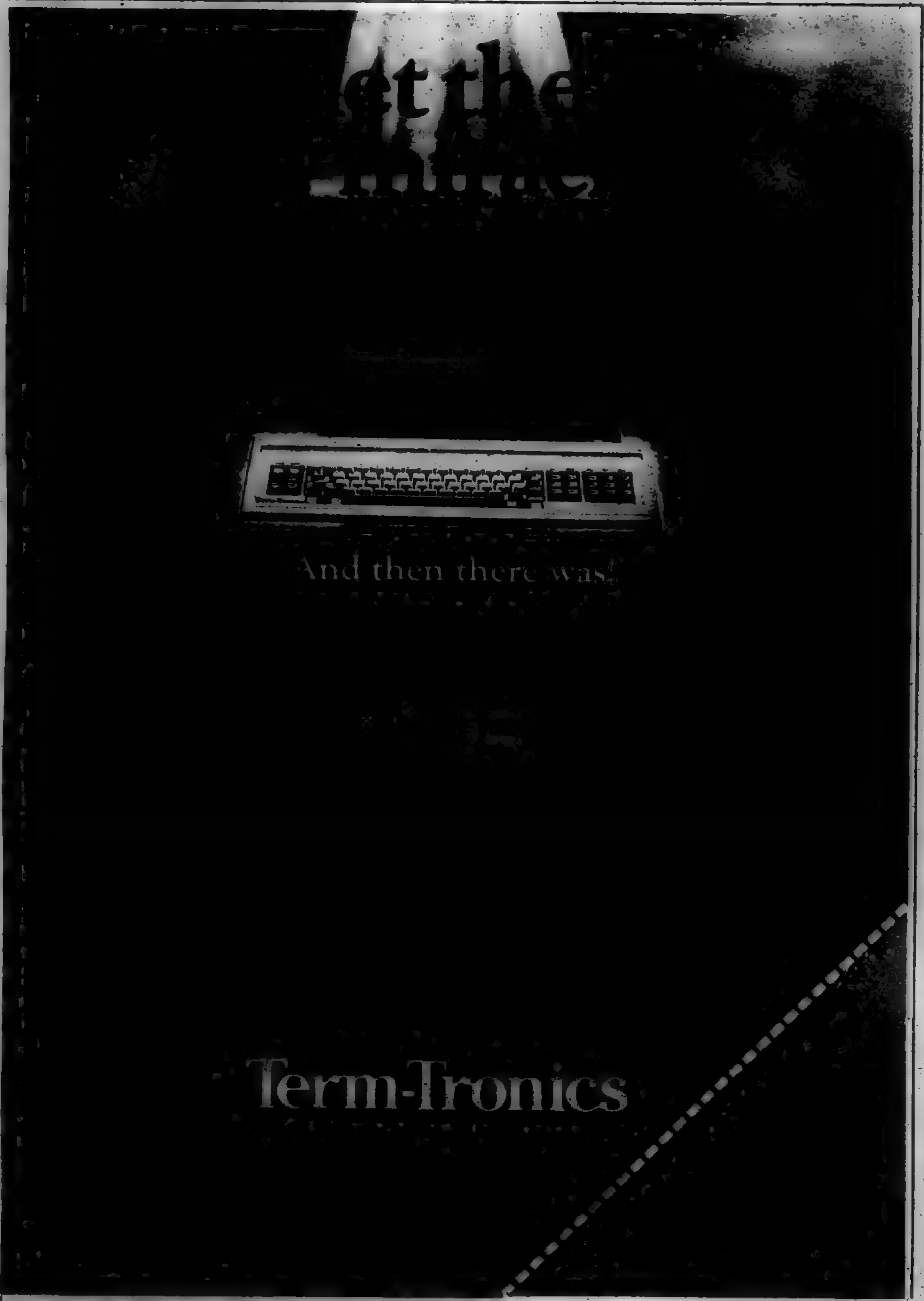
IBM reassigns Estridge to manufacturing

ARMONK, N.Y. — IBM announced Feb. 12 the reassignment of Philip D. Estridge, the executive who managed a small microcomputer development group that in 1981 announced the IBM Personal Computer and evolved into the Entry Systems Division.

Estridge, a corporate vice-president, was named vice-president of manufacturing with staff responsibilities for the company's worldwide manufacturing strategies.

He was succeeded as president of Entry Systems Division by William C. Lowe, who was formerly assistant group executive for IBM's Information Systems and Communications Group. Estridge replaced Edward M. Davis, who earlier was named president of the Data Systems Division of IBM's Information Systems and Storage Group.

An IBM spokesman last week said the move reflected a shift of responsibilities and declined to say whether Estridge's assignment was a promotion. IBM also denied speculation of corporate dissatisfaction with the Entry Systems Division.



IBM

from page 79

Group includes the general technology division, which manufactures logic, memory and special semiconductor devices and multilayer ceramics; and the system technology division, which manufactures circuit packaging, develops and manufactures intermediate processors and printers and develops programming systems.

The Information Systems and Storage Group includes the data systems division, which is responsible for the development, manufacture and associated programming for large complex systems; and the general products division, which is responsible for the development and manufacture of storage systems.

Paul J. Rizzo, IBM vice-chairman, was named review executive for the operations of IBM's worldwide marketing and service units, a responsibility formerly held by Akers.

Review executive named

Jack D. Kuehler, senior vice-president and formerly group executive under the replaced structure, was appointed to IBM's business operations committee, with new responsibility as review executive for the worldwide development and U.S. manufacturing operations of IBM's product groups.

John E. Bertram, vice-president and former president of the general products division, was named group executive for Information Systems Technology Group and was appointed as a member of the corporate management board.

John P. Cunningham was named assistant group executive for plans and controls for Information Systems Technology Group.

Group executive appointed

Carl J. Conti, vice-president and former president of the data systems division, was named group executive of Information Systems and Storage.

IBM vice-president Edward M. Davis was named data systems division president.

Ray S. Amuzayyad was named general products division president.

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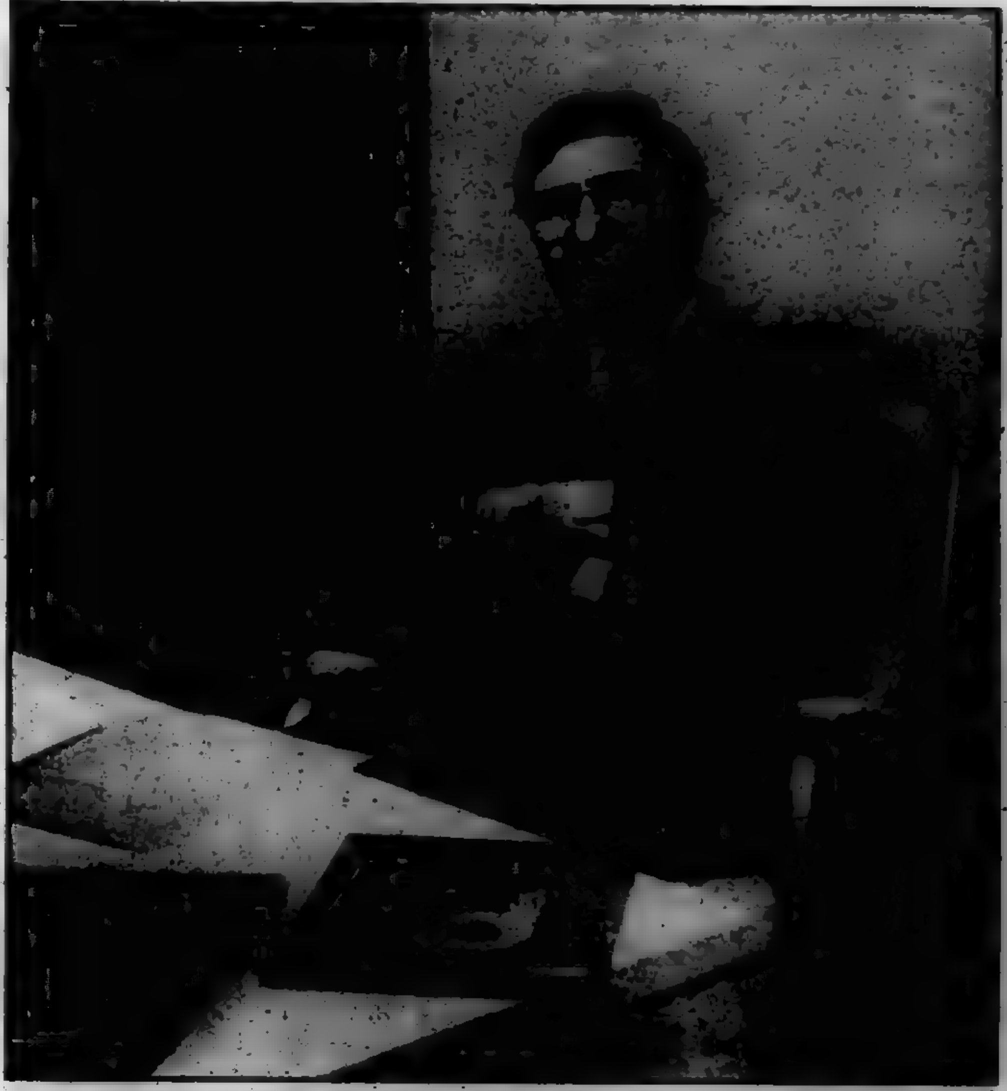

Bob Gildenberg, Vice President, Marketing, Philon, Inc., NY, NY

Bob Gildenberg is Vice President of Marketing for Philon, Inc. He is responsible for marketing fast-executing compilers for UNIX-based microprocessors. To sell his product, PHILON FAST/Compilers, he has to talk to executives at hardware manufacturers, software houses, systems integrators and VAR's, as well as government and selective end-user organizations.

He has found, through experience, that even though Computerworld is primarily positioned as an MIS/DP publication, it does the job for him.

> *"We didn't have as much money as we would have liked when we started, and rather than spreading our ads throughout several books, giving us a weak presence in each, I chose to concentrate in Computerworld. It was my sense that it reached most of the people I needed to talk to. And its weekly frequency would allow us to roll out faster than we could have with most other publications. The results have shown that judgement to be accurate.*
>
> *"More than 30 major hardware manufacturers have already signed up to distribute PHILON FAST/Compilers. In addition, many software companies will be using our compilers to speed development of their own products. So far we have exceeded our sales forecasts and have increased next year's forecast by over 300%."*

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NICKELS AND DIMES

T-Bar, Inc. announced revenue for the year ended Dec. 31 of $40.9 million, up 19% from $34.5 million in the same period one year earlier. Profits were $1.6 million, or 40 cents per share, compared with $782,000, or 20 cents per share, in 1983.

■

Masstor Systems Corp. reported fourth-quarter revenue of $9 million, compared with $7.4 million in the same period last year. The company posted a net loss of $3.3 million, or 21 cents per share, compared with a net loss of $3.8 million, or 25 cents per share, for the prior year's period. For the year, the company posted revenue of $26.2 million, compared with $21.8 million in 1983, and a loss of $17.3 million, or $1.11 per share, compared with a loss of $10.2 million, or 76 cents per share, in 1983.

■

Informatics General Corp. reported revenue of $191.1 million for the year ended Dec. 31, compared with $152 million in 1983. Profits were $6.2 million, or $1.12 per share, compared with $5.7 million, or $1.10 per share, in 1983. The company's fourth-quarter profits were $3.7 million, or 69 cents per share, on revenue of $56.9 million; in 1983, the company's profits were $3.7 million, or 68 cents per share, on revenue of $47.6 million.

■

Anacomp, Inc. reported first-quarter revenue of $31.5 million, compared with $34.8 million in the same quarter last year. The company posted a first-quarter net loss of $2.5 million, or 16 cents per share, compared with a net loss of $37.1 million, or $2.93 per share, a year earlier.

■

Communications Satellite Corp. reported revenue for 1984's fourth quarter of $120.3 million, compared with $107.7 million in the corresponding quarter last year. Profits were $14.3 million, or 79 cents per share, compared with $8.7 million, or 47 cents per share, in the corresponding period one year earlier. For the year, the company reported revenue of $442.3 million, compared with $440.4 million in 1983, and profits of $51.2 million, or $2.83 per share, compared with $50.1 million, or $2.77 per share, in 1983.

■

Scientific Micro Systems, Inc. announced revenue for the year ended Dec. 31 of $41.1 million, compared with $22.8 million the year before. Profits were $3.3 million, or 53 cents per share, compared with $2.4 million, or 46 cents per share, in 1983.

■

Silvar-Lisco announced revenue for the third quarter ended Jan. 31 of $4 million, an increase of 32% over the $3.1 million figure reported for the period last year. Profits were $205,000, or 3 cents per share, compared with $178,000, or 4 cents per share, for the corresponding quarter one year ago.

■

Zentec Corp. reported a profit for the fourth quarter ended Dec. 31 of $129,000, or 3 cents per share, compared with a loss of $1.6 million, or 49 cents per share, in the same quarter one year ago; revenue was $5.3 million, compared with $5.8 million in the corresponding 1983 quarter.

■

Perkin-Elmer Corp. announced that revenue for the second quarter ended Jan. 31 increased 13% to $329 million from $291 million a year ago. Profits were $18.7 million, or 42 cents per share, compared with $14.3 million, or 32 cents per share, in the same period last year.

■

Uccel Corp. reported profits for the three months ended Dec. 31 of $3.9 million, or 24 cents per share, compared with $1.2 million, or 7 cents per share, in the comparable period one year earlier. Revenue was $48.7 million, compared with $44.5 million in the corresponding quarter one year ago. For the year, the company posted profits of $7.9 million, or 49 cents per share, on revenue of $173.4 million, compared with 1983 profits of $187,000, or 1 cent per share, on revenue of $152.9 million.

■

Miniscribe Corp. reported a net loss of $5.7 million for 1984 on revenue of $123.6 million. During the previous year, Miniscribe earned $4.7 million, or 28 cents per share, on revenue of $76.5 million.

■

Data I/O Corp. announced profits for the fourth quarter of $957,000, or 9 cents per share, compared with $1.7 million, or 16 cents per share in the corresponding period a year earlier. Revenues were $13.1 million, compared with $11.5 million in the same quarter one year ago.

■

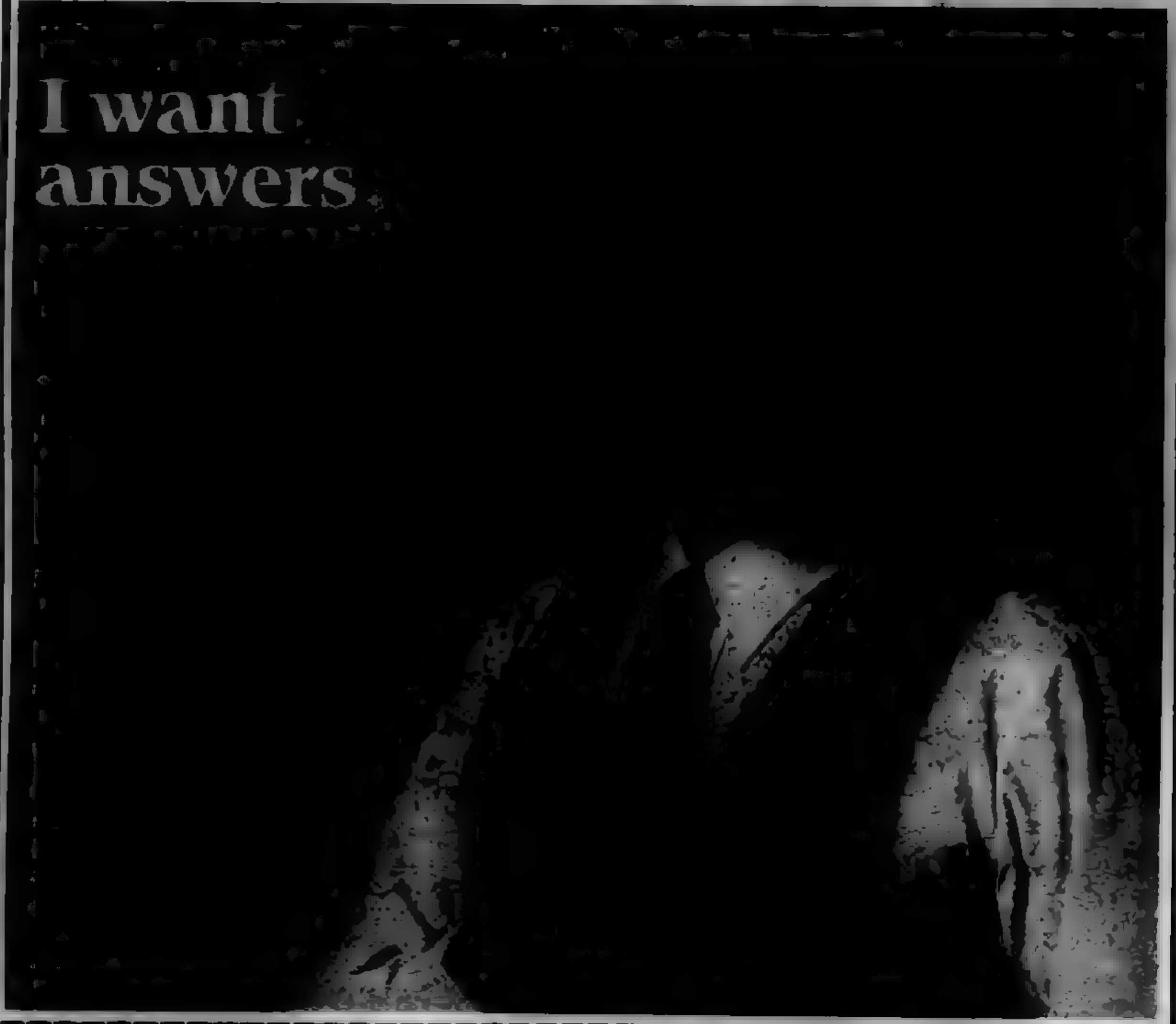
Computer & Communications Technology Corp. reported revenue for the fourth quarter of $33.2 million, up 58% over the comparable period last year. Profits were $3.2 million, or 42 cents per share, compared with a year-earlier loss of $27.3 million.

■

Gerber Scientific, Inc. reported profits for the third quarter ended Jan. 31 of $6.2 million, or 36 cents per share, an increase of 70% over $3.6 million, or 23 cents per share, in the prior year's quarter. Revenue was $52.5 million, compared with $41.6 million in the like period one year earlier.

■

Gerber Systems Technology, Inc., Gerber Scientific, Inc.'s 80% owned subsidiary, reported a loss of $566,000 for the period ended Jan. 31, compared with a net loss of $300,000 in the comparable period one year ago.



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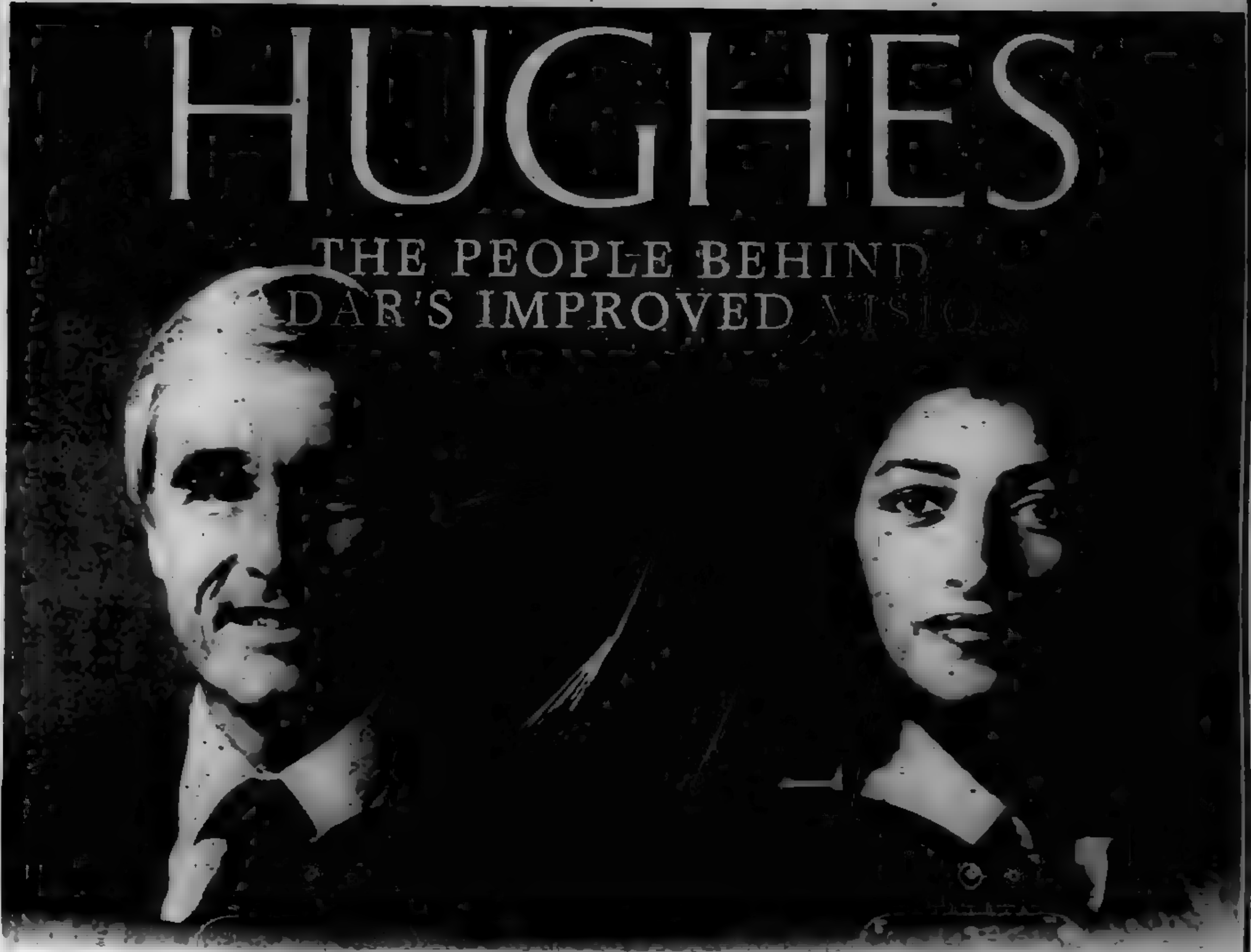

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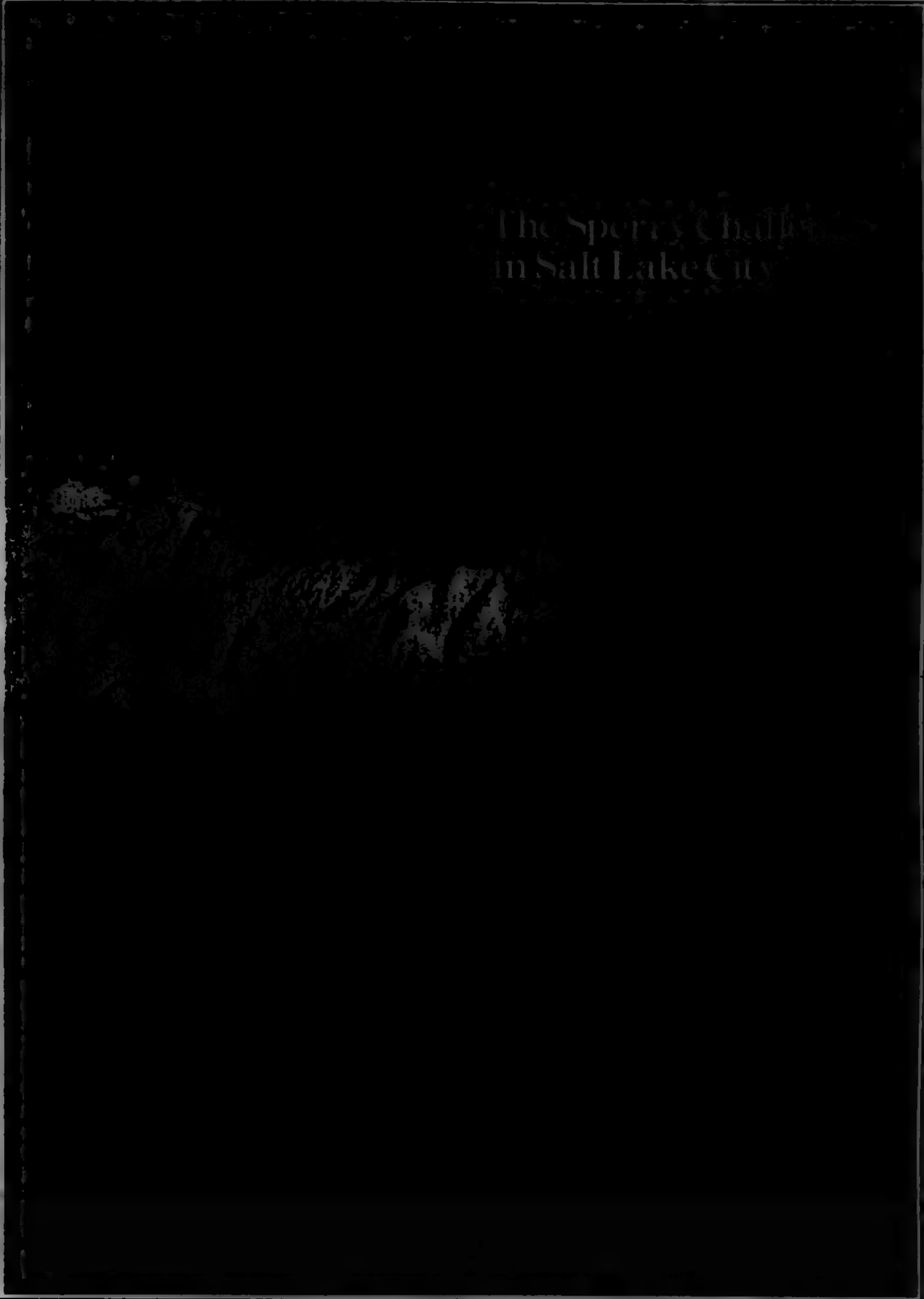

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COMPUTERPEOPLE, a national data processing placement and contract services company is expanding in Florida with a new Ft. Lauderdale Office. Our growth and the continued need for qualified data processing personnel in Florida combines for outstanding opportunities for you. We will provide a knowledgeable approach to your career planning because our Placement Counselors are former D.P. Managers. If you are a CONTRACT PROGRAMMER, SYSTEMS PROGRAMMER, PROGRAMMER/ANALYST, SYSTEMS ANALYST, or PROJECT LEADER with a background in one or more of the following, we may have the opportunity you've been seeking:

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(305) 771-[illegible]

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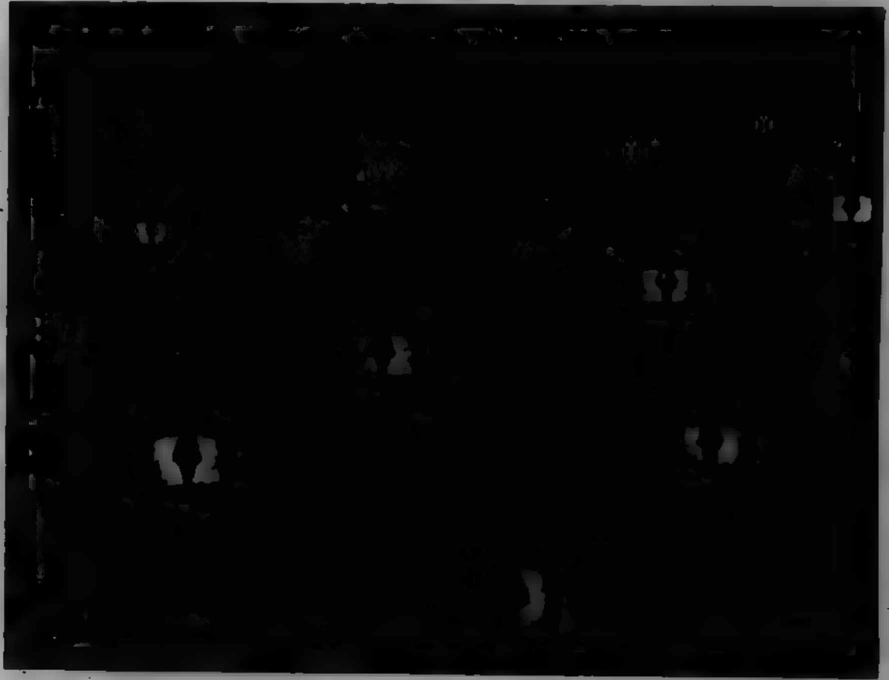

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FLORIDA

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Opening for Information Analyst/Designer to design and develop computer based Management Information Systems utilizing Fourth Generation Computer Software and Languages for business applications in support of Corporate Accounting and Marketing units of company, including project definition, development, installation, documentation and related activities; and assist in operation of Information Center by providing post-implementation user support, establishment and implementation of user training in Fourth Generation Computer Languages, and continuous software upgrading to current state of technology in Fourth Generation Computer Language. Position is with manufacturer of food products situated in Battle Creek, Michigan. Qualified applicants must have MBA degree with major in Management Information Systems, or must have M.S. degree in Management Information Systems with graduate school courses in Corporate Accounting, Market Research and Econometrics (one course required in each). Applicants must also submit one Management Information Systems graduate school project involving Fourth Generation Computer Software and Languages. Starting salary $27,040 per year plus company benefit plan for 40 hour week. Send resume, transcripts showing required coursework, and graduate school project to:

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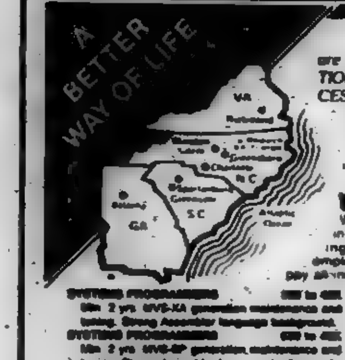

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Positions range from Programmer up through Project Managers supporting internal applications (finance/accounting, purchasing, sales/marketing, inventory, order entry). Responsibilities will include the design, development and implementation of new systems as well as support and upgrade of existing systems. Experience in OS/MVS, CICS, and structured design techniques highly desired.

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- in-depth knowledge of automation technology.
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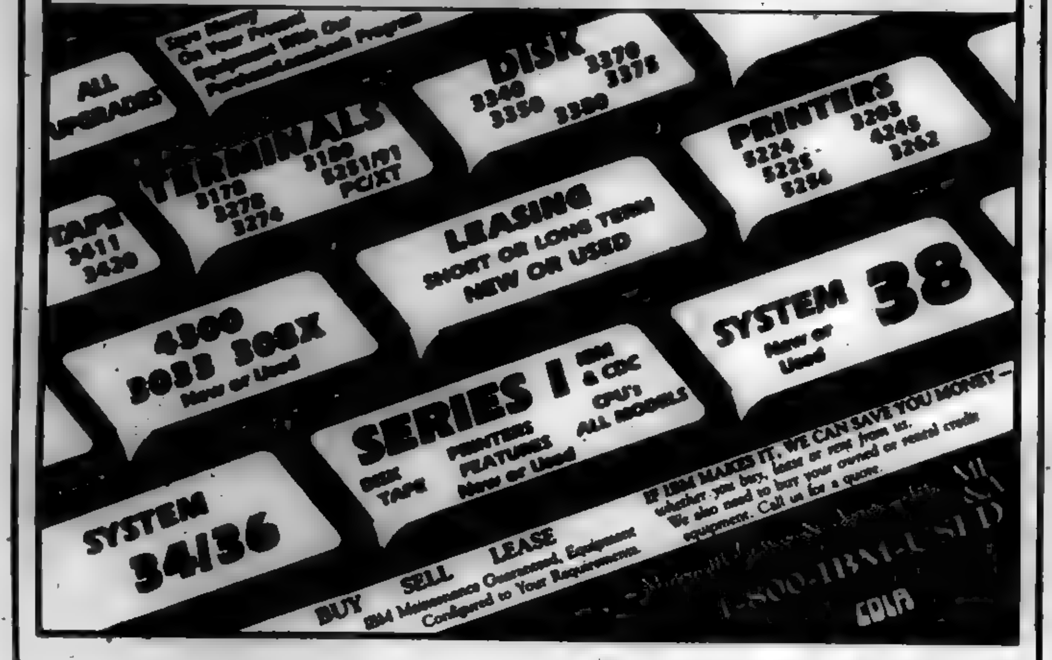
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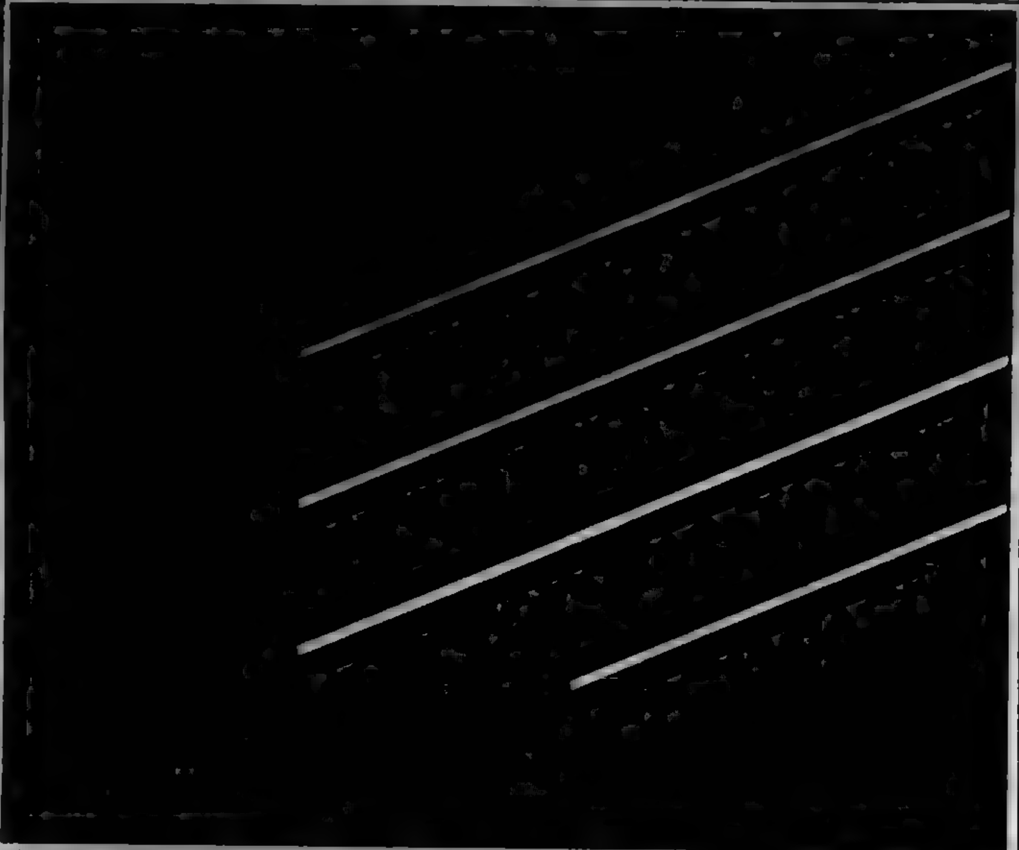

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Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications include Burroughs, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Sperry Univac, Salvage, Terminals, Misc. Systems and Miscellaneous.

Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be clearly typewritten. Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $140.00 (One unit minimum and no fractional units allowed.) There are no agency commissions and no quantity discounts.

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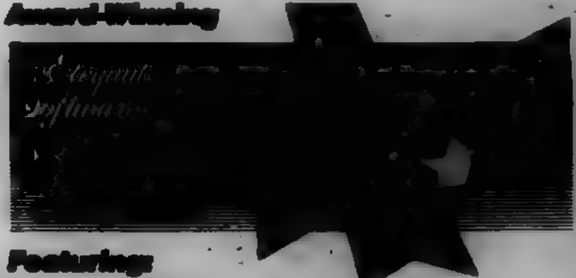

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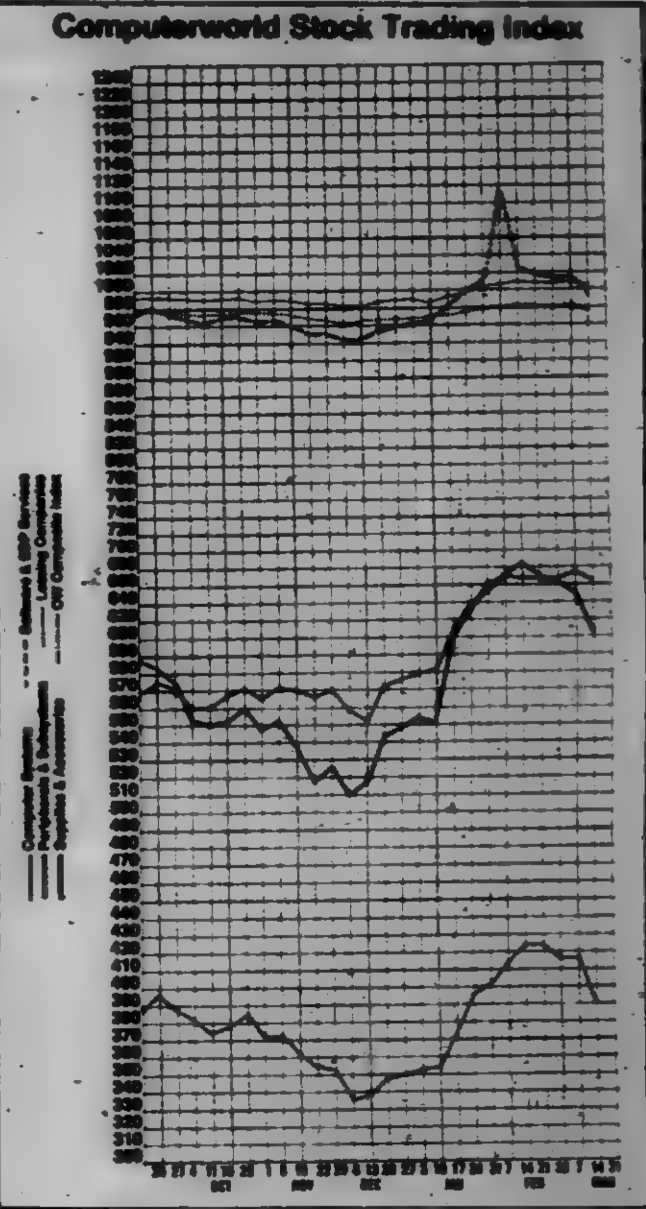

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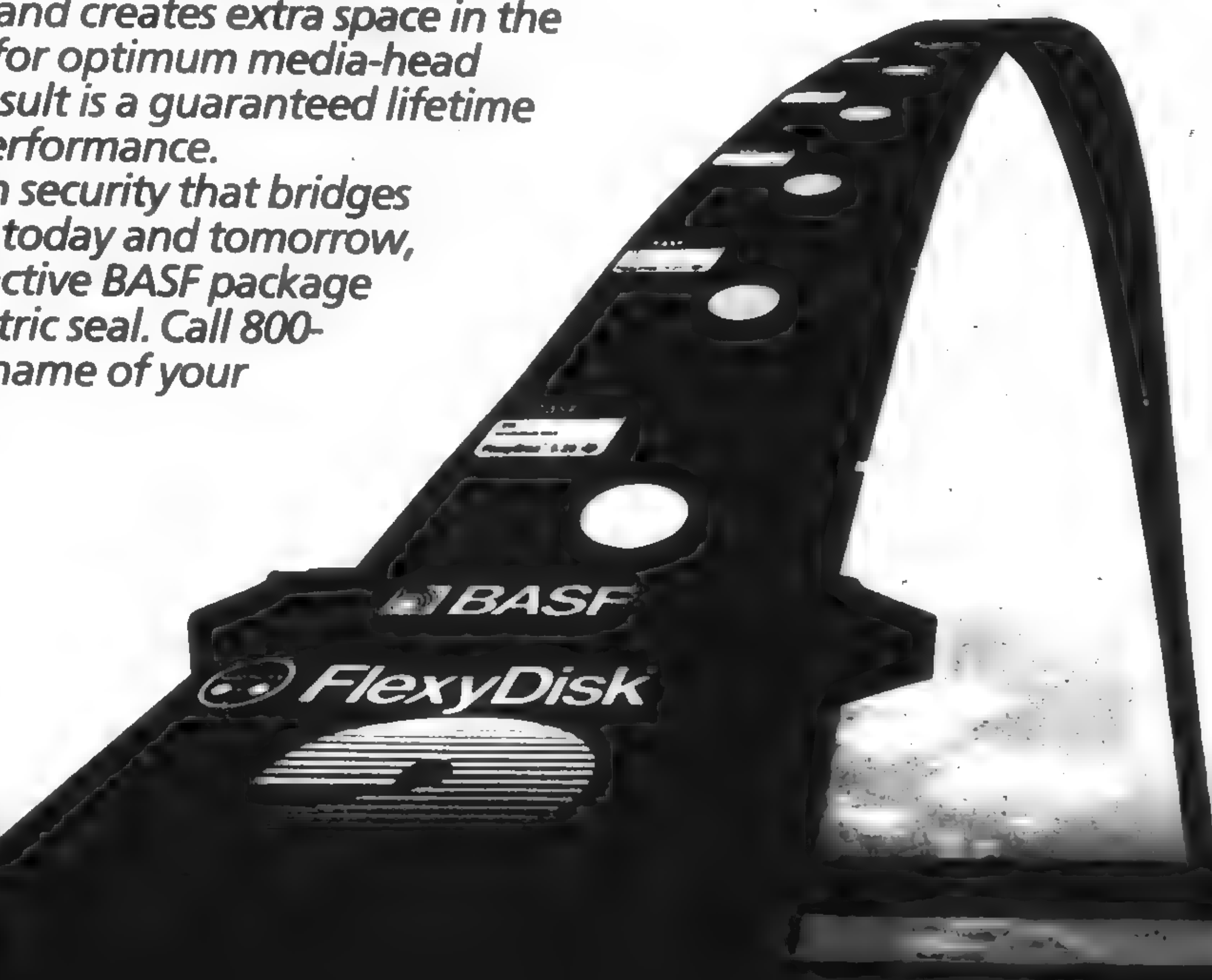

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By John O. Saunders
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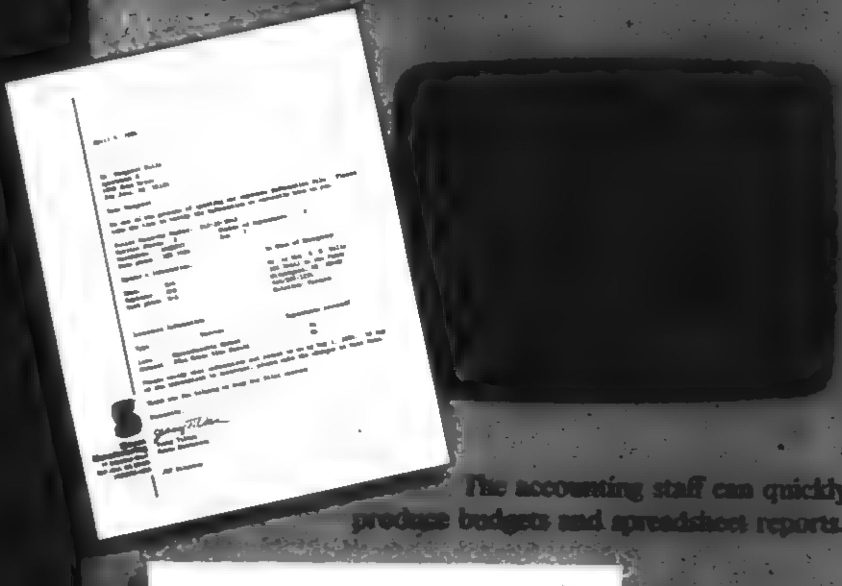

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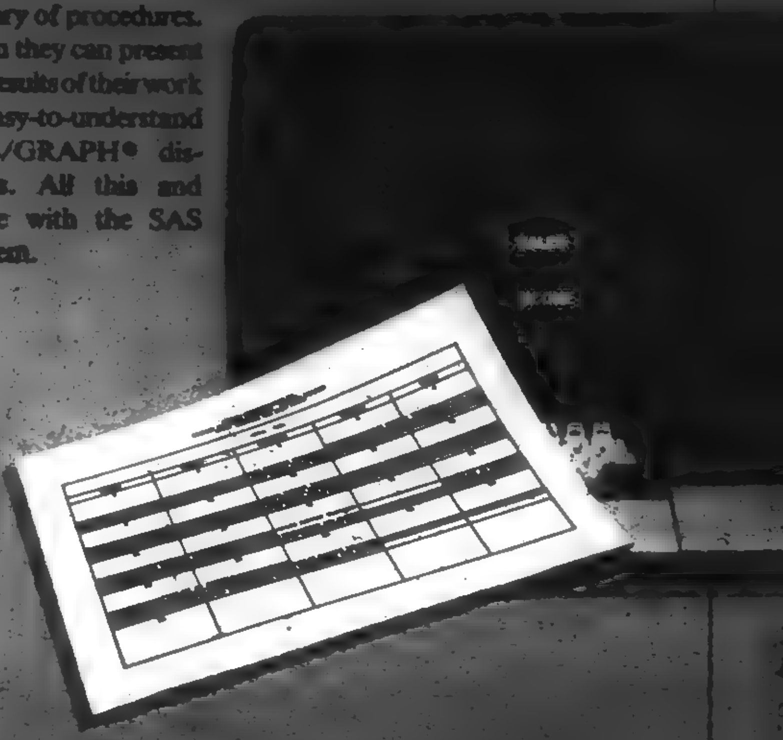

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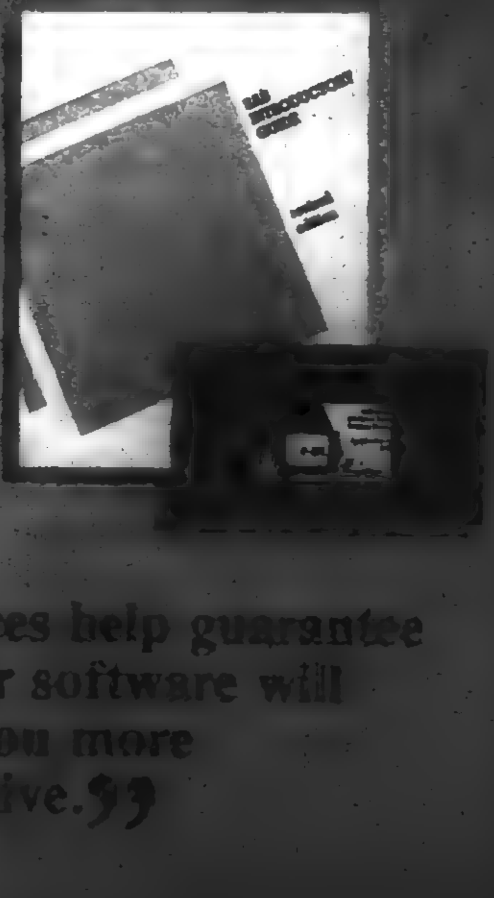

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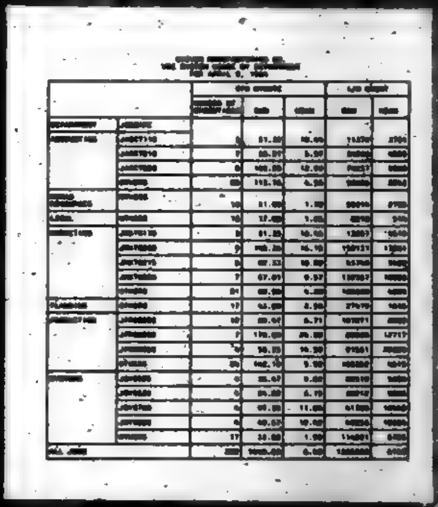

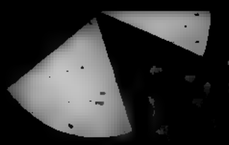

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Editorial

Users May Be Losers

The microcomputer software market was jolted into reality last year, and it wasn't a pretty sight. Too many vendors spent time chasing too few opportunities, resulting in unstable market conditions and the lingering question of what will happen next. During the last few years, vendors of all sorts rushed products to market in the wake of the personal computer explosion. Me-too products, poorly planned products and much needed products all jostled for the notice of the buying public. But in this day of cost efficiency, purchasers are getting tougher. To succeed, products must answer a business need and must also have that lucky mixture of strategy, marketing and timing. In the last year, the market has grown up and become more expensive. The cost of marketing and distributing software has made it more difficult for new companies to get into the market and stay in it. As a defense against this confusing marketplace, users are sticking with what they have rather than experimenting with the untried.

This reaction is understandable, but users may be the losers because of it. It is important to remember that software doesn't end at Lotus Development Corp.'s 1-2-3. The market is being held by a few products that gained popularity several years ago and have amassed a very loyal following. Research conducted by C.W. Communications showed that in 1984, Microsoft Corp., Lotus and IBM were the top three personal computer software vendors mentioned most by respondents. Although the market seems stuck with the old standbys, the next wave of software will not be too far off.

The trend away from single-user systems and toward multiuser systems will create the demand for new software to meet these applications needs. Niche products ranging from vertical applications and customized applications to after-market products for the major software packages will increase in market share.

It is the job of the MIS manager to keep this turbulent and confusing situation in hand. MIS managers have become responsible for selecting quality software for users' current and long-term needs. MIS managers must avoid the danger of underestimating what the personal computer can do. Too used to mainframe applications, MIS may be riding out this confusion in the market by staying with the best-known products, regardless of their organizations' needs. You as the MIS manager need to investigate what is out there and what's possible for users' needs. And above all, keep in touch with the user community. As they become more computer-sophisticated, their needs and desires for computer capability will also grow more sophisticated. MIS will have to keep up with these needs and, if possible, stay one jump ahead.

Insider

How Much Longer?

By Tom Willmott

Microcomputer software gained identity as a distinct and financially promising high-tech market opportunity when Visicalc burst on the scene in the mid-1970s. Industry lore attributes much of Apple Computer, Inc.'s early success outside the hobbyist market to this spreadsheet product. Of course, a wide variety of software programs were also available at that time for Radio Shack Corp.'s TRS-80 computers. But for the most part, personal computer users expected to write their own routines in Basic. Visicalc was really the first program to deliver sophisticated computing power to an individual's desk for a price.

In 1981, the introduction of the IBM Personal Computer changed the information processing industry and legitimized the purchase of micros for large organizations. Data center managers who had perceived the Apple II as little more than a toy had to look twice at a product blessed by IBM.

In 1984 IBM probably generated more than $4 billion in workstations and office system sales and shipped more than one million personal computers. From the microcomputer software perspective, this made a big business even bigger. For two years MS-DOS was the only development game in town.

The microcomputer boom also changed the way large organizations did business. Information systems managers accustomed to greeting the sales representative of a $5 million to $10 million software organization were forced to come to terms with three hackers from New Jersey whose total assets amounted to seven cases of Tab and a 1972 Chevy Malibu. One of the hottest products was 1-2-3 produced by Lotus Development Corp. In September 1982 Lotus was 17 people strong, renting space on the wrong side of Cambridge, Mass. In January 1983, they shipped their first box of software. Last month, Lotus announced that 1984 net income had doubled to $36 million from the previous year. Revenue for the period was $157 million. That's some distance from 17 cases of Tab.

But what of the future and the recent past? Three major market segments stand out in micro software. In application software, the most popular functions continue to be spreadsheet, data base, word processing and graphics, or some combination of all four. Frankly, the most interesting news in micro software in 1984 is that there wasn't any news. Lotus continued to dominate the large organization market. A handful of new creative packages came on the scene. But at least two companies with imposing venture credentials disappeared into the sunset. For the most part, there wasn't much to get excited about in the applications arena. 1985 doesn't look much better.

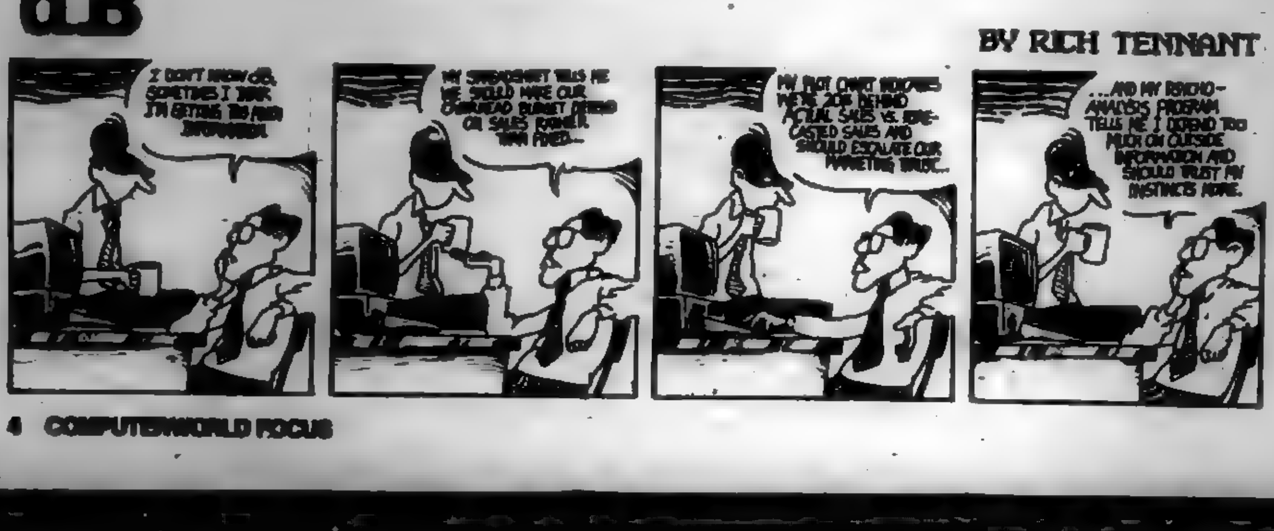
Communications software was more interesting. A number of vendors pressed on with development of terminal emulation and virtual disk programs, sometimes categorized as communications transport products. In addition, more than two dozen vendors, predominantly from a mainframe background, offered links between hosts and micro-based systems. Cullinet Software, Inc., Informatics General Corp., McCormack & Dodge Corp., Software International Corp., Mathematica Products Group, Inc. and others entered the fray. 1985 will be a year of testing and implementing these integrated micro-mainframe systems.

It's a grim day when the most exciting news in the industry revolves around systems software. But the introduction of products that provide micros with multiuser capabilities, windows and concurrent processes turned out to be the snazziest stuff of the year. It's not that we really need all that functionality quite yet. It's more that we've begun to glimpse how the markets will shape up in the next few years.

Topview from IBM, for example, suggests a proprietary systems software strategy that is a radical departure from IBM's strategy. The Macintosh windows are appealing and innovative. Development expenditures among the independent vendors for distributed operating systems are also a key to the future. And the jockeying between Microsoft Corp. and Digital Research Inc. is interesting.

Thus we begin 1985 patiently, or perhaps impatiently. Waiting for the real battle between IBM and Wang Laboratories, Inc. for WP dominance. Waiting for more software on the Mac. Waiting for something different and useful on the PC. Waiting for the implementation of micro-host communications. In this razzle dazzle, BMW 320i, Yuppie-driven, 45% growth-rate microcomputer world of ours, we're waiting for the newest of the new . . . the Lotus-Buster. Will the next genius please stand up!

Willmott is vice-president of user research and services for International Data Corp. in Framingham, Mass.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Bear With Us

A recent change in the USPS newspaper and magazine distribution systems has created a slowdown in delivery of *Computerworld Focus*. We are working diligently with postal and distribution authorities to normalize delivery. We appreciate your patience. *Focus* will appear 10 times in 1985. Send comments to The Editor, CW Focus, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

Q&A

In 1982, a young man entered a New England engineering college as a freshman computer-science major and aced every computer science course he took. He failed every other course, and after a year and a half, he and the school parted company. He was hired to work for a software consulting firm at a starting salary of more than $25,000. He noted that, although he wishes he had worked harder at school, the average starting salary for computer science graduates from his would-have-been alma mater is no more than what he's now earning.

This young man claims to be knowledgeable about the techniques practiced by hackers. He shared some of that knowledge with Computerworld Focus *for the benefit of our readers who might be having second thoughts about their own systems.*

Do you know how to break into a company's computer mainframe?

That's what I do every day. Actually, I'm not busting in; I have permission. I make the personal-computers speak with the large ones. For instance, the personal computer will think that the larger computer is a disk drive and that it can be accessed and things can be stored on it just like a disk drive. A large computer just thinks it has another terminal on it. And data files, for example, can be transferred between the two.

It was my impression that if you had a computer, a modem, emulation software and a good mind, you could get into other computers.

No problem. I do it often — it's fun. In fact I'm going to do it tonight. For instance, one of my typical things is getting [long-distance phone service company] secret codes so I can make free long-distance calls. I write a quick program on the computer to dial up the [company's] number and just start trying secret codes and it makes a list of all the codes that are valid. I'll go through that list until the code is taken off — maybe when somebody wants their code changed. I don't abuse the code because I would get pretty upset if somebody was doing that to me.

You restrict the number of calls you put on somebody else's number?

I try to. I got a [company] master password recently. That's been working for a few months, and it belongs to nobody. It was just a password left on the system; I've been calling all over on that one. I prefer the master password because you don't do any damage to anybody.

Have you ever gotten into any other mainframe?

I was hired to try to break into a mainframe to test its security. I said I could probably break into it, but I couldn't. It was very good security. There were some flaws and if I put more time in, I could have gotten past it.

A lot of things can be done to prevent

(Continued on Page 42)

Letters

Unix Alternatives

Computerworld Focus on Unix did a fine job of stating the pros and cons, but why did you choose not to expand the discussion to alternatives?

Most of the forthcoming seminars provide forums for topics like "Alternatives to Unix." In this way, they present the big picture. If you are indeed commited to a reporting style that would allow your readers to react to the "waves of change before they hit," how can you ignore the evolution in operating systems?

Dorothy A. D'Attoma
Director, Corporate Communications
Multi Solutions, Inc.
Lawrenceville, N.J.

Oops! . . .

This is probably one of a thousand letters that reminds you that we are in 1985, not 1984 [*CW Focus*, Jan. 16, page 5]. We humans enjoy pointing out typos in prestigious publications. (I have also saved a copy of the *New York Times* with the wrong date on the banner page.)

Your point that *Focus* is our publication is well taken, and I would like to add an idea. As manager of international systems for a computer consulting firm, I have the opportunity to travel to a number of countries outside the U.S. It never ceases to amaze me that most people in our business have misconceptions about the state of technology in foreign lands.

On recent trips to Saudi Arabia, I have purchased and enjoyed *Saudi Computerworld*. When I returned with copies of the publication, people asked me basic questions such as "Where do Saudis get electricity," not knowing that most countries are very much in the 20th century with computer technology.

A *Focus* edition on the subject "How is the rest of the world doing" with articles contributed by the CW foreign editorial offices would be of great interest to a growing number of people in the computer field. I have enjoyed *Focus* and the foreign editions. Keep up the good work.

Dennis J. Clark
Manager, International Systems
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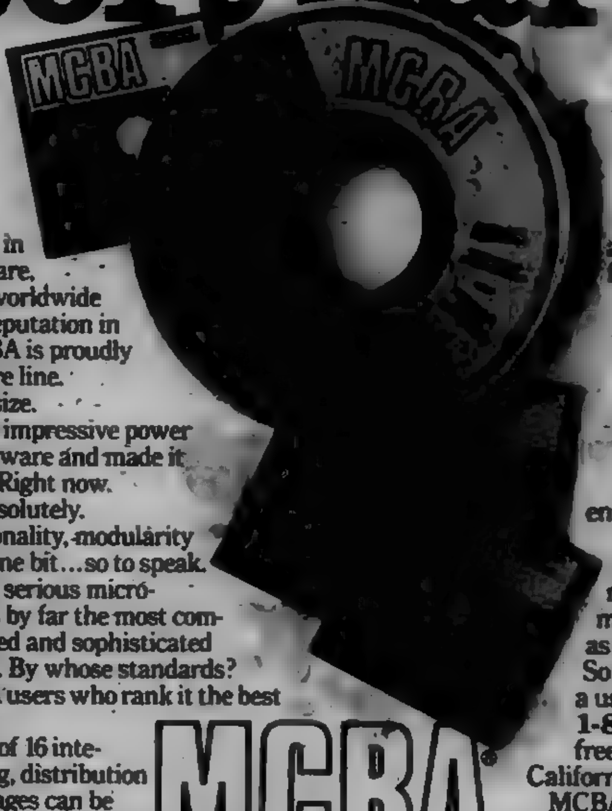

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In the News

No News is Bad News?

It seems to be the case these days that the big news isn't what is happening, but rather what isn't.

What may not be happening is the first-quarter 1985 release of DOS 3.1, without which the file server function on the IBM Personal Computer AT cannot exist. Because many companies purchased the AT for its file server capabilities, the delay of 3.1 will certainly be a disappointment.

Tom Willmott, vice-president of user services at International Data Corp. (IDC) in Framingham, Mass., confirmed the existence of technical problems in the AT world. Willmott pointed specifically to the Sytek, Inc. network, the hardware side of the 3.1 release of DOS, which he said was not being delivered on time either. He said he would not be surprised if delays in delivery occurred.

"IBM would much prefer that you do the right thing by them by buying either their own line of controllers or their own 36s and get into a star configuration. So if it's been delayed from a marketing standpoint, that wouldn't surprise me either," Willmott said. Many people bought ATs because they were simply more powerful processors and the 80286 technology would allow for retrofitting in a multiuser operating system, according to Willmott. "It's clear that connecting them in work groups is important, but I still maintain that while that's one product strategy, clearly IBM would prefer to hook them through controllers and 36s into a host-based system. That's how they make their real money," he concluded.

While rumors fly about the delay of the infant AT, IBM is doing its best to quash them. When asked to confirm rumors that 3.1 will not ship in the first quarter, a spokesman for IBM in Boca Raton, Fla., said IBM has made no announcement to that effect. With the first quarter almost over, such a statement may seem like the Long Blue Line, but the IBM representative stated further that the previously announced schedule has not been changed.

Crackdown On Copying

The powers that be at Wilson-Jones Co., the Chicago office supplies and equipment concern and a subsidiary of American Brands, Inc., a Fortune 100 conglomerate based in New York, probably wish they hadn't liked Micropro International Corp.'s Wordstar quite so much. Micropro and the Association for Data Processing Service Organizations, Inc. (Adapso) filed a joint suit on Jan. 17 against Wilson-Jones and its parent corporation for $225,000, alleging software piracy.

The Wilson-Jones suit is the latest in what appears to be a serious effort on the part of software development firms to crack down on unauthorized use of microcomputer software. According to a survey conducted by Future Computing, Inc., a market research organization in Richardson, Texas, software developers and vendors have lost an estimated $1.3 billion in revenues in the last three years.

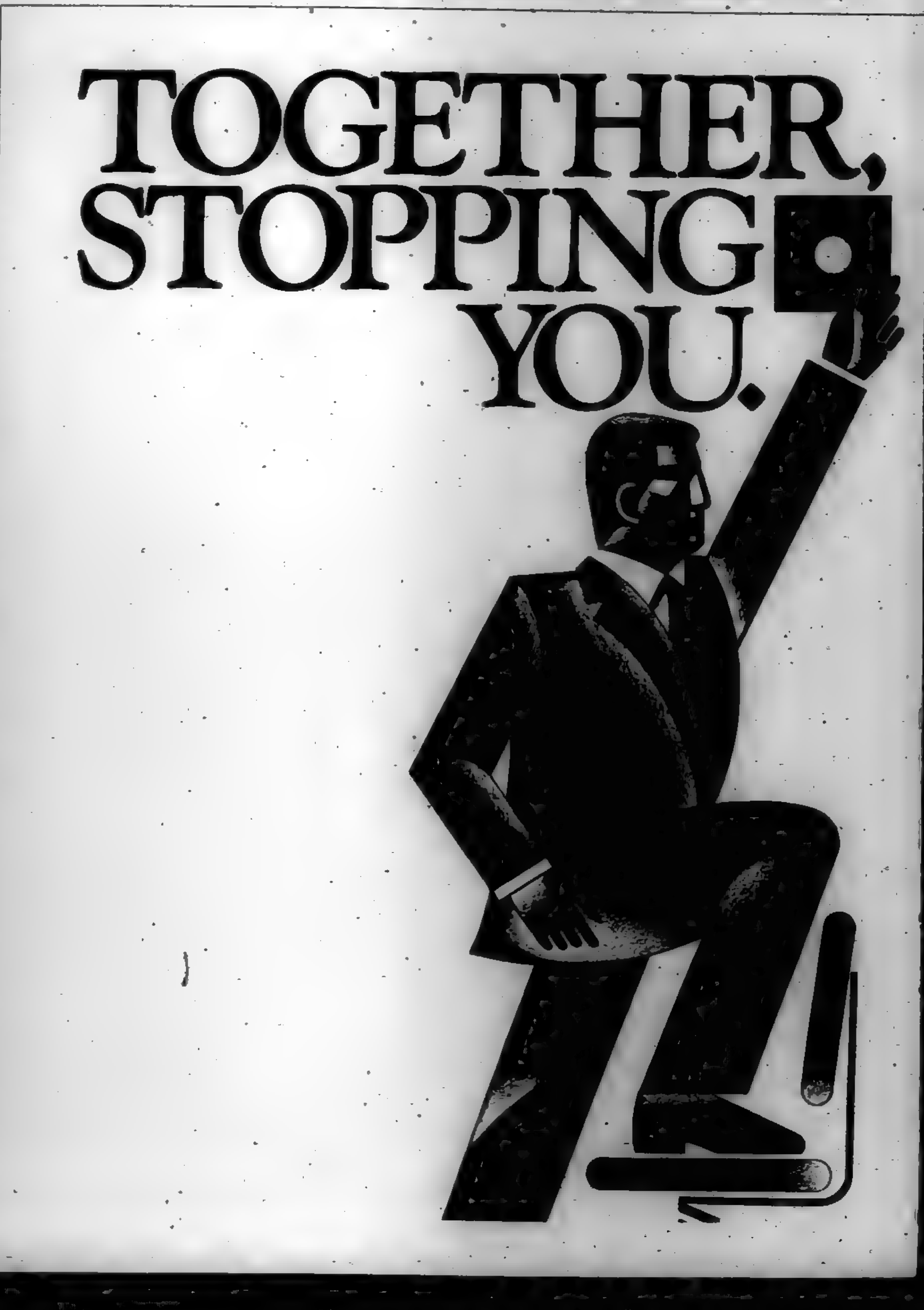
Although many software firms have been moderately successful in copy-protecting their packages, a number of others choose not to bother. IBM, has never attempted to copy-protect its packages. In fact, user manuals for its stand-alone Displaywriter and its microcomputer clone, Displaywrite 2, include detailed instructions for making backup copies. A source contacted at IBM said the company has been looking at methods of copy protection, but "there is no strategy at this point, so the answer is that we have no plans at this point in time to [implement copy-protection procedures]."

Among the methods suggested to stem the rising tide of piracy is Adapso's proposal to combine a lock in the software program with a hardware key to plug into a box in the RS-232 port on the microcomputer. Not only would this disallow unauthorized access, but it would also make it difficult to use the software on more than one computer.

Amy Wohl, president of Amy Wohl Associates, speaking at the Office Automation Conference in Atlanta recently, blasted Adapso and referred to the proposal as "absolute nonsense." Wohl stated that because the cost of software is prohibitive in a multiuser organization, software vendors need to heavily discount volume purchases.

Dave Sturtevant, senior director of public communications at Adapso, the Arlington, Va.-based organization that represents 750 companies in the computer software and services industry, said that since most software is purchased from retailers, control of volume discounts would be very difficult. He also stated that the copying that is going on is not exclusively within the Fortune 500 or Fortune 1000 corporations. He referred to such copying as an "epidemic situation nationwide" and added that a technical solution is the only solution. Sturtevant feels that the lock and key mechanism would not be as burdensome as its prepublicity would indicate. A user who wanted to use the software on a home personal computer could accomplish this by taking the key, the lock and the program disk home.

When asked about dedicated use of the RS-232 port, he said that the lock would be a pass-through and would not



In the News

prevent use of the RS-232 port for other purposes. Regardless of the outcome of the Adapso-Micropro suit, a serious need remains to address the needs of the large multiuser community. Few companies would choose to spend $100,000 or more for multiple copies of a software program if a legal alternative were available. The alternative may come in the form of good decision support software for the mainframe. Members of the user community agree that in the not-too-distant future similar operating systems will be compatible in both the mainframe and microcomputer environments. Unless the software houses find a cost-effective solution to multiple purchases or multiple licensing agreements, corporations may soon elect to use mainframe software for their decision support needs.

Now might be a good time for software developers to make their products more economically appetizing.

AT&T, EDS Sign Pact

AT&T recently signed a seven-year contract with Electronic Data Systems Corp. (EDS), acquired by General Motors Corp. in 1984, to jointly market computer and communications systems. With the agreement, AT&T will work with EDS to design and market vertical applications, specifically targeting the automotive industry.

AT&T had previously attempted to market an integrated system, the Net 1000, to Ford Motor Co. Last year, Ford stopped testing the system, which had cost AT&T an estimated $1 billion and 10 years.

Kim Myhre, director of communications industry research and office automation marketing planning service programs at International Data Corp. in Framingham, Mass., said that he did not see that the contract would have any effect on IBM or on its newly acquired telecommunications giant, Rolm Corp. Myhre stated that GM has been looking to develop its own network and that GM currently uses a lot of AT&T leased facilities. "AT&T, with its information network-type product, the NET 1000, has to establish some vertical direction. The deal that [AT&T] signed with EDS has a lot to do with developing GM's own network." According to Myhre, the implications for IBM, if there are to be any, would be long term. He said Ford turned down the NET 1000 because it was too expensive and weak on the applications side. "What AT&T was really selling there was communications facilities. What they didn't have to offer was processing services — value-added services — and now they're developing that in conjunction with GM." He stated that AT&T might remarket the applications part of that service to other automobile manufacturers, but that IBM will probably stick with its own applications-specific networks, in particular Inet, a value-added network for the insurance industry.

It is not likely that IBM and AT&T will move quickly into a head-to-head position on any applications-specific markets, Myhre said. "Quickly? The value-added network business is not a 'quickly' business."

Surprise Move

In other news from Big Blue, it came as a surprise to many when it was announced recently IBM had decided to move marketing and sales responsibility from the Entry Systems Division in Boca Raton, Fla., to its National Distribution Division (NDD) in Montvale, N.J.

An interesting point is that the National Distribution Division is the group that already handles personal computer sales to its own IBM Product Centers, which are in direct competition with the retailers. It remains to be seen whether the retail outlets will continue to get IBM Personal Computers and ancillary products as quickly as they have in the past.

However, the retailers see the move as an extremely positive step. Barbara Millard, president of Computerland Corp., the largest of all the retail chains with 700 computer stores worldwide, stated that IBM's divisional change was "a move in the general direction of making available products we never before have handled." Bert Helfinstein, vice-president of operations at Entre Computer Centers, the largest publicly held retailer of microcomputers in the country, expressed pleasure at the move. "Competition from the Product Centers has never been an important factor in this business and it doesn't bother me at all that the NDD also operates the retail centers." Helfinstein felt that the consolidation of marketing efforts will actually improve things for the retailers. "NDD is the part of IBM that is most attuned to third-party distribution. I think it further reaffirms IBM's long-term commitment to third-party distribution as a means of reaching the end user with its products," he continued. Helfinstein did admit that there are chronic questions regarding IBM's commitment to retailers, especially from the financial community.

An IBM spokesman was quick to echo the positive response of retailers and industry watchers. "The [non-IBM retail] dealers will continue to have the same day-to-day IBM contacts. The people within IBM remain the same, it's just that they happen to report to a different division. In the long run we expect the new organization to enhance the business prospects for the dealers."

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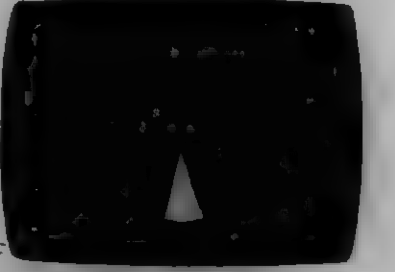

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Operating Systems: PCDOS, MSDOS, CP/M-86. Minimum RAM required: 192K. K-Graph: PCDOS only.

In Brief

Last month's issue of *Computerworld Focus* noted the merger of NBI, Inc., the word processor manufacturer in Boulder, Colo., with Computer Consoles, Inc. (CCI), of Rochester, N.Y., a supplier of applied computer systems in the telephone and office systems market.

At that time, Herman A. Affel Jr., CCI's chairman of the board, and Thomas S. Kavanaugh, president of NBI, issued a joint statement expressing confidence that the two companies complemented each other and represented a formidable combination of distribution, products, technology and customer support.

Well, maybe not complementary and formidable enough. On Feb. 6, 1985, in another joint statement, Affel and Kavanaugh said that "after careful study, we have jointly concluded that merging the two companies would not have been in the best interests of shareholders and employees."

DALLAS — Seven computing industry pioneers have been named to the Information Processing Hall of Fame, established by Infomart in Dallas, to recognize the most significant scientific, technological and business contributions made by individuals in the information processing industry.

Named as the seven members were John von Neumann, John Mauchly, J. Presper Eckert, Grace Hopper, Gene Amdahl, Jack St. Clair Kilby and Frank Lautenberg.

NORWALK, Conn. — Management information systems (MIS) and data processing executives are still searching for micro-to-mainframe communications software that is easy enough for untrained personal computer users to run without extensive MIS support. These executives also plan to use personal computers for electronic mail, but haven't found an appropriate link, according to the survey section of a new directory of MIS/DP executives published by International Resource Development, Inc. (IRD).

This directory costs $595 and is available from IRD, 6 Prowitt St., Norwalk, Conn. 06855.

HOUSTON — The Compaq Computer Corp. Portable is the most highly rated personal business computer, according to a recently completed 1984 study conducted by The Yankee Group. The study by the Boston-based market research and consulting firm shows the Compaq Portable received the highest overall rating, 3.1 on a 4.0 scale, moving up from Number Four ranking in 1983 and displacing the IBM Personal Computer XT as the top-rated model. The Yankee Group is based in Boston.

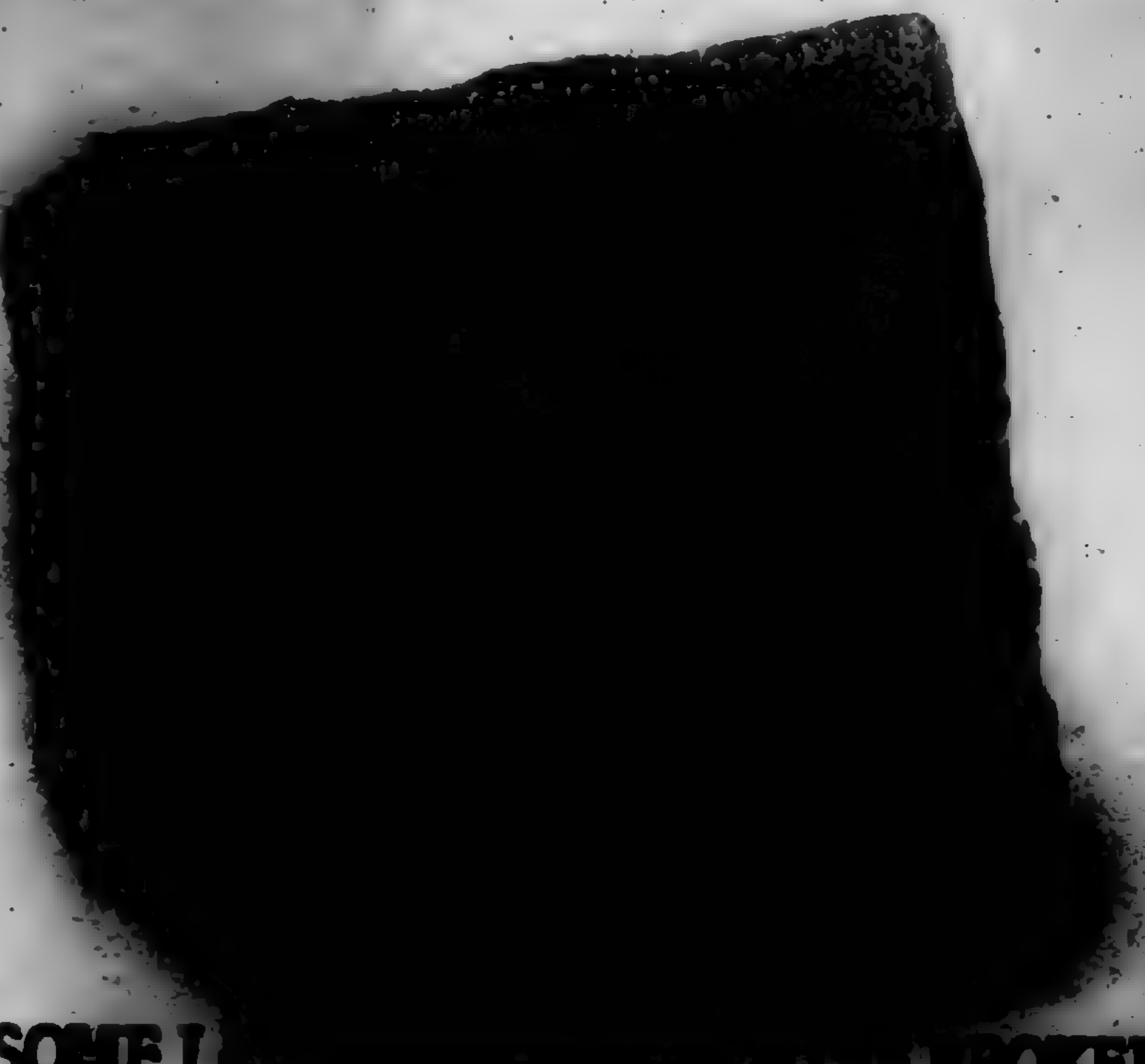
NEW YORK — Service and repair of computers and telecommunications equipment will double by 1990 to become a $46 billion industry, according to a recently released report commissioned by the Association of Field Service Managers (AFSM) and prepared by Arthur Andersen & Company.

The results of the study, which surveyed more than 100 service executives and customers, is intended to supply providers and users with market information.

The report found that the fastest growth segment will be office automation systems, and the service revenues for such systems will increase by 33% annually, to $8 billion by 1990. As the market moves away from mainframes and minicomputers, product manufacturers will begin to lose shares of service revenues to third-party service providers and self-service by customers.

Of particular interest to multivendor user companies is the prediction that many major manufacturers, such as IBM and Wang Laboratories, Inc., will offer service for competitive products that are networked with their own.

The complete report, "Future Trends in Service of Electronic Products," is available for $100 from the Association of Field Service Managers, Suite B, 6237 Presidential Court, Fort Myers, Fla. 33907.



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In the second half of 1984, several expert systems or knowledge-based software programs for microcomputers were announced, most available for less than $500. With these systems, the "what-ifs" and "if-thens" transcended number crunching and entered the real world of decision making. This new decision support software for microcomputers was a spin-off of an exciting subfield of computer science known as artificial intelligence — programming a computer to access a huge knowledge base, to apply certain known parameters to this knowledge base and to come up with conclusions based on all available information.

As long ago as the mid-1950s, researchers in the burgeoning field of artificial intelligence were programming computers to play chess and bridge. These games were probably chosen over pinochle and bingo because researchers wanted to prove a point: If a computer could play intellectually taxing games such as chess and bridge and beat a human opponent, then a computer must be smart. In truth, of course, programmers had input basic rules of the game, probabilities for moves and countermoves and some rules of thumb (heuristics). On the surface, it appeared computers had been taught to think; in actuality, computers were guessing. The guesses were successful more often than not because so much information was available, and the computers could access it with lightning speed. Most human minds cannot do as well.

Artificial intelligence has come a long way in the past 25 years. There are a number of good software programs that run on mainframe computers. And in companies with large computer systems, upper management is starting to take artificial intelligence seriously for two main reasons: the tremendous amount of information that can be put into the computer to make it "smart" and the ease with which this phenomenal amount of information can be accessed. No longer does computerese have to be used to instruct the computer. The information obtained from a simple command such as "Let me see the names and addresses of all the women in the Silicon Valley who earn more than $50,000 a year and drive a foreign automobile" can mean a great deal to the American automobile industry.

This same information would also mean a lot to the owner of an automobile dealership in San Jose, Calif. However, unless the owner has a very, very large computer, it will not be available to him. Microcomputer-based expert systems provide a practical and expedient solution for both the small-business person who uses a microcomputer in day-to-day operations and for the manager in a large corporation who needs some decision-making capabilities but has no need to access the corporate data base.

It is surprising that leaders in the field of artificial intelligence have not jumped on the miniaturization-for-micros bandwagon. Brenda Nashawaty of Artificial Intelligence Corp., a mainframe-based artificial intelligence firm in Waltham, Mass., said that company has changed direction and will not put out a microcomputer-based artificial intelligence or expert system. She stated that because reception to the firm's mainframe product, Intellect, has been so positive, the company has decided to put more of its resources toward enhancing Intellect. She does, however, think that a good expert system can exist on a micro. "One of the reasons we decided to postpone any release of a [microcomputer-based] product from our company is that we really want it to be the best it can be. Frankly, we see a better market for it along with the mainframe and minicomputer markets, and we're going to start looking into that area for research and development."

> **Upper management is starting to take artificial intelligence seriously because of the tremendous amount of information that can be put in to make the system "smart" and the ease with which this information can be accessed.**

There are those who do not agree a true expert system can be compatible with microcomputers. Robert Keller, president of Renaissance International, a Harvard, Mass., management consulting firm specializing in artificial intelligence, said. "[Expert systems for microcomputers] are interesting toys. It's not that the products themselves are bad; in fact, they're fairly sophisticated. But it's hard to do serious knowledge-based system work on a personal computer, since [the machines] are not very fast and usually don't have much storage." Keller added that they could be rather valuable tools if

Dumb.

123
123
1-2-3
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Files.

Stand-alone programs can't be made to work as a system no matter how hard you might try.

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used on a microcomputer with a fast processor and hard disk. Another limitation is the amount of information with which the computer must be familiar in order to provide valuable output. The old computer adage, Gigo (garbage in, garbage out) could be amended for expert systems to Dido (data in, decisions out). Keller prefers the term knowledge-based system to expert system simply because the amount of information necessary to make a system "expert" would be so great. The difficulty would lie in three areas: Much time would be spent keying information (most management-level people are not known to be speedy typists), random-access memory (RAM) on microcomputers is severely limited and few true experts are around to feed the machines.

> **Some believe true expert systems are not compatible with microcomputers because micros don't offer adequate speed or storage. Micros are also limited because of the amount of information the computer must be familiar with if it is to provide valuable output.**

Whether this new software is called decision support, expert, artificial intelligence or knowledge-based is a matter of preference. A sampling of the newest programs on the market is spotlighted below. All will run on IBM Personal Computers or compatible machines.

Although minimum requirements of memory and disk drives are noted, it should be borne in mind that, with the exception of Human Edge Software Corp.'s Mind Prober, these requirements are indeed minimums. If microcomputer users wish to run complex models, the machines should be configured with much larger amounts of RAM, have swift microprocessors and be equipped with hard disk drives.

Expert Choice *(Decision Support Software, Inc., McLean, Va.)* is a decision-support package designed for the executive or consultant. It provides a generic format that resembles an inverted tree, with the goal as the top of the tree and the criteria, the branches. Once criteria are established, Expert Choice leads the user through three types of comparisons: importance, preference and likelihood. If the comparison is verbal, elements are rated on a scale ranging from "extreme" to "equal." If the comparison is numeric, the values assigned range from 1.0 to 9.0, with 1.0 being equal. Based upon the weights the operator establishes, the software offers conclusions. At any time, the operator can change the importance of the criteria as more information is available.

Of particular interest in Expert Choice is the inconsistency ratio. If the values assigned to the various criteria are inconsistent, the decision reached will be meaningless. Expert Choice will let the operator know if the inconsistency ratio is high; then the operator can go back through the decision tree and change some of the comparisons.

Expert Choice lists for $495, runs on an IBM Personal Computer, Personal Computer XT or 100% compatible PC-DOS microcomputer with 128K bytes of RAM and one disk drive.

Lightyear *(Lightyear, Inc., Santa Clara, Calif.)* is a particularly easy-to-use expert system that affords great flexibility. The number of alternatives and criteria are limited only by the available RAM. For example, 50 alternatives with 100 criteria require 256K bytes, while 1,000 alternatives with 100 criteria require a fully loaded 640K-byte system.

The manual is small and extremely well written. It assumes marginal knowledge of the computer. Two completed examples are already on the disk that Lightyear provides, and the third example is created interactively, using the manual. Esther Dyson, president of Edventure Holdings, Inc. in New York, stated in *Release 1.0*, "Lightyear is actually fun to use: quick and interactive. . . . [It] can be used for everything from job candidates to loan approvals."

Because all the expert systems are geared to upper management, Lightyear's ease of use could make it an excellent bet. Lightyear retails for $495 and runs on IBM PC, XT, AT and other 100% compatibles using PC-DOS or MS-DOS version 2.0 or above and 192K bytes of RAM and one disk drive.

Trigger *(Thoughtware, Inc., Coconut Grove, Fla.)* differs from Lightyear and Expert Choice in that it is more a monitoring device than a decision-making one. It actually seems to take project management software, like Harvard Software, Inc.'s Harvard Project Manager, a few steps further. Mary Harrison, of Corporate Software, Inc. in Waltham, Mass., does not consider Trigger an expert system, referring to it instead as an

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[illegible]

"executive tool." She found it extremely easy-to-use, especially the tutorial on Managing by Exception. Asked to compare Trigger functionally with Lightyear, she said, "Trigger was designed for overall management of different functional areas within a company; Lightyear is really geared more toward decision-making."

Thoughtware, Inc. has recognized that written documentation is as important as interactive diskette-based tutorials and provides both, equally well done. Trigger runs on an IBM PC, PC/XT or IBM-compatible with 128K RAM and two drives. It retails for $495.

The computer can keep track of a large number of variables better than any human mind and can come to a conclusion. Remember, however, that the weight attributed to each criterion is highly subjective and conclusions could be biased.

Mind Prober *(Human Edge Software Corp., Palo Alto, Calif.)* is really more of a toy than an expert system, although the principles are the same. The user creates a file with the name of the person being "probed" and assigns an "agree" or "disagree" to many screens of adjectives. Mind Prober then generates a report, basically a personality profile, that tells the user how that person copes with stress, behaves in relationships, feels about sex and work and explores personal interests. Mind Prober cannot be considered a business tool; however, it could be good training for those who regard computers with fear and loathing or who will later use more complex expert systems. Human Edge also markets The Communication Edge, The Management Edge, The Negotiation Edge and The Sales Edge and has acquired the North American marketing and distribution rights to Intelligent Terminals Ltd.'s Expert Ease.

Mind Prober is a one-diskette program that runs on 64K bytes of RAM and is compatible with the IBM Personal Computer, Apple Computer, Inc. Apple II and Macintosh, Tandy Corp. TRS-80 and Commodore Business Machines, Inc.'s Commodore 64. The Commodore 64 version is $29.95, and each of the others costs $49.95.

What is the real value of expert systems? Can companies rely on the conclusions reached? The answers are very valuable, if used correctly; and, in general, no. If a high-level manager wants to assess the advisability of relocating company headquarters to one of six cities based on criteria ranging from interest rates to leisure activities, an expert system is a good tool. The computer's memory can keep track of a large number of variables better than any human mind, and the software can apply the knowledge supplied by the manager and the heuristics to come to a conclusion. What should be remembered, however, is that the weight attributed to each criterion is highly subjective, and conclusions could therefore be considered biased.

But there are ways in which expert systems can be used to good advantage. In order to overcome the argument that data in (BI) would skew decision out (DO), the systems could be used with good results as an adjunct to brainstorming. If six people were providing input, results might have more credibility; at the very least, audit trails are provided, backtracking is easy and changes can be made with little problem.

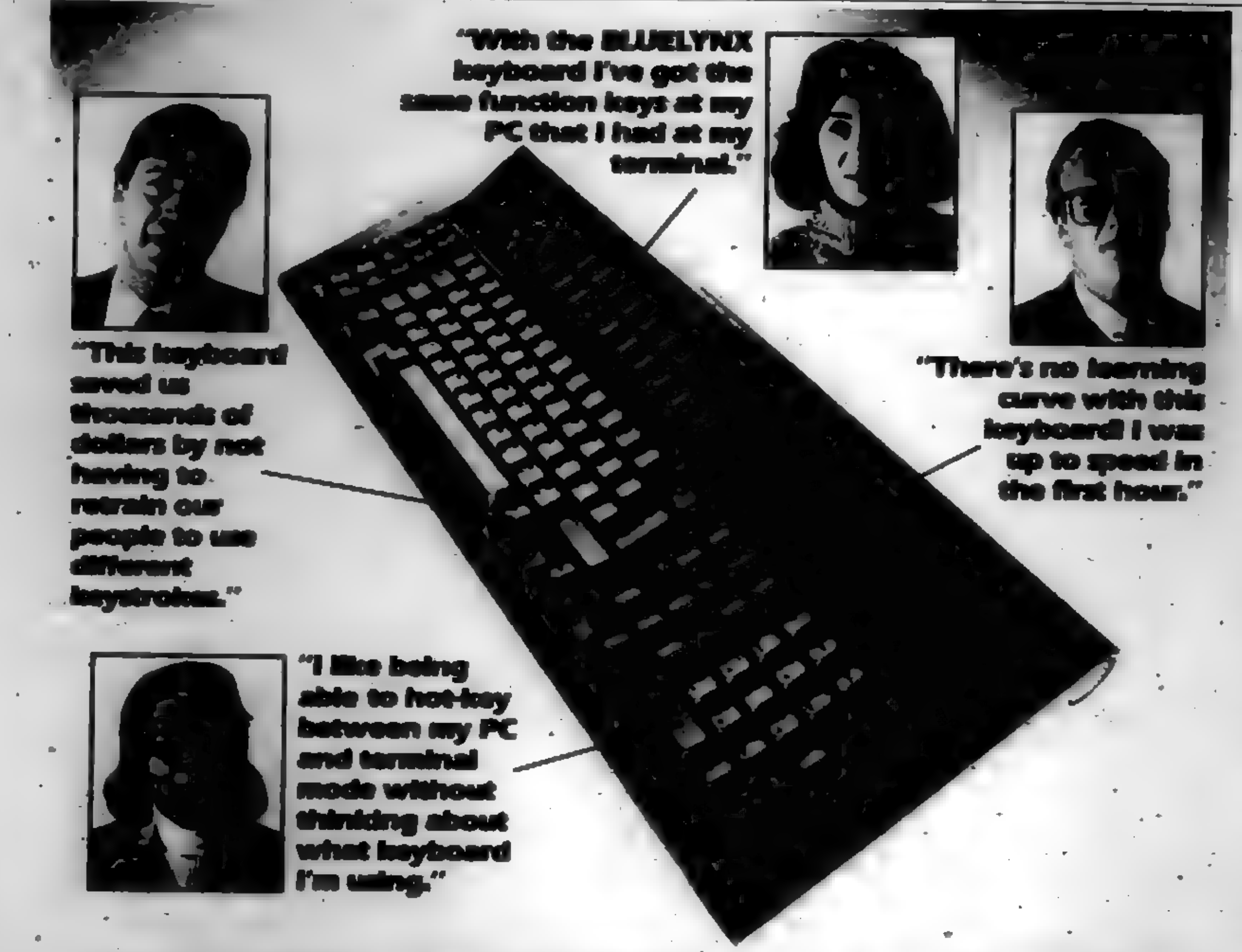
Another good use might be to provide concrete reasoning for a decision already made. But are decisions really made based on intuition alone? Corporate America might not admit it, but it does indeed happen.

Perhaps Robert Keller of Renaissance International put it best when he said the future evolution of artificial intelligence or expert systems is largely philosophical at this point, and companies that considered building their own expert systems are realizing what a monumental task it is. What companies are waiting for, said Keller, are products that have knowledge bases already built into them. "People are coming to realize that the techniques of artificial intelligence are in fact simply a set of tools that can be integrated into any data processing operation."

Expert system software for micros may be toylike and is obviously not taken seriously by companies that provide artificial intelligence for mainframe computers, but when a large system has a startup cost of $50,000 to $100,000 and the microcomputer software costs less than $500, it just might do nicely until the real thing comes along.

◆

White is senior writer at Computerworld Focus.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Forging New Micro Software

By Leonard P. Bergstrom
And Douglas Crawford

literally driving mainframe developments, particularly in the area of improving the user interface.

Choosing an appropriate computerized system has become a more perplexing assignment than ever before. The advent of the microcomputer and the concurrent explosion in software and potential for distributed data processing have made a difficult task even more difficult. A wide and ever-expanding range of software is currently available to support microcomputer activities.

On the corporate level, this software can be divided into three categories:

- Stand-alone micro products.
- Linked micro/mainframe products.
- Micro implementation of mainframe products.

Each approach embodies different philosophies, capabilities and levels of complexity, and each has positive and negative aspects. Further, each approach involves a different level of management decision as issues like control, access, integrity and data sharing become increasingly important.

The first category, stand-alone micro products, represents a low-risk, low-cost method to exploit the benefits of personal use and user-developed applications. Stand-alone products such as Ferox Microsystems, Inc.'s Encore! and Ashton-Tate's Dbase III offer independent users a significant capability and a shorter, less rigorous development cycle than most mainframe systems. Consequently, they present themselves as tempting solutions to a wide range of problems. In a small business environment, an independent micro can be a useful and effective tool; in a larger corporation, this same micro system can be the source of duplicated effort and inconsistent data.

The biggest problem with such packages is that they are stand-alone to the extent of being isolated. Such isolation covers many areas; chief among them is access to corporate data, training and application support. Users can begin to feel assured that their needs will be addressed only when such products become true standards in their own right (for example, Lotus Development Corp.'s 1-2-3) or when they significantly displace mainframe package capabilities (as is the case with many of the micro-based modeling packages]. Even in these instances, users are at a disadvantage in two areas. First, users must rely on the management information systems (MIS) group for data extraction; second, users will either need to be trained in the use of data transfer tools or will require applications to perform such activities.

In this context, less opportunity exists for small independent software vendors. Products from these vendors tend to be purely micro-based and to lack both attributes mentioned above — the ability to set standards and the ability to displace functions. Furthermore, the pressure has increased as giants like IBM, large software houses like Cullinet Software, Inc. and traditional information center authors like Information Builders, Inc. have entered the marketplace. Many small vendors have reacted by either concentrating on vertical markets or actively seeking larger partners that can provide the coverage, the promotional muscle and the research and development expense and man-years of effort required to remain competitive. The bright software developer with a personal computer in the attic will require more than a little assistance to be a commercial success today.

Of the three categories of business-oriented software mentioned earlier, the last two — linked micro/mainframe products and micro-implementations of mainframe products — address the need to balance local processing with some sort of centralized integration (or at least coördination). These approaches can accommodate the needs of both users and DP management. However, they require a more substantial planning and design effort and, consequently, a greater investment of time and money. Such products probably do not actually require much more of an effort; it's just that planning is recognized as being necessary up front.

Many of the large software houses are currently developing a single-vendor "total solution" approach to software. These providers traditionally have specialized in corporate production systems with large amounts of data and defined schedules that emphasize central control, responsibility and hardware optimization. A definite movement is now occurring toward the opposite end of the computing spectrum. These departmental and personal applications deal with information, special situations and decision support and they emphasize local initiative, responsibility and management optimization. Because of the dramatic differences between these computing needs and characteristics, it is not surprising that many vendors have taken the approach of a micro-workstation linked by a communications component.

Nowhere is this more clear than in the area of large data base management system (DBMS) vendors. These vendors seem to believe that to provide a micro version of a mainframe DBMS is to encumber the personal computer with unnecessary and inappropriate capabilities. For many corporations, this full product approach may not enable the central DP group sufficient control, nor does it necessarily provide the user with access to the wide variety of production files present within the company's data system. For these installations, vendors such as Cullinet, Applied Data Research, Inc., Mathematica Products Group, Inc. and Computer Corp. of America are offering

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MWC86

MWC86 is the most highly optimized C compiler available anywhere for the DOS and 8086 environment. The benchmarks prove it! They show MWC86 is unmatched in speed and code density.

MWC86 supports large and small models of compilation, the 8087 math coprocessor and DOS 2.0 pathnames. The compiler features common code elimination, peephole optimization and register variables. It includes the most complete libraries. Unlike its competition, MWC86 supports the full C language including recent extensions such as the Berkeley structure rules, voids, enumerated data types, UNIX* I/O calls and structure assignments.

Quality is why Intel, DEC and Wang chose to distribute MWC86. These industry leaders looked and compared and found Mark Williams to be best.

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MWC86 is the easiest to use of all compilers. One command runs all phases from pre-processor to assembler and linker. MWC86 eliminates the need to search for error messages in the back of a manual. All error messages appear on the screen in English.

A recent review of MWC86 in *PC World*, June, 1984, summed it up:

"Of all the compilers reviewed, MWC86 would be my first choice for product development. It compiles quickly, produces superior error messages, and generates quick, compact object library is small and fast the industry st

gger

not content to write the best C compiler on the market. To advance the state of the art in software development, Mark Williams wrote *csd*.

csd C Source Debugger serves as a microscope on the program. Any C expression can be entered and evaluated. With *csd* a programmer can set tracepoints on variables and expressions with full history capability and can single step a program to find bugs. The debugger does not affect either code size or execution time. *csd* features online help instructions; the ability to walk through the stack; the debugging of graphics programs without disturbing the program under test; and evaluation, source, program and history windows.

csd eases the most difficult part of development — debugging. Because *csd* debugs in C, not assembler, a programmer no longer has to rely on old-fashioned assembler tools, but can work as if using a C interpreter — in real time.

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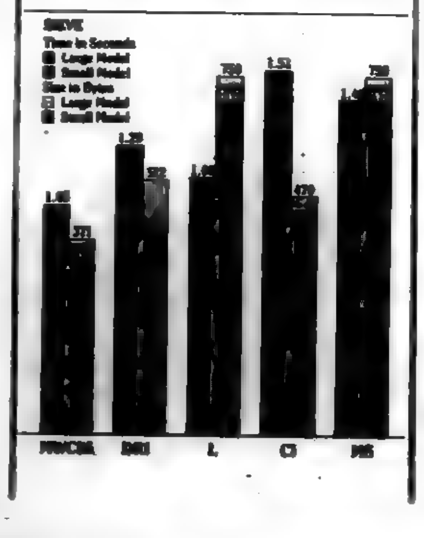


multicomponent systems with intelligent micro and mainframe links. These products take advantage of each component's strength: the micro's ability to provide a flexible and friendly user interface and the mainframe's capacity to store and allow rapid processing of large amounts of data.

Examples of the linked workstation category of micro software include the Golden Gate package from Cullinet and the IT series of products from Martin Marietta Data Systems, Inc. These offerings are linked to mainframe software (Cullinet's IDMS-R and IDB and Mathematica's Ramis II, respectively) to provide access to data and electronic communication facilities. The more overlooked aspects of such offerings are the data communications and electronic mail capabilities rather than the spreadsheet or data management capabilities. The communications component is important because it gets data back and forth between mainframe and micro and ostensibly offers some measure of control for the DP group. Electronic mail is important because it potentially provides a heretofore unavailable service. The spreadsheet and data management facilities of such offerings are not as important; they lack the clout of Lotus 1-2-3 for spreadsheets and do not effectively displace mainframe capability. In fact, they offer significantly less than mainframe data management capabilities.

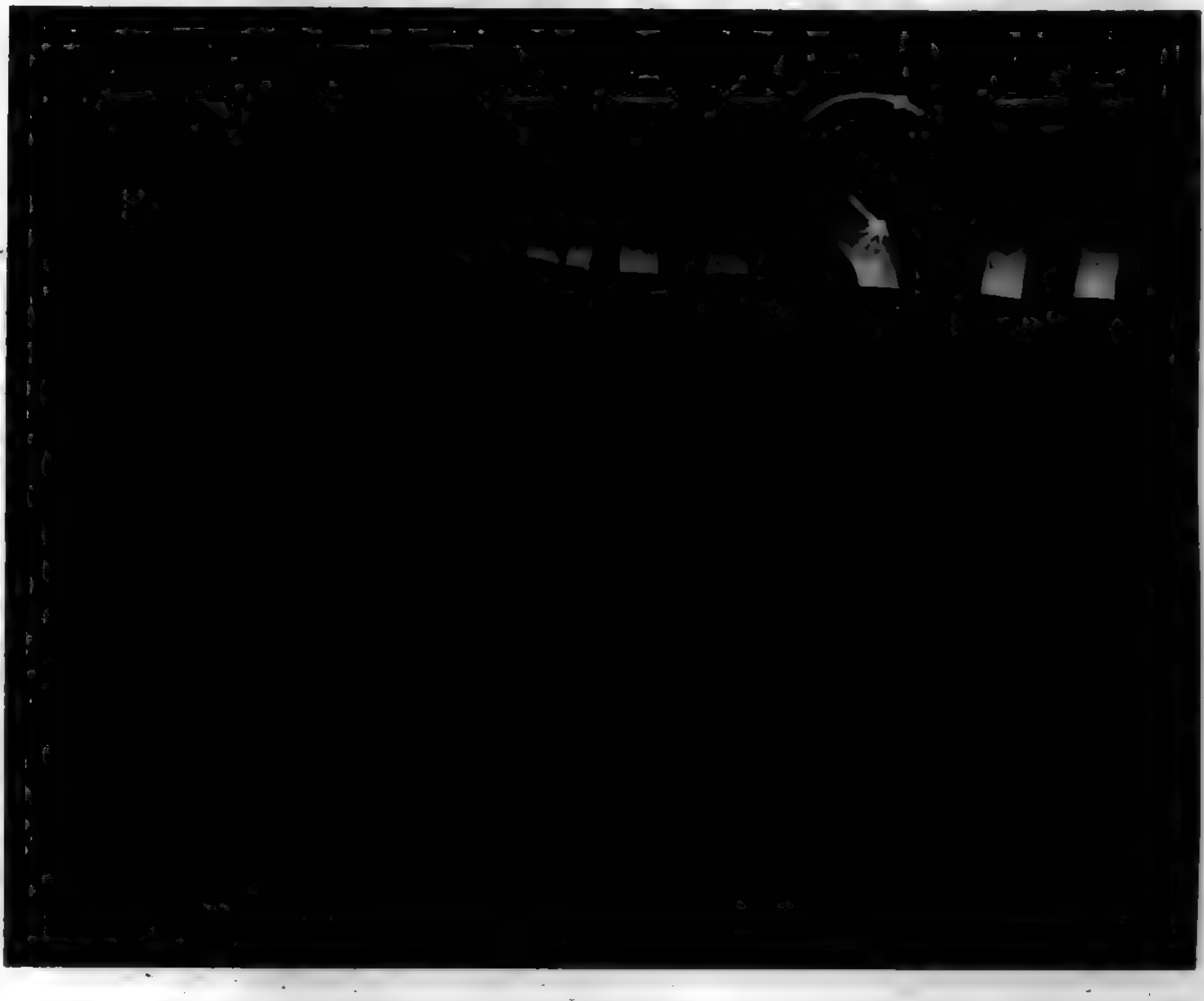
The status of existing micro software — both stand-alone and linked via a communications component — is similar to that of mainframe software a few years ago. On both levels, two approaches have been used to satisfy various functional software requirements. According to one philosophy, everything needed by the user should be embedded in a single product because when you are in it, everything is readily available for use. Other systems adopt the philosophy of concentrating on specific activities and providing interfaces to other products. A popular example of this component approach on the IBM mainframe level is dubbed Fits (Focus, IFPS, Tell-a-Graf, SAS Institute, Inc. SAS) which covers such capabilities as data management, report writing, financial modeling, graphics and statistics. Historically, component products that perform one area of activity very well and do not try to be all things to all people have enjoyed the greatest success. Perhaps the mixed reception accorded products like Framework and Symphony is because users don't want or need the additional features — Lotus' 1-2-3 is enough.

Integrated micro packages and inconsistent micro/mainframe offerings also raise another question. How many tasks are management level personnel interested in or required to learn? The answer seems to be a limited set of tasks, at least if the experience of 1-2-3 vs. Symphony is any type of guide. Why, then, do we assume that if someone is doing data management on a mainframe they will find it desirable to learn a second language to do the same thing in a more restricted way on a micro? Such a scenario favors a consistent micro implementation of mainframe products.

There are many decision support systems packages in which almost all of the functionality of the system has been transported to the micro; this approach gives users a cheaper development resource combined with a data communications facility, as well as mainframe resource for larger tasks.

The same statement can be made about certain data management packages such as Focus, Info and Oracle, which have provided consistent micro implementation over the past two years. Such implementations provide a comfort level in MIS managers not found in some other packages. In many cases these packages provide a "back of the book" answer to micro software purchases.

Consistent packages significantly reduce training and support requirements and provide a flexible range of computing options for users.



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MARTIN MARIETTA

Focus, authored by Information Builders, Inc. (IBI) is a prime example of a successful micro implementation of a mainframe product. The micro version introduced new ideas about user interfaces (for example, Tabletalk) being developed for the mainframe package. In addition, the micro version allowed IBI to transport its product to Digital Equipment Corp. and Wang Laboratories, Inc. minicomputers. The trend to micro software driving mainframe developments and integration across diverse hardware and operating systems is expected to be a continuing challenge to the software industry.

Many users of micro-based systems find that although they were initially satisfied with a product's capabilities, continued exposure to the product leads them to want more. They come to want enhancements and additions to the basic applications. When these requirements become large enough, either the hardware or the software cannot accommodate the changes. This problem seems less important if the IBM Personal Computer AT can be seen as shortly becoming a low-end business microcomputer and if software developments continue their current trends. But many new users are faced with conversion to a mainframe installation using a different product. Instead of being a threat to in-house information centers, micros often further foster the need and desire for still more computer applications, especially those with greater sophistication. "Computer literacy," born from micro usage by the average analyst or manager, creates a vastly increased need for the in-house information center.

Sooner or later the needs of users within large companies tend to focus on mainframe capabilities. The mainframe plays a significant part — whether for larger storage and computing capabilities or for that basic necessity of computer life, data. Whether this belief reflects reality or not, users do perceive microcomputers as being easier to use. The longer micros are in use, the greater the need for the mainframe.

Of the many players currently in the software arena, IBM's developments bear the closest scrutiny. IBM has been extremely active in micro and mainframe software. Although the company has made some arrangements with a number of noted DSS vendors (Comshare, Inc., Economic Sciences Corp., EPS, Inc. and Execucom Systems Corp.), its major activity has been focused internally. In addition to the release of DB2 and SQL/DS, as well as the appearance of QMF, a unifying front-end, IBM has announced a number of products geared specifically at the information center marketplace.

IBM's new thrust into micro software with its Personal Decision Series offers some practical solutions to many of the major corporate challenges in supporting personal computing. The Personal Decision Series is a set of related micro software designed for business and professional users. At the core of the product set is the IBM Data Edition, which is a prerequisite for the other offerings. As an integrated data manager, Data Edition provides capabilities similar to many stand-alone products and offers a host of capabilities in the areas of file handling, data entry, query, reporting and application development. What differentiates Data Edition from other products is its ability to access information from other members of the Personal Decision Series, from public data bases (for example, Dow Jones) and from the accounting software available on the PC-based IBM Business Management Series (for example, General Ledger, Payroll, Order Entry and Invoicing, A/P, A/R and Inventory). Of greatest importance to many companies are the connections available for the IBM System/36 or System/370, 4300 or 30 series hardware (either MVS or VM) using the Attachment Editions. A virtual disk feature allows the transparent utilization of the disk storage capacity on a host as a PC-fixed disk (up to two 10M-byte virtual disks active at a time). This allows multiple PCs to share common applications and facilitates maintenance and use of the host security and backup procedures.

The longer microcomputers are in use, the greater the need for the mainframe.

The other Personal Decision Series products are modular yet integrated, allowing IBM to tailor specific environments for users. This is a good example of the previously discussed approach to micro software and mirrors many common information center configurations. The selection of the data management component as the core of the system seems wise in that the majority of usage is in that area (typically 50% to 95% of all corporate information center usage). Other Personal Decision Series editions include the following:

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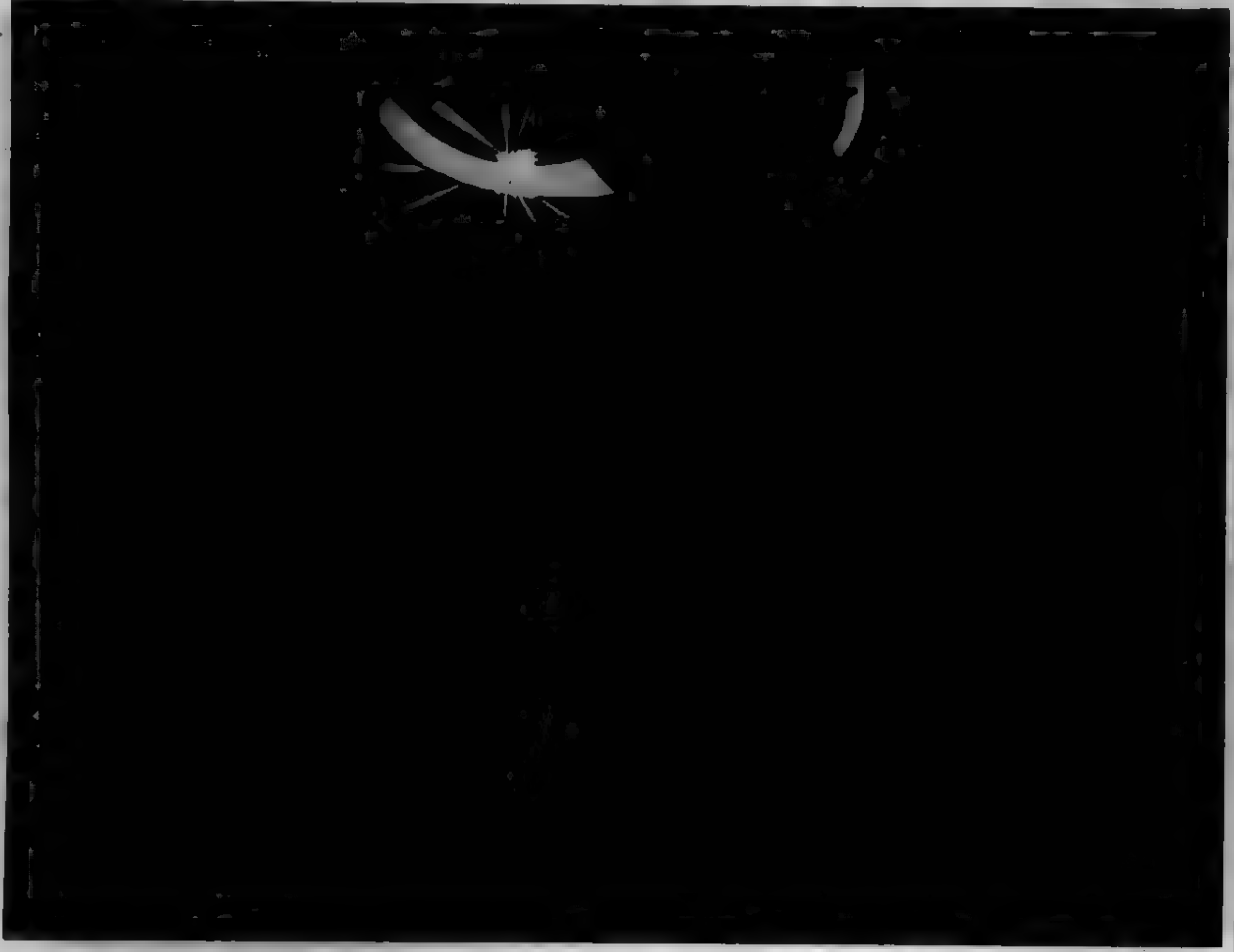

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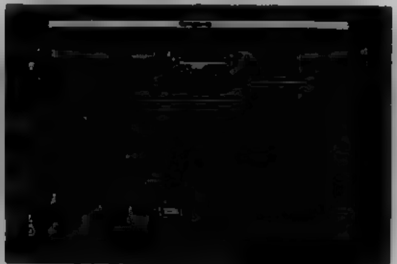
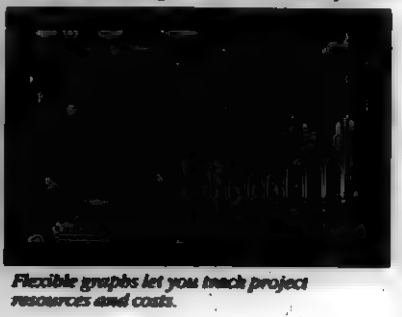


Schedule window shows tasks on a timeline; Roadmap window shows task dependencies.



Flexible graphs let you track project resources and costs.

Although the IBM offerings fall prey to some drawbacks of inconsistent micro/mainframe packages mentioned earlier, some mitigating factors include an apparently well-thought-out plan for data communications, the modularization of software allowing more function and the fact that IBM is involved. The largest success of these packages should initially be in small- to medium-size business environments, with the communications component enjoying a wider distribution as a utility. The other significant aspect of this offering is the quality and quantity of support provided. An adjunct to the Personal Decisions series is the Extended Support Program, which offers software maintenance, telephone hotline, program updates and a regularly published journal, as well as on-line training options — all designed to help in-house DSC managers.

Even though IBM's software approach does not exactly fit any of the previously discussed categories, IBM clearly has the capability to offer solutions in each of them. The current PC software set addresses the needs of small business and standalone professionals while partly solving DP requirements involved in corporate micro strategies. By adding a level of data integration with the data base management system activity (similar to Cullinet Software, Inc.) and developing micro versions of the information center products, IBM could provide solutions for any or all standalone, linked micro/mainframe and micro implementations of mainframe software needs. While IBM takes the position of being an "equal-opportunity" software interfacer, a one-stop shopping offering would be a welcome relief to many corporations that find it difficult enough to deal with one software vendor — much less half a dozen!

Because of their flexibility and increasing power, microcomputers have tremendous potential as corporate tools. The software providers that can deliver the best information access and complete integration will be the marketplace winners. Systems now being developed will not only support sophisticated local data analysis on the micro, but will also allow the micro to be used as a "window" through which other files on other systems can be viewed. The ultimate goal of this micro/mainframe integration effort is a system with sufficient intelligence and knowledge to locate and retrieve information, whether it is present locally or resides on a remote computer.

The productivity promises associated with microcomputers, however, will not be instantly or automatically realized. Success in this area will depend upon management's ability to evaluate long-term requirements and to develop and implement the requisite strategies. There is little doubt that distributed data processing is the wave of the future and the microcomputer is the most appropriate tool for implementation. A basic shift in emphasis in end-user needs has been away from processing logic and toward a shared information resource. The centralized corporate mainframes will become repositories of large data bases, interdepartmental communications and the extraordinarily demanding processing tasks that require supercomputer capabilities. All the analytic software will eventually reside on the micro level.

A glance backwards tells us that local processing capabilities, both in terms of hardware and software, have existed for some time. What has not become available is a uniform, cost-effective method of distributing the data from a central site out to the distributed locations. The vigorous and highly competitive telecommunications arena will undoubtedly lower transmission costs and support greater transmission speeds in the near future and will make an integrated, total solution approach to personal computing necessary for vendor survival in the corporate marketplace.

■

Bergstrom is vice-president of marketing and a principal of Real Decision Corp., a research and consulting firm headquartered in Darien, Conn. Crawford is director of data management decisions at Real Decision Corp.

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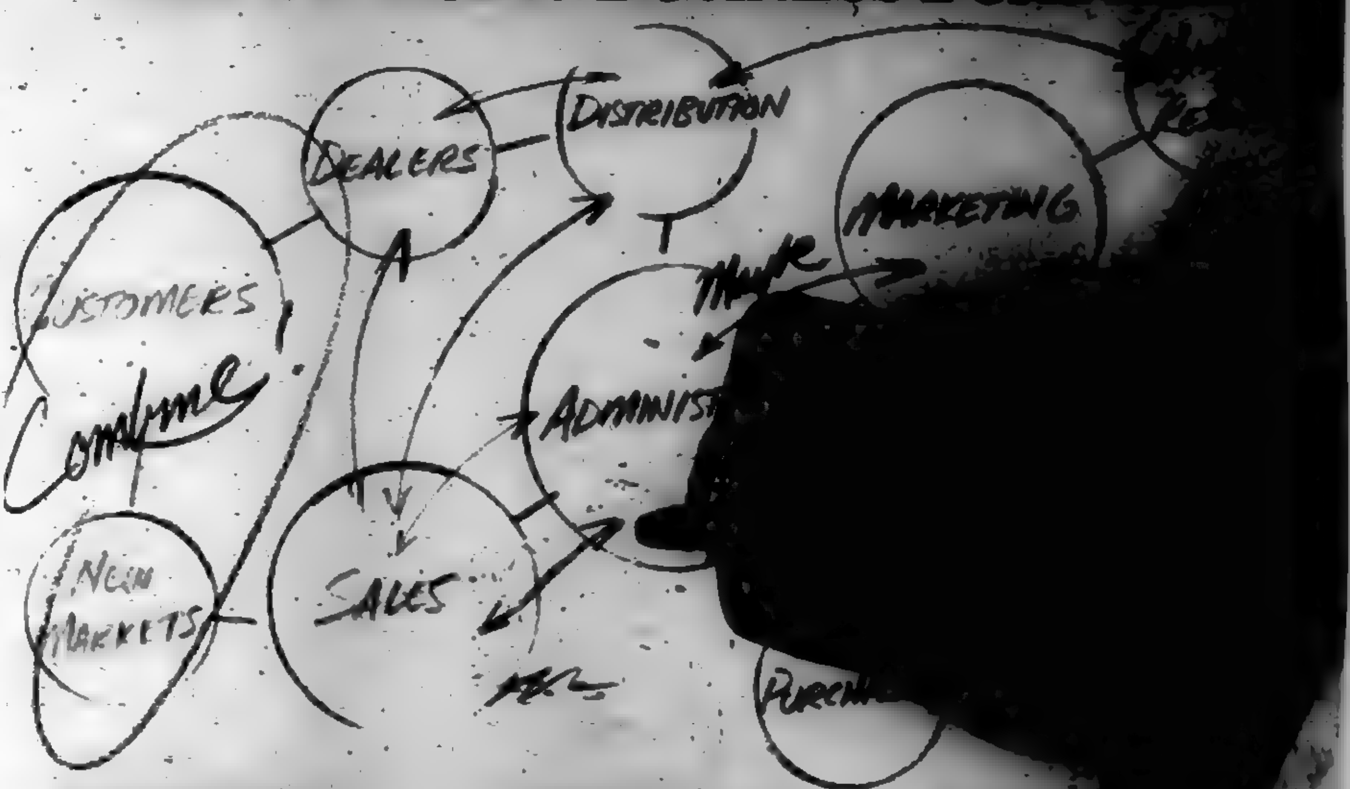

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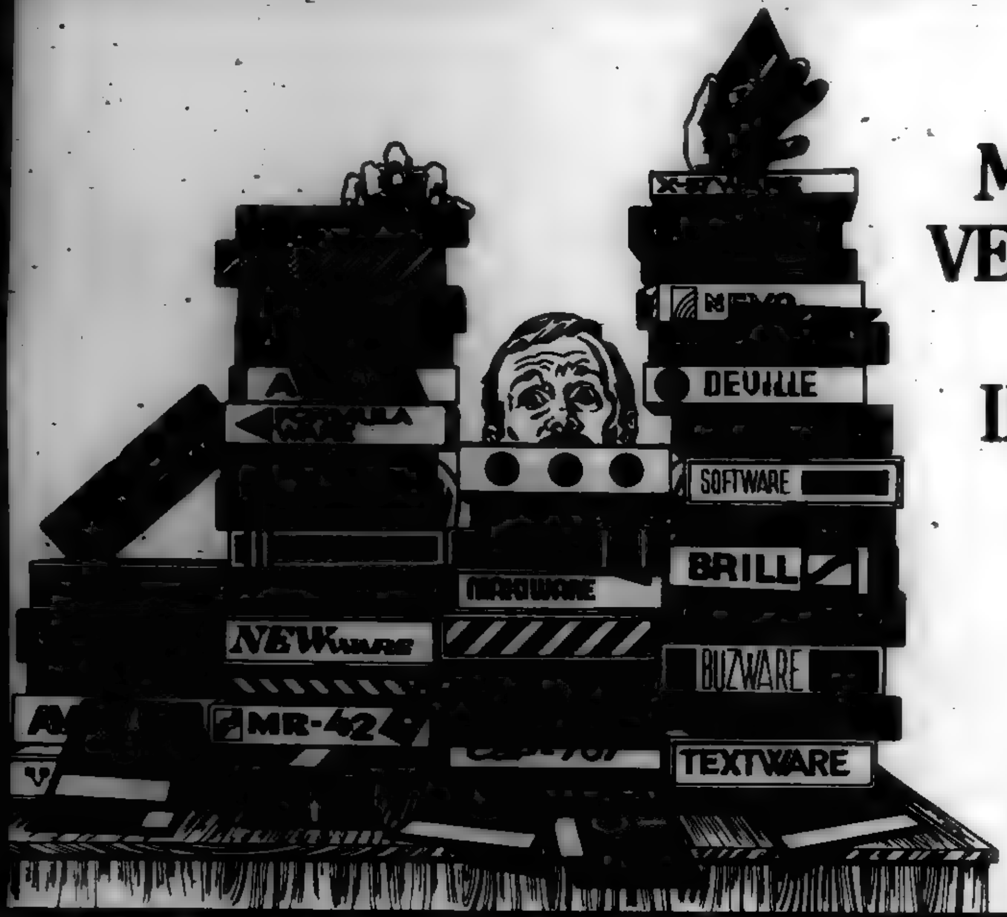

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Developing Software At IBM

By Glenn Rifkin

IBM's entry into the micro software arena may eventually add billions to its already bulging coffers, but Big Blue's motivation is not merely monetary. What IBM is seeking in the volatile personal computer market is control of its own destiny, and software may just be the driving force in that quest.

Make no mistake, the microcomputer software market is tinged with gold — an estimated $15.4 billion market by 1989, according to International Data Corp. (IDC) — and IBM has yet to be shy about jumping into lucrative waters. Initially, entrance into this new arena may prove to be a strategic one . . . a move to "try and gain more control of its hardware systems sales," according to Michael Killen, president of Strategic, Inc., a California consulting firm.

With an estimated $4 billion in personal computer sales giving IBM nearly 30% of the market in 1984, it is difficult to comprehend the company's feelings of insecurity. Yet industry analysts (as well as Steven Jobs, cofounder and chairman of Apple Computer, Inc.) are convinced IBM wants more — a great deal more. IBM opened the architecture and chose Microsoft Corp.'s MS-DOS operating system for the Personal Computer when it was first introduced in 1981. By doing so, IBM spawned a massive and lucrative industry for both PC-compatible hardware vendors and independent third-party software developers.

In order to secure its own continued growth rate of 15% to 20% annually, however, IBM must grab a larger slice of the very market it created, analysts said. The corporation is looking at the PC marketplace as a key contributor to future growth, and PC software development is viewed as a catalyst in that market. "IBM is in the process of taking back much of the compatibles market," Killen said, "and one way to do it is to come out with sophisticated hardware with a lot of hooks that are easily accessible only with IBM software. Software is part of the strategy to start bringing the PC-compatible market back home."

To secure its own continued growth rate, IBM must grab a larger slice of the very market it created. It is looking at the PC marketplace as a key contributor to future growth, and PC software development is viewed as a catalyst in that market.

The sophisticated hardware introduced last August took the form of the IBM Personal Computer AT, a powerful multiuser, multitasking machine. At the same time, IBM quietly announced Topview, a windowing software package developed internally at the Boca Raton, Fla., Entry Systems Division (ESD). Topview marked the computer company's Number 1 home-brewed PC software offering. Topview, which has just recently begun shipping, has stirred up tremendous interest among industry consultants and the trade press. The early assessment of the product is that its impact will be volcanic. "It will be a smash success," stated Scott M. Smith, an analyst with the Gartner Group, Inc. "My people think it will be dynamite," Killen said.

On its own, Topview does little for the PC user. It is not an applications package or an operating system; it falls somewhere in between. Topview, in fact, creates an environment in which application packages can be used in a windowing or multitasking mode. Though current IBM PC packages will run under it, they reportedly don't take full advantage of the system.

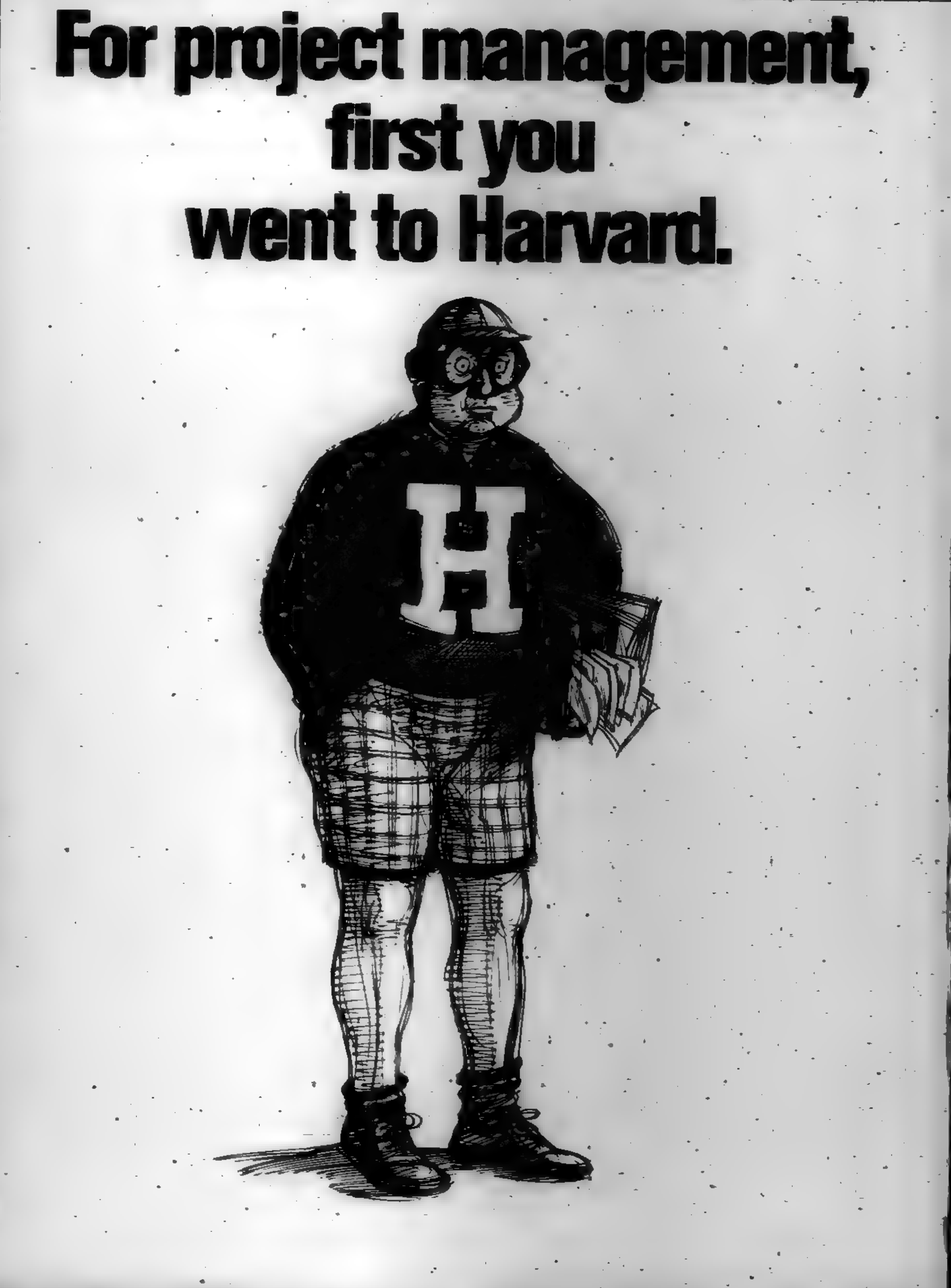
"Topview is a systems extension product," explained IBM's Bob Markell, vice-president of software and communications products for ESD. "In large systems terms, it's kind of like a subsystem." By creating this environment, IBM has set the groundwork for building a neat little fence around its PCs. Though Markell insisted that Topview "is as open as any other product we've released," analysts believe it could either lead to a proprietary operating environment for IBM or at least separate the end user from the architecture of the PC, so IBM could be free to change the hardware — to move away from MS-DOS, for example.

Markell dismissed most of the theories about the long-term intent of Topview. He pointed out that IBM is looking for ways to increase productivity on its systems, and Topview provides three essential elements — multitasking, simple user interface and windowing. He emphatically denied IBM is using Topview as the weapon in a battle to close off third-party developers. "The open architecture has been one of the key success stories of the PC," Markell stated. "We have absolutely no intention of changing that. The fact that people will take advantage of the software products by being able to exploit their capabilities provides us with a greater opportunity than could be gotten with a closed system."

Markell pointed out that IBM, in fact, has taken steps with Topview to ensure continued access by outside developers. The company introduced the Topview Programmer's Toolkit, which aids in developing applications for Topview, for $395. "It is extensive documentation of everything that Topview does," Markell declared. He also recalled that on the day Topview was introduced, IBM held a seminar with Topview's developers on hand to answer third-party vendors' questions. These seminars have continued on a regular basis, he added.

"If other products want to take advantage of the things we're doing, that can do nothing but help," Markell declared.

Though Topview doesn't close off outside development, it does provide a creative way for IBM to gain more control over its own future product offerings,



according to Smith. "People want to be able to plug applications into an operating environment, so Topview is a good idea," Smith explained. "But IBM is trying to separate the user from the architecture of the machine, so that if they want to change the hardware it will remain transparent to the user. IBM doesn't have that control now, but Topview will give it to them."

"IBM is trying to separate the user from the architecture of the machine, so that if they want to change the hardware it will remain transparent to the user. IBM doesn't have that control now, but Topview will give it to them."

This argument fuels speculation that IBM is itching to move away from the PC-DOS environment into new avenues without leaving its vast DOS base out in the cold. The company's announcement of PC-Xenix, a Unix-type operating system for the PC AT, for example, brought on an avalanche of conjecture. Again, Markell insisted that such was not the case.

"Our intent [with PC Xenix] was to provide good products for people who want to move into the Unix environment," he explained. "DOS remains a major part of the installed base for the PC and I would expect it to continue growing and being extended over time in substantial ways. There's a long laundry-list of requirements that, quite frankly, we need to get solved as soon as possible to let that environment keep growing.

"But it shouldn't be looked at in any way, shape or form as a reduced commitment to the DOS environment. We'd be crazy if we did that," Markell said.

The Directory, IBM's internally developed PC software, marks IBM's jump into the home, education and small business markets. The 36 low-priced application programs that form this group are separated into four categories: entertainment, education, productivity and business. The Directory is aimed at PCjr and stand-alone PC users, and the programs are available individually, in special value packages, or as a total package for $865.95. An IBM spokesman indicated that The Directory would be published three times annually with additional programs included.

It is ironic that the first actual PC software programs introduced by IBM for the large corporate setting have added more confusion; neither reportedly runs particularly well under Topview. The two packages of modularly designed applications are the Personal Decision Series (PDS) and the Business Management Series (BMS).

The PDS consists of six separate applications — Data, Words, Graphs, Plans, Plans Plus and Reports — which range in price from $150 to $300. According to a bulletin from IDC, information may be shared between the modules through the package's Data Edition in order to form compound documents.

BMS is made up of six accounting packages that cost $695 each; like PDS, each module may be used separately or as part of an integrated system. Though both PDS and BMS were developed internally, neither is new. The packages were both originally written years ago for larger IBM systems and reconfigured for the PC. Analysts point out that one reason the packages are not fully compatible with Topview is that they were developed by IBM's Information Systems Group, while Topview came from ESD.

Industry watchers consider the packages simply average "ho-hum" fare, which in IBM's case is usually adequate. That may suffice with PC software in the long run as well, but for now it isn't enough. Smith said. "Users are not running out to buy the software. The greatest chance of success will be with the BMS accounting products. In the PDS area, IBM has to contend with Lotus and it's got its work cut out for it there. The IBM name doesn't do much for them in software."

Barbara Isgur, president of BSI Consulting, Inc. in New York, agreed. "The major market share of IBM's software will be analogous to the number of PCs sold through IBM's National Accounts Division. People buying through retail channels will buy Lotus 1-2-3 and other packages that are accepted standards," she conjectured.

An IDC report on the packages pointed out that quality was not necessarily the issue. "It is important to note that the introduction of these programs should be seen as an attempt by Information Sys-

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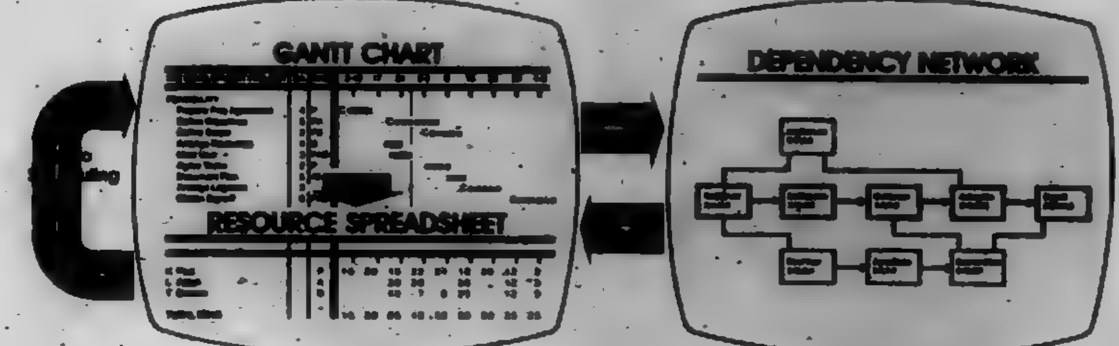

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tems to increase revenue rather than as a mainstream IBM move to displace the third-party software market. None of the PDS or BMS packages offer any significant advantages over currently available third-party packages," the report stated.

Smith added that IBM's greatest success may be in the small business area, using the accounting software as a lead-in.

IBM is actually beginning the arduous task of tying together its large, diverse and incompatible product line, using the Personal Computer and Personal Computer software to drive that maneuver.

Nonetheless, Markell acknowledged that IBM fully intends to bring a great deal of its large-system software down to the PC level; he gave as an example Displaywrite 2, the word processing software taken from the company's successful Displaywriter workstation. "We have a lot of attractive software in IBM, and we should do everything possible to make that software available to our users," Markell said. "You have to realize, however, that if they are not good products, they won't sell. What we are trying to focus on are products that have had a very positive reception with the user community. Where we provide consistency with the really good products throughout our line, it will do nothing but enhance IBM and the PC."

Smith of the Gartner Group disagreed with IBM's philosophy and said that bringing mainframe software down to the PC level was a big mistake. "It's a whole different ball game on the PC level," Smith insisted. "It's a different methodology and different user. To take an outdated program and try to squeeze it onto a machine for a novice user is a mistake. Certainly they have the people and money to build new software from scratch."

As it gropes and feels its way into this new arena, IBM is actually beginning the arduous task of tying together its large, diverse and incompatible product line, using the PC and PC software to drive that maneuver. "IBM is trying to move people upward," Isgur said. "They want the links and bridges to be as widespread as possible."

In that vein, IBM announced its Host Attachment programs, which reportedly extend the communications of the PDS modules to System/36, 370, 4300 and 308X hosts. These links consist of software running on the PC, on the host, and a terminal emulation card for the PC. The Attachment software will allow users to download and upload host files, run host applications in terminal mode and store PC-DOS files on the host as a virtual disk.

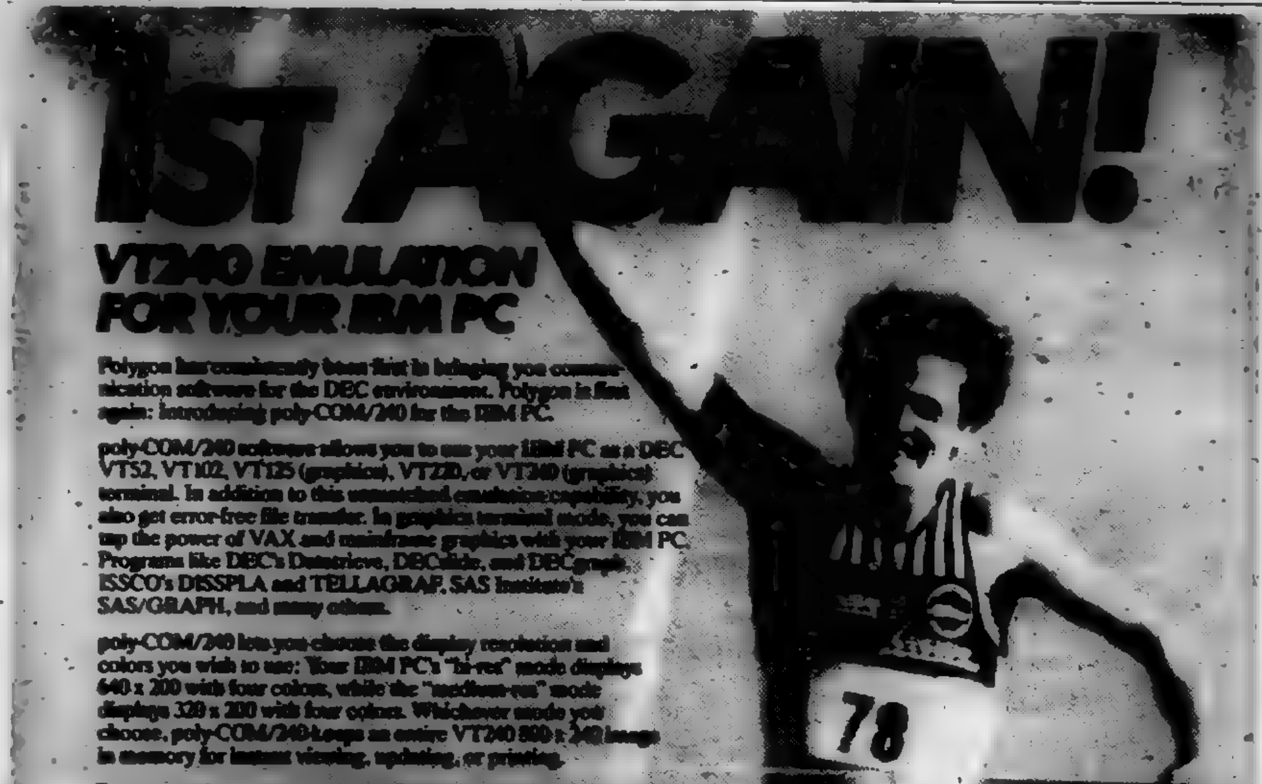
In the second quarter of this year, IBM is scheduled to deliver a new release of the Displaywrite PC software, Displaywrite 3 (which should signal the end of the Displaywriter) and to extend the Displaywrite WP architecture to the System/36 with Displaywrite/36. Consultants agree that IBM is setting up its office strategy using System/36 as a departmental host, with PCs as the desktop workstations.

"In the cases where we have good products, it just makes sense to make them available in the whole realm, especially for people setting up networks where they may switch from a PC to an intermediate node to a host system," Markell stated. "It would be nice if they didn't have to relearn every product they are using." Tying everything together will be no easy task. "It's going to be a long struggle," Smith declared. "Their software architecture is so diverse that they can only patch things onto the front end, which is what they are doing."

However its long-range plans finally conclude, IBM is keeping a benevolent profile at present. Markell insisted the company intends to rely on both internal software development and independent software manufacturers to supply "the functions that people seem to need, want or would find useful with the PC environment." He admitted that IBM would try to "optimize revenues" in that area, but added "the variety of software opportunities still out there is staggering."

Markell indicated the independent software community has not responded negatively to IBM's intrusion into its territory. "We've tried to be very open with them. In the case of Topview, we gave them information that will let them take advantage of new opportunities and be effective competitors with us," he stated.

Rifkin is update editor for Computerworld.



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Avoiding The Pitfalls in Developing Customized Micro Software

By John O. Saunders And Naomi Karten

One common misconception concerning the microcomputer is that it is best used as an organization person's personal tool. The user was to take full responsibility for the micro, and MIS managers had only to concern themselves with providing secure access to the corporate data base in order to support user activities.

With recent changes in the capacity of micro hardware, this view of the micro has become out-of-date. Micros are now appropriate foundations for both personal uses and customized applications. Failure to recognise this new role of the micro as a part of the organizational information architecture can lead to several problems for both the systems that are developed and the organizations that develop them.

Certainly the view of micros as personal tools was appropriate in the early stages of their use. The original Apple Computer, Inc. Apple IIs and Tandy Corp. TRS-80s were indeed personal computers in many senses. They offered relatively limited main memory capacity, floppy disk-based data storage, limited instruction sets and modest processing speeds. They were good for dedication to one task at a time that required user interaction. The early equipment, however, was not appropriate for transaction processing and multitasking production requirements of applications that ran on mainframes and minicomputers.

Micros have become identified with the notion of end-user computing, in which users are given powerful computing tools to apply to their needs as they see fit. The organization usually provides advice on the use of these tools, but the general assumption is that users will be able to solve many of their specific information needs on their own.

Unfortunately, in encouraging users to apply micros to their information needs, companies often do not make the critical distinction between organizational and personal information systems. Perhaps because micros have been so strongly associated with generic, end-user packages for word processing, spreadsheets and list management, corporate managers have assumed that users could not wander into the organizational systems territory. Consider the following cases:

- An article in a recent issue of the *Wall Street Journal* mentions a Dallas-based oil and gas company that fired several executives who made decisions that led to losses of several million dollars. The errors were caused by faulty calculations embedded in a microcomputer spreadsheet model.
- A credit analyst in a major East Coast bank spent several months developing a system using a spreadsheet package. The analyst intended the system to follow the bank's credit analysis guidelines so that it could be used by other loan officers. However, after developing 80% of the system by trial and error, the analyst found the model became so complicated, it could not easily be completed or extended.
- A large commercial bank used a summer intern to develop an IBM Personal Computer-based system for a portion of its trust operation. After one year, the business had grown substantially.

However, the system was designed in a manner that did not permit extension of its functions or transference to more powerful hardware. Thus, the bank had to decide whether to forgo further growth in the business or develop an entirely new system to meet the increase in demand.

All these stories have aspects that are familiar to DP professionals in the context of mainframe- and minicomputer-based systems. The image of either a critical system crippled by a subtle bug or a development project run amok, without any design or plan to guide it, are the basis for many DP war stories. Yet, in the examples noted above, we find systems developed by users for microcomputers, not by teams of programmers to run on a mainframe.

The consequence of faulty design or of poor planning can be just as devastating to such efforts as they are to larger projects.

Microcomputer hardware and software are now sufficiently powerful to support fully customized systems to meet organizational needs. Current microprocessors, such as the one used in the IBM Personal Computer AT, are as much as five times as powerful as the processor at the heart of the Apple II. The memory capacity, instruction set, on-line storage and memory management techniques are just as powerful in the next generation of micros as those of minicomputers several years ago.

Users are becoming aware of this enormous capacity and have gotten ahead of their management information systems organizations by building their own micro-based systems. Particularly in banking and financial industries, ambitious managers see micros as an excellent opportunity to get around the DP backlog and build systems to support some new product or service that they can completely control.

However, as the examples cited above indicate, relying on customized micro-based systems to meet organizational requirements can be a source of difficulty as well as opportunity. Most difficulties arise because of failure to recognize that a particular system serves the needs of the organization rather than an individual.

This distinction can be subtle. For example, was the spreadsheet model mentioned in the *Wall Street Journal* article intended for the personal use of the executives making the decision or for all executives making a similar decision? If the former, then the spreadsheet model was a personal information system; if the latter, it was an organizational information system.

The deciding factor has nothing to do with the hardware or the software used, or even with whether the system is computer-based. The distinction rests on the dependence of other parts of the company on the system's output. The fundamental test is whether, after a sudden failure of the system, individuals or groups within the firm would be impaired from performing responsibilities. By this criterion, it is clear that many micro-based systems have organizational implications.

> **Many micro-based systems have organizational implications. The fundamental test is whether, after a sudden failure of the system, individuals or groups within the firm would be impaired from performing responsibilities.**

The misperception of a micro-based system as personal rather than organizational leads to a number of project-oriented problems and organizational risks. Among the project-oriented problems likely to occur are the following:

- Inappropriate and insufficient resources are applied to the project.

The ease of purchasing micro hardware and the extremely low cost and ease of use of micro software have contributed to an attitude that micro applications are not very important. The result is that projects intended to operate on a micro are perceived as noncritical. As a result, staff with neither the time nor the experience to design and develop a system properly are assigned to the task.

A system may result from this effort and, with luck, it will operate satisfactorily. But the system will rest on a design that cannot be easily changed and will probably not be tested thoroughly or include documentation that would make it useful to others.

DATABASE MANA

d new improved sort time.

1:27

(time to sort 1,000 records)

Unfortunately, some companies have actually institutionalized this approach by deeming that the professional system development staff will not become involved in micro-based projects. Many information centers rigidly follow the guidelines first disseminated by IBM that the information center should not develop applications for users. Such an attitude forces users to turn to user-oriented software products, such as Ashton-Tate's Dbase III, and whatever expertise they can acquire from outside the firm to develop legitimate systems.

- Inappropriate development tools are relied on for building the system. Most advertising for microcomputer software quite properly promotes its ease of use as well as sophistication. However, the overall effect of this promotion is to suggest that just about anything one needs to do in a business environment can be accomplished with a generic list management package or an electronic spreadsheet. Users who are frustrated with waiting two months to get results from the data processing department are only too eager to accept this idea. As a result, users are often tempted to rely on a user-oriented package for developing a system that must meet much more sophisticated sets of requirements. Appropriate tools for these more sophisticated systems include high-level programming languages such as C and Pascal, powerful operating systems such as Unix and truly relational data base systems.
- An inappropriate development cycle is chosen (or not chosen) for a given project. Much recent research has shown that two generalized approaches exist for systems development — the traditional life cycle approach and an iterative design

> **Many information centers rigidly follow the guidelines first disseminated by IBM that centers should not develop applications for users. This attitude forces users to turn to user-oriented software products.**

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and development approach. The life cycle approach has been the standard methodology for large, complex systems based on mainframes and minicomputers, while iterative design and development methods have been used for decision support systems and smaller, end-user-oriented systems. Both development cycles are appropriate for micro-based systems depending on the complexity, criticality and organizational exposure of the system.

Unfortunately, managers rarely give explicit consideration to the proper development cycle to be used for projects. Nonetheless, this consideration is particularly important for micro-based systems because micros can be applied to systems for which either development methodology is appropriate. Thus, managers often make an implicit decision to follow an iterative design/development approach when it is not fully appropriate. But as the third example cited above demonstrates, many micro systems are critical enough to require a life-cycle approach to their development.

Unfortunately, managers rarely give explicit consideration to the proper development cycle to be used for projects. This consideration is particularly important for micro-based systems.

In addition to these project-oriented risks, developing customized micro-based systems also poses several risks to the organization. The most important danger is that the organization, in deciding to develop such systems, will choose to give up control over the process. Such lack of control can open the way for all the project-oriented risks already mentioned.

Other organizational risks include the following:

- The absence of corporate controls and lack of reconciliation of micro-generated output with other organizational systems can lead to management-based decision making based on erroneous data. Centralized systems, while monolithic, at least provide the opportunity for reconciling all similar data across different applications.
- The absence of control or even knowledge of who is developing what applications can lead to a proliferation of both data and applications. Managers increasingly voice concern over appearing at a meeting armed with spreadsheet output only to find other managers with other spreadsheets and different results. Similarly, large organizations may find that different divisions are developing the same micro-based application at the same time but with no coordination of effort.

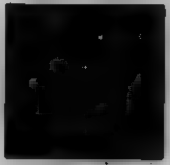
Thus, major corporations will soon find that they are, willingly or unwillingly, developing customized micro-based systems. In order to cope with the process, therefore, firms must take the following steps:

- Recognize the distinction between organizational and personal uses for micros. Develop guidelines that will help users understand the distinction, and develop policies for assisting users who can demonstrate a need for a micro-based system.
- Develop guidelines that can distinguish those applications that are best suited to mainframes and those best suited to microcomputers.
- Seek out opportunities for successful micro-based systems. Use such opportunities as a means of demonstrating the value of such systems and the value of using the proper design/development approach and development tools.
- Develop guidelines for the choice of development methodology, documentation standards and accountability for micro-based systems that are organizational in nature. Establish guidelines that will ensure a uniform approach to application design and development.

Specialized applications built around microcomputers can allow firms to enter new product areas, increase operational effectiveness and compete more effectively. However, it is necessary for firms to understand the special circumstances imposed by microcomputers in order to exploit these opportunities fully.

* * *

Saunders is a principal with the Boston Systems Group, Inc. He recently managed the development of a decentralized management system for a large university. Karten is president of Karten Associates in Randolph, Mass., and an associate of the Boston Systems Group.



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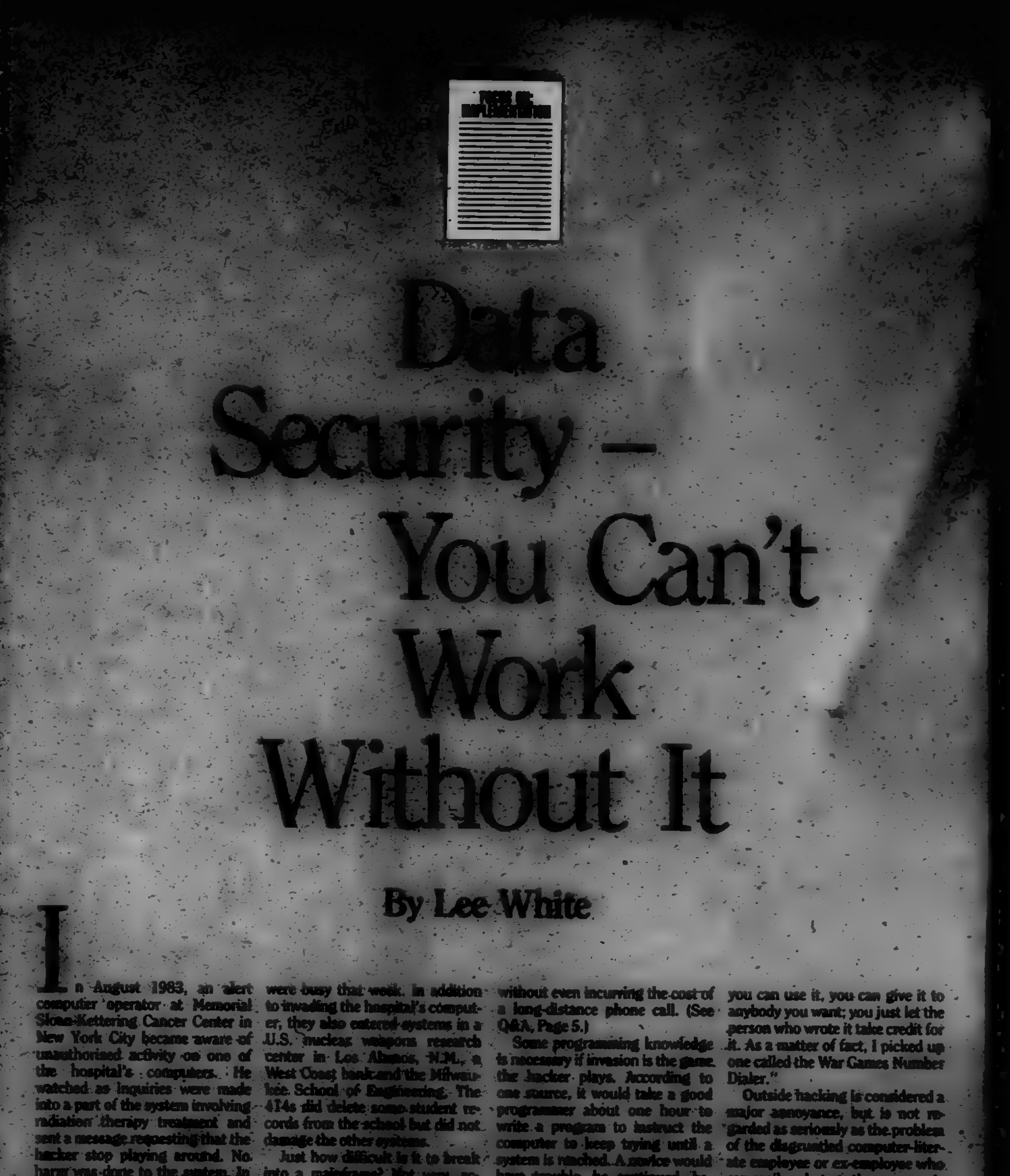

FOCUS ON: IMPLEMENTATION

Data Security – You Can't Work Without It

By Lee White

In August 1983, an alert computer operator at Memorial Sloan-Kettering Cancer Center in New York City became aware of unauthorized activity on one of the hospital's computers. He watched as inquiries were made into a part of the system involving radiation therapy treatment and sent a message requesting that the hacker stop playing around. No harm was done to the system. In fact, the particular machine and the program it was running had nothing to do with the actual treatment of patients, although the program was shared by many other institutions and was used to determine appropriate calculations for radiation dosages.

The trespassers were a group of Milwaukee hackers who came to be known as the 414s (the area code for Milwaukee), and they were busy that week. In addition to invading the hospital's computer, they also entered systems in a U.S. nuclear weapons research center in Los Alamos, N.M., a West Coast bank and the Milwaukee School of Engineering. The 414s did delete some student records from the school but did not damage the other systems.

Just how difficult is it to break into a mainframe? Not very, according to good guy and bad guy sources, all of whom chose to remain anonymous. As microcomputer software becomes more integrated and multifunctional, emulation software (software that enables a microcomputer to look like a mainframe terminal) hasn't changed at all.

For the price of a modem comes the ability to access other microcomputers and mainframes, often without even incurring the cost of a long-distance phone call. (See Q&A, Page 5.)

Some programming knowledge is necessary if invasion is the game the hacker plays. According to one source, it would take a good programmer about one hour to write a program to instruct the computer to keep trying until a system is reached. A novice would have trouble, he continued, because he has to control the dialing functions of a modem. But, he added, anyone with experience sending commands out to a communications port like a modem would have very little difficulty.

It can be much easier. One hacker said, "Some [electronic] bulletin boards have programs on them that you can take for free. The only thing is, you don't claim that you wrote it. You can take it, you can use it, you can give it to anybody you want; you just let the person who wrote it take credit for it. As a matter of fact, I picked up one called the War Games Number Dialer."

Outside hacking is considered a major annoyance, but is not regarded as seriously as the problem of the disgruntled computer-literate employee or ex-employee who can easily sabotage the company's mainframe.

The threat of internal sabotage is very real, and organizations are too often unaware of the danger until it's too late. In Los Angeles recently, two "logic bomb" programs were set in the two computers of Collins Foods International, Inc. The first was designed to destroy software and data, but would not go off without outside prompting. The second would

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erase data files and the software necessary to restart the computer. Two former employees were charged with conspiracy to commit computer fraud under California's recently enacted computer crime law. The two men, now employed as programmers at other companies, await trial.

In another California case, a former employee of Micro Porcelain Dental Laboratories, Inc. in Dublin planted a logic bomb in his company's computer to collect vacation pay he felt he was owed. The company paid, the machine was restarted and the employee was arrested and sentenced to 36 months' probation.

A close relative of the logic bomb is the "Trojan horse," so named because its harmless exterior hides a sinister purpose: This program will perform an expected function but also leave the system wide open; at a later time, the hacker can reenter the machine undetected.

Just what are organizations doing to protect themselves? Those that have been invaded by hackers or angry employees have increased security in order to stay a few steps ahead. A representative of the Memorial Sloan-Kettering Cancer Center, which the 414s targeted two years ago, said adjustments have been made to ensure that it would be "more difficult for them, very difficult, to tap into." The spokeswoman declined to give further information, saying that "once you start encouraging, people say, 'Well, let's see if we can do it.' "

An executive of the Security Pacific Bank, which was also tapped by the 414s in 1983, has had no further problems, internal or otherwise, and doesn't anticipate any. "We recognized what was happening with the 414s, we tracked it to only test data and eventually turned the data over to the FBI," he said.

The bank is continuing to monitor its security precautions. The DP department had its own internal system security group that was involved with software integrity. That group is now under the larger umbrella of corporate security. The group is implementing a software program that will look at some critical data bases. A DP executive explained: "We're putting through a user exit in the IBM software in our on-line time-sharing system. [This software] can block any access, even though there is a valid ID and password, if it's coming from an unexpected location. And we allow only a handful of people, on an extremely limited basis, access to our production systems. Those people are known by name. When they call into the computer center, the center calls them back and patches the connection, so it's been voice authenticated. The connection is made outbound after their phone call." He also mentioned a software security program product put out by IBM called Resource Access Control Facility (RACF) that presently runs under MVS. He expects IBM will have RACF available for VM within a year, at which time the bank will probably put it on its computer.

But such careful security measures can be very restrictive. It is possible to restrict access by ID, password and terminal address, but that level of security would make it impossible for an employee to walk across the hall and access the mainframe from a co-worker's terminal.

A simpler method, which is not applied very often, is the frequent changing of passwords. At California's Security Pacific Bank, passwords lapse after 90 days. Larry Dorf, senior vice-president, said this is a painless way to keep on top of problems. "Every time you beef up security procedures somebody gets annoyed because it interferes with his work habits. But frequent changing of passwords is a technique that we've gone to. First you get a warning, and then it lapses." If an employee at Security disregards the warning, he has to go through the procedure of requesting a new password, which can take a day or two. Dorf said very few people let passwords lapse.

Another method of security that could be more widely used is the U.S. Data Encryption Standard (DES) algorithm. Developed by the National Bureau of Standards, it is used in all automated teller machines (ATMs). When the card is inserted and the personal identification number is punched in, the message goes from the ATM across the communications line to the computer. The computer decrypts the envelope of the communications message, revealing the personal identification number, also encrypted. It then goes to the file record of the account balance and pulls it up; in that record, there is an encrypted version of the personal identification number. The two encrypted versions have to match in order for the cash to be issued. According to banking sources, a customer's personal identification number is not written down in any location, so that even bank employees are not privy to this information.

Although encryption techniques provide good security, even two layers of encryption may not be as foolproof as systems executives might wish. "It is helpful for security, but it's still not unbeatable," said one hacker. "It is getting more difficult. But if you're clever enough, you can figure out the one pattern that will decode it all, because if you think about it, two patterns added together to make one file has to somehow have one pattern."

Keeping large computer systems secure from access by unauthorized micro wizards is only one of the problems that worry organizational executives. Another takes the form of floppy disks on which sensitive data may be stored. "Corporate executives are finding that the proliferation of microcomputers has meant that really important, critical, competitively desirable information is allowed to kick around everywhere on floppy disks without any sort of protection,

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without any sort of security," said Kenneth Bosomworth, president of International Resource Development, Inc. (IRD), a market research firm in Norwalk, Conn. According to IRD, corporations are now finding that locks on doors of the mainframe computer room, security checks and lie detector tests for DP employees and sophisticated data encryption boxes to protect against tapping transmissions may not be enough.

"After the vice-president of corporate planning sets up his program and, out of his own head or out of papers in his own file cabinet, punches in the company's plans for the next five or 10 years," continued Bosomworth, "he might leave those floppy disks on his tables and around his office, unguarded over the weekend. Of course, he probably locks his file cabinet up very carefully for the weekend, but he still leaves floppy disks with all his corporate plans lying unguarded on his desk."

Although many companies disregard the dangers of randomly placed floppy disks, Security Pacific has taken positive steps to ensure the safety of sensitive company data that is stored on microcomputer diskettes. One of the departments for which Larry Dorf has direct responsibility is the information center, and he chairs an information center steering committee that includes a number of bank executives. Members of another committee, the DP security committee, have written a manual that takes into account all kinds of security issues, including micros.

"The cornerstone of what we're trying to get at is defining accountabilities, defining the fact that security is everybody's responsibility. We're going to help them implement the policies and practices through guidelines and do's and don'ts, but they're really the owners," Dorf said.

Microcomputer data integrity is easy to control and inexpensive to implement, according to the corporate executives contacted. In contrast, system integrity is costly, time-consuming and possibly not worth pursuing. Most DP managers said implementing security measures strong enough to repel unauthorized access would also make life very difficult for authorized users. "Sooner or later," said Dorf, "the law of diminishing returns comes into play."

Perhaps one answer to the problem of unauthorized access to data bases via micros lies not in trying to keep hackers completely out of computer systems, which the experts on both sides of the fence say just can't be done, but to make critical files as inaccessible as possible. Another possibility, suggested Wayne Cerow, president of Cerow Investigations and Consultants in Phoenix, Ariz., is the presence of monitors on computers that would alert staff members or security personnel to illegal system entry attempts.

Cerow also stated that hackers should be punished. Although most are juveniles, he said, states should change statutes, and hackers' home computers should at least be confiscated. "Maybe they should be made to do some sort of civic duty, but they shouldn't be made into heroes. They should know that it is against the law, it is a crime," he said.

Some of the youthful hackers have seen the errors of their ways, or maybe they've just seen a way to avoid prosecution. In Minneapolis, a 15-year-old youth who last year was caught tapping into a bank's computer has aided police in breaking the computer code of a suspected sex offender. It took the youth 45 minutes to break a system that had confused police for nearly a month. And in Columbia, Md., a 13-year-old agreed to help authorities solve instances of computer crime after he himself had been arrested for computer card fraud. It is interesting to note that the bank traced the telephone call of the Minneapolis boy, but the Maryland youth was caught after an informant spoke to the police.

Adult hackers are not faring as well as their youthful counterparts. Computer crime laws are now on the books in 33 states. Stanley Slyngstad of Thurston County, Wash., entered the State of Washington's computer system and had the state mail him checks totaling $17,000. Slyngstad kept none of the money, giving it instead to needy friends. His contention that he was a modern Robin Hood did not impress the judge. He was sentenced to 10 years in prison, but was paroled after 14 months. Another computer criminal in Arizona spent 30 days in jail and is now on probation.

One of the major problems security enforcement is up against is the unwillingness of many organizations to make public and therefore prosecute those who have illegally tampered with data. Although this situation is changing, many organizations are unwilling to risk public exposure of their data's vulnerability.

On a closing note, what ever happened to the 414s? According to the youths' attorney, Paul Piaskoski of Milwaukee, Neal Patrick was granted immunity for cooperating with authorities, and two or three of the others were charged with misdemeanor offenses and fined $500. A computer crime law existed in Wisconsin at the time but, according to Piaskoski, the break-ins were interstate rather than intrastate, "at least the ones that [authorities] were aware of."

Perhaps it's just as well that the 414s didn't serve any time in prison. An ex-convict who was charged under the State of Arizona's computer crime law was sentenced to 15 years in jail. Wayne Cerow said the ex-convict had previously learned to use a computer in jail.

White is senior writer at Computerworld Focus.

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Integrated Software — Past, Present And Future

By Morton Rosenthal

When Lotus Development Corp.'s Symphony and Ashton-Tate's Framework were introduced in July, most computer users expected them to be the ultimate in integrated packages.

Symphony, with its super spreadsheet, was supposed to be geared for the numbers-oriented user. Framework, with its outline capability, appeared to be ideal for the word-oriented person. Between the two, the market seemed to be covered. That's not quite the way things worked out.

Symphony turned out to be a little different from what was expected. Although Symphony does have a first-rate spreadsheet, it also has a major deficiency — all its other functions are based on the spreadsheet model. That's o.k. for a user whose world revolves around the spreadsheet, but it makes things rather tedious for other users whose word processing or data base needs have nothing to do with spreadsheets. And, in many cases, even spreadsheet experts find Symphony difficult to use.

Framework turned out to be a better balanced package than Symphony — and it even has a powerful spreadsheet. As is the case with Symphony, however, Framework's other functions can't compare to a collection of good stand-alone programs. Framework is easier to learn than Symphony is (unless you're already an expert at Lotus' 1-2-3), but it can be a challenge for someone who's never used a computer.

The game didn't end with the introduction of Symphony and Framework. In the last several months, a host of new integrated packages have appeared on the market. Some meet a need Symphony and Framework didn't fill; others don't seem to occupy any niche at all. Users who found the choice between Symphony and Framework tough now realize that selecting an integrated package can be as difficult as deciding what to order at a Chinese restaurant.

Five packages will be discussed here — Symphony, Framework, Enable (Alpha Software Corp.), Smart Software Series (Smart Software) and Electric Desk (The Software Group, Inc.). They are, in the judgment of Corporate Software, which annually reviews many packages for sale to its customers, the best available integrated products for corporate use.

Symphony — Symphony is an excellent spreadsheet, but its other functions are essentially add-ons. Because its functions are based on the spreadsheet model, nonspreadsheet tasks must conform to spreadsheet conventions. In the word processor, for example, blocks of text are moved as though they were cells in a spreadsheet. Because of Symphony's spreadsheet orientation, relatively simple integrated functions — such as merging data variables into a WP document — can be somewhat complicated.

On the other hand, if you enjoy keeping your calendar or maintaining your customer mailing list in a spreadsheet format, you'll feel comfortable with Symphony. It's great for 1-2-3 users who already have their spreadsheets jumping through hoops; it allows them to jump through higher and more difficult hoops.

Symphony is not for computer novices, however. It has several levels of menus that can be confusing even for veteran 1-2-3 users. In fact, of the five packages selected, Symphony was the toughest to learn. Ironically, it's also the most popular.

Framework — Framework is the best product of the five for integrating information into a single document or display. Because the program stores its information in frames that can be easily assembled in any order desired, it's excellent for integrating text, numbers and graphs into a finished report.

Although Framework isn't as similar to 1-2-3 as Symphony is, users of 1-2-3 will have no trouble making the transition to Framework. The package has a powerful spreadsheet, and it comes with a special start-up manual for 1-2-3 users. Framework even has a spreadsheet feature not found in Symphony — it allows consolidation of information from multiple spreadsheets into a single spreadsheet.

Unlike Symphony, Framework has an independent word processor and a real file manager, not add-ons that are extensions of its spreadsheet. In other words, you can easily use the word processor to draft documents that have nothing to do with a spreadsheet.

Furthermore, you don't have to worry about storing all your data in one large spreadsheet when you're running Framework, because the program makes your data manageable by breaking it into smaller units or frames. It's the difference between writing a report on one huge sheet of paper vs. piecing it together from several normal size sheets.

Another special feature of Framework is Fred, its built-in programming language. You will really be able to appreciate the power of Framework when you learn to use Fred commands as you work within the program. (You can start off using a few essential commands, then graduate to additional ones as your confidence builds.) Fred is also useful as a procedural language with which you can program a turnkey application system.

Framework is good for beginners because the menus and commands are consistent across all modules and are designed to make the program easy to operate as well as easy to learn.

Enable — The most capable all-around program is Enable. It is as powerful as a collection of stand-alone programs, and it offers the benefits of integration to boot. What's more, it runs in only 192K bytes of memory.

Especially noteworthy is Enable's spreadsheet, a fast, reverse-engineered version of 1-2-3. The menus, keystrokes and functions of the two spreadsheets are virtually identical. Also impressive are Enable's data base manager, which is fully relational; its word processor, which is by far the best word processor available in an integrated package; and its graphics component, which produces presentation-quality graphs and even has a three-dimensional feature.

At first, beginning personal computer users will find this program tougher to learn than Framework is, but after the basics are mastered, the advanced features will come relatively easily.

Users are finding that selecting an integrated package can be as difficult as deciding what to order at a Chinese restaurant.

Enable is the product of choice for anyone who needs top performance in two or more areas. It's an attractive alternative to multiple stand-alone programs because its similarity of commands across functions makes it easier to learn and use. It's also less expensive than buying multiple programs.

Smart Software Series — The Smart Series has several confidence levels that make it easy for beginners to learn the package. As users progress, they move up through the levels to get increasingly more power out of the software.

At its top level, however, this package offers less than either Enable or a collection of stand-alone programs. It is not recommended for anyone planning to be a power user in any area.

Relative to Framework, the Smart Series has better data base capabilities, but is less desirable for financial work. It is the most expensive of the five packages.

Electric Desk — The least powerful of the five packages is Electric Desk. All its functions have significant limitations. For example, Electric Desk's spreadsheet is limited to 255 rows by 255 columns, and a WP document can be no longer than 16 pages. Although these limitations may make the program unacceptable to advanced users, beginners won't notice the lack of sophistication.

Instead, beginners will notice Electric Desk's simplicity. Of the five integrated packages, Electric Desk is the easiest to learn. Budget-minded buyers will also notice the program's price, which is the lowest of the five.

This product is recommended for new personal computer users who want to perform a variety of computer tasks but don't aspire to sophistication in any area. It's also good as a starter package for new users who plan to graduate to a stand-alone program in their primary

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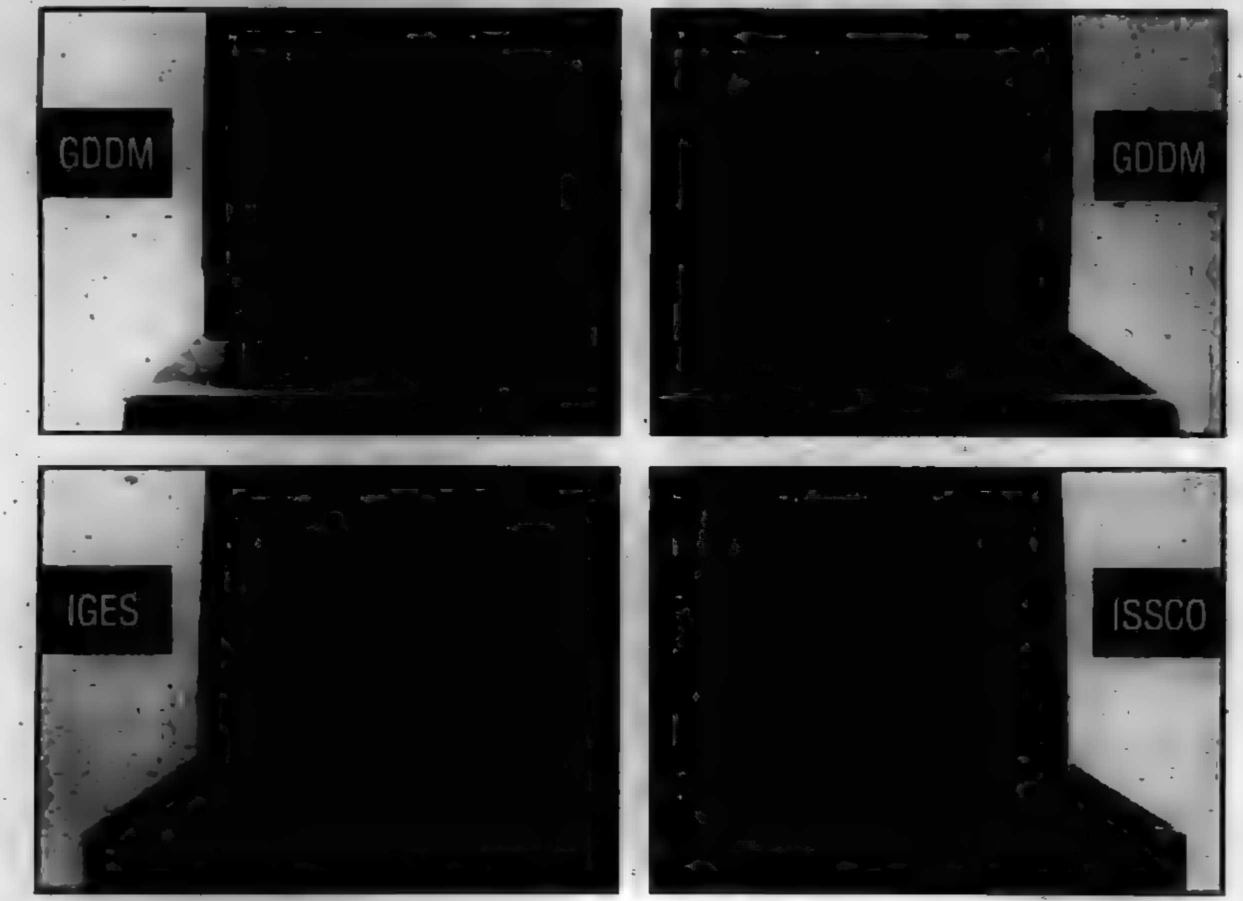

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area but continue to use the integrated package for other, less demanding needs. For example, a secretary might use Electric Desk as an introduction to personal computing. After becoming comfortable with the program, the secretary could switch to a stand-alone word processor for preparing documents but continue to use Electric Desk for maintaining mailing lists.

Integrated software may be popular today, but what are its prospects for the future? Will it replace stand-alone programs, or will it be replaced by increasingly specialized packages? How will it be affected by windowing software, such as IBM's Topview and Microsoft Corp.'s Windows?

Two schools of thought exist. One says integrated programs are the wave of the future because they are so much more convenient than a collection of stand-alone programs. There is only one set of commands to learn, data flows easily among applications and it's simple to switch from one application to another. Furthermore, integrated packages are generally less expensive than multiple dedicated programs.

The other school says integrated packages are too general for most users' needs. They don't let you pick and choose programs that are optimum for your particular applications — especially when your needs are highly specialized. Moreover, the forthcoming windowing software will allow you to integrate your stand-alone programs so that you'll realize many of the advantages of integration without sacrificing the functionality your specialized applications require.

It's too soon to tell which school will prevail. We tend to lean toward the dominance of stand-alone programs among serious personal computer users. If today's software shoppers think it's difficult to find the right program for a particular need, what are their chances of finding an integrated package with just the right combination of benefits to meet all their needs? A professional project planner, for example, may need a complex project management program combined with simple word processor and a presentation-quality graphics program that handles Gantt charts. Does such a package exist? Is one likely to be developed?

Integrated programs like Symphony will survive among the power users because its programs meet a specialized need, not because of the convenience they provide. Symphony, for example, is popular not so much because it's an integrated product, but because it's an excellent spreadsheet.

On the other hand, we think integrated software will survive as the product of choice for nonsophisticated users with nonspecialized requirements. Such users need personal-computer software for relatively simple tasks such as cranking out a short memo or an uncomplicated chart. They value the convenience of an all-in-one program over the sophistication offered by a collection of stand-alone programs. The availability of windowing software will not change their minds, because such software will never make stand-alone products as easy to use as the better integrated packages.

In other words, programs like Electric Desk will be around for a while because they provide computer novices with easier access to a variety of functions than they could get from struggling with a series of separate products.

One school of thought says integrated programs are the wave of the future because they are much more convenient than a collection of stand-alone programs. The other school says they are too general for most users' needs.

Whether integrated products will be more popular than stand-alone products depends on how personal computers are ultimately used. If power users greatly outnumber convenience users, stand-alone products will be winners. But if the masses turn out to be more interested in convenience than sophistication, integrated software will likely prevail.

Of course, plenty of room exists for both kinds of products; it's not likely that either type will become extinct any time soon.

■

Rosenthal is chairman of Corporate Software, Inc., a supplier of personal computer software to large corporations, and headquartered in Canton, Mass. The company also publishes a software guide and monthly newsletter to help its customers select and use personal computer software.

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The Long Climb Toward A Micro-Mainframe Link

By Christopher M. Yalonis
And Anthony Padgett

The micro-mainframe link is a technology in its infancy, waiting to be developed for a needy, confused market. The mainframe, filled with valuable, timely corporate data, lures many corporate micro users who have tasted the power of quick, local micro processing and improved micro productivity.

Micro-mainframe links are far from being complete or ample, although the need for micro-mainframe links has been evident since the first micros began filtering into corporations in the late 1970s. Microcomputers could provide easy local computer power in those ancient days, but they could not compete with a timesharing terminal for access to the corporate mainframe. Micro users might have had easy-to-use software, but they had difficulty getting the data with which to fill their spreadsheets. They first needed to request printed reports from the data processing department and then manually key the information into the stand-alone micro.

In 1982, a new set of products began to emerge, allowing micros to tap directly into mainframes. Initially, the programs were simple terminal emulation programs. Since then, more complex packages that integrate mainframe data with micro-based spreadsheets have been announced and delivered.

The micro-mainframe link has a long way to go. The gap between micros and mainframes is widened by incompatible data formats, inefficient communications standards and security hazards. In addition, DP managers continue very conservatively to guard access to the corporate data base. Finally, even if the micro user successfully gains mainframe access, there is a good chance the mainframe data will be simply too vast and unwieldy to transport back to the micro workplace.

In 1984, a growing number of major software houses and a variety of independent companies announced micro-mainframe links. The majority of these products, however, are still in beta test or have only been recently delivered. Most links have faced little real testing in a production environment, and users have had scant opportunity to evaluate the confusing, albeit dazzling, product array. Products priced at from $100 to $100,000 have been called micro-mainframe links.

Much of the present confusion

can be eradicated by defining and segmenting the market.

The micro-mainframe link market can be divided into six segments:

- Terminal emulation software.
- Integrated software links.
- Micro-sized mainframe software.
- Protocol converters.
- Hardware enhancements.
- Enhanced micros.

Terminal emulation is the most widely used means of linking micros and host computers. Special boards or software emulate a terminal specifically designed for the mainframe. IBM-compatible mainframes found in more than three-fourths of all corporate installations are generally accessed through the IBM 3270-series terminal protocol. By the middle of 1984, there were about 2.5 million terminals of these types in use in the U.S.

Micros can be hardwired to a 3270-series controller via products such as the Irma add-in board for the IBM Personal Computer that takes advantage of the 3270's speed and error-correction capabilities. Other products access a remote 3270 controller over asynchronous phone connections.

There are more than 100 communications packages that turn a micro into a dumb terminal. These packages have mostly been used to access commercial data bases, such as Dialog and Dow Jones, and to transfer Ascii text from micro to micro or dedicated word processor. Leading packages include Crosstalk by Microstuf, Inc., Smartcom II by Hayes Microcomputer Products, Inc. and PC Talk by Freeware. In 1983, several sophisticated variations came to market. One of the first, Visilink, was introduced by Visicorp, Inc. Visilink worked with Visicalc (developed by Software Arts, Inc.) to allow the user to download economic and financial data from Data Resource, Inc.'s data bases over phone lines into Visicalc spreadsheets. Prior to that, data from data bases had to be printed out or saved on a disk, then manually reinput into the Visicalc spreadsheet.

Late 1983 and the first half of 1984 saw other programs that allowed the user to turn the micro into a terminal more easily, download information from public data bases and automatically format the incoming data for immediate input into spreadsheets or financial analysis programs. Dow Jones data bases, Lotus Development Corp.'s Symphony and Ashton-Tate's communications modules are examples of products in this category. Other terminal emulators with file transfer came to market such as PC Express from Intelligent Technologies International Corp.

Integrated software links go a step further than terminal emulation. Terminal emulation programs do not allow data files from corporate mainframes to be downloaded to the micro to be manipulated or stored, without requiring the user to interact with the most often intimidating mainframe data base query language. Integrated software links have been recently introduced by several mainframe software vendors.

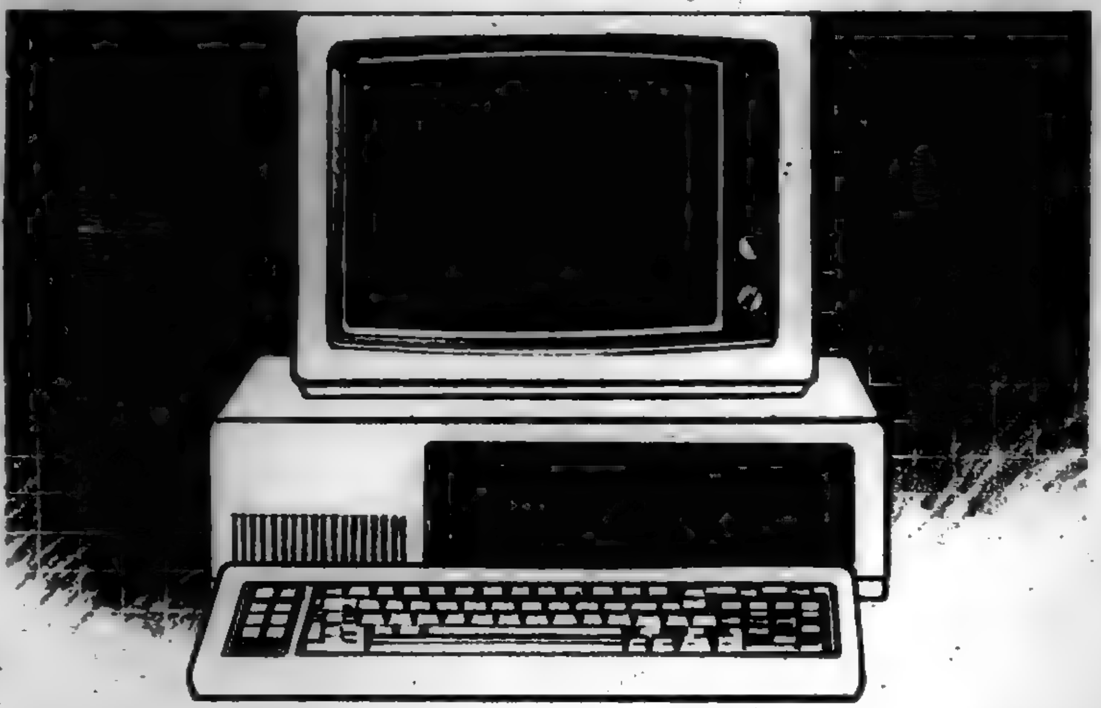
Until recently, micro DBMS software could not duplicate mainframe data structures.

These sophisticated programs move files from mainframe applications or data base management systems (DBMS) into familiar micro applications such as Lotus Development Corp.'s 1-2-3, Visicalc, or Ashton-Tate's Dbase II.

Part of the program resides on the mainframe and another part in the microcomputer. Users can select information from mainframe data bases and load it directly into spreadsheets or other programs without having to wrestle with difficult data base languages or file transfer commands. A few products allow the user to send the results of the spreadsheet mainpulation back to the mainframe, thereby revising the corporate data base.

The first full software link was announced by Management Science America, Inc. in early 1983. Since then, a half dozen other mainframe software vendors have followed with link announcements. Yet only recently have finished link products been shipped. Despite rigorous hype from vendors, most concede that initial orders have been slow, and sales of this specific type of link software were less than $10 million in 1983. Informatics General Corp.'s DB Answer/Visianswer, McCormack & Dodge Corp.'s Interactive PC Link and Computer Corp. of America's PC/204 are examples of this type of link.

In a sense, integrated software links do not offer micro users the ultimate in data access. Ideally, the most needed data would reside in the microcomputer itself. Until recently, microcomputer DBMS software could not duplicate mainframe data structures. Mainframe DBMS are increasingly using relational formats, in which data structures are defined by a series of tables rather than by individual records. But now several vendors are introducing micro versions of sophisticated



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mainframe packages. Oracle from Oracle Corp. and Mathematica, Inc.'s Ramis II PC are two examples of this type of product.

Products can be segmented further into those with open and those with proprietary architectures. Open architecture links claim to offer micros access to a variety of mainframe DBMS and file structures and offer downloading, often with automatic reformatting, into a number of micro data formats. Packages built in a proprietary architecture, a strategy adopted by many of the established large systems software houses to maintain or enlarge their existing user bases, usually provide access only to data residing in a particular vendor's mainframe software. The products generally allow for downloading directly into the company's micro software or into a limited number of popular micro packages.

Protocol converters allow Ascii terminals and micros to emulate a terminal that is compatible with the host computer's protocol. A protocol converter can make the data stream from a micro look like that of an IBM 3278 or 3279 terminal and associated cluster controllers. This allows communications with an IBM host using Systems Network Architecture (SNA)/Synchronous Data Link Control. Four basic approaches to protocol conversion are the following:

- Mounting software on the mainframe.
- Obtaining a micro with a built-in protocol converter like the IBM 3270 PC and 370/XT.
- Using an add-on board that may be inserted into or attached to the microcomputer. Most of the popular add-on boards perform 3270 terminal emulation for the IBM PC. If a number of micros need to be linked to a host or if different brands of micros need communications, then individual boards for each computer are less cost-effective than an external protocol converter.

The break-even point tends to be approximately three microcomputers at a given site.

- Linking one or more micros, terminals or printers to an external protocol converter. Up to now, this tends to be the choice in most offices where more than one micro is linked to a host.

In the other five micro-mainframe product categories, protocol converters are sometimes built right in. Companies with built-in protocol converters include IBM (with the PC 3270), Avatar Technologies, Inc., Protocol Computers, Inc. and Simware, Inc. At the very beginning of the micro-to-mainframe journey, users must make a fundamental choice: How will they physically connect microcomputers with the mainframe? There are two basic choices.

The first choice, an asynchronous connection, uses a modem attached to ordinary telephone lines. Installation is easy and cost is low. Existing phone lines in the office (or home) environment will generally be sufficient for the task. The main drawback is that asynchronous dial-up links only support transmission speeds of up to 2,400 bit/sec.

The system works as follows: A modem converts binary electric signals on the transmitting end from a terminal or computer into voice frequency signals that can be sent over the public telephone system. The modem on the receiving end converts voice frequency signals transmitted through the telephone system into binary electric signals that are forwarded to a terminal or computer. This process of modulating and demodulating gives the modem its name. Modems are generally categorized according to automation of answering and dialing functions and capacity for storage of dialing information, protocols, features and speed. There are three basic types: stand-alone, stand-alone acoustic and boards that slide into the back of the microcomputer. Two leading modem manufacturers are Hayes Microcomputer Products and Novation, Inc. The second, more complicated, method of making the physical micro-mainframe connection is a synchronous link using a coaxial communications

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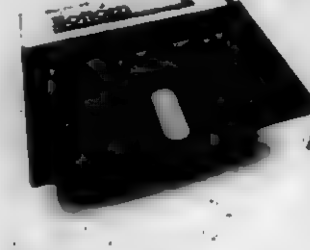

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board. This method is clearly much faster than a modem but requires a coaxial cable that must be specially installed. In addition, if the user wants to communicate over a distance, leased telephone lines are required. This method of connection should only be considered when a modem connection is just not powerful or fast enough.

Hardware vendors such as IBM, Wang Laboratories, Inc., Hewlett-Packard Co., Digital Equipment Corp. and Apple Computer, Inc. offer boards for their desktop computers.

Several independent vendors offer a variety of products within this category including Intelligent Technologies, DCA, Gateway Microsystems, Inc. and Forte Data Systems Co.

Enhanced microcomputers have built-in micro-mainframe links and were designed to run some of the applications written for mainframes. For example, IBM's 370/XT runs both the VM/CMS mainframe operating system and PC-DOS. It can upload and download data to and from a 370. DEC built terminal emulation, file transfer and Ethernet networking communications capabilities into its Microvax 1 Personal Computer. Data General Corp. offers three micros with integrated communications capabilities: the Desktop Generation models 10SP, 20 and 30. These micros run DG's AOS/DS operating system for the MV series of supermicrocomputers, and they can emulate DG and IBM terminals.

The Bank of America is typical of a large organization using micro-mainframe links. Its data center in San Francisco has 12 mainframes and 300 micros. Personnel ranging from financial planners to programmers are using terminal emulation and downloading files. But only programmers who are developing software are able to upload data. (This function is still in the test stage.) Company expectations are kept low and cautious, starting with terminal emulation. Another firm using links is Queens Hospital in Honolulu, which houses one IBM 3083 mainframe, 200 terminals and 40 IBM PCs linked to the 3083. Since early 1983, the hospital has used various communications products that allow terminal emulation, downloading and electronic mail. The entire nursing staff uses the link to check staffing schedules, patient admissions, transfers and discharges. Users have access to selected files and uploading is performed only on request from the DP department.

There are 35,000 mainframes installed in the Fortune 2500. Within that Fortune 2500, there will be an installed base of 2.5 million personal computers by the end of 1984. The need to link personal computers with mainframes is evident. The link products being introduced are not in search of a market. Nonetheless, several forces or developments will hinder link sales.

Most users lack awareness of or skills in using link products. Management information systems departments are reluctant to open up mainframe data bases to a large group of unsophisticated micro users. Most link products lack easy-to-use software that requires a minimal amount of training, installation and maintenance. The absence of communications and operating system standards provides a great deal of confusion among many organizations. Link products have a long sales cycle. Initial link product installations per site are few. Only after careful, cautious, lengthy review of these initial installations will a substantial number of additional installations occur.

The market factors that will spur sales outweigh these impediments. There will be a high penetration of IBM 3270 PCs and 370 XTs into the corporate arena, used for their enhanced communications facilities. Users will see the development of easy micro-like query languages and interfaces for nonprogrammers to access mainframe data bases from micros. The porting of more Unix-based business applications to microcomputers will allow file transfers and common applications to run between micros, minis and mainframes. Middle and upper management are becoming increasingly eager to access mainframe data via personal computers. The market will see the establishment of the IBM PC Network as a standard, and, within three years, an IBM token ring local-area network connecting diverse computers and accessing the X.25 and SNA environments.

Joint development and marketing efforts between mainframe and microcomputer software vendors will produce microcomputer-like marketing, documentation, pricing and user interfaces, as well as mainframe-like sophistication, power and corporate MIS department confidence. Vendors will build comprehensive security features into the link software, and gradual establishment of security and mainframe access policies within corporations will help to resolve MIS and top management security concerns.

Finally, as the link market grows crowded, prices will drop gradually, especially for the personal computer portions of the links. The mainframe portion, as it historically has, will retain price stability.

The micro-mainframe market is heating up and shaping up. While the giant software and hardware companies battle for their share of the lucrative pie, users can expect better solutions, easier-to-use software and lower prices. Customers will be the real winners.

* * *

Yalonis and Padgett are managing partners of the Jupiter Group, Inc., a market research and consulting firm specializing in the microcomputer industry. The firm is located in Sausalito, Calif.

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Micro Data Bases: The Information Pool

By Jan Duffy And Ken Matheson

Now that information can be generated and captured fairly easily, an obvious next step is to establish guidelines for information storage and retrieval. Little will be gained from imposing on our electronic files the same disorganization we have imposed on our manual and hard-copy filing systems.

Data base managers — often called data base management systems (DBMS) — permit users to apply predetermined labels to information as it is stored. This process provides an internal directory or index containing descriptions of information as well as clues about the relationships that exist among pieces of information. Originally designed for the management of information on the mainframes, the DBMS is now considered an essential tool for the frequent and creative personal computer user. Also, many off-the-shelf applications software packages use commercially available DBMS packages as a foundation.

Because the data base manager simplifies the organization of data, including storage and retrieval; manipulation and summarization, it can be one of the most important tools for the microcomputer user. The data base manager permits access to the central store for information as it is required, regardless of the application for which it is needed. This effectively eliminates the need to input the same information each time it is required for a different application or report. As a result, the margin of error is minimized and time consumed during repetitive inputting is eliminated. Maintenance of data in a central store also facilitates the data management function, encouraging the user to validate accuracy, maintain data in a current status and so on.

However, the issue of data base management is complicated because the user may have to deal with several structures; the two most common are hierarchical and relational. In a hierarchical data base, each record (an assembly of pieces that combine to make up a set of information relating to a specific item) has a master or parent item that appears in no other set of information (for example, an account number or a particular city). One of the problems, of course, is that in the real world, information rarely organizes itself in such a simple fashion (a specific account number may have locations in several cities). The problem of multiple relevance can be avoided by networking or linking the pieces of the hierarchy. However, it is not easy to change relationships of the links after they have been identified by the user. Unfortunately, these identifications are often made before the user is fully familiar with the DBMS and its capabilities and are frequently underestimated.

The relational data base, although it may be a heavier user of machine resources, more accurately represents the somewhat unstructured nature of everyday information. Each set of information (record) requires a unique identifier, which is automatically but transparently attached to each piece of information within the set. The master file can be accessed or queried to extract information that is then used to generate a new set of records, which can be manipulated, stored and so on. The system's biggest advantages are its infinite growth and flexibility in responding to new questions or newly formulated queries used to produce previously unanticipated reports.

Not all DBMS are simple to use; in fact, quite the opposite is true. Perhaps the most important advice for anyone considering the acquisition of a DBMS is to think through your requirements carefully and systematically, asking questions like those that follow:

- What information do you want to store in your data base, and where will that information come from?
- What type of reports do you expect to generate from the data?
- What do you expect the output to look like?
- How many records (sets of information) do you anticipate? Does your list of accounts number 1,000 or 10,000?
- Who is going to design and use the system?

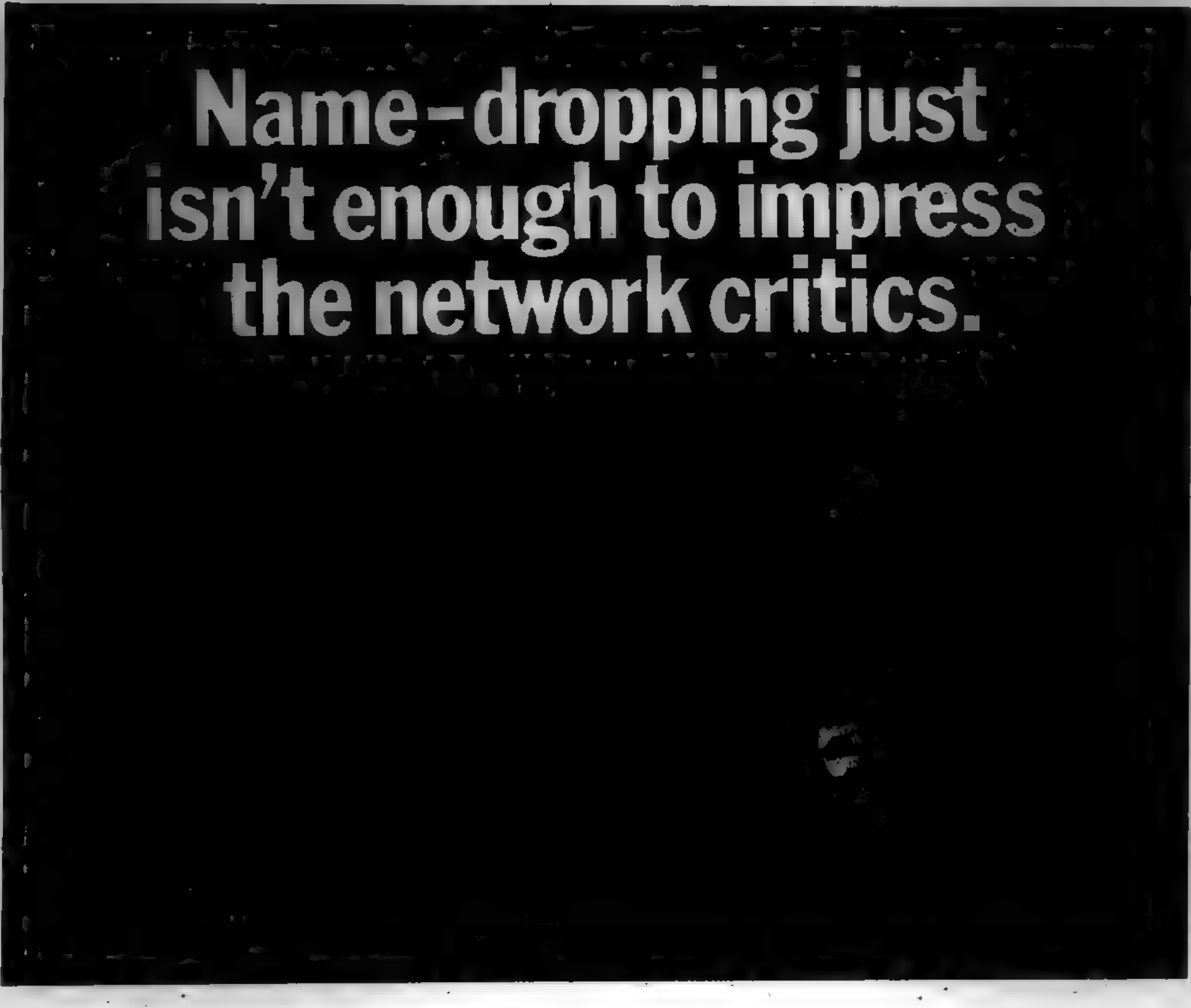
Too often, DBMS are purchased when the only piece of information considered is the ultimate application, with little thought given to how the old system works or doesn't work and how the new system might work better.

Not only should a DBMS be able to accept input from the sources the user anticipates using, it should also be sophisticated enough to make raw data readily available in the formats required by the analyst in order to complement tools that are being used.

In many instances, large data bases are operating with sophisticated data base management systems, and microcomputer users in these organizations have identified these data bases as potentially invaluable sources of corporate information to be used as input data for analytical processes. In some cases, access to corporate data bases requires only that selected data be downloaded directly to an application software package (for example, a spreadsheet). This requires real-time access to the mainframe data base and may require repetitive access for subsequent spreadsheets. It may be more convenient for the microcomputer user to access the corporate data base and to download a file or a selected portion of a file to the microcomputer's own DBMS so the selected data is available for local manipulation and reporting. This capability can be particularly beneficial in an organization with a high demand for mainframe time or in situations where the microcomputer is in a remote location and mainframe access involves time charges for data communications.

Some DBMS vendors have recognized the demand for mainframe data base access and the ability to download data to local microcomputers. These vendors have designed both micro DBMS packages and interactive link products to facilitate data sharing between the two computer environments. A microcomputer user can expect fewer problems if data can be transmitted from the mainframe data base to the microcomputer data base without reformatting or going through a data translation. Even when the DBMS for the micro and the hardware and software have been specifically designed to provide the link between the micro and the mainframe, data transfer problems can occur as a result of customized mainframe DBMS.

In most cases, the DBMS is only a facility for the management or custody of the data and is not in itself an analytical tool. Analytical tools that rely on the data stored by the DBMS as the source for business information must be able to extract the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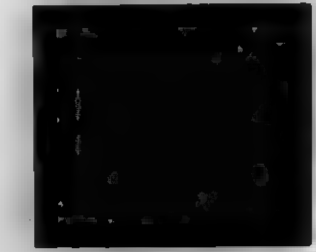

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required pieces of data in a usable format from the DBMS.

Applications software packages have specific methods of storing data and specifications for the format of the data which will be presented to the applications software for its use.

If the DBMS is expected to make data available for an application such as a spreadsheet, the user needs to ensure that the DBMS and the spreadsheet can work together. Application software packages that can directly integrate with the data base through direct data transfer are the most efficient in terms of setup time required; this relationship eliminates the requirement for rekeying previously captured and stored data.

If more than one person will be entering data into the data base, checks may be needed to prevent errors.

The data base management software must present data on the screen in a meaningful fashion and must make data available for use by applications software.

The DBMS requires a report-generating facility that can deliver selected data to the screen or to the printer, allowing the user to store the report formats for reuse with new data. The ability of the DBMS to select data and present it to the user in an appropriate, logical and useful manner often proves to be the DBMS' most beneficial feature. Any evaluation of potential benefits associated with a specific DBMS must include consideration of the system's ability to manipulate data and select information more effectively and efficiently than the user could without the assistance of the DBMS.

DBMS systems are used by a wide variety of users — the professional or management people who are occasional users, professional problem solvers or analysts, DP personnel and clerical personnel responsible for entering data into the data base and for making routine queries.

Ease of use for each of these individuals may be interpreted differently. If more than one person is responsible for entering data into the data base, checks to prevent input of inaccurate data may be needed.

DBMS users generally fall into two types: application designers and developers and application users. In many cases, particularly in the microcomputer environment, the designer is also the user.

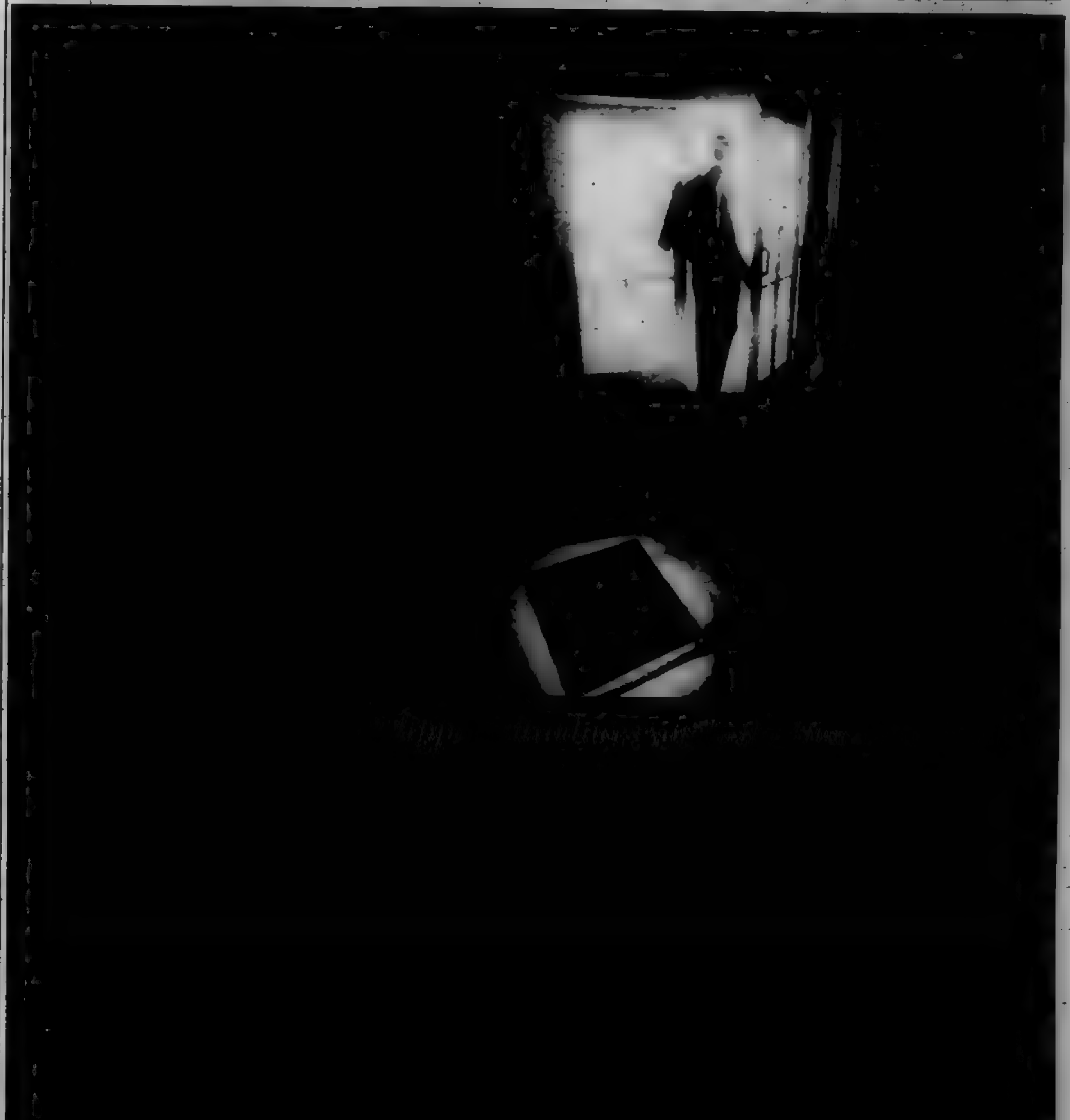
It is not always necessary for the user to be able to write the programs required to process the application. The DP department usually has staff members who are responsible for translating user requirements into computer programs and, on a smaller scale, the process is the same for the microcomputer. Someone needs to know how to write a program or design a command file that can be used to accomplish the desired result.

Some microcomputer DBMS packages use very sophisticated programming languages and require a significant level of programming skill; others are very simple and are designed for the user who does not have programming skills. In general, complexity of the application correlates with level of skill required to design an appropriate program.

The ease with which a casual user can operate a data base application depends to a large extent on the intended user group for which the DBMS was designed and the skills of the person who designs the application.

■

Duffy is a partner in Duffy and Bentley Consulting Group, office systems consultants, and is the editor of the Duffy and Bentley Report. *Matheson is a consultant with the same firm and is a contributing editor to the* Duffy and Bentley Report.



Q&A

(Continued from Page 5)

people like me from breaking in, but even this one didn't do them. For example, after a person tried three times to get in, the system would say, "Invalid, please log in again."

Some places give you three tries and then disconnect you from the computer. The phone line stays active so you can just reactivate your connection to the computer without having to dial up again. The system I was hired to break into didn't disconnect the phone line. I could just stay on that one phone call and keep on trying over and over again.

If you've given three bad tries to some computers, they will totally hang up on you. Then you have to reinitiate a phone call, and that gets a little complicated. That's a lockout, and it's good security.

I've read that it's best not to make it too hard to get in because then it's even more of a challenge.

Well, I don't know. I always try the easiest ways first. You can attack a system at a few obvious points and I always try them first because a lot of places don't have very sophisticated security. A lot of the older systems that have some security ignored these spots and those are the ones I usually hit up first.

What if organizations just made important files unattainable?

That would be tough. I got into my school's computer at the highest level, which was also the weakest link. If you can tie into the system as an operator, there's no protection against you. An operator is in the higher echelon and should not have any restrictions. Therefore, there's no protection. There always has to be at least one user with access to everything, so there's always the chance that a person is going to get in at that level. If you make it simple for people to get in, no matter what you do after they're in, they have entered your computer system. Once they're in, very little can be done to determine what they're doing on the system. The only real way to handle this situation is to have an operator keep tabs on what everybody is doing on the system. But computer protection on that kind of scale is difficult.

What about not allowing certain files to be written to — for example, preventing someone from writing a zero balance on a charge card?

In that situation, if a hacker tries to run the program that says you can't write to it, he won't be able to. But if the hacker can get in the system, he can access those files through a program he writes himself or by directly entering the file, not going through any particular program.

You'd get into the file at a level high enough to let you change it?

Yes. As a matter of fact, a friend of mine issued himself a charge card and had it shipped to a post office box. He gave himself a $10,000 credit limit. He destroyed the card when he got it because he didn't want to take any chances. It can be done and it is done easily.

Have you ever done anything just to prove you could do it?

I've gotten into the school's accounting and grading systems, but I didn't change anything. Most of the fun is getting in. To damage anything is stupid. When those 414s [Milwaukee's area code, referring to the students who entered the computer systems at Sloan-Kettering Cancer Institute in New York, Los Alamos National Laboratory in New Mexico and Security Pacific Bank in Los Angeles] went into the hospital files, there was no point in changing the file. All that can do is hurt somebody, and the hackers aren't going to benefit. I could see somebody wanting to break into a charge card company, issue themselves a card with a high credit limit and go up and charge up a storm. But to me, more of the fun is in getting into the system than in doing actual damage or making relevant changes to the system.

What kind of computer have you used to get into mainframes?

The one I used the most was a Radio Shack Model 100 portable computer because it has a modem and dialer built into it. I can dial up any computer system and just start throwing out text automatically. I can start throwing random passwords at it and trying random sequences and things like that. I set it up to go all night and keep on trying. The problem with that computer is that it doesn't dial into Touchtone, so it's not good for breaking into some of the long-distance services. For that, I use an IBM PC with a Hayes modem, which does have Touchtone capabilities. The Radio Shack now sells for about $300.

Is this kind of break-in really happening on a large scale?

It's done all the time. I recently got an advertisement from a local college about a computer security seminar. I haven't gone to it, but I'm sure some geniuses someplace are figuring out more ways of protecting systems. That's OK; it just gives us more room to play.

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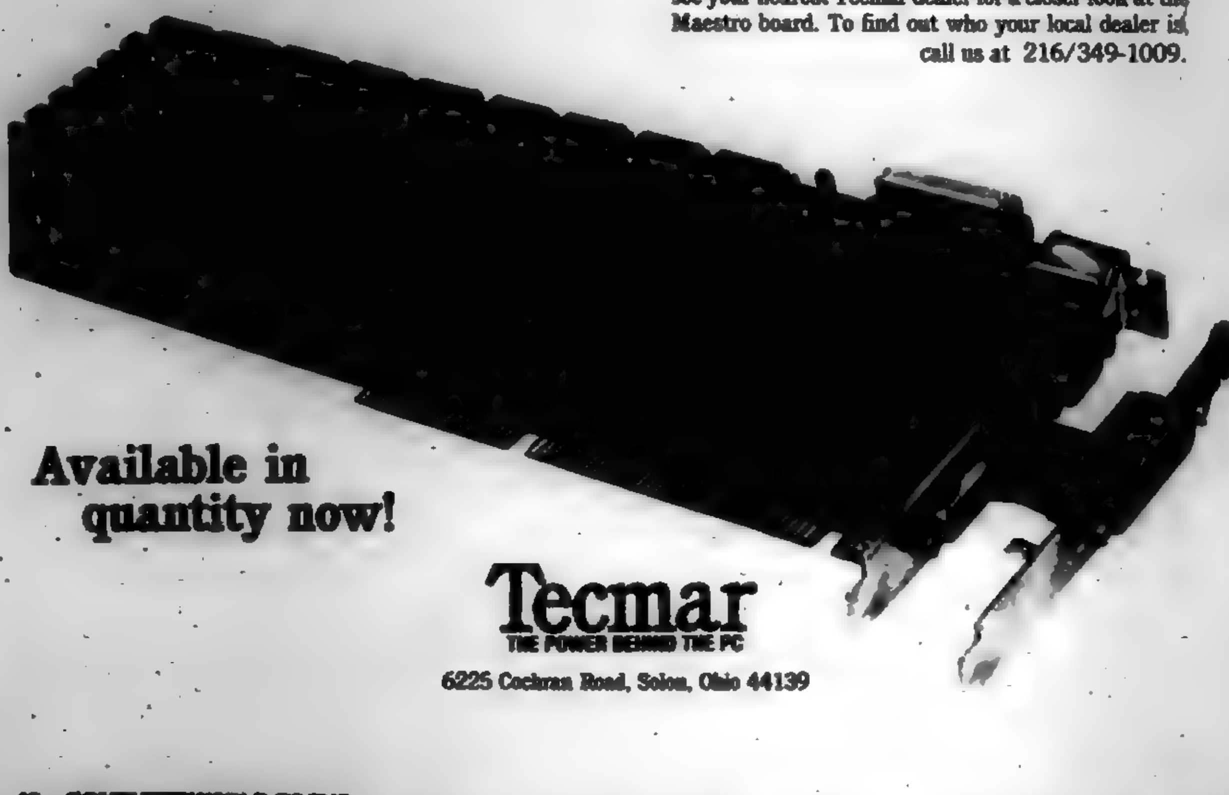

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Manager's Corner

By Michael E. Lawson

In this issue of Focus, a dizzying array of products is discussed and future software directions are explored. The user's role in all this is clear, but what will the information systems organization make of all this activity? What can information systems groups do to help their companies deal with this proliferation of products and potential directions?

Microcomputer software is popular because these packages are relatively inexpensive, very easy to use and useful in solving many of the problems managers and other business people confront. A list of general-purpose software for a manager's office might consist of a word processing package, a data base management system (DBMS), a spreadsheet, some graphics capability and a communications capability. Most end users will be able to utilize these software packages without assistance.

Two other areas, however, are not so easily managed by the end user. In these areas, information systems can perform a real service, both to the user and to the organization that must manage this environment. The first is communicating with other micros, large systems and external data sources. This area is especially trying for users who need to move information from one machine to another, rather than simply connecting to a host computer using a micro as a terminal. Information systems can provide a tremendous service just by developing a simple-to-understand and easy-to-use booklet that can walk the user through the process of uploading and downloading information. The exact nature of the information that can be made accessible in this manner should be thought through very carefully. After this decision has been made, data transfers should be made easy, and a central information systems shop should provide the service.

The second area in which information systems can be a help is that of standardizing on a set of approved software packages. Most users will probably already have a fairly common set of general-purpose software, and standardizing will enhance their ability to communicate with other people in the company. In many cases, standardization will be easier than you imagined and will in fact be welcomed. Go slowly, however, if it looks as though standardization will have to be imposed by the information systems organization. Your efforts will be better spent developing or making available file translation utilities that allow users with different software to share data sets created on micros and having no place on the larger company machines.

When information systems helps the end-user community with microcomputer software and data communications needs, it is not only the users who benefit. Information systems also benefits, through an increased ability to incorporate this type of software use into the overall software environment of the company. For example, each division or department of the organization is probably harboring at least one user who is an absolute whiz with a microcomputer and its software. A strong internal demand frequently develops for their products — applications, often in the form of utilities that make the micro more productive. With increased frequency, however, these people are developing applications that can be (and often are) used by many departments. Financial modeling and budget programs are good examples.

The information systems organization should be paying particular attention to this type of development. Software application products that can be used for a larger cross section of the organization may be products that should be developed on the larger system for reasons such as changes, maintenance and so on. In addition, such microcomputer software applications are often written in nonprocedural languages, and documentation or even written descriptions are usually absent. This can be especially bothersome when programs are created using spreadsheets where the program and the output are virtually the same. Unknown to the user, attempts to change the output can often change the product itself. Where practical, the information systems organization should take a lead in the development of these widely used application programs. Drawing the line between large-system and micro-based application programs is difficult. If development proceeds using microcomputer products, the information systems organization can be effective in establishing some guideline for program documentation. They can also help end users understand what constitutes good software attributes.

The use of microcomputer software and the development of application programs can be very enjoyable and useful. The process of purchasing, using and developing packages to assist end users needs to be managed. A hodge-podge of software packages and programs developed by people who have since left the company happened before with mainframe software packages. Microcomputer software packages present the information systems organization with a new set of challenges. Choose issues carefully and help the end users develop good development habits.

■

Lawson is director of the masters program in MIS at Boston University's School of Management.

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Products

PALO ALTO, Calif. — **Micro Focus, Inc.** recently announced Professional Cobol, a fully integrated package for the IBM Personal Computer, that combines eight programming tools, including a full screen source code editor; a forms screen painting tool: a high-speed GSA-certified high-level Ansi '74 Cobol syntax checker; animator; compiler; and run, library and build tools. Transition between tools can be accomplished with one keystroke, according to the vendor. Professional Cobol provides programmers with the ability to perform sophisticated Cobol applications without using mainframe resources.

Professional Cobol costs $3,000 per copy and operates on the IBM Personal Computer, Personal Computer XT, Personal Computer AT, 3270-PC, 3270-PC/G, 3270-PC/CX and Portable Computer as well as 100% IBM-compatible microcomputers.

It requires two double-sided disk drives, or one drive and one fixed hard disk, and PC-DOS 2.0, 2.1 or 3.0. For additional information, contact Micro Focus, Inc., Suite 400, 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

PRINCETON, N.J. — **Martin Marietta Data Systems, Inc.** has introduced IT-Software — 10 separate decision support and data processing programs. Each can be purchased and used separately, but all reportedly communicate with each other. At the core of the IT system is Keepit, a relational data base management system used for activities including data entry, data maintenance and reporting.

The other programs available in the series include spreadsheet, graphics and word processing, plus Linkit for personal computer to mainframe communications and Passit, which provides the capability for high-speed, bisynchronous or Systems Network Architecture file transfers.

The modular series is purchased separately, and packages range in price from $100 to $500. All can be run on an IBM Personal Computer or 100% IBM-compatible computers. Memory requirements range from 64K bytes to 256K bytes. For details contact Martin Marietta Data Systems, Inc., P.O. Box 2392, Princeton, N.J. 08540.

WESTBORO, Mass. — **Mitchell Management Systems, Inc.** recently announced Quick-Plan, The Executive Project Planning System. Quick-Plan builds project plans based on time, cost and resources through a series of menus written in conversational English.

The system provides 13 different report formats. Zoom, spread and isolating graphics are also available in screen and hard-copy mode. Networking features are in place to avoid resource scheduling conflicts that do not affect project duration.

Quick-Plan is priced at $995 and runs on most computers that utilize MS-DOS 2.0, including Data General Corp.'s Desktop Generation, Digital Equipment Corp.'s Rainbow, Hewlett-Packard Co.'s HP 150, IBM's Personal Computer Compatibles and Wang Laboratories, Inc.'s Professional Computer. The program requires a minimum of 384K bytes random-access memory and either two disk drives or one disk drive and one hard disk. For more information, contact Mitchell Management Systems, Inc., Westboro Office Park, 2000 W. Park Drive, Westboro, Mass. 01581.

RIDGEWOOD, N.J. — **Softest, Inc.** has announced Sofcom, a terminal emulation package that allows users to access a wide variety of data bases, electronic bulletin boards and electronic mail services and runs under both MS-DOS and Unix.

Sofcom presents a single menu with choices such as Dow Jones Retrieval Service, MCI Communications Corp. MCI Mail, The Source and Compuserve. When a service is chosen, the software will dial up, connect and log on.

Of special interest is the ability to record the entire session, record partial sessions, upload to electronic mail services pretyped messages from a word processing program and temporarily escape into the Unix or MS-DOS operating system, look up something in the data base and, without disconnecting, switch back to the interactive communications session.

Sofcom will be available in March of 1985 at a cost of $100 for MS-DOS computers and $300 for Unix computers. More information is available from Softest, Inc., 555 Goffle Road, Ridgewood, N.J. 07450.

SAN FRANCISCO — Vdam, a new software product that provides a fast translation module for the micro-to-mainframe link, was announced recently by **Phaser Systems, Inc.** With Vdam, each user can have access to specific pieces of information on the mainframe without having to upload or download entire files.

Mainframe files are formatted as if they were stored on hard or floppy disk drives under the PC-DOS or MS-DOS operating system. Each virtual drive on the mainframe can contain up to 10 million bytes of information, and each personal computer user can have up to four virtual drives. Vdam also provides automatic or discretionary backup of files on the mainframe. In addition, the software allows the management information systems manager to decide who gets access and what can be accessed and contains statistical functions that help to monitor patterns of mainframe usage and to antici-

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Products

pate surges in usage or periods of undercapacity.

Vdam, including the mainframe software and the five personal computer nodes, will cost $4,950 and will be available in March 1985. The mainframe requirement is Vtam, and compatible microcomputers include the IBM Personal Computer, IBM-compatible computers and those available from Wang Laboratories, Inc. and Texas Instruments, Inc. For details, contact Phaser Systems, Inc., 435 Sacramento St., San Francisco, Calif. 94111.

WOBURN, Mass. — **Imaging Technology, Inc.** has announced Image Action, a high-performance, interactive image processing software program for IBM Personal Computer-based systems. Centering around the use of menus and an optical mouse, the software requires no programming skills and users can become proficient in manipulating images quickly.

Used in conjunction with Frame Grabber, a board that plugs directly into an expansion slot of the IBM Personal Computer or 100% IBM-compatible, the operator can move the mouse-controlled cursor over a menu of possibilities to select the operation to be performed.

Some of the operations available include acquire and clear images, image filtering, image processing, graphics and save and restore.

Of note is the software's ability to work on an "area of interest" principle: Instead of altering peripheral or background parts of an image, Image Action can focus on a particular subsection of the image, which speeds up the image processing function.

In addition, on-line Help facilitates the learning process and eliminates the need to search through manuals for command descriptions.

Hardware configuration includes an IBM Personal Computer XT or Personal Computer AT or 100% IBM-compatible, with 512K bytes random-access memory, single diskette drive, display screen, 8087 math coprocessor, PCVision Frame Grabber, three-button optical mouse, video camera (RS-170 or RS-330) and high-resolution video monitor. Image Action costs $995 for a single license, and Frame Grabber starts at $2,995 (camera and monitor not included). Details are available from Imaging Technology, Inc., 600 W. Cummings Park, Woburn, Mass. 01801.

SAN JOSE, Calif. — An enhanced version of Easywriter II has just been announced by **Sorcim/IUS Micro Software.** The new version includes a correction speller, line drawer and automatic printer selection. The correction speller adds to the existing 88,000 word dictionary and suggests alternatives to the misspelled word. The line drawer is a facility for creating bar charts, graphs, time lines and organizational charts within a document. The line drawer permits entire documents to be prepared without using a separate graphics program. The automatic printer selection lets users select from a list of more than 70 printers to configure the system automatically.

In addition to the enhancements, Easywriter II integrates with all other packages in the Sorcim/IUS Easybusiness Systems Plus Series.

Easywriter II carries a suggested retail price of $395, and current users of the earlier version of Easywriter II can obtain a package with the three new features for $79.

Easywriter II runs on the IBM Personal Computer, Personal Computer XT, Personal Computer AT, 3270 PC, 3270 G, 3270 GX and other 100% IBM-compatible computers under DOS 2.0, 2.1, and 3.0. It requires a minimum of 192K bytes random-access memory (RAM) alone and 320K bytes RAM with the Easyplus windowing program, although 512K bytes RAM is recommended for the latter.

OAK BROOK, Ill. — **CDI Systems, Inc.** has announced several enhancements to its Trio software package. Trio enables users to download files from an IBM mainframe to the personal computer, extract information, convert the extracted data into the desired spreadsheet or data base format and upload to the mainframe.

The enhancements allow users to convert Ascii files into Lotus Development Corp.'s Symphony and Ashton-Tate's Dbase II and III formats and also supports the WKS format used by 1-2-3 and the IBM Document Interchange Facility (DIF) format used by a variety of spreadsheets. In addition, a new Data Export feature allows users to move spreadsheet data from 1-2-3 and Symphony into Ascii format for uploading to many mainframe data base systems. A third enhancement provides for loading of new data into existing spreadsheets and movement of data and formulas between 1-2-3 and Symphony spreadsheets.

Trio runs on the IBM PC, PC XT, 3270 PC or compatible systems equipped with two diskette drives or one drive and one fixed disk. The package requires 256K bytes random-access memory and DOS 1.1, 2.0 or 2.1. Trio sells for $395, and the enhancements are free for the first 90 days; beyond the 90-day period, a membership to the subscription support services guarantees enhancements for one year and costs $49 from CDI Systems, Inc., 2803 Butterfield, Oak Brook, Ill. 60521.

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If the space program had advanced as fast as the computer industry, this might be the view from your office.

And space stations, Martian colonies, and interstellar probes might already be commonplace. Does that sound outlandish? Then bear these facts in mind:

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[illegible] portable can add and subtract more than 20 times faster. And, by 1990, [illegible] have [illegible]

The [illegible]

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[illegible] computer [illegible]

for all [illegible]

The other [illegible]

[illegible]

Argentine [illegible]

Calendar

March 20-22, New Orleans — **International Spectrum U.S.A.** Contact: International Data Base Management Association, Inc., Suite 210, 9740 Appaloosa Road, San Diego, Calif. 92131.

March 22-24, Napa, Calif. — **Analyzing a Turbulent Market.** Contact: Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

March 25-27, Washington, D.C. — **Optical Storage of Documents and Images.** Contact: Technology Opportunity Conference, P.O. Box 14817, San Francisco, Calif. 94114-0817.

March 25-27, Boston — **Automating the Office.** Also, April 15-17, Chicago; and April 22-24, Washington, D.C. Contact: American Management Associations, P.O. Box 319, Saranac Lake, N.Y. 12983.

March 25-27, Boston — **The Integrated Voice/Data PBX.** Also, June 26-28, Dallas. Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

March 25-27, Washington, D.C. — **Strategic Planning for Office Automation.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

March 30-April 2, San Francisco — **West Coast Computer Faire.** Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

March 31-April 3, Atlanta — **Softcon.** Contact: Softcon, c/o Northeast Expositions, 822 Boylston St., Chestnut Hill, Mass. 02167.

April 1-2, Boston — **Using Dbase III.** Also, April 11-12, Columbus, Ohio; April 18-19, Oklahoma City, Oklahoma; April 25-26, Washington, D.C.; and May 2-3, Salt Lake City, Utah. Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

April 8-12, Boston — **The James Martin Seminar.** Also, April 15-19, San Francisco; April 29-May 3, Washington, D.C.; and May 6-10, Chicago. Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

April 9-10, New York — **The PC Frenzy is Over — What's Next?** Also, April 16-17, Berkeley, Calif. Contact: The Yankee Group, 14th Floor, 89 Broad St., Boston, Mass. 02110.

April 14-18, Dallas — **Computer Graphics '85.** Contact: National Computer Graphics Association, Suite 601, 8401 Arlington Blvd., Fairfax, Va. 22031.

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The IBM PC market is booming in Australia. By the end of 1984, almost 20,000 units will have been sold. **Australian PC World** — the only computer magazine for IBM PC users in Australia — premiered this March in response to the growing demand. Total distribution has already topped 16,000. And newsstand sales are vigorous from Sydney to Perth.

Forecasters predict that the Australian government and businesses will increase their usage of microcomputers by 170% over the next two years. **Australian Micro Computerworld** is the only monthly magazine covering this market. Written for both single-unit and networked users, most of our 12,000 readers are skilled professionals involved in the selection or design of systems and networks.

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2. Where can you buy an IBM PC XT or AT, AND have it installed, AND get on-site warranty for it? ____
3. Who will educate IC personnel or end-users at their site or yours? ____
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation? ____
5. What provides a micro software facility that allows you to customize a system to your specific requirements? ____
6. Who are the premier micro consultants to the *Fortune* 1350 companies? ____
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals? ____
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9. What company's evolutionary approach to software and service (also demonstrated by NOMAD, now NOMAD2, the premier 4GL/DBMS) ensures that they'll be a major force in the micro marketplace for years to come? ____
10. Name the companies that can provide all of the above? ____

*(Turn Page Upside Down for Answers)

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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VDT imbroglio shifts to state legislatures

By Maura McEnaney
CW Staff

The battle surrounding VDT regulation is taking a new twist this year, moving out of study committees and into legislative chambers across the country.

State laws regulating VDT purchase and installation failed to make it onto the books during the last legislative sessions. However, this year, intense organization and burgeoning media interest have set the issue afire once again.

Almost half the nation's states are considering VDT bills this legislative term. Many of the states with no pending VDT bills are contemplating such proposals as guidelines for purchasing VDT equipment.

The proposed laws fall into the following four general categories:

- Ergonomic bills that require employers to provide VDT workers with devices like nonglare and adjustable screens and removable keyboards. Ergonomic bills also mandate work breaks and, in some cases, require employers to provide alternative work for pregnant employees operating VDTs. The latter issue remains the most controversial for VDT legislation opponents, who maintain that scientific studies show no evidence that VDT exposure causes birth defects or miscarriages.
- Right-to-know bills aimed at educating and training workers about VDT use and maintenance.
- Purchasing guidelines for public agencies, as well as the establishment of study committees and education programs.
- Comprehensive legislation, which includes aspects of the above three categories.

"We're tracking 28 states," said Marty Dick-

See VDT page 5

Is industry downturn pegged to DP spending?

By Clinton Wilder
CW Staff

Although several leading computer vendors have reported declining sales growth in the first quarter of 1985, interviews with corporate DP and MIS executives reveal widely varied opinions on vendors' reports of a slowdown in corporate DP spending.

Several corporate DP users interviewed recently said their plans to order mainframes, peripherals and microcomputers are as healthy as ever. But others, including the nation's fourth largest commercial bank, have confirmed they are holding off on purchases, especially purchases of mainframes.

IBM, Digital Equipment Corp., Wang Laboratories, Inc. and Data General Corp. have all reported declining growth rates and all but DG have discontinued products or declared temporary production halts in the first quarter of 1985. Semiconductor makers laid off hundreds of workers as chip orders from computer makers nose-dived. Although several manufacturers blamed the downturn on declining export sales brought on by the strong dollar, they also cited a soft domestic business market as a factor in lower revenue.

"There's no slowdown in our case," said Bob Nelson, director of corporate information systems at Puget Sound Power & Light Co. in Bellevue, Wash. "We're right on the growth curve we planned three years ago and will probably upgrade from an [IBM 3083

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TOP OF THE NEWS

CW photo by S. Hall

Scientist, entrepreneur and businessman Gene Amdahl reflects on his successes and failures and on the state of the computer industry in an exclusive interview. **Page 15.**

■

The beta user of Software AG's Super Natural gave high marks to the package's rapid inquiry and reporting access to live production data. **Page 4.**

■

At last count, 235 micros from more than 30 vendors were in use at Woods Hole Oceanographic Institution, which has no top-down microcomputer plan. **Page 8.**

■

Burroughs launched an OA thrust spearheaded by a word processing system and an OA software package for its mainframes. **Page 12.**

■

Altos Computer Systems will use a new 32-bit microprocessor to power a 30-user supermicrocomputer featuring 1M byte of RAM and a 20M-byte hard disk. **Page 75.**

IBM to halt PCjr production

By Paul Korzeniowski and Ed Warner
CW Staff

ARMONK, N.Y. — The IBM PCjr's nova-like existence ended last week as Big Blue announced that it would cease manufacturing the machine next month.

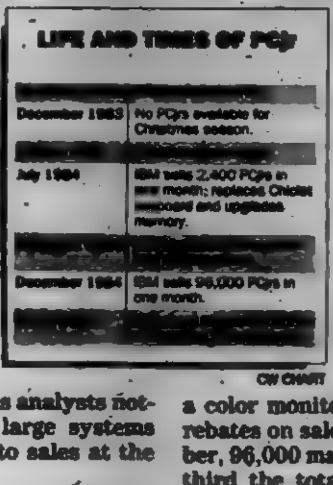
Introduced in November 1983, the PCjr marked IBM's entry into the home and education markets, which were dominated by Apple Computer, Inc., Tandy Corp. and Commodore Business Machines, Inc. Despite its dominant position as the world's largest computer manufacturer, IBM experienced difficulty in gaining a foothold in these markets. As analysts noted, IBM's strength in the large systems market did not translate into sales at the low end.

Six months after the PCjr was introduced, it was selling at a rate of only 2,400 units a month. IBM tried to increase sales by upgrading the computer's memory and replacing a controversial Chiclet-style keyboard with a typewriter-quality offering.

But the moves did little to help sales, analysts noted. Rather than competing with Apple and Tandy machines, IBM found that the PCjr was competing with its Personal Computer, according to Maureen Fleming, senior analyst at International Resource Development, Inc., a Norwalk, Conn.-based market research firm.

Last Christmas season, IBM bundled the PCjr with a color monitor and offered dealers $200 rebates on sales of the machine. In December, 96,000 machines were sold, about one-third the total PCjr sales for the entire

See PCJR page 4


LIFE AND TIMES OF PCjr

[illegible]	[illegible]
December 1983	No PCjrs available for Christmas season.
[illegible]	[illegible]
July 1984	IBM sells 2,400 PCjrs in one month; replaces Chiclet keyboard and upgrades memory.
[illegible]	[illegible]
December 1984	IBM sells 96,000 PCjrs in one month.
[illegible]	[illegible]

CW CHART

Shared micros commonplace

DALLAS — The personal computer may not be as personal as its name implies, according to a recent study by Future Computing, Inc. The study found that one quarter of personal computers in use by businesses are shared by 10 or more users.

The study, based on telephone interviews and 45,000 responses to a mailed questionnaire, also found that an average of 2.3 people share an office personal computer, according to Joe Curry, a senior analyst at Future Computing.

"The term 'personal computer' is a misnomer, given that [the micro] is in shared use," Curry observed. He explained the popularity of shared use by saying that "industries can't always justify users having their own personal computers; in any company [there is] a limited budget that can be allocated for personal computers."

The study also examined the practice of personal computing in 17 industries and

See SURVEY page 4

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NEWSPAPER

Labor board sizing up EDS workers' bid for unionization

Bargaining units focus of hearings

By John Desmond
CW Staff

DETROIT — Hearings before the National Labor Relations Board (NLRB) on attempts to unionize DP professionals transferred from General Motors Corp. to Electronic Data Systems Corp. (EDS) are focusing on the number and composition of bargaining units and on whether GM and EDS both or EDS alone employs the DP workers.

The hearings began Feb. 25, following the signing of United Auto Workers (UAW) petitions by 700 to 800 DP workers in Michigan. According to UAW organizer Maurice Long, who is coordinating the union effort, the union has proposed 14 bargaining units, whereas EDS has argued for only two nationwide. If conducted, separate union elections would be held for each bargaining unit.

Under the EDS plan, one bargaining unit would include professionals such as programmers and systems analysts; the other would include technicians, such as data-entry personnel and operators. The UAW has proposed that DP bargaining units include a mix of DP personnel in 14 geographic areas. The UAW is also arguing that GM and EDS are joint employers of the DP professionals, while EDS asserts it is sole employer.

Long charged that EDS is trying to "drag [the hearings] out to discourage interest" in the union and also to relocate union supporters away from the 14 sites that submitted petitions to the NLRB. Employees petitioning for a union are also being offered a two-day, all-expense-paid trip to Dallas, where, Long claimed, they are "wined and dined" in an effort by EDS management to win support.

In response, attorney John Howell of EDS said suggestions that hearings are being dragged out and union supporters are being singled out for relocation are "categorically false." He added, "The union recognized that it had a window of unrest to capitalize on. As time goes on, their support wanes."

'Far from wining and dining'

Further, he said, workers are being relocated as a "natural result of EDS taking over this mammoth DP organization." The trips to Dallas are "far from wining and dining" and are not directed at union supporters but at a number of transferred GM employees, he said.

In a related matter, efforts by transferred GM DP professionals to raise a legal fund to challenge a perceived loss of benefits have apparently been neutralized.

In order for transferred employees to receive stock grants of 100 to 1,000 shares promised by EDS and GM, the employees had to sign a release by March 14 stating they agreed not to sue the company over issues arising from their transfer, Howell acknowledged.

The legality of the release is being challenged by two transferred GM employees who filed a class action suit against the company alleging a loss of retirement benefits. The suit — filed by attorney Jules Olsman, representing Thomas Omans and Gary Cattin of the GM Technical Center in Warren, Mich. — maintains that the loss of certain retirement benefits is a violation of federal pension law. Olsman claimed the EDS release is void because it offered workers no compensation for giving up their right to sue.

Olsman maintained that transferred workers were offered stock before being told of the release. Howell of EDS answered that he is not sure when transferred employees were given details of the release.

Judge John Feikins of the U.S. District Court here issued a 10-day restraining order preventing EDS from asserting that employees have agreed to the release by accepting stock. The order expired March 14, and Feikins has yet to decide whether the release is valid, Olsman said. Feikins also has yet to rule who is included in the class of transferred GM workers affected by the Omans-Cattin suit.

State examines charges of $50 million DP cost overrun

By John Desmond
CW Staff

LANSING, Mich. — A state Senate committee here is investigating charges that a computer system bought by a state agency from IBM is costing too much and has performance problems. Meanwhile, a consultant has claimed the problems are due mainly to the agency's inability to attract qualified staff.

In 1980, the Michigan Employment Security Division (MESC) contracted to buy an IBM system consisting of a central 4381 processor and eight 4341 processors distributed in regional offices. Although contract figures are being disputed, the legislators charged that original estimates of $30 million have ballooned to more than $80 million.

At a recent hearing, members of Michigan's Senate Labor Committee expressed dissatisfaction with answers provided by the MESC staff and representatives of Arthur Andersen & Co. of Detroit, consultants on the project. To follow up the hearing, state Sen. Doug Cruce said a full-scale audit of the MESC contract will be conducted.

'There is nothing shady here'

Gerald Brundle, an Arthur Andersen partner, said he welcomed the audit, commenting, "There is nothing shady here." Describing how the MESC system problems arose, Brundle said the agency's DP shop made a transition from an IBM 370/155 to a state-of-the-art system in 1981.

"Their [the MESC] technology was obsolete," he said. "And they did not have the people in DP with the skills to take on such a project." According to Brundle, the MESC had difficulty competing in the private sector for skilled operators and programmers. "We came on to make up [for] the shortfall," he added.

Arthur Andersen consultants supported the system from January 1981 until mid-1984, when they were instructed by the MESC to phase out that support. But the MESC had made virtually no progress in hiring its own skilled staff, so the system "could not run without our expertise," Brundle said.

Brundle described the resulting problems: A backlog of batch jobs began piling up during December, January and February. Unemployment checks that should have taken five minutes to produce were taking 20 minutes. The delays caused long lines and dissatisfied customers. In addition, the MESC could not send out updated information to employers on what they were being charged for benefit contributions. As a result, belief that the system was not working grew, Brundle said.

Referring to Brundle's testimony at the hearing, Cruce said the consultant "continually cited statistics [on system uptime] that seemed to grossly contradict reality." Cruce estimated that the audit will take until mid-August to complete.

Burroughs ready to answer Sierra

NEW YORK — Burroughs Corp. tomorrow is expected to announce a high-end addition to its A series mainframes, said to be comparable in size to IBM's recently announced Sierra series, a Burroughs official disclosed last week.

The official, a senior marketing manager, claimed the processor will "be larger than Sierra ... and available much sooner" than IBM's machines.

Burroughs is also slated to unveil a series of mid-range processors at the press conference here. Featured at the conference will be W. Michael Blumenthal, chairman and chief executive officer, and Paul G. Stern, president and chief operating officer.

Blumenthal is expected to discuss the company's strategic mainframe direction in light of the high-end announcement. Also expected at the press conference is the announcement of several enhancements to existing Burroughs hardware.

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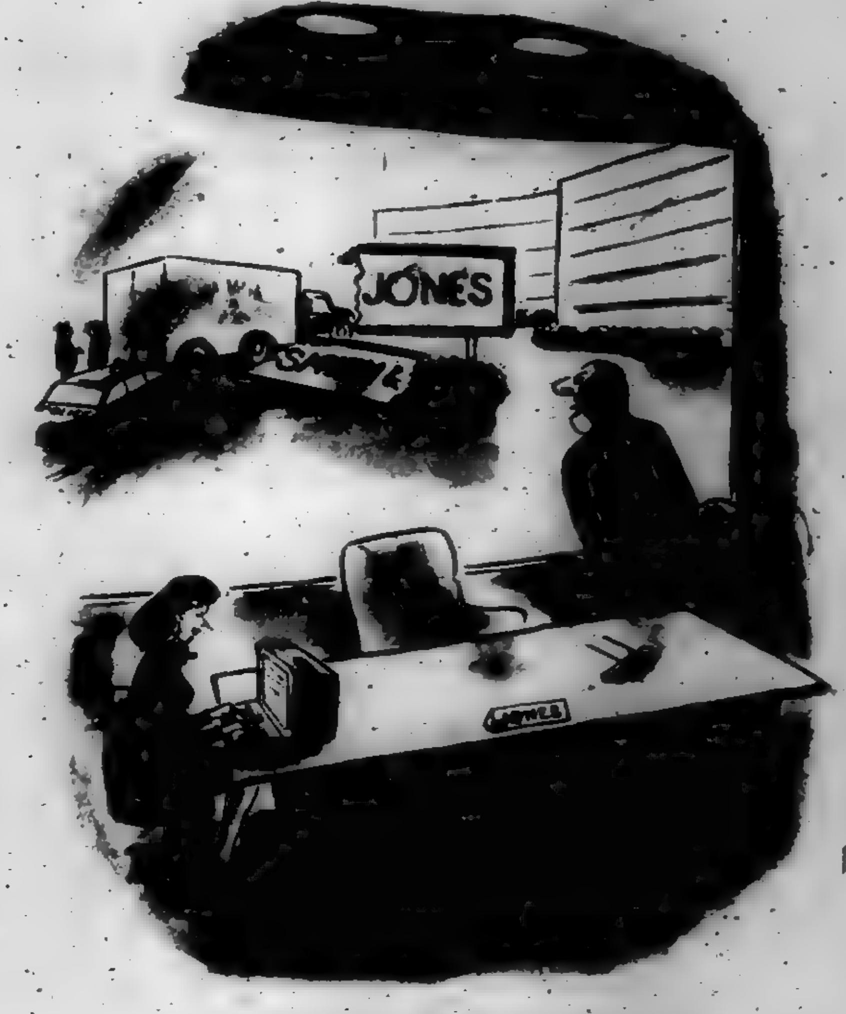

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Hospital finds Super Natural aids access to live data

FIRST USER

By John Gallant
CW Staff

WALTHAM, Mass. — The supernatural rarely plays a part in helping an information systems department implement its strategic plan.

But that is the situation at Waltham Hospital here, even though the supernatural refers to a software package. The 306-bed hospital is a beta test site for Software AG of North America, Inc.'s Super Natural, an end-user inquiry and reporting package that augments Software AG's Adabas data base management system and its Natural high-level applications development language.

Although currently operating in a test environment, Super Natural is helping MIS director Donald Cotton achieve at least one of his organization's strategic goals — getting live production data out to end users.

"Our goal has been to get data out to the people who pay the bills — the end users," Cotton said. "It has been next to impossible to meet the demand for data without adding extra programmers, but Super Natural will let me do that. Super Natural will get [MIS] out of the circle of developing applications the way we think they should be built and let the end users get at data the way they want."

Waltham Hospital's three-year strategic MIS plan was implemented in April 1983. Cotton said the MIS department was then migrating from an IBM System/3 small business computer, which supported the hospital's IBM RPG-II applications development, to an IBM 4331.

Cotton said the MIS department considered installing IBM's Patient Care software — a move that would have required the purchase of IBM's DL/1 DBMS and a shift to Cobol programming — but chose Software AG's Adabas and Natural instead. Since that time, the hospital's major applications systems — admitting, outpatient information, payroll and purchasing — have been restructured as fully on-line systems under Natural, which now supports all programming efforts.

Although Natural proved to be a superb programming productivity tool, the hospital reported, one aspect of it that prompted the implementation of Super Natural was a disappointment.

Natural not for unsophisticated users

"The focus of the overall game plan was to marry data with end users," said Joseph Ferro Jr., senior vice-president of finance. "One key to that was to acquire the DBMS, and the other was to provide data access through a friendly user language. But Natural just did not make it for unsophisticated end users. Fortunately, the company came out with Super Natural."

According to Cotton, Super Natural runs as an application under Natural and IBM's DOS/VSE on Waltham Hospital's IBM 4361, which recently replaced the 4331. Through menus and prompts, Super Natural allows end users to create reports and inquiries that access live production data maintained in Adabas. It automatically generates the Natural code required to perform the data base access. Super Natural itself can be accessed through a terminal or from a microcomputer via Software AG's Natural Connection.

Cotton said he plans a phased implementation that will eventually provide on-line access to Super Natural from 60 terminals throughout the hospital. "I am training one of my staff members to become our resident Super Natural expert," he said. "In addition, we will train selected people within each department who can teach others. If we just presented this product to the whole hospital at once, I would be swamped with requests for help."

Both Cotton and Ferro have already made use of Super Natural. In 10 minutes, Cotton designed a report showing the impact on each of the hospital's departments of a pay increase for Licensed Practical Nurses. Cotton said it took nearly a day for a programmer to develop a similar program written in RPG-II two years ago.

'We cannot wait for days or weeks for information'

"We are preparing for a bond issue," Ferro said, "and we needed to review our capital equipment expenditures. We were able to access that information in about five minutes with Super Natural. Our managers need that kind of access to data to help them make their decisions more quickly. We cannot wait for days or weeks for MIS to give us relatively simple information."

Cotton said Super Natural will free programmers from the task of developing ad hoc reports, allowing them to focus on building and maintaining core applications. In addition, it may help stem the influx of micros into Waltham Hospital — an issue that has been a cause for concern for Cotton.

"We have found that we cannot stop the intrusion of micros, but Super Natural is a tool that just might reduce the need for them," he noted. "We will be able to support most requirements through terminals because Super Natural makes so much mainframe information available to users. It provides a better view of the data base than most micro tools." More importantly, he said, Super Natural will help the hospital stay on track with its MIS strategy. "Our goal is to have data access capabilities in the hands of end users by the end of the third year. We can do that with Super Natural."

PCJR

from page 1

year and three times the number of Personal Computers sold that month.

Despite the sales increase, IBM was not making much money selling the machines. Future Computing, Inc., a Richardson, Texas, market research firm, estimated that IBM spent $450 for parts for each PCjr, which listed for $995. Comparably, parts for a Personal Computer cost $685, and it had a retail price of $2,500, the firm estimated.

"No one, not even IBM, could afford to give the machine away," IRD's Fleming noted.

The rebate program ended in February, as did the PCjr's luster. "IBM's share of the home market [sales] dropped from 17% in December to 4% in February," according to Abbi Lawrence, research analyst at Infocorp, a market research firm based in Cupertino, Calif. "So the product was dropped."

'Was never a big seller'

The announcement to drop the PCjr generally did not surprise industry observers. "The PCjr was never a big seller," noted Doug Carlston, president of Broderbund Software, Inc., a home market software vendor located in San Rafael, Calif. "The only time it sold well was last Christmas, when IBM was giving the machine away."

Seymour Merrin, chairman of Computerworks in Westport, Conn., hailed the move. "IBM is finally showing signs of maturity and is helping to eliminate confusion in distribution channels. . . . By dropping this machine, IBM also has eliminated confusion about its product line," he explained.

Industry observers agreed that Apple would be the chief beneficiary of the PCjr's demise. "Steven Jobs and John Sculley are lifting champagne glasses right now," Merrin said.

Lawrence added, "Apple is now the only major manufacturer selling a $1,000 home computer."

Analysts differed on IBM's plans, with some speculation that IBM would eventually reenter the home market. "IBM will examine the home market and cautiously enter it in 1986," Lawrence predicted.

Aaron Goldberg, director of microcomputer system services at International Data Corp. in Santa Clara, Calif., concurred, saying, "The educational market is too important for IBM to give up."

Observers also differed when asked if this decision reflected IBM's recent reorganization, which moved Philip D. Estridge from president of IBM's Entry Systems Division (ESD) (where the Personal Computer line is manufactured) to vice-president of manufacturing [CW, Mar. 18]. "Manufacturing is the most important division at IBM," IRD's Fleming noted. "Moving Philip Estridge to the manufacturing operation can be seen as a promotion. The reorganization allowed IBM to drop the PCjr without implicating an IBM official."

Merrin differed, noting, "Dropping the PCjr is the first of a series of changes that will be made at ESD — changes that I think will benefit everyone, including IBM."

SURVEY

from page 1

among 15 occupations. It reportedly found the banking industry to be the biggest user and the retail industry to be the smallest. Respondents from the industries most involved in personal computing were most likely to be using an IBM Personal Computer, the survey said. Firms least involved in personal computing also had the fewest Personal Computer users, the survey said.

From that finding, the study projected that personal computer manufacturers that compete with such major players as IBM, Apple Computer, Inc., Compaq Computer Corp. and AT&T should tailor their machines for use by those industries that currently are only slightly involved in personal computing.

Curry said the data from the survey's questionnaire was bolstered by follow-up telephone interviews with 3,000 respondents, 1,337 of whom were current micro users.

The profession that used personal computers the most, the survey found, was systems analysis. Half of all systems analysts use a micro, and 35% of those machines are from IBM, the survey noted. Salesmen and retail store owners were found to use micros the least, Curry added.

The survey found that IBM's presence was strongest among banking office workers, with 18% using Personal Computers and 7% using Personal Computer XTs. Apple microcomputers, meanwhile, were in use by only 5% of respondents from bank offices.

The survey, "Office Personal Computers: The Customers," is available for $3,000 from Future Computing, 8111 L.B.J. Freeway, Dallas, Texas 75251.

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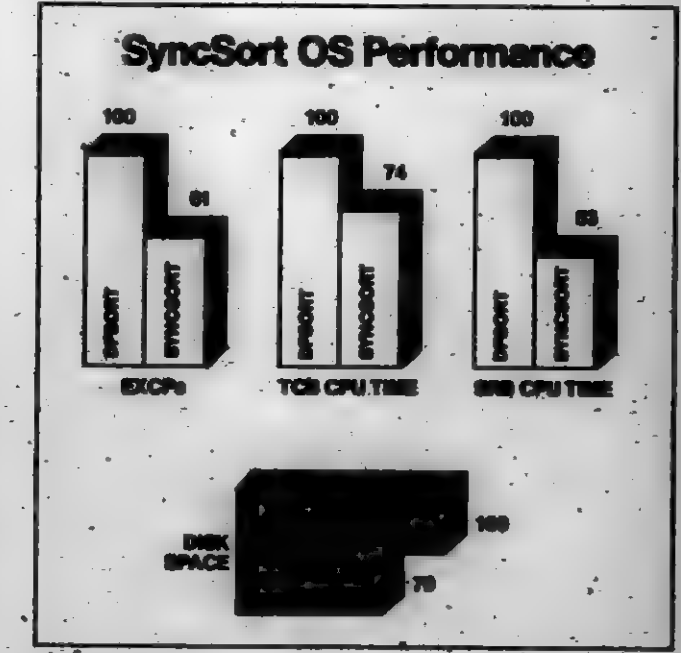

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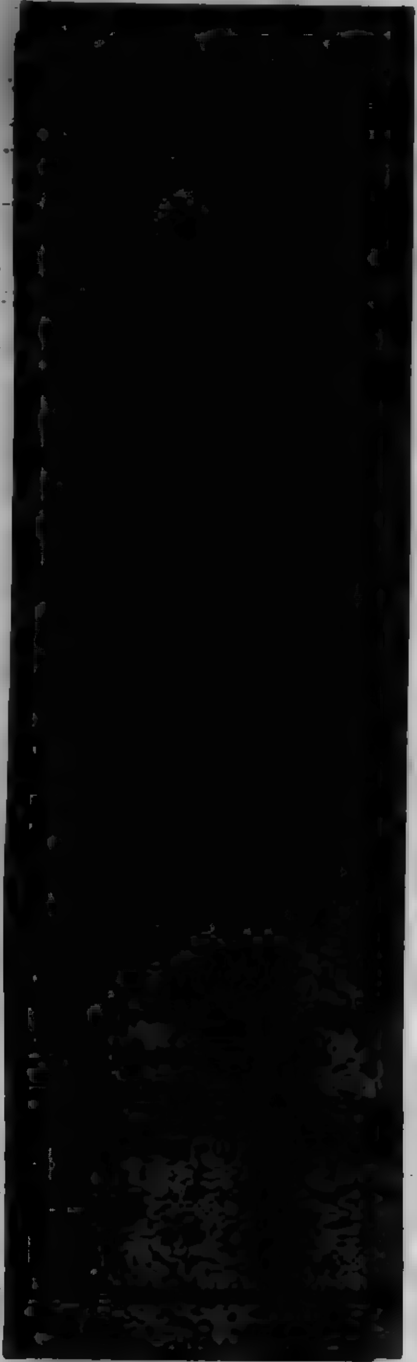


SOURCES: SERVICE EMPLOYEES INTERNATIONAL UNION, AIR TRANSPORT ASSOCIATION OF AMERICA, COMPUTER AND BUSINESS EQUIPMENT MANUFACTURERS ASSOCIATION

VDT from page 1

insen, VDT campaign project coordinator of the Service Employees Industrial Union (SEIU).

Last October, the SEIU joined forces with 9 to 5, the National Association of Working Women, with the hope of introducing legislation in 18 states. Many of the VDT bills filed resemble a comprehensive model bill designed by 9 to 5.

Those bills are meeting plenty of organized opposition. This year, large organizations using VDTs, such as the Air Transportation Association and the American Insurance Association (AIA), teamed up with the Computer and Business Equipment Manufacturers Association (Cbema) to form the Coalition for Office Technology.

According to James Brodsky, AIA corporate secretary and counsel, the coalition represents a more concentrated effort by the AIA and about a dozen member organizations to fight VDT legislation. Other coalition members include the American Newspaper Publishers Association, IBM and Digital Equipment Corp.

In years past, the AIA monitored Cbema's efforts against VDT legislation but remained out of the spotlight, Brodsky said.

"We did some lobbying, but [it wasn't] a full-blown effort," he said.

Although much of the proposed legislation around the country seeks to regulate ergonomic issues and mandates things like rest breaks and eye examinations for VDT workers, opponents say business should and can take on the role of educator.

Employees' problems with VDTs are too personal for far-reaching legislation, the groups maintain.

> ”
>
> *Employees' problems with VDTs are too personal for far-reaching legislation.*

To further emphasize that point, the Coalition for Office Technology is in the process of establishing an information center in Washington, D.C., which represents a more concentrated effort by business, Brodsky said.

Because it is no longer a new issue, "we're becoming experienced" in the VDT battle, said Zemphria Baskin, manager of government affairs at the Air Transport Association of America (ATA).

The ATA represents 31 U.S. airlines employing 150,000 VDT workers. The group tracks up to 4,000 bills filed nationwide each year, Baskin said. Nevertheless, she said, "At this point, the proponents are far more organized. It's their only issue."

States vary in approach to VDT legislation

By Maura McEnaney
CW Staff

Bills regulating VDT use being reviewed by state legislatures across the country are as different as the states from which they originate.

Oregon is the state furthest along in its attempt to implement VDT regulations. Earlier this month, the Oregon state Senate nearly gave its unanimous (27-1) approval to an education and ergonomics bill, which is now awaiting action from the state's Labor Committee in the House of Representatives.

The bill was recommended to the biennial legislature last year by a bipartisan committee of senators and representatives from business, unions and government agencies. It requires the state's Accident Prevention Division to set up an education program for employers in both the public and private sectors and requires the division to come up with guidelines for making VDT workstations ergonomically correct.

If adopted, the guidelines would be optional for private sector businesses and mandatory for state agencies where workstations are used for four hours or more each day. Machines already in use would not be subject to the regulations.

This year's VDT bill is a stripped-down version of a 1983 bill with more stringent guidelines. That bill died in committee, according to Doug Crooks, assistant executive director for the Service Employees International Union (SEIU) in Oregon. The SEIU is working with 9 to 5, the National Association of Working Women, to push for VDT regulations.

Crooks said it could be two or three weeks before the bill gets to the floor of the Oregon House, where, he said, it has an even chance of passing. Even with House approval, sources believe Oregon's governor, Victor Atiyeh, will veto any VDT legislation that reaches his desk. A spokesman in the governor's office said Atiyeh believes VDT regulations should fall under the jurisdiction of state regulatory agencies, not statutory regulations.

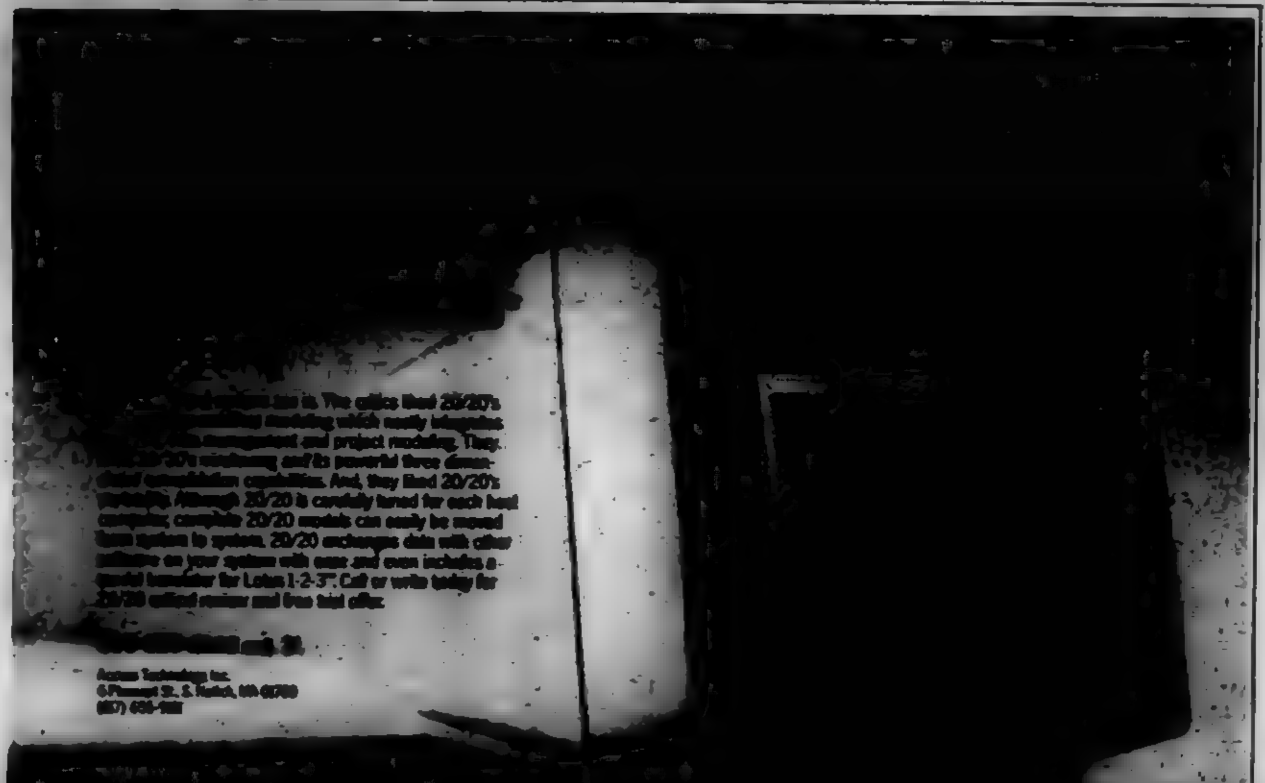
Opponents are already confident they have succeeded in stopping the VDT bill this year. "We have enough votes to defeat it on the House floor," said Gary Conkling, government relations manager at Tektronix, Inc.

Issues relating to VDT use are better addressed outside the legislative chambers, Conkling said. "We ought to take a stab at bad management policies" rather than machines, he said. Conkling and others believe this year's bill is an attempt to get any kind of VDT legislation on the books. "Within certain circles an attempt is being made to be the first state to get the VDT scalp," he said.

Proponents of VDT legislation agreed somewhat. "Things are pushing so hard in each state," said Marty Dickinson, VDT project coordinator for the SEIU "We are going to get VDT legislation somewhere on the books some time this year."

In Massachusetts, hearings on seven VDT bills will start early next month. According to William J. McCarthy, general counsel for the Associated Industries of Massachusetts, which is spearheading the effort against VDT regulations, the Massachusetts legislature has rejected VDT safety bills during each of the past five years. Last year, Massachusetts issued purchasing specifications and voluntary workstation guidelines for state offices using VDTs. The Massachusetts Department of Labor and Industries received a $75,000 appropriation to study the effects of VDTs.

While she termed those guidelines "a good first step," Elaine Taber, 9 to 5's program director, said Massachusetts still needs legislative action. The voluntary guidelines are for state workers only and do not cover the potential risks associated with VDT use, Taber noted.



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FDR/COMPAKTOR/ABR
Innovation Data Processing, Incorporated

MANAGEMENT SUMMARY

FDR (formally known as Fast Dump Restore) is a dump and restore utility designed to reduce the time required to produce a dump and restore the data. FDR replaces all standard IBM dump/restore utilities, supports all VS1 and MVS(XA) environments, and can be used with most IBM and compatible disk devices.

FDR uses three method plans in attaining input/output efficiency: 1) the use of increased blocking factors, 2) the elimination of redundant and unnecessary data, and 3) the use of cylinder orientation to minimize delays due to physical rotation, arm movement, and so on. FDR also offers a performance option (BUFNO=MAX) that increases the number of buffers FDR uses during the dump operation, and is designed to decrease elapsed time and save system resources. FDR has a full-volume disk-to-disk feature.

FDR includes a *Stand-Alone Restore* (SAR) program. This program allows restoration of a full-disk volume when, due to the unavailability of a VS1 or MVS operating system, FDR cannot be run. SAR can also be used to restore partial volumes and to clip a volume. SAR also aids the operator by issuing prompting messages on the console and error messages on the console, printer or tape whenever a problem is encountered during the restore. SAR also permits the Restore of specific tracks.

Recent enhancements to SAR include support of standalone operations in MVS/XA mode, a standalone backup capability, and support of backup and restore functions under VM.

A no-charge option available to FDR users is the *Data Set Functions* (DSF) subsystem. DSF allows the user to dump and restore individual data sets on a pack and to dump and restore by absolute tracks. It can also be used to restore data sets from full-volume FDR backup tapes and allows the user to rename a data set when restoring it. Password protection is provided, and can be activated on either a volume or data set basis.

Compaktor (CPK), an extra-cost option, is a disk management utility used to reorganize direct-access volumes using the FDR methodology. It reduces space fragmentation, merges data set extents, aids in positioning data sets, and offers several other solutions to frequent disk pack organization problems.

Automatic Backup and Recovery (ABR) is another extra-cost option that manages disk space on direct-access volumes. Disk volume and data set backup can be automated based on the last reference date and update characteristics. Data sets that have not been used for a time period can be automatically archived, freeing the disk space for more productive use. Reports can be tailored to user specifications. A Data Set Not Found Exit permits the Automatic Restore of data sets that have been archived without user intervention. The vendor recently released extensive ABR panels for TSO users. The panels provide complete dataset and volume reporting, thus permitting end users more direct control over their datasets. ABR is designed to operate with both the DSF and Compaktor subsystems.

FDR provides enhanced support for VSAM files which are cataloged into an ICF catalog. These data sets are also relocatable with DSF and ABR.

COMPETITIVE POSITION

While the packages listed on page one of this report compete with the FDR/Compaktor/ABR products, the only competition for FDR itself is IBM's DF/DSS. FDR is more efficient than the IBM product. This, along with its reliability, account for FDR's very extensive user base.

The other products listed as competition are disk space management packages and thus compete with ABR. The main competition includes Cambridge's ASM2 and Sterling's DMS/OS. While both of these products were introduced several years before ABR, neither has as large a user base. In addition, they are both more expensive than ABR.

The FDR/Compaktor/ABR family of products holds a very strong market position that is likely to continue. The family provides outstanding performance and reliability, and the vendor has earned a reputation for quality control that is equalled by few in the industry.

ADVANTAGES AND RESTRICTIONS

FDR, as its name implies, is a fast method for dumping and restoring data. The package is faster and more efficient than similar IBM utilities, and achieves a high performance level, reducing elapsed time and saving system resources.

A major advantage is the Stand-Alone Restore program. The ability to backup and restore disk volumes without an available operating system is critical to disaster recovery. The automatic restore to unlike devices and the automatic restore of archived files are additional advantages.

Another major advantage is the outstanding reliability of both the product and the vendor, as attested to by the rating in Table 1 and the wealth of comments from users. Many consider FDR the most reliable software package they have ever used, with never a bug to be found. Another decided advantage of FDR is the free 90-day trial offering.

USER REACTION

Twenty-three users of FDR responded to an independent Datapro survey. The average age of installation was 4½ years. The utility was running on various IBM mainframes as well as on an Amdahl 5860 and three NAS models. All but one were running under MVS, MVS/SP, or MVS/XA. Not every respondent rated all categories. Six did not rate User education, explaining that none is available.

TABLE I.	Excel.	Good	Fair	Poor	MAUR*	CA**
Reliability	23	0	0	0	4.00	1
Efficiency	19	4	0	0	3.83	1
Ease of installation	20	3	0	0	3.87	1
Ease of use	[illegible]	10	1	0	3.48	1
Troubleshooting	19	3	0	0	3.86	1
Documentation	10	9	3	1	3.22	1
User education	5	4	6	2	2.71	2
Vendor's maintenance	14	7	0	0	3.67	1
Overall satisfaction	17	5	0	0	3.77	1

*Mean Average User Rating, on a scale of 4.0 for Excellent.
**Cluster Analysis—the range of average user ratings attributed to each cluster for each category, where Cluster 1 is the highest and Cluster 4 is the lowest. (See Report [illegible] for individual category Cluster allocations.)

These users overwhelmingly stressed the advantages of FDR. All 23 said the package performed as promised by the vendor. Many comments were made regarding the outstanding reliability of the package, with long-time users saying that they have never had any problem with FDR. They consider IDP the most reliable software firm they have ever dealt with, with one commenting: "I wish some of the big name software folks took some lessons in quality assurance from Innovation." This is also reflected in the table above, with reliability receiving a very rare 4.00 rating.

Twenty users said FDR saves system resources, 18 said it saves staff time, 12 considered it inexpensive, and 16 said that using FDR resulted in financial savings for their companies. Fourteen considered the package simple to operate and 10 said it is flexible in its capabilities, allowing different device migration, archiving, single dataset restore, and global functionality.

Several users praised the vendor for providing excellent technical support. IDP is very responsive to problems or questions and the support staff is very well trained with thorough knowledge of the internals of FDR and MVS. In addition, IDP is quick to upgrade their product as soon as IBM announces any new hardware or system modifications. Furthermore, the vendor is continually improving and enhancing their products' capabilities.

Few restrictions were mentioned. Two users considered FDR complex and one said it is inflexible, while another said that the migration facility for data set movement to unlike devices is slow. One user said the documentation is poorly organized, while the user who rated documentation poor commented that there is no overall description of how all the components of the package fit together. As a result of this, much time is spent flipping through the manual to determine what is needed to carry out a requested function. A vendor spokesman explained that reorganization of the documentation is difficult because some users have only one component of the product. While there are no major plans for changing the documentation, the vendor is currently adding more examples of how to use the product. ☐

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Loose acquisition policy yields mixed bag of DP gear

By Eric Bender
CW Staff

WOODS HOLE, Mass. — Mainstream data processing operations are living side-by-side with a free-for-all attitude among researchers who use computers at the Woods Hole Oceanographic Institution here.

"There are no top-down rules about acquiring personal computers," said William Little, manager of the Information Processing and Communications Laboratory, whose job most closely resembles that of a DP manager. In fact, he noted, there is nothing to prevent researchers from going out and buying their own 32-bit superminis, a situation that has also happened.

Once they find funding for their research projects, scientists are free to buy whatever computers or software they think the projects demand or to purchase their own disk drives for the Digital Equipment Corp. VAX-11 machines Little's group maintains, the laboratory manager noted in a recent interview.

Flexibility, but difficulties

The institution is run by scientists with strong computer backgrounds who want to give researchers the freedom to choose their own equipment. This setup gives a lot of flexibility and the opportunity to snap up some bargains, Little said. But the approach also boosts support costs and the difficulties involved in tying the various machines together, he observed.

Although a single purchasing agent ends up buying most of the micros, the overall situation is chaotic, according to Andy Maffei, who supervises both data communications and personal computer support. However, he added that it makes a lot of sense to provide some centralized services.

Most scientists and assistants at Woods Hole work with computers, Little said. In addition to seven VAXs and five Wang Laboratories, Inc. word processing systems, a recent survey found approximately 235 micros from more than 30 vendors in use in offices and labs and in the field.

Of the micros, 47 are NEC Information Systems, Inc. Advanced Personal Computer IIs; 23 are IBM Personal Computers; 21 are Apple Computer, Inc. Apple IIs; 11 are Compaq Computer Corp. Portables; 10 are Tandy Corp. Model 100s; and the rest are split randomly among other vendors.

While many micros handle standard tasks such as word processing and budgeting, others are used for more unusual jobs, according to programmer Ann Martin. Martin tracks micros throughout the institution for an on-line data base designed to let employees know who has what equipment.

For example, the head of the institution's Physical Oceanography Department runs numerical models; while the Deep Submergence Laboratory performs image processing; and other scientists do computer-aided design or other graphics work. Stockroom employees handle their inventory, and chemical labs set up automatic data acquisition systems. The list goes on, Martin said.

The submersible *Alvin*

Hewlett-Packard Co. HP 2100 series minicomputers were the institution's standard real-time ship computers until around 1980, when they began to be phased out by micros, Little said.

The larger systems are not necessarily missed. They were expensive, their sheer size made them difficult to move around and if the disk drives crashed, the research cruise probably ended. Many of the mini's tasks are now done on a smaller, less expensive micro.

In one case, a Personal Computer on a supporting research vessel processes navigation data for the three-person submersible *Alvin*. The *Alvin* works worldwide, and "it's a lot easier to fly an IBM [Personal Computer] around than one of those big machines," Maffei pointed out.

In addition to placing increasing numbers of micros on ships, the laboratory also build computers for specialized data acquisition, which requires a great deal of computer expertise, Little said. As one illustration, he pointed out that most printed-circuit boards are not round, but a circular shape is a requirement to fit into standard deep-sea instrumentation casings.

Kenneth Prada, manager of the institution's Applied Engineering Laboratory, said that without specialized micros in oceanographic instrumentation, "there [would] be no need for microcomputers on shore, because there [would] be no data for them to process."

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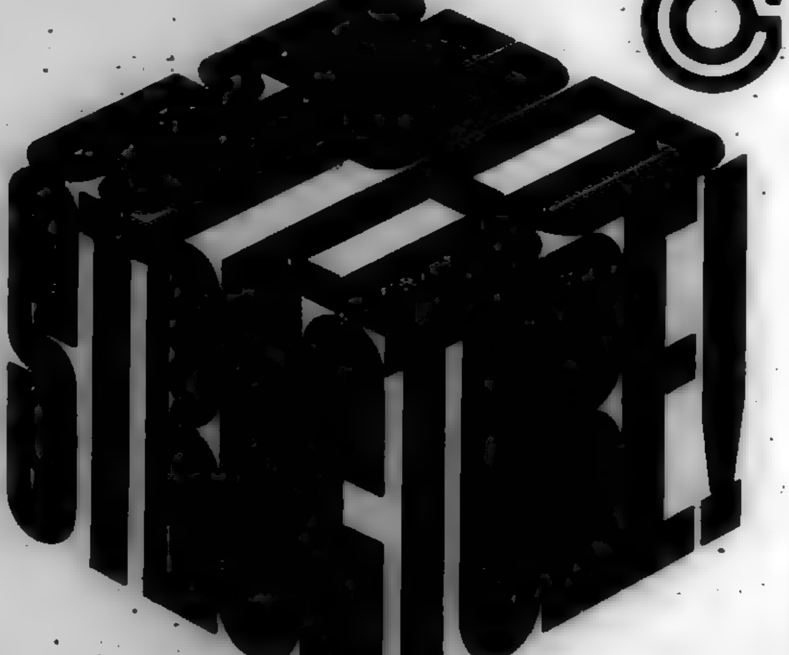

File transfer high on list of user's needs

Within the polyglot computer environment at Woods Hole Oceanographic Institution in Woods Hole, Mass., there is a great deal of interest in transferring files to other machines — particularly to the Digital Equipment Corp. VAX superminis, said Bob Groman, VAX systems supervisor.

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VAX [illegible] key to future [illegible]

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Consultants blend AI, conventional technologies

By John Gallant
CW Staff

CAMBRIDGE, Mass. — At Arthur D. Little, Inc.'s (ADL) Artificial Intelligence Program, there is no such thing as a pure AI system.

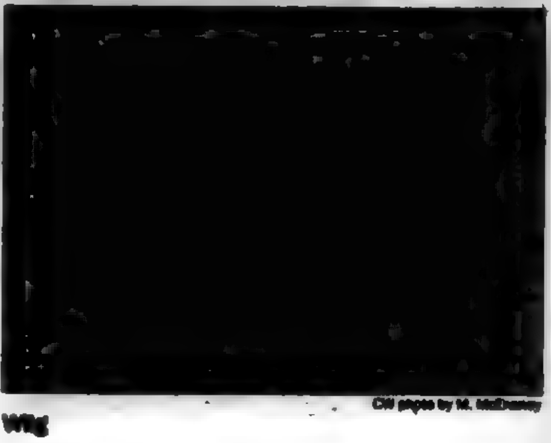
According to program director Karl Wiig, researchers involved in the giant consulting firm's current AI-related projects have been successful in merging conventional technologies and advanced AI techniques. Wiig cited the Personal Financial Planning System that the AI program is developing for a large U.S. financial institution.

Wiig said the fully automated system is intended to provide financial guidance — including advice on investment and money management strategies — to individuals with incomes between $20,000 and $70,000. Although the system employs more than 10 separate expert systems embodying the expertise of financial professionals, it also contains a conventional data dictionary and relies on operating services provided by IBM's VM/CMS. Developed in Lisp on a Symbolics, Inc. processor, the system will be delivered in final form in PL/I for use on an IBM mainframe.

"It is a blending of AI and conventional technology," Wiig said. "It uses explicit mathematical models for such things as tax calculations and cash-flow projections. Those are conventional techniques. But the reasoning process that is automated by the system is clearly AI technology. We could not manage that reasoning process using conventional technology."

Perhaps ADL deals in such hybrid systems because the AI program does not solely focus on research. Wiig said the AI program is geared to support ADL clients in applying AI technology and expert systems to their day-to-day operations. Wiig said the goal is to provide applications that leverage clients' existing systems investment or offer a return sufficient to justify investment in AI-dedicated hardware and software.

ADL's AI program has 27 staff members with a variety of backgrounds, including AI and operations research, the social sciences and electrical engineering. The team is currently involved in more than 20 client projects, which are supported by a computer laboratory equipped with six Symbolics 3600 and two Xerox Corp. 1108 processors networked to a Digital Equipment Corp. VAX-11/730 used as a file server and network manager.


CW photo by M. McEnaney

Wiig

"We are developing AI- and knowledge-based systems primarily for manufacturing and financial industries," Wiig said. "We have seen that there is really no such thing as a clean, AI-based system, particularly if you plan to use the system in real life. What is interesting about the systems we develop is that we have been able to build the bridges between AI and conventional systems."

Despite ADL's success in linking AI and traditional information systems, Wiig questioned the role that conventional DP departments and professionals will play in adopting AI technology within the corporate world.

"AI works with the knowledge that experts utilize to perform particular tasks. We found that we have to spend a tremendous amount of time trying to structure what happens in that setting," Wiig said. "To build a knowledge-based system, you must lay the [decision-making] process bare and obtain agreement from the experts about what happens. Should the DP shop do that job? Maybe not. We are going to make a number of mistakes if we think of this as a conventional DP activity."

According to Wiig, AI applications delve deeper into the actual managerial operations of a company than do traditional information systems, which often deal only with easily accessible surface data. "Information systems do not work with the private psychology of the individual," he said.

Wiig said a number of large corporations have already organized in-house AI laboratories or departments outside the DP environment. "I am sure that will create conflicts," he said. "It is an invasion of turf, so to speak. There will be a need for some adaptation on both sides."

Where possible, Wiig acknowledged, the bridge between AI and information systems should be fostered — at least for the time being.

"It is absolutely desirable to propogate the [AI] capabilities in environments that consist of IBM mainframes and [DEC] PDPs as long as the task, computationally, can be done," Wiig said.

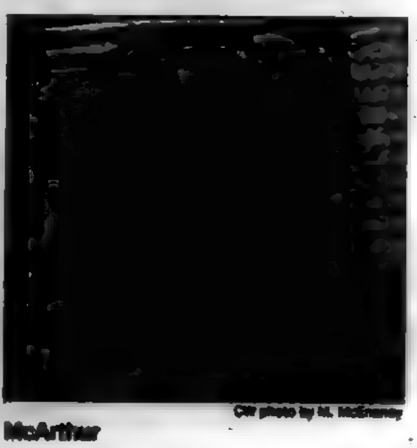
AI technology can also benefit small firms

The cost is justified when the need exists

CAMBRIDGE, Mass. — "Companies are missing the boat when it comes to artificial intelligence."

Helen Ojha, an expert systems design specialist with Arthur D. Little, Inc.'s Artificial Intelligence Program here, said she feels that is a valid criticism of most organizations.

"Business is changing," she said. "We are now in a period of incredibly rapid change. New people are coming into companies; older, experienced people are leaving. There is often no in-depth understanding of a company's operations. Without that understanding, a company cannot grow in today's business environment. AI and expert systems can stimulate understanding of an individual company's operations and the evolving industry."


CW photo by M. McEnaney

McArthur

Despite the high cost of AI-related hardware and software, both Ojha and colleague Robert McArthur, also an expert systems designer, said they believe even smaller companies can afford to take advantage of AI technologies.

Purpose for purchasing

"It is not a question of whether a company can afford to apply the technology," Ojha said, "but whether it can come up with the correct purpose for pursuing it. It is not the kind of technology you can invest in without careful business planning, which pays attention to the way knowledge is used within the company."

One critical problem, McArthur said, is that companies often try to apply leading-edge AI techniques that are irrelevant to their needs and that take years to implement.

"When we were just starting out here, some of the AI gurus said we were applying techniques that were old hat. So what? What we were doing was very useful. Companies do not need to be state of the art to be successful in implementing some of these AI technologies," he maintained.

Successful strategy

McArthur said a successful AI implementation strategy involves some immediate, if not overwhelming, payoff.

"You have to work first on things that show some benefit immediately to upper management," he said.

"One of the rules of thumb with the projects we work on is that people be able to use the system in some small way almost immediately."

— John Gallant

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Wang to halt manufacturing for two weeks

LOWELL, Mass. — Wang Laboratories, Inc. confirmed last week that it will shut down U.S. manufacturing operations during the first two weeks of July to bring inventories closer in line with demand and to save on operating costs.

Wang spokesman Peter Connell said Wednesday of last week that employees were asked March 15 to schedule their vacations for the July shutdown. Employees will be allowed to borrow against future vacation time, but those declining to take present or future vacation time will have to take an unpaid two-week leave, he added.

Earlier this month [CW, March 18], Wang announced that revenue growth for the current quarter is expected to be only 10%, and profits for the fourth quarter and fiscal year ending June 30 will probably be less than those for the year-earlier periods.

During a press briefing last Tuesday, at which no mention was made of the scheduled production shutdown, Wang President and Chief Executive Officer John Cunningham said he expects an industrywide slowdown in orders to last as long as nine to 12 months.

Cunningham said Wang has experienced slower growth in all product areas and across all distribution channels, although VS series products and personal computer products have felt less of an impact than their Office Information Systems products.

Usefulness of micro expert systems called limited

By Eric Bender
CW Staff

CAMBRIDGE, Mass. — Demonstrations on personal computers give a taste of what is possible with expert systems, but the taste may be misleading, cautioned artificial intelligence specialists at Arthur D. Little, Inc. (ADL) here.

While most of ADL's expert systems work involves creating systems with large knowledge bases that run on more powerful machines, the consulting firm has found a role for prototype software on personal computers.

One demonstration that examines political risks in various countries establishes "a very compelling dialogue" with users, according to Dennis Barlow, a consultant who has worked on numerous AI installations.

But risks crop up when clients who are sophisticated about computers and operations research look at a demonstration expert system on a micro. They are seeing only a very limited subset of what expert systems can do and may not be properly impressed, said ADL's James Davis, who specializes in knowledge-based systems.

A "serious" system with 1,000 production rules needs a large machine, while a personal computer might effectively handle only about 60 rules, Barlow said.

Knowledge-based software is very resource-intensive, and personal computers lack both sufficient memory and processor power to handle significant programs, commented Lawrence Brenkus, another ADL consultant who works with medical applications. And while micro versions of Lisp and Prolog are available, performance is further limited because the versions are interpreters rather than compilers, he said.

The programs currently available on micros could be generated without an AI language, Davis added. "Anything you could develop in Prolog or Lisp on the personal computer, I could develop in C or Basic, and it would run faster."

CW photo by E. Bender

Barlow

Another alternative is to create programs within a full-blown AI development environment and then hone them down "until you finally have something that works on the personal computer," Barlow said.

However, personal computers do represent a promising delivery vehicle for educating programmers about expert systems, the specialists agreed.

Micros can provide an inexpensive introduction for programmers, who often find AI languages rather strange, Brenkus pointed out. Initially, many find Lisp "something of a headache," he said. "You don't even know where things are stored — you're using source code for storage."

Another role may appear as some expert systems evolve into "real distributed knowledge systems with high-speed communications links," Davis predicted.

In this setup, "the big processor would have the bulk of the knowledge, and some of the knowledge could be siphoned off to the personal computer," Barlow said. A machine like the IBM Personal Computer AT might prove very suitable as a front-end device, handling graphics manipulation or other tasks, he suggested.

But today, users should beware "if anyone comes up and tries to sell you a floppy disk as an AI tool," Barlow summed up. "Anything on a floppy is not true AI."

Davis, however, pointed out that this boils down to a question of definitions and asked "how can you have 'false' artificial intelligence?"

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Word processor, software herald Burrough's OA thrust

By Charles Babcock
CW New York Bureau

NEW YORK — Burroughs Corp. last week made a thrust into office automation by announcing a word processing system and an OA software package for its mainframes and dangling the promise of an IBM-compatible document exchange architecture by the end of the year.

The word processing system, the Offswriter 25 (OW 25), combines Burroughs' B25 microcomputer hardware, a keyboard with 14 keys added to the standard microcomputer arrangement and word processing software. The software comes in two packages: one for general-purpose, managerial word processing and one for secretarial word processing, said Robert F. Holmes, president of Burroughs' Worldwide Marketing Organization.

The mainframe software, Office Management System II (OMS II), runs on Burroughs mainframes, including the recently announced A Series, and is said to allow document exchange and other communications between a mainframe and terminal. It is available in electronic mail, document management, workstation integration, networking, form letter format and electronic calendar modules. The modules can be run separately or together, Holmes said.

Burroughs' Document Format Architecture (DPA) was designed to be compatible with IBM's Document Content Architecture and Document Interchange Architecture (DCA/DIA). It is said to allow a Burroughs system to interface with the Document Interchange Format. The company intends to build the handling of compound documents — which may be composed of text, data, graphics and image and voice information — into DFA, Holmes said.

> Burroughs officials made clear that the announcement was meant to signal the company's commitment to OA.

A company spokesman claimed that DPA will be compatible with systems from Digital Equipment Corp., Wang Laboratories, Inc. and any other manufacturer that has announced it will use IBM's DCA/DIA as its communications interface.

The entry-level OW 25 word processing system is priced at $8,070 and includes Intel Corp. 80186-based B25 hardware; the Btos proprietary operating system, capable of calling up MS-DOS and CP/M operating systems as application programs; 512K bytes random-access memory; a 1M-byte floppy disk; a 10M-byte hard disk; and word processing software. Deliveries will begin in April, the company said.

The first two modules of OMS II software, the document manager and electronic mail, will be available in April for $8,500 on the Burroughs B1900 and A3 of the A series small-scale mainframes. It will be available the same month for $10,000 on the B5000 and B7000 series and A9 large-scale processors. It will be available in May for $10,000 on the B2000 and B4000 medium-scale processors.

No pricing has been set yet for DFA, said James A. Ekholm, senior marketing manager for OA systems.

Burroughs officials made clear that the announcement of the three products was meant to signal the company's commitment to OA. Holmes cited Burroughs' installed base of 10,000 OW 400 word processors, established over the last three years since it acquired Redactron, a former word processor manufacturer, and its installed base of 100,000 B25-based workstations.

Sixty percent of Burroughs' customers are data base and data communications users, making them OA candidates, Holmes added.

Opinion was divided among OA market observers on whether the Burroughs moves indicated it could become a successful OA player.

One group said no: Burroughs' announcements were purely a defensive strategy to prevent any more losses in its own customer base. A second group said Burroughs might be able to repeat its workstation success with the OW 25 system.

"[Burroughs'] workstation-oriented products could establish a beachhead for them," said David L. Cushing, associate director of the Omni Group Ltd., an OA market research firm here. Many of the 100,000 B20 and B25 workstations Burroughs has sold have been purchased by small businesses that are non-Burroughs sites, he noted.

Melody M. Johnson of Cable, Howse & Regan, an investment banking firm in Seattle, cited OMS II software as very useful to Burroughs customers and said the need of many businesses to upgrade typewriters to word processors could bring Burroughs new customers. The key will be later product offerings, she said, particularly DFA. "A lot of people will want to wait and see how well that architecture integrates IBM, [Apple Computer, Inc.] or whatever," she noted.

ORDERS

from page 1

Model JX] to two [3080 Model KXs] next summer. I can't visualize why [the computer companies] are experiencing slower growth."

The banking industry, however, is apparently singing a different tune. "Speaking for a lot of banks, I think there has been a general recognition that we've got to take a real close look at our operating costs," said Ed Nyce, senior vice-president of corporate systems and staff services at Manufacturers Hanover Trust Co. in New York. "We built a significant amount of capacity in 1983 and 1984, positioning ourselves to ride out until the IBM Sierras [3090 Model 400] arrived. There is a determined break in our acquisition plans while we await them."

Thomas Ardell, DP manager at John Deere Co.'s Portland, Ore., facility, said he is following a similar type of Sierra-based cycle. "[Demand] is definitely cyclical," he said. "Our needs are dependent upon the Sierra processing line, but it's not due for 18 months. I think lots of businesses are just making do with what they have until it's delivered."

Some corporate DP users reported a slowdown in the growth of orders because, like Manufacturers Hanover, their acquisitions in the last several years have satisfied their DP and MIS needs.

"If you've done a lot of new things [recently], your organization needs time to absorb that," said Eleanor Luce, MIS director of the Olin Corp. in Stamford, Conn. "You can't go flat out forever. Once you make that decision, that might have the lag effect of order deferral three to five months down the road."

'Vendors becoming victims of optimism'

One DP executive at the nation's second largest insurance firm suggested vendors are becoming victims of their own optimism. "I believe their forecasts were maybe too ambitious," said Dan Cavanagh, vice-president for DP at New York-based Metropolitan Life Insurance Co. "Is that an industry downturn or just their projections?"

Cavanagh said there has been no slowdown at Metropolitan Life, which is continuing with plans to add two new mainframes and about 1,000 terminals or workstations per year. "We need an awful lot of storage," he said. "That's where we see the explosion continuing."

Demand for more research data continues to fuel new acquisitions of DEC minicomputers at the New York-based pharmaceutical firm of Pfizer, Inc. "Our capital acquisition plans have increased beyond what we thought they would be a year ago," said Jack Cronin, Pfizer's corporate information services director.

The DP auditor for a Maryland health insurance firm admitted the demand for mainframe systems may have slowed but added that the industry's needs for micros and networking equipment will continue to grow.

"Here, and at two other large insurance firms that I know of, ordering is on or ahead of schedule," said William Rider of Blue Cross/Blue Shield of Maryland, Inc. in Towson, Md. "CPU-wise, we'll maintain for awhile; the immediate future is more for peripherals. With the trend to local-area networks, I can't see any large company surviving by just maintaining its current system or slowing down."

Many computer industry analysts believe fears of a 1985 recession have dampened industry's demand for DP power. But according to Bob Hammer, DP manager of the Caterpillar Tractor Co. plant in Joliet, Ill., hard-hit industries still need computers, particularly in computer-aided design and manufacturing applications on the factory floor.

"Our sales have been down, but to be competitive worldwide, we've still got to modernize," Hammer said. "We're playing catch-up with the automotive industry as it is. When times are good, people want systems; but when times are bad, they still want systems."

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Lotus says further testing will prompt delay in Jazz delivery

CAMBRIDGE, Mass. — Lotus Development Corp. last week announced that shipments of Jazz, its integrated productivity software for the Apple Computer, Inc. Macintosh 512K-byte personal computer, will be delayed until May 27. When Jazz was formally announced last November, the $595 package was scheduled for delivery in the first quarter of this year.

However, development "has required an unusual number of engineering refinements and rigorous testing," said Lotus Chairman Mitchell Kapor, who has often publicly criticized other software firms for not meeting their promised delivery schedules.

The program reportedly has crashed in several recent previews for user groups.

Jazz combines word processing, spreadsheet, graphics, data base management and communications functions.

OMB sets guidelines for federal information systems

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Office of Management and Budget (OMB) has drafted a policy document titled "Management of Federal Information Resources" that will require federal agencies to manage their information processing activities in a more businesslike manner.

The wide-ranging document, called an OMB circular, sets new information management policies for security, connectivity of computer systems, software, DP planning, training, end-user computing, electronic filing and the dissemination of information from government data banks.

The OMB issued the draft circular March 15 and is soliciting public comments on the draft before making it a final, mandatory policy for federal agencies. Comments are due May 14.

> ”
>
> *The OMB policy requires that federal agencies, when disseminating government statistics and other data to the public, rely on commercial vendors to the maximum extent possible.*

One controversial aspect of the OMB policy is a requirement that federal agencies, when disseminating government statistics and other data to the public, rely on commercial vendors to the maximum extent possible. "For example, before an agency establishes a service for electronic dissemination of government information via an on-line computer system, the agency should compare the cost of contracting for operation of the service [with] in-house performance and determine whether in-house performance is less costly," the OMB said.

This position is supported by the Information Industry Association here, but the concept has been questioned by librarians and academics, who argue that it will restrict the free flow of federal information to the public.

Other highlights of the OMB draft circular include the following new information system policies:

- Agencies must establish multiyear strategic plans for acquiring and operating information technology.
- Agencies must document the cost-effectiveness of information systems, foster the interconnectivity of DP systems, minimize the life-cycle costs of information technology and use off-the-shelf software unless customized software is more cost-effective [CW, Feb. 25].
- Agencies must train end users in their responsibilities for computer security, records management and protection of privacy.
- DP capacity requirements should be met through interagency sharing and from commercial sources before acquiring new capacity. Agencies should share spare capacity to the extent practicable.
- Agencies are directed to develop procedures that provide for timely acquisition of information technology.
- Agencies should avoid forcing program managers to use "monopolistic" central computer centers and give them the freedom to seek DP services elsewhere if that is cost-effective.
- Agencies are encouraged to develop electronic filing and retrieval systems but should give particular attention to such issues as privacy, public access, records management and cost recovery.
- Agencies must economize on the collection and dissemination of government data by conducting only those activities that are essential to agency missions and by relying on the private sector.

Alarming vulnerability of systems

The new OMB policy puts special emphasis on information security because of the alarming vulnerability of government computer systems, the document said, adding that security is "first and foremost a management issue and only secondly a technical problem of computer security."

The management office defined information security as "both the protection of information while it is within the systems and also the assurance that the systems do exactly what they are supposed to do and nothing more."

The growth of end-user computing has "increased the vulnerability of federal information systems and hence the level of management concern," the OMB document said. "Protecting personal, proprietary and other sensitive data from unauthorized access or misuse; detecting and preventing computer-related fraud and abuse; and assuring continuity of operations of major information systems in the event of emergency-related disruptions are increasingly serious policy issues," the OMB added.

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SEC's Edgar project a 'boondoggle,' legislators claim

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — In a blistering attack on the U.S. Securities and Exchange Commission's (SEC) experimental electronic filing system, U.S. legislators recently charged that the SEC system has been a mismanaged "boondoggle" and that it lacks the capability to retrieve important financial data.

Rep. John D. Dingell (D-Mich.), chairman of the House Committee on Energy and Commerce's Subcommittee on Oversight and Investigations, opened the March 14 hearing with the statement, "We have discovered disturbing evidence that the SEC's bold move [into electronic filing of corporate documents] may have become a blind stumble."

After five hours of criticism from congressional investigators and private industry, SEC officials denied virtually all of the allegations and said the Electronic Data Gathering and Retrieval system (Edgar) pilot project is working well. SEC Chairman John S. R. Shad criticized the subcommittee for holding what he called an unfair and unobjective hearing, to which Dingell shouted, "That's none of your business!"

Since Sept. 24, 144 companies have voluntarily submitted annual reports, proxy statements and other securities documents to the SEC in electronic format. The documents are available for inspection at public terminals, and can be analyzed by the SEC enforcement staff.

Last year the SEC awarded a $9.2 million contract for the two-year pilot program to Arthur Andersen & Co., an accounting and management firm, with IBM and Dow Jones & Co. as subcontractors.

Numerous charges levied

Dingell and Reps. Gerry Sikorsky (D-Minn.) and Ron Wyden (D-Ore.), citing investigations by the subcommittee staff and the General Accounting Office (GAO), levied numerous charges against the SEC's management of Edgar.

The legislators said Edgar is a "cost overrun" project because the $9.2 million contract price was higher than the $6 million estimate provided earlier to the House Appropriations Committee. SEC officials said the earlier estimate was the best available at the time and that the only cost increase in the contract has been $290,000 for a hardware upgrade, from an IBM 4341 to an IBM 4381.

The legislators also charged that the Edgar system is little more than a "glorified microfiche" system because it lacks data-tagging features that permit retrieval of specific financial data from the data base. The GAO reported that the contractor had dropped the development of automatic-tagging software from the pilot program. Because the SEC did not require corporate filers to submit data in standard formats, Arthur Andersen planned to develop software to tag automatically important financial data — such as profit-and-loss figures — in nonstandard filings, the GAO explained.

SEC officials said that because of unexpected difficulty in developing the data-tagging software, that feature will be postponed but has not been eliminated. SEC officials strongly objected to the assertions that Edgar is a glorified microfiche system, claiming that it has electronic mail, access to outside data base services and word processing and soon will have text-search capability.

The legislators also charged that the SEC rushed the contracting process to meet an arbitrary Sept. 24 starting date. "The SEC's rush to judgment didn't serve the public," said Wyden, referring to an abbreviated, 60-day contract-bidding period that elicited four bidders.

"I felt that [starting] date must be made," responded Kenneth A. Fogash, deputy executive director of the SEC. He said the SEC had a sense of urgency about starting the Edgar pilot at the promised time because it wanted to establish credibility with the securities industry and the volunteer filers.

Representatives from the Information Industry Association here also questioned whether the Edgar project — the government's first electronic filing system — should have been subject to an accelerated design and contracting process. "Truly, Edgar represents a great and bold leap. For this reason, we feel the schedule was too tight," said Peter Marx, the association's general counsel.

The critics also questioned the propriety of awarding the contract to Arthur Andersen because the firm audits many companies that report to the SEC and could benefit from inside knowledge of the Edgar data base.

Miti drops plan to limit copyright

TOKYO — The Japanese Ministry of International Trade and Industry (Miti) last week dropped its proposed plan to limit software copyright protections in the face of heavy pressure from U.S. government and industry, which feared Japanese firms would copy valuable mainframe operating system software.

Miti revealed to a U.S. trade negotiating team that it was dropping the year-old proposal and that it is also seeking to open up Japanese telecommunications markets when the government-owned monopoly of Nippon Telephone & Telegraph Corp. is deregulated April 1 [CW, March 4].

William Brock, chief of the U.S. Trade Representative's office, commented, "It is of major importance that Japan has recognized that copyright is an appropriate form of protection for software."

Miti's original plan called for software programs to be fully registered with the ministry, then these programs would enter the public domain after only 15 years, rather than the 50 years required for copyrighted products.

Additionally, Miti sought a provision to order the sale of software programs to third parties if the product carried significant market power.

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Gene Amdahl

At 62, Gene Amdahl is one of the computer industry's elder statesmen. During a career spanning 30 years, he played a leading role in the architectural design of the IBM 360 in the 1960s and went on to pioneer a new market in 1970 with Amdahl Corp., the first manufacturer of IBM plug-compatible mainframes.

Still reaching for the brass ring, Amdahl in 1980 started Trilogy Ltd. in Cupertino, Calif., and proposed to build a large-scale, IBM-compatible supercomputer built around revolutionary wafer-scale semiconductors.

Based on Amdahl's track record, the forecasts for the company were dazzling. Amdahl and his management team were able to raise a total of $276 million in investments from corporate luminaries like Sperry Corp., France's Bull, Digital Equipment Corp. and others, including the Irish government, thus becoming Silicon Valley's largest start-up.

But since then, Trilogy's ambitious plans have nose-dived. The task of developing wafer-scale technology proved exceedingly complex, and by early 1984, the company conceded it had run up against technical difficulties that subsequently caused it to cancel the semiconductor and supercomputer projects. The firm now has no major source of income and must support its corporate headquarters and well-equipped semiconductor plant. About $85 million remains of the $276 million raised.

In an interview this month with Computerworld's *West Coast correspondent Kathleen Burton at Trilogy headquarters, Amdahl discussed the company's problems, claiming that if events had turned out differently, "the world would have been changed."*

Q ***Trilogy's product strategy focused on developing wafer-scale technology. In light of the tremendous heat dissipation problems that subsequently developed, was this technical goal feasible? Were you attempting to accomplish too much?***

No. The wafer-scale technology is absolutely feasible, though now it's out of our reach financially.

We came extremely close. The main problem was not heat dissipation or wafer meltdown problems — in our design, there was no path for current flow in significant amounts — but a [short-circuiting] problem in the chip's upper layer. We cleared that up within three months and then discovered that we needed faster conductivity because of the chip's long path lengths.

As a result of these discoveries, a second pass at the chip was required, and the amount of money we had left just wouldn't carry us there. We needed twice as much money as we had. The areas that needed improvement were workable, but they weren't workable economically by that point.

Q ***Your son Carlton, Trilogy's ex-vice-chairman and chief scientist, said in a*** **New York Times** ***article last July that no one in the company's upper management understood the enormity of the development task. Is that accurate?***

Yes. Because of the scope and complexity of the development task, we found that almost everything had to be done differently at that scale. To someone looking at it initially, the task looked a third as large as it really was.

Our projections were way off. It was out of our control. If you look at something that is well solved today, you find that carrying it out to its numerical increase causes you to run into limitations. That's what happened to us.

Q ***In January 1984, Trilogy acknowledged problems with the wafer and later acknowledged other problems that led to canceling the mainframe and wafer projects. When did you first realize that serious problems existed, and why did the company deny that the problems were so serious?***

We didn't deny that our problems were serious, but keep in mind that a premature announcement of a problem can damage a company's stock as much as a delayed announcement [can]. We first began observing a serious shorting problem in late December 1983 and told the public in January 1984 as soon as we knew what the problems were.

We resolved the shorting difficulties within three months but then discovered other less obvious problems. That's when we decided we needed two more full passes for the chip design that would have taken one and a half years [longer] than we originally thought. That's when we canceled the [supercomputer].

We subsequently canceled wafer scale when we came to the conclusion that no other users, unless [they were] doing a very small system, would ever get [the product out] early enough either. It all takes money, and at our run rate, you didn't need to be out very far before you recognized that the money was gone.

Q ***How would you characterize Trilogy's problems — technological, managerial or a combination of both?***

The problems were a combination of technical and managerial. [More than] half of the technical problems were a result of not having adequate coordination and communication at the managerial level. It was as if two people were building a bridge at night with no communication between them; you'd probably observe a bump at the joint linking the two ends when the project was finished. That's what it was like.

The technical problems weren't insoluble but were the consequence of solving problems and finding out that the solutions didn't match the original plans.

Q ***You raised approximately $280 million [in capital investments] — $50 million from R&D partnerships, $55 million from an initial public offering, $115 million from a private stock offering, $10 million in overseas plant financing from the Irish government and more than $50 million from computer equipment lease financing. Most of these investments were based on your reputation and your vision of undeveloped products. Did you oversell Trilogy's potential?***

I don't think I oversold the potential of the technology, but I think I may have oversold our ability to put together everything it took to do it. As it turned out, the overall complexity of the computer, when you go into it, was too great, but had it been successful, the world would have been changed.

I think that Trilogy's prospectus took a very close look at the company and gave potential investors the best estimate we could make at that time of what lay ahead of us.

Q ***Trilogy's elaborate facilities have been characterized by some as being a modern-day Taj Mahal. What can we infer from that about the company's attitude toward costs, in general?***

The section everyone always remembers about Trilogy's facilities is this one administrative section, which is only about 5% of our total operation. It was done this way to overcome a problem we ran into at Amdahl. Our facility there made us look like a small company with limited resources, and consequently, everyone who walked in the door was concerned about Amdahl's survival. This section at Trilogy was done this way to provide visual cues to visitors to suggest just the opposite.

Also, the things we were trying to do here required technical support and very expensive equipment, or there wasn't a chance. Chip development costs are soaring today. I read recently that it costs [Intel Corp.] $10 million to develop a 64K-byte chip and $100 million to de-

See AMDAHL page 16

WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

Federal EFT to require NBS-approved security

WASHINGTON, D.C. — By 1988 all federal government electronic funds transfers will have to be properly authenticated or electronically sealed using approved standards, according to a recently signed agreement by the U.S. Department of the Treasury, the National Security Agency and the National Bureau of Standards (NBS).

The federal government annually accounts for $500 billion in collections and payments and the electronic transfer of $2.5 trillion in federal funds, according to the U.S. Department of the Treasury.

The security system will be developed using technical guidance from the National Security Agency and the NBS, which will oversee the design of electronic funds transfer devices.

"The stakes are extremely high," commented James H. Burrows, director of the NBS Institute for Computer Sciences and Technology. He said the NBS will work with the private sector to help protect financial networks that are based on electronic funds transfers.

A Treasury Department directive issued earlier this year specifies that federal EFT payments be electronically sealed using the NBS Data Encryption Standard.

The Treasury plans call for the agency to maintain an automated system for managing the cryptographic keys that will be required to open the EFT transaction once it has been sealed.

One feature of the proposed automated system will notarize the key with the names of the transmitter and intended receiver, according to NBS. The key management standard it is proposing for the Treasury Department payment systems is now going through the final approval process necessary before the standard is adopted by the American National Standards Institute.

College computer centers lack adequate equipment

WASHINGTON, D.C. — According to a recent National Science Foundation survey of universities, 93% of university computer science departments reported that they are unable to conduct critical experiments due to a lack of modern equipment.

Furthermore, top computer department personnel reported that roughly 40% of their equipment is inadequate for use by university researchers, and only 17% of the equipment could be considered state of the art.

The survey covered 91 computer science departments and facilities for the year 1982. The report, "Academic Research Equipment in the Physical and Computer Sciences and Engineering," is available from the Division of Science and Resources Studies, National Science Foundation, 1800 G St. N.W., Washington, D.C. 20550.

AMDAHL

from page 15

velop a 1M-byte [random-access memory] chip, and the company already has an infrastructure, integrated management and a customer base that start-ups like us didn't have. This would add another $150 million to $200 million to that figure.

Q *Did all that up-front cash give you the illusion that you had more money than you really possessed?*

No, but I think the money made us grow more quickly than we should have grown.

> ”
>
> *'We needed twice as much money as we had.'*
>
> — Gene Amdahl
> Trilogy Systems Corp.

Q *Three times you've wrestled with history: developing IBM's 360 mainframe and then starting the plug-compatible mainframe market at Amdahl. In light of recent events at Trilogy, how would you assess your standing as an entrepreneur in the eyes of potential investors. Has that changed from two or three years ago?*

I don't know. I haven't tried dipping my toe in the water. I bet I could probably raise investment moneys about as well as most people starting out for the first time.

Q *In the past, you've expressed bitterness toward IBM. Are you driven to upstage IBM continually? What is the genesis of your long-time attempts to do battle [with] IBM?*

My concern about IBM is that it will destroy the U.S. electronics industry with its insatiable hunger for growth. I don't think that's in the best interest of the people in the U.S. I think introducing competition is the most significant contribution you can make to the American public. For example, the price/performance on mainframes kept increasing until Amdahl came in and made inroads against IBM so that IBM had to drop [its] price/performance offering by a factor of three.

Q *What about Trilogy's future?*

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U.S. to use program to audit federal employees' calls

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. government plans to use a computer program to catch federal employees who are making personal, long-distance calls on government telephones, a government spokesman said last week. These computerized audits are worrying privacy advocates, who said the audits could be used to catch government whistle-blowers.

The telephone audit will be conducted by the inspectors general at federal agencies and will use software that can spot suspicious, frequently dialed numbers and note high-cost calls on monthly phone bills, according to a spokesman for the U.S. Office of Management and Budget (OMB).

The audit will be conducted for an indefinite period under the auspices of the president's Council on Integrity and Efficiency, composed of 17 inspectors general and headed by Joseph J. Wright Jr., deputy director of the OMB.

In a letter sent to Wright last week, Reps. Don Edwards (D-Calif.) and Patricia Schroeder (D-Colo.) expressed concern about the program's effect on civil liberties. "This proposal, however well-intentioned, raises the specter of Big Brother government at its most ominous," they wrote.

"While we would wholeheartedly support appropriate steps to cut down on misuse of the federal telephone system, we fear that the monitoring program under consideration may lead us into areas where the dangers far outweigh potential budgetary savings," the representatives stated in their letter.

Edwards and Schroeder asked Wright to respond to specific questions about the program, including queries about how the analyses would be used, who would have access to them and how to guarantee that the program would not be used to discourage whistle-blowers or to stifle dissent.

Jerry Berman, legislative counsel to the American Civil Liberties Union, said the audit will have a potentially chilling effect on government whistle-blowers and will create a climate of distrust among personnel in the workplace.

The OMB spokesman said the inspectors general do not intend to use the program to discourage whistle-blowers or otherwise invade worker privacy.

He said the administration is exploring ways to program safeguards into the software itself. Government auditors suspect that perhaps 30% to 40% of all telephone calls from federal offices are personal, he said.

The audit, to begin sometime after April, will search for "patterns of abuse" in long-distance calls only, by examining one out of every five calls placed through the government's intercity Federal Telecommunications Service and investigating all calls placed through commercial long-distance carriers, the OMB spokesman said.

He said the government's long-distance phone bill approaches $500 million a year. "If, in fact, we could make a 10% reduction [in personal calls], $50 million is worth going for," he said.

> ”
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> *'This proposal, however well-intentioned, raises the specter of Big Brother government at its most ominous.'*
>
> — U.S. Reps. Don Edwards and Patricia Schroeder

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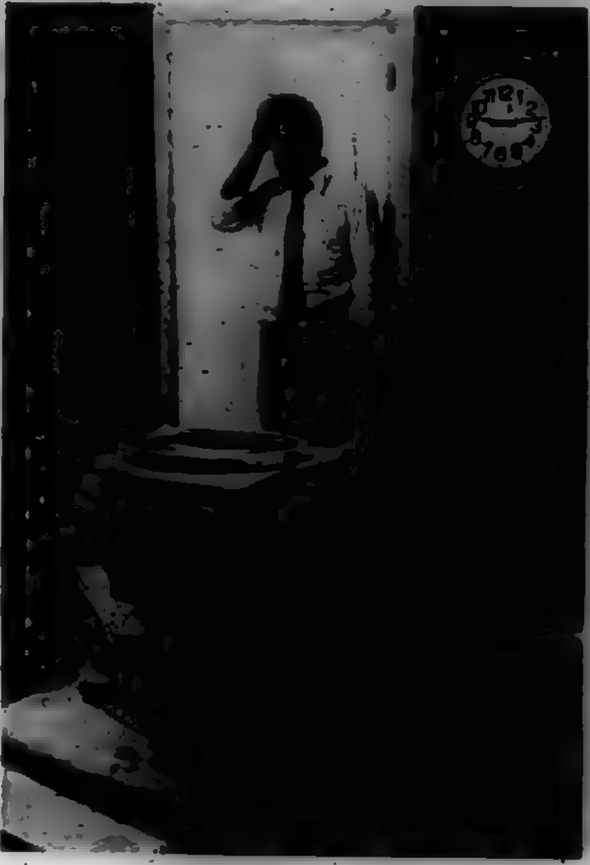

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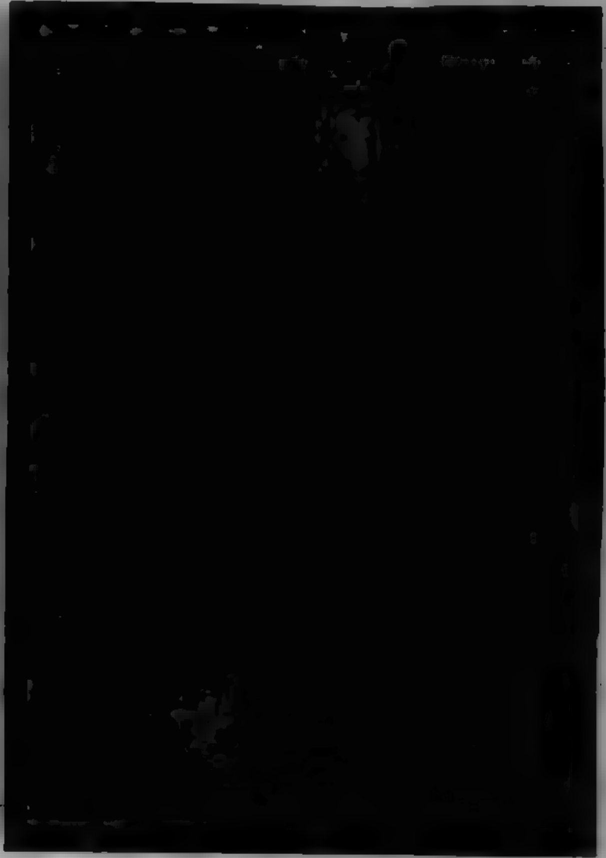

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Students linking math with computers shine in contest

By Donna Raimondi
CW Staff

WASHINGTON, D.C. — High school students who combined mathematics with computers took the first and third places in the 44th annual Westinghouse Science Talent Search here recently.

The contest, which boasts five Nobel Prize recipients among its former winners, began in 1942 and is sponsored by Pittsburgh-based Westinghouse Electric Corp. and Science Service, Inc. here, said Christopher C. Newton, Westinghouse's public relations manager in New York. This year, 1,069 students from around the U.S. entered the contest, he said.

Alan John Hu of La Jolla, Calif., walked away with the $12,000 first-prize scholarship for his method of speeding the location of information in a specific computer file. He said he derived a mathematical formula into which constants could be plugged to optimize searches of magnetic tape by using a combination of binary and sequential searches.

"I've been messing around with computers since third grade," Hu said. A trip to the library or 15 minutes with pencil and paper usually would solve the little problems that popped up, he said. But when he came across the idea of wasted search time and movement, Hu said he could not find references to it in the library and could not work it out easily. The project ended up taking 1½ years, on and off, he said.

The third-place winner was Michael Friedman of Brooklyn, N.Y., a senior at Stuyvesant High School in New York. Friedman set out to find a lower bound for an odd perfect number with eight prime factors. Using his IBM Personal Computer at home, he proved that if an odd perfect number with eight prime factors exists, it has to be larger than 10^{79}.

The field of applicants was narrowed to 40 finalists who were each interviewed by eight judges, Newton said. The winners were students the judges deemed the most creative thinkers, he added.

> *Using an IBM micro, Friedman proved an odd perfect number with eight prime factors has to be larger than 10^{79}.*

Dexpo set for late May

NEW ORLEANS — The seventh national DEC-Compatible Industry Exposition, Dexpo South '85, is scheduled to be held from May 28-31 at the New Orleans Superdome.

Sponsored by Expoconsul International, Inc., Dexpo South '85 will provide vendors of Digital Equipment Corp.-compatible merchandise with the opportunity to present their products to OEMs, systems integrators, dealers and DEC users.

The dates of Dexpo South '85 coincide with the annual DEC Users Society conference in New Orleans.

The registration fee for the exposition is $10. Exhibition space is priced at $18 per square foot.

For more information, Expoconsul International is located at 55 Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

Maintenance meet slated

DALLAS — The Education Foundation of the Data Processing Management Association and Sigma, the special interest group of DPMA on software maintenance, will cosponsor the third National Conference on EDP Software Maintenance May 6-8 at the Lincoln Hotel here.

A variety of topics will be covered including software maintenance and corrections.

The conference fee is $715 for DPMA members and $775 for nonmembers.

More information is available from the Conference Manager, U.S. Professional Development Institute, which is located at 1620 Elton Road, Silver Spring, Md. 20903.

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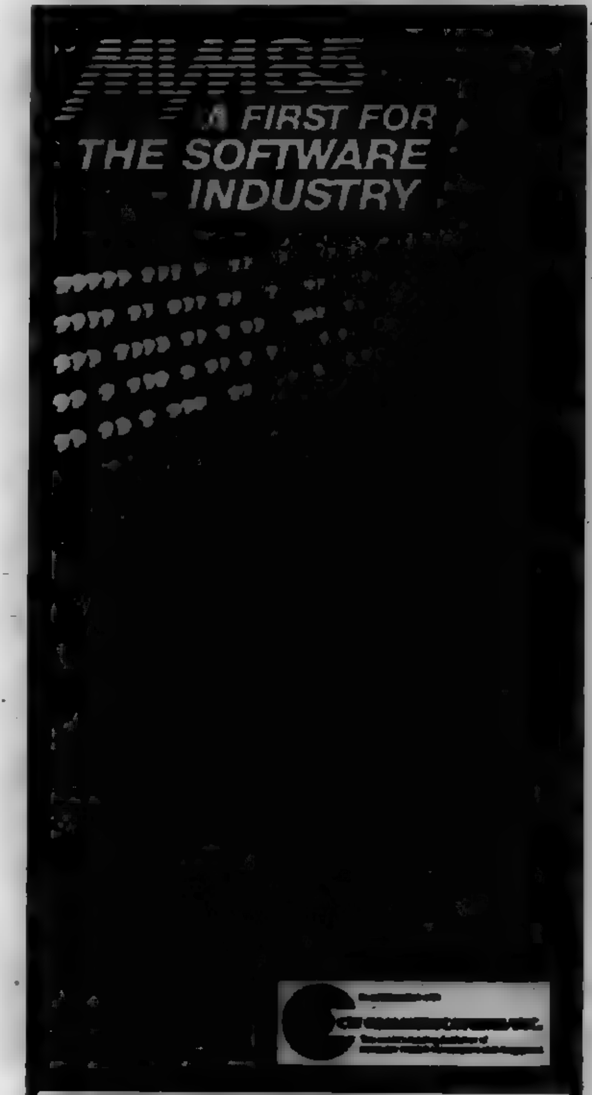

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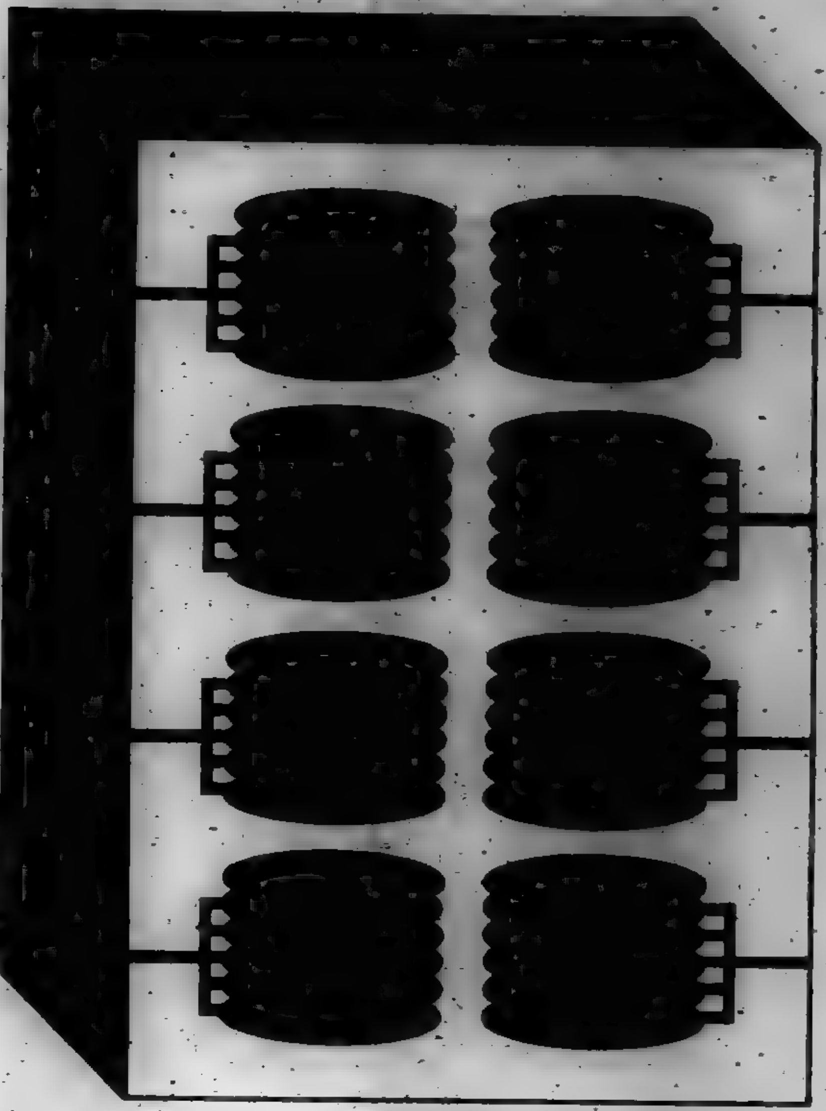

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TANDEMCOMPUTERS

Micros playing bit parts in China's high-tech plans

By Wu Zheng
and Li Min Hua
Special to CW$

BEIJING — China does not hope to lead the world in computer technology, nor will it be able to make extensive use of microcomputers at any time in the immediate future, according to an official of China's Ministry of Electronic Industries (Miti).

Xiu Zhen, vice-chairman of the computer department at Miti, recently voiced these sentiments at "Products in China's Electrical Industry," a month-long exhibition that Miti sponsored here.

In terms of computers, China needs large systems to "speed our commitment to modernization," Xiu said. Xiu said that any micro developments will have to be ancillary to large-scale industrial, governmental and military uses.

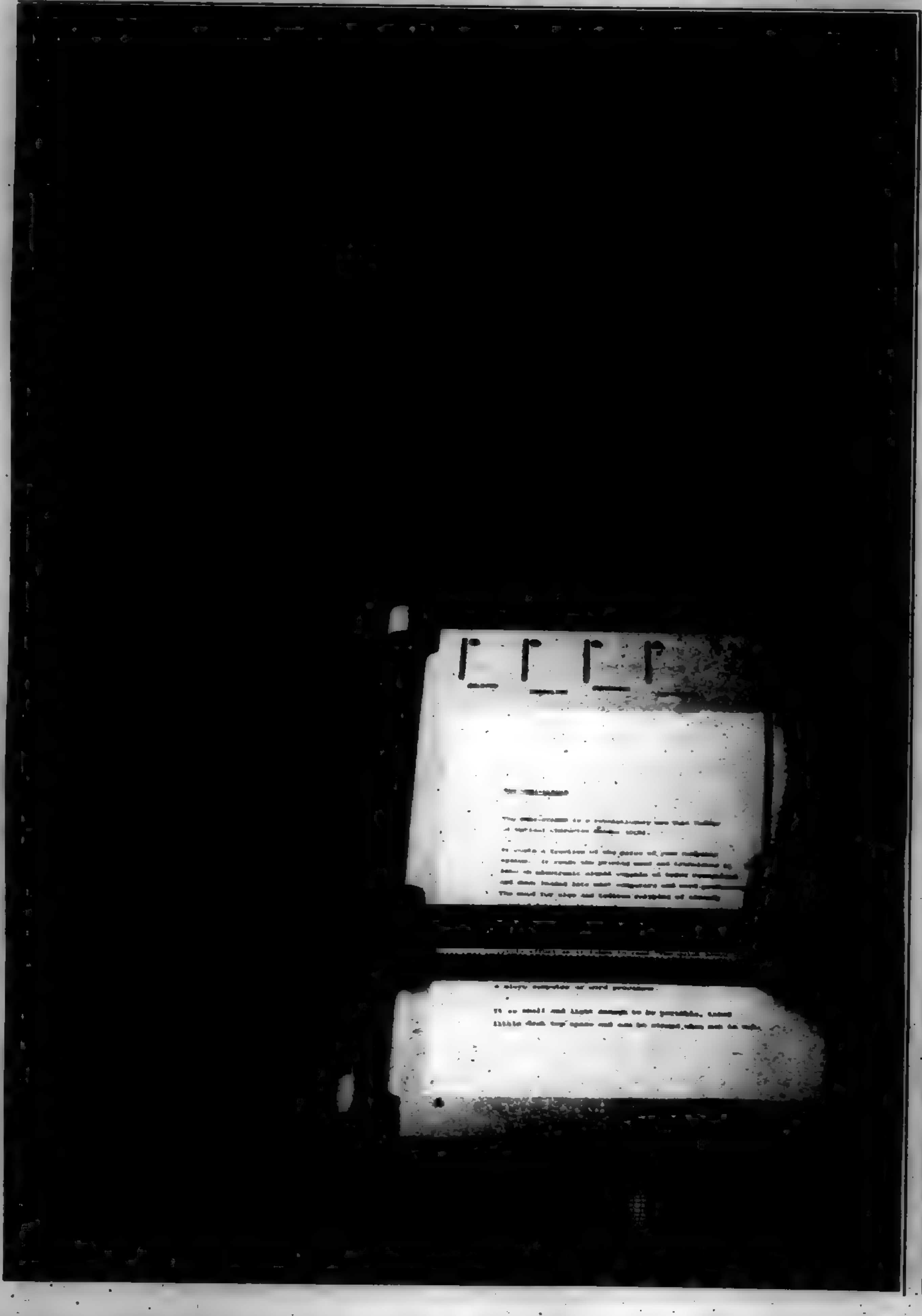
According to Xiu, even the cheapest of the personal computers still costs more than two years' salary for most Chinese professionals. Few micros were found at the Peking exhibition.

Recent statistics indicated that roughly 4,000 large- and mid-range computers and about 10,000 minicomputers now operate in China. "But China is still 10 to 15 years behind the world's advanced levels in integrated circuits and computer technology," Xiu admitted.

In a country with one billion people and an electronics industry that employs 1,300,000, Xiu is not worried that the computer might take away jobs.

"China needs the computer to do new work that people now are not trained to do," Xiu stressed.

Wu teaches at the Beijing Second Foreign Language Institute in China. Li Min directs the writing program in the English department of the Chinese University of Hong Kong.



Miti show spotlights advances

By Wu Zheng
and Li Min Hua
Special to CW$

BEIJING — The stated purpose of the "Products in China's Electrical Industry," held here recently was twofold: First, it allowed the electronics industry to demonstrate to the Chinese Communist party its many improvements in the four years since the removal of the "Gang of Four" [a group, led by the widow of Mao Tse Tung, which ruled China in the period following Mao's death]; and second, it allowed the industry to encourage the government and the private sector to cooperate in bringing about modernization.

The Peking exhibit was sponsored by the Chinese Ministry of Electronic Industries (Miti).

China's important technological achievements include the facility for processing army requisitions, radio and television communications, the ability to launch missiles, the development of sophisticated aerial surveying equipment and the use of microwave communications.

Computers did not compete successfully for the attention of the masses at the show. The curious could learn what the machines do by reading the large signs posted near each machine rather than by watching them operate.

Instead, the audience clustered around the [illegible] record players, tape recorders and TVs. The [illegible]

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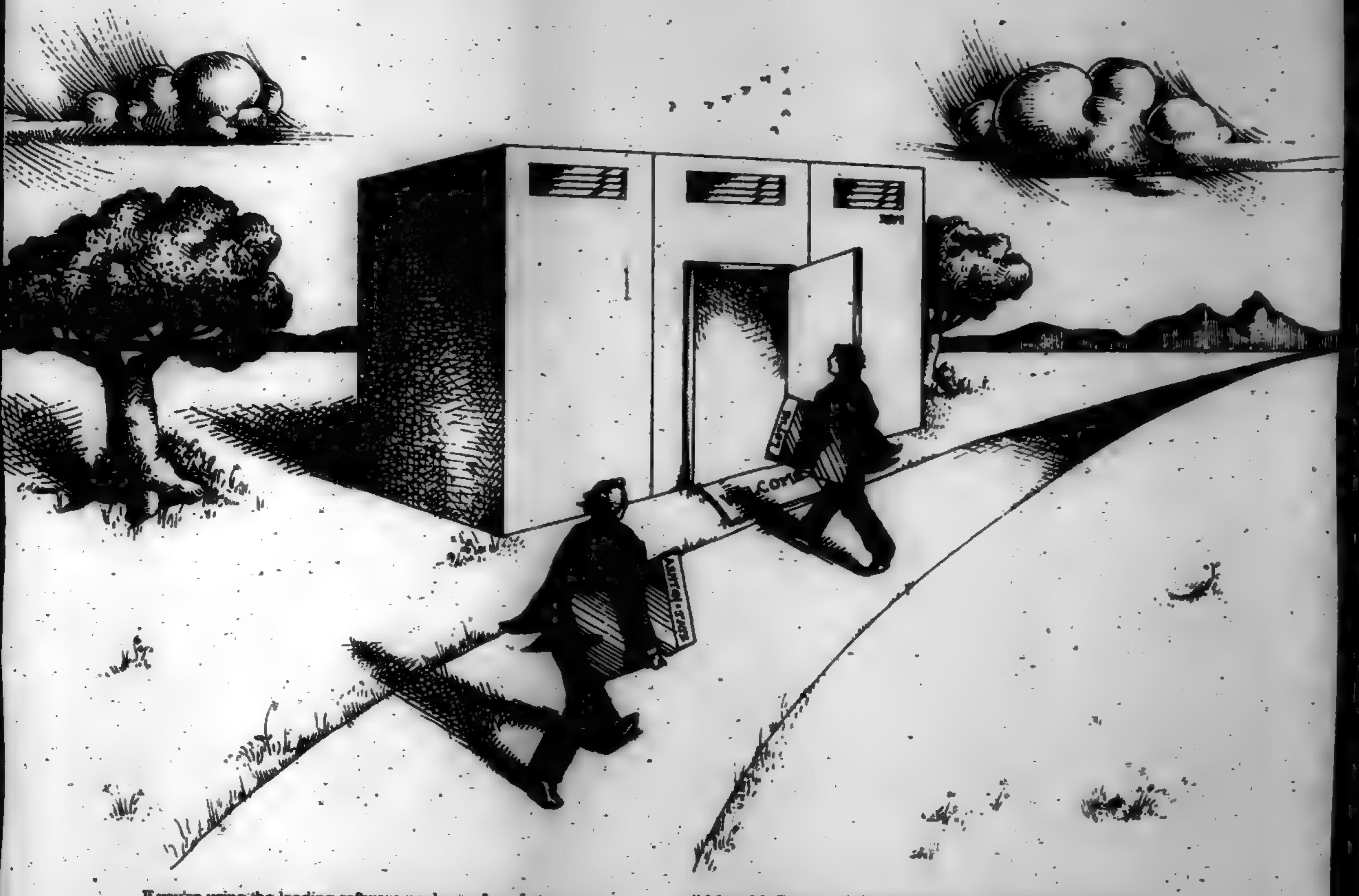

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INTERNATIONAL REPORT
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BELGIUM

GHENT — Europe still holds some winning cards in the high-technology game, according to the new chairman of the European Economic Community (EEC), Jacques Delors.

"Europe just needs a more advanced communications infrastructure to build one huge home market with 270 million people," Delors said during the recent Flanders Technology International Exhibition. The EEC is well on its way to creating a "transnational broadband backbone" network, using fiber optics and satellite communications, Delors said.

BRAZIL

BRASILIA — Control of Brazil's Special Department of Informatics, the agency that regulates the information industry here, has changed hands. The new director, Doria Porto, formerly headed the agency's Technological Center.

CANADA

OTTAWA — The Supreme Court of Canada is now hearing appeals by way of a nationwide videotex service. The service, which began March 4, enables the court to hear applications twice monthly from nine cities across the nation.

The service is completely interactive and uses two-way color video and audio links provided through Telecom Canada's Conference 600 service.

FRANCE

PARIS — The Societe d'Etude et Recherche Linguistiques et Informatique (Erli), a leading artificial intelligence company located here, has signed an agreement with Mathematica Products Group, Inc. of the U.S.

Under the agreement, Erli will offer a French natural language comprehension component for Mathematica's Ramis II fourth-generation language and data base management system.

JAPAN

TOKYO — NEC Corp. Vice-Chairman Atsuyoshi Ouchi will share the keynote platform with Zepu Dong, deputy chief engineer of the computer division of China's Ministry of Electronics Industry at the premier Comdex Japan trade show here this week. Ouchi will discuss "Japan and Asia — New Horizons for Small Computers," and Dong will review recent technological progress in China.

NETHERLANDS

AMSTERDAM — Although Paradyne Corp. is facing hard times in the U.S., its business is booming in the Netherlands. Ormas, a leading office automation firm here, has signed a multimillion dollar marketing agreement involving Paradyne's IBM Systems Network Architecture-compatible Pixnet and Pixloop local-area network technology.

SINGAPORE

SINGAPORE — The National Computer Board (NCB) of Singapore will be conducting computer certification examinations this year under the terms of a recent agreement with the U.S.-based Institute for Certification of Computer Professionals (ICCP). The examinations, which test computer competency, will be administered on May 11 and Dec. 7.

SWEDEN

STOCKHOLM — The Scandinavian Committee on Economy and Full Employment has advised the Nordic Ministry Council to grant $1.1 million toward the Nordunet computer network project. The project's goal is to link all national university networks in Scandinavia. It would eventually enable the universities to access each other's networks as well as data base networks in the U.S. and Common Market countries, a spokesman said.

■

STOCKHOLM — The Swedish electronics industry has shown little interest in Esprit, the European Economic Community's (EEC) $120 million high-technology research collaborative. Many of the Swedish applications for competitive Esprit research were rejected last year, reportedly because EEC officials considered the Swedish efforts half-hearted and sloppy.

WEST GERMANY

FRANKFURT — Standard Elektrik Lorenz AG has jumped on the bandwagon of firms offering digital private branch exchanges. The company, an ITT subsidiary, unveiled two PBX systems for office automation applications, based on the German Postal Telephone and Telegraph digital transmission technology.

UNITED KINGDOM

LONDON — British computer maker ICL Co. will hike hardware prices by up to 8%, effective April 1. The company is blaming the increases on the fall of the pound sterling against the dollar and the yen.

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Model aids firm in evaluation of Nasa shuttle purchase

PITTSBURGH — Astrotech International Corp. (AIX) wants to be first on the last frontier,

The company wants to buy a space shuttle from the U.S. National Aeronautics and Space Administration and contract with Rockwell International Corp. to build new shuttles for use in transporting people and materials back and forth into space as Nasa does now.

AIX is assessing the practicality of its ambition with the help of a software model using Encore! from Ferox Microsystems, Inc. in Arlington, Va.

The model, which runs on an IBM Personal Computer with 512K bytes of main memory, allows AIX to judge whether its financial assumptions are reasonable and whether the numbers justify the project, according to AIX financial analyst Rinaldo Acri.

The Ernst and Whinney accounting firm here helped develop the model, which produces balance sheets, cash statements and cost/benefit analyses based on different assumptions.

The Ferox software was chosen for its features, including tax tables such as the Accelerated Cost Recovery System, which automatically calculates depreciation, Acri said. Encore! also has goal-seeking capabilities, such as the ability to plug in revenues required to produce a 15% rate of return, he added.

Models used in proposal presentation

Initially, models were used to frame the initial proposal to Nasa for commercial operation of the space shuttle.

"The premise is simple. Nasa is poised to move into bigger development projects such as space station design and implementation. But the government doesn't really need the burden of operating space shuttles along with new development. That's where AIX comes in," Acri said. The long-term goal is to buy the entire fleet of shuttles, he added.

The models must show how the government as well as AIX will benefit from the proposal. The company's plan is to lease an existing shuttle and have one built for outright purchase. Since it takes five years to build a shuttle, the company would establish its business around the first, leased shuttle before launching the second, Acri said.

Complex negotiations are in the early stages. Acri said negotiations are now focusing on having Nasa accept a "memorandum of understanding" for how to proceed.

AIX, which had revenues of $100 million last year, owns three subsidiaries, including Special Metals Corp., which develops superalloys; Quasitronics, Inc., which makes computer peripherals and control devices; and Astrotech Space Operations, which processes satellites before launch.

Managing data topic of seminar

NEW YORK — William Synnott, senior vice-president of the Bank of Boston, and William Gruber, president of the Research and Planning Institute, will conduct a one-day seminar entitled "Managing Information Resources for Competitive Advantage" April 25 at the Hotel Parker Meridien here.

The seminar will focus on case studies about companies using technology as a competitive weapon. The speakers will address five critical success factors for information resource management: business and systems integration; planning for competitive advantage; building an information resource management architecture; end-user computing leadership; and change, management and the chief information officer.

Registration for the program is $595. Information is available from Research & Planning Institute, 215 First St., Cambridge, Mass. 02142.

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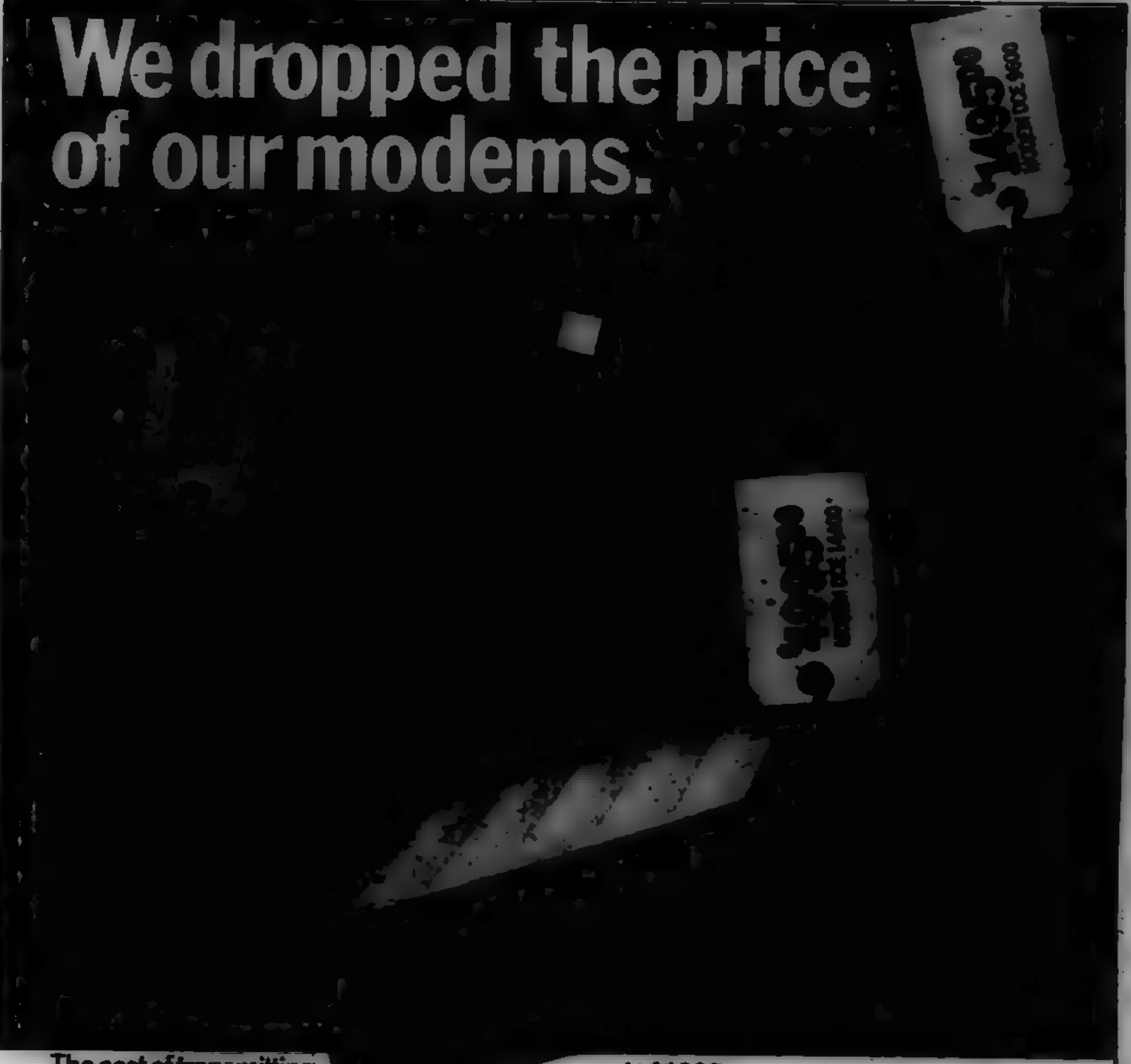

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Packages help London council bridge budgetary limits

LONDON — "If the Greater London Council (GLC) were an independent state, it would be among the top 20 [richest] on the United Nations' list," said the GLC's chief accountant. From airports to zoos, there is virtually no aspect of London life where the GLC does not play a role.

And if the GLC were an independent state, it would certainly have more computer hardware and software per capita than any other in the world: two IBM mainframes, nine CICS systems, 22 minicomputers, 350 micros, the potential for 800 VDTs and a DP staff of nearly 350 people, according to Chief Accountant Eric Hendin.

As the strategic planning authority for Great Britain's capital city, the GLC has major responsibilities for transportation, housing, public health and safety, industry and employment and arts and recreation for this city of eight million people.

With a budget of $2.8 billion and a staff of 22,000, the GLC recently needed help controlling costs. Despite a wealth of DP resources, none of the new financial systems the GLC installed recently were developed internally.

"In September of 1982, on-line financial packages had just come onto the market," Hendin recounted, "and after careful study, we concluded it would be much quicker and less costly to proceed with a package than to develop a new system in-house."

The council evaluated systems from three suppliers and ultimately chose the General Ledger, Budgetary Control, Accounts Payable and Accounts Receivable Systems from Management Science America, Inc. (MSA) of Atlanta, along with MSA's Easy-Plan module and Executive Peachpak, the micro-mainframe link.

"MSA had an on-line order facility to let us check the availability of funds," Hendin said. "MSA systems also give us a choice of methods for accessing stored data, which means cost savings for us."

Flexibility a primary concern

One of GLC's primary concerns was flexibility, Hendin noted. "This is an extremely complex organization. We have to allow for a variety of operational arrangements within a centrally controlled structure. At the same time, we need immediate information about the status of any given account because we are mandated by the government not to overspend. That's a big task, and we simply couldn't do it without a sophisticated system."

GLC differs from a commercial enterprise in several respects, all of which affect accounting functions, Hendin noted. One major difference is that in the fiscal year ending 1986, local authorities in Britain will be "resource controlled," which will limit the amount raised through taxes, making it imperative not to exceed budgets.

"Legally, we cannot overspend," Hendin explained. "But we don't want to risk underspending either, because that would represent lost opportunities for services to taxpayers. This is where the budgetary control system is going to help us — we can control expenditures at an early stage. Much of our spending is seasonal, and with [the budgetary control system], we can get an indication of our commitments immediately." Hendin said the system would handle a load of approximately 150,000 payments each year for the GLC.

> *'Our reporting requirements are much heavier than in a commercial organization. . . . I don't believe anyone is using the ledger report generator as extensively as we are.'*
>
> — Eric Hendin
> GLC

Another difference between the government and the private sector is the reporting structures. "Our reporting requirements are much heavier than they would be in a commercial organization," Hendin said. "The emphasis is on control at all levels, departmental to organizational. I don't believe anyone is using the ledger report generator as extensively as we are."

A third difference is the source of income for capital projects. "We borrow from the government and from London money markets," Hendin said. "But since we want to avoid 'shades of old New York' [bankruptcy], we must guarantee the redemption of our loan department. Here again, public accountability really sets us apart from the financial reporting you'll find in a typical business environment."

The council processes at least 650,000 payments per year, and Hendin predicted that one of the key benefits of the new on-line systems will be a reduction in the number of checks produced.

"Now we can make payments directly into the payee's bank account," he said. "We've been working with [Bankers Automated Clearing Services] on this, and we estimate that we could cut the number of checks we produce by 150,000 to 200,000 per year — a substantial savings."

Hendin can recite a laundry list of other benefits accruing from the new systems: quicker processing of urgent payments to contractors and suppliers; a forward due date facility that indicates cash flow and interest benefits up to several months ahead; two-stage validation checks on budget provisions and codes for better financial control; budget forecasting and modeling facilities; simpler value-added tax and contractors' tax calculations; fewer rejected and suspense account items; improved security; flexible allocation methods; unit costing and project costing capabilities; and quicker tracking of items passed for payment.

Once the GLC is in full production on all four of its new financial systems, Hendin plans to expand the use of each system's features. "We want to use the cost allocation module to calculate our administrative costs as we go, for example," he said.

"Another thing we want to do, which is a breakthrough in the use of a package by a local authority, is to automatically produce charges related to borrowing by service departments to fund capital projects. We created a special company — Company L — which is a consolidated loan fund or capital fund. It serves as a banker, making advances and loans to other GLC companies. We'll use the calculation facilities within the General Ledger System to work out the interest charges. It's a very sophisticated use of intracompany accounting. I don't know of any local government that's using a package in just this way."

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Crime awareness seminar scheduled

MINNEAPOLIS — A half-day seminar titled "Becoming Aware/Dealing With Computer Crime" will be held at the Northstar Hotel here on April 18. Geared toward nontechnical managers, the seminar is intended to help them become more aware of the consequences of insufficient control over computers.

The seminar, hosted by Dataline Corp. of Minneapolis and led by Robert Huber, computer crime specialist for the city of Minneapolis, will focus on the value of documentation, the magnitude of computer crime and its effect on business, the vulnerabilities and security/management perspectives of computer systems, safeguarding techniques, computer crime laws and preparation for prosecution.

The seminar will also be held April 22 at the Holiday Inn in Chicago, April 24 at the Atlanta Marriott in Atlanta and April 26 at the Hyatt Orlando in Kissimmee, Fla.

The fee for the half-day seminar is $85.

More information on the seminar is available from Dataline, P. O. Box 15221, Minneapolis, Minn. 55415.

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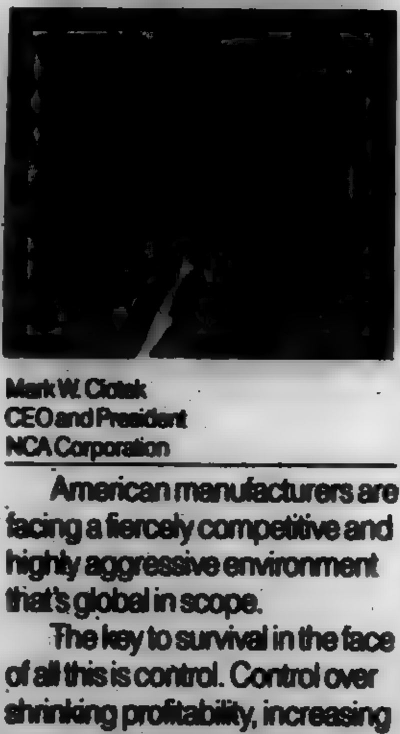

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But computerizing the manufacturing process is no guarantee of survival. Choosing the wrong approach could be just as costly as not automating at all.

As one person intimately involved with manufacturing, Mark W. Ciotek, explains: "Manufacturing today has to be treated as an integrated process instead of as isolated functions. Successful manufacturers are discovering that with the right approach to computer-integrated manufacturing (CIM), you can produce goods quickly without sacrificing quality."

Mark is CEO and president of NCA Corporation, a leading software developer and marketing company that's helping manufacturers stay competitive with a manufacturing resource planning (MRP II) system called MAXCIM.™

With 20 integrated modules, MAXCIM is designed to handle everything from financial planning in the executive office to job tracking on the factory floor.

"Our comprehensive approach requires a flexible computer system with a wide range of solutions," Mark points out. "That's why we chose Digital's VAX™ computers for MAXCIM. And that's why manufacturers are choosing us."

"VAX GIVES YOU THE WORLD'S MOST FLEXIBLE ARCHITECTURE."

Digital designed the VAX computing environment in a unique way – around one architecture and Digital's VMS™ operating system. "They're the only ones who have done this," Mark states. "As a result, we know we're working with the most flexible system available."

Included within the VAX computing environment is the VAX Information Architecture, a comprehensive system of integrated information management software products. From this vast array of products, NCA's customers can select those best suited for their needs.

Three of these VAX Information Management products – FMS™ forms management system, DATATRIEVE™ query language and report writer, and Common Data Dictionary – are used in conjunction with MAXCIM. By incorporating these products, MAXCIM optimizes the user-interface, and provides easy access and universal definitions for all of your data.

Customers also have the option of adding other Digital software such as DECnet™ networking software. The tremendous communications capabilities between Digital systems allows for unequalled distributed processing power. So you can access and exchange information –

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Digital, the Digital logo, VAX, VMS, FMS, DATATRIEVE, DECnet, MicroVAX I and VAXcluster are registered trademarks of Digital Equipment Corporation. MAXCIM is a registered trademark of NCA Corporation.

whether it's stored across the plant or at a plant across the country.

"Digital's approach to software is ideal for MAXCIM because the performance of an MRP II package is enhanced by the degree of integration between modules," Mark says. "And the superior integration within both MAXCIM and the VAX Information Architecture gives manufacturers the most flexible solution possible."

"AS PRODUCTION INCREASES, SO CAN THE POWER OF VAX."

"The economies of manufacturing demand standardization and growth," Mark points out. "With VAX computers, our customers have both."

Every model in the best-selling 32-bit architecture, from the MicroVAX I™ system right up to the largest VAXcluster™ system, is compatible, providing an economical growth path from desktop to data center.

"Because of this compatibility, you can use MAXCIM across the entire line of VAX systems," Mark says. "So when our customers upgrade, they can bring their existing applications right along with them."

This eliminates the need to convert databases, retrain people or totally abandon your investment. And VAXcluster systems provide enough computing resources to meet virtually any requirement.

"VAX computers let us meet the needs of just about any manufacturer," Mark says. "The low-end of the VAX family is ideal for smaller manufacturers, while clustering makes our solutions attractive to much larger companies. Some of our business now comes from existing customers who are upgrading their Digital systems to meet their growing needs."

The Compatible VAX family

"DIGITAL IS THE LEADER IN THE MANUFACTURING MARKETPLACE."

"Digital has a solid reputation among manufacturers," Mark states. "After all, they're the leader in distributed processing and are committed to CIM with dedicated resources. And the VMS operating system provides an unparallelled path for growth."

In fact, Digital anticipates and meets manufacturers' needs so successfully that NCA developed MAXCIM to run exclusively on Digital systems.

"We've never felt the need to offer MAXCIM on any other system," Mark says. "They're the experts in systems and we're the experts in MRP II software. Together, we can offer manufacturers the most comprehensive solution.

"Our customers have found that this is the ideal solution for them. With this kind of success," Mark concludes, "we'll never second-guess our choice of VAX computers."

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

VAX computers, like all Digital hardware and software products, are engineered to conform to an overall computing strategy. This means our systems are engineered to work together easily and expand inexpensively. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

To learn about Digital's VAX system, call 1-617-467-CAEM. To learn about MAXCIM, call 1-800-622-6584. Or write to Digital Equipment Corporation, 200 Baker Avenue, West Concord, MA 01742.

THE BEST ENGINEERED COMPUTERS IN THE WORLD.

digital™

TURNAROUND TIME

Larry Long

***Q** I am a computer professional with 20 years of experience in both teaching and programming. I can program in eight languages. I have been responding to newspaper ads for programmers and teachers for over six months and, in most cases, have not even received an acknowledgment of my inquiry, much less an offer.*

I do not respond to blind ads; I do not consider these either professional or legitimate. My resume is in the hands of several "headhunters," from whom I've heard absolutely nothing. Once, I even reformatted my resume so that 10 years of experience (and hence age) disappeared — no response to that either.

What's going on here? Am I unmarketable? If so, why and what can I do about it? I do not insist on holding out for the salary my experience might demand. I don't apply for a job unless I think I can do the work and accept an offer.

Something is amiss. You might be missing an important ingredient: perhaps a degree, management experience or state-of-the-art knowledge. Or, there may be something about your resume that is turning off potential employers; I routinely come across resumes that are at best arrogant and at worst downright irritating. Yet the writers of these resumes must have felt that they were putting their best foot forward, or they would not have distributed them.

The resume is often the key to the door and should be compiled with great care, with the intended reader in mind. Little things can result in your resume being placed in the circular file. Here are some examples: a 1968 college graduate included his college grade point average; a "supersalesman" writes three paragraphs on his first job and two sentences on his last job; a recent college graduate inserted the company's name in pencil on a pre-printed letter of transmittal; a systems analyst underlines his IBM 1401 Autocoder experience; and the list goes on.

If, in fact, it is your resume that is giving you problems, edit it and pass it on to four or five people who you know will be candid in their assessment. With competition for jobs the way it is, the letter of transmittal and resume must be flawless.

***Q** Last summer, our university took delivery of 200 microcomputers. The departments of sociology, psychology and religion set up a personal computer lab with 25 of them. I chaired a committee that met periodically last semester to decide what to do with them. I'm the only member of the committee with any computer background, and that experience is with mainframes. A search for related educational software turned up nothing that could be used for our courses.*

With pressure from administrators and no real guidance from the committee, I worked with a computer science graduate student to develop some question-and-answer software. We are using it this semester and neither students nor professors have found it useful. To date, the most popular usage of our laboratory is for word processing. Where would I look to find appropriate courseware?

To my knowledge, there is no single-source catalog for educational software. Computer retailers and, perhaps, your college library will have books or buyers' guides listing hundreds of educational packages; however, expect to find a paucity of educational software at the college level in your area. Your best source may be your academic professional journals. If you don't find it advertised or reviewed in these journals, it may not exist.

Good educational software is expensive to produce. Vendors view the educational market as having real potential — but for some time in the future, not now. It is common for vendors to offer business-related software to academic institutions at a 70% to 100% discount and call it promotion. On the other hand, the development cost of educational software falls on the backs of the intended consumers — educational institutions.

The quality and availability of educational software will probably remain relatively stable until it becomes clear that educational institutions are willing to place the same budget emphasis on software that they have on hardware.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

"Other than that, how was your new computer functioning?"

How to justify your VAXcluster.*

New Quantum RS is the answer. It is the only resource management system that allows you to report on VAX* or VAXcluster resource usage from one central data base.

When you require resource accounting, performance analysis, capacity planning, budgeting, cost tracking or chargeback, Quantum RS gives you the information you need to plan, control and react to system requirements.

Take the guesswork out of system management and justify your VAXcluster with Quantum RS.

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Outside Massachusetts, call toll free 1-800-232-5215. [illegible]

*VAX and VAXcluster are trademarks of Digital Equipment Corporation

NEWS

MANAGERS ON THE MOVE

ROBERT L. WHIPPLE has been named director of management information systems for Geo. J. Ball, Inc. in West Chicago, Ill. He will be responsible for administering the information services group and, additionally, will serve in functional and advisory capacities for data processing throughout the corporation.

Whipple

Whipple's most recent experience has been as director of systems and technical services for ESE, Inc., a subsidiary of Esmark, Inc.

Whipple has a B.S. degree in economics from the University of Illinois at Urbana-Champaign and a M.B.A. degree from American University in Washington, D.C.

Geo. J. Ball, Inc. is a worldwide horticultural breeder and supplier.

■

ROBERT C. TAYLOR has been appointed assistant vice-president and manager of technical research and office systems at Liberty Mutual Insurance Co.'s data processing center in Portsmouth, N.H.

Taylor

Taylor previously served as manager of research and information services in Portsmouth.

He graduated from Boston University in 1970 and holds a bachelor's degree in mathematics.

The technical research and office systems unit performs long-range research on computer products. The technical research unit is responsible for recommending corporate hardware and software standards.

The unit also monitors technological advances and seeks their practical applications to Liberty Mutual's operations.

■

ROBERT A. WHISTEN has recently joined Leasametric, Inc. as vice-president of management information systems. In this position Whisten will be responsible for overseeing all computer activities within Leasametric, including its extensive international terminal network that spans the U.S., Canada, West Germany, France and Israel.

Whisten

Prior to joining Leasametric, Whisten had served as director of information resources for Koret of North America, Inc. He was responsible for managing the computer operations department, the technical support group and a systems development department.

Whisten also worked at Crowley Maritime Corp. as a project leader and at Kaiser Industries as manager of employee benefits systems. Leasametric, a member of the Marmon Group, rents, leases and sells test instruments, personal computers, computer terminals and peripherals, microprocessor test and development systems and telecommunications test equipment.

Whisten attended Merritt College and Armstrong Business College.

"SOME DAYS JUST GETTING DATA THROUGH THIS CSMA/CD NETWORK IS A REAL BATTLE."
"WE SHOULD HAVE GONE WITH CONCORD DATA."

Alonzo Chappel. *Battle of Bunker Hill*. Courtesy The Bettmann Archive.

There was a time when the data collisions common to CSMA/CD-type local area networks were a painful fact of life. But times have changed. Today our Token/Net™ IEEE-802.4 broadband bus network provides a high-capacity, high-volume LAN solution for virtually any communications requirement. Developed first for the factory, where predictable, error-free data control and transmission are critical, Token/Net has proven itself as the most suitable network for the *entire* business/manufacturing complex.

Token/Net operates over *low-cost* CATV cable with enough bandwidth to link literally thousands of data, voice, or video devices over distances to 25 miles. Token/Net's multi-port TIMs (Token/Net Interface Modules) implement the IEEE-802.4 token passing access method, giving all users network access free from data collisions. Sophisticated software, diagnostics and full-featured management options give network managers complete control over network activity. If you're up in arms over networking systems that fall short of your requirements, call us at (617) 890-1394 or write 303 Bear Hill Road, Waltham, MA 02154, telex 951793.

Concord Data Systems
Leading the Communications Revolution

Token/Net is a trademark of Concord Data Systems, Inc.

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Introducing Cypress,® Cedar,™ and Juniper.™ Three fast, friendly, infinitely applicable desktop ideas from ROLM.

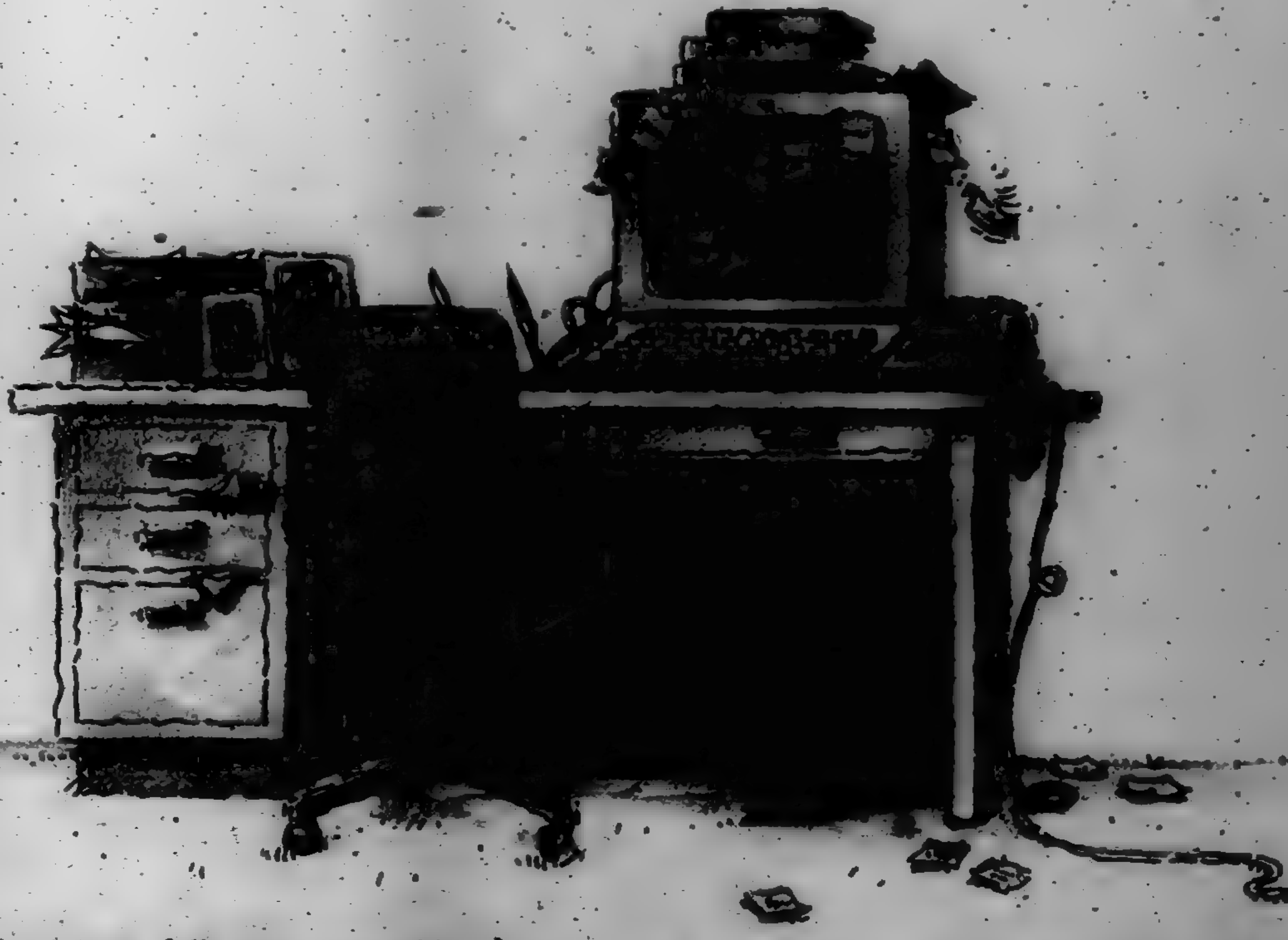
It comes as no surprise that people react to technology differently. Dyed-in-the-chip techies thrive on it. True non-believers avoid it instinctively.

Now you can please all of the people all of the time. Honest.

Say goodbye to complicated log-on codes. Just push a button and—whoosh!—travel all the way to a data base, talk to a mini or access your IBM mainframe.

Say hello to speakerphones, phone books, message takers and calculators. Built right in.

If you want to take snapshots of data in your mainframe, there's Cypress. It's as easy as Point & Shoot. It's a smart little ASCII terminal integrated with a fully-featured digital phone.



Need a 512 KB, fully IBM-compatible PC that runs programs like pfs:graph,™ the IBM Assistant Series,™ 1-2-3,™ and lets you mini-network through your phone line? Cedar's the one.

Already in love with your IBM® PC or XT but crave the affections of Cypress? Ask for Juniper. Its one slot adaptor card lets your system keep growing. And growing.

Of course, only ROLM has Cypress, Cedar and Juniper. Because only ROLM has the system to run them on. At its heart is the CBX II, a breakthrough communications controller that manages voice and data over standard telephone wire. Simply, brilliantly and cost effectively.

And ROLM has the technical edge, the operational track record and the worldwide service and support organization to please even the toughest customer.

So phone ROLM. High tech. Not high anxiety.

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TeleVideo

NEWS

CALL FOR PAPERS

THE FIFTH INTERNATIONAL ROCHESTER FORTH CONFERENCE

Rochester, N.Y., June 12-15

Papers are now being sought for this conference sponsored by the Institute for Applied Forth Research, Inc. Potential topics include: software engineering and software management practices; Forth applications; Forth technology, including finite-state machines and metacompilers; and Forth implementations.

Papers may be presented in either platform or poster sessions. Abstracts of 200-words must be submitted by March 30, 1985. Papers must be received by April 30, 1985 and are limited to a maximum of four, single-spaced, camera-ready pages.

Abstracts and papers should be mailed to Conference Chairman Lawrence P. Forsley, Laboratory for Laser Energetics, 250 E. River Road, Rochester, N.Y. 14623. For more information, write to Maria Gress, Institute for Applied Forth Research, 70 Elmwood Ave., Rochester, N.Y. 14611.

CMG '85 INTERNATIONAL CONFERENCE

Dallas, Dec. 10-13

This international conference will focus on the management and performance evaluation of computer systems. Papers, tutorials and new books are encouraged in areas such as establishing a capacity management program; justification, planning and control of personal computers; capacity planning and prediction; work load characterization/forecasting; distributed processing analysis; I/O subsystem performance analysis; user requirements and service agreements; AT&T's Unix; AI and expert systems; establishing goals and measuring productivity; DP budgeting, cost accounting, charge-back and financial management; hiring and managing a customer premises equipment (CPE) staff; professionalism in CPE; software performance; problem management and change control; management's relationship to corporate staff; and network design and optimization.

Preference will be given to papers and books that have not been previously presented. Authors of papers will be required to assign copyright for their papers to CMG for publication in the proceedings. Eight copies of abstracts are due by April 1, 1985, and should be sent to Program Chairman, CMG '85, Suite 302, 101 S. Whiting St., Alexandria, Va. 22034.

INTERNATIONAL CONFERENCE ON SYSTEMS, MAN AND CYBERNETICS 1985

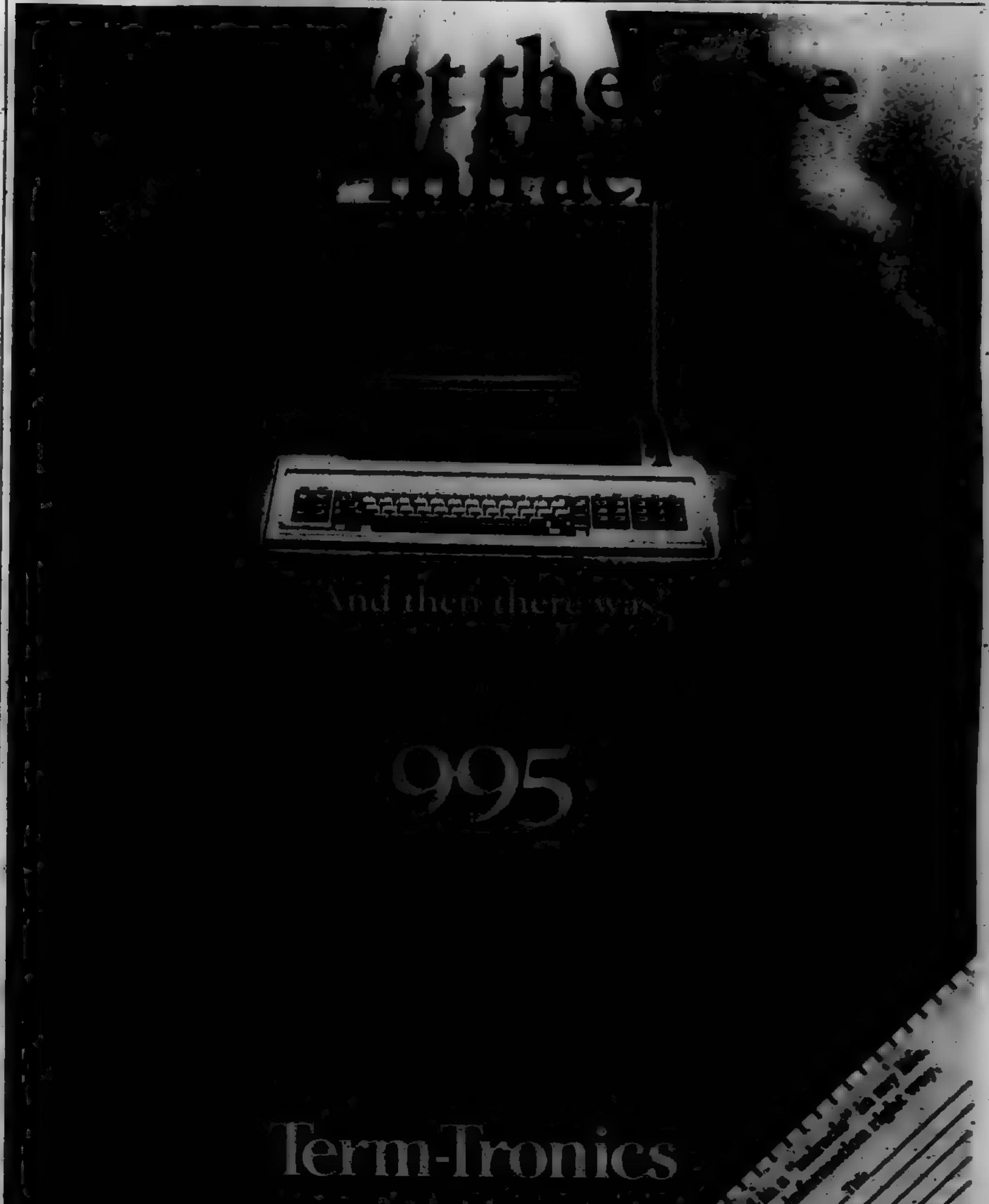
Tucson, Ariz., Nov. 12-15

Papers are now being accepted for this conference covering the following topics: human-machine interaction, large-scale systems, behavioral decision making, manufacturing systems, pattern recognition, human-computer interaction, expert systems, robotics, biomedical engineering and other related topics at the forefront of technology.

Three copies of a one-page abstract should be submitted by April 15 or completed papers by June 15 to A. Terry Bahill, Technical Program Chairman, Systems and Industrial Engineering Department, University of Arizona, Tucson, Ariz. 85721.

Directories List 32,000 D P Users

Each directory of computer installations lists 16,000 computer users covering the NY Metro Area (NY, NJ & CT), and the Mid-Atlantic States (PA, VA, MD, DC, WV & DE).
Each site includes a profile of the hardware installed, software installed, (languages, databases, etc.), consultants used, future plans, applications and DP executives' names, titles, and phone numbers. An index provides quick access to 133 cross references by hardware, software and industry. Price: NY-$370 and MA-$295. Call (212) 683-0606. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 10010.



CALENDAR

WEEK OF APRIL 21

APRIL 21-24, NASHVILLE — **The 1985 Annual Conference of the Association for Systems Management.** Contact: the Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 22-23, WASHINGTON, D.C. — **How to Manage Data and Information as Resources.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 22-23, BALTIMORE — **Structuring & Negotiating Hardware Contracts, Software Contracts, and DP Service Contracts.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held April 29-30 in Chicago.

APRIL 22-23, CHICAGO — **Data Communications and Networking for the IBM Personal Computer and Other Personal Computers.** Contact: Dorothy Daly Marshall, Digital Consulting Associates, Inc., 6 Windsor St., Andover, Mass. 01810.

APRIL 22-24, WASHINGTON, D.C. — **Protocols for Message Handling Systems.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 22-24, LOS ANGELES — **Data Base: A Manager's Guide.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held June 3-5 in Toronto.

APRIL 22-24, NEW YORK — **Speech Tech '85 Voice Input/Output Applications Show.** Contact: Media Dimensions, Inc., P.O. Box 1121, Gracie Station, New York, N.Y. 10028.

APRIL 22-25, CHICAGO — **CICS Applications Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 22-25, WASHINGTON, D.C. — **National Conference on Decision Support Systems.** Contact: Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

APRIL 22-25, SAN FRANCISCO — **The International Conference on Information Management.** Contact: The Institute for Information Management, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

APRIL 22-26, WASHINGTON, D.C. — **Design of Computer Operating Systems: Concepts and Principles.** Contact: George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

APRIL 22-26, NEW YORK — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

APRIL 22-26, NEW YORK — **MVS JCL.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001. Also being held April 29-May 3 in Chicago.

APRIL 23, BOSTON — **Seminar on Data Communications.** Contact: Bill Hopkins, Simware, Inc., 14 Concourse Gate, Nepean, Ontario, Canada K2E 7S6. Also being held April 24 in New York and April 25 in Washington, D.C.

APRIL 23-25, NEW YORK — **Teleprocessing Fundamentals.** Contact: Amdahl Corp., National Education Center, M/S 302, P.O. Box 3470, 1250 E. Arques Ave., Sunnyvale, Calif. 94088.

APRIL 23-25, LOS ANGELES — **Effective Management Techniques for Data Processing Managers and Project Leaders.** Contact: Abbott, Galvani Associates, 1850 Union St., San Francisco, Calif. 94123.

APRIL 24-26, ANAHEIM, CALIF. — **The IBM Personal Computer.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

APRIL 24-26, BOSTON — **Data Communications Systems & Networks.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

APRIL 24-26, BOSTON — **Local-Area Networks.** Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015. Also being held April 29-May 1 in San Francisco.

APRIL 24-26, WASHINGTON, D.C. — **MVS Internals.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas

One spectacular leap turns your phone system into a data-over-voice thoroughbred: The DATX™ System.

If you want to add data to your phone system, but don't want to replace your existing PBX or rewire your building, here's the cost-effective solution: The DATX System from General DataComm.

DATX is GDC's DOVtale℠: The story of how, in one spectacular leap, a leading edge data communications company can help you create an integrated, switched, data-over-voice system linking office to office, even building to building. A network that can save you as much as 30 percent per line on equipment costs alone. And because you add data only where you need it, you'll save even more than ever before.

How to switch to DATX.

The compact DATX System turns any office into a data/voice workstation by independently and simultaneously transmitting both, using your present phone system and installed wiring.

It's designed to provide the ultimate in ease of installation and relocation. Just plug the 2000 into a modular wall jack, then plug your phone and data terminal into the DATX unit. Quickly, easily it provides access between RS-232C- based remote terminals and data processing equipment centrally

78727. Also being held May 8-10 in St. Louis and June 5-7 in Houston.

APRIL 24-26, BOSTON — **X.25 and Packet-Switching Networks.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

APRIL 24-26, WASHINGTON, D.C. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

APRIL 24-26, SAN FRANCISCO — **Unix Systems Expo '85 — Spring.** Contact: David Small, Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

APRIL 24-26, WHITE PLAINS, N.Y. — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held May 1-3 in Rochester, N.Y.

APRIL 24-26, WASHINGTON, D.C. — **Computer Graphics for Business.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 25-26, WASHINGTON, D.C. — **Dbase III: Its Techniques and Its Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

APRIL 27-28, NEW YORK — **CICS Command-Level Intensive.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001. Also being held May 4-5 in New York.

APRIL 27-MAY 1, LOUISVILLE, KY. — **Common's Spring '85 Conference.** Contact: Common, Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.

WEEK OF APRIL 28

APRIL 28-MAY 1, MARCO ISLAND, FLA. — **Fifth Annual Conference and Symposium on Security and Disaster Recovery Planning.** Contact: Nancy DeMatteo, HSH, Inc., 6800 N. High St., Worthington, Ohio 43085.

APRIL 29-30, DES MOINES, IOWA — **Managing Information Centers Effectively.** Contact: Thomas Bisacquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 29-30, LOS ANGELES — **Software Configuration Management.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technical Training Corp., Department SCM, P.O. Box 3606, Torrance, Calif. 90510.

APRIL 29-30, NEW YORK — **Information Centers.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

APRIL 29-30, SAN FRANCISCO — **CAD/CAM Data Bases: Who's In Control?** Contact: Jacquelin Cooper, CAD/CAM Alert, 824 Boylston St., Chestnut Hill, Mass. 02167.

APRIL 29-MAY 1, DALLAS — **MVS Architecture.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held May 13-15 in Memphis and May 29-31 in New Orleans.

APRIL 29-MAY 1, CHICAGO — **Establishing a Computer Security Program.** Contact: Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

APRIL 29-MAY 2, WASHINGTON, D.C. — **Experts on Networks.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

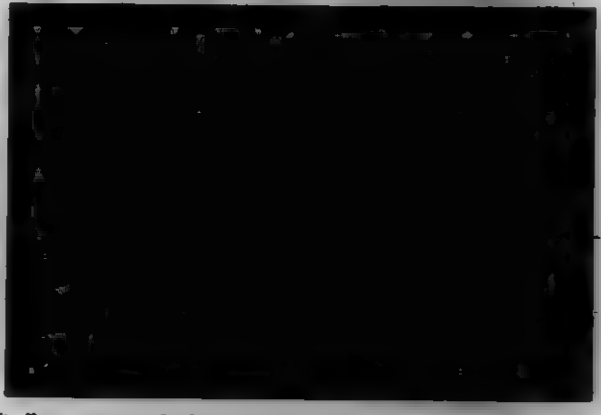
APRIL 29-MAY 3, SEATTLE — **Ada Software Engineering Workshop.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held May 6-10 in Boston.

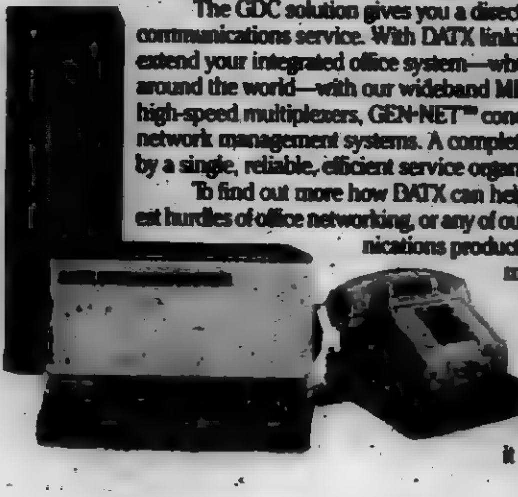
APRIL 29-MAY 3, NEW YORK — **CICS Internal Architecture.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 30-MAY 3, TORONTO — **Designing Digital Communication Systems.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45406, 6305 Arizona Place, Los Angeles, Calif. 90045.

APRIL 30-MAY 3, WASHINGTON, D.C. — **Implementing Local-Area Networks.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45406, 6305 Arizona Place, Los Angeles, Calif. 90045.

MAY 1-3, ANAHEIM, CALIF. — **Local-Area Networks: An Evaluation of Technology, Applications & Designs.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held May 8-10 in Cincinnati.





located up to 1.5 miles away. And it transmits both asynchronous and synchronous data at speeds ranging from 75 bps to 19.2 Kbps.

A rack-mounted DATX 2000R is pre-wired to the central telephone system. It offers the highest packaging density and lowest per-slot-cost available today with 32 units per shelf, plus plenty of room for dial modems, in 10½-inches of rack space.

Add a single DATX switch in your central phone room, and your integrated office system turns into a real data-over-voice thoroughbred. It allows any terminal user to communicate to any computer with a simple keystroke.

The complete DATX System also features built-in diagnostics that include remote loopbacks from the central switching system.

The GDC solution for total network control.

The GDC solution gives you a direct line to total data communications service. With DATX linking office to office, we can extend your integrated office system—whether it's across the street or around the world—with our wideband MEGAMUX™ or KILOMUX™ high-speed multiplexers, GEN-NET™ concentrators, and NETCON® network management systems. A complete networking system backed by a single, reliable, efficient service organization.

To find out more how DATX can help you over the toughest hurdles of office networking, or any of our other sure-footed communications products, contact our Sales Department, General DataComm, Inc., Middlebury, CT 06762-1299, (203) 574-1118.

The DATX System.
By turning your phone system into an integrated voice/data/switching office network, it puts you in the winner's circle.

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For more information, contact your GDC Sales Office.

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EDITORIAL

Blacklist

Integrity: rigid adherence to a code of behavior or ethics.

We've been scratching our heads lately trying to figure out why an increasing number of computer-related publications have decided to treat integrity as they would an impertinent dinner guest: they are ignoring it.

We are particularly puzzled — not to mention downright irked — by the growing tendency of some trade publications to ignore blatantly what is known as a "news embargo." Essentially, an embargo comes about when a vendor, for several reasons, previews a major product announcement for the press and requests that those who see the preview forego printing the information until a definite time in the future.

Like an off-the-record comment, it is clear to any experienced journalist that an embargo carries with it explicit dos and don'ts. It is a simple matter of business ethics. Why, we ask, are these universal ethics so difficult for people to follow?

Examples are in order. In late January, Apple Computer, Inc. announced its Macintosh Office. The company previewed the announcements the week prior to the public unveiling and did so for a select group of business, trade and daily newspaper reporters. Apple also made it clear at that preview that no information of the announcements was to be printed until after the company's annual meeting the following week.

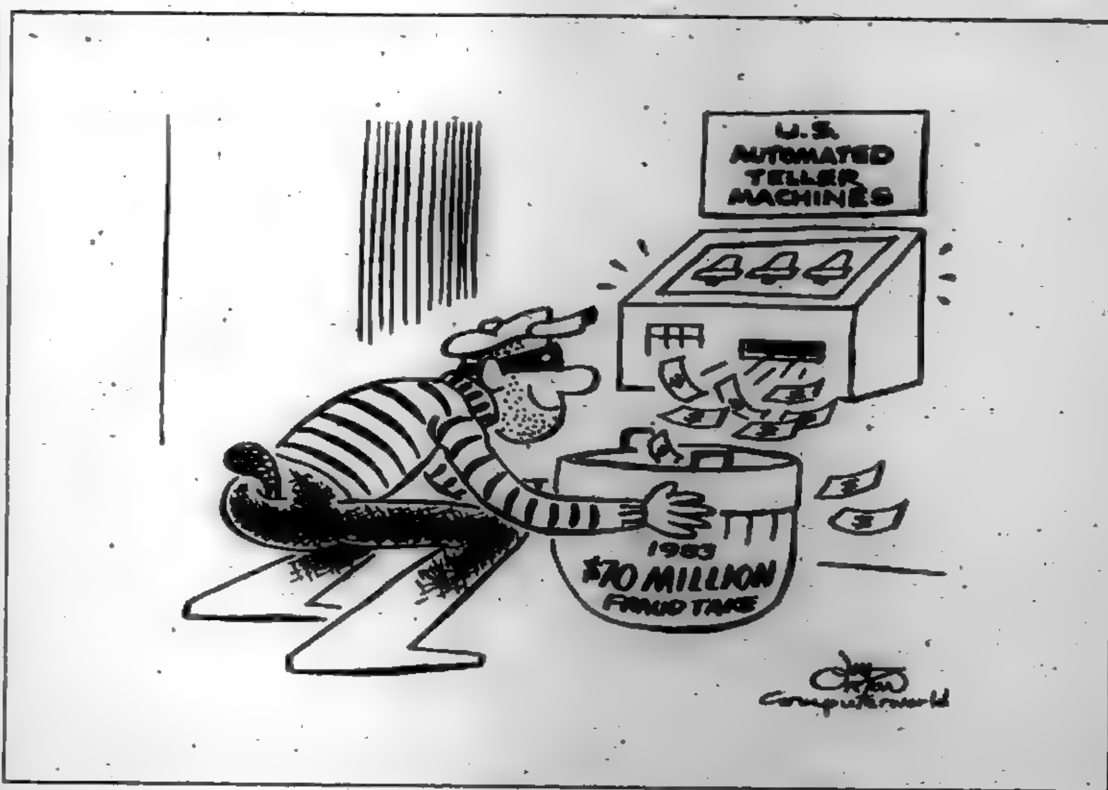
That is why *Computerworld* and other publications groaned the Monday before the annual meeting when a competing publication proudly and singularly played the story on its front page. That, Apple conceded, was blatant disregard of the embargo. This disregard, of course, was transparent to readers, who assumed the publication simply scooped the competition.

Some vendors have gone so far as to ask reporters to sign nondisclosure statements when previewing products. This, however, did not stop another publication from publishing an entire announcement one week in advance of the embargo date, as well as handing out copies of the article at a communications conference two weeks before the embargo date.

The list of flagrant violations of journalistic ethics goes on — and, unfortunately, the list is getting longer. The good news is that some vendors now realize how harmful this can be to general press relations and to their own self-interest. The vendors' reactions typically are taking the form of a new kind of embargo, namely, eliminating certain publications from the list allowed to see preview material. In other words, these publications are being blacklisted.

Computerworld will continue its longstanding policy of strict adherence to stated embargoes and hopes the vendors will continue to police embargoes using whatever means are appropriate.

Perhaps this will explain to our readers why, at times, we are the victim of our own integrity.



LETTER

DP salary gap citing called invalid

I found the article "Salary gap pervades DP" [CW, Feb. 11] reasonably well-balanced in dealing with DP salaries. From my experience in Fortune 500 companies, entry-level salaries are indeed based upon ability and not on an individual's sex.

The material and the manner in which it was handled tips the overall balance of the article to a feminist view. As such, it is appropriate as an editorial, but certainly not as a news item. It was already acknowledged that new hires draw within 3% of each other ($24,828 vs. $24,060). The article said employers desire longer hours than they advertised for, which the article said men are more willing to provide. Then a statistically invalid survey was quoted as finding an average male salary at $32,085 and the average female salary at $22,060, when education and job satisfaction levels were said to have "no significant differences."

Any survey on male/female DP salary that does not take into account years of experience is invalid. The average female in DP has been in the field a much shorter time than the average male. Ten years ago women could be found in the profession but certainly not in the numbers found today.

One striking difference between men and women in this profession is their ability to accept their own limitations. When a man realizes he is not capable of performing the work required of him, he will acknowledge this and seek another line of work; a woman in the same situation has been conditioned by our society to immediately conclude that she has been discriminated against.

David A. Crowell
Bartlesville, Okla.

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VIEWPOINT

Technical support staffs deserve a fair shake

THE DATA CENTER
John P. Murray

One absolutely critical MIS area whose contribution does not always receive its fair share of credit is the technical support group. Those of us blessed with competent, hard-working technical support people too often tend to overlook their contributions.

Of course, such is not the case in installations where the competence level is less than desirable. Because of the critical nature of the technical support function, a less-than-competent performance from the group quickly generates both bad press and real difficulty for the entire MIS function. When that situation occurs, it is impossible to take technical support for granted, because technical support problems quickly become the concern for all of MIS.

Because of the technical support group's critical nature and because of the various pressures it faces, considering some of the continuous concerns that are part of the technical support group's job might be worthwhile. If we can empathize more with the technical support group's problems, perhaps we can develop a better appreciation for the work these people do.

First, because of the nature of the work, the role of technical support tends to be thankless. When the work is well done, when the operating system and all the ancillary software is functioning correctly, no one notices the hard work being done to make it all happen.

In fact, to some degree, doing a really good job in the technical support area tends to work against the section. When a serious operational software problem does arise in a well-run installation, there is often greater than warranted excitement generated in the rest of MIS and often in the entire organization because the event is unusual. We become accustomed to a certain level of performance. Over time, any slippage from that level tends to assume unrealistic proportions.

It is easier to appreciate the pressure the technical support group faces when you consider the fact that its mission is not only complex, but also structured so that even rather minor errors or problems beyond the group's direct control (the failure of one vendor's software products, for example) can earn the group instant and very high-level visibility. This is particularly true in an interactive processing environment, where loss of the system easily equates to loss of much of the production throughout the organization.

> ”
>
> *When a serious operational software problem does arise, there is often greater than warranted excitement generated in the rest of MIS and the organization because the event is unusual.*

In even a moderately sophisticated information processing environment, a very tangled web of software may be installed to provide the required services. In addition to the standard operating software, teleprocessing software and job accounting and data base system packages, any number of ancillary software components may be installed to improve, modify or monitor the operating environment. All this software must be tailored to operate together not only reliably, but also in a manner that assures rapid recovery if a failure arises. This is a formidable task!

This situation presents a clear vulnerability problem for the technical support staff. New versions of the existing software component or a "fix" to the existing version must be installed to bring the package up to the required operating level to assure continued vendor support or to improve the operating environment. Anything can go wrong when these changes are effected. If something does go wrong, the consequences range (always with the chance of embarrassment for technical support) from minor difficulty to loss of the entire system, perhaps for a substantial period. And in a sophisticated information processing environment, several minutes may be considered substantial.

So the pressure to keep the system operational is always present. In addition, because of the heavy use of the system, opportunities for the technical support group to make system changes do not occur very often. Considerable work must be carried on during the third shift and on weekends — not a particularly pleasant prospect for those who have to get the job done. That pressure can also increase the tension between technical support and the rest of the MIS organization.

IBM system users will get some help

There is help for those with IBM systems. The installation of the IBM VM software product will, among other things, provide a facility for building a test environment where much of the preliminary software changes and testing can be carried on during prime shift time. VM can help decrease the work time the technical support people must spend on the third shift and on weekends. Some installations are concerned that VM uses too many resources. This is not true if it is correctly installed and managed. And the benefits derived will more than compensate for the additional resource cost.

Although the technical support group faces a unique and difficult array of concerns for which those outside the section should show a bit more understanding and patience, it can improve its image. The technical support section should be more attentive to "selling" itself to the rest of MIS. Those in technical support may say this is not the case — that their jobs are to keep things running.

See SUPPORT page 40

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Drive to certify quality assurance accelerates

QUALITY
Wayne Smith

At the 1984 Data Processing Management Association (DPMA) Quality Assurance Symposium in Chicago, a survey of attendees showed that more than 80% wanted certification programs for quality assurance analysts. This topic was also discussed heavily during the board of advisors meeting of the Quality Assurance Institute (QAI), which meets annually during the DPMA symposium. (I am a member of that board.) The QAI, under executive director William Perry, has taken a significant leadership role during the last 1½ years, attempting to act as a catalyst for such a certification program. The increasing recognition and acceptance of software quality assurance programs, together with the strong membership support the survey reflects, makes this an important topic for the entire data processing industry.

Although this program is clearly only in its formative stages, there is a growing sense that it should be established. At this point, six local QAI chapters have accepted the assignment to assist in further defining the nature of the program. It is their responsibility to define the skills and knowledge that would form the basis for certification. The final program is scheduled to be presented to the QAI board during the April DPMA Quality Assurance Symposium, with the goal of being launched later this year.

Continuing education required

As it is currently envisaged, the certification program is intended to certify qualifications and will require certified applicants to maintain their skills through continuing education programs. It is intended that the initial process will not require applicants to take a test, but rather require that their skills and experience be deemed acceptable to their peers. Compliance with a code of ethics and a statement of responsibilities will be required, and it is anticipated that the finalized certification process will be administered by an independent agency specializing in such programs.

The need for such a program stems from the growing importance of quality DP systems. Up to now, organizations that have established independent quality assurance functions have faced two somewhat troublesome and recurring problems: substantiating the credibility of the individual analyst (the "quality" of the quality assurance analyst) and identifying the qualifications for the role in hiring, placement and performance appraisal.

The certification program attempts to professionalize the role of the quality assurance analyst and, as a consequence, improve the role's ability to assist MIS at all levels. In particular, it is hoped that the certification process will assist MIS to ensure that those placed in roles as quality assurance analysts will meet an industry-defined level of performance and thus address both credibility and qualification issues.

Diversity may create problems

The question of quality assurance analyst certification was discussed by Nancy Kastl, a manager with Harris Bankcorp, Inc. and coordinator of the Chicago Quality Assurance Association, at one of the group's local chapter meetings. Kastl said the members questioned the feasibility of such a program because of the current high degree of diversity among the practitioners about the exact role of quality assurance. The group indicated that almost 30 different activities fall under the overall quality assurance umbrella. Moreover, high on the group's list were the human factors and interpersonal skills that are highly subjective and thus somewhat more resistant to precise specification. Kastl said a stronger stabilization of the quality assurance function was needed before a suitable certification program could be successfully launched.

Peter Wilson, manager of the internal quality assurance group of my organization who is also involved

See QUALITY page 40

Smith is vice-president, specializing in quality, at Applied Information Development, Inc. in Oak Brook, Ill.

VIEWPOINT

LETTERS

Clarifying relational DBMS

The In Depth article, "Relational DBMS" [CW, March 4] offered innovative and valuable ideas on designing data base management system products for high performance. It also has prompted me to issue the following (I hope pragmatic) warnings on the subject:

■ Co-location storage techniques and combined indexes can clearly boost performance. But will they also impede one of the heralded advantages of relational systems — their suitability for physically distributed data bases?

■ The tendency is unavoidable, but beware of treating "relational DBMS" as a generic class and of assuming that any given characteristics or technique is the exclusive property of one or the other.

■ Distinguish between the relational DBMS model itself and products that attempt to implement it. Have you noticed that attacks upon relational DBMS tend to focus on the inadequacies of commercial products, whereas the defenses (and this article was a refreshing exception) choose to discuss the model itself? Both sides may be correct. Do not fall for the relational DBMS label; judge each product on its own merits or demerits.

■ At the risk of being facetiously grouped with defenders of the Roman numeral system, I have to qualify the article's central point: Once relational DBMS perform, "then no single reason remains for implementing any other kind of DBMS." Most relational products (not models, but products) have a fatal flaw entirely apart from their current performance characteristics — they fail to support defined data relationships and referential integrity.

This flaw relegates them to the status of file managers, as opposed to true DBMS. Many are essentially two-dimensional products trying to model a three-dimensional (or better yet, four-dimensional) world.

Relational DBMS may indeed be the next "golden apple," but in our enthusiasm, let's not treat it as the last word in fruit.

Bob Morison
Burlington, Mass.

Salary adjustments needed

In the article "Some will go hungry" [CW, Dec. 31/Jan. 7] on DP salaries, a manager was cited who said that after his systems analyst gained experience, the employee was worth $8,000 more than the manager was paying him. The manager went on to say that, once experienced, the systems analyst left and that the manager had to hire someone new and retrain him.

It is clear that the manager understands the problem: He does not pay his experienced systems analyst market value for his DP skills, so the systems analyst leaves. I am amazed that the manager — having understood his personnel problem so well — did nothing to solve it but went on in the cycle of hire, train, lose, hire, train, lose. The solution has to lie in the company's job and salary structure.

George E. Sauer
Rockville, Md.

QUALITY

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with several client organizations in establishing quality assurance programs, raised a different issue. He said he believes that perhaps the current constructive efforts surrounding certification could be reoriented slightly so that the objective would be to certify a company's entire quality assurance program. This would not only include the basic matrix of duties and responsibilities actually required to carry out the various quality assurance roles but would also define their relationships, organizational placement and management reporting requirements. This top-down approach would give an organization the generic architecture of a quality assurance program to use as a road map, helping the organization to improve the quality of its information services products. This architecture also would more clearly define the various roles in the quality assurance program. Some roles would necessarily be a part of the quality assurance function; others might not. For example, configuration management, independent testing and system design assurance are all important roles in an effective quality assurance program and could benefit from a level of certification, but not all are necessarily part of an actual quality assurance function.

SUPPORT

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not conduct public relations campaigns. But being a bit more open, putting additional effort in letting those affected know ahead of time what may happen if the system goes down and building MIS confidence through plans to be put into place if things do go wrong all go a long way toward building confidence in the technical support group's ability as well as lessening tension between technical support and the rest of MIS.

Technical support provides a necessary function, often under adverse circumstances. Those who are not involved in the day-to-day issues that these people must deal with should be a little more appreciative of their work and more aware that without the contribution of a competent technical support section we are all in serious trouble.

All in all, WordPerfect is absolutely stunning.

PC Magazine

In the beginning, the creators of WordPerfect set out to design the perfect word processing software for business. Along the way, they tested each new function on the very secretaries who would eventually be using it. Thanks to them, the product lives up to its name: WordPerfect.

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PC World

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SOFTWARE & SERVICES

SOFTLINE
Gary Gulden

Analyze needs for exec systems

A recent survey by the MIT Center for Information Systems Research suggested that more than half of Fortune 500 corporations are developing an executive information system of one form or another.

An executive information system typically is a terminal- or microcomputer-based workstation designed to provide access to personal, corporate and external data bases. Intended to support the key aspects of a senior executive's work, it offers a menu of easy-to-use applications tailored to the executive's needs.

Glowing accounts of successful executive information systems abound in the business press, but most efforts yield disappointing results. Below are three case histories that may suggest why.

To begin, let's dispense with the obvious reasons why information systems projects fail: poor top management support, shoestring budgets and inept information systems staffs. The following three corporations have none of these problems.

- They are strong industry performers with first-rate management teams.
- They had sound, capably staffed and well-supported organizations responsible for implementing and supporting the executive information system.
- Their efforts to develop an executive information system enjoyed informed support from senior management.
- They provided executives with relatively easy to learn and use workstation environments.
- They were not afraid to spend a reasonable amount of both time and money in the

See SOFTLINE page 52

Gulden is vice-president of Index Systems, Inc. in Cambridge, Mass.

SOFTALK/JOHN GALLANT

Distributed tools on horizon?

It's amazing how a little software can make a big computer behave. Consider microcomputer software. Only a few years ago, when all that was available to pioneering micro users was a handful of games and some esoteric techie-oriented programs, the mainframe acted like the lion in *The Wizard of Oz* — it was the king of the corporate information processing forest.

When some micro packages with useful business applications hit the market, such as Lotus Development Corp.'s omnipresent 1-2-3, the microcomputer took off in the corporate world. The mainframe, on the other hand, seemed to take on the role of the settlers in one of those tired westerns that fills the television screen on a lazy Saturday afternoon. The mainframe, and the minions who maintained it, went into a reactionary "bring the wagons into a circle" mode to defend against the onslaught of the micro hordes.

Today, microcomputer software is again changing the role of the mainframe. With the advent of micro-mainframe communications software and with the promise of integrated micro-mainframe applications — with shared processing responsibilities — the mainframe is becoming something of a Father Flanagan to the micro kids of the information processing Boys Town.

The mainframe is beginning to share its wealth of information and its num-

See MICRO page 60

Mapics II out for System/38

WHITE PLAINS, N.Y. — IBM has announced that its Manufacturing Accounting and Production Information Control System Version II (Mapics II) now runs on the IBM System/38 minicomputer. The company also announced enhancements to its Mapics II software for the System/36 mini.

IBM

According to an IBM spokesman, Mapics II for the System/38 provides manufacturers with integrated, modular applications. The product consists of [illegible] application modules, including production control and costing, payroll, accounts payable and receivable, inventory management, product data management, order entry and invoice, material requirements planning (MRP) and cross-application system support. Files can be migrated from existing System/38 Mapics systems to Mapics II.

See IBM page 44

Programming facility offered for SAS package

CARY, N.C. — SAS Institute, Inc. has announced an interactive programming facility and an applications development tool for its SAS System statistical software.

An SAS Institute spokesman said SAS/IML is an interactive programming facility for data analysis and manipulation. The software is said to be interactive at the statement level, with each statement executing immediately. It is designed to save programming time because data management, mathematical and matrix operations are built into the software.

The spokesman said SAS/IML is a tool for handling data and programming mathematical applications. It offers a high-level programming approach similar to the APL language, data manage-

See SAS page 46

■ Decision Point announced an IBM CICS application generator/42

■ Medrick Enterprises unveiled a tape management system for Prime Computer processors/43

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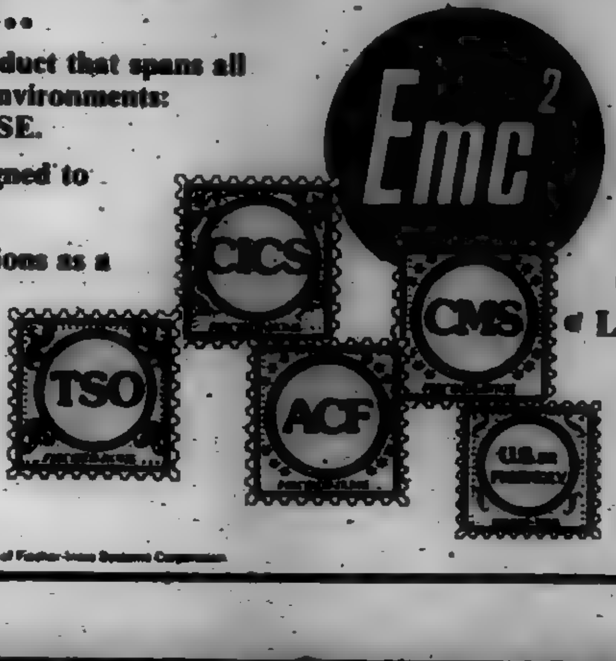

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SOFTWARE & SERVICES

SYSTEMS SOFTWARE

■ Raxco, Inc. has announced that its accounting and system billing software now runs on Digital Equipment Corp. VAX processors under DEC's VMS Version 4.0.

Rabbit-1 Version 4.0 facilitates system usage accounting that allows computer resources to be charged differently for a variety of environments, a spokesman said. The software includes capabilities for electronic mail billing, select image surcharging, job queue accounting and a shift monitor.

Rabbit-1 is priced at $995 for DEC VAX-11/730 and VAX-11/725 systems.

Raxco, 1370 Piccard Drive, Rockville, Md. 20850.

■ Decision Point, Inc. has announced PRO-2, an IBM CICS applications generator.

A spokesman said PRO-2 is a Cobol map and program builder. PRO-2 allows a user to name the map to be developed and then paint the desired format on a blank screen. PRO-2 then converts the developed map into IBM Basic Mapping Support macros, which are assembled and stored in the source program library. The product converts program definitions into structured CICS Cobol command-level code for storage in the program library.

To build a program, a user names the program, the files and fields it will use and where it will be stored. PRO-2 takes the definition and converts it to CICS Cobol command-level code.

PRO-2 costs $17,500 for the DOS environment and $24,500 for OS.

Decision Point, Suite 200, 2995 N. Cole Road, Boise, Idaho 83704.

■ Diversified Software Systems, Inc. has announced a job control language (JCL) utility for IBM's OS/VS and MVS operating systems.

Job/Scan reads one or more JCL statements, automatically accesses any called procedures and performs more than 150 syntax and logic checks, a spokesman said. A user Exit facility can be written in Cobol, PL/I or assembler language. The product can be executed on-line by any editor or as a batch program.

Job/Scan is licensed for $12,500.

Diversified Software Systems, Suite 205, 996 Minnesota Ave., San Jose, Calif. 95125.

■ Axios Products, Inc. has announced Spitab table management software for users of IBM's DOS or MVS operating systems with CICS and IMS.

According to a spokesman, Spitab provides capabilities for building and managing tables. Spitab acts as an interface module to allow applications programs to retrieve data from tables and provides security features.

Spitab costs between $10,700 and $17,000, depending on the operating environment.

Axios Products, 2364 Middle Country Road, Centereach, N.Y. 11720.

■ Delft Consulting Corp. has announced the BCC checkout compiler for the C language. It is available on Digital Equipment Corp.'s VAX series running AT&T's Unix System V or the University of California at Berkeley's 4.2BSD Unix, AT&T's 3B series under Unix System V and on the Contel Codata 3300 micro.

The BCC compiler aids in the debugging and reliability testing of C programs. The product reportedly inserts error-checking code into a program during compilation and displays a message if an error is found.

Prices for the BCC compiler range from $950 to $9,950, depending on host system.

Delft Consulting, 432 Park Ave. S., New York, N.Y. 10016.

■ A security system and capabilities for document report distribution are among the enhancements con-

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SOFTWARE & SERVICES

tained in Version 4 of Help/38 Systems, Inc.'s Robot38 system software for the IBM System/38 minicomputer.

Robot38 allows users to execute programs and commands with no operator intervention, permitting 24-hour operation of computer systems, a spokesman said. Program recovery enhancements enable Robot38 to call on an alternative program in the case of program failure.

Robot38 Version 4 is priced at $1,595.

Help/38 Systems, 15102 Minnetonka Industrial Road, Minnetonka, Minn. 55345.

■ **Signal Technology, Inc. has announced Version 4.0 of its Smartstar series of development and information management software for users of Digital Equipment Corp. VAX computers.**

Version 4.0 offers a general report writer and Opal, an interface that allows for relational program query and reporting to both DEC's RMS and RDB relational data base management systems. Smartstar features a user interface to DEC's RDB and a Relational Query Processor interface to VAX RMS files.

Pricing for Version 4.0 of Smartstar ranges from $3,500 to $25,000, depending on host system.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117.

■ **Mednick Enterprises has announced a tape management system for Tandem Computers, Inc. computers.**

Tapes/MGR catalogues magnetic tapes as they are used and tracks what is on each tape, where it is located and when it should be scratched and cleaned, a spokesman said.

The product consists of a maintenance program that allows the user to define data sets and produce reports; a tapes request program that notifies operators that a tape should be mounted or dismounted; a tapes scratch program that scratches expired tapes; and a tapes operator utility program used for handling missing tapes.

Tapes/MGR is priced at $3,500.

Mednick Enterprises, 1680 Arbor Drive, San Jose, Calif. 95125.

APPLICATION PACKAGES

■ **Manufacturing Management Systems has introduced a closed-loop manufacturing system for IBM's DOS and OS/MVS operating systems.**

Reportedly, the Manufacturing Resource Simulation (MRS) system consists of three integrated modules: master production scheduling, material requirements planning and capacity management. MRS includes sales order tracking functions and a simulation process that combines backward and forward planning capabilities.

The master production scheduling module includes capabilities for job-chaining, multilevel planning and computer-generated billing.

MRS is priced at $126,000.

Manufacturing Management Systems, P.O. Box 14484, Houston, Texas 77221.

■ **J. D. Edwards & Co. has introduced an enhanced version of its financial applications software for IBM System/38 minicomputers.**

The World Systems financial software reportedly includes general ledger, accounts payable and receivable and address record-processing modules.

Enhancements include a redesigned data base that allows users to maintain monthly information and support up to 14 accounting periods each year and a question mark function that allows users to call up on-line documentation. Functions supporting partial payments and a report generator for creating custom reports have also been added.

The set of four World Systems modules costs $41,000.

J. D. Edwards, 4949 S. Syracuse St., Denver, Colo. 80237.

See TOOLS page 44

The exceptional flexibility of the ESP 6310 terminal sets it sharply apart from the crowd.

Upgradable to an IBM® PC workstation. Add an ESP 9310 module and your ESP 6310 becomes an IBM PC. You get a loaded terminal and a personal computer on a single footprint. That's unsurpassed present *and* future flexibility.

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For more about the ESP 6310, the flexible terminal with the unlimited future, call Esprit (Es-pree) toll free at 800-645-4508. In NY State 516-293-5600.

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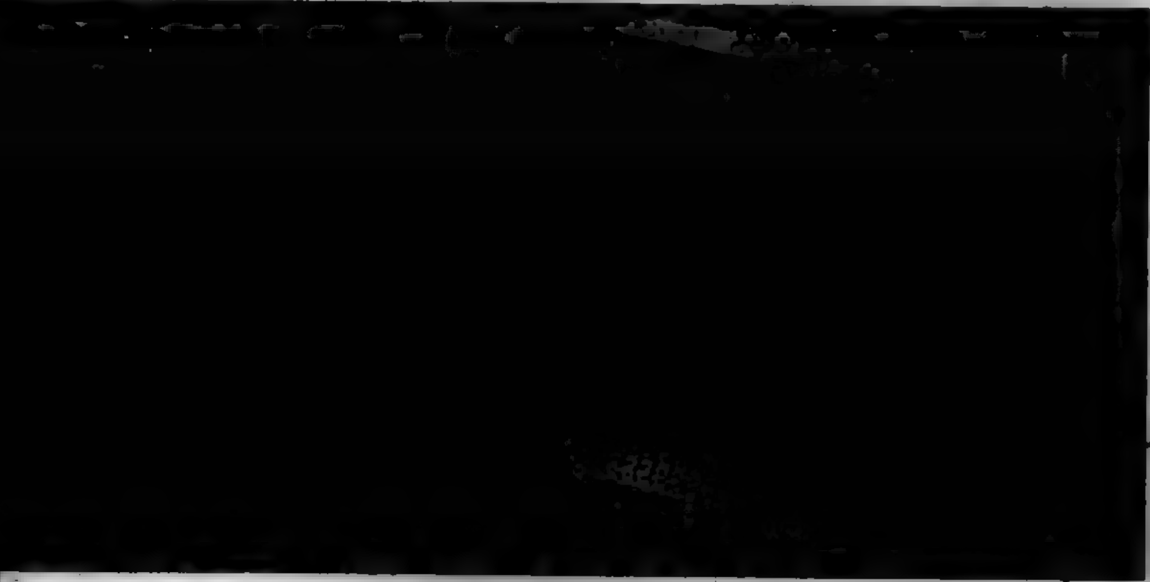


Esprit
Systems, Inc.
PEACE OF MIND TECHNOLOGY

Graphwriter
THE ART OF PERSUASION

SOFTWARE & SERVICES

TOOLS from page 43

■ Uccel Corp. has announced Release 3.2 of its Paperless Item Processing Manager interface for electronic funds transfer between financial institutions and automatic clearinghouses.

The Paperless Item Processing Manager includes automatic proof control and transaction warehousing that bases distribution on destination requirements.

The product runs under IBM's DOS and OS operating systems. It can be installed as a stand-alone product or licensed as part of Uccel's Infopoint financial information network. It costs $45,000 for DOS systems and $52,000 for OS systems.

Uccel, Uccel Tower, Exchange Park, Dallas, Texas 75235.

■ McDonnell Douglas Computer Systems Co. has introduced a job shop management package for its Microdata line of minicomputers.

The Job Shop Management and Control System (JMC) consists of seven integrated modules: job estimating, quoting, routing, inventory control, bill-of-materials, purchase order processing, work order launching, shop floor control and standard financials, a spokesman said. Modules are priced from $8,000 to $20,000.

McDonnell Douglas also announced the Manufacturing Management and Control System (MMC) for Microdata minicomputers. MMC modules include: engineering, sales order processing, master production scheduling, work-in-process costing, shop floor control, standard costing, inventory planning, purchasing, work order launching, accounts receivable, accounts payable, payroll and general ledger.

MMC is priced from $2,500 to $37,500, the vendor said.

McDonnell Douglas Computer Systems, 17481 Red Hill Ave., Irvine, Calif. 92714.

■ Alpine Datasystems, Inc. has announced version 4.2 of its Project Time Management software for Digital Equipment Corp. computers running DEC's RT-11, RSTS and VMS operating systems.

Project Time Management Version 4.2 includes a budget overrun report, a selective accounts receivable aging analysis that shows outstanding balances for periods defined by the operator and a deferred billings report that lists items intentionally postponed from current billing, a spokesman said.

Project Time Management Version 4.2 costs from $7,000 to $20,000.

Alpine Data Systems, Suite 1950, 111 S.W. Fifth Ave., Portland, Ore. 97204.

■ Control Data Corp. has introduced the menu-driven Cyber-Exploration and Production Interpretation Capability (Epic) system, an integrated set of applications and interpretation tools for oil and gas exploration, analysis and production processes.

Cyber-Epic operates on CDC's Cyber 180 computer series under CDC's NOS operating system. The system also operates on industry

Continued on page 46

IBM from page 41

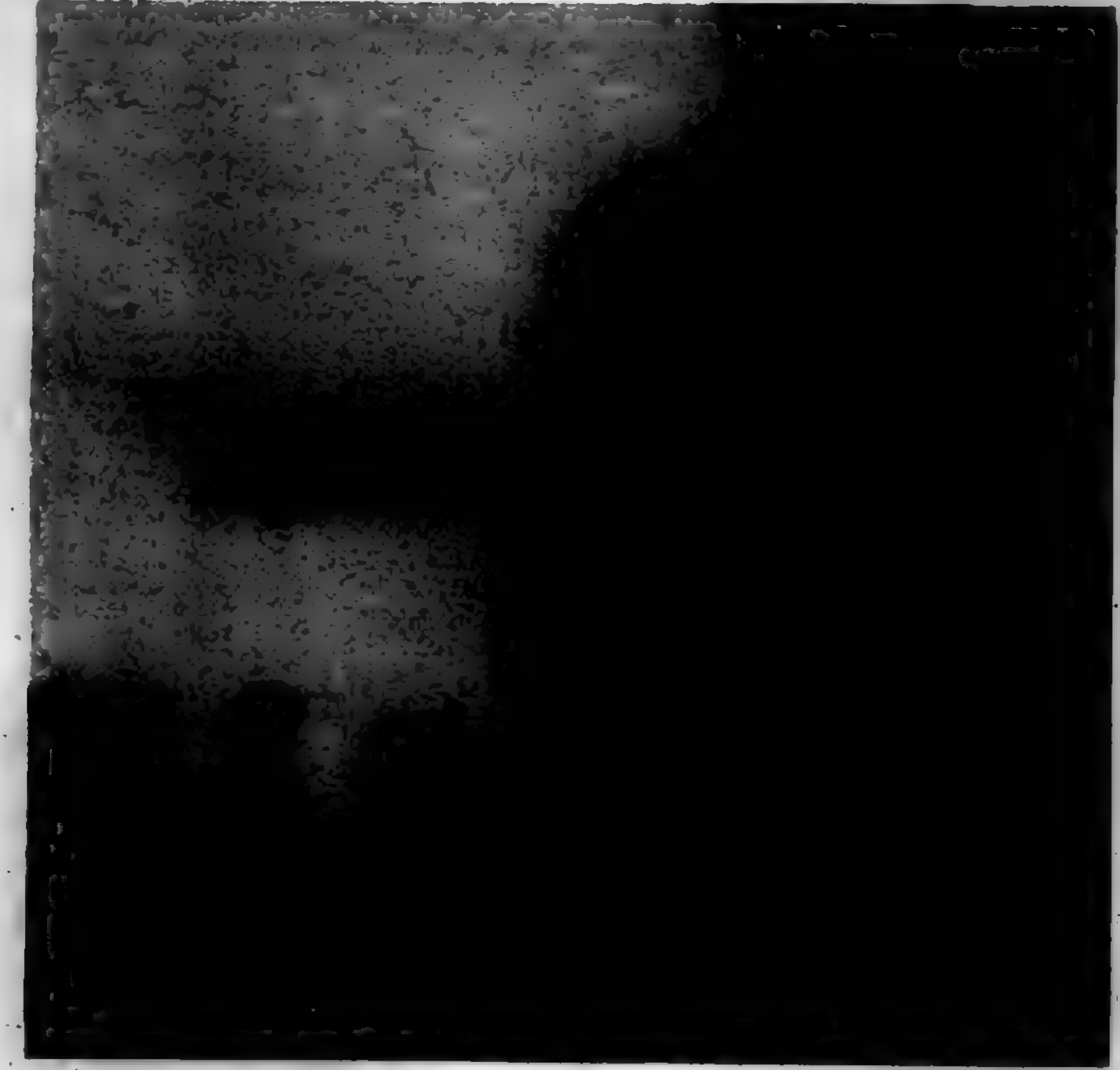
Programs are written in System/38 RPG-III programming language and were designed to execute under System/38's CPF. The IBM System/38 CPU must be used with the system. A security system restricts access within the applications.

Mapics II for the System/38 will be available in the fourth quarter, and module prices will range from $2,420 to $8,860.

Several enhancements were added to IBM's Mapics II for the System/36. According to an IBM spokesman, these include an MPSP facility for coordinating business and production plans and MRP; an L/LM facility that tracks the location and age of inventory according to batch, lot or item; and an IMFP facility that includes capabilities for calculating inventory quantities to three decimal places.

MPSP costs $11,500 and will be available in the fourth quarter. L/LM costs $4,200 and will be available in the first quarter of 1986. IMFP costs $20,000 and will be available in 1986.

IBM Information Systems Group is located at 1133 Westchester Ave., White Plains, N.Y. 10604.



To date, there are 20,000 COMET International systems installed around the world, serving over 100,000 individual workstations.

In the EDP business, that's a golden record.

The reason for the success lies in the problem COMET software solves: decentralized control.

For most international companies, the software created for headquarters just won't work at the local level.

And the software created at the local level does not conform to headquarters' needs.

Makeshift solutions are expensive, and most often, they don't work very well.

COMET does.

COMET was designed to meet local managements' and headquarters' requirements at the same time.

It provides decentralized locations with stand-alone computer power, without sacrificing the head-office need for up-to-date information.

COMET does this by recognizing that every corporate structure is different. And that different local offices have radically different needs.

Each individual COMET system is tailor-made from an extremely large variety of products matched to the needs of the departments where they will be used. These products are put together into one system which works.

As the company's requirements grow, COMET can be upgraded to work with them. Vital communication between the head office and the decentralized locations is never broken, and information flows smoothly both ways. All of this is supported by Nixdorf's international service and support organization. Our software specialists adapt COMET to keep up with changes in local laws and regulations.

COMET permits program modifications to be transmitted over telephone lines to local systems, saving time, effort, and expense.

All of this works to make our customers more competitive wherever they compete.

If our record is golden, it's because theirs is.

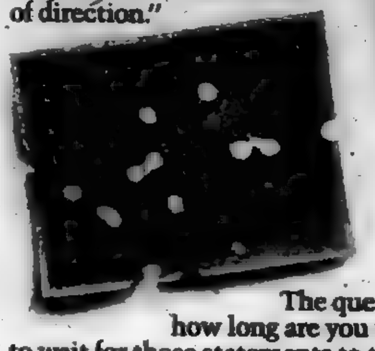
Nixdorf Computer Corporation, 300 Third Avenue, Waltham, MA 02154.

NIXDORF
COMPUTER

ARE IBM'S STATEMENTS OF DIRECTION LEADING YOU ASTRAY?

Perhaps the biggest problem with IBM's office systems and solutions is that many of them are still on the drawing board.

Sure, the hardware's available. But the software that makes it all perform and ties it all together is described only in IBM's "statements of direction."



The question is, how long are you willing to wait for those statements to turn into solutions?

THE WANG SOLUTION IS AVAILABLE NOW.

Compare IBM's System 36 with Wang's VS, for example.

With the Wang VS, you can tie into WangNet, Wang's broadband local area network (LAN) that facilitates the exchange of data, text, graphics, electronic mail, and video information.

IBM's local area network for the System 36 still isn't available.

The Wang VS family is fully compatible from top to bottom, uses one operating system, and runs all the same software without reprogramming or recompiling.

FEATURES	WANG VS 85	IBM SYSTEM 36
Migration without conversion up to 192 users	Yes	No
32-bit Architecture	Yes	No
Cache	Yes	No
Object Code Compatibility	VS 15, 25, 45, 65, 85, 100, 300	36 only
Virtual Memory Operating System	Yes	No
Removable Storage Options	Yes	No
Local Area Networks	Yes	No
Architectured for OA/DP	Yes	No
Relational Data Base	Yes	No
Industry de facto Standard Word Processing	Yes	No

System 36, on the other hand, uses an operating system that's incompatible with any other IBM system. And IBM uses two mainframe applications – DISOSS and PROFS – that aren't compatible with each other. Unfortunately, the product that's supposed to tie everything together is still in the planning stages.

The Wang VS also offers you Wang OFFICE, a set of office automation applications that connects the VS to other Wang office systems and provides you with totally integrated information processing.

If you want IBM's version of Wang OFFICE for the System 36, you'll just have to wait for it.

JUST GIVE US ONE SHOT.

As the chart indicates, there are lots of reasons why you should choose a Wang VS computer over IBM's System 36.

And we'd really like a chance to tell you the rest of our story, which includes Wang's commitment to service and support. We'd also like to prove ourselves in a benchmark test.

So call Wang at 1-800-225-9264. Or write to the Wang Business Executive Center, One Industrial Avenue, M/S 5413, Lowell, MA 01851.

WANG

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Continued from page 44

standard graphics workstations, such as Tektronix, Inc. and Landmark Graphics workstations that are connected to the host computer.

The price of Cyber-Epic ranges from $50,000 to $300,000.

CDC, Petroleum Industry Marketing, P. O. Box 0, 8100 34th Ave. S., Minneapolis, Minn. 55440.

DATA BASE MANAGEMENT SYSTEMS

■ **Computer Corp. of America (CCA) has announced a marketing agreement with Decision Resources Corp. that gives CCA exclusive marketing rights to a software link between CCA's Model 204 data base management system and SAS Institute, Inc.'s SAS System.**

The Statistics and Graphics Extractor/204 (Sage/204) runs on IBM mainframes under OS, DOS and CMS environments. The interface is licensed for $12,000.

Computer Corp. of America, 4 Cambridge Center, Cambridge, Mass. 02142.

■ **Relational Database Systems, Inc. has announced that its Informix relational data base management system for AT&T's Unix environments is now available on Perkin-Elmer Corp. 3200 superminicomputers and Model 7350 supermicrocomputers.**

According to a spokesman, Informix provides a collection of programs designed to aid in building multiuser applications. Features include an interactive query language, a nonprocedural report writer, screen generation and menu creation facilities.

The price ranges from $3,000 to $12,000, depending on the host processor.

Relational Database Systems, Suite 600, 2471 E. Bayshore Road; Palo Alto, Calif. 94303.

■ **Applied Data Research, Inc. (ADR) has announced that its Datacom/DB relational data base management system can be interfaced with SAS Institute, Inc.'s SAS System.**

Proc Dbview reportedly allows users to extract data stored in a Datacom data table and to be used in a SAS program. SAS users can use their corporate data stored in Datacom/DB for statistical analysis and graphics, the company said. Data stored in a Datacom/DB table can be extracted in a format that can be read by SAS software.

It is available free to users of the Datacom/DB and SAS System.

ADR, Rt. 206 and Orchard Road, Princeton, N.J. 08540.

■ **Sir, Inc. has announced that its SQL+ relational query system is now available for Digital Equipment Corp.'s Tops 10 and Tops 20 operating systems.**

According to the company, SQL+ is a component of SIR/DBMS, a relational data base management system (DBMS) designed for analysts and researchers. SQL+ includes an interac-

Continued on page 50

SAS from page 41

ment commands and string handling capabilities. Variables in statements can refer to entire matrices of values, allowing a single statement to operate on one value or on hundreds of values. Production release is scheduled for mainframes and minicomputers in the second quarter. It will be available for IBM's PC-DOS in the third quarter.

The initial release of SAS/IML will run under IBM's OS, TSO and CMS operating systems; Digital Equipment Corp.'s processors under VMS; and Prime Computer, Inc.'s Prime 50 series under Primos. The PC-DOS version will operate on the IBM Personal Computer AT and Personal Computer XT. Use of SAS/IML requires the base SAS System. The first-year license for SAS is $8,000 and for SAS/IML, $2,000.

SAS/AF was described by the spokesman as a full screen facility for interactive development of user applications. Using menus and screens developed with SAS/AF, users can run base SAS System jobs without knowledge of the SAS language. Procedures in the SAS/AF system allow a program designer to build screens, control the user path through an application and transport screens between operating environments.

The initial release of SAS/AF for IBM mainframes is scheduled for the second quarter. The first-year license fee is $3,000.

In addition, SAS Institute announced a computer-based training (CBT) series for the base SAS System. The initial course in the series, "Fundamentals of the SAS Software System," is designed to teach new SAS users how to use SAS directly through the SAS software. Users learn to write and execute test programs using the SAS Display Manager System, a full screen facility for interacting with all parts of an SAS job, including statements, output and system messages.

The CBT course runs under IBM's TSO and CMS operating systems. It requires installation of the base SAS System and SAS/AF. The first-year license fee is $1,500.

More information is available from SAS Institute, which can be reached through Box 8000, SAS Circle, Cary, N.C. 27511.

Are you a gambler by nature?
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If you wouldn't bet your salary on a roll of the dice, why are you gambling with your business? Now you can have computer back-up protection starting at only $895.00 per month.

Fully equipped with an IBM 4341 Group II computer, tapes, disks, CRTs and communication equipment, HOTSITE® can put your computer operations back in business in a matter of hours.

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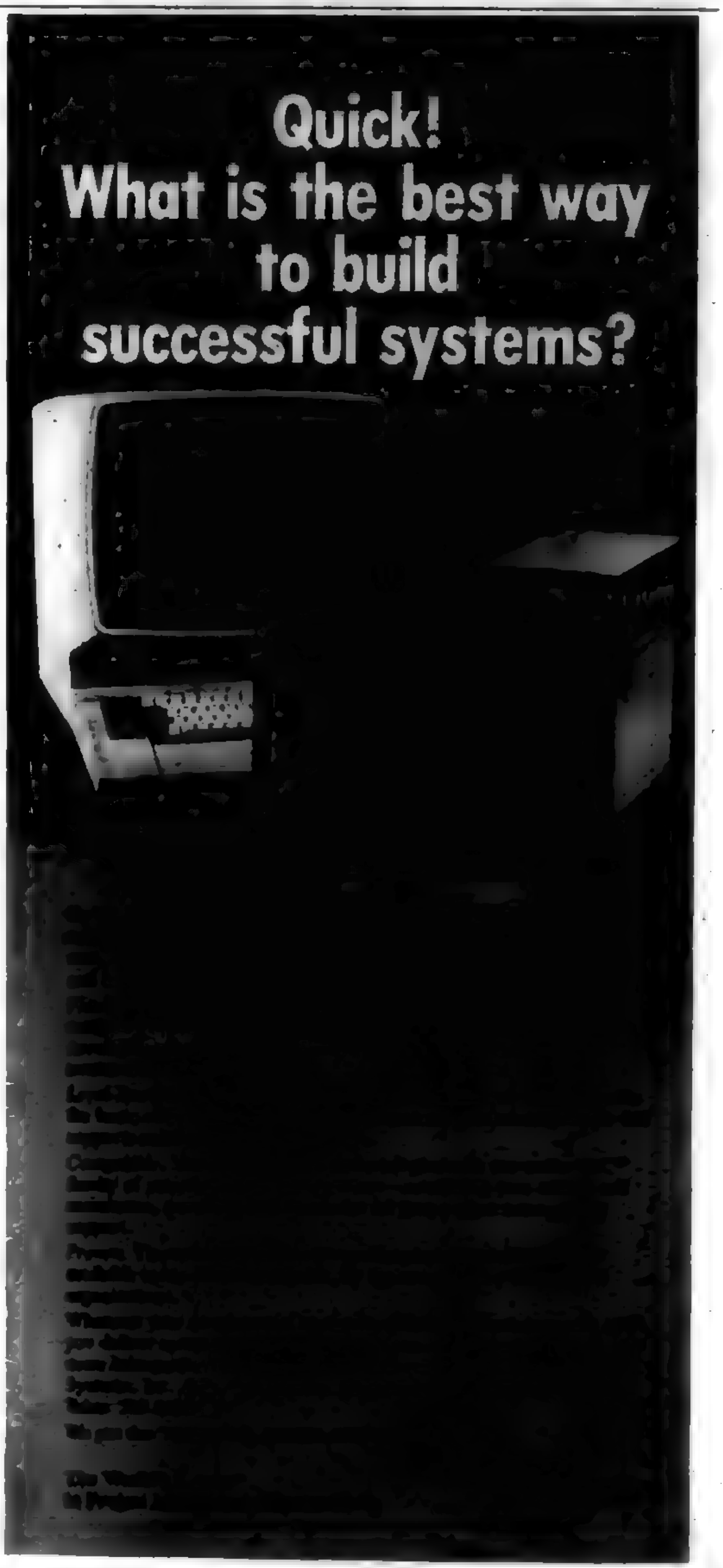
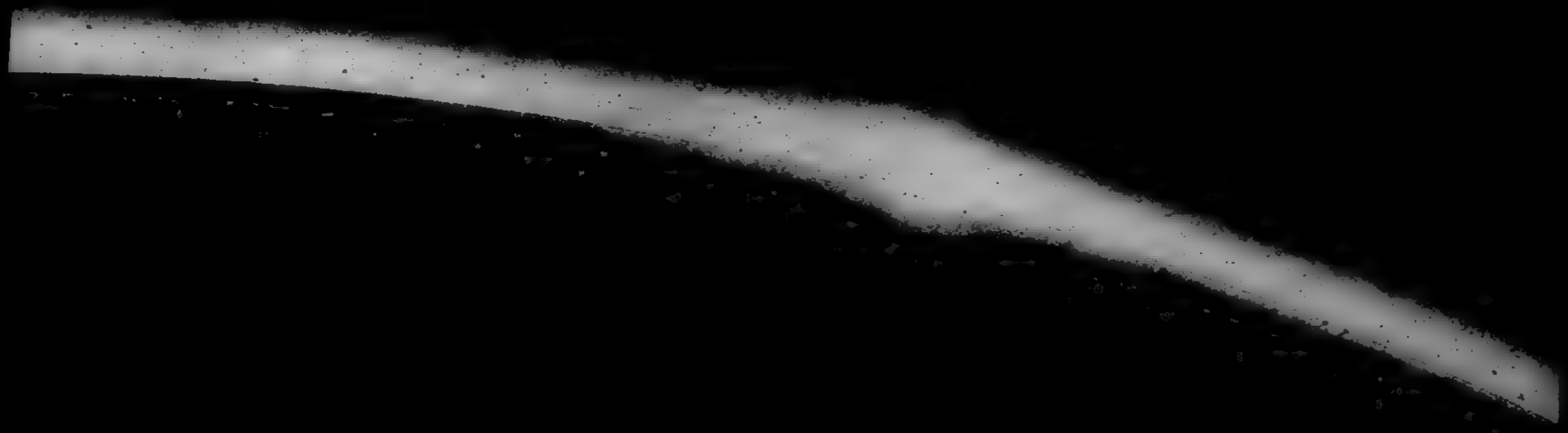


Canadian
Office Automation
Technology

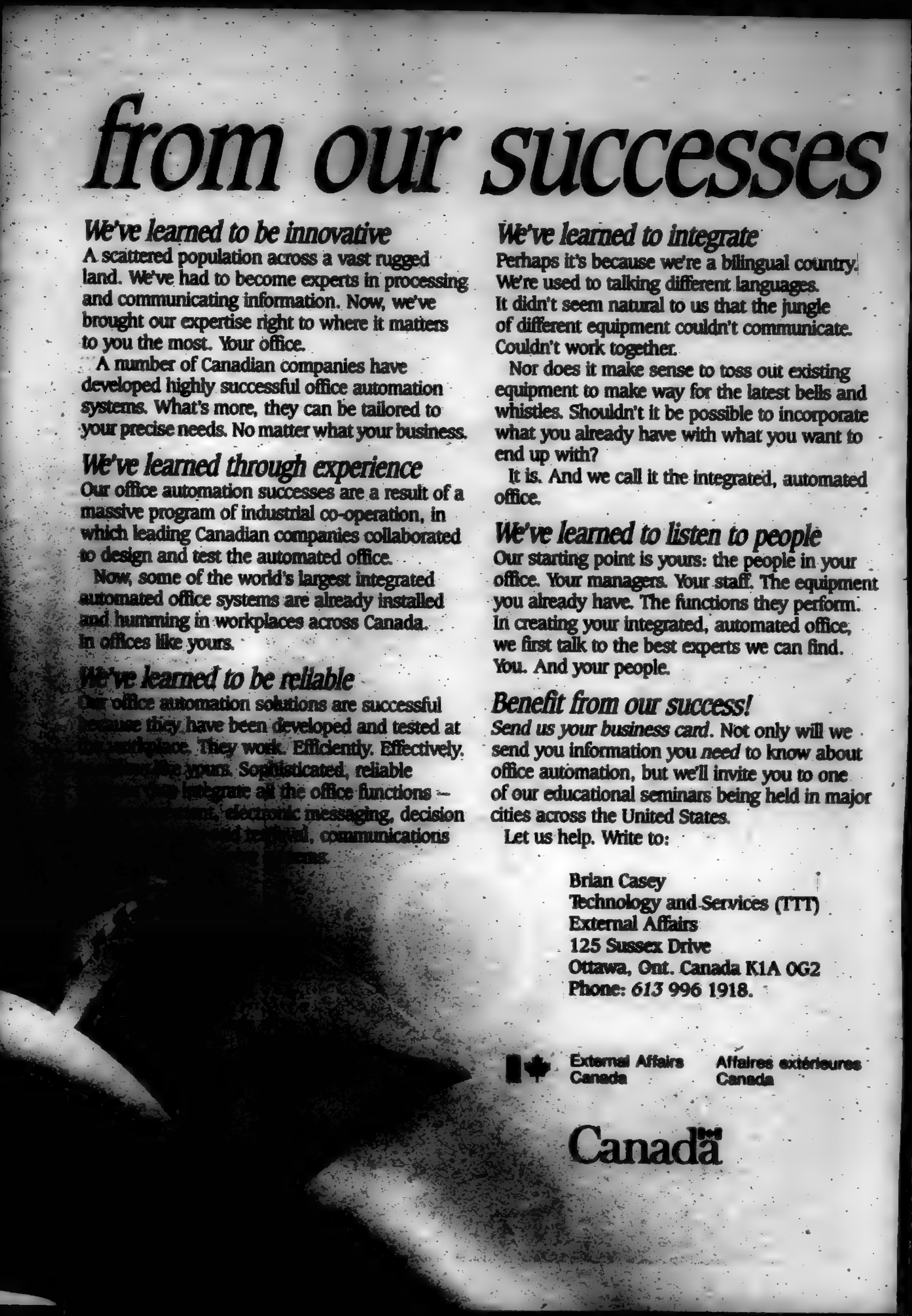
What have we learned over the past 111 years?



[illegible] learned a lot

[illegible]

[illegible] technology is the key to tying our [illegible] country — and your office systems — together.



from our successes

We've learned to be innovative

A scattered population across a vast rugged land. We've had to become experts in processing and communicating information. Now, we've brought our expertise right to where it matters to you the most. Your office.

A number of Canadian companies have developed highly successful office automation systems. What's more, they can be tailored to your precise needs. No matter what your business.

We've learned through experience

Our office automation successes are a result of a massive program of industrial co-operation, in which leading Canadian companies collaborated to design and test the automated office.

Now, some of the world's largest integrated automated office systems are already installed and humming in workplaces across Canada. In offices like yours.

We've learned to be reliable

Our office automation solutions are successful because they have been developed and tested at the workplace. They work. Efficiently. Effectively. [illegible] like yours. Sophisticated, reliable [illegible] integrate all the office functions – [illegible], electronic messaging, decision [illegible] retrieval, communications [illegible] systems.

We've learned to integrate

Perhaps it's because we're a bilingual country. We're used to talking different languages. It didn't seem natural to us that the jungle of different equipment couldn't communicate. Couldn't work together.

Nor does it make sense to toss out existing equipment to make way for the latest bells and whistles. Shouldn't it be possible to incorporate what you already have with what you want to end up with?

It is. And we call it the integrated, automated office.

We've learned to listen to people

Our starting point is yours: the people in your office. Your managers. Your staff. The equipment you already have. The functions they perform. In creating your integrated, automated office, we first talk to the best experts we can find. You. And your people.

Benefit from our success!

Send us your business card. Not only will we send you information you *need* to know about office automation, but we'll invite you to one of our educational seminars being held in major cities across the United States.

Let us help. Write to:

Brian Casey
Technology and Services (TTT)
External Affairs
125 Sussex Drive
Ottawa, Ont. Canada K1A 0G2
Phone: 613 996 1918.

External Affairs Canada | Affaires extérieures Canada

Canada

Continued from page 48

tive display processor for developing fully formatted reports without programming.

SIR/DBMS, including SQL+, sells for between $25,000 and $40,000, depending on hardware configuration and operating system. The product costs $40,000 for the DEC Tops 10 and Tops 20 operating systems.

SIR, Suite 400, 890 Davis St., Evanston, Ill. 60201.

■ **Four-Phase Systems, Inc. has announced that Unify Corp.'s Unify relational data base management system is available for Four-Phase's Series 2000 computers.**

Unify reportedly provides nontechnical end users with tools to design high-performance, transaction-oriented data base applications.

The Unify DBMS costs $1,995.

Four-Phase Systems, 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

■ **Lanier Business Products, Inc. has announced a data base management program for the accounting, legal and insurance professions that runs on Lanier's EZE desktop workstations.**

Datamanager II is said to enable nonprogrammers to perform data retrieval and reporting. When combined with the vendor's One-Step word processing program, Datamanager can prepare columnar reports, address labels and letters.

Datamanager II costs $1,100.

Lanier Business Products, 1700 Chantilly Drive N.E., Atlanta, Ga. 30324.

MICRO from page 41

ber-crunching strength with the micro, which, because of its increasingly powerful and functional software, has unique talents its large systems brethren do not share. It is no longer an either-or situation in information processing.

In its emerging role as central supplier of services, the mainframe can do what it does best — manage massive data bases, process huge volumes of data and serve as a distribution engine for electronic mail, among other things. The micro will handle those functions for which it is best suited — ad hoc data manipulation and local data entry and editing, for example.

Sounds idyllic, doesn't it? Well, don't expect the transformation to come overnight. Anyone who has had firsthand experience with the current generation of micro-mainframe links knows that link technology has a long way to go before it makes transparent, simple data sharing practical. As for integrated micro-mainframe applications, that's a horse of a different color, to steal from the *Oz* theme again.

Distributed applications

If link technology can be described as being in its infancy, distributed applications technology is certainly only in its first trimester. Even marketing cadres, who are quick to seize new issues and opportunities, have yet to take up the banner of applications integration in the product marketing crusades.

Thus, when one of the leading applications software companies — that's it on the clues — hinted recently that it will soon release the first products in a planned line of what it labeled distributed personal computer applications, it piqued some interest.

The company said the distributed personal computer applications are essentially subsets of its extremely popular mainframe systems. The company claims the products will allow a user to download a subset of the mainframe functions, enter and manipulate data as though working within the mainframe application, perform editing and validation functions on the micro and upload the processed information as a mass of batch transactions that will then be incorporated into the full mainframe system.

Offloaded to micro

In that way, the company postulated, a portion of the mainframe processing has been offloaded to the micro, reducing mainframe resource consumption, utilizing the local processing power of the micro and cutting direct-connect communications costs.

Such capabilities would be extremely useful for a remote corporate branch or division that could, say, download necessary general ledger functions, process its own general ledger and upload the information for inclusion in the full general ledger.

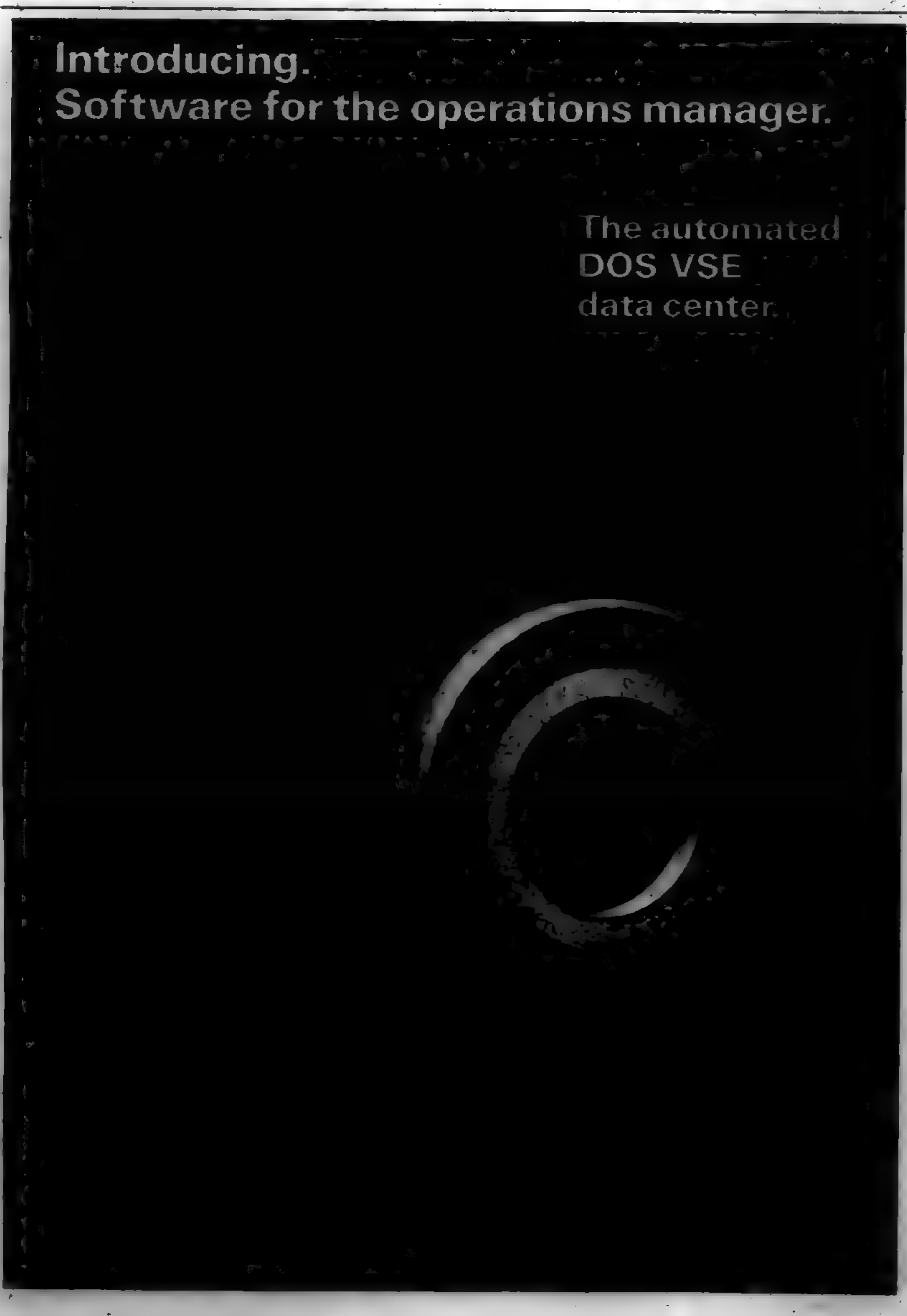
The company admitted it is taking only small steps at first — offering only the simplest of functions, such as data entry and validation — in the first wave of such distributed applications.

Not yet announced

Though the product has not yet been officially announced, it has been used by a number of the company's existing clients, who were said to be extremely pleased.

User reaction should be interesting when the products hit the open market. Many people claim that users are growing disenchanted with their micros due to the dearth of new and innovative micro-specific applications. If this is the case, the integrated applications may be warmly embraced. Much depends on how sophisticated the products are, considering they are merely the first offshoots of a new technology.

In any case, the move toward integrated functionality — where the micro is an extension and not an alternative to the mainframe — has clearly begun. It's time for the mainframe to be fitted for its Father Flanagan robes.


Introducing.
Software for the operations manager.
The automated DOS VSE data center.

Honeywell's secret to improving the return on your *information* investment.

Honeywell, I said, tell me the secret to getting bigger returns on my information investment.

It's no secret, they said.

Please, I said; I just want to know what the insiders know. I'll never tell another soul. Promise.

There is no secret, they said. All you have to do is increase the accessibility of your online information while decreasing the cost of producing and maintaining that information.

It's all very easy when you use our Solution Center and Development Center tools.

Actually, I knew it all along.

Let's begin with a definition.

Return on Information Investment (ROII) means the degree to which an organization benefits from its investments in information resources. This includes computer equipment, software, and manpower.

How can ROII be improved? In large part this is a function of how information is used by your organization and how that information is created.

But for general purposes, ROII can be improved by increasing the accessibility of your information while decreasing the cost of producing and maintaining that information.

By increasing accessibility, we mean letting more people use more information more easily. By decreasing costs, we mean letting program developers, system administrators, and operations people make more efficient use of the system.

At Honeywell we've developed strategies just to help you achieve these objectives:

The Solution Center enables you to offer your end users special GCOS 8 software packages to aid in decision-making, planning, forecasting, and creating reports. All capable of concurrent operation with your production applications with little or no dependence on your DP department. The result is improved self-sufficiency, productivity, and performance.

The Development Center is a collection of GCOS 8 based software tools designed to permit your program developers to design and test applications more quickly, assist system administrators in providing better performance and control, and to assist operations in managing daily computer room activities.

And, Honeywell's design strategy for cohesive micro-through-mainframe software, networking, and computing equipment affords the long-range investment protection growing organizations need in order to keep ROII healthy in the years ahead.

By focusing on both increasing accessibility and decreasing costs, you can optimise your ROII.

That's the secret.

You might have known it all along. But, in case you didn't, call us for more information, 1-800-328-5111, extension 2757. Or write: Honeywell Inquiry Center, MS 440, 200 Smith Street, Waltham, MA 02154.

Honeywell
100
Years

Together, we can find the answers.

Honeywell

SOFTLINE

from page 41

development process.

Company A

At this major "smokestack" corporation, the chief executive officer was the most visible sponsor of the executive information system effort. The CEO believed that some fundamental and important changes were under way in the industry and intended the executive information system to serve as a tool to open the minds of his fellow managers to new ways of looking at their business.

At the CEO's direction, an executive information system group was established and given what amounted to a blank check. Within less than a year, the group had executive information system workstations on the desks of the company's 20 top executives. The workstations offered a variety of standard and ad hoc reports from a broad range of financial, operating and industry data.

A system that monitored executive use of the executive information system revealed a comparatively high degree of login activity during the first two or three weeks of installation. After that, demand fell to practically nothing for nearly a year, with the exception of short, isolated bursts of activity following the end of each fiscal quarter.

A closer look at the situation revealed that the CEO's management team did not share his views on the changing business environment. They saw no compelling need for improved insight into the business and, therefore, reacted to the executive information system with indifference or resistance.

Although business changes are an important stimulus to developing a successful executive information system, good results seldom materialize unless the entire management team recognizes and accepts the change. This was clearly not the case in this instance. As a general rule, an executive information system intended to induce change in managerial behavior fails, and one that supports a recognized need for change succeeds.

Company B

The head of this leading pharmaceutical corporation's fastest growing and most profitable division commissioned the development of an executive information system, which was to be, above all else, a marketing data base. The information systems organization was charged with bringing together in one data base a wide array of industry, customer, competitive and product sales history information.

The executive information system project team ran into substantial problems with data reliability and comparability — multiple product numbers for identical products was a particularly thorny issue — and it requested and received substantial budget and schedule extensions. When the day of unveiling finally arrived, the division head posed three important questions to the new system — none of which it could even begin to answer. After additional extensions of time and budget and two repetitions of this experience, the CEO branded the effort a failure and withdrew all support and funds.

Why did the effort fail? The division was in a high-growth, high-change mode of operation. The division head and his management team, unlike the executives in the previous case, had an intense thirst for improved information to help them better understand their rapidly changing and highly competitive marketplace.

But in this atmosphere of rapid change, the managers of the division were almost totally unfocused in their information requirements. As a result, they asked for, and expected to receive, an all-knowing, all-seeing data base that could answer almost any question.

Executives in rapid-change situations have to be focused in their executive information system needs.

Company C

At this major chemicals firm, the vice-president of information systems secured senior management's support and active participation in the development of an executive information system geared to the improvement of executive productivity. As in the preceding cases, an executive information system team was established and given ample funding and time. In very short order, the executive information system group placed microcomputers in the homes and offices of the six top executives of the company.

These systems offered a combination of generalized and specifically tailored applications based on needs that were identified earlier through a series of careful and thorough interviews. The quality of the group's work was superb. They received compliments from executives using the system, as well as inquiries and requests for visits from like-minded executive information groups in other corporations.

Despite the company's senior management being highly impressed with the executive information system team and the quality of its work and the ready availability of dedicated coaching and support from the executive information system staff, the usage of and value obtained from the executive information system remained negligible in the year after its installation.

Why did this happen? The company was enjoying a relatively calm period. Its markets and competitive positions were strong. Thus, apart from their natural curiosity, the senior executives felt no pressure to modify their work styles and make use of the system. Executive information system efforts aimed at executive literacy alone are destined for a ho-hum reception.

Hackers hate this modem.

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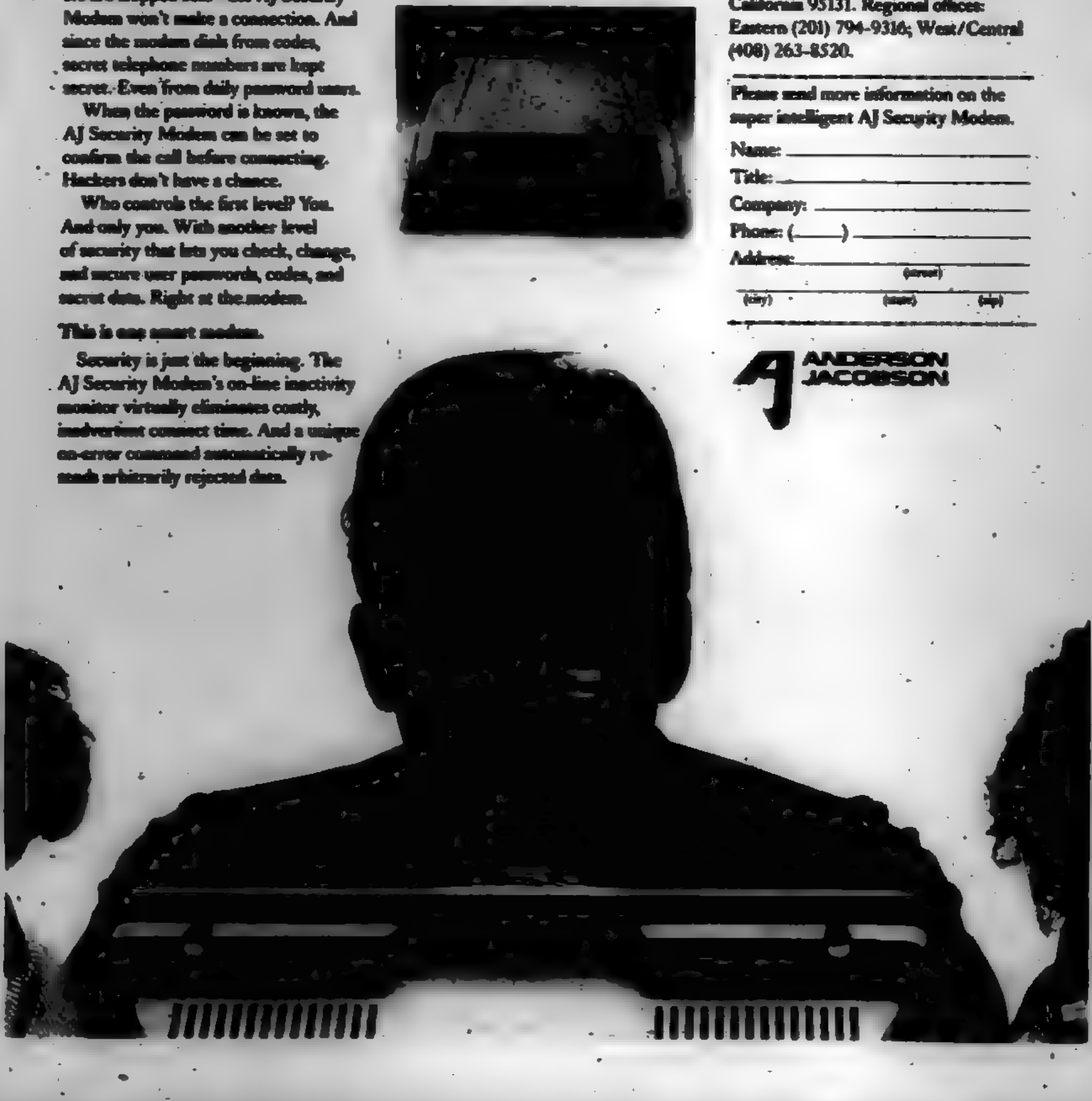

A Tale of Three Languages

C ADA & Lisp

By Ed Acly

Three high-level languages are attracting widespread interest because they satisfy certain requirements better than Cobol, Fortran, fourth-generation languages or application generators:

- The C language, in association with AT&T's Unix operating system, delivers more efficient programming environments.
- The Ada language, along with the Ada environment, applies software engineering principles to today's software crisis.
- Lisp has been adopted by vendors in the artificial intelligence community for symbolic processing.

It is not practical to discuss C or Ada without also discussing Unix and the Ada Programming Support Environment (Apse). Just about every version of Lisp includes an environment of programming support tools. The presence of these environments for all three languages is an important criterion that distinguishes them from the traditional Cobol and Fortran languages and a strong indicator of where programming technology may be headed. These environments provide a wide variety of automated tools that were developed to allow the programmer to write, test and implement programs more efficiently.

The history and philosophy of the C programming language are closely tied to the history and philosophy of the Unix operating system. C could be viewed as the language tool developed to implement the Unix philosophy. This philosophy calls for an operating system that is generalized, open-ended, flexible, powerful and modular.

Unix was developed by professional programmers at Bell Laboratories to provide an environment that would better support teams of programmers. Among the requirements of a better program development environment were:

- Simplicity and ease of use in order to promote the use of the environment.
- Faster, easier development of large programs, where the need for improvement was greatest.
- Portability so that the environment could be moved from one hardware architecture to another.

Unix was originally written in Digital Equipment Corp.'s assembler language. To provide portability to Unix, the C programming language was developed. Then Unix was rewritten in C with a completion date of 1973. The actual tools portion of Unix, its program development environment, started to develop at Bell Labs in 1973 as the PWB/Unix version. Today, the C compiler and the Unix tools are all part of what is marketed by AT&T as System V.

By definition, the C language is a general-purpose programming language. As both a high-level and low-level language, C allows the programmer to access machine facilities when required, while freeing the programmer of many of the housekeeping chores of assembler language. The primary features of C are:

Brevity of expression. C is a small and concise language. It only has 30 reserved words. For example, C does not include I/O facilities or operations, formatted files, character strings or lists. High-level functions not present in the C language are provided by functions that are external to C. This brevity tends to make C easier to learn and understand. On the other hand, the same brevity of expression allows a great deal of meaning and functionality to be packed into a very small amount of code. This is a very powerful attribute, but if not properly used, it can lead to code that is obscure and confusing.

Functions. A function is the equivalent to the subroutine from other languages. It is a self-contained piece of code that performs some unit of work. Functions are an extension to the C language and provide the high-level functionality needed by the programmer that is not part of the C language.

A well-designed C program is modular. The large problem to be solved by the program is broken down into smaller tasks, with a function used for each. The C program becomes a grouping of functions that are strung together to produce the desired results. By writing functions to be general purpose and then feeding them parameters at runtime, code can be reused from one program to another. The library becomes a depository of predefined program portions or of software tools.

Abundant set of operators. The C language presents a wide variety of operators, allowing it to be mapped very closely to the processor on which it is to be run. This variety of operators, which match closely to the common operation codes of most processors, ensures a one-to-one translation between C and the host operation codes.

Portability. A number of the other features of C contribute to its portability. For example:

- C's brevity makes it easier to port from one processor architecture to another. This brevity also makes new compilers easier to write.
- Features that are specific to a processor architecture are generally isolated as functions in the runtime library. Then, porting requires the rewriting of nonstandard functions stored in the library.
- C's low-level operators are simple and correspond closely to the machine language operators common to most processors.
- C deals with simple objects, such as bits, addresses and numbers. C does not deal with data files or character strings.

Control structures. The C language offers the modern control structures required for structured programming. Included in these control structures are:

- Decision making (if, else).
- Choosing from possible alternatives.
- Looping (while for, do).
- Go to.

These control structures allow for the single-threaded execution of instructions. They do not provide for multiprogramming or parallel operation of synchronized tasks.

Flexibility. Compared with other high-level languages, C does not present a rigid set of rules that the programmer must follow. C imposes few restrictions; it will allow the programmer to do almost anything desired. This means that the same results can usually be produced in a number of different ways. A program can be structured or unstructured; it can be efficient or eloquent.

Important points

Although the C language is not yet an Ansi standard, the version of C provided by AT&T with Unix is the de facto standard.

Despite the fact that Unix so heavily influences the C standard, the language lives a life all its own. C compilers are available for nearly every major operating system. The reason for this is due to C's popularity with systems programmers.

C is a language to be used by professional programmers working at the systems level. It is not well-suited to beginning programmers. It will probably never replace the Cobol or Fortran used for business applications. Currently, a great deal of

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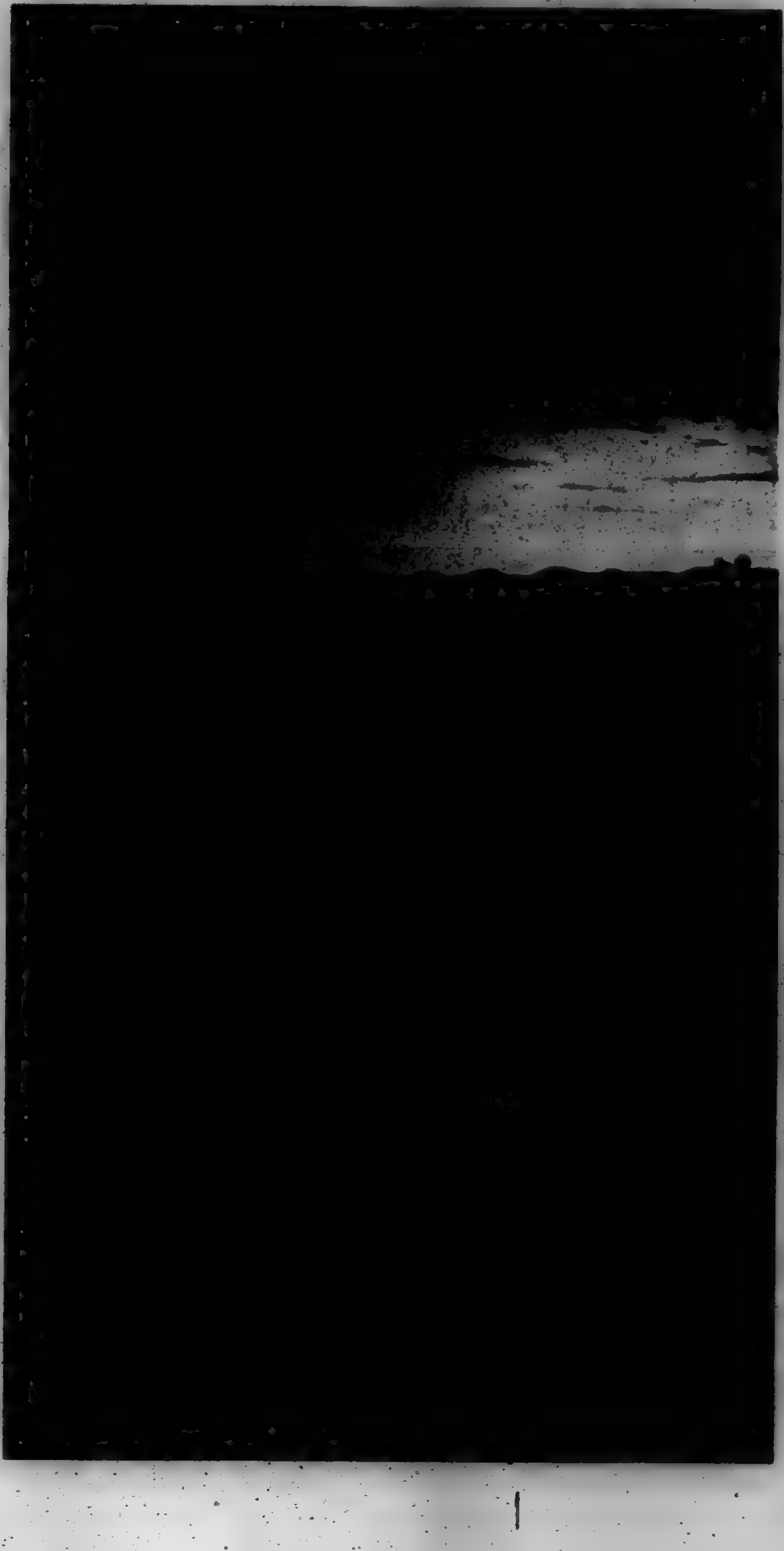

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commercial systems software is being written or rewritten in the C language. C has the potential to become the standard for systems programmers.

C programs can be well-structured if good programming techniques are adhered to because the common control structures required are all present in the language, and functions allow the program to be split into independent sections, which can separate the detail of the program from its main flow.

> ”
>
> *At the root of all these symptoms was the failure to manage effectively the complex solutions that were required for embedded computer systems.*

DOD's Ada

Ada was designed and developed under the sponsorship of the U.S. Department of Defense (DOD) specifically for embedded computer systems. An embedded computer system is one that is part of and dedicated to a larger system — for example, an aircraft or missile whose main purpose is not to perform computation. This definition of an embedded computer system rules out those used for scientific research and commercial data processing operations whose main purpose is to perform calculations.

In sponsoring Ada, the DOD was reacting to what has been termed the "software crisis." DOD studies in the early 1970s saw a dramatic escalation in software costs, to the point where the cost of software had become more than that for hardware. Even worse, projections through the '80s saw the cost of software in extreme cases approaching 90% of the total cost for embedded computer systems. Ada was developed in order to provide a means to decrease the cost of software for embedded computer systems.

Symptoms of this software crisis at the DOD were quite similar to those experienced on the outside, namely that software was:

- Very expensive, with costs too often exceeding estimates.
- Not responsive to user requirements.
- Inflexible.
- Not easily modified.
- Not reusable from one system to another.
- Not reliable.

At the root of all these symptoms was the failure to manage effectively the complex solutions that were required for embedded computer systems. As the power of the computer grew and its costs decreased, increasingly complex applications of computers were demanded. The software methodologies and tools were not in place that would allow complex solutions to be properly engineered and managed in order to deliver a reliable product. Methodologies and tools being used were too dependent on manual activities and coordination. At the same time, the balance had swung to the point where computer resources were now cheaper than manual resources.

New methodologies, tools and a language were needed to make heavier use of the computer and thereby decrease the cost of software. Accordingly, the DOD began work on Ada as the vehicle to control its escalating software costs. With Ada, the DOD would promise two distinct products: a new, common, high-order programming language that would embrace, and even enforce, modern programming practices; and a complete programming support environment that would embrace modern software engineering principles and tools for software development, maintenance and support.

Because Ada embraces both a language and a programming support environment, the remaining sections on Ada cover both of these topics.

Ada's history

The most striking feature in the history of Ada is the central role of software engineering. Software engineering strives to bring discipline into the process of producing software by applying classical engineering principles to software production. Means to this end include the introduction of a consistent methodology and a set of automated tools to control the complexity of the software life cycle.

Software engineering is ingrained within Ada. Ada was developed by software engineers. The process used to specify and design the language followed accepted software engineering principles. The language incorporates features required to implement software engineering techniques easily.

In December 1980, Ada became a military standard. Subsequently, the DOD established the Ada Joint Program Office, whose goal is to manage the implementation of the Ada language and program support environment. The Ada Joint Program Office spearheaded the effort to have Ada accepted as an Ansi standard. Starting in 1981, the program office managed further programs aimed at submitting Ada to more international review by language experts.

This process caused further changes in Ada until February 1983, when Ada was accepted as an Ansi standard. This Ansi standard is frozen until 1988, when it will be reviewed once again based on the experience to date. Efforts are currently

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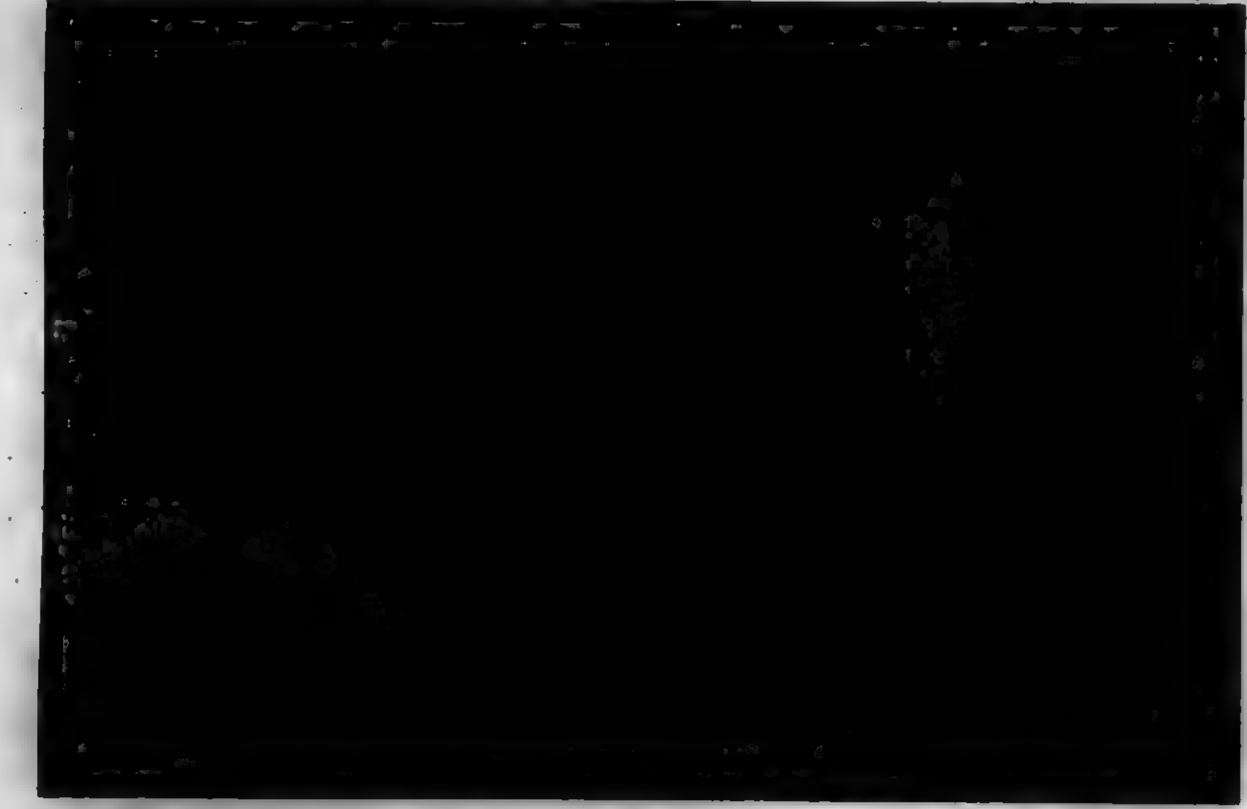

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Ada compiler validation schedule

well under way to have Ada accepted as a standard by the International Standards Organization.

In June 1983, the DOD issued a directive that put some muscle behind the effort to make Ada a standard. This directive was a revision of DOD directive 5000.31 and reads in part as follows: "The Ada programming language shall become the single, common, computer programming language for Defense mission-critical applications. Effective Jan. 1, 1984 for programs entering Advanced Development and July 1, 1984 for programs entering Full-Scale Engineering Development, Ada shall be the programming language. Only compilers which have been validated by the Ada Joint Program Office shall be used for software to be delivered to or maintained by the government."

The significance of this directive was twofold. First, it became quite clear that DOD contractors would have to adopt Ada for future work. Second, "Ada" was registered by the DOD as a trademark. Accordingly, a compiler could only be marketed as an Ada compiler after it had received DOD approval.

Enforcing compliance

This approval or validation process is the method chosen by the DOD to enforce the compliance of all Ada compilers with the standard language specification. Under no circumstances will the DOD allow any subsets or supersets of the Ada language to exist. In order to be validated as Ada by the DOD, a compiler must pass all tests in the Validation Test Suite, currently consisting of more than 2,200 programs. Once validated, a compiler must be resubmitted for revalidation once a year. If a compiler does not pass all tests in the suite, the DOD will not allow it to be called "Ada."

Because of the complexity of the language, only now are production-quality compilers beginning to arrive in significant numbers. To be classified as production quality, a compiler must implement the full language and must produce efficient machine code. The compilers currently validated or scheduled to be validated are shown in the table above.

The standardization of Ada as a common, high-order language provided the framework to develop the second Ada product, the programming support environment. This consists of a set of automated tools and the means to integrate them in order to provide complete life-cycle support. The objective of the DOD is once again to lower software life-cycle costs by providing an environment and user interface that is common (portable) for systems development personnel across all hardware architectures.

Features of Ada

Members of the Ada culture profess that Ada, if implemented on a wide-scale basis, will revolutionize the entire software industry. Their claim is that no single cure will solve the software crisis.

On its own merits, neither an automated programming technique, a new programming language nor the

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AGENDA

8:30 – 9:00	Registration — Fee is $50. (This includes Coffee and Buffet Luncheon.)
9:00 – noon	"Artificial Intelligence through Logic Programming" An introduction to Artificial Intelligence (AI) and Logic Programming software, with emphasis placed on Expert Systems and their applications across the industry. An overview of the software tool, MPROLOG, and its use in creating Expert Systems. Explanation Systems, Natural Language applications and Rapid Prototyping through Logic Programming will all be illustrated with examples based upon implementations from MPROLOG. We will conclude with our suggested strategy for quick results.
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practice of software engineering principles is the answer. Rather, a holistic approach is required that will bring together all of the above.

The goal of the Programming Support Environments is to provide an integrated and standard set of tools that assist in all phases of the software life cycle — that is, they can be used during requirements analysis, specifications, detailed design, implementation and maintenance. The key attributes are:

- Integration — the tools all work together.
- Comprehensive scope — tools are available to help automate the entire software life cycle.
- Standardization — a common interface is provided between the tools and the host operating system. The tools request operating system services from this interface and not from the operating system. This allows the environments to be portable from one proprietary operating system to another.

In the Programming Support Environments, the center is the host operating system, which is encapsulated by the Kernel Ada Programming Support Environment (Kapse). Within the Kapse are the services usually requested from the processor's operating system. It supports the rest of the environments by providing a processor-independent interface. This interface appears standard to the outside world from one hardware architecture to another. This means that while the Kapse is not portable, it allows all other elements to be portable — that is, the same — no matter what the underlying processor.

The next layer out is called the Minimal Ada Programming Support Environment (Mapse). This layer contains the minimal set of tools required and adequate to write and maintain software. These are:

- Ada compilers and cross compilers — used for both the host and target processor.
- Configuration control tools — used to control the configuration of large projects.
- Command language processor — very similar to that provided on Unix systems. In fact, in some environments it will be modeled directly after Unix. Unix-like features found here will include things such as shell scripts, I/O redirection and pipes.
- Control flow static analyzer — used to chart the topography of program control.
- Dynamic analysis tool — used for testing to provide facilities such as program breaks, tracing, snapshots, execution timing and stub creation for unfinished programs.
- Data base manager — provides the integration needed to interface the many tools with each other. The data base stores information for a project for its entire life cycle. History for the objects in the data base will need to be stored long enough to let any object be re-created when required. Sufficient information must be stored to provide for reporting of project management.
- Debugger.
- Editors — used for source programs, general text, specifications documents and design documents.
- File administration tools — used for file backup, archiving and processor transfer.
- File comparison tools.
- Linkers/loaders — used for both host and target machines.
- Pretty printer — used to format text data stored by the editor for output. The format depends upon the type of text.
- Program analysis tools.
- Set-use static analyzer — used to produce a cross reference listing telling where data is both referenced and updated.
- Terminal interface routines — used as device handlers for different terminal types.

The Apse layer contains additional tools to support the systems analysis and design phases, as well as any other areas of the life cycle not covered by Mapse tools. Areas covered by the Apse tools include:

- Ada program editor — used specifically for Ada coding and providing aids to ease this process.
- Configuration control tools — more advanced than those provided in the Mapse.
- Documentation tools — used to produce and control project documentation.
- Fault report system — used to process change requests and error reports.
- Program design tools.
- Project management — used to track projects and their due dates, the comparison of actuals to budget and so on.
- Requirements analysis tools.
- System design tools.
- System specification tools.
- User-supplied tools.

The benefits from the implementation of a full Apse will be felt throughout the entire software life cycle.

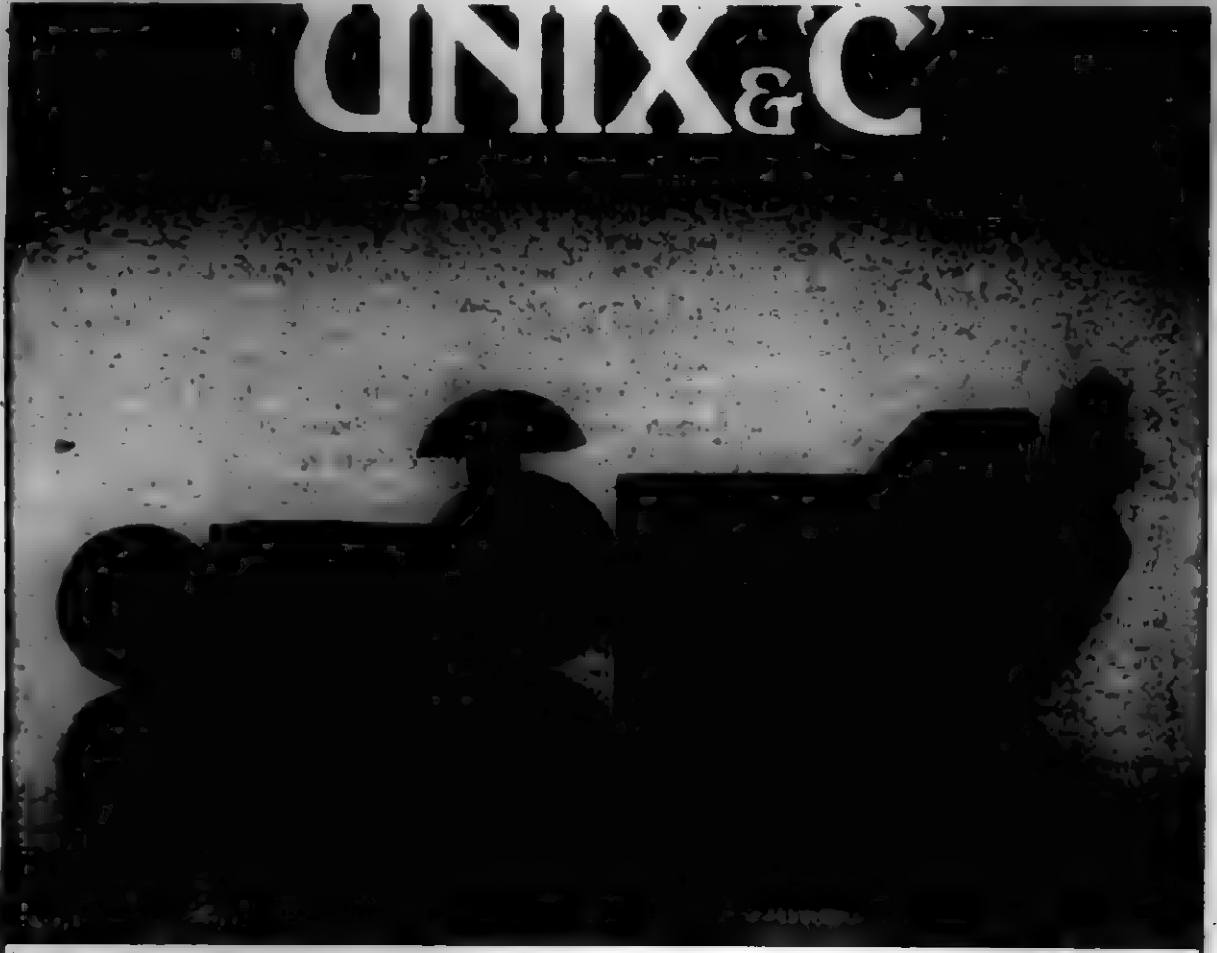
Few organizations have achieved adequate management control over the software life cycle. Tools currently available, because of their lack of integration, do not provide adequate measurement and control of the cycle.

Today, the business and systems analysis functions are predominantly manual. This results in an extremely time-consuming process if a thorough or less than thorough job is done because of pressures to comply with the schedule.

Many of the tools in Ada are aimed at providing assistance to the programmer. This is the same area toward which many of today's tools are targeted.

Consequently, cost savings in this area may not be as great. However, many of today's tools may be integrated into the Apse.

Maintenance today is all too often haphazard, relying upon testing to substitute for some good up-front



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planning. The configuration control tools of the Apse are aimed at decreasing the cost and improving the quality of maintenance.

Ada facilities

Examples of Ada facilities that are needed for embedded systems and that are not found in popular languages such as Cobol and Fortran are:

Parallel processing. More than one portion of a program, a task, can run independently and concurrently. This allows the program to interface simultaneously with more than one device or to execute simultaneously on more than one processor or to just run faster. Information can be passed between tasks through a mechanism called a rendezvous. Control of the parallel tasks is handled transparent to the application program by the Kapse. Other programming languages must call operating system services in order to process in parallel.

Real-time capabilities. Embedded systems require that responses be issued rapidly enough so that the input to the system upon which a programmed decision was made is still true. In addition to speed of execution, Ada's real-time facilities include functions such as the start of a process at a predefined time or the repetition of a process at predefined intervals.

Exception handling. Embedded systems controlling weapons cannot abort or give up control to the operating system when an unexpected condition, an exception, is encountered. On the contrary, the application program must have the ability to react directly to the exception and, thereby, to recover from an error. Ada provides powerful facilities to allow the application program to handle exceptions. However, the option is still left open to defer an exception to handling by the operating system.

User I/O. Embedded systems are often connected directly to specialized I/O devices, such as sensors, to measure air speed or actuators to open and close valves, for which there are no provisions in the Ada language. Because of the rapid response required in the real-time environment, the I/O devices often communicate directly with the application program rather than expending the time and instructions for the application program to request I/O services through the operating system. In addition, embedded systems often do not employ file structures that are dependent upon the operating system, because the embedded system is executed without the support of an operating system.

In order to deliver cost-effective systems, the Ada language was designed to incorporate software engineering principles that became popular in the '60s and '70s. It was felt that the application of these principles, all contained in one product, would produce systems that are reliable, efficient and modifiable.

Packages. To better manage large software projects, software engineering employs two methods — abstraction and decomposition. Abstraction refers to the

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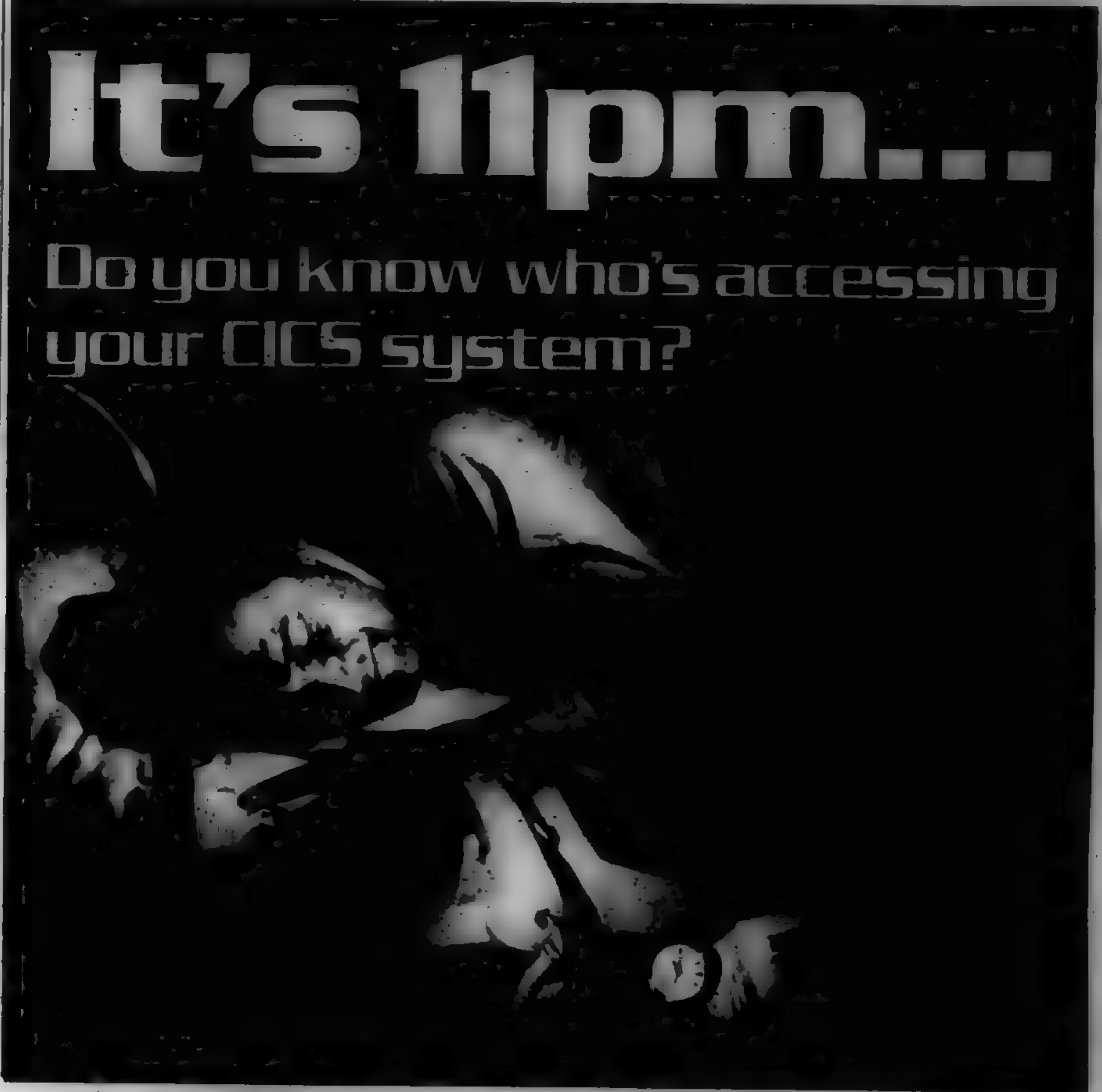
> *Ada provides powerful facilities to allow the application program to handle exceptions. However, the option is still left open to defer an exception to handling by the operating system.*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> ***Even though Ada product implementation will span the remainder of the decade, Ada's success is already guaranteed based solely on the DOD market.***

logical simplification of a complex problem by focusing only on its essential components while deliberately ignoring the nonessential detail. The Ada package supports both abstraction and decomposition. Ada packages are combined to make Ada programs. The package is separated into two distinct parts:

- The specification declares the package's interface to other packages. It is the logical requirements, the "what" for the package. It contains the data visible to the package's users.
- The implementation gives the procedures (accompanied by any internal data required by the procedures) needed to implement the specification. It is the procedural details, the "how" to accomplish the specification. It contains details that are hidden from its users. Any internal data used here can be encapsulated. This protects the internal data from erroneous updating by other packages in the program.

Strong data typing. This means that the programmer can specify in more detail the type of data (allowable values and operations) that a data field can contain. For example, for the description of the MONTH field, the acceptable values could be explicitly given as JAN, FEB, MAR, APR and so on.

Separate compilation. Ada does not require that the entire package or program be compiled at one time. Rather, the specification and the implementation portions of a package can each be compiled separately. This allows the "what" of a process to be compiled separately — for example, early on during the system design phase, from the "how" of that same process.

Generic units. The objective of a generic package is to produce a generalized program unit that can then be tailored to a specific use at compilation time when parameters are supplied. The payback from generic units is that a package can be created once in a generalized format and then tailored to serve many different purposes at compilation time.

Combining the features discussed so far, Ada proponents predict that Ada will revolutionize the software industry because it will provide for the first time a sound structure for the reuse of software. They see Ada moving the industry toward industrialized programming where programs are built from components selected from a software library.

No longer will the writing of a program generally entail starting from scratch. The ability to construct programs from already available, reusable components will have the greatest impact on productivity. In evaluating this prediction, consider the basis for the claim:

- Portability is built into both the Ada language and environment.
- Ada packages and program units can be independently developed and programmed.
- Interface specifications between packages can be carefully engineered and cataloged.
- Independently developed packages and program units could be combined, once large software libraries are developed, to form a large part of programs that need to be developed.
- Generic program units could be developed and cataloged to process common functions.

Many of the features discussed above will be implemented during the remainder of the 1980s. In 1984 a number of production-quality compilers arrived. This year should be marked by the arrival and first use of

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We have examined the Datasouth TX-5180 and found its features and characteristics exceed accepted expectations for IBM 34/36/38 printers. A partial list follows.

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☐ Tractor feed forms: 3"-15"
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the DOD-sponsored Mapse. It is likely to take the remainder of the decade for fully functional Apses to arrive. Probably the key element for the Ada environment is the Mapse data base. In order to act as the repository of project data for the full life cycle, complex relational data base technology will probably be required. It could take until 1990 before this technology reaches full production quality.

Even though Ada product implementation will span the remainder of the decade, its success is already guaranteed based solely on the DOD market. Currently, Ada is specified for 37 different application systems in the Army, Navy and Air Force with a combined contract value of $307 million. The number of systems using Ada is expected to grow rapidly, reaching a contract value of $1.3 billion in 1990.

These figures are just for DOD work. They do not include any other government or private systems where Ada might spill over. In addition, Ada has a wide international commitment. It will likely become a military standard for many of the Nato countries, and in many respects Ada's commercialization in Europe is ahead of that in the U.S.

The success of Ada in the commercial world is by no means guaranteed and will evolve at a much slower pace. The features of Ada will make it more attractive for some applications than for others. For example:

- Real-time applications such as industrial process control.
- Factory automation.
- Health care and medical systems.
- Banking and financial applications.
- Large projects with many programs and many activities that must be coordinated.
- Applications with a long life during which considerable maintenance must be done.

Since Ada is not mandated for the commercial world, a great deal of product development will be required before its degree of success can be clearly predicted. Quite likely, Ada will be used initially by DOD contractors for nongovernment contracts on which they are working. Ada's success here could determine how rapidly its commercial use spreads.

Productivity gains from the use of Ada will be slow at first. Because Ada's way of doing things is so different, it will take several years just to build up the nucleus of trained personnel to allow for increased productivity. More importantly, reusable software components will only develop as a result of Ada projects. Thus, productivity gains due to reusable software will have a snowball effect.

Lisp language

Lisp (short for list processing) was developed in the late 1950s by John McCarthy at MIT to meet the unique requirements of artificial intelligence and symbolic processing. Lisp was the first high-level computer language to focus on the manipulation of nonnumeric, symbolic data and objects, rather than on the manipulation of numeric data. The facilities of Lisp are used to represent and manipulate knowledge based on its symbolic representation.

There is no one standard version of Lisp. Lisp has remained popular in the AI community because it provides the basic building blocks from which other AI languages and tools can easily be built. In the U.S., Lisp and its derivatives appear entrenched as the AI languages of choice.

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> ***Because Ada's way of doing things is so different, it will take several years just to build up the nucleus of trained personnel to allow for increased productivity.***

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Lisp is an applicative language. This means that it is structured around applying functions (operations) to a linked list of arguments that accompany those functions. A Lisp program is simply a series of function calls or requests to perform operations. If required, the function calls are preceded by any needed function definitions.

Execution of a Lisp program consists merely of the evaluation of each function call in the sequence it is presented, based on the functions defined and stored by the Lisp system. Each function call results in a Lisp value being returned by the system to the caller of the function. In addition to list processing, limited capabilities are present to manipulate characters and numbers.

A function call or function definition is only coded in the syntax of a list, which can be of an indefinite length. Thus, the list is the only data structure for a Lisp program. The syntax of a list starts out by naming the function (operation) to be performed, followed by the arguments that are to be fed to that function using full parentheses. When the function is executed, its arguments are first evaluated to determine their actual value. When the evaluation is complete, values of the arguments are used to invoke execution of the actual function.

As an applicative language, the focus of Lisp differs from most other programming languages, which are primarily composed of statements that freely route control from one portion of the program to another and concentrate on the assignment of values to variables. Most dialects of Lisp provide for simple control structures. These control structures are also coded as function calls in the list format. However, Lisp places its greatest emphasis on recursion as its primary control structure for repetitive processing.

Lisp includes list manipulation functions that allow for the creation, modification and destruction of lists. This is possible because of:

- The simple, structured syntax for all Lisp functions.
- The flexibility of the list syntax allowing the list to be of an indefinite length and the number of arguments for a function to be of an arbitrary length.
- The ability of Lisp functions to create and return a function in any data structure format.
- Both programs (function executions) and data being represented and stored in the format of lists (both are treated as normal data objects). This means that programs can be modified as data, and data can be executed as a program. One Lisp program can dynamically create and then execute another Lisp program.

These list-manipulating functions allow lists to be combined, taken apart or changed to form any desired data structure. Primitive data structures are combined in a list to form more complex data structures. This combining can continue to form as complex a data structure as required by the application.

Many of the Lisp dialects include programming environments. Programming tools typical of a Lisp environment are predefined functions — an editor, debugging aids and a compiler to allow the creation of machine code in place of the interpretative functions when efficiency is important.

The impact of Lisp on end users through internal application development using the language is likely to be limited. Rather, as AI application systems become more capable and widespread, they are likely to be written in Lisp or one of its derivatives and sold as turnkey packages. Users will then be in a position to interface with the application through user-friendly front ends rather than by actually programming in Lisp.

The need for user-friendly front ends is recognized by AI vendors. Several application-specific front ends have recently arrived on the market. Expectations are for more universal front ends to be brought to market. Vendors recognize that the absence of user-friendliness will limit the spread of AI applications.

About the author

Ed Acly is a senior consultant for International Data Corp. (IDC). This article is excerpted from the "Emerging Programming Languages" research memorandum prepared by IDC for its User Services clients. The full report can be ordered from IDC, 5 Speen St., Framingham, Mass. 01701.

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9:00-9:15	Welcome
9:15-9:45	Personal Computing 1985: User Presentation on Recent Trends in Corporate Personal Computing
9:45-11:00	Spreadsheets and Financial Modeling for Organizational Productivity: Using Lotus 1-2-3™ and IFPS/Personal™
11:00-11:30	Managing Spreadsheets and Financial Models: A Case Study
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IN DEPTH

IEEE 802.4
CSMA/CD
Nancy R. McMillan

Going with a standard

By Tony Bolton

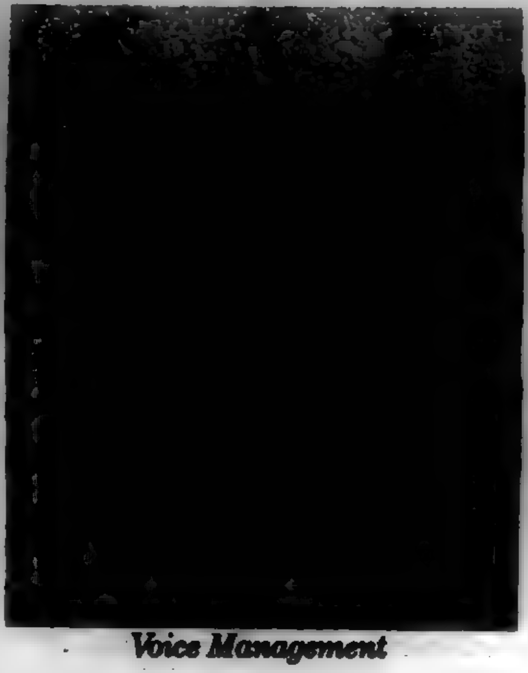
But which one?

Which way to go for a local-area network standard for the office? IEEE 802.3 CSMA/CD—(Ethernet-type) has been the usual choice, but a vendor says that as offices increasingly suffer the communications problems of the factory, IEEE 802.4 token bus broadband networks make sense.

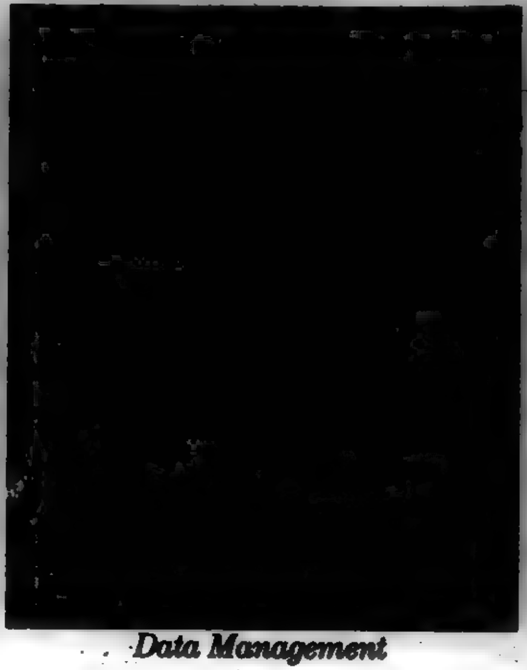
Local-area network users and vendors typically perceive standardized networks as having two separate and distinct application environments: IEEE 802.3 CSMA/CD networks (Ethernet-type) have a comfortable niche in the office, and IEEE 802.4 token bus broadband networks are suited principally for the factory. However, the rapidly changing office environment, along with reduced costs and greater sophistication of IEEE standard token-passing networks, are causing these conceptions to change.

Among the early developers of CSMA [carrier-sense multiple access with collision detection] networks were major office automation vendors who knew and understood office equipment. Just a few years ago, the processing environment of the typical office was dominated by the mainframe, and communications consisted primarily of batch transactions with very limited interactive processing between stand-alone word processing systems and the like. As a result, most local-area networks sold in the office environment to date have provided point-to-point, host-to-terminal connections for inconstant and "bursty" network traffic, which is precisely the kind of traffic that CSMA/CD networks best handle.

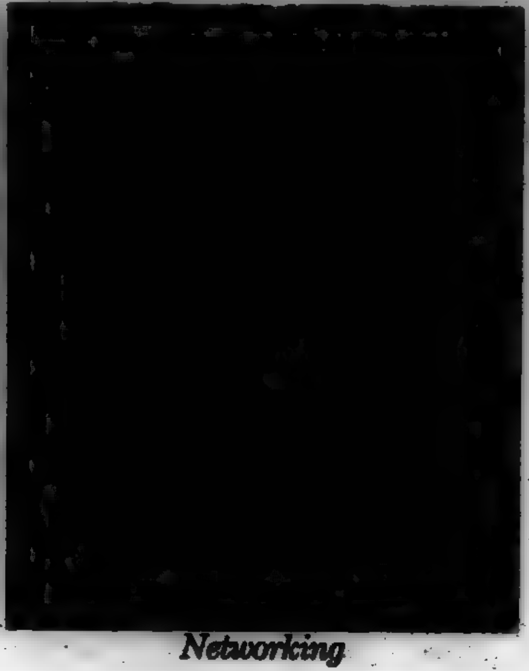
ILLUSTRATION BY NANCY R. MCMILLAN



Voice Management



Data Management



Networking

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But is this the automated office of today and, more importantly, tomorrow? The office environment is changing; personal computers and distributed workstations have led to more decentralized, local processing. At the same time, an increasing number of data processing and MIS systems have high-speed, synchronous data transmission requirements.

This equipment is available from a variety of vendors, most with incompatible communications protocols. In fact, the office is now a sophisticated complex whose communications requirements are drawing increasingly closer to those of the factory.

The factory has always consisted of diverse equipment from multiple vendors. This equipment is located throughout the facility in pockets, or islands, which function as relatively autonomous groups in a distributed processing fashion. For instance, production, material and quality control information typically originates in the MIS/DP environment, while the engineering drawings and programs used to specify and control manufacturing processes on the plant floor originate in engineering offices and computer-aided design and manufacturing centers.

Clearly, one of the objectives in the factory is to integrate these islands of automation by providing immediate access to shared data, thus supporting real-time decision making by management and on the plant floor and ensuring the smooth control of manufacturing operations without costly downtime. Likewise, as the hardware and software in the office complex become more sophisticated and less expensive, with more reliance on local processing, the need to access shared data increases.

Furthermore, as communications involving digital images, virtual terminal and large file transfers become more common in the office workplace, the nature of the communications link begins to resemble the real-time, constant and interactive communications flow of the factory. It is important, then, to examine the technologies behind the IEEE 802 standards in light of current and future application requirements, without preconceptions as to the traditional market alliances of the past.

Current products meet two IEEE 802 standards.

IEEE 802 standards

The IEEE 802 project has focused its effort on standardizing the lower two layers of the open systems interconnection (OSI) reference model. To date, networking products meet two of the IEEE 802 standards for media access control (see figure).

Common elements of these access methods include data rates of between 1M and 20M bit/sec, decentralized control over access to the network and robust error detection via a 32-bit frame check sequence. The differences between them, however, result in strengths and weaknesses that should be matched to the application and the network environment.

The IEEE 802.3 CSMA/CD access method uses a bus topology so that all stations on the baseband cable can simultaneously hear all transmissions. If a station detects activity on the network, it waits to transmit until the network is free.

When initiating a transmission, the station monitors the network to determine if another station began transmitting at the same time, which results in a collision. If stations detect a collision, both wait unequal amounts of time before attempting to transmit again.

Token passing

Token passing is the access method specified in the IEEE 802.4 standard. It employs a special data frame, called a token, which continuously circulates among all stations on the medium. A station can transmit data only when it holds the token. A station can only hold the token for a fixed maximum amount of time, which gives an upper bound to the length of time any station must wait before gaining access to the network. This is what makes token passing deterministic in nature, as opposed to the contention-based access of CSMA/CD networks.

CSMA/CD networks are useful in situations where network traffic is bursty and frame arrival times are not critical, such as in asynchronous terminal communications. Under light loading conditions, users have very rapid access to the network. As a result, CSMA/CD networks are often found in an environment that does not require constant or time-critical communications or high network loads.

However, as network use increases with the addition of more asynchronous terminal users, increased distributed processing and the rise in high-speed, synchronous transmission requirements such as IBM 3270 communications, CSMA/CD networks present several problems.

Because CSMA/CD's collision-detection method does not guarantee that further collisions will not occur when a station makes repeated attempts to access the network, the network cannot supply an upper bound on the time required to transfer data, which makes it difficult to monitor or manage network flow reliably.

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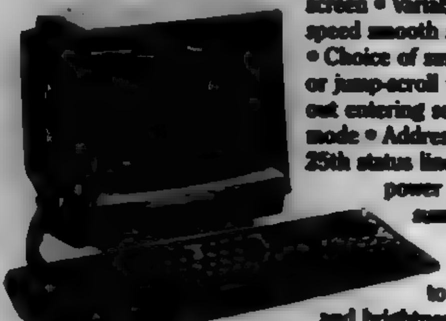

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In addition, as the load on a CSMA/CD network increases, collisions increase exponentially. This increase can cause sudden decreases in network performance just when the network is busiest. The threshold at which CSMA/CD networks become inefficient because of repeated collisions is calculated to be about 30% of maximum capacity, which is the recommended guideline for *average* system load.

In contrast, because stations on a token bus network are limited to an upper-bound time in which they can hold the token, delays in accessing the network can be reliably calculated. A further advantage of token bus networks is their ability to prioritize data frames and stations on the network. Critical users can receive increased access to the network by lengthening the time they are allowed to hold the token.

In addition, the 802.4 standard defines four priorities of data frames, a technique that ensures that the network will always transmit high-priority frames and shed low-priority frames in descending order as network load increases. The ordered, predictable nature of token passing is one of the principal reasons factory users have chosen this access method for their time-critical operations.

Network length

CSMA/CD's requirement that all stations must be able to listen to the medium before and during data transmission affects both the length of the network and the size of transmitted data frames. To compensate for the time it takes a station to listen to the length of the network, the 802.3 baseband standard specifies a minimum frame size of 512 bits. At a data rate of 10M bit/sec, this large frame size is necessary so that if a station at one end of the network begins to transmit at the same time as a station at the other end, their messages are guaranteed to overlap so that the collision can be detected.

This process becomes impractical on baseband networks with lengths greater than 2,500 meters. The IEEE 802 committee is expected to propose nearly identical limits to the broadband CSMA/CD standard it is currently reviewing. Because token passing does not require collision detection to access the medium, messages can be of any length, and network size is limited only to the time it takes the token to circulate around the network.

> ”
>
> ***The threshold at which CSMA/CD networks become inefficient because of repeated collisions is calculated to be about 30% of maximum capacity, which is the recommended guideline for average system load.***

Baseband coaxial cable, specified for the baseband versions of CSMA/CD and token bus networks, can run longer distances than the shielded twisted-pair wiring common to private branch exchange (PBX) systems but is not as immune to noise. In order to preserve the transmission properties of the cable, there are specific constraints placed on how and where network interfaces attach to the cable.

For instance, the 802.3 CSMA/CD baseband standard gives specific intervals for tapping into the cable, and access units and drivers must be located right at an active tap. In addition, to add stations to a CSMA/CD network (as long as the 2,500-meter maximum network length is not exceeded), special drop cables are required to connect the station to the active tap on the main trunk.

Broadband coaxial cable, specified in only the 802.4 token bus standard, has superior frequency handling characteristics, can run distances up to 25 miles and provides excellent immunity from noise interference.

Drop cables as long as 30 meters can connect stations to the main trunk.

Most important, however, is the bandwidth it provides. In contrast to single-channel baseband coaxial cable, broadband provides multiple channels that can carry signals from several networks, as well as other applications such as voice and video, simultaneously.

In broadband systems, remote stations use lower ranges of the broadband frequency to transmit data to a common central point, called the head end, while signals traveling away from the head end to the remote sites use higher frequency channels. A remodulator is located at the head end to receive upstream signals and remodulate them to a channel in the downstream direction.

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Why key DP/MIS managers are keeping RCA Cylix a secret.

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is important in the office complex. In addition to handling data communications, a single broadband cable can provide the backbone for networking all types of communications — teleconferencing, PBX systems, closed-circuit TV, educational telecasts and CATV.

The use of a standard wall-mounted outlet eliminates the need to rewire offices every time a new network station or system is installed. Instead, drop cables can connect the new station or system to a passive tap on the trunk cable. Because broadband cable is not subject to the same distance limits as baseband, network users can choose to wire their entire building complex to allow for relocation of individuals and equipment, as well as future growth.

The major costs of a network derive from the backbone media hardware and the communications interface components. Typically, broadband systems are more expensive than baseband systems, particularly in smaller installations where the required head-end remodulator and amplifiers (if necessary) represent a large percentage of the total system cost.

In larger installations, however, the costs of 802.3 baseband coaxial systems and 802.4 broadband systems become nearly equivalent because of the high cost per meter of the 50-ohm coaxial cable, special drop cables and active taps required by 802.3 CSMA/CD systems. Installation costs are roughly equivalent, although broadband systems may require some preinstallation design, which could add to the cost.

The major cost distinction between the two types of networks, then, is the cost of the communications components, which typically ranges between $500 and $1,000 per connection. The codification of CSMA/CD technology in the IEEE 802.3 standard, as well as its acceptance, has led to low-cost, very large-scale integration (VLSI) implementations of the CSMA/CD protocol. As a result, a variety of vendors now offer CSMA/CD communications components, and users are directly benefiting from low-cost products attributable to competition, as well as a variety of enhancement options, such as bridges and gateways between separate networks.

> ”
>
> *The use of a standard wall-mounted outlet eliminates the need to rewire offices every time a new network station or system is installed.*

The IEEE 802.4 token bus standard was approved by the IEEE 802 committee just three months after the 802.3 CSMA/CD standard and has since generated a high degree of interest among network users and vendors. Cost per connection for token bus networks is now slightly higher than CSMA/CD networks, but VLSI implementations are on the horizon.

The cost of an IEEE 802.4 token bus network will follow a downward cycle comparable to that of CSMA/CD networks. In addition, plans are already under way to develop bridges that will enable the token bus broadband network to serve as the backbone network in the office complex, as well as a general-purpose communications network.

The predictable and ordered nature of token passing readily lends itself to network management. Because a well-defined set of protocol rules is used to detect and resolve system errors, each network station can easily track and report errors. In addition to monitoring the behavior of the basic token-passing access protocol, network managers can monitor the load on a network (and invoke the priority mechanisms available to them before high network loading becomes a problem) or configure the network to do this on an automatic basis.

Choosing the right network

Just as the flexibility and multipurpose applications of broadband cable, combined with the distinct advantages of the token-passing access method, provide specific benefits to the factory, they readily lend themselves to the changing office environment. Data communications managers in the office complex, therefore, must look again at their networking requirements now and for the future. One thing is certain in this dynamic environment: Once a local-area network is installed, system requirements are bound to change and user expectations will increase.

Thus, network performance is a critical consideration, and other factors, such as expandability, network length, network load, cost and management tools, are equally important. While CSMA/CD networks have a strong foothold in the office today, the advantages of token bus networks ensure that both types of networks will peacefully coexist there in the not-too-distant future.

About the author

Tony Bolton is director of product management, planning and marketing for local-area network products at Concord Data Systems, Inc. in Waltham, Mass. Bolton oversaw the development of Concord Data's Token/Net local-area network, the industry's first broadband token bus network to meet the IEEE 802.4 standard.

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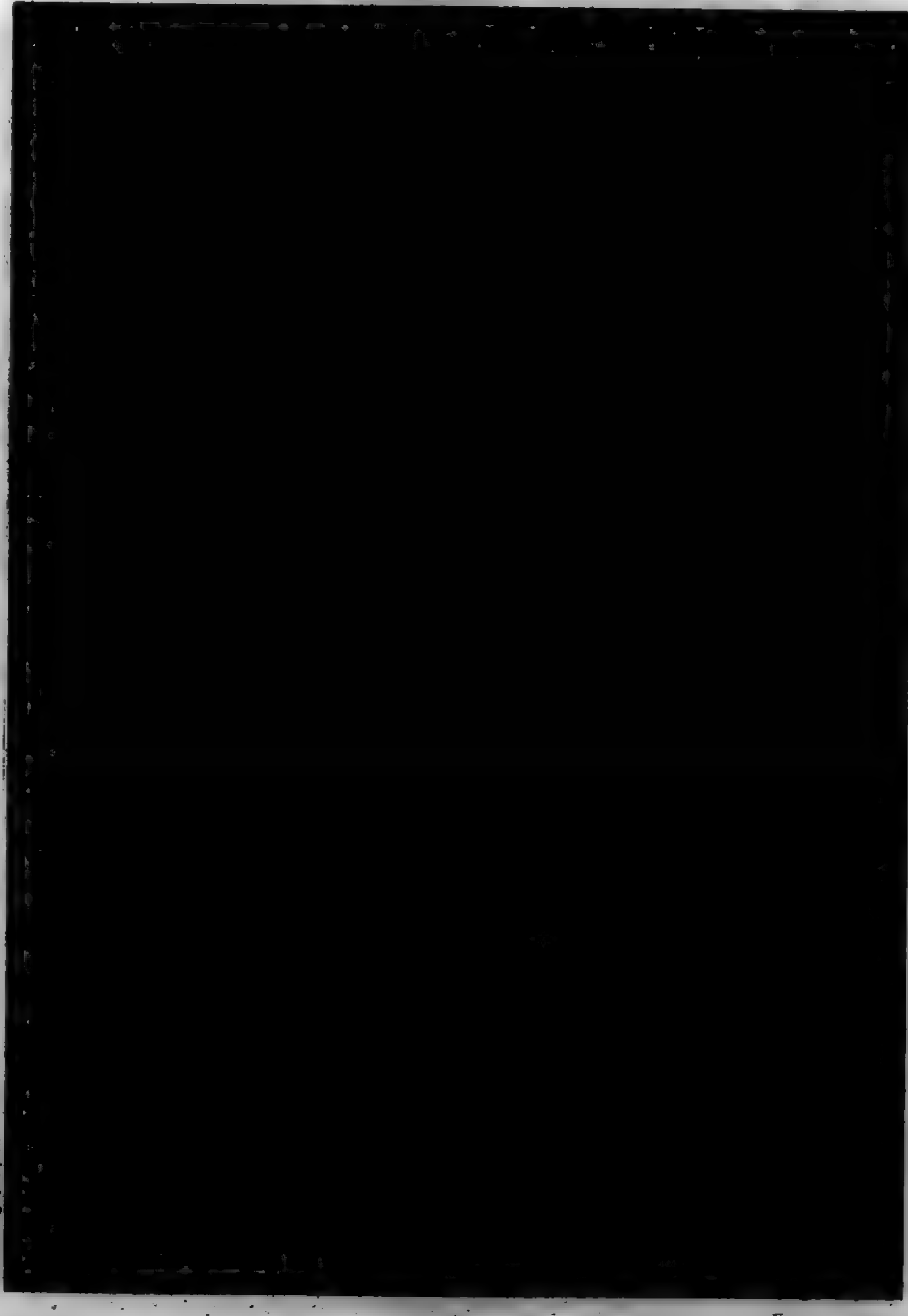
Special Report

Computerworld
March 25, 1985

Graphics Systems
Form and function



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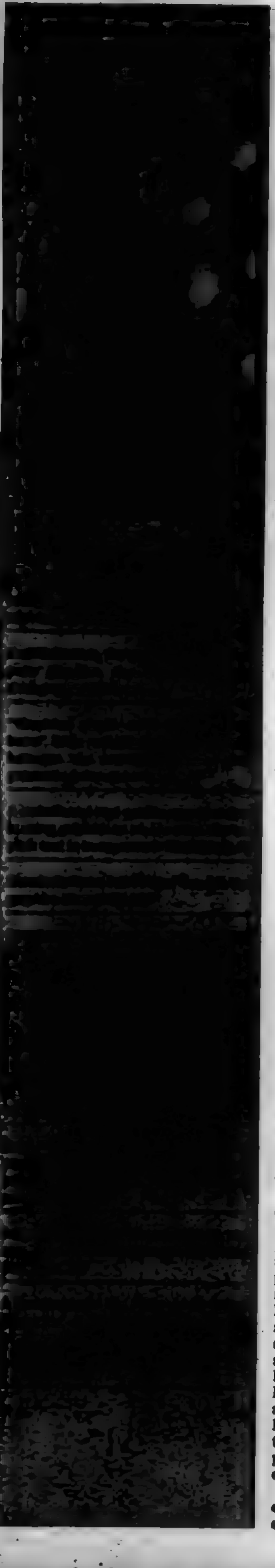

Hardware to capture spotlight

Chip-level advances, laser printers, nets stealing software's thunder

By Edward Warner
CW Staff

While the story of microcomputer graphics has been one of graphics applications software, analysts say that in the next year or so it will be hardware's turn to take the stage.

One of the reasons for this turnaround is that graphics software will become available as firmware on read-only memory chips, greatly increasing the speed of execution of graphics functions.

In addition, advances in peripherals will occur with the arrival of low-cost laser printers that truly integrate graphics with text. Also coming onto the hardware front is the use of local-area networks, which will make possible the sharing of those printers and plotters.

The greatest hardware advances on the near horizon, though, will come at the chip level, according to analyst Stanley Klein, president of Technology & Business Communications, Inc. Included, he said, will be more widespread use of the 32-bit microprocessor, which will accelerate program execution, and the use of denser random-access memories (RAM), including 1M-byte RAM chips. Such RAMs, Klein said, will speed graphics — or any other program — by allowing more of it to reside in working memory, rather than on a disk.

Another major advancement at the chip level will be the incorporation of graphics functions on silicon chips, Klein noted, especially in the area of computer-aided design, the most often used form of computer graphics. Two firms, Weitek Corp. of Sunnyvale, Calif., and Silicon Graphics, Inc. of Mountain View, Calif., have already introduced boards incorporating some of the basics of CAD software. This year, Manufacturer's Consulting Service, Inc. will release firmware containing the basics of its CAD programs, Klein said. In addition, MCS, Inc. of Irvine, Calif., publishes the Anvil 4000 and Anvil 1000 CAD packages.

Putting the basics of CAD onto a chip, explained industry analyst Carl Machover, frees software to be programmed for more complex functions and, most importantly, allows the program to run faster since it would not need to interact with the disk. New releases of the software would not affect the firmware, since the basic vocabulary of design remains the same, said Machover, president of Machover Associates Corp., a White Plains, N.Y.-based consulting firm specializing in computer graphics. Looking toward the more distant future, "some of us are talking about putting a whole CAD package on a chip," he said.

Already, Machover noted, one vendor is offering a coprocessor for minicomputers that is said to provide for program acceleration. Meanwhile, Mega Tech Corp. of San Diego, Calif., and Lexidata Corp. of Billerica, Mass., have developed CAD hardware with what Machover called "picture enhancement features." On the personal computer side, a hardware box is available that provides for basic line drawing, a CAD function once found only in software, he said.

Whether with a personal computer or a mini, users can soon expect firmware and denser RAMs to provide "performances that are several orders of magnitude faster than what you can expect to get out of pure [CAD] software," Machover said.

The hardware for output and display of graphics is also getting better and cheaper, according to graphics analyst Alan Paller, president of AUI Data Graphics in Washington, D.C. Within a year or so, he observed, users will see the spread of low-cost laser printers that have the capability to produce both graphics and text. Already, he said, the Apple Computer, Inc. Laserwriter, introduced in January, is a harbinger of that trend.

Users also will see the development of high-quality black-and-white dot matrix printers with an output of up to 250 dot/in., up from the current high of 200 dot/in., Paller predicted.

Another genus of printers set to make a big splash, Paller added, are those using high-quality color thermal transfer. Currently, he noted, one of the few such printers is the D-scan machine marketed by Seiko Instruments, Inc., priced at approximately $8,000. "Inexpensive color hard copy is one of the real needs," analyst Klein observed.

Klein also predicted that "amazing" price reductions would continue in the graphics peripherals market.

Whether laser or color thermal, the new generation of printers will still be costly and, as Paller observed, the spread of local-area networks will be an indirect hardware boon to graphics. "You can ruin the value of hard-copy devices by not sharing them," he warned.

The display of graphics images will also continue to improve this year, if 1984 was any indication. The past year saw the popular use of high-resolution bit-mapped displays, as in Apple's Macintosh and IBM's recently announced Personal Computer Professional Graphics Display, reportedly capable of displaying 256 colors simultaneously, and Professional Graphics Controller. The display and controller were designed to be used together and are targeted at the CAD market, IBM said.

While new printers and displays may be popular, Paller said that user interfaces such as the mouse are "yesterday's news" and few advances can be expected soon. Klein agreed, claiming that interfaces "are not going to make or break the technologies," though voice input may soon become popular.

One interface on the personal computer that is catching on for CAD graphics users is the graphics palette, a pressure-sensitive device that can translate drawings done on it into images on the screen.

Such an interface is already common on mini-based CAD systems and, according to the marketing manager for one palette vendor, is the most natural one for draftsmen making the move to the CAD method of drawing. Such workers, according to Andy Nilssen of Pencept, Inc., are more comfortable working with pad and pencil than they are with keyboards.

Pencept of Waltham, Mass., produces the Penpad 320 graphics tablet for the IBM Personal Computer. Recently, the firm introduced a version of Penpad 320 with an interface to the Autodesk, Inc. Autocad package, the personal computer CAD package said to be most widely used. Called Pencad, the package includes a Personal Computer interface board, software and Penpad 320.

Related to the touch-sensitive pad is the image sensor, a relatively new CAD input device that can be moved over a three-dimensional scale model of a product to capture its shape and design.

Another type of peripheral making its mark on the graphics scene is the image processor, such as the Wang Laboratories, Inc. Professional Image Computer (PIC), which uses a camera lens on a lighted stand to scan and digitize a picture for storage, manipulation and even transmission. Other devices, such as the AT&T Video Display Adapter and Image Capture Board, rely on video cameras to capture images.

The AT&T products, both an-

See HARDWARE SR/5

Carl Machover:
An Interview

Computer graphics, an area rich with opportunities, is a very familiar field to Carl Machover. He has been involved in the computer graphics industry for more than 25 years.

Machover began his career in computer graphics in the 1950s with United Technology Corp. and Skiatron Electronics and Television Corp. In 1960, he became cofounder and executive vice-president for Information Displays, Inc., an early pioneer in the computer graphics market. In 1976, Machover formed Machover Associates Corp., a consulting firm specializing in computer graphics.

He is also an author, speaker and adjunct professor of computer graphics at Rensselaer Polytechnic Institute.

In a recent interview with Computerworld *Special Reports Editor Janet Fiderio, Machover discussed computer graphics, an industry that is rapidly changing.*

***Q** A lot has happened at the microcomputer level in graphics over the past year. What developments can we look forward to in '85 and '86?*

If we use the past as an example, and look at today's market pressures, we will see increased function in the workstation itself.

I expect to see greater function in microcomputer hardware additions of one kind or another, not in software. There will be increased pressure to refine the picture quality or the resolution of microcomputer displays.

For example, early micros had a 125- by 125-pixel resolution, while some of the more recent units are in the 300- by 400-pixel range.

Currently, there is a graphics board available for the IBM Personal Computer AT that provides a 480- by 640-pixel resolution. I would guess that in about a year we will begin to see personal computers with a 1,024- by 1,280-pixel resolution.

Also, the amount of internal storage memory will increase. Today a microcomputer with 512K bytes is not unusual; a couple of years from now a microcomputer with 4M to 5M bytes may be the norm.

My guess is that you'll see a very low-price scientific market (a graphics scientific market) emerging that makes use of these new micros. I think that the de facto standard will evolve around the AT.

***Q** What about graphics software? What will be some of the hotter microcomputer developments in this area?*

Computer-aided design. The whole series of CAD systems that are being introduced are worth watching. Autodesk, Inc.'s Autocad, for example, sold almost as many CAD systems based on the microcomputer as the conventional CAD industry has sold in systems since 1969.

There are some interesting statistics involved here. By the end of '84, it was estimated that there were about 15,800 to 16,000 conventional CAD systems installed. This represents about 65,000 workstations: conventional Computervision Corp., Applicon and IBM (machines). That is in a period from, say, 1970 to 1984.

In the two years since we have had microcomputer CAD, the microcomputer CAD industry has delivered 15,000 systems, about 10,000 of which were delivered by Autocad. That is one workstation per system, so the number of workstations is down and the dollar value represented here is down, but the body count is phenomenal.

These systems will become more functional and refined; they will also become more specialized. Most of the microcomputer CAD-based systems today are sort of generalized drawing systems.

So microcomputer CAD systems are moving into the vertical markets?

Yes. What is happening is that they are moving into a second-level market in which vendors are adding refinements for given application areas; I think that this trend will accelerate.

CW photo by J. Fiderio

The problem with second-level or vertical markets is that there is no distribution channel for them. Once you use a microcomputer and go into a vertical market, and you are selling systems in the $10,000 to $15,000 range, how do you sell them? The normal levels of support are simply not available.

There has been a real problem establishing communications and distribution channels for these levels, and I think once those channels get well established, this market will explode even more than we see it today.

***Q** How does this growth in the personal computer computer-aided design and manufacturing market affect the mini and mainframe CAD/CAM market?*

I think it has scared . . . the conventional market.

Large companies are beginning to recognize that they are going to have to put some strategy in place to account for the personal computer's increasingly sophisticated presence in the market.

I think over the next few years what you'll find is that most of the major companies will have some level of personal computer offering. It is not clear how it is going to go.

***Q** Where do you think the market separation will fall?*

I think to survive, larger companies will expand the product that they offer. I don't see a mainframe- or minicomputer-based system surviving without offering some link on the manufacturing side and offering more integrated systems. I think the ones that are not integrated are going to migrate down to the microcomputer level.

After all, more sophisticated users are recognizing that the big payoffs come from the integration of engineering and drafting and computer-aided engineering, drafting and CAD/CAM. It is unlikely that they can build an effective system based on microcomputers for that environment because they can't get enough performance out of them. What they will need is a mixed environment of mainframes, minis and personal computers but operating on a project rather than a task basis.

New users will tend to migrate to the low-cost workstations and the microcomputer. Larger companies will use micros as part of their strategy but will continue to have essentially closed shops. For drafting functions, the high-speed functions of a turnkey system are very important. The numerical control aspects in some cases require many resources.

When a user moves into very sophisticated analysis, such as circuit analysis, he probably doesn't have enough power in a microcomputer for the process, or it would just take too long.

***Q** Presentation graphics are in the news a lot lately. Do you think that executives are really more attuned to the benefits of presentation graphics, or do you think it's hype?*

It is a little bit of both. I think that classically, the business person, as opposed to the scientific person, does not have a background in graphics — most of his professional training is in numbers, not in graphs.

Many, however, are recognizing that they are being deluged with so much data that they have no choice but to find a way of being more efficient in the use of that data. They have to find a way of turning data into usable information.

Certainly one of the tools for doing that is graphics of one kind or another. So there are a large number of business people who are recognizing that the only way that they can survive is through the use of these graphics systems. Others still have a degree of skepticism, but this issue has gone on for years.

There certainly is an amount of hype — trying to get people to do this — but the bottom line is that increasingly they are. The business graphics market is growing faster than the CAD/CAM market.

***Q** Do you think that recent advances of low-cost laser printers and advanced pen plotters, ink-jet printers and color thermal transfer printers will help boost corporate use of the microcomputer?*

Yes. Probably the one that will be most instrumental in doing that will be the laser printer. For a printer to meet corporate applications, it must have high resolution, be very fast and be relatively inexpensive. The thermal dye transfer of the pen plotters and the ink jets are still technologies that are too time-consuming.

The present limitation on laser devices is that they do not have the color technology. I sense that there will be color lasers on the market economically priced within the next couple of years. We are already beginning to get rumors about it, and I think that once those become available the logjam argument for not using the graphics because "I can't get enough output copy in color" is going to be broken.

***Q** Right now the military dominates the simulations sales market. Do you see simulations sales for commercial use growing?*

Yes I do, although it's a cost-sensitive market. A good high-performance simulator in today's market costs $5 million just for the display generator portion.

Airlines can purchase simulators because a training session in a simulator costs around $400 an hour, whereas a training session in a real airplane can cost $4,000 an hour. But if I am going to simulate people driving down the road, as in a driving school lesson, the economics just aren't there at that price. There are many simulation markets that will open up as the cost of simulation goes down.

I think there are two conflicting trends in the simulations market. There's the true computer graphics kind of simulation, and there is the growing use of interactive videodisks.

I think there is going to be a real race between the simulation growing out of videodisk technology and the simulation growing out of computer graphics technology. I think what will happen is that you will get distinct classes of simulators and some of them are going to be based on videodisk technology and others are going to be based on computer graphics technology.

***Q** Will artificial intelligence play a role in tomorrow's graphics systems?*

Yes, if you define AI as a generalized machine for thinking as people think. At this point, AI probably is still too academic to be used in the graphics area, but a subset of the field — knowledge-based systems or expert systems — are extremely important for graphics.

I would guess that it will take three to five years before dramatic products in this field arrive, but certainly it is an area that has to be watched carefully.

Special Report

Executive support systems put corporate data base

By Alan Paller
Special to CW

> *In commercial organizations, MIS executives recognize that today's fast-paced, competitive markets make it necessary to have the best information available immediately.*

The use of support systems in executive suites is on the rise throughout the U.S. Today, executive support systems can, with the push of a single button, deliver information rapidly, accurately and in graphics formats that communicate trends and patterns.

Nicknamed "graphics visual early warning systems," these new tools revitalize the relationship between top management and DP departments. They put the resources of corporate data bases at the fingertips of the people who need that data to manage the organization. They deliver the data in graphics format, usually in less than 10 seconds. And when an executive sees information that needs to be communicated to other people, he can, with the push of a button, automatically produce 35mm slides, overhead transparencies or paper charts.

At General Motors Corp. (GM) headquarters in New York, executives consider their graphics executive support system so important that they will not discuss it publicly. At a GM subsidiary, Electronic Data Systems Corp. (EDS), an executive support system helps senior management monitor the performance and finances of all regional data centers.

According to one EDS executive, the graphics system made buying a mainframe unnecessary and helped to cut overhead cost growth significantly.

GM is not the only organization to discover graphics executive support systems. The U.S. Army Aviation Systems Command pioneered an online system for its senior officers that includes 1,400 charts, which are automatically updated each time the data changes. Each chart is available at the touch of a button. The Air Force's Electronic Systems Division is prototyping a similar system.

Other organizations, both large and small, are considering extending similar capabilities to senior managers. Their goals are the same — they want to make the computer a vital tool for top management.

In commercial organizations, MIS executives recognize that today's fast-paced, competitive markets make it necessary to have the best information available immediately. That is the justification for Sears Roebuck & Co.'s Easy Access System, which provides instant access to the previous day's operating results from more than 95% of its retail stores.

Improvements involve top management

In government agencies, MIS executives recognize that productivity improvements will not happen without the involvement of top management. That involvement is made easier when management has fingertip access to the data that measures productivity.

What has surprised a number of MIS managers is how quickly demand for these systems can spread among top management.

That raises the next question. If executives are excited about these new push-button systems, why has it taken so long for the idea to catch on? Four barriers made these systems impractical in prior years:

- The data was not there. Either it was not on the computer, or it was there and only the experts knew how to get at it. Retrieval systems required extensive training, and executives did not have the time to learn the systems.
- Equipment was expensive and communications were slow. Graphics terminals used to cost $20,000 or more. Also, communications lines were too narrow to pass pictures quickly. No one wanted to spend a lot of money, only to have to wait a minute or longer just to see the picture.
- Graphics hard-copy equipment demanded too much effort. Once a chart was created on the screen, there was no easy way to make a high-resolution 35mm slide, an overhead transparency or a paper chart automatically. The terminal or personal computer user had to be an expert plotter operator, keep his own pens and paper and even learn the switch settings. Most executives know their time is too limited for them to become machine operators.
- The personal computer arrived without connections to the data. Outfitted with Lotus Development

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Paller is president of AUI Data Graphics, a consulting firm in Washington, D.C., and chairman of training and education for the National Computer Graphics Association.

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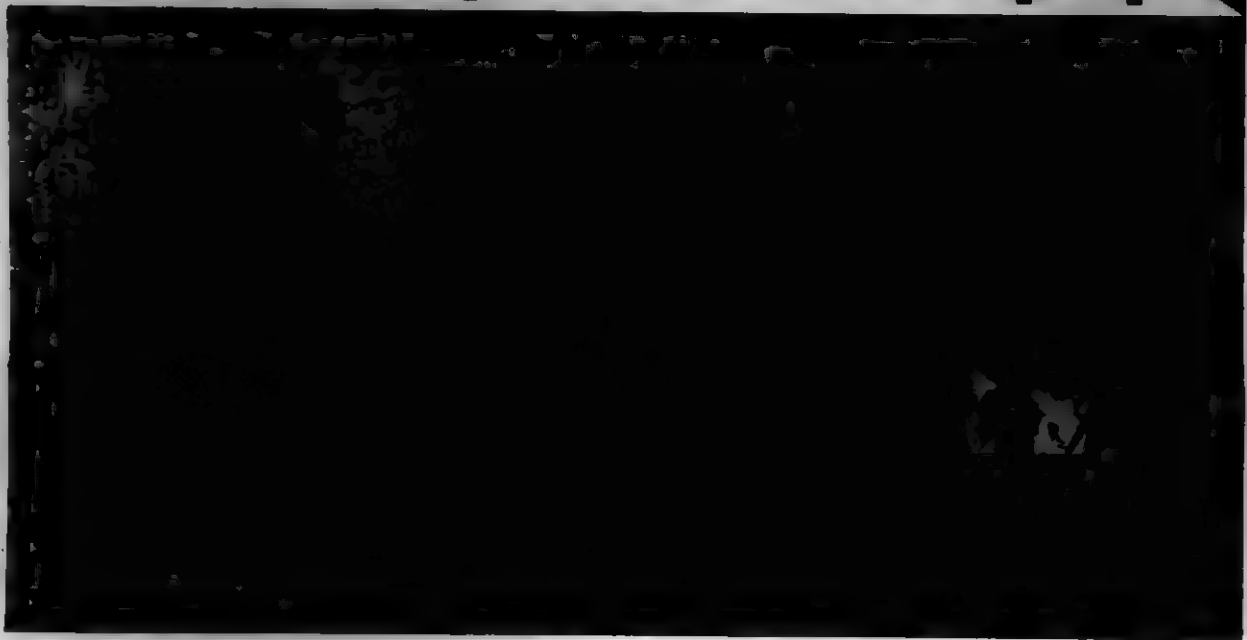

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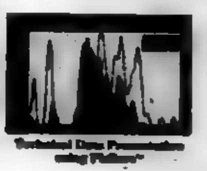

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Corp.'s 1-2-3, the personal computer promised easy executive computing, but the novelty soon wore off for senior managers.

The cost of graphics terminals has dropped below $5,000. New graphics hard-copy equipment has been introduced that operates automatically and can be shared by dozens of users.

The pioneers who built their own systems spent one to two man-years creating the software and three to six months putting together the right data and the right charts to solve the business problems. All of them felt the investment was worthwhile, but they would have preferred an off-the-shelf solution.

Late in 1984, a combination of new announcements in the graphics software and hardware fields made off-the-shelf graphic visual early warning systems for IBM computers available for the first time.

The principal components are listed below:

- IBM's Graphics Data Display Manager software provided support for instant access to graphics images. It also provides a mechanism for transferring graphs from SAS Institute, Inc.'s SAS/Graph and IBM's Interactive Charting Utility into Issco Graphics' Tell-A-Graf, which is the method of choice for supporting the new graphics devices listed below.
- Issco's Ivias option to Tell-A-Graf provides a system that stores and retrieves charts instantly, manages the automatic updating of libraries of charts and provides push-button access to graphics devices for production of 35mm slides, transparencies and paper charts.
- New graphics devices provide shared access to higher quality output. Output from these devices is available at the touch of a button.

Some of the new graphics peripherals include the following:

- Matrix Instrument's QCR film recorder makes artist-quality slides but acts as a printer to an IBM computer. The price is less than $40,000 for a single device that can serve hundreds of users.
- Quality Micro Systems, Inc. laser printers make publication-quality black-and-white charts at a rate of two to eight per minute at a cost of less than $15,000. It can be shared among dozens of people and serves as a standard printer when not being used for graphics.
- IBM's updated 3800 laser printer brings high-priced but very high-speed black-and-white graphics to every user of the IBM mainframe computer.
- Tektronix, Inc.'s and Advanced Color Technology, Inc.'s new ink-jet printers make full-color charts on paper or transparencies and run without operators for extended periods.
- Nicolet Zeta Corp.'s 887 plotter offers continuous plotting without operator intervention and can emulate IBM printers.

Evidence of extraordinary demand for graphic early warning systems can be found in the number of organizations that decided to acquire the new Ivias software before the end of 1984.

Sixty different organizations, ranging from aerospace and pharmaceutical firms to banks, oil companies and government agencies, spent an average of $20,000 each to give their users immediate access. The number of organizations is expected to rise by 400% during 1985, as top managers discover that executives of other companies in their industries have, at the push of a button, instant access to the data they need to stay competitive.

HARDWARE

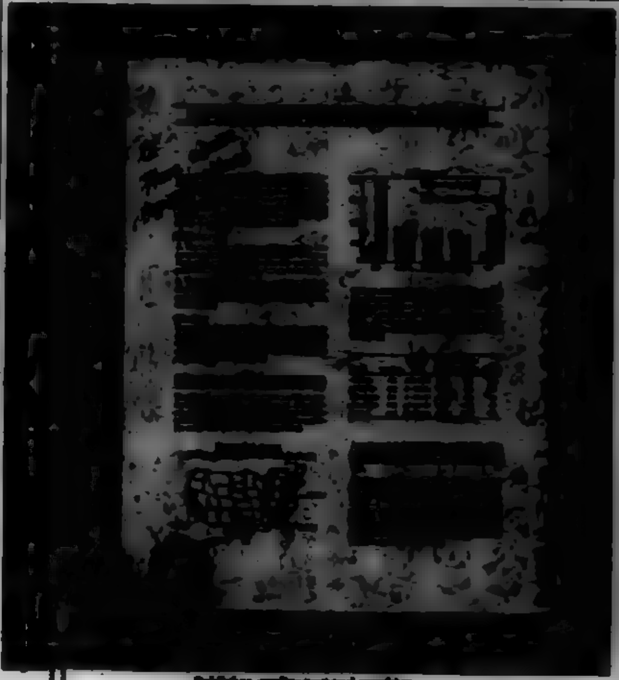
from SR/2

nounced early last year, are said to permit three-dimensional pictures to be captured and displayed — albeit two-dimensionally — and to be sent over telephone lines to other users. AT&T said that the products and related software would permit a realtor, for example, to transmit pictures and prices to prospective buyers.

The Wang PIC, according to its marketing manager Len McCarthy, has found a broad range of applications, including its use by a bank to replace telex and optical character recognition transmissions. Early this month, Wang introduced a package for CAD, using the PIC, that included Autocad2 along with a black-and-white thermal transfer printer, a 30M-byte storage unit, a high-resolution monitor and a Wang Professional Computer, the unit upon which the PIC is based.

Taking a futuristic view, Machover said that five to 10 years from now the big development in graphics will occur in the mainframe environment, with the rise of parallel processing. Parallel processing, now in only limited use, would allow for the creation of richly detailed scenes that could be changed in seconds.

This all goes to show that while the personal computer may now be in vogue for graphics use, the day of minicomputer and mainframe graphics is far from over. As Machover said, the increasing use of the personal computer for graphics "does not mean that we won't need larger resources. For every problem that we start migrating down to the personal computer, we can think of a whole new series of new problems that we had no way of attacking before."



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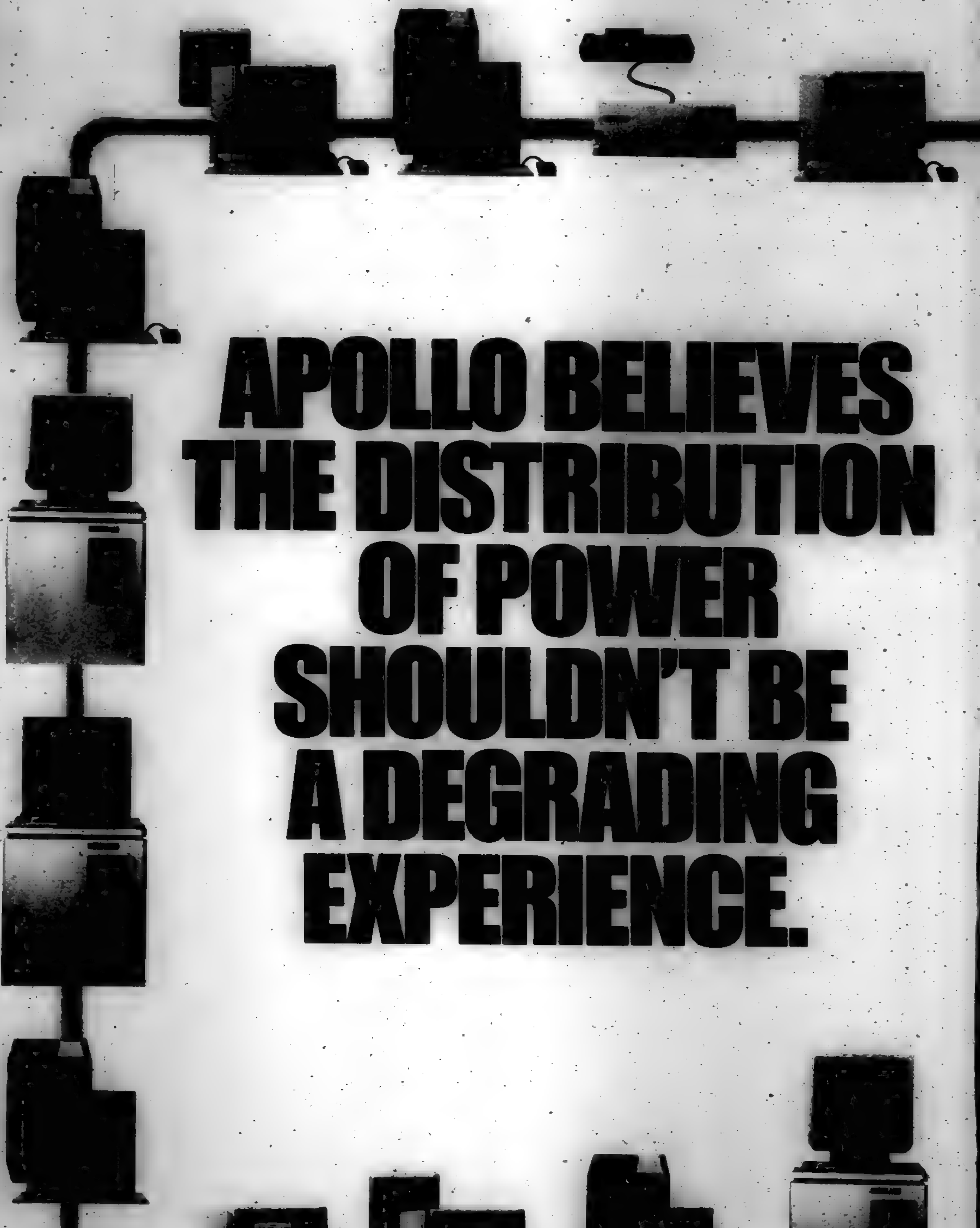

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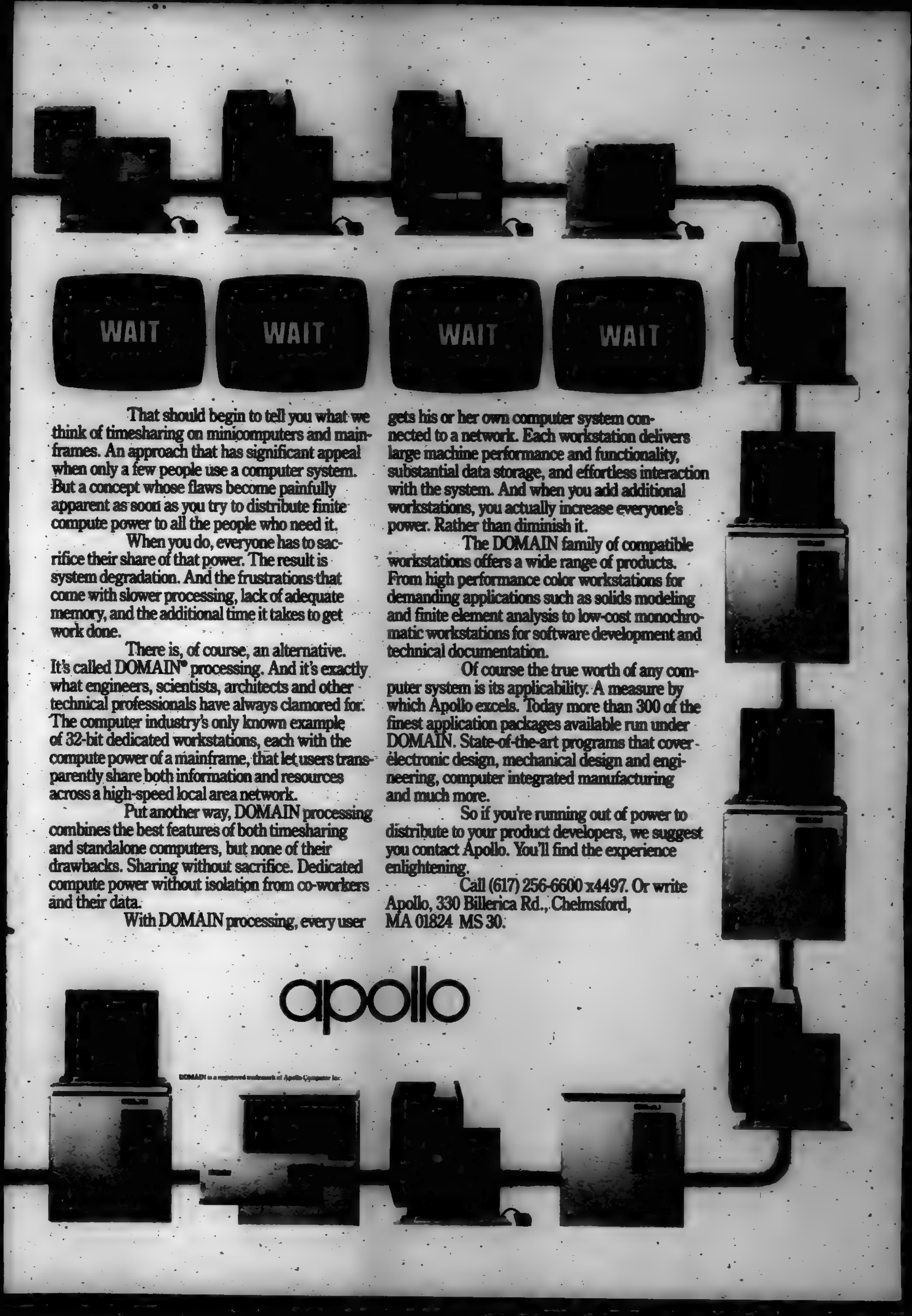

That should begin to tell you what we think of timesharing on minicomputers and mainframes. An approach that has significant appeal when only a few people use a computer system. But a concept whose flaws become painfully apparent as soon as you try to distribute finite compute power to all the people who need it.

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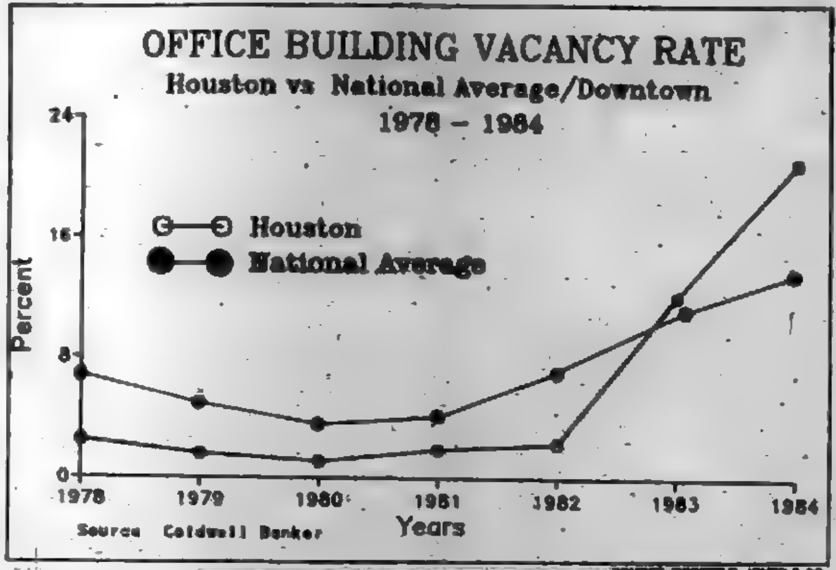
Visual aids enhance value of appraisal firm's reports

Automated graphics process improves turnaround time, quality of designs



SOURCE: ROBERT B. JONES & CO.

Figure 1. Vacancy charts are one form of graphics the firm produces.

HOUSTON — A commercial real estate appraisal firm here is using computer-generated graphics to buttress hardbound reports that it creates for clients who want to know the current and future value of investments they are planning to make.

Robert B. Jones & Co. appraises office buildings, golf courses, malls, horse ranches and other large commercial properties. Its clients — the Federal Deposit Insurance Corp., Chase Manhattan Bank, Gulf Oil Corp. and others — pay the firm between $5,000 and $200,000 for its services.

When clients ask Robert B. Jones to appraise a building they are thinking of buying, the firm studies the building's income history, the demographics of the neighborhood where the building is located and the amount of money a similar building would cost to construct at current market rates. The company then compiles the information into reports that comprise hundreds of pages.

With the reports, Robert B. Jones aims to answer the question that lies in the back of a buyer's mind. Jim McGrath, systems manager at the firm, said that question is: "If I spend a dollar today, what's it going to be worth 10 years from now?"

Charts and graphs allow the reports to draw this bottom line so that clients can see it clearly. With graphics, McGrath said, "You can take three pages of confusion [and] make it into a chart, and a kid can pick it up and understand it."

Until recently, designers in Robert B. Jones' graphics department manually produced charts and graphs for the reports. Their turnaround time was slow — a designer, for example, typically needed at least two hours to determine how to partition a pie chart, draw the chart and color it in — and the results were relatively crude. "We weren't doing anything fancy," McGrath said.

Last year, the firm began a search for software to automate the task. Robert B. Jones had installed a 4M-byte Digital Equipment Corp. VAX-11/750, so the search centered on software for that machine. The software had to meet two operating criteria: it had to be easy for designers to use and had to offer them flexibility in their work.

- **Ease of use.** The use of automation, in general, had just begun at Robert B. Jones, and some users had yet to log on to a terminal. One of the benefits the firm hoped to reap from graphics was an understanding and acceptance of computer tools.

- **Flexibility.** Because graphics output would be used to supplement the different categories of research the firm included in its reports, the software had to produce a variety of charts and graphs.

McGrath said the firm eliminated most of the 14 software packages it investigated because they fell far short of the ease-of-use requirement. With them, he said, "you pretty much had to be a programmer . . . to generate simple charts."

In July 1984, Robert B. Jones purchased Exhibit, a graphics package from Information Processing Techniques Corp. (IPT). The firm served as a beta test site for the VAX version of the software, which IPT had until then offered only for Data General Corp. machines.

> ”
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> *'You can take three pages of confusion [and] make it into a chart, and a kid can pick it up and understand it.'*
>
> — Jim McGrath
> Robert B. Jones & Co.

After two months of testing and reworking the software, Robert B. Jones brought it up in production mode. Graphics designers have cut their average chart turnaround time to about 15 minutes, McGrath said.

The designers work on DEC VT241 color and VT240 monochrome graphics terminals. They call up preformatted charts and plug in values that the firm's real estate appraisers have uncovered in their research for a specific client. After entering the information, the designers output the chart on an eight-pen Zeta Research, Inc. plotter. Graphics designers can also use Exhibit to call Ascii text files from various data bases and format them for plotting.

The automated graphics process is easier than the old manual method, McGrath said. Because the charts are already formatted, the designers no longer need to plan each one individually, he said.

The increase in productivity has allowed the firm to expand its valuations department from eight to 15 certified real estate appraisers without adding any new members to its four-man graphics department.

The graphics department has used the software to create bar charts that show market absorption (how quickly office space gets leased once it is available) in a specific area and plots that show building vacancies over time for a given area (Figure 1), along with other functions.

Such neighborhood demographics point out trends that influence the value of commercial real estate. Houston, for example, currently has a glut of office vacancies, McGrath said, and building owners are "doing everything shy of giving office space away."

Robert B. Jones' employees use the graphics they produce to help their clients grasp the complex market trends that underlie appraisals. "It makes [market influences] much easier to understand for people who would not normally understand what you're talking about," McGrath said.

The firm also uses computer-generated graphics to help its executives analyze in-house performance. In one application, two bar charts — one showing fee-income goals, the other depicting actual daily income — are printed side by side so the company's managers can see if production is on schedule.

If employees meet the company's goals, they earn quarterly bonuses. When Robert B. Jones began producing the fee-income bar charts, its executives noticed that fees generally trickled in during the beginning of any given month, picked up and then slacked off in the middle of the month and soared at month's end. The firm's employees had made the push at month's end in order to meet goals and win bonuses, McGrath said.

During their month's end rush, the employees put in overtime hours, for which the firm had to pay premium wages. When the charts alerted executives to the trend, the managers took steps to level off fee income throughout the month in order to halt the month-end rush and bring down the amount of money they paid out in overtime wages.

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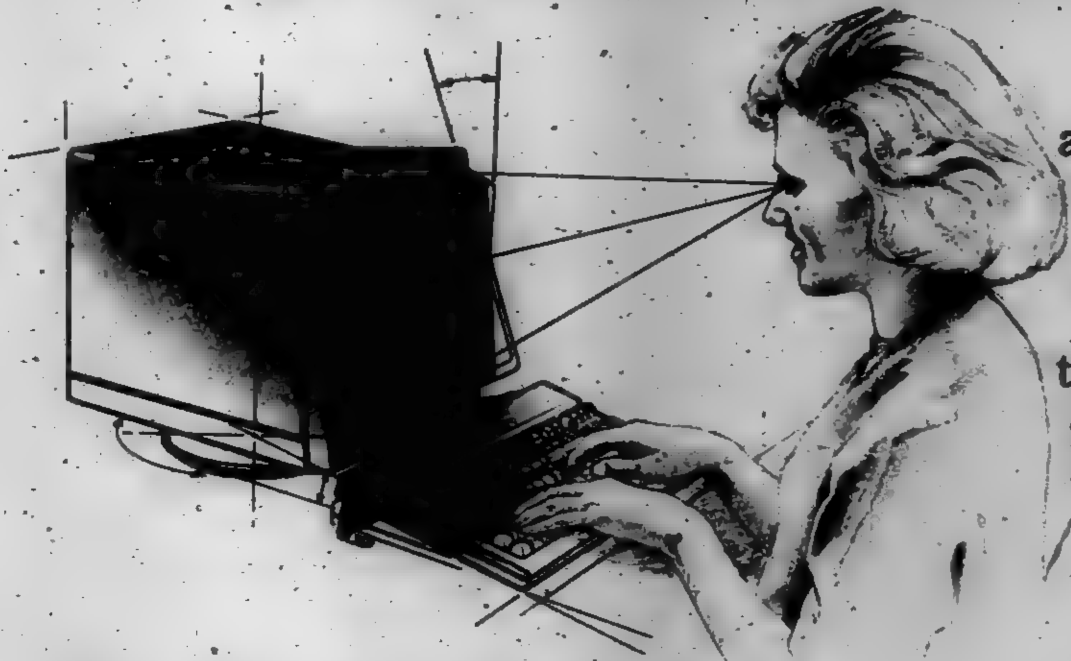

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Special Report

Ansi standards draw attention of graphics industry

By David H. Shuey
Special to CW

Standards are increasingly a concern in today's computer graphics industry. In the U.S., graphics standards are developed under the auspices of the American National Standards Institute (Ansi) committee X3H3. The committee, which consists of nearly 70 voting companies, works in conjunction with the International Standards Organization (ISO).

Recent X3H3 committee efforts have focused on the following graphics standards:

■ **The Graphical Kernel System** (GKS) provides a two-dimensional graphics interface for applications development. It is intended to provide a device-independent kernel system. As such, it does not provide extensive graphics formatting capabilities such as axis generation, pie chart utilities and shaded characters.

These capabilities were omitted from GKS to shorten the development process and make the standard more manageable when implemented and certified; their omission will also make training more manageable in the user community.

In addition, the ISO sponsored an effort in the past year to extend GKS to a three-dimensional system. The emphasis here was to provide 3-D graphics description and viewing capabilities while retaining the form and behavior of the existing two-dimensional GKS standard.

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The Computer Graphics Metafile was designed to provide a picture transfer mechanism for graphics systems.

The viewing model, previously developed for the Programmer's Hierarchical Interactive Graphics Standard (Phigs), was provided as input and influenced the current form of 3-D GKS. The ISO approval of 3-D GKS is expected by this summer.

■ **Phigs** is being developed by the X3H31 committee as a graphics interface for applications development. It is not intended to replace GKS but rather to provide a graphics standard for applications whose needs are not met by GKS or its extensions.

Some of these needs are the display and manipulation of geometrically related objects; the rapid motion of parts of an image, within the constraints of the graphics device performance; and the need for increased flexibility in the modification of picture components.

Areas where the use of Phigs is appropriate include computer-aided design and manufacturing (CAD/CAM), computer-aided engineering (CAE), process control, molecular modeling and page layout applications.

The concept of the hierarchical graphics data structure is central to Phigs and allows the applications programmer to describe picture components, such as a standard part or the description of multiple views of an object, and use it repeatedly in the final image without respecification.

Phigs incorporates modeling transformations to relate spatially the various parts of the hierarchy. This capability is familiar to applications that deal in the spatial relationships between objects. Flexible display modification capabilities enhance the hierarchy's utility.

Phigs seeks to provide a small number of modification commands that allow unconstrained modification of all parts of the stored hierarchical data. This simplifies making applications changes to the display, including changes Phigs designers did not foresee.

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Graphics packages that use the Computer Graphics Interface can easily integrate new hardware into the system.

■ **The Computer Graphics Metafile** was designed to provide a picture transfer mechanism for graphics systems. A metafile need not be produced by a device-independent graphics system such as Phigs or GKS. It was designed to be independent of the graphics system that produced it.

The picture the metafile describes can be drawn in two ways. An applications program can read the metafile and then use a graphics system to draw the picture. Alternatively, an application can be written that reads the metafile and uses device driver routines to draw the picture in a manner similar to a plot spooler.

The graphics metafile was designed for picture exchange, not for the exchange of geometric data. The National Bureau of Standards' Initial Graphics Exchange Specification (Iges) standard has been developed for the transfer of both geometric and nongeometric product definition data between CAD/CAM systems. The graphics metafile and Iges are intended for different purposes and use different levels of representation for their data.

■ **The Computer Graphics Interface** (CGI) was designed to serve the needs of hardware and software vendors. Graphics packages that use the CGI can easily integrate new hardware into the system, especially if the hardware has been developed using the CGI.

The CGI was designed to serve a wide range of graphics packages and devices. It must be simple enough to support basic graphics devices and packages and functional enough to support more sophisticated graphics devices and packages.

The CGI divides each major functional area into a basic set of functions and several optional sets of functions called "option sets." To conform to the standard, a basic set of capabilities must be present. Each option set is divided into required and nonrequired functions.

A CGI-conforming interface must support the basic set of functions for a device class, plus the required set of functions in any option set supported. Inquiry functions are provided to identify supported option sets and nonrequired functions that may be supported.

■ **Language bindings.** Phigs and GKS are functional standards. To use a standard in applications development, the programmer needs a standard interface between the functions of the standard and the selected programming language. This standard syntax definition is called "language binding." Bindings to most graphics programming languages are being developed for GKS and will be added as separate sections to Part 2 of the Ansi GKS standard. These language bindings define the calling sequences for the GKS functions and the mapping of GKS data types to the available types of the language.

The Fortran binding to GKS is complete and will be published with the Ansi GKS document. Other bindings in development are to Pascal, Ada and C. Preliminary work has been done on binding to PL/I and Cobol. In addition, the design of a generic language binding is being considered. This binding would be effective in multilanguage applications environments.

Documentation on the X3H3 committee projects described above is available from the X3H3 Secretariat, Computer and Business Equipment Manufacturers Association, Suite 500, 311 First St. N.W., Washington, D.C. 20001.

Shuey is a section manager for McDonnell Douglas Information Systems Products Co., a supplier of information products.

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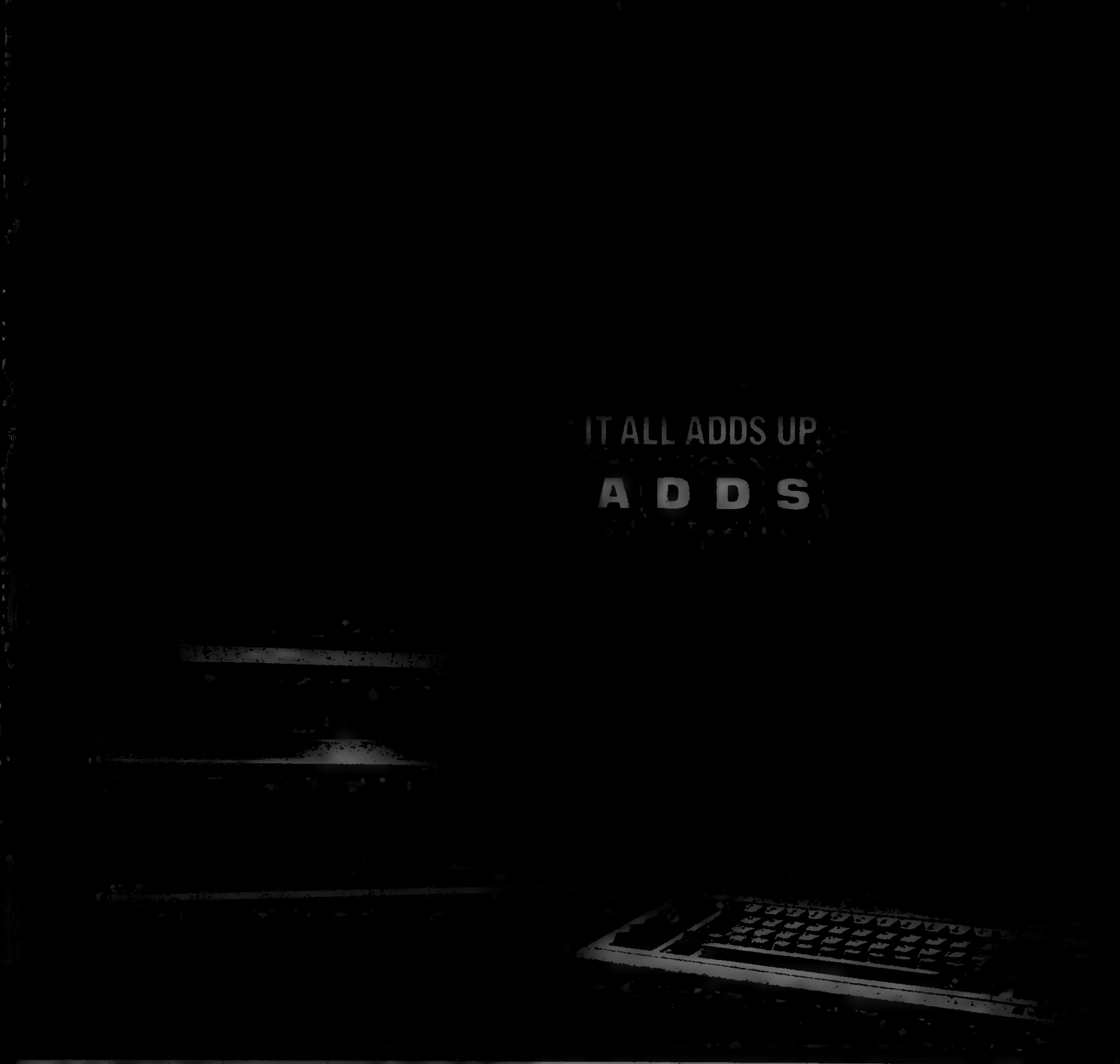

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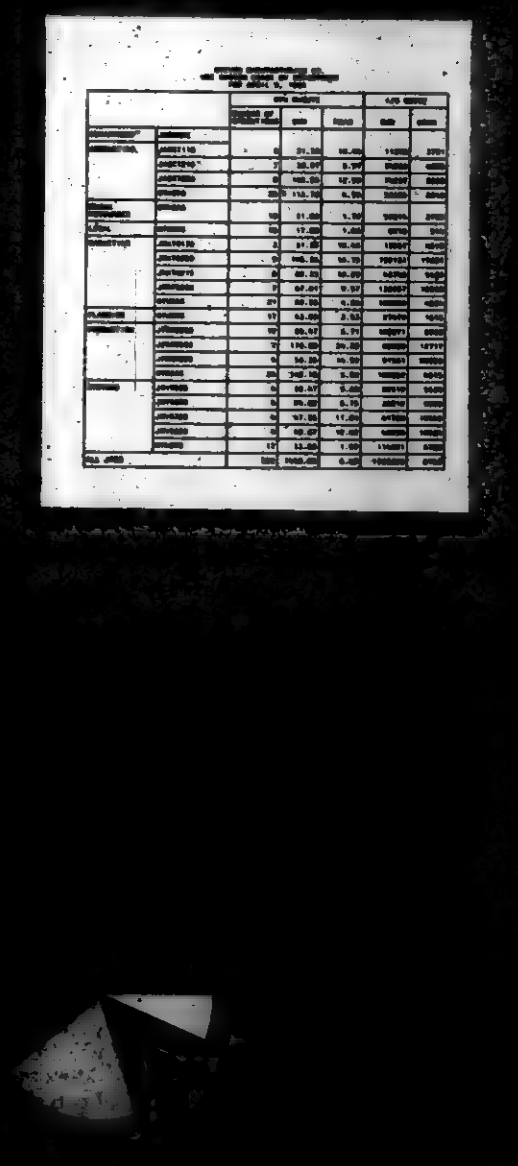

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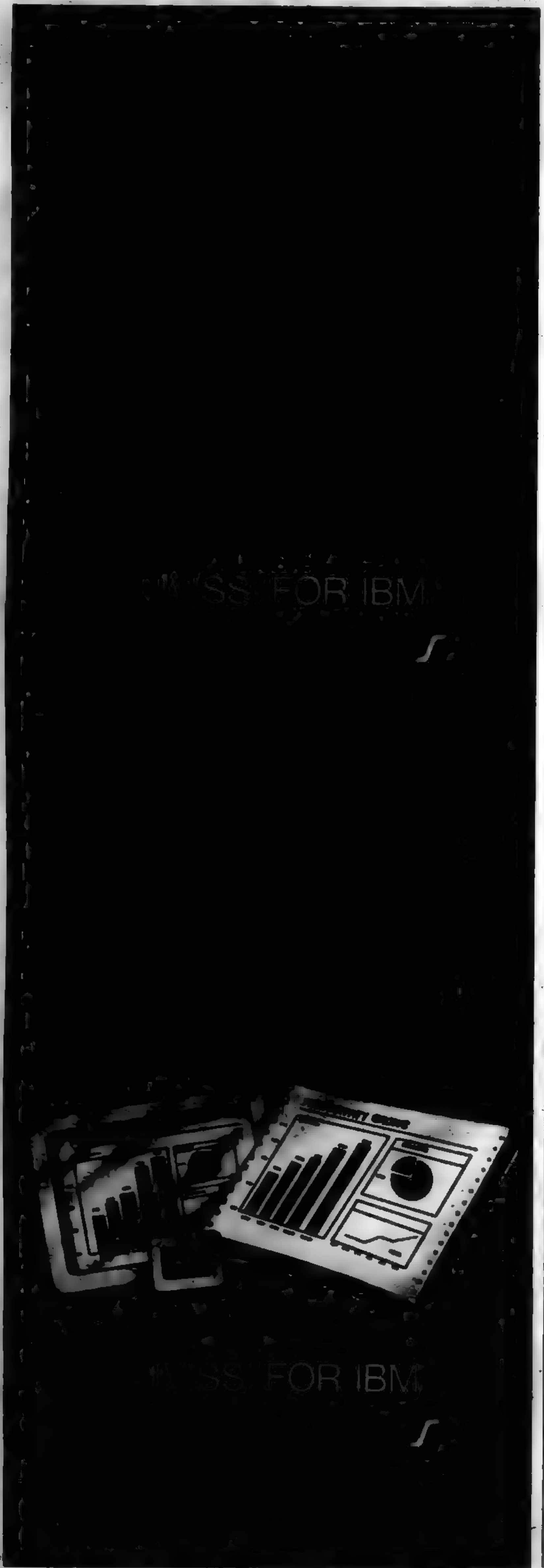


Special Report

Cadd solves engineering firm's production woes

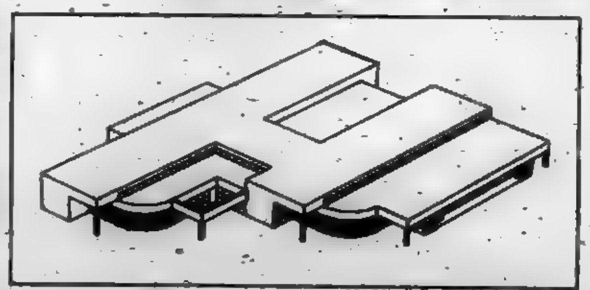
After long-term corporate growth creates array of project coordination and drafting challenges

By Phil Anzel
Special to CW

LARAMIE, Wyo. — Computer-aided drafting and design (Cadd) has helped an engineering consulting firm here draw the line on a series of chronic production problems.

At Banner Associates, Inc., a firm that provides civil, mechanical, electrical and architectural design and project management for clients like the U.S. Army Corps of Engineers, corporate growth over a number of years had heaped weighty demands on production draftsmen and brought on a series of problems.

Growth led to work on larger, more complicated jobs; average project budgets grew from $5 million to $15 million. The increased complexity required more individuals to work on drawings than had in the past, and engineering coordination became a problem. On one reservoir project, a group of draftsmen layed out a road in the same place another group had already planned to put a spillway; the road design returned to the drawing board.



SOURCE: BANNER ASSOCIATES, INC.

Top view of library designed by Banner

In addition, drawing quality varied from one draftsman to the next. As many as 10 draftsmen's work went into any given project, and inconsistency of style reduced the overall quality of work going out the door.

Moreover, there was no direct connection between computer-aided engineering — carried out by some homegrown programs running on a 2M-byte Digital Equipment Corp. VAX 11/780 superminicomputer — and manual drafting activities. The firm's computer staff suggested Cadd to solve these problems.

The staff's early efforts, used to whet the corporate appetite for Cadd, consisted of making low-resolution graphics upgrades to a DEC LA 120 printer and two VT100 CRT terminals. Selanar Corp. graphics boards fitted to the three machines allowed for graphics representation of some data from the engineering programs. The boards allowed draftsmen to use the programs to create, view and print x/y plots, contour maps and some cross-section drawings.

Within several months, the graphics capability — used by about eight of the firm's 15 draftsmen — was considered indispensable to Banner's operations. Success created a corporate environment of reception toward Cadd, so Banner's computer staff launched a search for a more comprehensive system.

Systems the firm examined fell into four categories:

- Subroutine libraries that did not include any type of user interface.
- Stand-alone systems.
- Multiuser software/hardware systems.
- "Open" systems — those that provided both open loops for custom programming and off-the-shelf software for immediate use — that would run on Banner's VAX.

The firm discarded subroutine libraries — their prices were attractive, but they would give the firm nothing to show initially for its investment. Banner estimated that it would need between six months and a year to compile a drafting front end for the subroutines. Such a delay far outweighed any economic advantage.

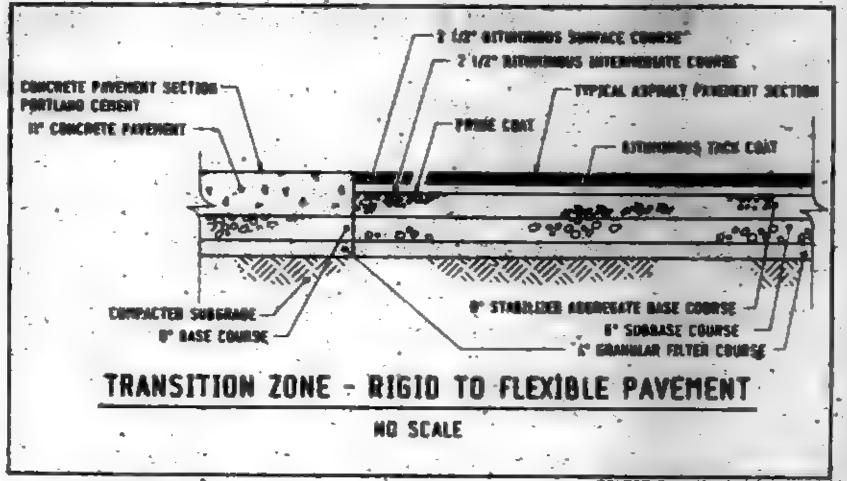
The stand-alone systems were eliminated because of the technical burden of coordinating multiple users performing many simultaneous projects on loosely coupled machines. Networking schemes that were available at the time to connect stand-alone workstations and VAX machines fell short of the company's standards. In addition, the small systems were not cost-effective in quantity, and most had difficult user interfaces.

Passing up multiuser hardware/software systems was difficult because these systems provided all the functions the firm desired. Banner finally rejected this option, however, because it had made a sizable investment in its VAX and did not want to add extra processors that would duplicate its existing hardware.

With the search narrowed down to open systems, Banner drew up a set of requirements against which it weighed different vendors' products. Any system that the company purchased would have to include the following:

- Two-dimensional Cadd capabilities. Because the primary task of the system was replacement of manual drafting, this capability was crucial.
- A command-driven setup. Banner had considered menu-driven systems and rejected them. While menus were easy for the novice user, the way they operated — requiring users to switch from menu to menu for different tasks — would cripple production draftsmen's speed. Banner wanted to use keyboards as its primary input path for new data and digitizers for inputting existing drawings.
- Three-dimensional capability for future projects. The firm desired solids modeling but considered a wire-frame capability adequate for the tasks that were likely targets for automation.

Anzel is manager of computer services at Banner Associates, Inc., an engineering consulting firm in Laramie, Wyo.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8" SUBBASE COURSE
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TRANSITION ZONE - RIGID TO FLEXIBLE PAVEMENT
NO SCALE

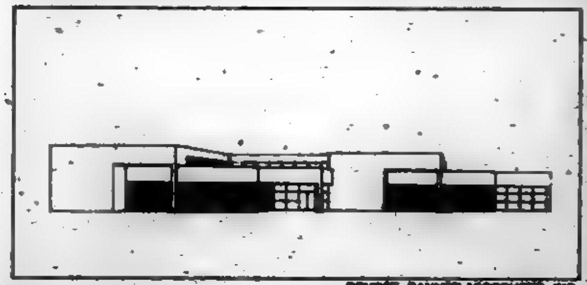
SOURCE: BANNER ASSOCIATES, INC.

Graphics representation of a road cross-section

■ An interactive interface between the Cadd system and Banner's homegrown engineering software. The firm decided that future development with Cadd would require tight links between applications programs and graphics. Most Cadd packages offered a file interchange facility, but the firm needed more than that.

Cost was also a factor, as was the standing of the Cadd vendor itself. Banner had to weigh not only the initial system price, but also the incremental cost of adding new workstations.

Banner wanted a vendor that was firmly established and had a reliable product but was small enough so that Banner could have input into the ongoing development of the Cadd system.



SOURCE: BANNER ASSOCIATES, INC.

Front view of the same library

The firm selected Palette from Palette Systems, Inc. and installed the vendor's software on its VAX in April 1984. Along with the software, Banner installed eight Tektronix, Inc. 4105, 4109 and 4115 terminals, a variety of digitizers and ink-jet printers and a Hewlett-Packard Co. 7586B plotter.

Productivity matched in a month

Training proceeded rapidly: In less than one month, terminal users matched their manual productivity; once the draftsmen were comfortable with the machines, most could handle double their former work load. Some operators have tripled their output.

Banner's computer staff let individual engineering department managers decide whether to use Cadd, and the managers' initial reactions ranged from affection to aversion. The only drafting group in the company to come on-line at first was one in the electrical/mechanical design department.

Since then, acceptance of the Cadd system has become universal at Banner, with the structural, civil and architectural design departments using Cadd capabilities. Most of the firm's draftsmen use the system in any given month.

Completed design drawings that took an average of 40 man-hours to produce manually now take an average of 20 man-hours. It is no longer cost-effective for the firm's draftsmen to do new drawing projects by hand.

Department coordination improved

Coordination among departments has improved significantly because the system has overlay capabilities that allow one group's design to be placed over others on a terminal screen. Draftsmen can see during the initial phases of a project whether designs conflict (whether, for example, electrical draftsmen have planned for a wire drop where no structural conduit exists); they can then fix problems before they have devoted a lot of work to a project.

In addition, the Cadd software provides a standard letter set so drawings are more uniform than they were before.

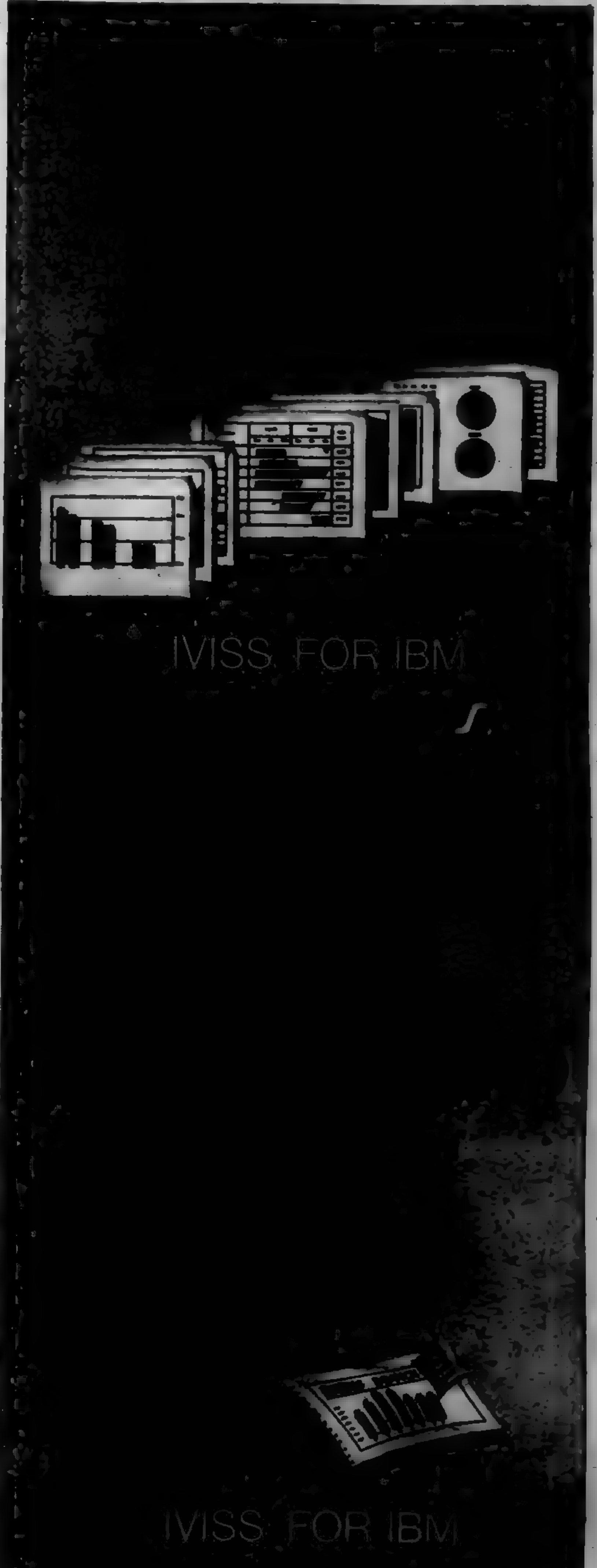
Standard symbols that Banner has programmed into software libraries allow draftsmen to use greater detail than they previously did.

When they worked manually, draftsmen could not include on their drawings symbols for lighting fixtures, for example, because drawing the symbols over and over consumed too much time. Both lettering and drawing are of a higher quality than they were when draftsmen did them by hand.

These capabilities have given Banner a competitive edge in both the production and presentation stages of its projects. The system has helped convince customers to award the firm complex design jobs.

The Cadd vendor has been receptive to suggestions about system enhancements. Palette, for example, has begun to offer small and large digitizers — products for which Banner had expressed a need — in addition to its medium-size line.

Banner is currently installing a leased line and multiplexers to support additional workstations and another plotter at a satellite office in Brookings, S.D. It has also begun to look at ways to increase the cycle capacity of its VAX processor. Since the firm brought up its Cadd system, it has upgraded the VAX to 6M bytes, but engineering, design and administrative applications are using all of the newly available capacity. This problem is a healthy one, an indicator of the success of the firm's venture into Cadd.



Three-dimensional viewing pays off in productivity

Interpreting complex models simplified

By Richard M. Fichera
Special to CW

The use of three-dimensional graphics technology in any application requiring the visualization or manipulation of complex geometries is almost guaranteed to pay off in user productivity.

When local interactivity is added to adequate three-dimensional renderings, the traditional model of interaction between user and computer is changed. Typically, graphics are used for the previewing and postprocess viewing of data. It is now possible for end users to manipulate complex three-dimensional objects interactively.

Because of an earlier lack of high-quality interactive graphics, engineers and other technical professionals developed conventions for working with ambiguous line drawings and have codified them as elaborate drafting standards.

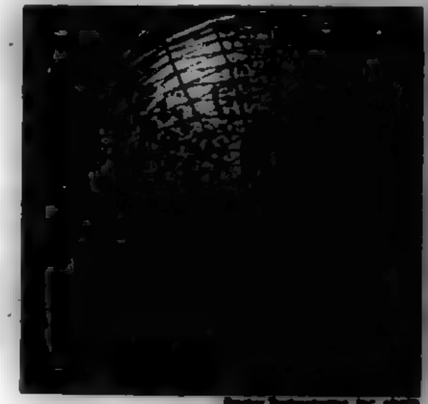

Raster Technologies, Inc. photo

Figure 1. An object composed using a wire-frame renderer.

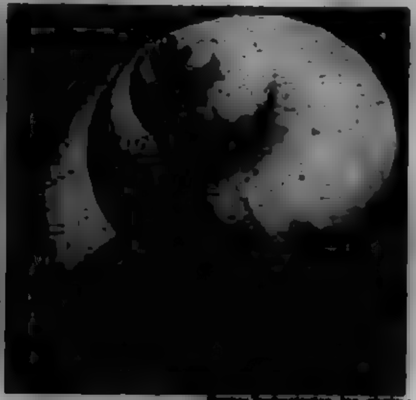

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Figure 2. A Gouraud shaded, depth-buffered rendering of Figure 1.

Many problems that engineers encounter involve the interpretation of what are essentially multidimensional mathematical functions. These can be visualized clearly and rapidly when they are presented graphically.

Another area where three-dimensional graphics is helping to define new interactive techniques is the geophysical industry. Geophysicists interpreting three-dimensional seismic data can work much faster when they can interactively walk through their data looking for oil-bearing features.

The development of high-quality rendering techniques has been one of the hottest research and development areas in graphics. The simulation of all of the subtle cues that the human visual system uses to deduce the three-dimensional nature of real-world objects is not trivial but involves substantial fundamental research to establish the basic models.

The basic model for a renderer is the scene, which has the following basic parts:

- Object geometry.
- View geometry.
- Lighting models.

Object geometry is the model of the object that is to be rendered and defined in some arbitrary coordinate space. View geometry is the relationship of the viewer's eyepoint to the object geometry. This has implications for such effects as perspective and decides which portions of the object will be visible.

The lighting model is the interaction of the available sources of light, the surface characteristics of the object geometry and the view geometry. The model can be extremely complex, with multiple light sources of varying colors, varying base colors of the object geometry and other surface properties such as a specular or shiny reflection.

The rendering task can be seen as composed of two subtasks — visible surface processing and color and shading processing. These operations are often linked, as in "hidden surface removal and shading," but they are actually separate processes.

Visible surface processing is the correct display of only those portions of an object visible from a given eyepoint. Color and shading processing is the calculation of the correct color for each visible pixel on the display. This is where the complexities of the light model come into play. The actual calculations used to determine the color of each pixel can be very time-consuming, and much of the work involved in developing an effective renderer is often focused on finding shorthand ways to do those calculations.

See [illegible] SR/22

Fichera is director of marketing at Raster Technologies, Inc., a components manufacturer in North Billerica, Mass.

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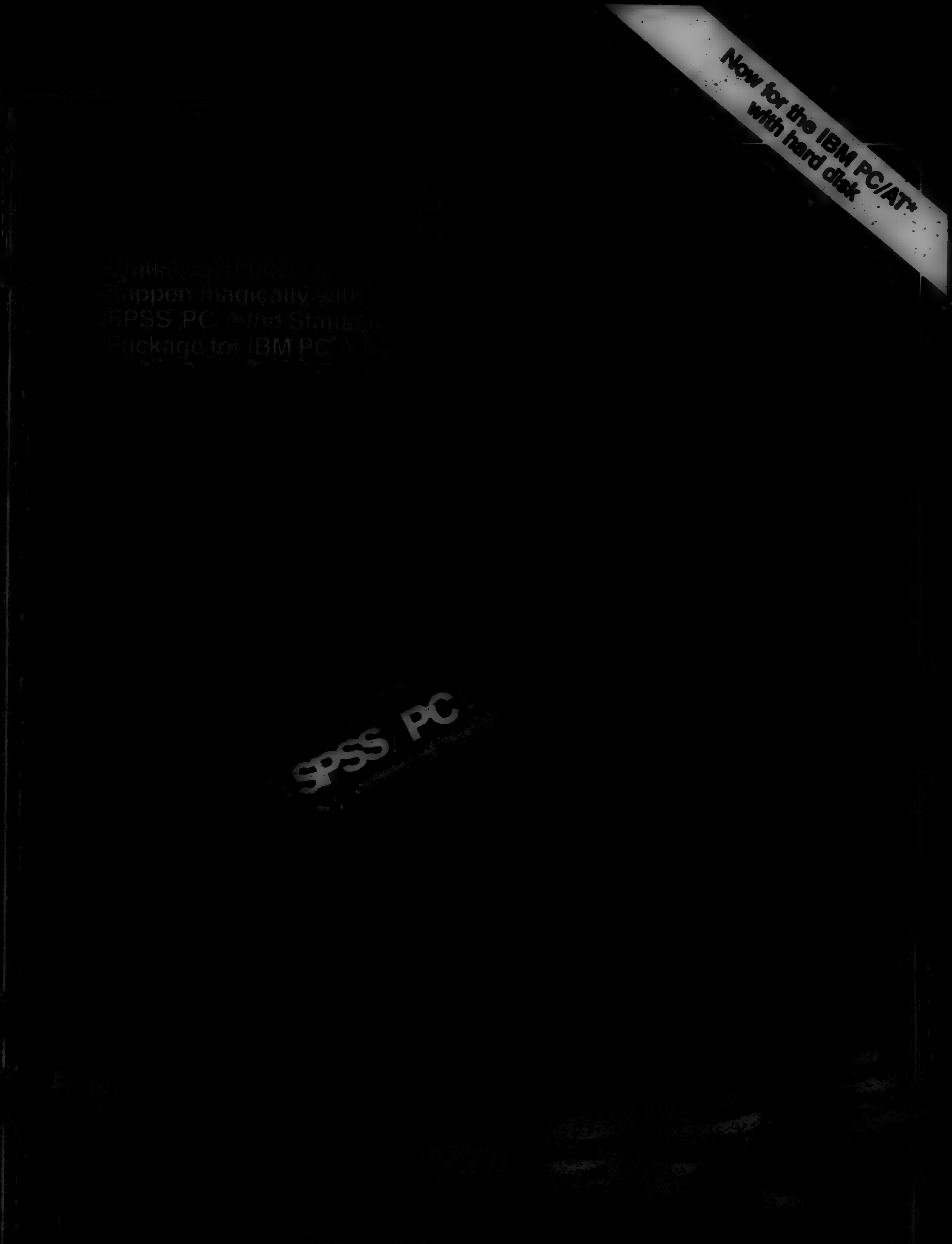
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Special Report

Microcomputer graphics show high sales potential

By Oliver L. Picher
Special to CW

> *Because so many computers lack sophisticated graphics support, the potential market for microcomputer graphics programs is enormous.*

The rest of the computer industry may have seen a period of sluggish sales and general disinterest, but the microcomputer graphics market is still growing at a respectable pace — that is, if the number of new programs available is any indication.

A survey of microcomputer graphics programs conducted by Datapro Research Corp. in February revealed an abundance of graphics-related programs on the market. The number of programs identified increased 33% over a previous survey conducted last August. Although some areas of the graphics market showed signs of a shakeout, much of the program increase can be attributed to new offerings from new entrants in the market.

The market for microcomputer graphics programs is a relatively immature one. Although more graphics programs are probably available than any other type for a microcomputer (spreadsheets, word processors and others), the installed base of these programs is a good deal smaller than that of programs in other categories.

Best-selling graphics programs, for example, generally have an installed base ranging from 10,000 to 50,000 copies, as compared with 500,000 to 750,000 copies for the best-selling spreadsheet programs.

Because so many computers lack sophisticated graphics support, the potential market for microcomputer graphics programs is enormous. This market consists of utility programs, specialty graphics programs and business graphics programs.

- **Utility programs** are the oldest and most competitive segment of the market. The programs are generally graphics tools that might enable users to combine quality graphics with their Basic or Pascal programs or might allow images displayed on screen to be sent to a dot matrix printer or might provide support for such graphics devices as light pens or digitizing boards. These programs are common, very inexpensive and often produced by smaller software houses.

- **Specialty graphics programs** have seen the greatest growth in the past year. The number of personal computer-based computer-aided design and manufacturing programs, for example, has increased dramatically and will probably continue to increase for some time. These personal computer CAD/CAM packages can be used to turn an ordinary personal computer into a high-quality computerized drafting and design system; the programs are generally expensive, but they are still less expensive than a dedicated CAD/CAM system.

The past year has seen the introduction of several other types of specialty graphics programs. One of the most unusual categories is mapping software. There are now several packages that can be used in either cartography or in demographic planning, and others are sure to follow. Project management and statistical analysis are two other growing areas. Although neither is a purely graphics-based application, the use of graphics makes the results produced by these programs that much easier to understand.

Another potential high-growth area is in computerized typesetting and page layout. These programs have been available for a number of years, especially as dedicated systems, but Apple Computer, Inc.'s introduction of the Macintosh and the new generation of inexpensive laser printers seem to have given this market area a shot in the arm. The availability of these programs, along with inexpensive hardware, could create a tremendous boom in small, in-house publishing operations.

- **Business graphics programs**, which generally create bar and pie charts, are still doing well according to the Datapro survey. These programs fall into two more categories: analytical graphics and presentation graphics.

Although the two types of business graphics programs use the same sort of charts, the purpose of the charts is different for each category.

Analytical graphics programs are meant to be used as decision-support tools; users would take data from another source and then use the graphics to help pinpoint the major trends occurring in the data.

Presentation graphics programs

Picher is associate editor/analyst at Datapro Research Corp. in Delran, N.J.

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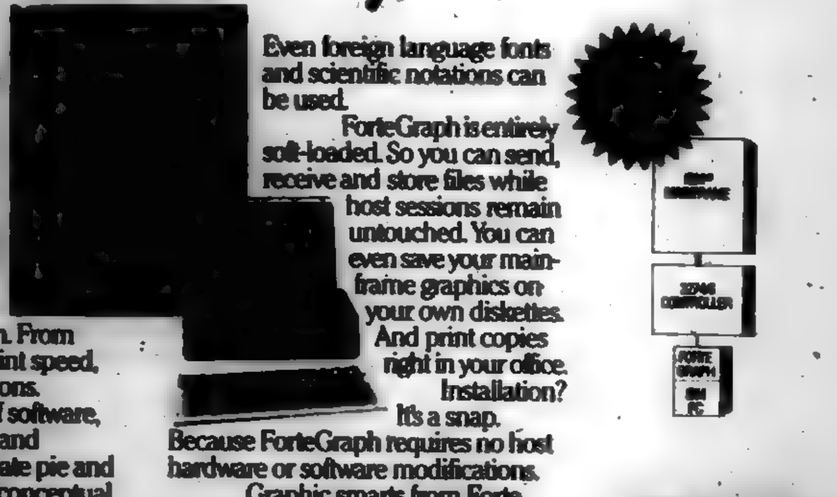

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in sluggish marketplace

are used as communications tools; the program may show the exact same data used in an analytical chart and even may use the same format, but a variety of other highlighting features, such as the use of color, special text styles and background shading, would be used to emphasize the message of the chart.

The shakeout

If a shakeout is occurring among graphics programs, it is among analytical graphics programs. Because access to data is an essential characteristic of this sort of program, there has been a dramatic shift away from stand-alone, analytical graphics programs toward integrated programs. Lotus Development Corp.'s 1-2-3, which combines a spreadsheet program with built-in graphics functions, was only the start of this trend.

The number of integrated programs, where graphics is only a part of a complete application program, has increased faster than the number of stand-alone business graphics programs.

However, the introduction of such integrated programs as 1-2-3 has probably expanded the graphics market overall. More than 500,000 copies of 1-2-3 have been sold. Almost any survey of personal computer users will place Lotus' 1-2-3 as the best business graphics program available, which makes it clear that many people are getting their first exposure to computer graphics through 1-2-3.

> ***If a shakeout is occurring among graphics programs, it is among analytical graphics programs.***

Many of the successful stand-alone presentation graphics programs have capitalized on the success of 1-2-3 by taking the charts produced by 1-2-3 and enhancing them with the use of color, special text styles and even freehand images.

The success of a presentation graphics program depends on the high quality of the graphics, especially in the output. Data transfer is also important, but not as essential. Judging from vendor response to Datapro's survey, the competition in the presentation graphics area is also getting quite fierce.

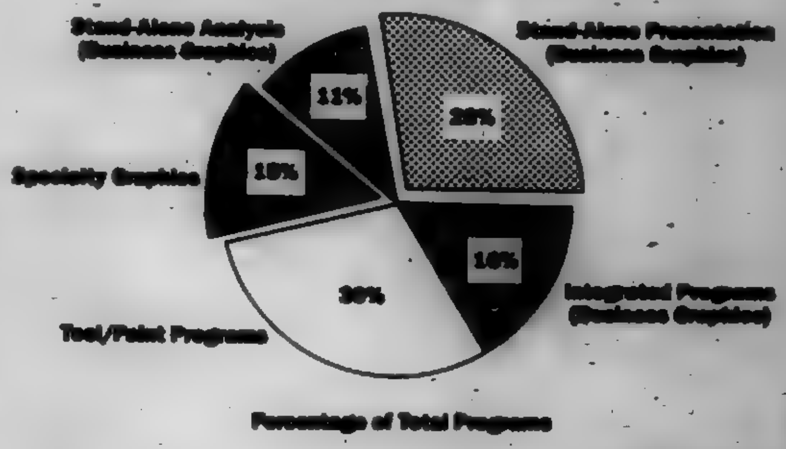
The most common new feature offered was support of the Polaroid Corp. Pallette, or some similar slide-making system. Several other vendors had just introduced programs that produced text slides for use on an overhead projector; these programs were meant to be used as companion pieces to the vendors' other business graphics programs.

Although the market may be tight and the vendor competition increasing, it is clear that the micro graphics market is still going strong. There will probably always be a need for small utility graphics programs, although they will never be the most glamorous part of the market.

In terms of business graphics, the market for analytical graphics programs is now the domain of the integrated productivity program. However, because of the limitations of computer size, disk storage and just plain processing speed, a market for stand-alone presentation programs with more flexibility and better quality than the integrated programs will continue.

The competition between presentation graphics programs so far has been healthy. The number of features has grown and the graphics quality has improved immensely during the last two years, and users will probably continue to see an improvement.

Types of Graphics Programs
February 1985 Datapro Research Corp. Survey



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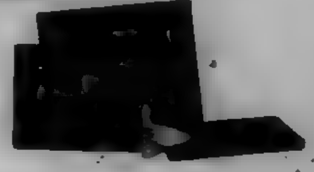

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Special Report

Established corporations move into graphics market

By Stanley Klein
Special to CW

Despite its growth and all the hullabaloo surrounding it, computer graphics still remains a niche market, accounting for no more than 10% of total computer revenue. Because of this, computer graphics has largely been an entrepreneurial field — pioneered by start-up companies.

Product lines by the start-up companies have encompassed hardware, software, systems and services — indeed, the gamut of computer graphics. But hardware innovation is losing ground as an entrepreneurial opportunity.

Established corporate giants, such as IBM, 3M Corp. and Eastman Kodak Co., are beginning to move into the computer graphics hardware field in earnest. Start-up firms, in turn, are moving into graphics software.

The history of the graphics marketplace provides some perspective on the current trends. Over time, computer graphics has become an adjunct to the traditional computer field, especially at the low end, where graphics applications — bar code printing, forms creation and elementary line-graph drawing — tend to be simplistic.

Computer graphics, however, remains distinguishable as a distinct field at the high end; for example, in computer-aided design and manufacturing, image processing, film animation, simulation and modeling applications.

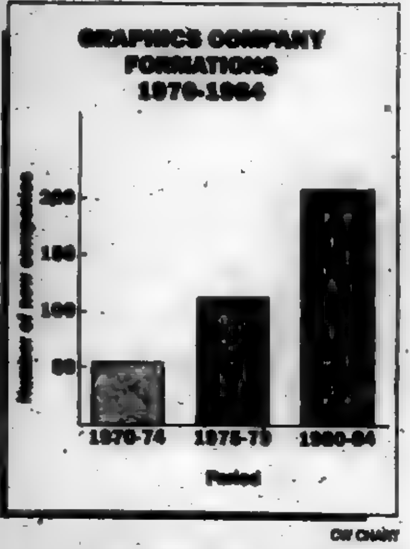
Here, the minimum resolution requirement is 512 by 512 pixels, and 1K- by 1K-pixel resolution is preferred. Available palettes offer hundreds of color choices with shading simultaneously on the screen, and fancy manipulations occur in three dimensions. Computational and display speeds provide for smooth movements of objects, with response times measured in microseconds.

The wide variety of peripherals for high-quality presentation output — those machines designed to produce overhead transparencies, slides and the like — also distinguishes the business graphics field from traditional computer applications.

High-end applications, then, have spawned products apart from those used in traditional DP, and a distinct market and supplier population has grown up around them. The supplier population is composed mostly of start-ups, as the corporate birth dates of the 550 graphics firms listed in the 1985 "S. Klein Directory of Computer Graphics Suppliers" makes clear. Of the 550 firms, 392 have been formed since 1970.

The 1985 edition of the directory contains four times as many vendors as appeared in the first edition, published in 1980. Corporate proliferation during this five-year period has been fueled by an abundance of venture capital. The surge can be dated specifically to 1978, when IBM dropped memory prices by 40%, thereby rendering computer graphics technology economically viable almost overnight.

The number of start-up computer graphics companies has almost doubled during each five-year period in the past two decades (Figure 1). The years 1981 and 1982 were peak periods — more than 60 computer graphics companies were launched during each of the two years.



CW CHART

Figure 1. The number of new companies has doubled every five years.

Recently, established companies have entered the market. Foremost among these, of course, is IBM. Big Blue started its major move with a color graphics workstation it introduced less than two years ago. IBM significantly enhanced the workstation this fall, when it also made major board-level and software improvements to its Personal Computer product line in terms of graphics capabilities.

For its move into presentation graphics, 3M started up a 35mm slide-making service a few months ago. The company has since moved into art and design applications by acquiring exclusive marketing rights to a turnkey paint system made by Artronics, Inc.

See NICHE SR/25

Klein is editor of "The S. Klein Newsletter on Computer Graphics." Klein's Sudbury, Mass.-based firm, Technology & Business Communications, Inc., publishes the newsletter and companion directories of graphics suppliers.

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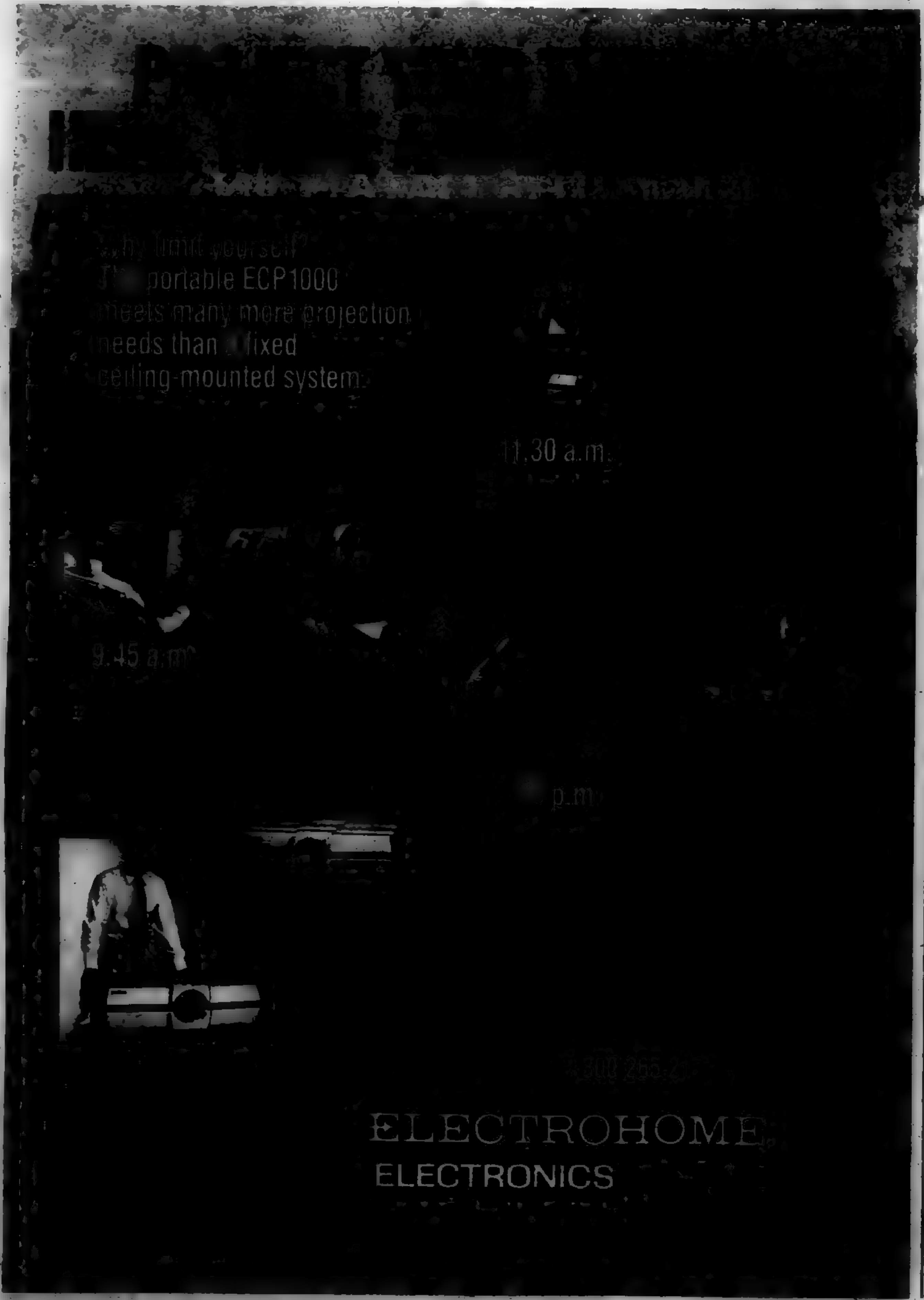
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There are currently three renderers in commercial use — wire frame, depth buffer and ray tracer.

The wire-frame renderer is the most basic. It was implemented for use with direct-view storage tubes and vector refresh systems. This renderer, while fast, shows only the edges of the object (Figure 1, page SR/16). A look at the image will highlight some of its disadvantages — detail can be cluttered, and it is hard to differentiate a surface from a hole.

The depth-buffer renderer goes a step further and provides an effective way both to resolve the geometric ambiguity present in a wire-frame rendering and provide for easy integration of techniques to improve visual realism. A depth-buffer renderer uses, in addition to the displayed image raster, a duplicate image memory, which stores physical depth information for each pixel. If the existing value indicates that the new pixel is in back of the existing pixel, it is not written. With the declining costs of memory, this has become a practical method for low-cost graphics systems.

Techniques for implementing some of the "shorthand" shading calculations can be added to the depth buffer. These techniques are used to estimate shading and color values between exact points, typically at the vertices of patches. The two common shading methods are Gouraud (Figure 2, page SR/16) and Phong, named after their originators.

Ray tracing

Ray tracing is the rendering technique that gives the most realistic results. It works by mathematically tracing a ray from the viewer's eyepoint through each visible pixel on the screen and checking for intersections with each possible object in the data base. If an intersection is detected, a check is then made to determine whether the ray ends there or if a reflected or refracted subray should be generated.

This process is very time-consuming, with typical ray-traced images taking from six to 12 hours on a Digital Equipment Corp. VAX-11/780 class minicomputer. It does, however, yield a variety of visual effects, including reflections, transparency with refraction and soft shadows, that cannot be easily obtained with other renderers.

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Graphics use takes off with firm's top managers

Aerospace company's system gives execs easy access, computer literacy

LOS ANGELES — Graphics use has broken the top-management barrier at an aerospace firm here.

In the engineering department of Northrop Corp.'s aircraft division, a vice-president and five senior managers have menu-driven access, through IBM 3279 Model 3 color graphics terminals and homegrown software, to any of 241 charts that present key project, budget and manpower data. Northrop plans and builds sophisticated fighter aircraft such as the F-20 Tigershark and the F/A-18 Hornet.

The setup that provides top managers with graphics data about design projects, the Executive Management Information Network (Emin), evolved from a project that put decision support and graphics software in the hands of lower level personnel in the engineering department. That project, the Information Service Center (ISC), began in 1983. Today, the center serves about 450 users.

NORTHROP

When graphics use proved to be popular with engineering personnel, systems analysts in the ISC decided to try and take the concept to the top. According to analyst Jon Rockeman, the step seemed only natural: "With all these people producing charts, we wondered, 'Why can't managers view them?' "

The ISC staff decided that management could use the graphics but only if the system of accessing them met some broad criteria. "Managers at that level don't know what they want," Rockeman said, "but they definitely know what they don't want."

Generally, top managers at Northrop did not want to spend much time either learning to access or actually accessing graphics information. So, above all, the Emin system had to be easy to use. Analysts designed the system so that managers could call up any desired chart through a series of menus.

With the first menu, the manager selects the category of chart (manpower or budget, for example) that he wants to view. A menu appears on the manager's screen that shows a list of chart names within the chosen category.

The list includes only charts that have been recently updated, deleted or added. These are in chronological order — the chart that has been changed most recently appears at the top of the list — and cover two weeks of activity.

To call up a chart, a manager types an "S" next to the name of the chart and presses the Enter key on his keyboard. The chart appears on his terminal screen. If he wants to view charts in sequential order, backward in time from the most recently updated one, the manager need only continue to press his Enter key. The response time between request and display ranges from five to 10 seconds.

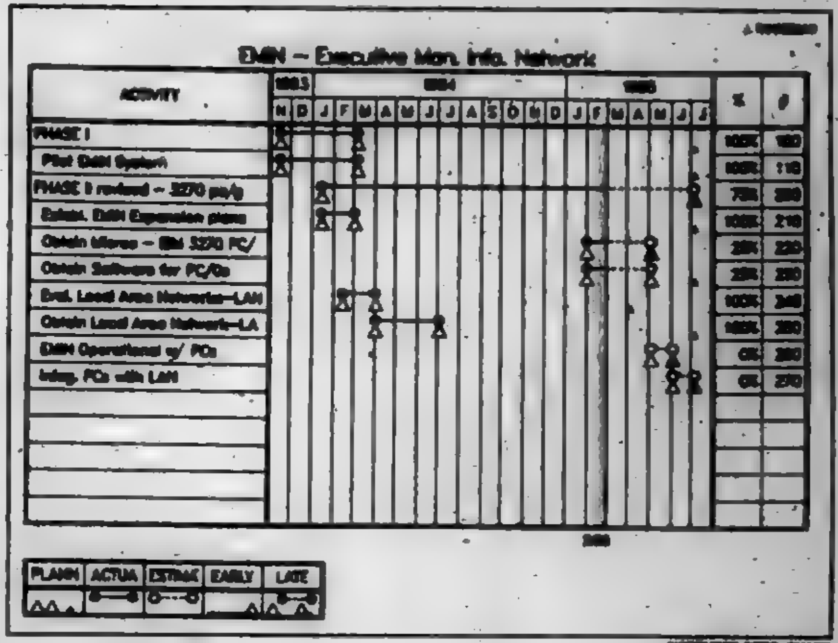
Each chart file displays the date on which the file was last updated. Charts also include the names and phone numbers of the lower level managers who created them. If an executive needs more information about a topic, he can get it easily.

The information the charts contain is of a strategic nature, culled from operational information at lower management levels. Lower level managers prepare the charts using various software packages running on a 16M-byte IBM 3033, mainly Issco Graphics Software's Tell-A-Graf and Tell-A-Plan and IBM's ADRS II/BG and GDDM.

Emin also provides top managers with tabular data, which they can combine into pie charts through interactive sessions with the mainframe.

These sessions do some harm to response times, Rockeman explained, but no more than one manager at a time generally uses them, so the problem is not a major one.

The Emin project is still in its pilot stage, but it has been reviewed for possible use by other managers in the aircraft division and by personnel at other Northrop facilities.



NORTHROP CORP. CHART

An example of the kind of charts to which Northrop executives have access.

Within the engineering department of the aircraft division "the response to Emin has been very positive," Rockeman said. "We have top-level executives who want timely, high-quality information. I think everyone realizes the productivity gains."

Computer literacy for management

He said that the system's benefits are hard to quantify, but that one positive result of Emin is that it gives top managers some computer literacy. If managers are comfortable with the technology, he reasoned, they will be more amenable to bringing office automation into their departments.

A recent event just may bear him out: One of the managers who initially seemed disinclined toward Emin recently ordered $300,000 worth of personal computers for his staff.

Rockeman said the move was, at best, an indirect result of the Emin program. But the ISC staff hopes the trickle-down effect of office automation will stand as a further justification for introducing executives to computers.

NICHE from SR/20

Continental Can Co. recently created a graphics services unit to automate artwork preparation and production in consumer packaging applications. Its service is built around Scitex's Response 350 computer graphics publishing system.

Also moving in for the kill in computer graphics is Eastman Kodak. Last fall, Kodak introduced an instant slide-making film intended to compete against a similar Polaroid Corp. product. It also invested $20 million to acquire a 7% ownership in Sun Microsystems, Inc., a manufacturer of graphics workstations. Other established companies in the photography market have recently made entries into computer graphics.

These stirrings may signify the end of the era in which start-ups dominated graphics hardware innovation. With established companies entering the hardware market, younger firms are moving toward software. For example, Casa/Gifts, Inc., which was established in 1984, offers finite element software for use in mechanical engineering.

Entrepreneurs are also creating graphics software to run on micros. One example is Foresight Resources Corp., established in 1980 and reorganized last year. The firm designed a two-dimensional computer-aided design package for the IBM Personal Computer featuring a human interface much like the one Apple Computer, Inc. uses on its Macintosh.

The next few years promise to bring more of the same. An outpouring of personal computer graphics software will be one of the next entrepreneurial waves.

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KOFFLER

Special Report

Tools cut lab's development time

BETHPAGE, N.Y. — Programmers in Grumman Data Systems Corp.'s graphics development laboratory here have decreased their development time by as much as 50% with a tools package that allows them to write programs for a variety of output devices without making modifications to accommodate each machine's capabilities.

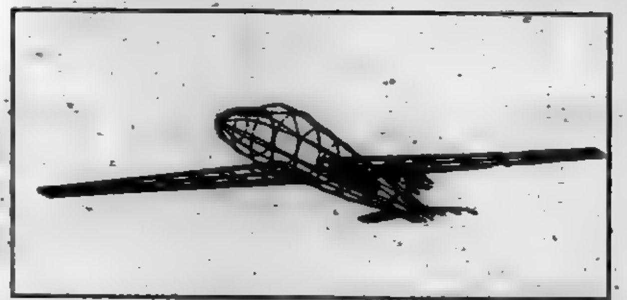
The lab develops programs, particularly computer-aided design and manufacturing (CAD/CAM) applications, for different groups within Grumman Corp., Grumman Data Systems' parent firm.

Its projects include three-dimensional modeling, real-time simulation of aircraft guidance and control and the verification of cutting paths for computer-controlled milling machines.

The broad scope of the applications requires an equally broad assortment of output devices — color raster terminals, hybrid storage tube/refresh terminals, highly intelligent 3-D vector refresh displays and several drafting plotters. It uses terminals from Tektronix, Inc., Ramtek Corp., Raster Technologies, Inc. and IBM, and plotters from Tektronix, Versatec, Inc. and Comp/80.

The graphics software the lab uses to service the different machines is DI-3000, a device-independent tools package from Precision Visuals, Inc. The package includes subroutines for 2-D and 3-D transformations, graphics primitives (rectangles and sectors, for example), multiple text fonts and polygon fills.

According to Michael Holtzman, a senior programmer/analyst and head of the graphics lab staff, the software allows programmers "to develop applications on one device and transport them to others throughout the company, regardless of model or manufacturer."



SOURCE: GRUMMAN DATA SYSTEMS CORP.

A 3-D drawing produced by Grumman's CAD/CAM tools.

Grumman has installed two copies of the package: one on the corporation's 32M-byte IBM 3081 mainframe and the other on a 4M-byte Digital Equipment Corp. VAX-11/780 in the graphics development lab.

Programmers can call any of 160 subroutines that are included in the package through a host Fortran program. The subroutines accept parameters from the programmers and produce images for an idealized virtual graphics device that incorporates the attributes of most common physical devices.

Software device drivers then convert the images into device-dependent instructions, which can be understood by the device in use and can take advantage of as many hardware features as that device provides. Grumman uses some device drivers that it purchased from Precision Visuals and others that its programmers developed themselves.

For an application called Aptdraw, a CAM utility the graphics lab created for Grumman Aerospace's Corp.'s Machining Technical Services group, programmers used DI-3000 for development work that they performed on a full-color raster device. The application, however, normally runs on monochrome terminals and single-pen plotters.

The device-independence of the program lets the machining group reserve its expensive color workstations for applications that absolutely need color, Holtzman said.

In another application, the development of a mathematical curve that allows users to manipulate free-form surfaces interactively, programmer Julius Kim said the tools package cut his development time in half. It allowed him to specify a mathematical model for a single virtual device instead of considering the hardware capabilities of several physical devices.

Kim said he also relied on the package's ability to transform 2-D and 3-D images from its own coordinate system to a virtual device coordinate system. The package performs the transformation after programmers specify the eight corner coordinates of the display windows and viewports they want to use.

Besides saving the graphics lab time and allowing users to take advantage of devices best suited to their needs, the tools package helps the lab with its future acquisitions. It uses the package in its continual evaluations of new equipment, such as high-capacity vector refresh terminals and high-speed communications devices, according to Holtzman. "DI-3000 allows us to accommodate equipment upgrades without major reprogramming," he said.

The lab is currently working on programs that allow users to access drawings generated from CAD/CAM systems for use as illustrations in technical manuals and other publications.

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MICROCOMPUTERS

Future business micro to offer 1M byte of RAM, 32-bit CPU

By Edward Warner
CW Staff

Ask the soothsayers of the computer industry what the corporate personal computer will look like in 1990 and nearly all describe a machine with at least 1M byte of internal memory, several hundred megabytes of storage and a 32-bit microprocessor — all beneath a blue and white IBM logo.

In addition, they say the soul of that new machine — its operating system — will likely support multitasking and a windowed operating environment such as IBM's Topview, Digital Research, Inc.'s Graphics Environment Manager or Microsoft Corp.'s Windows.

Beyond these similarities, however, the personal computers of these visionaries' dreams differ. Equally strong differences also arise among corporate microcomputer managers, some of whom wonder if all that added power is really needed.

"A lot of that stuff scares the hell out of me," said Neil Cookrish, in-house microcomputer consultant at Bankers Trust Co. in N.Y. "A lot of people are using personal computers for things they shouldn't be using [personal computers] for." If the machines get much more powerful, he said, users "are going to get lost."

"If you need [5M bytes] of memory," he observed, "maybe you should be on a mainframe."

Aaron Goldberg, an analyst with International Data Corp. (IDC), a Framingham, Mass.-based market research firm, disagreed. "Put yourself in the place of someone in 1983 saying [to himself] 'I've got 10M bytes of storage, who could ask for more?' " he suggested. Most corporate users have already used up the maximum storage of their 10M-byte hard disks, he claimed, and are now crying for more powerful machines.

Such machines are nearly on the horizon, he observed. Within five years, he said, users will find themselves confronting a personal computer with a 200M-byte internal hard disk, diskette drives storing from 2M bytes to 5M bytes and a 32-bit

See FUTURE page 58

Seattle bank buying 1,000 Macintoshes

By Kathleen Sullivan
CW West Coast Bureau

SEATTLE, Wash. — Seattle First National Bank recently announced it has agreed to buy 1,000 Apple Computer, Inc. Macintosh microcomputers that will be used in its corporate headquarters and offices here and distributed throughout the state at its more than 150 branch offices.

Lou Mertes, executive vice-president of Seattle First National's operations group, said the bank plans to install approximately 250 Macintoshes during each quarter over the next year. He said the machines will be used by the "entire gamut" of Seattle First National personnel, including secretaries, professionals, managers, customer service representatives and the sales and marketing staff.

The Macintoshes will handle word processing, spreadsheets, graphics and elec-

See SEATTLE page 58

■ Compass Systems introduced a 'classified' version of its Grid portable computer with embedded encryption capabilities/54

■ Intel announced Open Net, a local-area network connecting dissimilar microcomputers running under several operating systems/55

INSIDE

Software/54
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Vendors search for next big win

SMALL TALK
Eric Bender
CW Senior Editor

It's 1987 and you're a Manhattan executive. Business is temporarily slow and you're bored with your job. You come in and boot the personal computer, read your electronic mail off the local-area network, look at images of product advertisements (sent from your company's San Francisco office for your neighbor to review), voice-annotate a memo, check the new expert system that replaced half your staff, log on to Dow Jones & Co., call your stockbroker and electronically place a sell order, play Space Flight Simulator, surreptitiously read through your boss' files, graph the Northeast monthly sales report six or seven ways, try to crash Lotus Development Corp.'s Symphony 3.0, and there goes the morning.

Each year there are more choices of pleasant and mildly useful things to do with an office microcomputer, but which new programs are genuinely needed by the multitudes?

You know the ones — the next major packages, the "whole new category" applications that will leverage micros for all those hours when no one's even playing Flight Simulator.

Software vendors are forever waltzing

See CHOICE page 57

PC-DOS version of SAS System makes its debut

CARY, N.C. — SAS Institute, Inc. has introduced a version of the SAS System that runs under IBM's PC-DOS on the Personal Computer AT, Personal Computer XT and compatible machines.

Scheduled for availability in the third quarter of 1985, the integrated software reportedly provides tools for data management and retrieval, statistical analysis, report writing, graphics and applications development.

SAS Institute emphasized that the new software is compatible with its counterparts on mainframes and minicomputers. "The SAS language, syntax and commands

See SAS page 58

Where Giants Fear To Tread

For five years NESTAR has ventured where giants have feared to tread—local area networking. In fact, NESTAR has installed more large local area networks in large institutions than any other manufacturer.

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Local Area Networks For Large Organizations

NESTAR

Grid micro touts government-certified encryption

By Mitch Betts
CW Washington Bureau

McLEAN, Va. — Grid Systems Corp. last week added to its Compass line of portable computers a new model that provides embedded encryption features.

The Model 1117 is certified by the U.S. government to provide secure communications up to the confidential level of classified information.

The product, which will be marketed to military, intelligence and other government agencies and contractors, adds high-grade communications security features to the Model 1107, which has government-approved Tempest shielding that prevents leakage of electromagnetic impulses, a Grid official said.

The Model 1117 is the first product to be certified by the National Security Agency (NSA) for communications security under the NSA's new Commercial Comsec Endorsement Program, according to an NSA official.

The product reportedly permits secure point-to-point communications, including conversational text and file transfer, as well as secure point-to-host communications. It is certified for the communication of messages up to the confidential level of security but not for secret or top secret levels, the vendor said.

Like the Model 1107, the Model 1117 has 512K bytes of random-access memory and a 6-in. diagonal amber display and weighs 15 lbs, including modem. It supports Grid peripherals, software and terminal emulators.

The price for the Model 1117 is $12,995, or $1,000 for an upgrade of the 1107.

Grid's federal sales office is located at 7923 Jones Branch Drive, McLean, Va. 22102.

SOFTWARE

■ C. S. Laboratories has introduced Version 3.5 of its C/Script II applications development system for the Ryan-McFarland Corp. Version 2 Cobol compiler. The product is available for IBM Personal Computers and compatibles and Microsoft Corp. MS-DOS or AT&T Unix-based machines supporting Ryan-McFarland Version 2 runtime.

C/Script II automates RM-Cobol applications development, allowing users to specify data, screen descriptions and program-specific information, a spokesman said.

RM-Cobol reportedly allows an unlimited amount of user code to be entered. Source code programs are generated through the use of skeleton files, a data dictionary and three source code generators.

C/Script II for a single user costs $1,950.

C. S. Laboratories, 459 Dean Road, Auburn, Ala. 36830.

■ Modular Software has announced Modular Bridge, which reportedly allows IBM Personal Computer users to transfer files between the Pick Systems PC-XT operating system and other operating systems.

The product reportedly allows the user to write PC-DOS or MS-DOS files onto Pick T-Dump format diskettes. It requires a Personal Computer or compatible with PC-DOS or MS-DOS 2.0 or 3.0 and two double-sided diskette drives or one diskette drive and a hard disk.

Modular Bridge costs $106.

Modular Software, P.O. Box 304, Union City, Ga. 30291.

Index, Inc. has announced Structured Architect, software that reportedly combines analysis, graphics and documentation capabilities into an integrated environment for IBM Personal Computer users.

The product runs on the IBM Personal Computer, the Personal Computer XT, the 3270 Personal Computer and the Personal Computer AT

Continued on page 87

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Intel announces Open Net for linking dissimilar micros

By Kathleen Sullivan
CW West Coast Bureau

SANTA CLARA, Calif. — Intel Corp. recently introduced Open Net, a local-area network said to allow dissimilar microcomputers and operating systems to be connected on a network.

At present, Open Net will enable communication among systems using Microsoft Corp.'s Xenix, IBM's PC-DOS and Intel's RMX operating systems, the company said.

Intel announced four Open Net products, including two printed-circuit boards that reportedly connect microcomputers to Ethernet local-area networks and to RMX and Xenix networking software packages, which allow concurrent file sharing among RMX- and Xenix-based systems.

Transparent file access

Open Net's networking software provides transparent remote file access, which permits users to manipulate files from remote locations as if the file resided on a local node, the company said.

In a related development, Ungermann-Bass, Inc. of Santa Clara, Calif., announced two network controller boards that will allow IBM Personal Computers and some IBM-compatible systems to communicate with products in Intel's Open Net family.

The boards use Ungermann-Bass's Personal Connection network controllers to run software jointly designed by the two firms.

Intel also joined forces with Microsoft to ensure that Open Net would be compatible with that firm's Microsoft Networks local-area network software. Microsoft Networks is said to allow network file access among personal computers that run Microsoft's MS-DOS operating system.

Additionally, Open Net's network protocols are fully compatible with IBM's PC Network, an Intel spokesman said.

Provides alternative

The spokesman added that Open Net provides an alternative in a market that is "fragmented" by networks based on a variety of proprietary protocols.

Open Net is based on protocols developed by the International Standards Organization (ISO) and is said to consist of hardware and software products that cover all seven layers of the ISO network model.

Intel said Open Net's open architecture provides a set of "building blocks" for network integrators, OEMs and end users.

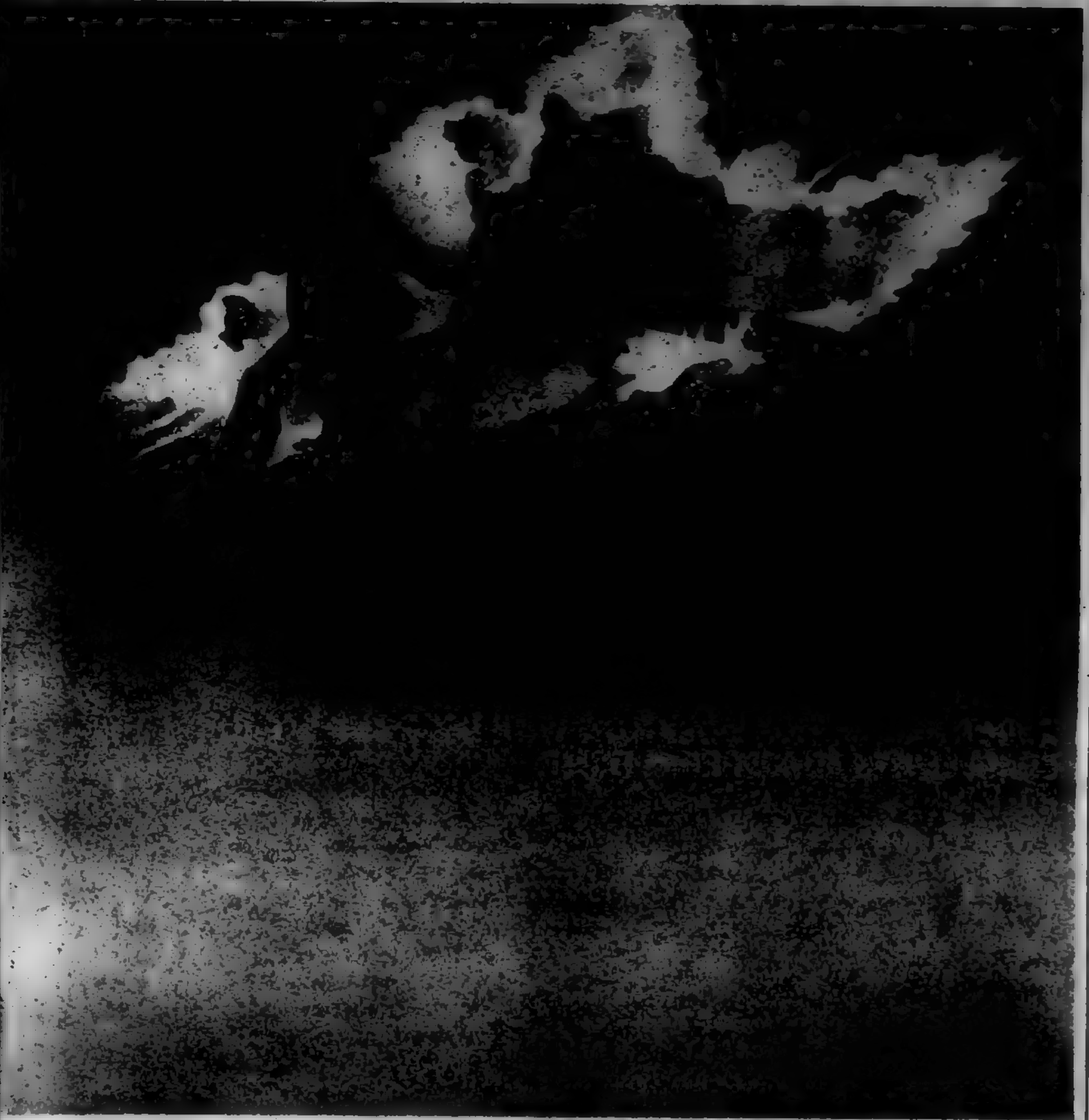
On-board memory

Intel said its ISBC 552 and ISXM 552 circuit boards feature on-board memory and are based on Intel's 80186 microprocessor, 82586 local-area network coprocessor and 82501 Ethernet serial interface chip. The ISBC 552 is the "unbundled" version of the board; OEMs can download network programs into the board's random-access memory for custom applications.

The ISBC 552 and ISXM 552 boards will cost $1,500 and $1,900, respectively. The RMX and Xenix networking software will be available for OEM licensing for $9,500 each.

Intel is located at at 3065 Bowers Ave., Santa Clara, Calif. 95051.

"What kind of place is this? No cotton shorts in software and no hammers in hardware!"



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Continued from page 64

with 256K-byte memory and the IBM Color Graphics Adapter. It can also be used with Compaq Computer Corp.'s Portable, Plus P or Deskpro computers.

Structured Architect costs $5,000 for the first unit and $2,250 per additional unit.

Indite, P.O. Box 4179, 325 E. Eisenhower Pkwy., Ann Arbor, Mich. 48106.

■ **Advanced Microsolutions (AMS) has introduced a Basic language translator designed to help convert Hewlett-Packard Co. Series 80 Basic programs to the HP Series 200 Basic versions 2.1 and later.**

The AMS Series 80 to Series 200 Translator can translate 90% of all Series 80 Basic language keywords, including read-only memories and binaries, according to the vendor. Translated data files will retain their original random or serial structure.

The product is priced at $695.

Advanced Microsolutions, Suite 207, 110 Alma St., Menlo Park, Calif. 94025.

■ **Advanced Market Technologies has announced the availability of its portfolio management applications software for Digital Equipment Corp.'s Professional 300 series of microcomputers.**

The Portis Investment Management System gives users capabilities for tracking, maintaining and evaluating multiple client portfolios, a spokesman said. The product incorporates menu-driven commands and on-line help facilities.

Reportedly, the Portis Investment Management System provides automated valuation of portfolios and provides an optional generation of daily transaction reports. Each portfolio can contain up to 84 stocks, bonds and options, for a total of 256 investment listings.

Portis Investment Management is priced at $495.

Advanced Market Technologies, 831 Grandon Ave., Columbus, Ohio. 43209.

COMMUNICATIONS

■ **Telenetics Corp. has announced Expressdata 121, a 1.2K bit/sec modem that runs on the IBM Personal Computer.**

The asynchronous, full-duplex modem is stored on an expansion card that fits inside the micro. It features autoanswer and autodial features and is compatible with Hayes Microcomputer Products, Inc.'s command protocol, the vendor said.

The modem includes an adaptive equalization feature that adjusts communications to various telephone line conditions and helps to ensure error-free transmission.

The product is bundled with VM Computing, Inc.'s Relay communications software that supports micro-to-mainframe communications, includes password and encryption features and emulates IBM 3270 series terminals. The software compresses data so that file transfers work at a speed of 1.6K bit/sec.

The modem costs $495.

Telenetics, 895 E. Yorba Linda Blvd., Placentia, Calif. 92670.

CHOICE

from page 53

through *Computerworld*'s office, with jazzy new offerings in presentation graphics, image manipulation, voice communications, icon-based networks, decision support packages, desktop organizers or project management.

The concepts usually sound good and useful — at least to some people, some of the time.

Take project management — William Lohse, president of Breakthrough Software in Novato, Calif., suggested that two generations of software from now, more people will be managing projects than doing spreadsheets on micros. Who can say he's wrong?

But even if that potential exists, it will take a long time to convince those throngs of users. And customers now seem more interested in refinements to currently popular software packages.

"We're in a less exciting mode," commented Richard Rabins, president of Alpha Software, Inc. in Burlington, Mass. Many packages sound as if people should want to buy them, but "it's not necessarily the sexiest and most innovative products that succeed," he said.

And the genuinely useful aspects of the hot packages are often mundane. For example, some outline processors originally designed as brainstorming tools may end up simply managing details.

Management Science America, Inc. (MSA) next month will introduce another product family that will do something even less exciting — emulate mainframe data entry terminals at remote sites.

But the packages probably will do quite well among MSA's customer base, because they offer a chance to cut communications costs and mainframe processing loads.

These roads to success, though, are too slow for the many micro software vendors who need a big hit. Very few are making any real profits. "There's only one company out there that's constantly doing well, and that's [Lotus Development Corp.]," Rabins said.

"The only companies making money in software are a handful that have the standard," said Lohse, whose company, like Sorcim/IUS and others, hopes to create a standard in project management packages. He acknowledged that the goal represents "a small eye of a needle, and it's shrinking."

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Canon Business Machines

FUTURE

from page 53

CPU addressing 1M byte of random-access memory (RAM) and 2M bytes of virtual disk memory.

Signs of the movement toward 32-bit microprocessors are already visible, with AT&T, Motorola, Inc. and National Semiconductor Corp. all shipping such devices. Intel Corp. plans to begin deliveries of its 32-bit 80386 chip to systems developers this summer.

Another industry observer surpassed Goldberg in his expectations for the personal computer of the 1990s. Al Hirsch, editor of the newsletter "Datapro Reports on Microcomputers," published by Datapro Research Corp., a Delran, N.J.-based market research firm, predicted that 16M bytes of RAM — the maximum storage addressable by the 32-bit chip — will become the standard. For storage, he added, users can expect to see 500M-byte units based on magnetic media technology.

Hirsch also speculated that 64-bit microprocessors might come into use on personal computers by the end of the decade.

Raymond Falls, an associate editor of Datapro's newsletter, also predicted increases in the data storage standard — and decreases in diskette sizes. No longer will the 5¼-in. floppy be the standard, he said, "It looks like it will go to 3½-in. now and who knows what later."

The prognostications of Future Computing, Inc.'s David Wilson were in line with those of Hirsch, though Wilson pegged the hard-disk storage standard at 100M bytes. For increased storage, however, Wilson pointed toward the rise of optical disk storage units to which users could write data once and store up to 1G byte. Such an estimate, he added, "is quite conservative."

Wilson, an analyst with the Dallas-based market research firm, said the price for the personal computer of 1990 will be around $5,000. Wilson predicted that this price will also include a built-in local-area network interface, a 4.8K bit/sec modem, a graphics processor located on a chip instead of on a board and a color display.

On the software side, Wilson and Goldberg both predicted the increasing use of artificial intelligence in applications, with Goldberg speculating that AI will make for "softer software" that tailors itself to users' needs. An example of this, he said, is software that provides automatic data backup.

Wilson, meanwhile, said he expected no large changes in the IBM Personal Computer's operating system, other than the greater use of windows and icons and possibly even a "shell" to aid unfamiliar users.

Overall, the Personal Computer will not look or operate very differently from the way it does today, Wilson said. "What we're projecting [for the personal computer] is not revolutionary," he said, "just bigger."

What is revolutionary, observed Will Zachmann, an IDC vice-president, is the impact that increasingly powerful personal computers will have in the coming years on the corporation itself, making the micro the site of most data processing. In the future, Zachmann said, "the question will no longer be 'why can't we take it off the big computer?', but 'why can't we do it on the desk?' "

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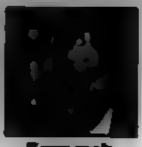
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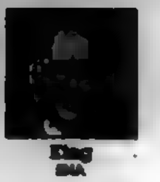
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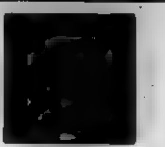
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SAS

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work the same in all operating environments," according to Senior Vice-President John Sall.

Users can develop and test applications on the Personal Computer and then upload them for mainframe production runs with larger files, SAS Institute said. Also, smaller applications can be downloaded to the microcomputer.

The initial release is said to include the SAS Data step, all data manipulation procedures, basic statistical procedures, a windowing facility and the SAS Display Manager System. SAS/IML, an interactive programming facility for advanced mathematical, engineering and statistical applications, is also available.

First-year fees for corporate customers with as many as 50 workstations are $2,500 for the basic product and $1,500 for the SAS/IML facility.

The software requires systems with 512K bytes of random-access memory, a hard disk drive and PC-DOS 2.0 or later release.

SAS Institute can be reached through Box 8000, SAS Circle, Cary, N.C. 27511.

SEATTLE

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tronic mail. Seattle First National does not plan to install Apple's Appletalk network; instead, the bank will hook up the machines to its existing leased-line network, Mertes said. In the future, Macintosh users will be able to access the bank's electronic mail system, which resides on its IBM 3084 Model QX mainframe.

Mertes, who said the contract primarily covers Apple's 128K-byte machine, said the bank will also buy an as-yet-undetermined number of 512K-byte Macintoshes as the situation demands. Seattle First National, whose contract also includes provisions to buy Apple Imagewriter printers, is now evaluating the firm's new Laserwriter printer, he said.

Mertes said the bank's decision to buy the Macintoshes rested on two economic criteria. Although he declined to reveal how much the bank was paying for the machines, he said the contract represented an economically sound choice, because the machines could be distributed to a wide group of people at a low cost.

"The Macintosh is also economical in terms of training," Mertes said, adding that the machine's ease of use was another deciding factor.

COMMUNICATIONS

Firms target 3270 user base

By John Dix
CW Staff

Eyeing the large installed base of IBM 3270-type terminals, three value-added network carriers announced services providing support for these synchronous devices at the recent Interface '85 communications conference.

General Electric Information Services Co. (Geisco) of Rockville, Md., unveiled the Marknet 3270 Binary Synchronous Communication (BSC) service; GTE Telenet Communications Corp. in Reston, Va., introduced support of IBM's Synchronous Data Link Control (SDLC) protocol; and Computer Sciences Corp. (CSC) of El Segundo, Calif., announced international support of 3270 BSC terminals.

The services of Geisco, GTE Telenet and CSC provide native support of IBM cluster controllers or devices that emulate one of these controllers. The controllers are polled from the carriers' network nodes, which emulate IBM 3705 and 3725 communications processors through software or special packet assemblers/disassemblers.

See SERVICES page 66

Synchronous support meets needs

By John Dix
CW Staff

While value-added network carriers have traditionally supported mostly asynchronous devices — their low operating speeds permitting the most efficient use of the leased lines used to string together network nodes — these carriers are now turning their attention to the synchronous world.

IBM's 3270 peripheral family is an alluring user base. By the end of 1984, roughly three million IBM 3270-type devices were in use — approximately 30% of all installed terminals, according to Ilene Goldman, a research analyst in charge of the workstation program at International Data Corp., a Framingham, Mass.-based market research firm.

See SUPPORT page 66

Bytex offers 4,000-port matrix switch

SOUTHBORO, Mass. — Bytex Corp. has announced a member in its family of electronic matrix switches used in backup switching and patching.

The Autoswitch 480 is said to provide nearly twice the capacity of the company's Autoswitch 240 while occupying the same floor space. The product supports 4,000 ports, or 2,000 lines per side, and a number of common interfaces including RS-232 and V.35.

According to a Bytex spokesman, the Autoswitch 480 can be used to support analog and digital communications facilities in a network with asynchronous or synchronous devices. Network devices may include terminals, modems or multiplexers and may be connected on private or common carrier analog or digital transmission facilities.

In normal operating mode, the product's digital port subsystems are said to be transparent to clock signals, treating them exactly as data. Optionally, the subsystems may be configured to provide clock signals for connections between data ter-

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- Symplex Communications has announced the Quantum series of data compression modems/64
- Tymnet has expanded its Async-to-3270 service, which gives users with Ascii terminals and personal computers dial-up access to IBM 3270 applications/67
- Northern Telecom has announced an Automatic Call Distribution Package that increases the call management capability of Northern Telecom's SL-1 private branch exchange/74

INSIDE

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Test Equipment/67
Auxiliary Equipment/67

DCA unveils enhanced time-division muxes

NORCROSS, Ga. — Digital Communications Associates, Inc. (DCA) has announced Netlink II, an enhanced version of its Netlink time-division multiplexer, and Switching Netlink, an enhanced time-division multiplexer.

The company also announced enhancements to its Series/300 line of network processors and a bit-oriented protocol pass-through software package that enables network processors to transport Synchronous Data Link Control (SDLC) traffic in an IBM Systems Network Architecture (SNA) environment over a DCA trunk.

A company spokesman said Netlink II provides voice, data and compressed video transmission at speeds up to 1.54M or 2.05M bit/sec. It reportedly is compatible with any asynchronous Ascii terminal, as well as DCA's Network Management System, which enables a manager to control the network from a central location.

Netlink II features support of traditional drop and insert for multipoint networks; redundant power supplies, logic, T1 carrier modems and facilities; support of independent trunk clocks; support of D4 framing compatibility required for connection to AT&T's Accunet T1 service; compressed or expanded Continuously Variable Slope Delta modulation technique to handle voice transmission; and automatic time of day reconfiguration.

Netlink II is available in 20- and 44-channel desktop units and is expandable to 128 channels in rack-mount form. The 44-channel Netlink II, available now, is priced at $5,795. The 20-channel version, scheduled to be available in May, is priced at $4,195.

Switching Netlink also provides voice, data and compressed video transmission at speeds up to 1.54M or 2.05M bit/sec but also offers switching capability, a spokesman said. Operators can reportedly perform switching functions with program commands, obviating the need to move ca-

See NETLINK page 74

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IBM SQL/DS and DB2 relational DBMS now on PC

ORACLE, the relational DBMS compatible with IBM's SQL/DS and DB2, is now available on the IBM PC/XT and PC/AT. While SQL/DS and DB2 run only on IBM mainframes, ORACLE runs on IBM mainframes as well as on DEC, DG, HP and most other minis and micros. Any application written for SQL/DS or DB2 will run without modification on the complete range of systems supporting ORACLE, including PCs.

SQL/DS and DB2 are relational database management systems; ORACLE is a relational DBMS plus an integrated set of 4th generation software tools for application generation, report writing, color graphics and network communications.

Oracle Corporation introduced the first relational DBMS in 1979. Now, ORACLE provides the only complete implementation of the IBM-standard SQL language available for the PC.

Oracle Corporation cites three principal application areas for its product's capabilities:

■ The ORACLE Application Development Center provides a PC-based development center for the creation of DB2 and SQL/DS applications. The flexibility of the personal computing environment is made available to programmers creating applications for use with IBM's relational database products.

■ The ORACLE Personal Information Center extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

■ The ORACLE Distributed Information Center provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

Using ORACLE's SQL*LINK networking facility, ORACLE on such diverse systems as MVS, VM/CMS, VAX/VMS, UNIX and PC/DOS can selectively exchange database information using the full capabilities of the SQL language. Applications, portable across all environments, can be run identically on any system, and data can be intelligently extracted for use at any site.

ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 2043.

CONTROLLERS

■ **SBE, Inc. has introduced M68COM, a communications board compatible with Intel Corp.'s Multibus that provides eight full-duplex channels.**

The Motorola, Inc. 68000-based board has four multiprotocol serial channel controllers that enable users to programm the eight channels independently. Each channel can run asynchronous, bisynchronous, X.25, Synchronous Data Link Control and High-Level Data Link Control protocols as well as be configured to support RS-232, RS-422 and RS-423 interfaces. M68COM can support from less than 5 bit/sec to 38.4K bit/sec programmable transmission rates and up to 880K bit/sec external rates.

The board offers between 128K and 512K bytes of dual-ported random-access memory with parity protection. In addition, four erasable programmable read-only memory (Eprom) sockets accommodate up to 256K bytes of Eprom.

The board costs $1,595.

SBE, 2400 Bisso Lane, Concord, Calif. 94520.

VOICE/DATA COMMUNICATIONS

■ **Avanti Communications Corp. has added an option to TPAC-1.5, a programmable access unit for T1 services.**

The option, Integrated Service Unit (ISU), consists of a channel service unit and data service unit, the vendor said. With the product, an AT&T Accunet user can meet Accunet's framing and density requirements without modifying existing data terminal equipment.

ISU features include integrated loopback processing and automatic clear channel sensing, the vendor said. The clear channel capability reportedly yields an additional 192K bit/sec of user bandwidth when T1 services are upgraded.

Data ports operate at speeds from 2.4K bit/sec to 1.34M bit/sec and support RS-232, RS-449 and V.35 interfaces. The product was designed for file transfers, computer-aided design and manufacturing applications and video teleconferencing.

The ISU option costs $1,900.

Avanti Communications, Aquidneck Industrial Park, Newport, R.I. 02840.

■ **Digital Products, Inc. has unveiled its Printdirector line of printer sharing products that enables asynchronous devices to share a single printer.**

The PD5 has five serial ports, enabling four computers to use one printer. It is priced at $495. The PD6 has six ports, two of which can be configured as parallel ports. The PD6 device costs $695.

A PD MS 0/4D version has four serial ports with a 60K-byte print buffer. This unit costs $995.

The PD MS1 is a seven-port version (four serial and three parallel ports) with a 60K-byte print buffer and costs $1,295. The PD MS2 is a 12-port unit (eight or six serial ports with four or six parallel ports) with a 120K-byte print buffer and costs $2,545.

The PD MS3 is a 17-port (12 or eight serial ports and five to nine parallel ports) with a 180K-byte print buffer and costs $3,745. Another version, the top-of-the-line PD MS4, is a 22-port (16 or 10 serial ports, six or 12 parallel ports) unit with a 240K-byte print buffer and costs $4,895.

Digital Products, 600 Pleasant St., Watertown, Mass. 02172.

SOFTWARE

■ **Software Development and Maintenance International, Inc. has introduced an IBM 3780 terminal emulator for IBM mainframes using its DOS/VSE, OS or MVS operating systems.**

According to the vendor, SDM3780 can submit jobs to and retrieve output from remote job entry systems. Data files can be transferred among incompatible systems without reformatting the data or transferring magnetic tapes, the vendor said.

SDM3780 is priced at $4,500 for DOS/VSE installations and $5,000 for OS or MVS installations.

Software Development and Maintenance International, 134 Spring Ave., Fuquay-Varina, N.C. 27526.

■ **Datanex, Inc. has announced Hasp+ 4.3, an enhanced version of its Hasp+ communications software for users of Digital Equipment Corp. VAX and PDP-11 series computers.**

According to the vendor, Hasp+ 4.3 enhancements enable users to dial multiple sites automatically with multiple phone numbers from a single queue and allows VAX systems to become the central mainframe in a remote job entry network.

Hasp+ 4.3 is priced at $5,500.

Datanex, P.O. Box 1728, Eugene, Ore. 97440.

MULTIPLEXERS/ MODEMS

■ **Scientific-Atlanta, Inc. has announced the Model 6403 and Model 6403M radio frequency (RF) modems that allow point-to-point communications over a broadband coaxial network.**

The modems feature quadrature-amplitude shift keying digital modulation, an inverted frequency scheme and RF channel spacing of 750 kHz, the vendor said. The product supports point-to-point communications between a 6403 and Scientific-Atlanta's 6402 broadband modem without a head-end frequency translation, the vendor said.

The vendor said both modems are frequency-agile, with transmit and receive frequencies programmed by a handheld keypad. The products operate in synchronous, full-duplex mode.

The modems can be mounted in a 19-in. rack.

Model 6403 costs $5,105, and Model 6403M sells for $5,600.

Scientific-Atlanta, P.O. Box 105600, One Technology Pkwy., Atlanta, Ga. 30348.

See MODEM page 64

Micom Systems extends series

SIMI VALLEY, Calif. — Micom Systems, Inc. has announced Micro 800/2M, a data concentrator compatible with the company's modular Micro 800/2 family, which uses firmware cartridges for software changes and upgrades.

An eight-channel Micro 800/2M consists of a cabinet, chassis, power supply, removable circuit board and choice of plug-in Featurepak cartridges. Three expansion channel modules, each of which support eight terminal channels, enable support of up to 32 channels.

The Featurepak cartridge reportedly enables users to protect their investment in hardware by providing a way to accommodate changes in operating environments.

With a terminal connected to the Micro 800/2M's command port, users can gather and report statistics, troubleshoot and report alarms, the company said. Users can also alter terminal channel specifications — parity and number of stop bits, for example — using the terminal-initiated channel configuration option, the vendor reported. Other options include plug-in modem modules that support 9.6K or 14.4K bit/sec transmissions.

Prices for the data concentrator range from $3,500 to $7,150.

Micom Systems is located at 4100 Los Angeles Ave., Simi Valley, Calif. 93063.

Uptime

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CICS Dynamic File Allocation is a must for effective CICS scheduling. It is the gateway to non-stop, round-the-clock CICS systems. It eliminates batch update constraints. It guarantees bullet proof restarts. It allows you and your batch jobs to add and remove CICS files at will, without disrupting your user community. Site license $4,000.

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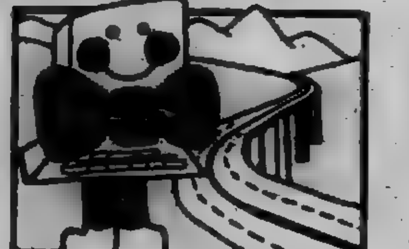

The German computer market is the largest in Europe and the third largest in the world. It has over $11 billion in installed general purpose computers. The fastest growing segment of the German computer market is the microcomputer, with an installed value of $283 million. There were 10,000 IBM PC's sold in 1983 and another 30,000 units including IBM PCjr's are expected to be installed by the end of 1984.

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We cover the microcomputer market with our microcomputer publication — MicroComputerwelt. Every month, MicroComputerwelt circulates to 65,000 German microcomputer professionals in the business, science and education fields.

PC Welt is our monthly publication specifically designed for IBM PC users. PC Welt's total distribution is 50,000 and it is being sold at newsstands throughout Germany.

Computer Business, modeled after MICRO MARKETWORLD in the United States, covers all channels of distribution in the computer industry. Computer Business, circulates to 10,000 key decision makers with bulk-buying responsibility.

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Introducing the Priam DataTower™ Mass Storage System for personal computers.

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It's like sitting at a mainframe.

Now users can do applications like inventory management. CAD/CAM, or CAE. Accounting. Econometric modeling. Even software development. Any application that calls for fast access to lots of information. Best of all, this floor-standing unit lets users keep their desks as neat (or messy) as they like.

At 27" x 9" x 20½" the DataTower makes a perfect fit.

Each DataTower contains Priam's own field-proven, high-performance 8" drive, from 75 to 292 MB (formatted capacity)—the same drives that have made us a leading U.S. manufacturer of high-quality voice-

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coil Winchesters. Combine that with our intelligent high-performance controller, and you've got a system that will improve throughput and response time in a very big way.

Need more than 292 MB on your LAN? Just add our new Expansion Tower,™ containing either one or two additional 8″ drives, giving you up to a full gigabyte of PC mass storage.

A model of data integrity.

Instead of providing just the standard functions, Priam designed the DataTower with all the features found in a supermini mass storage system. Including automatic error recovery and defect management to protect against accidental data loss. There's also a streaming tape drive with 60 MB cartridges, to back up data by file or entire partition.

Priam is the leading U.S. manufacturer of 8″ voice-coil disk drives, in unformatted capacities of 85, 188, and 344 MB.

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The Priam DataTower. For PC mass storage, it's the best little deal in town.

MODEM

from page 60

■ **Universal Data Systems, Inc. has announced 9600 FP, a 9.6K bit/sec modem designed for multipoint networks.**

The product's automatic adaptive line equalization allows four-wire, full-duplex, private-line operation over 3002-type leased lines without manual strapping, the vendor said. The digital adaptive feature compensates for delay and amplitude distortion caused by interference in the received signal.

The vendor said that it includes a 10-position rotary switch for selecting talk or data mode, initialization mode and eight test modes. The test features include local and remote activated digital loopback, local analog loopback and 511 test pattern generation and checking. Nine front panel displays help users determine how to send and receive data.

The product features a fallback mode that will allow a user to change to either a 4.8K bit/sec or 7.2K bit/sec data transmission rate, the vendor said.

The 9600 FP costs $1,995.

Universal Data Systems, 5000 Bradford Drive, Huntsville, Ala. 35805.

■ **Prentice Corp. has announced P 212 ST, a full-duplex, asynchronous modem with transmission speeds that range from 110 to 1.2K bit/sec.**

The vendor said the modem is compatible with the communications command set of AT&T 212A and Hayes Microcomputer Products, Inc. modems. The product features automatic dialing, automatic answering and uses a light-emitting diode to verify connections.

The P 212 ST, which uses an RS-232 interface, costs $425.

Prentice, P.O. Box 3544, 266 Caspian Drive, Sunnyvale, Calif. 94088.

■ **Astrocom Corp. has unveiled a modem emulator that operates either separately or combined with RS-232 and V.35 interfaces for intrafacility communications.**

The V.35 interface is said to enable terminal-to-computer communications at up to 2,000 feet, at asynchronous speeds of up to 57.6K bit/sec or synchronously at switch-selectable speeds of 2.4K, 4.8K, 9.6K, 19.2K, 38.4K, 56K or 57.6K bit/sec. It replaces back-to-back modems and can provide interface conversion from RS-232 to V.35, according to a company representative.

The single-quantity price for the RS-232 stand-alone version is $367; for the circuit card version, the price is $235. The optional V.35 interface unit is $419 for the stand-alone version and $295 for the circuit card version.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

■ **EF Data Corp. has released its fully synthesized BCM-101 digital broadband modem, which is available in data rates of 756K bit/sec and 1.544M bit/sec.**

Typical error-rate performance is 10 to the -9 power. Frequency range is 5 MHz to 400 MHz with steps of 50 kHz.

The modem costs $3,450.

EF Data, 1233 N. Stadem Drive, Tempe, Ariz. 85281.

■ **Concord Data Systems, Inc. has announced the CDS 224 modem card that operates asynchronously at 300 bit/sec and asynchronously or synchronously at 1.2K bit/sec and 2.4K bit/sec.**

An automatic answering feature recognizes the transmission speed of an incoming call and adjusts the modem accordingly. The vendor said the three-speed modem card is plug-compatible with many rack-mount chassis.

The product offers an optional automatic outdialing feature that supports pulse and tone dialing.

Integral diagnostics reportedly provide a fault isolation feature and include digital self-tester, analog self-tester and an internal test pattern generator and checker.

The modem sells for $855 or $895 with the autodial option.

Concord Data Systems, 303 Bear Hill Road, Waltham, Mass. 02154.

■ **NEC America, Inc. has announced a leased-line modem, the DSP 19200M, that can reportedly operate asynchronously or synchronously at 9.6K, 12.2K, 14.4K, 16.8K and 19.2K bit/sec.**

The modem operates over four-wire-type 3002 leased telephone lines with D1 conditioning.

The product will be available in June for $12,000.

NEC America, Data Communications Products Department, 1012 Stewart Drive, Sunnyvale, Calif. 94086.

■ **Symplex Communications Corp. has announced the Quantum series of intelligent modems for data communications.**

A spokesman said the Quantum series uses the same data compression and statistical multiplexing technology incorporated in the company's Datamizer data compressor. The Quantum series includes the Quantum 14.4, the Quantum 9.6 and the Quantum DSU/CSU.

The Quantum 14.4 reportedly offers 24K bit/sec line capacity, while the 9.6 and DSU/CSU offer 19.2K bit/sec line capacity.

The Quantum 9.6 is priced at $7,450, The Quantum 14.4 costs $9,950, and the Quantum DSU/CSU is priced at $6,450.

Symplex, 5 Research Drive, Ann Arbor, Mich. 48103.

See MODEM page 67

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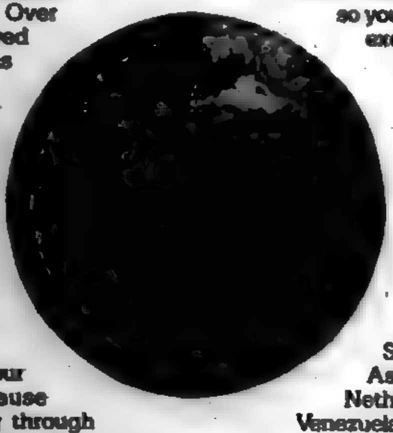

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MODEM

from page 64

■ Gandalf Data, Inc. has announced a rack-mounted version of its LDS 260 synchronous local modem, called the RM3260, used in file-to-file transfer applications over privately owned lines at distances up to 2.4 miles.

A spokesman said the rack-mounted LDS 260 modem is available in 56K bit/sec or 50K bit/sec versions. The unit supports speeds from 19.2K bit/sec to 256K bit/sec and any speed within that range. Point-to-point and multipoint operations are supported, RS-232C and V.35 interfaces are available and up to 14 rack-mounted LDS 260s fit into one 19-in. LDS 3000 rack.

Prices for the RM3260 start at $655.

Gandalf Data, 1019 S. Noel, Wheeling, Ill. 60090.

■ T-Bar, Inc. has announced it will market the PMS/1060 distributed processing network management system, developed by Thomson-TITN of France.

A spokesman said the PMS/1060 is a hardware and software product that provides users with central control of their networks. The PMS/1060 monitors, measures and displays performance indicators in real-time, including message volume and activity and number and type of system errors for each terminal or application in the system.

Other features of the PMS/1060 include dynamic downloading, which allows switching between protocols by entering a command, selective or continuous monitoring and a data base management system incorporating the C language and AT&T's Unix.

The price of PMS/1060 ranges from $55,000 to $640,000 for systems with from 16- to 512-line capability.

T-Bar, P.O. Box T, 141 Danbury Road, Wilton, Conn. 06897.

NETWORK SERVICES

■ Tymnet, Inc. has announced an expansion to its Async-to-3270 service, which gives users with Ascii terminals and personal computers dial-up access to IBM 3270 applications.

Users can access full-screen 3270 applications on the Tymnet public data network via Tymnet's 2.4K bit/sec dial-up Async service. New features include added printer support and end-to-end transmission and protocol conversion services.

The charge for the Async-to-3270 service — which includes conversion, rental of modems and transmission of the data — is approximately $8 to $10 per hour.

Tymnet, 2710 Orchard Pkwy., San Jose, Calif. 95134.

AUXILIARY EQUIPMENT

■ Contel Information Systems, Inc. has introduced Mind-Inventory data base software for the management of telecommunications resources with the IBM Personal Computer and Personal Computer XT.

Mind-Inventory reportedly stores information on orders, equipment, circuits, configuration costs and maintenance. It is said to index data on the basis of serial number, equipment location, date of purchase and date of installation or other criteria.

It is said to track costs and inventory based on data input by the user.

The package requires 512K bytes of internal memory and costs $4,950.

Contel Information Systems, 130 Steamboat Road, Great Neck, N.Y. 11024.

■ IE Systems, Inc. has introduced BIS-7706, a Honeywell, Inc. program that runs on an IBM Personal Computer with a bisynchronous communications adapter enabling Honeywell VIP 7700 or 7705 terminal emulation.

The product allows a user to communicate with a Honeywell mainframe or controller over point-to-point or switched telephone lines by synchronous modems. BIS-7706 supports VIP 7705 functions in-

Continued on page 72

TEST EQUIPMENT

■ Hewlett-Packard Co. has announced its HP 3457A, a 3½- to 6½-digit multimeter that provides seven measurement functions, extended resolution to 7½ digits and optional scanner capabilities for testing electronic components, such as disk drives, printers, plotters and modems in a computer system.

The measurement functions include frequency, period, dc and ac currents and resistance. Users can store up to 1,050 readings or entire measurement sequences in the instrument, the vendor said.

Price of the unit is $2,800. The armature-relay multiplexer assembly costs $450, and the reed-relay multiplexer assembly costs $450.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

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SERVICES

from page 59

Dedicated access to Geisco's Marknet 3270 BSC service is available in 63 cities and on a dial-up basis in 200 cities, according to Daniel Casco, product manager of synchronous services. Using leased lines and dedicated node ports, IBM 3271, 3276 and 3274 controllers can be supported at speeds up to 9.6K bit/sec.

Dial-in connections are limited to 2.4K to 4.8K bit/sec transmissions. The required line speed will be determined by the number of devices supported by the remote controllers and the response time desired. The dial-in access is primarily intended to accommodate personal computers emulating 3274 controllers, Casco said.

Geisco offers host connections for 3270 BSC in only 11 major metropolitan areas where it maintains network services centers manned around the clock. "This is the best way to serve the host connections, the most important interface in the network," Casco said. Hosts are supported at 2.4K, 4.8K, 9.6K and 19.2K bit/sec.

Dial-in access costs range from $3.50/hour to $12/hour, Casco said. Dedicated dial-in ports cost $380/mo to $600/mo. Dedicated leased line ports cost $320/mo.

Character charges range from 1 cent/1,000 characters to 25 cents/1,000 characters, depending on the volume of data transmitted.

GTE Telenet has offered BSC services for almost a year, according to company spokeswoman Claudia Houston, and is now supporting SDLC for users of IBM's Systems Network Architecture (SNA).

> *'[Network services centers are] the best way to serve the host connections, the most important interface in the network.'*
>
> **— Daniel Casco, General Electric Information Services Co.**

SDLC service requires a leased-line and dedicated-access facility at the nearest Telenet node. Houston indicated that the service is available in 25 of the 373 cities Telenet serves.

Controllers and host are supported at 4.8K or 9.6K bit/sec. Network support is provided by putting an X.25 frame around each 3270 SDLC packet, according to Houston.

The service costs $700/mo and $1,200/mo for terminal support at 4.8K and 9.6K bit/sec transmissions, respectively. The charges include fees for transmission of 75,000 and 100,000 packet/mo. Host support at the same speeds costs $1,050/mo and $1,525/mo.

Although CSC also offers domestic 3270 BSC service through its Infonet network, Bernard F. Gallagher, vice-president of network services, said its international service sets CSC apart from other carriers.

Service from the U.S. is available to Canada, Australia, Mexico, South Africa, Japan, Hong Kong, Belgium, Denmark, Finland, France, Germany, Italy, Norway, Spain, Sweden, Switzerland, the Netherlands and the UK.

IBM controllers are supported from Infonet nodes in those countries with dial-up links to dedicated node ports at 2.4K or 4.8K bit/sec or with leased lines and deciated ports at speeds up to 9.6K bit/sec. Hosts are supported at speeds up to 14.4K bit/sec.

Four to 10 terminals would typically require a 9.6K bit/sec link. Whidden said it would not be realistic to operate more than 10 terminals on a single controller, even though it is technically feasible.

The service costs $1,200/mo and carries an additional charge of 6 cents/1,000 characters transmitted.

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SAMKHYA / CORPORATION

SUPPORT

from page 59

Although the economies the packet-switched carriers can offer with synchronous services are not as compelling as those offered with asynchronous services (the higher speeds eat into the bandwidth of the shared lines between carrier nodes), these relatively new services are cost-effective in certain applications.

As an example, Daniel Casco, product manager of synchronous services at General Electric Information Services Co. (Geisco), said, "We are competitive in any configuration against AT&T's Wats and pretty competitive in the dedicated-line environment."

When users have a number of sites co-located within one or two states, Casco said, it would probably be more cost-effective to go with a multidrop leased line.

The benefits of one approach over the other "depend on where you need service and how much you use the line," according to Alan Schaevitz, senior consultant and director of the San Francisco office of Network Strategies, Inc., a data communications consulting firm based in Burke, Va. "The key factor is the difference between flat-rate charges with leased services and the usage-sensitive charges of packet services.

"If you're leasing a line and using it for an hour per day, then a packet service that charges you on a usage-sensitive basis might reduce your costs quite a bit," he said. "On the other hand, if you have a lease service and use it 100% of the time at full speed, then you're not likely to find a packet service to meet your needs."

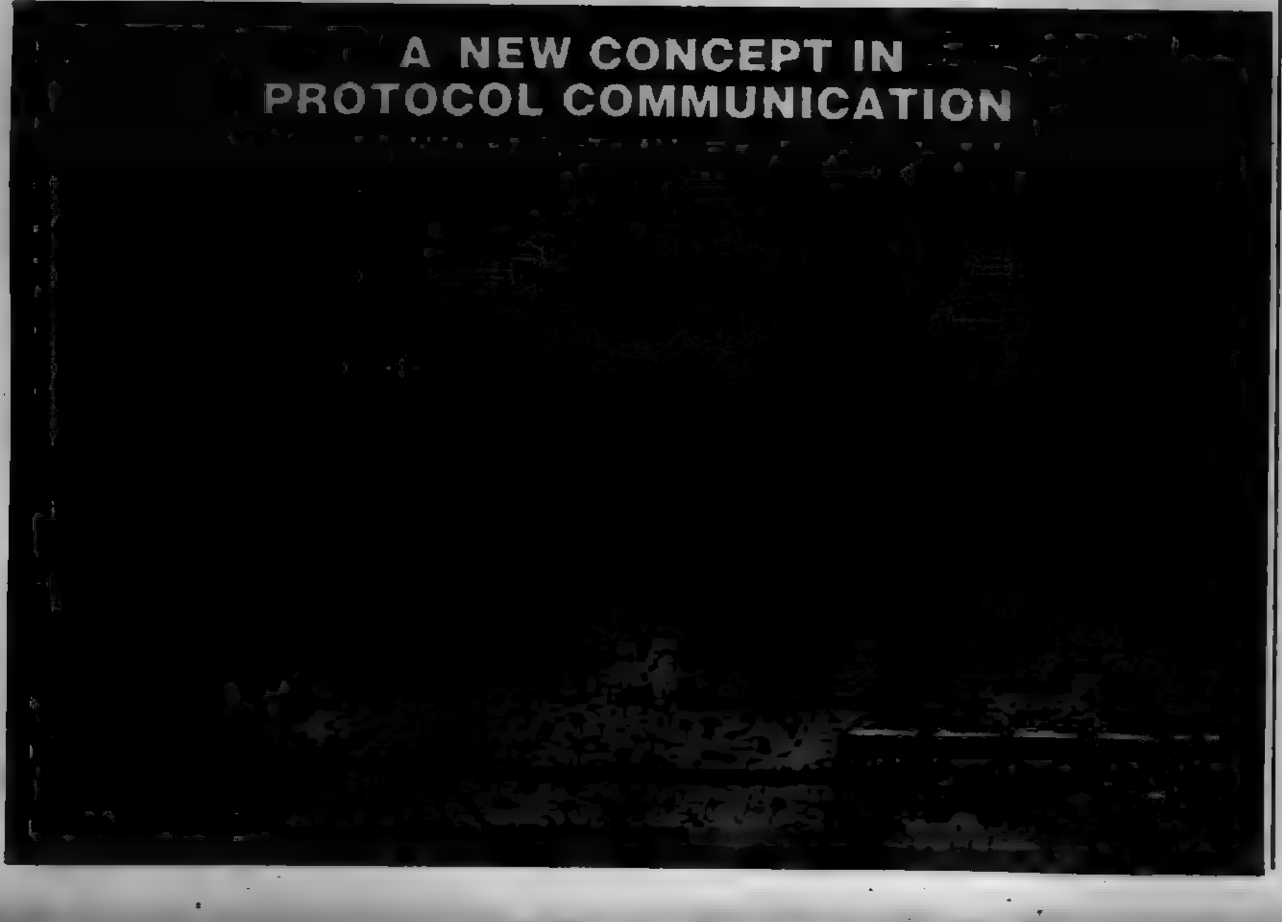
Changes cause complications

A straightforward traffic analysis will generally determine whether to go with leased facilities or packet-switched services, but changing applications can complicate the decision. Swapping micros for terminals, for example, can drastically change communications requirements.

"A person sitting at a terminal eats up line time," noted John King, executive director of James Martin Associates, a Carmel, Calif.-based consulting firm. "With personal computers, you don't have all the processing done at the central site, you can pull down a block of information to process, which lowers the utilization of the communications circuit."

Geisco's dial-in 3270 Binary Synchronous Communication (BSC) service is, in fact, targeted at personal computer users, Casco said. To access it, users must upgrade their micros to emulate an IBM 3274 controller by adding a synchronous modem, communications board and appropriate software. The Geisco nodes that support 3270 BSC emulate IBM 3705/3725 communications processors and provide local polling of the "controllers."

The one problem packet-switched carriers face with their 3270-type synchronous services is in the wooing of users. "These carriers have come in to the party so late they are facing mostly installed systems," King said. "Customers already have the bulk of their 3270s installed on multidrop and point-to-point lines."



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COMMUNICATIONS

Continued from page 67

cluding screen formatting, polling responses, data link control and time-out control.

A vendor spokesman said that the terminal emulation package features menu-driven configuration and Help files as well as addressable VIP printer support and a Send capability.

The price of BIS-7705 is $695.

IE Systems, P.O. Box 359, 112 Main St., Newmarket, N.H. 03857.

■ **General Datacomm Industries, Inc. has announced MAU-3, a high-speed, multiple access unit designed for polled, synchronous digital networks.**

MAU-3 reportedly can be used as a modem-sharing or port-sharing device. It is said to enable up to four data service units, local-area data sets or terminals to share one communications device in a polled network. This capability reduces the number of transmission lines, local loops, data service units and local-area data sets in a polled network.

The product features internal or external timing and synchronous operation at speeds up to 512K bit/sec.

MAU-3 costs $1,395.

General Datacomm Industries, Middlebury, Conn. 06762.

■ **Cleo Software has announced Syncable, a smart cable component option to its 3780+ and 3270 terminal emulation packages that allows asynchronous microcomputer devices to communicate with synchronous modems.**

According to the vendor, the Syncable connects microcomputers directly to a synchronous modem while running under Microsoft Corp.'s MS-DOS, IBM's PC-DOS and AT&T Unix operating systems and using Cleo's terminal emulation software.

The cable option is included with the software emulation packages, which range in price from $795 to $1,295.

Cleo Software, Edgebrook Court, 1639 N. Alpine Road, Rockford, Ill. 61107.

■ **Wolfdata, Inc. has introduced two X.25 dial network interface products for use with personal computers.**

The WD212-X.25 Integral Modem/Packet Assembler Disassembler (PAD) and the WD212-X.25 Stand-Alone Modem/PAD are both said to conform to CCITT standards.

The WD212-X.25 combines an AT&T 212A-compatible modem with an X.25 PAD for use with IBM's Personal Computer, Personal Computer XT and Personal Computer AT and with the AT&T Model 6300, the vendor said. The stand-alone device can also be supported through an RS-232 connection.

According to the vendor, both devices have been certified by GTE Telenet Communications Corp. for dial service on the Telenet public data network.

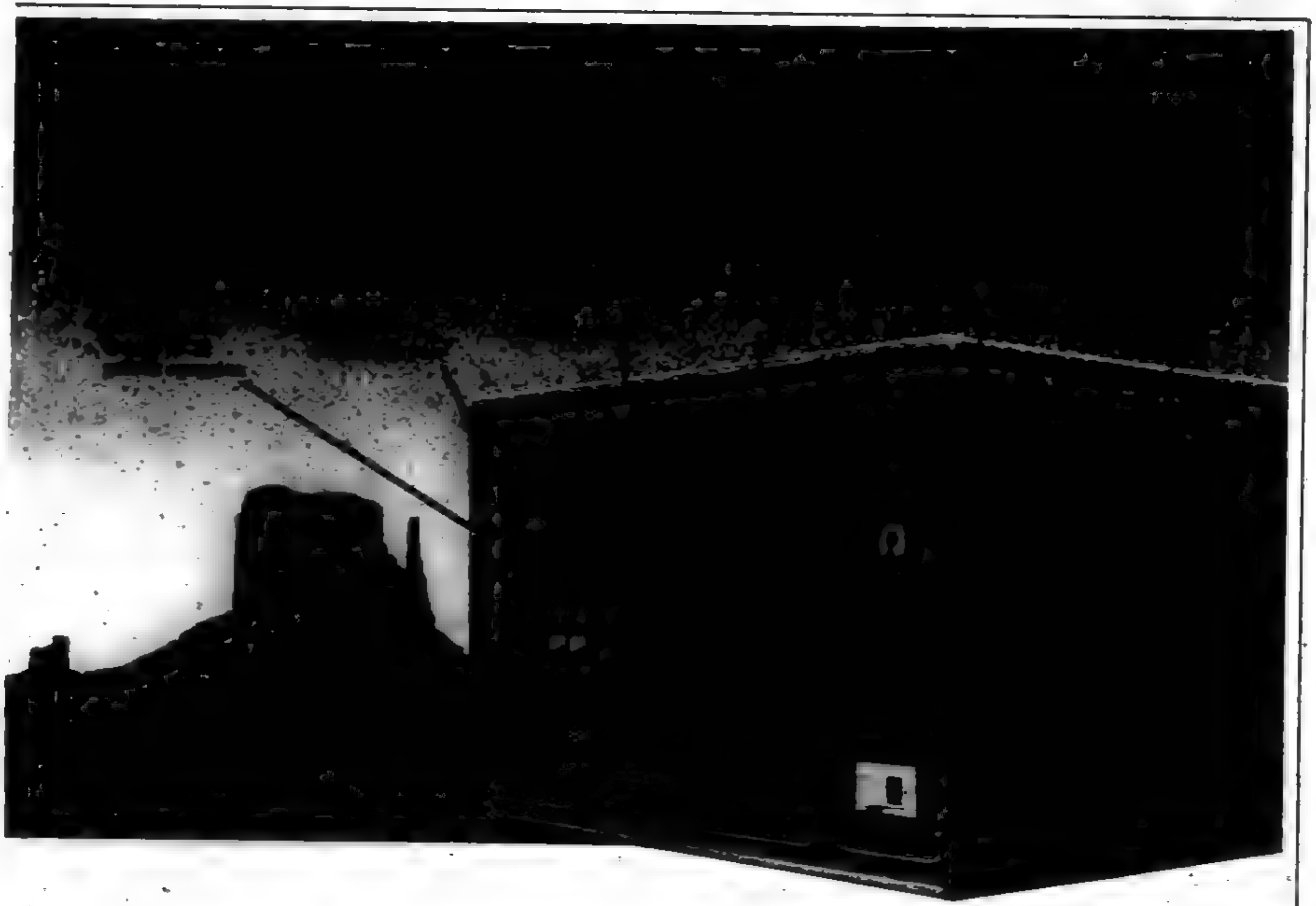
The WD212-X.25 Integral Modem/PAD is priced at $650, and the WD212-Stand-Alone Modem/PAD is priced at $695 each. Quantity pricing is also available.

Wolfdata, 187 Billerica Road, Chelmsford, Mass. 01824.

■ **AT&T Teletype Corp. has announced an asynchronous adapter for its synchronous E4540 terminal system that allows the company's IBM 3270-compatible workstations to access hosts operating with either protocol.**

According to a company spokesman, another keyboard-selectable option provides a horizontal split-screen mode, allowing the terminal to interact with an asynchronous and synchronous hosts simultaneously.

Continued on page 74



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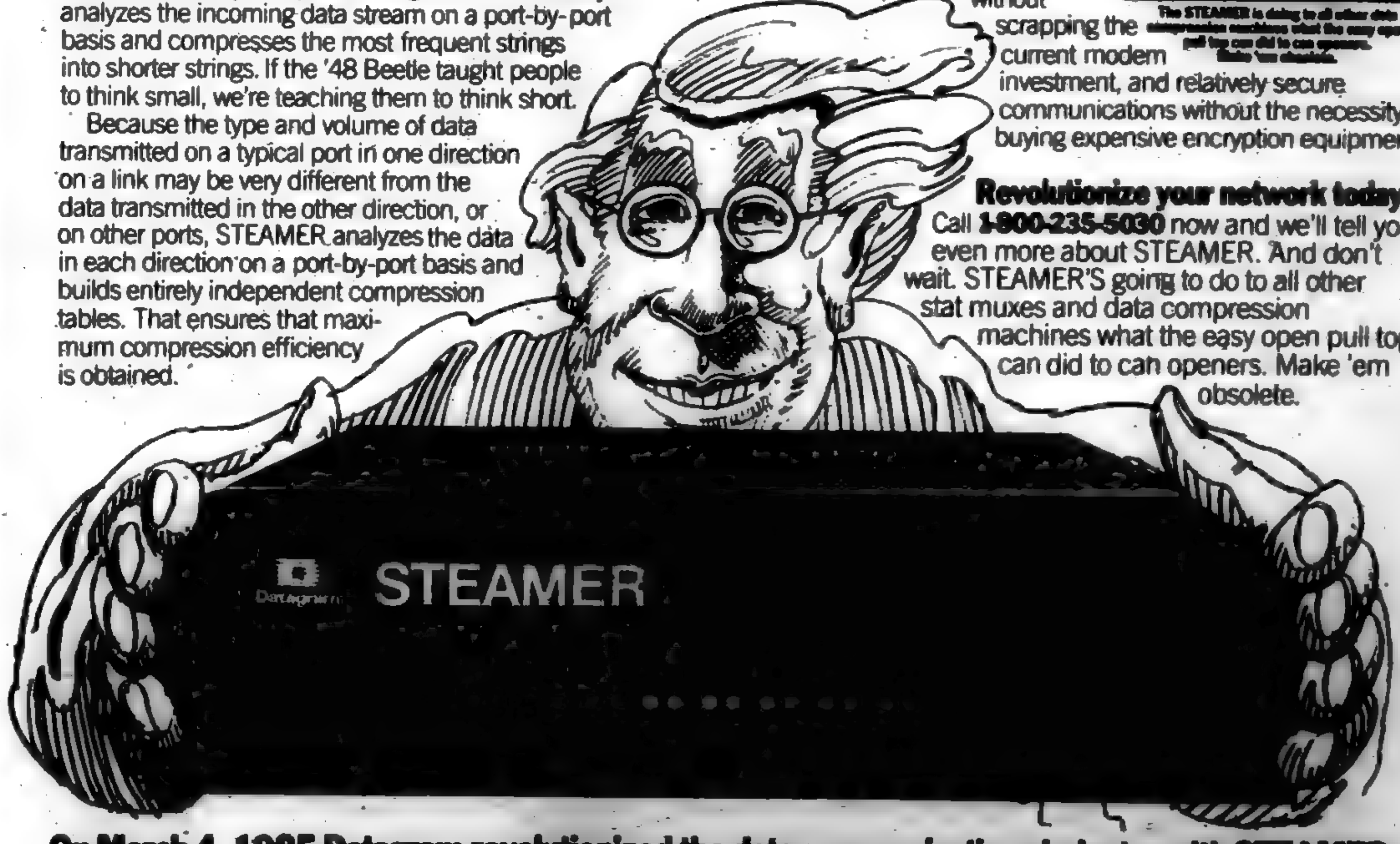

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Continued from page 72

The asynchronous adapter consists of a small module and program diskette. Each module provides the E4540 displays with access to eight RS-232 asynchronous modem ports with line speeds of up to 2.4K bit/sec, the company said.

In asynchronous operation, the E4540 displays reportedly are compatible with applications programs based on the Ansi X3.64 display terminal protocol and Digital Equipment Corp. VT100 and VT52 operation.

The E4542, to be available the second quarter, is priced at approximately $900.

AT&T Teletype, 5555 Touhy Ave., Skokie, Ill. 60077.

■ Northern Telecom, Inc. has announced its Automatic Call Distribution Package D (ACD-D) for use in conjunction with available ACD software to increase the call management capability of Northern Telecom's SL-1 private branch exchange.

ACD-D, which runs on the SL-1 and an associated Digital Equipment Corp. PDP-11 minicomputer for report generation, is said to increase the number of possible answering stations on an SL-1 from the previous 320 to 500.

It provides ACD supervisors with terminal displays on call processing performance of all answering positions, including highlighting of deviations from the normal call processing program, such as incoming emergency calls or an increase in call waiting times.

Call information is passed at 1.2K bit/sec to a DEC PDP-11/23+ or at 9.6K bit/sec to a PDP-11/44.

The cost of the package, based upon the number of lines, ranges from $3,500 to $4,000.

Northern Telecom, 685A E. Middlefield Road, Mountain View, Calif. 94043.

■ Microbar Systems, Inc. has introduced a single-board communications computer designed for use in AT&T Unix environments with systems built on the Intel Corp. Multibus.

COM16 is said to function as a 16-line communications controller in a Multibus system or as a stand-alone, single-board computer in dedicated communications equipment.

It reportedly allows users to implement IBM Synchronous Data Link Control, bisynchronous and other protocols without overloading the main system processor.

It is said to feature 24-bit addressing and 8- or 16-bit data transfers; to provide IEEE 796 bus interface with eight lines of RS-232, expandable by adding eight more lines of RS-232 or RS-422; and to run 16 lines at 9.6K bit/sec full-duplex or 16 lines at 19.2K bit/sec in half-duplex mode.

The unit price is $1,890, according to the vendor.

Microbar Systems, 785 Lucerne Drive, Sunnyvale, Calif. 94086.

NETLINK

from page 59

bles, add switch boxes or make hardware changes to accomplish channel routing.

The price for Switching Netlink, which is available now, is $6,295.

The bit-oriented protocol pass-through software reportedly enables a user's Series/300 network processors to transport SDLC and most other bit-oriented protocols over a DCA trunk.

The software provides fully transparent pass-through of native-mode SNA/SDLC, the company reported.

The one-time licensing fee for the bit-oriented protocol pass-through software, scheduled to be availible in April, is $795.

The Series/300 network processors have been enhanced with a high-speed X.25 link and an Ethernet interface. The X.25 link complies with 1980 and 1984 CCITT recommendations for X.25 gateways and operates at speeds up to 72K bit/sec. The X.25 link enables a Series/300 to act as a packet switch. The Ethernet interface enables Series/300 network processors to be networked.

The X.25 link price is $4,995 for the licensing change, $4,995 for one-trunk compatibility hardware and $5,995 for two-trunk compatibility hardware. The Ethernet interface, which consists of a two-board set, is priced at $5,995.

DCA is located at 303 Technology Park, Norcross, Ga. 30092.

BYTEX

from page 59

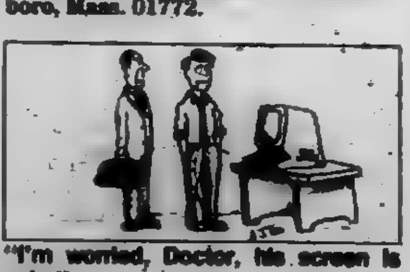
minals. This configuration is said to increase throughput.

With a single command at the system's CRT System Control Console, a group of digital ports can be switched to a like group of ports or single analog or can be attached across the switch to like ports.

Autoswitch 480 provides audit and control information and trend determination, the vendor said. It features password security, preprogrammed command sequences, time-driven commands and event-driven commands. The product is fault tolerant and redundant.

Autoswitch 480 costs range from $30,000 to $200,000, depending on configuration.

Bytex is located at Southboro Office Park, 120 Turnpike Road, Southboro, Mass. 01772.



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SYSTEMS & PERIPHERALS

HARD TALK
Tom Henkel
CW Senior Editor

Hitachi volleys IBM's Sierra

Judging by Hitachi Ltd.'s swift response to IBM's Sierra announcement, the Japanese electronics giant clearly has been doing its homework. Hitachi's two high-end processors, announced in the U.S. as National Advanced Systems Corp.'s (NAS) AS/XL line, appear to match the performance of IBM's 3090 Model 200 and Model 400 processors almost exactly.

Because it is highly unlikely that Hitachi whipped the two machines together in the month that passed between the IBM and Hitachi announcements, Hitachi's competitive analysis people appear to have had the IBM Sierra announcement pegged, apparently without IBM's help. Recall that it has been a little more than two years since Hitachi, National Semiconductor Corp. and NAS were named, along with several Japanese electronics firms, in an IBM trade secrets lawsuit in which IBM claimed the Japanese were trying to swipe its high-end mainframe plans.

If everything goes according to plan, Hitachi's high-end mainframe, which is marketed by NAS as the AS/XL Model 80, will be available about a year earlier than IBM's equivalent 3090 Model 400. But bear in mind that both the Model 80 and Model 400 employ fairly complex emitter-coupled logic circuit technology. As is often the case with new technology mainframes, last-minute problems can sometimes delay early shipments.

It is too early to speculate whether either NAS or IBM will have such problems.

But an interesting omission from Hitachi has some some analysts a bit skeptical. Hitachi refuses to release the machine cycle times for the new boxes, claiming the figures, which are freely released on its other CPUs, are now confidential. Some analysts have said the firm's refusal to disclose cycle times could mean the Hitachi machines are paper tigers. It won't take long to find out, however. Hitachi says it will begin

See NAS page 82

Altos unveils 32-bit micro

By Kathleen Sullivan
CW West Coast Bureau

SAN JOSE, Calif. — Altos Computer Systems this week will become the first company to introduce a multiuser microcomputer system that incorporates Motorola, Inc.'s 32-bit 68020 microprocessor, according to the company.

Dubbed the Altos 3068, the system will run AT&T's Unix System V operating system and support up to 30 users, according to Phillip E. White, Altos' senior vice-president of marketing.

In its base configuration, which is said to support 10 users, the Altos 3068 includes a 1.2M-byte floppy disk drive, 1M byte of random-access memory (RAM) and a 20M-byte hard disk drive. The Altos 3068 will be able to accommodate up to three 5¼-in. hard disk drives. The firm offers both 33M-byte and 68M-byte disk drive modules, which come with built-in power supplies, White said. As an option, a 60M-byte streaming tape drive is available.

The Altos 3068, which is mounted on a floor-standing chassis, is said to include five boards, each of which serves a distinct function. In a standard configuration, the Altos 3068 includes a CPU board, a RAM board, a two-board file processor subsystem and a serial communications subsystem board.

In addition, the Altos 3068 is said to include three expansion slots, which can be used to support more users or more memory, White said.

See ALTOS page 78

Challenger boasts IBM fit

Harris VDTs offer 3270 compatibility

By Donna Raimondi
CW Staff

DALLAS — Harris Corp. has issued its Challenger Information Display System series of CRT terminals, control units and printers that are compatible with IBM 3270 series products at the device level. The units reportedly can also be attached to other current Harris interactive system devices, such as those supported on Harris' 9200 and 9116 systems.

The Challenger system supports both local and remote configurations in IBM Systems Network Architecture/Synchronous Data Link Control or Binary Synchronous Communications protocols, the vendor said.

According to Harris, 3270 compatibility is implemented at both the host and device levels. Remote communications speeds ranging from 1.2K to 56K bit/sec in either half- or full-duplex modes are supported.

The Harris line includes the H274-41A floor model local controllers and H274-61C/41C desktop remote controllers. The H274-41A local model costs $5,364 and

See HARRIS page 79

Memorex subsystem hits U.S. market

SANTA CLARA, Calif. — Memorex Corp. has released its IBM 3370-type disk subsystem for the U.S. market. Previously, the subsystem was available only in Europe.

Called 3690-2, the unit can be attached to IBM 4331 Models 2 and 11, 4341, 4361 and 4381 CPUs. It is said to be functionally equivalent to the IBM 3370 Model 2.

According to Memorex, the subsystem may be attached to IBM's 3880 storage control units. It can also be attached to integrated Dasd adapters on 4331 and 4361 CPUs or to a high-speed block multiplexer channel via the Memorex 3888 or 3696 dual director storage control units.

The 3690-2 employs a fixed-block architecture and has a reported storage capacity of 729.8M bytes per spindle. Each unit within the 3690-2 subsystem has a single spindle with a vertically mounted head disk assembly.

Up to four units reportedly can be included in each string. Each head disk assembly is said to be accessible by two independently addressable actuators, according to the vendor.

The subsystem is priced at $35,480 for the 3698-2 string controller and disk drive and $26,600 for the 3690-2 disk drive units. Leasing arrangements are also available.

More information is available from Memorex, San Tomas at Central Expwy., Santa Clara, Calif. 95052.

- Mentor Graphics unveiled a Hardware Modeling Library for Apollo Computer Domain local-area networks/79
- Bell & Howell unveiled the COM printing system that is compatible with IBM mainframes/82

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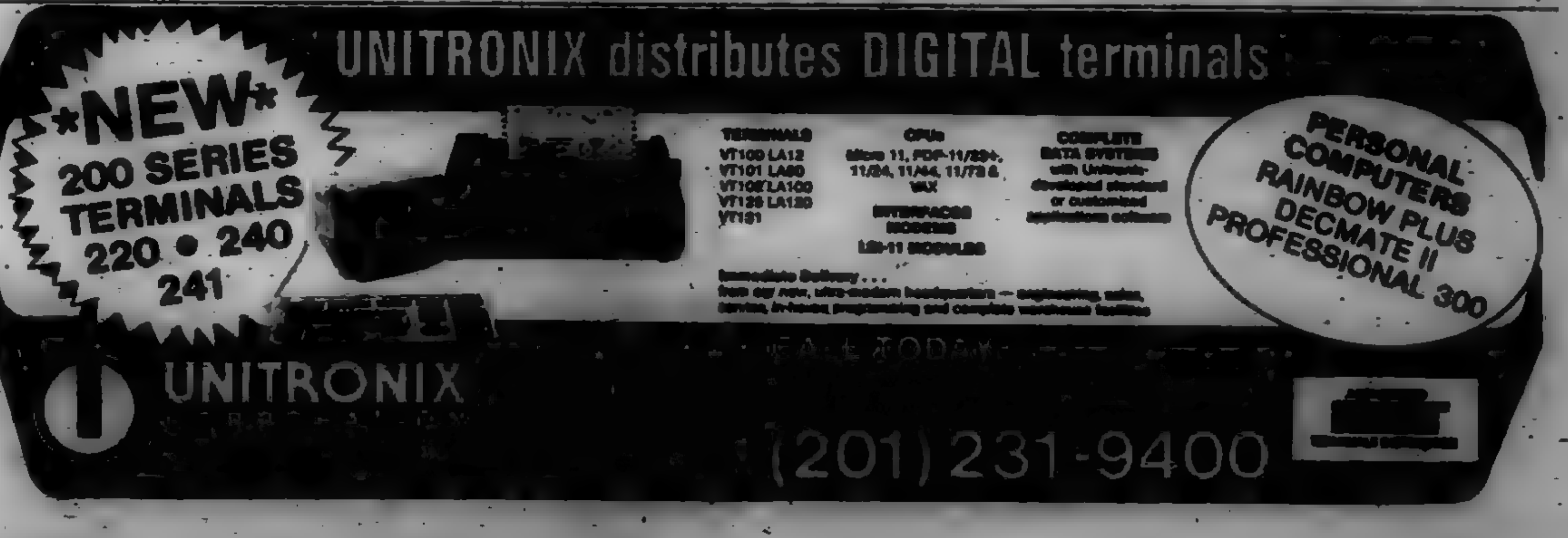
Turnkey Systems/82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[illegible] small concession [illegible]

ALTOS

from page 75

The CPU board, which is built around a 68020 microprocessor that runs at 12.5 MHz, includes a number of features that enhance the system's performance, White said. The Altos 3068 is said to feature an 8K-byte data and cache memory, which is organized as two 4K-byte sets that allow the CPU to run at up to 18 MHz with no wait states.

The memory management unit reportedly supports demand-paged virtual memory and includes a high-speed address translation cache for further performance improvement, the company said. The new system reportedly allows up to 16M bytes of virtual address space per program. An optional 68881 floating-point processor can be added to the CPU board.

Altos designed three RAM boards for the new system, featuring 1M, 2M and 4M bytes of memory, respectively. Users reportedly can expand the system up to 16M bytes.

The Altos 3068's file processor subsystem is included on two boards; one board contains storage device controllers, while the other includes an Intel Corp. 8086 microprocessor that manages file access, White said.

The 8086 chip controls four direct memory access channels, which reportedly allow the transfer of data between peripheral devices and internal memory without the intervention of the CPU. The channels handle the system's hard disk drives, streaming tape, floppy disk drive and parallel printer port.

The company is offering two serial communications subsystem boards for the Altos 3068, White said. Each board is said to include an 8086 microprocessor running at 8 MHz, and each has 10 serial ports.

Two ports are available for hooking up synchronous modems; another supports the company's Worknet local-area network. When attached to the Altos 3068, Worknet reportedly transmits data at 1.4M bit/sec.

Board features

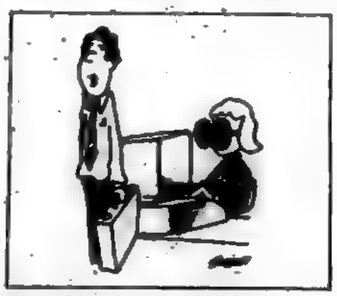
The standard serial communications board features 32K bytes of RAM, while the optional board has 128K bytes of RAM and reportedly will support X.25 and Systems Network Architecture (SNA) protocol software.

The Altos 3068 is said to be able to support asynchronous modems for dial-up data base services or off-site communication. Also, the system reportedly provides communication with IBM mainframes, offering IBM 3270 and 3780 bisychronous communication and 3270 SNA/Synchronous Data Link Control communication.

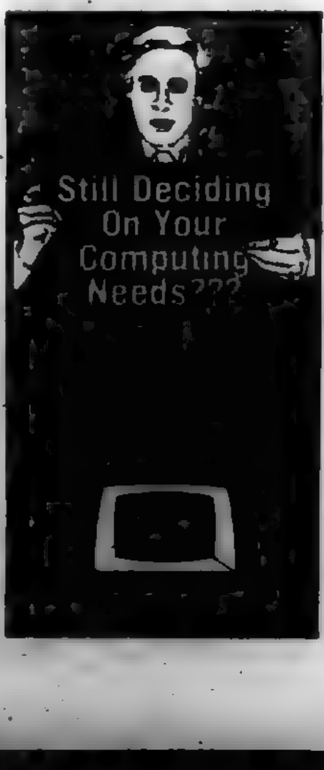
The Altos 3068 runs Release 2, Version 2 of the Unix System V, including record and file locking, virtual memory and multiple swap areas, which allow users to configure the number and size of swap areas on a disk. Altos reportedly plans to introduce applications software specifically tailored to the system this summer.

In its base configuration, the Altos 3068 will be priced at $7,000 in OEM quantities. White said shipments will begin in July.

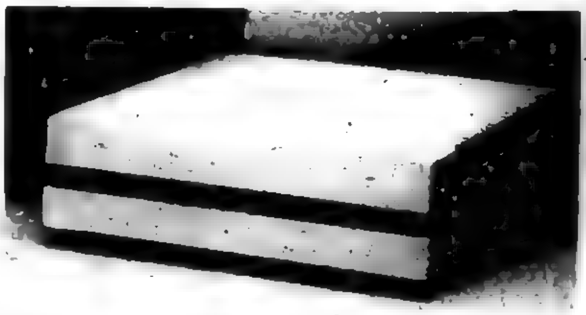
Further information is available from Altos Computer Systems at 2641 Orchard Pkwy., San Jose, Calif. 95134.



"Who's the lady with the glare problem?"



THE NIU-180 LOWERS COST-PER-CONNECTION.



Announcing the NIU-180: the first of an extraordinary new family of Network Interface Units that represents a direction everyone's been waiting for in local area networking. *Much higher performance. Much lower cost.*

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Mentor Graphics unveils HML for simulation modeling

BEAVERTON, Ore. — Mentor Graphics Corp. has released its Hardware Modeling Library (HML) device that connects into Apollo Computer, Inc.'s Domain local-area networks. HML uses large-scale integration/very large-scale integration (LSI/VLSI) devices as simulation models for logic and fault simulations.

The HML system accepts off-the-shelf components, semicustom and full-custom integrated circuits and existing printed-circuit board subsystems as models. It allows the LSI/VLSI devices to run at their rated clock specifications, accepting clocking at rates up to 16 MHz.

The HML is part of the design engineering data base, and users do not know if they are using the software simulation in the network or the HML hardware simulation. Reportedly, the HML unit becomes an extension of the simulation library, available to multiple concurrent users across a workstation network.

Integrated circuit interface boards are inserted into HML's backplane. A 256-channel I/O port is also available for interfacing printed-circuit boards or subsystems to the HML.

Another option is real-time, asynchronous sampling of signal timing behavior on all active pins of the component.

The HML system is a stand-alone chassis that contains a control processor, from 1M to 2M bytes of memory used to store vectors of information and up to eight cards that can contain between one and four chips that will make up the hardware library. Prices start at $39,900 without the parts library. The HML will be available in July 1985.

Mentor Graphics is located at 8500 S.W. Creekside Place, Beaverton, Ore. 97005.

HARRIS

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supports 32 devices. The H274-61C remote unit costs $7,200 and supports 16 devices. It can be upgraded to the H274-41C remote model, which costs $11,760. All controllers are available now.

The H180 (an IBM 3180 equivalent) has an optional display message printer that provides desktop, hard-copy output. The H180 costs $1,795 and will be available in June. The H179, a color version, costs $2,195 and will be available in November.

The H178 (an IBM 3178 equivalent) has a 12-in. display and supports a variety of keyboard styles, the vendor said. It costs $1,524. Also available is an IBM 3270 Personal Computer look-alike, the H270PC, which costs $6,995 and will be available in September.

A letter-quality printer — the H188 (an IBM 5210 equivalent) — offers printing at 55 char./sec from 6 to 8 line/in., 10 or 12 char./in., and up to 132 columns. The H188 costs $5,364.

The H187 dot matrix printer, which competes with the IBM 3287 printer, is a 200 char./sec unit with a near-letter-quality speed of 45 char./sec and a 52-db noise level, the vendor said. It costs $5,100. Another dot matrix printer — the H168 — competes with the IBM 3268. It is a 56.6-lb, 400 char./sec machine with a noise level of 55 db. The price of the H168 is $6,600.

More information is available from Harris, P.O. Box 809022, 16001 Dallas Pkwy., Dallas, Texas 75380.

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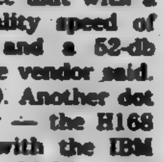

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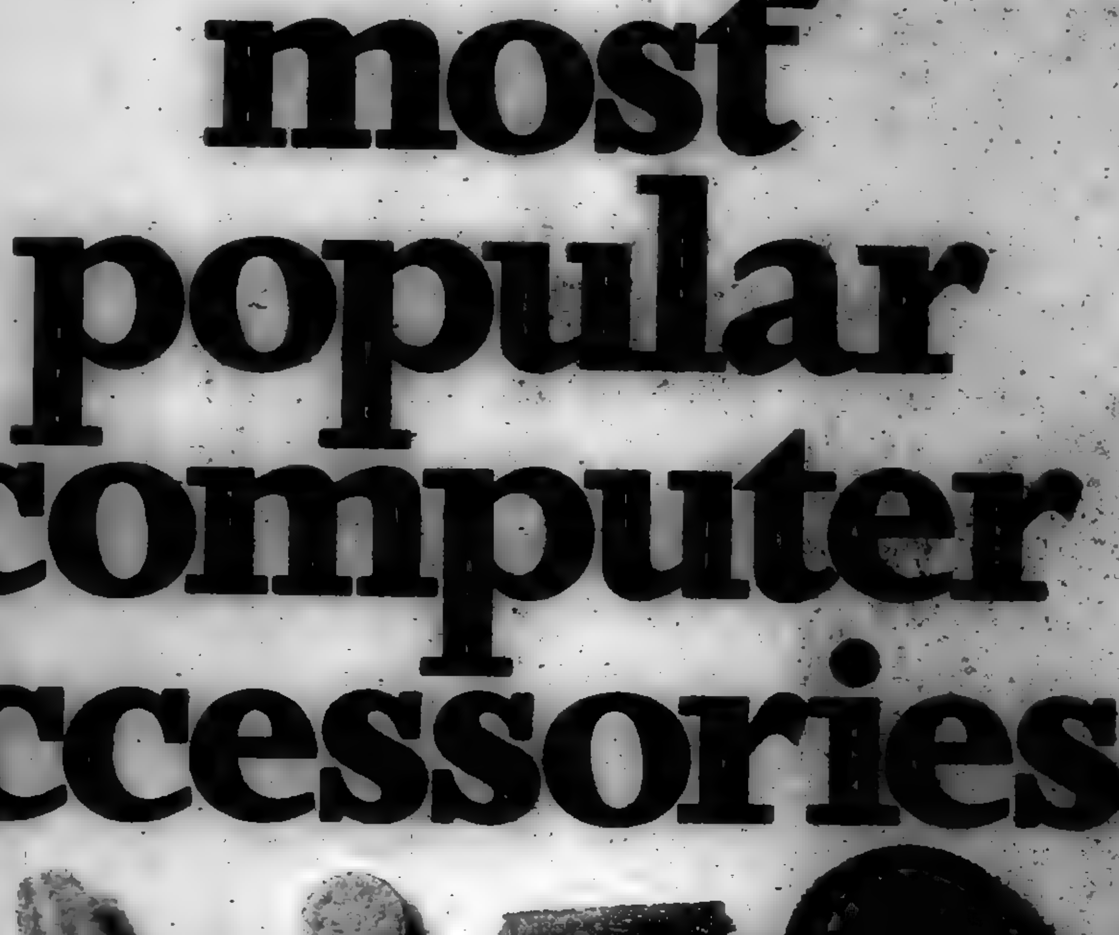

Do you ever get the feeling that computers are treated with more respect than people?

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(Source: "Ergonomic Principles in Office Automation" Pub. 1983 by E.I.S. AB, Sweden.)

The result has been a whole range of computer-induced problems ranging from stress and fatigue to blurred vision.

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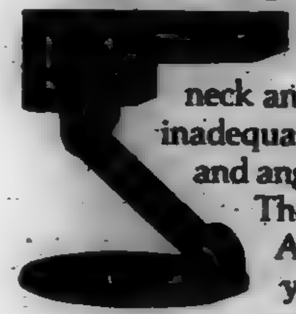

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TURNKEY SYSTEMS

■ Bell & Howell Co.'s Computer Output Microfilm (COM) Division has introduced a COM printing system for small- and medium-volume users that creates cut-fiche masters directly on-line to IBM and compatible mainframes under IBM's MVS or DOS/VSE operating systems.

The system includes Bell & Howell's 6650XP COM Printer, either a CRT or hard-copy terminal, primarily used for runtime messages, and host-resident software.

The 6650XP runs up to 26,000 line/min and is controlled through an existing operator terminal. It reportedly emulates an IBM 3211 paper printer.

The 6650XP costs $93,500.

Bell & Howell COM Division, 16691 Hale Ave., Irvine, Calif. 92714.

NAS

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delivery of the new machines to Japanese buyers in the fourth quarter. NAS will begin U.S. deliveries six months later.

■

Speaking of paper tigers, there are rumors afloat that the newly announced IBM 3090 Model 200 may meet a fate similar to the company's 3081 Model D.

IBM announced the Model D in 1981 amid mounting pressure from users and speculation from analysts about IBM's future systems strategy. According to some observers, IBM announced the Model D to put an end to the speculation. A few months later, the company essentially replaced the Model D with a better machine, the 3081 Model K.

Rumor has it that the same thing may happen to the Model 200 because IBM, facing flat first-quarter earnings, is hoping the lackluster performance of the Model 200 (despite its impressive floor-space savings) will spur users to buy more 3080 series CPUs while waiting for the appearance of the 3090 Model 400 in 1987.

Once satisfied with 3080 sales, IBM could beef up the performance of the Model 200 or unveil a new model that offers everything the Model 200 does and more. This rumor may be supported, or quelled fairly quickly, when IBM's official 3090 delivery schedule hits the streets. If IBM plans to deliver only a handful of the Model 200 CPUs in the first half of 1986, the paper tiger claims may have some basis.

■

Still breathing? While NAS, Amdahl Corp., Storage Technology Corp. and Memorex Corp. have been getting a lot of attention recently in light of IBM's Dasd and high-end mainframe announcements, this may be a good time to start wondering whatever happened to the other plug-compatible manufacturers. Remember the companies in the IBM 4300-compatible marketplace, such as IPL Systems, Inc., Cambex Corp., Nixdorf Computer Corp. and Global Ultimacc Systems, Inc.? Quiet hardly describes their actions in the past year. The 4300-compatible marketplace was blasted by IBM's 4361 processors and the high-end 4381 Model Group 3. Firms competing in that market have not been helped by the formidable competition from a slew of superminicomputer vendors, including Prime Computer, Inc., Digital Equipment Corp. and Data General Corp.

Some analysts say the 4300-compatible business is at an all-time low and headed downward. The next six months may be a telling period for 4300-compatible vendors, some of which have seen their stocks drop to about $2 a share, down from the high teens a few months ago.

■

Reverse psychology? When DEC unveiled its VAX 8600 processor last October [CW, Nov. 5], it made a point of touting the machine as a competitor to IBM's 3084. Apparently trying to set itself up as a competitor to IBM's mainframe accounts, DEC noted that seven 8600s linked in a Vaxcluster configuration offered roughly the same performance as the 3084. Now DEC's claims may be taking an interesting twist. Some Amdahl salesmen have gotten the idea that if it takes seven VAX 8600s to equal one 3084, maybe some of those big Vaxcluster accounts would like to buy one of Amdahl's 580 series processors instead. The enterprising idea seems to make sense; time will tell if it is successful.

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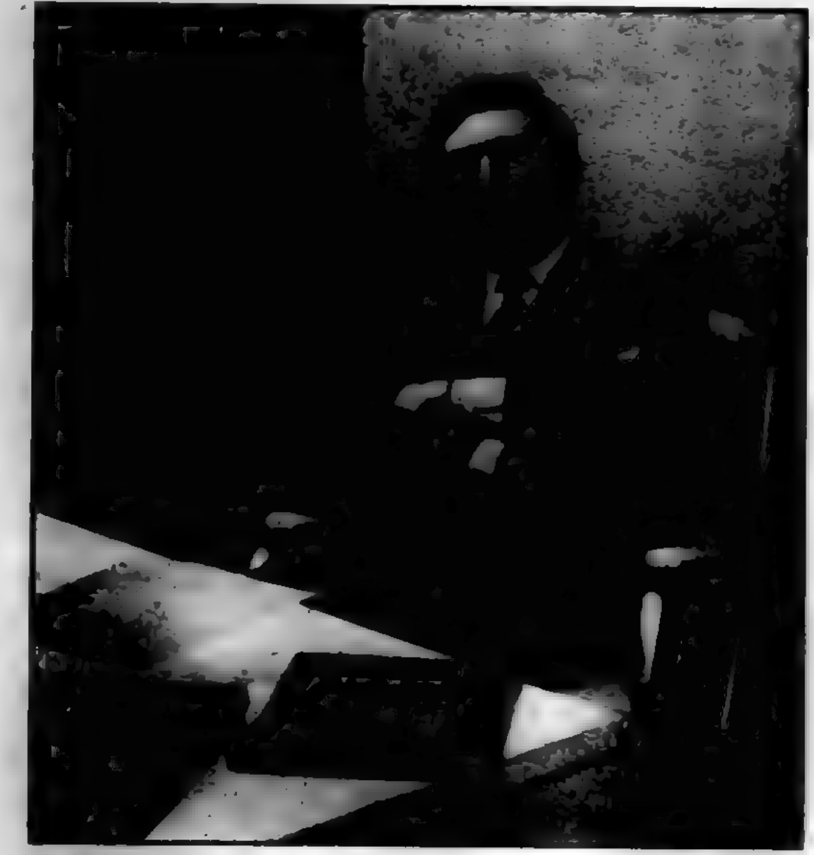

Bob Gildenberg, Vice President, Marketing, Philon, Inc., NY, NY

Bob Gildenberg is Vice President of Marketing for Philon, Inc. He is responsible for marketing fast-executing compilers for UNIX-based microprocessors. To sell his product, PHILON FAST/Compilers, he has to talk to executives at hardware manufacturers, software houses, systems integrators and VAR's, as well as government and selective end-user organizations.

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COMPUTERWORLD

COMPUTER INDUSTRY

Edelman takes control of Datapoint

NEW YORK — Datapoint Corp. announced here recently that it has agreed to make Asher B. Edelman chairman of the company and give him control of half of the seats on the board of directors. The negotiated truce ended Edelman's effort to solicit consents from shareholders to replace the current board.

The settlement marked the third time that Edelman has forced a computer manufacturer to accept his proposal to split up the divisions of a company and sell them off to the highest bidders. He previously forced the liquidation of Management Assistance, Inc. and was appointed vice-chairman of Mohawk Data Sciences Corp., which is also attempting to liquidate.

It was reported that Datapoint, the San Antonio-based manufacturer of computers and office automation products, had agreed to pay expenses incurred by Edelman in his battle to acquire the company. Edelman has acquired 11.9% of Datapoint and will replace Harold O'Kelley, who has resigned the position of chairman, it was announced.

The settlement came after Datapoint lost a court hearing over new bylaws it had instituted in an effort to delay Edelman's bid for control.

Following the rejection of his earlier bid to purchase all outstanding stock for about $23 a share and the adoption of the bylaws requiring a waiting period for soliciting consents from shareholders, Edelman challenged the bylaws in court and mailed out solicitations for the consents.

Unlike proxies, soliciting consents enables a dissident shareholder to force a management change upon the collection of consents representing a majority of shares without having to call the shareholders together for a meeting.

Datapoint posted a loss of $15.9 million on revenue of $129.5 million in the quarter ended in January. In fiscal 1984, ended last July, it posted profits of $28.2 million on revenue of $600.2 million.

During its battle for the hearts and minds of shareholders, Datapoint management said it also wished to sell the company but argued that it was better suited to that role than Edelman.

Datapoint indicated that it believes $200 million can be raised through the sale of its service operations and another $100 million can be raised through the sale of its manufacturing operations.

The company reported that it sold its Inforex subsidiary to Recognition Equipment, Inc. for $12 million in cash and the assumption of about $2.5 million in liabilities.

■ Wilton H. Jones, the man who transformed a consulting company into Multimate International, sat down to talk in depth about a number of issues facing the micro software industry/85

■ The U.S. government recently declared an interest in loosening up export regulations for Eastern-bloc-destined high-tech goods that are already available on the world market/87

■ Micro manufacturer Kaypro recently settled an antitrust suit lodged by the state of California, which charged the company with threatening dealers who did not follow pricing guidelines/88

Trilogy revival in CEO's hands

By Kathleen Burton
CW West Coast Bureau

CUPERTINO, Calif. — Six months after abandoning the highly ambitious plans on which the company was founded, Trilogy Ltd. still has a bright future, in the eyes of Henry Montgomery.

Characterized by some industry analysts as a corporate "Doctor Fix-it," Montgomery was brought in as president of Trilogy last September and in December assumed the role of chief executive officer from Gene Amdahl, company founder and chairman.

According to Montgomery, Trilogy is trying to turn the technologies developed during its aborted wafer scale integration project into cash and is also considering acquisition of a start-up semiconductor firm as a possible investment.

"There's a treasure trove of potential here, but we have to focus on the most feasible alternatives due to our finite financial resources," Montgomery said during a recent interview. Trilogy's cash reserves at the end of 1984 were $85 million, compared with about $276 million initially raised through a variety of sources when the company was started in 1980, according to Montgomery.

He conceded that Trilogy still has no

See TRILOGY page 92

S & H barred from selling Indas

By Peter Bartolik
CW Staff

NASHVILLE — A federal judge here has permanently enjoined S & H Computer Systems, Inc. of Nashville from marketing its Indas data analysis system, which SAS Institute, Inc. successfully claimed was derived from its SAS program.

U.S. District Court Judge Thomas A. Wiseman Jr. issued the injunction earlier this month in a 32-page judgment that found that "S & H's primary purpose in obtaining [an SAS] license was to obtain detailed technical information not otherwise available for use in the preparation of its conversion of SAS to run on [Digital Equipment Corp.] VAX computers."

S & H initially filed suit seeking a declaratory judgment that it was not violating a copyright. The civil suit was tried without a jury in September 1983. SAS Institute charged S & H with copyright infringement, breach of contract, fraud,

See SUIT page 88

INDUSTRY INSIGHT/PETER BARTOLIK

Cbema fails to grasp logic of VDT fears

The Computer and Business Equipment Manufacturers Association (Cbema) must have been headquartered in Washington, D.C., for too long. Its spokesmen are beginning to sound like those of the tobacco lobby.

Cbema quickly lobbed a charge of irresponsibility in the direction of a Massachusetts firm that introduced a radiation shield to attach to VDT screens [CW, March 11]. The organization added that the company marketing the shield, said to block 98.5% of low-frequency electromagnetic waves generated by a VDT screen, "is exploiting the fact that radiation is very hard to understand for nonscientists."

As far as I know, there is no proof that wearing a mail carrier's uniform is a direct cause of dog bites, but I'm sure that doesn't stop mail carriers from taking preventative action.

It is generally believed that there is still no cure for the common cold. But that doesn't stop people from using cold

See LOBBY page 87

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COMPUTER INDUSTRY

Proposed software rental ban warrants careful review

OUTSIDE LINES
L. J. Kutten

During the past year, a segment of the software industry has clamored for a law prohibiting software rentals. Some companies claim they suffer incalculable lost revenue as a person rents software not to "test drive" the program but rather to make a pirated copy.

These cries of woe have not fallen upon deaf ears. Late last year, U.S. Sen. Charles McC. Mathias Jr. (R-Md.) introduced a bill that would prohibit software rentals.

The senator said the bill will be reintroduced this year.

The proposed law states that in spite of the fair use doctrine, "unless authorized by a copyright owner, the owner of a particular copy of a computer program may not, for purpose of direct or indirect commercial advantage, dispose of or authorize disposal of the possession of the copy by rental, lease or lending or by any other activity or practice in the nature of rental, lease or lending."

As I see this bill, it will cause more problems than it will solve. These problems arise from the fact that the Copyright Act, 17 U.S.C. £ 101(n), defines a computer program as "a set of statements or instructions to be used directly or indirectly in a computer program to bring about a certain result." There is no requirement for the computer program to have any particular characteristics or that it even be stored on magnetic media.

As drafted, this bill could legally prevent any library from loaning out any book or magazine that contains a computer program without first getting the software copyright owner's permission. To do otherwise could make the library liable for copyright infringement.

But let's assume the bill is modified to apply only to computer programs on magnetic media. What personal property do you own that contains a computer program? A brief survey of my home and office disclosed the following: alarm clock, coffee machine, washing machine, dryer, videocassette recorder, stereo receiver, record player, cassette tape deck, microwave oven, ceiling fans, sewing machine, telephones, telephone answering machine, refrigerator, photocopier, typewriter, portable calculator, two microcomputers, disk drives, modem, computer printer and last but not least, my car.

Illegal to rent microwave oven?

The bill as drafted does not require that the computer program be a stand-alone item. Does this mean that before any of these goods can be rented, I must get the manufacturer's permission? Could I be sued for copyright infringement because I rented a microwave oven for the weekend?

OK, let's assume the bill is amended to apply only to computers and computer programs.

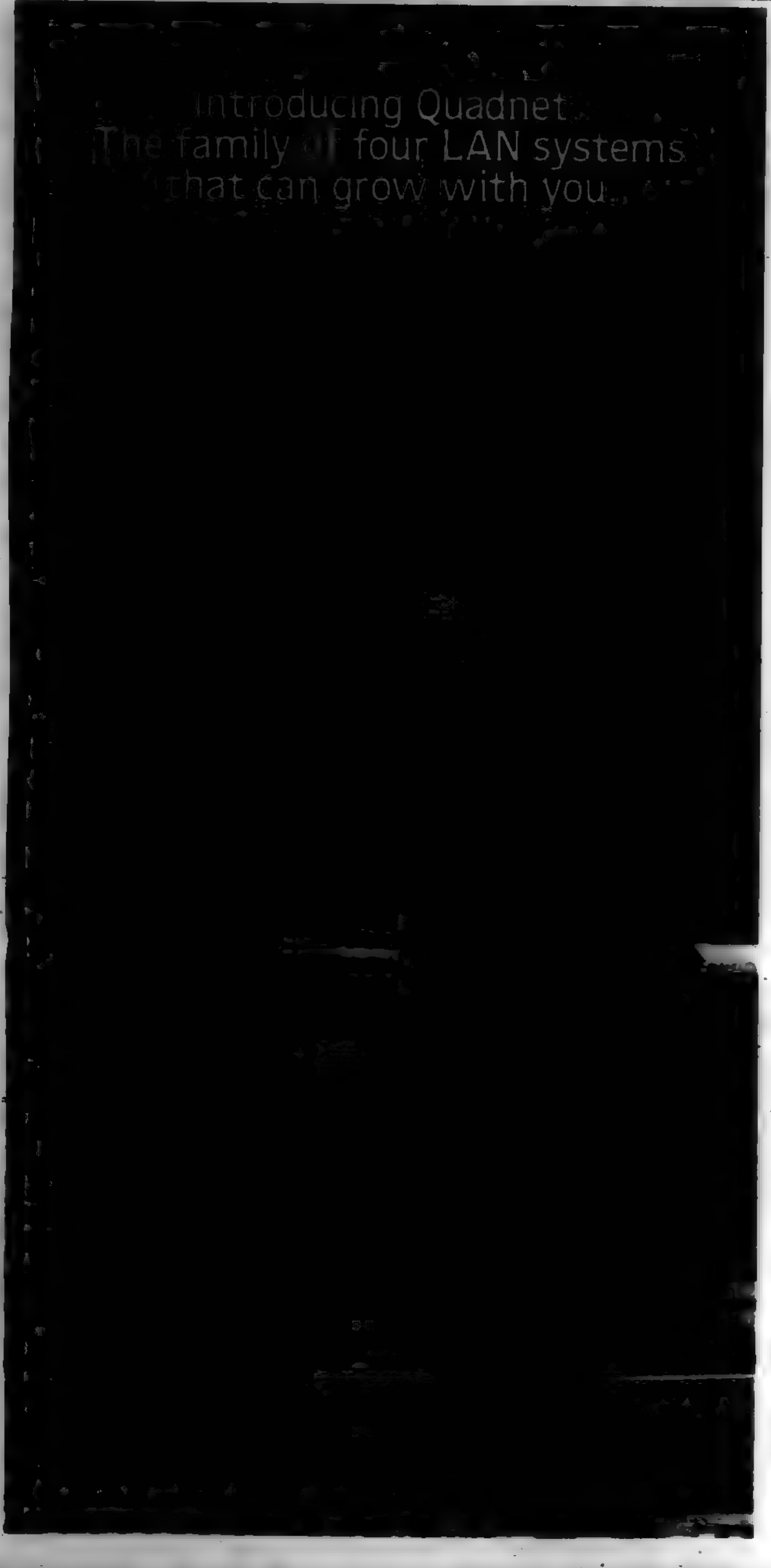
First the entire industry of leasing computers can be put at risk. What happens if Apple Computer, Inc., IBM, Honeywell, Inc., NCR Corp., Tandy Corp. or any other hardware manufacturer says it wants to control all the leasing of its hardware? Under this bill, it could legally do so. What a perfectly legal way to eliminate competition.

Too outrageous, you say; no court would enforce it. OK, let's limit the bill to just applications software.

Consider applications software embedded in hardware. Does the fact that

See RENTAL, page 92

Kutten is a writer specializing in computer law topics. He is a member of the Illinois and Missouri bars. His book, Computer Buyer's Protection Guide, *was published last year by Prentice-Hall, Inc.*



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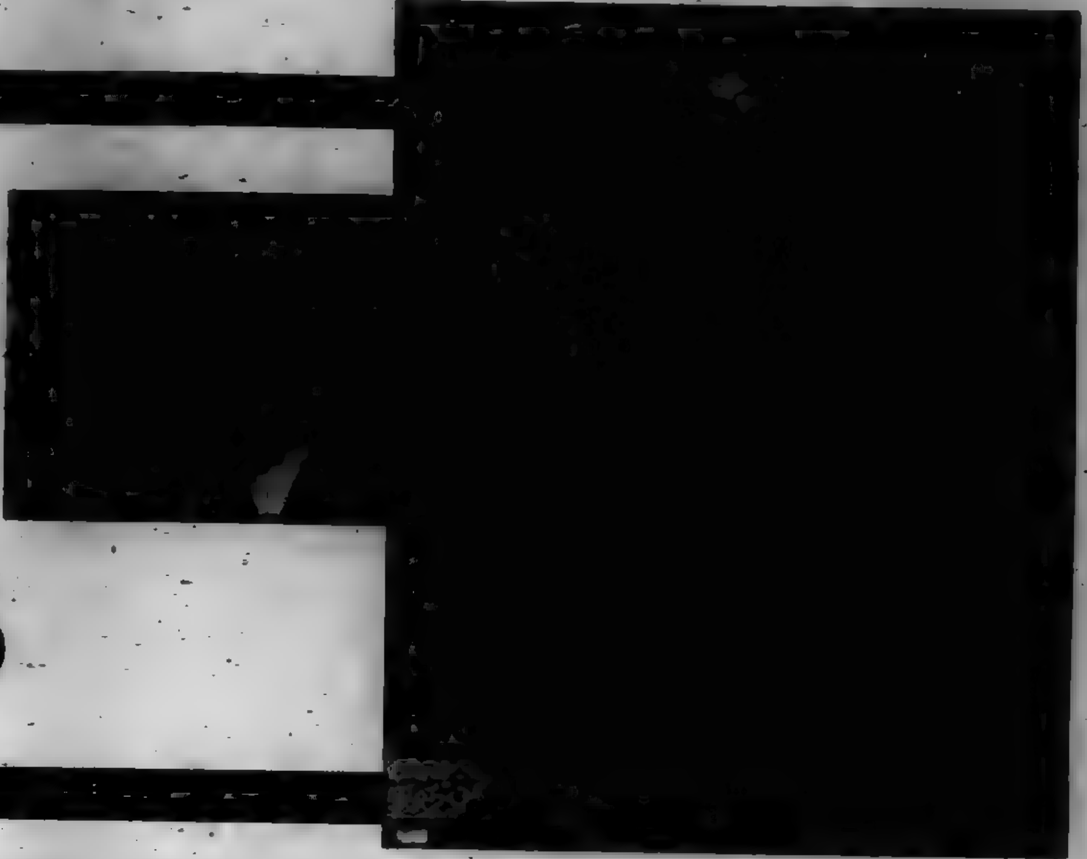

Wilton H. Jones

Without the blessing of venture capital, Wilton H. Jones transformed W.H. Jones & Associates, a consulting firm, into Multimate International Corp., one of the premier suppliers of microcomputer word processing software.

In 1981, Connecticut Mutual Life Insurance Co. hired the consulting firm to produce a micro word processing package with commands and capabilities that resembled a Wang Laboratories, Inc. word processor. When the package was completed, Jones began marketing it to other large insurance companies. Multimate has since grown into a $25 million company with 150 employees.

Computerworld senior writer Paul Korzeniowski recently interviewed Jones at Multimate headquarters in E. Hartford, Conn.

Q ***Will the microcomputer software market soon shift to a product like IBM's Topview or [Digital Research, Inc.'s] Gem?***

For the next six months, [Microsoft Corp.] MS-DOS or [IBM] PC-DOS will remain the principal operating systems. Right now, Topview represents an unknown that most software companies are examining. Since it has the IBM name, it has a good chance of becoming a standard. But Topview does not seem to be as technically advanced as [Microsoft Corp.'s] Windows.

We expect the industry to adopt a package like Topview, so we are looking very carefully to see what company will produce *the* product that ties our package to [Lotus Development Corp.'s] 1-2-3 or a graphics package.

I don't think that users will notice a shift toward operating environments until 1986. It will take at least another year for one package to become popular and for companies like us to convert our products to it.

Q ***Will a Topview-like package run under PC-DOS, [Microsoft's] Xenix or [AT&T] Unix?***

It will run under whatever IBM pushes. We have not observed much Unix activity yet. Users primarily work with PC-DOS operating systems.

Q ***What products are large companies endorsing?***

They are confident in IBM — the name and the hardware, so most companies support the IBM [Personal Computer] and packages like Lotus' 1-2-3, Multimate and [Ashton-Tate's] Dbase II or Dbase III.

Companies realize that some employees may . . . be best able to use an [Apple Computer, Inc.] Macintosh or a Unix-based machine, so [they] have bought a few of these machines and are evaluating them. It will take time before Topview and the Macintosh are accepted in the corporate environment.

Q ***How important is graphics to a user?***

Integrating text and graphics will soon be a requirement for most general-purpose packages. White-collar employees work with charts and graphs and need a mechanism to take a data base file or information from a memo and insert or convert it into a chart.

By the third quarter, we plan to offer a package that will allow a user to draw a graph with one package, save it and incorporate the graph in a Multimate document. By 1986, packages will have to incorporate video and voice as well as graphics.

Q ***What word processing enhancements can users expect?***

We think the day will come when a word processor will check a customer's sentence structure. There are syntax checkers available now, but they are inefficient or require a mainframe. With the [IBM Personal Computer AT], we are starting to possess processing power capable of running a syntax-checking package. Other advancements are being made, such as chips that search for key words or match speech patterns.

Q ***Will the Macintosh be accepted in large corporations?***

When a company spends $100 million to promote a product to the business community, it perks interest. But we may have a problem translating our product to the Macintosh because it is a different world. We don't think we can port our existing product onto the Macintosh effectively, so we must develop a new product and a new product line. Today, Multimate on the Macintosh is true vaporware, and we wouldn't produce anything until late [this year] or early 1986.

Q ***How do you view IBM's recent moves into the microcomputer software market?***

For all practical purposes, IBM is our biggest competitor. There are a few items we try to offer that they do not offer. We offer service, support and a guarantee of future updates and improvements. For corporations, the question is: Will Multimate be in business in a few years? [They] are positive that IBM will exist, but they are not sure about us.

Q ***What steps does Multimate have to take to stay in business?***

Our product has to be kept current. When someone announces new features and functions, it is not imperative that we have them on the day they are announced, but we must incorporate them within six months. Our customers expect us to update the product so it has the latest and best word processing functions. When IBM opened the door to [Document Content Architecture], which allowed documents created with its Displaywriter to be moved to other IBM systems, we followed suit.

We don't feel we have the answer to word processing. We feel we have to generate new products to keep up with the competition.

We produce three updates a year. In 1985, we will also expand our product line and add word processing packages for vertical and technical markets.

Q ***Do you intend to remain strictly a word processing company?***

We have [to go] a long way to capture a large percentage of the market. Today, we have only 10% of the IBM [Personal Computer] market; we would like to have 30% or 40% of that market. It may take two years to get to that point. It becomes cost-prohibitive to try to capture more than that. When a company reaches the 30% to 40% mark, it competes with products like the Displaywriter, which has a niche and a known name.

Q ***How important is advertising to a product's success?***

We don't believe in spending large sums on promotional advertising during football games or the Super Bowl. We don't think it pays off. We cut our advertising budget from $350,000 [a month] to $50,000 a month, and there was no impact on sales.

Something is missing in software advertising. There are too many things that a potential customer doesn't understand. He knows little about word processing and needs training to determine if a package is designed for him. We can't overcome this limitation through advertising.

Q ***How do you respond to the claim that advertising costs are preventing small companies from entering the market?***

It is not just advertising but shelf space, channel of distribution and other items that may stop the emerging company. With a new product, a company should first try to find a niche and then leverage its way into the market through the niche.

A company should find a vertical market, [such as] a data base for doctors. Then it could build from that market. Yet no company has followed our example. There are a few companies attempting to leverage their positions by enhancing Lotus' 1-2-3. These companies are supplying templates for the product. I think that is a good marketing strategy, and I think these companies will be successful.

Q ***What is the future of networking?***

Right now, only 10% of our users have a net-

See JONES page 92

SPECIAL REPORT

Micros in Big Business

In the April 29th Computerworld Special Report we'll report on management strategies for integrating micros into corporate information systems; offer users' experiences with micros; discuss the emergence of the Personal Computing Manager; provide overviews of business-related microcomputer hardware, applications software, and systems software; look into security risks; and examine how large MIS/DP organizations are networking their micros.

If you market business-related micro products, tell Computerworld's 600,000 readers in the April 29th issue. Our readers are heavily involved in the purchase of business-related micros, services, and supplies. For example, our subscribers at end-user organizations are personally involved in purchase decisions for the following products:

Product	Percent involved in purchase decisions
Microcomputers	84%
Local area networks	79%
Micro-peripherals	74%
Portable personal computers	75%
Floppy disks and diskettes	83%

Our subscribers at vendor organizations are equally influential — especially when you consider that they often buy in quantity:

Product	Percent involved in purchase decisions
Microcomputers	57%
Micro-peripherals	52%
Portable personal computers	34%
Floppy disks and diskettes	43%

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Agency moves to ease trade

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Commerce is proposing regulations to ease export restrictions on U.S.-manufactured computers, telecommunications products and technical data, if similar products are being sold to Eastern bloc countries or are available in foreign countries.

Commerce Secretary Malcolm Baldrige said the proposed regulations would remove current controls on certain U.S. exports when those goods are of such comparable quality and are available to Eastern bloc countries in sufficient quantities that "controlling them would no longer improve the U.S. national security."

Baldrige described the proposed regulations as "a cautious approach" to the issue of availability of foreign products that are similar to U.S. models. The rules that Baldrige proposed would spell out the procedures that both the exporter and the U.S. government must follow.

Unfavorable response to controls

U.S. companies have recently responded unfavorably to the strict export controls placed on U.S. technology. The U.S government had instituted these controls to prevent U.S. technology from falling into the hands of Eastern bloc countries, particularly the Soviet Union, and helping with the modernization of their armed forces.

In determining the comparability of foreign commodities and technical data, the Commerce Department said it would consider the following factors: end use, similarity of design or resolution of technical problems and similarity of performance and reliability characteristics.

The Commerce Department outlined the types of information that would be required from an exporter seeking to decontrol a product that was also available in a foreign country, such as non-American sources and their addresses, name and model design, technical information on its performance and quality and information on production and demand including data on trade of the item to Eastern bloc countries.

Comments on the proposed regulations that were published in the federal register March 15 must be received by May 14 at the Commerce Department's Office of Export Administration.

LOBBY

from page 83

remedies, nor does it stop the marketing of a wide array of these cold remedies.

Certainly there has been no conclusive proof that VDTs cause radiation-related maladies. Studies to date — and they all seem to be generated by somebody that has already taken a position on the issue before conducting the study — have been quite contradictory.

No law against precautions

There is no law preventing people from taking precautions. Who in this country would dare tell a pregnant woman that she shouldn't worry about the effects of low-level radiation on her fetus because conclusive evidence won't be available for another five years or so? The attitude that "What hasn't been proven, simply doesn't exist" is the same attitude that coated the nation's schools in asbestos and allowed the chemical contamination of hundreds of drinking water aquifers.

The day may come when it can be proven that VDTs pose no health hazards. But if the evidence goes the other way, there is going to be hell to pay.

Perhaps Cbema should move its headquarters to California and try to "mellow" a bit. It would be a real shame if someday that lobby is held in the same light as the nuclear power lobby.

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Kaypro settles antitrust suit out of court

Firm agrees to halt alleged coercive acts

SOLANA BEACH, Calif. — The state of California announced the recent out-of-court settlement of an antitrust suit against Kaypro Corp., charging that the microcomputer company threatened to revoke the dealership status of California retailers selling Kaypro products below list price.

Under terms of the settlement reached earlier this month, Kaypro agreed to refrain from allegedly coercive practices and to pay the state $19,500 in civil penalties and court costs. The company neither admitted nor denied the charges of coercive pricing.

California Deputy Attorney General Wayne Liao said Kaypro expressed interest in settling out of court shortly after the state subpoenaed documents from the firm. The stipulated and final judgment was announced when the suit was formally filed March 7 in the state court in San Diego.

"We believe the settlement is comparable to a favorable trial result," Liao said.

'Toe the line'

The state of California charged that in 1982 and 1983, Kaypro distribution representatives warned 12 to 15 authorized Kaypro dealers orally and in writing that the dealers' discount pricing jeopardized their dealership authorization. "We alleged they told the dealers that if the dealers didn't toe the line, they risked their dealership status," Liao said.

Liao said the alleged coercion referred to most of the personal computer products offered by Kaypro at the time.

"No one product stood out," he said.

A Kaypro spokesman declined to comment on specifics of his company's case but said that Kaypro believes the settlement was satisfactory.

SUIT

from page 83

trade secret misappropriation and unfair competition. Wiseman ruled only on the copyright and contract claims and declined to rule on the other issues. In an earlier ruling, the court had issued a summary judgment that S & H had violated the terms of a license agreement with SAS Institute.

Richard Dohrmann, vice-president of S & H, said the company was surprised and upset by the decision and was planning an appeal. He said the company had been confident of a favorable decision based on four previous rulings turning down injunctions requested by SAS Institute.

The SAS program was designed for use on IBM computers, but in 1981 SAS Institute began working on a version for use on DEC's VAX computers, Wiseman ruled.

The judge found that in 1981, Vanderbilt University Prof. Charles Federspiel and two colleagues, William Vaughn and Wayne Ray, formed a limited partnership, PSAS, Ltd., with S & H as a general partner, and executed a development agreement with S & H to develop a set of programs similar to SAS but for use on VAX computers. S & H licensed a copy of SAS for use on an IBM computer at Tennessee State University but, according to Wiseman's ruling, loaded portions of the SAS source code on a VAX located at Federspiel's department at Vanderbilt and translated the code from the IBM coding scheme to the VAX coding scheme.

Rejecting S & H's arguments that it sought to run test runs of SAS on the VAX, the judge found "that S & H adopted SAS, wholesale and in detail, as the design documentation for its [Indas] product." The judge found evidence of "slavish copying of structural detail" by S & H and subsequent "efforts to destroy, alter and disguise the evidence."

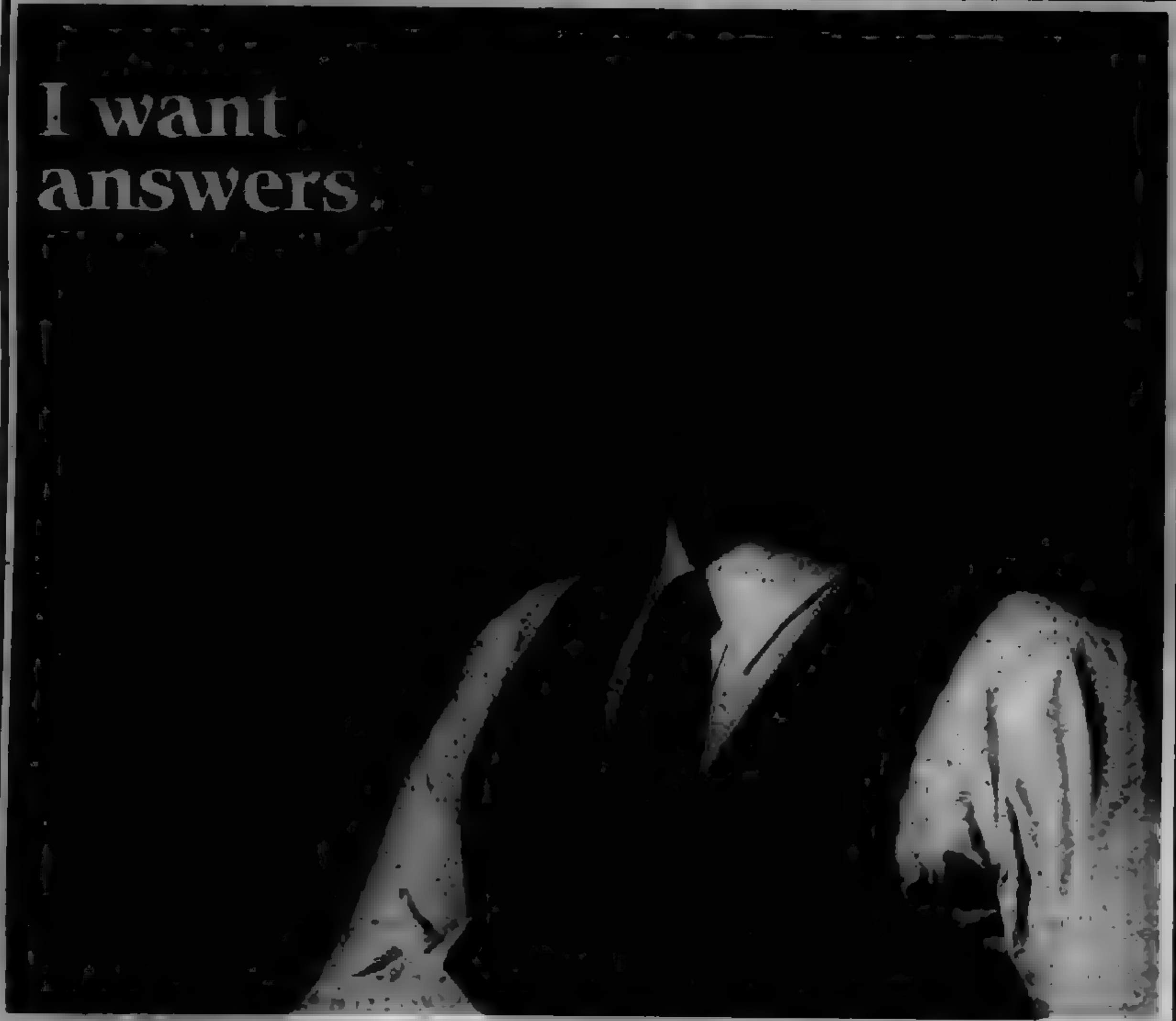
Wiseman rejected S & H's claim that the court could only order the excising of specific lines of source code from Indas. Wiseman also issued a broad injunction prohibiting S & H from "any marketing of Indas, or any other product copied or derived from Indas or SAS." He ordered S & H to pay the costs of SAS, but said he could not order S & H to pay attorneys' fees.

SAS Institute declined to say whether it would pursue further remedies for the issues on which the judge declined to rule.

Dohrmann of S & H said certain circumstantial events, such as putting the SAS package up on the VAX, certainly looked bad and appeared to cause the judge to disbelieve S & H claims.

Dohrmann noted that Wiseman ruled that an earlier version of the SAS package was developed in part under federal grant and therefore is in the public domain. He said the SAS Institute only claimed that one-half of 1% of Indas' 186,000 lines of code was similar to SAS code, while 30% of code in the later SAS package was identical to the earlier version.

S & H, which markets other software products for DEC equipment, began marketing Indas in December and will provide full refunds to the 15 licensees to date, Dohrmann said. He conceded that a lengthy appeals process could effectively eliminate any future marketing potential no matter what the final disposition of the case.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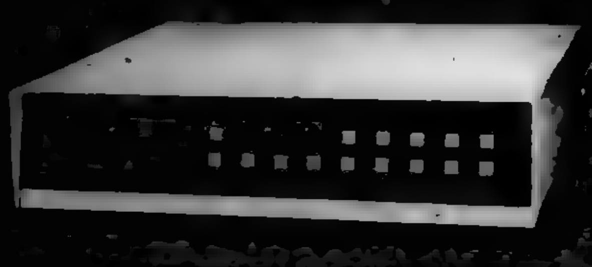

[illegible] Lynx by [illegible]

RENTAL from page 84

Wordstar is embedded in the Epson America, Inc. Geneva computer or Multiplan in Tandy Corp.'s Model 200, prevent them from being rented?

Assuming that behavior is not prohibited, then the bill must be limited to applications programs stored on floppies or magnetic media.

If so, then there are large federal tax implications. Under current tax laws, it is cheaper in many circumstances to lease a program than to buy it. If software is bought outright, then under Revenue Procedure 69-21, it must be amortized over "five years or such shorter period as can be established by the taxpayer as appropriate in any particular case." If the software is rented or leased, then it can be deducted as a rental expense under Internal Revenue Code § 192. The consequences can be severe. Consider the following example:

To start my new business I need two computer programs; one costs $25,000 and the other $250. Both have a five-year life expectancy, but I think I will only need them for 24 months. If I have to buy the software, I must spend $25,250 before I even start business, and I am limited to a $5,050 deduction each year unless they have shorter life expectancies. In comparison, assume I lease the programs for $800 a month. I now have a yearly deduction of $9,600. The $15,650 difference in first-year out-of-pocket expenses could mean the difference between success and failure. Assuming I am correct in my 24-month estimated need, my total out-of-pocket expense will be $19,200. This is $6,050 less than if I had bought them.

TRILOGY from page 83

product to sell and posted only modest revenue last year after scrapping projects to develop wafer-size semiconductors and a large IBM-compatible mainframe. Most of the revenue was generated by the sale of development contracts and from proceeds from a research and development partnership with Sperry Corp. that has since been discontinued, Montgomery said. The company expects no significant revenue from new products until late 1986, he added.

Central to Trilogy's new direction is the recycling of several advanced techniques perfected during its aborted wafer scale project — notably chip-packaging and high-performance semiconductor interconnect technologies — and a multichip module project that is at least a year from full production, Montgomery said.

He said Trilogy has yet to decide whether production of the new chip will be done in-house or whether the company will acquire a semiconductor firm to produce the module and generate revenue. "We're looking at something like California Devices, Inc.," Montgomery said. California Devices is a San Jose, Calif.-based semiconductor manufacturer with which Trilogy briefly engaged in merger negotiations last December.

Trilogy's cost-cutting moves to date include leasing one wing of its Cupertino headquarters to Hewlett-Packard Co., taking a $1.4 million write-down by shutting down its $7 million manufacturing plant in Ireland last August and trimming staff from 600 to approximately 180 employees during 1984. Trilogy is still trying to lease its computing facilities to local companies and is seeking tenants to take over its wafer fabrication plant here, Montgomery said.

In another belt-tightening measure, Trilogy decided last month to discontinue developing a high-powered, IBM-compatible workstation. Montgomery said Russell Drew, former Trilogy marketing vice-president, will proceed with that project as an outside venture.

During the first nine months of 1984, Trilogy's losses totaled $79 million on revenue of $10.2 million. Montgomery said Trilogy's long-term debt at the end of 1984 totaled $34 million, with current liabilities for the period totaling $17 million. Though year-end figures have not been released, Montgomery said Trilogy will post a loss for the fourth quarter of 1984 and for the year.

JONES from page 85

work, yet networking is recognized by almost all customers as imperative. To keep our customers, we will have to offer a network version of Multimate within six months.

It is easier for a word processing package to be tailored to a network than it is for a spreadsheet or a data base. The word processing vendor doesn't have the problems of file and record locking. It will take the other vendors more time to develop network packages.

Q ***How will network software be priced?***

A license for a master on a file server will be more expensive than the current price of a package; the cost for each node will be less. With two or three users, a corporation would lose money. With eight users, the company may save money.

Q ***Should software be copy-protected?***

Our software is not copy-protected. Generally, our customers do not want to buy copy-protected software. Copy protection creates inconveniences for customers working in a professional, honest manner. Yet we have a mechanism that would allow us in two days to include copy protection.

We know that for every package we sell, there is a second copy produced. We are not sure how the other copies are used. If a user has one copy in the office and one at home, we do not mind.

We are working with [the Association of Data Processing Service Organizations, Inc.]. If an industry copy-protection standard is adopted, we will endorse it.

Q ***Will Microsoft prices soon fall?***

Generally, vendors will add features rather than lower prices. We have not noticed that other companies are lowering their prices.

There have been price cuts. It is a distribution problem with dealers and distributors — not vendors — cutting prices. That problem seems to be ending. If prices do drop, we would unbundle some of our features and offer different versions of the product at lower prices.

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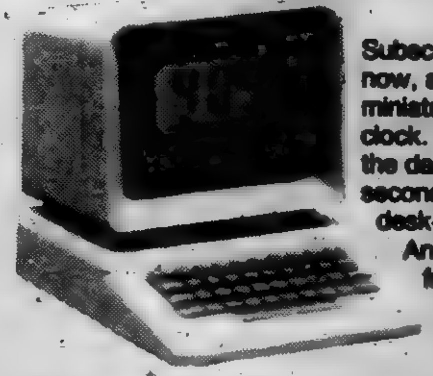

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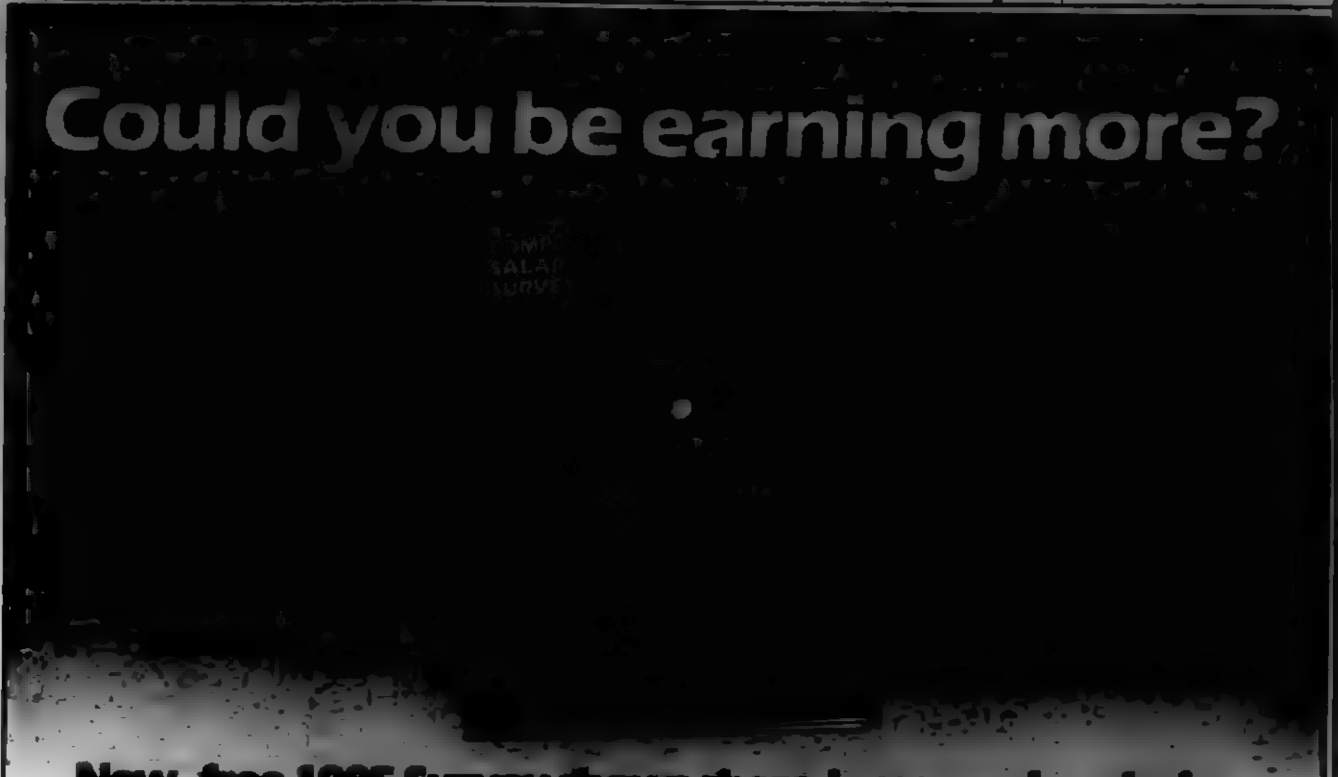

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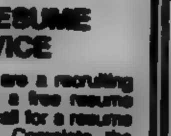

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Training opportunity for an individual with software instruction experience. Experience required in the preparation and presentation of system level operational and programming courses. Knowledge of system electronics desirable, as well as experience teaching real-time interactive system software to experienced customer engineering personnel. Some travel worldwide may be necessary.

PROGRAMMER ANALYST

Career opportunity for experienced programmer/analyst to design, develop, implement, and install computer based signal processing systems. Knowledge of real-time interactive, PDP, VAX, SEL, or HP systems a plus. Experience in Fortran and assembly language desired. A BSCS, BSEE, or similar educational preparation required.

ALL POSITIONS REQUIRE U.S. CITIZENSHIP.

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The professional work at Fairchild Weston is organized around individual and small team projects. As a result you will gain responsibility, visibility and accountability. You will be involved from start to finish, including customer interface, design, development and delivery.

THE COMPANY

Fairchild Weston is part of the $6 Billion Schlumberger group which emphasizes decentralized management. We are responsible for multiple projects and systems within our three primary product lines: Telemetry, Signal Processing, and Data Recorders. Under our tradename, EMR, we market to both commercial and defense customers thus ensuring a stable environment. Our present career opportunities represent both growth and internal promotions. Professional technical turnovers in the past twelve months have been under 4%.

THE LOCATION

Sarasota is located on Florida's fabulous Gulf Coast. Blessed with an outstanding climate our employees enjoy year-round outdoor activities. Sarasota has excellent schools and cultural activities plus a diversified and affordable real estate market. In addition, housing taxes are very low and there is no state income tax in Florida.

Fairchild Weston offers top compensation, liberal fringe benefits, relocation assistance, and a casual but challenging work environment. For confidential consideration, please submit your resume to Manager of Professional Employment, Dept. 36, FAIRCHILD WESTON SYSTEMS INC., P.O. Box 3041, Sarasota, Florida 33578.

FAIRCHILD WESTON SYSTEMS INC.

An Equal Opportunity Employer

SYSTEMS ANALYST/ PROGRAMMER

Rohm and Haas Seeds Inc. has a senior-level opening for a Systems Analyst/Programmer to work at our Research Laboratories in Spring House, PA. Rohm and Haas Seeds Inc. is a wholly-owned subsidiary of Rohm and Haas Company, a leading multinational chemical firm.

A principal responsibility of the position is to work with Rohm and Haas Seeds Inc. personnel in formulating systems objectives. Designing solutions to complex computer problems in data base management, statistics, graphics and scientific software is another important aspect.

You should have experience in JCL, SAS, FORTRAN, data base systems, plus experience in systems design. A BS or MS degree in Agronomy, Biology or related science with a strong computer background is preferred. A BS or MS in Computer Science with a strong background in agricultural science is also acceptable.

Spring House sits twenty miles north of center-city Philadelphia — amidst suburbs, estates, and countryside.

Rohm and Haas offers a highly competitive salary and benefits program, including relocation assistance. We are committed to growth through research. We maintain a working climate conducive to professional development; and we promote from within.

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Personnel Resources
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Middle South Services provides a state-of-the-art technical environment in its (2) 3084 MVS/XA and 4381 VM/CMS shop. There is currently large scale IMS DB/DC development work in progress. Middle South Services is committed to staying on the leading edge of technology, and is heavily involved in the use of application generations and user friendly fourth generation languages.

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EOE

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DIRECTOR OF INFORMATION SYSTEMS
Stephens College

Stephens College, an undergraduate women's college located in Columbia, Missouri, invites nominations and applications for the position of Director of Information Systems.

The Director will attend to all administrative computing needs of the college community and reports directly to the Vice President for Business Affairs. The Director must immediately develop a plan-of-action to install a computing facility capable of satisfying the processing needs of student and development activities, admissions, registration, and the general business affairs of the college, in a state-of-the-art manner. These needs are currently provided by an IBM 360/20 card system and a PDP 11/34.

Qualifications: Candidates must have a bachelor's degree and three to five years of technical and managerial experience, preferably in an academic organization. The candidate must also have the ability to communicate and work effectively with the administrators and manage a staff which presently numbers approximately five and have sufficient knowledge of the technical aspects of the field to make sensible decisions concerning the acquisition of equipment and software and the ability to articulate these decisions clearly to administrators and staff.

Salary is competitive based on qualifications and level of experience.

Send resume, names of three professional references, and transcripts to:

Mr. [illegible] C. [illegible]
Vice President for Business Affairs
Stephens College
Columbia, Missouri 65215

Deadline for applications is close of business April 12, 1985.

Stephens College is an affirmative action/equal opportunity employer.

Data Processing

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High school diploma or equivalent and five years experience in job offered. 40 hours per week; $743 per week. Please send resumes to: Personnel Dept., KW/DC, Siemens Corporate Research & Support, Inc., 186 Wood Avenue South, Iselin, NJ 08830. An equal opportunity employer.

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EOE/M/F/H

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Indicate position, A or B, for which applying. WVU is an Equal Opportunity/Affirmative Action Institution.

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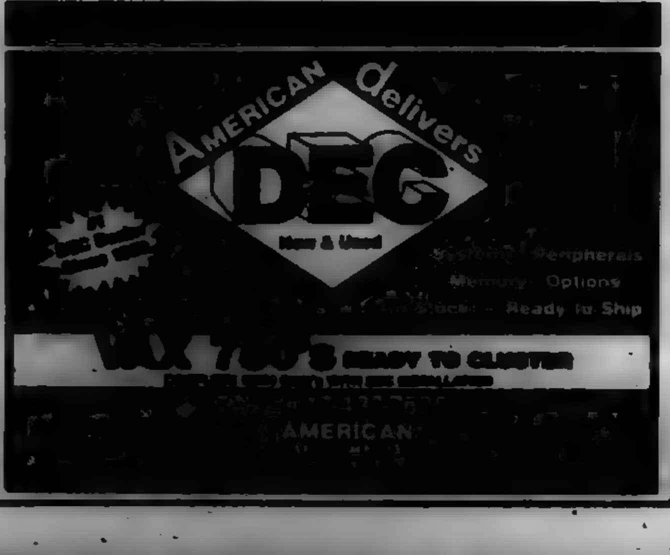

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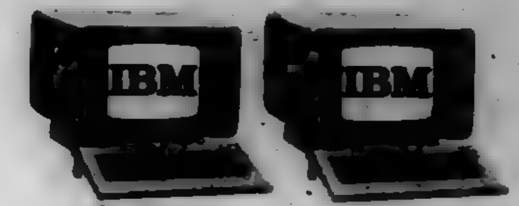

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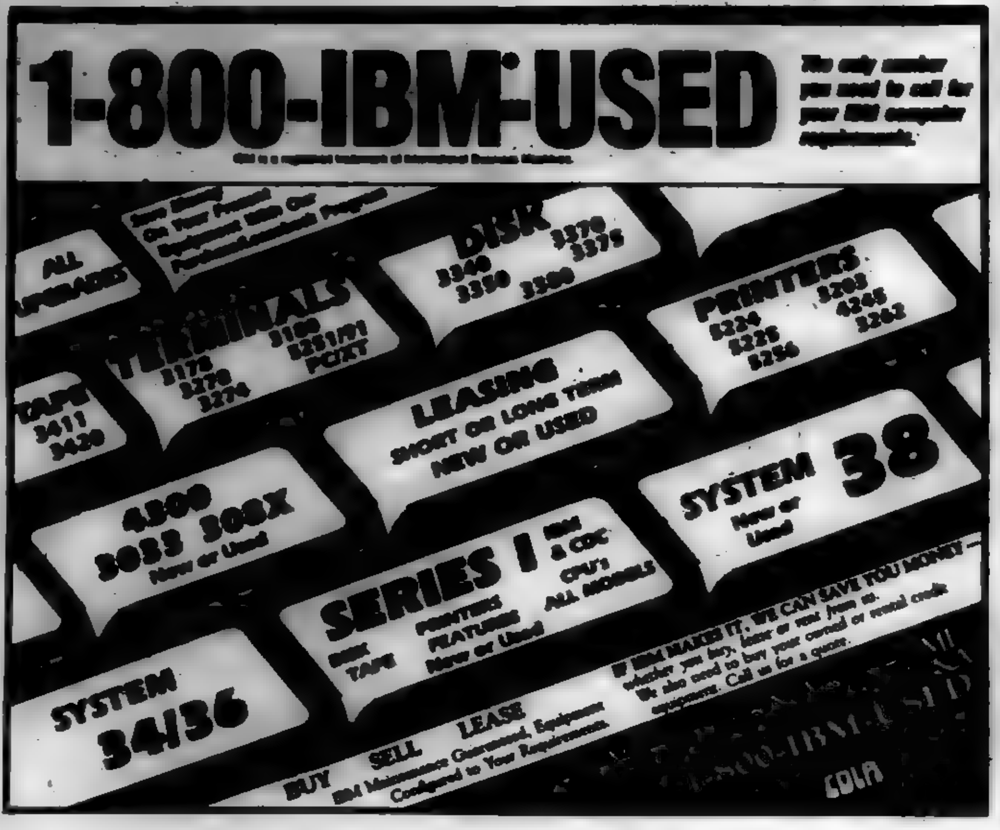
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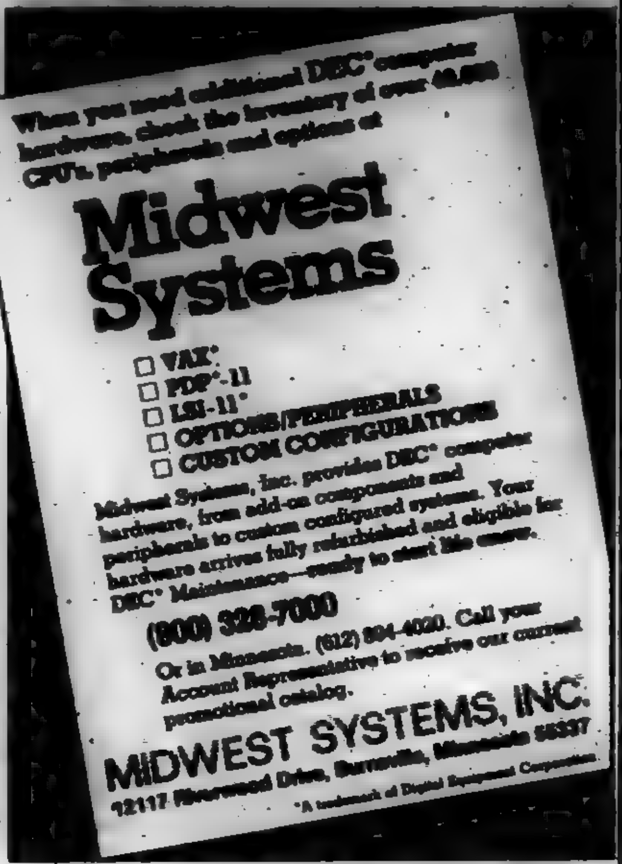

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Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be clearly typewritten. Ads may be given over the phone to our ad takers. We cannot accept camera ready copy. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

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Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

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Classification: ____________
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Company: ____________
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- All ads are standard in format and typeface. No special typeface, borders or logos are allowed. Copy may be up to 25 words per unit.
- The Bulletin Board ads are listed by manufacturer or by product type under appropriate headlines.
- Ads are set on a six-column page in our classified section under "The Bulletin Board"

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  The body copy should describe the equipment and state the price.
  The closing should supply the seller's name and telephone number.
  This is all the information an interested buyer needs for follow up.
- Ads are accepted by mail, phone or by telecopier.
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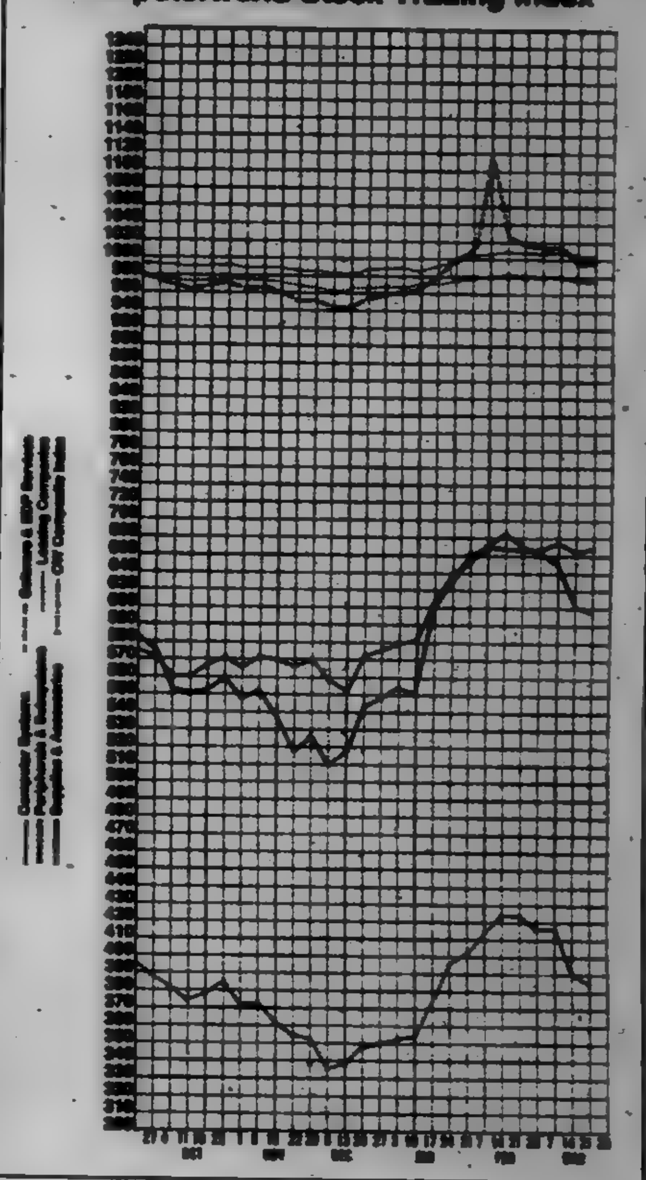
Computerworld Stock Trading Index



Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES WEDNESDAY, MARCH 20, 1985

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[illegible]

LEASING COMPANIES

[illegible]

COMPONENTS

[illegible]

SOFTWARE & EDP SERVICES

[illegible]

PERIPHERALS & SUBSYSTEMS

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SUPPLIES & ACCESSORIES

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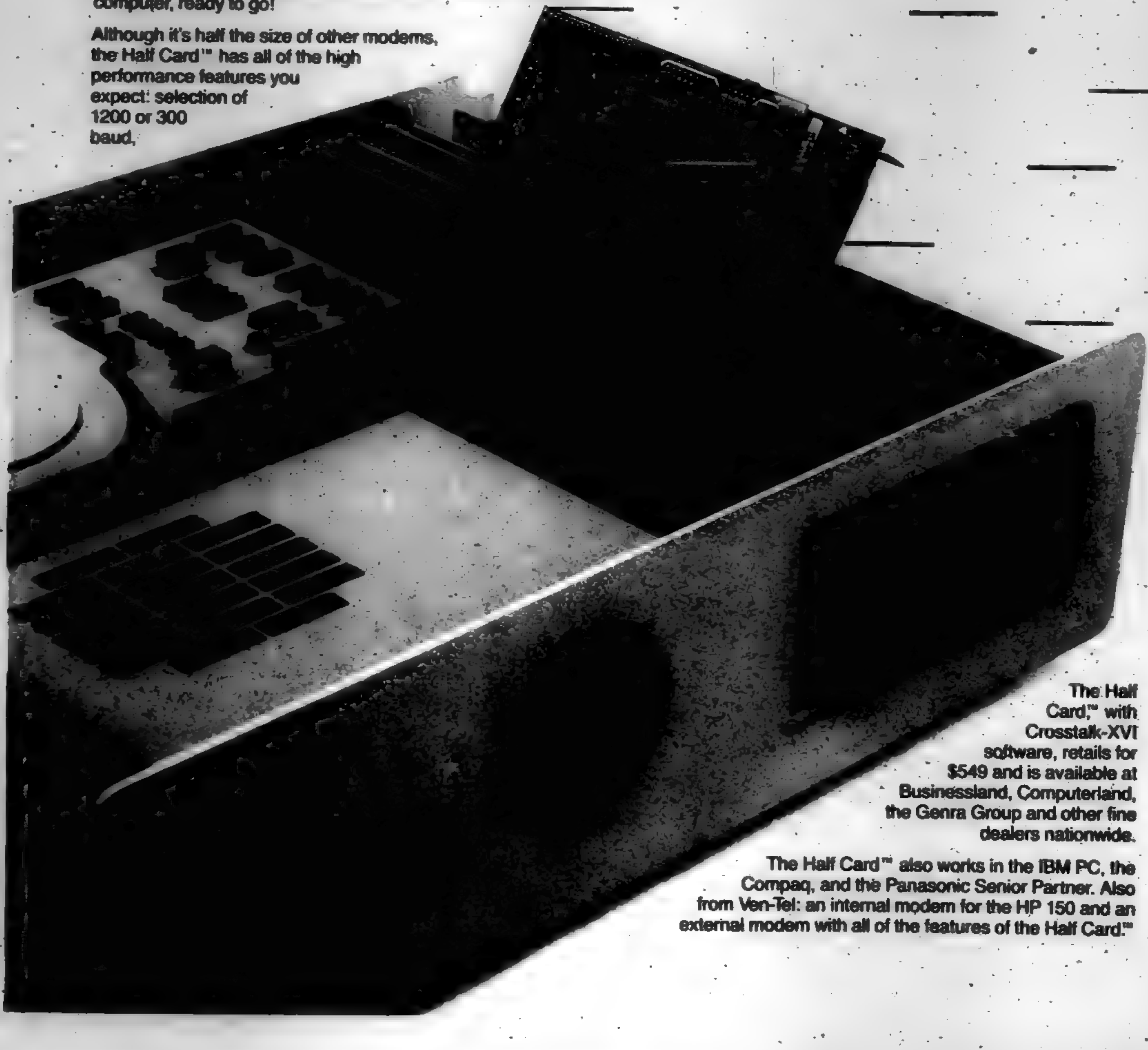

The Half Card,™ with Crosstalk-XVI software, retails for $549 and is available at Businessland, Computerland, the Genra Group and other fine dealers nationwide.

The Half Card™ also works in the IBM PC, the Compaq, and the Panasonic Senior Partner. Also from Ven-Tel: an internal modem for the HP 150 and an external modem with all of the features of the Half Card.™

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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Processor blitz strikes high end

Burroughs adds CPUs

A 15 rivals IBM 3090; V series debuts

By Tom Henkel
CW Staff

NEW YORK — Continuing the year-long rehabilitation of its mid-range and high-end systems, Burroughs Corp. last week matched the performance of IBM's high-end 3090 mainframes with the eight-model A 15 line. The company also took the first steps toward replacing its B2000, B3000 and B4000 series processors with the V series machines.

The following are highlights of last week's announcement:

- The A 15, which reportedly performs an average of 2.6 times faster than the company's previous high-end processor, the B7900. The A 15 line includes one-, two-, three- or four-CPU configurations and occupies roughly 45% less floor space than the B7900.
- The V 340 and V 380, which are successors to the B4925 and B4955 mid-range processors. Burroughs claimed the two processors are the first in a line that will eventually replace its B2000,

See CPU page 8

Honeywell launches top-of-the-line DPS 90

By Tom Henkel
CW Staff

PHOENIX — Displaying the first fruits of its year-old relationship with Japan-based hardware manufacturer NEC Corp., Honeywell, Inc. last week unveiled its most powerful mainframe to date. The DPS 90 is a five-model processor line said to offer performance comparable to IBM's recently announced Sierra CPUs.

In addition to the mainframe line, Honeywell announced the following:

- A mass storage subsystem that is based on IBM's 3380 disk drives, three magnetic tape processors and an enhanced version of its mainframe belt printer for the DPS 90 line.
- Enhancements to the firm's DPS 6 line of minicomputers, including the 32-bit DPS 6/85 and the 16-bit DPS 6/42. Honeywell also unveiled two fixed-disk mass storage devices with capacities of 132M and 413M bytes for the DPS 6 line.
- Communications software for the DPS 6 that allows the sys-

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TOP OF THE NEWS

Run for the money. When fear of mass withdrawals forced 71 Ohio banks to close, ATMs were brought down statewide for the first time. Page 6.

■

Cullinet and Lotus targeted the information center with a system that links Cullinet data base products to Lotus' 1-2-3 and Symphony. Page 14.

■

Having reservations. The Justice Department may seek divestiture of airline reservation systems if they are found monopolistic. Page 15.

■

Despite a plunge in profits, Wang said it will still unveil products in the coming months. Page 77.

AT&T unveils desktop Unix PC

By Eric Bender
CW Staff

NEW YORK — AT&T Information Systems celebrated its first birthday in the commercial computer arena last week by introducing a desktop Unix-based microcomputer, enhancements to the AT&T PC 6300 personal computer, a twisted-pair local-area network and a touch-screen voice/data terminal.

The announcements underline AT&T's intentions to emphasize connectivity between various computer and communications workstations and to provide customers with upgrade paths, according to James Edwards, AT&T Information Systems' Computer Systems president. "There is very little 'value-added' that even AT&T can bring to the marketplace if we do it box by box" rather than by providing networking with a range of communications options, Edwards said.

The following are among the debuts:

- AT&T called its much-rumored Unix PC a "next-generation" desktop system that integrates computing with voice/data communications. The machine is built around a 10-MHz Motorola, Inc. 68010 microprocessor with virtual memory capabilities and offers multitasking, multiuser operation under AT&T Unix System V. A software shell provides a bit-mapped windowing environment, complete with mouse and icons, and isolates inexperienced users from Unix, AT&T said.

See AT&T page 13

IBM unwraps fault-tolerant processor line

By James Connolly
CW Staff

RYE BROOK, N.Y. — IBM made official its plunge into the fault-tolerant market last week with the announcement of a system based on Stratus Computer, Inc. Stratus/32 superminicomputers.

IBM is introducing its System/88 just a month after the announcement of an OEM agreement providing IBM nonexclusive remarketing rights to various Stratus products. According to some industry watchers, IBM's move could provide a boost for smaller companies fighting to enter the fault-tolerant transaction processing field while hurting the industry leader, Tandem Computers, Inc.

The three models of the System/88 will be targeted to industries requiring uninterrupted on-line service, including banking, retailing and manufacturing, according to IBM. The System/88 reportedly utilizes the Stratus/32 processor and Stratus VOS operating system, under the name System/88 Operating System. The balance of the system, such as disk and tape drives, controllers and consoles, is composed of IBM peripherals.

Details such as performance figures for the System/88 were unavailable. However, a Stratus spokesman said the three versions of its Stratus/32 run at 0.7, 2 and 3 million instructions per second.

The entry level IBM system is the System/88 Model 4576-20, consisting of two processor modules, duplex 4M-byte sets of memory, a 20-slot chassis, a 1600/6200 bit/in. tape drive, two 143M-byte disk drives, an IBM Personal Computer as a console, and eight communications lines, supporting asynchronous and synchronous communications. A typical configuration costs $187,670.

The mid-range System/88 Model 4576-40 also has duplex 4M-byte processor modules, a 40-slot chassis, 32 communications lines and four 448M-byte disk drives. A typical system costs $437,840.

The high-end System/88 Model 4576-60 is a duplex 8M-byte system with dual disk, tape and communications controllers, six 448M-byte disk drives, two tape drives and 31 lines. It costs $672,000.

See IBM page 6

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NEWSPAPER

IBM predicts profits will decline

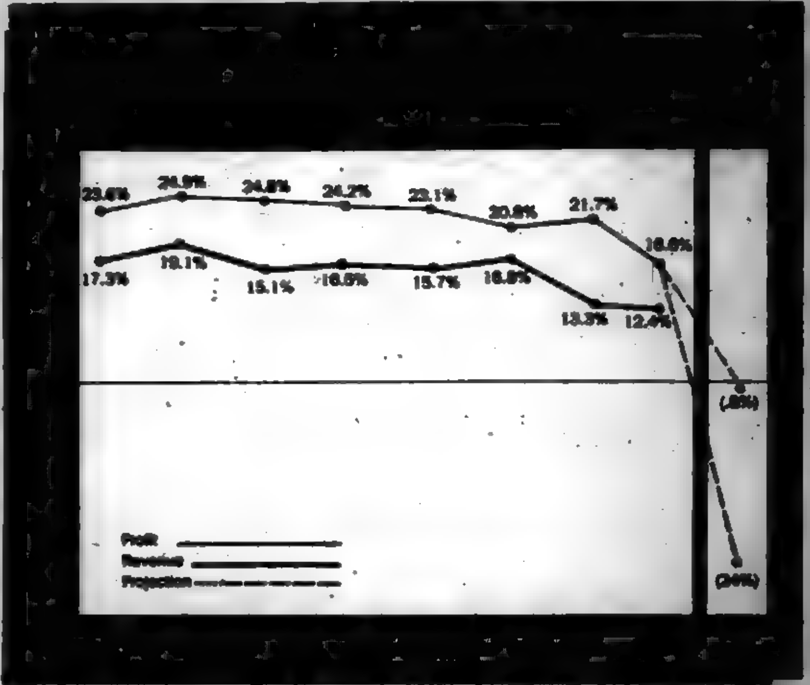
Company blames value of dollar overseas for first dip since 1981

By Peter Bartolik
CW Staff

ARMONK, N.Y. — IBM recently announced that it expects the first quarter of 1985 to produce the company's first drop in profits since the last quarter of 1981. Earlier this year [CW, Feb. 18], IBM had said it expected flat profits for the quarter ended in March.

IBM said further that it is "comfortable" with securities analysts' estimates projecting first-quarter earnings per share in a range from $1.50 to $1.96 per share. That range would produce profits ranging from $917 million at the low end to $1.19 billion at the high end, compared with $1.2 billion reported in the first quarter of 1984.

In a statement, the company said that despite the short-term decline, its customers have responded to recent product announcements by going ahead with their installation plans.



CW Chart

Figures for the first quarter of 1985 represent a projected decline based on Wall Street analysts' estimates, a range with which IBM said it is "comfortable." IBM reported that despite the short-term decline, customers have responded to recent product announcements by going ahead with their installation plans.

Growth for year

"The resulting increase in product shipment rates will make a substantial contribution to the second half of 1985, leading to solid growth for the year as a whole," according to the company.

As it did in February, IBM again attributed the lower earnings to the strength of the U.S. dollar in international currency markets and a hesitation by customers to order large systems prior to the announcement of the 3090 series mainframes.

Despite a flood of downward revisions by minicomputer companies, IBM indicated it has not suffered any setbacks in orders for medium-scale processing equipment. "Orders have been quite good across the product line, and we see no discernible trend," an IBM spokeswoman reported.

Weak technology stocks

Michael J. Geran, an analyst with E. F. Hutton Group, Inc., said he lowered his first-quarter earnings-per-share estimate from $1.97 to $1.65 but only lowered his estimate of fiscal year 1985 earnings per share by 5 cents to $11.75; in fiscal year 1984, earnings per share were $10.77.

At the New York Stock Exchange, on the first day of trading following IBM's announcement of the 3090 series mainframes, the company's stock dropped to $3.25, and analysts said the weakness in technology stocks was causing investors to abandon the market.

Because IBM has reduced its income from rental equipment, Geran said, the company needs to boost shipments by 25% to increase profits by 15%.

"That won't happen until the second half," according to Geran, when IBM will ship its double-density 3380 storage systems and will resume shipments of 3080 series mainframes as well as the initial shipments of the 3090 Model 200 mainframes.

Wohl to pen CW column

Feature to target end-user concerns

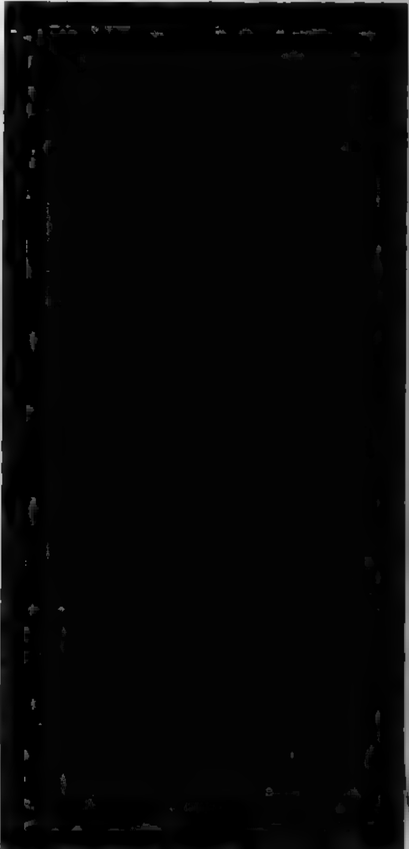
Amy D. Wohl joins *Computerworld* this week as a regular columnist.

In her bimonthly "Wohl Street Minijournal," this insightful — and sometimes outspoken — industry watcher will discuss the issues and technologies that make end-user computing a major area of concern for today's management information systems executive.

In late 1984, the noted speaker, writer and commentator on every aspect of computers in the front office founded Wohl Associates, a consulting company headquartered in Bala-Cynwyd, Pa., that specializes in office automation and end-user computing.

Prior to that, she spent five years as president of Advanced Office Concepts Corp., an office automation firm in Bala-Cynwyd. Wohl's experience also includes a five-year stint as an executive editor and consultant with Datapro Research Corp. in Delran, N.J.

Wohl received a bachelor's degree in economics from La Salle College in Philadelphia and a master's degree in the same area of concentration from Temple University, also located in Philadelphia.



CORRECTIONS

IBM announced the reassignment of Philip D. Estridge, formerly president of the Entry Systems Division, on March 12, not Feb. 12 as was reported [CW, March 18].

GTE Data Services, Inc. [CW, March 18] is a subsidiary of GTE Corp., not of GTE Telenet Communications Corp. as was previously reported.

NEWS SUMMARY

In addition to announcing a line of mainframes, Honeywell offered enhancements of its DPS 6 line of minicomputers/5

The closing of 71 Ohio savings and loan institutions had a minimal impact on regional data centers serving the banks, but one manager said the required shutdown of the banks' ATMs set a precedent/6

Private-line users may have a difficult time unraveling AT&T's new rate structure/11

Compaq announced a personal computer/communications workstation/12

Cullinet Software and Lotus have announced the Information Center Management System/14

The U.S. Department of Justice is monitoring a new form of bias in computerized airline reservation systems/15

A group of optometrists had some enlightening advice on how to avoid eyestrain from VDT-related work/17

A bill before the Florida legislature would allow residents to tap into state electronic records/19

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A software package may lead Dade County, Fla., investigators to a man who is believed to have raped 40 women/24

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End-user terminal testing helped determine an insurance firm's DP department's purchasing choice/30

With the help of a manufacturing planning system, the world's largest bootmaking firm is striding toward improved operations and lower costs/32

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SUSPENSE

How did IBM's rookie sort (Rel 7.0) do in its first meeting with "Lefty" SyncSort? Read all about it!

or Call (201) 568-9700.

Get the inside scouting report.

It is one of those historic moments in the Annals of Sort! The very first appearance in competition of IBM's new DFSORT, Release 7, in the tough-as-nails MVS/XA League. Will the kid be able to live up to his advance press notices?

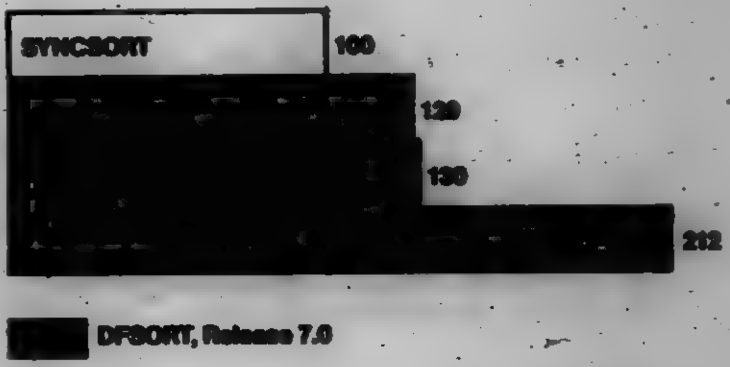
Confidently DFSORT7 strides to the plate... knocks the dirt out of his spikes... hitches up his britches... raises his sort assists.

Then, as sorting fans everywhere gasp in amazement, he lifts his arm lazily and points toward the centerfield flagpole, thousands of bytes away. The kid is going to try to emulate Babe's mighty homerun shot!

Moments later, SyncSort winds up... a curving white blur is seen... and... and...

There is no joy in Armonk! DFSORT7 struck out every time it came to bat against the latest release of SyncSort (Release 2.SE) in a recent series of MVS benchmark tests. (In sorting, as in most other forms of human endeavor, it's a long way from *baby* to *Babe*.)

The bar charts below tell the story more eloquently than we can:



That didn't surprise us too much. **After all IBM isn't known for its sorts... and we're not known for our computers.**

We stick to what we do best. Maybe some day they will too. But in the meantime, you're faced with a choice of sorts. You can use their sort, which gets the job done (eventually). Or you can use our sort. We're a little faster. (We're also very modest.)

syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

FRUITS

from page 1

tem to coexist with an IBM System Network Architecture environment.

Based on NEC's S-1000 CPU, the DPS 90 line consists of one-, two-, three- and four-processor configurations and a redundant dual-processor model.

Honeywell said the uniprocessor DPS 90/91 offers from 30% to 70% more performance than the uniprocessor version of the older DPS 88/81. That means the DPS 90/91 offers internal performance of roughly 10 to 12 million instructions per second (Mips). The DPS 90/92 and DPS 90/92T offer 1.8 times the performance of the DPS 90/91, and the DPS 90/93 offers 2.6 times the performance of the Model 90/91. The four-processor DPS 90/94 is said to offer 3.4 times the internal performance of the DPS 90/91, or roughly 34 to 41 Mips.

The basic DPS 90 configuration consists of modular components including a CPU, a system control unit, a main memory unit, an I/O processor, a power supply unit, a system console and an interface adapter unit that allows users to connect peripherals that conform to the Federal Information Processing Standards guidelines.

The DPS 90 was designed to use Honeywell's Gcos 8 operating system, and software designed to operate under Gcos 8 on the older DPS 8 and DPS 88 mainframes will operate without change on the DPS 90 line.

Honeywell said the DPS 90 systems have integrated array processing capabilities that allow the system to operate in scientific environments. To augment this capability, Honeywell said it will offer an enhanced release of Gcos 8 that includes a Fortran compiler designed to take advantage of the system's array processing capabilities.

Available in late 1985, the DPS 90 reportedly will use current mode logic circuitry. The one-, two- and three-processor models are field upgradable to the four-processor model, but users of other Honeywell systems, such as the DPS 8 and DPS 88 mainframes, cannot field-upgrade to the newly announced models.

Main memory ranging from 32M to 256M bytes is supported on the DPS 90 line. However, a maximum of 128M bytes of main memory is supported on each system control unit/main memory unit cabinet. Consequently, the uniprocessor DPS 90/91 and dual-processor DPS 90/92 support 32M to 128M bytes of main memory. The redundant dual-processor DPS 90/92T, DPS 90/93 and DPS 90/94 support from 64M to 256M bytes of main memory. The DPS 90 is the first Honeywell mainframe to offer 256K-bit memory chips, and memory enhancements are available only in 32M-byte increments, which cost $400,000 each, Honeywell said.

A DPS 90/91 processor with 32M bytes of main memory costs $4 million. The dual-processor DPS 90/92 with 32M bytes of main memory costs $5 million. The redundant dual-processor configuration costs $6.3 million for a 64M-byte capacity. A three-processor DPS 90/93 with 64M bytes of main memory costs $7.3 million. The DPS 90/94 with 64M bytes of main memory costs $8.4 million.

Honeywell's Large Computer Products Division can be reached through P.O. Box 8000, 13430 N. Black Canyon Highway, Phoenix, Ariz. 85066.

HONEYWELL, INC.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Relative Performance[1]	107-385	329	470	493	887	[illegible]	1,281	1,676
Memory size in bytes (Minimum-Maximum)	4M-64M	16M-64M	16M-256M	32M-128M	32M-128M	64M-256M	64M-256M	64M-256M
Lease Price (Lease Term)	$38,084 (5 Year)	$91,200 (4 Year)	$141,000 (4 Year)	$183,721 (4 Year)	[illegible] (4 Year)	[illegible] (4 Year)	[illegible] (4 Year)	[illegible] (4 Year)
Channels (Minimum-Maximum)	1-08	10-40	10-40	16-48	16-48	16-48	16-48	16-48
[illegible]	No	No	No	No	No	No	No	No

1. CW estimates are based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For the processor only. Each of the models in the DPS 8 line can accommodate multiple processors.

CW Chart

Disk, tape, printer products round out Honeywell debuts

PHOENIX — To support its newly announced DPS 90 line of mainframes, Honeywell, Inc. unveiled a mass storage subsystem, a line of magnetic tape processors and an enhanced version of its mainframe-oriented belt printer.

The PSP3380 series mass storage subsystem is based on IBM's 3380 disk drives, sold to Honeywell via an OEM agreement reached with IBM in late 1984. The subsystem consists of a mass storage processor and one or more mass storage units. Each mass storage unit has two fixed-head disk assemblies and provides a total storage capacity of 1.26G bytes. The units have an average seek time of 16 msec and a peak data transfer rate of 3M byte/sec, the vendor said.

Honeywell said it is also offering the disk subsystem to users of the DPS 88 processor line.

A mass storage subsystem consisting of a dual-access controller, two head-of-string disk drives and two slave drives costs $380,000 and will be available in 1986.

Also announced were the MTP8031, MTP8032 and MTP8033 magnetic tape processors. The units connect to high-speed data channels via the bidirectional I/O data transfer paths under control of Honeywell's Gcos 8, Multics or CP-6 operating systems. The tape processors control the transfer of data to and from up to eight tape drives.

Single- and dual-channel controllers support a variety of peripherals. An optional dual simultaneous channel feature can be used to increase data transfer efficiency and support up to 16 tape drives, the vendor said.

The MTP8021 is a freestanding primary channel unit that operates at 1.6K to 6.25K bit/in. MTP processors were designed for installation into the MTP8021. A tape subsystem consisting of a controller and eight tape drives costs $195,000.

Honeywell also enhanced its mainframe belt printers to support a parallel interface for use with the DPS 90. The units previously were available with a serial interface. The PRU0908 and PRU1208 printers operate at 900 and 1,200 line/min and cost $35,000 and $38,000, respectively. A $28,000 controller and channel attachment are also required. Current users of the belt printers with a serial interface can upgrade the units to accommodate a parallel interface for $3,000.

Honeywell's Large Computer Products Division can be reached through Box 8000, 13430 Black Canyon Highway, Phoenix, Ariz. 85066.

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Honeywell adds pair of minis, storage units to DPS 6 line

WALTHAM, Mass. — In addition to unveiling a line of high-end mainframes, Honeywell, Inc. enhanced its DPS 6 line of minicomputers.

Announced were the following:

- The DPS 6/85, an entry-level 32-bit minicomputer said to offer two-thirds the performance of the top-of-the-line DPS 6/95. The DPS 6/85 is geared for use in heavy transaction processing and distributed processing environments and is field-upgradable to the larger DPS 6/95. It offers a main memory capacity of 4M bytes and a total disk capacity of 3G bytes. The unit costs $57,000 and reportedly will be available in June.
- The 16-bit DPS 6/42, a 32-user system designed for use in warehousing, distribution and manufacturing environments or as a nodal processor in Honeywell or IBM networks. The system can support up to 2M bytes of main memory and 3G bytes of mass storage. It is priced at $19,300 and will be available in June.
- Two mass storage devices for currently marketed DPS 6 models. The mass storage devices offer 132M or 413M bytes of formatted storage, respectively, and employ Winchester-type fixed media disk drives with multiple sector read/write capabilities, automatic track and cylinder switching and the ability to perform simultaneous seek operations on up to three other units during data transfer to another unit. Up to eight of the newly announced disk drives — in either capacity — can be linked to the DPS 6/42 or DPS 6/85 systems. The 132M-byte disk unit costs $14,500, and the 413M-byte unit costs $31,000. Both units will be available in June, the vendor said.
- A 9-track, dual-density tape subsystem was announced for the DPS 6 that is said to offer 6.25K bit/in. group-coded and 1.6K bit/in. phase-encoded recording capabilities. The unit contains a 128K-byte buffer that allows data to be transferred to the CPU at channel speeds. The unit and accompanying controller cost $22,900 and will be available in June.

A tabletop streaming tape drive was also announced. The ¼-in. tape unit has a 64M-byte formatted capacity. It was designed to back up small disk files and can be used with any appropriately configured DPS 6 or Honeywell Level 6 Megabus system. The tape unit can be panel-mounted in Honeywell's Microsystem 6/10 microcomputer or the DPS 6/22 minicomputer. It costs $4,600 and will be available in June.

- Enhancements to the Microsystem 6/10 microcomputer include a doubling of the unit's main memory capacity from 512K bytes to 1M byte, an increase in the integral mass storage from 20M to 56M bytes and a color graphics display and graphics printer. The enhanced version is available immediately and costs $6,995.

Honeywell announced the products through its Small Systems Group, 20 Smith St., Waltham, Mass. 02154.

Trilogy set to buy Elxsi

CUPERTINO, Calif. — Trilogy Ltd. said last week it has reached an agreement in principle to acquire Elxsi, a privately held manufacturer of large multiprocessor systems, and intends to merge the operations of the two companies.

The merger, if approved by shareholders, will provide Trilogy with its first commercial product. Founded in 1980 by Gene Amdahl, Trilogy raised more than $270 million in financing from various sources in an attempt to develop wafer-scale integrated semiconductors and to build a high-performance IBM-compatible computer based on the semiconductors.

Both projects were scrapped last year. Amdahl, who founded Amdahl Corp. following a successful career with IBM, said recently that the complexity and scope of the projects were too vast to be completed within the designated time frame (CW, March 25).

Under the terms of the agreement with Elxsi, Trilogy will issue or reserve for issuance to Elxsi shareholders about 38 million new shares in Trilogy, which would give Elxsi shareholders slightly less than 50% of Trilogy and significantly dilute the holdings of Trilogy's earlier industry backers. Digital Equipment Corp., Sperry Corp. and France's Bull all made significant investments in the company, but both DEC and Sperry have since made accounting provisions to write down large portions of their investments.

Elxsi, based in San Jose, Calif., last year began marketing systems targeted at the engineering and scientific markets. It has an installed base of more than 40 machines and in 1984 generated sales of $18 million while posting a loss of $7 million.

Trilogy's subsidiary, Trilogy Systems Corp., advanced $5 million to Elxsi for working capital, and Elxsi granted Trilogy an option to acquire 25% of its stock prior to the merger under certain undisclosed circumstances.

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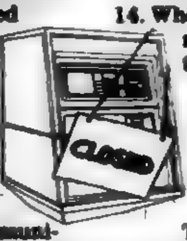
RECOVERY

Ohio bank crisis prompts first-time shutdown of ATMs

By John Desmond
and Clinton Wilder
CW Staff

CINCINNATI — When 71 savings and loan institutions in Ohio closed March 15, the terrific went out of Tellerific; the green went out of the Green Machine; and customers probably called Jeanie something other than her given name.

These 24-hour automatic teller machine networks with the amusing monikers had to stop conducting transactions for customers of the state-insured thrift institutions that were ordered closed after the March 9 failure of Home State Savings Bank of Cincinnati.



The DP manager overseeing Jeanie said the shutdown was a first for his network. However, DP managers serving many of the closed banks reported the shutdown had a minimal impact on their work.

James Hudepohl, vice-president of communications at Cincinnati's Fifth Third Bank, which operates the Jeanie network of 280 ATMs, said the technique used to shut off the eight ATMs in the network affected by the closings had never before been used and would only otherwise be used in disaster recovery. During normal maintenance the machines are never turned off, he said.

An all-IBM shop, the Fifth Third Bank operates multiple 3033 mainframes running MVS/SP 1.3 and more than 100 3380 disk drive spindles. The bank functions as a switch for five ATM networks in Ohio, routing ATM transaction messages to their destinations.

"We keep track of settlements between banks — who owes whom money. The client banks authorize or originate the transactions," said George Landry, senior vice-president of operations and DP at Fifth Third. The bank has 11 million accounts in its data base, but the five closed savings and loans served by Fifth Third were a small percentage of the 86 banks served by the Jeanie network.

To turn the ATMs off, a simple software change was made. "We turn a bit in a table entry that says the machines are not available," Hudepohl said. When customers tried to use a 24-hour access card, they received the appropriate message.

Gov. Richard Celeste ordered the 71 savings and loans closed on the evening of Thursday, March 14. When Landry and Hudepohl came to work the next day, they called the governor's office to ask about shutting down the necessary ATMs. At about 11 a.m., the governor's attorney called back with instructions that the ATMs be closed. "We wanted to make sure we did the right thing," Landry said. "We did everything we could to protect our customers' interests."

The delay in getting authorization to close the ATMs gave those bank customers with access cards a chance to retrieve some cash from their accounts that Friday morning, Landry acknowledged.

Many of the closed Ohio savings and loans are small- to medium-size financial operations that depend on regional data centers for time-shared DP service. Two such data centers in Ohio reported that the closings had a minimal impact on their overall DP operations.

The thrift crisis meant a 15% to 20% reduction in the number of transactions, which averages 100,000 daily, serviced at the NCR Corp. Data Service Center in Dayton, Ohio, according to David Bogner, production manager at the center. Bogner based the estimate on transactions from 15 client savings and loans that had to close. "It meant that I didn't have to print as many reports, but the machines were still busy," Bogner said of the closings.

The all-NCR center operates three mainframe-based systems, each with an NCR Criterion 8575 mainframe with 3M bytes of main memory and the company's VRX operating system. Two systems are serviced by 10 NCR 658 disk drives with a 200M-byte capacity, and one is served by 12 658s. The transaction slowdown had no impact on his staff, and no special preparations were required to service transactions once the client institutions began reopening, Bogner said.

One manager at a Cincinnati-based data center said there may be a secondary DP impact as larger, federally insured savings and loans seek to acquire some of the 71 closed institutions. "Our members are already buying up the institutions that don't want to go back in business under the same name," said Don Cox, manager of data and communications at Savings & Loan Data Corp. (SLDC), which processes transactions for 300 savings and loans institutions in 11 states. "We'll have to convert those accounts. Of the 2,000 accounts that we service [from nine closed savings and loans], I wonder how many will stay in existence."

Cox said that the closings affected less than 1% of SLDC's 250,000 daily transactions. SLDC services its 4½-million-account database with two Burroughs Corp. 4900 mainframes for on-line processing and a third 4900 CPU for systems development and programming.

"These were really mom-and-pop-type operations, so there was not much impact on our processing," Cox said. "We simply stopped handling their transactions. Our problems here were miniscule compared to the people trying to get their money out."

IBM

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IBM said the fault-tolerant systems, in which a duplicated component takes over for a component that fails, can communicate with other IBM systems, including the IBM 370 environment. Like the Stratus/32, the System/88 reportedly can be arranged in a string of 32 modules.

IBM reported that the System/88 can operate as an independent computer or communicate with other systems through SNA networks and X.25 packet switching networks as well as via bisynchronous or asynchronous protocols.

The System/88 will be available "on a limited basis" in late 1985, according to IBM. The company said marketing support will be provided by a new System/88 office in IBM's National Accounts and National Marketing divisions.

Omri Serlin, head of ITOM International in Los Altos, Calif., and an observer of the fault-tolerant market, speculated that while customers may initially use Stratus application software on the System/88, IBM's move into the field will fuel application production by independent software developers.

He noted that some software that is likely to be used by early customers includes Stratus' interface for IBM's Systems Network Architecture, USP Unix-compatible interface, and Stratus' transaction processing and office systems.

However, he said that the "limited" availability caveat could mean that IBM plans to introduce supplemental products, such as its own interfaces with other IBM systems, in the coming months.

IBM's approval

Serlin said the IBM announcement could have the effect of placing the computer industry giant's stamp of approval on a fault-tolerant market where only Stratus and Tandem have delivered significant numbers of systems. Stratus' installed base of 300 processors runs a distant second to Tandem's more than 7,000 processors.

"The potential for the fault-tolerant market is large already. The principal reason the systems aren't selling is the lack of compatibility with existing equipment and the lack of credibility of some of the companies. IBM's entry could have a blessing effect," noted Serlin.

But he said the entry could also hurt Tandem as IBM gives more credibility to Stratus. "A key influence will be negative in relation to Tandem. Customers who may have liked Stratus' products in the past often decided to go to Tandem because Stratus is new and inexperienced," observed Serlin.

He added that Stratus' OEM agreement with IBM doesn't mean that Stratus will abandon its end-user sales avenues. "They don't want to be captive to IBM," said Serlin, noting that other manufacturers have suffered when they relied heavily on IBM and then watched IBM abandon their product or introduce its own products in competition with the OEM's equipment.

IBM is located at 900 King St., Rye Brook, N.Y. 10573.

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Burroughs unveils replacements to B4000 series CPUs

By Donna Raimondi
CW Staff

DETROIT — Burroughs Corp. last week launched a line of processors it claims will eventually replace its B2000, B3000 and B4000 series. The firm announced two models of the V series, the V 340 and V 380, said to be direct replacements to the older B4925 and B4955 processors, respectively.

The basic difference between the V 340 and V 380 is their I/O capability. The V 340 has one I/O subsystem, and the V 380 has two I/O subsystems, a company spokesman noted.

Scheduled for delivery beginning in the fourth quarter of 1985, the newly announced machines feature a different instruction set and operating system than the B4000 series machines they replace. The instruction set, said to be 35% larger than the one used on the B4000, reportedly improves the V series processors' ability to function in heavy batch and high-volume transaction processing environments. Burroughs contended that 40% to 50% of its B4000 series customers are from the financial community and are heavy batch and transaction processing users.

The newly announced operating system, MCP 1.0, is a superset of the operating system used on the B4000 line. It adds the ability to support multiprogramming environments, dynamically allocate memory and automatically perform system logging and reporting functions. The operating system can also support shared system configurations, the vendor said. Other capabilities are as follows:

- An on-line, interactive debugging facility at both the program and MCP levels.
- The ability to tailor I/O operations to suit specific devices.
- Multithreading and reentry of operating system functions.

MCP 1.0 is said to be code compatible with its predecessor so that no changes need to be made to a user's software.

The V 340 and V 380 models include 256K-bit memory chips and are configured with 10M bytes of memory, expandable to 20M bytes in 5M-byte increments. The previous maximum main memory on the B4000 series was 5M bytes, the vendor said. When upgrading memory capacity, memory interleaving is converted from two to four paths, providing additional system throughput and capability, the vendor said.

The character-oriented CPUs use decimal arithmetic and are said to be suited for executing business programming languages such as Cobol, RPG and Linc. The V 340 and V 380 systems contain function processors that operate individually in a pipeline fashion. This allows steps to be overlapped, the vendor said. These steps include instruction prefetch, program and address calculations, data fetch and manipulation, instruction executions and independent I/O initiation and transfer.

Multiterminal environments can be configured on the V 300s with the use of the Burroughs B974 and CP 3680 front-end processors.

The V 340 is priced at $390,400, and the V 380 costs $702,600. More information can be obtained from Burroughs, One Burroughs Place, Detroit, Mich. 48232.

CPU

from page 1

B900 and B4000 series processors.

With first deliveries scheduled for the third quarter of this year until the second quarter of 1986, the A 15 was designed to supersede the B7900 processor line. Burroughs still plans to manufacture the B7900, and the units will remain the logical growth path for users of the mid-range A 9 processor line. Hollis L. Caswell, Burroughs' corporate vice-president and president of its System Products Group, said the A 15 was not intended to replace the B7900 line, but he admitted that the performance of the low-end A 15 models overlaps that of the high-end B7900 line. Paul G. Stern, Burroughs' corporate president, said the A 15 line offers a 15% to 20% better price/performance ratio than the B7900 line.

The A 15 models are object code compatible with Burroughs' B5000, B6000, B7000 and A series processors. The A 15 architecture reportedly allows users to run applications software programs from earlier Burroughs systems without having to make a software conversion.

Based on emitter-coupled logic air-cooled gate arrays, the A 15 reportedly requires 55% less power and air-conditioning than a similarly configured B7900.

Eight models of the A 15 line were announced and include the uniprocessor Model F, the dual-processor Models H, I and J; the triprocessor Models K and L; and the quadprocessor Models M and N. The A 15 models are field upgradable within the line, but older Burroughs systems, such as the B7900 line, are not field upgradable to the A 15 line, Burroughs said.

The A 15 Model F supports from 24M to 48M bytes of main memory, whereas the dual-processor configurations support 24M to 96M bytes of main memory. The triprocessor and quadprocessor configurations support from 24M to 192M bytes of main memory, the company said.

The uniprocessor A 15 Model F is said to offer roughly 2.6 times the performance of a comparable uniprocessor configuration of the B7900. Caswell said actual performance of the system ranges from roughly 2.2 times that of the B7900 in Fortran-based scientific applications to 3.5 times that of the B7900 in I/O-intensive data base applications. This difference, Caswell explained, results from architectural improvements in the I/O processing capabilities of the A 15 processors. Caswell said that in a CPU-to-CPU comparison, the A 15 offers roughly twice the performance of the B7900.

The dual-processor versions of the A 15 offer 1.9 times the performance of the Model F, and the triprocessor configurations offer roughly 2.8 times the performance of the Model F. The quadprocessor models offer 3.6 times the performance of the Model F, Caswell said.

The Model F, with 24M bytes of main memory and one I/O subsystem capable of supporting up to 32 data link processors and up to 256 communications lines, costs $2.9 million. It reportedly will be available in the third quarter of this year.

The A 15 Model H, with 24M bytes of main memory and one I/O processor, costs $4.2 million. The Model I, which offers the same main memory as the Model H but with two I/O processors (offering support for up to 64 data link processors and 512 communications lines), costs $4.5 million. The Model J, which offers 36M bytes of main memory, two I/O subsystems and a CPU partitioning option, costs $5.1 million. The dual-processor models reportedly will be available in the fourth quarter.

The Model K, with 24M bytes of main memory and two I/O subsystems, costs $6.1 million. The Model L, with 36M bytes of main memory, two I/O subsystems and a partitioning option costs $6.8 million. The triprocessors will be available in the first quarter of 1986, the vendor said.

The quadprocessor Model M, with 24M bytes of main memory and two I/O subsystems, costs $7.6 million. The Model N, with 36M bytes of main memory, two I/O subsystems and the partitioning option, costs $8.4 million. The quadprocessor models will be available in the second quarter of 1986, the vendor said.

Burroughs is located at One Burroughs Place, Detroit, Mich. 48232.

BURROUGHS CORP.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Relative Performance¹	279	474	1,185	725	1,378	1,857	2,537
[illegible]							
Memory size in bytes (Minimum-Maximum)	12M-96M	12M-96M	12M-96M	24M-48M	24M-96M	24M-192M	24M-192M
[illegible]							
Lease Price (Lease Term)	$77,705 (3 Year)	$114,703 (3 Year)	$153,173 (3 Year)	$124,100 (3 Year)	$193,305 (3 Year)	[illegible] (3 Year)	[illegible] (3 Year)
[illegible]							
Channels⁴ (Minimum-Maximum)	27-256	27-256	27-256	Up to 32	32-64	32-64	32-64
[illegible]							
Bus Architecture?	No	No	No	No	No	No	No
[illegible]							

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For the processor, console, power supply and all prerequisites.
4. Burroughs processors use data link processors in place of conventional I/O channels.

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Honeywell, Burroughs aim to secure mainframe base

By Tom Henkel
CW Staff

Last week's high-end mainframe announcements from Honeywell, Inc. and Burroughs Corp. are attempts to keep IBM from pirating their most treasured mainframe customers, industry analysts observed.

The Honeywell DPS 90 and Burroughs A 15 lines are part of a traditional game played by members of the so-called Bunch mainframe vendors, noted Harry Edelson, president of Edelson Technology Partners, a consulting firm based in Saddle Brook, N.J.

Edelson explained that vendors competing with IBM must quickly demonstrate that they can match the performance of IBM's latest high-end processors or run the risk of losing their high-end mainframe customers to IBM. He said it would have been more surprising if Honeywell and Burroughs had failed to announce products that compete with IBM's 3090 line.

According to Edelson, the user base of the Bunch companies has slowly eroded during the past 10 years, with most of those users switching to IBM or compatible systems. Edelson said he expected that the latest round of processors from Burroughs and Honeywell would curb the loss of customers to IBM but probably would not stop the trend.

Frank Gens, an analyst with the Boston-based Yankee Group consulting firm, said that keeping up with IBM on the hardware front is only one part of the equation. The Bunch companies are comparatively weak in matching IBM's impressive list of mainframe software, he said.

Similar but different strategies

The latest announcements from Burroughs and Honeywell are strikingly similar but reflect the companies' markedly different business strategies.

Both vendors announced processor lines of one-, two-, three- and four-CPU configurations. Burroughs has offered several additional models with varying main memory and I/O processing capabilities, and Honeywell added the DPS 90/92T, a redundant configuration, to its line.

Both the A 15 and DPS 90 lines appear to offer internal performance that compares favorably with IBM's performance claims for the 3090 systems. However, both companies chose to match but not really exceed the performance of IBM's 3090s. Many industry watchers have long held as a commandment for successfully competing with IBM that one should never tip one's hand in anticipation of future IBM announcements. Honeywell and Burroughs appear to have obeyed that commandment.

Honeywell and Burroughs have targeted the same basic delivery window — late 1985/early 1986 — for their high-end systems. This move appears to have been geared to the general expectation that IBM's high-end 3090 Model 400 would be available much earlier than the 1987 delivery date IBM finally announced.

Although most aspects of IBM's 3090 announcement were fairly predictable, the 1987 availability of the Model 400 was a surprise, Gens noted. He speculated that Honeywell and Burroughs, like Hitachi Ltd., which had announced its version of the 3090s two weeks earlier [CW, March 18], accurately anticipated the performance IBM's Sierra line would offer but geared their development efforts to coincide with an expected late 1985 availability of the Model 400. Now all three firms appear to be hoping to cash in on the long wait for the Model 400, he said.

IBM delay for financial reasons

Gens noted that IBM appears to have delayed delivery of the Model 400 for purely financial purposes — namely, to sell more 3080 series processors — as opposed to technical difficulties.

A notable difference between the Burroughs and Honeywell announcements is that Burroughs has developed and will manufacture the A 15 CPUs, as well as disk drives through its Memorex Corp. subsidiary, whereas Honeywell plans to integrate Japan-based NEC Corp.'s S-1000 CPU with IBM's 3380 disk drives to form the DPS 90.

A Honeywell spokeswoman emphasized that although Honeywell has designed its system around the S-1000, the two systems are not interchangeable. The DPS 90 contains modifications that make the device compatible with Honeywell's Gcos 8 systems software environment. Likewise, whereas Honeywell buys 3380s from IBM and tape drives from Storage Technology Corp., the subsystems formed from the peripherals are tailored to the Honeywell environment.

With the Burroughs and Honeywell announcements, three of the five Bunch companies have announced systems that compete with IBM's high-end processors (Control Data Corp. enhanced its Cyber 180 line before IBM unveiled the 3090). NCR Corp. and Sperry Corp. have yet to respond with products to IBM's announcement.

Gens noted that NCR, which has traditionally appealed to a lower level user, may not immediately unveil a 3090-class processor. Thus, the spotlight now will be on Sperry.

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Private-line rate changes to pose challenge for users

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — Barring any further changes, private-line users face an uphill climb understanding and converting to AT&T Communications' revised private-line rates, slated to go into effect April 6.

The rate changes will have the greatest "adverse" impact on multipoint private-line customers, according to William Fanslow, an AT&T account manager who made his remarks in the first video teleconference held by the International Communications Association (ICA), a telecommunications managers' group. Multipoint lines are being hit so hard because the per-station installation fee for voice-grade, private-line service is scheduled to skyrocket from $78 to $374, Fanslow said. Other increases will be reflected in the new tariff structure, which breaks down private-line rates into interexchange and local components. In aggregate, the totals of the rate components are more than current costs for end-to-end, private-line service, Fanslow said.

The interexchange rates reflect the higher special-access rates the former Bell operating companies are charging AT&T to terminate private-line facilities. Previously, AT&T Communications' private-line tariffs bundled the local-exchange portion of the transmission together with the interexchange charges.

Fanslow said that the three categories of service — total, coordinated and baseline — will each have advantages and disadvantages.

- Total service will put complete end-to-end responsibility into the hands of AT&T Communications.
- Coordinated service will mean the customer gets two bills — one from AT&T and one from the local-exchange carrier for access. AT&T will act as an agent of the customer in procuring the local loops.
- Baseline service leaves the service configurations and local-exchange access up to the customer. AT&T will not guarantee end-to-end service as it will in other categories.

Planning by telecommunications managers will become especially important since the different private-line access options will range in cost from $45 to $115 per month, depending on type of service and distance, Fanslow predicted.

On the other hand, Lee Selwyn, president of Economic Technologies, Inc., sees the "unbundling of local access as providing lower cost opportunities for the customer."

Under the new tariff structure, rates for local-access facilities will be distance-sensitive like AT&T Communications' traditional interexchange services. Other private-line options requested by the customer to be performed by the carrier — such as common control switching arrangements, bridging, multiplexing, customer-controlled reconfigurations and teleconferencing arrangements — will also trigger separate charges.

Users will still be able to receive other private-line service features like signaling, conditioning, echo suppression and analog-to-digital conversion at additional cost.

ICA counsel Brian Moir told the video teleconference audience that ICA is encouraging the Federal Communications Commission to structure the tariffs so that local third-party suppliers other than AT&T and the former Bell operating companies can provide connection services between customers and AT&T central offices. These suppliers would have the advantage of offering nontariffed services.

AT&T will accommodate these third-party suppliers, Fanslow said, but presently cannot process their requests for service hookups. He said AT&T Communications does not plan to accommodate CATV companies as carriers. Another impact on users is a projected increase, up to an additional $11 a month, in the current $25 per month surcharge on private branch exchange stations serving private-line configurations, Fanslow said.

Software tax issue raised

Prompted by lawsuits, officials examine ruling

By Maura McEnaney
CW Staff

OLYMPIA, Wash. — Officials for the state of Washington's Department of Revenue here are examining its 1982 ruling that exempted software licenses from state sales taxes.

The examination was prompted by several suits brought against the Revenue Department by companies seeking to recoup approximately $1 million in back taxes paid on software licenses during a four-year period. The state has agreed to grant the refunds, following an audit by the department.

According to Washington attorney Sam Saracino, the Revenue Department exempted software licenses from the sales tax in response to a request from IBM. The ruling said that although off-the-shelf software was tangible property and subject to the state's 7.9% sales tax, software employing "nonexclusive license-to-use" arrangements did not constitute retail sales and was not subject to a sales tax.

As a result of the ruling, Seattle-First National Bank filed suit against the state, seeking $750,000 in taxes it claims to have paid on software agreements. Saracino represents Seattle-First in the case.

Boeing Computer Services Co. in Richland, Wash. and Rainier National Bank in Seattle have also filed suit against the state. The suits are subject to the state's four-year statute of limitations.

State officials have examined the licensing arrangements at Rainier, but the bank has received no refund, according to Murray Aston, vice-president and corporate tax manager. Rainier is seeking approximately $70,000 in back taxes paid on software licenses.

Although few companies have filed suit against the state, "The potential revenue loss is significant," Johnson said. "It's a multimillion dollar matter." The Revenue Department ruling not only changed the software licensing agreements but also the way that software companies in the state are taxed.

Currently, the state's gross-receipts tax consists of two rate structures: Retailers and wholesalers are charged approximately 0.5%, and service organizations, such as banks, pay a 1.5% gross-receipts tax. By ruling that customized software is not subject to retail sales tax, the Revenue Department classified software companies in Washington as service businesses, subjecting them to three times the tax payments.

The Revenue Department's findings on the software tax policy are expected to be released in approximately one month, according to Lee Johnson, state assistant attorney general.

Meanwhile, the tax ruling continues to hold widespread implications for Washington businesses, Saracino said. Companies that paid 7% tax on a $100,000 annual software license could recoup approximately $25,000 paid over a four-year period, he said. However, when he explained the implications to the Washington Bankers Association, "A lot of people just weren't interested in pursuing it," he said.

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Compaq unit integrates micro with communications

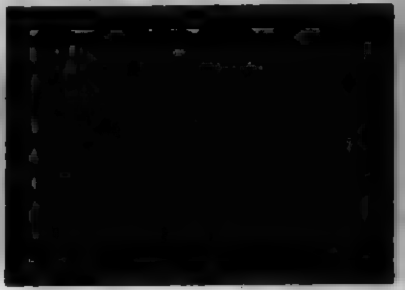
By Eric Bender
CW Staff

NEW YORK — Compaq Telecommunications Corp. of Dallas, a subsidiary of Compaq Computer Corp. of Houston, last week rolled out a workstation that integrates personal computing and communications tasks.

The Telecompaq reportedly targets managers in medium- to large-size corporations who are not presently computer users and combines an IBM Personal Computer-compatible micro with a host of voice/data communications functions.

The Telecompaq allows users to switch between functions by pressing a single button, the company said. With two telephone lines or future links to digital private branch exchanges [PBX], the Telecompaq handles simultaneous voice and data communications. Users can reportedly suspend a personal computing task to make or receive a call and then resume the personal computing task where they left off.

Six models were introduced, offering a range of random-access memory (RAM) and disk storage options. Top-end models feature 640K bytes of RAM and a 10M-byte hard disk drive.



The Telecompaq is built around an Intel Corp. 8086 processor with 384K bytes of RAM for personal computing and personal productivity work and a Zilog, Inc. Z80A communications processor with 64K bytes of RAM. The dual-speed Intel processor runs at 4.77 MHz and 7.14 MHz.

Other features include an integral 9-in. green text-graphics monitor, an internal Hayes Microcomputer Products, Inc. 300 bit/sec or 1,200 bit/sec modem, two IBM-compatible expansion slots, an RS-232C port, a parallel port, a battery-powered data/clock system, two 360K-byte diskette drives for personal computer applications, a third 360K-byte diskette drive for personal productivity use, an IBM-style keyboard enhanced with function keys and Microsoft Corp.'s MS-DOS 2.11 operating system.

For voice communications, the Telecompaq offers a separate telephone unit with speakerphone and handset and a telephone function panel next to the computer screen.

Built-in support software reportedly provides 80 user-programmable telephone functions; TTY and ADM3A terminal emulation; an electronic phone directory with search capabilities, attachment of notes and addresses and autodialing; a data communications directory for automatic connection, modem setup and dialing, file transfer and capture to and from disk; automatic logon and logoff abilities; and electronic mail.

The bundled productivity software permits users to switch between computing and communications tasks and also gives calendar, electronic notepad and calculator applications. Dedicating a third drive to these tasks permits managers to create their own portable data bases on diskette, Compaq Computer President Rod Canion pointed out.

Compaq does not presently plan to offer an upgrade kit for its current personal computer customers.

Three versions that connect to two standard analog telephone lines are scheduled for June shipment, while three other systems that interface to six standard analog keyset lines will be delivered in August, Compaq said.

The Telecompaq is priced from about $4,195 to $6,395, depending on configuration, the vendor said.

Compaq announced a joint marketing and research and development agreement with Mitel, Inc. of Boca Raton, Fla., under which Mitel will remarket the Telecompaq as a peripheral to its SX-2000 digital switch under the name of Superstation by late summer. The two companies also will work together on a proprietary interface to the SX-2000 integrating the Superset 4 electronic telephone with the Superstation.

In addition, Compaq has signed PBX interface licensing agreements with Northern Telecom, Inc. and AT&T Information Systems, according to C. Murray Francois, president of Compaq Telecommunications.

Compaq Telecommunications is headquartered at 15182 Marsh Lane, Dallas, Texas 75244.

Syracuse, DEC agree to create university net

SYRACUSE, N.Y. — Syracuse University (SU) and Digital Equipment Corp. have signed an agreement to create a computer network that will link the university's 14 schools and colleges and a number of residence halls.

The network will connect computer-aided design laboratories and computers for general-purpose processing, along with clusters of graphics computers. It will also extend to four dormitory sectors of the SU campus and will allow residents access to the systems.

As part of the agreement, SU will acquire $15 million worth of computing and networking resources from DEC.

The purchase includes a cluster of VAX 8600s, DEC's recently announced top-of-the-line superminicomputers.

A DEC spokesman estimated that four to five years will be required to complete the network.

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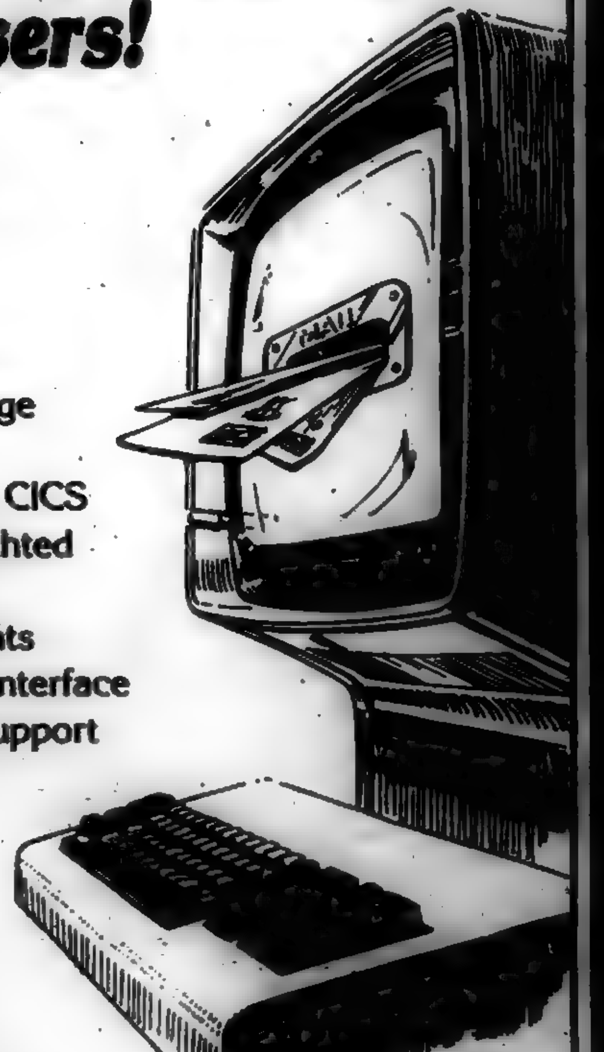

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Analysts laud Unix PC interface, decry lack of tools

By Edward Warner
CW Staff

Computer industry observers who have worked with the AT&T Unix PC said the machine's stellar feature is the icon-based interface that it relies on to make the Unix operating system easy to use.

That interface, analyst George Colony noted, while not technically a shell, "is definitely easier to use than MS-DOS" and will be the major reason why "you're going to see a lot of onesies and twosies [of the unit] in [Fortune 1,000-size] companies."

Colony, president of Forrester Research, Inc., in Cambridge, Mass., said he has used the Unix PC for two weeks, and his biggest criticism is its lack of "a set of applications like the MS-DOS library."

Russell Gee, vice-president of Access Technology, Inc., a Natick, Mass., software vendor, said it is too early to tell whether the Unix PC is the "breakaway box" for Unix that the IBM Personal Computer was for DOS but praised the machine as "a serious and well-thought-out next step." Gee, whose firm will soon offer a Unix version of its 20/20 spreadsheet for the machine, said the success of the Unix PC will be determined by third-party software houses that write programs for it.

Concurring with this perspective was Jim Sullivan, senior analyst at Yates Ventures, Inc., a Palo Alto, Calif., market research firm specializing in Unix. Though he said he expects Unix to be received very well by the corporate personal computer market, Sullivan added, "We need to see how well the software industry is going to align itself with the machine and the Unix marketplace."

Benefits needed to justify conversion

The lack of Unix applications software, meanwhile, will prevent at least one corporate microcomputer manager from urging his firm to switch to Unix. The "benefits [of Unix] must be more significant than [those of] MS-DOS to justify going through the agony of conversion [to it]," said Gene Maiman, project manager for microcomputers at Columbia Pictures Industries, Inc. in New York.

The switch from MS-DOS to Unix as the operating system of choice is a virtual certainty, however, according to Lou Dasaro, technical analyst for Complete Technology Corp., an Elmhurst, Ill., firm that provides contracted corporate microcomputer support services. Dasaro predicted that "MS-DOS is going to run as a Unix application, and that's the way thing's are going to go."

Competition for the Unix PC, according to analyst Sullivan, will come from several supermicrocomputers — in particular, the Altos Computer Systems, Inc. Model 586, the Convergent Technologies, Inc. Miniframe and the NCR Corp. Tower — as well as the IBM Personal Computer AT.

Colony, meanwhile, predicted that potential users' unfamiliarity with Unix will limit the new machine's sales largely to engineers and scientists, a group already possessing some Unix experience. Although AT&T has priced the machine at the low end "as a loss leader," Colony said, he did not expect the former telecommunications giant to be able to sell more than 40,000 Unix PCs in the next 12 months.

The fear among software developers that IBM will come to dominate the market for software for its own machine is what software vendor Gee acknowledged as an incentive for developers to write for Unix. "The whole market is scared of IBM becoming the field marshal," he said.

AT&T from page 1

The Unix PC supports up to nine casual users and up to four users in tasks with heavy processing requirements such as word processing, Edwards said.

Telephone features, available by plugging in a standard handset, reportedly include simultaneous voice and data communications, dialing services, a host of call management features and an optional electronic mail capability. An internal 300/1,200 bit/sec modem is standard.

A basic Unix PC, priced with operating system at $5,590 and shipping now, includes the CPU with 512K bytes of random-access memory (RAM), expandable to 2M bytes; a 512K-byte diskette drive; a 10M-byte hard disk drive; three expansion slots; a mouse; a keyboard; a 12-in. monochrome monitor with 720- by 348-pixel resolution; a parallel port; an RS-232C port; and a clock calendar.

> *'There is very little "value-added" that even AT&T can bring to the marketplace if we do it box by box'*
>
> —James Edwards
> AT&T Information Systems

AT&T announced 28 software packages for the Unix PC, half of which are programming and development tools, and hopes to double that number by midyear, Edwards said.

Upgrades to the 6300 will permit that machine to compete head-to-head with the IBM Personal Computer AT, Edwards said.

Among them, the AT&T Communications Manager expansion card includes a 300/1,200 bit/sec modem and supports simultaneous voice and data transmissions, one-button dialing, context switching between communications and personal computing applications and emulation of AT&T 4410 and Digital Equipment Corp. VT100 terminals. The card, priced at $599, will be available this month.

AT&T also introduced a version of the 6300 with 512K bytes of RAM and a 20M-byte hard disk drive, shipping in second-quarter 1985, which is priced at $5,620.

Xenix 3.0, The Santa Cruz Operation's adaptation of Microsoft Corp.'s Xenix, is available now for the 6300, priced at $395.

Additionally, an Intel Corp. 8087-2 numeric coprocessor will be marketed this month for $295. A $150 mouse also will be available this month.

The Starlan local-area network was described as a 1M bit/sec twisted-pair network designed to connect Microsoft's MS-DOS and Unix machines to each other and to AT&T's Information Systems Network. A typical configuration linking a Unix-based system with an MS-DOS machine would cost about $1,500.

Starlan supports both star and daisy-chain configurations. A reasonable upper limit is reached at about 200 nodes, with additional expansion capabilities under ISN, officials said.

Starlan reportedly is compatible with the IEEE's 802.3 network development effort and with Microsoft Networks software.

The net will have a phased introduction beginning in fourth-quarter 1985. Full file-sharing between machines running the two operating systems is not scheduled until first-quarter 1986.

The AT&T Personal Terminal, complete with soft-touch screen, reportedly provides managers and executives with one-touch access to voice and data information and all System 75 and 85 PBX Unified Messaging services.

The system will be offered next month for $1,795, or for $1,895 including keyboard. Optional add-on phone directory and security cartridges will be priced at $70 and $50, respectively.

AT&T Information Systems is located at 100 Southgate Pkwy., Morristown, N.J. 07960.

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Mainframe package joins Lotus tools, Cullinet software

By John Gallant
CW Staff

BOSTON — Cullinet Software, Inc. and Lotus Development Corp. targeted the corporate information center with the introduction last week of a system that combines Cullinet's Information Database (IDB), end-user-oriented mainframe tools and host data links to Lotus' 1-2-3 and Symphony.

The Information Center Management System (ICMS) is designed for IBM mainframes under IBM's standard operating systems. The software offers end users access to host data from mainframe terminals; so-called departmental machines from manufacturers including Data General Corp., Digital Equipment Corp. and Wang Laboratories, Inc.; and microcomputers running 1-2-3, Symphony, Cullinet's Goldengate integrated software and other micro packages.

A Cullinet spokesman said ICMS is based on three components. The first component was described as an IDB-like facility that provides access to mainframe data maintained in Cullinet's IDMS/R relational data base management system, IBM's Vsam, DL/1, IMS and other systems. Based on Cullinet's IDB technology, the facility allows users to access data in IDMS/R and Vsam files directly and provides a summarization of data maintained in other data bases.

The second component — the End User Computing Facility — includes both end-user data query and application development and report writing tools. The Automatic System Facility and the On-Line Query system contained in the component are both nonprocedural, menu-driven tools. The Automatic System Facility allows end users to develop ad hoc mainframe applications and reports from a terminal. On-Line Query enables users to query mainframe data using relational commands.

The spokesman said the third component of ICMS, known as Open Systems Architecture, provides for the integration of other processors, including departmental machines and micros. Cullinet has already announced interfaces linking its mainframe systems to DEC's All-In-One and DG's CEO office systems and Wang Office software.

In addition, Cullinet's Universal Link and Symphony Link packages will tie Goldengate, 1-2-3 and Symphony into ICMS. Universal Link is designed to provide users of Goldengate and 1-2-3 on the IBM Personal Computer with access to mainframe data within IDB. Symphony Link will deliver the same capabilities to Symphony users.

Both links will automatically reformat mainframe data into the appropriate formats for use within the micro software and will facilitate both data uploading to and downloading from the IDB component of ICMS.

The spokesman said that Lotus worked closely with Cullinet in the development of the link portions. Cullinet will market ICMS as a stand-alone information center offering that does not require the installation of its IDMS/R.

The mainframe portion of ICMS is currently available and costs $150,090. Both Cullinet's Universal Link and Symphony Link will be available in the fourth quarter. Universal Link will cost $300. Pricing for Symphony Link has not been set, but the spokesman said it will be approximately $300. Pricing for the departmental machine interfaces will be set by DEC, Wang and DG.

Cullinet Software is located at 400 Blue Hill Drive, Westwood, Mass. 02090.

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Justice monitoring bias in airline reservation systems

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Justice is monitoring a new form of bias in airline computerized reservation systems (CRS) and may have to seek divestiture of the highly successful systems if they are found to be monopolistic, an official told Congress recently.

The issue was explored at a recent hearing held by the U.S. Senate Subcommittee on Aviation, which is searching for remedies to the admitted bias in the reservation systems owned by United Airlines, Inc. and American Airlines, Inc., the dominant air carriers in the U.S.

The Civil Aeronautics Board (CAB), before its demise last year, issued rules prohibiting an airline-owned CRS from favoring the airline's own flight schedules in the "primary display" [CW, Aug. 6]. But at the subcommittee hearing, a Justice Department official said the airlines are providing travel agents with an automatic bypass feature that shows them a second display, which is intentionally biased in favor of the CRS owner.

'Result of loophole'

Charles F. Rule, deputy assistant attorney general for antitrust, said the airlines have taken advantage of a loophole in the CAB rules, which are now administered by the U.S. Department of Transportation. "The secondary screen phenomenon is a result of that loophole," Rule testified.

In addition to the secondary display bias, Rule said, the Justice Department is concerned about recent increases in the fees that American and United charge smaller airlines to be listed in the reservation systems. The high charges "may reflect monopoly prices," he testified.

"All options, including litigation and divestiture, are being held open," Rule said, adding that further regulation by the Department of Transportation would be preferable to divestiture.

Matthew Scocozza, the transportation department's policy chief, said that the CAB apparently believed that if travel agents had equal access to biased and unbiased displays, agents would opt for the unbiased one.

"It is now claimed that the continued availability of biased displays, coupled with mechanisms and [financial] incentives that make it less attractive to use primary displays, threaten to undercut the rules against bias," he testified.

Rule and Scocozza, however, said the government should not rush into further regulatory action but should monitor the situation for several more months and see how the CAB rule works.

But smaller airlines urged the government to take much quicker action to stop what they view as monopoly activity.

'Purpose of deregulation threatened'

Daniel May, president of Republic Airlines, Inc. of Minneapolis, testified: "In the CRS situation . . . market forces are not working, and the basic purpose of [airline] deregulation is threatened."

> *'All options, including litigation and divestiture, are being held open.'*
>
> — Charles F. Rule
> U.S. deputy assistant attorney general

He said that the remedy is to prohibit airlines from owning CRS systems. "This can be accomplished either by sale or spin-off to existing stockholders," he suggested.

Executives from United and American vigorously defended their CRS ventures, arguing that their foresight and hefty financial investments in CRS have resulted in major improvements in service for all airline customers.

They said that the competitive advantage of display bias — or "preferential sequentialization" — was the original incentive for making the investments.

Robert L. Crandall, president of American Airlines, said his firm's Sabre CRS is the largest real-time commercial data processing and communications system in the world and "one of the great success stories of the modern free enterprise world."

'An awe-inspiring achievement'

"The system is capable of processing, at its central site, in excess of 1,000 messages per second, and in data processing terms that is an awe-inspiring achievement," Crandall told the subcommittee.

If he had to sell Sabre, Crandall said, "the purchase price would be large, because it is a profitable business, and it is not a business we [would] choose to get out of."

Crandall testified that he instituted the secondary display feature only because United did, and said he would get rid of it only if his competitors did, too.

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WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

Grace Commission's proposals get GAO nod

WASHINGTON, D.C. — The General Accounting Office (GAO) recently reported that it agrees with most of the cost-cutting recommendations of the so-called Grace Commission in the area of government computer operations.

The president's Private Sector Survey on Cost Control, chaired by industrialist J. Peter Grace, reported in January 1984 that the government has not effectively managed its information systems, resulting in obsolete and inefficient DP operations.

The GAO, in a report to the U.S. Congress, agreed with the Grace Commission about the need for improved management, leadership and technical support for government DP operations. For example, the GAO supported the consolidation of duplicate payroll systems and improvements in the procurement process.

GAO tells agencies to cut leasing costs

WASHINGTON, D.C. — U.S. government agencies, which spend about $1.1 billion a year to lease computer hardware, could reduce costs on existing leases by refinancing the leases or buying the installed equipment, the General Accounting Office (GAO) reported.

A recent GAO report said the auditors had studied leases covering 240 hardware items and found that leasing alternatives would have produced savings of 25% to 70%.

The leasing alternatives, the GAO said, include the following:

■ Purchasing hardware that an agency plans to keep for a long time.

■ Refinancing a straight lease to reduce leasing costs, by means as a sell/lease back transaction, or replacing hardware with identical equipment leased from the used computer market.

■ Exercising contractual options to change from a lease to an installment purchase.

■ Replacing leased equipment with government-owned equipment no longer needed by another agency.

"DP managers at the civilian and defense installations GAO visited had not identified or pursued the various refinancing alternatives open to them," the GAO reported.

The GAO urged the heads of federal agencies to require DP managers to conduct a cost-effectiveness analysis of all existing leases and develop a plan to employ the refinancing options described in the report.

Congressman skeptical of FBI data base plan

WASHINGTON, D.C. — Rep. Don Edwards (D-Calif.) recently expressed strong reservations about a Federal Bureau of Investigation plan to expand its national crime data base to include an intelligence file of reports about suspects in white-collar crimes.

The FBI plans to expand the National Crime Information Center to allow federal, state and local law enforcement agencies to enter information about persons being investigated for serious white-collar crimes. Information in the proposed Economic Crime Index could include unverified reports and police speculation about persons who have not been charged with a crime.

Edwards, who is chairman of the U.S. House Subcommittee on Civil and Constitutional Rights, recently wrote to the U.S. Department of Justice expressing concern that the expanded data base would include investigational data that is not in public records. He said it may be inaccurate and would be widely available to law enforcement officers around the country. The FBI data base plan was also questioned by the American Civil Liberties Union.

"Certainly, we must fight crime at all levels in our society," Edwards wrote. "But we also have an obligation to preserve our fundamental constitutional liberties, including the right to privacy and the presumption of innocence."

Optometrists write prescription for VDT eyestrain

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Concerned about VDT workers' frequent complaints of eyestrain, leading optometrists urged office managers to reduce sharply office lighting levels in an effort to cut glare. They also suggested that managers encourage rest breaks and job variety and purchase VDTs with stable, legible screen characters.

The recommendations were made at the American Optometric Association's Symposium on Vision in the High-Tech Society, held here recently. One presentation, by Hicksville, N.Y., optometrist Lowell Glatt, recommended the use of lightly tinted polarizing glasses that, he said, reduce glare and improve eye comfort for VDT workers.

The optometrists said VDT workers should receive regular eye examinations because VDT work can aggravate existing vision problems, even minor ones that do not affect such tasks as reading or driving, and because people who wear glasses or contact lenses may need a special prescription for focusing on the intermediate distance of the VDT screen.

Bifocals require trifocals

Glatt said that bifocal wearers, who must tilt their heads back to focus on the VDT, should use wideband trifocal lenses for VDT work, with the middle band of the lens focused on the VDT screen.

He also urged corporate managers to hire VDT workers based on their visual abilities. "If you needed a typist who could type at 100 words per minute, you wouldn't hire someone who could type at 50 words [per minute]," he observed, "so why should you hire someone who doesn't have the visual skills to do the job?"

Vincent King of the Ferris State College of Optometry in Big Rapids, Mich., said dozens of private and government VDT studies have shown that people who work on VDTs for hours on end are the ones most likely to suffer eyestrain.

He recommended rest breaks and redesign of the job so that workers can use their eyes in different ways throughout the day. "It is the continual focusing on one task that puts stress on the eyes," he said.

Glare biggest gripe

The top-ranked complaint among VDT workers is lighting glare from windows and overhead lighting, King said. On that subject, Donald Pitts of the University of Houston College of Optometry, made several recommendations for office managers:

- Cover windows with blinds, awnings, curtains or reflective film.
- Use indirect lighting, install diffusers over fluorescent lights and use dimmer switches.
- Cover walls with low-reflectance materials in neutral tones.
- Use antiglare filters for the VDT screens as a last resort.

Pitts said most modern offices have three times more lighting than is appropriate for VDT work, and he strongly recommended ambient luminance of about 35-ft candles for VDT work.

Jitter and flicker

VDT purchasers should also specify terminals that reduce the jitter and flicker of on-screen characters, he said. Jitter is caused by an insufficient video reflection voltage, which makes the electron beam inaccurate when refreshing the character, Pitts said.

Flicker, he said, is caused by a fast decay of the phosphor and a slow refresh rate. "Accept nothing below 65Hz [frequency]. A lot of VDTs are 45Hz, 50Hz, [or] 55Hz, which is not a fast enough refresh rate," Pitts said.

On the controversial subject of screen color, Pitts asserted that displays with black characters on white screens provide the most legibility, visual comfort and work efficiency.

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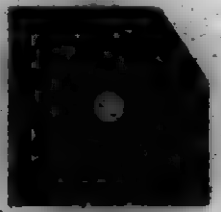
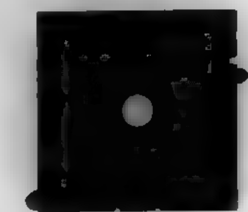
Aunt Molly's jam

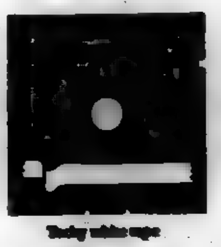

Dog-eared jacket

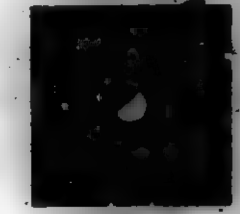
Regular coffee, two lumps

[illegible]

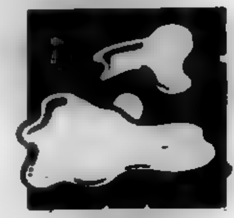

Hot dog mustard

Dust (cough-cough)


Tacky white tape


Boss's cigar ashes

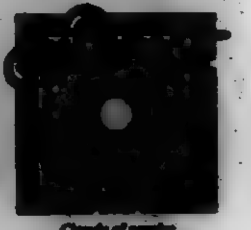
Dry martini, one olive

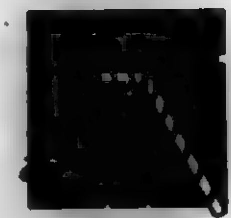

Spilled milk

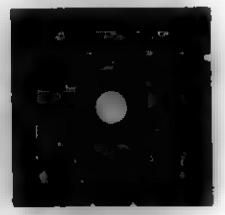
Potted plant—no pot

The big chill

Lunchcounter ketchup


Clouds of smoke

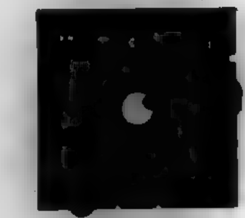

Fizzy orange soda


Waterbased ink spots

Sunny side up

English breakfast tea

[illegible]


Chocolate fingerprints

Sudsy soap bubbles

One scoop of ice cream

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Florida bill proposes electronic access into agencies

Residents may be allowed to tap into state records

By [illegible]
CW Staff

TALLAHASSEE, Fla. — Any Florida government agency that wants to give residents remote access to computerized records can do so if a bill pending in the legislature here passes.

The bill, introduced in the 1985 session, seeks to permit, but does not mandate, all local, county and state agencies to give remote access to their electronic records to any Florida citizen with a computer, said the director of a committee studying the issue.

Edwin Levine, staff director of the Florida Joint Committee on Information-Technology Resources, said the plan is not one of individual citizens dialing up to extract little bits of information. The system he foresees is one in which high-volume users of information — such as real estate professionals and large law firms — will have a direct line to the host computer on which the records are being maintained.

Levine's committee was set up three years ago to address planning for and implementation of computers in Florida government agencies, said Sen. George Stuart (D-Orlando). Last year, the committee addressed computer security issues, and this year remote access is the primary issue, he said.

If the bill passes, access to government records will continue to be free for people who come in to an agency and ask for the records, staff director Levine said. The proposed computer-access legislation calls for remote-access users, however, to pay direct and indirect costs to the agency from which they acquire information, so that the governments in Florida will not be in competition with private businesses that currently offer government information in a profit-making capacity.

The service would improve the quality of the state's computer systems, Stuart said, because needed equipment could be bought at the expense of the users and not at the expense of the taxpayers.

However, fees collected for this remote-access service would not revert automatically to the agency that generates the service, said Randy Esser, chief of the Bureau of Information Services for the Department of Highway Safety and Motor Vehicles.

All the money collected would go into general revenue, and there would be no change in the process of applying for more equipment, he said.

Common date set for spring meet

LOUISVILLE, Ky. — The IBM users group, Common, which claims to have members representing more than 3,000 IBM installations worldwide, will hold its Spring '85 Conference at the Galt House hotel here from April 27 to May 1.

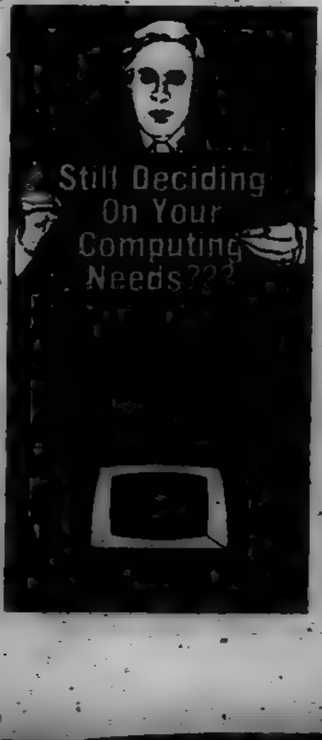
Common's membership includes users of the IBM System/34, System/36 and System/38, Series/1, 4300 series and Displaywriter as well as the IBM Personal Computer, according to the users group.

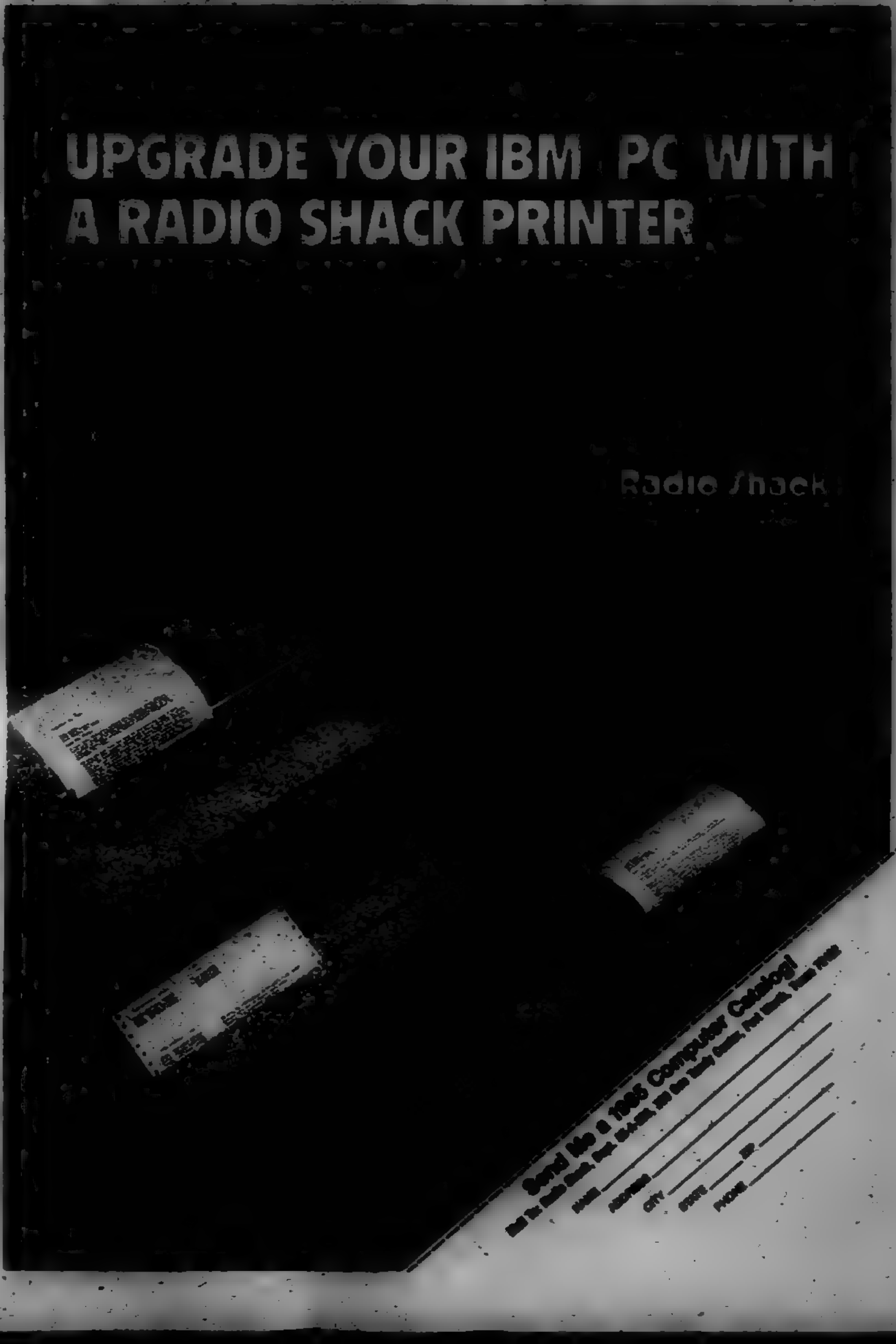
During the conference, more than 260 presentations are scheduled on management and applications topics. The faculty of Northwestern University will present special management sessions that will be eligible for Continuing Education Unit credits.

The registration fee for members is $130 in advance and $165 at the conference.

For those who are not members of Common, the fee is $200 in advance and $225 at the conference.

Further information on the IBM users conference is available from Spring '85 Conference, Common, which is headquartered at Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.

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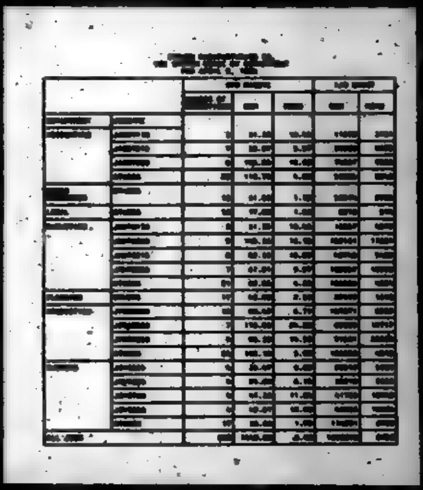

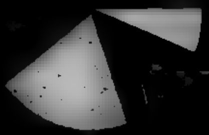

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Arizona county to cut ties with DP services contractor

By Jeffry Beeler
CW West Coast Bureau

PHOENIX — Government officials in surrounding Maricopa County, Ariz., have voted to sever all ties with the independent DP services contractor that was overseeing the county's computing operations for nearly three years.

When the break with Systems and Computer Technology Corp. (SCT) is complete, the county will reportedly revert to its former practice of maintaining its own captive information systems organization.

But to ensure a smooth transition from third-party management to in-house management, the county's disengagement from SCT is expected to be leisurely, according to Bill Haselwood, the company's executive director.

Internal processing

For years, Maricopa County performed all its information processing activities internally. But in the early 1980s, the county's longtime computing services director unexpectedly resigned to accept a position in private industry.

When a subsequent personnel search failed to produce a qualified successor, members of the county's Board of Supervisors entered into a contract with SCT, a computing services firm based in Malvern, Pa.

Roughly three years later, a reconstituted board reversed the earlier decision and voted for SCT's eventual expulsion.

If the phaseout process goes according to schedule, the county's business relationship with its outside services contractor will end in June 1986, according to Haselwood.

Divorce process slow

Both sides stress the need for pursuing the divorce slowly.

"You can't turn control of the computer services department back to the county all in one day, because the organization's management structure is now SCT's," Haselwood said.

The demise of the county's DP services arrangement comes as little surprise to SCT. Each party originally intended the agreement to be temporary, and each expected SCT eventually to turn over the reins of the county's information systems department back to their owner, according to Haselwood.

In fact, he added, the two sides insisted on including a "phase-back" provision as part of their original contract.

But the timetable under which the county would regain full control over its MIS destiny was deliberately left indefinite, Haselwood said.

Now, in the wake of the Board of Supervisors' recent vote, the expiration date for the county's service contract is no longer open-ended, Haselwood said.

'County at SCT's mercy'

What prompted the board to impose a firm cutoff date was a mounting suspicion that the arrangement "was placing the county at SCT's mercy," according to Dick Bryce, the governing body's executive assistant.

Ever since the contract took effect in May 1982, all the county's information systems employees have been on SCT's payroll.

In theory, therefore, the independent DP services company "could have shut down the county's entire computer operations," Bryce said.

Although the likelihood of such a closing was considered extremely slim, "the board members still wanted to exercise more direct, day-to-day control" over Maricopa County's MIS organization, Bryce said.

Aside from their concerns about control, the board members found little to criticise in SCT's performance.

In fact, in a recent audit by a Big Eight accounting firm, the services vendor won high marks for its management of the county's systems operations, he said.

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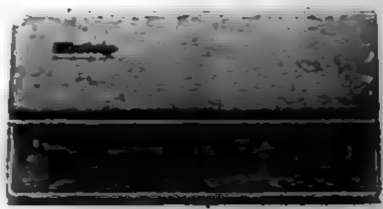

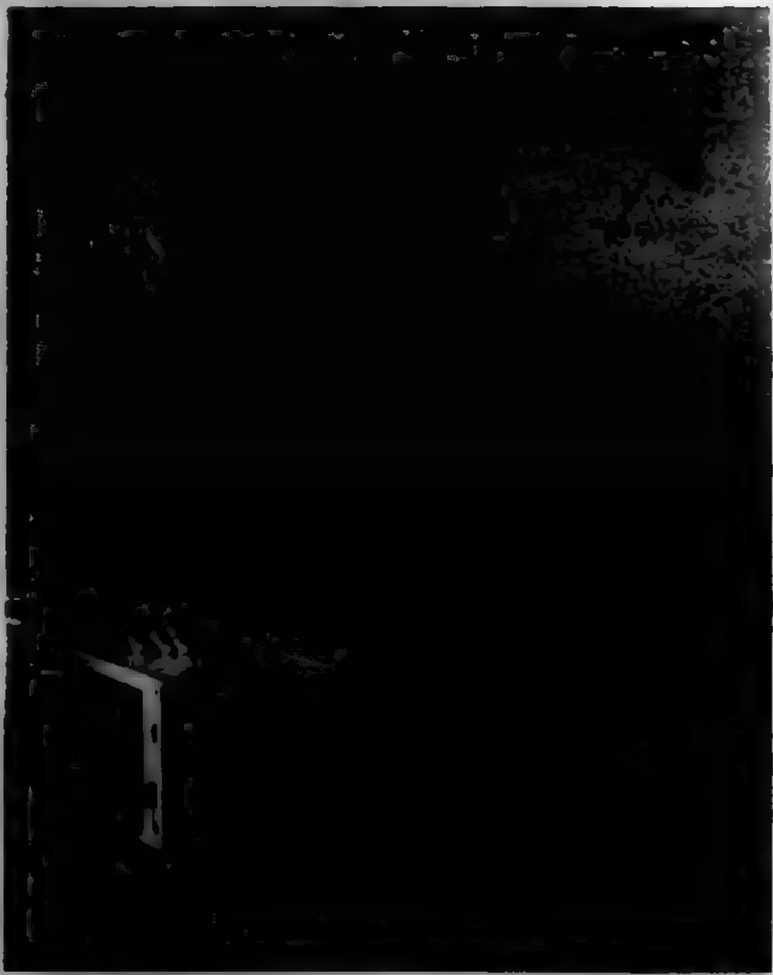

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SOFTWARE INTERNATIONAL

Software Thinking That's Impossible To Ignore

Package aids county's hunt for rape suspect

By Paul Korzeniowski
CW Staff

MIAMI — Investigators here have turned to a software package for aid in apprehending a man who may have raped as many as 40 women in the last 2¼ years.

The package, IBM's Storage and Information Retrieval System (Stairs), provides ad hoc storage and retrieval capabilities for a large volume of text or data.

IBM recently donated a copy of the package to the Dade County Computer Services and Information System here. "There have been a number of unsolved rape cases that may or may not be attributed to one person," Thomas L. McGovern, Dade County's MIS director, said. "Investigators are attempting to determine if there are similarities in the cases that can be traced to one person or a group of people. A package like Stairs may help to determine this." McGovern would not comment specifically on how the package may be used, fearing that publicity would jeopardize the investigation.

In 1981, city agencies in Atlanta used Stairs to aid in the search for the person responsible for the murder of approximately 25 children. Richard Silvey, systems programmer and research analyst for the city's Office of Management Systems, was a member of a special task force formed to aid the investigation. "Whenever there is a case like the child slayings, police have to work with a large amount of data," he explained. "A lot of people called the police with information and tips. The department needed a system to input data, store it in a data base and allow the officers to query the data base. Stairs provided this capability."

The package was used with the city's in-house arrest and incident tracking data base management system. For example, an investigator could have the system list all males who own red, compact automobiles. "If the system produced 7,000 records, an investigator could have entered qualifying data to produce a workable number of records," Silvey said.

Silvey was not sure if the package helped lead to the man convicted of the slayings. "I don't think that the system produced one piece of information that allowed police to say 'That's our man,' but information about him was probably provided in some police records," the analyst noted.

When the child slaying cases were closed, Atlanta city agencies stopped working with Stairs, opting to use only the city's DBMS.

When Dade County began to evaluate Stairs, its IBM sales representative suggested that Dade County consult authorities in Atlanta. "Our IBM sales representative said that Dade County might call us, but they haven't called yet," Silvey noted. "We would be willing to work with them and show them how we established our task force, explain the functions it filled and illustrate how computers aided our investigation."

Bank saves time with software

PROVIDENCE, R.I. — A host of efficiencies have reportedly accrued for Fleet Credit Corp., the asset-based lending subsidiary of Fleet National Bank of Rhode Island, since it switched to on-line commercial finance software.

Fleet experienced a reduction of between 160 and 200 hours per month, compared with what had been spent in manual accounting and calculations — an average savings of more than 40 hours per week, according to Dennis Joyal, vice-president of the firm's business credit division.

Other advantages Joyal said the firm gained were access to on-line data to troubleshoot potential problems, the potential for loan managers to look at the components of entire transactions and the capacity to produce reports instantaneously, although most are printed out at night and delivered by 8 a.m. the following day.

No disruption of procedures

Fleet moved to computerization by putting its new software, including the Commercial Finance Package from Century Data Services, Inc. (CDS), on an IBM 3083 mainframe at its parent firm's headquarters. It has since found that new business can be handled by the system without disrupting procedures or requiring additional personnel, Joyal said.

The CDS Commercial Finance Package tracks and monitors Fleet's revolving asset-based loans. It gives the institution's loan administrators daily on-line access to information on loans, yield and income, regardless of the size of the portfolio.

The software permits the bank's demand deposit accounts (DDA) to interface with Fleet's Commercial Finance Program, Joyal said. Because customers of asset-based lending institutions often have accounts with the bank, Joyal said, Fleet finds it preferable to debit and credit their DDAs instead of billing them directly, he said.

Fleet Credit loan offices in Atlanta, Dallas, Minneapolis and Newport Beach, Calif., he added, are now linked with the Commercial Finance Package on the bank's mainframe, but they can only read historical data.

Fleet's back office, Joyal noted, has also benefited from automation. Immediate posting of transaction data helps prevent overadvances, provides audit reminders and frees the staff for additional duties, he said.

When Fleet moved to computerization and adoption of the Commercial Finance Program, it decided to use the bank's IBM 3083 mainframe rather than purchase an in-department micro or minicomputer, Joyal said. The main reason, he explained, was security though standardization and economy; the potential to network terminals nationally was also important.

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Last Thursday, Cullinet introduced a new way of managing information on an IBM mainframe that made DEC, Wang and DG users very happy.

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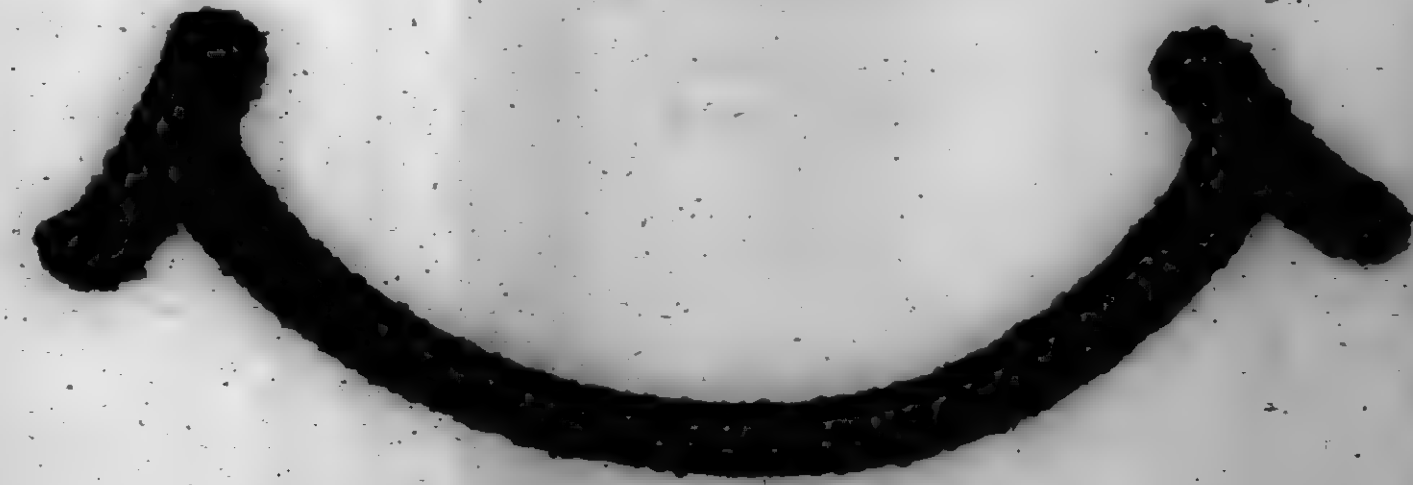
And Lotus users positively ecstatic.



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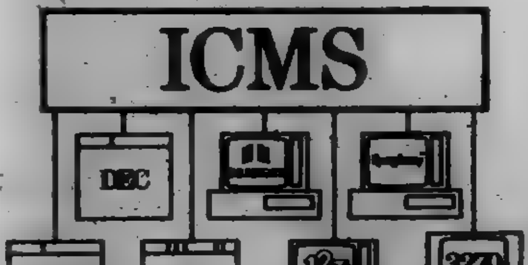

What makes ICMS so appealing to companies like DEC, Wang and DG is its *open system architecture*. A feature that finally makes intelligent communication between the mainframe and the minicomputer worlds possible. DEC, Wang and DG have all signed licensing agreements with us to develop and market ICMS links to their minicomputers.

And Lotus™? ICMS is the "link" the company that developed Lotus® 1-2-3™ and Symphony™ has been looking for. The link that gives users of their products *easy* access to mainframe information. Last Thursday, Cullinet and Lotus announced a joint development agreement.

Of course, ICMS also works beautifully with GOLDENGATE, our own integrated personal computer package. A package designed to provide an optimum working environment for each of its functions—spreadsheet, database, word processing, graphics and communications.

It's an unusual day when DEC, Wang, DG and Lotus users are all smiles about the same thing. But, then, as you can see, last Thursday was very unusual.

For more information about ICMS, phone us at 1-800-225-9930. In Massachusetts, the number is 617-329-7700.

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INTERNATIONAL REPORT
CW International
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AUSTRALIA

BRISBANE — Queensland's State Government Computer Center has ordered roughly $5 million worth of Sperry Corp. computer equipment, including the Sperry 1100/92 system and seven communications processors. The Government Computer Center needed the Sperry 1100/92 system to cope with heavy processing demands, which have been increasing at an annual rate of 30%, a spokesman said.

JAPAN

TOKYO — Toshiba Corp. and Sord Co. announced an agreement under which the two firms will cooperate on future research and development. Reportedly, Toshiba gained a 37.5% interest in Sord and has provided Sord with a new vice-president in addition to semiconductors, office automation equipment and peripherals. The companies have agreed to concentrate on micro technology and will work jointly on future development, production, sales and marketing.

SINGAPORE

SINGAPORE — Operation of this country's first national retail electronic funds transfer system is slated to begin in June. The $2.5 million pilot project is called EFT at Points-of-Sale (EFTPOS). The company coordinating the program, Network for Electronic Transfers Pty. Ltd., was formed by the five major banks that own EFTPOS. The network software is being supplied by Cap Information Systems, a spokesman said. The hardware front-end of the project consists of a three-CPU Tandem Computers, Inc. Nonstop II system, along with 50 model 9575 POS terminals from International Computers Ltd.

SWEDEN

STOCKHOLM — Swedish communications giant Ericsson AB is expected to announce two additional products: the Ericsson portable Personal Computer and an enhanced version of its Alfaskop terminal line, which is compatible with the IBM 3270 Personal Computer. The Ericsson portable is said to resemble — with the exception of its plasma screen — the latest offerings from Hewlett-Packard Co. and Data General Corp. It features a single 3½-in. microfloppy disk drive and runs under Microsoft Corp.'s MS-DOS operating system. Pricing was not available at press time.

In an unrelated announcement, Ericsson reported that 1984 corporate annual revenue was down 11% from the previous year.

■

STOCKHOLM — Four out of five top Swedish executives never use Personal computers at work, according to a report recently published here. In addition, some 51% saw no reason for executives to use personal computers on the job.

■

STOCKHOLM — The National Swedish Telecommunications Administration (NSTA) will offer computer training to its staff of approximately 44,000. The employees will reportedly be offered the opportunity to participate in workshops and will be able to take home personal computers during the training period. Employees will also be able to purchase home computers at discounted prices through the NSTA. "We want to prepare our employees for the information society and create an understanding of computerization," said Torbjörn Berlin, head of the NSTA project.

■

STOCKHOLM — Nordic Software AB has announced a software publishing and distribution agreement with U.S.-based QED Information Sciences, Inc. Nordic will translate and distribute QED's line of educational software for IBM Personal Computers and Apple Computer, Inc. Apple and Macintosh machines.

SWITZERLAND

ZUGERBERG — Computer Camp International, a San Francisco-based computer training institute, recently announced schedules for the first European computer camp to be held here. Two separate three-week sessions, designed to provide an in-depth introduction to the Apple Computer, Inc. Macintosh, will be conducted July 15-Aug. 8 and Aug. 3-24.

The program offers classes in Basic, telecommunications, choosing peripherals, expandability options and how to use common applications programs such as word processors, data bases and spreadsheets. The camp is open to boys 14-17, and classes will be conducted in English and limited in size to eight.

WEST GERMANY

STUTTGART — Hewlett-Packard GmbH here greeted its 25th year in business by posting record results. Its 1984 revenue was up 42%, and profits rose 35%, sources reported. The West German HP also hired 700 employees last year and invested approximately $60 million in R&D. For the coming year, Chairman Eberhard Knoblauch predicted a company growth rate of approximately 25%.

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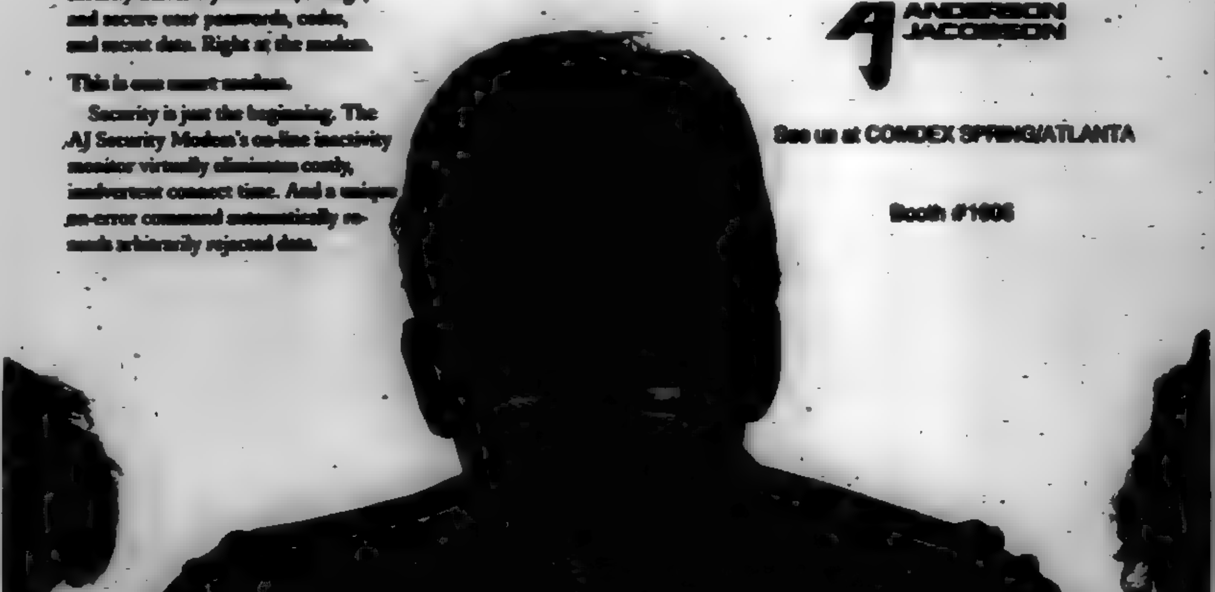

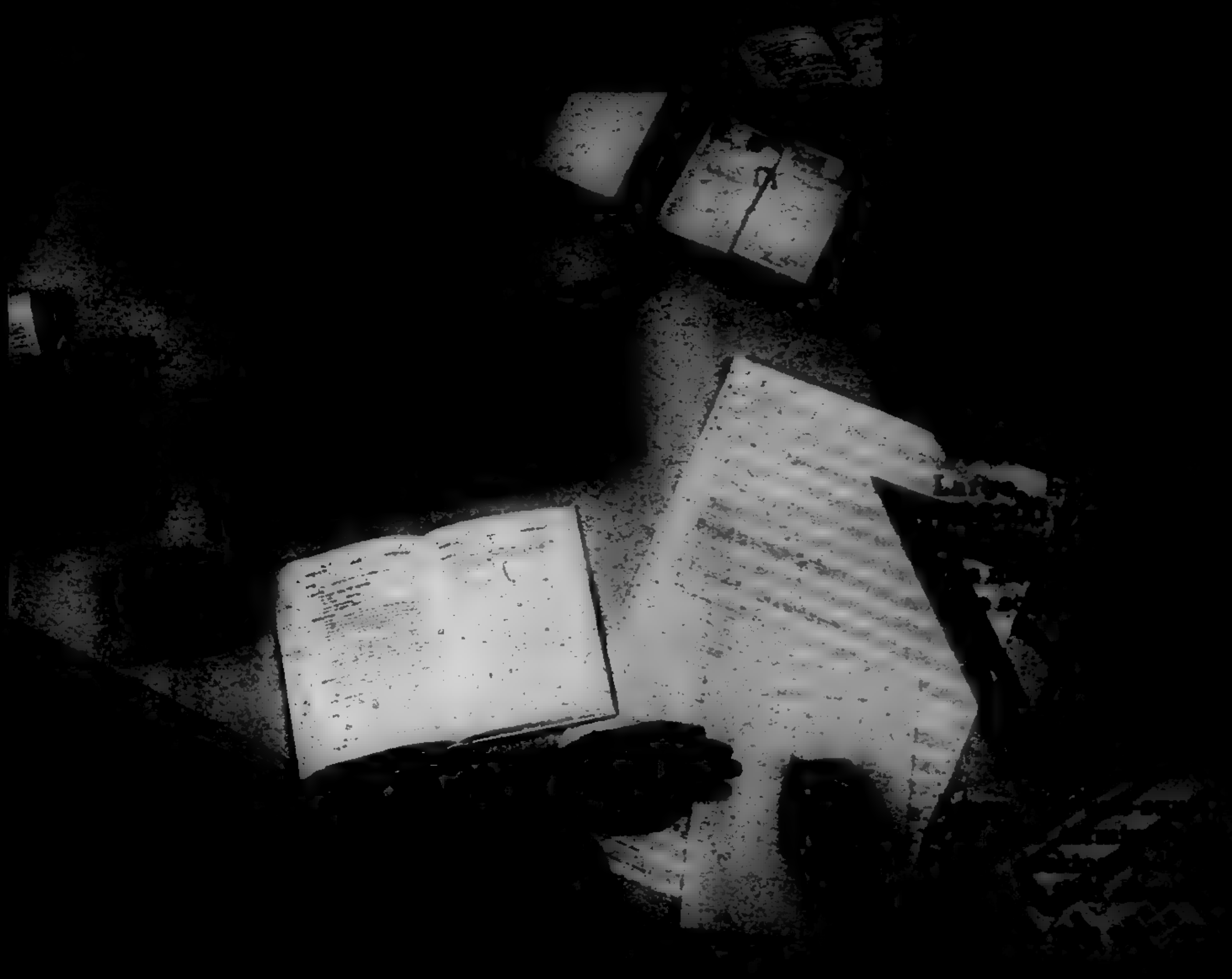

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Insurance company consults employees on terminals

MILWAUKEE — While most data processing directors base their terminal purchase decisions solely on cost, service and other factors, one of the nation's largest insurance companies considered the opinions of 100 employees before purchasing ITT Courier Terminal Systems, Inc. 1700 display terminals.

Northwestern Mutual Life Insurance Co. based here asked data entry workers from 46 of the firm's divisions to try out the low-cost, standard display terminals of two vendors — ITT Courier and IBM.

According to Jeff Dunn, associate director of information systems for Northwestern Mutual, the result of the tryout was a determining factor in the company's decision to purchase 300 ITT Courier 1700 display terminals this past year.

"One hundred data entry workers compared the ITT Courier 1700 display terminal with the IBM 3178 display terminal. Ninety-eight percent of the users preferred the 1700," Dunn said. "We, of course, considered these statistics in our purchase decision."

Northwestern Mutual purchased the ITT Courier 1700 display terminals to replace its older Incoterm Model A66-01 display terminals at corporate headquarters. The terminals connect with an IBM 3081 GX running MVS with 24M bytes of main memory.

Chuck Foulke, Northwestern Mutual systems analyst and supervisor of the tryout, said the ITT Courier 1700 and IBM 3178 were selected because both ITT Courier and IBM were installed, compatible vendors at Northwestern Mutual.

Foulke said each tryout participant received a demonstration of each terminal and was then asked to perform a general insurance application. After working with each of the terminals, each user was asked three questions:

- Which terminal did you prefer?
- Why did you prefer that terminal?
- What features would you like to see on future display terminals?

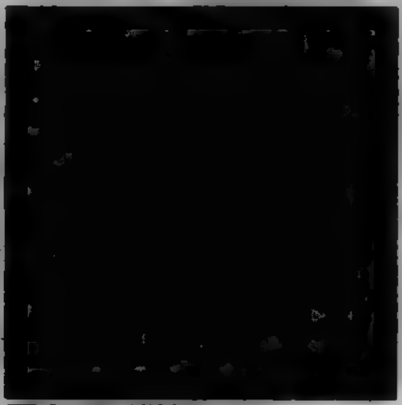
According to Foulke, the users noted ergonomic features as the major reasons for their selection of the ITT Courier 1700 over the IBM 3178.

Features of the ITT Courier 1700 that were repeatedly mentioned in the comparison included the following:

- Physical size of the terminal.
- Clarity of the characters.
- Tilt and swivel capabilities of the CRT terminal.
- Positive tactile keystrokes.
- Separate 10-key pad for numeric purposes.

Connie Piskula, tryout participant and unit head of terminal operations for Northwestern Mutual's loan department, said the compact size of the ITT Courier 1700 was important in her choice because she and other Northwestern Mutual data entry workers have small workstation areas.

"The compact terminal takes up less desk space and provides a more comfortable, efficient place to work," Piskula said.


ITT Courier 1700 keypad

According to Foulke, the separate 10-key pad was one of the most important features among the data entry workers. He said that in the tryout, data entry workers from all departments said they believed the 10-key pad was a necessity in their areas of work.

Gloria Venski, tryout participant and supervisor of Risk Appraisal South, said several keyboard features were the deciding factors in her decision to choose the ITT Courier 1700.

"I thought the additional Enter key on the 10-key pad would be a time-saving device," she said. "Another feature I liked was the detachable keyboard. It had an extendable cable that let me place the keyboard up to five feet from the terminal."

Foulke said that data entry workers indicated a desire for more ergonomic features on future display terminals. "The most common response was for features that would reduce eyestrain and fatigue, such as a choice of color and varying character sizes," he added.

"We have some data entry workers that are on the terminals all day long. It's important for management to consider their needs when purchasing new terminals," Venski said. "The fact that management let us be a part of the purchase decision meant a lot to everyone."

"Surveying the actual users was unique for our company," Foulke said. "We received very positive feedback from both supervisors and users."

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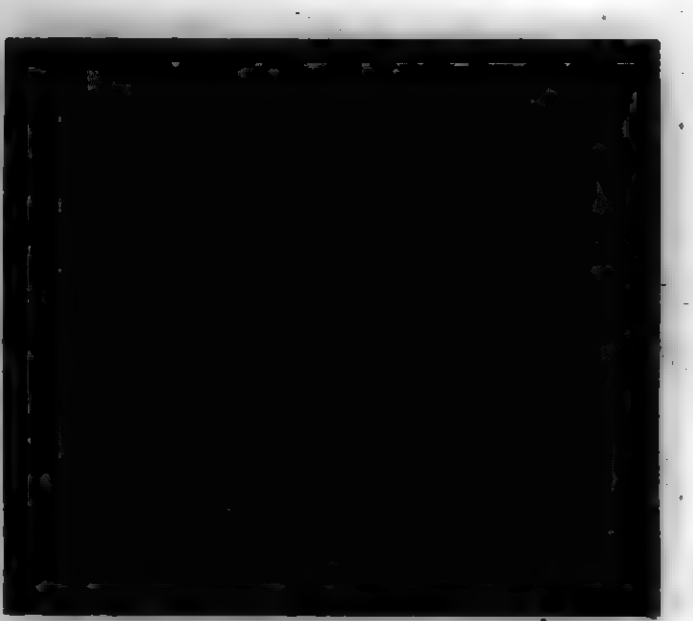

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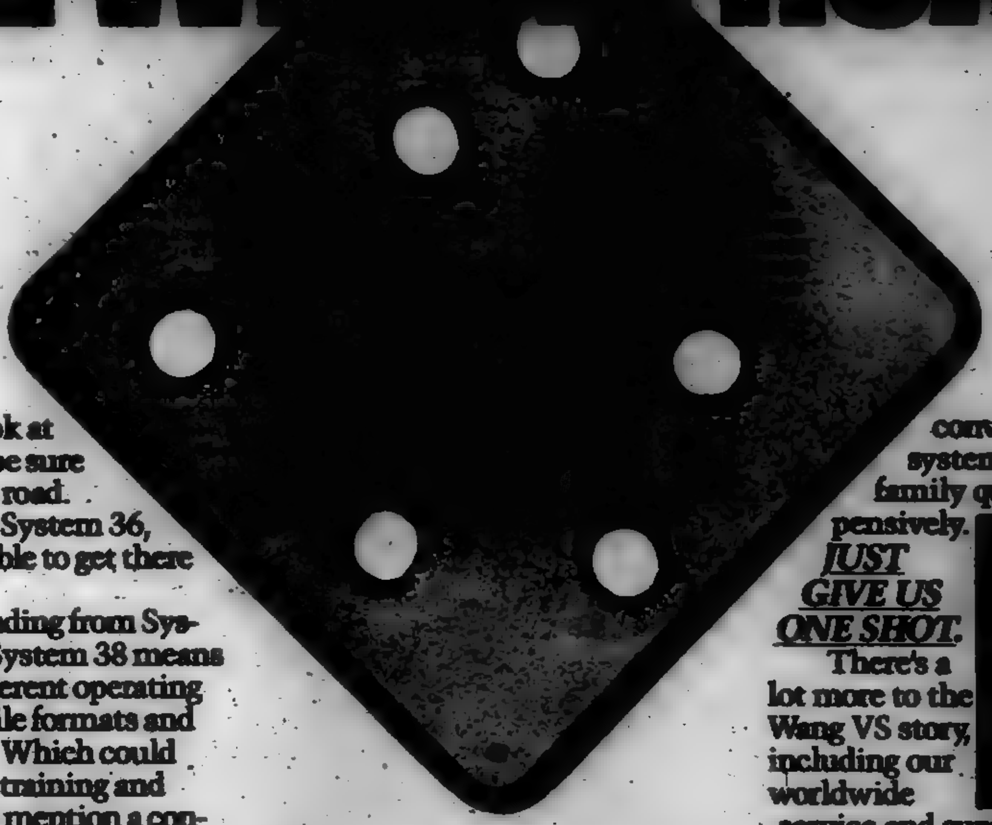
IS YOUR IBM OFFICE SYSTEM TAKING YOU DOWN THE WRONG ROAD?



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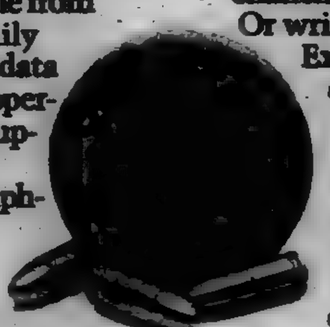

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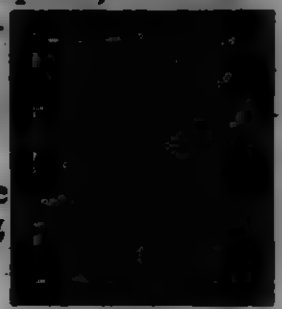

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WANG

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Boot maker's system sends waste walking

Acme Boot production facility

CLARKSVILLE, Tenn. — With the help of a manufacturing resource planning system, the world's largest bootmaking company is striding confidently toward improved manufacturing operations and lower costs.

With manufacturing operations at eight plants in Tennessee, Texas and Massachusetts, Acme Boot Co. crafts more than four million pairs of boots each year. The boots are marketed under a variety of brand names, including Acme, Dingo, Dan Post and Lucchese.

Acme maintains a data processing center for its manufacturing operations at its headquarters here, with an Amdahl Corp. 470V/5-II mainframe running IBM's OS/VS1 and VM/CMS under IBM's CICS. The data center also uses Cincom Systems, Inc.'s Total data base management system. Workstations in the remote manufacturing facilities are tied into the Amdahl mainframe via communications lines.

Acme offers more than 4,000 styles of boots with a host of different sizes and individual variations, and management must control a variety of materials in inventory. Each of Acme's manufacturing plants employs approximately 250 workers on a piecework incentive basis.

With the far-flung and diverse nature of Acme's manufacturing operations, the company encountered some nagging problems such as poor inventory turns, inaccurate inventory planning, increasing paperwork, higher-than-desired labor costs and inadequate tracking of work in progress. In an effort to counter these, Acme decided to implement Cincom's Manufacturing Resource Planning System (MRPS).

Cincom's MRPS is a closed-loop production and inventory control system that incorporates seven functional modules:

- Inventory control.
- Bill of materials.
- Master production scheduling.
- Material requirements planning.
- Cost management.
- Shop floor control.
- Purchasing.

According to Larry Miller, director of manufacturing systems at Acme, prior to the implementation of MRPS, Acme workers used manually produced work tickets to indicate the completion of various steps in the boot-making process.

Today, Acme's workers use computer-generated work tickets that are more accurate and easier to read, Miller said.

"The work tickets provide the data that the payroll department needs to determine compensation for each worker," Miller said. "The migration to automated paperwork is definitely having a positive effect on Acme's direct labor costs.

What Miller labeled as indirect labor savings are also being realized with MRPS. At Acme, boots are manufactured in 12-pair cases and, at various points in the manufacturing process, a pair may be pulled from the case for defects or for reworking.

"In the past, when a defect — or 'back shoe' — was identified, it still was common for our inventory to maintain the original 12 pairs, even though there were now only 11 pairs," Miller said.

Miller said the ability to track pairs of boots accurately throughout the manufacturing process has substantially reduced the indirect labor costs involved in reworking back shoes.

According to Purchasing Manager Robert Bryant, annual inventory turn rates have improved since the company implemented MRPS.

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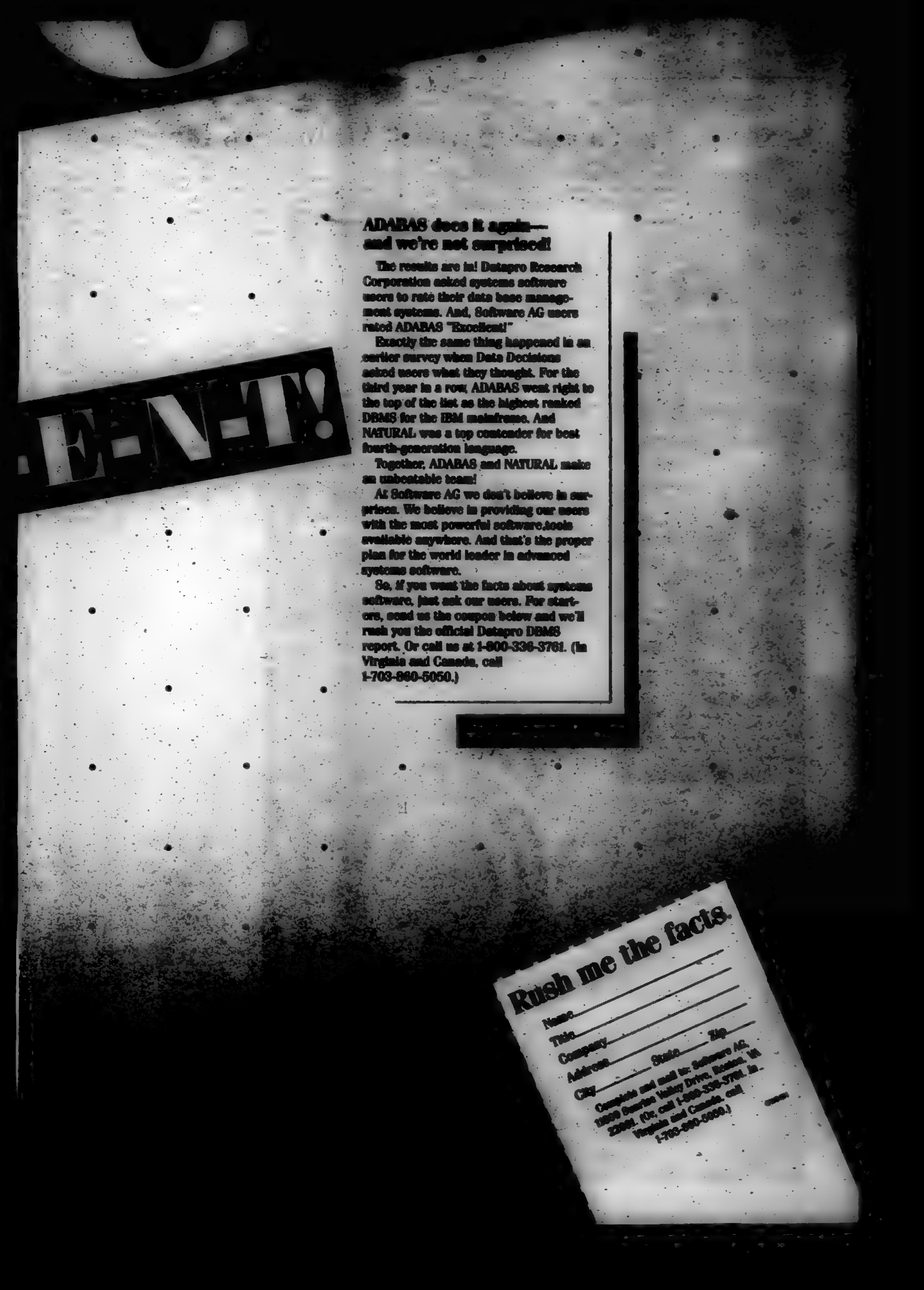

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Seafood chain hooks up with CAD to draw blueprints

LEXINGTON, Ky. — A seafood restaurant chain based here designs its outlets with the help of computer-aided design systems.

Long John Silver's Seafood Shoppes in neighborhoods across the nation have been designed with the aid of Cadam, Inc.'s computer-aided design and manufacturing (CAD/CAM) Cadam and a Spectragraphics Corp. terminal running off IBM mainframes at Jerrico, Inc. headquarters here.

Jerrico has more than 1,200 Long John Silver's outlets and another 74 Jerry's Restaurants throughout the U.S. In 1981, the company found its architectural drawing capabilities taxed by its rapid expansion.

Jerrico architects recommended a CAD system to reduce the need for original drawings and to increase architectural productivity. Standard areas in each restaurant, such as dining areas, kitchens and lobbies, would not have to be redrawn.

The search for a solution began in the fall of 1981. Three types of systems were researched:

- Microcomputer-based.
- Minicomputer-based.
- Mainframe-based.

The micro-based systems were ruled out because their storage capacities were too small to support Jerrico's long-term drawing storage needs.

A typical set of restaurant building plans contains approximately 30 drawings, some with up to six overlays per drawing, which would have quickly exhausted the limited drawing storage capacity of a micro system. In addition, microprocessor speeds at that time were too slow and could only accommodate simple drawing tasks.

Research into minicomputers led Jerrico to consider Computervision Corp., a vendor of turnkey CAD systems. Computervision's system's advantages included a special architectural engineering software package, high-quality drawing techniques, color terminals, a user-friendly programming language and a training package. The disadvantages of the proposed system were its somewhat limited on-line drawing storage capacity, limited data integration with other Jerrico data bases and slower terminal response than a mainframe system. Additionally, significant expansion would have required a second system.

Mainframe systems offered more promise. The IBM system ran Cadam, a program that offered the speed and power Jerrico wanted. It also had the advantage of being compatible with Jerrico's IBM 4381 Model Group 2 host and with IBM terminals engineered for rapid response. Thus, data entered through Cadam could be shared with other Jerrico data bases, and all restaurant drawings could be stored on-line using IBM 3380 disk drives.

Cadam's compatibility with IBM and IBM plug-compatible equipment, however, proved to be the deciding factor, leading Jerrico to launch a 12-month test of an IBM mainframe-based system. It included four IBM 3250 terminals, Cadam software and a California Computer Products, Inc. black-and-white plotter. Jerrico said it believed at the time that it selected the best performing system for the money but soon discovered other alternatives.

Performance advantages

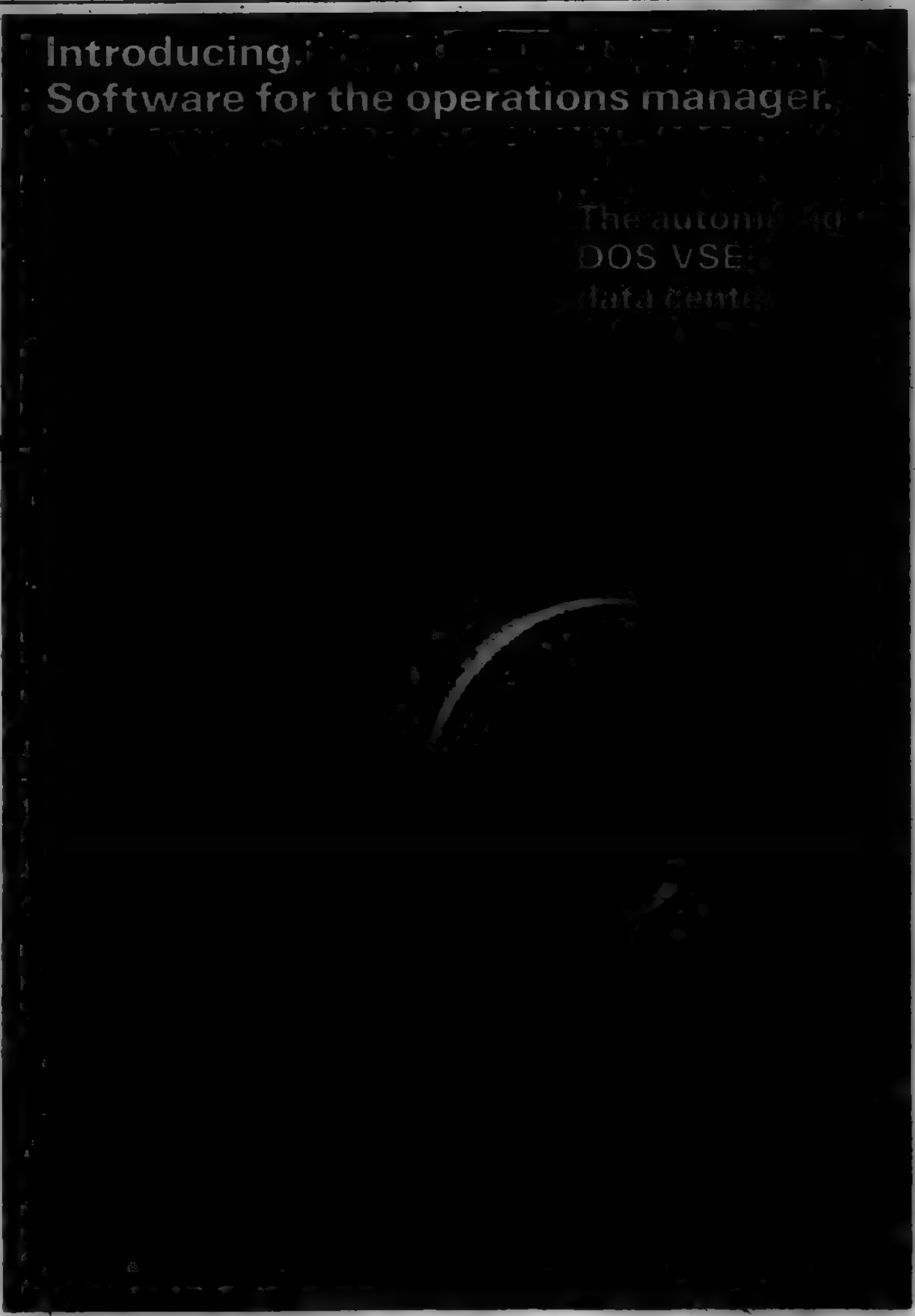
Six months later at a CAD graphics show, Robert Taylor, an associate architect at Jerrico, looked at Spectragraphics's System 1250 terminal and found that it offered performance advantages. It emulated the IBM 3250 monochrome stroke system and supplied IBM CAD/CAM users with the versatility of color and more displayable vectors. The System 1250 also provided a higher resolution display, real-time raster screen updates and a modular design that allowed several workstations to be connected without flicker or significant losses in controller performance. Also, input from keyboards, function switches, light pens and data tablets were all supported.

In addition, the Spectragraphics System 1250 incorporated the 3250 order set, plus its own expanded orders, which allowed for color designs and the generation of wide lines, large points and area fill.

Taylor, however, was most interested in the System 1250's upgrade capabilities and in particular its ability to support an upcoming release of Cadam that would allow for up to 11 distinct shades of gray on a monochrome screen.

Taylor and Jerrico's data processing department discussed the matter and concluded that Spectragraphics' equipment was the best choice, because it allowed the company to grow with the future releases of Cadam. The company installed four Spectragraphics monochrome 1250 terminals in May 1983, and recently Jerrico added another monochrome 1250 and a color 1250. Today, some 50 fully operational Long John Silver's Shoppes have been designed using a System 1250, and 10 of the company's 17 draftsmen on day and evening shifts use the 1250s full time.

Taylor said, "The ability to isolate and copy standardized elements is the key. Maximum productivity is based on making one original drawing do the work of dozens."



MANAGERS ON THE MOVE

RICHARD T. PALMER has been appointed vice-president of management information systems for the Colgate-Palmolive Co. His new responsibilities will focus on furthering maximum productive use of computer technology in all facets of the company's business. Associated with Colgate since 1981, Palmer joined the company as director of MIS.

Palmer

Prior to joining Colgate, he was president of administrative services at Bradford National Corp. for two years. He was previously with Merck & Co., where his last post was senior director of MIS. Palmer is a graduate of Wayne State University.

■

Staley

SUSAN STALEY has been named director of data processing at Execucall, Inc. in Cincinnati. She will have overall responsibility for Execucall's IBM System/35 computer.

Staley began her career with IBM and joined Execucall from the Delta Queen Steam Co., where she was data processing director.

She earned a bachelor's degree in economics from Wilmington College.

■

Orlowsky

T. P. ORLOWSKY has been appointed director of management information systems for Transco Group, Inc. He is a specialist in systems design and analysis. In his position, he will design, program and maintain systems for Transco that apply to the transportation industry.

Orlowsky previously served as project manager for Panalpina, Inc. He has also been associated with Gran Colombiana, Inc., and U.S. Lines.

A graduate of the State University of New York at Farmingdale, Orlowsky received an associate applied science degree in computer science.

Intech '85 expo scheduled

SAN FRANCISCO — Intech '85, the third annual Integrated Information Technology Conference and Exposition, will be held Aug. 26-29 at the Moscone Center here.

The conference will focus on business solutions in major user applications. Topics to be covered in lectures and discussion groups include information security, networks, personal computers, integrated voice/data networks and managing the technology. Representatives of Boeing Computer Services Co. will discuss strategy for migrating to standards. User case histories are scheduled from Westinghouse Electric Corp. and Ford Aerospace & Communications Corp.

The exposition will include floor demonstrations of integrated voice/data systems, personal computer-to-mainframe connections, personal computer local-area networks and advanced security technologies.

The conference also includes a two-part program on computer and communications alternatives with participation by IBM and AT&T system users and vendor technical personnel.

Registration fee for the conference is $495, and admission to the exposition is an additional $10.

More information is available from National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

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EXPERT SYSTEMS IN GOVERNMENT SYMPOSIUM

McLean, Va., Oct. 23-25

Papers are being sought for this conference sponsored by the IEEE Computer Society, Inc. and Mitre Corp. in cooperation with the American Institute of Aeronautics and Astronautics/National Capital Section. This conference will offer high-quality technical exchange and published proceedings.

Topics of interest include, but are not limited to, the following areas: professional applications, office automation, command and control, exploration, weapon systems, systems engineering, equipment, project management, flexible automation, software, architecture, imagery, education, entertainment and expert advice giving.

Completed papers are to be no longer than 20 pages, including graphics, and must be received by the program chairman by May 1.

Four copies of papers should be sent to Kamal Karna, Program Chairman, Mitre, 1820 Dolley Madison Blvd., McLean, Va. 22102.

Notification of acceptance and instructions for the preparation of manuscripts will be provided by May 20.

THE SIXTH INTERNATIONAL CONFERENCE ON INFORMATION SYSTEMS

Indianapolis, Dec. 16-18

The conference committee is accepting papers for this sixth annual conference. It is particularly interested in submissions concerning enterprise analysis/information systems planning; management of the information resource; methods for assessing the impact and/or effectiveness of information systems; productivity tools and support environments; integration of telecommunications, data base, distributed processing and office automation; development and use of knowledge-based support systems; issues in, approaches to and results of user-developed systems; contributions to and selection criteria of research methodologies; computer-based education and training; and results of long-term, multiperson information systems research programs.

The program chairman must receive completed papers in triplicate no later than May 6.

The papers should not be longer than 25 printed, double-spaced pages, including illustrations, tables and references.

They should be written in English and on one side of the page only, and authors' names should appear only on a separate title page. The program chairman will accept written requests for a more detailed style guide for the format of the submitted paper.

For additional information, contact Jeffrey A. Hoffer, Conference Chairman, Graduate School of Business, Indiana University, 10th and Fee Lane, Bloomington, Ind. 47405.

INTERNATIONAL CONFERENCE ON COMPUTER-AIDED DESIGN (ICCAD - 85)

Santa Clara, Calif., Nov. 11-14

This conference will be oriented toward electrical engineering computer-aided design professionals, concentrating on CAD for integrated circuit design.

Paper topics include, but are not limited to, design and methodologies, CAD systems, interactive graphics, modeling and simulation techniques, design automation, layout and layout verification and testing.

All papers should be suitable for a 25-minute presentation and must not have been previously presented or published. Authors should submit 12 copies of both a one-page summary and a more detailed description of up to 1,000 words in length.

Submissions should clearly identify the following information on the first page: the title of the paper, full author name and affiliation and complete return address and telephone number of the individual to whom all communications should be addressed. Submissions are due by May 10 and should be sent to Ian Getreu, ICCAD-85, P.O. Box 1972, Beaverton, Ore. 97075.

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CALENDAR

WEEK OF APRIL 28

APRIL 28-MAY 1, MARCO ISLAND, FLA. — **Fifth Annual Conference and Symposium on Security and Disaster Recovery Planning.** Contact: Nancy DeMatteo, HSH, Inc., 6800 N. High St., Worthington, Ohio 43085.

APRIL 29-30, DES MOINES, IOWA — **Managing Information Centers Effectively.** Contact: Thomas Biscquino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

APRIL 29-30, LOS ANGELES — **Software Configuration Management.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technical Training Corp., Department SCM, P.O. Box 3608, Torrance, Calif. 90510.

APRIL 29-30, NEW YORK — **Information Centers.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

APRIL 29-30, SAN FRANCISCO — **CAD/CAM Data Bases: Who's In Control?** Contact: Jacquelin Cooper, CAD/CAM Alert, 824 Boylston St., Chestnut Hill, Mass. 02167.

APRIL 29-MAY 1, DALLAS — **MVS Architecture.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held on May 13-15 in Memphis and May 29-31 in New Orleans.

APRIL 29-MAY 1, CHICAGO — **Establishing a Computer Security Program.** Contact: Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

APRIL 29-MAY 2, WASHINGTON, D.C. — **Experts on Networks.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

APRIL 29-MAY 3, SEATTLE — **Ada Software Engineering Workshop.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held May 6-10 in Boston.

APRIL 29-MAY 3, NEW YORK — **CICS Internal Architecture.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 29-MAY 3, CHICAGO — **MVS JCL.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

APRIL 30-MAY 3, TORONTO — **Designing Digital Communication Systems.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

APRIL 30-MAY 3, WASHINGTON, D.C. — **Implementing Local-Area Networks.** Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

MAY 1-2, LONG BEACH, CALIF. — **Artificial Intelligence and Advanced Computer Technology Conference/Exhibition.** Contact: Tower Conference Management Company, 331 W. Wesley St., Wheaton, Ill. 60187.

MAY 1-3, ROCHESTER, N.Y. — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held May 8-10 in Denver.

MAY 1-3, DENVER — **Lotus 1-2-3 Applications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

MAY 1-3, ANAHEIM, CALIF. — **Local-Area Networks: An Evaluation of Technology, Applications & Designs.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held May 8-10 in Cincinnati, May 15-17 in Hartford, Conn., May 20-22 in Denver and May 29-31 in Parsippany, N.J.

MAY 1-3, SAN FRANCISCO — **Digital PBXs.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 1-3, DANVERS, MASS. — **Symposium on Small Systems.** Contact: Fred Maryanski, EECS Department, University of Connecticut, Storrs, Conn. 06268.

MAY 2, CHICAGO — **Building Security Awareness.** Contact: Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

MAY 2-3, SALT LAKE CITY — **Using Dbase III.** Contact: The American Institute for Professional Educa-

See CW page 40

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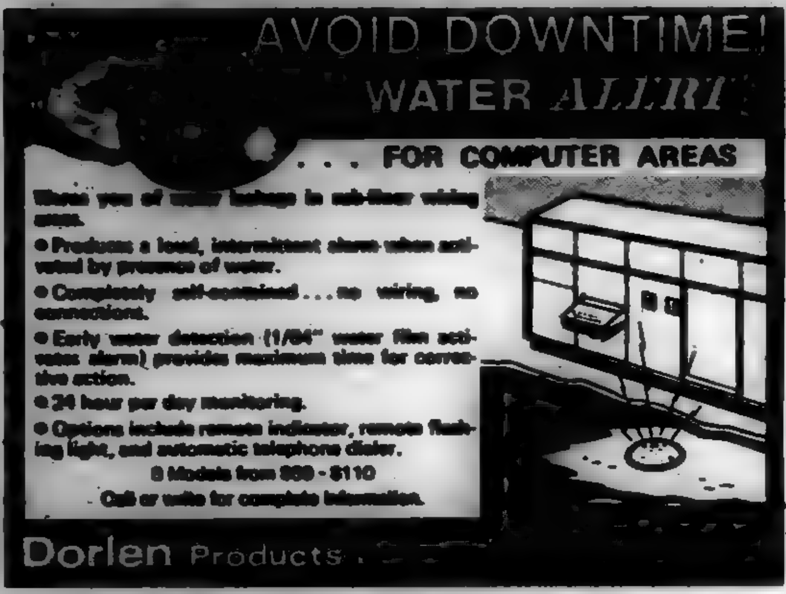
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tion, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

MAY 2-3, CHICAGO — **Introduction to Communications Security.** Contact: Computer Security Institute, 43 Boston Post Road, Northboro, Mass. 01532.

MAY 3, BELLEVUE, WASH. — **Unix for Managers.** Contact: Kathy Howard, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

MAY 4-5, NEW YORK — **CICS Command-Level Intensive.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

WEEK OF MAY 6

MAY 6, NEW YORK — **CICS/VS Internals.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held May 8, 10, 13 and 15 in New York and May 20-24 in San Francisco.

MAY 6-7, LOS ANGELES — **CICS/VS Performance & Tuning.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held May 20-21 in Fort Lee, N.J.

MAY 6-7, WAKEFIELD, MASS. — **Software Rapid Prototyping.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Dept. SRP, P.O. Box 3608, Torrance, Calif. 90510. Also being held May 9-10 in Orlando, Fla., and May 13-14 in Washington, D.C.

MAY 6-7, WASHINGTON, D.C. — **Software Maintenance.** Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Department SMA, P.O. Box 3608, Torrance, Calif. 90505. Also being held on May 9-10 in Boston and May 16-17 in Atlantic City.

MAY 6-7, HOUSTON — **MVS Overview.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held June 24-25 in Washington, D.C., and September 9-10 in Austin, Texas.

MAY 6-8, BOSTON — **Relational Data Base.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held May 13-15 in Los Angeles.

MAY 6-8, DALLAS — **EDP Software Maintenance.** Contact: Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

MAY 6-8, DALLAS — **Networking Personal Computers.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 6-8, SAN FRANCISCO — **Data Communications System Components.** Contact: Systems Technology Forum, 900 Fern Park Drive, Burke, Va. 22015.

MAY 6-9, WASHINGTON, D.C. — **Vtam: From Start to Finish.** Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held May 13-16 in Denver, May 20-23 in Los Angeles and May 28-31 in Fort Lee, N.J.

MAY 6-10, HOUSTON — **Structured Systems Design Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092. Also being held May 20-24 in Houston.

MAY 6-10, CHICAGO — **The James Martin Seminar.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

MAY 6-10, WASHINGTON, D.C. — **Hands-On Programming in the C Language.** Contact: The George Washington University, Continuing Engineering Education Program, Washington, D.C. 20052.

MAY 8-10, LOS ANGELES — **X.25 and Packet-Switching Networks.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 8-10, SAN FRANCISCO — **Local-Area Networks.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402. Also being held May 13-15 in New York.

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EDITORIAL

The big chill

The computer industry has come down with a sudden case of the chills, brought on by depressed markets and excessive inventories. The result of this unexpected downturn is a disturbing pattern of layoffs, work stoppages and reduced earnings among major manufacturers, leading at least some large users to reconsider or delay equipment purchases.

The list of casualties in the first quarter of this year is long and bloody:

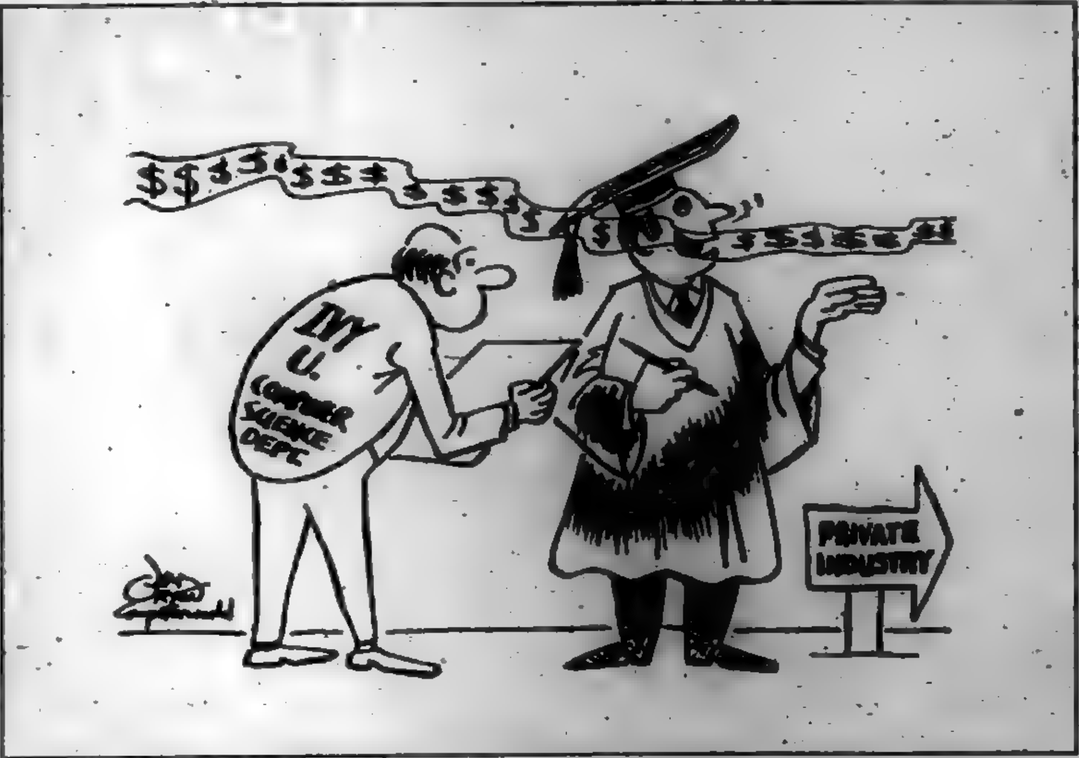
- Wang Laboratories, Inc. admitted it will close all its U.S. manufacturing facilities for two weeks in July, sending 6,000 employees on a mandatory summer vacation [CW, March 25]. Reason: excess inventory.
- Apple Computer, Inc. imposed a staggered one-week halt in manufacturing operations at its Apple II and Macintosh plants during March and April [CW, March 11]. Reason: inventory backlog.
- Texas Instruments, Inc. extended its reduced workweek at its semiconductor plants through midyear [CW, March 4], and specialty chip maker Micron Technology, Inc. said it will fire half its 1,250 employees. National Semiconductor Corp. shut down production for two weeks in February — its first halt since 1981. Reason: softening market demand.
- Intel Corp., which reported hefty increases in revenue and profits for 1984, announced it might not earn any profit for the first three months of 1985 [CW, March 4]. Wang projected its third-quarter earnings will fall 30% to 40% below the same period a year ago. IBM expects first-quarter profits to decline, its first earnings drop since 1981. Datapoint Corp. posted a second-quarter loss and agreed to a liquidation strategy proposed by arbitrageur Asher B. Edelman [CW, March 25]. Convergent Technologies, Inc. discontinued operations for its Workslate laptop computer and disclosed a $14 million loss for 1984. Informatics General Corp. posted depressed profits for 1984 [CW, Dec. 31/Jan. 7].
- IBM killed PCjr. Exxon Corp. quit the office systems market [CW, Feb. 25]. Management Science America, Inc. reached agreement to sell two of its retail microcomputer software subsidiaries [CW, March 4].

Analysts are hedging their bets on the duration of this downturn, but the consensus is that the worst may be over, at least for semiconductor manufacturers. Equipment manufacturers, however, may continue to be plagued during the second quarter and possibly longer by inventory buildup and especially by reduced demand among end users.

The crucial question is this: Does the industry have a chill or a nasty cold? Is this a minor blip in a tremendous growth pattern or does it mean that the economy-leading information processing industry is exhibiting the first signs of a new recessionary cycle?

It may be that the industry, caught up in the frantic practice of one-upping the competition, has simply overwhelmed the users' ability to absorb the flood of new products brought to market in the past couple of years. Users must decide whether the industry has simply tripped over its own feet and needs a few months to correct the imbalance, or if the warning bell is chiming a signal to tone down expenditures and batten down the hatches.

Unfortunately, the latter strategy can only exacerbate the apparent weakness in the U.S. economy that recent indicators have identified.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'I'm happy to stay on teaching here, sir. Hold it! What's that delicious aroma downwind?'

LETTER

'Strictly OA' refuted as Wang credo

It seems that from the article "Overhaul to bolster OAC attendance, interest" [CW, Feb. 25], *Computerworld*'s editors are with the majority of industry editors who insist on keeping Wang Laboratories, Inc. caged in the same old office automation pigeonhole, whereas newcomers in the front-end office market, such as IBM, preen their feathers atop the perch of the fourth estate.

When Wang claimed leadership in OA, we were really talking about integrated information processing — a claim we could rightly make, because no one else was doing it. In fact, Wang became the "office automation computer company" because the press virtually demanded we use the arbitrary definition it had applied to the computer activity occurring outside the traditional MIS environment.

The press, not Wang, chose to equate anything other than DP with the ever-enigmatic term "office automation." Even the systems have been slighted: Numbers are processed on computers; words are processed on processors. I challenge anyone to tell me the real difference between the two, for it seems, "A rose is a rose is a rose," whether you're crunching numbers or letters.

Wang has been pushing integrated information processing since 1979. It has refined the philosophy and the product since then, maintaining that under the integrated information processing umbrella are OA — which is more than word processing — telecommunications and DP. If you're not integrating DP, OA and telecommunications, then you don't have integrated information processing.

Edward Clough
Lowell, Mass.

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VIEWPOINT

Technology offers hope for organ transplants

LECHT ON SCIENCE
Charles P. Lecht

I was revolted when I first heard that doctors had attempted a human heart transplant. If the transplant was a success, I wondered if any of us ever again could feel safe entering a hospital in which human heart transplants were practiced. And when the transplant turned out to be a success, the specter of human sacrifice materialized in the minds of thinking people everywhere; a human heart transplant requires at least one person to die for another to live. I've always considered human heart transplant surgery barbaric, and I believe I am not alone in holding this viewpoint.

It is unfortunate and illogical that recent attempts to perfect the implant of an artificial heart has brought the morality of the surgeons who undertook this operation into question. One doctor whose patient died was forced to defend his decision to use an artificial heart instead of one taken from the chest of a dying person by citing a growing shortage of "qualified donors" and his need for immediate action if his patient was to be saved. He should have been given a medal — as should the doctor who saved William Schroeder's life through the use of an artificial heart. Neither transplant attempts required someone else to die for the operation to begin.

Recent advances in very large-scale integration silicon chips provide every reason to believe that creating working simulations of just about every part of the human body may one day be possible. Today our attentions are focused on the heart, but we must remember that medical and computer scientists together have been making great strides by creating artificial eyes, ears, limbs, arterial systems, kidneys and the like — although progress in this field is not proceeding fast enough. Most inhibiting is the lack of a marketplace as financially promising as business or military systems. Although approximately 25 million Americans (roughly 10% of the population) qualify as "severely disabled," a disproportionate number can't afford the kind of technological devices that may even partially reduce their afflictions. Only a dramatic reduction in the research and development costs needed to create far more effective and cheaper devices can change this situation. Considering the price/performance improvements we've seen in our world of technology, this may occur in our lifetimes.

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> *The evolution pattern of devices will give us a model for the creation of systems to support the severely disabled, including devices to replace organs and correct nervous disorders.*

The evolution pattern of devices we've seen thus far in related fields will give us a model for the anticipated creation of systems to support the severely disabled, including devices to replace organs, correct nervous disorders and so on. For example, today's increasingly miniaturized video cameras offer hope for the blind that eye replacement is possible. These cameras — now comfortably carried around in a travel purse and weighing less than 5 lb — required a moving van just 25 years ago. The personal computer I use on board a trans-Pacific airliner weighed as much as 30 tons in the 1950s — consider the Eniac, for example. This same technology can be used to operate a robotic arm, and it is just a matter of time — and I hope not too long — before we can expect to see the cumbersome device that supports the Jarvik 7 artificial heart be made smaller so that both fit into a package no larger than the human heart they replace.

Complexities of technology abound

We cannot help but be impressed by the incredible developments we've seen in large-scale integration, but we cannot underestimate the complexities our scientific community faces in the use of this technology to create artificial parts of the body. The logic and memory complexities of a single human cell are said to far exceed anything we may ever be capable of reproducing in our chip technology. And the information systems networks that our organs depend on to function may offer such an enormous degree of complexity that their reproduction is unobtainable outside the biological world. I assume we believe that this is true — which previously prompted our scientific community to search for organ replacement, especially organs deemed "vital," solely through the transplant of living organisms rather than through the implant of inorganic computer systems technology.

Perhaps we can unlock the mystery of how to grow a living heart, kidney, arm or leg in a laboratory, but the results of employing the discovery may not be as satisfactory as those obtained through the creation of artificial devices like the Jarvik 7. We cannot avoid noticing that, with proper engineering, the meantime between failure of the technology's operation could far exceed anything nature has ever produced. This may revolt some people who fear the possibility of our eventual robotization, but it alone — even carried to the extreme — could never be the cause. We've seen too many human robots emerge in our lifetimes without even a single artificial tooth gracing their mindless bodies.

If we knew how to regenerate our own body parts on demand, of course, the entire issue of how to correct failures in our physical functions would be set to rest once and for all. But until that day, the artificial organ replacements that emerge from a computer systems laboratory are far preferable to the real thing.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Unix evolves as a choice, not a standard

WOHL STREET MINIJOURNAL
Amy Wohl

Predictably, the entry of AT&T Information Systems into the information systems market has brought with it a new emphasis on Unix. However, interest in Unix — particularly as a multiuser OS environment for office users and office automation software — was already an important factor in the marketplace.

"Interest" is the key word here, because much of the promised software has never, in fact, materialized. Some software has died aborning; a little has reached the market (notably in bundled systems and in Quadratron Systems, Inc.'s omnipresent Q-One and Q-Office packages), and many packages are seriously overdue but still promised.

What's going on? The following three separate (and intersecting) trends are occurring:

- Much OA software has been (or is being) developed in the Unix environment, largely because of its availability, portability and familiarity.
- Unix's seeming portability makes it an attractive target for software writers, who seek a reasonably large market, and for small hardware vendors, who must depend on third-party vendors for the software they need but can't afford to write themselves.
- Non-IBM hardware vendors (and IBM itself on alternate Thursdays) are pressed to compete with AT&T Information Systems by offering Unix support.

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> *If we are going to have a half-dozen or more versions of Unix extant in the marketplace — each slightly different from the other and each optimized to a particular vendor's hardware — then we will have little or no portability and very little software.*

But what does all this sound and fury about Unix portend? Probably less than meets the ear. To dissect the above-delineated trends, consider the following:

- Much less Unix application software has been developed than was anticipated. In fact, about 50 Unix hardware vendors offer Quadratron's Q-One word processing software not because it's good (which it is), but because there's not much competitive product available.
- Unix can only attract and encourage a large body of software if the portability of Unix-based software makes it usable across a broad spectrum of hardware offerings. If we are going to have a half-dozen or more versions of Unix extant in the marketplace — each slightly different from the other and each optimized to a particular vendor's hardware — we will have little or no portability and very little software.

Because it is likely that IBM will embrace the same Unix standard as AT&T Information Systems and the others, it is unlikely that a single Unix standard, strongly defended, will emerge.

- Many commentators have confused IBM's reluctant support of Unix with enthusiastic endorsement. Do not expect IBM to be a strong Unix supporter. Big Blue considers Unix a defensive move, an attempt to ensure that not a single customer — based on his desire to use a Unix environment — moves from IBM's customer set to AT&T's. We expect IBM to continue to be a reluctant handmaiden at the Unix altar: It will surely support

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Wohl is president of Wohl Associates in Bala-Cynwyd, Pa., and editor of the "The Wohl Report on End-User Computing" newsletter.

LETTERS

Licensing options

The article "Thou shalt not dupe" [CW, Jan. 28] did not address the issue of current licensing restriction and its impact on end-user ability to apply the software to the application for which the user purchased it.

The statement that data processing departments have grown up with license agreements but that users of microcomputer-based software have not and need to be brought in line assumes there is little difference between the two environments.

I am currently concerned with the accessibility of the licensed software. When software is licensed for a mainframe or microcomputer, the accessibility to that software is limited only by the number and locations of the terminals and communications ports connected to the system. Although the software is limited to a single CPU, it is available to a large group of users.

Current software licensing for microcomputers attempts to follow the same practice of limiting the use of the software to a single CPU. But, as a result, the accessibility of that software is also limited, and this is where one of the problems lies.

I am now working on an alternative project that uses three microcomputers to collect data, which will then be forwarded to a fourth for merging and conversion to a standard format. If a licensed software package — such as a data base management system — is used to develop the programs required to collect the data on the central micro, three additional copies of the software package will need to be purchased to allow the developed programs to be used on the other micros. It is difficult to explain to a client why the additional expense is necessary, especially when the software costs $700 a copy.

Limiting the software to one CPU, in a case like this, seems inappropriate. An option in the licensing should provide additional copies to a single purchaser at a considerable discount, such as 10% to 20% off the price of the first copy, with consideration given to volume purchasers.

Kenneth Jagerski
Hickory Hills, Ill.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or fewer. Letters may be edited for the purposes of clarity and brevity. Letters should be addressed to Editor, Computerworld, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

UNIX

from page 43

Unix, and it will surely continue to promote IBM solutions to customers, encouraging IBM software from third-party vendors.

When the dust clears — which will take far longer than anyone thinks — we should expect the following:

- Unix as a second standard (second to IBM's de facto standards, that is) with most hardware vendors providing support.
- Some Unix OA software, although much OA software will stay outside of the Unix camp because of vendor love for proprietary operating systems, the performance problems for this I/O-hungry application and IBM's failure to set the tone by strongly encouraging Unix software. (The phrase "damning with faint praise" springs to mind.)
- The possibility that IBM will propose another proprietary (at least partially open) operating system to succeed its PC-DOS. This will, of course, become an immediate de facto standard, particularly if it permits current PC-DOS software to run under it.
- Unix as a standard will be blurred if proposals from January's Uniforum conference to create a set of Unix extensions — each optimized to a particular set of applications — should materialize.

In the end, Unix will take its proper place in the marketplace not as the standard but as one of a series of choices. It will be useful where its tools offer advantages and passed over where and when newer products (particularly those blessed by IBM and its coattail progeny) enter the market and become accepted. $

SCIENCE/SCOPE

After slowing from 107,000 miles per hour to subsonic speeds in just two minutes, NASA's Project Galileo Probe will take the first direct samplings of Jupiter's atmosphere later this decade. During its plunge through the brightly colored clouds, much of the Hughes Aircraft Company probe's forward heat shield will be eroded by temperatures of several thousand degrees. Once the probe has slowed, a mortar in the rear heat shield will fire to deploy a parachute. This parachute will pull off the back cover, releasing in turn the main parachute. Small explosives will release the front heat shield from the descent module. The parachute will slow the descent as the shield continues into the interior of the planet. Data will be transmitted to an orbiting spacecraft for relay to Earth. Project Galileo is set for launch in May 1986 and is scheduled to arrive in August 1988.

An antenna system made entirely of composite materials is operating on LEASAT, a communications satellite launched last year from the space shuttle. The antenna's structural elements and fittings are made of carbon powder, fiber, and epoxy. This approach eliminates metal pieces that cause spurious signals when impinged by many different high-energy radio signals. The carbon powder also improves the conductivity of the outer surface of the antenna and prevents arcing, the harmful build-up and discharge of static electricity. Hughes built the 7.5-ton LEASAT for operation by a subsidiary, Hughes Communications Services, Inc. The Navy leases capacity for all U.S. military services.

A new 5-volt-only, 256-bit nonvolatile random access memory combines the data retention capabilities of an EEPROM with the convenience of a CMOS RAM. The Hughes circuit, designated H13500, is designed for such applications as reconfigurable systems and fault protection without battery back-up. It is organized as 64x4 bits. Both the read and write operations are performed as in a standard CMOS RAM. A single store operation transfers all data in the RAM cells in parallel to the background EEPROM array. The recall operation restores data in parallel to foreground RAM cells.

A new laser that better penetrates battlefield smoke, haze, and dust will let tank gunners determine the range of any target they can see with a thermal imaging system. The laser is the first carbon dioxide laser rangefinder developed in the U.S. for tactical military applications. It determines range based on the few millionths of a second it takes a laser pulse to reach a target and reflect back. During advanced development tests, the rangefinder demonstrated greater performance under obscured battlefield conditions than the solid-state lasers currently used for military rangefinding. Because the laser and the thermal imaging system operate in the same wavelength, they have the same performance characteristics under battlefield conditions and bad weather. The Hughes laser is also harmless to the human eye and can be safely fired during training exercises. A development model has been configured for evaluation in the M1 Abrams main battle tank.

Career growth opportunities exist at Hughes Support Systems for a variety of engineers qualified by degree or extensive work experience. They include systems engineers, radar engineers, and software and hardware design engineers for major simulation and test equipment programs. Also, field engineering posts throughout the U.S. offer travel, autonomy, and responsibility for the life cycle of Hughes electronics systems. Please send your resume to Lowell Anderson, Professional Employment, Dept. S3, Hughes Aircraft Company, P.O. Box 9399, Long Beach, CA 90810-0463. Equal opportunity employer. U.S. citizenship required.

For more information write to: [illegible]

HUGHES

SOFTWARE & SERVICES

An IBM mainframe data retrieval tool debuts from Informatics General/47

Harris gives its superminicomputer line software for computer-assisted engineering, design and manufacturing/47

Language Processors introduces high-level language compilers/47

SOFTLINE/LES GILLIAM

Is the thrill gone for DP achievers?

Many of the data processing professionals with whom I have contact are frustrated with their careers. The challenge of new technology, which was so important in earlier days, has lost its appeal. For some, boredom is prevalent. For others, the pace has quickened, but the same tasks are repeated. Many have no specific goals and believe their careers are flowing in no particular direction — or worse yet, in no direction at all.

Maybe you have been in DP for several years and have begun to wonder if you made a mistake because your professional progress seems to have stalled. Or maybe you are just getting started in computing and are searching for the secrets that will lead to an enjoyable and rewarding career. A

See BORED page 51

Gilliam is an independent consultant based in Ponca City, Okla., and a regular contributor to Softline.

SOFTALK
John Gallant
CW Senior Editor

ADL putting AI technology to work

The corridors are narrow, and the painted cinder block offices that house Arthur D. Little, Inc.'s (ADL) Artificial Intelligence Program are cramped, but the significance of the applied research under way there extends far beyond the less-than-palatial accommodations.

At ADL's Cambridge, Mass., headquarters, AI is leaving the comfortable laboratory environment, which has been its home to date, and going out into the working world. Wearing the many-colored robes of consultants, researchers at ADL's AI program are applying AI to problems of the real world — turning advanced techniques into actual applications for a variety of industrial clients.

Perhaps it would be more accurate to say the AI program is putting AI technologies to work, for

See AI page 50

Lowell Jay
Arthur

> *"Count what is countable, measure what is measurable, and what is not measurable, make measurable."*
> — Galileo Galilei

he desire to measure — to quantify and classify the components of the physical world — is a basic human trait. The ability to measure has fueled past technological advances by shedding new light on the pieces of the puzzle of nature, contended author Lowell Jay Arthur. Thus, it is appropriate that Arthur opens his most recent book, Measuring Programmer Productivity and Software Quality *(John Wiley & Sons, New York), with Galileo's charge to the scientific world.*

Arthur may be described as a proponent and missionary of the cause of programmer productivity and software quality measurement — also known as software metrics. Software metrics is the latest weapon in the continuing battle to improve applications quality and increase productivity. But despite man's obsession with measurement, the principle of software metrics has won few adherents in the software development world. "There are instruments to measure almost every principle and practice in most fields," he wrote, "but not in software development and maintenance. . . . And the only way to ensure high quality and productivity is to measure products as they are produced."

Arthur, who also wrote Programmer Productivity *(John Wiley & Sons, New York), is a programmer productivity analyst for Mountain Bell Telephone Co. in Denver. He discussed software metrics in a recent interview with John Gallant,* Computerworld *Senior Editor/Software.*

Define the term software metrics.

Software metrics is simply the attempt to develop measurement tools to identify quality characteristics in software and to use those measurements, in turn, to develop productivity measurements. It is an attempt to

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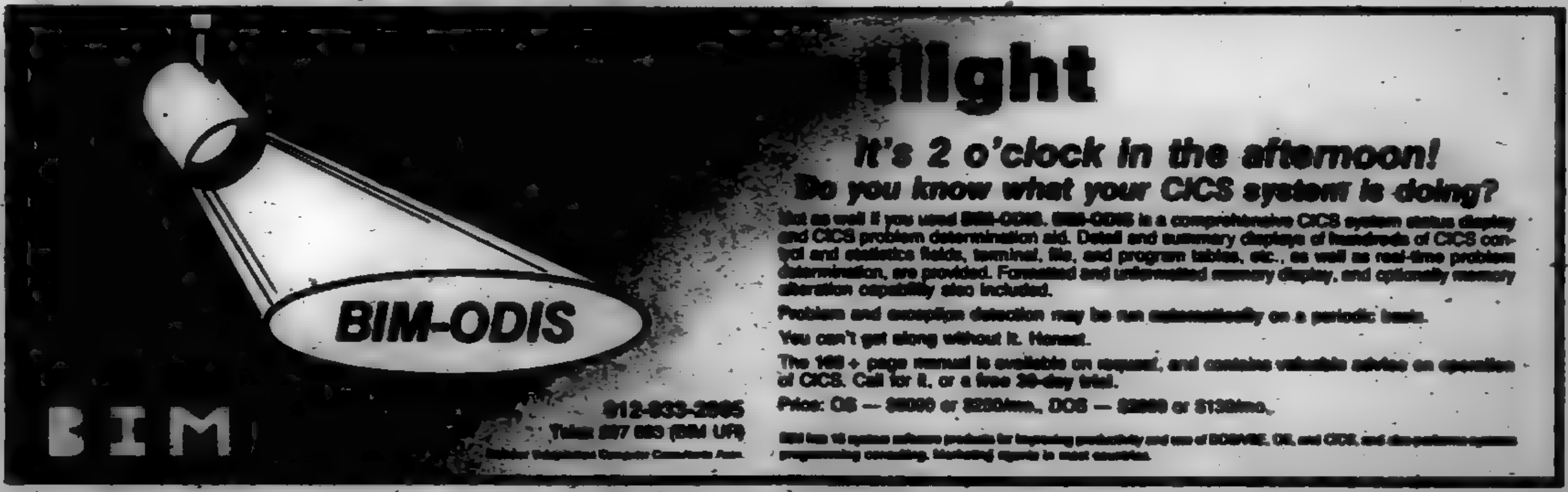

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PC Magazine *February 19, 1985*

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November, 1984

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Personal Computing
March, 1985

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PC Magazine
February 19, 1985

"Enable, a five-function integrated system from The Software Group, merits a close look by any individual or organization interested in a solid package that is well balanced in all of its applications."

Popular Computing
March, 1985, Paul Goldner, Raymond Head, Yoram Lirtzman, Michael Wilding

"Quite simply, this package has so many outstanding attributes that even the worst skeptics of integrated software have to be impressed. The spreadsheet is very close to 1-2-3; the word processor combines the best thinking of WordStar, MultiMate, Volkswriter, and EasyWriter; the data base offers the functionality of dBASE II, but with many of the ease-of-use features of PowerBase; and the program offers business graphics and telecommunication. Taken as a whole, Enable surpasses the functionality of Symphony, Framework, Aura and Open Access."

IBM PC Update
December, 1984

Enable first in "Performance" rating—including speed and capacity of all modules tested. Enable first in "Versatility" rating—including power and functionality of all modules tested. Enable rated first in overall evaluation of the word processor module.

Software Digest Ratings Newsletter
Rating of 15 Integrated Products
December, 1984

"Enable welds its five applications together with outstanding integrity—yet each is exceptionally full-functioned in its own right."

Business Computer Systems
January, 1985

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Infoworld
January 21, 1985

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Harris offers CAD software package for supermini line

FORT LAUDERDALE, Fla. — Harris Corp. has announced a design, drafting, engineering and manufacturing software system called Harriscad that runs on Harris superminicomputers ranging from the Harris 60 to the Harris 1000.

According to a vendor spokesman, Harriscad enables users of computer-aided design and manufacturing systems to go from design concept, drafting and analysis to manufacturing on one system. Harriscad resides on a common system data base included with the package and provides functions that include numerical control and data base management.

A menu-driven package, Harriscad features separate software modules that handle various mechanical engineering tasks. All modules are linked by the common data base and feature interfaces to complementary software packages.

Harriscad modules include a drafting system, a three-dimensional design system, a manufacturing system, a specialized applications system for modeling and analysis and an integrated design, drafting and manufacturing system. Harriscad can interface with two other software packages: PDA Engineering, Inc.'s Patran and Swanson Analysis Systems, Inc.'s Ansys. Patran is a solid- modeling and finite-element preprocessing and postprocessing program. Ansys is a finite-element analysis program for stress, thermal, dynamic and dynamic response analysis.

The price for Harriscad ranges from $56,250 for a full Harriscad system, including drafting, design/drafting and drafting/numerical control modules on a Harris 60, to $120,000 for those modules on a Harris 1000. The Harris superminicomputers run the company's Virtual Operating System.

Harris' Computer Systems Division is located at 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

On-line retrieval tool for IBM data bases out from Informatics

WOODLAND HILLS, Calif. — Informatics General Corp. has announced Answer/DB-Inquiry for on-line data retrieval from any IBM mainframe data base.

According to a spokesman, Answer/DB-Inquiry provides mainframe terminal users with access to production IBM Vsam data sets and IBM IMS/DB or DL/I data bases through CICS/VS and IMS/DC under OS/VS or DOS/VSE.

Answer/DB-Inquiry allows users to retrieve information with English-syntax queries. Up to 10 data base files can be opened and viewed at the same time, including any combination of DL/1 and Vsam files.

Answer/DB-Inquiry reportedly processes user-defined requests and output statements and displays requested data on the screen or routes it to a printer. Data base security against unauthorized access is provided through user profiles, the vendor said.

Answer/DB-Inquiry costs $20,000 for the OS/VS-compatible package and $15,000 for the DOS/VSE package.

More information on Answer/DB-Inquiry is available from Informatics, which is located at 2103 Ventura Blvd., Woodland Hills, Calif. 91364.

LPI announces compiler line

WALTHAM, Mass. — Language Processors, Inc. (LPI) has announced a family of high-level compilers for Cobol, RPG-II, Pascal, C, PL/I and Basic aimed at systems utilizing the Motorola, Inc. MC68000 microprocessor and AT&T's Unix.

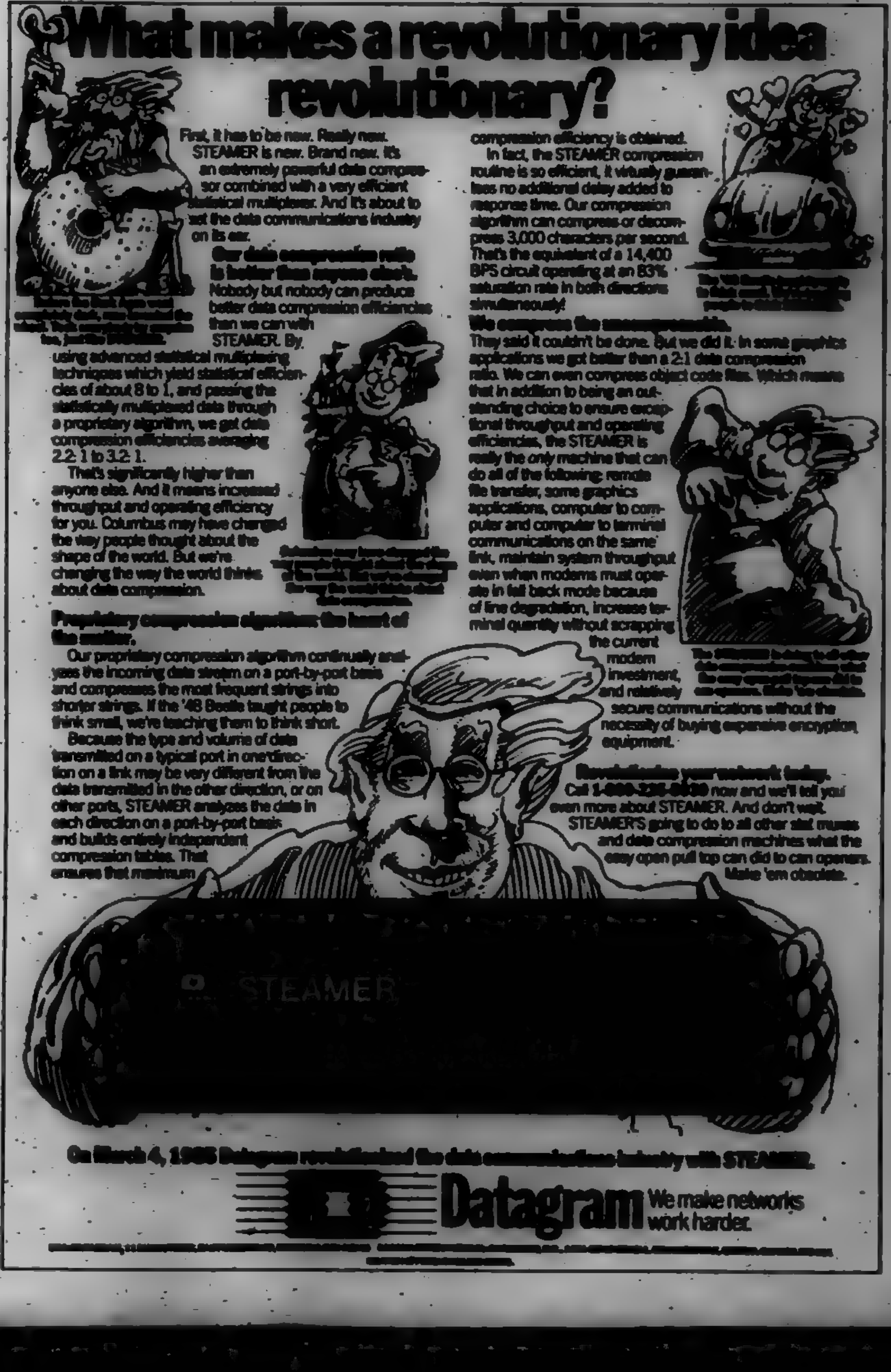
A company spokesman said the line embraces LPI's Component Architecture, a modular design combining a front end, an optimizer, a code generator, a runtime library and a high-level debugger. The compilers use the same access method to handle data files, so programs written in one language can address and use files written in another. The architecture also allows single programs to be written in more than one language, a feature supported by the LPI-Debug multilanguage debugger.

LPI-Cobol meets the Ansi 1974 high-intermediate standard, with extensions to allow users to transport programs written for IBM 370 series CPUs using Cobol-68. LPI-RPG-II is compatible with System/34 minicomputers, so that users can transport RPG-II programs to their MC68000-based system.

LPI-Pascal implements IEEE/Ansi standard Pascal, with extensions designed to speed program development.

Each LPI compiler module is priced at $50,000.

LPI is located at 400-1 Totten Pond Road, Waltham, Mass. 02154.



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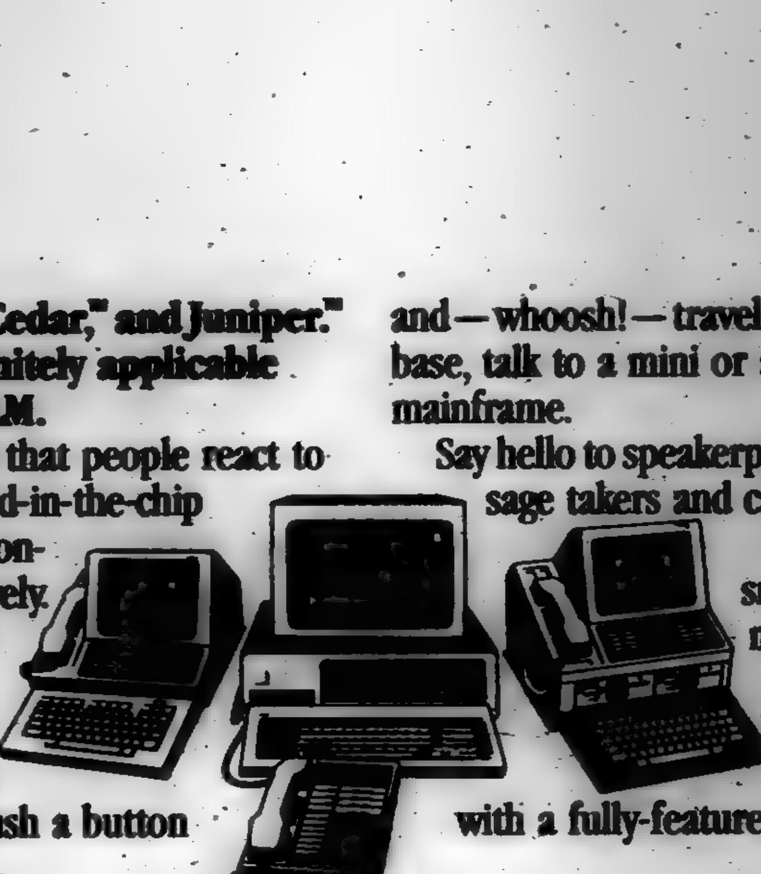

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AI

from page 45

even the program's director, Karl Wiig, is hard-pressed to define the amorphous term artificial intelligence.

"I do not know what AI is," Wiig acknowledged during a recent interview. "But I think we do know what the AI technologies are. They are the products and techniques that fall out of the horn of plenty of AI research. If you ask what AI itself is and is not, you get into a semantics debate that leads nowhere. We think, rather, about the use of AI technology for applications, and we try to make those applications as knowledgeable and intelligent as possible."

Applications key

The significance of ADL's AI undertakings can be summed up in that one word — applications. Many people, especially those in the traditional information systems world, have sharply criticized AI researchers for dwelling too long on the leading edge, for not handing the fruits of their labors down from their lofty academic sphere.

But some AI researchers contend the traditional DP shop is not yet an appropriate environment for budding AI technologies. They reason that current hardware and software architectures are not designed, and were not intended, to support the radically different processing and programming requirements of technologies such as expert systems and natural language interfaces.

Others state that until AI-dedicated tools such as Lisp machines become affordable to a wider corporate audience, and until mainstream manufacturers like IBM begin to offer AI-related support tools such as Lisp compilers for their processors, AI cannot hope to gain a toehold in the information systems world.

There is also a small minority of AI aficionados who question whether AI technologies can, or should, ever meld with DP. Whether from academic hubris or just plain disdain for traditional information systems, that minority would have AI remain untainted by DP. "There are a number of AI people," Wiig stated, "who do not recognize that DP has anything at all to offer."

Weakening possible

Thus, it is remarkable that ADL's AI program has been so successful to date in merging AI and conventional information/knowledge processing technology. In certain cases, Wiig and his colleagues admit, that blending can result in some weakening of an AI application transported to a DP environment.

For example, an expert system developed in Lisp on a Lisp machine and cross-compiled to C or PL/I to run on a mainframe loses much of its flexibility to change and adapt to new knowledge. Knowledge maintenance, so to speak, must be undertaken in the Lisp environment and the system once again must be ported to the conventional language. The application also becomes opaque, AI researchers claim, making it difficult for users to discern just how the system reached the conclusion it did. When it comes to expert systems, that reasoning process is every bit as important as the answers the system generates.

[illegible]

While that degradation is a concern to AI program staff members, they remain cognizant of the massive investment U.S. industries have made in the current generation of information systems. Wiig said that, with ADL's help, clients have been successful in developing AI applications that either make use of existing systems or provide a functional or financial return high enough to warrant investment in dedicated AI hardware and software. The trick, they say, is not to become enamored of the technology but to carefully explore where it can be applied to improve operations.

That is a message that other AI researchers, at least those who would like to embrace the corporate audience, and AI product vendors would do well to heed. With this idea in mind, they could perhaps win a greater constituency within DP and spur interest in, and acceptance of, AI technologies. Skirting the information systems world can only spawn conflict and slow the adoption of the powerful, if still formative, AI technologies.

BORED

from page 46

fresh look at the key factors of success in DP may be just what you need.

Your definition of success and your goals will probably change many times throughout your career. As you achieve one level of success, you must set new goals so you may reach your full potential. If you do not have a goal to shoot for, how will you know when you hit it?

There is a difference between education and training. Formal education is required if you are to have a reasonable chance of attaining your goals. For example, someone in computer operations who wants to go into programming may have limited success without a college degree. A master's degree in computer science usually prepares a person for greater responsibilities than does a bachelor's degree. If you have set your sights on a position in management, a master's degree in business administration may be valuable.

But formal education is only part of the preparation for a career. You should strive to keep your skills and knowledge base up to date throughout your career by undergoing training — and opportunities for that training abound in our industry. Your education will set the framework for your career, but the application of trained skills will move you up within that framework.

We need to be honest with ourselves about our natural talents and abilities. Attempting to accomplish outstanding feats in any field for which we are not skilled is frustrating, unenjoyable and unsuccessful.

The difference between a positive attitude of support and contribution and a negative, fault-finding and complaining attitude can be counted in the money earned over the many years of a career. A negative attitude repels, but a positive attitude acts as a magnet, drawing to itself the strength of those who want to help you succeed.

Successful people have an intense desire to excel. That desire is called drive, which is both a physical and mental condition. Withstanding the pace and pressure of a career in information systems requires much energy and stamina. Good eating habits and regular exercise pay rich dividends in providing some with the strength to perform when others lag. That extra measure of energy and desire could be your ace in the hole — the difference between you and your competitors.

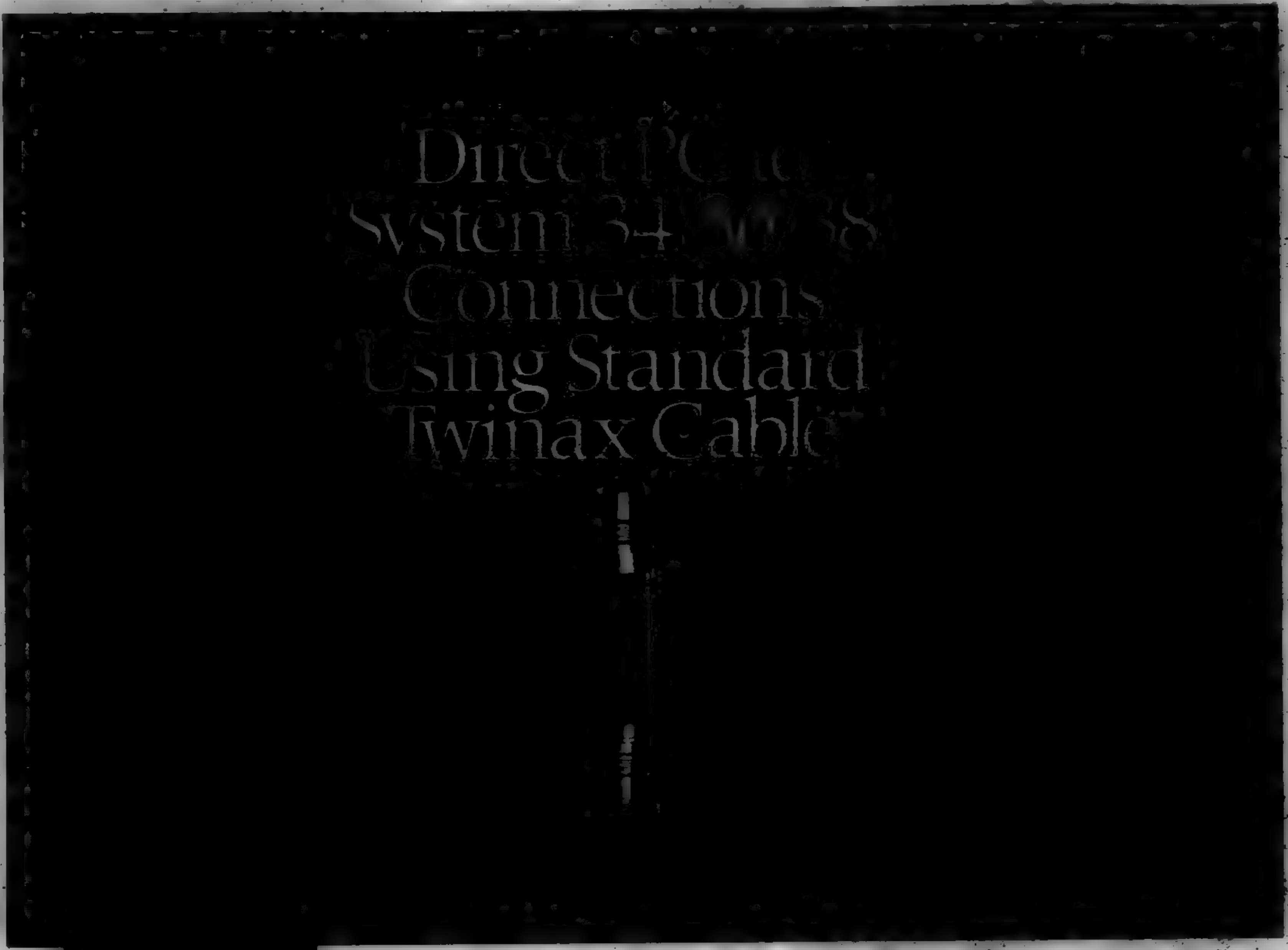
Success in any field requires an above-average investment of time, and DP is no exception. The number of hours you devote to your career each week is a key factor in determining your advancement. Employers look for people willing to give that extra time. Be careful not to work beyond a sensible level, though; that can lead to physical or mental fatigue, which hampers your effectiveness.

> ”
>
> *Education will set the framework for your career, but the application of trained skills will move you up within that framework.*

Usually, those who advance in an organization view their responsibilities as more of an owner than an employee. That is, they become personally concerned with the success of the business. They continue to look for ways to make the business more successful, whether or not it benefits them directly. Commitment separates the successful from the unsuccessful.

Most outstanding achievers in the computer field effectively use their time by planning, organizing and prioritizing their activities. A calendar, task list and daily planning time will help you in this area. The calendar reflects your commitments and due dates; the task list shows the specific activities you need to address; and the daily planning time is for updating the calendar and task list and for setting time priorities.

Setting goals and planning a path to reach them is not a one-time exercise. Occasionally, you should prepare a progress report to assess your performance. That report may highlight an area on which you should place renewed emphasis.



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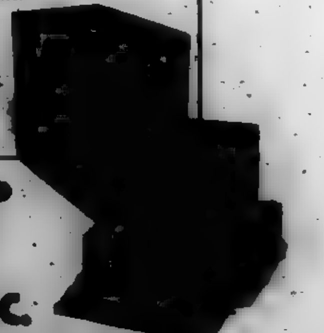

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ARTHUR

from page 48

quantify the quality of whatever is being produced rather than going through laborious manual processes, like inspections and walk-throughs.

You state that measurement often carries a negative connotation. Does the use of metrics sometimes cause resentment or a backlash on the part of those being measured?

You have to remember that most people have not been measured in the past. Consequently, they want to be certain they are being measured on a reasonable scale. People have to get used to the units of measure and, in their own experience, validate those measures. The general public right now accepts pounds and kilograms, but people have problems when you mention, say, lines of code or some other measure. They have heard that lines of code do not always work, so they try to discredit the measurement because they aren't ready to be measured yet.

How can that be overcome?

Basically, it takes some management skill. You have to convey the message that metrics is a tool that you want people to consider as a professional improvement in their jobs; a way for them to improve the quality of their code and become better from a systems analyst or programmer standpoint.

What are the primary yardsticks or measures used in software metrics?

They fall into two basic classes: size and complexity. From a size standpoint, executable lines of code — all the verbs in a given module — is one fairly good metric of size. As programs get larger and larger, with more than 200 to 300 executable lines of code, they become very multifunctional. There are all kinds of bad things that can occur in such large systems.

Most of the complexity measurements have evolved around decisions. Decisions are the things that send you down one path or another, and at every branch in the process you add a little complexity. Decisions are statements such as IF-THEN-ELSE, DO-WHILE or DO-UNTIL.

Once a development group begins using metrics, how long is it before improvements in program reliability or reduced maintenance become noticeable?

That is a function of finding a champion within a group who is willing to look at and use the tools. Once you get a champion, the champion then sells it within the work group to everyone else. That champion is the person who is willing to do a rigorous job of building a new system or taking an old program and doing preventive maintenance on it, taking out as much size and complexity as possible.

Given mankind's obsession with statistics, why has the use of metrics not really caught on?

Predominantly, because it has resided mainly in the laboratory environment. It has been done in big shops where you can collect all the necessary data and statistics to show that something is a valid metric. The research findings get published in things like the *IBM Systems Journal*, which not all people read. The other side of the coin is that management, for a long time, has not been concerned with quality; it has been concerned with getting a product out the door at a certain date. As long as there is a lack of concern about quality, there is no reason to invest in building these tools to aid and abet the programming task.

Does it require special training in metrics or certain management skills to implement metrics successfully?

It requires a lot of human factors skills. The society you are going into is not used to being measured. So, in general, it is going to see that as a threat. You have to also be a pretty good technician to get all the necessary information from the various sources and put it into a program that will do these measurements automatically.

Because some of the benefits may be further down the road, does that make it difficult to sell the metrics concept to management?

If you are sneaky, you sell it as a means of measuring productivity. Or if management is really hot on quality, you sell it as a means to measure that. If you start measuring, collecting this information and tying it into people hours, total dollar costs, total computer usage — creating some productivity statistics — management will buy off on it.

What are some common problems software organizations encounter when they first apply metrics?

The most common [problem] is that when you put in a tool like metrics,

See ARTHUR page 54

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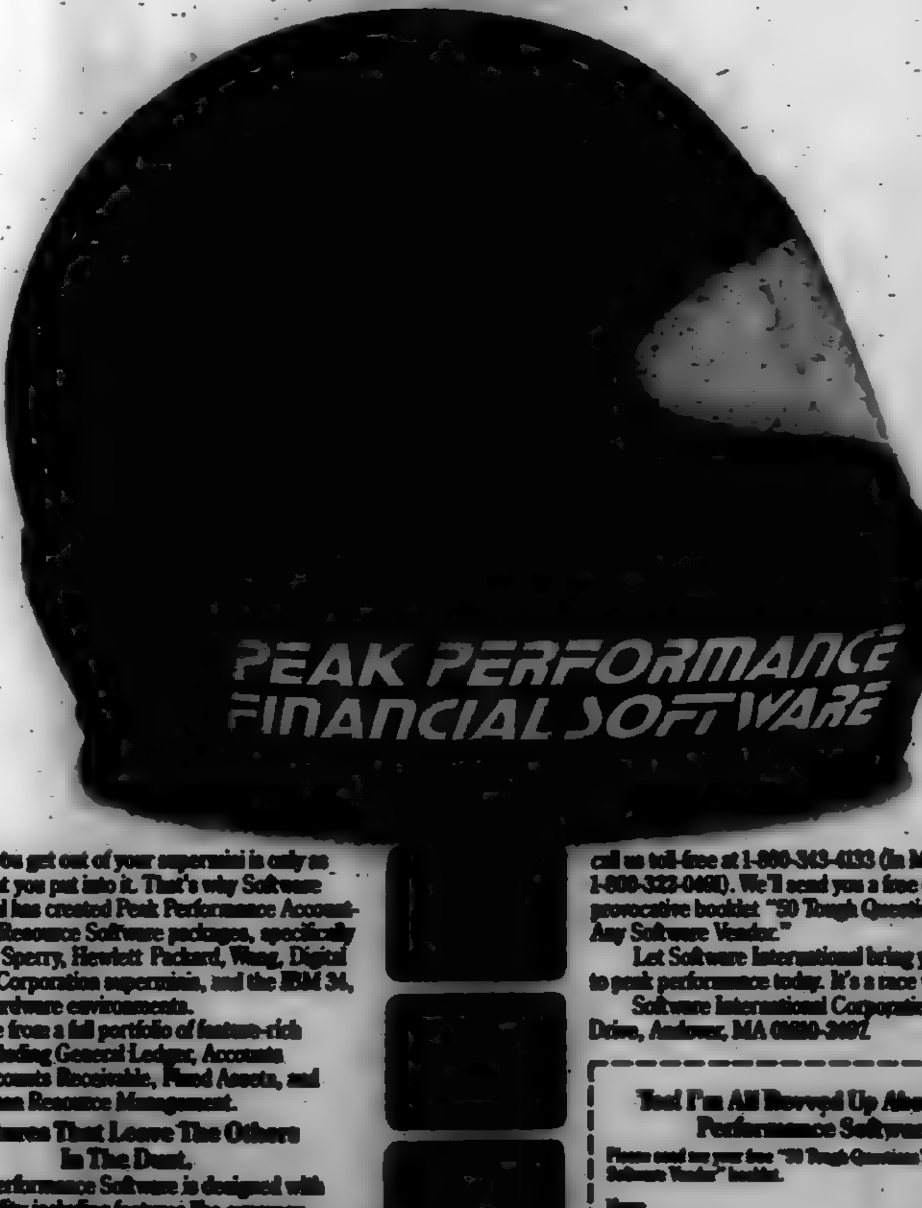

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SOFTWARE & SERVICES

ARTHUR

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people expect it to be perfect. But measurement is an inexact science. Your measuring tool is only as good as the current state of the art. People want exact tools, and this is not yet an exact science.

Is the focus of metrics primarily on improved quality or increased productivity?

It is on quality. If you can identify your quality problems and fix them, you are going to get significant productivity increases. The more quality problems you fix, the better off you will be. There is a cadre of programming gurus who have agreed that certain [commands] like GOTO cause problems later in maintenance. If GOTOs are causing 10% of your program logic problems, and you get rid of them, you will recover the costs of downtime and repair.

Will burgeoning maintenance costs eventually force management in most organizations to adopt the use of metrics?

I believe so.

Are the results of software measurement useful in helping DP managers explain the problems of quality and maintenance to senior management?

Absolutely. The DP manager will complain that he has to devote three or four people a month to maintaining one program. That is ridiculous. But the manager can never get the commitment from upper management to go in and do something about it. Management says, "Just keep it running; keep it alive."

With metrics, you can develop numbers and measures that quantify what is wrong with the program and explain to management that you are going to take out this or that or make it more modular. At the end, you can show that you succeeded in these goals and that now, say, only two people have to maintain the program. Management will see the gains and will begin to invest more in quality. Metrics can be a tool to quantify what is wrong and to show that you are succeeding at repairing it.

Are there currently adequate tools available in the marketplace to support the use of metrics, particularly the automation of it?

There are no metrics programs available to my knowledge. Most things today are experimental measurement tools built by larger organizations trying to get a handle on these things. I don't think anything has matured into being a product, but they are fairly easy to build in your own environment.

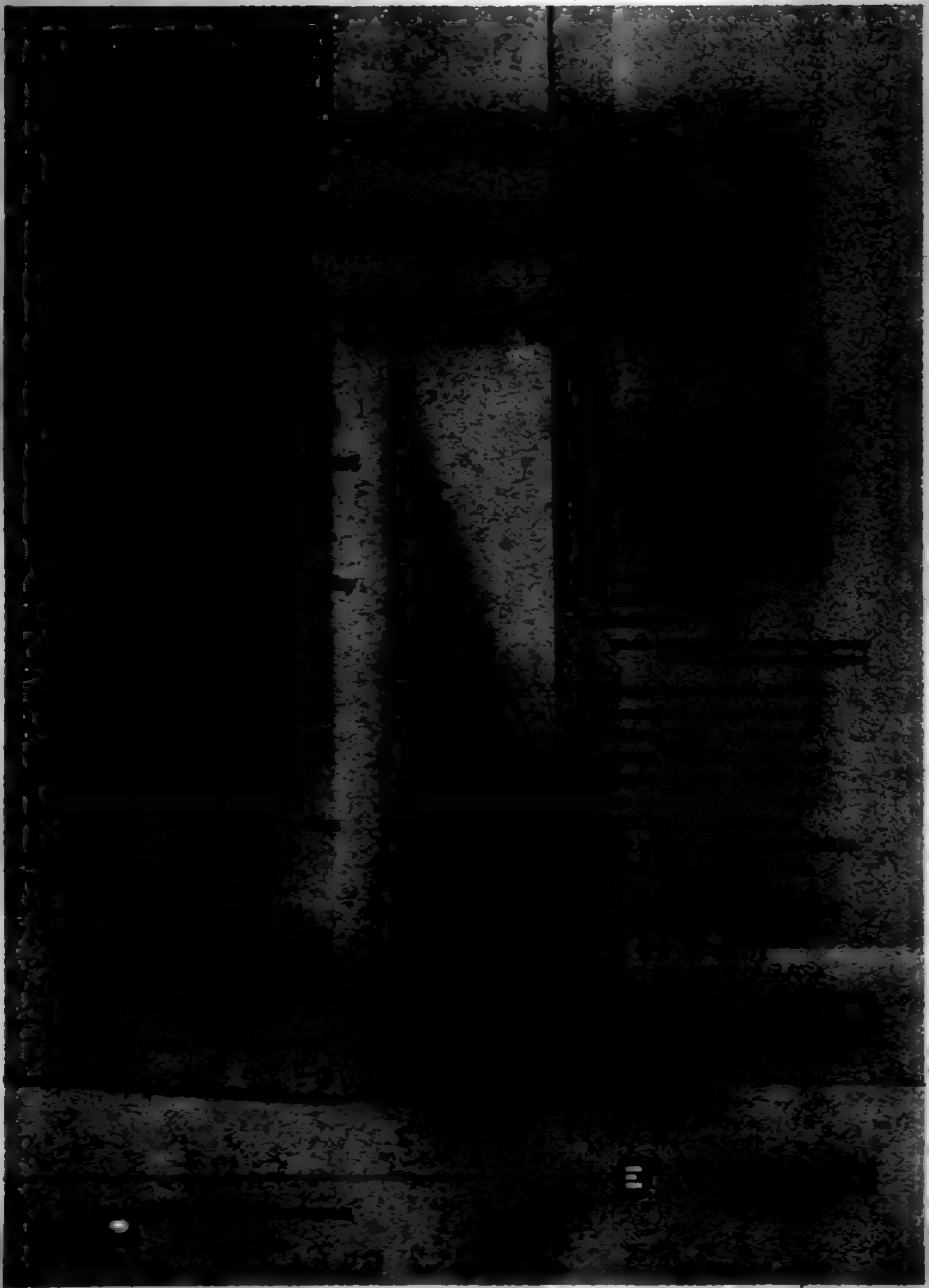
Does adherence to metrics and strict quality measurement take the art and creativity out of programming?

Not really. You discover that the super programmers — those who turn out the modular, maintainable, structured systems — have learned what the best programming style is. They are extremely creative people because they have found the best way to do something. Metrics allows you to identify what the super programmers do and translate that into training to bring other programmers quickly up to that level.

Are there any software development environments in which the use of metrics is not applicable?

Not that I know of.

"And this one has even been a guest host on the *Tonight Show*."



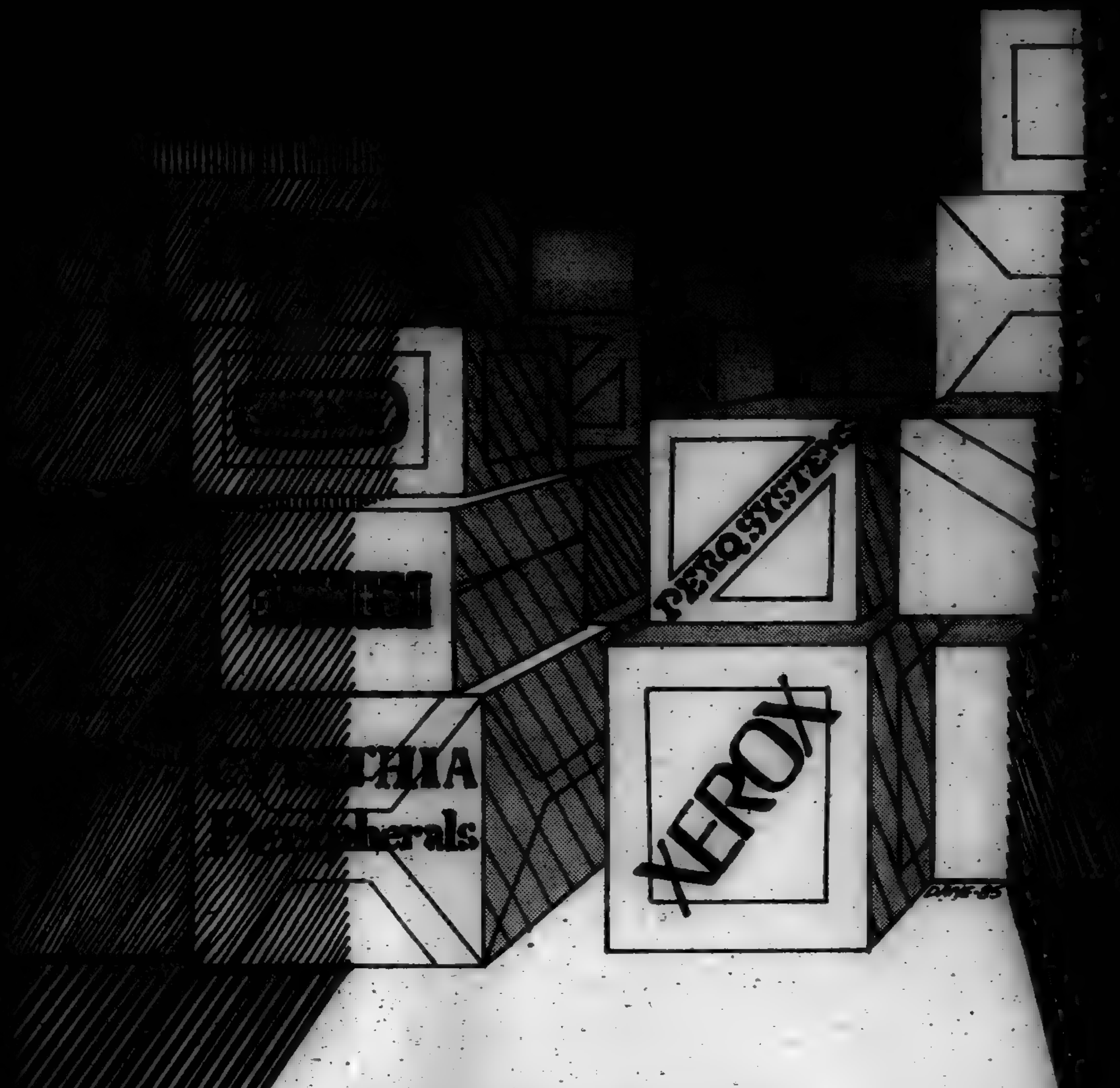


ILLUSTRATION BY [illegible]

In search of a printer

By Vincent Cavo

Now is a difficult time to shop for electronic page printers. The low end of this market is just evolving as a result of the recent introduction of low-cost print engines. As often occurs, the software to support new products lags somewhat behind. Consequently, some printer features or operational environments may not be supported initially, and there may be no standards.

The American National Standards Institute is now trying to establish some form of standardization for the laser printer industry. Eventually, this effort should simplify the selection of printers.

The best way for a user to survey the market is to proceed as follows:

- Develop an understanding of the equipment.
- Identify equipment sources.
- Establish a basis for comparison.
- Collect equipment specifications.
- Identify user requirements.
- Correlate user requirements and equipment capabilities.

In at least one instance I know of, the organization failed to examine the requirements of its users thoroughly enough. As a result, it had to get a second printer simply because the first did not support a particular character font. Buying the second printer (after three months of attempts to tailor the first one) proved more cost-effective than investing additional resources in upgrading the first.

In my search for a nonimpact printer that could be used as a peripheral, I considered primarily laser printers but also magnetic, ion and LED types. Each is built around a core that is essentially a paper photocopier engine.

The significant difference among these printers is the technique used to charge the surface of the photocopier's drum or belt prior to the application of toner or ink. Two common types of lasers used in the laser printers are gas (for example, helium-neon) and semiconductor diode. The latter type of laser is also utilized in fiber-optic communications.

Generally, each type of printer makes use of the electrostatic printing process, which in turn relies on the xerographic or dry-copy technique. In this process, fine particles of toner are deposited onto a metallic surface. The segments covered by the charged particles form an image of letters, numbers, lines or graphics. The images are bound to paper by a combination of heat and pressure as the paper comes into contact with the electrostatically sensitive drum or belt.

Laser printers have been commercially available for about 10 years. However, their cost prevented widespread use. Typically, high-end laser printers capable of printing 60 to 100 page/min. commanded price tags of several hundreds of thousands of dollars. Their speed, 10,000 to 20,000 line/min as compared with the few thousand lines per minute for conventional mechanical printers, makes them cost-effective in some applications and hence justifies their high price (for example, in the insurance industry). Recent technological advancements and new designs significantly reduce costs to the point where low-end laser printers, capable of printing five to 20 page/min, can be purchased for from $3,000 to $10,000.

Magnetic, ion and LED printers are recent entries into the marketplace and represent alternatives to the technique used to charge the printer's drum surface. Product offerings are limited, though, and their cost currently exceeds the cost of comparable laser-based printers. The proclaimed advantages are increased reliability and lower maintenance costs, primarily because of considerably fewer moving parts.

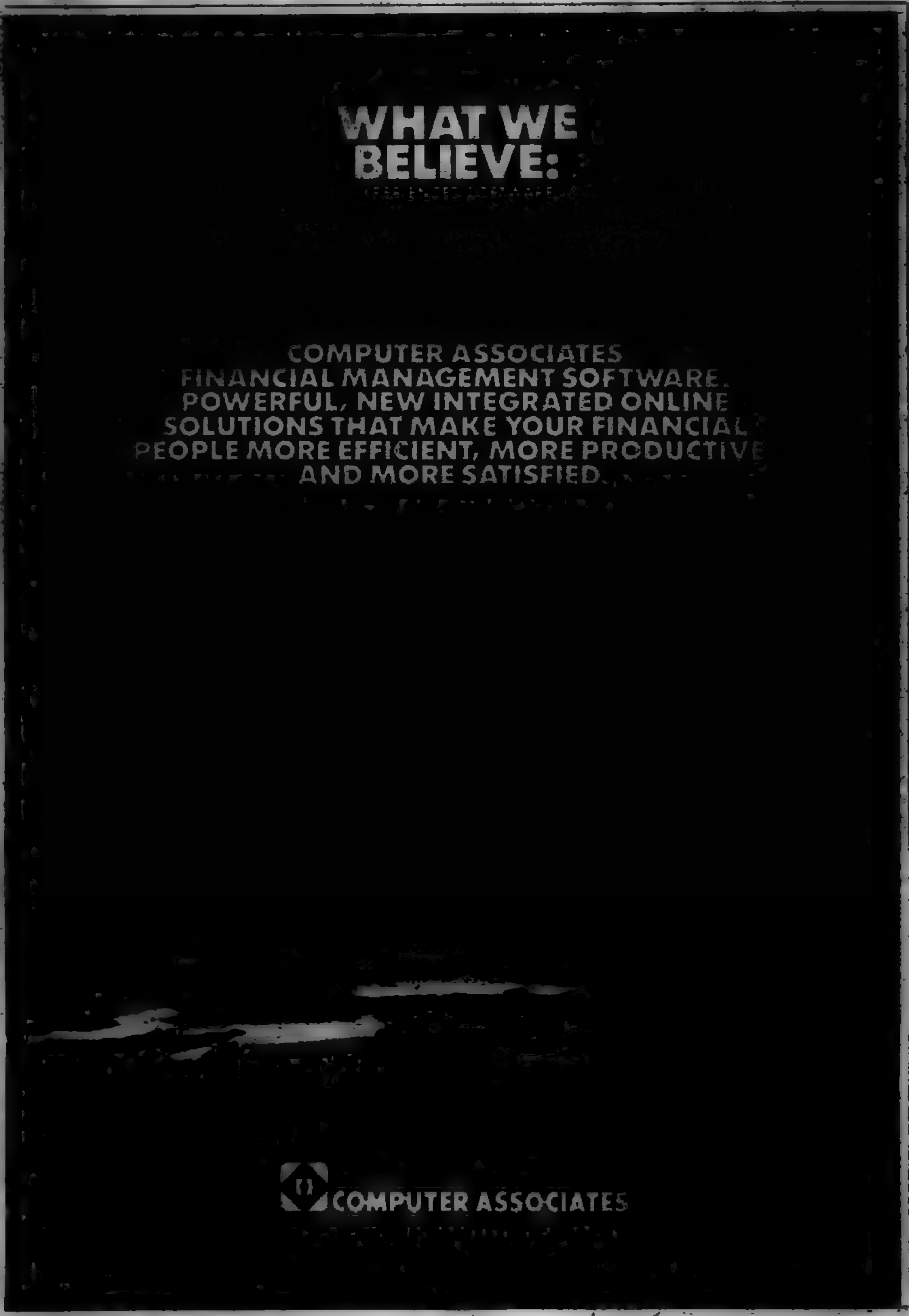
The dumb photocopier printer, lacking a local processor, relies on the host computer to fulfill any processing requirements the printer might have, such as the rasterization of output data. These printers rely heavily on the host computer and require more interaction with the host than do the intelligent printers.

On the other hand, intelligent photocopier printers have both a local processor and considerably more local memory (random-access memory, read-only memory, bit map, floppy disk and so on). The amount of local memory required depends upon whether or not a brute force approach is utilized, one bit for every dot or approximately 1.2M bytes for an 8½- by 11-in. page, or the utilization of sophisticated compression algorithms that may require only 20K to 30K bytes per page. Necessary processing is off-loaded from the host with the concomitant increase in throughput and/or capability and a resultant reduction in the host-printer interaction.

With both types of printers, host preprocessing will be required to support certain printer features or capabilities, such as graphics or the intermixing of text and graphics. This preprocessing is generally performed by special-purpose software resident on the host that must be acquired in order to use certain printer features. Often, the cost of this host-resident software may equal or exceed the cost of the printer itself.

How it works

Before the electrically sensitive unit is charged to represent the print images sent to the printer, the data must be converted to a raster form. Basically, this process involves the decomposition of all print elements into an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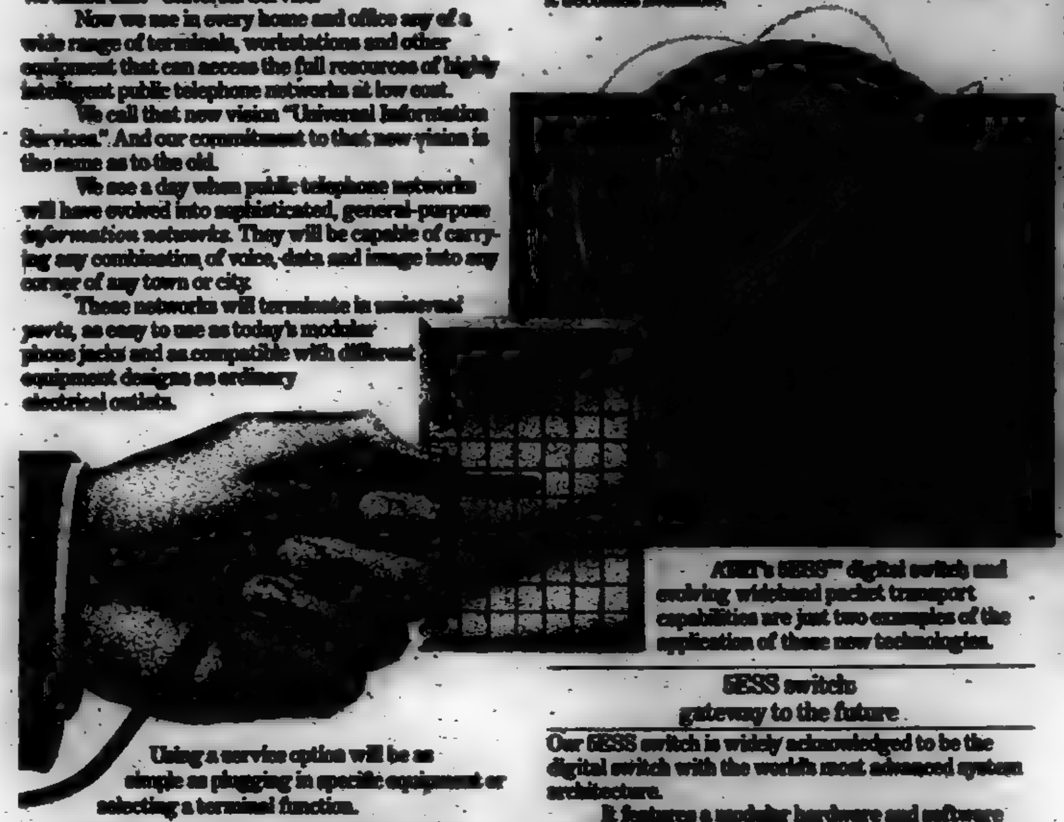

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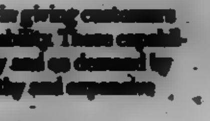

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[illegible]

ordered sequence of dots. A dot represents the basic unit or building block used in the construction of the print images by the printer-charging mechanism. This is analogous to a pixel in graphics, and often the two terms are interchanged.

The quality of the final image depends upon the size of the dot produced by the charging mechanism. For example, a typical photocopier printer today can generate 300 dot/in. with each dot occupying approximately 0.003 in. In comparison, the resolution or dot size for dot matrix printers ranges from 0.02 in. to .007 in. Printers are currently available in the marketplace, such as the Canon printer, which can achieve dot sizes of 0.002 in. Resolution of 700 to 800 dot/in. is needed to be considered typesetting quality. Currently under way are attempts to achieve typesetting quality.

Internally, each dot is represented by a single bit or binary digit that is independent of the dot size. Hence, once an image is rasterized, the quality of the final output depends on the printer dot resolution or dot/in. Conceptually, the rasterized image can be used as readily on a 300 dot/in. printer as on a 700 dot/in. printer, although the quality of the end product will be significantly different.

The charging mechanism imparts a charge by switching the beam off and on for all dots on line number one during a left to right scan parallel to the drum axis. Lines two through six are done in a similar manner and in sequential order. The image becomes obvious once the entire dot pattern is laid down.

For example, in a laser printer, the laser beam scans across the length, generally the drum axis of rotation, of the cylindrical printer drum imparting the necessary charges. The drum then advances forward by a given increment (for example, the dot resolution), and the entire drum length is again scanned and the proper charges applied.

This process of advancing the drum by a given increment and scanning the drum length is repeated until the entire drum is charged or the latent image generated. The charged areas attract the toner, which is then transferred to paper in a manner similar to a standard photocopier, revealing the latent image. The process is extremely rapid, being accomplished in approximately 1 to 2 msec on the low end and 100 microsec on the high end.

In a laser printer, scanning of the drum surface is accomplished by reflecting the laser beam off of a rotating polygonal set of mirrors. Each face of the rotating mirrors causes the laser beam to scan the entire drum length. The scans per second is equal to the number of mirror faces times the number of revolutions per second of the rotating mirrors. An LED printer accomplishes the scanning process by electrically switching the current to a stationary linear

Vendor	Representative product(s)	Approximate price	Pages/min
Corona Data Systems, Inc. 275 E. Hillcrest Drive Thousand Oaks, Calif. 91360	Corona Laser Printer (L)	$ 3,395	8
Cynthia Peripherals Corp. 766 Sanaleso Ave. Sunnyvale, Calif. 94086	Model MF6090 (M)	$50,000	90
Dataproducts Corp. 6200 Canoga, P.O. Box 746 Woodland Hills, Calif. 91365	Model MP24 (L)	$12,495	24
Delphax Systems 977 Pantera Drive Mississauga, Ont. Canada L4W2W6	Model S6000 (I)	$35,000	60
General Business Technology 1891 McGaw Ave Irvine, Calif. 92714	Model 6600XP (L) Model 6620XP (L) Model 6630XP (L)	$22,500 $15,600 $ 5,995	12 12 8
Hewlett-Packard Co. 3000 Hanover St. Palo Alto, Calif. 94304 or 11000 Wolfe Rd. Cupertino, Calif. 95014	Model 2687 (L) Model 2688A (L) Model 2686 (L)	$12,800 $25,950 $ 3,495	12 12 8
IBM Information Systems Group 900 King St. Rye Brook, N.Y. 95193	Model 3820 (L)	$29,900	20
Perq Systems Corp. 2600 Liberty Ave., Box 2600 Pittsburgh, Pa. 15230	PLP 10 (L)	$15,000	10
Royal Business Machines 500 Day Hill Road Windsor, Conn. 06095	Royal 2800 (L) Royal 8800 (E)	$19,500 $73,750	20 60
Talaris Systems, Inc. 7840 Herschel Ave. P.O. Box 8309 La Jolla, Calif. 92038	Model 800 (L) Model 1200 (L) Model 2400 (L)	$ 9,990 $24,990 $34,990	8 12 26

E - LED printer
I - Ion printer
L - Laser printer
M - Magnetic printer

Figure 1. Some printer vendors

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	GPT Page Printer 1	Cynthia EP6000	Dataproducts LZ 2600	Delphax Systems S6000	Hewlett-Packard Laserjet 2686A	Quality Micro Systems Lasergrafix 800	Quality Micro Systems Lasergrafix 2400	Talaris Systems 800
Approximate price	[illegible]	$60,000	[illegible]	$35,000 (OEM)	[illegible]	$9,995	$35,000	[illegible]
Fonts								
Style (type)	[illegible]	27	[illegible]	8	[illegible]	300 SFD	300 SFD	[illegible]
Max. design size (points)	[illegible]	96	[illegible]	15	[illegible]	36 SFD	36 SFD	[illegible]
Magnification	[illegible]	No	[illegible]	No	[illegible]	SFD	SFD	[illegible]
Total No.	[illegible]	27	[illegible]	2	[illegible]	SFD	SFD	[illegible]
No. downloaded	[illegible]	16	[illegible]	Yes(FO)	[illegible]	Yes	Yes	[illegible]
No. in firmware (ROM)	[illegible]	4 (8 max.)	[illegible]	2	[illegible]	12 +(O)	12 +(O)	[illegible]
No. of font/line	[illegible]	24	[illegible]	2	[illegible]	SFD	SFD	[illegible]
No. of font/page	[illegible]	24	[illegible]	2	[illegible]	SFD	SFD	[illegible]
Variable width	[illegible]	Yes	[illegible]	Yes	[illegible]	Yes	Yes	[illegible]
Generation	[illegible]	Yes	[illegible]	No	[illegible]	Yes	Yes	[illegible]
Forms capability	[illegible]	Yes(O)	[illegible]	Yes(O)	[illegible]	Yes(DL)	Yes(DL)	[illegible]
Host interfaces								
Software (names)								
Text processing	[illegible]	No	[illegible]	No	[illegible]	Q,T,X	Q,T,X	[illegible]
Graphics output	[illegible]	No	[illegible]	No	[illegible]	R	R	[illegible]
Other	[illegible]	No	[illegible]	No	[illegible]	C,S,T,P	C,S,T,P	[illegible]
Hardware	[illegible]	N/A	[illegible]	N/A	[illegible]	SFD	SFD	[illegible]
Operating systems	[illegible]	N/A	[illegible]	N/A	[illegible]	A,B	A,B	[illegible]
Controller								
Emulation	[illegible]	No	[illegible]	I (O)	[illegible]	C,T,U,V	C,T,U,V	[illegible]
Interface	[illegible]	G,M	[illegible]	G,B+(O)	[illegible]	R,P,G+(O)	R,P,G+(O)	[illegible]
Processor	[illegible]	NS 8031	[illegible]	LSI-11	[illegible]	MC68000	MC68000	[illegible]
Local memory	[illegible]	D,T(O)	[illegible]	B,T,W	[illegible]	No	D	[illegible]
RAM (char. image)	[illegible]	12K bytes	[illegible]	.5M byte	[illegible]	2M bytes	2M bytes	[illegible]
ROM (fonts)	[illegible]	32K bytes	[illegible]	64K bytes	[illegible]	.5M bytes	.5M bytes	[illegible]
Bit map (graphics)	[illegible]	No	[illegible]	1M byte+(O)	[illegible]	Yes	Yes	[illegible]
Job output stacker	[illegible]	Yes	[illegible]	Yes(O)	[illegible]	No	Yes	[illegible]
Engine output								
Page/min	[illegible]	90	[illegible]	60	[illegible]	8	24	[illegible]
Page/mo (max.)	[illegible]	1M to 1.5M	[illegible]	.1M to 1.5M	[illegible]	5,000	50,000	[illegible]
No. page/drum belt	[illegible]	10M	[illegible]	1M	[illegible]	N/A	50,000	[illegible]
Print engine	[illegible]	N/A	[illegible]	A2400	[illegible]	LBP-CX	XP2400	[illegible]
Resolution (dot/in.)	[illegible]	240	[illegible]	240	[illegible]	300	300	[illegible]

Figure 2. This small sample of nonimpact printers illustrates the range in print engines and prices.

array of diodes. On the other hand, magnetic printers employ a row of perpendicular recording heads to magnetize areas of the drum surface, thereby simulating the laser scanning process.

Pros, cons

Among the advantages of the electronic page printers, as compared with the more conventional mechanical printers, are high print speed; high performance/price ratio, the ability to change typefaces automatically, graphics capability and typesetting. They offer a wide selection of fonts; handle forms, logos and electronic signatures; can intermix text and graphics; operate quietly (generally less than 55 dba); and produce high-quality output (at high resolutions). The disadvantages include the limit to the number of pages per month of output (product dependent), a potential increase in maintenance costs and reliability comparable to regular photocopiers.

Equipment suppliers can be identified by referencing periodical indexes such as the *Science and Technology Index*. For disciplines in which rapid technological advancements occur, it becomes necessary to survey the marketplace frequently. It is predicted that there will be at least 50 different print engines by the end of 1985.

My survey of the marketplace performed in November 1984 turned up a total of 22 vendors of low-end, nonimpact printers (five to 20 page/min). The vendor list is shown in Figure 1. (IBM, which introduced its 3820 laser printer this past February, has been added to the list.) Suppliers of magnetic and ion printers are included in the list, regardless of print speed, because they represent newly emerging technologies of which the reader should be aware. In the LED area, Sanyo Business Systems Corp. of Moonachie, N.J., is reportedly developing a printer to be priced at approximately $3,100 that will output 20 page/min.

Some of these printers are achieving speeds approaching those of laser printers that cost five to 10 times more. For example, the Delphax Systems S6000 ion printer prints 60 page/min and is available to OEMs at a cost of approximately $35,000. Xerox Corp. recently acquired 50% of Delphax Systems. For the most part, the vendors listed here supply the necessary hardware or software interfaces to enable utilization of the printers and do not actually manufacture the print engine.

> ”
>
> *Hardware and operating system dependencies soon arise once the user attempts to take advantage of some features such as graphics or multiple page fonts.*

Following is a list of the basic print engine manufacturers: Cynthia Peripheral Corp., Delphax, Honeywell, Inc., IBM, Uppster and Xerox.

In West Germany, there is Siemens Corp. In Japan, the manufacturers include Canon, Fujitsu Ltd., Hitachi Ltd., Minolta, Panasonic Co., Ricoh and Toshiba, Ltd.

The companies who develop the interfaces or controllers for the print engines include Dataproducts Corp., Electronic Machine Corp., Imagen Corp., Personal Computer Products, Inc. and Rasterization, Inc.

Some companies that integrate the controllers with the print engines are Imagen, Quality Micro Systems, Inc. and Office Automation Systems, Inc.

Vendors often give different names to different features. Comparing printers therefore requires distinguishing which features are the same. One such term is "proportional spacing," which is also expressed as "variable width fonts."

Some printers can digitize a document locally for transmission back to and storage on the host computer by scanning a document placed on the glass window. This feature is extremely handy in creating new fonts for logos or electronic signatures and so on, but its ultimate use is left to the user's imagination. Generally, for a printer that does not support this feature, a separate unit can be purchased and interfaced to it.

A local copy capability is an integral part of some printers, enabling them to be used as a standard copier. Another attractive feature is the ability to distinguish between the output of several different tasks. Job separation is beneficial in a multiuser environment.

Job separation is accomplished by an offset stacker or an output stacker or collator. An offset stacker separates each job's output by shifting the output a few inches left or right, while the output stacker separates material by utilizing separate distinct bins. For printers without this capability, job separation can be accomplished by the software through the use of a title page separator.

These printers typically can accommodate standard and legal paper sizes, ranging in weight from 16 to 24 lb. Some can also handle other paper sizes such as European, ledger, fanfold and the A and B series sizes. Multiple input trays of varying capacity may be provided as optional or standard equipment. They permit concurrent use of several paper sizes or may simply increase the machine's input tray capacity. Selection of a given input paper tray on some printers can be performed under software program control.

Another desirable feature, provided via a manual-feed capability, is the ability to handle nonstandard paper types, such as envelopes, transparencies, post cards, business cards and labels.

For the most part, the printers can be interfaced to any hardware, provided that the proper interface is available — for example, an RS-232 or a Centronics Data Computer Corp. parallel interface. However, the existence of these interfaces only permits the printer to be used in a manner analogous to a conventional printer.

Points to watch

Hardware and operating system dependencies soon arise once the user attempts to use some printer features such as graphics or multiple page fonts. At this point, software, which is necessary in order to utilize these features, enters the picture with its accompanying hardware and operating system dependencies. The availability of software to drive these printers becomes a critical issue. Without it, some printer features cannot be used.

Another item that needs to be clarified is printer resolution. Even though a printer may be capable of achieving a resolution of 300 dot/in., it may not be capable of maintaining that resolution for an entire page of output. This deficiency generally results from the lack of local memory to bit-map an entire page, say 8½ by 11 inches.

For example, the Hewlett-Packard Co. Laserjet 2686A has only 59K bytes of local random-access memory, which when used for full-page graphics can only achieve resolutions of 75 dot/in.

In Figure 2 (on ID/5), optional printer features explicitly identified by the vendor are labeled as such. However, for the sake of brevity, price is not listed. The price specified for the printers does not include discounts or any optional features. In order to use all of the printer features, such as a graphics capability, software must be acquired from the printer vendor or a third-party software firm (see Figure 3).

The cost of the software can add substantially to the cost of the printer. Depending on the application, the cost may exceed the printer price.

Some print engines have a limited life with respect to the number of output pages, after which the entire print engine must be replaced. Since several different levels of maintenance may be available, it is important that the buyer be aware of what parts are covered within a maintenance agreement.

Printers are generally offered as a complete package, except sometimes for additional fonts or special interfaces. For example, in order to support a user's graphics requirements, it may be necessary to purchase an optional controller or additional host software.

Certain printer features may not have the software to support them right now. For example, a printer with the capability to perform graphics or intermix text and graphics on a page of output may not have the required software for the given environment (for example, Gould, Inc.'s Concept 32/6705 running Unix BSD 4.2).

In the course of reaching a purchase decision, trade-offs and compromises inevitably occur.

About the author

Vincent Cavo is a programmer/analyst for the State University of New York College of Technology in Utica.

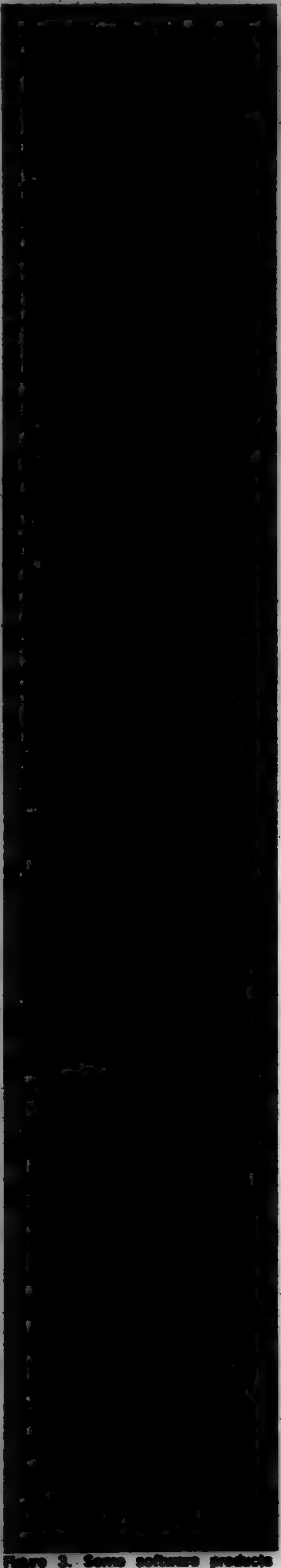
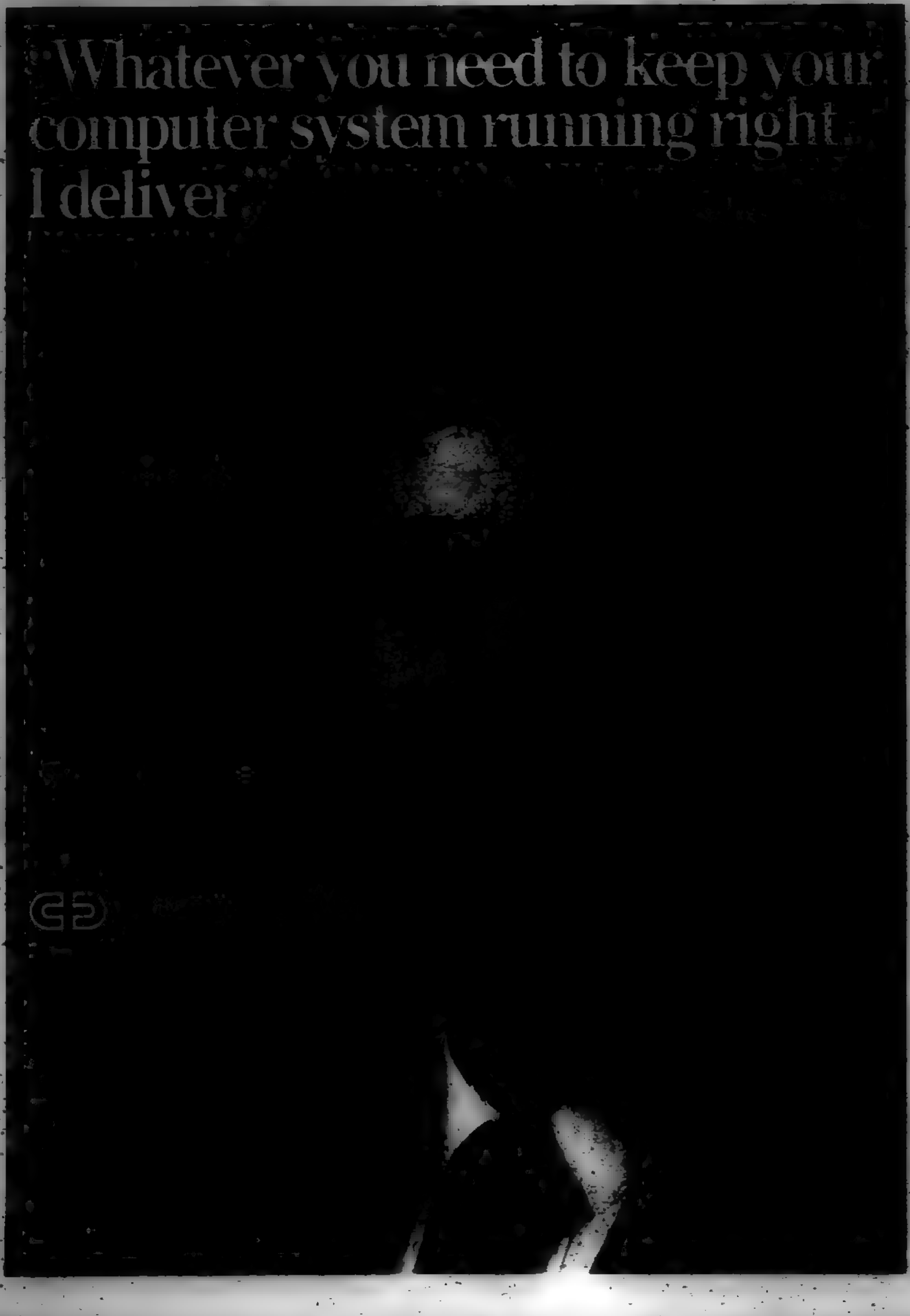


Figure 3. Some software products and vendors



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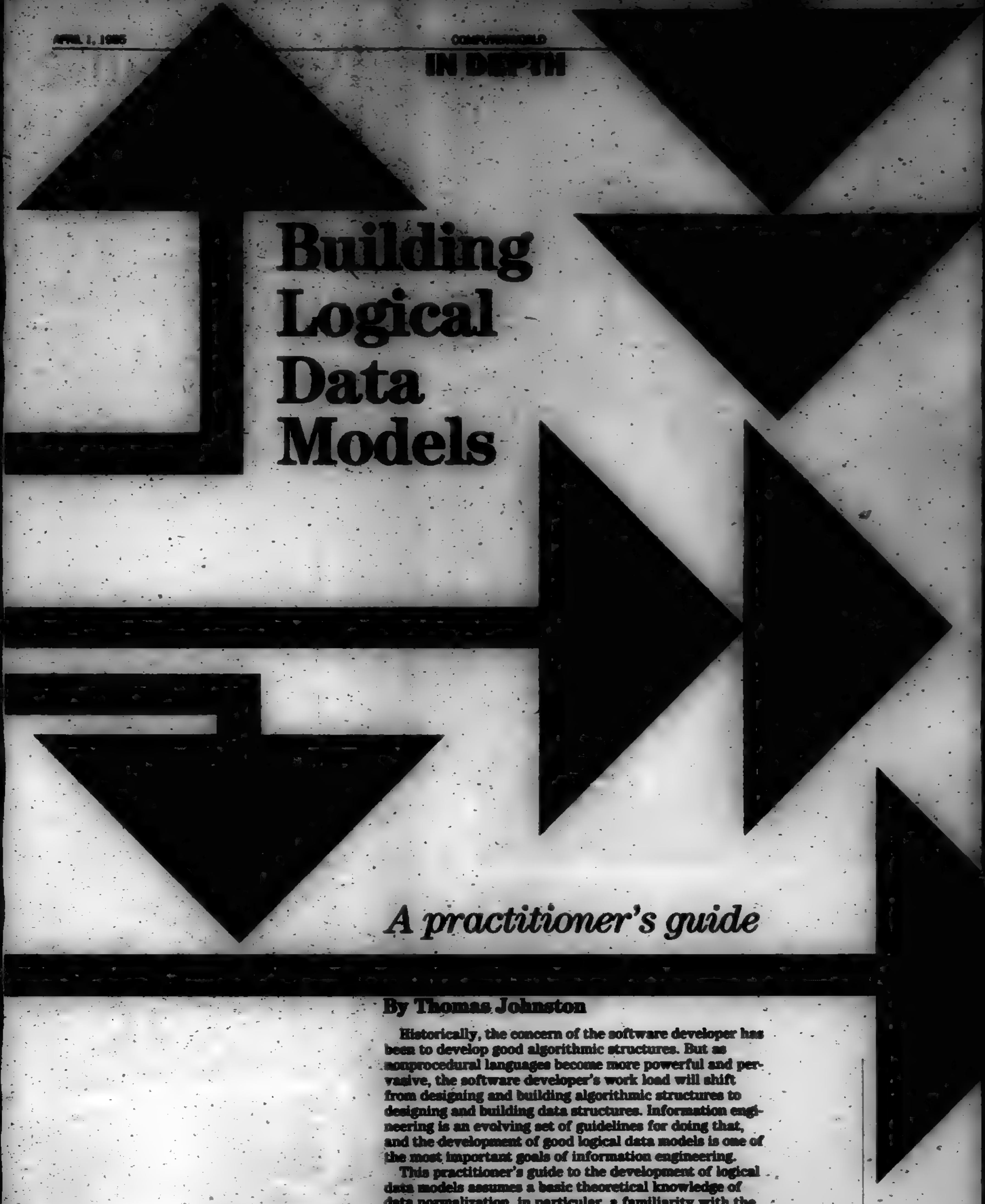


Building Logical Data Models

A practitioner's guide

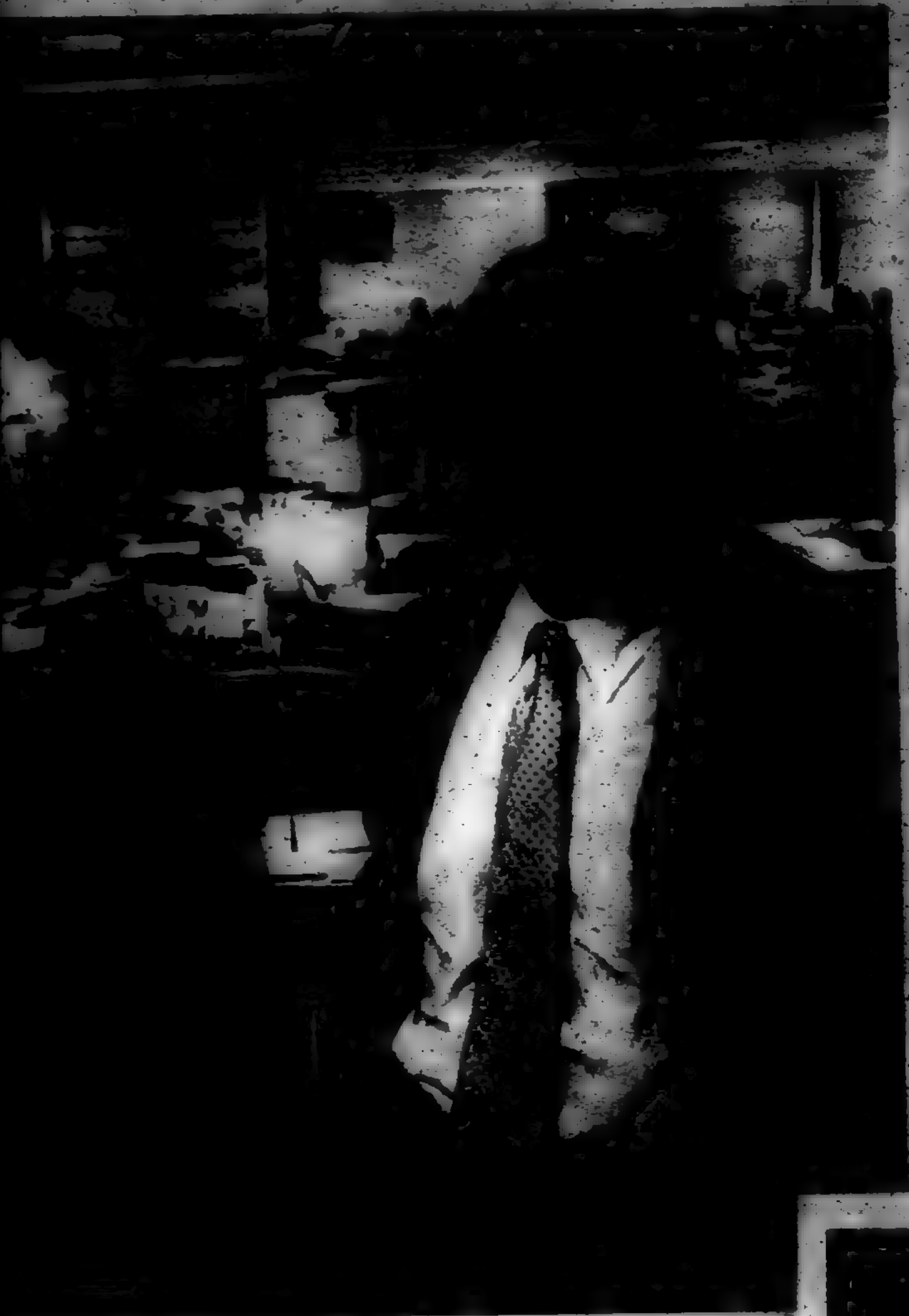
By Thomas Johnston

Historically, the concern of the software developer has been to develop good algorithmic structures. But as nonprocedural languages become more powerful and pervasive, the software developer's work load will shift from designing and building algorithmic structures to designing and building data structures. Information engineering is an evolving set of guidelines for doing that, and the development of good logical data models is one of the most important goals of information engineering.

This practitioner's guide to the development of logical data models assumes a basic theoretical knowledge of data normalization, in particular, a familiarity with the first three normal forms and the use of foreign keys to implement them in a relational framework.

A logical data model, specifically, is:

- A data dictionary of well-defined and well-named data elements, containing no homonyms or synonyms. Each data element means one thing, and no two data elements mean the same thing.
- A set of data groups in third normal form, with relationships implemented by propagating primary



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keys as foreign keys in related data groups.

- A schematic of these data groups, based on the Bachman convention of using "—>" to represent a 1:1 and "—>>" to represent a 1:M relationship.
- A method for assessing the adequacy of logical data models by proofing them against user views of the application being developed.

The use of foreign keys is a hallmark of relational data base management systems (DBMS) and one reason they appear so natural to the user. There are no relationships implemented with hidden machinery (external pointers, internal pointer segments) whose workings are understood only by technicians. It is also the principal reason they are so flexible; any future request for data that could logically be met according to the rules of the enterprise can be accommodated by relational cut-and-paste operations — without the need for modifications to the machinery.

In relational DBMS, these are the relationships among data groups and the way foreign keys implement them:

- 1:1 relationships implemented by propagating the primary keys of the "from" data groups as foreign keys in the "to" data groups, enforcing the rule that the foreign key data elements can have no duplicate values.
- 1:M relationships implemented by propagating the primary keys of the "from" data groups as foreign keys in the "to" data groups, with duplicates permitted in the foreign key data elements.
- M:M relationships implemented as 1:M relationships with intersection data groups whose keys are made up of the primary keys of the intersecting data groups. Duplicates are permitted in each component of the intersection data group primary keys, the components being foreign keys of the intersecting data groups.

The following steps are based on actual experience in developing logical data models. Emphasis is given to the problems that may be encountered in trying to follow them.

Step 1: Enter a representative set of user views into text editor files.

If master files of a relevant system are available, the analyst should use them as the basis for constructing the logical data model. They are likely to be more comprehensive (to contain more of the data elements that belong in the model) than any set of reports or input transactions. And they are a manageably small set to work with, usually on the order of one or two dozen discrete files. Any comparably comprehensive set of reports, screens, input transactions and so on would be several times as large. In this approach, the term "user view" should be taken to refer to any combination of data that occurs within the system, so that programs, for example, are "users" whose files are user views.

Figure 1 shows some of the master

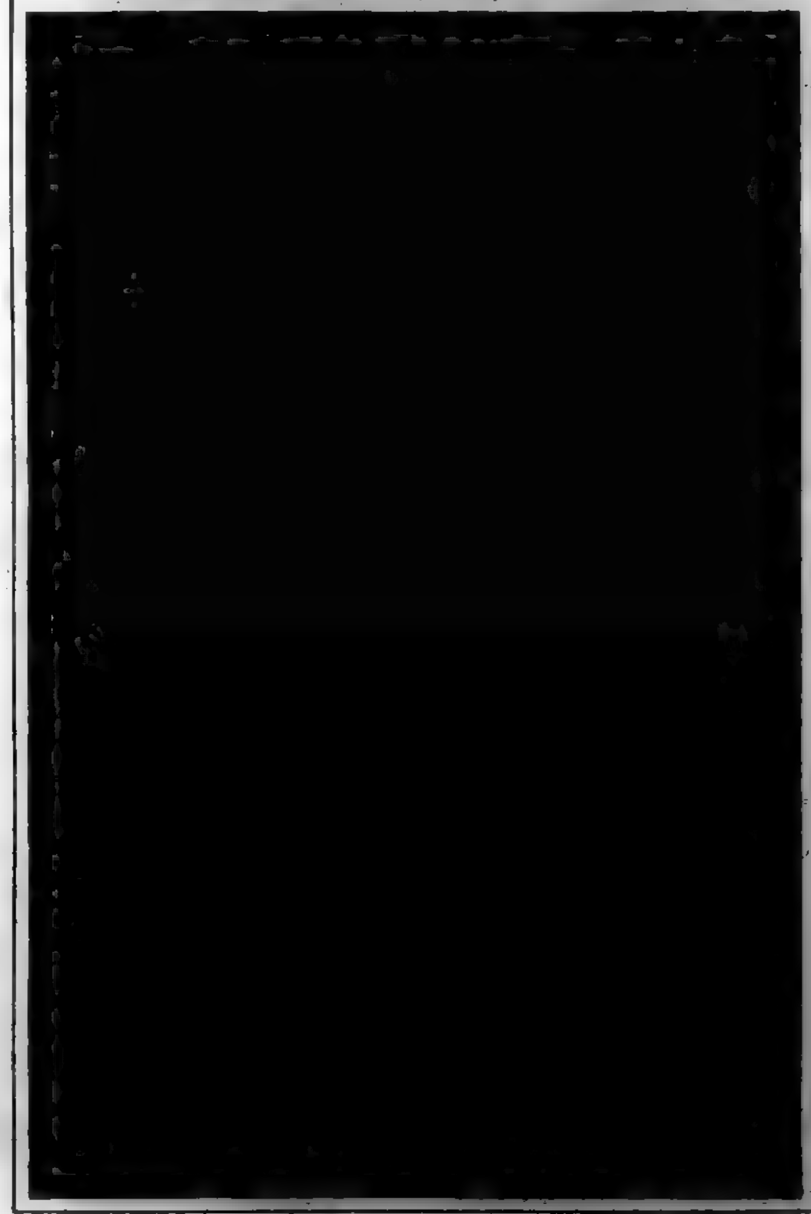

Figure 1. Master files of source systems

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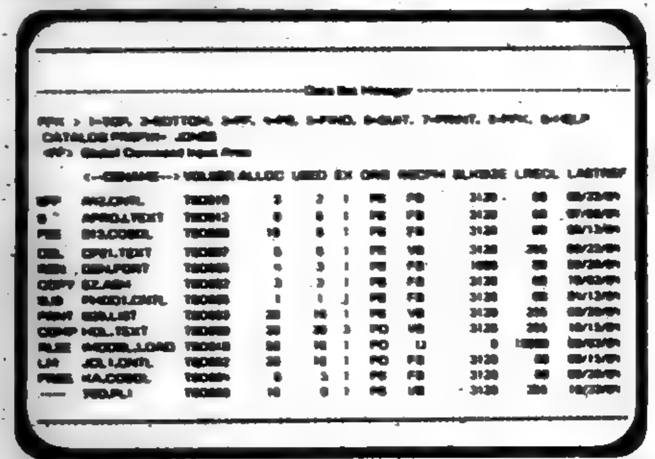

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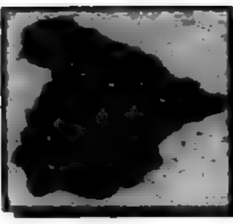

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MAI Basic Four, 14101 Myford Road, Tustin, California 92680 • Tel: (714) 731-5100 • Telex: 4720187 files contained in a subset of an accounts receivable system and some of the data elements in those master files. The numbers on the left make it possible to track intermediate and final products back to the original source system data elements and data groups; they are an audit trail.

Potential problems: The entire data base design effort can be derailed at the outset if the analyst does not begin with a manageably small set of views. Vendors of data base design aids such as Data Designer advocate development of logical data models by synthesizing user views. Each view is normalized, bubble-charted and entered into the computer; the design aid then synthesizes the views into a preliminary data model.

What is wrong with this approach is that until the analyst has a thorough understanding of the meaning of each data element, his bubble charts will not be accurate. The kinds of mistakes made in initial bubble charts of views are the following:

- Foreign key occurrences may not be identified initially, because the same data element will have quite different names on different reports. It takes considerable knowledge of the application and the subject area before these synonyms are seen to be different names for a single data element. Consequently, in initial bubble charts, synonyms may abound; this means that foreign key relationships may be overlooked.
- Spurious data groups may be created initially. Often, the analyst makes mistakes in bubble-charting reports that contain detail lines following a header group. He will chart detail lines as single data groups and assume that their key is among the data elements farthest to the left on the line. But often, detail lines are assembled from multiple data groups, and elements from the same data groups may appear in both header and detail areas on reports. Finally, primary keys sometimes do appear toward the right on the printed page.

Step 2: Scrub out the implementation-specific data elements, leaving only those that would be found in any adequate system of its type.

This step is necessary when the logical data model is being constructed bottom-up from one or more existing applications. The advantage of bottom-up construction is that the resultant model is less likely to be overly simplistic; the dangers of reflecting undesirable idiosyncrasies of an individual system are minimized by the normalization process itself.

They can be further minimized by starting from two relevant systems and also by combining bottom-up synthesis with top-down decomposition of the fundamental entities of concern — using such methodologies as entity-relationship analysis (Chen) or Business Systems Planning data decomposition (IBM).

Potential problems: Scrubbing the implementation-specific data elements is not as straightforward as it sounds. For example, while it is pretty obvious that batch control totals or internal switches controlling the traversal of menu trees should be scrubbed, what should be said about a switch indicating that a general ledger extract has been made? Or a switch preventing the system from running after Report A unless Report B has also been run?

No matter what heuristic rules are developed for scrubbing, it ultimately gets down to semantics and application knowledge — to knowing what data elements mean, what those data elements do and, finally, what the application should do for the end user. However, given that knowledge, this step can be interpreted to mean keeping data elements that fall into one of the following two categories:

- A data element presented to the end user (whether on a screen, a report, a query or the like) that he might reasonably be expected to find helpful in managing a company's receivables (in the case of this accounts receivable example).
- A data element not presented to the end user but that controls a decision that any adequate system of its type would have to make.

In this case, the former would include such obvious data elements as customer number, customer balances and various subtotals and totals on balances. It would exclude batch control totals, transaction error codes and messages and other performance-monitoring data elements not specific to accounts receivable.

The latter would include switches for clearing and rolling totals at period-end, creating file extracts to feed general ledger and sales analysis and an open-item vs. balance-forward customer type code. It would exclude restart and recovery flags and switches controlling the sequence of reports, provided the sequence would not be required of any adequate accounts receivable system.

Step 3: Find the native and foreign key occurrences of primary key data elements and give them the same name as the key data element itself. Name and define the relationships that the foreign key occurrences implement.

Figure 2 shows the results of this step, in which foreign keys have been identified and named. The relationships that have been annotated are those implemented by means of foreign keys that occur as nonkey attributes. Relationships implemented by foreign keys that occur as primary keys are generally perspicuous and so have not been annotated. (The data dictionary is being populated as data elements are named and defined, but is not shown here.)

Potential problems: Because the different foreign key occurrences of a data element implement different relationships but the name of the data element remains the same,

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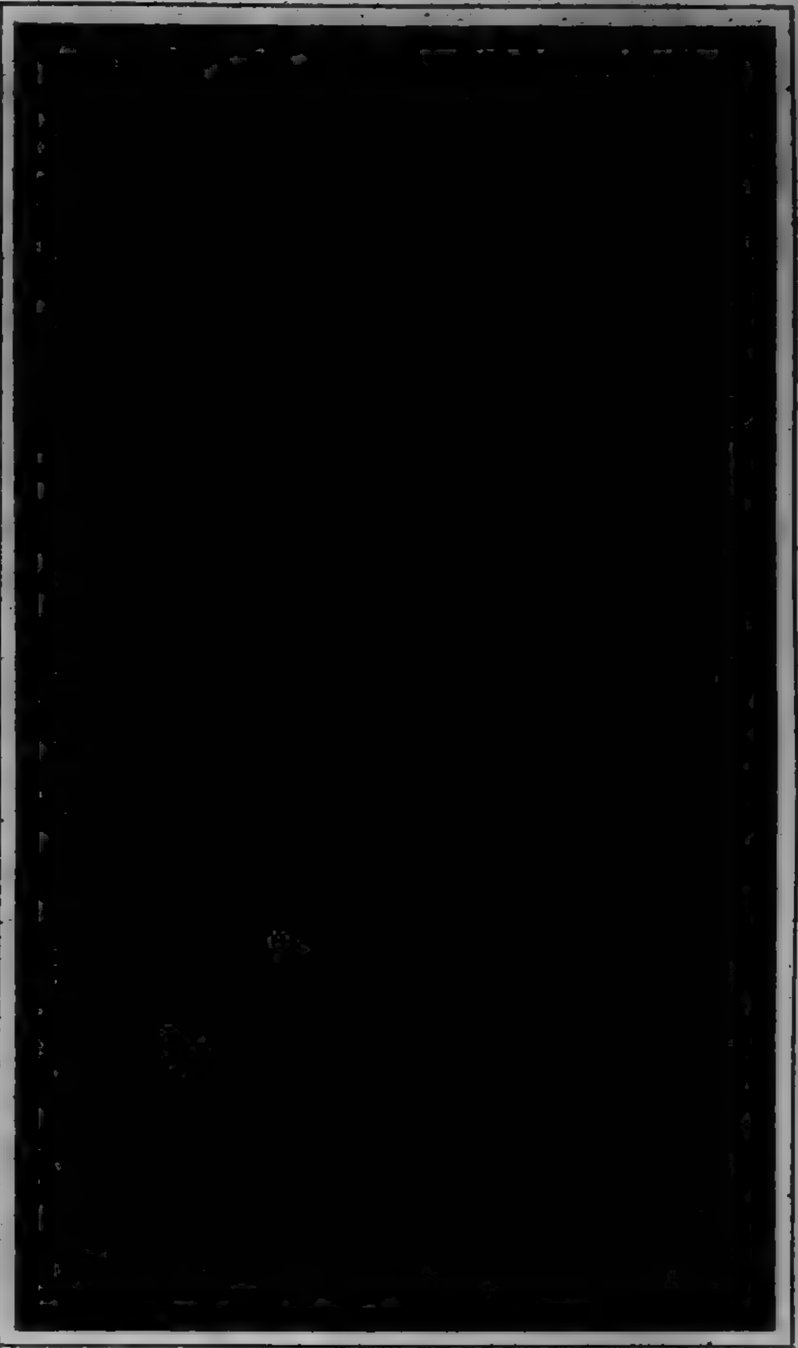

Figure 2. Foreign keys and relationships

those different relationships must be named and defined. For example, ACCT-ID always points back to the Chart of Accounts Data Group, where it is the key. But in one data group, it may represent a corporate entity total of sales tax, while in another it may represent a "bucket" for the amounts on invoice line items.

Until the analyst knows which data elements are going to be primary keys, he cannot identify their foreign key occurrences and name those occurrences correctly. This situation requires him to normalize before he names, so that he will know which data elements are keys.

For example, if he did not know that a certain fiscal date was going to be the primary key for the accounting-period data group, he would give different names to its different occurrences (he would create synonyms). The relationship of the accounting-period data group to other data groups would, therefore, fail to be made.

On the other hand, the analyst cannot normalize a mass of data elements that likely contains both homonyms and synonyms; it is a scrubbed set of data elements that should be normalized. He must name before he normalizes. As to synonyms, if a single data element is called by different names on four different reports, it will appear as four different elements in the data model.

If several of its occurrences are thought to be key data elements, it will lead to the creation of spurious data groups. All occurrences of a single data element must be identified and given the one name assigned to that data element.

As to homonyms, no homonym can be fully functionally dependent on any primary key, unless by accident the two (or more) semantically distinct elements it represents both happen to be dependent on the same key. The two or more data elements it combines should be separately defined and named and each put into its appropriate data group.

The solution to this chicken-or-egg problem is, unremarkably enough, that neither naming nor normalizing comes first. But rather than trying to name everything all at once, the analyst should concentrate on the structural elements, that is, the keys that distinguish data groups from one another and that, as foreign keys and intersection data group keys, relate data groups to one another.

Step 4: Name and define all remaining (nonkey) data elements. Put each in the data group that has

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Figure 3. Schematic of the logical data model

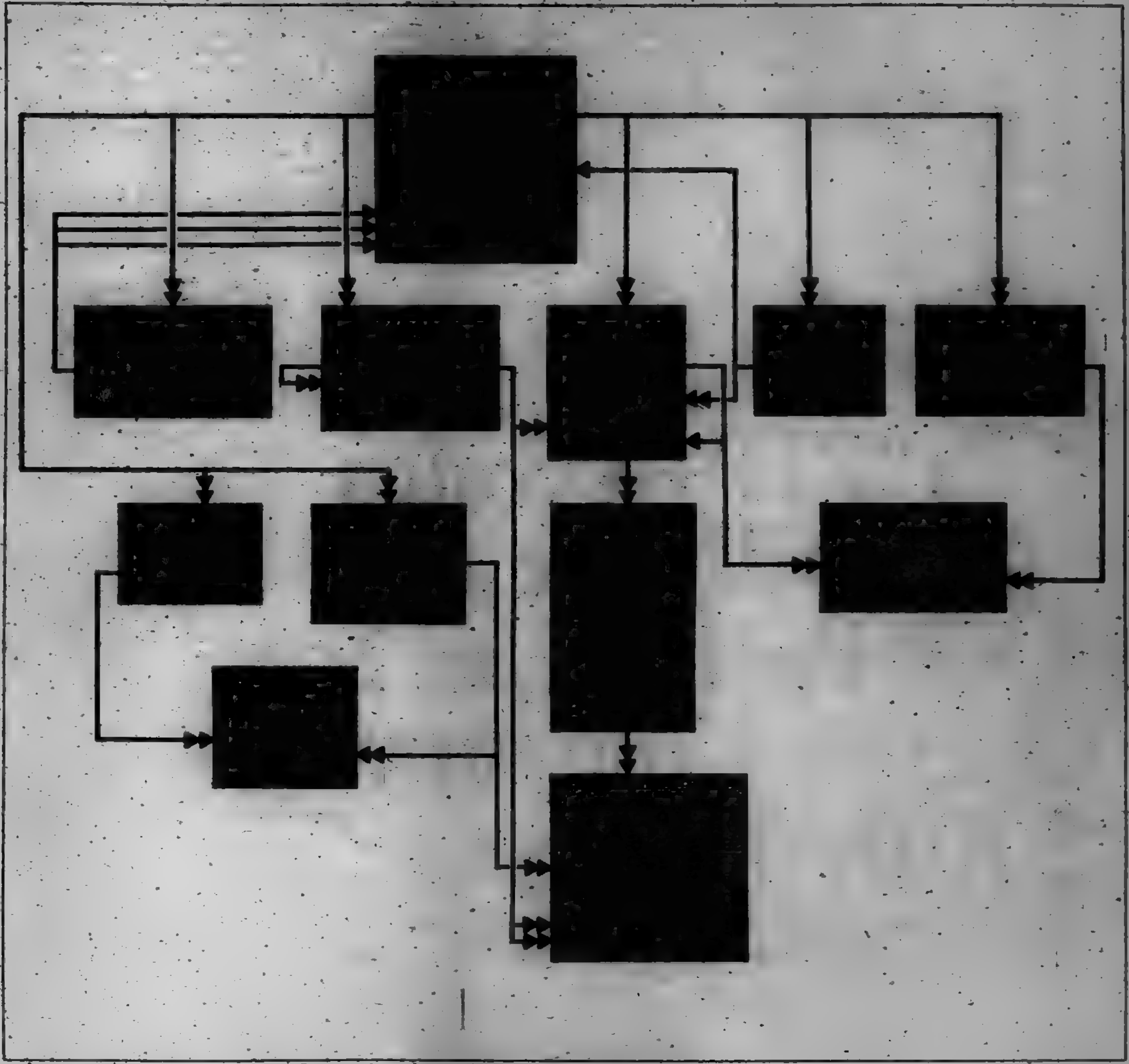

Figure 4. Logical data model diagram

the primary key upon which it is fully functionally dependent. Create new data groups where necessary to ensure that all data groups in the logical data model are in third normal form.

The next task is to assign each nonkey data element to the data group whose primary key it is fully functionally dependent upon, creating new data groups where necessary to preserve third normal form. This step is almost as straightforward as textbooks make it seem. Assuming that the rules defining the first three normal forms are understood, what is needed to make this step work is simply a set of data elements whose definitions are understood by the analyst. Figure 3 shows the results of this step — a complete set of logical schemata for the subject area being normalized.

Potential problems: Most of the homonyms and synonyms should have been weeded out by this point, but a few may remain. Remaining homonyms are likely to appear as data elements that seem to belong in more than one data group; if this situation cannot be resolved, then there are two meaning units ("morphemes," to linguists) combined under one name, which should be split apart and named separately. If this is done correctly, each should then go easily into its appropriate data group.

Remaining synonyms are likely to manifest themselves as foreign key relationships that should be there but are not. The reason the relationships are not there is that a foreign key occurrence has been given a separate name and listed as a nonkey data element.

In an earlier version of this logical data model, for example, there was no Accounting Period Data Group; each occurrence of the data element ACCT-PER-ID was given a separate name. Then it was realized that a fiscal date was needed for a report of customer sales totals. This led to the creation of the Accounting Period Data Group, in which fiscal dates

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were paired with accounting periods. Each separately named occurrence of an accounting period in the other data groups was then replaced by ACCT-PER-ID, thus documenting the foreign key relationship by which the correlation with fiscal date was established.

Step 5: Proof the logical data model against the significant user views. These include transaction records, batch-control records, error reports, other unedited listings, intermediate files, formatted reports, file extracts for interfacing to general ledger, screen displays, query listings and so on.

Steps 1 through 4 create a provisional logical data model. In building it, the analyst deepens his application knowledge and his knowledge of the semantics of the data elements and groups. He avoids trying to normalize a mass of user views before he has this essential knowledge.

With this provisional logical data model, he can then take one significant user view at a time — reports, input transactions, data entry, update or inquiry screens — and normalize those views, recording them as bubble charts.

If he cannot accommodate the views without creating new keys, then he adds the corresponding data group to the logical data model. Otherwise, he simply adds any new data elements to the data groups indicated in the bubble charts and already present in the logical data model.

Potential problems: Reports raise the issue of derived data elements, for they normally contain several levels of totals, and the question is whether or not to include them in the logical data model. The answer is to do so if and only if convenient; if the end user does not need to see the derived data element anywhere except on the report, then there is no need to store it.

However, that total may be a periodic snapshot of a summarization. The report may be run weekly, but better control might be achievable if the total was updated and presented daily or even updated continuously and presented on demand. In such cases, the total should be stored as a data element.

Figure 4 on ID/16 shows a modified Bachman schematic of the final model. All M:M relationships have been resolved into 1:M relationships with intersection data groups. Where two or more semantically distinct relationships exist between the same two data groups, separate arrows have been shown for each relationship. Again, it should be emphasized that this does not represent a complete accounts receivable system but only selected data elements and data groups from such a system.

Final product

As to methodologies, sole reliance on bottom-up synthesis of user views will not readily produce a good logical data model. There is more than an analogy with a view of the scientific method that was prevalent several decades ago: that science proceeds by inductive generalization from observable matters of fact.

This view is no longer held by philosophers of science. Many of the astronomical observations on which Galileo based his support of the Copernican theory, for example, were in fact compiled by Tycho Brahe, but interpreted by him to support the Ptolemaic theory. The inductive generalization description ignores the fact that any nontrivial set of facts can support multiple interpretations — here, that any nontrivial set of user views can support multiple logical data models.

This is the theoretical mistake implicit in pure bottom-up normalization, that is, normalization of user views followed by synthesis into a data model. But there is a practical mistake also — the mistake of getting swamped by too many views. Without expert application knowledge, the analyst needs to select a manageably small set of views, which nonetheless will encompass most of the data to be included in the model.

This approach makes room for a learning curve. The experience of constructing a provisional model will always produce a deeper understanding of the application than passively reading books or manuals or interviewing end users. Once the provisional model has been constructed, books, manuals, end users and user views are all significantly more meaningful.

As for tools, a grease board and a text editor are the best tools for developing logical data models. During the early design stages, changes come fast and furious, and a delay of even an hour is oppressive. Instant responsiveness is more important than any sophistication of tools. Changes can be made to a grease-board model instantly; changes to text editor data can be available on a local printer within minutes.

The model should be developed and proofed on the grease board or text editor until it is stable through several iterations. Only then should an automated design tool, such as Data Designer [Database Design, Inc., Ann Arbor, Mich.], PSL/PSA [Isdos, Ann Arbor, Mich.] or Excelerator [Index Technology Corp., Cambridge, Mass.], be used. The value of the tool is then as an organized repository for a final or near-final logical data model. It will not materially assist, and may actually hinder, the process of developing the model.

About the author

Thomas Johnston is a data base consultant with Rehab Group, Inc., Atlanta, Ga., which provides information systems planning, analysis, design and development services to federal agencies. RGI is currently working on the specification of a Continental Army management information system for the U.S. Army Forces Command.

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MICROCOMPUTERS

Rx: Computing power

Hospital goes multiuser route for DP needs

By Kathleen Sullivan
CW West Coast Bureau

COUPEVILLE, Wash. — Whidbey General Hospital, a rural hospital located on Whidbey Island, which hugs the northern Washington coastline, had once cast its eyes longingly on mainframe-based information systems. "But we didn't have the resources to purchase a mainframe, so that was out of the ballpark for us," said Robert Maxwell, the hospital's controller.

So Whidbey General decided to take a different route to meet its data processing needs. About a year ago, the hospital installed a multiuser microcomputer system, the Personal Mini 16 (PM16), developed by Televideo Systems, Inc., and bought a custom-designed medical management software package offered by a Washington-based software house.

Now the 50-bed hospital has the computing power that would normally be found in a facility four times its size, Maxwell said. "Most U.S. hospitals that have data processing capabilities are much larger than Whidbey General's," Maxwell said. "Usually, you must have 200 beds just to be able to afford an order entry system and financial resources five to 10 times as big as ours."

Maxwell estimated that the hospital spent about $150,000 on the system, including research and development costs, a figure he said represented one-tenth the outlay for an equivalent mainframe system.

Maxwell, like two other PM16 users interviewed by *Computerworld*, gave Televideo high marks for its system. Attracted to the PM16 because of its architecture and low cost, all three users said they had found the system to be reliable.

Earl Mott, an in-house computer consultant at the Moline, Ill.-based John Deere Co. headquarters, said the system's network software, designed by Utah-based Novell, Inc., was the driving force in the

See TELEVIDEO page 60

Turbo Pascal micro tool gets enhancement

SCOTTS VALLEY, Calif. — Borland International has enhanced Turbo Pascal, a Pascal applications development environment that runs on a number of microcomputers.

The enhanced program reportedly compiles and executes programs at twice the speed of previous versions. Other enhancements include a memory-mapped editor and a feature that allows a user to develop graphics programs, the vendor said.

The enhanced package also is said to allow users to build their own applications library subroutines and offers optional support for Binary Coded Decimals.

Turbo Pascal consists of a compiler, an editor and a simple spreadsheet. It runs on micros with IBM's PC-DOS, Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M-80 and CP/M-86 operating sys-

See PASCAL page 62

- Ryan-McFarland has introduced a version of its RM/Cobol for IBM's PC/IX operating system/56
- Front Row Systems announced software that creates customized menus for Lotus Development's 1-2-3 package/56
- Emulex unveils a memory board that can boost the IBM Personal Computer AT's internal memory to 3M bytes/56

INSIDE

Software/56
Systems/[illegible]
Communications/[illegible]
Board-Level Devices/[illegible]

AGS unveils software

KING OF PRUSSIA, Pa. — A systems management package designed to guide managers in the development and maintenance of software systems has been introduced by AGS Management Systems, Inc. for the IBM Personal Computer.

Called Computer-Aided Methodology, the software reportedly includes development guidelines, systems management guidelines, an automated priority ranking system, automated estimating systems and an automated project planning and management system.

In the initial phase of the project's development, users are guided through the reviewing and prioritizing of service requests, AGS said. Next, the software is said to permit planning and estimation of the extent of the work involved in the project. In the work scheduling phase, the system assists in the planning, organizing and scheduling, reviewing and managing of the project. In the work management phase, the software reportedly offers the tools to measure project status and performance.

The software comes with two references and is priced at $22,950 for a single-user license. It requires at least 512K bytes of internal memory.

AGS Management Systems is located at 980 First Ave., King of Prussia, Pa. 19406.

SMALL TALK
Eric Bender
CW Senior Editor

A month for foolery

Almost every day seemed like April Fools' Day last month.

IBM drops the ax on the PCjr. The revamped PCjr is a good little machine, and it was the best-selling micro during the 1984 holiday season. But earlier this year after IBM boosted prices, sales softened, and it was time for a little Blue pruning.

And once again, the industry is waiting for the next IBM move, although the giant vendor is now trying to avoid surprising itself. Among its current concerns is the PC Network, scheduled to ship by today, which will not necessarily achieve a stunning success. ("What do you mean, rewire the entire building just for this?")

See FOOLS page 62

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■ The ORACLE Personal Information Center extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

■ The ORACLE Distributed Information Center provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

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ORACLE is currently installed on over 1000 superminis and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 2043.

IBM PC/IX gets RM/Cobol

ROLLING HILLS ESTATES, Calif. — Ryan-McFarland Corp. (RM) has introduced a version of its RM/Cobol language for IBM's PC/IX operating system, which is based on AT&T's Unix System III.

Software developed under IX RM/Cobol reportedly can run on single-user systems under IBM's PC-DOS and on the Personal Computer AT under Microsoft Corp.'s Xenix, on IBM's Series 1 under Unix, on IBM's System 9000 under Xenix and on IBM's 370, 3030, 3080 and 3090 series machines and the 4300 series mainframes under VM/CMS.

IX RM/Cobol gives PC/IX users access to more than 2,000 RM/Cobol-based programs, the vendor said. IX RM/Cobol features, said to be the same as those of RM's standard RM/Cobol language, include relative and index file access methods at Level 2, the highest level of Ansi's multilevel standard.

The latest version of the language's compiler is also included, RM said.

IX RM/Cobol is also said to offer multikeyed index files with alternate and duplicate keys and a portable applications code.

A full IX RM/Cobol system is priced at $750; runtime packages are priced at $230.

RM is located at 609 Deep Valley Drive, Rolling Hills Estates, Calif. 90274.

Data base and applications tool out for IBM Personal Computers

BILLERICA, Mass. — Data Language Corp. has announced that its fourth-generation data base and applications development system now runs on the IBM Personal Computer XT, Personal Computer AT and compatible microcomputers.

According to a company spokesman, the Progress applications developer, which also runs on multiuser AT&T Unix systems, is insulated from the underlying operating system.

Data base structures can be changed without dumping or reloading data, the spokesman said.

Progress includes a recovery feature that permits an automatic back out of uncompleted transactions after a system failure.

When a Progress procedure is moved from Microsoft Corp.'s MS-DOS to Unix, multiuser capabilities are automatically invoked, the vendor said.

The Progress data base and applications development system for the IBM Personal Computer AT, Personal Computer XT and compatibles are priced at $695 for single-user systems.

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Menu software for 1-2-3 bows

ATLANTA — Front Row Systems has announced Menu Maker software, said to permit the creation of customized menus for use with Lotus Development Corp.'s 1-2-3 software. It runs on the IBM Personal Computer line, including the Personal Computer AT, with color or monochrome screens.

Menu Maker reportedly allows users to replace the 1-2-3 menu with a menu of their own creation. The customized menus and worksheets enable users to develop complete systems in 1-2-3 and serve as a reference to aid in learning the 1-2-3 program.

Menu Maker is said to teach more advanced techniques such as accepting input and performing string manipulation and program iteration. The product reportedly includes a utility worksheet which may be inserted into any current worksheet to reduce the number of keystrokes used in 1-2-3. Menu Maker costs $50.

Front Row Systems can be reached through P.O. Box 550346, Suite 520, 8 Piedmont Center, Atlanta, Ga. 30355.

Memory board debuts for AT

COSTA MESA, Calif. — Emulex Corp. has introduced its Mega Memory, which provides up to 3M bytes of random-access memory (RAM) for the IBM Personal Computer AT.

The Mega Memory addition to Emulex's Persyst product line, a full-size printed-circuit board, fits into any of the AT's 16-bit slots. A total of six banks, representing 12 rows, can be populated, using either 64K- or 256K-bit chips.

The board comes with Emulex's Wait-less Printing print spooling software and its Insta-Drive RAM disk emulation software.

Prices range from $395 for a version without RAM but with sockets for the customer to fill with memory chips to $5,495 for 3M bytes of RAM.

Emulex can be reached through P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

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SOFTWARE

■ **Clarity Software Corp.** has enhanced its 3-2-1 GO software for the IBM Personal Computer line.

The 3-2-1 GO software reportedly converts Lotus Development Corp.'s 1-2-3 and Symphony spreadsheets to the models and data files usable in Execucom Systems Corp.'s Interactive Financial Planning System (IFPS).

Release 2.0 of 3-2-1 GO translates all 1-2-3 and Symphony functions with equivalent definitions in IFPS and supports the new features of IFPS/Personal Release 2.0.

The vendor said 3-2-1 GO Release 2.0 is being provided free to current users and priced for new users at a corporate license fee of $3,200.

Clarity Software, Suite 306, 13276 Research Blvd., Austin, Texas 78750.

■ **Cambridge Computer Corp.** has introduced its PC73/78 software for emulation of Honeywell, Inc. terminals on the IBM Personal Computer line, including the Personal Computer AT.

Under PC73/78, the Personal Computer is said to be able to emulate the Honeywell VIP7200, VIP7300 and VIP7800 series of asynchronous terminals. The software also reportedly uses Intel Corp. 8087 or 80287 math coprocessors, if available, and provides remote and screen printing simultaneously with host inquiries and updates.

The software is priced at $395.

Cambridge Computer, 151 Bender Road, Mount Carmel, Conn. 06518.

■ **H & A Computer Systems, Inc.** has introduced an IBM Personal Computer version of its Program Executive System (PXS), an integrated applications development environment previously available only on the IBM Series/1 minicomputer.

Using PXS, applications for the Series/1 can be downloaded to the Personal Computer and run under IBM's PC-DOS, according to the vendor. Applications development will also be speeded, the vendor added, because users will be able to compile their programs on the Personal Computer itself.

PXS includes a procedurally based application development language, PXL, that reportedly provides the functionality of the C language with the ease of use of IBM's RPG language. PXS' data management capabilities include indexed, linked and direct file organization and unlimited secondary indexing.

Up to four levels of nested menus are said to be supported by the software's integrated menu manager. Data files developed under PXS are protected against accidental erasure or damage during an update.

PXS and PXL are each priced at $590.

A screen/report source code generator and a documentation system, said to be similar to a data dictionary, are available as options at $200 each, according to the vendor.

H & A Computer Systems, Suite 204, 30 Hotaling Place, San Francisco, Calif. 94111.

■ **ADP Financial Network Services**, a division of Automatic Data Processing, Inc., has announced enhancement of its Cash Express Workstation financial management software for the IBM Personal Computer and Personal Computer XT.

Cash Express Version 1.1 allows users to isolate specific account groups for analysis and to take advantage of unattended data retrieval and selective system security, a spokesman said.

Version 1.1's Cash Position Slicing function is said to allow users to view selected account groups according to specified criteria. Other enhancements reportedly allow cash managers to instruct their workstations to retrieve specific data at prescribed times each day and to limit the extent to which individual users can access the software.

The product is priced at $3,500 for a perpetual license for the IBM Personal

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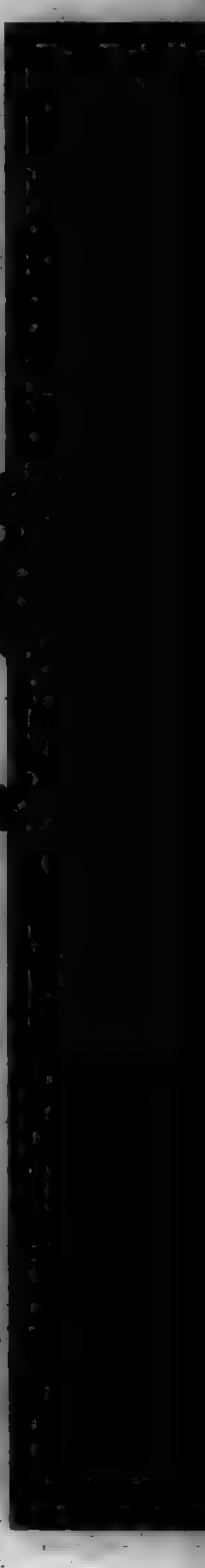

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ADP Financial Network Services, 175 Jackson Plaza, Ann Arbor, Mich. 48106.

SYSTEMS

■ **Intertec Data Systems Corp.** has introduced its Headstart ATS-286, a personal computer incorporating the Intel Corp. 80286 microprocessor and reportedly offering compatibility with the IBM Personal Computer.

Headstart ATS-286 can operate either as a single-user stand-alone or as a multiuser system when connected to an Intertec Multilan Storage System, available separately. The Multilan system is said to support up to 255 ATS workstations.

Use of the Intel 80286 is said to provide the ATS-286 with program execution at least eight times faster than that available on the Personal Computer. The Intertec system features 256K bytes of internal storage, a 12-in. screen with 80-col. by 25-line format and the capacity to display graphics with 640- by 200-pixel resolution. An optional 5¼-in. floppy disk unit provides 720K bytes of storage.

The ATS-286 is priced at $2,495. The disk unit is priced at $595. The Multilan Storage System units are priced ranging from $2,495 to $6,995, the vendor said.

Intertec Data Systems, 2900 Broad River Road, Columbia, S.C. 29210.

■ **Wang Laboratories, Inc.** has introduced its Engineering Support System (ESS), based on its Professional Image Computer (PIC) workstation.

The ESS combines the PIC image-processing workstation with Autodesk, Inc.'s Autocad computer-aided drafting software package. The PIC workstation reportedly features a desktop scanner that digitizes images from sheets of paper and stores them in raster format. The images can then be composed with other previously digitized images and/or integrated with new text to form entirely new documents.

The Autocad software reportedly allows engineering professionals to capture, create, modify and combine both raster and vector images and then merge them with integrated text to form documents for specific purposes, such as engineering change orders. Drawings are stored in floating-point vector format, the vendor said.

Options for the ESS include support for Microsoft Corp.'s MS-DOS applications as well as several terminal emulation protocols, including the teletypewriter terminal emulation protocol. The ESS is priced at $20,810, including the PIC workstation, Autocad software, a monitor and thermal printer. All software needed for image composition and text integration is reportedly provided with the PIC.

Wang Laboratories, One Industrial Ave., Lowell, Mass. 01851.

■ **Philips Information Systems, Inc.** has announced the consolidation of its P3100 personal computer and its Communications Cosystem in a package called Desk Automation. The P3100's CPU and the Cosystem share the system's VDT, keyboard and printer.

Desk Automation reportedly joins applications such as word and data processing, electronic mail, calendar and communications.

The consolidation reportedly allows the Philips P3100 and Cosystem to provide voice/data transmission over normal telephone lines, to perform speed dialing and to connect with external data bases.

The product costs $1,995.

Philips Information Systems, Suite 300, 15301 Dallas Pkwy., Dallas, Texas 75248.

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COMMUNICATIONS

■ **Keyword Office Technologies has announced new document-exchange software modules for its Keyword 7000 document-interchange system.**

Two of the modules, for the IBM Displaywrite 2 text-editing software and IBM's 5520 administration system, provide links from various incompatible word processors and micros to IBM's Document Content Architecture, a spokesman said.

Other modules reportedly support Wang Laboratories, Inc.'s Office Information Systems 5¼-in. format, Office Solutions, Inc.'s Office Writer and Lanier Business Products, Inc.'s Super No Problem software.

Keyword also announced a capability for all its software to produce Ascii output, allowing documents to be moved into various environments for electronic mail, print output and interchange to other systems.

The modules cost $495 for unidirectional pairings between incompatible systems.

Keyword Office Technologies, 2047 Hamilton Ave., San Jose, Calif. 95125.

BOARD-LEVEL DEVICES

■ **Linkdata has announced a multiuser enhancement for the IBM Personal Computer that reportedly supports up to nine terminals and a printer all operating simultaneously.**

The Multi-PC/68 incorporates two enhancements to the Personal Computer to adapt it to the multiuser environment, according to the vendor. These are an add-in Motorola, Inc. 68000 processor board with up to 512K bytes of memory and an intelligent serial I/O card called Linkterm that reportedly can support four or eight additional RS-232 ports usable for terminals, printers and modems.

The add-in boards work on any standard Personal Computer, Personal Computer XT or Personal Computer AT with 128K bytes of memory and support the company's 25M-, 46M- or 66M-byte disk systems, the vendor said.

Prices for the enhancements are $2,395 for the Motorola processor, $875 for a four-port version of Linkterm and $1,225 for an eight-port version of Linkterm.

Linkdata, 2005 Rt. 22, Union, N.J. 07083.

See BOARD page 62

TELEVIDEO

from page 58

firm's selection of the PM16. He described the Novell network's performance as outstanding.

Mott said Televideo provided an implementation of the Novell network that was "significantly cheaper" than those offered by other firms, "especially with the discounting available to John Deere." The company has installed three PM16s, which are being used by its software development staff and a variety of engineering personnel.

John Deere has connected IBM Personal Computers to its PM16s. But Mott said the company is looking forward to Novell's next version of the network software, which will allow users to hook up IBM Personal Computer ATs to the network.

Unlike Whidbey General, which relies primarily on customized software, John Deere's staff is using off-the-shelf software on the PM16. At present, the firm is using Micropro International Corp.'s Wordstar; a data base manager designed by Irvine, Calif.-based Dayflo, Inc.; and Enable, an integrated software package developed by the Software Group, a Ballston Lake, N.Y., firm.

Mott said the company first bought the PM16 to handle its word processing applications. Currently, its word processing staff is sharing 38M bytes of disk storage and two high-quality, high-speed printers. This ability to share peripherals was one of the attractive features of the system, he said.

'Zero downtime'

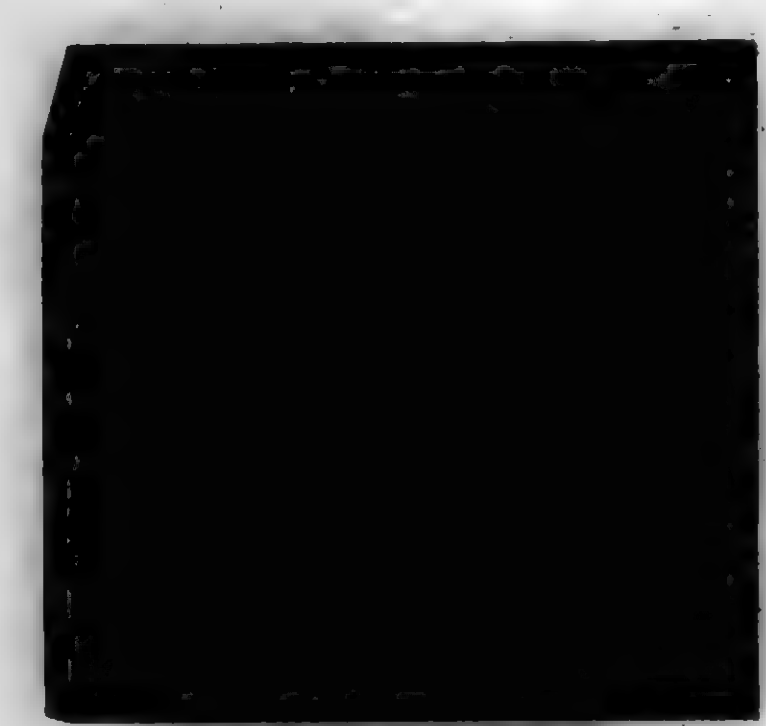
David Britton, both assistant principal and systems administrator at Fife High School in Tacoma, Wash., oversees the use of its PM16, which was installed last September. According to Britton, the system has performed flawlessly since the start of the school year. "We have had zero downtime on the system," he said.

Fife High School, which has 600 students, is using both custom-designed software and commercial packages on the system, Britton said. Its administrative operations — which include everything from monitoring attendance and producing class schedules to sending out grades — are handled by Schoolmaster, a program developed by a Tumwater, Wash., company.

Before installing the PM16, Fife shared an on-line system with 40 other school districts, a situation that sometimes resulted in competition among the districts for the system's resources — when it came time to issue report cards, for instance. Relying on a third party to produce reports proved frustrating as well, because the school would find itself waiting a couple of days to receive reports it had requested, Britton said.

He said the school was attracted to the PM16 because of its record-locking capability, a feature the school has found very important.

In addition, Britton praised the system's dynamic disk allocation, which he described as the "ultimate in disk storage." Unlike traditional hard disk systems, in which a disk is physically divided into user areas that remain fixed, dynamic allocation is flexible. The system chooses the most efficient way to store the data, he said. As a result, there is "no dead space on the hard disk," he explained.



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SPECIAL REPORT

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In the April 29th Computerworld Special Report we'll report on management strategies for integrating micros into corporate information systems; offer users' experiences with micros; discuss the emergence of the Personal Computing Manager; provide overviews of business-related microcomputer hardware, applications software, and systems software; look into security risks; and examine how large MIS/DP organizations are networking their micros.

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BOARD from page 60

■ Winning Designs has introduced its IQ186 coprocessor expansion board for the IBM Personal Computer line.

The IQ186 reportedly features a full Winchester disk controller, an Intel Corp. iAPX186 processor and the ability to download user-written software programs and drivers into resident random-access memory.

Using its Basic I/O System routines, custom applications reportedly can be designed. Included with the IQ186 are software for spooling to RS-232, serial and parallel interfaces as well as a subset emulator of Digital Equipment Corp. VT100 terminals and a resident iAPX186 debugger.

The IQ186 is priced at $1,595.

Winning Designs, Suite 230, 7910 Ivanhoe St., La Jolla, Calif. 92037.

■ Zilog, Inc. has introduced 2M-byte and 4M-byte memory expansion option boards for its System 8000 supermicrocomputers.

The boards reportedly increase the System 8000's maximum memory to 8M bytes. They can be used in all models of the System 8000 family, including the Series/1, the Plus Series and the Series 2, according to the company.

The 2M-byte board is priced at $10,950. The 4M-byte board is priced at $18,950.

Zilog, Systems Division, 1315 Dell Ave., Campbell, Calif. 95008.

■ Emulex Corp. has introduced its Persyst Mono Combo and Color Combo combination boards for the IBM Personal Computer line.

Both boards are said to offer multifunction and display capacities on a single board with no use of piggybacking and to provide both monochrome and color display. They use gate array technology and offer up to 384K bytes of on-board memory, the vendor said.

Included with the boards are two software programs, Insta-Drive and Wait-Less Printing. Insta-Drive reportedly uses user-assignable random-access memory to emulate the storage capacity of up to four single-sided diskette drives. Wait-Less Printing provides user-defined buffering through automatic spooling.

The Persyst Mono Combo Card and the Persyst Color Combo Card are each priced from $520 to $1,145, depending on the amount of on-board memory.

Emulex, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

FOOLS from page 55

Don Estridge leaves Boca Raton, Fla. The head honcho at IBM's Entry Systems Division left to supervise IBM's manufacturing operations. Perhaps IBM wanted someone else in the public eye, but the shift probably was just the normal rotation of IBM executives.

Digital Equipment Corp. still isn't over the Rainbow. Three weeks after safeguarding inventories for the Rainbow personal computer by acknowledging that production was shutting down, DEC bundled the high-end machine with office automation software and flung it out into the world again. For once, industry analysts were unanimous — stunned at DEC's refusal to accept the need for IBM compatibility.

None of that Jazz. Lotus Development Corp., which has ragged unmercifully on other software vendors for late deliveries, was forced to delay shipment of its Jazz integrated package for Apple Computer, Inc.'s Macintosh. The package is "buggy as a swamp," one Lotus insider said, and it kept crashing during public previews.

This is not the first time Lotus was late, however, although the company dodged the bullet the first time around. In April 1983, Mitch Kapor promised a second version of 1-2-3 by year end. If this package didn't evolve into Symphony (which shipped in July 1984 and thus would be six months late), it hasn't appeared at all.

People started throwing around software piracy numbers as if they meant something. A Future Computing, Inc. study found that half the business software packages in use are unauthorized, and that figure is now quoted everywhere. But those results don't get much respect in the software industry. One marketing vice-president remarked that "you or I could pull just as good numbers from the air."

Then there were the minor curiosities — such as AT&T and Compaq Computer Corp. once again making conflicting product announcements during the same week in New York, or Burroughs Corp. dashing into office automation half a decade behind everyone else.

It has all been very entertaining, and there may be other good news lurking behind all of this — that the customer choices in personal computing are not quite as predictable as they seemed a month ago.

PASCAL from page 55

tems and requires 35K bytes of random-access memory.

Turbo Pascal sells for $69.95; options that support an Intel Corp. 8087 math coprocessor or Binary Coded Decimals each cost $39.95.

Borland International is located at 4113 Scotts Valley Drive, Scotts Valley, Calif. 95066.

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COMMUNICATIONS

AT&T touts Accunet, DMI interface

By John Dix
CW Staff

ORLANDO, Fla. — An AT&T Communications spokesman recently outlined how its Accunet digital network service works with AT&T Information Systems' Digital Multiplexed Interface (DMI), an interface AT&T is promoting as a standard.

Speaking before about 100 representatives of 30 manufacturers that have pledged support or interest in DMI, Dave Ferguson, district manager of AT&T Communications custom services planning, explained how DMI and Accunet services now work together and detailed plans for future capabilities.

DMI is a signaling format that specifies how 1.54M bit/sec T1 digital transmission facilities are split into individual channels. It calls for the bandwidth to be divided into 24 64K bit/sec channels and for the use of common-channel signaling. With this signaling method, information about remote devices on 23 of the channels — such as whether they are on- or off-line — is combined in the 24th channel, Ferguson explained.

Although use of one channel is lost with common-channel signaling, the remaining 23 channels can operate at full 64K bit/sec rates because they are not encumbered by signaling data. By comparison, bit-robbing signaling techniques — as used in the Computer-to-Private Branch Exchange Interface developed by Digital Equipment Corp. and Northern Telecom, Inc. — require one bit in every byte to be used for signaling, which lowers obtainable channel speeds to 56K bit/sec.

Ferguson said customers can use AT&T Communications' Accunet T1.5 service today to interconnect PBXs and computers outfitted with DMI interfaces on a point-to-point basis. In this application, the Accunet service is essentially a 1.54M bit/sec pipe. There is one caveat: Although the service provides a clear channel over which customers can pass any type of digital information — data, voice or video — the traffic must contain a certain number of binary 1s to meet a 1s density requirement.

"Out of every 8 bits you send, you have to send at least one [1]," Ferguson said. "When you send a zero, there is no signal, and if you don't send a signal for a long

See AT&T page 66

■ Telematics International has introduced a network control software package designed for the company's Net 25 line of packet switches/64

■ DEC has announced Scholar, a synchronous/asynchronous 2.4K bit/sec modem that is said to be AT&T compatible and adhere to international standards/64

■ Network Systems has announced that its Hyperbus local-area network product line can now be installed with the standard IBM cabling system/66

INSIDE

Voice/Data Communications/64

Multiplexers/Modems/64

Local-Area Networks/66

Network Services/66

DATA STREAM
Paul Korzeniowski
CW Staff

Hype obscures issues

During a session titled "Office Automation Roundtable" at the recent Interface '85 communications conference in Atlanta, an attendee asked panelists if a software package existed that could easily notify users about a problem on a network and help a network manager locate the problem. With puzzled looks on their faces, three well-known consultants passed on the question.

This scenario illustrates some of the problems communications managers may face today. Consultants, research firms and the trade press love to talk about tomorrow, but their talk centers on pie-in-the-sky topics like voice/data integration, networking models and local-area networks that support everything. Everyone is eager to spout off about such topics, but the rhetoric's significance to real-world problems is questionable.

"A consultant will come in, examine your operation and say, 'You need a [voice/data private branch exchange], two satellite

See PROBLEMS page 67

Fiber net use increases

Canadian phone companies convert

By Brian Banks
Special to CW

Cherished for years as the transmission medium of the future, fiber-optic networks are now beginning to appear in force. This month in Canada, for example, Sasktel, the provincial telephone company of Saskatchewan, will inaugurate its recently completed $56 million broadband network, a 3,268-km, fiber-optic, long-distance telephone network serving 52 communities across Saskatchewan.

At approximately the same time, CNCP Telecommunications will begin installing its first fiber-optic network, a $20 million, 720-km system that will serve the Toronto-to-Montreal corridor. And Bell Canada reports that work is proceeding ahead of schedule on its plan to convert all copper-based, short-haul telephone networks within its jurisdiction to fiber optics by the end of the century. Through the end of 1984, Bell Canada had installed more than 20,000 km of fiber-optic cable in this network. The company plans to install double that amount of cable by the end of 1986.

See CANADA page 67

Banks is the assistant editor of Computer World Canada, *the Mississauga, Ont.-based sister publication of* Computerworld.

Lightnet links eastern U.S.

NEW HAVEN, Conn. — Lightnet, Inc. has begun construction of the second portion of its planned 5,000-mile fiber-optic network, which ultimately is designed to link 43 cities in 24 states east of the Mississippi River. The network, a 1,077-mile route, will pass from Washington, D.C., through New York to Chicago. A 455-mile route through Florida is now operational.

The company plans to install a fiber-optic cable from New York to Princeton, N.J. Four planned routes, centering in Atlanta, will pass through Washington, D.C.; Jacksonville, Fla.; New Orleans; Chicago; and Detroit.

US Telecom, Inc. has signed contracts with Lightnet and will be a primary contractor for the system as well as a customer.

Lightnet is located at 900 Chapel St., New Haven, Conn. 06506.

Bridge Communications unveils gateway for broadband networks

ATLANTA — Bridge Communications, Inc. has announced Gateway Server/6 (GS/6), which allows the interconnection of multiple Ethernet local-area networks over CATV-based broadband networks.

A company spokesman said GS/6 is an internetwork router that permits communications among up to 255 Ethernet networks over a single 6-MHz broadband channel. Communications over the CATV channel is at a signaling rate of up to 2M bit/sec, using a carrier-sense multiple access mechanism.

Reportedly, the GS/6 uses a mid- or high-split, single-cable system, which can be accommodated on spare channels of an existing cable plant, including those from broadband network suppliers such as Ungermann-Bass, Inc. and Sytek, Inc. The unit uses standard CATV-based broadband components such as frequency translators, the vendor said.

The GS/6 features a modular architecture that includes an Ethernet controller card, a Motorola, Inc. 68000-based CPU card executing Xerox Corp. XNS high-level protocols and a High-Level Data Link Control controller card, the company spokesman said.

The GS/6 filters network traffic so messages are sent only to their intended addresses. Ongoing monitoring of the Ethernet/broadband interface is provided by the GS/6, which has a Network Management Facility for traffic statistics, line-error monitoring and remote loop-back diagnostics.

The GS/6 is priced at $10,500, plus a $150 annual license fee for routing software.

Bridge Communications is located at 1345 Shorebird Way, Mountain View, Calif. 94043.

Western Union offers discount

UPPER SADDLE RIVER, N.J. — Western Union Corp. announced recently that users of its Easylink and Telex services can obtain discounts of up to $1,000 per month on its long-distance telephone service.

Business customers will be able to apply 20% of their Easylink bills and/or usage charges for Telex — including Worldwide Telex — as credit to their monthly long-distance telephone charges, the company reported.

The joint-service discount cannot exceed the actual long-distance bill and is applied to the following month's charges. It will reportedly increase customers' savings over AT&T services more than the 25% average presently possible.

More information on the service is available from Western Union at One Lake St., Upper Saddle River, N.J., 07458.

VOICE/DATA COMMUNICATIONS

■ Racal-Milgo, Inc. has added the Communications Management Series (CMS) Matrix Switch, which it purchases from Bytex, to its line of network management and diagnostic control systems.

The switch is said to provide system redundancy for major network data communications and terminal equipment. Reportedly, in the event that any device fails, the CMS Matrix Switch can restore the network to full operating capacity in seconds by reallocating port assignments from the failed unit to its designated backup.

In its basic configuration, CMS Matrix Switch consists of mainframe units and interface port cards controlled by a single terminal.

Prices for CMS Matrix Switch, scheduled for delivery in April, start at $40,000. Add-on components are priced separately.

Racal Milgo is located at 8600 N.W. 41st St., Miami, Fla. 33166.

■ GTE Communications Systems Corp. has announced that its GTE Omni PABX (private automatic branch exchange) has been certified as an X.25 interface for use on GTE Telenet Communications Corp.'s packet-switching public data network.

The Omni PABX is one of 165 X.25 interface products from 110 vendors that have been certified by GTE Telenet. The line is equipped with a dual-bus architecture that permits simultaneous communication over twisted-pair wires. The line is designed for companies with 30 to 1,800 employees.

GTE Communication Systems is located at 2500 W. Utopia Road, Phoenix, Ariz. 85027.

■ Telematics International, Inc. has introduced Net 25 Interactive Network Facilities (INF), a network control software package designed for the company's Net 25 line of packet switches.

The package is designed to support a network with one or more network control centers. Network routing tables, node configuration files and software modules are created at the network control center and downloaded to network nodes, the vendor said.

INF's traffic-monitoring facilities provide a central collection point for statistics, alarms and call accounting information. Statistics collected at frame and packet levels are logged to disk for report generation. At the operator's console, real-time data can be displayed. Up to 255 types of alarms can be defined and each one is assigned an alarm group and severity level.

The product's security features include a 16-character user identification code, illegal entry reports and restriction of user access to various capabilities.

Net 25 INF costs $15,000.

Telematics International is located at 1415 N.W. 62nd St., Fort Lauderdale, Fla. 33309.

MULTIPLEXERS/ MODEMS

■ Digital Equipment Corp. has announced Scholar, a synchronous/asynchronous 2.4K bit/sec modem that is said to be AT&T compatible and to adhere to international standards.

Scholar is said to feature Bell 103, Bell 212A and CCITT V.22 compatibility as well as the international CCITT V.22 BIS standard at 2.4K bit/sec.

The modem can be connected to any workstation via an RS-232C port.

Scholar is priced at $895 and will be available in May.

DEC, 146 Main St., Maynard, Mass. 01754.

■ Datagram Corp. has announced the Steamer data compressor and statistical multiplexer, featuring the company's own compression algorithm.

A spokesman said Steamer's algorithm is intended to analyze incoming data streams on a port-by-port basis and on a directional basis. Compression ratios average 2.2:1 and 3.2:1.

Steamer is said to be able to compress and/or decompress 3,000 char./sec. The statistical multiplexer routine accommodates data from up to eight asynchronous input channels at speeds up to 9.6K bit/sec. Output data is transmitted in compressed

Continued on page 66

"ENOUGH OF THIS 2400bps RHETORIC; WE'VE GOT TO FIND SOMEONE WHO CAN DELIVER THE MODEMS WE NEED!"
"THIS CALLS FOR CONCORD DATA."

A. Jones. Patrick Henry Delivering His Speech at the House of Burgesses. Courtesy The Bettmann Archive.

There's no argument that in today's business arena, 2400bps full duplex dial modems provide the lowest cost and fastest route to data communications. But of all the modem manufacturers that are promising you great dial line savings, there's only one company delivering the modem products you really need–Concord Data.

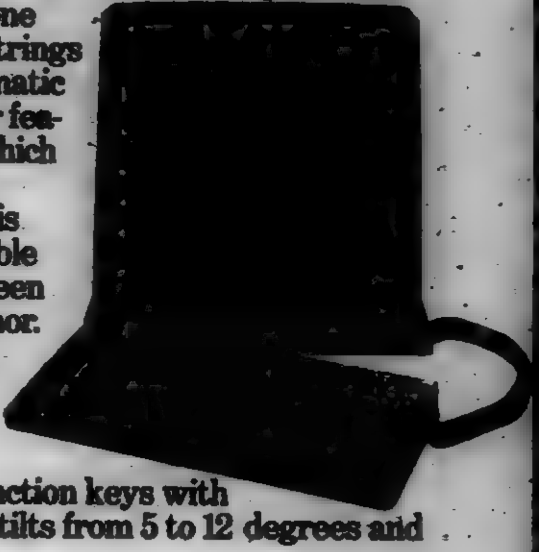
We offer the largest family of 2400bps modem products on the market, with features that you can mix and match to get just the data performance your business application requires. Choose from autodialing, error correction, statistical multiplexing, complete diagnostics and more. We even have the world's first central site, rack-mounted modem card that operates at 2400, 1200, and 300bps. We've installed over 50,000 modems worldwide, and we're shipping *thousands* more each month. And naturally, we're offering revolutionary prices on our complete line. If you've heard enough talk about 2400bps dial line modems, and are ready for action, call us at (617) 890-1394 or write 303 Bear Hill Road, Waltham, MA 02154, telex 951793.

Concord Data Systems
Leading the Communications Revolution

WHAT'S BEHIND OUR CONVERSATIONAL TERMINAL MAKES WHAT'S IN FRONT OF IT MORE PRODUCTIVE.

At Teletype Corporation, we just made another intelligent move. We added an integrated modem to the 5410 conversational terminal—making it an even better value.

In addition to saving desk space and being cost-effective, the modem gives the 5410 "built-in" intelligence that greatly improves operator productivity. For example, all the operator has to do is push a single key, and the modem will dial a host computer and perform the logon operation. And the operator can store up to three phone numbers and logon strings in the modem. Automatic answering is another feature of the modem, which is 212A compatible.



The 5410 is also now available with a white, green or amber Phosphor. No matter which color you choose, your operators will appreciate the crisp, easy-to-read characters. High resolution is maintained even when switching from an 80 to 132 column mode.

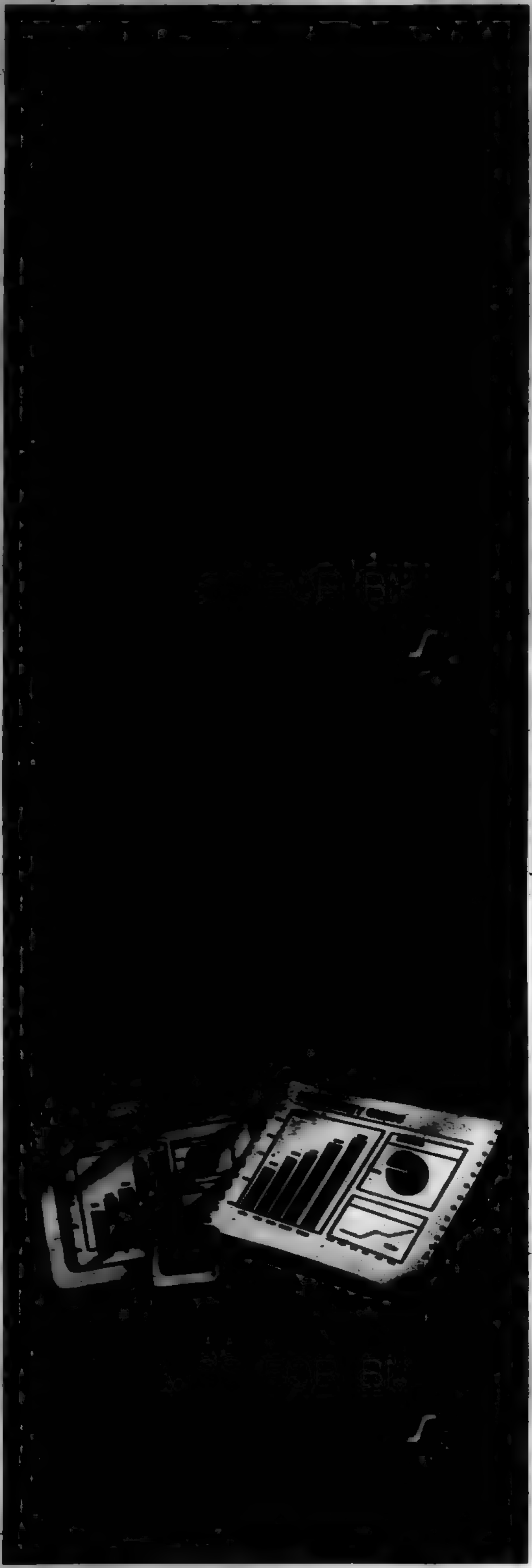
Other features that enhance productivity include 8 programmable function keys with matching screen labels; an English option menu; a detachable keyboard that tilts from 5 to 12 degrees and has tactile feedback; standard character sets; and the list goes on and on.

In the interest of operator productivity, write to Teletype Corporation for more information on the 5410 at:
5555 Touhy Ave., Dept. 3223-H, Skokie, IL 60077. Or call
1 800 323-1229, ext. 111.

TELETYPE: VALUE SETS US APART.

"Teletype" is a registered trademark and service mark of Teletype Corporation.

AT&T
Teletype Corporation



COMMUNICATIONS

Continued from page 64

form over a full-duplex link at up to 9.6K bit/sec using the X.25 Level II protocol.

Prices for the three-channel Streamer start at $1,395, and the eight-channel unit with built-in 9.6K bit/sec modem is $4,995.

Datagram, 11 Main St., E. Greenwich, R.I. 02818.

LOCAL-AREA NETWORKS

■ **Network Systems Corp. has announced that its Hyperbus local-area network product line can now be installed with the standard IBM Cabling System.**

A spokesman said the Hyberbus supports both IBM 3270 devices and RS-232 devices. All Hyberbus units delivered since 1983 can function with the new cabling.

With Hyperbus, terminals and workstations are connected in a work area with twisted-pair wire to bus interface units, which are in turn interconnected with a coaxial cable.

Hyperbus prices start at $292.50 per port; no special features or options are required to interface with the IBM Cabling System.

Network Systems, 7600 Boone Ave. N., Minneapolis, Minn. 55428.

■ **Concord Data Systems, Inc. has announced Token/Scope Network Analyzer, a first-level protocol logic analyzer for its IEEE 802.4-compatible Token/Net local network.**

Token/Scope consists of a 5M bit/sec frequency-agile radio frequency modem, access unit and control unit. A network manager controls the network with a Digital Equipment Corp. VT100 or compatible terminal. The product is said to enable network managers to monitor and analyze network performance in real time.

The analyzer features a Command mode from which network managers can select four options: monitor mode, to survey the operation of the token-passing protocol in real time on any broadband channel; trace mode, which records specific network events through user-defined instructions; analyze mode, which displays a chronological record of frames monitored during a trace mode or of lengthy nonframe activities; and the memory option, which allows a user to read frame information stored during trace mode in a Token/Scope card memory queue. Help screens are available for each option.

Token/Scope Network Analyzer costs $30,000.

Concord Data Systems, 303 Bear Hill Road, Waltham, Mass. 02154.

NETWORK SERVICES

■ **AT&T Information Systems recently announced an Access Controller to serve as an interface between the company's Dataphone II, Level 4 System Controller and its Dataphone multiplexers.**

A spokesman said the new product can be used to monitor and control all Dataphone multiplexers. These devices are controlled by System Controller workstations that connect transparently to any port of the Access Controller. The workstation issues commands and receives reports on the status of individual multiplexers and the network as a whole.

Polling commands can be grouped and stored in the Access Controller for immediate execution at a specific time or repeatedly at chosen intervals. Each multiplexer attached to the Access Controller can be addressed with English commands. The Access Controller can monitor from 16 to 240 ports.

The product, scheduled to be available in May, costs $6,085 to $26,200, depending on configuration.

AT&T Information Systems, 100 Southgate Pkwy., Morristown, N.J. 07960.

AT&T

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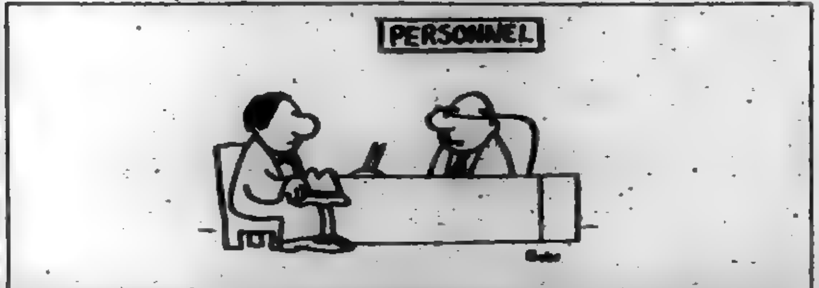
time, the line will drop."

AT&T Communications intends to support DMI in a customer premise-to-network configuration by 1986, Ferguson announced. This would enable customers with DMI-equipped machines to access an AT&T Communications central office switch through Accunet T1.5 facilities, and from there, access on a channel basis any of AT&T Communications' family of digital services. Each of the 23 64K bit/sec channels, for example, could be routed through the company's Dataphone Digital Service to different locations.

To provide this capability, AT&T Communications will have to upgrade its switching facilities to recognize the DMI signaling format, Ferguson said. "To bring Accunet service into our network and then branch it out into other services, we have to provide signaling to those other services," he said. DMI will be supported with Accunet T1.5 as an option.

Support of the DMI bit-oriented signaling format in this application — customer premise-to-network termination — is "a major step in AT&T Communications' plans to support an Integrated Services Digital Networks," Ferguson concluded.

Copies of the technical reference addenda to AT&T Communications' PUB 41460, which details the DMI signaling format, are available for $51, prepaid, from Literary Data Center, Inc., P.O. Box C-9104, Brooklyn, N.Y. 11021.



"We don't have a regular pension plan. We find it's cheaper in the long run just to let everyone embezzle a little."

CANADA

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Bell Canada is also looking to expand fiber optics into its other services. "Right now we are studying the question of using fiber optics on our long-haul networks," said David Barr, director of planning and standards for Bell Canada's corporate engineering group. "We are also looking seriously at fiber optics for its use in the local loop, particularly to serve large office buildings whose tenants could take advantage of fiber optics' high-volume, high-bandwidth capability."

This is only the beginning. According to Kessler Marketing Intelligence, a research firm in Newport, R.I., the worldwide market for fiber optics reached $761 million last year. Various forecasts indicated that the worldwide market will range between $3 and $6 billion by the end of the decade. And even these numbers may be low. In the U.S. alone, for example, a dozen companies have budgeted $6 billion to be spent over the next four years on long-distance telephone networks.

> **99**
>
> ***Bell Canada has installed more than 20,000 km of fiber-optic cable in its phone net and plans to double that by the end of 1986.***

Projects of similar magnitude are also under way in other parts of the world, especially in Europe and Japan, and a number of intercontinental fiber-optic links are also in the works. Add to that fiber optics' potential in other fields, such as local-area networks, and the growth potential for the market is anybody's guess.

This rapid spread of fiber-optic technology is not surprising when the advantages of the media are compared to conventional technologies. Fiber is extremely accurate, with error rates as low as one error per billion bits. It boasts commercially available transmission speeds in the range of 500M bit/sec, and in laboratory tests that level has been exceeded several times. Because the signal consists of pulses of light, fiber optics is also immune to electrical interference and offers a high level of security.

Further gains are being made as new types of fiber-optic cable are developed. The current trend is toward monomode fiber-optic cable vs. more traditional multimode cable. As their names suggest, the two cables differ in the number of paths they allow a light beam to travel along. Monomode, which permits only one possible beam route, is gaining favor in long-distance networks largely because of potential cost savings. A signal requires less frequent amplification when it only has one path to follow, meaning a monomode network needs fewer signal repeaters along its route. These repeaters represent a major portion of network costs.

If fiber optics still has disadvantages, the most pressing of these occurs when it comes to interfacing with conventional communications systems. A recent report by International Data Corp. (IDC), a Framingham, Mass.-based research firm, pointed out that optical fiber-optic signals must still be converted back to electrical form for amplification.

In addition, the report said, fiber-optic technology still lacks a simple, low-cost method for multiplexing fiber-optic signals. The IDC report predicted that fiber optics will soon surpass microwave in long-haul networks due to its potentially greater carrying capacity.

Even satellite systems will feel the squeeze. IDC said that international telecommunications services are currently split at 40% undersea cable and 60% satellite. By 1993, the report said, the ratio will be 65% undersea to only 35% satellite.

PROBLEM

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dishes and a local-area network.' Thank-you very much," said Wushow Chou, professor of computer science at North Carolina State University in Raleigh, N.C. "What you are left with is a bunch of buzzwords."

A manager cannot solve problems with buzzwords. And more often than not, the buzzwords do nothing but confuse the issues at hand.

Buzzwords usually connote technologies that may not be widely used today but are expected to be commonplace in the future. Consultants and researchers are fond of buzzwords because buzzwords lend credence to bold predictions. It doesn't matter if the predictions are never realized. In fact, buzzword technologies often never gain widespread acceptance.

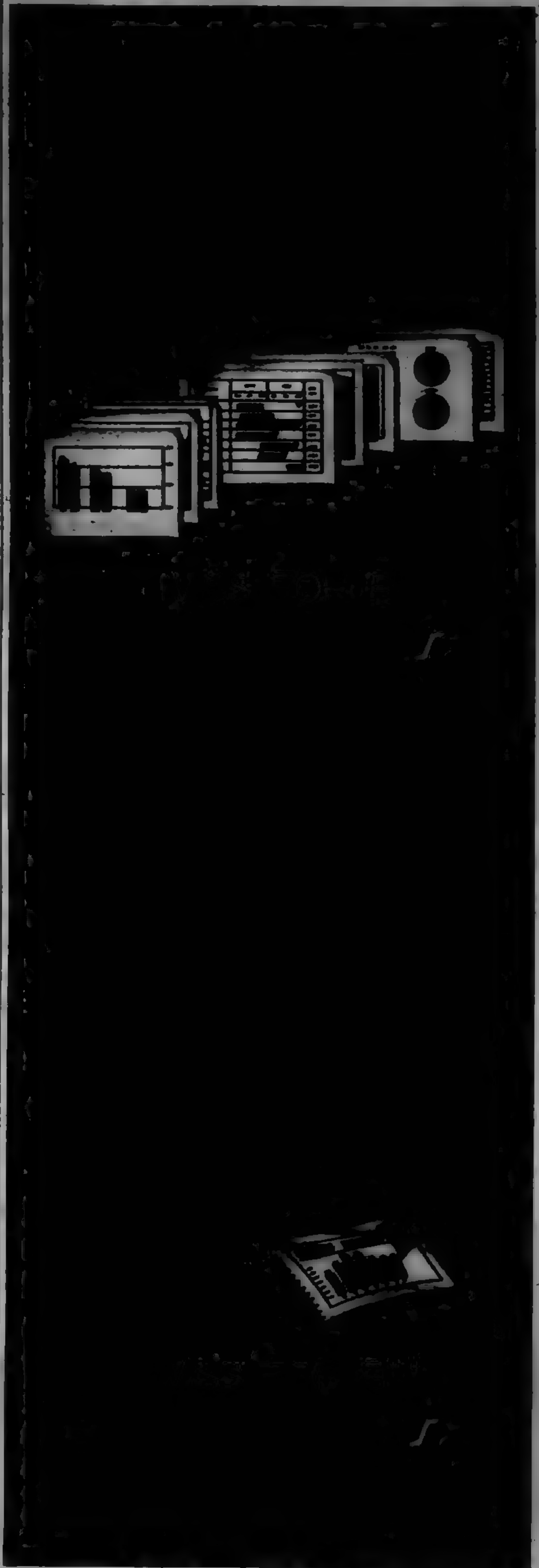
Buzzwords can make people sound knowledgeable. A consultant's knowledge, for example, may be limited to theories concerning technical trends rather than encompassing the practical considerations of implementation. That's why consultants often have difficulty answering questions like those posed at the panel session.

Vendors also like buzzwords. Buzzwords let them lump their products, correctly or incorrectly, into one class of equipment. By itself, XYZ Corp.'s 123MDW means little. But when 123MDW becomes an intelligent voice/data private branch exchange, the product gains a measure of credibility, even if it does not work or does not provide the functions offered by other voice/data PBXs.

Communications managers should not let buzzwords influence purchase decisions because they can mask immature technologies. At Interface, Chou paraphrased John Gantz, editor of the "Tech Street Journal" investment newsletter. "Five years after the trade press and consultants stop talking about a technology, it will actually be implemented," Chou said. Five years may be a conservative estimate. Despite years of talk about local-area networks, they remain an elite technology.

Even the most optimistic research firm predictions estimate that only 16% of all micros will be interconnected with local nets by 1988. By then, talk about local-area networks may have begun to give way to actual implementation of the technology.

Only by experiencing the implementation of new technologies will managers begin to understand their practical considerations.



Test Your Microcomputer IQ*

1. Name a totally integrated software package that was rated #1 by *Software Digest*.
2. Where can you buy an IBM PC XT or AT, AND have it installed, AND get on-site warranty for it?
3. Who will educate IC personnel or end-users at their site or yours?
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation?
5. What provides a micro software facility that allows you to customize a system to your specific requirements?
6. Who are the premier micro consultants to the *Fortune* 1350 companies?
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals?
8. What is the easiest way for an IC manager to satisfy the many end-user needs in the organization?
9. What company's evolutionary approach to software and service (also demonstrated by NOMAD, now NOMAD2, the premier 4GL/DBMS) ensures that they'll be a major force in the micro marketplace for years to come?
10. Name the companies that can provide all of the above?

*(Turn Page Upside Down for Answers)

1.DunsPlus Software 2.From DunsPlus 3.The DunsPlus Education Staff 4.DunsPlus's Communications Utilities 5.The DunsPlus Tool Kit 6.DunsPlus's Professional Consulting Staff 7.The DunsPlus Support Center 8.Call DunsPlus at 800-DNB-PLUS 9.Dun & Bradstreet, the parent company of DunsPlus 10.DunsPlus

If you answered all of the above correctly, you've already solved most of the problems facing you. If not, give us a call at 800-DNB-PLUS, or write us at 187 Danbury Road, Wilton, Connecticut 06897.

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SYSTEMS & PERIPHERALS

DEC trims memory tab

MAYNARD, Mass. — Digital Equipment Corp. has reduced the add-on memory prices for large-volume buyers of its VAX, PDP-11 Unibus and Q-bus systems using 64K-bit memory chips. The company said it has implemented volume purchase prices for its add-on Unibus memory.

The revised prices apply only to quantities of 200 or more in any combination of eligible products and is therefore geared primarily to OEMs.

If an OEM already has a volume agreement in effect, that customer can purchase annual add-on memory options in small increments throughout the year, according to DEC.

The VAX memory boards for the VAX-11/725, 11/730, 11/750 and 11/780 systems have been dropped from approximately $2,750 per megabyte to $1,650 per megabyte.

Volume purchase prices for add-on Unibus memory have been reduced from approximately $4,900 per megabyte to $2,000 per megabyte.

Selected Q-bus memory prices have been reduced and include the MSV11 (1M byte) Q-bus that was previously $2,800 and is now $1,500, and the MSV11 LF (128K bytes) that was reduced from $1,000 to $450. All of the prices above apply to minimum quantity orders of 200.

No further reductions apply on these items. Similar end-user price cuts have been made for the Q-bus and Unibus, the vendor said.

More information can be obtained from DEC, Maynard, Mass. 01754.

Large WP users get laser printer

CUPERTINO, Calif. — Motorola/Four Phase Systems, Inc. has announced its Model 8165 laser printer as an option to its Series 4000 and 6000 families of office information systems. The printer is geared to users with large word processing requirements, the vendor said.

The 8165 — priced at $39,800 — is a xerographic printer that features 300- by 300-dot resolution and 12 page/min output. Standard features include two 98-char. utility fonts for vertical and horizontal printing and an operator self-test and diagnostic display.

Options include a variety of fonts, a leasing plan for 36 or 45 months and several service programs.

More information is available from Motorola/Four Phase at 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

Datamedia ups 1620 support

NASHUA, N.H. — Datamedia Corp. has announced that its Model 1620 supermicrocomputer is now able to support up to 42 users.

Replacement of the Pick Systems Pick operating system from Version 1.3 to Version 2.0 — along with the 2M-byte memory board the company announced in January and the Model 1620's 2K-byte memory cache — allows the system to support up to 42 users, the vendor said.

Datamedia said that it will provide Version 2.0 of the operating system free of charge to the company's existing customers.

A 2M-byte 42-user Model 1620 Supermicro configured with the Pick operating system costs $36,400.

More information is available from Datamedia, 491 Amherst St., Nashua, N.H. 03063.

HARDTALK
Kathleen Sullivan
CW West Coast Bureau

Altos 3068 carving niche

With the introduction of the newest member of its multiuser microcomputer family — the Altos 3068, a 30-user system built around Motorola, Inc.'s 68020 microprocessor — Altos Computer Systems, Inc. appears to be trying to establish itself on the upper tier of an emerging class of computer systems based on microprocessors. The Altos 3068, however, is capable of a performance that rivals large minicomputers.

Although many supermicrocomputer vendors have set their sights on the traditional minicomputer marketplace, Altos, one of the first companies to use the 68020, appears to have managed to scrape its way to the top of the heap, at least temporarily.

Jim Renalds, a senior analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm, said, after evaluating a preview model of the system, that he accepts Altos' contention that the Altos 3068 can match the performance of a Digital Equipment Corp. VAX-11/780. The Altos 3068, he said, gains much of its performance capability from its architecture, which is based on a state-of-the-art microprocessor with a proprietary bus structure.

Scheduled for shipment this summer, the Altos 3068 will probably strengthen the company's position in the multiuser microcomputer market, Renalds said. "Altos has really brought to market a

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- Raster Technologies and Boston's Computer Museum are sponsoring a contest for graphics artists/76
- Acctex Information Systems unveiled a turnkey document storage and retrieval and storage system/76

INSIDE

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Printers/Plotters/72

Report targets systems capacity

DP execs urged to adopt work load forecasting program

WASHINGTON, D.C. — Systems capacity forecasting is playing an increasingly important role in the life-cycle management of data processing systems and should become an ongoing process in most shops.

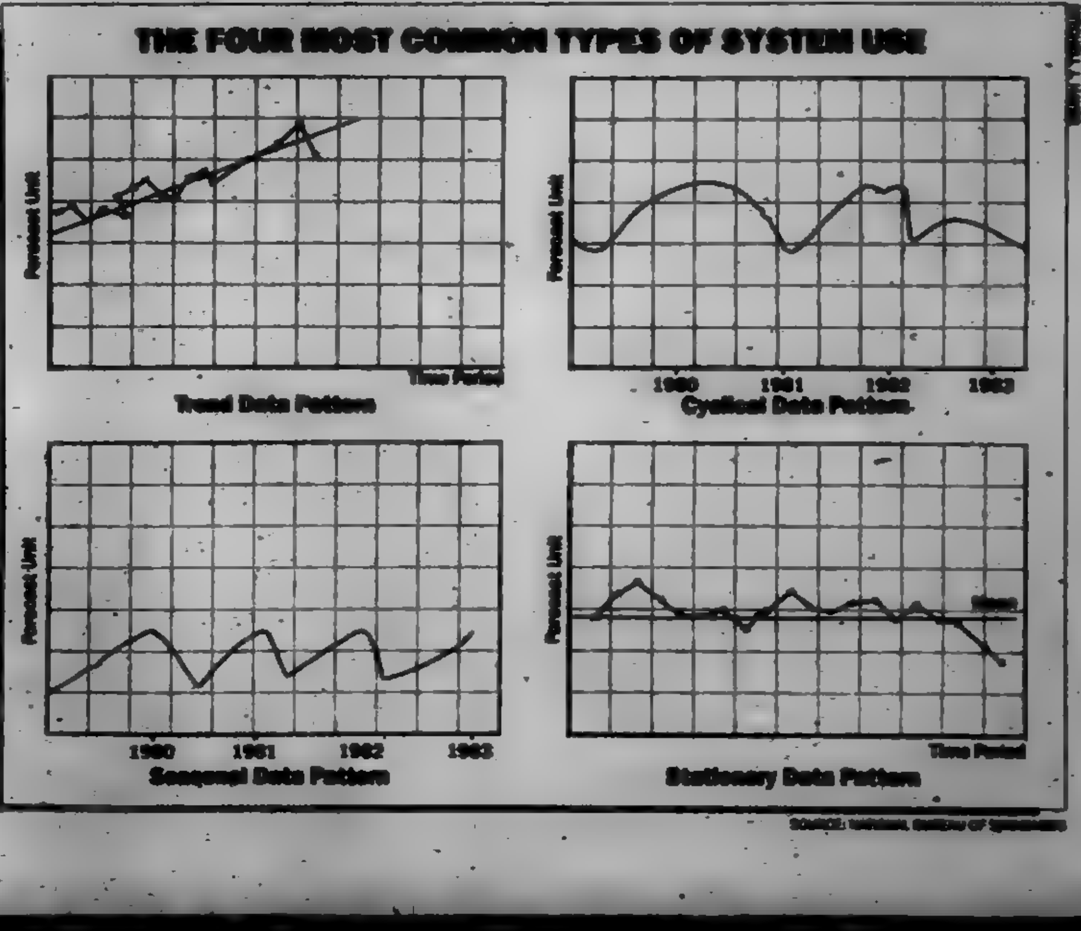
This is the finding of recent report issued by the National Bureau of Standards called "Guide on Work Load Forecasting." The report contends that DP managers should start a capacity forecasting program with an analysis of historical data and collection of future requirements.

Several steps can aid DP executives in performing effective work load forecasting. These include the following:

- Identifying the forecasting objectives.
- Organizing a forecasting team.
- Collecting data by work load levels.
- Analyzing historical data.

It is necessary to assess systems work load on different levels. For example, a work load can be

See FORECAST page 76


THE FOUR MOST COMMON TYPES OF SYSTEM USE

SOURCE: NATIONAL BUREAU OF STANDARDS

Computer museum, graphics firm to sponsor contest

NORTH BILLERICA, Mass. — Raster Technologies, Inc. and Boston's Computer Museum are jointly sponsoring a contest for developers of computer-generated graphics images.

Called the First Annual International Computer Graphics Image Contest, the competition is offering a $2,000 grand prize for the most creative, unique and visually appealing graphics image entered. Awards of $1,000, $500 and $200 will also be offered for runners-up, according to Raster Technologies.

Entries should be submitted in a 35mm color slide format; two slides per entry must be included. Submissions must be received by Raster Technologies by May 30, and all entries must contain identifying information that will allow the judges to determine the source of the entry. Winners will be announced July 23 at the Raster Technologies booth at Siggraph '85 in San Francisco. The winning entries will be displayed at the Computer Museum after Aug. 1, Raster Technologies said.

Professional, student categories

There are two entry categories for professionals (those currently employed and working on a computer graphics system) and a student category (for those currently enrolled full-time at an accredited college or university), the company said.

Entries will be judged by a panel of computer graphics designers including Alan Barr, associate professor of computer science at the California Institute of Technology; Alyce Kapro, a computer graphics consultant; Oliver Strimpel, associate director and curator of the Computer Museum; and Andries van Dam, chairman and professor of the computer science department at Brown University in Providence, R.I.

For more information, or to submit entries, contact the First Annual International Computer Graphics Image Contest, c/o Raster Technologies, Nine Executive Park Drive, North Billerica, Mass. 01862.

TURNKEY SYSTEMS

■ **Aeztec Information Systems (AIS) has released a turnkey document storage and retrieval system that incorporates an IBM Personal Computer, AIS' Find search and retrieve software and a micrographics reader/printer.**

Find was written to provide modular growth from a single personal computer-based system to large-scale turnkey document image management systems controlling a combination of micrographics and optical disk media. Prices start at $35,000.

AIS, Suite 600, 131 Steuart Street, San Francisco, Calif. 94105.

DATA STORAGE

■ **Motorola/Four Phase Systems, Inc. has introduced a 350M-byte hard disk drive that doubles the maximum disk storage for the company's Series 4000 and Series 5000 office information systems.**

The DD350 is a rack-mounted drive with 276M bytes of formatted storage capacity. Up to four drives may be used for a capacity of 1,104M bytes. A Four Phase NP/80 intelligent disk controller is required to add the drive to the 4000 or 5000.

The price of the DD350 disk is $32,000 with volume discounts available. The required NP/80 disk controller costs $10,750.

Motorola/Four Phase Systems, 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

■ **American Digital Corp. has announced two disk drives for the firm's System 73-1 minicomputers.**

A Data Products, Inc. Cipher group code recording Cachetape ½-in. tape drive provides up to 180M bytes of storage per reel to back up large Winchester disk drives.

Also available is Fujitsu America, Inc.'s Eagle 10½-in. Winchester-type fixed disk drive with 474M-byte capacity and 18-msec positioning time. As an update to the System 73-1, the price of the Cipher group code recording Cachetape is $4,900. The Fujitsu drive costs $6,600.

American Digital, 3525 W. Peterson, Chicago, Ill. 60659.

■ **Zetaco, Inc. has introduced its Model MZT-3 magnetic tape coupler that interfaces half-line formatted tape drives with Texas Instruments, Inc. [illegible] and [illegible] minicomputers.**

The MZT-3 supports data transfer rates of up to 1M byte/sec and uses electronically erasable programmable read-only memory technology to replace on-board switches. The MZT-3 reportedly supports up to four tape drives, including any mix of start/stop, streaming, cache, group coded recording and tridensity.

The MZT-3 Tape Coupler consists of a coupler, one set of tape cables, diagnostic software, a streaming utility and complete documentation and costs $1,675.

Zetaco, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

TERMINALS

■ **ITT Courier Terminal Systems has introduced its ITT 1778, an IBM 3270-compatible display terminal that attaches directly to IBM 3274 and 3276 controller ports.**

The 1778 has a 12-in. monitor, green or amber screens and a choice of three keyboards — a 92-key data entry format, a typewriter format and a typewriter format with numeric keypad. It costs $1,550 for the green monitor with keyboard, and $1,600 for the amber monitor with keyboard.

ITT Courier Terminal Systems, 1515 W. 14th St., Tempe, Ariz. 85281.

■ **Innovative Electronics, Inc. has announced its Transactor industrial bar code data-entry terminal which works with the firm's Netmaster control control unit and Factory Data Collection system.**

Information gathered by the Transactor terminal can be on-line to the host computer, or stored in the Netmaster for later use and report generation. The user may download files to the Netmaster from the host for validation purposes.

The terminal is connected to the Netmaster via RS-422 multidropped polled communications. It is equipped with a 16-char. alphanumeric display and a bar code wand. A laser scanner is optional.

Transactor costs $1,250, the vendor said.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

■ **Lee Data Corp. has unveiled its Model 2130 color display unit which is compatible with IBM's 3179 display.**

The Model 2130 includes a 14-in.

Continued on page 72

Uptime

Provide 24 hour CICS access

CICS Dynamic File Allocation is a must for effective CICS scheduling. It is the gateway to non-stop, round-the-clock CICS systems. It eliminates batch update constraints. It guarantees bullet proof restarts. It allows you and your batch jobs to add and remove CICS files at will, without disrupting your user community. Site license $4,000.

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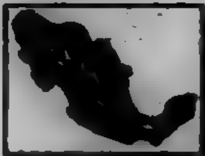

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SYSTEMS & PERIPHERALS

Continued from page 70

monitor, 122-key keyboard and logic module. It operates in either on-line or local-command modes. In on-line mode, the display will support host applications requiring up to seven colors. In the local-command mode, users may select two- or four-color support.

The unit costs $2,095 and will be available this month.

Lee Data, 7075 Flying Cloud Drive, Minneapolis, Minn. 55344.

■ Electrohome Ltd. has introduced two special-purpose color data display monitors that were designed for desktop computers, public information display systems, stock exchange display and educational applications.

The ECD 1904 is a 19-in. unit with .53mm dot pitch and 80-char., 560-pixel by 240-line resolution. The ECD 2504 is a 25-in. unit with .84mm dot pitch and an 80-char., 560-pixel by 40-line resolution.

The monitors are compatible with the IBM Personal Computer and with U.S and European red-green-blue standards, the vendor said.

The U.S. prices for the units are approximately $965 for the 1904 and $1,159 for the 2504. They will be available in late April.

Electrohome, 809 Wellington St. N., Kitchener, Ont., Canada N2G 4J6.

■ Chromatics, Inc. has announced six peripherals for its CX 1500 Colorgraphic Display System: a digitizer, a mouse, a light pen, a trackball, a function switchbox and bezel switches.

The X-Y Digitizer is a 16-in. by 16.2-in. tablet with an 11.7 sq.-in. active flat white matte surface. It has a four-color coded button puck that can select and position objects on the screen or from a menu, the vendor said. The digitizer costs $2,895.

A nonmechanical, optical mouse includes three buttons for input selection and a 9-in. by 11-in. mouse-pad surface. It is supported by firmware supplied in the CX 1500 Workstation and in all Graphical Kernel System (GKS) host library options. One mouse costs $595.

The CX Light Pen is said to allow user input of screen coordinates by pointing the pen at an illuminated area of the screen. It can be used as a logical input device in GKS programs, the vendor said. The light pen costs $995.

The trackball reportedly allows user input of positioning information for user feedback. It features three momentary action switches with red LEDs, quadrature outputs, a peripheral processor and cast-aluminum housing, the vendor said. The trackball generates 200 ball-revolution/min at 192 pulse/revolution. It costs $2,995.

A 24-function switchbox has lamped programmable switches that allow input of frequently used user-defined character strings with a single keystroke, the vendor said. GKS support reportedly allows use of this feature as a logical input device in GKS programs. The switchbox, including a snap-in overlay, costs $2,995.

Bezel switches are said to allow choice of a user-displayed menu or input frequently used, user-defined character strings with a single keystroke. GKS support reportedly allows the switch to be used as a logical input device in GKS programs. The switch consists of an eight-function switch printed-circuit board, bezel modifications and mounting panel. One switch costs $295.

Chromatics, 2558 Mountain Industrial Blvd., Tucker, Ga. 30084.

■ Televideo Systems, Inc. has unveiled its Model 955 Ascii VDT, which was designed for office automation applications.

The terminal features a 14-in., 80- by 132-col. display. It has up to four pages of memory in both 80- and 132-col. mode.

The 955 terminal costs $699 and is scheduled to be available for shipment this month.

Televideo Systems, 550 E. Brokaw Road, San Jose, Calif. 95112.

■ Lear Siegler, Inc. has unwrapped its ADM 12 Plus editing terminal, which is compatible with its ADM 2, ADM 12 and ADM 31 terminals and the Televideo Systems, Inc. 925, 950, 912 and 920 terminals.

The ADM 12 Plus features an 80- or 132-col. display, programmable cursor keys, a variable format display memory, variable-speed vertical scrolling and horizontal scrolling. It provides two pages of 80- or 132-col. by 24-line display memory or a choice of wide and long page memory configurations.

A four-page memory option is available to double the standard memory formats and add a 158-col. by 48-line display memory format. The terminal includes 16 programmable function keys.

The ADM 12 Plus costs $745.

Lear Siegler, 901 E. Ball Road, Anaheim, Calif. 92805.

PRINTERS/ PLOTTERS

■ Datasouth Computer Corp. has released its TX5220 bidirectional multimode printer for the IBM System/34, 36 and 38.

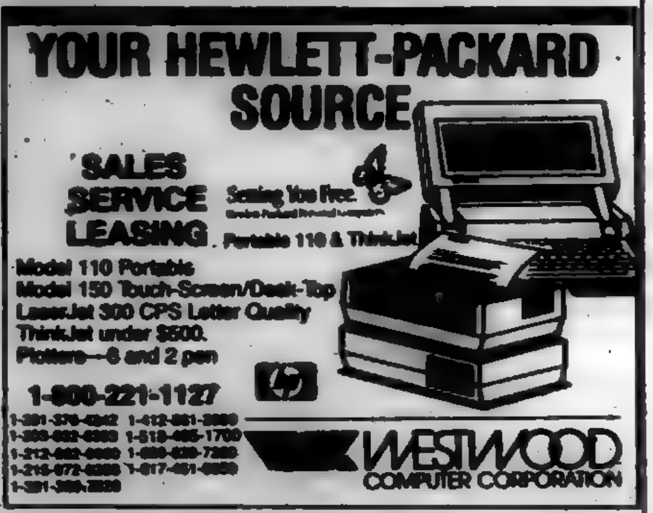
The TX5220 is said to emulate the IBM 5256, 5224 and 5225 printer series and interfaces directly to the IBM systems via a standard twin-axial cable in its back panel. It does not require an external protocol conversion box, the vendor said.

The printer can be used as an intermediate or terminating printer on a chain of up to seven devices. It also has a Centronics Data Computer Corp.-compatible parallel interface for use as a shared printer on an Ascii system, according to the vendor.

Features include 220 char./sec printing in draft mode, 90 char./sec in memo mode and 40 char./sec in near-letter-quality mode, as well as dot-addressable graphics.

The TX5220 costs $2,495.

Datasouth Computer, 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.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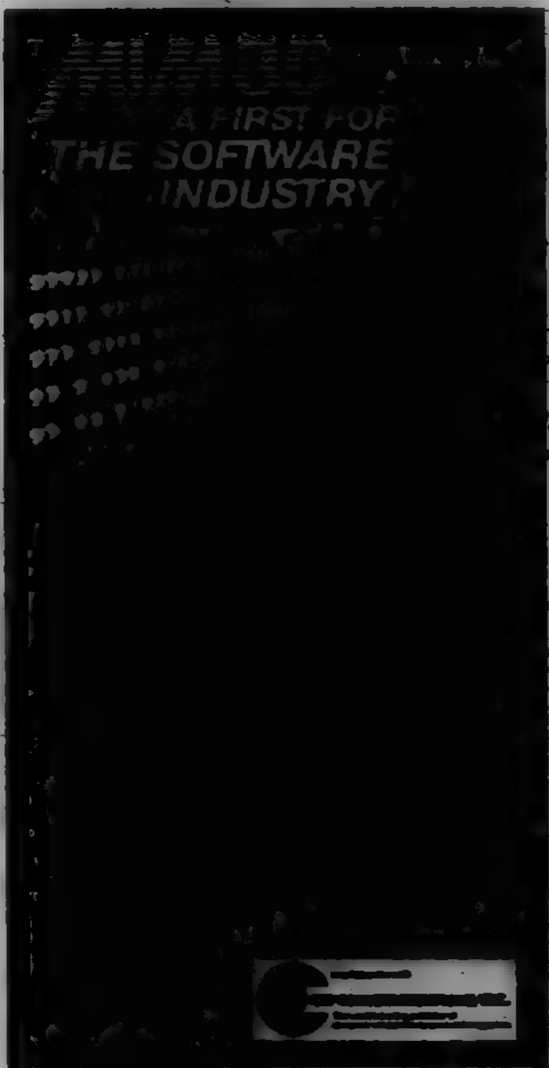
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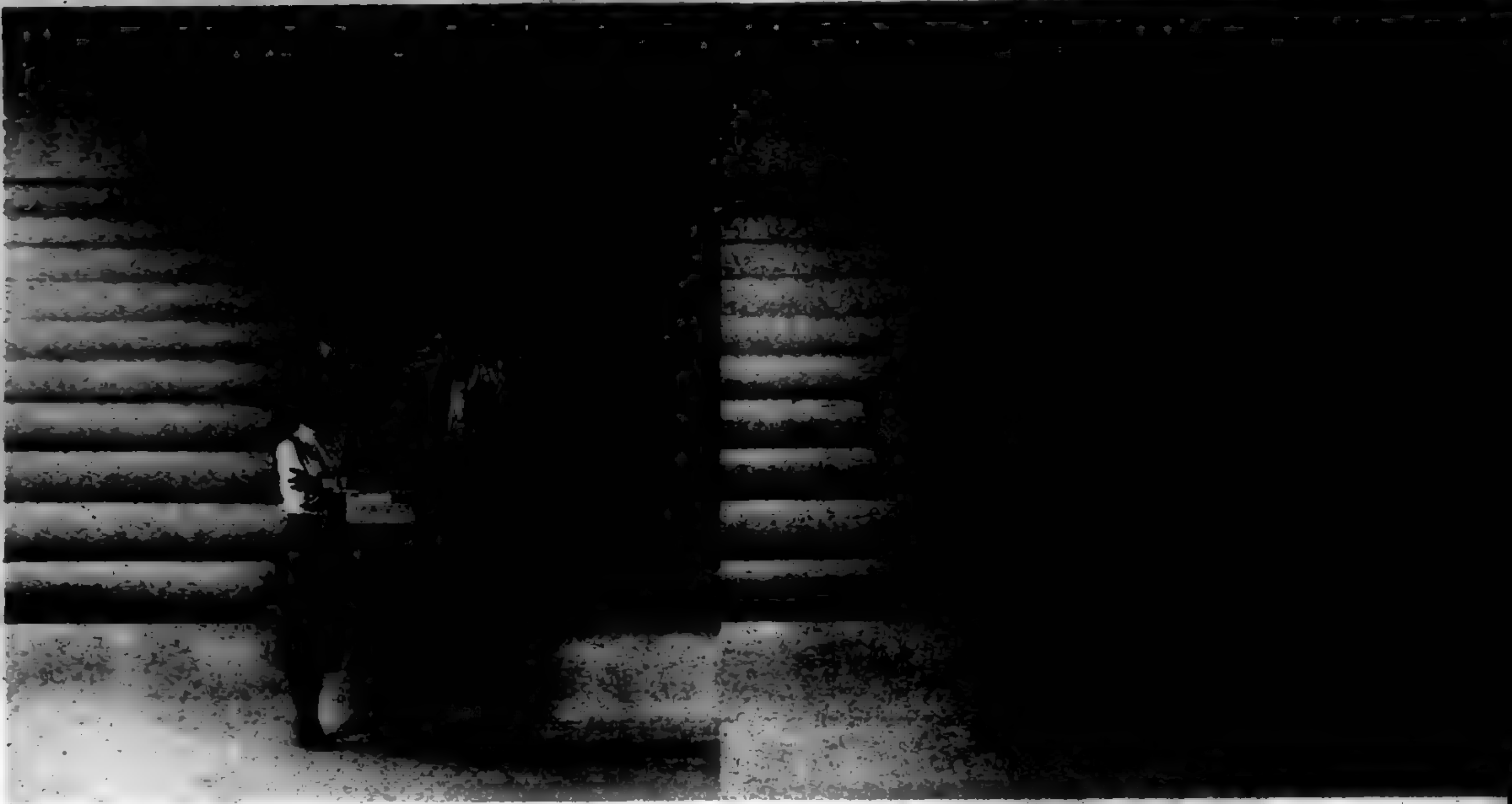

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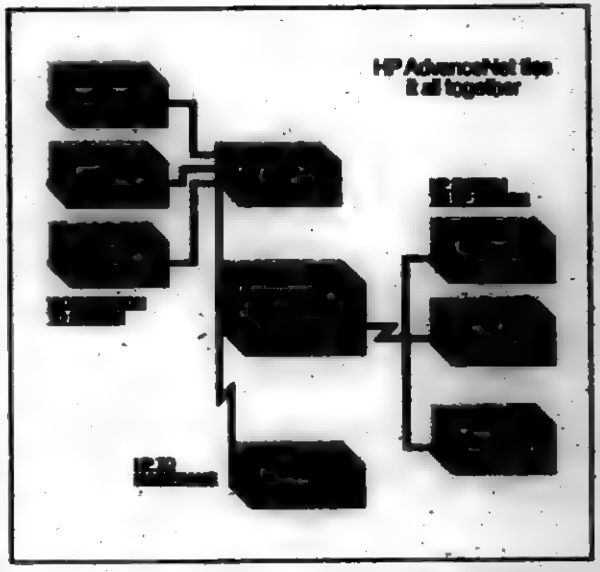

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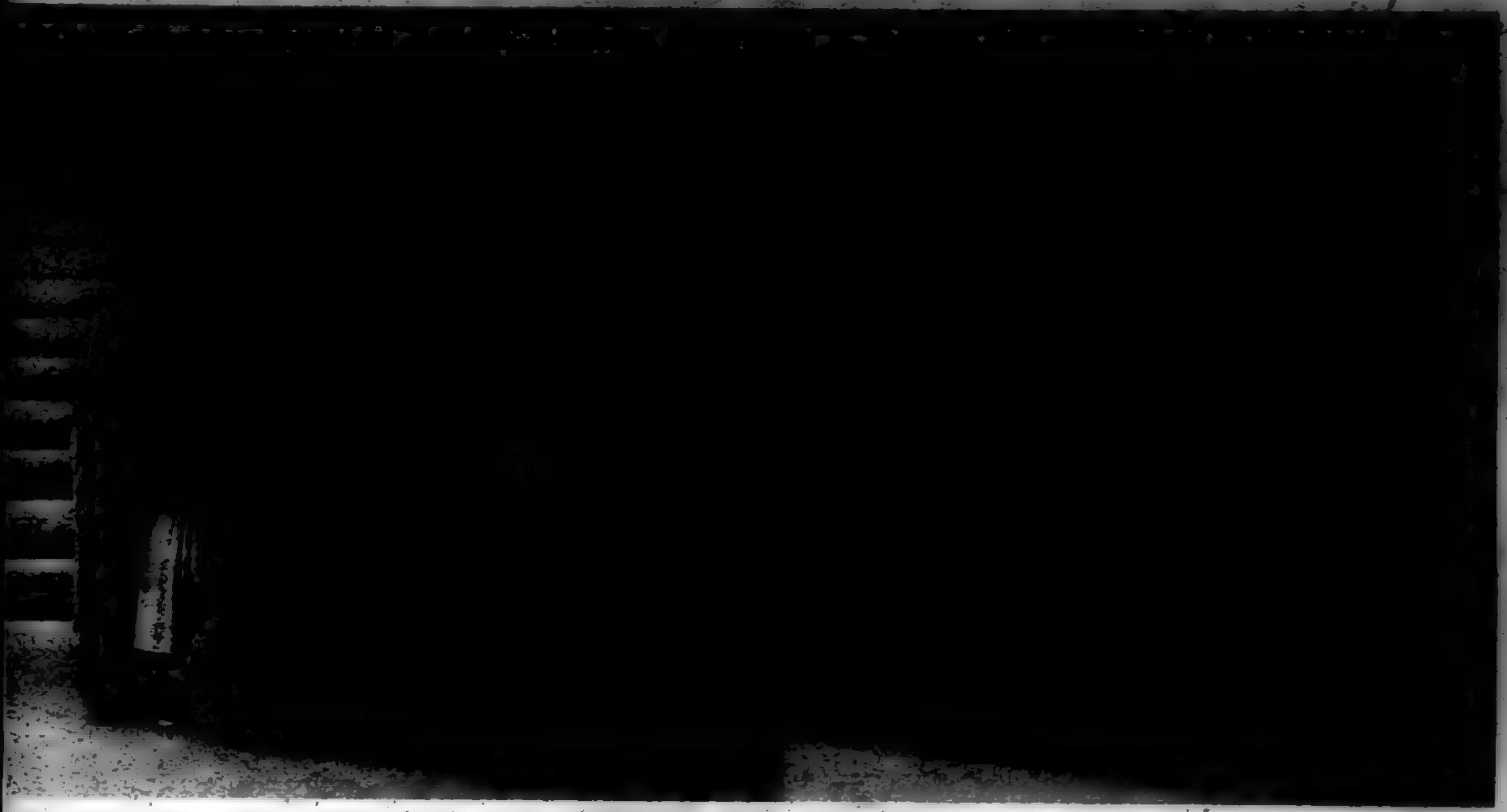

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FORECAST

from page 69

described by its mission, its functions, quantifiable events, DP operations, DP resource usage and DP plans. Each of these work load levels can be associated with different levels of management and/or users. Evaluation of the DP operation at the various levels will provide the necessary input for translating mission requirements into DP resource needs, the report said.

After work load data has been collected from the different levels, the forecaster must analyze the data with regard to applications systems and total work load, the report said.

The analysis of historical data by applications systems can reveal important information necessary to build a model that will be used to forecast a given applications system. For example, historical data from different levels can be plotted using simple histograms and scatter diagrams.

Choosing a technique

Upon completion of the preliminary steps to forecasting, DP executives should select a forecasting technique. The most commonly used techniques include the following:

- Simple moving averages.
- Exponential smoothing.
- Classical decomposition.
- Simple linear regression.
- Multiple linear regression.
- The Box-Jenkins method — considering data availability and the pattern of the historical data, accuracy vs. cost of using the technique and desired forecast span, the report said.

Forecast spans should be broken down into short-, medium- and long-range time horizons for which forecasting is to be performed. The short range is from one week to two years; the medium range is from two to five years; and the long range is defined as a time horizon of five or more years, according to the report.

With the exception of the Box-Jenkins forecasting technique, all other techniques assume that one of four underlying patterns can be identified in the historical data. These general trends are as follows:

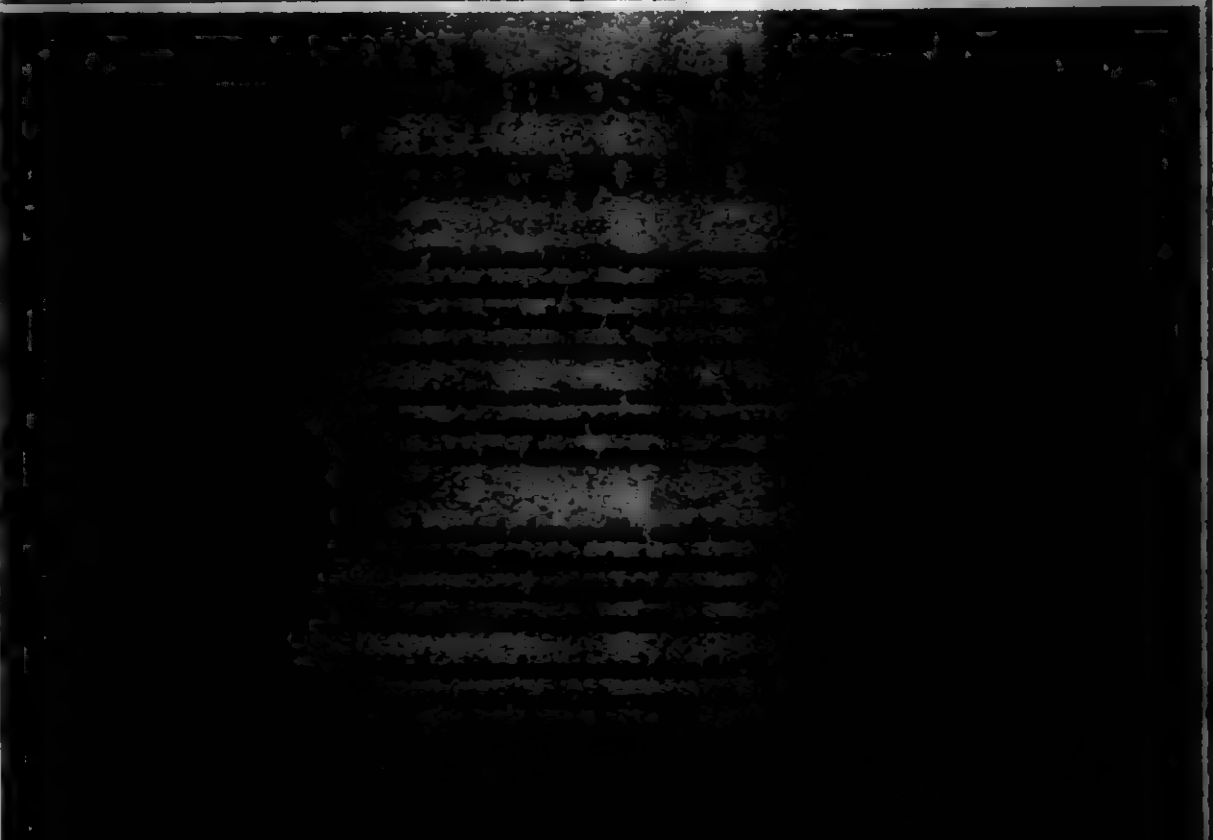
- The trend data pattern, when the work load increases as a result of changes in the way the existing system is used. This includes, for example, an increase in the number of transactions processed by the system or in program development.
- A cyclical data pattern that can be caused by a system change, such as the introduction of new applications or the elimination of others.
- A seasonal data processing pattern caused by periodic tasks that affect the overall systems work load.
- A stationary data pattern that occurs when a time series behaves as random fluctuations around a mean value, and no trend can be identified.

Analyzing results

The forecaster should build a model using part of the historical data and then exercise the model on the remaining data to show how the forecast values compare with the actual values, the report said.

The results of the forecasting process need to be analyzed carefully and evaluated before any decisions can be made based on the them. The results present decision makers with information on whether adequate computer resources are available to perform the users' work load.

The "Guide on Work Load Forecasting of the Computer Science and Technology" series (S/N 003-003-02634-4), which gives examples of forecasting using the various methods and includes a suggested reading list, can be obtained for $3 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.



ALTOS

from page 69

system that will set a lot of the industry on its ear," he predicted.

Tim Bajarin, vice-president of microcomputer research at Creative Strategies, Inc., a market research firm also located in San Jose, agreed with Beneida. Altos is "way ahead of everybody else" with the release of the Altos 3068, Bajarin said, noting that the system's modular design offers users a flexibility that few other companies can match. "The system has tremendous potential," he said.

In the Altos 3068, up to eight specially designed boards can be inserted into the chassis, with each board serving a distinct function. In a standard configuration, a system would include a CPU board, a random-access memory board, two file processor subsystem boards and a serial communications board.

"It uses plug-in boards the way a personal computer does," Bajarin said. "That really sets them apart."

He agreed with Beneida that the Altos 3068 strengthens the company's stand in the multiuser microcomputer market. Altos has already established itself as a company that offers quality and service with its current family of multiuser systems, based on Intel Corp. microprocessors, Bajarin said. Now, he noted, it will be able to offer its customers an upgrade path to a system based on a true 32-bit microprocessor.

Bajarin also applauded Altos' selection of AT&T's Unix System V operating system, noting that System V is on its way to becoming the standard in the Unix market.

Both analysts praised the Altos 3068's remote diagnostics software, which is available as an option on the system. "Most multiuser microcomputer companies don't have remote diagnostics," Beneida noted. "That's much more typical in the minicomputer or mainframe market."

Neither analyst thought Altos would encounter problems getting an adequate supply of the Motorola microprocessors for the system.

COMPUTER INDUSTRY

Wang girds for offensive

Planning product bows despite downturn

By Peter Bartolik
CW Staff

BOSTON — Wang Laboratories, Inc. believes the industrywide slowdown in orders growth could last up to a year, but despite that, the company intends to make aggressive product announcements over the next few months, senior executives said recently.

Wang recently projected 10% growth for the third quarter ended March 31 and a decline in profits for the fourth quarter and fiscal year that ends June 30; the company also confirmed it plans a two-week production shutdown in July [CW, March 25]. It was also reported that top executives had agreed to a 10% pay cut.

Claiming that Wang's problems are symptomatic of an industrywide slowdown, John Cunningham, president and chief executive officer of the office automation leader, said, "I don't think it's a three-month phenomenon, but I also don't think it's a two-year phenomenon." He said the slowdown, which other vendors have acknowledged, could extend for nine to 12 months.

Speaking here at a press briefing, Cunningham and other Wang executives conceded that delays in shipping Wang Office software products contributed to the drastic downturn in Wang's fortunes from its historic 30% growth rate. "I think if we had done a better internal job, we would be feeling this not as much," Cunningham said.

He added that Wang will attack the general slowdown as an internal problem and will make its operations more efficient. During the current fiscal year that ends in June, he said, Wang will have hired only about 1,800 employees, down from the original goal of hiring 4,000.

Fred Wang, executive vice-president and chief development officer, said the delay in shipping Wang Office resulted from the complexity and scope of the project. "The magnitude of the project just continued to grow," Wang said. "The architecture was the right one, but there was just a

See WANG page 84

Datapoint to hinge sale on users' needs

By Peter Bartolik
CW Staff

SAN ANTONIO — With the battle for management control decided, Datapoint Corp. will move toward liquidation in a manner designed to ensure that its "customers are provided with the best of products and services," officials said recently.

A week after the company negotiated a conditional surrender with arbitrageur Asher B. Edelman [CW, March 25], the top executives of the company mailed out a letter to customers pledging that the liquidation effort will be "designed to satisfy our customers and strengthen our products and services." The letter was signed by Edelman, who was named chairman as part of the settlement, and Edward P. Gistaro, the company president and former chief operating officer who assumed the title of chief executive officer from resigned Chairman Harold E. O'Kelley.

In an interview with *Computerworld*, Gistaro stressed that Datapoint will not sell off its various operating divisions in a piecemeal manner. What has been holding up the sale of its manufacturing and service operations, he said, is that "we haven't been able yet to put together an ongoing business relationship between the potential buyers."

Edelman and the company have said they hope to sell off the service operations for $200 million and the manufacturing operations, which produce distributed data processing and office automation equipment and networks, for $100 million.

Gistaro said he met with Edelman and was convinced the arbitrageur is committed to meeting the best interests of the customers and recognizes the value of the company's relationships with customers. "That's the only reason I'm with the company," Gistaro said, adding that he antici-

See DATAPOINT page 84

■ Eastman Kodak recently announced another computer industry acquisition, and archrival Polaroid didn't sit still/82

■ Another IBM executive was moved recently, as the reshuffle of Big Blue's information systems group continued to reverberate/84

IPL blames 1984 revenue losses on shipping delays, market lag

WALTHAM, Mass. — IPL Systems, Inc. recently reported a net loss of $11.9 million, or $2.38 per share, on revenue of $4.6 million for fiscal 1984, which ended in December.

In 1983, the midrange plug-compatible mainframe vendor posted a loss of $4.2 million, or 85 cents per share, on revenue of $9.9 million.

In the fourth quarter of 1984, IPL experienced a net loss of $5.1 million, or $1.03 per share, on revenue of $1.3 million. A year earlier, the company had reported a loss of $2.5 million, or 51 cents per share, on revenue of $2.2 million.

According to IPL, the 1984 results were adversely affected by several factors, including depressed prices in the midrange mainframe computer market, delays in the shipment of its IPL Model 4460 and the provision of significant reserves against inventories.

The company said that cost-cutting measures implemented during the year enabled it to increase its cash balance to $3.9 million in the fourth quarter.

Press conference gaffe raises questions of credibility

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

On a recent Tuesday, Wang Laboratories, Inc. held what seemed to be a comprehensive press briefing to go over the company's business and product strategy. The reason for the briefing, top executives said, was that Wang felt it needed to do a better job communicating with the press.

The following day, Wang confirmed that just the previous week it had told production employees to take vacations or unpaid leaves during the first two weeks of July for a companywide production shutdown (see related story above). Asked why no mention of the shutdown was made during the press briefing, a Wang spokesman lamely replied that the company considered the issue "an employee communication."

Submitted for your consideration (fade in: theme music from the *Twilight Zone*) is a classic example of a credibility gap in the making.

Several months ago during a non-industry-related meeting in Boston, according to one person who was there, Wang President John Cunningham was discussing the company's phenomenal 30% growth rate, which had not yet declined to the 10% rate the firm expects to record for the quarter that ended in March. Noting that most of Wang's competitors had at one time or another suffered setbacks in business goals, Cunningham reportedly told the audience, "I feel like the last virgin."

That phrase points out what some industry analysts believe is a potentially significant shortcoming on Wang's ledger books: The company has never before had to deal with adversity.

Right now, the company is in the throes of adversity; a Boston newspaper even reported that a senior management team at Wang is evaluating a number of cost-cutting measures, including layoffs.

During the press briefing, Cunningham noted that there is little Wang can do to counter the extremely negative impact of the strong dollar in international currency markets. The challenge, he said, is how the company manages its business during this difficult period.

Right now, crisis management is the key issue for Wang. The company is at a turning point in its history. No longer able or content to live off its famed word processing base, it can only prosper by moving ahead with new technological solutions to defend its office automation base from the invasion of the Big Blue sales hordes.

Wang has taken an aggressive stance. A current print advertising campaign has unabashedly taken potshots at IBM, and the advertising effort has moved to television in some areas with high-priced, high-impact fusillades directed against the moral integrity of IBM.

Although that campaign is applauded in this corner for its directness and mass appeal, advertising alone is not sufficient to move the company forward. The sympathy bought with millions of advertising dollars can vanish overnight in the light of negative news stories. The fact is that Wang has a lot more to lose than most of its competitors during the current industry downturn. Above all, it needs to establish credibility by taking a proactive stance during an adverse period.

By neglecting to mention a scheduled production shutdown, Wang has indicated that, at this point, it is attempting to bar the doors against bad news. That can produce a shelter mentality, something that breeds nasty surprises.

COMPUTER INDUSTRY

Investors seek to scoop up shares of Wall Street darlings

OUTSIDE LINES
Bohdan Szuprowicz

Institutional investors are constantly on the prowl for undiscovered high-technology companies whose stock prices will appreciate to reflect their rapid growth in revenue and earnings.

When institutions collectively acquire 20%, 30% or more of the outstanding shares of such companies, these become the darlings of Wall Street. Their prices may appreciate rapidly as even more institutions rush in to get a piece of the action.

By the same token, when the stock of these companies falls out of favor, institutions eliminate these positions from their portfolios, which results in dramatic price drops of those shares.

During the last two years, 21st Century Research has been keeping track of changes in institutional ownership of approximately 200 stocks of some of the fastest growing and most popular high-technology companies. An analysis of those changes during the 12-month period from January 1984 to January 1985 yields some fascinating results indicating which stocks are on their way to becoming the new darlings of the institutions and which ones are definitely falling out of favor.

For example, Valid Logic Systems, Inc., supplier of computer-aided engineering systems for custom design of complex microchips, went public in October 1983, and by February 1984, Standard & Poor's Corp. reported that 0.11% of its stock was acquired by institutions. A month later, 6% of that stock was owned by institutions, and by January 1985, almost 21% ended up in institutional portfolios. Institutions increased their ownership of Valid Logic at an average monthly rate of 1,895%.

On the other hand, Tandon Corp., the minifloppy leader long standing as an institutional darling with more than 59% of its outstanding shares in institutional portfolios, reported that it had been dumped consistently throughout last year at a rate of 2.6% every month. It also reported that by January 1985, only 40% was left in institutional portfolios.

IBM is the bellwether of high-technology stock, and more than 50% of its stock is in the portfolios of more than 1,600 institutions at all times. IBM has the most widely held stock ever, but IBM is a poor indicator of the high-technology sentiments of institutional investors. Although institutions are always trading IBM, its institutional ownership level remains relatively stable. Actually, institutions hold much larger percentages of shares of companies like Digital Equipment Corp. (86%), Texas Instruments, Inc. (71%) or Tandem Computers, Inc. (69%) but in considerably fewer portfolios. As a result, prices of these stocks are volatile.

Observe acquisition rates

To single out the high-technology darlings in the making, it is necessary to observe institutional ownership acquisition rates as soon as the company goes public. Second on our list is Seeq Technology, the manufacturer of electrically erasable programmable read-only memory semiconductors. Seeq Technology's institutional ownership zoomed from a mere 0.78% in February 1984 to 27% by the beginning of 1985, which translates into an average monthly acquisition rate of about 344%.

Stratus Computer, Inc., the fail-safe computing start-up, recently caught the attention of IBM. Stratus is also among the institutional rising stars whose monthly accumulation rate averaged 26% in 1984 with 22% of its outstanding shares in professional portfolios.

Tandem, the established leader in the fail-safe computing business, has so far withstood the challenge, and its institutional ownership edged from 62% in January 1984 to almost 70% one year later. However, this does not yet reflect the effect on institutional holdings of the Stratus-IBM agreement that may seriously erode that secure position when institutions realize the full impact of the tie-up between those two firms.

Compaq Computer Corp.and Kaypro Corp. are two of the recent portable computer "pure plays" that illustrate how institutions did not go for the concept, despite extensive publicity and spectacular growth of both companies. As soon as Compaq went public, 14 institutions grabbed more than 5% of its stock. Two months later in May 1984, more than 12% of the company shares were in institutional portfolios. But this was a rather short-lived romance, and in January 1985, only 9.5% of Compaq remains in institutional portfolios.

Kaypro, by comparison, was a nonstarter with institutions that acquired 0.46% of the stock by May 1984. At the outset of 1985, Kaypro held a paltry 0.56% of the company, which is far from qualifying it to become a Wall Street darling.

Szuprowicz is president of 21st Century Research of North Bergen, N.J. and publisher of Supergrowth Technology USA.

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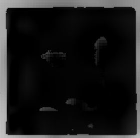
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82

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COMPUTER INDUSTRY

Kodak to buy electronic imaging firm

ROCHESTER, N.Y. — Eastman Kodak Co. recently announced plans for its second acquisition in recent weeks with an agreement to pay $56.3 million for all outstanding shares of Eikonix Corp., an electronic imaging company located in Bedford, Mass.

Earlier, Kodak had announced an agreement to acquire Verbatim Corp., the Sunnyvale, Calif.-based manufacturer of floppy disks and other storage products.

Meanwhile, Kodak's rival in the instant photographics market, Polaroid Corp. of Cambridge, Mass., announced recently it had signed an agreement to buy the U.S. operations of Verbatim's Data Encore diskette duplication service.

The Data Encore operation, not included in the Kodak acquisition of Verbatim, provides software duplication and copy protection devices.

Polaroid, which, like Kodak, is seeking to expand into the computer products field, also announced in March that it had increased its ownership in Advanced Color Technology, Inc. (ACT) from 36% to 82%. Polaroid acquired its initial investment in ACT, a designer and manufacturer of color ink-jet printers, in October 1983.

Kodak said it had agreed to purchase in excess of 50% of Eikonix's stock from several officers and directors and certain shareholders for $16.12 a share. It will also seek the remaining shares for the same price.

Eikonix produces such merchandise as digital cameras, laser beam recorders, scanners and image processing systems and in 1984 posted revenue of more than $6.5 million. The company will be operated as a wholly owned subsidiary of Kodak following completion of the agreement, Kodak said.

J. Phillip Samper, Kodak executive vice-president and general manager of the company's Photographic and Information Management Division, said the acquisition "provides an important element in our long-term business strategy for both our Graphics Imaging Systems Division and our Atex subsidiary."

PE elects McDonell board chairman

NORWALK, Conn. — Perkin-Elmer Corp. recently elected President and Chief Executive Officer Horace G. McDonell as chairman of the board. Executive Vice-President of Operations Gaynor N. Kelley was named president and chief operating officer, and McDonell will continue as CEO.

McDonell succeeded Robert H. Sorensen, who had served as chairman since 1980. Sorensen will remain on the board of directors until the company's annual meeting in November.

McDonell served as president and chief operating officer of PE from 1980 until 1984, when he was elected CEO.

Since joining the firm in 1962, he has served as executive vice-president of operations, senior vice-president and vice-president and general manager of the instrument group. He is also a director of Uniroyal, Inc.

Bell Atlantic to acquire computer chain

DALLAS — Compushop, Inc., a 63-store computer retailing chain in the West and Midwest, recently announced it will be acquired by Bell Atlantic, the Bell system's Philadelphia-based holding company for the mid-Atlantic states.

Bell Atlantic also recently acquired Sorbus, Inc., a nationwide computer maintenance firm, and Tri-continental Leasing Corp., an equipment leasing and financing company. In addition, Bell Atlantic holds a majority interest in A Beeper Co., which markets electronic paging equipment and cellular telephones.

Under terms of the acquisition, one share of Bell Atlantic common stock will be exchanged for 14 shares of Compushop common stock, of which there are approximately 3.5 million shares outstanding. Bell Atlantic will also hold the option to purchase all remaining unissued Compushop stock.

Bell Atlantic reported sales of $973 million, or $9.94 per share, in fiscal 1984 and recently increased its annual dividend to $6.80 per share.

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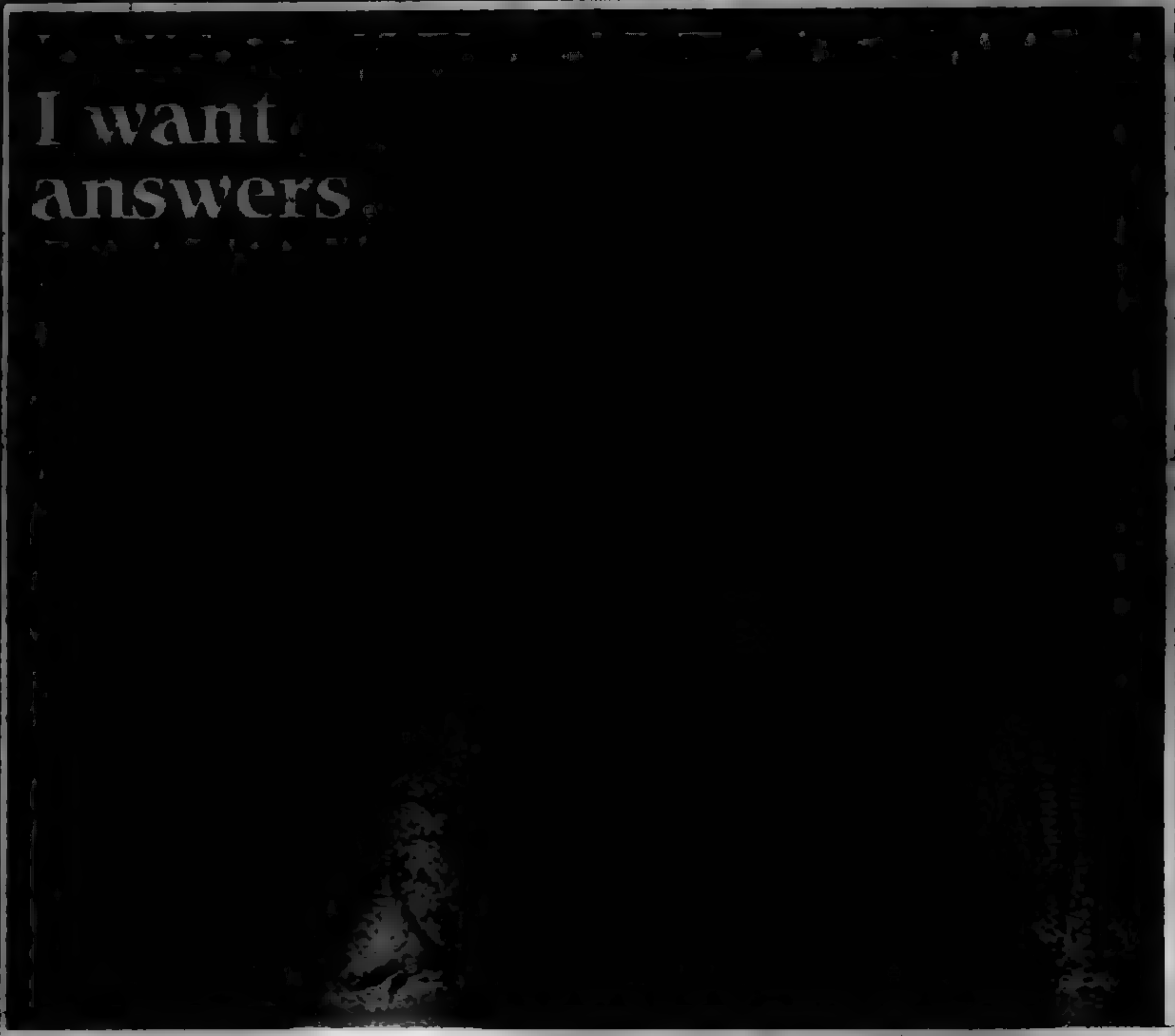

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IBM exec named

SAN JOSE, Calif. — IBM recently announced the appointment of Ray S. AbuZayyad to president of the General Products Division here.

AbuZayyad, formerly assistant to the group executive of the former Information Systems and Technology Group, replaces John E. Bertram, who was named group executive of the new Information Systems Technology Group [CW, March 18].

The General Products Division is responsible for worldwide development and U.S. manufacturing of storage systems and program products.

AbuZayyad was general manager of the San Jose facility from 1982 to 1984 and was appointed a division vice-president in 1983.

DATAPOINT

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pates remaining on board after a sale is negotiated.

Edelman's strategy has been to maximize the return to shareholders by selling off portions of stock for more than the market value of the company as a whole. He similarly wrested control of Management Assistance, Inc. and liquidated that company and was named vice-chairman of Mohawk Data Sciences Corp. with a similar goal.

Despite Edelman's strategy, Gistaro said, customers will benefit because the components of the company will be placed "in very strong hands."

The battle between Edelman and the Datapoint board, which was reconstructed in the settlement to give Edelman 50% voting control on the board, had a negative impact on customers and sales personnel, Gistaro said. This, in addition to an industrywide slowdown, has reduced sales over the past few months, he said.

However, Gistaro said, the fact that a settlement was reached amicably "will have a salutory effect" on sales and customer relations.

A further part of the settlement was that Edelman will be reimbursed for expenses incurred in his takeover effort. Gistaro said reimbursement can be no more than $1.5 million.

The company still faces a shareholder lawsuit challenging retention bonuses, or "golden parachutes," established by the board when O'Kelley was in charge. Reportedly $15 million was placed in trust for 36 top officers. Gistaro said funds were placed in trust for "various reasons, not just retention bonuses."

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9A07-61

WANG

from page 77

larger amount of standard-based code that had to be written for the product than we had expected."

According to Wang, the son of the company's founder and chairman An Wang said much of the Wang Office system could not be tested until the entire system was up and running.

Capturing the market

Much of the briefing focused around how Wang intends to capture the emerging market for what it calls "integrated information processing" in the office environment.

Company executives stressed that Wang is positioning itself to be the major alternative in the office environment to IBM and is taking a systems approach to processing voice, image, data and text in the integrated office.

The difference between Wang and other vendors, the executives said, is that Wang perceives the network itself as the center of corporatewide processing, rather than a host processor.

Total solutions provider

Samuel F. Gagliano, vice-president of product planning and product strategy, said the company intends to be a total solutions provider for small businesses and provide Fortune 1,500 companies with departmental data processing and office automation systems that will tie into IBM-based corporate MIS.

Gagliano said Wang's VS series of processors will form the basic office engines for word and data processing, linking downward to word processors and microcomputers and linking upward to centralized processing systems.

In a month or so, Gagliano said, Wang will announce a desktop system that will include Wang's 2200 small business system architecture on a chip, using very large-scale integration to package what formerly required 11 circuit boards.

Also, Gagliano added, sometime in the next few months, Wang will introduce a multiuser type of microcomputer system.

"The next step is to place the VS system on a desktop," Gagliano added.

Aggressive ad campaign launched

In the meantime, the company has mounted an aggressive advertising campaign aimed at shooting holes in IBM's apparent attempts to sell department systems based on its System/36.

The campaign, belittling the System/36 and IBM in general, "is step one in getting [Wang] aggressive again," according to Robert L. Doretti, senior vice-president of U.S. operations, sales and marketing strategy.

Cunningham expressed some resentment at IBM for announcing products and statements of intent that reach far into the future. However, he stopped short of saying IBM is intentionally seeking to disrupt competitor's marketing plans.

"I don't think IBM understands the disruption in the marketplace caused by statements of direction and some long-term product announcements," he said.

Cunningham added, "It is very difficult for any player to compete against some of the more nebulous [IBM] direction statements."

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Ft. Lauderdale, FL [illegible]
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Administer central academic computing and campus microcomputer facilities; and assist in development of campus LAN. Facilities include VAX-cluster (11/780's) w/ 3.5G online storage. Requirements: minimum five years experience in academic or related computing including management and administration; technical expertise in hardware and software; Masters degree (doctorate preferred). Significant teaching and scholarly record is desirable. Salary commensurate with qualifications. Available fall, 1985 (appointment date negotiable to July 1986). Nomination deadline: April 19; Application deadline: May 3, 1985. For complete position description or to nominate or apply, contact:

Search Committee for Director of Academic Computer Center, c/o Office of Academic Affairs, University of North Carolina at Greensboro, Greensboro, NC 27412. (919) 379-5494.
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The Director of Computer Services is responsible for hardware, software and information systems for University administrative, instructional and office automation computing. The Director reports to the Vice President for planning and analysis and supervises a staff of more than 10 professional and support employees. Current hardware includes an IBM [illegible], VAX 11/780, CT and Jacquard systems.

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**Chair, Computer Services Search Committee
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the [illegible]

[illegible]
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Rich's
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Send 2 copies of resume, Attn: Job #R85-843, to: MIT Personnel Office, 77 Massachusetts Ave., Bldg. E19-238, Cambridge, MA 02139. MIT is an equal opportunity/affirmative action employer.

MIT

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COMPUTERPEOPLE is a rapidly growing regional software services and consulting firm. We have an immediate need for seasoned software engineers to support client applications in real-time digital telecommunications and process control.

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We are looking for new employees, but will consider subcontractors. Columbus and Sunbelt opportunities. Call or send your resume to:

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[illegible] Corporate Exchange Dr.,
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Contact Gary Hunt for specific information about these Senior positions:

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Responsible for implementing the tasks defined below on software development projects. These engineers will report to project leaders. BSCS, EE or Math with six plus years experience in definition, design, development and delivery of software systems, utilizing VAX or Motorola 68000 computers. Required fluency in PASCAL, structured FORTRAN, MACRO-11 or Assembly languages. Experience with MIL-SPEC standards required.

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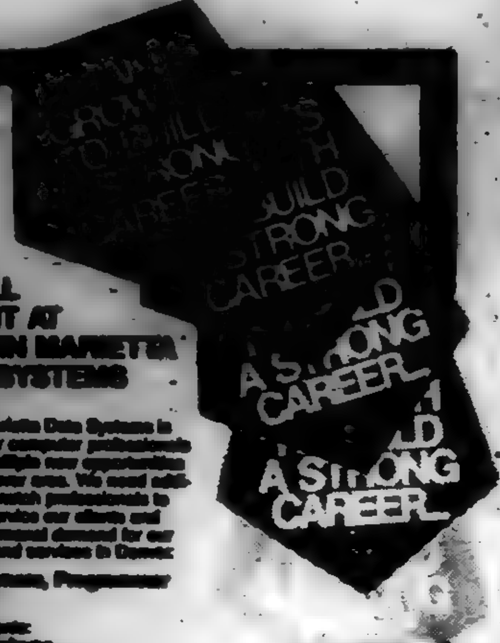

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7071 Orchard Lake Rd.
200 West Bloomfield, MI 48033
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Texasgulf Chemicals Company is currently seeking applicants for the newly created position of Senior Systems Analyst at our Soda Ash/Mining operation in Southwest Wyoming.

This is a position of significant responsibility which will require the successful candidate to coordinate the conversion of an existing terminal operation to an IBM 4381. Also included will be the conversion of batch programs to on-line systems. Applicants should possess "hands on" experience in most phases of software development with the interpersonal skills to provide guidance to non-D/P personnel.

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Compuware develops software products for the IBM mainframe market. Our internationally known award winning products, Abend-AID and File-AID, have over 2,500 users worldwide.

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The Product Developers are the backbone of the Technical Development and Support Department. Their expertise is relied on for new product development and product maintenance. We are currently looking for Product Developers to work on our CICS, IMS-DC, File-AID and DOS products. The qualifications for these positions are:

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- IMS-DC/VTAM — This person will provide our group with the expertise in VTAM or IMS-DC to bring a new product to market.
- File-AID — This individual will contribute to the File-AID team by assisting them in developing and maintaining the File-AID product line. A good understanding of OS and MVS systems, data management and file systems is necessary along with a thorough comprehension of SPF/PDF.
- DOS — We are currently looking for individuals to assist us in converting our products to DOS [illegible] and to assist in the development of a batch interactive testing facility using [illegible].

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The Product Specialist is the sales/technical interface of the Products Division. Their primary responsibility is to provide the sales staff with the tools that are necessary to sell our products and to provide our customers with the training and support they need to use our products. In-depth knowledge of programming environments and our products is essential. Specific areas of concentration are:

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The Product Support Representative's purpose is to supply the highest level of professional and technical assistance to Compuware's customers and sales staff. Specific areas of expertise that we are looking for include:

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- GENERAL SYSTEMS — This individual will provide support to our customers in a variety of areas. We are looking for an individual with a good systems background.
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Resumes will be accepted until April 22, 1985. [illegible] Judiciary Personnel Office, Richard J. Hughes Justice Complex, CN-037, Trenton, NJ [illegible]

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Software Programmer – VAX systems

Responsibilities will include installing and maintaining VMS operating systems, developing system software for support of VAX computers, and providing both technical support and education to users and operators. Also included is the evaluation and installation of software packages as well as assisting users in the development of application software when appropriate.

Qualifications for this position include a BS/MS in Computer Science or Information Science, 3-5 years systems programming experience with VAX computers, and experience installing and maintaining VAX VMS operating systems. Working knowledge of computer networks, application development, and one or more high-level language highly desirable. Experience with DECsystem-10 hardware and software a plus.

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[illegible] Charlotte Memorial Hospital & Medical Center, P.O. Box [illegible], Charlotte, NC [illegible]

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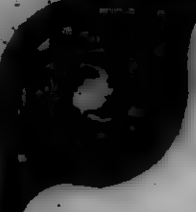

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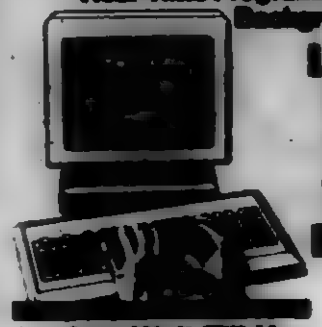

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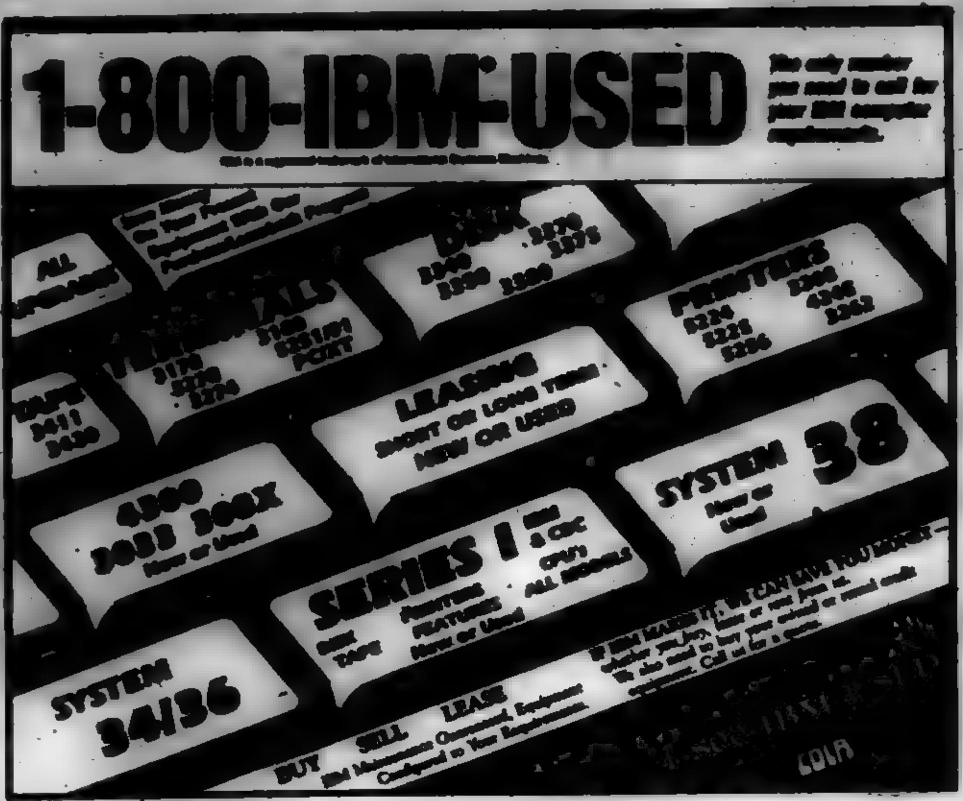
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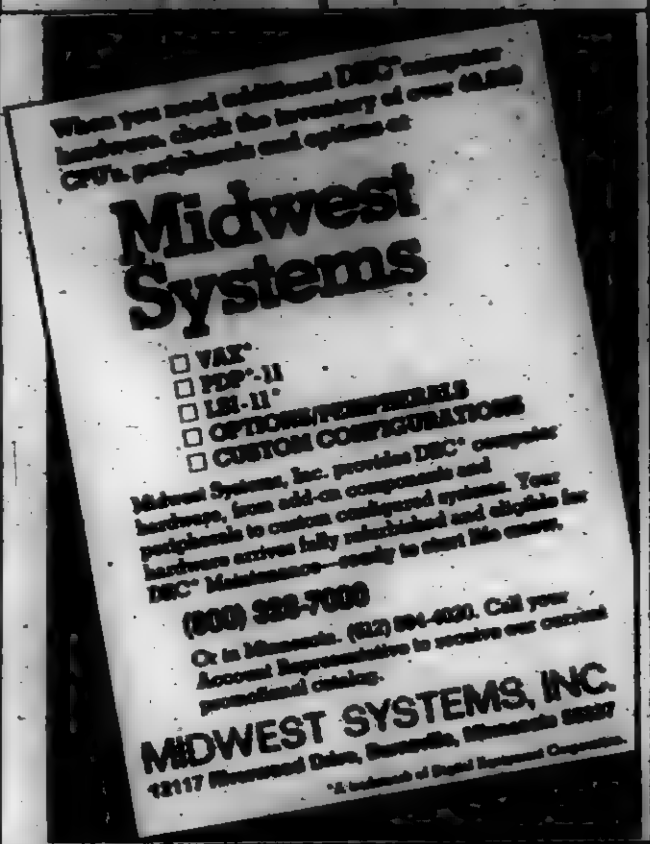
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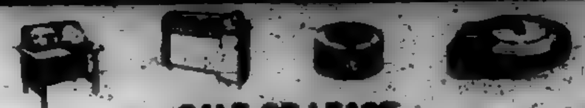

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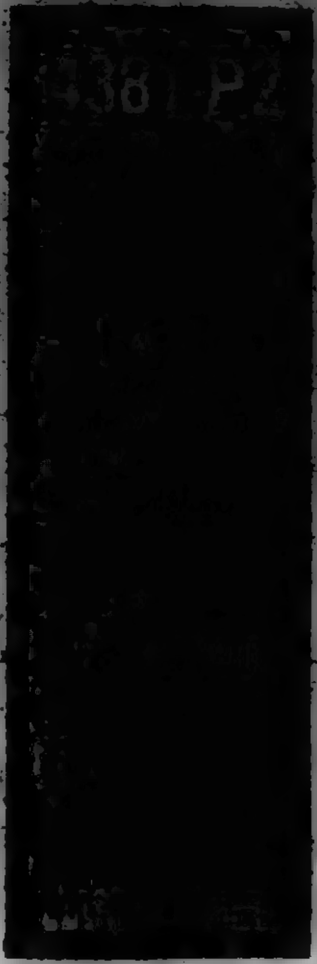

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4321	0.25	1
4331-1	0.25	0.5 to 1
4331-11	0.36	1 to 2
4331-2	0.50	1 to 4
4341-9	0.52	1 to 4
4361-3	0.70	2 to 4
4341-10	0.75	2 to 4
4341-1	0.88	2 to 4
4341-11	1.1	2 to 8
4361-4	1.16	2 to 12
3031	1.2	2 to 8
4361-5	1.45	2 to 12
4341-2	1.5	2 to 16
4341-12	1.85	2 to 16
3031AP	2.0	2 to 8
4381-1	2.1	4 to 16
3032	2.5	2 to 8
4381-2	2.7	4 to 32
3033S	2.9	4 to 16
3083CX	3.3	8 to 32

SYSTEMS	MIPS (Millions of Instructions Per Second)	MEGABYTES
4381-3	4.0	[illegible]
3083E	4.2	[illegible]
3033N	4.3	[illegible]
3083X	4.4	[illegible]
3033UP	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] 32
3033AP	[illegible]	[illegible] to 24
[illegible]	[illegible]	[illegible] to 32
[illegible]	10.0	16 to 32
[illegible]	[illegible]	16 to 48
[illegible]	[illegible]	16 to 64
[illegible]K	[illegible]	16 to 48
[illegible]KX	15.6	16 to 64
[illegible]	26.6	32 to 96
[illegible]	28.7	32 to 128
[illegible]	29.4	64 to 192
[illegible]-400	52.9	128 to 384

• First [illegible] installation 1987

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SYSTEMS	MIPS	MEGABYTES
470V[illegible]	[illegible]5	8 [illegible]
47[illegible]	[illegible]	[illegible]
[illegible]V/8	[illegible]	[illegible]32
[illegible]	[illegible]	[illegible]64
[illegible]	[illegible]	[illegible] to 64
[illegible]	[illegible]	16 to 64
[illegible]	[illegible]	24 to 64
[illegible]	[illegible]	32 to 128
5870	[illegible]	16 to 64
[illegible]	[illegible]5.6	32 to 128

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SYSTEMS	MIPS	MEGABYTES
AS/8043	5.2	8 to 32
AS/8053	6.5	8 to 32
AS/8063	8.4	16 to 32
AS/9040	7.2	8 to 48
AS/9050	9	8 to 48
AS/9060	11.2	16 to 64
AS/9070	16.2	16 to 64
AS/9080	20	16 to 64
†AS/XL-60	26	32 to 256
†AS/XL-80	50	64 to 256

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The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based upon hardware/software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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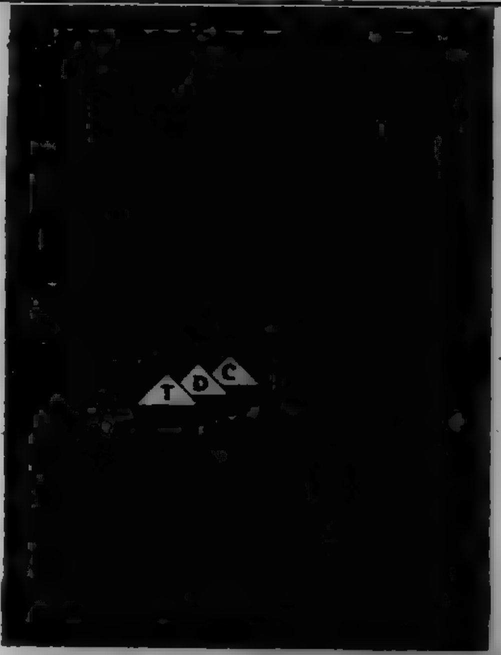

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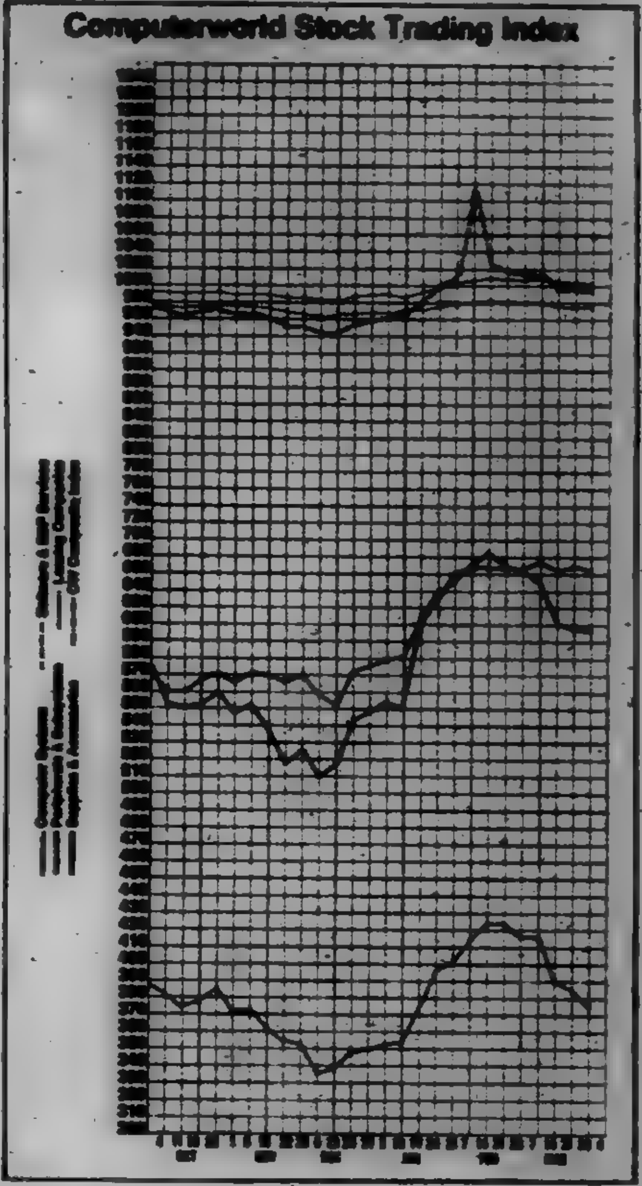

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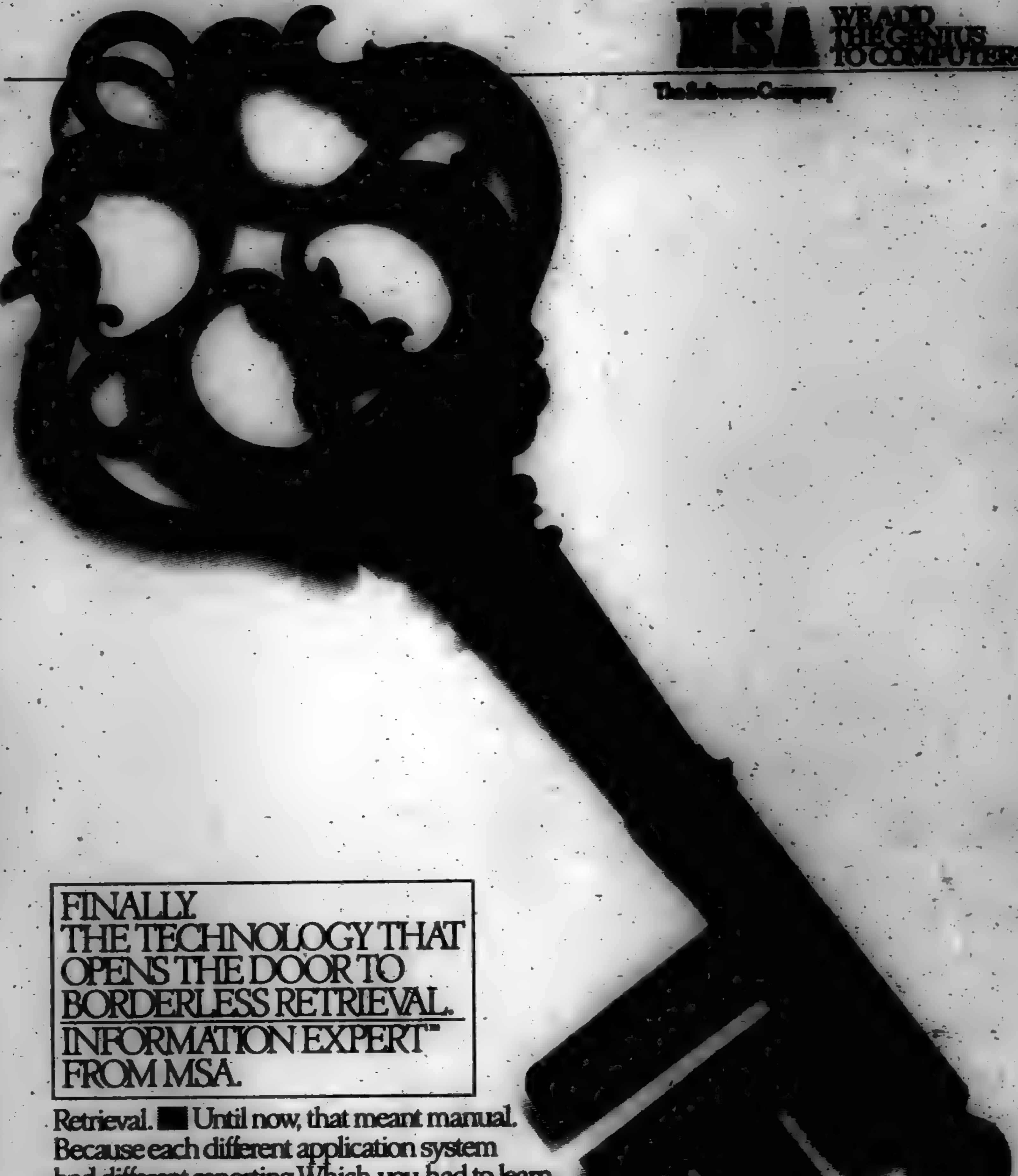

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Family tree
The life and times of IBM/36.

In Depth
Inside IBM's research center
ID/2

In Depth
The power of fourth-generation languages
ID/19

TRW launches broadband local-area net

By John Dix
CW Staff

TORRANCE, Calif. — TRW, Inc. last week announced its first commercially available broadband local-area network, said to support full-duplex, RS-232 asynchronous communications between terminals and hosts at 2M bit/sec.

Devices within the broadband Concept 2000 contend for the network using the carrier-sense multiple access method. Up to 20,000 users can be accommodated on a single network, the company reported.

Later releases of the network will support synchronous traffic, and according to J. Edward Snyder, general manager of the TRW Information Networks Division, gateways are being developed to Ethernet, IBM's Systems Network Architecture and X.25 protocols.

Products currently available with the TRW Concept 2000 include the following:

- Intelligent Connector Units that support devices at speeds up to 19.2K bit/sec, come in two- and four-port versions and

See TRW page 6

IBM rolls back micro prices

Do reductions signal imminent PC2 arrival?

By Eric Bender
CW Staff

BOCA RATON, Fla. — IBM last week lowered prices across most of its Personal Computer line and introduced two models of the Personal Computer XT.

The price cuts, which range up to 12% on systems and 16% on peripherals, affect the Personal Computer, Personal Computer XT, Portable Personal Computer, 3270 Personal Computer and Personal Computer XT/370 models (see chart page 6).

Industry analysts considered the announcements relatively small adjustments to IBM's microcomputer marketing strategy and noted that the price drops had been widely anticipated. Many observers suggested that IBM's next major move will be the debut of the much-rumored PC2, a low-end version of the Personal Computer AT, sometime this summer.

IBM "added a little pizzazz to the XT, repositioned the Personal Computer modestly and held off on other announcements,"

See IBM page 6

Micro graphics offer low-cost presentations

By Eric Bender
CW Staff

Across the U.S. at any given moment during the business day, scores of more or less enthralled audiences are sitting through presentations. Graphics created on personal computers offer the promise of inexpensively making these common, crucial yet often boring events much more productive.

PRODUCT SPOTLIGHT

In medium to large corporations, people are particularly likely to make presentations, and everyone wants to look good in front of an audience, according to David Tarrant, vice-president for applications products at Graphic Communications, Inc. in Waltham, Mass.

Microcomputers provide alternatives for many whose only other option has been "simple and not very satisfactory [overhead transparencies]," he said. Users can create their own graphics at a fraction of the cost that internal graphics departments or outside firms charge. In addition, confidential material can be guarded more closely.

Micro-based presentation graphics "save me a great deal of time," said Susan Taggart, marketing communications manager for Cycare Systems, Inc. in Dubuque, Iowa. One major advantage for Cycare, which handles data processing for medical groups, is the ability to update the firm's product slides quickly, she said.

Graphics has been "a late bloomer among productivity packages," but interest is building as more effective packages, high-resolution monitors and less expensive output devices become available, commented Peter Higgins, group product manager for planning products at Microsoft Corp. in Bellevue, Wash.

Today, most potential users lack expertise with computers, cameras and graphic

See GRAPHICS page 9

TOP OF THE NEWS

Apollo Computer unveiled software that is said to allow two popular versions of AT&T Unix — University of California at Berkeley 4.2 and System V — to run separately or simultaneously on a workstation. Page 7.

■

Simplified microcomputer-mainframe links and better integrated packages will lead the coming wave of microcomputer software, according to attendees' predictions at Softcon. Page 11.

■

To date, IBM has announced just one product — an adapter for a communications controller — for users of T1 digital communications facilities. Page 91.

■

Prime results. An early user of Prime Computer's 9955 superminicomputer found that the machine not only met but in some cases also exceeded Prime's performance claims in benchmark tests. Page 99.

■

CDC will trim its work force by an unspecified number of employees to cut costs, blaming the action in part on its ownership of one of Ohio's troubled savings and loan institutions. Page 107.

FYI

Outspoken micros keep support center humming

By John Gallant
CW Staff

NATICK, Mass. — "Transaction number three in the R&D start-up took 19 seconds. The threshold is 5 seconds."

The emotionless, metallic voice, intermittently echoed by three other synthesized human voices, drones out a warning of degrading applications response time. With tireless vigilance, the voices rise and fall in a bizarre litany of computer system problems.

Surely this must be a vision from a DP manager's nightmare — the computers are talking back. Like predatory end users, they sound off as each problem arises.

But the scene was not stolen from the dream-ravaged sleep of an MIS executive. Rather, it is repeated every day at McCormack & Dodge Corp.'s technical support center at the software vendor's headquarters here. At the center, IBM Personal Computers, equipped with Votrax, Inc. voice synthesizers, are linked to what Dean Redfern, M&D's director of computer services, labeled critical mainframe applications. Emulating terminal users, the micros — dubbed PC Robots — routinely fire off transactions to the applications and sound out a warning when response time exceeds defined parameters, when an abend occurs or when a file is erroneously closed.

Thus, Redfern said, support center staff members are aware of systems problems and can initiate corrective action before they receive a telephone call from a dismayed user awaiting the return of the cursor or from a disgruntled sales representative faced with a failed product demonstration.

Currently, the outspoken micros are tied into four major on-line applications

See VOICES page 4

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NEWSPAPER

AT&T competitors to pay by minute

FCC orders dropping of discounted flat-rate charge

WASHINGTON, D.C. — The Federal Communications Commission will require AT&T's largest competitors in the long-distance telephone business to pay local telephone companies for their actual minutes of use rather than the flat discounted fee they have been paying.

Starting Jan. 1, 1986, MCI Communications Corp., GTE Sprint Communications Corp. and Satellite Business Systems will face increased line costs based on actual minutes of use to reach their customers through the local telephone company lines, although they will still be paying less than AT&T.

Currently, the flat-rate charges paid by the largest long-distance carriers to the local companies are based on an average of 9,000 minutes of use monthly per line.

Proponents of the change to actual-usage fees said the larger companies were using local lines more than the average 9,000 minutes monthly and therefore were getting more than the 55% discount.

Costs for smaller companies

Smaller long-distance companies, such as Lexitel Corp. and Allnet Communications Services, Inc., which have reported less usage than the 9,000 minute average, will have their connection costs lowered, according to Albert Halprin, chief of the FCC's Common Carrier Bureau.

The FCC action comes as GTE Sprint has raised questions about the speed of the FCC's deregulation agenda following the divestiture of AT&T in January 1984 that is resulting in increased costs for access.

GTE Sprint recently claimed that the future of a competitive long-distance market may be in "severe jeopardy." The GTE Sprint statement was issued with a report on the future of the long-distance market by the consulting firm of Booz, Allen & Hamilton.

Upgrade beats IBM DOS/VSE delivery

RYE BROOK, N.Y. — IBM users awaiting initial shipments this month of DOS/VSE 2.1, which was announced a year ago [CW, April 23, 1984], have been offered an enhanced version of that release that includes support for 4K-byte paging under VM.

IBM last week announced DOS VSE/SP 2.1.1, which provides significant modifications to VSE/SP 2.1. The support for 4K-byte paging in IBM 370 mode, an enhancement from 2K-byte paging, means that DOS/VSE can run as a guest operating system under VM on the IBM 4381 Model 3 and on 3090 series processors, which support only 4K-byte paging.

The 4K-byte paging also allows native VSE/SP 2.1.1 to use full cache storage on the IBM 4381. Previous releases used only half the 4381's cache storage.

The announcement ends speculation on whether IBM would support 4K-byte paging in the new version of DOS, which is used by nearly 47% of IBM mainframe users, according to the Framingham, Mass.-based market research firm International Data Corp. In its announcement, IBM referred to VSE/SP 2.1.1 as a "major step forward in the evolution of VSE."

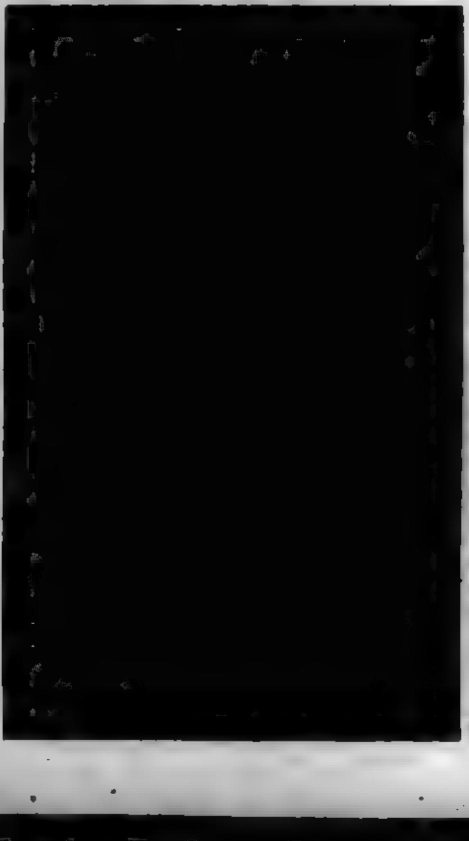
VSE/SP 2.1.1 also supports IBM's recently announced 3380 Models AD4 and BD4 disk drives [CW, Feb. 11] and the 3270 Extended Data Stream to make use of highlighting, extended colors and load-programmed symbols of the 3270 display system. The enhanced version also supports 3290 large screens for user programs running in interactive partitions of ICCF and the autostart and programmable power-off features of the IBM 4361.

All functions of the previously announced but not yet delivered VSE/SP 2.1, including an increase in virtual address space of 16M bytes to 40M bytes, are included in the enhanced version, an IBM spokeswoman said.

In addition, IBM has discontinued support for its 3203 Models 1 and 2 and 5203 printers, which had attached to IBM 370 Models 115 and 125 processors. Support for those processors was discontinued with the announcement of VSE/SP Version 2.

The full-function VSE/SP 2.1.1 is priced at $48,500 for a basic license and $43,650 under the distributed license system option. The charge to upgrade from full-function production VSE/SP 1.1 to VSE/SP 2.1 is $8,090. The charge for upgrading from SSX/VSE to VSE/SP Version 2.1.1 is $36,730 for a basic license and $33,057 under the distributed license system option.

More information is available from IBM, 900 King St., Rye Brook, N.Y. 10573.



CORRECTIONS

In "Cash registers to mainframes" [CW, March 18] the development of NCR Corp.'s 304 processor was a joint venture between NCR and General Electric Co., not NCR and Westinghouse Electric Corp. as was reported.

A story on IBM's projected profit decline [CW, April 1] incorrectly reported that IBM's stock price dropped $3.25 the day following the announcement of the 3090 series. The stock dropped on the first day of trading following IBM's announcement that profits were expected to decline for the first quarter.

"Computer museum, graphics firm to sponsor contest" [CW, April 1], incorrectly stated a segment of the rules for a computer-generated graphics contest sponsored by the Boston Computer Museum and Raster Technologies, Inc. The story should have read: "Entries must not contain identifying information that will allow the judges to determine the source of the entry."

It was incorrectly reported [CW, Feb. 25] that Software Design Associates, Inc. had acquired Systems Strategies, Inc. Systems Strategies was acquired by AGS Computers, Inc., which is the parent company of Software Design Associates.

General Electric Information Services Co. reported that character charges for its Marknet 3270 Binary Synchronous Communications service range from 1 cent/1,000 char. to 2.5 cents/1,000 char., not to 25 cents/1,000 char. [CW, March 25].

NEWS SUMMARY

DG has added a multiuser micro for AT&T Unix software development to its Desktop Generation line of personal computers/4

Although the U.S. and Japan are searching for ways to resolve their differences over trade imbalances, the U.S. Congress has passed resolutions to threaten to impose trade barriers for Japanese products/4

Apollo Computer has announced software that reportedly combines Berkeley 4.2 and System V versions of Unix on a 32-bit workstation, allowing the coresident operating systems to run either separately or simultaneously/7

CW at Softcon: Better integrated packages and simplified microcomputer-mainframe links will lead the next wave of micro software, conference visitors predicted . . . Debate continued over the best approach to dealing with software piracy, but there was little doubt that the problem will continue to grow . . . Micro-mainframe links were seen as a prelude to the micro-mini-mainframe links of the future . . . Two speakers offered ideas on how to manage micros in the corporate environment/12-14

U.S. negotiators have reached a preliminary agreement with European countries concerning transborder data flow/15

Companies in the EFT industry must take an assertive stand on telecommunications issues, speakers maintained at the annual Electronic Funds Transfer Association convention/18

The results of benchmark testing on programming productivity were released at a recent forum/22

Office automation offers women multifaceted career opportunities, according to a speaker at a recent Association for Women in Computing seminar/25

Communications specialist positions can be good career paths for women in the 1980s/26

Wire service machines in radio and television network newsrooms are being switched off and replaced by electronic newsrooms/28

As the first network to use an electronic newsroom system, the Cable News Network has found that it has developed an edge over the other major news networks/29

In Cambridge, England, a quiet high-tech explosion has been under way, one that has been ignored by the British government/32

Prime Computer solved a taxing problem with a software package that helped automate its tax computations/38

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DG multiuser micro targets Unix software development

By Edward Warner
CW Staff

WESTBORO, Mass. — Responding to what it said was a cry for more Unix applications, Data General Corp. last week announced Model 45, a multiuser workstation for Unix software development.

A part of DG's Desktop Generation product line, the Model 45 will incorporate two microprocessors, the DG Microeclipse and the Motorola, Inc. 68000. The Motorola chip will run applications developed under the Model 45's Desktop/UX operating system, a native version of Unix based on AT&T's System V. The Microeclipse processor, meanwhile, will handle I/O, system calls and interrupts, reportedly speeding program execution. The DG chip also supports Desktop Generation printers, terminals and storage devices, including a 71M-byte hard-disk storage unit introduced for the line last week.

Up to two of the 71M-byte disks reportedly can be connected to models in the Desktop Generation line, including the Model 45.

Also among the DG rollouts was a streaming tape cartridge, reportedly containing 560 feet of tape and offering backup of 18.7M bytes.

The basic configuration of the Model 45 reportedly consists of 512K bytes of random-access memory (RAM), one diskette drive, a 15M-byte disk storage unit and support for up to eight users. At the upper end, the unit can be configured with up to 4M bytes of RAM and a 142M-byte disk, providing support for up to 12 users.

Desktop/UX is said to be an implementation of Unisoft Systems Corp.'s Uniplus+ operating system and reportedly supports the System V software library. It reportedly includes the standard Unix Bourne and C shells, a C compiler and upward mobility with DG's DG/UX, the native Unix for DG's line of 32-bit superminicomputers. For telecommunications, it supports the TCP/IP and Unix-to-Unix networking protocols.

In its basic configuration, the Model 45 costs $11,845. A license for Desktop/UX costs $1,800; a TCP/IP license costs $750. Both the Model 45 and Desktop/UX are said to be available within 90 days of DG's receiving an order. The 71M-byte disk storage unit costs $7,995. The 18.7M-byte tape cartridge costs $45.80.

Chris Saleh, product manager for DG's Technical Products Division, referred to the Model 45 as a "low-end, entry-level Unix development box." While noting the dissimilarities among the Model 45, the IBM Personal Computer AT, which can run a version of Unix System III, and the AT&T Unix PC, which runs Unix System V, Saleh said the availability of Unix on personal computers is creating a demand for Unix applications.

DG is located at 4400 Computer Drive, Westboro, Mass. 01580.

VOICES

from page 1

that impact nearly all of M&D's 1,200 employees, Redfern said. The systems include a demonstration application that supports sales and marketing personnel across the country; a customer training system linked via an IBM Systems Network Architecture network to education centers in Natick, Chicago, Los Angeles and Huntsville, Ala.; a dedicated IBM CICS environment supporting software developers; and what Redfern called a corporatewide support system that includes capabilities such as electronic mail.

According to Steven Colbert, senior tools consultant and developer of the PC Robot software, the micro monitors are linked via coaxial cables to M&D's networked mainframes. The Natick data center operates an IBM 4341 and a 3081G, as well as a National Advanced Systems Corp. AS/9060 mainframe.

Like M&D's users, the PC Robots have access to a variety of environments, including IBM's MVS, MVS/XA, VM/SP, DOS/VE, IMS, CICS, DB2 and other vendors' software.

The PC Robot software was based on M&D's Interactive PC Link system. In addition to emulating a transaction-initiating end user and emitting synthesized alerts, the micros calculate response times, maintain a history of them and chart the results for service-level comparisons.

In addition to the four PC Robots that currently maintain the support center, the company recently installed a PC Robot at the Huntsville education center to monitor network- and communications-related delays.

"Before we installed the [PC] Robots," Redfern said, "we were in the traditional reactive mode. There would be a problem, and we would get a phone call from a user.

"Now we are in a proactive situation. We know first. We can say we are aware of the situation, and we expect to have it resolved within a certain period of time. Users feel more comfortable. In fact, the number of calls to the help desk from all types of users has dropped significantly. Users know we are on top of problems," he said.

Technical Support Manager Edward McGowan said the PC Robots can raise quite a din in the narrow confines of the support center, especially during peak processing periods when response time can slip.

But, he confided, the voice synthesizers can be turned down, and the staff often ignores alerts if the response-time degradation is only a temporary, expected occurrence.

Redfern said M&D plans to expand the PC Robot project to monitor all on-line applications. Currently, Colbert is researching methods for programming the micros not only to complain but also to take corrective action where possible.

"Micros are a programmable black box," Redfern said. "They can do more than just spreadsheets. We have a $12,000 investment in micros babysitting a $15 million data center."

U.S.-Japan trade agreement reached, but Congress remains wary

WASHINGTON, D.C. — U.S. and Japanese trade officials last week said that agreements to permit easier entrance for U.S. manufacturers into the Japanese telecommunications market have been reached and will will be unveiled by the Japanese April 7.

However, members of U.S. Congress continued to express skepticism over the latest trade liberalizing agreements. Two weeks ago, the U.S. Senate, in a 92:0 vote, called on President Reagan to retaliate against Japan by curbing imports if Japan does not eliminate entry barriers to its own markets.

Last week, the Senate Finance Committee passed a bill giving President Reagan 90 days to obtain increased access to Japan's markets or to ban Japanese imports.

U.S. trade officials have regularly announced progress in trade liberalizing agreements they have reached with their counterparts only to find later that the policies are not carried out by Japanese bureaucracy.

The Reagan administration moved to dampen lawmakers' criticism of Japan's policies by asking them to wait and see exactly what steps have been taken. At the same time it is using congressional displeasure with the trade issue to pressure the Japanese government to take action.

The Reagan administration has held out the possibility that the Federal Communications Commission could restrict entry of Japanese communications products to the U.S. through denying certification for connection to the nation's telephone system. However, officials are sensitive to the possibility that this action could lead to Japanese retaliation.

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SUSPENSE

How did IBM's rookie sort (Rel 7.0) do in its first meeting with "Lefty" SyncSort? Read all about it!

or Call (201) 568-9700.

Get the inside scouting report.

It is one of those historic moments in the Annals of Sort! The very first appearance in competition of IBM's new DFSORT, Release 7, in the tough-as-nails MVS/XA League. Will the kid be able to live up to his advance press notices?

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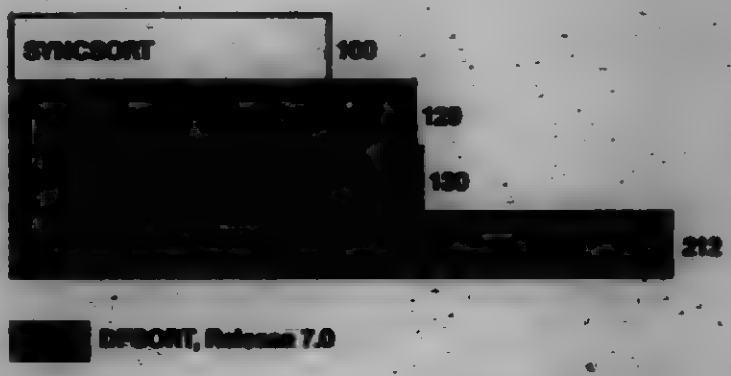
Then, as sorting fans everywhere gasp in amazement, he lifts his arm lazily and points toward the centerfield flagpole, thousands of bytes away. The kid is going to try to emulate Babe's mighty homerun shot!

Moments later, SyncSort winds up…, a curving white blur is seen…and…and…

There is no joy in Armonk! DFSORT7 struck out every time it came to bat against the latest release of SyncSort (Release 2.SE) in a recent series of MVS benchmark tests. (In sorting, as in most other forms of human endeavor, it's a long way from *baby* to *Babe*.)

The bar charts below tell the story more eloquently than we can:



That didn't surprise us too much. **After all IBM isn't known for its sorts…and we're not known for our computers.**

We stick to what we do best. Maybe some day they will too. But in the meantime, you're faced with a choice of sorts. You can use their sort, which gets the job done (eventually). Or you can use our sort. We're a little faster. (We're also very modest.)

syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

IBM

from page 1

commented Michael Geran, vice-president of research at E. F. Hutton & Co. in New York. "You have to move the old stuff before you can sell the new stuff."

Available immediately, the two Personal Computer XT systems differ from standard models only in their lack of a built-in hard disk drive, an IBM spokesman said. The systems, which can accept an optional 10M-byte hard disk drive, are designed to offer a more flexible upgrade path than that offered by a standard Personal Computer, he said.

One model with 256K bytes of random-access memory (RAM) and a single 360K-byte diskette drive will cost $2,270, while a similar version with two diskette drives will cost $2,570.

In addition to the price cuts detailed in the chart, IBM dropped the cost of a Personal Computer with 64K bytes of RAM and two floppy disk drives from $2,240 to $2,115. Cost of a comparable single-disk-drive system, however, rose from $1,265 to $1,390. The cost of the Personal Computer XT/370 was reduced from $8,395 to $7,895.

Costs of 3270 Personal Computer models also dropped slightly: the Model 2, from $3,785 to $3,745; the Model 4, from $4,650 to $4,485; the Model 6, from $6,210 to $5,710; the Model 24, from $5,990 to $5,825; and the Model 26, from $7,550 to $7,050.

In addition, pricing on enhanced graphics 3270-PC models fell: the G/GX Model 12, from $4,130 to $4,090; the G/GX Model 14, from $4,755 to $4,590; and the G/GX Model 16, from $6,580 to $6,080.

For more information, IBM Entry Systems Division is located in Boca Raton, Fla. 33432.

IBM PERSONAL COMPUTER PRICING CHANGES

System Units (with Keyboard)	New	Formerly
[redacted]		
Personal Computer, 64K-byte with two 360K-byte diskette drives	$ 2,115	$ 2,240
[redacted]		
Personal Computer XT, 256K-byte, two 360K-byte diskette drives, 10M-byte fixed disk drive, asynchronous communications adapter	$ 3,895	$ 4,395
[redacted]		
IBM Hardware Options		
[redacted]		
Fixed Disk Adapter	$ 495	$ 590
[redacted]		
Personal Computer XT Expansion Unit	$ 2,090	$ 2,290

Source: IBM; CW Chart

In addition to the price changes shown, costs for 64K-byte versions of IBM Personal Computers and all 3270 Personal Computers models were altered. Pricing did not change for the Personal Computer AT, and other options such as memory add-ons were not affected, an IBM spokesman said.

TRW

from page 1

reportedly can be used with single or dual-cable networks with one or four channels. The modular ICUs contain a power supply; a Zilog, Inc. Z80-based board that provides addressing, protocol handling and buffering; and a radio-frequency modem.

A dual-port ICU costs $1,195 and a four-port ICU costs $1,595. The same devices outfitted with frequency-agile modems — permitting attached devices to access up to four 6-MHz network channels — cost $1,595 and $1,995, respectively.

■ The Multiport Intelligent Connector Unit, a rack-mounted or stand-alone network interface unit, can support up to 32 serial asynchronous ports.

All ports can share the same modem and power supply, Snyder said, and attached devices can communicate without being routed through the network. A 32-port ICU costs $12,119.

■ The Network Monitor, based on a Digital Equipment Corp. PDP-11/23 with the Ultrix 11 operating system, is said to monitor the activity and performance of ICUs and/or cable plant status for small to mid-size networks. Both capabilities cost $5,000 each.

■ The System Control/Monitor, a $15,000 software package for DEC VAX 11/730s, provides monitoring and control of all ICUs and cable plant information for large networks. Management data is acquired automatically and displayed in color-coded topographical visuals.

■ The Frequency Translator, which is needed for single-cable networks divided into send/receive channels by frequency, costs $3,000 but may be configured with automatic switch-over to a redundant unit for $6,500.

Network starter kit

The company also announced availability of a network starter kit that costs $4,295 and includes plans, necessary cabling and standard ICUs to support eight users.

The TRW Concept 2000 uses 350-MHz coaxial cable and can be used to support multiple subnetworks, Snyder said.

Such a network may support office devices within a certain band of frequencies while simultaneously supporting personal computers on a separate band, Ethernet protocols used in computer-aided design and manufacturing applications on another and perhaps a process control network on yet another frequency band. Bridges permit communication between the bands.

More information is available from TRW's Information Networks Division, 23800 Hawthorne Blvd., Torrance, Calif. 90505.

IBM unveils DB2 dictionary

IRVING, Texas — IBM has announced the Data Dictionary Database 2 interface (DD-DB2), which expands the IBM dictionary's general functions to support IBM's DB2 and aims to improve system and application programmer productivity.

IBM also announced the Plant Automation Communication System for Series/1 minicomputers in industrial automation environments and the Image View Facility (IVF) for VM and DOS/VSE, which allows users to view documents that have been scanned, captured and stored by the IBM 8815 Scanmaster in the IBM 370 Distributed Office Support System environment running under MVS and CICS, DOS/VSE and CICS/VSE.

According to an IBM spokesman, DD-DB2 features a front-end dialogue under IPF, a dictionary model, extension for DB2 support and DB2OUT and DB2IN facilities. The product is written in PL/I and is available for MVS.

The front end reportedly provides for the use of DB2 in IBM's ISPF environment. The DB2OUT facility allows users to output DB2 constructs from the dictionary, and the DB2IN facility allows users to input DB2 constructs from the DB2 catalog into the dictionary.

DD-DB2 is said to improve productivity by using dictionary information for creating, modifying or deleting DB2 objects; by using the DB2 catalog for creating or modifying DB2 objects; and by helping to synchronize dictionary and DB2 constructs.

The one-time charge for DD-DB2 is $4,000; the one-time charge for the Plant Automation Communication System is $8,000. The one-time charge for the VM and DOS/VSE versions of IVF is $5,400 each, with product availability in May.

More information can be obtained from IBM, 5205 N. O'Connor Road, Irving, Texas 75039.

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Apollo tool fuses Berkeley 4.2, System V Unix versions

By John Desmond
CW Staff

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced Domain/IX software that reportedly combines University of California at Berkeley 4.2 and System V versions of AT&T's Unix on a 32-bit workstation, allowing the two Unix standards to run separately or simultaneously as coresident operating systems.

Domain/IX is targeted at Apollo users who want to run 4.2 and System V applications and at software developers who want to support both Unix standards, according to Apollo's Unix product manager Mark J. Hatch.

According to Hatch, the 1983 version of Berkeley 4.2 Unix is incorporated in the product but not in extensions of 4.2 announced since then. Hatch said users are not likely to write programs using both 4.2 and System V, because such applications would be confined to running on Apollo hardware.

Features of Domain/IX include a hierarchical file structure extending across the network, demand paging across a network, a minimum of one disk per network, a range of graphics libraries, support for bit-mapped monochromatic and color displays and support for C, Lisp, Fortran 77 and the International Standards Organization's version of Pascal programming languages.

The Unix file system on Apollo's Domain token-passing ring network appears to all users as a single file structure, although the data may be located on various system nodes.

This feature is said to eliminate the need for file transfer or for duplicate copies of data. With Domain/IX, any workstation or server processor can demand page from anywhere in the network; thus, a local disk is not needed for every workstation.

The four programming language compilers share a common code generator, which allows programmers to combine different programming languages in one application.

The Domain system also supports the Ethernet local-area network, the Department of Defense's TCP/IP protocol for accessing Digital Equipment Corp. VAX series superminicomputers and the X.25 standard protocol. Communication with IBM hosts is possible with software emulating several IBM RJE subsystems. All Domain workstations have RS-232C ports and provide DEC VT100 terminal emulation.

Domain/IX software will run on all nodes in the Apollo family, the firm said. Domain/IX costs $425 per node and $9,100 per site. The price of Berkeley 4.2 alone or System V Unix alone is $300 per node and $6,500 per site.

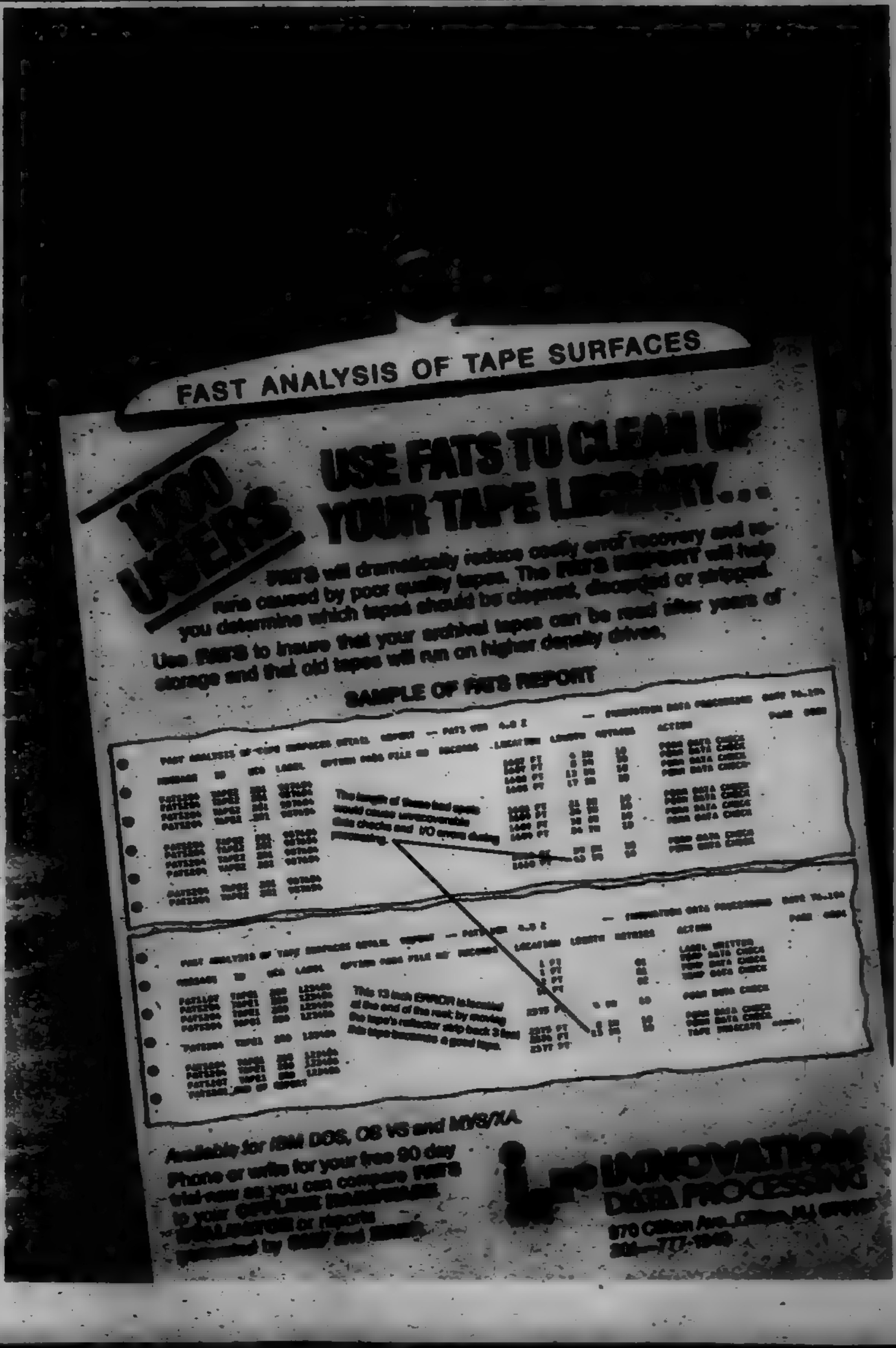
Apollo is located at 330 Billerica Road, Chelmsford, Mass. 01824.

OA conference slated for June

WASHINGTON, D.C. — Syntopican XIII — the Association of Information Systems Professionals' (Aisp) annual office automation/information systems conference and exposition — will be held at the Convention Center and the Mayflower Hotel here June 17-20.

The conference theme is "Making Business Systems Effective."

Registration fees are $425 or $325 for Aisp members. Registration before April 30 costs $30 less. More information can be obtained from Aisp Conference Services, 1015 N. York Road, Willow Grove, Pa. 19090.



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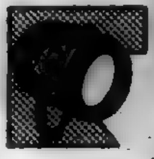
User cites immediacy of micro graphics

NEW YORK — When it comes to producing presentation graphics, Bob Ford and Helen Griffin disagree. The two Manufacturers Hanover Trust Co. managers make their line, bar and pie charts on, respectively, a departmental personal computer and a terminal linked to a corporate mainframe.



Ford, a personal computer graphics user and manager of business development and analysis for the bank's Financial Services Group, said he likes being able to see results immediately when he outputs a graph from his department's IBM Personal Computer-based graphics workstation onto its attendant Hewlett-Packard Co. HP 7475A plotter. "I can walk over there and see the output, do it my way and get the results," he said.

Griffin, the bank's graphics consultant and trainer, said Manufacturers Hanover's companywide graphics system, accessible on over 4,000 terminals in use at Manufacturers Hanover worldwide, makes it cost-effective for many users to share the centralized graphics output of the banking company's two Nicolet Zeta Corp. 810 drum plotters. Also in use are two Tektronix, Inc. 4692 ink-jet printers attached to a Tektronix 4510 rasterizer (which Griffin said is used to enhance output quality) and a commercial-quality slide-making system.

Users may not be able to see their output immediately, Griffin said, but when they do, the output is often of equal or better quality than that of a personal computer plotter.

The Nicolet plotters produce an average of 2,000 graphs and charts per month, a level of demand so great, Griffin said, that passwords have been issued to restrict

See CHARTS page 9

PRESENTATION GRAPHICS SOFTWARE PROGRAMS FOR THE IBM PERSONAL COMPUTER

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Business Resources Westport, Conn.	*Chart-Master*	Bar, pie, line, area and scatter charts; data entered and stored independent of chart type	192K	Over 13 printers, 33 plotters, Polaroid Corp. Palette	$375
	Sign-Master	Word charts, including title pages, headlines, tables, financial summaries and forms	192K	Same as Chart-Master	$345
[illegible]					
Graphic Communications, Inc. Waltham, Mass.	*Graphwriter*	Produces bar, line, combination, text/word, pie and specialized format charts; batch processing	128K	Variety of printers, plotters; Polaroid Palette, Matrix Instruments, Inc. PCR/QVP film recorder	$395 for Basic Set; $395 for Extension Set; $695 for both
[illegible]					
International Microcomputer Software, Inc. San Rafael, Calif.	*PC Paintbrush*	Free-form drawing; enhancements of graphs, text and images from other packages; choice of text fonts	192K (PC-DOS 2.0 and up)	Over 24 printers; Hewlett-Packard Co. 7475A, 7470A plotters	$139
[illegible]					
Software Publishing Corp. Mountain View, Calif.	*PFS:Graph*	Creates bar, stacked bar, line, mixed bar/line, pie and area charts; combines up to four graphs on a single set of axes	128K	Wide variety of printers, plotters	$140

A sampling of the dozens of specialized graphics software programs available for the IBM Personal Computer. Many of these packages also run on other microcomputers under Microsoft Corp.'s MS-DOS operating system.

	PRESENTATION GRAPHICS OUTPUT DEVICES — HARD COPY		
[illegible]			
Epson America, Inc. Torrance, Calif.	*FX-80 printer*	Prints in up to seven colors at speeds to 160 char./sec; 128 fonts; accepts special fonts downloaded to printer memory; dot-addressable graphics with 1:1 vertical-horizontal ratio	$800
	HI-80 plotter	Plots in four of 10 available colors; draws at up to 9 in./sec on paper and acetate	$599
[illegible]			
Hewlett-Packard Co. Palo Alto, Calif.	*Model 7475A plotter*	Six-pen graphics plotter with resolution to 0.001 in. and speed up to 15 in./sec; accepts 11- by 17-in. paper or overheads	$1,895
	Thinkjet	Thermal ink-jet printer with removable cartridge; prints up to 150 char./sec.	$495
	Laserjet	Prints up to eight page/min with 300- by 300-dot resolution; horizontal or vertical printing	$3,495
[illegible]			
	PRESENTATION GRAPHICS OUTPUT DEVICES — OTHER MEDIA		
[illegible]			
Autographix, Inc. Chicago, Ill.	*Autographix 200*	Workstation produces high-resolution 35mm slides, color overhead transparencies, color prints, hard copy, video presentations; optional Matrix Instruments, Inc. QCR film recorder produces extremely high-resolution slides	$35,500 for Autographix 200; $32,000 for optional film recorder
[illegible]			
Polaroid Corp. Cambridge, Mass.	*Palette Computer-Image Recorder*	Produces color 35mm slides with 72-color palette, within minutes, on desktop	$1,799

Top, a small cross-section of the hundreds of printers and plotters that may be used with the IBM Personal Computer. Bottom, three specialized graphics output devices, chosen to illustrate the range of options available in microcomputer-based presentation graphics. The Autographix, Inc. Autographix 200 is a complete turnkey system based on an IBM Personal Computer XT.

GRAPHICS

from page 1

design; therefore, increases in ease of use are critical, emphasized William Biggs, graphics products manager at Digital Research, Inc. located in Monterey, Calif.

The percentage of business microcomputer users generating graphics will rise from 14% in 1984 to 21% this year, according to market research firm International Data Corp. (IDC), which is located in Framingham, Mass.

An IDC study last year estimated that slightly more than a million users will create graphics on personal computers this year and predicted that the total number of users will rise to almost 11 million in 1989.

Specialized packages to increase

The number of users employing specialized graphics packages are expected to climb from 661,000 to more than seven million within that time period, according to Deborah Kelly, manager of computer graphics research at IDC.

Many users first saw microcomputer graphics in Lotus Development Corp.'s 1-2-3 integrated package. The next step was to move beyond 1-2-3's relatively simple analytical graphs into more complicated, customized presentation graphics with higher quality output.

Presentation graphics functions can be divided into several categories: graphing charts, word charts and free-form (including paint and draw packages). Many, but not all, packages concentrate on one of these functions.

Range of chart types available

Graphing packages offer a range of predefined chart types and typically add some ability to glamorize them by picking among colors, labels and other enhancements.

Word chart software is aimed at producing simple messages in an attractive format — a relatively straightforward but important task, according to David Obershaw, graphics software product manager at Hewlett-Packard Co. in Santa Clara, Calif.

While talk about presentation graphics immediately brings data-driven graphing charts to mind, most presentations are actually oriented more toward text and drawings, Obershaw said.

Free-form packages can generate organization charts, corporate logos and many other complex graphics. Also, they can sometimes pull in prepared images from program libraries.

Paint and draw packages appear superficially similar but differ drastically in software architecture, Graphic Communications' Tarrant said. Paint software is pixel-oriented, while draw programs are object-oriented. This translates into differences in working methods and in output; for example, plotters typically provide vector output and cannot easily accommodate paint packages, he noted.

Both types of programs generally work best with a mouse, graphics tablet or other input device rather than the keyboard, and so far they have seen only limited use in corporations.

Need for 'free-form' infrequent

"Casual users don't take the time to create anything very complicated" with free-form packages, IDC's Kelly said.

"The need for a [free-form] package is short-term and doesn't occur very often," said Rich Reed, manager of personal computer administration at Cigna Corp. in Bloomfield, Conn.

Presentation graphics software also can generate report graphics. Color output is not nearly as important for reports, which tend to be reproduced in black and white, analysts pointed out.

With all these features to choose from, graphics users often work with several packages, each with different advantages.

For example, Glenn Fund, manager of end-user computing at GCA Corp. in Bedford, Mass., uses Chart-Master and Sign-Master from Decision Resources, Inc. of Westport, Conn., along with Digital Research, Inc.'s DR Graph. Among their strengths, Chart-Master is particularly easy to use, Sign-Master is good at setting up neatly formatted tables and DR Graph can set up multiple graphs on the same page, according to Fund. "They're all good," he said.

Picking through the flurry of features available in one package or another, some prove more useful than others. One often-promoted feature, the ability to import data from other programs, is not particularly important, according to Kelly.

Relatively few users take advantage of the feature, Digital Research's Biggs agreed, because excess data can clutter a presentation. "With more than 30 data points, you're designing a bad graph," he said.

CHARTS

from page 8

the access of Manufacturers Hanover's 400 known graphics users.

Griffin said that users of Manufacturers Hanover's terminal-based graphics gain access to what she called high-powered software — Issco, Inc.'s Telegraph package — which runs on two Digital Equipment Corp. Decsystem-20 mainframes. The mainframes, she added, have the processing power to support Telegraph's ease-of-use interface, Cue Chart, from which users can select the appropriate graphics presentation format for their data. Ford, meanwhile, said he creates an average of 30 charts per week in his department's micro-based graphics work area.

— Ed Warner

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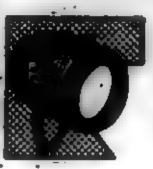
Flourishing add-on mart keeps pace with micro graphics

As friendlier and more powerful graphics software becomes available, increasing numbers of micros are being equipped with graphics or color cards and monitors, and inexpensive but capable output devices are making their debuts.

A flourishing add-on industry supplies cards and monitors that boost the graphics capabilities of IBM Personal Computers. IBM is also moving in that direction, the best recent example of this being the Enhanced Graphics Adapter and Enhanced Color Display announced last summer. With an optional memory card, the new Big Blue hardware offers 16-color graphics in 640- by 350-pixel high-resolution mode.

However, "it doesn't matter how fine graphics looks on [the] screen if you can't get it from the screen to the presentation media," said William Higgs, graphics products manager at Digital Research, Inc.



The most common microcomputer output device, the dot matrix printer, generally provides graphics output suitable for reports and presentations that do not require a high degree of polish.

For higher resolution, the next step is a pen plotter. Costs for some models have been driven below $1,000, according to Deborah Kelly, manager of computer graphics research at International Data Corp. (IDC) in Framingham, Mass.

In the case of laser printers, the price drops have been even more dramatic, with some price tags now dipping below $4,000. The new desktop model systems have dazzled a great many users.

"All strike-on technology is now obsolete," said Ron Goldfarb, office automation manager at Pratt & Whitney Co. in East Hartford, Conn. Laser printers "do it better at less cost in deathly silence," he said, and the ability to mix graphics with text on the same page is another bonus.

Further down the road, low-end ink-jet printers will also play a larger role in presentations, others said.

These hard-copy devices produce on paper and often directly on overhead transparencies. For more formal presentations to larger groups, the next step up is 35mm slides.

The cheapest method of generating slides from microcomputer graphics is simply to take a picture of the screen, either with jury-rigged equipment or with a commercial system such as Eastman Kodak Co.'s CRT Slide Imager, which costs $370 excluding development equipment. Some users find the results satisfactory.

However, this technique has two main drawbacks. The quality is limited by screen resolution, and colors may look odd because the eye reacts differently to glowing dots on the screen than it does to ink on a page.

Film recorder

Another approach is an inexpensive film recorder. The most popular of these is Polaroid Corp.'s Palette Computer Image Recorder, a desktop system which retails for $1,799, including processing equipment but excluding software.

Palette has sparked considerable industry debate on whether the system's resolution is high enough for standard business use. The hardware handles up to 930 by 700 pixels, but software typically is limited to the 640- by 400-pixel high-resolution mode for the standard IBM color monitor. This is significantly below the resolution offered by commercial slide-making houses, observers pointed out.

However, Palette-style equipment produces slides at a fraction of the usual commercial cost, and it may be the only answer for many price-conscious users, IDC's Kelly said. And, again, users may have no qualms about the quality. "Your notion of what's high quality will differ from mine," said David Tarrant, vice-president for applications products at Graphic Communications, Inc. "Graphics departments typically have imposed higher demands than those of the users."

Turnkey systems

At the high end of the slide-making spectrum, turnkey systems based on Personal Computer XTs or ATs generate professional-quality slides but may carry price tags rising above $70,000. While these systems also find a role in many organizations, they are designed for visual specialists rather than typical micro users.

Another option is on-screen displays, running either on computer monitors, television sets or video projection systems. Presentations running on standard monitors are best suited to very small audiences.

Finally, there are specialized presentation systems such as Videoshow from General Parametrics Corp. in Berkeley, Calif. With associated software running on a Personal Computer, the Videoshow hardware creates presentation diskettes that can store sequences of very high resolution pictures with up to 1,000 colors. The portable Videoshow unit then is hooked up to a monitor or other video display equipment for presentations. Users may also create slides through an optional Videoshow system based on the Palette.

— Eric Bender

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Users firm on requirements for future micro software

CW AT SOFTCON

By John Gallant
CW Staff

ATLANTA — "I am not sure anyone knows what the next big [microcomputer] software packages will be," Buddy Ray said. "I am not certain there will be another major breakthrough product like [Software Arts, Inc.'s] Visicalc. Maybe we have already covered all the bases."

Ray, manager of technical products for Atlanta-based Comsell, Inc., was typical of the attendees interviewed by *Computerworld* at last week's 1985 Softcon conference here.

While many attendees were uncomfortable predicting what the next generation of micro software will look like, they had little trouble deciding what they want to see next.

'The loud scream is for access'

A pressing issue, according to Loyd Towers Jr., a computer systems analyst with the U.S. Army Logistics Center in Petersburg, Va., is the introduction of generic, easy-to-use micro-to-mainframe links. "In my organization, the loud scream is for access to mainframe data. We need something much easier and more broad-based than the proprietary systems available today. I know a generic link that lets you get at all types of data is a tall order, but it should not be impossible."

Towers was not alone in his desire to see more facile, open links. Jack Stimler, associate senior scientist at the Phillip Morris Co. Research Center in Richmond, Va., said his company is concerned with the linking of all types of processors.

"We are looking at the integration of micros, mainframes and minicomputers," Stimler said. "We would like to be able to store information on the mainframe and download it as necessary to the other machines for manipulation. We need to see better links that provide the ability to link any kind of micro to larger processors from all manufacturers. I think the ease of use will come over time, and we will even see laptop access to the mainframe."

"I would like to see better integrated packages," said Arnold Shostak, a partner with Richter & Associates, a Montreal-based management consulting firm. "Today, the components of those packages cannot do what individual packages can — they are just not as good. Also, once local-area networks get off the ground, we will need to see more sophisticated business applications for the micro."

In addition, Shostak said, the coming months will see the end of what he labeled "useless" micro packages. "I am talking about those desktop organizers," he said. "It is fun to put your telephone list and your diary up on screen, but it is really not worthwhile. We can also get rid of the packages that let you run four or five applications at once. All you do is slow each of them down to a quarter of their speed."

Towers also said he would like to see more sophisticated integrated packages in the future. "I think the integrated products have to get better in each of the areas they cover. Right now, most of them are only good in the area the company is familiar with, such as the spreadsheet component. Also, the vendors will have to work on shrinking the memory requirements for the products. It would be nice to run an integrated package on a dual-floppy machine at home."

Comsell's Ray said artificial intelligence applications, such as expert systems, have the potential to be among the more important micro packages to come. "Maybe AI is the next big area for micros," he said, "but that still has a long way to go. That will grow slowly; we are only now beginning to see processors with the power to handle these kinds of applications."

Jerry Eggers, professor of engineering technology at East Tennessee State University in Johnson City, Tenn., said he is hoping to see micro-based tools for computer-integrated instruction. "I am very interested in that type of teaching — interactive instruction using micros and laser disks. It promises to be very useful for both training and general education. There are a number of companies working in that direction, but a lot of the advances are still on the technological horizon."

One of the most important future micro applications — in-house publishing systems — is already beginning to emerge, according to Don Schwartz, president of Londonderry, N.H.-based Don Schwartz Associates, a manufacturing representative firm. "I think that type of office publishing system has already arrived, to some extent. It will allow users to do typesetting, page layout, graphics input and to publish their own newsletters and other things."

But what else the future holds is anyone's guess, he said. "Everybody says someone will come up with the miracle package that will make the micro useful in the home. I do not know what that will be," Schwartz said. "And I do not think anyone does."

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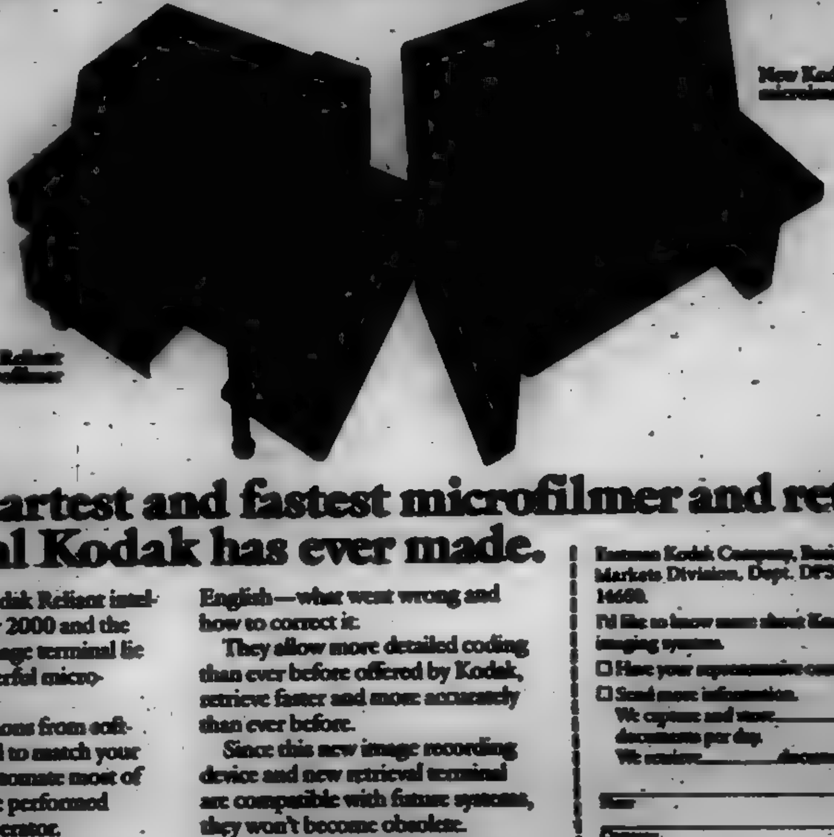
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Panelists divided on copyright protection schemes

CW AT SOFTCON

By John Gallant
CW Staff

ATLANTA — The nomenclature of modern-day piracy is laced with buzzwords and phrases like hardware keys, hidden program booby traps and worms, site licensing agreements and shrink-wrap licenses, bounty hunters and corporate policies and procedures.

Those are a sampling of the methods proposed to curtail the illegal copying of microcomputer software programs — methods that divided speakers at a recent panel session on software piracy held here at last week's 1985 Softcon conference. While there was debate over the feasibility of such software protection schemes, there was general agreement that the problem of copyright violation is bad and getting worse.

Ronnie Ward, executive vice-president of Richardson, Texas-based Future Computing, Inc., cited his firm's 1984 survey indicating that software vendors lost $600 million in revenue last year as a direct result of piracy. That figure, he said, is expected to grow to nearly $800 million by the end of 1985, compared with projected total market revenue for micro software vendors of $3.2 billion.

Ward said the Future Computing study showed that, on average, for each authorized copy of the 12 most popular micro packages in use today, there is one unauthorized copy also in use. "It is our belief that copying will become a greater problem, and most publishers will have to go to a copy protection scheme," he said.

Kenneth Wasch, executive director of the Software Publishers Association, which represents about 130 independent software vendors, countered one attendee's notion that piracy has actually helped micro software vendors by giving users an opportunity to evaluate packages before purchasing them.

"The product life cycles of two of the most successful [micro] packages, which happen to be games, have been dramatically shortened. Copies of these programs are available in every school through easily accessible channels. In fact, one of the companies is really lamenting the weak copy protection they used with the program."

Ronald Palenski, associate general counsel with the Association of Data Processing Service Organizations, Inc. (Adapso) said Adapso's antipiracy efforts are geared to fostering the belief that there exists a "social contract" between users and vendors of micro software that should not be broken by pirates. Adapso has embraced a four-pronged attack on piracy that includes efforts in education, in public relations, in the legislative arena in the courtroom — including a recently launched suit against American Brands, Inc. and Wilson Jones Co. [CW, March 11] — and in the technological realm with such proposals as the hardware key protection method, under which a hardware lock and key would need to be inserted in the micro's serial port for the software package to run.

"We [Adapso] are aiming at the development of a set of standards that can be used to build software protection methods," Palenski said. "That process is open to all. We are not engaged in product development. Our approach mirrors the theory of social contract. The standards will address both the effective protection of the vendor's product and the user's ease-of-use of that product."

Asked whether the various copy protection schemes imply that vendors do not trust corporations to police their users through internal antipiracy policies, Palenski said, "Our goal is to persuade companies to adopt piracy policies, and we have gotten a large number of requests for help in doing just that."

Site licensing

On the issue of site licensing of micro software, E. Ric Giardina, general counsel for Micropro International Corp., said only a handful of users have expressed real interest in the concept. "Many companies look into the idea of site licensing, but they often balk at the idea of standardizing on one piece of software," he said. "Site licensing will work, but it will not cut out piracy. You cannot provide a site license for everyone."

Giardina said the rapid pace of technology has proven to be a real problem for software vendors struggling to protect their assets from piracy. "As soon as we were faced with the problem of multiuser licenses, we saw we had to face the issue of networking. This is an evolving process. We are doing everything we can, but we still have to do more."

When asked whether software vendors may employ "bounty hunters" in the future to sniff out those engaged in illegal copying, Wasch replied firmly, "No."

"Many people have volunteered to turn in pirates. It is not our intention to hire bounty hunters but to monitor what is happening in the user community and to choose appropriate cases for action. You do not want to look like you are at war with your customers."

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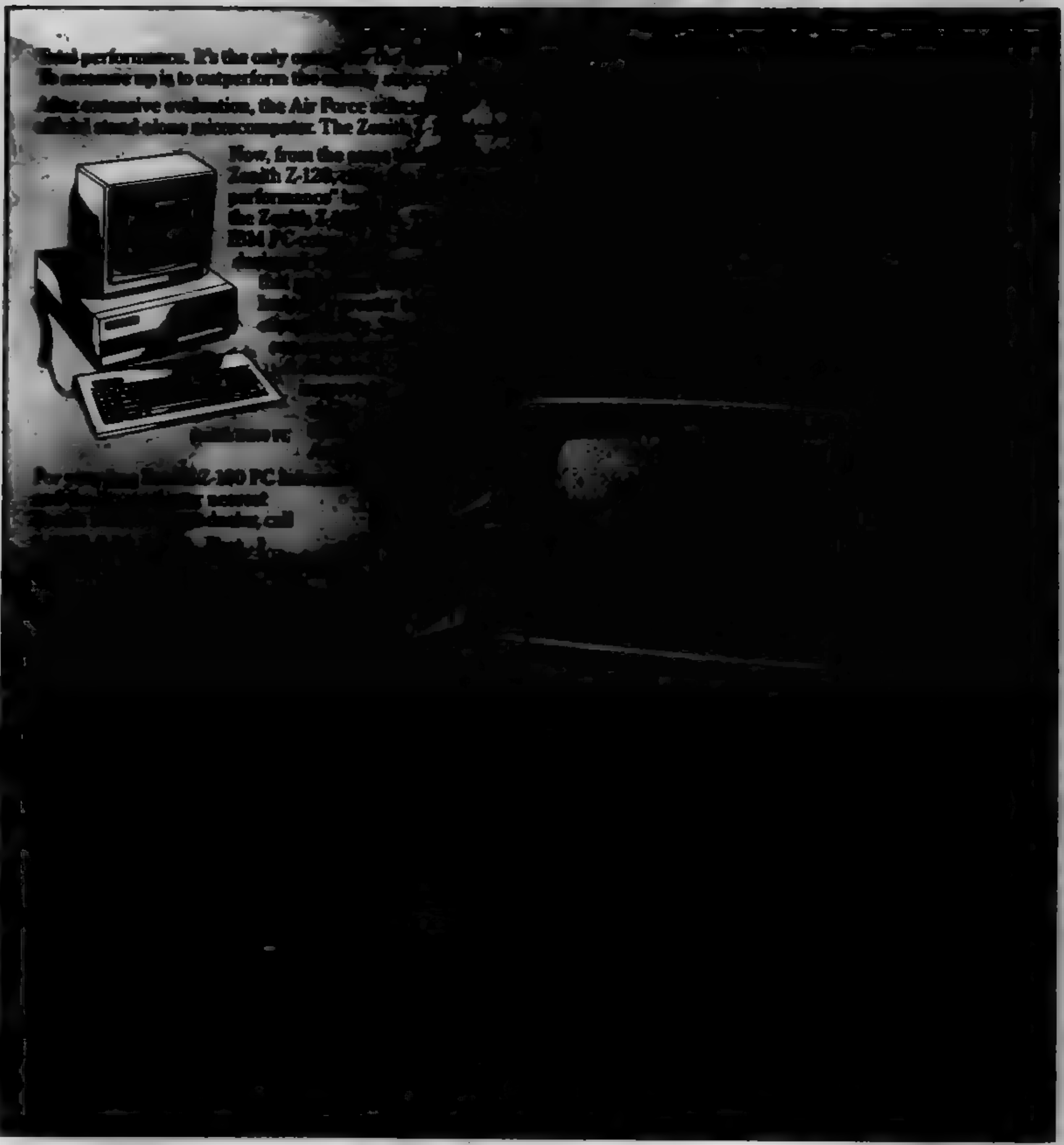

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Micro-mini-CPU links seen as future in integration

CW AT SOFTCON

By John Gallant
CW Staff

ATLANTA — Microcomputer-to-mainframe links are but a passing fancy — the future belongs to the micro-minicomputer-mainframe link.

That was the message of several speakers during a session on micro-mainframe links at last week's 1985 Softcon conference here.

According to Larry DeBoever, president of Linkware Corp., a link vendor, micro-mainframe technology is only a temporary phase paving the way for integrated micros, minis and mainframes.

"In the next three to five years," DeBoever said, "large organizations will acquire micro-mini-mainframe link technology. The result will be corporate personal computers attached to local-area networks, not mainframes. Superminis will act as local-area network file servers using corporate data extracts from the mainframe. The major minicomputer players, Wang Laboratories [Inc.], Digital [Equipment Corp.] and Data General [Corp.], are already positioning themselves to fill that need."

DeBoever cautioned prospective link buyers to use micro-mainframe communications products to solve current tactical problems and also to consider carefully what role the selected link will play in the very different networked environment of tomorrow. That is, planners must adopt a strategic plan for the future integration of processors.

"There are tactical and strategic solutions," he said. "Most people settle for the former because they cannot find the products that will allow them to leverage new technologies."

Fellow panelist William Shattuck, a software analyst for San Francisco-based Montgomery Securities, said, "I think the idea that micro-mainframe links are a passing technology is correct. But how will we evolve into this world of local-area networks and minicomputers?"

"It is my belief," DeBoever said, "that a few new companies will emerge to fill the need for data communications networks. I think the whole concept will break loose when IBM legitimizes the idea of local-area networks. When IBM ships its first local-area network, everyone will shift to that technology. But IBM's Achilles' heel is its lack of a substantive mini. That is why the mini vendors are really going after that market."

Panelist Gerald Cohen, president of Information Builders, Inc., agreed that the mini will play a vital role in the future integration of processors. "The mini is an ideal staging device," he said. "You can download host data to departmental machines linked to a number of personal computers. That is an up-and-coming application for the mini."

Similar software for both sides

Cohen said software vendors addressing the micro-mainframe — even micro-mini-mainframe — communications market should aim at providing similar software on both ends of the link. "Providing the same software on both sides of the link is important," he said, "because once a user learns the product, he will be able to use it across all levels of hardware."

DeBoever said users must tread carefully in selecting from the among the current micro-mainframe links. He said a company's link strategy must be considered in the context of its current and future communications technology and its applications and data base strategies.

"You cannot look at links in a vacuum," he said. "Anybody can write a file transfer product, but the true integration of personal computers and hosts is the real problem. That is akin to cross-domain processing, which is still far off in the future."

AIIM annual meet set for April

WASHINGTON, D.C. — The Association for Information and Image Management (AIIM) will host its annual conference and exposition for managers, directors, analysts and planners from April 29-May 2 at the Washington Convention Center here.

The 1985 AIIM Show will feature seminars on emerging technologies, engineering, micrographics and generalist information as well as a variety of general interest events.

Field trips to the Library of Congress optical digital data disk program and the Navy military personnel records system have also been planned.

Registration fees for the conference and exposition range from $160 for a half day to $590 for four full days, plus an additional $20 charge for on-site registration.

More information is available from AIIM, Department of Conference and Exposition, 1100 Wayne Ave., Silver Spring, Md. 20910.

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Decentralized MIS key to managing corporate micros

CW AT COMPUTER FAIRE

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — Imagine for a moment that the traditional data processing department is represented by a well, whose vast water reserves are overseen by a well manager — the MIS director. To tap the well's resources, users bring their buckets to the well manager.

This time-honored way of drawing water is challenged, however, when someone discovers that a powerful river flows nearby.

Unlike the well, the river — microcomputer technology — is available to everyone. No longer do users have to take their buckets to the well; soon, many are going directly to the river, entirely bypassing the well manager.

According to Robert N. Watkins, who presented the well analogy to an audience at last week's West Coast Computer Faire, MIS directors should welcome the discovery of the river.

Watkins, an instructor at Learning Sciences Corp., a Santee, Calif.-based consulting firm, told his audience that the goal of MIS managers should be to "decentralize computer competence" and "create an environment where users can succeed."

The MIS manager can accomplish these tasks by encouraging the use of all the organization's resources, from microcomputers to mainframes, he said.

Manager should advise users

Drawing on his well analogy, Watkins said, "We have to create a situation where the well manager can advise users on when the water is safe to drink and which container is the most appropriate one to use.

"We have to let them know when they should go to the river and when they should come to the well," he continued. "We should give users canteens and teach them that they don't always need someone to lower the bucket for them."

MIS managers do not have to turn users into programmers to accomplish this goal, Watkins said. Instead, they can provide the tools that will "create stronger users" and lessen their dependence on the MIS staff. Fourth-generation query languages represent one such tool, he explained.

The data processing staff must also learn how to develop a good working relationship with end users, Watkins said. In the past, organizations relied primarily on technocrats who developed programs and tools for users. But with the growing number of personal computer users, new skills are required.

Empathy for user concerns

Watkins said the MIS staff needs to develop empathy for user concerns, which differ from the technical staff's interests. Users, for instance, will view program development differently from programmers.

"They might not care how elegant our code is, but then again, they don't see it," Watkins said. "What they care about is getting a job done without a lot of trauma."

Maria Quandt, who oversees the use of personal computers at Siliconix Inc., a Santa Clara, Calif., semiconductor firm, also spoke at the seminar.

She said her company has standardized on IBM. The firm has purchased 50 IBM Personal Computers, including IBM Personal Computer XTs and ATs. Instead of buying equipment from a variety of vendors, Siliconix decided to sign a contract with Businessland, which provides the systems and peripherals.

The agreement has a definite advantage when it comes to troubleshooting and maintenance, she said. "If we had bought equipment from different vendors and something happened, everyone would be pointing their fingers at everyone else," she said.

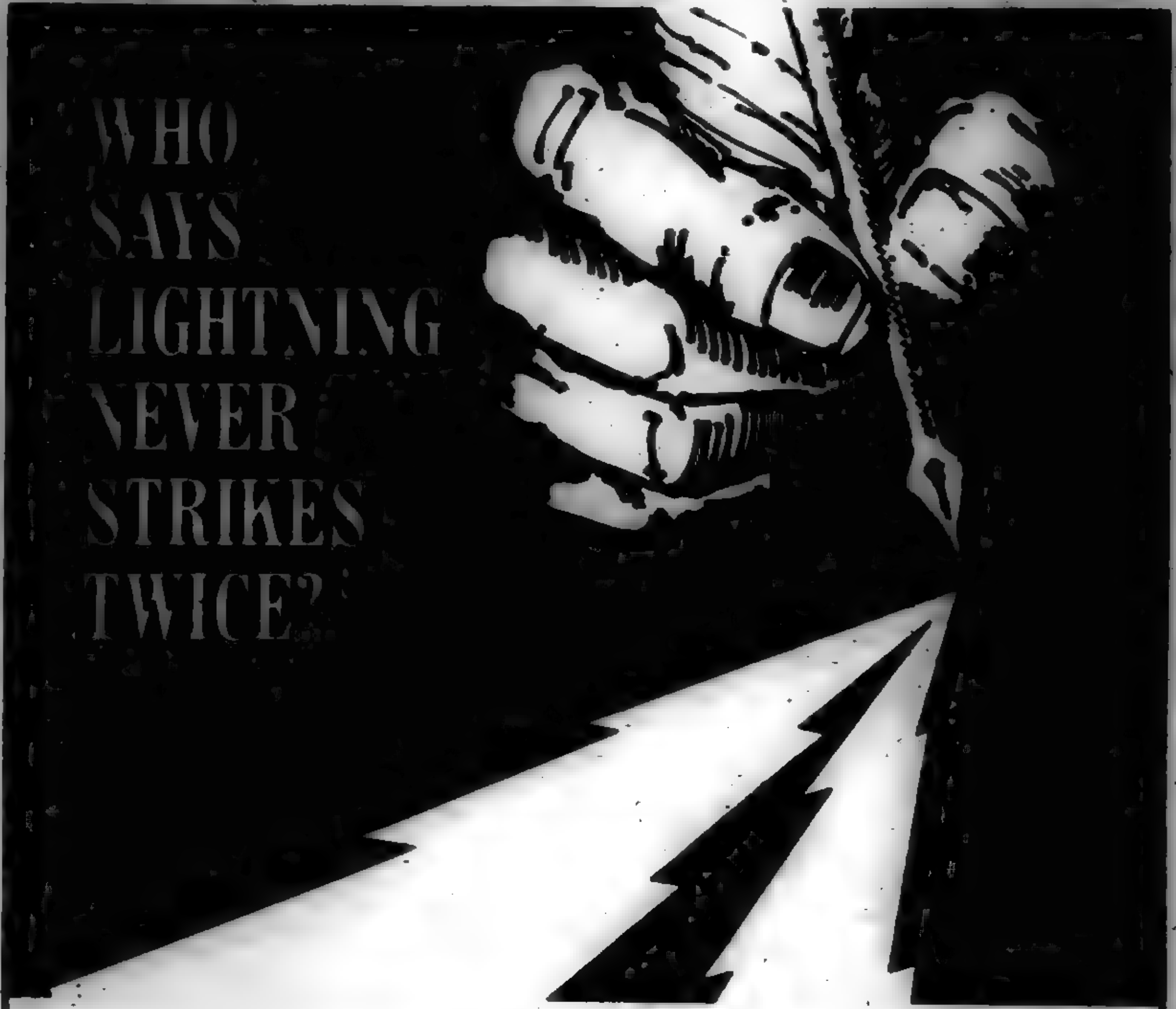
Siliconix relies on an independent training firm to teach its employees how to use various software packages, Quandt said, and the arrangement has worked out well. Many employees see the chance to leave the plant for training as a bonus, she said. And outside training is a more effective tool than in-house training, Quandt said.

Outside training better

"It's difficult to find time in a workday to give an individual tutorial," she explained. "And it's better to send employees outside the plant for training, so that all their attention can be focused on learning during that period of time."

Siliconix plans to sign a contract with a third-party maintenance company, Quandt said.

"This little chore of troubleshooting is endless," Quandt said, adding that she spends 40% to 60% of her time trying to solve hardware and software problems. She said when a system goes down, she typically spends about two hours trying to handle the problem. Quandt estimated that the firm would spend approximately $25,000 for a one-year agreement.



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U.S. negotiators win accord on transborder data flow

Policy wording caused wrangle

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — After a more than two-year struggle, U.S. negotiators have reached a preliminary agreement with European countries on a written statement on transborder data flow. Ministers of the Organization for Economic Cooperation and Development (OECD) are expected to endorse the statement of general intent formally this week.

The development is a major achievement for the U.S., which has faced resistance from France on producing a statement of general intent on the transborder data flow issue. In recent years the issue has been a thorny one for U.S. multinational corporations that transport large volumes of data across national boundaries with the aid of computers, data processing and telecommunications.

> *The development is a major achievement for the U.S., which has faced resistance from France on producing a statement of general intent on the transborder data flow issue.*

The 24 member countries of the OECD, representing the developed economies of the free world, argued about the wording of the transborder data flow policy declaration since its drafting by the U.S. two years ago. A final form of the statement was agreed upon by the executive committee of the OECD two weeks ago and will be presented to OECD ministers for approval this week.

"We are very pleased at the progress we have made so far. It is a useful development and augurs well that the ministerial level will go along," commented Anne Hollock, director of the Office of Trade in the Bureau of Economic and Business Affairs at the U.S. Department of State.

The policy statement noted that "computerized data and information now circulate, by and large, freely on an international basis," and that privacy protections have been adopted for the data in most countries. In addition, the statement said, "Investments and trade require a climate of transparency and stability in policies and regulations" governing transborder data flow.

During the past two years, the French delegation pushed strenuously for the inclusion of language targeting the different types of intracorporate data flow and wanted the OECD to embark on a comprehensive study to measure the quantity and type of each data flow. This effort was strongly opposed by the U.S., Canada, Britain and several European countries.

The policy declaration states that it is the intent of the 24 OECD member countries to "promote access to data and information and related services, avoid the creation of unjustified barriers to the international exchange of data and information [and] seek transparency in regulations and policies relating to information, computer and communications service affecting [transborder data flow]."

The policy declaration, if adopted by the OECD ministers, sets out a further agenda to focus on other transborder data flow issues. Hollock said reaching agreement on this statement may help the foreign ministers decide to take up another U.S. concern, namely, getting the OECD to include trade in services at the next plenary meeting of the General Agreement on Tariffs and Trade conference.

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NEWS

WASHINGTON UPDATE
Mitch Betts
CW Washington Correspondent

Three major airlines drop biased CRS displays

WASHINGTON, D.C. — Under government pressure, three major airlines have agreed to eliminate from their computer reservation systems (CRS), a feature that provided travel agents with computer displays biased toward each airline's own flight schedule, according to the U.S. Department of Transportation.

United Airlines, Inc., American Airlines, Inc. and Trans World Airways, Inc. voluntarily agreed to eliminate the biased displays from their CRS after discussions with Transportation Department officials.

The move came shortly after key members of Congress and the Justice Department discussed the possibility of forcing divestiture of the reservation systems [CW, April 1].

The now-defunct Civil Aeronautics Board prohibited bias in primary CRS displays, but the major airlines had added a feature that permitted travel agents automatically to lock in a secondary display that deliberately favored the CRS vendor.

At a recent U.S. Senate hearing, officials from small airlines said the divestiture is needed because the CRS systems operated by United and American give the dominant carriers a monopoly power.

United and American officials disagreed, saying their investments in hardware and software have improved service for consumers.

Computer industry ruled exempt from contract act

WASHINGTON, D.C. — The U.S. Court of Appeals here recently upheld the U.S. Department of Labor's 1983 decision to exempt computer service vendors from the Service Contract Act, which establishes a minimum wage for service contracts with the U.S. government.

The court decision resolved a longstanding dispute between the computer industry and labor unions over the applicability of the act to computer service contracts with the government. The law was intended to prevent "wage busting," where an employer cuts wages to become the lowest bidder for contracts.

The AFL-CIO and seven other unions sought to overturn the exemption, arguing that some computer service technicians are underpaid and that the Labor Department improperly granted the exemption.

The Computer and Business Equipment Manufacturers Association and the Computer & Communications Industry Association supported the exemption on the grounds that a wage floor would disrupt the industry's merit pay practices, which base pay on performance and experience.

The court agreed that the industry is not conducive to wage busting and said that former Secretary of Labor Raymond J. Donovan had properly exercised his statutory authority to grant the exemption.

Cbema opposes Reagan's proposed ICST budget cut

WASHINGTON, D.C.— The Computer and Business Equipment Manufacturers Association (Cbema) recently announced its opposition to the Reagan administration's proposed 50% budget cut for the Institute for Computer Sciences and Technology (ICST).

At a budget hearing held by the U.S. Senate Subcommittee on Science, Technology and Space, Cbema President Vico E. Henriques said ICST's program to develop computer network interfaces and techniques for testing protocol performance should not be eliminated.

The Reagan administration proposed a fiscal 1986 budget of $5 million, half the previous budget of $10 million, and said the standards development programs should be turned over to the private sector. The ICST is a unit of the National Bureau of Standards.

Henriques said the standards' work improves the competitiveness of U.S. business in world trade, and he disputed the idea that the ICST standards program could be transferred to the private sector.

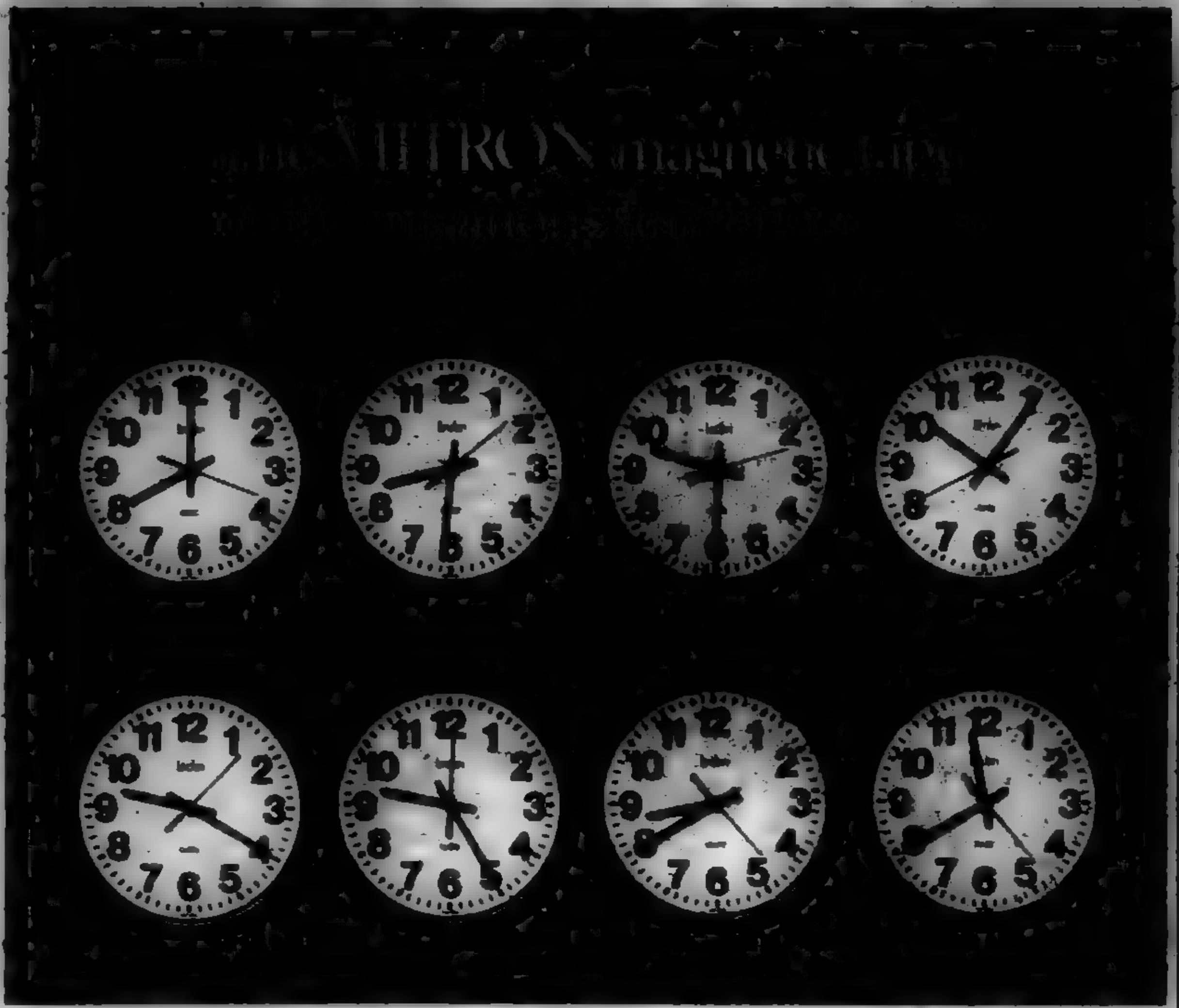
"It would take any private sector organization ... several years to reach the level of development and expertise that ICST currently has. If and when that level were reached, we seriously doubt that the neutrality and nonproprietary aspects of the ICST programs would remain," Henriques testified.

The Institute of Electrical and Electronics Engineers, Inc. also testified against the ICST budget cut at a separate Senate hearing.

Metalworkers to profit from automated tool growth

WASHINGTON, D.C.— The increased use of automated machine tools in the U.S. metalworking industry, spurred by the National Bureau of Standards' (NBS) research on automated manufacturing, will save the industry up to $250 million to $760 million a year by 1990, according to a recent report.

The report, prepared by the Management Collaborative Group of Chapel Hill, N.C., said the NBS Automated Manufacturing Research Facility "appears to be playing a key role in laying the groundwork for incremental implementation of computer-integrated automated manufacturing."



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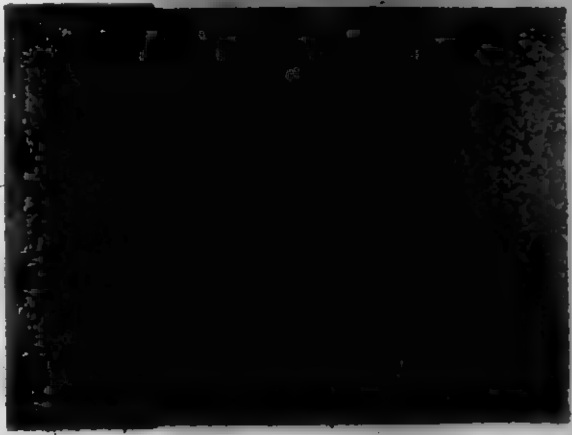

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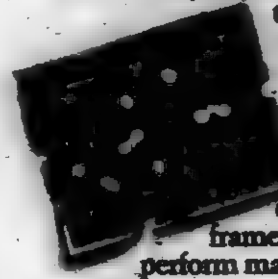

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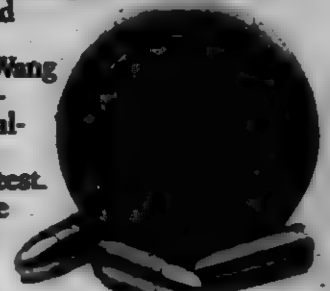

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EFT industry needs assertive stand with telecom firms

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — In a deregulated telecommunications environment, companies in the electronic funds transfer (EFT) industry can no longer afford to take a laissez-faire attitude toward telecommunications issues. Instead, they must adopt an assertive stance in order to minimize risks and maximize benefits in dealings with telecommunications carriers.

That was the message Michael Senkowski delivered to a seminar audience at the annual convention and exposition of the Electronic Funds Transfer Association, held here last week.

Companies that want to reduce their telecommunications costs must "learn how to bargain with telephone companies," said Senkowski, a partner in the Washington, D.C., law firm of Wylie & Rein. He noted that negotiating with telecommunications firms can dramatically reduce costs.

Bargaining reaps benefits

As an example of the benefits of negotiating, he cited ABC's nine-month bargaining effort for communications services for the 1984 Olympic Games. Because ABC was willing to bargain for a contract, the network paid only one-third of what it would have paid without negotiations, he said.

"It's important to recognize that you have choices and alternatives in telecommunications service," Senkowski explained. "That gives you leverage in negotiating the terms of a contract with telephone companies."

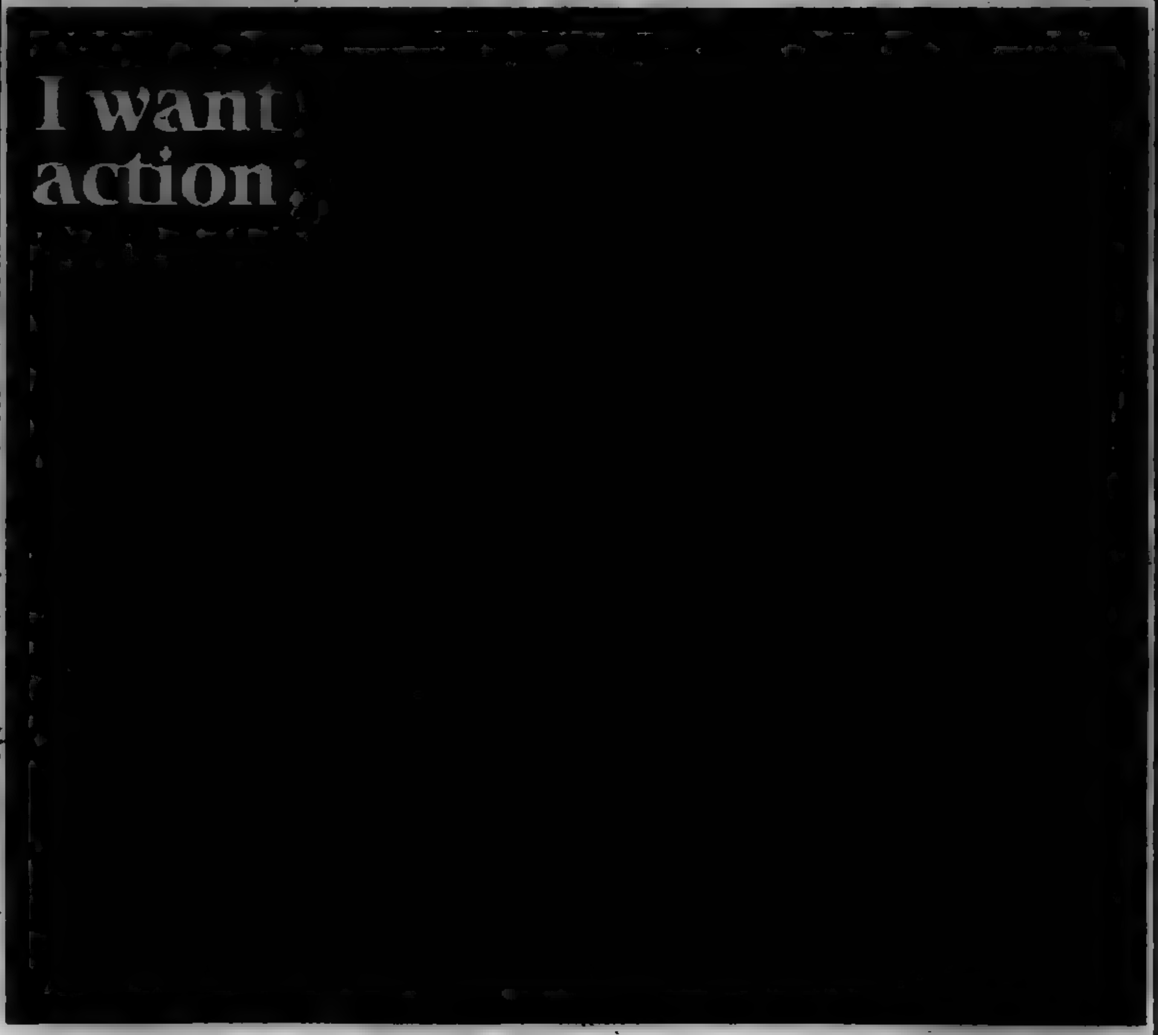
He noted that an understanding of the current telecommunications regulations and policies is also critical. If a company does not have the resources to follow the regulatory proceedings, it should hire a consultant who can keep it informed on telecommunications issues, he said.

Agreement on issues

Ron Osterberg, a partner in the Antietam Group, a Summit, N.J.-based firm specializing in EFT research and consulting, agreed with Senkowski on the importance of telecommunications issues.

"Stop treating telecommunications like a stepchild and start treating it like a discipline," he urged the audience.

Deregulation has produced unpredictable costs, Osterberg said. To help keep costs in line and to counter the tendency toward instability, he recommended that companies take an active role in tariff hearings.



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IEEE meet to emphasize graphics

SILVER SPRING, Md. — The Institute of Electrical and Electronics Engineers, Inc. (IEEE) is sponsoring the 1985 Trends and Applications Conference at the Sheraton Inn-Northwest Washington here May 20-22.

The conference theme is the use of computer graphics for greater productivity. The keynote speaker will be Andries van Dam, chairman of the Department of Computer Science at Brown University, Providence, R.I. He is coauthor of the book *Fundamentals of Interactive Computer Graphics* and has been an editor of several publications on computer graphics.

Tutorials on May 20 will be offered on business graphics and graphics standards. On May 21 and May 22, the conference topics will include computer-aided design and manufacturing, animation, business graphics, presentation graphics and data base-to-graphics interfaces.

Registration fees range from $90 for the conference alone to $470 for the tutorials and conference. More information is available from Trends and Applications '85, P.O. Box 639, Silver Spring, Md. 20901.

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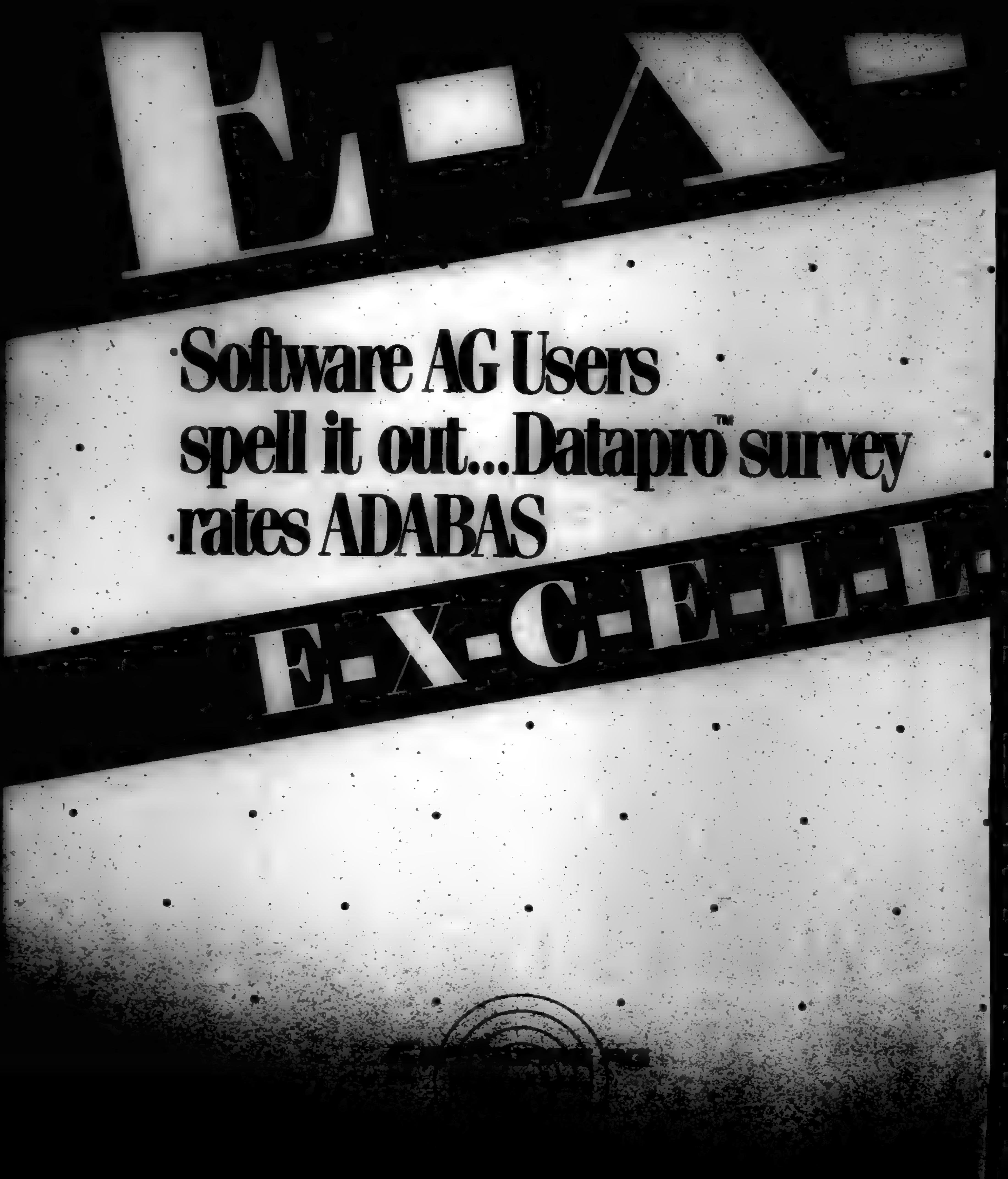
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Study finds work area can impact programmer's ability

By Jeffry Beeler
CW West Coast Bureau

NEWPORT BEACH, Calif. — A programmer's physical work environment apparently influences software productivity far more profoundly than MIS managers had previously suspected, according to Atlantic Systems Guild, Inc. (ASG) principal Tom DeMarco.

Speaking recently at an ASG-sponsored Structured Development Forum, DeMarco for the first time disclosed the results of a programming benchmark test that challenges accepted notions about why some programmers excel while others consistently lag.

Programming productivity has long been known to vary dramatically from individual to individual. Between the best programmers and the worst lies a productivity differential of some 25-fold, DeMarco said.

In the past, wide variations in coding output have been attributed primarily to factors like individual differences in ability, he said. But after examining the results of its programming benchmark test, ASG began to consider alternative explanations.

The study suggests that programmer productivity hinges to a large degree on environmental considerations like desk size, noise levels and privacy, DeMarco said.

"We're not saying that the size of your desk makes you a better programmer," said DeMarco's fellow ASG principal, Tim Lister. "Obviously, programming productivity is affected by all sorts of factors. But what we do say is that the work environments of programmers vary widely from organization to organization and that there seems to be a strong correlation between performance and environment."

Change job environment

In companies where programmer work spaces are optimized, coding productivity can rise four- or even fivefold, DeMarco said.

"Changing the physical characteristics of a programmer's personal job environment is the most important thing a manager can do to improve software productivity," he added.

Underlying DeMarco's comments is his long-standing belief that MIS managers need a standard yardstick for gauging relative programmer performance. Because such rating systems have been virtually nonexistent, "most companies don't have even the foggiest notion of where they stand in the broad scale of coding productivity," he said. But in today's increasingly competitive business environment, MIS managers "can no longer afford to remain ignorant" about how their programmers measure up to the rest of the industry.

DeMarco's conclusion eventually led him and his New York-based consulting firm to devise a programming benchmark test that would allow applications developers to rank themselves against other members of their profession.

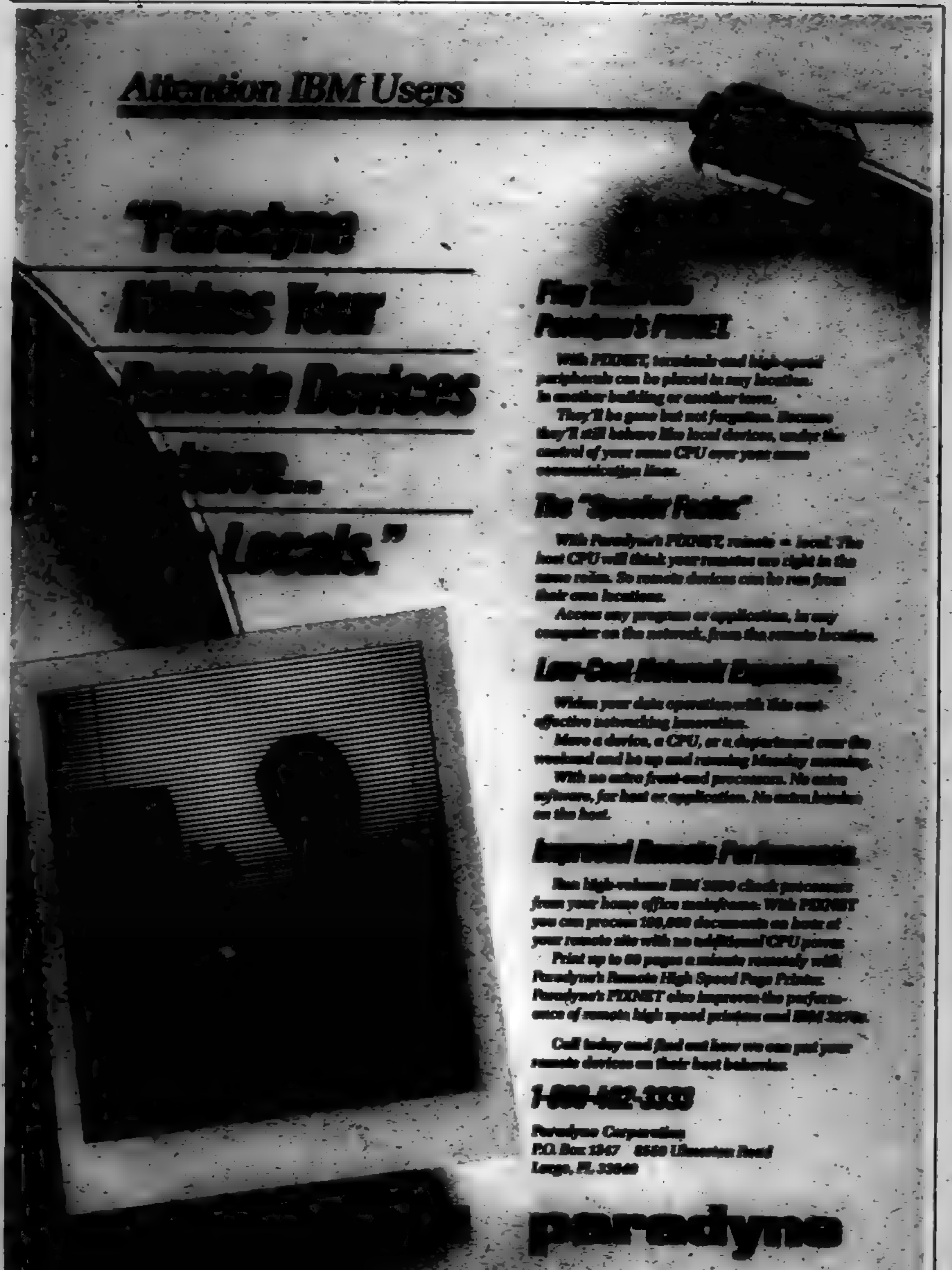
Nicknamed the "Coding War Games," the test was designed to show whether software productivity is significantly affected by the environment in which programmers work. In concept, the exercise is fairly simple: Once each year, programmers from different companies are given the same coding assignment, which they are asked to complete within one day.

Test administrators note how long each contestant took to code successfully the assigned application and then rank the competitors according to their finishing times.

In 1984, the exercise drew 166 programmers from 36 companies. Each participant was experienced in coding, was allowed to use any language and facilities and was paired with another volunteer from the same employer, DeMarco said.

When the exercise was

See TEST page 24



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Ample work space tops productivity recommendations

Many computer user organizations inadvertently retard their software output by forcing their programmers to work in cramped, noisy surroundings that make sustained concentration and high productivity virtually impossible, according to Atlantic Systems Guild, Inc. (ASG) principal Tom DeMarco.

"An effective work environment is the most important factor in determining programmer productivity," DeMarco said during a recent Structured Development Forum, sponsored by ASG in Newport Beach, Calif.

To optimize their software productivity, employers should allot each of their staff programmers a minimum of 100 square feet of dedicated floor space, including 30 square feet of tabletop, DeMarco said.

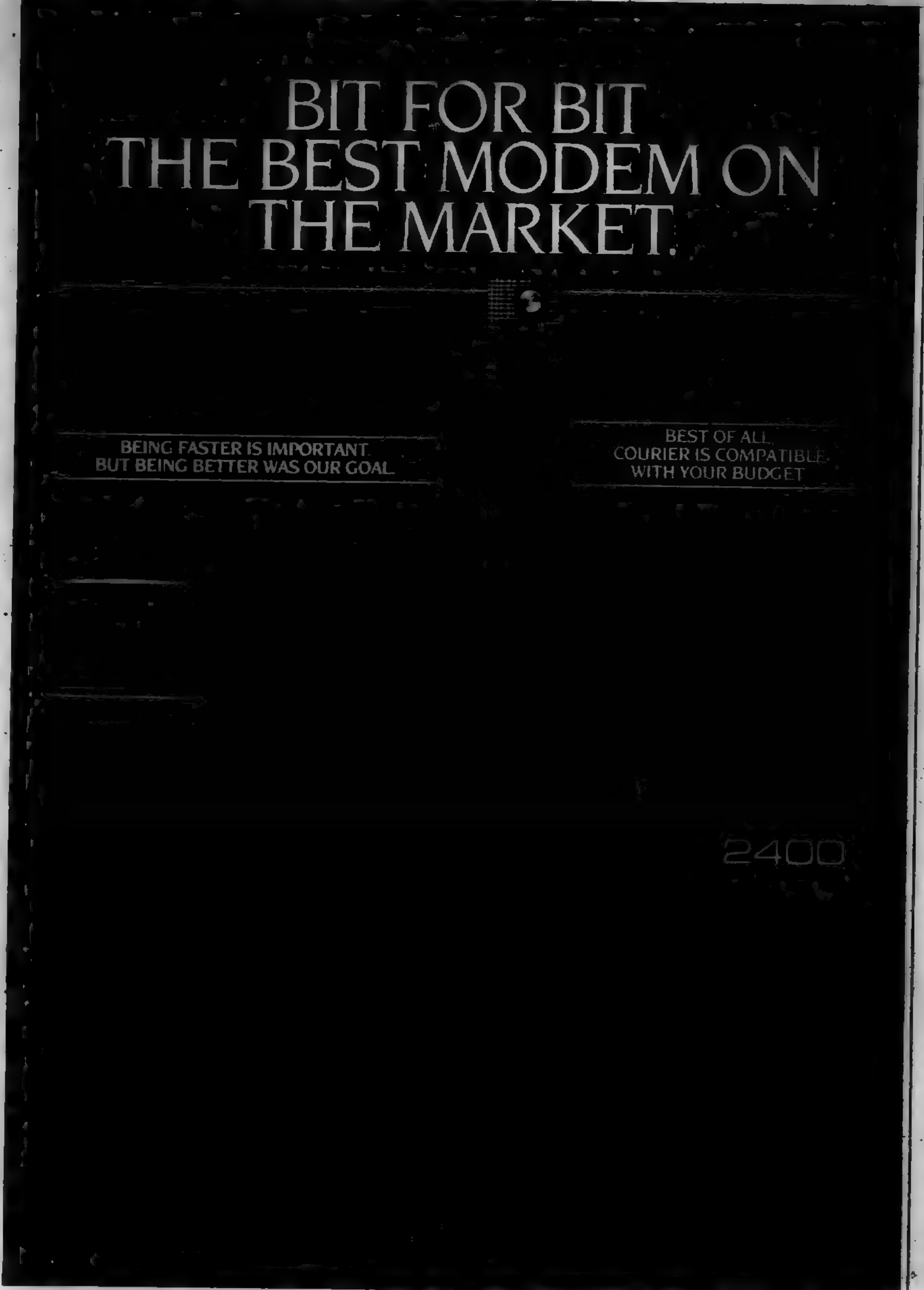
Quiet, private offices needed

If programmers are to perform at maximum efficiency, they also require a high degree of quiet, telephones that can be turned on and off at will and private offices with doors and ceiling-high walls.

Many corporations, however, skimp on such amenities and squeeze their programmers into tiny cubicles, where they are constantly beset with interruptions and chatter from neighboring coworkers, DeMarco said.

In the short term, the bare bones approach to work space design may enable corporations to minimize their overhead.

But in the long run, DeMarco warned, "cheating on floor space or physical environment is the most expensive economy of all," because it undercuts programmer productivity.



TEST from page 22

over, ASG personnel compared the finishing times of all the programmers who had completed their assignments without any errors. At first, the test results looked fairly routine: Across the entire sample, productivity varied widely, just as DeMarco and his associates had expected. In fact, the fastest of the competitors finished their coding tasks roughly eight times more quickly than the slowest, he said.

But when the test administrators examined their findings in detail, they were struck by how little finishing times differed among members of the same team. On the average, the speediest members of the teams completed the coding assignment just 20% faster than their partners, Lister said.

"We didn't expect the test to produce this kind of result," DeMarco said. "It came as a complete surprise to us."

The investigators then questioned the competitors about their everyday work environments and reached some telling conclusions:

- In general, the most productive 25% of the contestants reported having nearly twice as much floor space as the least productive 25%.
- More than half of the fastest quarter described their work areas as acceptably quiet, compared with 29% for the slowest quarter.
- More than 60% of the top fourth of the finishers expressed satisfaction with the amount of privacy their work areas afford, whereas only 19% of the bottom fourth said they feel the same way.

"What the data suggests," DeMarco theorized, "is that there's something about a company, its working environment and corporate culture that affects a programmer's productivity either favorably or adversely. People in good organizations do well, while people in bad organizations do poorly."

Lister expressed a similar view. Although he stopped short of attributing the test results entirely to differences in physical work environments, he minimized the significance of other potential influences like inequalities in training or salaries.

OA offers alternative path to DP career success

By [illegible]
CW Staff

NEW YORK — Office automation — as a career track — can offer women experience in management, technology and employee relations, according to Nathely McElrath, user support manager of office information systems at First Boston Corp. here.

Many people equate office automation with word processing, electronic filing, telephone messaging and other office duties, but specializing in OA offers training in a myriad of functions, said McElrath, who spoke at an Association for Women in Computing seminar titled "DP Career Survival: The Trend Toward Specialization," at the New York University Club here recently.

Office automation is data processing, McElrath contended. OA functions include knowledge of personal computers, telecommunications and DP applications, she said. Programming knowledge is vital for some jobs in OA, McElrath said, because even if 95% of the users are happy with what is available to them, there are always the 5% who need customized reports or information that is not easily available. For women with a DP background, the opportunities are many and varied, she said.

Titles and functions for OA have not been clearly delineated yet, in contrast to data processing, which has a clear progression from junior programmer to programmer, and then to junior analyst, senior analyst, up to project leader and on to manager, she said.

Office automation positions continue to grow, McElrath said, because OA saves time in the corporation, and time is money. "I like OA because I can take the results of what DP does on its big IBM mainframes and put [them] on my Wang system, and my end users love it," she said.

In addition to the traditional aspects of OA, managing an OA environment includes tasks like negotiating with vendors for discounts and valid information, McElrath said. Other facets of the job include equipment selection, purchasing and assembly, she said, as well as inventory record keeping. An OA manager must keep current on issues like ergonomics, telecommunications, user training and software evaluation as well, she added.

Local-area networks are being installed for OA use, so "If you don't know telecommunications, learn it," she advised.

There are several paths of progress in OA, McElrath said. Word processors can move to supervisory and training positions within an OA department, she said. Another career path is from central computer operations to hot line service to personal computer support, she added. A data processing professional can move from anywhere in the OA structure to a top management position, she said.

Keep current with technology

"You don't have to know how to program a personal computer," she said, but the more technical knowledge acquired, the better the chance for advancement. New OA equipment hits the market all the time, she said, so keeping up with current technology is very important.

McElrath is closely watching developments in image readers, for instance, so that when she decides they are practical to use, she can incorporate them into her organization, she said. "Users are reading about the new technology and asking us for the latest stuff — unlike before, when we had to push things on them," McElrath said.

The ultimate goal of OA is to clear everyone's desk of everything, McElrath said. The OA system will replace calendars, pens and pencils and telephones with one do-everything terminal, she said.

ICA conference planned for May

DALLAS — The president of Rolm Corp., Kenneth Oshman, will be the keynote speaker at the International Communications Association's 38th annual conference and exposition, Telecom '85, here May 5-10.

Also to speak at the conference is futurist Alvin Toffler, author of *The Third Wave*. Toffler will reportedly discuss his new book, *The Adaptive Corporation*, which examines AT&T and lays out his strategy for corporate survival in the information age.

Several technical programs reportedly will take place covering such topics as the status of European networks, cellular radio systems and voice mail, among others.

Registration for the conference is $450 for those from ICA member companies and $550 for those from nonmember companies. A spouse's program is priced at $125. Retired members and their spouses are admitted free.

Vendors and consultants providing telecommunications services may not attend, the ICA said.

The ICA is located at Suite 828, 12750 Merit Drive, LB-89, Dallas, Texas 75251.

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Communications offers channels to job opportunities

By [illegible]
CW Staff

NEW YORK — "Communications!" As the family friend offered "plastics" to Benjamin Braddock in the movie *The Graduate* so Susan Jarrett offers communications to women in the 1980s.

The communications field — incorporating voice, data, video and radio — offers women many job opportunities, and the best way to break into communications is through voice communications channels, said Jarrett, assistant vice-president of telecommunications at Bankers Trust Co. here. Jarrett and Constance Schack, an officer in telecommunications at Pershing, a clearinghouse on Wall Street, jointly addressed the Association for Women in Computing (AWC) seminar titled "DP Career Survival: The Trend Toward Specialization" at the New York University Club recently.

There are four basic career paths in voice communications: user management, technical support, vendor business and consultation, Jarrett said. Each path offers opportunities for women with backgrounds ranging from liberal arts degrees to highly technical degrees, she said.

For user management positions, "You have to be an expert in telecommunications, and if you are not, you have to know which vendor or consultant to go to," Jarrett said.

Responsibilities involve some traffic engineering, bill verification and cost control, systems operations and maintenance, she said. Understanding the hardware and software that enhances voice systems is necessary, as is user training, Jarrett continued.

Other functions of a voice communications user manager are circuit assurance and transmission testing, dealing with problems arising from circuit and transmission problems, keeping up the telephone directory and keeping the telephone operators up to date on the systems capabilities, Schack said.

Technical support makes all the rest happen, Jarrett said. Jobs in this category involve repairs, general maintenance and helping with transmission testing [circuit assurance], she said. Most large companies have their own technical support staff, but vendors also offer such positions, she said.

Vendors offer a plethora of jobs for people whatever their level of technical expertise, Schack said. Equipment vendors and transmission vendors need people to manufacture or distribute, sell, service and maintain communications systems.

'A niche on the vendor side'

"You can find a niche on the vendor side," Jarrett said, depending upon the level of technical expertise. Consulting, however, usually requires five to 10 years in the industry, she said.

But even in consulting — evaluating, selecting and implementing new products, establishing networks, doing long-term feasibility studies — there are jobs gathering data that require two years or less of communications experience, she said.

"There are loads of opportunities," Jarrett said. Voice communications is lagging behind the data processing industry by about 15 years, she said.

As companies discover that their phone bills are growing and voice technologies are changing rapidly, the voice communications field becomes more important to them, she said.

Women should join professional telecommunications organizations, take courses and read appropriate publications in order to upgrade their skills and keep current, Jarrett said.

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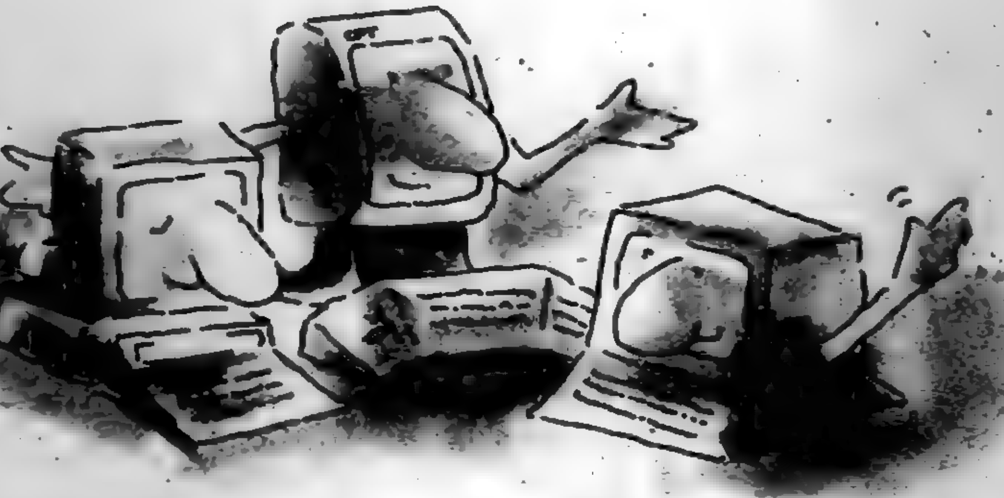

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NCR users meet set for April 28

DAYTON, Ohio — The Federation of NCR User Groups will hold its annual conference April 28 through May 1 at the Westin Galleria in Houston.

Former astronaut James Irwin will give the keynote speech on April 29. NCR Corp. Chairman Charles Exley Jr. will address the group on April 30. The conference will consist of 65 educational sessions and an exposition of NCR-related hardware and software products.

The registration fee for the meeting is $530. More information is available from Rodney McComas at the Federation of NCR User Groups, Mail Station USG-1, Dayton, Ohio 45479.

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Systems bring quiet to chaotic network newsrooms

By Donna Raimondi
CW Staff

NEW YORK — Radio and television network news directors are switching off noisy wire service machines and the confusion that accompanied them in favor of quiet, electronic newsrooms. Two of the national television and radio networks have installed electronic systems to handle the material coming into their newsrooms from their own and outside sources.

The volume of news received by NBC News from wire services such as the Associated Press, United Press International, Reuters and others was unmanageable to the point that there was the possibility of missing a story, according to John J. McCormick Jr., director of systems development for the radio, news, sports and enterprises divisions of NBC.

CW photo by D. Raimondi

Hoffman

Wire services have increased the number of stories they transmit from about 350 to 1,200 a day over the last decade, he said. At the same time, the average length of the stories has increased by about 50% and transmission speed has gone from 5 char./sec to 120 char./sec, he said.

Information that came into the newsroom clattered onto news wire machines in several layers of hard copy, which were torn off by copy people and distributed to news writers, McCormick said. The writers then edited the stories into scripts on their typewriters, he said. A major story could hit and not be distributed to the proper news writer because of the delivery time delay, he said.

Wire stories at NBC News now are fed directly into a Basys, Inc. electronic newsroom system and onto the terminals of writers and editors, McCormick said. The stories are coded into categories — sports, weather, news bulletins, business — and fed into an all-topics file, he said. Script writers have immediate access to all stories, and word processing capabilities with which to write and edit the stories that apply to them, he said. Audible signals on the system alert the writers to news bulletins, he said.

NBC News contracted with Basys, a Mountain View, Calif.-based firm, for two separate systems — one for network radio news and one for network television news, McCormick said. In September 1983, NBC News installed a trial system with 27 terminals for the television network, he said.

In 1984, NBC News asked Basys for the largest system it could provide to help cover the Democratic Party's national convention in San Francisco and the Republican Party's national convention in Dallas. At the time of the conventions, about 600 NBC News people learned how to use the electronic newsroom system, he said.

The national conventions

See NEWS page 30

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CNN scoops rivals with first electronic news system

By [illegible]
CW Staff

The electronic newsroom system — new to NBC and CBS — has been in operation at the Cable News Network (CNN) of Turner Broadcasting Systems, Inc. since the network's inception five years ago.

There were no systems designed specifically for television news when CNN started, according to Robert Barnes, director of corporate information systems.

CNN encouraged and partially funded the development of the Basys, Inc. newsroom system in 1979 to have it ready by June 1, 1980, when CNN went on the air, Barnes said. Nobody had ever done 24-hour news network programming before, he said.

"We have one hour to put together a one-hour newscast," Barnes said. Without word processing, electronic news gathering and printing, the network could not do what it wanted to do, he said.

Every department and function in Atlanta, as well as each of CNN's eight bureaus in the U.S., has 9.6K-bit/sec on-line, real-time terminals, Barnes said, over AT&T's Digital Dataphone Service (DDS). The company decided on a digital service to avoid problems with hackers, he said.

Everyone in the organization can keep track of schedules, telephone numbers, satellite feed times, show rundown and booking, as well as wire service information, Barnes said. CNN sets up files for special events and automatically routes any news wire information with certain keywords into that file, he said.

The first space shuttle launch in 1980 gave CNN its first taste of the power of its system, Barnes said. "We were just a few months old and had just barely gone on the air when the space shuttle happened," he said.

File for shuttle stories

Barnes grabbed a terminal, a modem and a small printer and drove to the site of the launch; with one telephone, he dialed Atlanta and set up a file for space shuttle stories, he said. The computer automatically selected all wire stories about the shuttle and dumped them into the file, he said.

CNN's equipment at this point consists of three Onyx Systems, Inc. computers for CNN and two of them for Cable News Headline News Service.

The machines run under AT&T's Unix operating system, Barnes said. The company will more than double its capacity this year (from the present 120 to 300 ports) by replacing the Onyx machines with a fault-tolerant processing system that is currently in development, he said.

There are wire machines in the newsroom strictly as backup devices, Barnes said. "Any machine that runs 24 hours a day is going to break," he said, and CNN cannot afford to miss any important news.

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NEWS

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also helped convince CBS, Inc. News of the value of electronic newsrooms, said Larry Cooper, director of news for CBS News Radioradio program. CBS News brought its Newstar system, from Colorgraphics Systems, Inc. of Madison, Wis., to the conventions in San Francisco and Dallas last year, he said.

CBS News staff wrote the convention news scripts for radio news in those cities and engineers inserted the sound back in New York, he said. "This saved us considerable money because we didn't have to move out a lot of tape-editing facilities, engineers and personnel to handle that," Cooper said.

The Newstar radio system provides electronic mail, bulletin flashes, address files and word processing functions as well as the wire service, Cooper said. Writers, editors, assignment editors and staff members in the seven studios in the CBS News building have terminals from which they can access news stories, edit them and send them on for the next step in the process, he said.

A total of 20 terminals are in place now, and the addition of eight more will allow the radio news feature operation to come on-line soon, he said. The television arm of CBS News will install the system in the next few weeks, he added.

NBC News' Basys system is composed of two Onyx Systems, Inc. CPUs running under AT&T's Unix operating system with Onyx communications controllers that link up to the writers' Qume Corp. terminals or Digital Equipment Corp. VT220s, according to Sheldon Hoffman, managing director of news production systems.

> *'There was a loud roar of disapproval from the people from whom we were taking terminals.'*
>
> — Larry Cooper
> CBS News Radioradio program

The processors run in a mirror system for redundancy, he said. NBC News will soon have four CPUs, probably DEC VAX series machines, each supporting one-quarter of the system devices, he said.

The CBS News radio system was designed and manufactured by Colorgraphic Communications Corp., Cooper said, at a cost of approximately $150,000. The system for the CBS News television division will have a lot more features, such as teleprompting and video machine start-up, and will cost more than a million dollars. The CBS News radio system has a pair of hard disks with 340M bytes of storage, he said.

Instead of going to a backup computer, the main CPU consists of a series of microcomputers, with each board handling two devices, he said. If one board goes down, only two terminals or other devices are affected and boards can quickly be pulled out and sent to Colorgraphics for repair while spares are plugged in, he said.

Cooper said he had some problems training "people who have been working on typewriters for 100 years" who did not want to give up their typewriters. By election night, the users had changed their minds, he said. According to Cooper, when several of the terminals had to be moved to a television studio on election night, "there was a loud roar of disapproval from the people from whom we were taking terminals."

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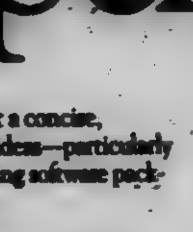

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SOFTWARE INTERNATIONAL

Software Thinking That's Impossible To Ignore.

Cambridge evolving as England's Silicon Valley

By Amy MacDonald
Special to CW

CAMBRIDGE, England — The word Cambridge usually conjures up two images: cabbages, which are grown on the flat fenlands here, and King's College, whose lofty Gothic steeples epitomize Cambridge University. More recently, however, other images have been associated with Cambridge: the computer, and more surprisingly, the Porsches, swimming pools and other symbols of commercial success that are visible signs that this rural backwater is becoming the Silicon Valley of England.

In 1960 there were roughly 30 high-tech firms in this area; today there are about 360, with a yearly revenue of nearly $1 billion. More than 300 of them were established in the last five years. Companies are continuing to start up at the rate of two a month.

Although Cambridge-area firms include the two giants of the British computer industry — Acorn Computers and Sinclair Research, Ltd. — about 75% of the companies here are small (employing under 200 people), independent and homegrown. They include such respected names as Cambridge Interactive Systems, Shape Data, Laserscan, Logica, Cambridge Consultants and Cambridge Instruments. Most are research-and-development-oriented (volume production tends to be subcontracted out). One-third design either hardware or software for computers, with a special concentration of computer-aided design activity.

Cambridge University's real contribution has been as a spawning group for new companies. A family tree shows that virtually every new firm grew in some way from its hallowed halls. The university espouses the notion of commercial application of academic know-how and has fostered a strong relationship between the school and industry. In evidence of this stance, the university does not object if its professors simultaneously hold jobs as company directors.

Sir Clive Sinclair, of Sinclair Research, claims that this was not always the case. He recalled that when he first came to Cambridge, he was denied permission to read an important research paper in the university library because he wanted to use it for commercial purposes.

According to "The Cambridge Phenomenon," a report published by Segal Quince & Partners, some academicians are still worried that the phenomenon could go too far — as it has in the U.S. "The boundary between advice to industry and consultancy is very blurry. . . . We must be careful not to become a firm of consultants to industry," the report said.

At the same time, there has occurred a financial crunch at Cambridge University, which forced many academics out into the business world. Competition from industry has not yet created a serious university "brain drain" — in fact, if anything, administrators seem relieved. "The availability of jobs is a great boon," said John Bradford, Trinity bursar.

Little help from government

An estimated 20% of area firms have taken advantage of a government loan scheme to help new small businesses, and a similar number were aided by the government's Support for Innovation funding. But the majority survived by being self-funded or through term financing.

A Department of Trade and Industry spokesman estimated that the UK spent several million dollars last year on projects encouraging high-technology industry; it spent less than France, West Germany and Ireland. Much of that money went to entice firms to locate in areas like Scotland. Consequently, the

See UK page 36

MacDonald is a free-lance writer living in London.

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In Your Corner.

NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

SYDNEY — Five major American Express (Amex) outlets in the Asia-Pacific region will use only IBM equipment, because of a recent mandate by American Express International. Amex sites here, as well as in Hong Kong, Seoul, Singapore and Bangkok, have been ordered to convert existing systems to IBM.

■

CANBERRA — Equipment from Japan's Facom Ltd., valued at $1.8 million, will reportedly replace equipment destroyed by fire at the National Library here. The equipment will restore the library's on-line network services to 200 branches throughout Australia. The operations were halted in a fire last month.

■

MELBOURNE — Three academic institutions here received Pyramid Technologies, Inc. scientific processors to participate in national artificial intelligence projects funded by Australia's Department of Science. Melbourne University is planning to develop a new version of Prolog and a deductive data base, Monash University will experiment with algorithms for unification, and the New South Wales Institute of Technology is working on producing expert systems.

BRAZIL

BRASILIA — Contem, a local NCR Corp. subsidiary, may be the first to construct a front-end NCR Contem 3000 system in Brazil. The modular and transparent processor is said to function in the IBM Systems Network Architecture network environment. The company is awaiting approval of Brazil's Department of Informatics.

FRANCE

PARIS — Victor Technologies, Inc., after rising from the ashes of Chapter 11 under the U.S. Federal Bankruptcy Act, unveiled two additional microcomputers for its European audience here during the recent Spring Informatique show. The company, now owned by Swedish Datatronics, introduced the VPC, an IBM-compatible machine reportedly offering more power than IBM's Personal Computer XT for a 20% lower price tag. The company also debuted the VLI, an upgrade of the former model 9000 that is also IBM-compatible. Both systems are said to be available this month.

JAPAN

TOKYO — AT&T is working to crack Japan's value-added network and office automation markets. Agreements have already been struck with Japan ENS, Inc., Ricoh Co. and Olivetti-Japan.

According to AT&T International's Vice-President John Hinds, AT&T has shipped packet-switching equipment to Japan ENS, Inc. and will be distributing AT&T office systems through Ricoh and Olivetti-Japan.

■

TOKYO — Japan Storage Technology Corp. (STC) has redirected its product strategy here, in the wake of the American parent company filing for bankruptcy protection under Chapter 11 under

UK

from page 32

firms in Scotland and in England's Thames River Valley region are largely outside imports and subsidiaries from other countries.

Imaginative financial and management support from the local branch of Barclays Bank has also played a critical role, one that in the U.S. would have been undertaken by venture capital, according to Nick Segal, author of "The Cambridge Phenomenon." From an early date, Barclays' manager undertook to finance many of the risky new companies and created a computer club where the heads of new companies could fraternize, air problems, exchange tips and make crucial business contacts.

So, while Britain does not pose a threat to the industry, Americans may have something to watch across the waters.

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the U.S. Federal Bankruptcy Act.

The Japanese company is selling the parent company's magnetic disks, integrated circuit disks and tape disks, along with products from other companies. Insiders here said the firm will probably test-market a series of computer-aided design and manufacturing products in Japan and then offer them for sale in the U.S.

NETHERLANDS

AMSTERDAM — MAI's European operations are reportedly being dismantled here as a result of cost-cutting procedures. Dutch vice-president of the firm Albert Snelling has resigned, and it is thought that only a few technical people will be retained here. National Advanced Systems, Inc. is also facing problems in Europe. In the wake of a recent corporate reorganization, senior officers and the general manager of the firm's Dutch operations have left the company.

■

AMSTERDAM — IBM is selling its Personal Computer to students here at very attractive prices, in direct competition with Olivetti Corp. and Commodore Business Machines, Inc. For approximately $1,260, students carrying college identification can get an IBM Personal Computer with 128K bytes of memory and two floppy disk drives.

■

THE HAGUE — Because of political reasons, the Dutch Postal, Telephone and Telegraph (PTT) authority will use several suppliers for its digital public telephone exchange currently under development. Sources reported that AT&T, Philips Information Systems, Inc. and Ericsson Information Systems will supply the PTT with communications systems through 1988, after which point ITT will enter the ranks with its system 1240.

SWEDEN

STOCKHOLM — Sore backs, strained eyes and other ergonomic-related complaints are just excuses to avoid technology, according to the Swedish Association of Graduate Engineering (Sage) here. Sage maintained in a recent statement that the main issue of computerization in Sweden is its resulting short-term unemployment. But without computerization, Sage insisted, Sweden will face long-term unemployment.

■

STOCKHOLM — Computer experience is considered more important than a university degree for starting computer career here, according to a leading Swedish industrialist. "We have noticed no correlation between good grades and work performance. It's more important to recruit from within the industry," according to Rolf Johansson, president of Atlas Copco Data. Johansson said the high demand for computer personnel here necessitates taking greater risks in the hiring process. But because nobody stays at these jobs for very long, he concluded, "It's easy to get rid of people who don't work out."

■

STOCKHOLM — Computerization has yet to result in any noticeable savings here, according to Swedish government officials who convened recently at a "Computer Day" held for all Swedish state departments. The state DP workers said they are now only in the planning stages of automation, and many structural changes can be anticipated. The seminar participants also said more education is needed to maximize the benefits of computerization.

WEST GERMANY

GUETERSLOH — The Berlin software house M.I.S. Ingenieurbuero Gmbh has been taken over by Bertelsmann-Gruppe, the media giant based here. The software house will be added to the newly formed Bertelsmann Software Gmbh. M.I.S., best known for its Bechentext word processing package that won the 1984 German Software Award for its integrated package called Papyrus. The firm's focus will be on software for personal and home computers.

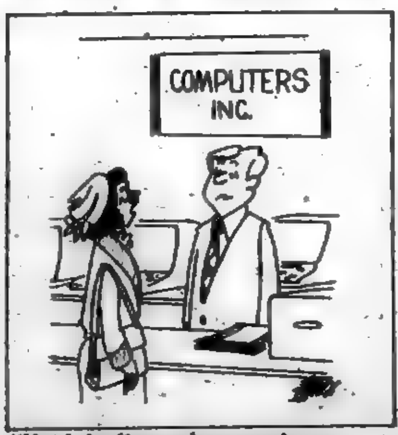
■

COLOGNE — The Business Institute for Automation here plans to demonstrate its videotex system in conjunction with four prominent partners at the upcoming Hannover Faire. Participating in the project will be BMW AG, an insurance company called Versicherungsgruppe, the grocery chain Rewe Zentral AG and the city government of Duesseldorf.

■

KARLSRUHE — An artificial intelligence research project was announced here by the University of Karlsruhe. The $3.5 million project is expected to encompass speech recognition and the use of computers in medical diagnosis.

The West German government has reportedly earmarked some $65 million over the next three years to develop expert systems.



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Calculation aid speeds company's tax computations

NATICK, Mass. — A computer systems vender here had a taxing problem on its hands until it installed a software package to calculate sales and use taxes on its computer products and services.

When Prime Computer, Inc. bills its customers, its invoices must include any state, county or local taxes that are levied in areas where the customers are located. The firm processes more than 11,000 invoices each quarter, has sales that add up to more than $500 million a year and serves customers that are scattered throughout the U.S. and the world.

Until recently, finding the correct sales or use tax rate for each customer was a nightmare, according to John Griffen, a senior tax specialist for Prime. "We were using a manual system to add all those different rates to our invoices," he said.

Order entry employees from the firm's sales accounting division used tax manuals to compute the sales taxes Prime had to collect from its customers and forward to different regional governments. The employees checked invoices to determine where a client was located, then looked through the tax manuals to try to pick out the most up-to-date tax rate in that locality.

"But even at that, with all those invoices to process, we were lucky if we could pick up the correct amount of state taxes due, never mind the county and local taxes assessed in some jurisdictions," Griffen said.

'No problems'

In 1981, the firm automated its tax computations with software from AVP Systems. The Sales/Use Tax package, which runs on a 4M-byte Prime 750, computes the taxes due for different localities and integrates the information into Prime's billing and accounting system. "Now we have no problems computing the correct tax," Griffen said, "and we can do it automatically."

Error rates on invoice taxes have dropped from about 9% to about 3% since Prime began using the software, according to George Connor, Prime's supervisor of taxes. He said the firm has substantially increased its business since the days of manual tax accounting, so he cannot estimate the time savings the automated system represents.

When a customer orders products or services, employees in Prime's order entry department enter information about the order, including the customer's address and Zip code, into the system.

After checking Prime's customer files to make sure a customer is not exempt from taxes, the AVP software reads the customer's Zip code and uses it to determine appropriate taxes. The system then generates invoices that include the taxes.

Griffen said the tax information is kept up to date because each month AVP sends Prime coding sheets from which data entry workers input changes in tax rates. If a large area suddenly switches its tax rates between updates, the vendor sends Prime additional information at once, he said.

The updates prevent Prime from facing problems like one the firm encountered about five years ago, during a New York City tax change. Prime did not learn about the change until after it had processed about 40 invoices at the old rate, according to Connor. For each of those invoices, employees in the tax department had to figure the taxes a second time, a task that consumed most of one business day.

"Now we get those changes immediately," Griffen said, "and both the current rate and the prior rate of a tax are in our system, so we've always got the correct rate for the date of the sale."

Connor said the 3% error rate that remains in Prime's tax calculations emanates mainly from conversion programs Prime constructed to get AVP's software to run on its computers. The software had been written for IBM systems, and Prime's programmers did a quick, stopgap conversion to bring it up quickly on Prime's machines.

The firm is now comparing its conversion programs against those that AVP has since written for other customers who run Prime shops so that it can make the software more accurate, he said.

Expert systems symposium topic

WASHINGTON, D.C. — The use of expert systems in an emergency management program will be explored in a symposium here April 24-25 in the main auditorium of the Herbert C. Hoover Building at the U.S. Department of Commerce.

The symposium will bring together AI researchers and emergency management personnel, according to the cosponsors, the Federal Emergency Management Agency and the National Bureau of Standards.

Registration is free.

Additional information is available from Paul Bryant, Federal Emergency Management Agency, Washington, D.C. 20472.

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TURNAROUND TIME

Larry Long

Q *I fought for and received authorization to award salary increases to my programmer/analysts that are almost double the increases for the rest of the company. My arguments centered on raising compensation to reach parity with other employers in the region.*

I had hoped that these increases — as much as 25% — would result in highly motivated workers. I'm aware of studies that show compensation on the low end of things that motivate computer people, but the priority for my staff was money.

If anything, morale is lower this year than last year. Where do I go from here?

The results of many studies on what motivates computer people uniformly show remuneration at or near the bottom. This conclusion was confirmed by what happened in your company. Lack of pay parity may cause someone to leave one job for another, but it is not an effective motivator. In a nutshell, highly motivated people are that way because they are inherently self-motivated or they have good managers.

Besides coordinating the efforts of a group, a good manager pays attention to the individual. A good manager makes a special effort to match assignments to the skills and interests of the individual. A good manager provides real as opposed to token guidance and support in the area of career development.

Granted, these individual activities take up valuable time, but in the long run, they provide a far greater contribution to the company than nitpicking memos and meetings for meeting's sake.

Q *In four months, we are scheduled to implement a homegrown manufacturing resource planning (MRP) system. I am the project leader. While drawing up the conversion plan, it became apparent that we had a real problem. The MRP system is such a radical change from the way we have traditionally handled manufacturing systems that the conversion calls for some structural reorganization and some facilities changes.*

The difference in approach and the monitoring of personnel make parallel conversion impossible with current resources. We considered hiring 10 temporary people for two months, but that proposal fell through when the managers involved decided it was a waste of time and money to train temporary people on the old procedures.

I've recommended a direct conversion, but the users said this is out of the question. They offer no alternative. Do you have one?

With the implementation of more and more integrated, on-line information systems, direct conversion has become an increasingly appealing alternative to the traditional parallel conversion. The implementation of an MRP system is an invitation to go cold turkey with direct conversion. A phased conversion is not as applicable to MRP as it is to other systems.

Offset the greater risk of direct conversion with extra-thorough system testing and user training. I would suggest that you continue to press for a direct conversion effort.

Q *Three months ago, I was a victim of a companywide cutback. Although it is little comfort to me, data processing was not hit as hard as other departments.*

I am attempting to find a DP position (any position) in the local area. My 22 years of DP experience have gotten me some interviews, but I feel my age (47) has ultimately been the determining factor.

Could you suggest a search strategy for someone in my position?

Even though you may be willing to take a job at the salary of an entry-level programmer, potential employers feel that, over the long run, this is not a workable situation. Put your maturity to work for you. Look outside of the MIS function to the user departments. Most user departments would prefer to hire someone like you in a user liaison capacity rather than some young "techie."

The year 1985 may well be the year of the user liaison (or business analyst or account executive). Although these types of positions have been around for some time, for the first time, user departments are recruiting such people in large numbers.

Check out opportunities in the user areas as well as MIS. And, don't forget your old company; substantial companywide cutbacks are often followed by the voluntary departure of many good people. I would expect that some of these openings will be filled with user liaisons.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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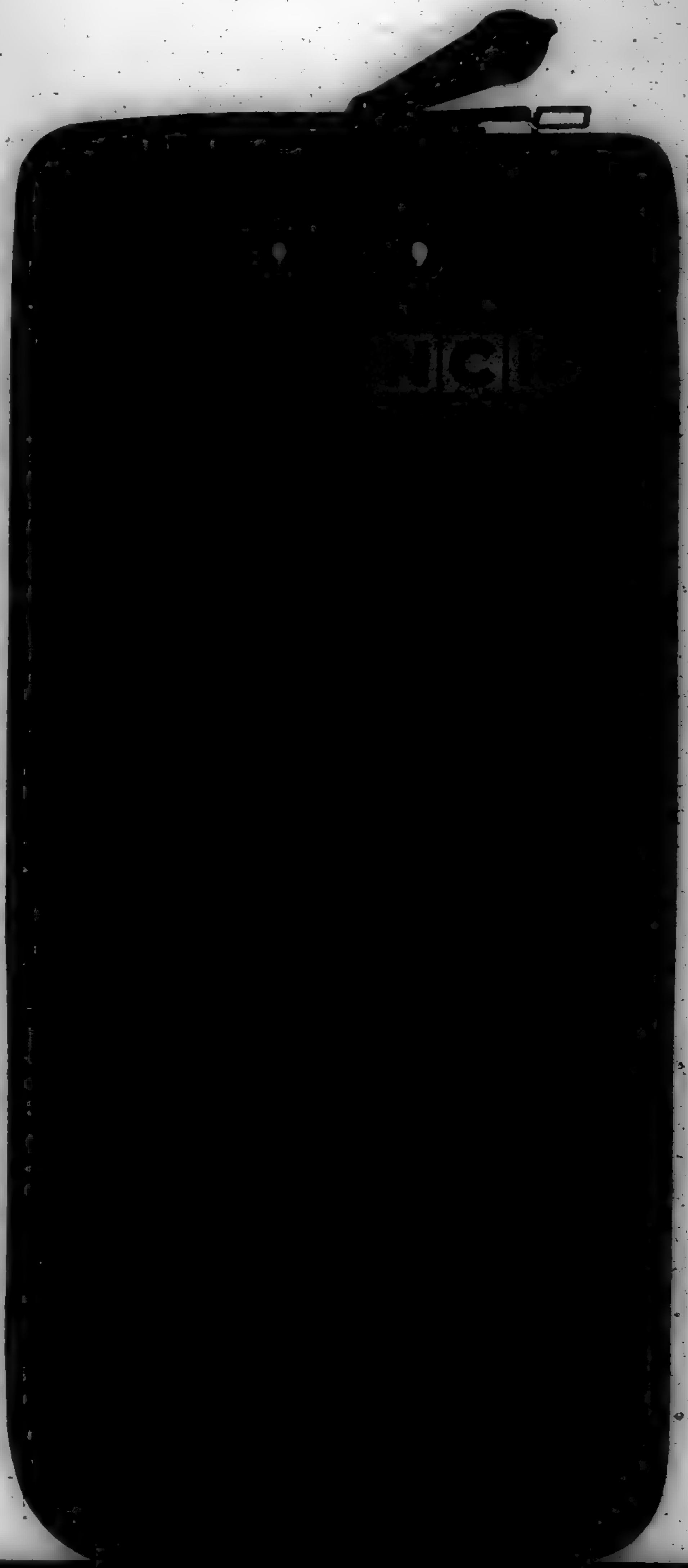

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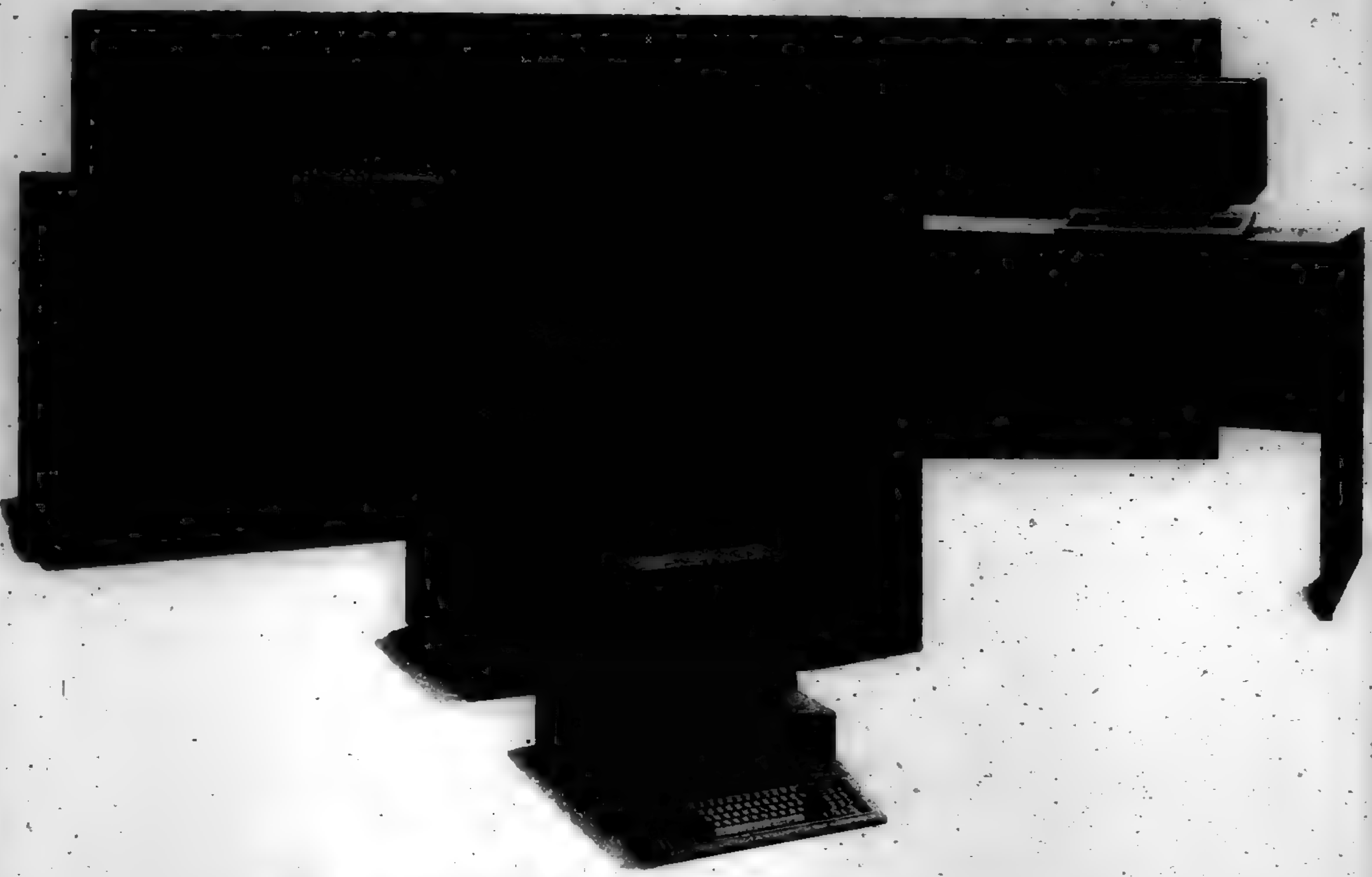

The UNIX* operating system from PC to mainframe.

CALENDAR

WEEK OF MAY 5

MAY 6, NEW YORK — CICS/VS Internals. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held May 20-24 in San Francisco.

MAY 6-7, LOS ANGELES — CICS/VS Performance & Tuning. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held May 20-21 in Fort Lee, N.J.

MAY 6-7, WAKEFIELD, MASS. — Software Rapid Prototyping. Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Department SRP, P.O. Box 3606, Torrance, Calif. 90510. Also being held May 9-10 in Orlando, Fla., and May 13-14 in Washington, D.C.

MAY 6-7, WASHINGTON, D.C. — Software Maintenance. Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Department SMA, P.O. Box 3606, Torrance, Calif. 90505. Also being held on May 9-10 in Boston and May 16-17 in Atlantic City.

MAY 6-7, HOUSTON — MVS Overview. Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held June 24-25 in Washington, D.C., and Sept. 9-10 in Austin, Texas.

MAY 6-8, BOSTON — Relational Data Base. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held May 13-15 in Los Angeles.

MAY 6-8, DALLAS — EDP Software Maintenance. Contact: Conference Manager, U.S. Professional Development Institute, 1620 Elton Road, Silver Spring, Md. 20903.

MAY 6-8, DALLAS — Networking Personal Computers. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 6-8, SAN FRANCISCO — Data Communications System Components. Contact: Systems Technology Forum, 900 Fern Park Drive, Burke, Va. 22015.

MAY 6-9, DENVER — CICS/VS Logic & Debugging. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held May 13-16 in Fort Lee, N.J., May 20-23 in Atlanta and May 28-31 in San Antonio.

MAY 6-9, FORT LEE, N.J. — IMS/DC (Data Communications) Programming. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MAY 6-9, WASHINGTON, D.C. — Vsam: From Start to Finish. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held May 13-16 in Denver, May 20-23 in Los Angeles and May 28-31 in Fort Lee, N.J.

MAY 6-10, HOUSTON — Structured Systems Design Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092. Also being held May 20-24 in Houston.

MAY 6-10, CHICAGO — The James Martin Seminar. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

MAY 6-10, WASHINGTON, D.C. — Hands-On Programming in the C Language. Contact: The George Washington University, Continuing Engineering Education Program, Washington, D.C. 20052.

MAY 8-10, SAN FRANCISCO — Local-Area Networks. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held May 13-15 in New York.

MAY 8-10, LOS ANGELES — X.25 and Packet-Switching Networks. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 9-10, WASHINGTON, D.C. — Negotiating Computer Contracts. Contact: Law & Business, Inc., Harcourt Brace Jovanovich, Publishers, 855 Valley Road, Clifton, N.J. 07012. Also being held May 30-31 in Boston and June 17-18 in San Francisco.

MAY 9-10, MINNEAPOLIS — Personal Computer Local-Area Network Software. Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55425. Also being held May 16-17 in Washington, D.C., and May 22-23 in San Francisco.

WEEK OF MAY 12

MAY 12-16, SEATTLE — APL '85. Contact: Robert J. Geller, Apartment C, 2416 E. Madison St., Seattle, Wash. 98112.

MAY 13-14, DALLAS — Using Dbase II and the New Dbase III to Manage Information. Contact: Professional Development Institute, North Texas State University, P.O. Box 13288, NT Station, Denton, Texas 76203.

MAY 13-14, CHICAGO — Understanding Telecommunications Technologies for Non-Engineers. Contact: Telestrategies, Inc., Suite 102, 6842 Elm St., McLean, Va. 22101.

MAY 13-15, WASHINGTON, D.C. — Introduction to Data Communications. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015. Also being held May 29-31 in San Francisco and May 29-31 in Houston.

MAY 13-15, NEW YORK — The

See NEW page 44

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☐ YES
I simply can't be bothered making comparisons.

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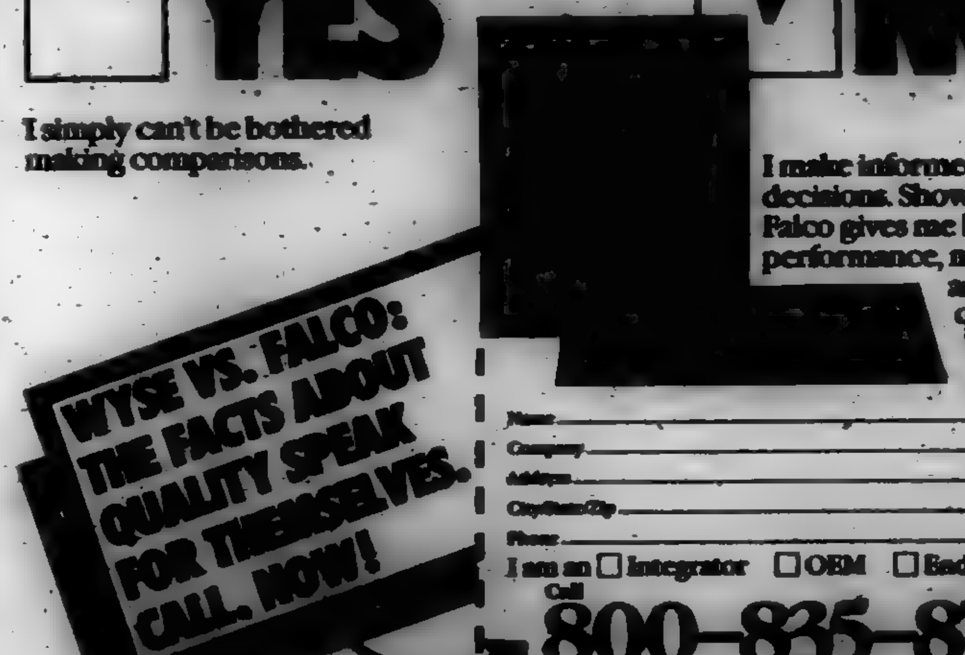
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MAY

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Associated Information Managers Fourth Annual Conference. Contact: Associated Information Managers, 1776 E. Jefferson St., Rockville, Md. 20852.

MAY 13-15, TORONTO — **Controlling Software Projects: Management, Measurement and Estimation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

MAY 13-16, DENVER — **The Fifth International Conference on Distributed Computing.** Contact: Earl Swartzlander, TRW Corp., Defense Systems, One Space Park, Redondo Beach, Calif. 90278.

MAY 13-17, SAN FRANCISCO — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

MAY 13-17, HOUSTON — **Structured Systems Analysis Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

MAY 14-16, PARIS — **International Ada Conference.** Contact: Hans Horst, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

MAY 14-17, ST. LOUIS — **The Association for Integrated Manufacturing Technology's 22nd Annual Technical Conference and Exposition.** Contact: Association for Integrated Manufacturing Technology, Suite 800, 111 E. Wacker Drive, Chicago, Ill. 60601.

MAY 15-16, AUSTIN, TEXAS — **MVS System Tuning.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held Aug. 22-23 in Dallas.

MAY 16-18, LOS ANGELES — **The Southern California Computer Faire.** Contact: David Small, Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

MAY 17, LOS ANGELES — **Independent Computer Consultants Association (ICCA) Interconnections '85.** Contact: ICCA, P.O. Box 27412, St. Louis, Mo. 63141.

WEEK OF MAY 19

MAY 19-23, NASHVILLE — **Software Jamboree.** Contact: Software AG of North America, Inc., 11800 Sunrise Valley Drive, Reston, Va. 22091.

MAY 20-22, HILTON HEAD, S.C. — **Audit Managers Symposium.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

MAY 20-22, SILVER SPRING, MD. — **1985 Trends and Applications Conference: Utilizing Computer Graphics.** Contact: Trends and Applications '85, P.O. Box 639, Silver Spring, Md. 20901.

MAY 20-23, WASHINGTON, D.C. — **Vtam Concepts and Facilities.** Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held Aug. 12-14 in Houston and Nov. 18-20 in Washington, D.C.

MAY 20-23, VIRGINIA BEACH, VA. — **Navy/Micro OA '85.** Contact: Bostron Corp., Suite 716, 1511 K St. N.W., Washington, D.C. 20005.

MAY 20-24, BELLEVUE, WASH. — **C Programming Workshop.** Contact: Kathy Howard, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

MAY 21-24, PARIS — **Intelligence International Exhibition and Congress.** Contact: Simtec Communications, 211, rue Saint-Honore, 75001 Paris, France.

MAY 21-22, TARRYTOWN, N.Y. — **Technology and Market Forecasting in Electronics.** Contact: Futurecast Learning Center, 40 Birch St., Redwood City, Calif. 94062.

MAY 22-24, KYOTO, JAPAN — **International Conference on Foundations of Data Organization.** Contact: Yahiko Kambayashi, Department of Information Science, Kyoto University, Kyoto 606 Japan.

MAY 22-24, WASHINGTON, D.C. — **Management Skills and Techniques for New and Prospective Managers.** Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022. Also being held June 26-28 in New York.

MAY 22-24, NEW YORK — **Network Protocols and Standards.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

WEEK OF MAY 26

MAY 28-29, CHICAGO — **VS Cobol II.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held May 30-31 in New York.

MAY 28-30, KINGSTON, ONTARIO — **15th Annual Symposium on Multiple-Valued Logic.** Contact: H.T. Mouftah, Department of Electrical Engineering, Queen's University, Kingston, Ontario K7L 3N6, Canada.

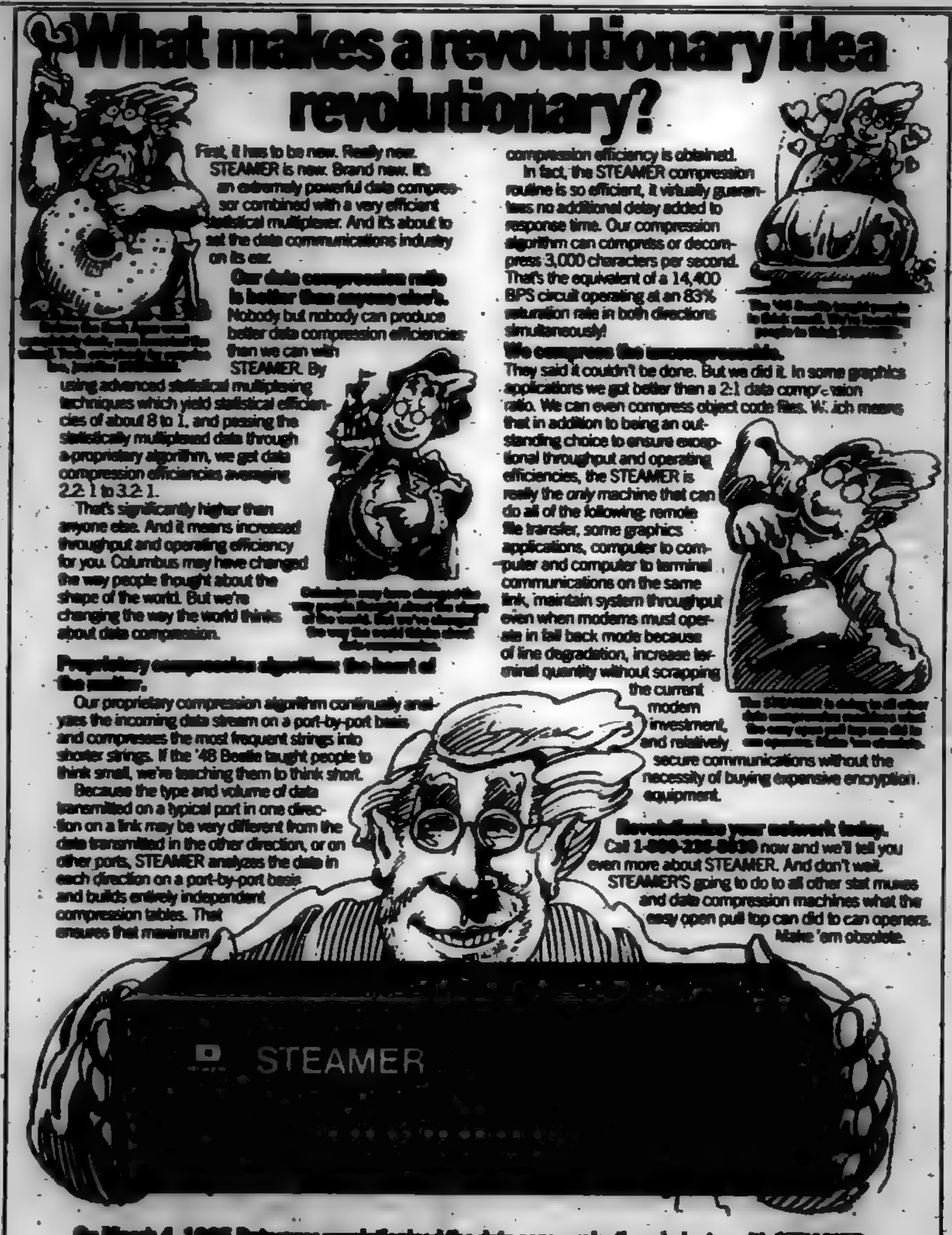
MAY 28-31, NEW ORLEANS — **The Seventh National DEC-Compatible Industry Exposition (Dexpo South '85).** Contact: Angela Wright, Expoconsul International, Inc., 55 Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

MAY 28-31, SAN FRANCISCO — **CICS Application Design.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held May 28-31 in New York.

MAY 28-31, NEW YORK — **TSO ISPF.** Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

MAY 29-30, DALLAS — **Opportunities & Pitfalls.** Contact: Ken Orton, Future Computing, Inc., 8111 LBJ Freeway, Dallas, Texas 75251.

MAY 30-31, WASHINGTON, D.C. — **Legal Issues in Acquiring and Using Computers.** Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.



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EDITORIAL

Sound and fury

For better or worse, the critical health and safety issues concerning VDT use are moving through various state legislatures, where initial steps toward some sort of a VDT regulatory environment will likely be taken this year [CW, March 25].

The legislative debates on VDT safety will, if nothing else, summon forth the complete body of knowledge supporting or debunking the claims made about the hazards of VDT use. This is the good news, because people from both sides of the issue have presented salient information to back up their arguments. The bad news is that, given the same information and arguments, politically motivated legislatures cannot always be trusted to act reasonably.

Early reports from state legislatures indicate that pro-regulation groups, led chiefly by 9 to 5 and various employee unions, are gaining the upper hand over those railing against VDT regulation, such as the Computer and Business Equipment Manufacturers Association. The pro-regulators scored a victory late last month in conservative New Mexico, which enacted legislation regulating VDT use for state workers. The New Mexico regulation provisions include controlled room lighting, scheduled work breaks for VDT operators and adjustable workstations.

It appears that liberal states such as Massachusetts and California will likely approve similar regulations — the difference being the states' active consideration of regulation in the private sector as well.

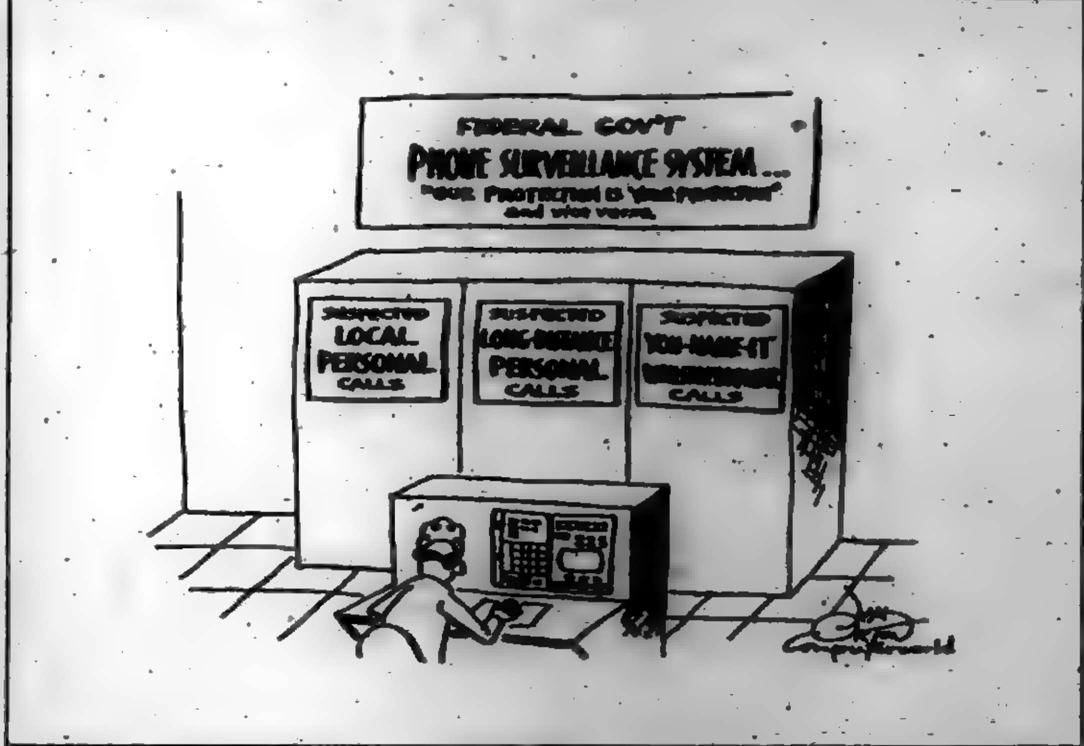
But the conflicting — and at times mutually exclusive — evidence from both sides of the VDT safety issue that filters in makes the proper course of regulatory action uncertain.

Consider the comprehensive survey the Data Entry Management Association conducted last summer of its members who work both with and without VDTs. Survey results showed that VDT workers do indeed experience a wide range of physical problems, including backache, fatigue and eyestrain. The survey also showed that a significant number of non-VDT workers suffered from the same ailments. As Dema asked when analyzing its results, is it the nature of office work and the general work environment that cause the problems, or is it high technology?

If high technology is not the culprit, as the Dema survey suggests, then it would be incumbent upon any wise employer to provide the necessary seating, controlled lighting and work breaks to eliminate general office health problems. A worker functions a lot better without pain.

However, the pro-regulators ask, can employers be trusted to act wisely? We'd have to ask the same of workers. In *Computerworld's* offices, for example, dozens of employees work on terminals eight and more hours a day, but few take regular, permitted breaks from the terminal. Similarly, the federal government has mandated the installation of seatbelts in all cars sold in the U.S., but how many drivers actually wear them? Whether at work or on the road, old habits die hard, if at all.

Meanwhile, the sound and fury over VDT radiation emissions is abating. The VDT safety bill recently introduced in California does not address the issue, unlike an earlier unsuccessful bill. New Mexico's recent legislation does not address the issue either. The radiation issue, however, is far from decided. It awaits a definitive, comprehensive study by the Occupational Health and Safety Administration to sink some statistically sharpened teeth into arguments on both sides of the matter.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Computerworld

LETTER

Jobs, not employees, hard to find

I would like to present a different point of view from the article "Qualified programmers, analysts difficult to find" [CW, Dec. 31/Jan. 7]. It is difficult for an experienced analyst/programmer to find a decent position. Glenn Lukowicz said in the article: "[People do not] want to test or finalize their projects." To this I have to respond, "Wrong: I don't." And I know a number of good programmers who do. However, I do not like to be hamstrung in a company where the only thing that counts is the "political" aspirations of some would-be, half-God manager — a sentiment I share with a lot of good programmers.

John Kozial said in the article: "We don't have IBM equipment — we have [Honeywell, Inc.] — and we don't even expect to find Honeywell experience." I have some IBM Personal Computer and very limited IBM System/34 experience, but I have eight years of programming experience on minicomputer to mainframe systems (the latest three years on Digital Equipment Corp. machines). With a business degree and another eight years in accounting and business management, I do understand business applications. I am not just (barely) able to code, but I am also quite capable of designing and developing business-related applications with excellent standards, including full programmer and user documentation. And I take pride in my work, and so do some others.

Good people in their fields are sitting in boring, dead-end jobs, and some would go anywhere to get out of those jobs. How about a story entitled, "Where are the jobs?"

Name withheld by request

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VIEWPOINT

Careful shoppers find the best personnel

MANAGEMENT MATRIX
Walter F. Cuirle

What kind of a store do you go to when you go shopping? Let's say you have three options: You can go to a shopping mall, to a local Main Street store or to what we'll call a boutique.

Each type of store has its own image. Local stores offer independent ownership, experience, substantial inventory and a personal touch. A mall offers convenience. Individual stores in the mall may change, and many of them may be franchises with controlled or limited inventories. But what the mall's individual stores lack in experience, the mall as a whole makes up for in its breadth of offerings. The boutique is different. Like the stores on Main Street, the specialized inventory and personal touch is an important part of the boutique, but the inventory is small and high priced. There's an appearance of expertise but, like the stores in the mall, the boutique may be relatively new. Image is a large part of what the boutique has to sell. The hard question is this: Is it just image or is this place destined to become an established Main Street store?

Clearly, where you shop depends on what you're buying, and this is true when you're shopping for a new employee through an agency.

Employment agencies fall into the same categories as those stores. There are large, full-service agencies comparable to malls. Agent turnover may be fairly high and the level of expertise among the agents may vary a lot, but, in many cases, the breadth of their offerings compensates for that. You would probably call there for a good deal on, say, a computer operator or junior applications programmer — salaries of up to $20,000 a year or so. Sorting through the stack of resumes you get when you go to the employment mall is a lot like sorting through a stack of jeans at a sale table.

The smaller firms often have enough experience in the industry to offer more specialized service. You know them, your colleagues know them — they've been around awhile and there is every reason to believe they'll stay. When you call, you'll get personal attention from the same person you talked to last month or last year. You don't have to explain the terms you use. The inventory is there, but you are only shown a handful, and those are carefully considered and usually close to the mark the first time. You may shop here for supervisory personnel or key employees like a senior systems analyst or a lead programmer — salaries of $35,000 a year or so. You pay a little more than you do at the mall, but it's clearly worth it in the time you save and the quality you get. It's like shopping at the Main Street clothing store with its knowledgeable owner at your elbow.

> *The smaller firms often have enough experience to offer more specialized service. You know them — they've been around awhile and there is every reason to believe they'll stay.*

Something strange happens when it's time to look for employees with highly specialized skills or those at the upper management level — a manager of data base administration or applications programming, for example, or annual salaries of more than $40,000. People don't really expect to find what they want at the employment mall in this case, but for some reason they will abandon the Main Street shop as well and succumb to the employment boutique's carefully crafted image.

Caution is justified. After all, not only is this level of salary higher than usual, but perks and a whole array of supplementary benefits are often involved as well. Be just as cautious about the agency as you are about the applicant. How long has it been around and who are its other clients? Does it match the applicant to your needs, or does it try to convince you to change your needs to suit the applicant? How big is its "inventory" of applicants, and where do they come from? Are you dealing with a future Main Street shop or with a trendy boutique?

Watch for two things — exclusive-listing retainers and front-loaded nonrefundable fees. High-end employees are hard to find. It takes some time, so it may be reasonable for an agency to want money up front. However, some agencies set this up as a fixed nonrefundable retainer fee, payable whether they succeed or fail, and throw in the stipulation that you list the opening exclusively with that agency for some period. The logic of the exclusivity is generally hard to follow, but it is particularly so if that so-called retainer is completely separate from the finder's fee. The finder's fee itself may be set up as a percentage of salary or of the total package. If that fee is demanded in full, up front within 30 days, and you have no claim to a reasonable refund if your new employee quits on the 30th or doesn't work out by the 31st, then maybe you should look around some more.

A good place to start is your familiar supplier on Main Street. If it can't meet your requirements, it can probably refer you to a reputable shop that can. In the long run, it's good for both your business and theirs. But while you're there, why not take a little extra time to describe your special needs? You never know what there might be in the back.

Cuirle is a senior associate with Nicholas De Maio Associates in Bryn Mawr, Pa.

'Credibility gap' undermines user confidence

HUMAN CONNECTION
Jack Stone

Searing concerns and apprehensions from the public and Congress about U.S. Department of Defense (DOD) budget and procurement policies seem to be making a dent in the DOD's recalcitrance to "clean up its act." The mark is slight, mind you, but a dent nonetheless.

Consider the following developments:

■ The U.S. Navy announced a massive change in its personnel policy, recognizing that in the selection of senior leaders, procurement knowledge and experience (plus a Harvard Business School degree) would weigh heavily in a candidate's favor, as opposed to strictly military operations experience.

■ A White House spokesman said the executive branch would consider negotiating budgetary line items, but only where waste and procurement stretch-outs would lead to savings.

■ A U.S. Air Force representative said the continued negative press on spare parts overcharges and procurement fiascos was "undermining public confidence" in the military.

> *The DOD is known to possess truly unlimited funding for DP power and all the management and technical brains to go with it. So, in the absence of full knowledge and understanding of what goes on there, one has to conclude that DOD leaders either don't know or don't care about how the procurement process works.*

Citizens vitally interested in the defense posture of the nation are wondering just what in the world is going on at the DOD. Of course, the bad press is weakening the nation's confidence — and justifiably so when the DOD's blatant, if not ludicrous, foul-ups in the procurement of spare parts are considered.

Information center managers should take a hard look to make sure their centers are not in situations akin to the DOD's.

Many outside observers believe the events reported by the press are symptomatic of gross mismanagement. After all, the DOD is known to possess truly unlimited funding for data processing power and all the management and technical brains to go with it. So, in the absence of full knowledge and understanding of what goes on there, one has to conclude that DOD leaders either don't know or don't care about how the procurement process works.

In the DP center, conditions are ripe for a credibility gap and diminution of user confidence when some or all of the following conditions exist:

■ A continual stream of underground murmurings is picked up in the user areas about how the center "continues to make same mistakes" and "doesn't know or doesn't care" about fixing them.

■ User department heads routinely complain about the excessive corporate resources allocated to the center, at the expense of the rest of the organization, and how it is being "frittered away" without adequate review and control by a corporate oversight committee.

■ Managers regularly voice concerns over the length of time it takes for new applications to come onstream and "how the responsiveness of the center seems to be lessening with time rather than improving."

How can you combat the credibility problem? Obviously not by a wholesale change in center operations — in no way is this feasible. A more practical way is through an expert communications program with the user establishments — a public relations program, if you will — to ensure that center accomplishments are fully appreciated, development projects are on course with respect to corporate objectives and the inevitable systems problems are being attended to with alacrity. $

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personnel development.

The second whole-mirth 'Computer-Aided Life Catalog'

READER'S PLATFORM
Walter Murphy

We at the Computer-Aided-Life (CAL) Catalog take the future seriously. We listen even when the most skeptical prognosticators predict that the future without computers and technology would be like a car without wheels. We also listen to our customers, and they seem to be saying, "Make our lives simpler, our decisions easier." And this is fortunate for us (that is the CAL premise). CAL combines the inevitability of computers and technology in our lives with practical applications. One customer wrote, "Until I read your CAL Catalog, I thought a silicon chip was a high-tech nacho. What a revelation! I ordered the diatonic utensils (from last year's catalog), lost 10 pounds and told my friends, 'Better living through technology, chubby!' "

This year's CAL concentrates on personal enrichment products. We try to use the technology to make life easier, whether it's dressing, cooking, complaining, making decisions or sorting through the plethora of information we are assaulted with every day. You've let CAL into your homes and offices — now we want it to be a part of your lives.

For those of you have trouble deciding what to wear and when and how to wear it, the CAL system's Jeeves is for you. Jeeves is simply an integrated optical, voice and data base system that functions as your own personal dresser. Optical scanners size you up and down and will verify Color Coordination, Seasonal Selection, Fashion Trend Analysis and Natty/Chic Quotient. You can make your own fashion statements without creating a public outcry.

A dressing advisor

The Jeeves data base also tracks your dressing habits so that you are as unpredictable as hemlines in Paris. Be madcap and a fop, but have good fashion sense! Jeeves prompts you for clothes selection or analyzes your selection with an optical scanner for the occasion and the proper alignment of pleats, knots and cuffs. Sensible prompts like "Green and red only look good on Christmas trees" or "Didn't you wear that just last Tuesday?" or "That looks like an explosion in a polyester factory" or "Would you mind dimming that tie, please?" virtually eliminate sartorial blunders. With Jeeves, you'll never make the fashion statement, "Sure I got dressed in the dark. With these clothes, wouldn't you?"

If your life is so busy that you can't even remember what you had for supper last evening, Cooktek is for you. A nutritionally balanced system that gives new meaning to menu selection, Cooktek frees you from the bother of deciding what you want to eat and then cooking it. It's like an in-house diner without the ugly place mats.

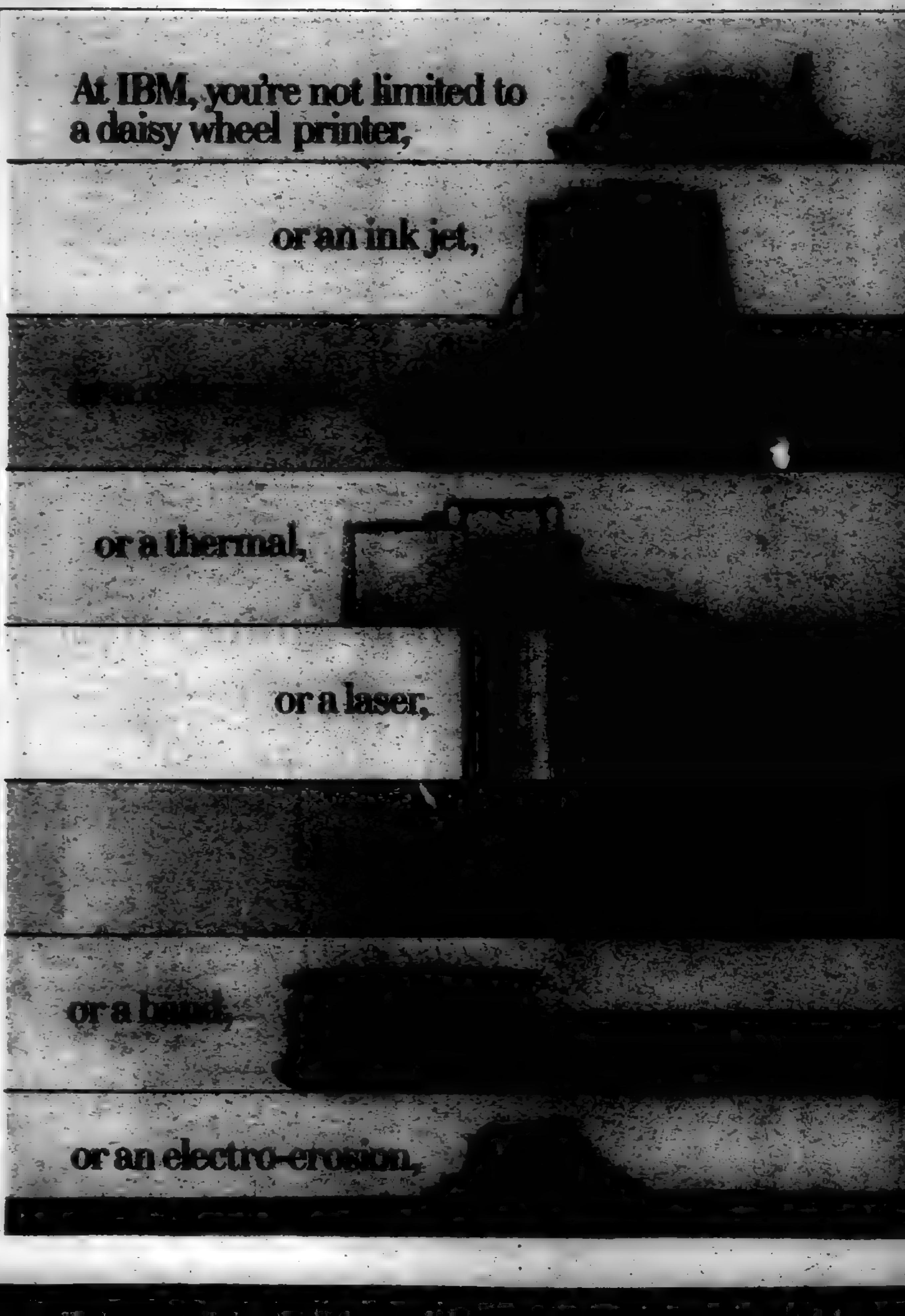
You are presented with the Menu du Jour, from which you select your meal, providing it's fresh and good for you. Cooktek integrates motherly good sense with technology for those living alone.

The Cooktek Food Delivery System (FDS) interfaces with virtually any microwave oven. This model prepares your selection and offers useful advice while you are eating: "Don't eat so fast" or "Is that spoon too small or would you rather have a shovel?" or "Chew your food — don't inhale it!"

Cooktek is available in three dietary versions: Mainframe (meat-n-potatoes), Miniveggie (no red meat) and

See CAL, page 49

Murphy is a technical writing consultant in Demarest, N.J. His first whole-mirth computer-aided life catalog appeared last year in Computerworld *[CW, March 12, 1984].*



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VIEWPOINT

LETTERS

Concept not a threat

Richard Stallman, vocal advocate of free software and subject of the letter "Free software philosophy refuted" [CW, March 4], is certainly not a "threat" to any legitimate software developer. His promotion of the concept of free software carries no unlawful purpose. Stallman has freely distributed the fruits of his labor to a wide community of users and has tried to encourage a "communal" sharing of enhancements to his software. He is not a thief.

Certainly not a "parasite" at MIT's Artificial Intelligence Laboratory, Stallman has independently produced a free text editor that has inspired many clones and imitations — most of which are commercial (not for free) and vastly inferior to Stallman's original. Stallman gives away source code, too.

Those who have extensively used Stallman's text editor can appreciate the value of this free software. The editor is by far the best I have ever used and is infinitely better than any of the reasonably affordable commercial competition.

The group in which I work has benefited enormously from the using the text editor and has also made excellent use of Columbia University's Kermit programs. Free software can probably only be produced through some type of subsidy and will never be as plentiful as commercially motivated software. But instead of feeling threatened by it, users should rejoice when offered free software. Some of the best things in life are indeed free.

Ted [illegible]
New York

or a dot [illegible]

or a color dot [illegible]

CAL from page 40

Microbiotic (no meat or aggressive vegetables).

It seems that the person you want to complain to always has an answering machine. If you become furious at the mechanic who installed truck tires on your subcompact, and your mind is momentarily blted when his answering machine requests that you leave a message, then Canned Heat is for you.

Package for tirades

A compact recorder that is easily installed on your phone, Canned Heat is a series of prerecorded tirades for all occasions. When asked to leave a message, you can simply enter a three-character code and listen as your anger and frustration is transmitted through the receiver. Each message can be personalized with your name: "This is Mr. Murphy, and I want to speak to the cretin who validates Darwin's Theory!" Or you can record your own messages for later use.

Canned Heat also allows you to leave increasingly hostile messages to those who think they have better things to do than return your calls: (mild) "Gimme a call when you get a chance; (annoyed) "There's a problem with your bill"; (livid) "I realize you're busy fleecing other unsuspecting citizens, but get back to me before I call my lawyer"; (out of control) "!&%$#, in spades, buddy! I have your wife and kids!"

Advice is one thing a true whiner is never without, but knowledge should also be readily available. With the Smartalex remote communications system, you can remove from your vocabulary the word "Duh!" and the phrase "Gee, I didn't know that!"

Smartalex allows you to analyze other people's conversations, access any popular data base and have facts and opinions transmitted to you almost instantaneously. Smartalex is part modem, speech synthesizer, remote display, tutor and all-around know-it-all.

Whether you want to flaunt your knowledge shamelessly or be better informed, Smartalex gives you a wealth of information for the mere price of data base connect charges. Be able to correct colleagues with statements like "That's right, rebel insurgents in Central America did plot to kidnap Julio Iglesias" or "Where do you get off, buddy! I'll have the exact figures in a minute."

If you order now, all of this year's products receive the CAL lifetime guarantee. However, it is a lifetime as measured by Soviet-presidential tenure.

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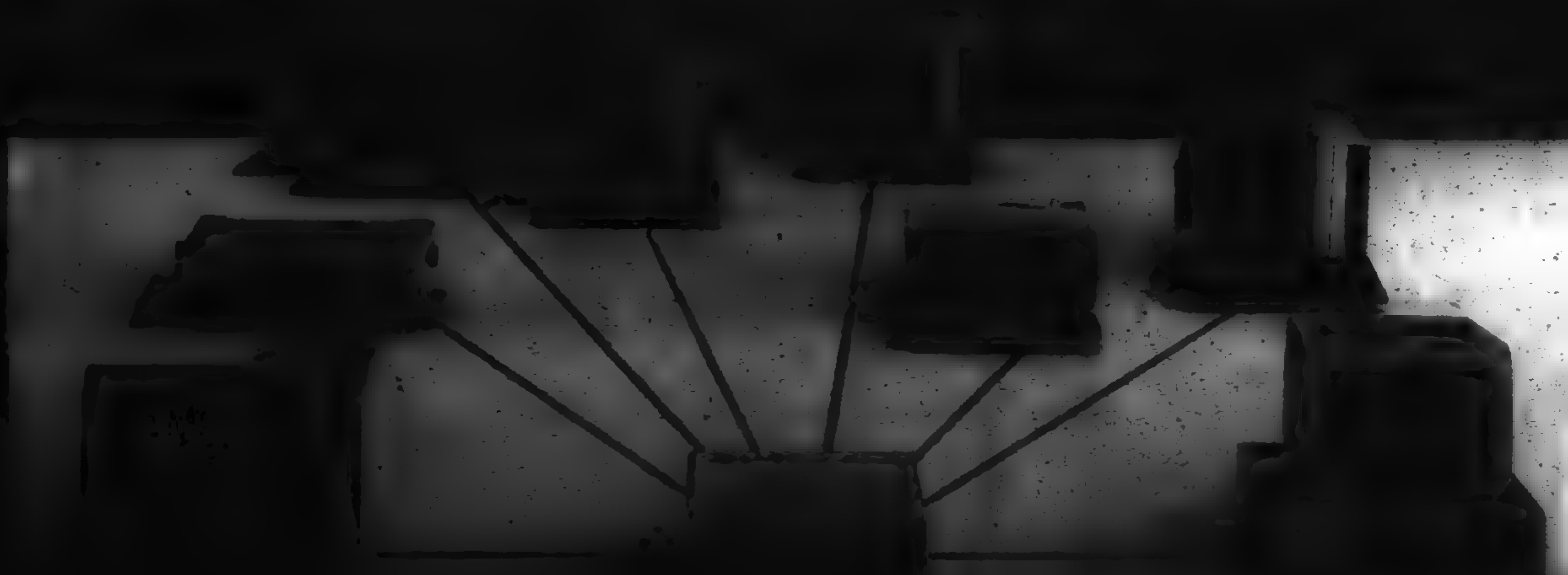

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Systems.

SOFTWARE & SERVICES

Small tasks reap AI gains more quickly, report finds

By [illegible]
CW Staff

Companies considering a foray into artificial intelligence may reap immediate benefits by applying expert systems technology to smaller tasks, such as configuring computer systems and planning the repair of telephone cables.

That was one of the findings of a recent report on expert systems technology from London-based Ovum Ltd. The report, titled "The Commercial Applications of Expert Systems Technology," stated that the AI applications showing the first real return on investment tend to be those that are "less glamorous." Ovum defined expert systems as applications that extract inferences from a knowledge base.

While financial services, oil exploration and military applications are good candidates for expert systems development, "modest or small expert systems are likely to produce quicker real benefits," the report said. These smaller systems, it explained, are often used to support equipment design and maintenance and fault diagnosis. They embody the expertise of technical personnel rather than highly trained experts, the report added.

Areas in which AI is attracting a lot of research attention, including medicine and teaching, may not be the areas that produce appropriate commercial applications, according to the Ovum report. "In these areas an expert system will be replacing an established human expert directly, and the financial benefits will not be very great."

Two major decisions facing companies considering the use of an expert system are the scope of the application and whether or not the expert system will be developed in-house. According to the report, "[the] benefits of the in-house, small system approach are often overlooked . . . It can bring early benefits at low cost and

See EXPERT page 68

SOFTALK/JOHN GALLANT

Vendor synergy reaps deals

Sometimes it is hard to believe that the computer industry has yet to mark its 50th anniversary. Surely in the scant four or five decades that have passed since modern information processing technology was born there has been more written about the computer era than any other period of mankind's existence, including the dark centuries before recorded history.

The software industry is an even more recent phenomenon. Only a handful of independent software vendors can trace their roots back more than a decade — fewer still can outline a genealogy of more than a decade and a half. Despite the sheer volume of software companies that exists and disregarding the impression of size their massive advertising efforts foster, the biggest of the big software vendors today is dwarfed in revenue by some of its more established hardware brethren.

That is an important fact to remember, especially in light of the increasingly embraced view that software is beginning to drive the whole computer industry. Some pundits have even gone so far as to augur that not so very far into the future, hardware, like razor handles, will be given away free to sell software, the equivalent of razor blades.

Outlook ignores problems, strengths

Such an outlook neglects some important difficulties that software vendors face and it ignores some vital strengths that hardware companies maintain to this day. Despite the relative immaturity of the computer industry, hardware companies exhibit more legitimacy than the

See VENDORS page 68

SOFTLINE
T. Capers Jones

Maintenance push is on

After more than 30 years of software production, the factors that impact programmer productivity are gradually becoming clear. There is one major topic, however, that remains largely unknown and is significantly underreported — improving productivity through software maintenance and enhancement.

This is unfortunate since, as the industry matures, more effort will be devoted to maintenance and enhancement. It is time that the productivity factors for this work are clearly understood.

Most of the algorithms and rules of thumb for evaluating software productivity were developed for new programs and tend to be inaccurate for maintenance and enhancement purposes. Even the basic law of software development — that small projects are more productive than larger ones — turns out to be incorrect for maintenance and enhancements.

The overhead costs of exploring the system or program to be modified are so high that small maintenance and enhancement revisions of only a few lines of code are less productive than larger ones. Surprisingly, maintenance and enhancement productivity tends to peak

See CODE page 52

Jones is a consultant for Nolan, Norton & Co. in Lexington, Mass., and the author of two books and numerous articles and reports on software quality and production. He is a regular contributor to Softline.

■ Vmark Computer unwrapped the Universe DBMS for porting software developed under Pick Systems' Pick operating system to Pyramid Technology hardware/63

■ Digital Communications Associates announced communications software that allows transfer of binary files between micros with its Irma board and IBM mainframes running VM/CMS/59

INSIDE

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CODE

from page 51

when the size of the revision is about 1.5% to 3% of the size of the program being modified.

For example, when updating a 10,000-statement Cobol program, productivity will often be higher when adding 300 new lines of code than when adding only 10 or 15, when productivity rates are expressed as function points or lines of code per unit of time. Very large program updates, such as adding more than 10,000 lines of code to a 100,000-line program, actually begin to slide back down the productivity curve.

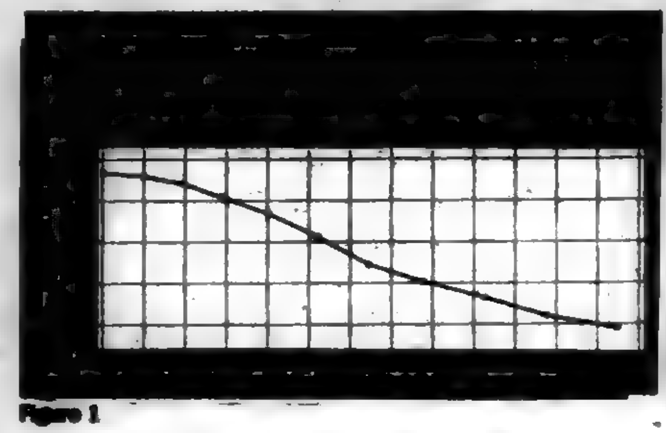


Figure 1

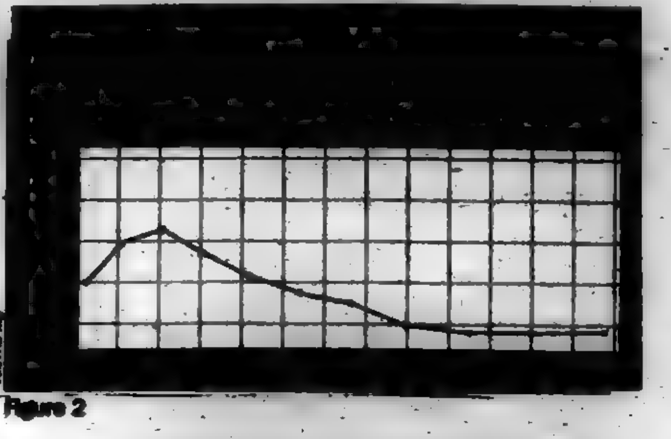


Figure 2

Figure 1 illustrates typical Cobol productivity rates for new program development, while Figure 2 indicates typical Cobol productivity rates for maintenance and enhancement projects.

While many of the factors that affect maintenance and enhancement productivity, such as staff experience, tools and the like, are identical to those that affect new programs, there is one unique factor of great significance: the structure and status of the program or system being modified. As an experiment, 26 maintenance and enhancement programmers were interviewed to determine what impact they thought structured coding had on maintenance. Although their responses were subjective, they were quite revealing.

The programmers felt that if the source code was well-structured and cleanly segmented, they could make any given change in about one-quarter the time it would take to update a poorly structured program. The programmers also said carefully structured code lowered the probability of adding new bugs during modification by as much as 50%.

Ensuring software quality during maintenance and enhancement is important. For new Cobol programs, the total quantity of bugs typically averages about 30 per 1,000 source code statements. However, adding new code to an existing software program is a much more hazardous undertaking. Some experts report that the error density in changed and updated code can run to up to three times that of new code, leading to as many as 90 bugs per 1,000 source code statements. This is one of the reasons why attempts to modify purchased software packages so often come to grief.

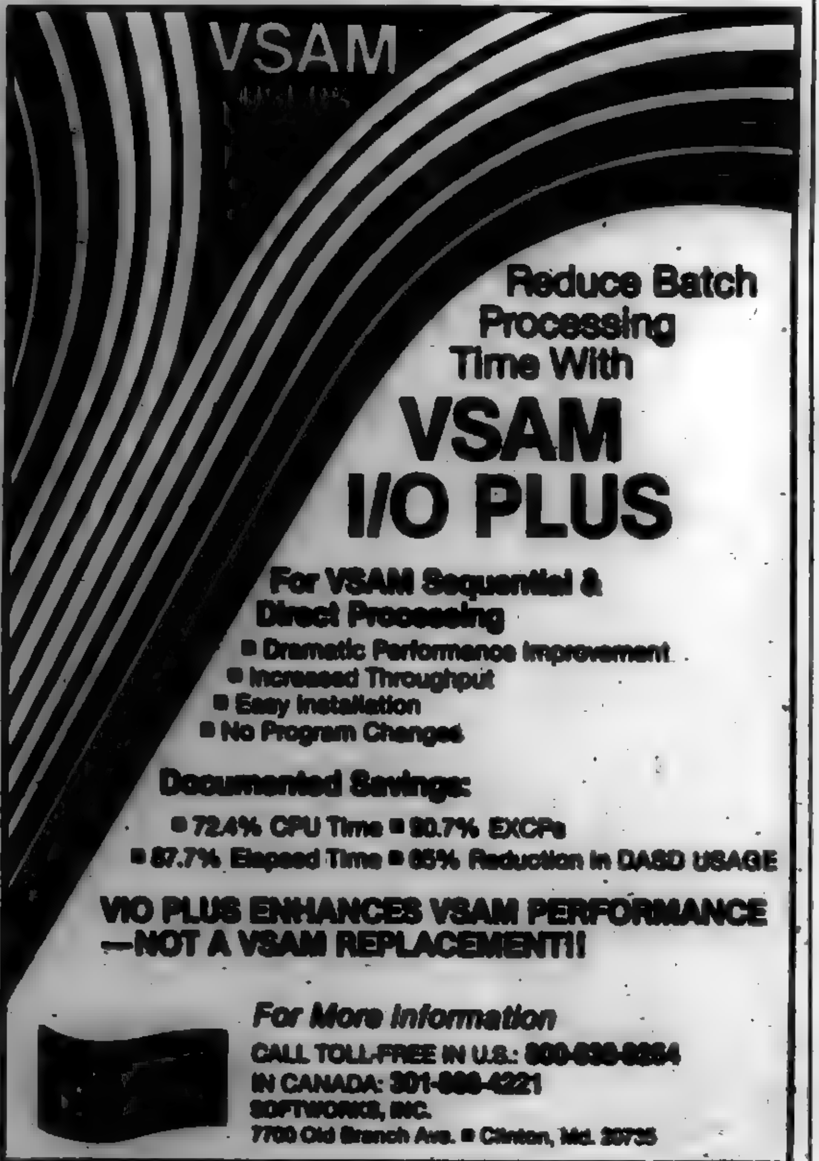
The current findings on maintenance and enhancement productivity can be summarized as follows. Even revising a well-structured program can incur additional costs that can lower design, coding and testing productivity levels below new program norms.

Productivity might run 10% to 25% below rates for generating the same amount of new code, with the important distinction that productivity will usually peak when the size of the update is 1.5% to 3% of the size of the program being modified.

Revising a poorly structured program may yield a productivity increase 25% to 75% below the rate for the same amount of new code and a bug rate up to three times that of new code.

As a final point, the programmers were asked to discuss how much code should be changed in an existing program before the whole system should be redesigned. For carefully structured programs, new code totaling 50% to 60% of the original system could be absorbed fairly safely, they said. For poorly structured programs, scrapping the original program at the earliest opportunity was the subjective conclusion, with a rough estimate that after adding 10% to 15% new code, the maintainability quotient would approach disaster levels.

For many years, the importance of maintenance has been significantly underestimated. The work of a few dedicated specialists such as Girish Parikh, Nicholas Zvegintzov and Eric Bush has begun to change the perception of maintenance. It is gradually being recognized as a major technical discipline with its own unique productivity and quality characteristics.



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Vmark interactive DBMS out

NATICK, Mass. — Vmark Computer, Inc. has announced the Universe interactive data base management system.

This product is said to enable applications software that is developed under Pick Systems' Pick operating system to run under AT&T's Unix on Pyramid Technology Corp. hardware.

A spokesman said Universe is also compatible with applications software developed under Prime Computer, Inc.'s Prime Information data base management system running under the Primos operating system.

Vmark has an agreement with Pyramid to market the Universe system and other office automation software and application generator tools with Pyramid's 90 series superminicomputers.

Universe is not available separately.

A spokesman said the Pyramid version of Unix incorporates features of AT&T's Unix System V and University of California at Berkeley 4.2 versions.

Vmark will offer eight Pyramid systems providing support from 32 to 128 users.

Prices for the Pyramid systems range from $150,000 for the 90X model to $350,000 for the 90MX dual-processor model.

Vmark is located at 5A Strathmore Road, Natick, Mass. 01760.

Micro communications software boasts support of IBM machines

WALTHAM, Mass. — Support for the IBM Personal Computer AT has been added to Management Decision Systems, Inc.'s (MDS) microcomputer-to-host communications software.

Express-Mate/Link Version 1.1 links the IBM Personal Computer, Personal Computer XT and AT and compatibles with MDS' mainframe Express decision support system (DSS) under Prime Computer, Inc.'s Primos and IBM's VM/CMS operating systems.

Version 1.1 includes built-in communications and file translation facilities, a spokesman said. Express-Mate/Link allows data to be uploaded to Express and stored for later retrieval by the micro application. For downloading of data, users can transfer selected portions of mainframe DSS applications to the micro.

Express-Mate/Link includes a menu-driven interface, scrolling capabilities, command recall and automatic login. The product requires an asynchronous port and Hayes Microcomputer Products, Inc. Smartmodem or compatible.

Express-Mate/Link Version 1.1 is priced at $295.

MDS is located at 200 Fifth Ave., Waltham, Mass. 02254.

OBS Software unwraps tool for MVS, VM

SAN FRANCISCO — OBS Software, Inc. has announced Excellink, a micro-mainframe file transfer and communications software package for IBM's MVS and VM operating systems.

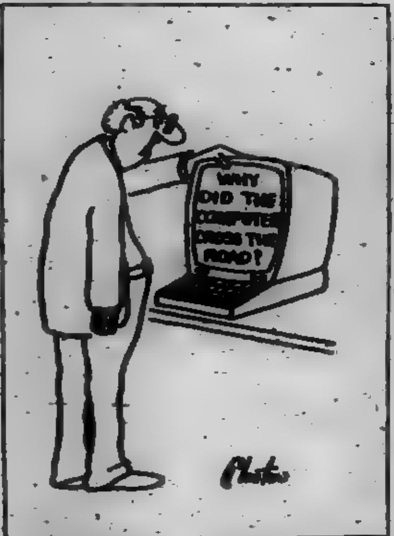
A spokesman said Excellink's IBM 3101 terminal emulator and protocol converter provide IBM 3270 emulation capabilities. The product reportedly allows file transfers between the micro and the mainframe over dial-up lines or coaxial connections.

Excellink supports coaxial connections through a Digital Communications Associates, Inc. Irma board or dial-up connections for line-by-line emulation of dumb terminals.

Excellink is said to transfer files through IBM's TSO and CMS at speeds up to 9.6K bit/sec. After logging on, users may return to the micro operating system without dropping the host session and network connection, according to the vendor.

The microcomputer portion of Excellink, including the IBM 3101 terminal emulator, is priced at $150. The mainframe portion is priced at $5,500.

OBS Software is located at 115 Sansome St., San Francisco, Calif. 94104.



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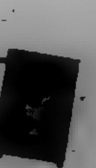

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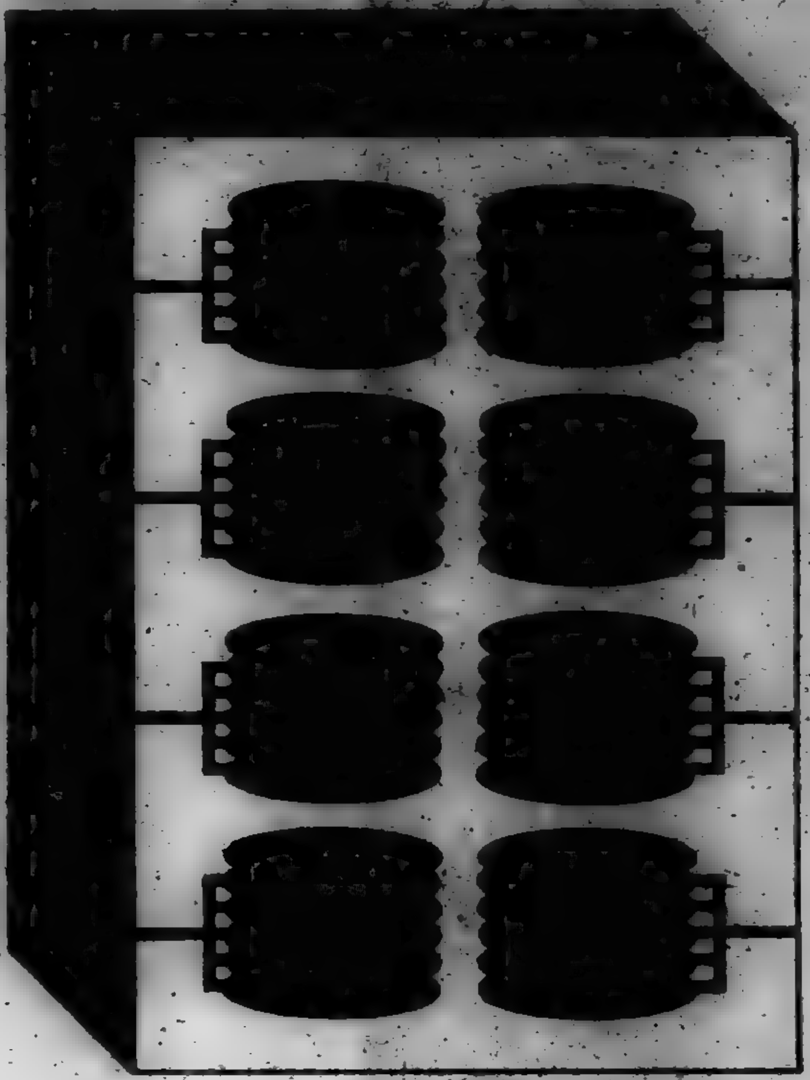

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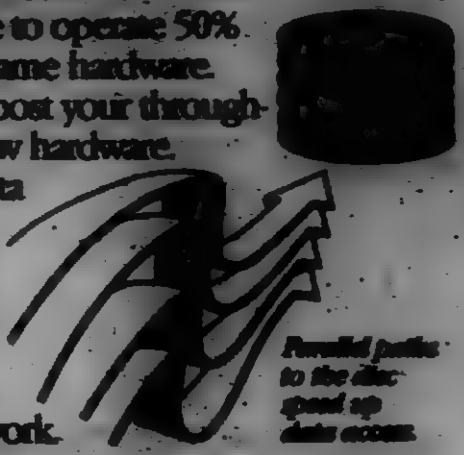

Parallel paths to the disc speed up data access.

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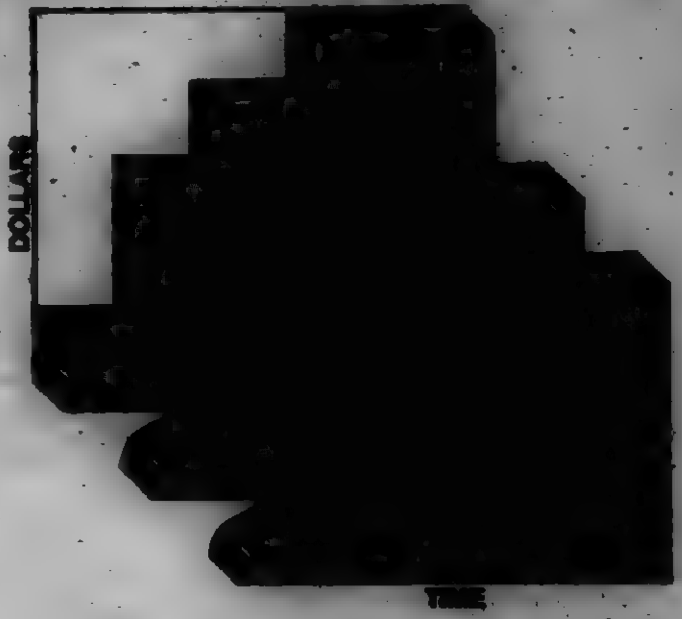
When you outgrow a Tandem system, you don't replace it. You just add to it. You can start with two processors in a local system and expand at any increment you choose, all the way to 4,080 processors worldwide. You never buy more than you need.



Tandem matches need. The competition overspends it.

With Tandem, your software expands, too. So you only write applications once. It's also a fault-tolerant system that stays on line without using idle backup components. Instead, each component has at least one identical copy with which it shares the workload. No single failure can shut you down.

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Tandem systems are already at work for Fortune 500 companies in banking, telecommunications, manufacturing, transportation, retailing and energy, as well as several branches of the U.S. Government.

To find out what we can do for you, call (800) 482-6336. Or write for our annual report. Corporate Headquarters: 19191 Vallco Parkway, Dept. 762, Cupertino, California 95014.

TANDEMCOMPUTERS

Canaan Computer offers links for IBM units

TRUMBULL, Conn. — Canaan Computer Corp. has introduced two communications software products that link IBM Personal Computers to Canaan's DCS 5400 departmental computers, and IBM Personal Computers to mainframes running VM/CMS via the Canaan DCS 5400.

Multigate-VM is a gateway between the IBM Personal Computer and the IBM mainframe running VM, a spokesman said. It permits the exchange of IBM's PC-DOS and VM/CMS files between two Canaan DCS 5400 minicomputers or from the DCS 5400 to an IBM mainframe running VM. The program works with IBM's Remote Spooling Communications Subsystem facility and is free to Canaan DCS 5400 users. Multigate-PC consists of the PC Server and Canaan Server programs. PC Server redefines the use of the keyboard and function keys when the Personal Computer is connected to the Canaan DCS 5400. The PC Server includes capabilities for moving between a PC-DOS application and multiple VM/CMS sessions.

Canaan Server provides PC-DOS file transfer facilities to and from a Personal Computer. PC-DOS files stored on a DCS 5400 are treated as CMS files. The product also allows users to share files with other DCS 5400 users, according to the vendor. Multigate-PC is priced at $1,195.

Canaan Computer is located at 39 Lindeman Drive, Trumbull, Conn. 06611.

Many successful companies
are putting BABIES to work.

DCA adds binary link for Irma

NORCROSS, Ga. — Digital Communications Associates, Inc. has introduced communications software that facilitates the transfer of text and binary files between IBM mainframes and microcomputers equipped with the company's Irma board in an IBM 3270 communications network.

Irmalink FT/CMS supports mainframes under VM/CMS and the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatibles running Microsoft Corp.'s MS-DOS 2.0 or IBM's PC-DOS 2.0 or higher.

The product can handle both text and binary files and can support sequential and partitioned data sets with fixed and variable record formats, a spokesman said. Users can create and store custom transfer definitions and can modify parameters, including the prefix of a qualified data set name on the host or the code table used to define character sets.

Micro users can initiate file transfers by entering the source file name and destination file name. Irmalink FT/CMS assigns the transfer definition, including the characteristics of the transfer based on the file name entered.

Irmalink FT/CMS is priced at $175.

Digital Communications Associates is located at 303 Technology Park, Norcross, Ga. 30092.

SYSTEMS SOFTWARE

■ Triangle Software Co. has announced Release 5.0 of its JCLcheck systems utility for IBM mainframes under IBM's MVS, OS/VS, MVS/XA and VM/CMS operating systems.

JCLcheck detects and diagnoses IBM JCL errors before a program is submitted for test or production runs, a spokesman said. Release 5.0 enhancements include an on-line interface to IBM's ISPF; and support for IBM's Print Services Facility JCL control statements and Uccel, Inc.'s UCC7 scheduling software.

JCLcheck is priced at $17,825.

Triangle Software, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif.

■ Pansophic Systems, Inc. has announced an enhanced version of its EZ/Key language-directed prompter/editor. EZ/Key Version 2.2 runs under IBM's DOS and OS operating systems and is designed to aid in the en-

SOFTWARE & SERVICES

the development of Pansophic's Easytrieve Plus programs.

Version 2.2 enhancements include the addition of a utility password for IBM CICS users and support of the CICS Dynamic Transaction Backout facility. Version 2.2 is also said to feature as much as a 50% reduction in core requirements and improved response time.

EZ/Key Version 2.2 is priced at $9,000 for OS environments and $15,000 for DOS.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

■ Hewlett-Packard Co. has announced terminal emulation software that allows its HP 9000 Series 200 supermicrocomputers to act as interactive, asynchronous, alphanumeric terminals to mainframes and minicomputers manufactured by Digital Equipment Corp., Data General Corp., Control Data Corp. and Prime Computer, Inc., among others.

According to a spokesman, the HP 2392A and DEC VT100 terminal emulator, the HP 98791B, replace HP's asynchronous terminal emulator, the HP 2622A terminal emulator and the VT100 and HP 2622A terminal emulator.

The HP 98791B emulator reportedly is intended to ease host processor workloads by off-loading tasks to the Series 200 workstation. The HP 2392A and VT100 terminal emulator software provide access to host peripherals, files and time-sharing systems; transfers Ascii format files between the host and the Series 200; and allows a user to run programs designed for HP 2392A and VT100 terminals.

HP 98791B terminal emulation software is priced at $500.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

■ GT Software, Inc. has introduced a Help screen and menu processor facility for applications running under IBM's DOS/VSE, OS/VS1 and MVS/XA operating systems with IBM's CICS.

According to a spokesman, Assist/GT consists of three components: Tutor/GT; Menu/GT; and DOCM/GT. Tutor/GT can be used to add Help screens and tutorials to existing CICS-based applications without changes to source code. Menu/GT allows the user to add menus as front ends to existing applications, and DOCM/GT can be used to produce hard-copy documentation and system overviews.

Licenses for Assist/GT range from $2,500 to $6,500.

GT Software, 4411 E. Jones Bridge Road, Norcross, Ga. 30092.

■ Consumer Systems Corp. has announced enhancements to its JCL Flow Documentation Package for IBM's OS and DOS operating systems. JCL Flow is an applications documentation system providing graphics system flow charts, cross-reference reports and information management capabilities.

Enhancements in JCL Flow/OS Release 2.3 include an IBM IMS interface, a Xerox Corp. 9700 laser printer character set and commands to aid in retrieval, reformatting and control of input.

A permanent license for Release 2.3 of JCL Flow/OS costs $8,250; the DOS version costs $7,500.

Consumer Systems, 1100 31st St., Downers Grove, Ill. 60515.

■ Oregon Software, Inc. has released its Pascal-2 compiler for Digital Equipment Corp.'s Ultrix-32 version of AT&T's Unix operating system.

Pascal-2 conforms to the International Standards Organization's (ISO) Pascal standard (ISO 7185) and supports features including packed data structures and set types of up to 256 elements. The compiler allows calls to compiled routines written in Pascal, C or Fortran. Ultrix-32 is a version of the University of California at Berkeley's 4.2 BSD Unix that supports virtual memory and demand paging.

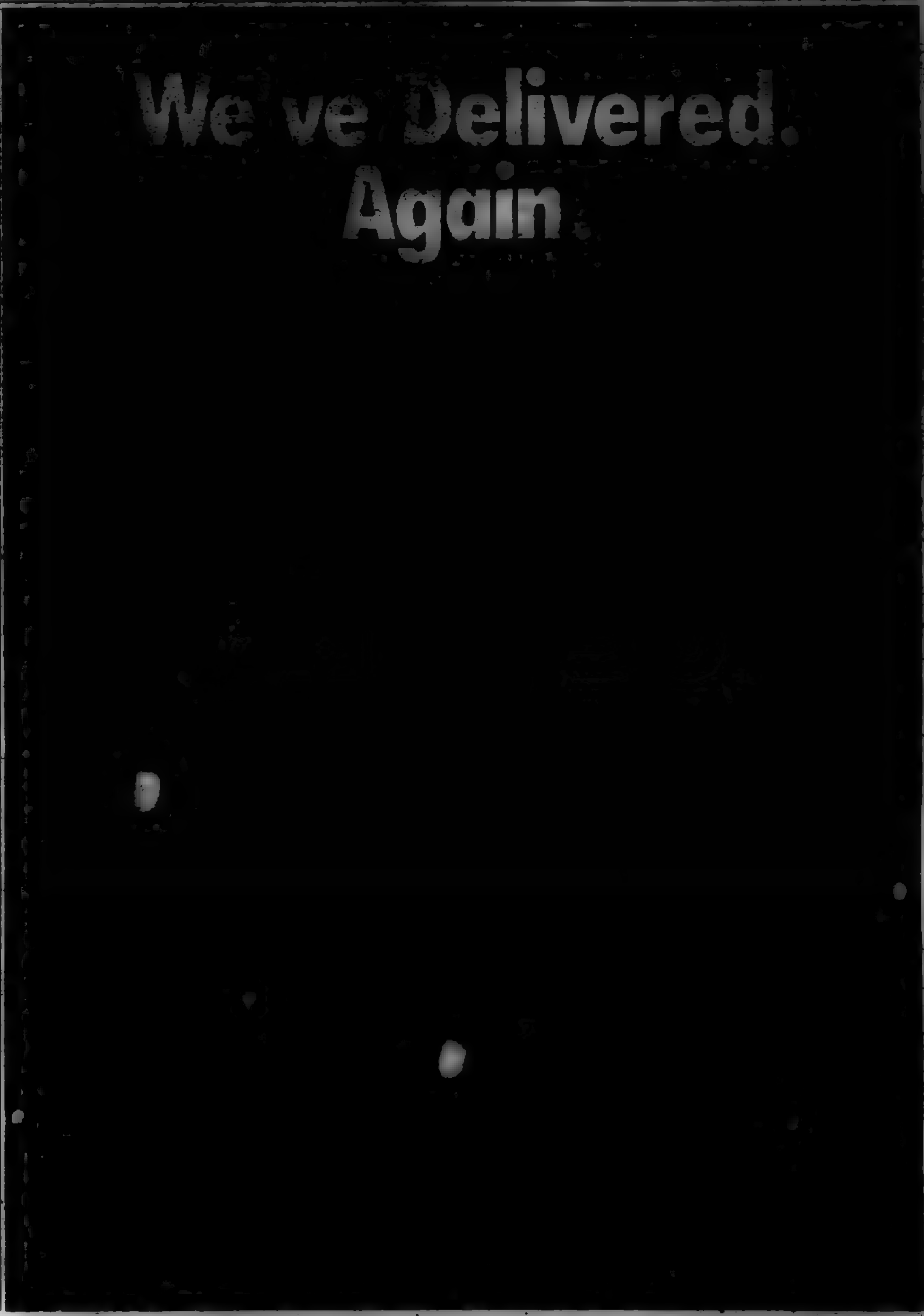
Pascal-2 for VAX/Ultrix machines costs $4,500.

Oregon Software, 6915 S.W. Macadam Ave., Portland, Ore. 97219.

■ California Software, Inc. has announced Rescue/MVS, an on-line hardware reliability system that captures, analyzes and displays IBM system failure data.

A spokesman said Rescue/

Continued on page 60.



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**Computerworld, August 20, 1984*

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SOFTWARE & SERVICES

Continued from page 57

MVS immediately notifies operations personnel of a system failure, allowing them to take remedial action to limit the impact of the failure. One or more consoles can be used as monitors that display temporary and permanent system failures in real time across a network. The product pinpoints the sources of failure, analyzes problems, correlates groups of problems and identifies whether the unit or media is the cause of failure.

Operators can query the system by paging through the status of problems or specific units where problems are occurring. That history can be saved and printed out for confirmation of system status or further analysis. Rescue/MVS delivers data on all IBM mainframes, channels, control units, disks, drums, tape drives, mass storage units; unit record equipment and teleprocessing networks. It operates under IBM's MVS, VM and DOS operating systems.

Rescue/MVS begins at $15,000.

California Software, 2232 Nebraska Ave., Santa Monica, Calif. 90404.

■ VM Software, Inc. has announced a sort/merge utility for IBM mainframes under VM/CMS.

A spokesman said Vmsort rearranges data in a user-defined sequence. Users can sort records of either fixed or variable length. The Vmsort utility can be invoked as a terminal command or from a PL/I, Cobol or assembler user program. I/O data may reside on any device supported by CMS. The control statements used to invoke Vmsort are compatible with OS and DOS.

The permanent license fee for Vmsort is $5,000.

VM Software, Suite 355, 8070 Chain Bridge Road, Vienna, Va. 22180.

■ Computer Systems Development, Inc. (CSD) has announced the SMC Basic interpreter for Digital Equipment Corp. VAX processors under VMS version 3.7 or later.

The product was developed jointly by CSD and Science Management Corp. The SMC Basic interpretive language allows for use of files under DEC's Record Management System. RMS files may be defined within a program, and a program may have up to 29 files open at once.

Other features of SMC Basic are systems directives for on-line execution of Digital Command Language procedures or programs written in other languages, explicit and implicit precision control, elimination of rounding errors in business math and automatic conversion of numeric data types.

Prices for SMC Basic range from $2,795 on a Microvax I to $7,795 on the VAX 8600.

CSD, Suite 160, 300 Ellinwood Way, Pleasant Hill, Calif. 94523.

■ Chicago-Soft, Ltd. has introduced a network performance monitor for IBM's MVS/SP Version 1.3, MVS/XA and Vtam Versions 1.3, 2.1 and 2.2.

Netspy reportedly provides response time and traffic statistics per terminal and application. It also provides three levels of response time for the host and the network. The product displays response times and traffic statistics from an IBM Network Communications Control Facility 3270 screen or IBM's TSO command processor and provides System Maintenance Facility records for batch reporting.

Netspy is licensed for $6,250 for the first CPU.

Chicago-Soft, Suite 2, 738 S. LaSalle St., Chicago, Ill. 60610.

■ Southern Systems, Inc. has announced the MPMF forms generation package for use with its Mercurion I nonimpact printer on IBM mainframes under OS/VS1, OS/VS2, VM, DOS/VS and DOS/VSE.

A spokesman said the forms generation software defines font selection for form text and data insertions, boxes, lines, shading and language and text on forms. Input records are presented in 80-col. format.

Features of MPMF include reverse video and blank support for text and the ability to compress characters in a space. MPMF is priced at $5,000.

Southern Systems, 100 Belcher Road, Clearwater, Fla. 33515.

■ Amalgamated Software of North America, Inc. has announced Release II of its IBM RPG-III compiler for the IBM System/34 and System/36 minicomputers.

A spokesman said Release II makes the structured programming facilities of RPG-III available to IBM RPG-II users on the System/34 and System/36. Programming commands supported by Release II include DO, DO-WHILE, DO-UNTIL, IF/THEN/ELSE, COMPARE-AND-BRANCH and CASE. The RPG-III compiler supports disk file operations such as READ PREVIOUS, OPEN and CLOSE and UPDAT.

The Release II compiler costs $600.

Amalgamated Software of North America, P.O. Box 6610, Malibu, Calif. 90265.

■ Information Processing Techniques Corp. has introduced a C language applications development tool for programmers developing software for Motorola, Inc. 68000 microprocessor-based machines.

A spokesman said C86 runs on Data General Corp. computers under Rdos, AOS, AOS/VS and Information Processing's AT&T Unix-based Eclix operating systems. It is also available for Digital Equipment Corp. computers running DEC's VMS or Ultrix. The product includes a cross-compiler

Continued on page 60

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SOFTWARE & SERVICES

Continued from page 59

that generates 68000 code from C source code and a cross-assembler that produces relocatable binary files that can be linked through C68's linking loader. C68 also includes a librarian facility for the linking loader. C68 is priced at $7,000.

Information Processing Techniques, 1096 E. Meadow Circle, Palo Alto, Calif. 94304.

■ **Software Development Systems, Inc. has announced Version 3.0 of its Uniware Software Development System for AT&T Unix operating systems.**

A spokesman said the enhanced version includes an absolute-listing generator that produces listings for absolute addresses and linked object code. Other enhancements include a link editor, an object module librarian, a symbol name lister and an address map utility. The package supports multiple overlays, arbitrary length symbol names and unlimited symbol capacity.

Uniware 3.0 is priced at $2,000 for Motorola, Inc. 68000 microprocessor- and Unix-based machines.

Software Development Systems, 3110 Woodcreek Drive, Downers Grove, Ill. 60515.

■ **Executive Support Products, Inc. has announced the Extended Printer Queueing (XPQ) facility for use on Honeywell, Inc. processors under Honeywell's Gcos 8 and Gcos 3 operating systems. The product extends the capabilities of the company's Remote Printer Queueing (RPQ) product.**

XPQ reportedly enables users to direct printing jobs to an available printer. XPQ can support a maximum of 600 remote printers as opposed to the nine printers RPQ supports. XPQ will queue print requests until the printer is available. XPQ also provides a batch-interfacing capability to allow reports produced in batch to be directly routed to printers assigned to the XPQ system.

A permanent license for XPQ costs $8,900 per CPU.

Executive Support Products, Suite 211, 3901 MacArthur Blvd., Newport Beach, Calif. 92660.

■ **Systar Corp. has announced File/34-38, a package that reportedly facilitates file transfers between IBM Personal Computers and IBM System/34, 36 and 38 minicomputers through public data and packet-switching networks.**

File/34-38 is designed to run with Systar's Gateway 34/38 front-end communications package and communicate through Systar's PC Elf IBM 3101 terminal emulation program. It reportedly interactively stores or retrieves files from the minis and contains an error-checking protocol for data transmission to the micro.

The product is priced at $750 as an enhancement to Systar's Gateway 34/38 and PC Elf programs.

Systar, 1762 Technology Drive, San Jose, Calif. 95110.

■ **Virtual Microsystems, Inc. has announced Version 3.0 of its Bridge/86 software that allows users of Digital Equipment Corp. VAX minicomputers to run Microsoft Corp.'s MS-DOS.**

Version 3.0 reportedly provides support for the Decnet network, disk caching, mounting and unmounting of floppy disks of up to 8M bytes during processing and on-line Help screens. Decnet support allows the MS-DOS user to access a remote VAX, according to a spokesman.

Version 3.0 of the Bridge/86 is priced at $7,500.

Virtual Microsystems, Suite 300, 2150 Shattuck Ave., Berkeley, Calif. 94704.

■ **Value Software, Inc. has announced Release 2.0 of Vadispatch, its report distribution package for IBM's MVS operating system.**

The product now supports Xerox Corp.'s 9700 printers, according to a Value Software spokesman. Other enhancements include processing options for reports, capabilities for producing shipping labels and expanded IBM System Management Facility records.

Vadispatch is priced at $32,000.

Value Software, 498 North Kings Highway, Cherry Hill, N.J. 08034.

■ **Unidot, Inc. has announced a family of software tools to run on AT&T's Unix systems, including cross-compilers, macro assemblers and other development tools.**

A spokesman said the products are targeted to microprocessors from Intel Corp., Zilog, Inc. and National Semiconductor Corp. The macro assemblers produce the appropriate assembler code for the target microprocessor. The Unidot assemblers support a flexible macro facility and conditional assembly facility. They also support up to 255 separately relocatable object sections, a full assembly listing, symbolic debugging and a symbolic cross-reference listing.

All the macro assemblers use mnemonics compatible with the microprocessor's operating code mnemonics and assembly language syntax. For development of code in a higher level language, Unidot offers several C cross-compilers. Unidot's C cross-compilers for a variety of microprocessors accept all current Unix extensions and the full C language, and the code produced may be put into read-only memory.

Prices for the products vary with the host processors but range from $600 to $4,000.

Unidot, 662 Park Point Drive, Golden, Colo. 80401.

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APPLICATION PACKAGES

■ STSC, Inc. has announced Version 5.5 of Dataport, its data analysis package for IBM mainframes under VM. The company also introduced a Dataport interface to Integrated Software Systems Corp.'s (Issco) Tell-A-Graf graphics package.

Version 5.5 is said to include an added RUN command and a merge feature that allows users to merge tables by creating new rows, columns or pages. Dataport provides graphics, spreadsheet-like analytical functions and data interfacing capabilities. It supports analysis of spreadsheet-like tables with a range of mathematical, financial and statistical functions.

Dataport's Tell-A-Graf interface provides full screen "pick-and-point" menus to allow users to select options for line, bar, pie and text charts. Dataport automatically generates Tell-A-Graf command and data files to produce the desired graph.

Datapoint costs $14,000. The Tell-A-Graf interface costs $4,000.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

■ Distribution Management Systems, Inc. has announced the DMS-1000/IBM Distribution System for order processing, inventory management, invoicing and purchasing. The system runs on IBM 4300 and 3030 series mainframes under OS/MVS.

A spokesman said DMS-1000 allows orders to be entered on-line either locally or on a remote dial-up basis. As each order is entered, the system validates customer and product codes, prices each line item, checks and commits inventory, assigns a shipment warehouse and performs a credit check of a customer's account.

The inventory management module tracks and updates inventory and reports products whose net inventory levels fall below reorder points. Reports generated include stock status reports by warehouse and combined totals for multiple warehouses.

DMS-1000/IBM Distribution System costs $170,000.

Distribution Management Systems, 81 Hartwell Ave., Lexington, Mass. 02173.

■ The Wheatley Group, Ltd. has announced Version 3.0 of Wheatley Insurance Systems (Wins), an interactive data base management system (DBMS) for property and casualty insurance companies and managing general agents. Wins runs on the IBM System/38.

A spokesman said Version 3.0 of Wins supports a number of personal, commercial and specialty lines of insurance and is intended to simplify file processing, document handling and lengthy printing. It also includes enhancements to the claims processing, policy management and accounting modules.

The revised claims application modules are integrated with the policy management and accounting modules using a relational DBMS. Data and applications security is provided through password and data file restrictions. Audit trails of transaction activity are maintained automatically.

The starting license fee for Wins is $150,000.

The Wheatley Group, One Huntington Quadrangle, Melville, N.Y. 11747.

■ Tower Systems International has announced Release 5.3 of its Omnicalc spreadsheet for IBM mainframes under VM/CMS and MVS/TSO.

Included in the enhanced release are a menu prompting facility for spreadsheet commands and an improved command structure, a spokesman said. Release 5.3 of Omnicalc provides capabilities for multiple windowing and three-dimensional modeling, a spreadsheet formula audit facility, an external program link and on-line help files.

Release 5.3 carries a license fee of $300 per month.

Tower Systems International, 19782 MacArthur Blvd., Irvine, Calif. 92715.

■ Uccel Corp. has announced Version 5.0 of its Commercial Loans Manager, a component of the company's Infopoint integrated banking system for IBM DOS and OS environments.

Commercial Loans Manager processes commercial lending arrangements such as notes, commitments, participations and indirect liabilities, a spokesman said. Expanded processing capabilities reportedly include calculations for Rule of 78s, pro rata and sum-of-the-balance functions. Clients can define charging methodologies for each institution and tailor the methodologies, according to the vendor.

The price of the Commercial Loans Manager ranges from $82,000 to $98,000.

Uccel, Uccel Tower, Exchange Park, Dallas, Texas 75235.

■ Management Science America, Inc. has added a case mix management module to its Health Care Sys-

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SOFTWARE & SERVICES

Continued from page 92

tem for IBM mainframes running the DOS, OS and MVS operating systems.

A spokesman said the Marketing, Clinical and Financial Information System includes capabilities for forecasting service demand, managing multiple product lines and supporting third-party billing.

The Health Care System is priced from $150,000 to $225,000.

Management Science America, 3445 Peachtree Road, Atlanta, Ga. 30326.

■ Sigma Consulting Group has introduced Workmart, a maintenance management package for Hewlett-Packard Co. HP 3000 systems.

Workmart is a modular system for facility and equipment maintenance that is based on a data base management system. Workmart reportedly provides facilities for maintaining equipment records and history, scheduling preventive maintenance, work order processing, storeroom and purchase order control and cost and management information reporting.

The base price for Workmart is $30,000.

Sigma Consulting Group, Suite 104, 12465 Lewis St., Garden Grove, Calif. 92640.

■ Administrative Technology, Inc. has announced an investment portfolio performance auditing system for Data General Corp. minicomputers under DG's AOS, AOS/VS and Rdos operating systems.

A spokesman said the Investment Portfolio Performance Audit System (Ippas) was written in Cobol and can be ported to other operating systems supporting that language. The product facilitates the analysis of investment income by relating income to original and current values, calculating unrealized yield to cost and market and relating each instrument and group of instruments to total portfolio value and income.

Audit trails track transactions for portfolios managed by a number of dealers.

Ippas is priced at $10,800.

Administrative Technology, 35 W. 35th St., New York, N.Y. 10001.

■ J.C. Silvestri Associates, Ltd. has introduced an investment management system for IBM System/34 and System/36 mainframes.

Designed for government agencies and municipalities, the Maxback package enables investment portfolio managers to monitor investment performance. Decision-support tools and a variety of standard reports are included in the package, a spokesman said.

Maxback is licensed for $4,900.

J.C. Silvestri Associates, 134 W. Lake St., Addison, Ill. 60101.

■ American Management Systems, Inc. has announced that its Computer-Assisted Collection System (Cacs), designed to aid in the collection of delinquent credit card and loan accounts, is now available for Tandem Computers, Inc.'s Nonstop II and Nonstop TXP CPUs.

A spokesman said Cacs provides on-line access to current accounting, collection and employee performance data. Cacs monitors all accounts and schedules collection work according to user-defined criteria.

Cacs is also available for IBM mainframes and Wang Laboratories, Inc. processors. The Nonstop version of Cacs is priced from $125,000 to $150,000. The IBM version is priced from $150,000 to $170,000, and the Wang version starts at $65,000.

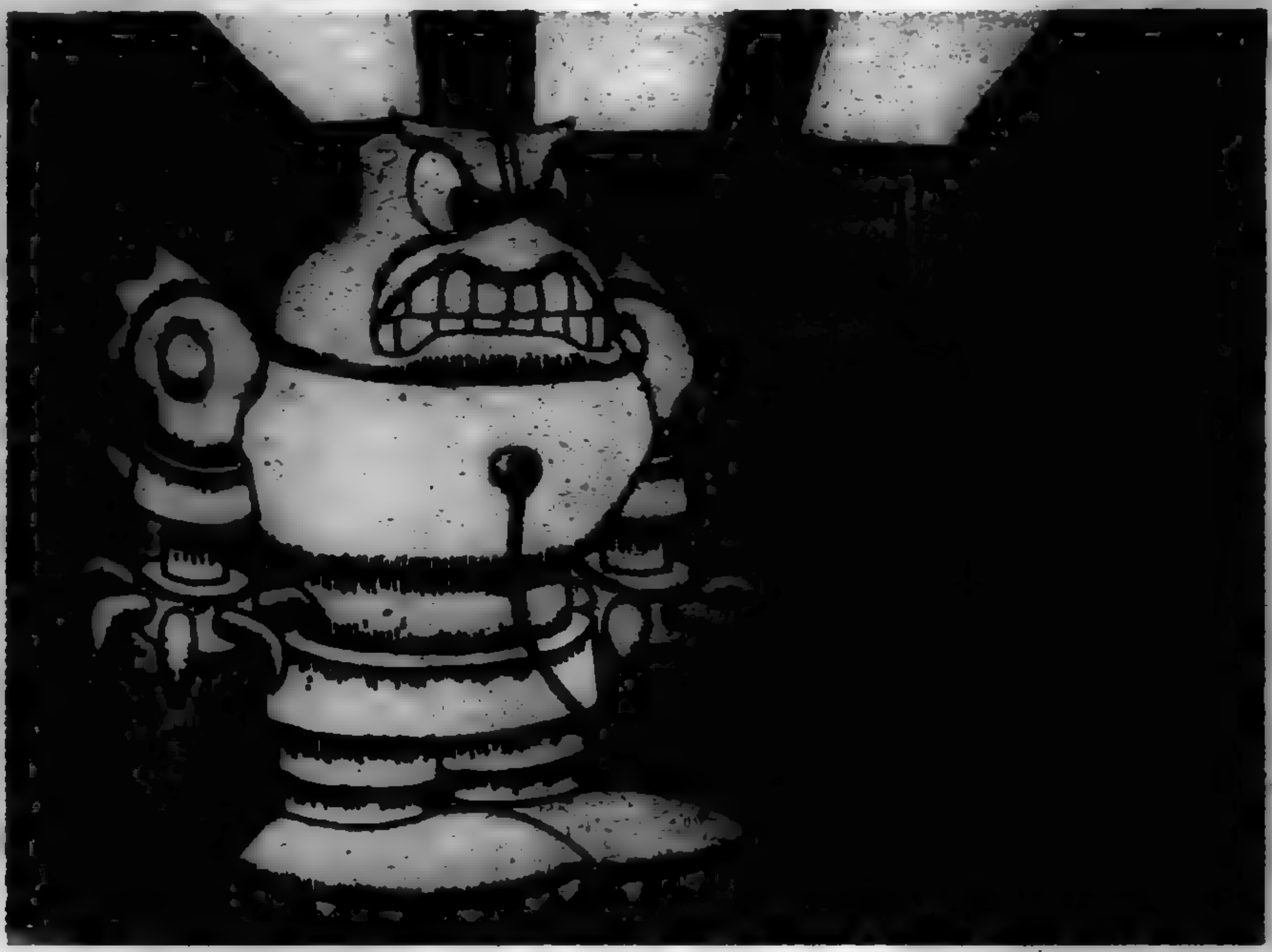
American Management Systems, 1777 N. Kent St., Arlington, Va. 22209.

■ User-defined function keys and an optional security system are among the enhancements to Release 3 of MCBA, Inc.'s accounting and distribution system for Texas Instruments, Inc.'s Business Systems minicomputers.

Designed to operate under TI's DX10 operating system, packages include accounts payable and receivable and general ledger. It is said to permit programs and data to be stored on selected disks or directories and includes enhancements that permit integration with MCBA manufacturing packages.

Release 3 packages are priced from $2,000 to $4,500.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.



Some people just ask for trouble.

Isn't it amazing just how many people go around asking for trouble?

Why, we're willing to bet there are people in your DP department this very minute flirting with disaster.

They're running the risk of a misplaced DD override, an invalid concatenation, or some other equally obscure JCL error bringing the whole kit and caboodle to a screeching halt.

When all they have to do to keep things running smoothly is use our JCLCHECK™ program.

JCLCHECK software catches all JCL errors and provides complete, on-line JCL validation and concise error diagnostics. Plus complete documentation on a job stream or entire production system suitable for insertion in the run book. And it can operate under TSO, TONE, ROSCOE or CMS.

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Over 400 DP departments now use JCLCHECK software to correct the errors of their ways, and save money at the same time.

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Still, some people are destined to find these things out the hard way.

To that we can only add, better them than you.

Yes, I want to stop living dangerously.

☐ Send me details on the JCLCHECK program.

☐ Have a representative call me.

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COMPANY

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PHONE OPERATING SYSTEM

Return to: Triangle Software Co., 4340 Stevens Creek Blvd., Suite 275, San Jose, CA 95129, (408) 554-8121.

Triangle Software Company

If you don't ask for us, you could be asking for trouble.

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JCLCHECK is a trademark of Triangle Software Company.

SOFTWARE & SERVICES

■ Information Processing Techniques Corp. has introduced Version 4.13 of its Exhibit presentation graphics package.

A spokesman said Exhibit runs on Digital Equipment Corp. superminicomputers under DEC's VMS or Ultrix operating systems and Data General Corp. superminis under DG's AOS/VS, AOS or Rdos.

Exhibit also runs on Information Processing Technique's AT&T Unix-based Eclix operating system.

Enhancements to Exhibit include the ability to enter up to 1,000-data points, the ability to use plotters or printers and support for solid-fill graphics capabilities, according to the company spokesman.

License fees for Exhibit range from $2,700 to $7,590, depending on host system.

Information Processing Techniques, 1096 E. Meadow Circle, Palo Alto, Calif. 94304.

■ Digital Equipment Corp. has announced that Manufacturing and Consulting Services' Anvil-3000D two-dimensional drafting system is now available for the DEC Vaxstation I workstation.

A spokesman said the Anvil-3000D is a drafting package subset of Manufacturing and Consulting's Anvil-4000 design package, which runs on DEC VAX processors.

Anvil-3000D capabilities include geometric construction and manipulation, display control, drafting with user control of dimensions and notes and data management.

The drafting system also features a proprietary algorithm for hidden line removal. This feature allows users to simulate a three-dimensional model.

Anvil-3000D is priced at $8,750.

DEC, 2 Iron Way, Marlboro, Mass. 01752.

■ Integral Systems, Inc. has announced Human Resource Management Software (HRMS) for the IBM System/38 that contains payroll, personnel management and data security packages.

HRMS was previously available only for IBM mainframes.

A spokesman said the personnel and payroll modules are integrated and can also be used in stand-alone mode.

The data security system protects all applications modules, controlling access to the individual employee and data element level.

HRMS/38 features on-line, menu-driven processing and a field-by-field, on-line Help facility.

Prices for HRMS/38 modules begin at $35,000.

Integral Systems, 165 Lennon Lane, Walnut Creek, Calif. 94596.

■ STSC, Inc. has announced Version 2.2 of Trucks, its fleet management system for IBM's VM/CMS and MVS/TSO.

Trucks 2.2 includes an enhanced system for generating truck routes, added user commands and five additional reports, a company spokesman said.

The enhanced routing system sequences routes and provides capabilities for shifting orders between routes to improve order consolidation.

Added reports reportedly include the following: driver trip sheets; loading manifest; driver manifest; dispatch summary; and trip directions report.

Trucks 2.2 is priced at $175,000.

STSC, 2115 E. Jefferson St., Rockville, Md. 20852.

■ Fusion Products International has announced Version 2.0 of its Fusion/36 Management Information Center, a data retrieval package for IBM System/36 minicomputers.

A spokesman said Version 2.0 adds functions that include logical join, a personal computer interface and several output options to the report generator.

The addition of logical join allows users to perform sort and select operations on any of the retrieved fields, including those selected from files other than the primary file.

Fusion/36 is also capable of creating interchange files in Ascii, Ebcdic or Software Arts, Inc.'s Data Interchange Format, allowing data transfer to a microcomputer for use with Lotus Development Corp.'s 1-2-3 and other micro software packages.

Version 2.0 of Fusion/36 is priced at $3,000.

Fusion Products International, Suite 295, 900 Larkspur L.C., Larkspur, Calif. 94939.

■ Environmental Systems Research Institute has announced Revision 3.0 of its Arc/Info software for managing geographic information by creating a data base with graphics map displays. Arc/Info runs on processors from Prime Computer, Inc., Digital Equipment Corp., Data General Corp. and IBM under VM/CMS.

A spokesman said Revision 3.0 includes a Map Library supplement that uses a spatial tiling system to manage multilayered geographic data bases.

A user reportedly can extract data from Map Library by specifying a geographic area and a set of layers.

The system automatically extracts the selected layers, clips each layer by geographic window, joins the clipped tiles into a full map, handles and corrects map sheet overlap and edge-match and loads the data into specified user work space, the vendor said.

Revision 3.0 of Arc/Info costs $75,000.

Environmental Systems Research Institute, 380 New York St., Redlands, Calif. 92373.

PROGRAMMING

Why pcMAINFRAME™ is the only intelligent way to link PCs and your mainframe.

As more and more users demand more and more data, your programming resources can get stretched pretty thin.

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And, since security is a concern with any mainframe access system, pcMAINFRAME offers four levels of protection: rigid internal protocols, user IDs and passwords, data "profiles" controlled by the Systems Administrator, and a transmission log showing each request by type, PC ID, date, time, number of records transferred and error messages.

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VENDORS

from page 51

majority of software vendors, and they can exercise substantially more marketing clout.

Those assets were pointed out in a recent International Data Corp. (IDC) report entitled "Third-Party Software Strategies of the U.S. Hardware Manufacturers."

According to the Framingham, Mass.-based market research firm, "Software vendors have their share of problems. . . . They, too, face the enormous burden of software development headaches. Not only that; marketing costs are astronomical and usually preclude their dealing with anything but a limited geographical base. They often lack credibility because of their small size and limited user base, preventing further the kind of industry penetration they need for continued profitability in the face of escalating costs and user demands."

Massive investment required

Hardware vendors, too, especially those experiencing financial hard times, are pressed by the massive investment required to maintain existing software, let alone the huge sums necessary to develop new systems. Users want far more in the way of software than hardware-oriented companies — including even the giant blue vendor — can hope to supply.

The long lead time involved in bringing, say, a cross-industry application to market also weighs heavily on hardware vendors. Why should users wait for such a system to be delivered from their hardware supplier when they can purchase a similar one from a software company with no delay? In fact, the end user may even opt for another vendor's hardware if it runs the desired third-party software.

Thus, IDC stated, "What appears from the dilemmas of the two groups is a rare synergy between the requirements of the hardware industry and those of the software industry. Hardware vendors, which require software to move their products, in turn provide marketing strength and lend legitimacy to smaller software companies. Hardware vendors that lack the resources and contacts to reach smaller accounts can rely on regional software companies that have long-standing relationships with local user communities to reach them."

What's the likely outcome of that synergy? You guessed it — deals. These deals include software marketing arrangements and product, even company, acquisitions.

According to IDC, that fact is not lost on computer vendors. The months since early 1983 have seen "intense activity among hardware manufacturers seeking to persuade third-party vendors to write software for systems in all size classes," the report contended.

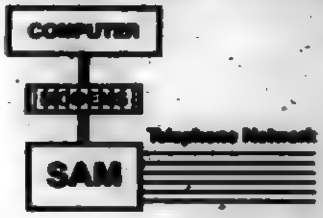
Future for third-party software?

What does the future hold? "IDC feels this activity will continue with ever-increasing intensity in the next few years. Hardware vendors have seen what a tremendous sales tool third-party software can be. Additionally, third parties have proven themselves to be an important channel of distribution which will prove critical in the highly competitive atmosphere of the late 1980s."

That is good news for users. Although it has been quite some time since users had to rely solely on their hardware supplier for software, in the future they will have a veritable smorgasbord of software spread before them.

As hardware costs continue to fall, computer vendors will have to become more attuned to the software needs of their clients to stay in the game. That kind of attention can only bode well for users. The symbiotic relationships that will spring up between the hardware and software vendors, each hoping to maintain its place in the history of the industry, promise to offer users some interesting opportunities in the near future.

What's the only
Perfect Crime?



IT'S WHEN NO ONE KNOWS THERE'S BEEN ONE. Computer crime is 10 times more profitable than robbing a bank. That's a fact. But, this statistic is only available on KNOWN computer crime...it's impossible to know how much monetary and informational theft goes undetected; some of it, perhaps, from your own system. The ability to access computers via dial-up ports is beneficial, but it creates a potential exposure akin to leaving the vault door unlocked. Disgruntled employees, strikers, malicious hackers and dishonest competitors can obtain information, vandalize the system, even misappropriate inventory...all from a push-button phone.

This high-risk threat of computer fraud has generated the urgent need for the LeeMAH Secure Access Multiport (SAM). SAM reduces your system vulnerability by allowing access to AUTHORIZED LOCATIONS ONLY via callback. SAM connects on the analog side of the modems. You can stop the perfect crime...with LeeMAH's SAM.

SAM also:
- Interfaces with any modem, any speed, any protocol.
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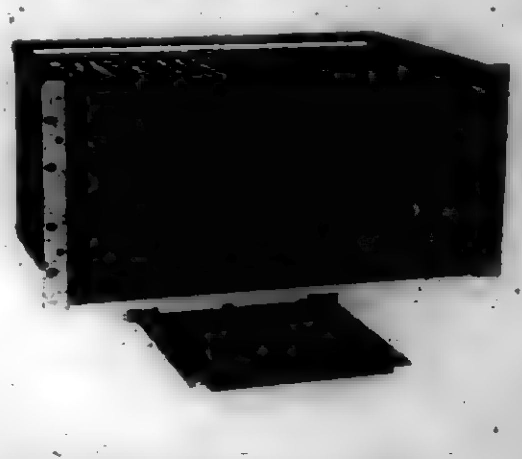
- Up to 64 ports per system.



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EXPERT

from page 51

can provide a good basis for going on to develop major systems." Large-scale expert systems supporting production processes, asset management and new products design, for example, are often "difficult and slow to implement," the report said.

"Small systems may well have more practical impact and market significance than larger ones — at least in the short run," the Ovum report noted.

The environments that offer the most favorable prospects for expert systems continue to be the larger, wealthier and more rapidly growing industries that have taken to computerization. Those groups, the report maintained, will continue to account for a large share of the expert systems market.

The Ovum report predicted more than 1,000 small commercial expert systems will be available in the U.S. by 1988. Marketing strategies will be an important factor in the success of vendors selling expert systems, the report noted, adding "If some of the small systems are well chosen and packaged for mass markets, they could become widely used, while the promoters of major systems are still struggling to prove their value and get them accepted."

The role of research foundations and systems houses in the development of expert systems is on the decline, the report noted. Knowledge engineers once employed by these foundations have started their own firms.

The report is available for $395 from International Planning Information, 164 Pecora Way, Portola Valley, Calif. 94025.

"What'll they think of first?"

Lotus® and Cullinet are working together for the first time.

They're working on a new micro-to-mainframe link that will help personal computers communicate with mainframe computers. A link that will allow Symphony™ from Lotus to tie directly into Cullinet's Information Center Management System (ICMS).

Lotus and Cullinet.

When the two leading innovators in software development put their minds together, the only question left is—"what will they think of next?"

Lotus® Cullinet

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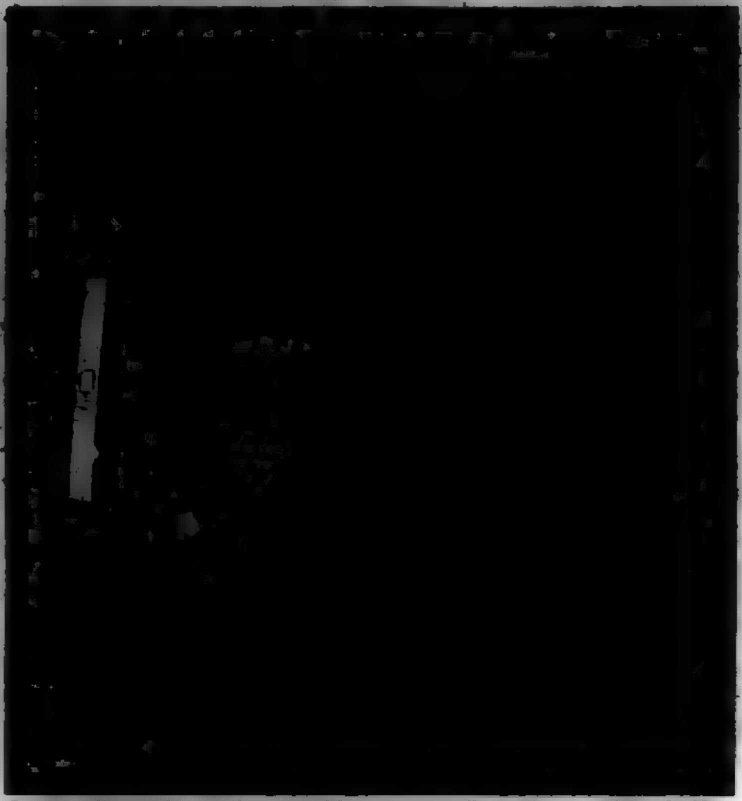
Thomas J. Watson Research



An experimental speech recognition system allows the creation of office documents, such as letters or memos, by voice. Words spoken from a 5,000-word business vocabulary are displayed as text on the screen.

The first X-ray image of live human blood platelets was accomplished by IBM scientist Ralph Feder. A novel X-ray method combined with techniques borrowed from computer chip manufacturing produced this first view of a blood platelet's structure.

For the sake of IBM

By George Harrar

"If you look at the world of very small objects, you find there is no science there."
— Praveen Chaudhari

YORKTOWN HEIGHTS, N.Y. — The computer industry is pushing against the limits of the known.

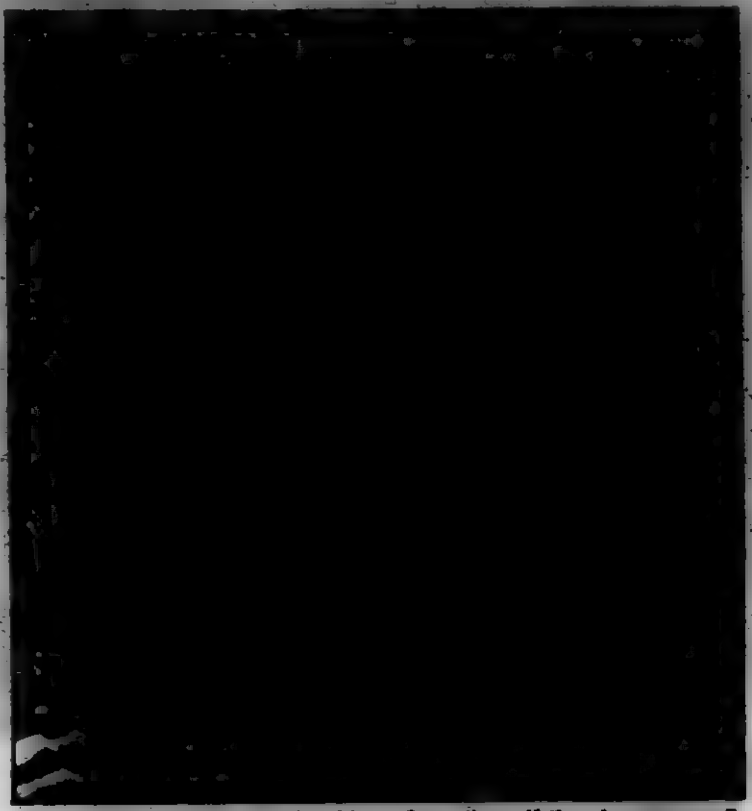
At IBM's Thomas J. Watson Research Center, that means:

- Generating the shortest light pulses ever — 12 femtoseconds (quadrillionths of a second).
- Creating a speech recognition system that translates voice into screen text from a 5,000-word vocabulary, with 95% accuracy.
- Capturing the first X-ray image of live human blood platelets.
- Building an expert system (YES/MVS) to monitor and control a mainframe's operating system through real-time, interactive operation.
- Developing an experimental 64K-bit memory chip that works at speeds of 16 to 20 nanoseconds (billionths of a second).

These achievements of the last year or so at Yorktown Heights illustrate the research division's dual function: to explore technologies that eventually may be integrated into IBM products (speech recognition, YES/MVS, the 64K-bit chip) and to advance science (light pulses and X-ray imaging) regardless of whether the research applies to IBM products.

"The goal is a research division famous for its science and technology and vital to IBM." This encapsulation of Yosktown Heights' mission appears in a small glass sphere for visitors to see. Leon Cookman, director of administration, says: "We labored over the word 'famous.' We decided, what the hell, we would use it because it means what we want, and that is a research organization that is world class."

Center



Composed of six layers on the chip surface, the self-timed sense amplifier, magnified here several thousand times, detects information stored on the high-speed 64K-bit chip.

and science

IBM, master of marketing, rarely hears the name "master of technology." The computer giant is hobbled by its own success. Whatever it sells it sells by the million. Innovation must prove itself not just in terms of performance but also in manufacturing. A good idea at IBM must be manufacturable a million times over.

Over the years, the research division, which includes the Yorktown Heights headquarters as well as San Jose and Zurich branches, developed:

- The thin film head, which makes the advanced disk systems of IBM possible.
- The relational data base concept, based on pioneering work by Edgar Codd.
- The high-end robot that IBM currently markets along with the accompanying robot control language, AML.
- Fortran, the first high-level programming language to be accepted widely.
- The single device memory cell, on which all of IBM's main memories are based.

The new challenges are submicron.

"Why is it," asks Praveen Chaudhari, vice-president of Science, "we can't make a thousand-angstrom device? We sell several-micron devices. What's to prevent us from building a half-micron device and manufacturing and selling it? It's just that we don't know how to control processing and materials. There is nothing fundamental in nature that says you can't."

There are no rules of science showing how you can, either. The industry is passing into the submicron world of matter where there is no experience as teacher.

The industry has extracted, Chaudhari says, almost all

the knowledge there is about how to build computer devices. "We don't know how things behave when they get that small. I know how this table is behaving, but if I take a quarter or a tenth of a micron of that, its properties are going to be different than in bulk form. How do you make sure that when you deposit atoms on a given substrate they come down in the arrangement you want? How do you make sure that the right kinds of atoms got there?"

The development and manufacturing of semiconductor VLSI [very large-scale integration] devices still involve a large element of empiricism, according to John Armstrong, vice-president, Logic and Memory. "Every time you go from 256 to 512 [K bits] or every time you take a step of factor two in density, you get a new set of problems. You might well say, 'You should have silicon processing licked by now. You've been doing it for 15 years — anybody ought to be able to do it.' The fact is, anybody can do it, if you want to practice last year's technology."

Armstrong suggests a way to distinguish among all the manufacturers a customer can choose from when buying a computer system: "Ask the vendor how it really works at the level of the atoms and molecules." IBM can buy a considerable understanding of computers at this molecular level with its $4.2 billion annual expenditures on research and development companywide.

For instance, how does reactive ion etching work? "Why is it that if you have a glow discharge in a certain rarified atmosphere of gases, it etches silicon selectively and not oxide or another gas?" Armstrong asks. "What determines the tolerance you have on the process? To answer those questions requires an understanding of atomic physics, surface chemistry and plasma physics and chemistry.

"You can't understand everything on a scientific basis. But it is very important to understand key features that may bite you in development and manufacturing. If you don't really understand it, you don't really know how to control your tools."

■

One-tenth of IBM's 370,000 employees work in 26 development labs, 14 science centers and three research labs worldwide. The research labs, headquartered in the semicircular building at Yorktown Heights, form a division employing 2,800.

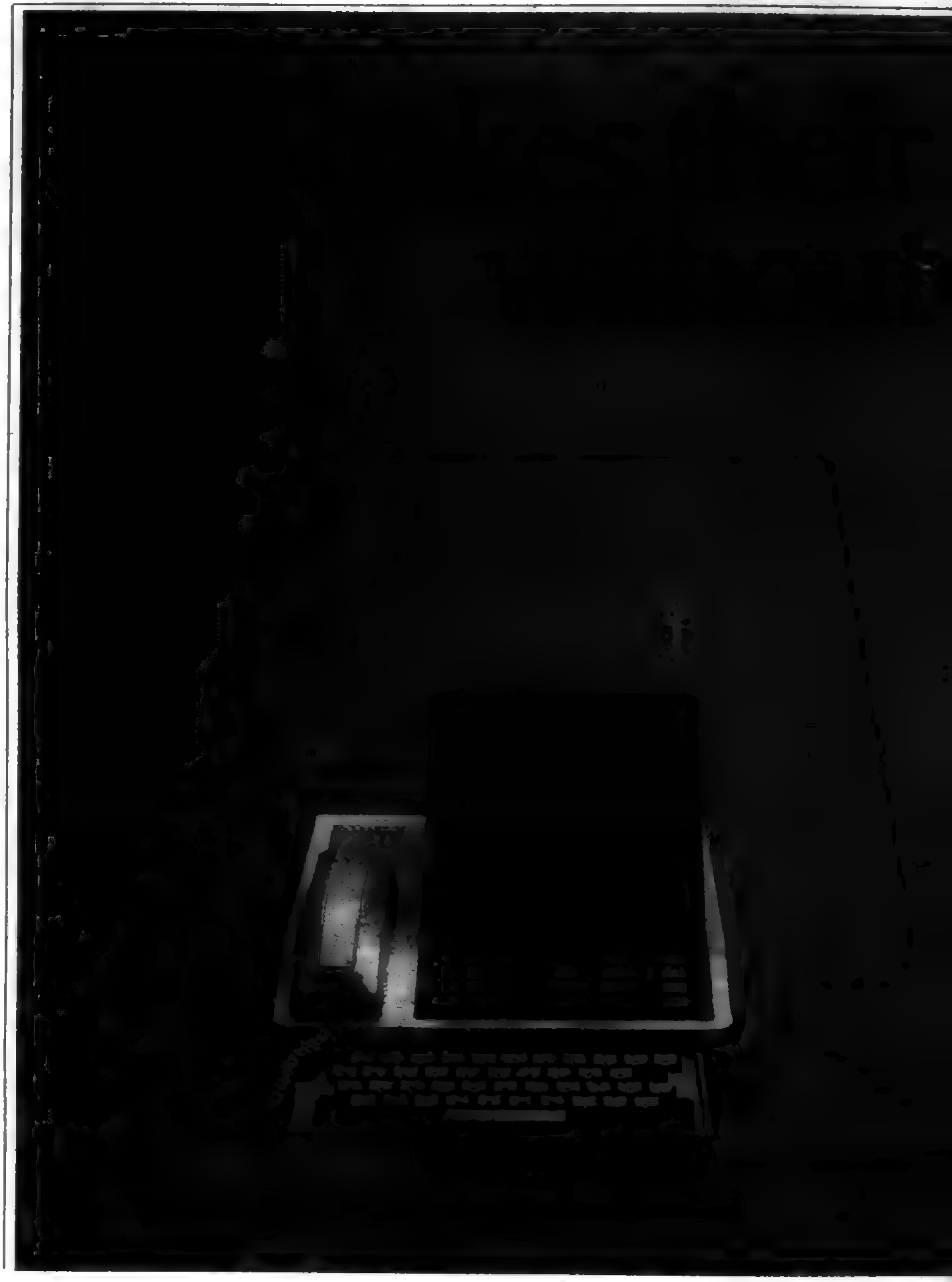
Thomas J. Watson Jr., who dedicated the research center in his father's name 24 years ago, told *Computerworld* in a June 13, 1983 interview: "We built laboratories in attractive places — the West Coast, Yorktown, Zurich and near Cannes, overlooking the Riviera — simply to get people to come and work for IBM. Belief in R&D is probably 35% of why we became successful."

Today, the director of the research division, Senior Vice-President Ralph Gomory, reports to Chairman of the Board John Opel directly — not through any product group. This line to the top gives Yorktown Heights the independence to choose its own areas of research rather than always responding to the demands of the product groups.

The researchers are reminded often that they do not work far from the very practical, corporate needs of Armonk. Cookman, the director of administration, says: "We tell [them] they have a responsibility for technology transfer. What it means is that when your research work has gotten to a point where you have a result you think is useful, it's your job to go out in IBM and make that work known and do your best to see it gets used somewhere. In the early days, we, like a lot of research organizations, felt that if you did great work and sort of threw it over the transom, somebody would find it and yell 'Eureka!' and take off with it."

The Watson Research Center divides its efforts under the "Science" and "Advanced Projects" headings. Advanced projects might be called applied science elsewhere. Science at Yorktown Heights is indistinguishable from that practiced at major research universities. Science is the underpinning of knowledge for the research division and corporation as a whole. As Cookman says, "We never want to let this science base erode."

Computer science in general lacks the fundamental laws that describe and



govern other fields, such as physics. IBM is searching for the laws that specify limits so that when, as Armstrong says, "you start to design new and better architectures, you will know whether there is 2% left that you can gain, or whether you are 98% there and a fundamental law says you can't get any better."

Surfaces and interfaces draw considerable attention in the science area. "You still have unanswered scientific problems in bulk materials like ceramics," Cookman says. "I believe we are the world's largest electronic user of ceramics. In the 3080 series, there is a multilayered ceramics package which is about a dozen layers of ceramic sheets which then have to be fired and controlled. When we got into that manufacturing problem a few years back, we found out that one didn't understand enough about the basic science of ceramics. There was just not enough fundamental information available to the world. So we have built a science team in ceramics."

Most research follows IBM's natural field of interest — anything that might conceivably need to be known to make business computing machines. But as scientists get close to discovering anything — computer-related or not — they don't like being told to redirect their energies to more corporately rewarding areas. If the research division thinks it can make a contribution to the world of science rather than to the world of IBM, one or two researchers will be spun off for a while to see what they can come up with.

So alongside the logic and memory, storage, I/O and non-von Neumann architecture research going on here, one finds the pursuit of the magnetic monopole, for example.

"Theory says you can have a single magnetic pole," Cookman says. "No one has ever detected one, and we don't know whether there are 10 in the universe or 100 or 1,000. But since we have done a lot of work in superconductivity and had made some of the most sensitive magnetic field detectors, we decided to enter that search.

"We are also trying in an eloquent way to measure the mass of a neutrino. And one researcher who is an M.D. is using a computer to model epileptic seizures — the way neurons fire and finally all get in phase and you get one huge burst which is an epileptic seizure."

Daniel Grischkowsky's "Ultrafast Science With Lasers" team generated history's shortest light pulses in November — 12 femtoseconds. Ultrashort pulses can be used as a strobe light to slow or freeze the apparent motion of molecules, atoms and electrons.

Physicists inside IBM — Ralph Feder, Veronica Banton and David Sayre — joined with medical researchers outside the corporation to develop flash X-ray microscopy. The technique, first demonstrated early this year, allows high-magnification photographs of a blood cell's structure while the cell is alive.

Closer to IBM's vested interests is artificial intelligence research, such as YES/MVS (Yorktown Expert System for MVS operators). This experimental in-house system was designed to manage a complex computer facility with minimal intervention of an operator.

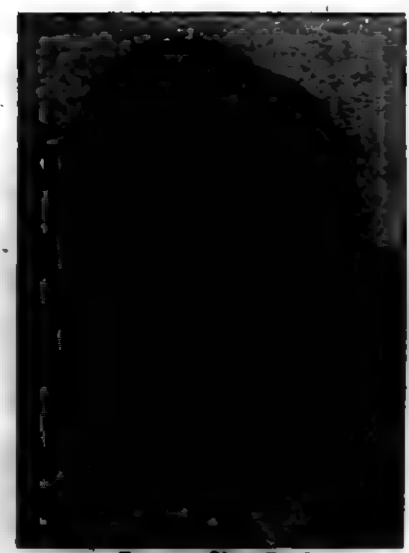
Speech recognition often falls under the "artificial intelligence" heading, but IBM avoids that label. Last October the Watson Research Center announced an experimental system whose aim is continuous speech recognition in real time. But the "continuous" part of the goal appeared to be so difficult to attain that IBM modified its expectations.

Cookman says, "In the last year, the director of research asked the [speech recognition] group what it could do if it accepted one small constraint, and that is, asking the speaker to pause slightly between each word as he speaks."

What the group showed it could do was develop a system with a business vocabulary of 5,000 words that is individually speaker-trained (to account for accents) and 96% accurate. An identification program examines the context of words to distinguish, for instance, among homonyms such as "to," "too" or "two."

The spoken word "period" can indicate time or punctuation, as in, "I would like to see the sales report for the third period — period." The IBM system prints one word

> ”
>
> *We need to know the properties of metals, ceramics, plastics, polymers, composite materials, glasses. I can tell you where every one of these is used, and without the right properties, the device wouldn't work.*


Praveen Chaudhari

as a period and the other as a punctuation mark. This distinction is no trivial feat. The text being printed out on the screen slows to deal with "period — period" problems and then races to catch up, despite the fact that the calculations are done by three Floating Point Systems array processors and an IBM 4341.

The "slight pause" researchers built in to stop the natural elision between words keeps this system in the realm of experiment and out of any office application soon.

"We wanted to show that you can do it," Cookman says. "The first thing people ask is, 'When will I have one for my PC?' That is like turning to the Wright brothers and saying, 'OK, it flew, where is the drink cart?' "

For technology transfer to work, the Watson Center researchers must carry their work far enough along to be able to offer the development labs a tested, known quantity. Still, the unexpected happens.

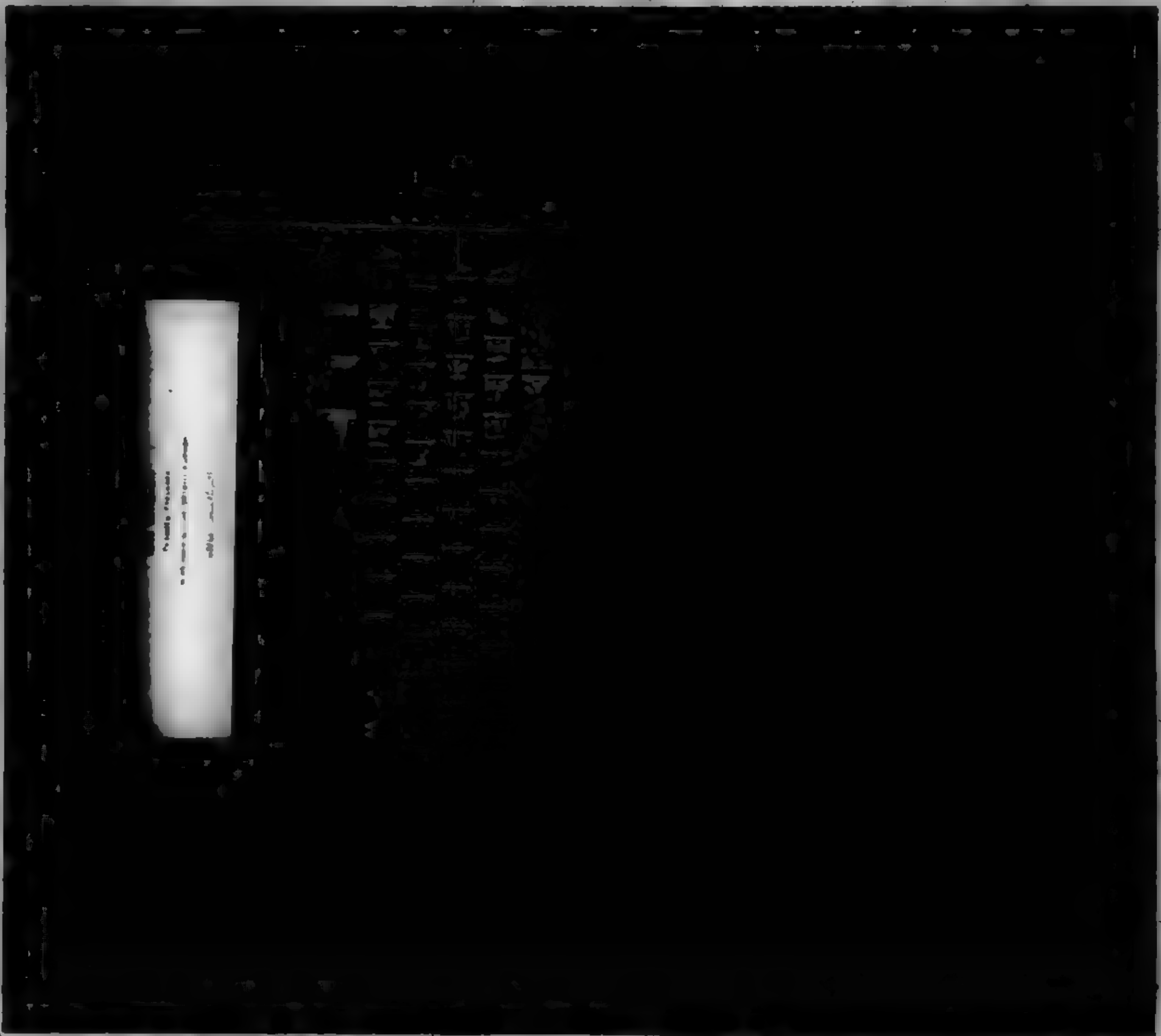
"Before we announced our 3080 series," Chaudhari remembers, "we ran into difficulties in manufacturing. All the problems had been solved in Advanced Technology, but they [the 3080s] were out in manufacturing now. They began having yield problems. If you're going to make money, it is important to get your yield as high as you can. A bunch of us from the science department went to the divisions. Within a matter of months with their help, we solved their problems. The yields began to go up.

"You uncover these [problems] when you are really in a manufacturing mode and they're coming down the line. You suddenly realize that all that pilot line business where things are controlled better — it's not quite the same. It gets a little bit harder as you go down the stream."

Besides anticipating problems, researchers must realize that any small product improvement they come up with must fit into the greater scheme. Armstrong sums up the corporate line: "IBM sells systems. We don't sell chips, we don't sell packages — we sell systems. What's important is what makes the system best. If I figure out a way to make a chip that is 10 times faster than this, but I still have to have 400 or 500 chips and I put those 10-times better chips on the same package, I'm going to be lucky to get 10% improvement at the system level.

"Let's say you have 64K memory technology licked; now you're going to work on 256K memory chips. It is not just a question of scaling down the dimensions and getting better control over the process. You have to do that, but what you find is that there is a whole new set of things that can go wrong."

Watson Center researchers are concurrently working on MOS and bipolar technology, asking how these devices can work and be fabricated reliably when all the important



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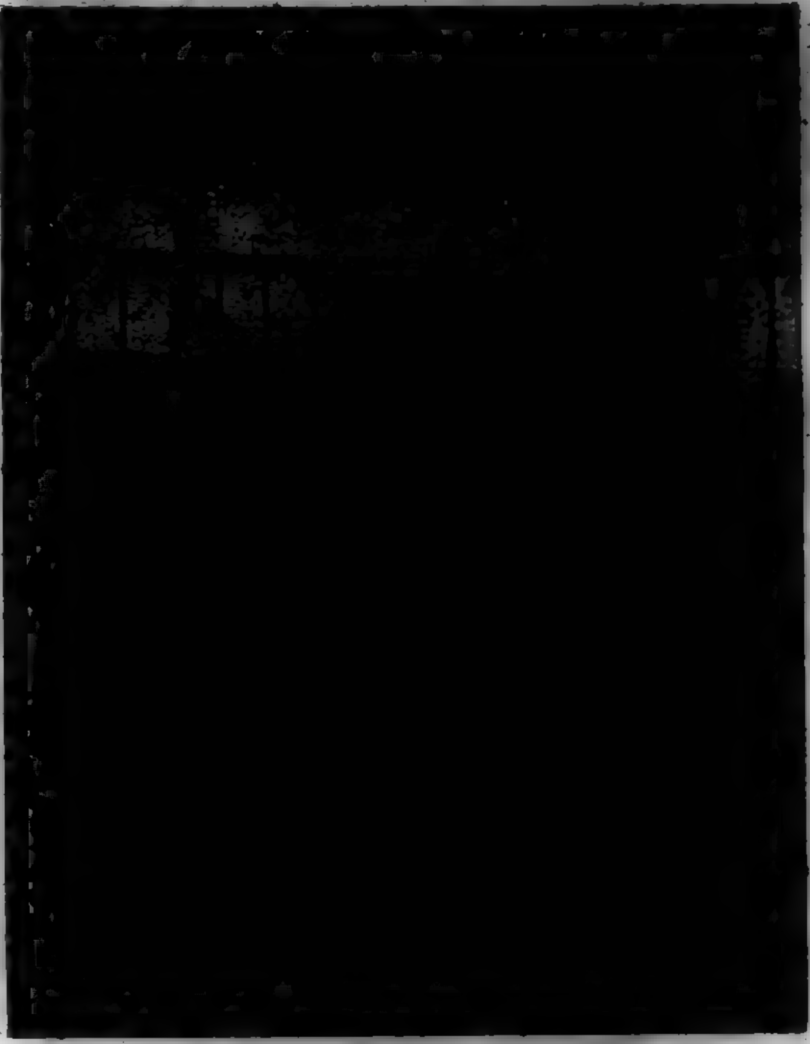

Looking out from IBM's Yorktown Heights facility

dimensions are submicron.

Armstrong says, "How do you make a very, very thin layer of silicide on an MOS device, and how can you control the abruptness of the interface between the silicide contact and the silicon? The electrical properties of a Schottky Barrier are determined probably by a thickness of a material only a few atoms thick. The perfection and cleanliness of that very small region of space are reflected in the electrical properties. So it has been a constant source of research to understand how to control such a delicate structure in a manufacturing environment."

Getting an innovative chip through the rigors of manufacturing still doesn't ensure it will ever be used in an IBM system. "The 3080X has a 26- or 27-nanosecond cycle, or whatever," Armstrong says. "You ask, 'Why isn't it shorter? What are all the delays in there?' Well, the speed of the chip is less than one-half of what makes up the speed of the computer. More than half is due to packaging."

Chaudhari's Science group must understand the bottlenecks on the road to technological advances well enough to say, "Hey, that's a hopeless route, forget it," or "This is what you have to do to overcome it."

The Watson scientists spend considerable effort creating materials that don't exist normally in nature — materials deliberately structured for manufacturing and use in products. "In the semiconductor technology or electronics business," Chaudhari says, "you're going to do this with an unprecedented number of things that have never been tried before in the history of man. That's where the challenge is."

Throughout IBM product lines, whether printers or typewriters or CPUs, it's the material that typically stands in the way of performance improvements, and not just silicon. The challenge is first to understand how the material behaves and second to control its behavior during the manufacturing process.

"Most people think that in an electronics company, semiconductors would be the thing that people would be working on," Chaudhari says. "But in fact, semiconductors are just one material. We need to know the properties of metals, ceramics, plastics, polymers, composite materials, glasses. I can tell you where every one of these is used, and without having the right properties, the device wouldn't work."

Chaudhari graduated from MIT and joined IBM in 1966 as a research staff member — the general title for all new employees. "There are no exceptions," he says. "After they have shown us they can do good science, then we consider them for management."

Promotions to management are apparently not routine matters of longevity. "A good manager can do some good, but a bad manager can do an awful lot of harm," Chaudhari says. "It is a good thing to remember about managers. We don't want to hire anybody who would say yes to us. We want to hire someone who is likely to say 'Why?' "

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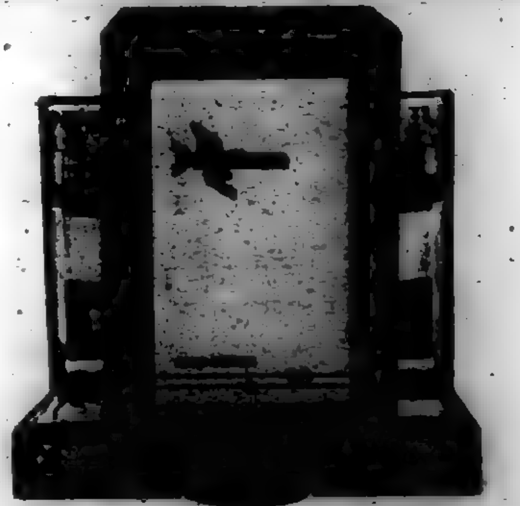

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Turning speech into screen text

One of the more ambitious research projects now under way at the Watson Research Center is a prototype speech recognition system developed by Frederick Jelinek, senior manager of Continuous Speech Recognition. The result of 12 years' research, Jelinek's system currently incorporates a 5,000-word vocabulary.

The current test application for the system is a set of internal memos including examples from such top IBM executives as Frank Cary and John Opel. An operator reads the memos into a microphone, pausing briefly between each word, and a monitor displays the system's translation of the words.

A study in the ambiguities of spoken communication, the speech recognition system attempts to match words in its vocabulary with the sounds it receives from an operator. The system also attempts to adjust its interpretation to fit the context of the sentence.

One of Jelinek's favorite examples is Shakespeare's "To be or not to be," a phrase that causes particular difficulty for the system because it must determine whether the user means to, too or two and B, be or bee.

Jelinek was interviewed in Yorktown Heights by Tom Henkel, senior editor, systems.

How do you view your role in developing your speech recognition project into an IBM product?

I think I'm supposed to sell it to someone in some division. We have only had a real-time speech recognizer operating since July, so it may be too early. There are questions we haven't answered, such as "How robust is it?" and "How many people can use it?"

Right now, we are experimenting with people who are very much interested in making the recognizer work. In other words, we are using our friends. I'm not sure how the recognizer will work if it is used by someone who doesn't have a personal stake in making speech recognition work.

Before we can hand the project over to the product people, we are going to have to do what we call a robustness trial. We will take the speech recognizer to 50 different offices and record people who are not our friends and see how well it does for them.

Is working in such an experimental field a disadvantage when it comes to convincing IBM to develop speech recognition into a commercially available product?

I don't feel it is a handicap right now. I've been doing this for 12 years, and I'm pretty glad when they leave me alone. I would certainly like to see products made from the ideas we have generated here, there is no question about that. But at the same time, there are problems we haven't answered yet. Perhaps when we solve those problems, the case will be so overwhelming that the product development people will have to say, "We'll take it tomorrow."

Right now we have a functional prototype. I certainly would like to bring it to a good enough performance [level] so people could use it and get a feel for what it would be like to have one. But this research does not address any economic questions. For example, should it be provided for single users? Or should the capacity be distributed through terminals? After all, research shows that most executives dictate maybe two memos a day, and each memo takes about 20 minutes. So the rest of the time this speech recognition system would be idle. It is quite possible that it is uneconomic to develop it into a stand-alone product. Maybe it should be used in a network.

> ”
>
> *We could not assemble any system, except for an enormous price, that could handle continuous speech recognition. So we took a step backward and decided to put pauses in between words.*

Do you have any responsibility in making those economic decisions?

No, how could I? I know nothing about marketing.

How has your research changed during the 12 years you have been working on this project?

We started out just recognizing digits. Then we added an artificial language. "Artificial" means there was a grammar, and if you did not say the words that made up a sentence in that grammar, then it wouldn't recogize them. The artificial language had a finite grammar of 250 words. Out of those 250 words, you could say about 14 million sentences. When you said a word (except for the word "the") and it was correctly recognized, the system knew exactly where you were in the grammar because the words were only in one spot. That was all continuous speech. Isolated speech came later.

The next step was to do something called laser patent text. We found that in Washington, D.C., they have descriptions of patents in the laser

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field. We thought that lawyers probably write similarly — I mean they are not concerned with original expression. Even though the sentences in the patents look complicated, they are very much alike. We saw this would be a good step to go into natural language, so we made a 1,000-word vocabulary.

None of this research was in real time, and we were using general-purpose computers. After about three years, we thought it was time to incorporate some human factors into our research and get some experience in real time. When we looked into real-time processing, it turned out that we could not assemble any system, except for an enormous price, that could handle continuous speech recognition. So we took a step backward and decided to put pauses in between words. That reduced the computational load by about a factor of six.

So we got our own 4341 and bought three Floating Point Systems array processors. We did not want to mix the errors we made in constructing special hardware with the errors we made constructing our algorithms. Also, we wanted to run this on a commercial, well-supported system — nothing homegrown. If we wanted continuous speech recognition, we would have to make the hardware ourselves.

How does the system work now?

The current application is to create text using voice. The application is for office memoranda. There is a terminal, a keyboard, a mouse and a microphone. The idea is that you dictate a memo and create text. Whatever errors you create, you correct them, then push a button and [the memo] is printed out. Right now, we do not have the system connected to an electronic mail system. But that is one thing we would like to achieve, because we suspect most people send mail electronically rather than on paper. So we must have this system hooked into an electronic mail system before it will be accepted as a product.

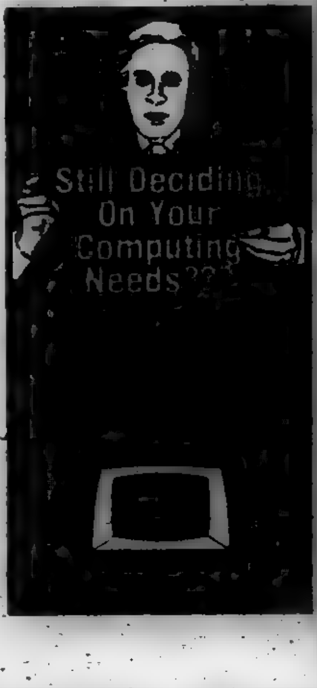
Currently, the system has a 5,000-word vocabulary. Of course, you can say anything you wish, but if it is not among these words, the system will make an error. We would like to enlarge the vocabulary to 20,000 words because our current estimates indicate 20,000 would be adequate for most applications. Right now, about 7% of the words you wish to say are not in the vocabulary.

This is a learned system?

You have to provide it with about 100 sentences, or about 1,000 words. That takes about 20 minutes. Sentences appear on a screen and you read them. That is the data the system uses to make a picture of your voice. Unfortunately, this step is currently on our mainline batch computer, so it takes maybe a day to process.

How many voices can the system recognize?

It's a matter of disk capacity. Right now, we have maybe 20 people who can talk to the system. All you have to do is identify who you are, and the system goes to the disk, takes your voice parameters, loads them and it is ready. Now I suppose if you used this system as a Personal Computer extension, there would only be one hard disk, and it would not work for any number of people. We have a plan to squeeze the hardware into 12 cards, which could be used in a Personal Computer extension box. We think we will have that done this year. But you have to understand, this is just a design that will probably not meet IBM quality standards.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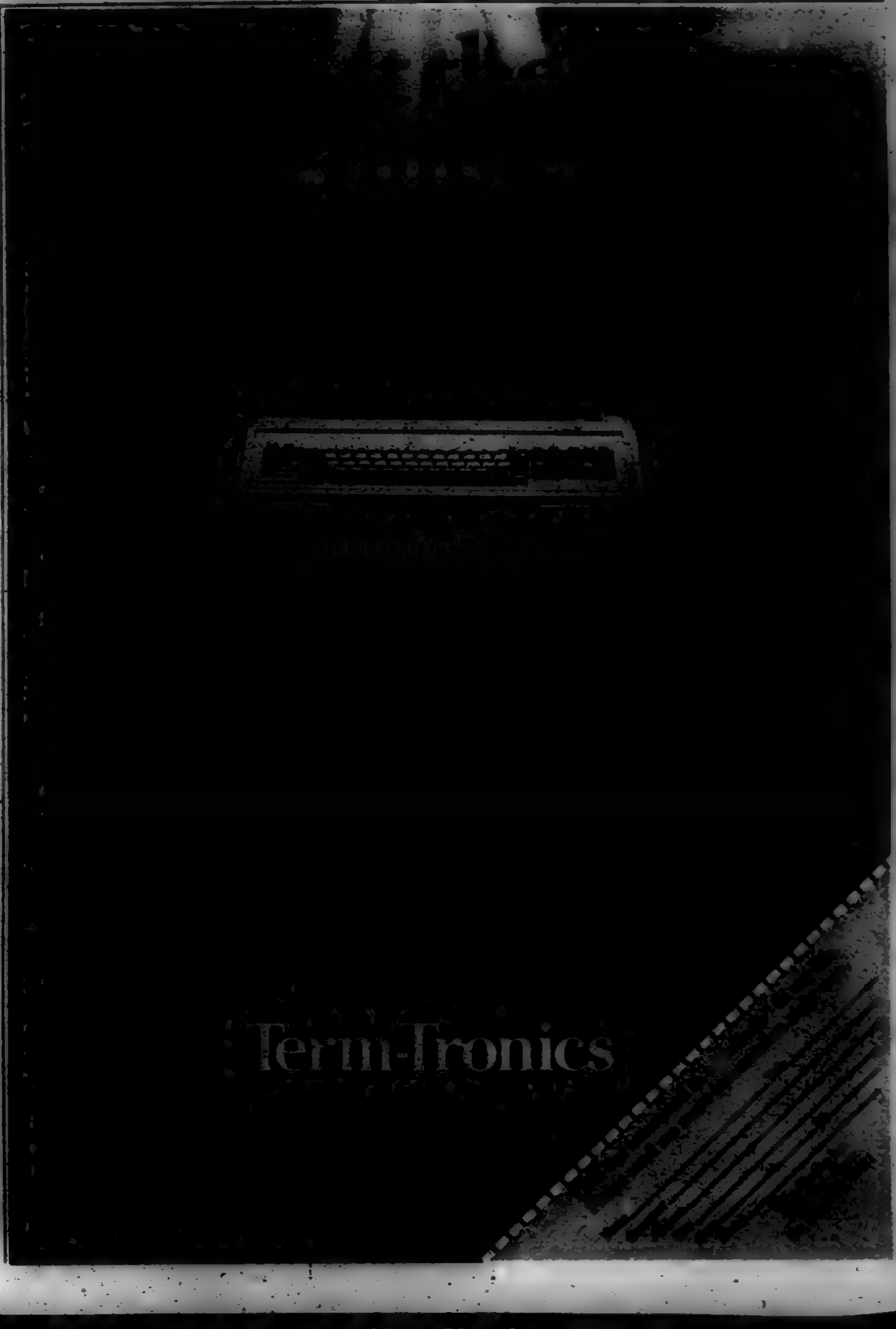


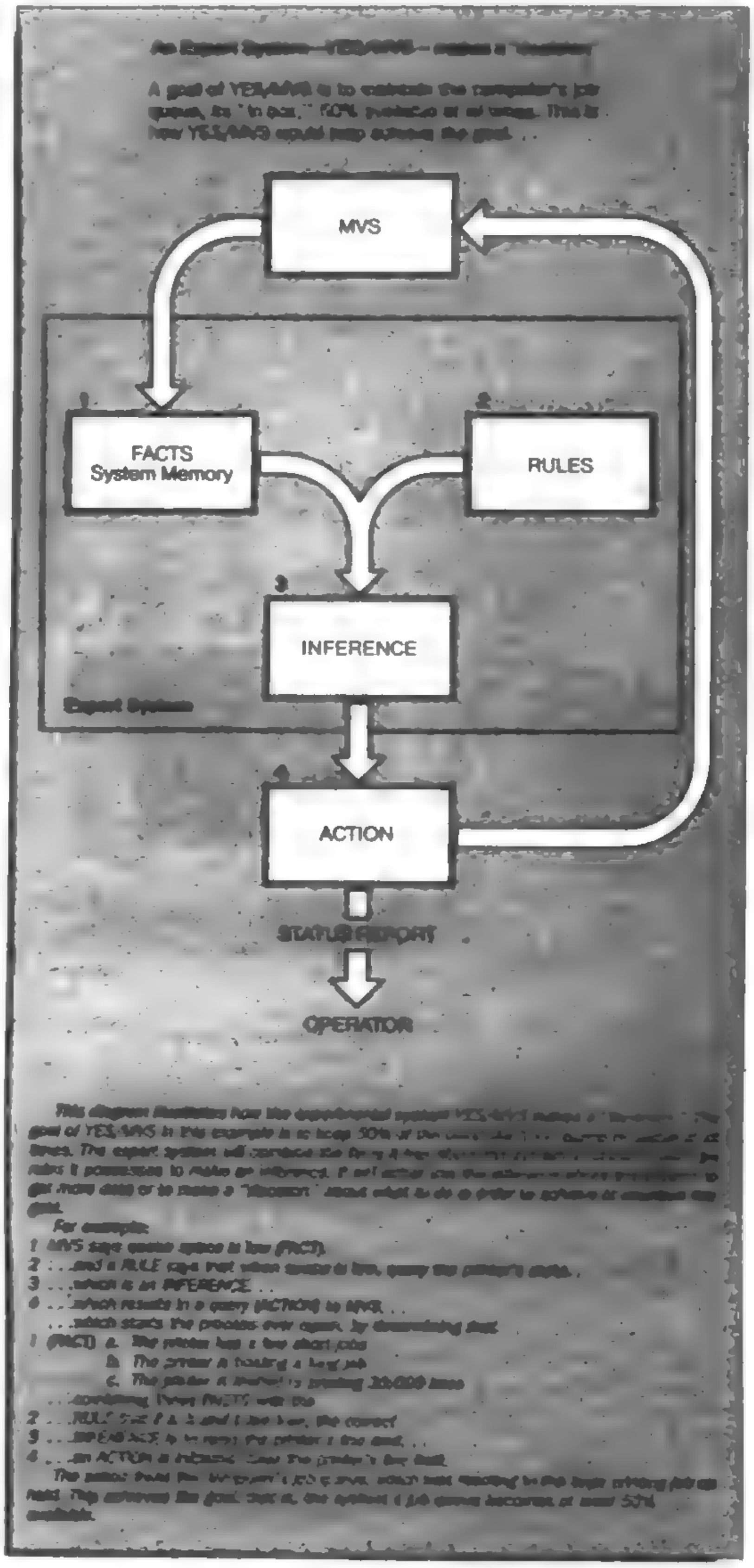
Expert help for MVS

YES/MVS, or the Yorktown Expert System for MVS operators, is an experimental, continuous, real-time expert system designed to control an operating system interactively.

In essence, the expert system can perform automatically many of the functions of a computer operator. The software runs under IBM's VM/370 operating system on an IBM 3081 mainframe. The expert system was designed to monitor the MVS operating system running on another mainframe. This arrangement was made so that problems with YES/MVS do not interfere with the operation of the MVS system. If YES/MVS fails, the subject MVS system can still operate under manual control. Likewise any problems in the subject MVS system will not affect the operation of the expert system.

Currently, YES/MVS is partitioned into three virtual machines for speed and functional separation. One machine contains the MVS operator expert, another contains the MVS Communications Control Facility (MCCF), and the third is used to control the YES/MVS operator's display console.

Se June Hong, senior manager of knowledge systems at the Watson Research Center, recently discussed YES/MVS with Tom Henkel, senior editor, systems.



How did the YES/MVS project get started?

IBM hadn't officially done anything in artificial intelligence for some time. That gave us something of a reputation for being anti-AI, which was not true. The expert systems group was started in February 1983 with the goal of expanding the technical horizons of AI, while at the same time developing something concrete.

We spent three months searching for a domain that would give us something new to do. We didn't want to develop yet another expert system using existing technology. We wanted to do something advanced. We discovered that another group within IBM, the Computer Installation Management Group [part of the Computer Science Department] wanted to develop advanced tools for computer operators. It was an ideal marriage because the operator environment is a real-time, continuous operation situation — not session-oriented.

We took the OPS5 system that was developed at Carnegie-Mellon University and extended it to deal with real-time aspects, distributed processing and so on. After about a year and a half, we got it on-line.

In the beginning, YES/MVS operated like an operator's helper. It was saying "I suggest this" and asking operators what they thought. It was an advisory system.

Now YES/MVS does maybe two-thirds of all the operator's functions that are nonmanual. By "nonmanual" I mean things like answering phones, putting on tapes and shutting off switches. But other things, such as reacting to messages and trying to preallocate resources so things run smoothly, can be handled by YES/MVS.

Our goal was never to replace the operators. We wanted to give them high-level advice that would free their hands. In a critical situation, YES/MVS talks to the operator just as a human operator would in a critical situation. It consults with the operators.

Where did you find the experts to develop YES/MVS?

All over. We had gobs of expert systems programmers on this one. The way we got YES/MVS operating in an automatic mode is just like any other software. It had to run successfully for six or seven night shifts before it was brought up in the daytime. When we were running YES/MVS on the night shift, we tested by sabotaging the machine here and there and watching the response.

How much more work do you have to do before YES/MVS can be developed into a product for IBM customers?

Since we have published details of YES/MVS, we have been deluged with customer requests asking if they can have it today. We tell them to wait because it requires more development work. This is, after all, a single location, and YES/MVS has to be made portable. We must be able to change the rules to be able to accommodate different general policies, configurations and so on.

An interesting question is: How do you verify an expert system? It's an ironic question, and we really don't know the proper procedure.

Where will this project go from here?

It will go to a large machine group, the same people who designed OS. They will have to make it customizable so that it can go to any site of any size. They will have to increase the coverage so that it performs not only two-thirds of an operator's duties but covers everything. The large machine group will probably want to add functions beyond what operators do and make it into a total installation management package capable of doing capacity planning and long-term configurations.

Will you lose control of the project when it is transferred to the product development people?

I'll gladly lose control over it right now. The computer installation management group is continuing to work on YES/MVS, but as far as the expert systems group is concerned, we're happy, we're done. We want to do something else.

Do you know what your next project will be?

We're looking seriously in several directions. The YES/MVS project was, in a way, a crash project. We had to get a group on board and put ourselves on the map. We feel we have done that; now we want to get into some longer term research work.

Did the YES/MVS project develop out of someone's idea or was the need for the research prompted by the product development people?

Neither. This one developed out of the perception that expert systems are important. The technology is in its infancy; there is a lot to be done.

Since your first expert system research project was aimed at the mainframe sector, does that mean your future research will also be directed toward large systems?

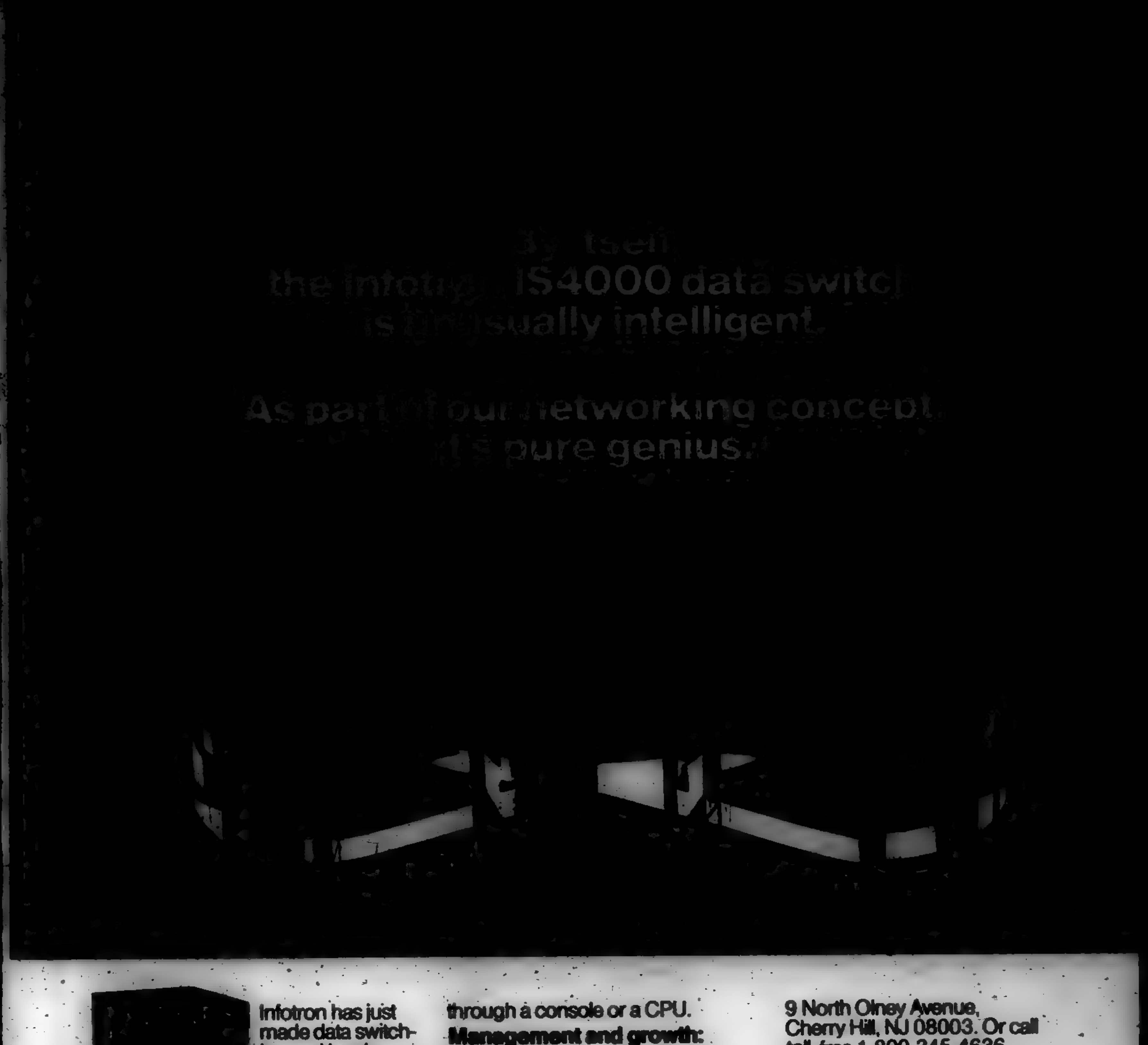
We are not bound to big or small systems. We recognize that you often need a big system to develop an expert system that takes advantage of data bases and communications capabilities. It can also be economical to a big system because you are using cheap, dumb terminals. On the other hand, there is a rationale for using workstations. We're more interested in AI issues than the mechanical needs of implementing AI. Regardless of whether it is a small machine or a big machine, it is more the problem of somebody who is going to put out a product. I hope that will be someone other than me.

How do you balance your commitments to develop products for IBM and your desire to do basic research that will have an influence on the AI field?

The scientific portion of anything we do here at the Watson Research Center should be publishable. Exact information, such as implementation details, can be IBM-confidential. You can effectively isolate the company-confidential portions from the scientific portions. You can become an artist in doing that.

How does the research environment at IBM differ from the environment at an academic institution?

At the university level, you have more freedom to propose your own problems, propose your own axioms and solve your own theorems. In industry research, you are given an actual real-life problem, so you cannot extract clean axioms and solve clean theorems. It is inherently more difficult.



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Saying no to Josephson

British physicist Brian Josephson theorized in 1962 that circuits would become superconductive — lose virtually all resistance — when cooled to near absolute zero (about minus 460 degrees Fahrenheit). The essential technical problem for researchers was to cool the circuits in a liquid helium bath and still maintain the superior switching speeds of Josephson junctions.

IBM, Bell Laboratories and Sperry Corp. risked millions of dollars in the hope that Josephson circuits could become the basis of a new computer system.

By November 1983, all three had scaled back or scrapped their efforts, in effect giving up on Josephson technology. Japanese firms continue to research it.

George Harrar, senior editor, features, spoke to the man who made the decision to end Josephson research.

John Armstrong
Vice-president
Logic and Memory

I made the decision along with the man I report to and the man who headed the program who reported to me. The manager of that program came to me and said it was time to stop. Nobody had ever told us we were spending too much money. Plenty of technical folks in the silicon house thought that they were going to stay so far ahead that [Josephson technology] would never catch up. We did not drop that program just because it was costing us too much money. We stopped because we know more about it than anybody else and yet can't make a good computer out of it.

The [Japanese] don't know yet as much as we do. There are basic difficulties with the Josephson device which will be, at the system level, extremely hard to get around. We had built large pieces of a small computer, done the packaging, built the logic chips with lots of gates on them, designed them to memories. We had some idea of how fast the computer would work.

Our view, at the moment, is that we do not see any really significant practical limitations to the continued evolution of silicon technology. There may be limitations — there is an end to everything somewhere — but it's not the main thing on our agenda to find a replacement for silicon. The main thing is "keep on with silicon."

You read in the press a lot about Josephson junctions that switch at 10 picoseconds or gallium arsenide devices switching in eight or nine picoseconds. These are extraordinarily misleading [figures]. They accurately say how fast that little device switches when you don't require it to connect to anything else.

Never let anybody tell you that large U.S. corporations will not support high-risk technology ventures. Josephson was very high risk and IBM supported it very substantially. At the time we started, the individual switching speed of the Josephson device was far faster than any other device we knew about. And it was therefore hoped that a system built around such devices would be far faster than some other system.

What we found was, yes, we could build it, and it wouldn't be that much better than the silicon computer that would be available at the same time. That's why we stopped. It's not that we couldn't do it but that it wouldn't have been that much better.

Any technology that tries to displace silicon is shooting at a moving target. It's not enough even to think you can do marginally better. You have to be able, at the system level, to do dramatically better before it is a reasonable proposition to ask customers to go with a new technology. So this business about being "technologically advanced" — I think you have to be a little careful. What counts is not who has got the fastest device, or even who has got the most novel or nifty-sounding device, but who can integrate that into a system that delivers reliable and good performance.

We're studying gallium arsenide quite hard but not from the point of view that it is going to be the successor technology to silicon. We absolutely believe it's a fallacious notion that gallium arsenide will displace silicon. There may very well be applications in the communications between subsystems of a large computer system. I would think very likely that optical communications will play a role in systems of the future. There may be specialized signal processor applications, maybe situations where you need modest levels of integration.

People say, "This device is five times faster than the comparable silicon device; therefore, there will be a computer system five times faster." Wrong. What counts is how good the system is. You have to build it. You can come up with a new device that's good, and we support working on a lot of novel devices. You find one that looks particularly promising, now try to build chips. We build chips — that's good for openers, but it's not a computer. You have to have a package that does not squander the speed of your chip, assuming you've been able to keep the speed of the device at the level of the chip.

If you've still kept some of that advantage from the device level to the chip level, then you have to match that improvement with the package, so that at the module level you still have some advantage. But even so, one of those [modules] is not enough to make a computer. It takes nine of them. So they go on some board. You've got to have the technology for that board that does not

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Silicon at IBM: What's up?

Tak Ning walks between the two sides of silicon research — silicon bipolar and MOS [metal oxide semiconductor]. He heads the Silicon Devices and Technology Department, about 30 people divided into the two camps.

Ning, a research staff member for 11 years at IBM, investigates integrated process devices and technology. His group is part of the Advanced Silicon Technology Laboratory.

Ning spoke to George Harrar, senior editor, features.

IBM, if it's not the only one, is one of the very few industrial research organizations devoting significant resources to silicon bipolar devices. Other companies, when they work on VLSI [very large-scale integration], imply MOS and MOS only — in fact, Cmos [complementary metal oxide semiconductor]. Either we're crazy or we're up to something. I think history has proven that we're up to something.

Silicon bipolar has been, and as we see it, continues to be the backbone of the very high-speed computer. When I started working on bipolar, there were already publications saying there was no future. Many people believe that; as a result, they don't work on it. By not working on something, indeed there is no future.

We're trying to achieve two things for bipolar. One is the more traditional — very high-speed logic and memory. We are finding there is a lot of potential in bipolar VLSI as well.

I am making bipolar involving techniques that are familiar to people who work in MOS but not familiar to people who have been working on bipolar alone for many years. It's this coupling between one area and another that is really giving, in our view, life to bipolar.

At this moment, we have finished a lot of exploratory work down to half micron, using direct electron beam writing. We are pushing the half micron to Cmos and beyond, and also we have done quite a bit of work at one micron bipolar.

As far as bipolar vs. MOS — they understand in Fishkill [N.Y.], the IBM bipolar house, they understand very well why I should work on bipolar. They may ask why I should work on MOS. When I go to Burlington [Vt.], the MOS house of IBM, they understand why I should work on MOS. They may ask why I work on bipolar.

For the very high end of the computer — [it's] silicon bipolar. I don't believe MOS is able to do it in any time in the near future, do it in a competitive way. And similarly, for the more conventional VLSI, there is certainly a market for MOS.

squander the performance you've built into this module. Every one of those things adds something to the cycle time.

If you want to build a computer, you have to be experienced enough and technologically mature enough to understand all the trade-offs and all the considerations that go into it.

Leon Cookman
Director of Administration

We did not get out of the big program because we failed in anything we set out to do. We found that the performance gap between silicon as a semiconductor device and Josephson closed faster than we expected. The performance gap left just did not warrant switching to a whole new technology.

People tend to think that every decision in IBM is made in Armonk. That's not right. We are a pretty decentralized company. That decision to get out of Josephson was made here by the director of research after consulting with his people.

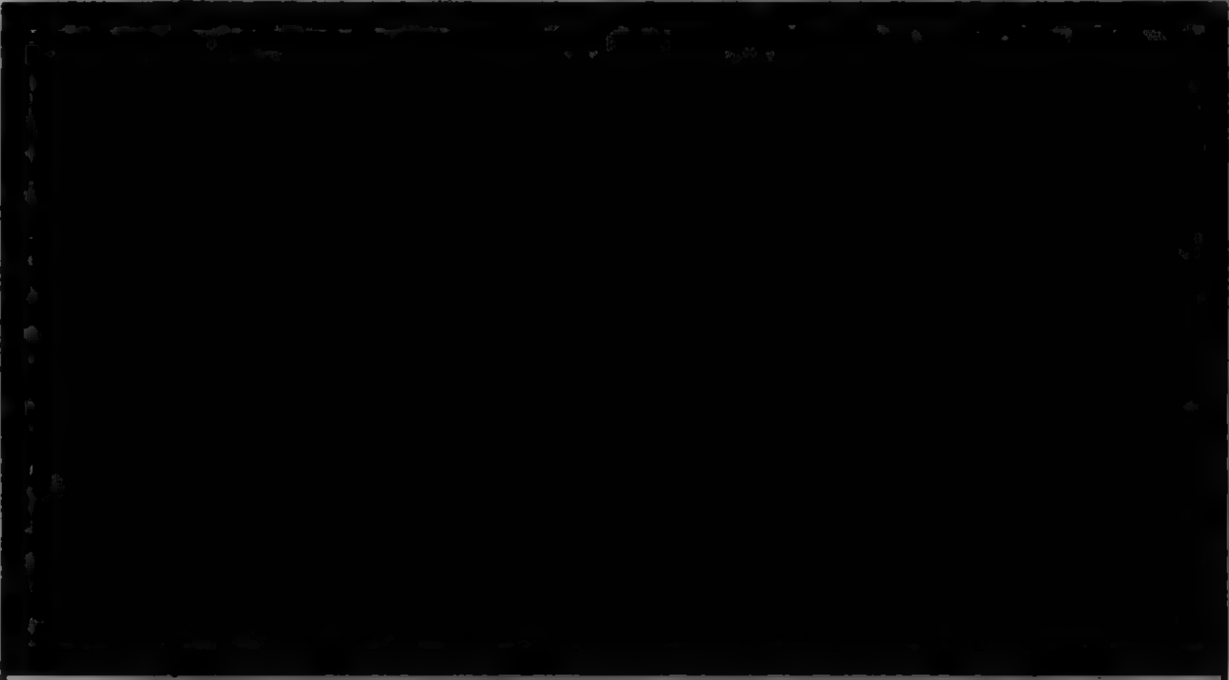
All of those people merely moved from the Josephson area into our other high-speed device work: silicon, gallium arsenide and so on. So we have as much work going on in high-speed devices for the future as we ever had. It's just that we moved our chips around on the betting board.

Joseph Logue
Manager of Packaging Technology and Systems

This is a program I managed until a little over a year ago. It hasn't been stopped completely. We have a small effort continuing to look at the Josephson technology, but it's more in a research mode than in a development mode.

We had done quite a bit of work on packaging Josephson chips and substrates and so forth, but we haven't continued with that aspect of it. We're looking at the fundamental devices.

In terms of gallium arsenide, we are not actively engaged in the packaging program at this point. We feel that we have enough work going on in packaging in general that we can accommodate anything that would be needed for the gallium arsenide work, with maybe the exception of operating at liquid nitrogen temperature, in which case, the work that we've done on the Josephson program would probably be fairly applicable.



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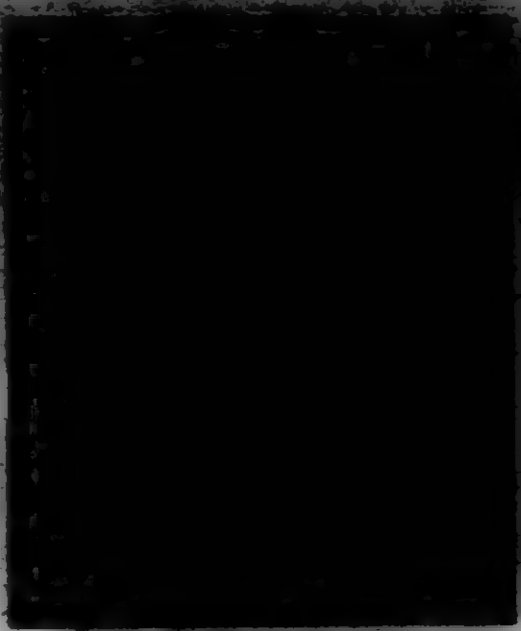

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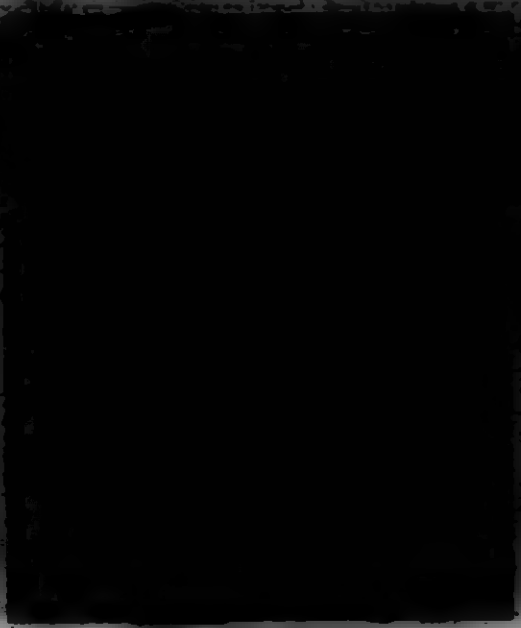

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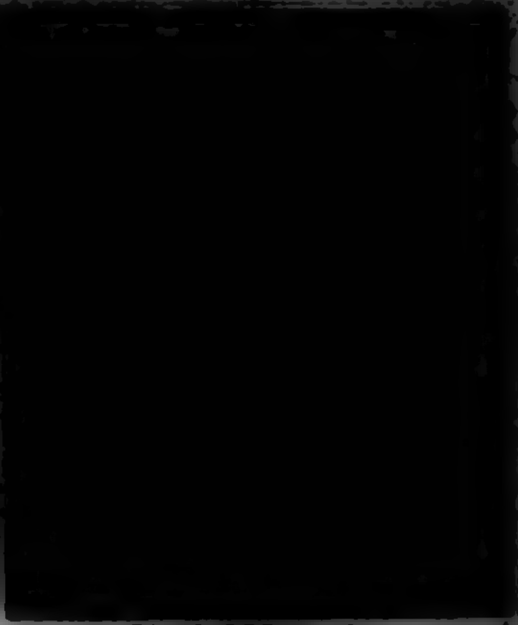

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Systems ideas put to the test

Even the systems center at IBM's Watson Research Center is a test bed for IBM products. For example, the information systems department recently moved an internally developed software package called PC/VM Bond into the commercial sector. The package links IBM Personal Computer users to the mainframe-based VM operating system.

Allan Wyle, director of Computing Systems, manages this department, which serves mostly scientists and uses a large number of experimental programs.

He was interviewed by Tom Henkel, senior editor, systems.

What is your basic charter?

My charter is to provide service to the user community in research and to improve productivity. I buy machines from IBM and put a configuration together and try to provide really top service. Our configuration may be a little different from some of our customers' because we interconnect large machines and try to make them look like one machine to our user community.

We have terminals, or PCs, coming in through local switching and going to a large number of systems with shared data. Our configuration is a little unique, because if this one machine goes down, users can just go on one of the others and get their data. We can do that through local modifications to the system. This [the multiple pathing feature] is really a research project.

When the users here log on in the morning, we tell them which machine is performing the best, and they can log on to that machine. If during the day they are on one of the machines and the performance gets bad, the system will tell them to move over to one of the other machines.

These things are accomplished by a lot of modifications throughout the system. These modifications are not as simple to transfer as something like PC/VM Bond.

[In the Yorktown Heights complex, there are two different sets of systems, one running VM and the other MVS. The VM complex includes six 3081s. The MVS complex consists of a 3084 that will be upgraded to a 3090 by midyear. There are also 20 4300 series systems, some running VM and some MVS.]

The PC Bond project originated in information systems and then developed into a commercial product. Was that the first for the department?

No. Over the years, we have been successful enough to ship 15 to 20 products. HSM [Hierarchical Storage Manager] was one, Resource Access Control Facility (RACF) was another. There are quite a number of success stories.

I suppose many people here at Yorktown Heights using your systems have suggestions on how they can be made a little better. Do you receive much input from the user community?

We have thousands of users who all know just a little more than we do and are very free with their suggestions on how we can improve things. And that is important. There are a lot of good people in the computer science department who know systems. And when they see something they don't like, they make suggestions. And many times we follow them.

> **"** *We can try a product out with thousands of users pounding on it, and if we see problems, we can fix it.*

We try to establish an environment that encourages innovation that we can take advantage of. We have a shared disk on our system that any user can put his program on, once he follows a fairly simple set of procedures. For example, if someone wants to put a new interpreter language out there, he can announce it on a bulletin board. When everyone logs on in the morning, they will find a poster that says there's a new interpreter language on the shared disk along with information on where to get additional information. And people can use it and feed back.

There is a correlation between what is on that disk and what has moved into the product area; Rex is one that comes to mind. Rex is one of the interpretive languages that is on VM/370. It came out of the computer science department. They put it on the shared disk, and it was pounded away by the users. It improved until the product people became interested.

A complimentary example is PC/VM Bond. Our user community here knows Rex and thought we should have that on a PC. So we implemented a Rex interpreter for the PC. And that came out as part of the PC/VM Bond product.

We have a very demanding user community. We put whatever we do in-house and let our user community try it. And it evolves over the years into something that is reasonably good.

There are distinct user communities out there. There are, for example, administrative people, scientists and computer scientists. The programming community is very large, and when we make a change, for example to an editor, we have many people who don't like what we

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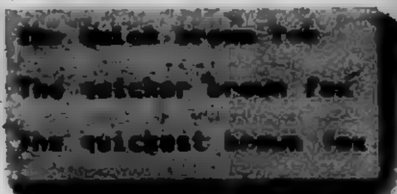
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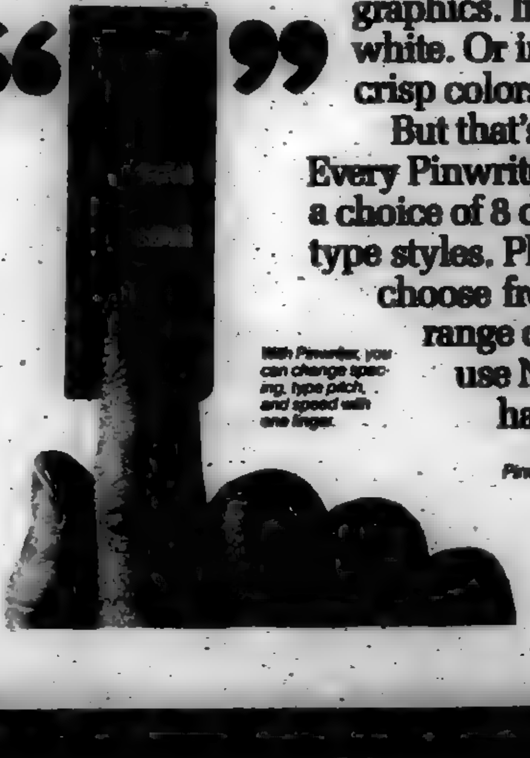

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> *You can keep on introducing change and you can keep on developing things as long as your systems are stable. And to keep them stable, you have to have a good management system for introducing change.*

do. And they feed back. That is how things get better.

Do you keep your ear to the ground to keep track of experimental projects going on in other parts of IBM?

We look all through IBM. We work with the product people. If we find a product that looks like it may solve some of our requirements two or three years from now, we try and get early versions of it. Among the products we received early and worked on was the 3800 Model 3 all-points-addressable laser printer. Another example is the 3880 disk controller models D11 and D13.

I have a half-dozen unannounced products that we are using here now. We are evaluating them and feeding back to the product people. We are a unique test bed because we can try out a new product in an environment that is much better than the average test sequence. We can try it out with thousands of users pounding on it, and if we see problems, we can fix it. In the case of the 3880 controllers, we made some modifications to the VM operating system to make the controllers run more efficiently.

And we can let the product people know what is wrong with a product and let them fix it for our environment, if they don't want to take what we have done.

Your department appears to be halfway between the research and product development stages. How do you fit into the IBM product development scheme?

First and foremost, we provide a service. And as long as the service is good, we'll survive. Second, when I see an opportunity to improve the service, I'll take a few spare resources and apply them there. If we're successful, we'll go to the product guys and say, "Do you like it?" And most of the time, they say it has passed the test of being pounded and is useful. Sometimes they say, "But it doesn't fit with our strategy" or, "It is low on our priority list." Most of the time, they will send someone down to see if a project can be transferred into a product.

Technology transfer is based on many things, one of which is, "What have you done in the past?" We have a reputation for producing relatively good things.

One's reputation, or track record, appears to be very important at Yorktown Heights. Does that quest for a good reputation influence your research? Are you reluctant to get into a situation where an idea could fail because it could damage your reputation?

No, it is not an influence. I have two or three things going that most probably will not make it. The difference between someone who is successful and someone who isn't is that the successful people try and minimize the things that aren't going to succeed. They recognize them sooner rather than later. And the things that separate the really good guys are they know what is going on both inside and outside IBM. They really minimize the number of bad directions they take. But we all take risks.

How do you determine when you have done enough research and an experiment is not going to pan out?

I'm different from the physics department, the logic department or other departments. I don't do any work unless I can see results within two to three years. If I see a project wandering without real hard results or it is not progressing well, I think it is a candidate for redirection.

How do you balance the desire to develop new projects with the responsibility to provide a stable environment for systems users here at the Watson Research Center?

There is always a conflict between change and stability. Every installation manager is faced with that same dilemma. We have a good set of management procedures on how to introduce change into our systems. We introduce change very slowly and in a very sequenced way. Our procedures are probably very similar to those of the big banks or airlines. We change our systems very frequently, probably more than most of our customers. You can keep on introducing change and you can keep on developing things as long as your systems are stable. And to keep them stable, you have to have a good management system for introducing change.

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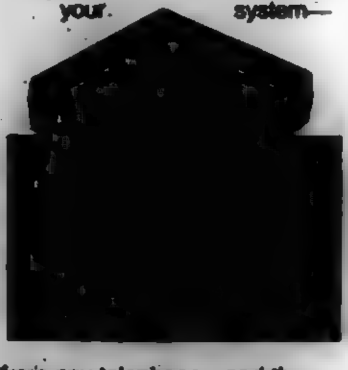

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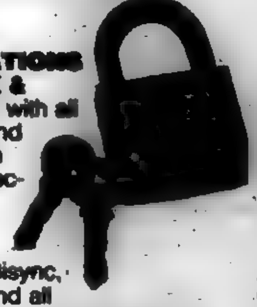

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Power to the users

Part one

By Pieter Mimno

Major changes are occurring in fourth-generation language application development techniques. New technology and fresh ideas are causing rapid improvements in the effectiveness and applicability of high-productivity languages.

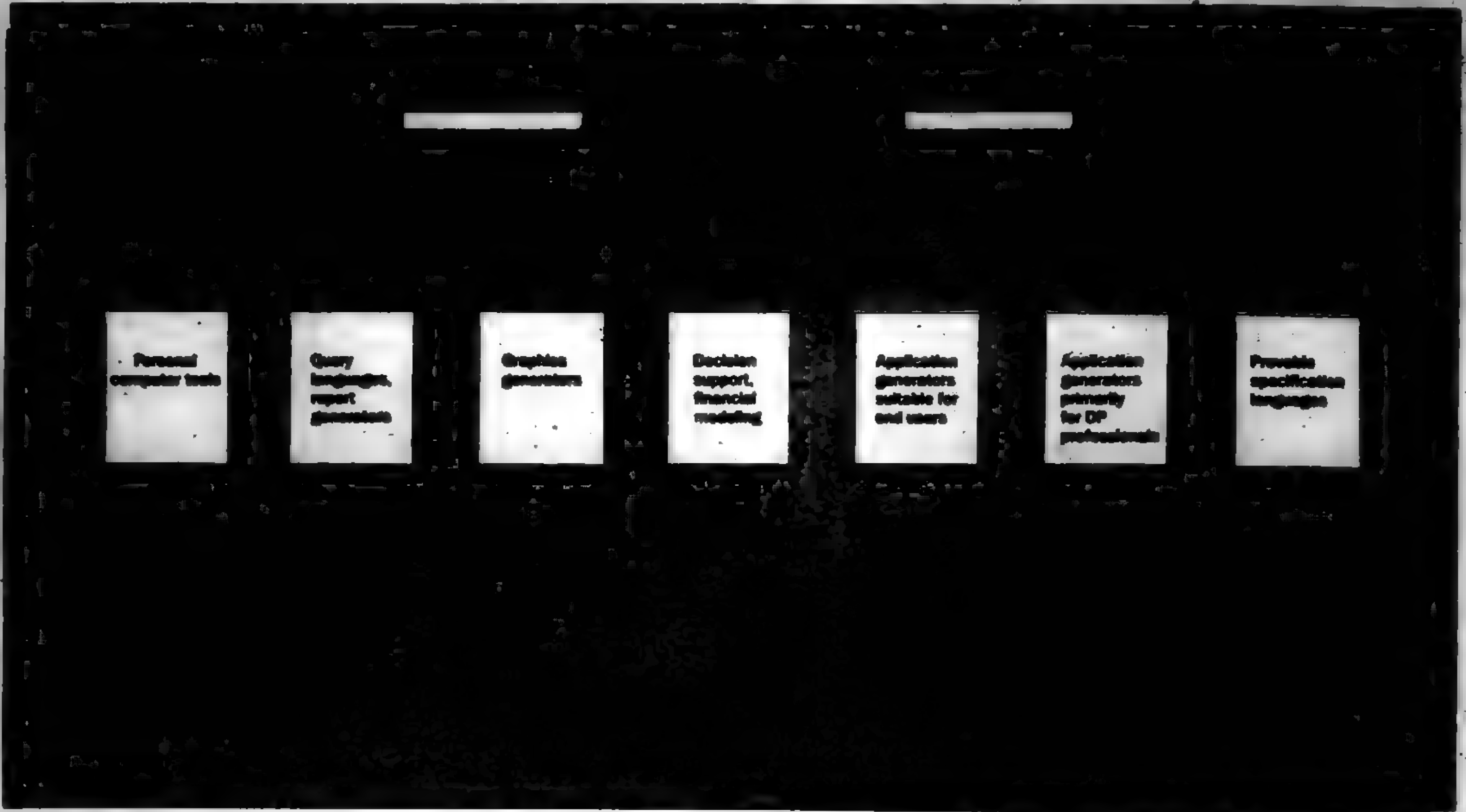
End users can now be provided with simple fourth-generation language tools that enable them to process routine applications without assistance from DP. Organizations typically report productivity improvements of 10:1 relative to Cobol for end-user-driven information processing applications that do not require much procedural logic.

DP professionals can use more complex versions of these same tools to build large-scale batch or on-line applications. Moderate to large-scale applications requiring an extensive amount of customized procedural logic may be built three to four times faster with fourth-generation languages than with Cobol.

Intense demand for simplified access to computers and for increased development productivity has resulted in dozens of new and improved fourth-generation language tools. The ensuing competition has led to a striking improvement in the way computers are used.

Most fourth-generation language tools have been developed within the U.S. for an IBM environment. ***The James Martin Report on High-Productivity Languages*** tracks 45 leading fourth-generation language tools.

The second part of this two-part series will cover fourth-generation products.


Personal computer tools
Query languages, report generators
Graphics generators
Decision support, financial modeling
Application generators suitable for end users
Application generators primarily for DP professionals
Provable specification languages

Charts reprinted with permission of The James Martin Report on High-Productivity Languages, published by Technology Insight, Inc.

Figure 1. Categories and examples of development tools

Of these 45 tools, 43 originated in the U.S., and 35 were developed for an IBM environment. This does not reflect a bias toward U.S. tools or toward the IBM environment. It is simply the result of intense competition within the U.S., coupled with a lack of effort in foreign countries.

Significant changes in application development techniques are now occurring:

- Familiar manual development techniques used for 15 years or more are being replaced by more efficient automated techniques.
- Tools appropriate for end users are being widely used for data query, data input and editing, report generation, graphics generation, decision support systems and some categories of application generation.
- End users are moving rapidly toward a distributed computing environment in which a personal computer is used as an intelligent workstation for local data manipulation and a mainframe is used to store corporate data.
- Information centers are beginning to provide a stable, well-supported environment for end-user computing.
- Automated development tools appropriate for DP professionals are now available that replace the need for Cobol for most business applications.
- Provable specification techniques generate code automatically from bug-free specifications.
- Entirely new technologies are springing up that will eventually eliminate the need for hand code for all applications.

Fourth-generation languages are difficult to define. One simple definition requires that a language not be called "fourth generation" unless the following holds true:

- Users can obtain results in one-tenth the time required by third-generation languages such as Cobol and Fortran.
- The system is user-friendly, user-seductive and easy to learn and remember.
- The tool is appropriate for use by both end users and DP professionals.

Another way to define fourth-generation languages is to list the categories of application generation languages:

- Integrated personal computer tools.
- Query languages and report generators.
- Graphics languages.
- Decision support and financial modeling systems.
- Application generators suitable for end users.
- Application generators intended primarily for DP professionals;
- Provable specification languages.

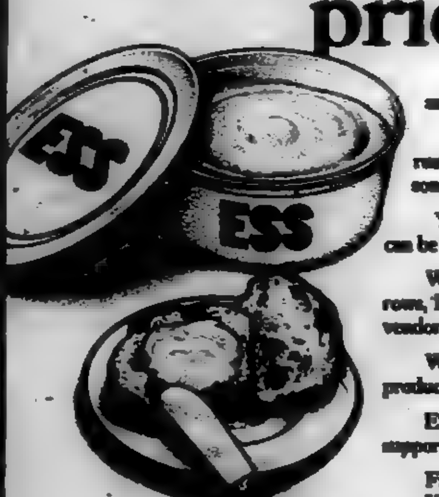
Language tools

Figure 1 shows representative categories of fourth-generation language tools and includes examples of specific tools in each category. Products listed on the left side of the figure require little or no data processing experience. In many cases, an end user can make effective use of these products with no support from DP personnel. The more complex products listed on the right side of the figure are intended to be used by experienced DP professionals. Figure 2 provides a listing of leading high-productivity tools.

As shown in Figure 1, a non-DP professional can start with simple facilities, such as stand-alone personal computer tools, and progress to more complex and powerful tools.

Integrated tools

Many business professionals who lack experience with computers find it necessary to access and manipulate information from the corporate



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data base. The ideal first step for them is to purchase an IBM Personal Computer or equivalent machine and learn how to use simple, end-user-oriented tools, such as Lotus Development Corp.'s 1-2-3 or Symphony, Ashton-Tate's Dbase III or Framework or the IBM Personal Decision series and Business Management series.

The next logical step for the business professional: Download data from the corporate data base and process that data on a personal computer using integrated personal computer tools. Several tools provide the capability to utilize a personal computer to request information from a data base on an IBM mainframe. These products include Artificial Intelligence Corp.'s Intellect; Comshare, Inc.'s System W; Information Builders, Inc.'s Focus; Mathematica Products Group, Inc.'s Ramis II; D&B Computing Services' Nomad2; Cincom Systems, Inc.'s Mantis; Software AG of North America, Inc.'s Natural; and Cullinet Software's ADS/On Line.

The data is automatically transmitted to the personal computer in the format required by 1-2-3 or Dbase III. The user can then operate on the data using the personal computer tools with which he is already familiar.

Query languages

Query and update languages on either a personal computer or a mainframe let users interact with a computer using a simple, easy-to-understand language. Examples of leading mainframe query languages include Intellect; Digital Equipment Corp.'s Datatrieve; IBM's QMF, SQL/DS or Query-by-Example (QBE); Pansophic Systems, Inc.'s Easytrieve; and Infodata Systems, Inc.'s Inquire. Using Intellect, queries can be made using everyday conversational English, such as:

REPORT THE BASE SALARY, COMMISSIONS AND YEARS OF SERVICE BROKEN DOWN BY STATE AND CITY FOR SALES CLERKS IN NEW YORK AND MASSACHUSETTS.

Requests such as this one may invoke automatic searching or joining of multiple data base records. Because of the searching or joining operations, query languages are tied closely to their associated data base management systems (DBMS).

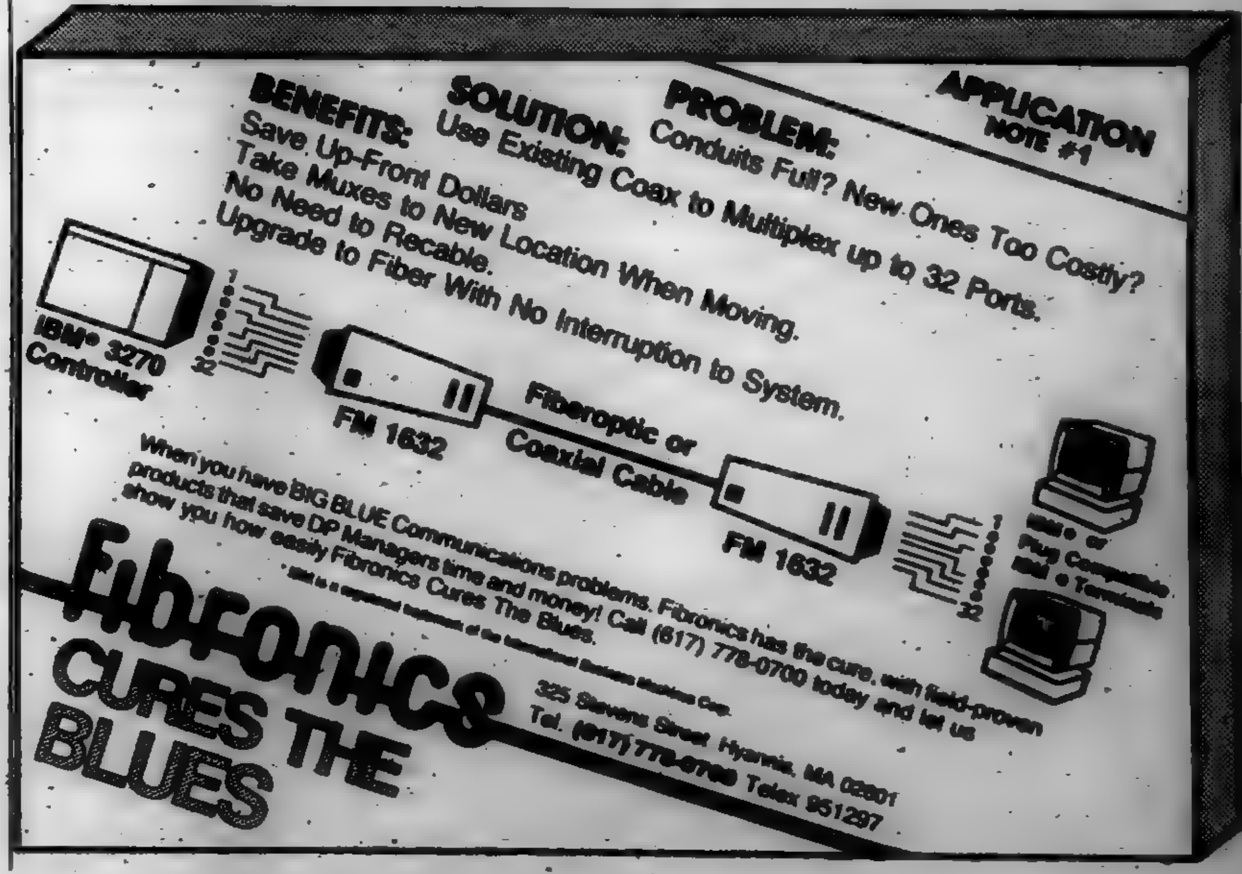
Report generators are used to extract required information from a data base, to manipulate the data, to build files and to produce formatted reports. Good report generators allow substantial arithmetic or logic to be performed on the data before it is displayed or printed. Many report generators integrate with query facilities and a data base system. In general, they are easy to learn and highly versatile. Examples include IBM's ADRS II, Datatrieve, Intellect, QBE, SQL/DS, QMF, Easytrieve, RPG III, Honeywell, Inc.'s Personal Data Query and Inquire.

The most comprehensive graphics facilities for mainframes are provided by dedicated tools such as Integrated Software Systems Corp.'s Tell-A-Graf. Routine presentation graphics requirements are easily met by the graphics components of integrated personal computer tools such as 1-2-3 or Framework as well as the graphics components of full-function application generators such as Focus, Ramis II, Nomad2, Mantis and Natural.

			Suitable for	
Category/Product	Vendor	Environment	End User	Analyst
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Query languages and report generators				
ADRS-II	IBM	IBM	✓	✓
Datatrieve	DEC	DEC	✓	✓
Easytrieve	Pansophic Systems	IBM, Siemens	✓	✓
Inquire	Infodata Systems	IBM	✓	✓
Intellect	Artificial Intelligence	IBM, Honeywell	✓	✓
RPG-III	IBM	System 36	✓	✓
QBE	IBM	IBM	✓	✓
QMF	IBM	IBM	✓	✓
SQL/DS	IBM	IBM	✓	✓
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Decision support and financial modeling				
Express	Management Decision Systems	IBM, Prime	✓	✓
System W	Comshare, Inc.	IBM, IBM Personal Computer	✓	✓
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Application generators for DP professionals				
ADS/Online	Cullinet Software	IBM	*	✓
CSP	IBM	IBM		✓
DMS	IBM	IBM		✓
Application Factory	Cortex Corp.	DEC	*	✓
Ideal	Applied Data Research	IBM	*	✓
Info	Henco, Inc.	IBM, DEC, Prime	*	✓
Linc	Burroughs Corp.	Burroughs	*	✓
Mantis	Cincom Systems	IBM	*	✓
Mark V	Informatics General	IBM	*	✓
Mimer	Savant Institute	IBM, various	*	✓
Natural	Software AG	IBM, DEC	*	✓
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

* Subset may be suitable for end users.

Figure 2. Leading fourth-generation language products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Decision support and financial modeling tools help business professionals solve business problems. They help users analyze data, answer "what-if" questions, create financial or other models and generally extract meaningful information from complex data.

There are basically three categories of decision support systems (DSS):

- Simple, two-dimensional spreadsheet tools for the IBM Personal Computer, such as 1-2-3, Framework, Microsoft Corp.'s Multiplan, Software Arts, Inc.'s Visicalc, Comshare, Inc.'s Micro W and the Plans Edition component of IBM's Personal Decision series software for the Personal Computer.
- Mainframe DSS tools capable of manipulating complex business models in multiple dimensions, such as System W and Management Decision Systems Corp.'s Express.
- Highly sophisticated tools, such as Express, that incorporate powerful operations research techniques and multidimensional relational data bases.

The end user may start with simple, two-dimensional spreadsheet tools for the personal computer, which are capable of building business models of moderate complexity. When it becomes necessary to analyze models in more than two dimensions, the user may then move on to the more powerful mainframe tools such as System W and Express. These tools maintain the data base separately from the model equations and support functions such as rate-of-return calculations, discounted cash flows, currency conversions and so on.

Application generators

Application generators are integrated fourth-generation language tools that permit an entire application to be generated. The most useful full-function application generators support a wide range of integrated components, including a DBMS, data dictionary, security facilities, query language, report generator, screen painter, graphics generator, decision support or financial modeling tools, multiple end-user interfaces, high-level procedural language, data definition language, distributed processing facilities, a micro-to-mainframe communications link and a separate version of the tool for a personal computer.

Rather than using separate tools to perform query, reporting, graphics, decision support and application generation functions, the user can apply one highly comprehensive tool to perform all of these functions. These integrated tools provide a single, consistent interface to the user rather than the multiple, disjoint interfaces offered by separate, specialized tools.

Application generation tools that are oriented toward end users include Focus, Ramis II, Nomad2, SAS Institute, Inc.'s SAS, Sperry Corp.'s Mapper, Oxford Software Corp.'s UFO, Computer Associates International, Inc.'s CA-Universe, IBM's TIF and Hogan Systems, Inc.'s Umbrella System. Of these tools, Focus, Ramis II and Nomad2 provide the most comprehensive set of integrated facilities.

Most of these languages are relatively easy to use and generally contain a subset of functions that are suitable for use by end users. Three of these tools (Focus, Ramis II and Nomad2) support a version of the tool that may be run on an IBM Personal Computer, Personal Computer XT or Personal Computer XT/370. Routine applications not requiring a large amount of procedural logic can often be developed in one-tenth the time required to write an equivalent Cobol program by hand. The resulting application contains far fewer errors and is much easier to debug than a hand-generated Cobol program.

Faster results

These factors together make it possible to obtain results much faster than with traditional programming. Recently, several integrated application generators have become powerful and versatile enough to permit the elimination of hand code for most business applications.

Many of the application generators available today aim more for DP professionals than for end users. These heavy-duty tools provide a full range of capability to implement transaction processing applications and complex logic. In many cases, an application can be tailored to run efficiently in a heavily loaded online transaction processing environment.

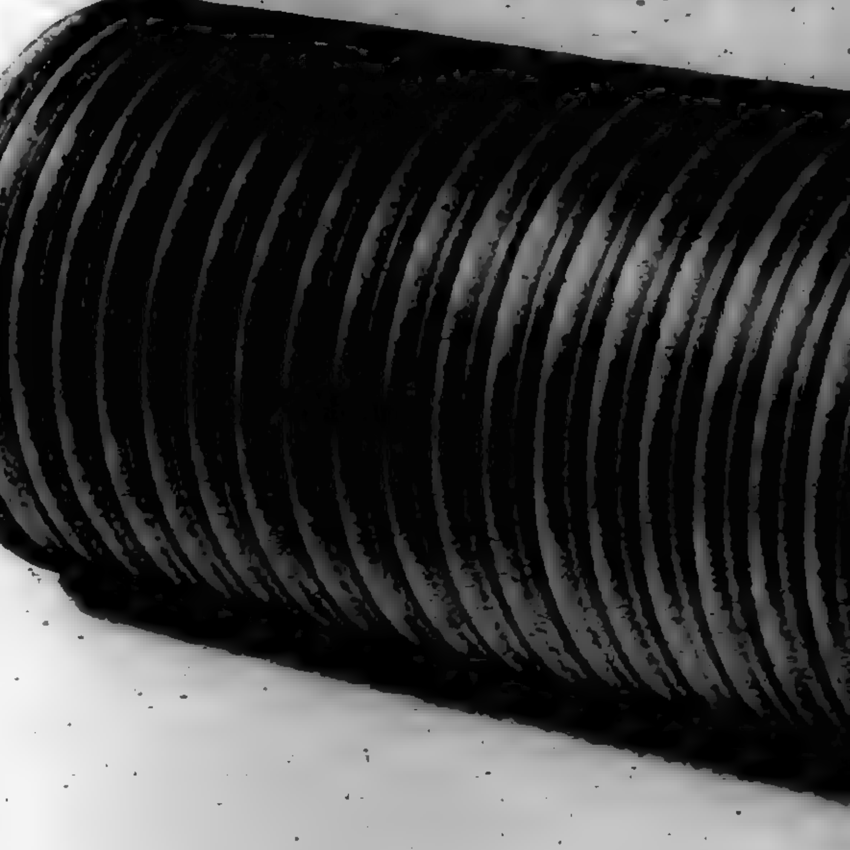
Application generators for DP professionals generally include a very high-level procedural language that is used to specify logical operations. These tools are usually integrated with a full-function DBMS that supports both relational and other data structures.

Examples of application generators for DP professionals include Applied Data Research, Inc.'s Ideal; ADS/On Line; IBM's ADF, CSP and DMS; Natural; Mantis; Cortex Corp.'s Application Factory; Pansophic Systems, Gener/OL; Henco Software, Inc.'s Info; Informatics General Corp.'s Mark V; Burroughs Corp.'s Linc; and Uppsala Data Centre's Mimer.

Techniques now available enable analysts who are not mathematicians to create specifications that are free of logical errors. Currently, the only practical tool using provable specification techniques is the Use.it system developed by Higher Order Software.

The unique feature of Use.it is that it has the ability to prove mathematically the logical correctness of specifications. Errors in specifications that have been detected automatically by the system may be easily corrected by the user. Specifications that have been proven

For fast relief



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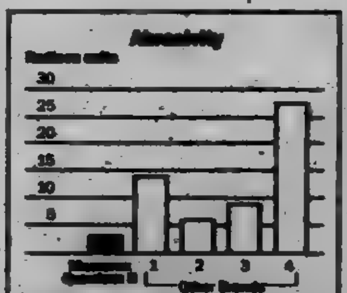

by Use.it to be logically correct may be converted automatically into program code and consistent documentation for a specified system environment.

Major trends

The intense competition between fourth-generation language products and the development of better technology are resulting in the following significant improvements in fourth-generation language tools:

■ Integration. Formerly distinct functions are being combined to produce powerful integrated tools with a common user syntax.

■ Automation. Manual development techniques are being replaced by automated techniques.

■ Accessibility. Fourth-generation language tools are becoming accessible to a much broader range of end users.

■ Personal Computer versions. Several of the leading fourth-generation languages are available in versions that run on the IBM Personal Computer XT or XT/370.

■ Information center orientation. Full-function fourth-generation language tools are ideally suited for use in an information center environment.

A composite of the features supported by leading full-function fourth-generation languages is presented in the box at right. These are features that a potential buyer should seek.

Integrating functions

Rather than acquiring numerous incompatible tools, each supporting one or more functions, it is much more effective to select development tools that integrate as many useful functions as possible within a common command and operational framework.

For example, Focus, Ramis II and Nomad2 provide support for both relational and hierarchical structures, support of external data files, a data dictionary, query language, report generator, graphics generator, screen painter, procedural language, interfaces to external languages, financial support tools, distributed processing functions and support for a separate version of the tool on an IBM Personal Computer or XT/370. Other leading full-function fourth-generation languages such as Natural, ADS/On Line, Mantis, Ideal and Application Factory provide a smaller subset of these functions.

More limited fourth-generation languages such as SAS, Mapper,

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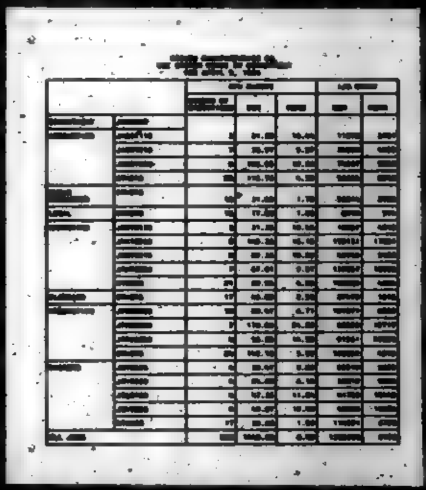

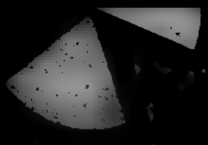

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UFO, CA-Universe, TIP, Umbrella, ADF, CSP, Genor/GI, Info, Mark V, Linc and Mimer support substantially fewer integrated components.

Ramis II provides 28 integrated functions accessible by a user within a common set of interfaces. Focus, Nomad2, Natural, ADS/On Line, Mantis, Ideal and Application Factory provide progressively fewer integrated functions.

Automated development

The most important new trend in technology is the replacement of manual development techniques with automated ones. There are major differences between the two:

- Manual techniques are incapable of providing the 10:1 productivity increase that is required and must be replaced by automatic techniques wherever possible.

> ***Structured techniques, such as those advocated by Edward Yourdon, Larry Constantine, Chris Gane, Trish Sarson and others provide only a small improvement in productivity over conventional manual techniques and should be replaced by automatic techniques.***

- Structured techniques, such as those advocated by Edward Yourdon, Larry Constantine, Chris Gane, Trish Sarson and others provide only a small improvement in productivity over conventional manual techniques and should be replaced by automatic techniques.
- Automation of manually oriented conventional or structured techniques is not productive and should be avoided.
- Automated tools require entirely new methodologies.
- Automated tools utilizing new methodologies are available now and should be considered for use for all new applications.

Automatic code generation is an integral part of automated development techniques. The nonprocedural (that is, noncoding) components of full-function fourth-generation languages make it easy to specify to the computer what the user wants to do. Using most of the leading fourth-generation languages, it is relatively easy to formulate a query, specify a report, plot a graph or analyze data using statistical tools. Most of these tools also contain user-friendly interfaces to define data variables, data attributes, screen layouts, menus and interactive dialogues.

These nonprocedural components of fourth-generation languages may be used effectively by non-DP professionals to access data, generate simple data entry and editing transactions and produce reports or graphs. These same nonprocedural components may be put to work by experienced systems analysts to build prototype systems that may be demonstrated for the end user. All these tasks may be performed without writing a line of procedural logic.

The procedural component of full-function fourth-generation languages is used to specify the specialized logic required in most applications. The procedural language used by fourth-generation languages is a high-level programming language that includes I/O statements, loops, conditions, control statements, arithmetic and assignment statements.

A typical fourth-generation procedural language is similar to Cobol but of a higher level. For some fourth-generation languages, such as Focus, Nomad2, Natural, Ideal and Application Factory, the procedural language is rich enough in functions to replace Cobol for most business applications. Less richly endowed procedural languages require escapes to Cobol, Fortran, PL/I, APL or assembler to implement specialized procedural logic.

A problem for all fourth-generation languages is that the specification of procedural logic is a slow process compared with the specification of nonprocedural functions, such as the generation of screens, reports, graphics and on-line transaction dialogues. Applications requiring a relatively small amount of specialized procedural logic can be developed 10 to 15 times faster than with Cobol. Most end-user-driven information processing applications fall into this category, since they utilize primarily nonprocedural functions.

Unfortunately, most real-world applications developed by DP professionals require a great deal of procedural logic. The logic is used to specify detailed processing functions, utility functions, error handling conditions, highly customized formatted reports, specialized interfaces and so on. In one large application, for example, 15% of the total effort was devoted to the nonprocedural development of screens and reports. However, 35% of the total effort was consumed in coding utility routines using the fourth-generation procedural language.

In general, if an application requires a substantial amount of procedural logic, the overall productivity improvement provided by the fourth-generation language will be reduced.

Various techniques have been used by different fourth-generation

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language products to minimize the time required to specify procedural logic. Both ADS/On Line and Application Factory encourage the specification of small modules of logic tied directly to specific events in the application. In Application Factory, logic modules may be attached to screen events, report events, data base access events, menu events or data entry events. The effect is to eliminate the need for large blocks of procedural code and to simplify maintenance.

Action diagramming techniques have been used recently to simplify the specification of procedural logic. Action diagrams clearly show the logical structure of the procedural code. To date, Application Factory is the only fourth-generation language tool that supports action diagramming techniques.

Well-designed languages offer the following:

- Avoidance of unnatural, computerese syntax.
- Use of natural English wherever possible.
- Choice of multiple command interfaces geared to different levels of user experience (that is, choice of natural English, two-dimensional menus or near-English command syntax).
- User-seductive interaction with the computer.
- Adequate menus, prompts, Help and self-teaching facilities.
- Rapid, on-line interaction with displays.
- Two-dimensional display dialogue.
- Use of overlaid display windows.
- Use of graphics symbols (icons).
- Use of a mouse to select commands, menus, scroll and edit functions.
- Minimal keyboard interaction.
- Intelligent default options.
- Simple subset of operations that can be learned in one or two hours.

Most fourth-generation language tools force users to learn a rigid set of commands or statements, which must be entered precisely in order to avoid syntax errors. Very few tools offer user-friendly human interfaces.

Apple Computer, Inc.'s Macintosh and Lisa may serve as a standard against which the human interfaces of fourth-generation languages are compared. No existing fourth-generation language even approaches this standard yet.

Focus and Ramis II provide the user with a choice of interfaces including natural English, menus or command syntax. Natural, Mantis and Ideal offer a more limited choice of menus or commands. This range of choices makes it possible for non-DP professionals to use a subset of the functions provided by the tool. The end user may start with a simple subset of the functions that can be learned in two hours or less. Once the user has become completely familiar with the subset, he can progress to a wider range of functions.

Focus incorporates a well-designed, menu-driven human interface called Tabletalk, which encourages the user to move from simple to more complex functions. Tabletalk provides a user-friendly interface for queries and reports. All Tabletalk functions are selected from menus, which minimizes errors and eliminates the need to learn a command language. In response to menu selections, the Focus command that corresponds to the selected operation is displayed in a separate window on the bottom of the screen. This window can be used as an effective self-teaching aid for the more powerful Focus command language.

Almost all fourth-generation languages require the user to enter commands according to a precise syntax. A small number of tools, including Tell-A-Graf, permit the user to enter commands in a flexible, near-English syntax. Many versions of the same command are acceptable to the system.

Natural English language processors are beginning to be used in fourth-generation languages. Both Focus and ADS/On Line incorporate an interface to the query and report generation language Intellect. Ramis II is the first fourth-generation language to incorporate a fully integrated natural language processor called Ramis II English.

Although the range of applicability of natural English processing remains relatively narrow, the potential is enormous. Currently, its use provides an easy first step in computer literacy for decision makers who do not have

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> ***Apple Computer's Macintosh and Lisa may serve as a standard against which the human interfaces of fourth-generation languages are compared.***

the time or inclination to learn an alien command syntax. Ultimately, the more widespread use of natural English processing should eliminate the need for rigid command languages.

Support for personal computers may become one of the most important factors to be evaluated in selecting one fourth-generation language over another.

The provision of fourth-generation languages on a personal computer greatly enhances the language's value to the user. Applications may be developed or run interchangeably on a personal computer or mainframe. Data may be accessed from the mainframe and processed on the personal computer. End users may use fourth-generation language functions on the personal computer to progress step by step toward computer literacy.

Currently, only four fourth-generation language tools are available in both a personal computer and mainframe version. PC/Focus is available on an IBM Personal Computer XT or AT. Ramis II/PC is available on the XT/370. Nomad/PC is available on the XT/370. Cricket (the Personal Computer version of Mantis) is available on the XT/370.

Improvements to fourth-generation languages will likely occur in the following directions:

Integration and automation.

- Wider use of structured constructs.
- Use of action diagrams to simplify the specifications of procedural logic.
- Provable specification techniques.
- Continued evolution to relational data bases.
- Integration of application packages with fourth-generation language.
- Integration of decision support tools with fourth-generation language.
- Definition of standards for data representation.

Human factors.

- Elimination of alien, nonhuman syntax.
- Use of natural English for command languages.
- Use of human interfacing techniques currently available only on the Macintosh and Lisa.

Support of personal computers.

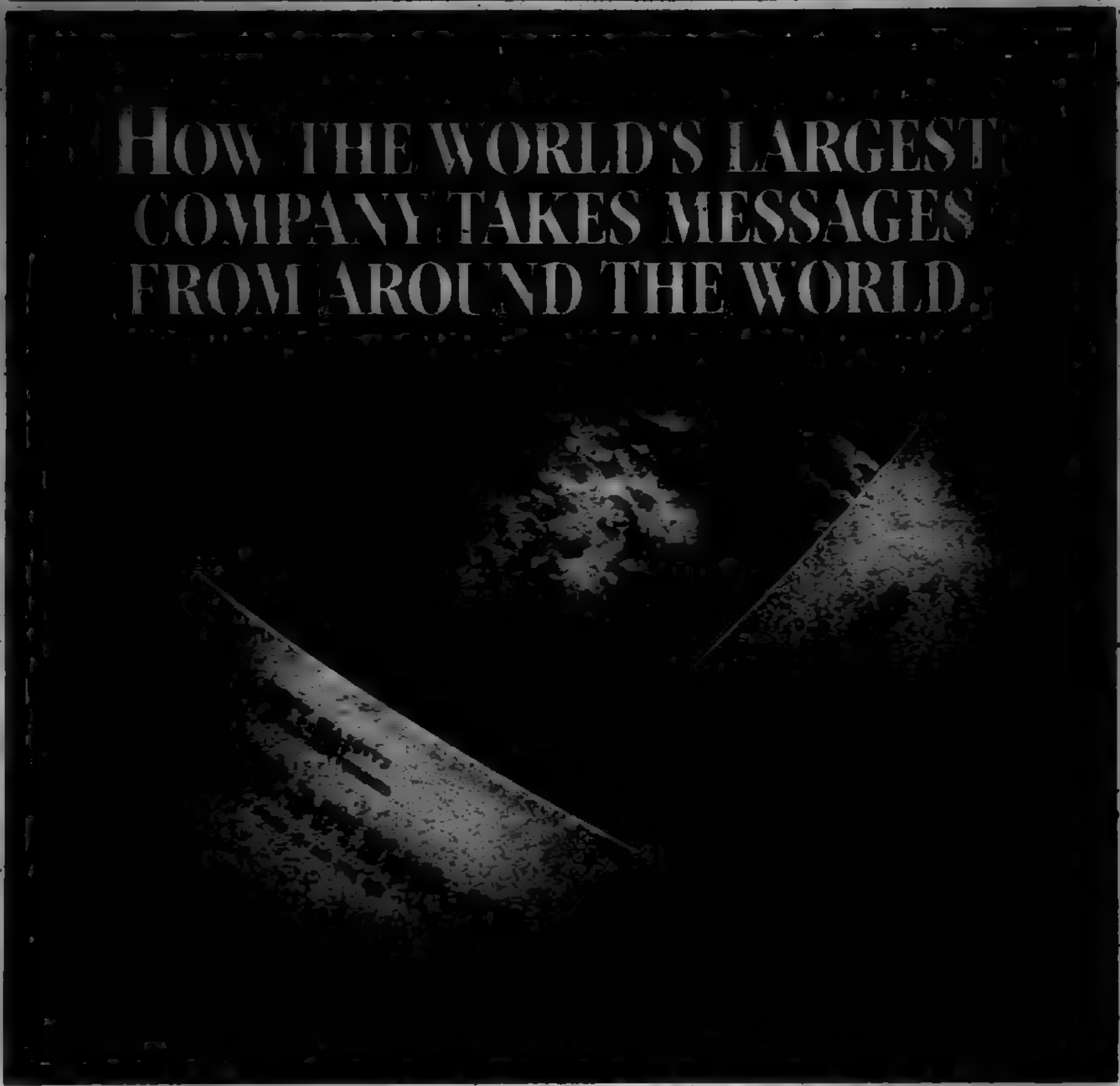
- Evolution of more powerful local workstations supporting the needs of knowledge workers.
- Subsecond response time.
- Very fast interaction with system (for example, 400 interactions per hour).
- High-speed interface to distributed data base.
- Transparency of data residence.
- Widespread use of personal computers for information processing, application development and management of a local data base.

Information centers.

- Massive growth in support of end-user computing and knowledge workers.
- Reduction in the number of tools used in information centers and an increase in their power.
- Consolidation of fourth-generation language development methodology based on advanced prototyping techniques.

About the author

Pieter Mimno is president of Technology Insight, Inc. of Marblehead, Mass., which publishes The James Martin Report on High-Productivity Languages. *The Martin Report is a new information service that provides continually updated information on high-productivity tools. Editor and co-author of The Martin Report, Mimno has 24 years of experience in the computer field and does independent consulting.*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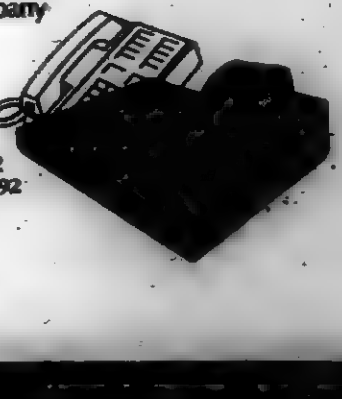

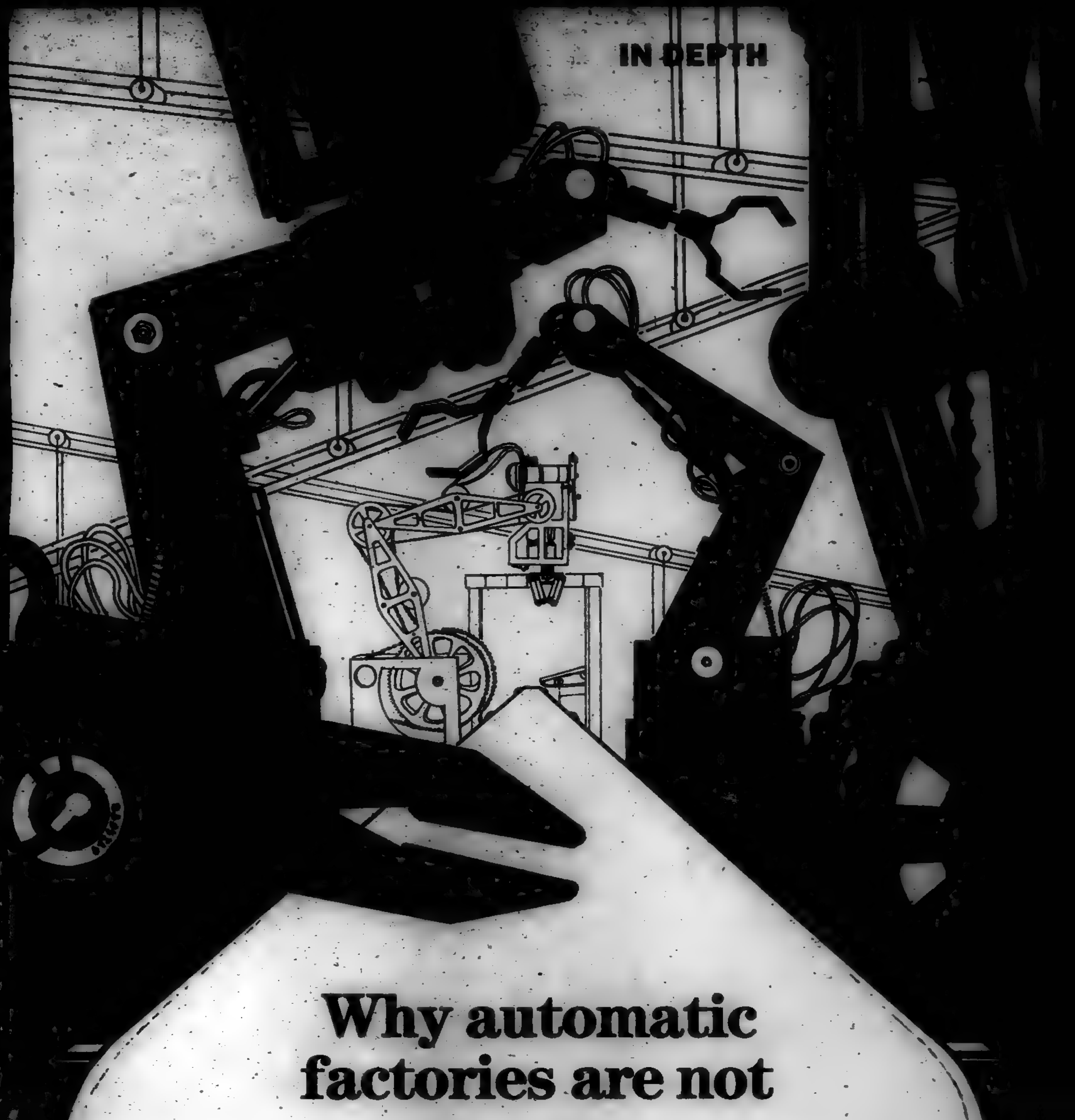

Why automatic factories are not

By William Taylor

After years and years of coaxing automatic factories to work about one-tenth as well as they ought to work, we realize we have been going about it wrong. The problem is not with the technology — that is well understood. We have trouble because we do not have the right mental model of our factories. Automatic factories are easy for computer systems folk to build but hard for factory folk to use.

Most of us understand the factory floor. Programmable controllers are wired to about 200 I/O points each. Input points tell the programmable controller what is going on, and the controller uses output points to influence the world. Programmable controllers support very few kinds of I/O points. Contacts let the controller read switches or turn things on and off. Analog modules let the controller read and set voltages. Register modules read and write numbers. Exotic modules send pulse trains to servo motors; and that is about it.

Things are stable at the top, too. Factory host computers handle order entry, factory scheduling and material requirements planning in large companies. That is why requests for proposal (RFP) for factory automation say that data from programmable controllers must get to the factory host or computers.

This situation leads to the triangular diagrams we see in factory management magazines. The bottom layer shows programmable controllers running equipment as far as the eye can see. The top of the triangle is a mainframe. We computer builders have a simple task. For our first trick, we let the computer know what is

ILLUSTRATION BY DAVID J. [illegible]

going on in the factory so it can tell management. For our next trick, we let the computer pass management's orders back to the programmable controllers. If we boil factory RFPs down, that is what the users are trying to do. Imagine the chairman steering a multibillion-dollar corporation from a terminal attached to some master computer, and you have the idea.

The computer knows what is on order and what is in inventory, with a time lag depending on how fast data is entered. If the system knew what was happening from moment to moment, it should be able to run the plant. That is the theory, anyway.

The problem is, there is too much going on for mainframes to make sense of it. Each programmable controller has about 200 points, and there may be 300 or 400 controllers in the factory. That is far too many bits per second for a computer to cope with. For instance, the RFPs call for us to put something in the triangle that summarizes the data. The computer does not need to know that limit switch No. 43 on programmable controller No. 146 has closed — it needs to know how many pistons are being made, and if not, why not.

Tying programmable controllers to the computer won't work — it would be swamped with too much data. We have to put something in the triangle that gets data from programmable controllers and turns it into information for the computer. The data rate must be reduced so a computer can handle it.

The big picture

There are more ideas for filling the triangle diagram than there are equipment vendors, but they boil down to the same thing: We must put a data collector over the programmable controllers. Whenever we get too many data collectors, we put in another layer. Finally, the top layer talks to the computer.

It is hard to make money selling data collectors, because there is only one data collector for every 16 to 32 programmable controllers. If there are 300 controllers, there may be 10 or 11 data collectors. Programmable controllers we readily understand; however, data collectors are a nightmare.

In short, the money's in programmable controllers, and the headaches are in data collectors. Vendors would rather not discuss data collectors at all, but programmable controller buyers demand that someone wire them up. Vendors are hoping someone else will sell data collectors, so they can concentrate on the more profitable controllers.

The little picture

Never mind that no one knows how to build a data collector. Assuming we could buy them, how would we use them? Well, they collect data from programmable controllers and pass summaries up. Data collectors get orders from on high and distribute them to programmable controllers. We establish communications paths by wiring the collectors together, assigning them addresses and building address tables.

We build a chain of command by wiring programmable controllers to the data collector from which they take orders. We hook programmable controllers to the nearest data collector because it saves wire. We run local-area networks so that they cover a reasonably compact area of the factory regardless of what the programmable controllers in that area are doing. Communications paths are laid out geographically.

That is where the famous triangle diagram comes from. We have programmable controllers at the bottom, running machines that make money. We wire programmable controllers that happen to be near each other into a data collector.

Next, we string a factorywide communications cable so that data collectors can communicate with their bosses and so on up to the computer.

This is a very seductive theory. It feels right that data should flow neatly to the top of the hierarchy and turn into orders that flow neatly down.

The trouble is, that is not how a factory works. No matter how we label the boxes, this is the same old army hierarchy. An army hierarchy is optimized to get a million men moving in the same direction with a few hours' notice, but we seldom have to do that in factories.

"WE JUST FOUND OUT THAT OUR LOCAL AREA NETWORK DOESN'T MEET OUR PERFORMANCE NEEDS."
"WE SHOULD HAVE GONE WITH CONCORD DATA."

Benjamin West. The Death of General Wolfe, 1770. Courtesy The Bettmann Archive.

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Figure 1 shows the classical factory automation block diagram. Programmable controllers handle equipment on the factory floor. Programs in the controller convert contact closures into process information and report to data collectors. Data collectors gather information from many programmable controllers and pass it up. Eventually, enough summary data gets into the host computer that the computer knows what is going on in the factory.

Management gets factory status information from the host computer. Management orders are relayed down through data collectors to programmable controllers. This is how the factory is controlled. There are problems with this approach because data flow does not correspond to process flow.

The workings of a factory

There are two basic styles of factory operation — production-push and demand-pull. U.S. factories use production-push. We run our machines flat out, building up stock for the next process. We buffer each process so that we can keep the factory running, even if many of the machines are not.

The Japanese use demand-pull. When they want something, they send a message to the upstream processes asking for parts. These processes either supply the parts or ask further upstream. That is the idea behind the "just-in-time" approach — put off making something until it's needed.

Whether we think of a factory as production-push or demand-pull, the fundamentals are basically the same. It takes so many widgets to make a wadget. It takes so many wadgets to make a frammis and so on. Inventory carrying costs and quality are affected by whether we push raw materials in the front or pull finished products out the back; but either way, we finally produce something to sell.

A factory makes and combines parts. Raw materials are pummeled into parts, which go into bigger parts. Production people think of a factory as a river flowing from left to right. Raw materials start at the smallest branches on the left. Streams combine as parts are assembled. Dams stop the flow to build up buffer stock. More and more streams come together, and we finally get a finished product out the door. A factory is a real-time parts implosion system. Instead of exploding products into parts as a parts explosion program does, a factory implodes parts into products.

Where designs go wrong

Computer types have been misled because a parts implosion tree looks like the computer tree, only turned on its side. After all, raw data comes off the floor into programmable controllers. The controllers run processes and pass summaries up. The information streams converge at the computer. This gives us a picture of current events in the factory. Combining data into information does not seem very different from combining raw materials into products.

We have found, through bitter experience, that the factory tree and the process tree do not relate well. A geographic chain of command scatters data about a process across several data collectors, and we cannot find out what is going on. Consider raw materials entering a factory. They flow to machining stations managed by programmable controllers. Machining stations are close together, so machining programmable controllers are wired to the same data collector. The collector knows about machining, but it does not know where a part comes from or where it goes.

The process tree runs across, and the computer tree runs up and down. Each vertical data collection branch crosses many process branches instead of running along one process. Each data collector knows about parts of many different production paths, but it does not know much about any production path. Data collectors are unable to tell much about the overall process, because each has only bits and pieces of the big picture.

Suppose, for instance, a data

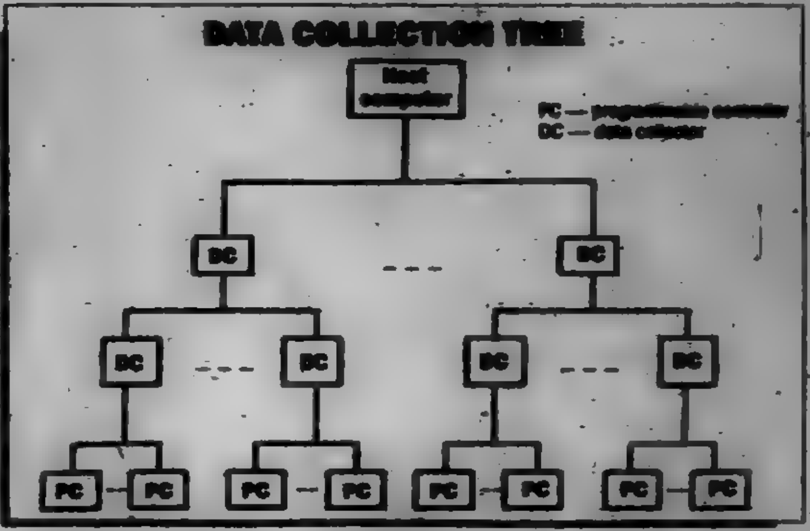
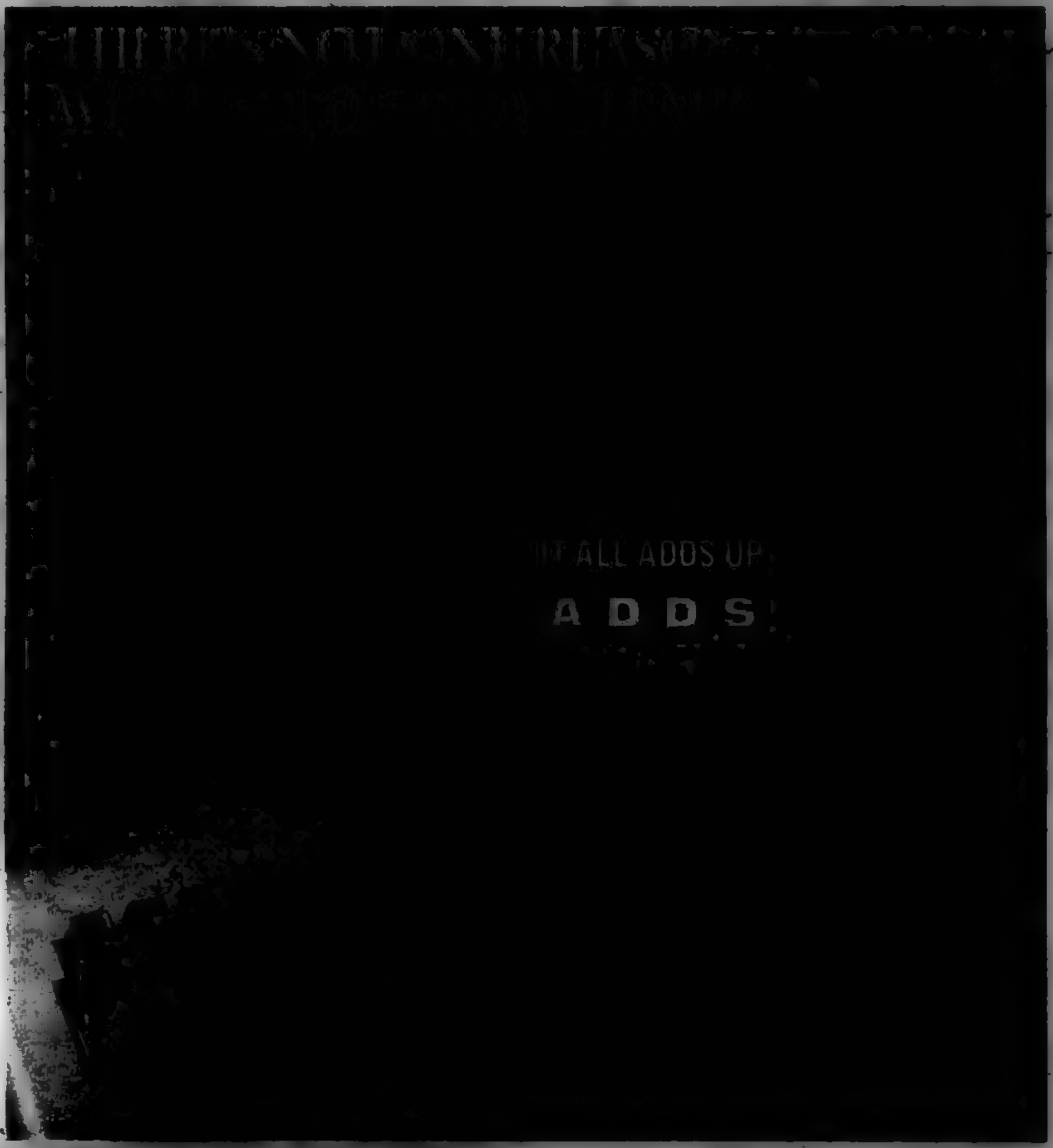


Figure 1



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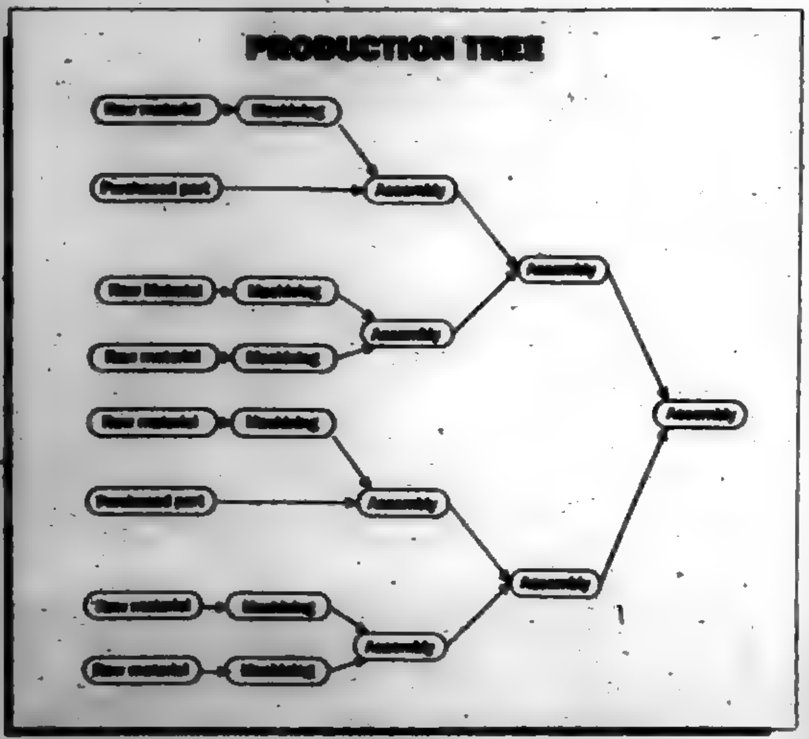
PRODUCTION TREE
Raw material
Machining
Purchased part
Assembly
Raw material
Machining
Raw material
Machining
Assembly
Assembly
Assembly
Raw material
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Purchased part
Assembly
Assembly
Raw material
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Assembly

Figure 2

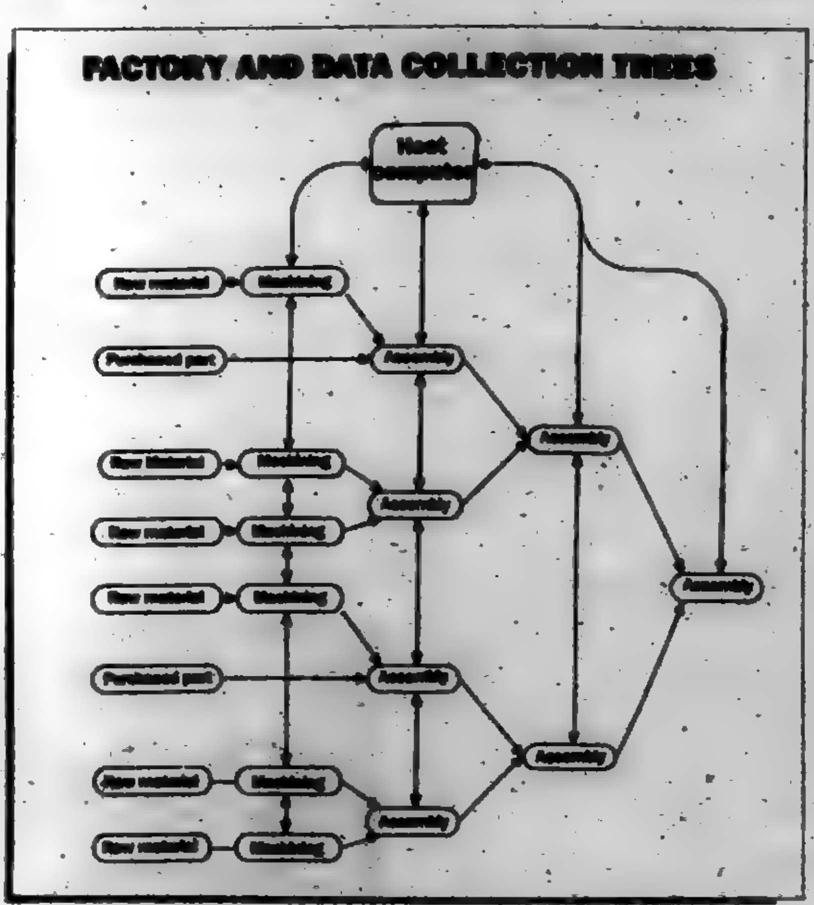
FACTORY AND DATA COLLECTION TREES
Host computer
Raw material
Machining
Purchased part
Assembly
Assembly
Raw material
Machining
Raw material
Machining
Assembly
Assembly
Raw material
Machining
Purchased part
Assembly
Assembly
Raw material
Machining
Raw material
Machining
Assembly

Figure 3

collector states that programmable controller No. 432 is stopped. It does not know whether it stopped because it is broken or if the next programmable controller is stopped and the buffer is full. The data collector knows all about programmable controllers near controller No. 432. It does not know about the process that controller No. 432 is trying to implement because it is not wired to its programmable controllers. They are not part of its chain of command.

Who has the big picture?

The computer at the top should know if we are making widgets — summaries from data collectors are processed there. A computer could match reports from programmable controllers with process information from parts explosion data, figure out how parts of the process relate and provide overall status information. That is a computer builder's approach to factory automation — get the data into the system and let it tell us what we need to know. This also makes money for the computer manufacturer. It takes a big mainframe to map a process flow tree going left to right into a data collection tree running up and down.

A factory host could describe the process tree to the data collectors. Then a collector could give process status, provided data collectors swapped information or got it from the computer. This strategy makes data collectors cost more — because they have to store more data. Instead of just worrying about subordinate programmable controllers, they get process flow from computers and status from other data collectors. Data collectors get so big that nobody can afford them or write the software that they need.

We can solve this problem without expensive data collectors or a large computer by arranging the chain of command to follow the process instead of the floor layout. Thus, put a data collector wherever parts come together. The data collector gathers data from programmable controllers downstream and sends reports to data collectors upstream. Each data collector knows how things are going in the process.

Figure 2 shows what happens in a factory. Parts flow through the process from left to right, as described earlier. Each machining and assembly step is controlled by a programmable controller. Buffers between process steps hold parts. Factory management is interested in how the process is going. Branches of the process tree wander all over the factory, depending on how the plant has been laid out. Communications systems in factories collect data geographically, with little regard to the process. Each data controller knows about an area of the factory, not a part of the process.

It is the interaction between the factory tree and the data collection tree that causes trouble (see Figure 3). In this example, one of the data controllers knows about all the machining stations; another data controller monitors some of the assembly stations; and the third data controller monitors the rest. The information about any branch of the process tree is spread through all of the data controllers because the data tree and the factory tree run in different directions.

This arrangement is simple but wastes data collectors. Each one could handle data from eight to 16 programmable controllers. There are very few places in a factory where six parts converge.

If we put data collectors where only three or four parts come together, they get data from only three or four programmable controllers instead of eight or 16, and we need

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more of them to cover the factory.

We could put data collector-like functions into remote I/O for programmable controllers. The simplest scheme is to build an I/O module that swaps eight or 16 bits between two programmable controllers. The module would make eight outputs from one programmable controller look like inputs to the other programmable controller and vice versa. Company electricians could write ladder programs that would communicate via these bits.

Given a remote I/O link from each programmable controller to its upstream controllers, each one can tell how well it is being fed by upstream processes. We follow a process by wiring programmable controllers together and do not use data collectors at all. This changes the problem from data management and networking, which we do not understand, to remote I/O and process layout, which we do understand. Factory people understand remote I/O and do not understand networks. They will be happier if remote I/O modules replace networking.

> *Factory people understand remote I/O and do not understand networks. They will be happier if remote I/O modules replace networking.*

In effect, sharing information between programmable controllers via remote I/O gives us distributed control. Each one controls its process and shares status and summary information via what it thinks is remote I/O. This lets us share information without the grief of going to full networking.

Local-area networks

But, some object, even if each programmable controller knows what its downstream and upstream colleagues are doing, we still need networks to download programs to personal computers. What about flexible manufacturing? If remote I/O wiring is specific to a process, we have to make drastic changes when we change products. Since we need networks anyway, there is no reason to use fancy remote I/O to share information — we should be able to use the network for that.

This argument would be stronger if networks worked the way a factory does. The problem is, local-area network theory is based on the telephone system, and factories operate on the bulletin board system.

Networking people have defined seven layers of protocol which, theoretically, let any computer talk to any device. Whenever a computer needs to talk to a robot, for example, the computer asks the network to set up a virtual circuit to the robot. The virtual circuit makes the network act as if there were a private wire directly between the computer and the robot.

It would cost too much to run wires between each pair of machines that might have to talk to one another, just as it would be prohibitive to run wires from every telephone to every other telephone. The network makes one shared wire act like many private wires.

Once a circuit is established, the computer can talk to the robot as if it were a normal peripheral. The network establishes the connection, sends information in the computer's format to the robot and changes it to the robot's format. We pay for this flexibility with complex networking boxes. When customers buy a network of boxes with the seven protocol layers integrated into them, they get integrated grief, too.

Problems with networks

It takes a lot of software to implement the seven layers, some of which are still poorly defined. Dials do not

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last long in factories, so vendors put protocol software into read-only memory (ROM). In order to save distance on the main communications wire, the boxes are placed up near the ceilings of factories, where maintenance people cannot read the address switches or error indicators.

This "ROM-in-the rafters" approach leads to high maintenance costs. Putting the boxes up in the first place and getting all the address switches set correctly is a challenge. It's as though the faucets in a plumbing system had address switches. If the address is wrong on any faucet, all of them leak. How do we find the one with the wrong setting?

These problems are being solved, but even when the seven layers arrive in all their glory and we can quit climbing ladders to replace ROMs, we still have problems.

Think about the virtual circuit between the computer and the robot controller. The program in the computer has to know that a circuit must be attached. There are usually operating system calls to establish and operate such a link, but applications programs have to know about them. Current definitions of the protocol between networks and computers forces application programs to know the device names by which links are established.

Computerized factory control

Think about what factory control systems should do. We want the computer at the top of the factory to take current orders, inventory and machine status into account and operate the factory in the most profitable manner at all times. As we reduce work in process and go to just-in-time systems, such control becomes increasingly critical.

This does not sound too difficult — we have order entry systems that operate in real-time, and we have materials requirements planning (MRP) programs. All we have to do is couple the MRP system to the order entry system, give it access to current factory status, and we're home free, right?

Not quite. MRP is a batch program. It was not designed to interact with real-time factory data. It reads files representing factory status at some point in time and generates a production schedule that is supposed to be followed for a while. MRP programs have to be completely rewritten in order to tune factories in real-time.

We all know how expensive it is to write large programs, such as full-house MRP systems. Making MRP couple to a huge number of virtual channels in order to find out what every machine in the factory is doing is going to be even more difficult.

Well, many say, nobody in his right mind would do that. Everybody knows we write a data acquisition program that sits in front of MRP and any other program that needs to know what is happening. A data acquisition program polls all the personal computers over the network and maintains an up-to-the-minute image of factory status. Any programs that need this data look on the disk where the data acquisition program put the data. In effect, the data acquisition program makes the factory look like a relational data base, which MRP accesses to learn what the factory is doing.

This situation shares the cost of the data acquisition program between programs that need information, but application programs still have to go through complicated gyrations to get information. Instead of issuing network incantations, programs retrieve information by issuing data base incantations. This may be easier, but programs will still be more expensive than we would like them to be.

Not only that, the data acquisition program is a very complex program. It establishes virtual circuits to every device, polls them periodically and averages information. We have to assign addresses to each network box and keep lists of everything attached to each box. This information needs to be kept current and made available to the data acquisition program. In effect, we have centralized all of the complexity in one program.

Telephone analogy

Network systems that let us establish virtual circuits are like the telephone system. Provided our computer knows the robot's name, it can ask the network to look up its address to establish a link to the robot and talk to it. This is like telephone calling — the network implements a large number of two-way conversations at once. The trouble is, factory information does not flow along two-way paths, where information is consumed by one user. Factories operate on the bulletin board system, where information is posted so that all interested parties can read it.

Machine operators generate shift reports. Foremen summarize reports from many machines into a department report, and department reports are summarized for the factory manager.

People use information from each machine in different ways. The plant manager can focus on a particular machine, if need be. Machine operators communicate with maintenance and with operators of adjacent machines, sometimes without knowing who the others are.

Figure 4 on ID/38 shows part of the process tree from the previous figure. Some of the problems are eliminated if programmable controllers share status information via remote I/O. Swapping eight to 16 bits of data gives a programmable controller information about upstream and downstream processes. Plant electricians can put in status swapping using conventional ladder programming. This reduces networking, which is not well understood, to standard ladder programming, which is well understood.

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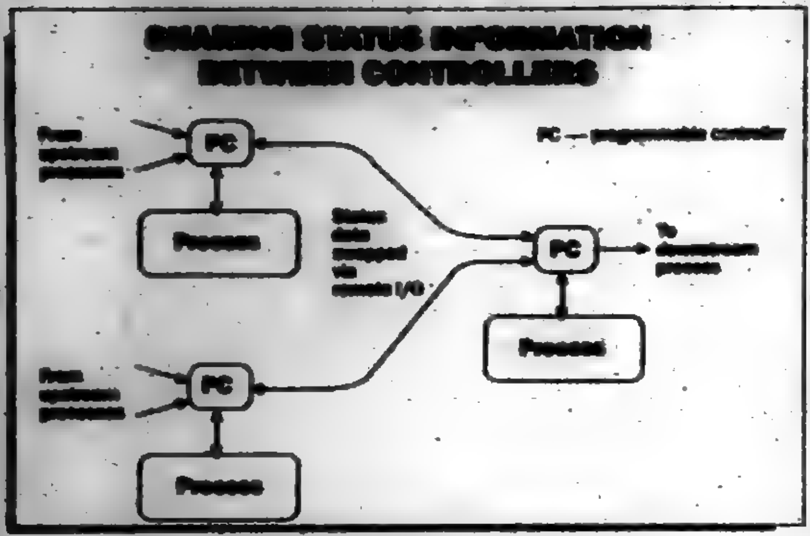
SHARING STATUS INFORMATION BETWEEN CONTROLLERS
From upstream processes
PC
Process
PC — programmable controller
Status data swapped via remote I/O
PC
To downstream process
Process
From upstream processes
PC
Process

Figure 4

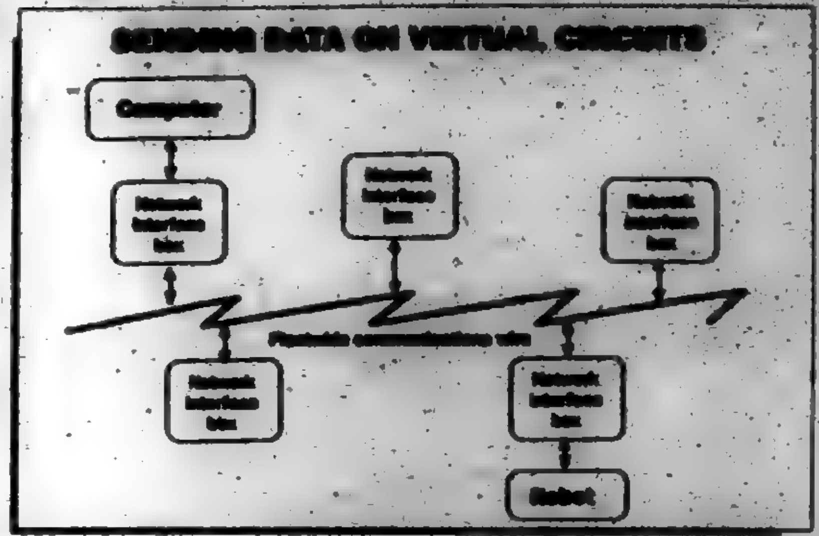

Figure 5

Local-area networks supply many virtual circuits that computers use to communicate with devices (see Figure 5). The computer asks the network to establish a circuit between the computer and the robot. The network sets up the circuit and translates data between the computer's format and the robot's format. Again, this is like the telephone network — the system maintains a large number of two-way conversations on the same shared communications wires.

Broadcast data

Although they do not like to talk about broadcast data, network developers admit that broadcasting is a natural way for networks to operate. Since data shares a single cable, everybody sees everybody else's mail anyway. The protocol software carefully throws away mail for everybody else so that each device sees only its own. Storing all the mail would duplicate each device's status information in all the other devices. This arrangement would take too much buffer memory, so network builders prefer to offer virtual circuits instead.

There is an easier way to manage data sharing in a factory. Most of the nonsense with hierarchies of data controllers comes about because we do not have enough communications speed to send all the information on one wire. The limitations of two-way communications are imposed because networking boxes do not have enough buffer memory to store all the mail. Most processes need unpredictable amounts of data from other processes, and management reports need data from many processes at unpredictable times, so we really need a more flexible system.

There is an idea kicking around that we call the Big Bad Bus, or B-Cubed. B-Cubed uses a very fast fiber-optic network, which turns the entire factory into one address space. We can transmit 120 million bits per second on an optical fiber, which costs about $1 per meter. Stringing eight of those in parallel and assuming some loss because of communications overhead gives us a bus carrying 80 million bytes per second — about as fast as a minicomputer backplane.

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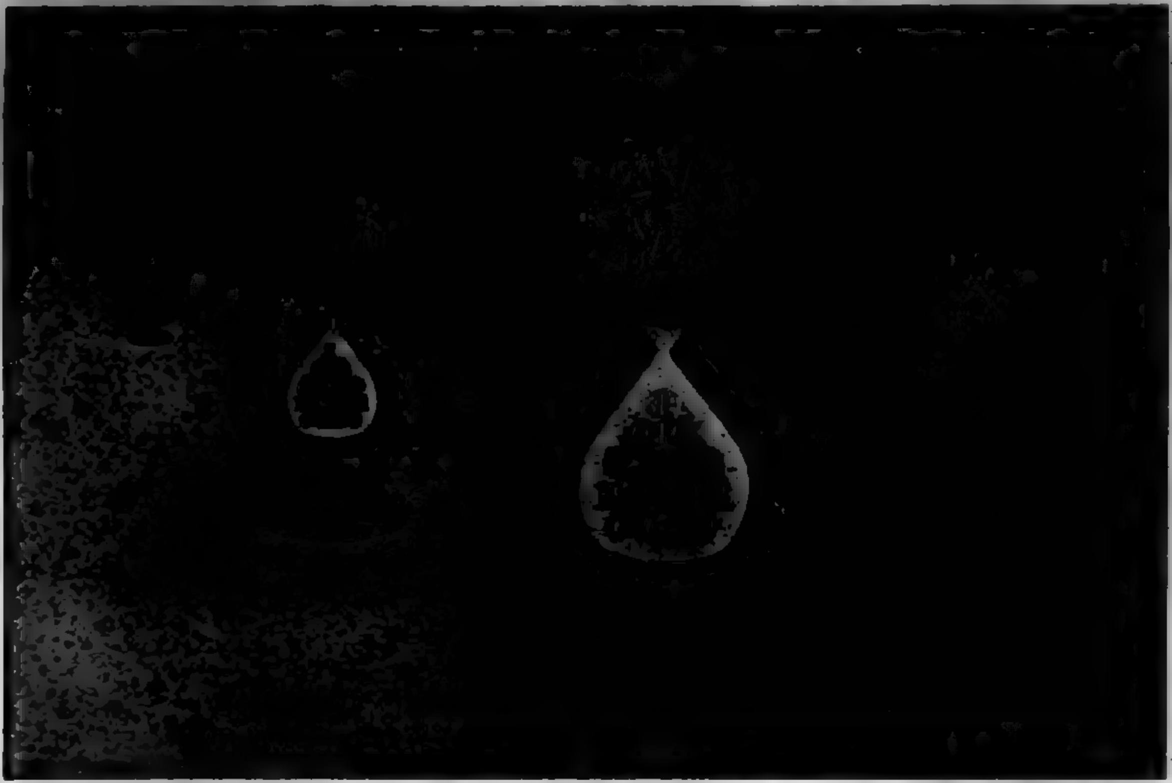
Without complete understanding of user needs, software development can take forever.



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factory. If we use 64 bits, all of General Motors Corp. might fit into one address space.

Each device has a special memory that acts like ordinary memory, except that read requests fetch data from somewhere else via the network. Application programs that need information just reference it; the bus interface makes memory in any part of the factory look as if it were part of the application program.

Memory management

This reduces the problem of virtual circuit and network management, which we do not understand, to memory management — which we do understand.

This is like using remote I/O to share status information. Each computer manages its process and stores summary reports in its public memory. Any other computer that needs the information just references the data, and the network supplies it. Applications programmers do not litter their programs with calls to networking routines — they just let compilers generate address references.

How B-Cubed works

Each device has private memory, which its processor uses without waiting for network access. The device stores public information in a part of its memory, which is managed by the network interface. The network interface transmits information from public memory whenever a request comes for that part of the factory address space.

When the processor requests data that is not in local memory, the network interface sends the address out over the network and stores the reply.

The low-order million bytes or so of factory memory stores a table of addresses. Whenever a new machine appears on the network, it searches this memory for the first unoccupied slot and puts its address there. An address server manages this address table. This arrangement makes address assignment automatic, and there are no address selector switches on any device.

The address server also maintains format information for each device. These format records are similar to data base schemata and tell how data records are laid out in each device. Other devices can read information from a device even if the data format changes.

When an application program starts, it searches for the addresses of the information it needs and stores the addresses in pointers. It also retrieves the format records so that it can decode the data fields. Later on, it accesses data by referencing it relative to the pointer.

Memory conflict is avoided by access rules. Each device writes into the part of the virtual memory that it controls, but nowhere else. No other device writes there, but any device can read from any part of memory.

When two devices need to interact, they set up mailboxes in their respective memory areas and use the mailboxes to send messages to each other. Any other device can watch to see what is going on, but no other device can interfere.

Operating the factory

Big Bad Bus turns the entire factory into a single computer with many processors. We understand how to coordinate multiple processes — operating systems like Unix have been doing this for a long time with semaphores, pipes, mailboxes and a few other mechanisms. We also know how to handle real-time interactions — Unix has been extended for real-time by a number of vendors.

One way to make effective use of factory data is to centralize data collection in a data acquisition program (see Figure 6 on ID/40). The data acquisition program establishes virtual circuits to all the data sources on the network and periodically polls each device for current information.

Factory status is stored in a factory image file on disk. This information is used by the MRP software to schedule the factory in the most profitable manner.

Centralizing the task of maintaining the image of the factory has problems, however. The data acquisition program has to poll for raw data, which causes heavy traffic on the communications network. It would be more economical for each device to maintain its own summary information and let any devices that need this information ask for it as necessary.

Software is simpler if the entire factory is treated as a single virtual memory space (see Figure 7 on ID/40). Each device has some private memory and some shared memory. The processor uses I/O points to control the process and also calculates summary information. Summary data is placed in shared memory. Whenever any other device or the central computer needs to know process status, it gets the information from the shared memory.

The communications protocol is hidden from each processor and from its software — each device treats all other devices as if they were locally addressable memory. Processors use local memory for most calculations to minimize traffic on the virtual bus. The server maintains the address table. It lists which device is located at each memory address and describes the public data area formats.

Special chips

Implementing Big Bad Bus requires special chips in order to keep the cost reasonable, but these chips should cost no more than Ethernet chips. These chips manage some virtual memory and transmit a few

"We had a thirty-day trial but twenty minutes made up our minds about Data Check Recovery."

Linda Lewis, Systems Programmer, Blue Cross and Blue Shield of the National Capital Area, Washington, DC

"We had been looking at Software Corporation's Data Check Recovery for nearly all of the 30-day trial period and we hadn't really made up our minds. It was useful, but we weren't convinced that it was necessary.

"Then we had a permanent data check in the middle of a five-pack VSAM file. It happened in the middle of the night and if we could not have restored the file quickly, it would have delayed users all over the country.

"Without DCR, the best that we could have hoped for is to have restored the file sometime the next day. At worst, the data was destroyed. But with DCR, it was just a matter of my sitting down at my terminal at home and telling Data Check Recovery to recover the file.

"That one incident made up our minds. If we had never used it again, it would have been worth the cost. But we have had three permanent data checks on our 3380s since then and with DCR, only one of them was really permanent."

Data Check Recovery is a powerful, dependable utility that recovers DASD data that has become unreadable due to permanent I/O errors and corrects temporary I/O errors before they cause more serious problems. Data Check Recovery supports all OS operating systems and corrects data checks on 3380s, 3375s, 3350s and 3330s.

For more information about how DCR can keep permanent I/O errors from turning into permanent disasters, call Software Corporation of America toll-free at 800/368-7638. In Virginia, call 703/471-1545.

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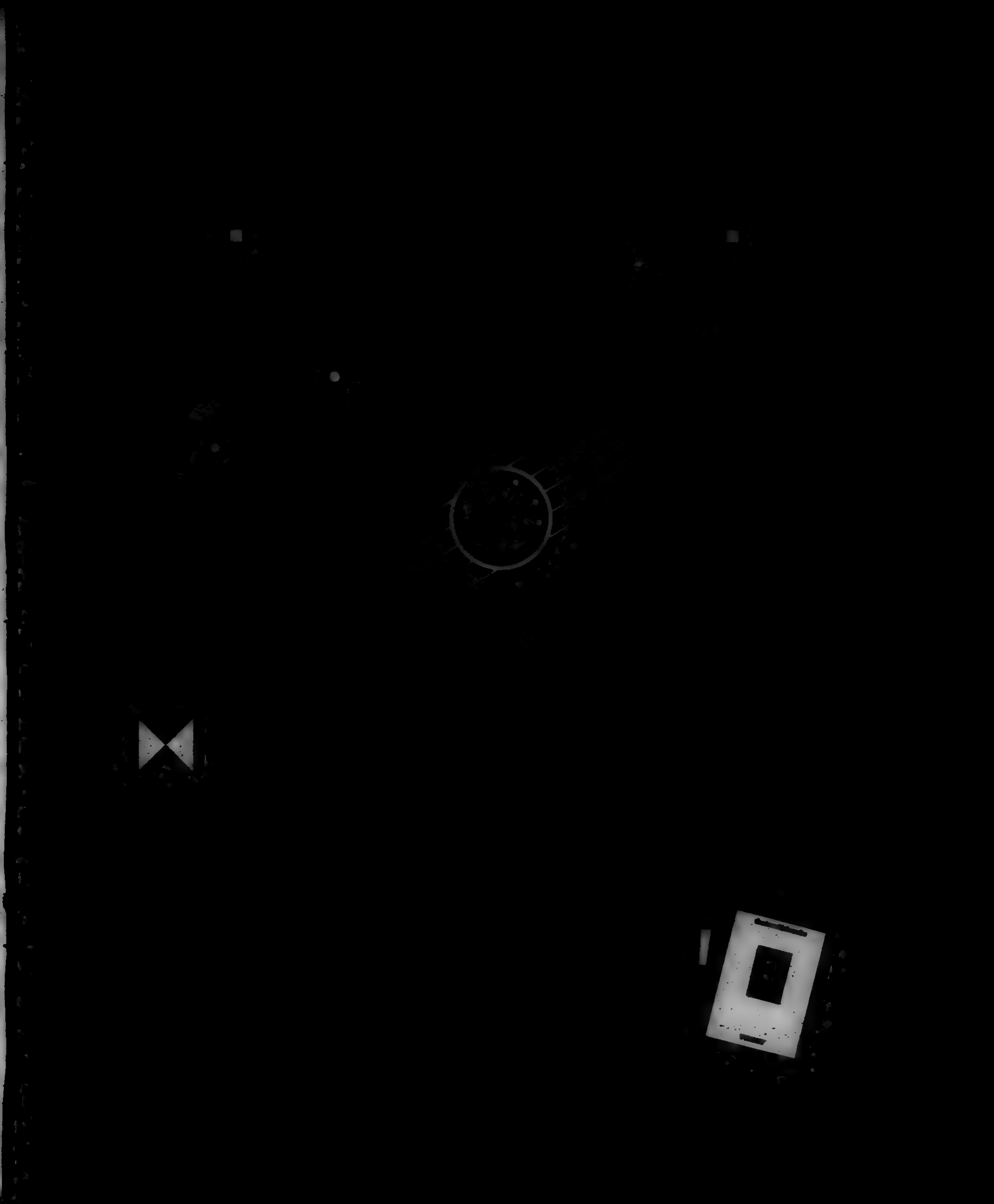

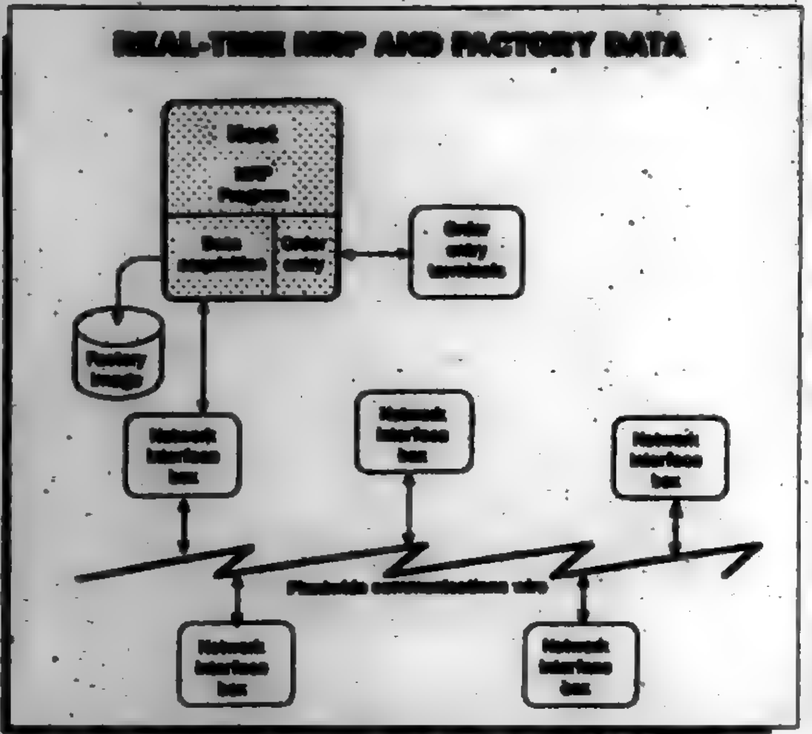
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MRP
Program
Data
acquisition
Order
entry
Order
entry
terminals
Factory
image
Network
interface
box
Flexible communications wire

Figure 6

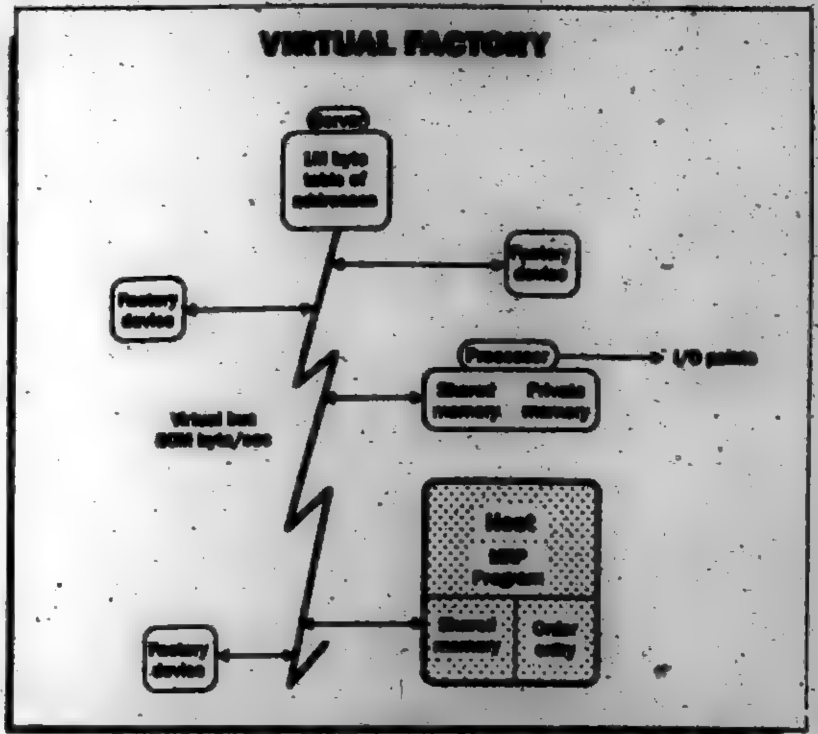
VIRTUAL FACTORY
Server
1M byte
table of
addresses
Factory
device
Processor
I/O points
Shared
memory
Private
memory
Virtual bus
80M byte/sec
Host
MRP
Program
Shared
memory
Order
entry

Figure 7

different message sizes, so they are simpler than proposed network boxes. Applications programs act as if factory status information were in memory at all times, so they become much simpler than if they had to get information over a network or from a data base.

This simplifies applications just as managing distributed processes via remote I/O simplifies programmable controller programming.

We have shown why network hierarchies do not operate factories as effectively as we would like. We need networks to control individual machines, so substituting remote I/O for networks will not solve all our problems.

Networks were designed to implement two-way conversations rather than broadcasts, which makes applications software more complicated than is necessary.

Turning the entire factory into a single address space via the Big Red Bus simplifies the software in each device and eliminates most of the software in the network boxes. B-Cubed uses the speed of fiber optics to simplify the networking and applications software.

About the author

William Taylor leads the Office of Advanced Systems and Software Technology, Industrial Automation Section, at Gould, Inc. Taylor has worked with programmable controllers and interactive motion controllers. He is the coauthor of an executive report titled "Demystifying Artificial Intelligence."

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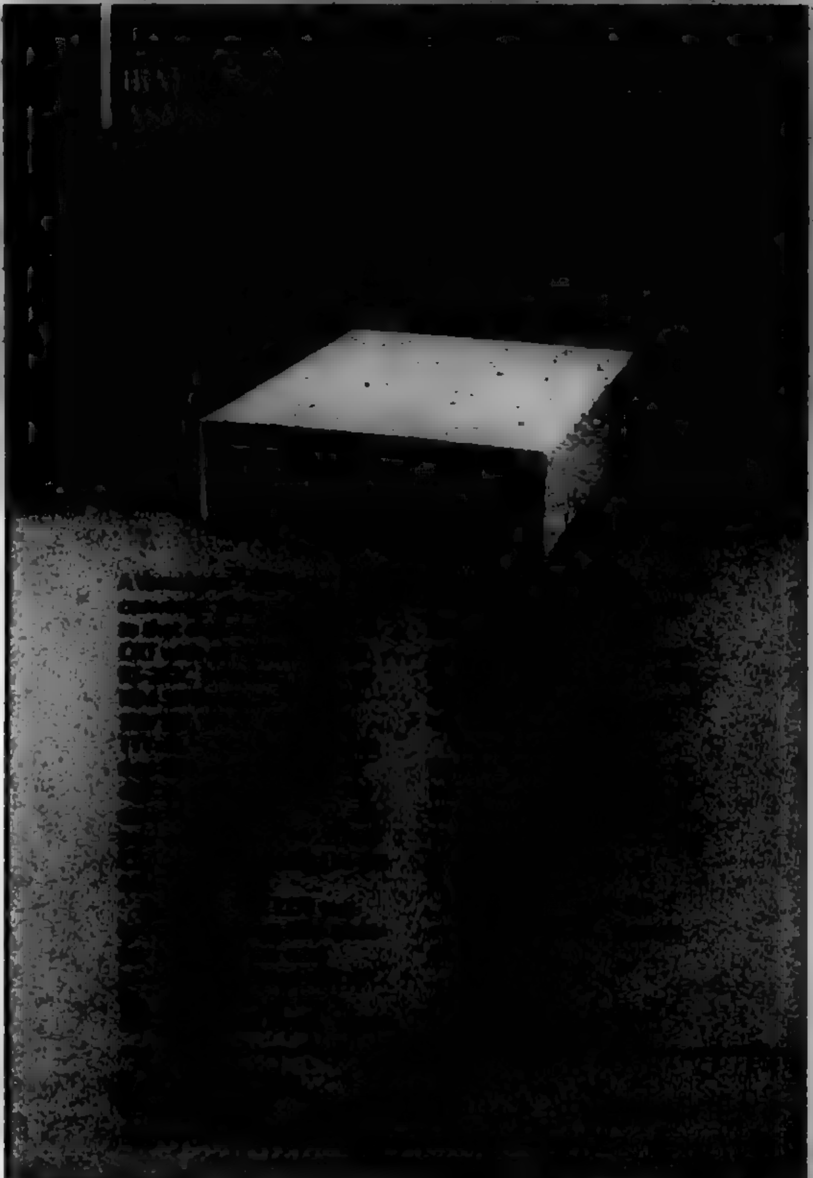


MICROCOMPUTERS

TI introduces Business-Pro high-end micro

By Edward Warner
CW Staff

DALLAS — Texas Instruments, Inc. unveiled last week a 512K-byte personal computer that reportedly can function as a stand-alone unit, a local-area network server or the hub of a multiuser system supporting up to eight users.

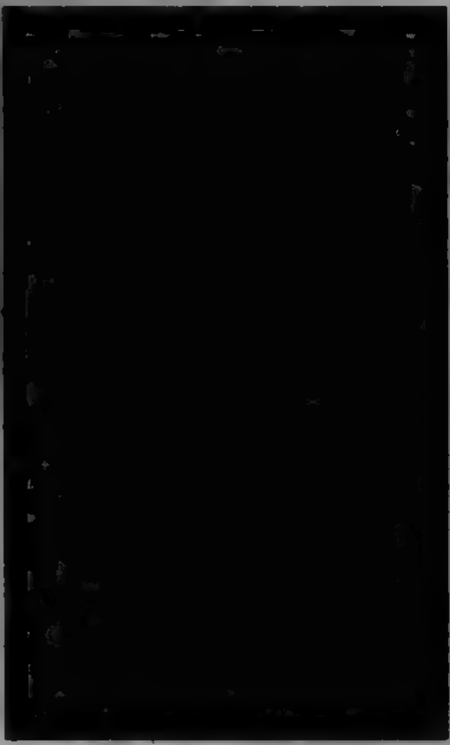
One version of the TI Business-Pro would reportedly come equipped with a 21M-byte hard disk and CRT controller that would allow it to function as the equivalent of the enhanced version of an IBM Personal Computer AT, a machine for which prospective users are currently facing a nine-month wait.

Based on the Intel Corp. 80286 microprocessor, with a reported memory expansion capacity to 3.5M bytes, the Business-Pro is said to offer the speed and memory needed to run software having artificial intelligence capabilities. It debuted with a program called Arborist, which TI said adapts AI to decision management.

The Business-Pro, TI said, will become part of the firm's Professional series of personal computers and will initially be offered in two single-user versions, both running under Microsoft Corp.'s MS-DOS and available in June. A multiuser, multi-

See TI page 90

The TI Business-Pro



- Ashton-Tate introduced versions of its Dbase III data base management system for the AT&T Unix PC and Data General DG/One lap-top computer/75
- A coprocessor device that lets Apple Computer's Macintosh run IBM Personal Computer software was unveiled by Dayna Communications/75
- ADP Network Services announced software designed to improve remote data entry on IBM Personal Computers/78
- Alpha Software unveiled Keyworks, a macro-generation package for the IBM Personal Computer/78
- IBM released software that manages applications on the Personal Computer line/79

SMALL TALK
Paul Korzeniowski
CW Staff

PCjr needed more than Big Blue logo

For more than two decades, the name of IBM has been synonymous with success. On a few occasions, Big Blue has stubbed its toe when entering a new market, but never has the company fallen on its face as it did last month when it dropped the PCjr.

Why did Big Blue tumble?

A chief reason was that IBM did not differentiate between the home, education and business markets. Filled with hubris from its smashing entry into the

See SMALL page 86

Cartridge tape subsystems bow

LOVELAND, Colo. — Two ¼-in. tape cartridge subsystems for use with the IBM Personal Computer line, including the Personal Computer AT, have been introduced by Colorado Memory Systems, Inc. (CMS).

The two subsystems, one offering 60M-byte tape backup and the other offering a combination of 60M-byte tape and a 20M-byte hard disk, will be marketed under the Tecmar, Inc., label, CMS said. Each unit is said to be small enough to sit on the Personal Computer itself and to incorporate tape storage units having three heads, a feature said to speed data verification.

The extra heads offer immediate read-

See TAPE page 86

Multimate-Wang conversion offered

EAST HARTFORD, Conn. — Multimate International Corp. has introduced a conversion program to permit documents created under its Multimate word processing program to be transferred between IBM Personal Computers running the software and the dedicated word processing minicomputers of Wang Laboratories, Inc.

Multimate documents are reportedly converted into Wang's WPS format, its document interchange format for transfer of documents among its family of dedicated word processors. The conversion reportedly maintains nearly 100% of document integrity, with the need for little or no cleanup editing.

The conversion is also said to retain

See WP page 86

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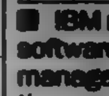

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MICROCOMPUTERS

Micros gain graphics tools

MICRO BITS
Kathryn Alesandrini

For a price, microcomputer business graphics can look as crisp and colorful as graphics straight from the art department. But without paying extra, you are often faced with the choice between colorful graphics or graphics with clarity and higher resolution.

For example, IBM Personal Computer screen graphics are colorful, but they lack precision since the standard screen resolution is only 320 by 200 pixels. Apple Computer Inc.'s Macintosh sacrifices color to provide better resolution, coming in at 512 by 342 pixels. The choice between resolution and color is involved in many microcomputer purchasing decisions.

> **New hardware and software can transform micro graphics into snappy, full-color graphics at a fraction of the cost of traditional graphics.**

When a limited budget forces a choice, do people opt for color or do they want precision in business graphics? That choice was recently posed to a group of managers and a group of trainers. The trainers overwhelmingly opted for resolution, while the managers were equally split between color and resolution.

The survey also tested the respondents' preferences for visual thinking and their visual abilities. The first group included 63 managers and information center professionals. They were asked a series of questions from a "Visualizer Verbalizer Questionnaire" such as "Do you like doing work that involves the use of words?" and "Do you have vivid dreams?"

A closer look at the data reveals some interesting differences between those who picked color and those who picked resolution. Here's a summary:

- Verbalizers prefer resolution. People who tend to rely on verbal thinking rather than visual thinking prefer displays of high resolution when a choice must be made between resolution and color. Verbalizers would rather follow verbal directions than see a demonstration. For instance, they prefer to read written directions than to look at a map when finding a new location.
- Color is more visual. Visualizers and "right-brain" thinkers prefer color displays. They will sacrifice the crisp look of higher resolution graphics to have color.

What do these results mean for those users of presentation graphics? One implication is that presentation graphics should be tailored to the audience.

Show engineers, computer specialists, lawyers and other verbalizer groups prefer crisp, high resolution graphics. But use of colorful displays will attract visualizers such as pilots, artists, athletes and some managers.

To be on the safe side, go for colorful and high-resolution graphics so everyone is happy.

New combinations of hardware and software can transform microcomputer graphics into snappy, full-color graphics at a fraction of the cost of traditional graphics.

Truly state-of-the-art graphics usually have been created on mainframes and minicomputers, complete with high-resolution film recorders that create picture-perfect slides.

But now there are two main ways to achieve a similar look with microcomputers: add upgraded hardware or take your graphics needs to a service center for enhancement.

You can have a graphics workstation that almost rivals what the big boys have if you are willing to invest in a high-resolution color card, a high-resolution monitor and a film recorder. For example, IBM's Enhanced Color Display with an upgraded graphics card is 640 by 200 pixels, although currently there are few graphics programs that will run on the enhanced version.

High-quality output can be accomplished by way of a film recorder. For a whopping 4,000- by 4,000-pixel line resolution, there's the Samurai recorder, which cuts off the jagged edges of microcomputer graphics to produce crisp, colorful images. The limitation is that the film recorder currently accepts input from only one program — the company's own graphics software package.

Coming in at 640 by 400 pixels with up to 72 colors is the Polaroid Corp. Palette recorder with an affordable price tag. Actually, the Palette itself is capable of resolutions of up to 920- by 700-pixel lines, but current software does not make use of that potential.

No time or money for in-house imaging? Now there's the picture-perfect connection. Graphics enhancement services allow you to send your micro graphics over phone lines for enhanced colors and better resolution. The only costs are for the transmission software, the standard modem for data communications and the service center charges for slides and so on. Once enhanced, your graphics can be returned as 4,000- by 4,000-pixel picture-perfect slides.

Imedia Corp. offers the support package PC Presenter that automatically converts Lotus Development Corp.'s 1-2-3 formats into code that can be communicated to the high-

See GRAPHICS page 83

Alesandrini, president of Microconnect in Santa Monica, Calif., writes frequently on business applications of computer graphics.

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Optionware adds WP to Lotus' 1-2-3

BLOOMFIELD, Conn. — The introduction of Optionword+ from Optionware, Inc. reportedly brings word processing capability to Lotus Development Corp.'s 1-2-3 software.

Optionword+ reportedly operates in the 1-2-3 environment with no need to change programs and uses 1-2-3's mathematical abilities to construct tables that can be inserted into text. It also offers graphics capability as well as calendar management functions, a telephone directory and a to-do list.

The package's word processing functions reportedly include justification, insertion, deletion, erasure and the capacity to edit and copy. Users can set up paragraphs and margins and are informed of page breaks on the screen.

The software's to-do list is said to have a capacity for up to 40 activities; deadlines and priorities can be assigned to each. Its calendar management function includes an appointment scheduler and calendars for the years 1985 to 1988.

Under Graphmate, its graphics function, the software reportedly lets users develop graphs by filling in data screens. Among the graph types available are line and stacked bar. Graph formats can be changed with one keystroke.

Optionword+, available this month, requires a minimum of 256K bytes of internal memory and is priced at $99.95.

More information is available from Optionware, located at Corporate Place, Four Barnard Lane, Bloomfield, Conn. 06002.

IBM offers Slidewrite software

WHITE PLAINS, N.Y. — IBM has introduced Slidewrite software for the creation of presentation-quality text slides using the IBM Personal Computer.

Slidewrite reportedly allows slides to be produced on paper or on overhead transparency film with an IBM 7371, 7372, 7374 or 7375 color plotter or IBM Graphics Printer.

The package features the ability to edit text or enhance charts using lines, arrows and boxes and to shrink or expand text automatically, according to IBM.

The software generates high-resolution characters, provides batch capability for unattended printing and can transform Ascii text files from a word processor or spreadsheet into charts, IBM said.

It can also retrieve IBM Displaywrite 2 or Displaywrite 3 print files or Displaywrite 3 Ascii files that have been saved on a diskette or disk.

Slidewrite requires a minimum of 128K bytes of internal memory, a graphics adapter card and an output device.

It is priced at $225, IBM said.

More information on Slidewrite is available from IBM National Accounts Division, which is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

Device enables Macintosh to run IBM software

By Kathleen Sullivan
CW West Coast Bureau

SALT LAKE CITY — In an effort to make Apple Computer, Inc.'s Macintosh computer "more appealing to IBM-biased computer users," Dayna Communications recently announced MacCharlie, a coprocessing device the company said will allow Macintosh users to run IBM software.

MacCharlie, a separate hardware unit that connects to the Macintosh with cables, is an L-shaped box with a custom-designed pedestal. According to the firm, MacCharlie is designed so that users can place a Macintosh on the pedestal, where the two units fit snugly together.

Once the systems have been connected, users can run the Macintosh in its own mode or in an IBM Personal Computer mode, the company said. By selecting the IBM mode, users will be able to run IBM applications software on the Macintosh.

According to the firm, the system will allow users to transfer information from an IBM applications program to a Macintosh program. For instance, a user could transfer information from a Lotus Development Corp. 1-2-3 spreadsheet to the Macintosh's clipboard and then paste the data into a Macwrite document. However, the information could not be manipulated once inside the Macwrite document, a company spokesman said.

MacCharlie is said to allow users to transfer Ascii data files between MacCharlie's 5¼-in. disk drive and the Macintosh's 3½-in. disk drive.

The system, which is based on an Intel Corp. 8088 microprocessor, reportedly includes 256K bytes of random-access memory (RAM) and one 5¼-in. 360K-byte double-sided, double-density disk drive. Dayna also plans to offer MacCharlie Plus, which will include 640K bytes of RAM and two disk drives, according to a company spokesman.

MacCharlie comes with Microsoft Corp.'s MS-DOS 2.1 and Gwbasic, the company said. It includes an RS-232 serial communications port and an Apple Imagewriter printer port. In addition, the system is said to feature an IBM expansion chassis connector.

MacCharlie will be available in late May, according to Dayna President William K. Sadleir. MacCharlie will cost $1,195, and MacCharlie Plus will cost $1,895.

More information is available from Dayna Communications, Suite 530, S. Main St., Salt Lake City, Utah 84144.

Share It out for IBM net

PRINCETON, N.J. — Martin Marietta Data Systems, Inc.'s It Software Division has announced Share It, a multiuser data base management system for the IBM PC Network.

The product is said to bundle It Software's Keep It Plus data base management software with Cogent Data Technologies, Inc.'s data base machine board. Share It is also reportedly compatible with the Gateway G/Net adapter card used in the Novell, Inc. Netware/G and with personal computer net boards manufactured by AST Research, Inc. and Orchid Technology, Inc.

With the Cogent board, Share It reportedly maintains data base index files on the board itself. The board is said to handle all file access with an Intel Corp. 80186 coprocessor and disk controller and includes firmware for flat file access, B-tree indexing and record locking.

Shipment of the product is not anticipated until the release of IBM PC-DOS 3.1 and the IBM PC Network program required to operate the network, the vendor said.

Share It's price ranges from $950 to $1,450, depending on the number of workstations. The Cogent board costs $1,750 for the IBM Personal Computer XT and $1,995 for the Personal Computer AT.

More information is available from Martin Marietta Data Systems, P.O. Box 2392, Princeton, N.J. 08540.

Ashton-Tate rolls out tools

CULVER CITY, Calif. — Ashton-Tate has introduced versions of its Dbase III data base management software for the new AT&T Unix Personal Computer and for the Data General Corp. DG/One laptop personal computer. Framework, an integrated multifunction software package, will also be offered for the DG/One, Ashton-Tate said.

Dbase III, a relational data base management package, reportedly allows users to develop customized applications that put data base files to use. It offers storage capability of two billion records per file and 128 fields per data base.

Framework is said to produce documents containing graphs, outlines, text, spreadsheets and data base information. It also offers a high-level programming language and a telecommunications module.

Ashton-Tate is located at 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

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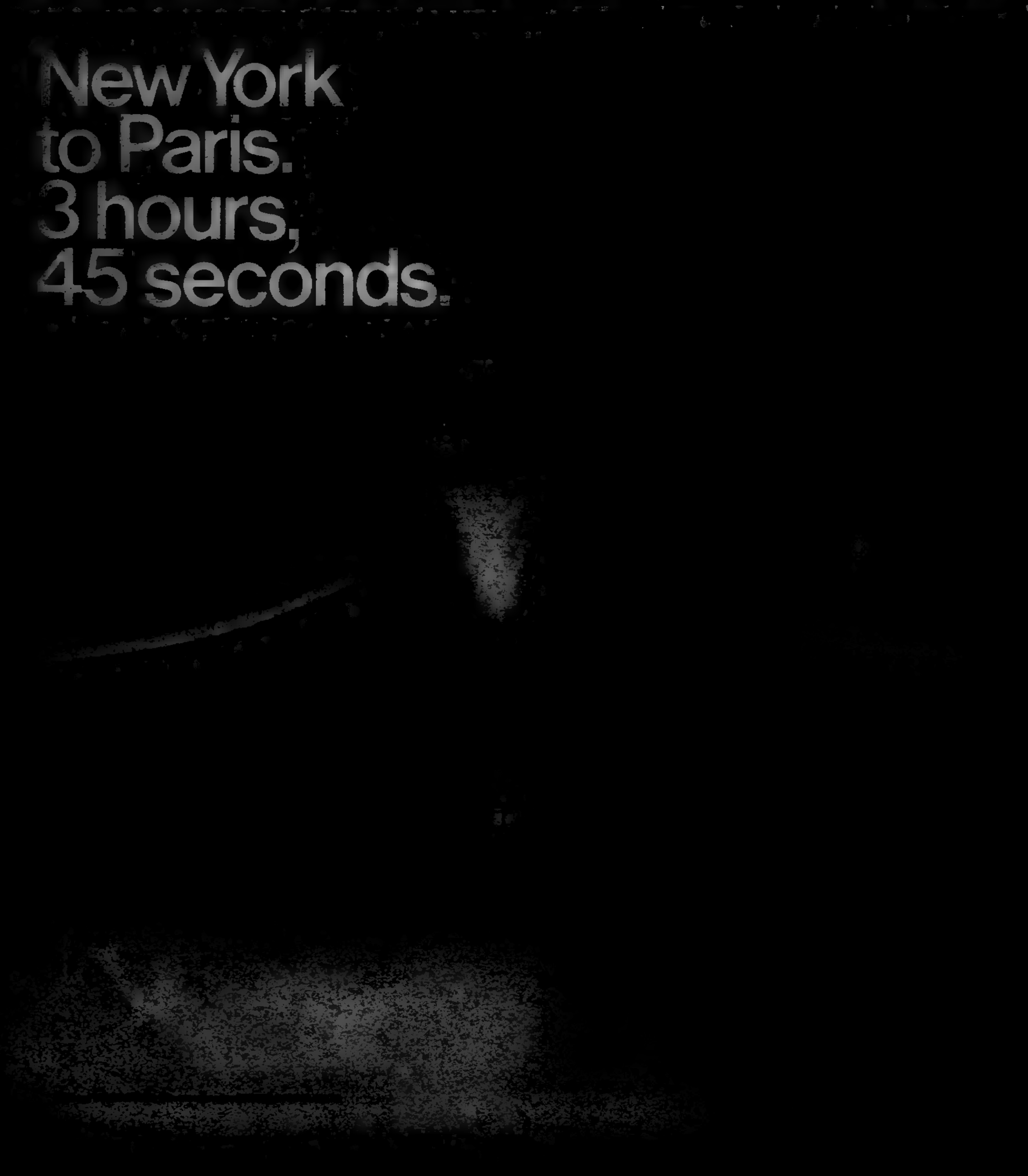

world as well, including the computers and workstations that are part of Team Xerox.

With the G1/G2 analog compatibility option, it can communicate with other slower speed facsimile terminals. With the RS-232-C option, it can also convert and print ASCII encoded information from a vast array of computers.

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New York to Paris: 25 seconds.

ADP Network Services remote computing product bows

ANN ARBOR, Mich. — ADP Network Services, Inc. has unveiled software that can reportedly improve the ease, speed, accuracy and economy of remote data entry with an IBM Personal Computer.

Called ADP/Preface, the software is said to aid in the creation of user-defined screens and menus for full screen data entry to a remote ADP Network Services central computing system. It can also develop data entry front ends for users' custom applications and for applications built around ADP Network Services' prepackaged software for financial analysis, project management or other applications, according to ADP Network Services.

The development of formats for data entry screens reportedly can be done entirely on the Personal Computer. Developers paint each screen by specifying titles, prompts, data types and field parameters in their choice of colors as well as layouts.

Valid ranges or lists of acceptable responses for each prompt can be specified, ADP Network Services said. Screen formats defined by the software can be used for on-line and off-line data entry.

ADP/Preface users must first obtain direct Personal Computer access to an ADP central computing system, using the software's terminal emulation capabilities. A data entry screen is then displayed and stored on the Personal Computer. Users enter the appropriate data and receive immediate validation for each data field.

The software is available to ADP Network Services clients for a $995 companywide license fee, which includes two copies of the software, documentation and a function key template.

ADP Network Services is located at 175 Jackson Plaza, Ann Arbor, Mich. 48106.

IBM micros gain macro program

BURLINGTON, Mass. — Alpha Software Corp. last week introduced Keyworks, a keyboard macro program for the IBM Personal Computer and compatible machines.

Priced at $89.95, Keyworks is said to be a menu-driven program for creating macros that permits users to record sequences of keystrokes and later access them with only one or two keystrokes.

Keyworks permits users within an applications program to assign both a name and a description for each macro and to get an on-screen directory of each macro, Alpha Software said. Keyworks also features a full screen pop-down editor for making immediate changes to macros.

The main Keyworks menu reportedly allows users to list, edit, save and get macros. In addition, it provides Microsoft Corp. MS-DOS functions within the application, allowing users to list directories, rename files, erase files, create files, create and delete subdirectories, change the logged disk drive or format a diskette without leaving the program.

A screen-save feature turns the screen off after a specified period of time to avoid burning an image into the screen. Pressing any key restores the screen, Alpha said.

Keyworks is said to be compatible with most major business programs, including Lotus Development Corp.'s 1-2-3, Multimate International Corp.'s Multimate, Micropro International Corp.'s Wordstar, Microsoft's Multiplan, Ashton-Tate's Dbase II and Dbase III, Alpha Software's Electric Desk and others.

The package requires a minimum of 64K bytes of random-access memory and IBM PC-DOS or MS-DOS 2.0 or above.

Alpha Software is located at 30 B St., Burlington, Mass. 01803.

"LOTUS", PC-DOS",
…HOW DO YOU GET IT ALL TO WORK TOGETHER?"

IBM program organizes Personal Computer applications

WHITE PLAINS, N.Y. — Two months after it began shipping its Topview windowing environment for its Personal Computer, IBM has introduced a program for the micro that reportedly allows users to switch instantly between installed applications such as Topview does.

Also like Topview, the IBM Personal Computer Organizer software is said to permit users to transfer some data between programs. Topview costs $149; Personal Computer Organizer is priced at $150.

Unlike Topview, though, Personal Computer Organizer does not provide windowing or the capacity for concurrent processing, IBM said. Instead, it reportedly gives users a menu of their installed programs and permits them to switch to another application by hitting one key.

According to IBM spokesman Thad Madden, Personal Computer Organizer's ability to aid program installation is its main advantage over Topview. "Topview is for people who use the Personal Computer for a variety of tasks at the same time," Madden explained. "Organizer is for organizations with varying applications requirements, especially large organizations."

File movement under Personal Computer Organizer reportedly can be done either automatically or from a menu.

The receiving application must be able to handle nonkeyboard input and accept the format of the incoming file, IBM added.

Personal Computer Organizer reportedly provides onscreen installation information for 12 applications and allows users to add installation information on others. Installation information is provided for IBM's Professional Office System Personal Computer Connection, Displaywrite 1, 2 and 3, the Personal Decision Series, Lotus Development Corp.'s 1-2-3 and other packages. Users also can create their own menus of installed applications.

Required for use with the organizer program are a hard disk unit, the IBM 5153 color display with Color Graphics Adapter, the IBM 5152 graphics printer or equivalent and 128K bytes of memory plus the minimum memory required by the largest installed program.

The Information Systems Group of IBM's National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

Windowing developed for Xenix

DALLAS — Five Paces Software, Inc. has announced Viewnix, a windowing interface for Microsoft Corp.'s Xenix operating system running on the IBM Personal Computer AT and XT.

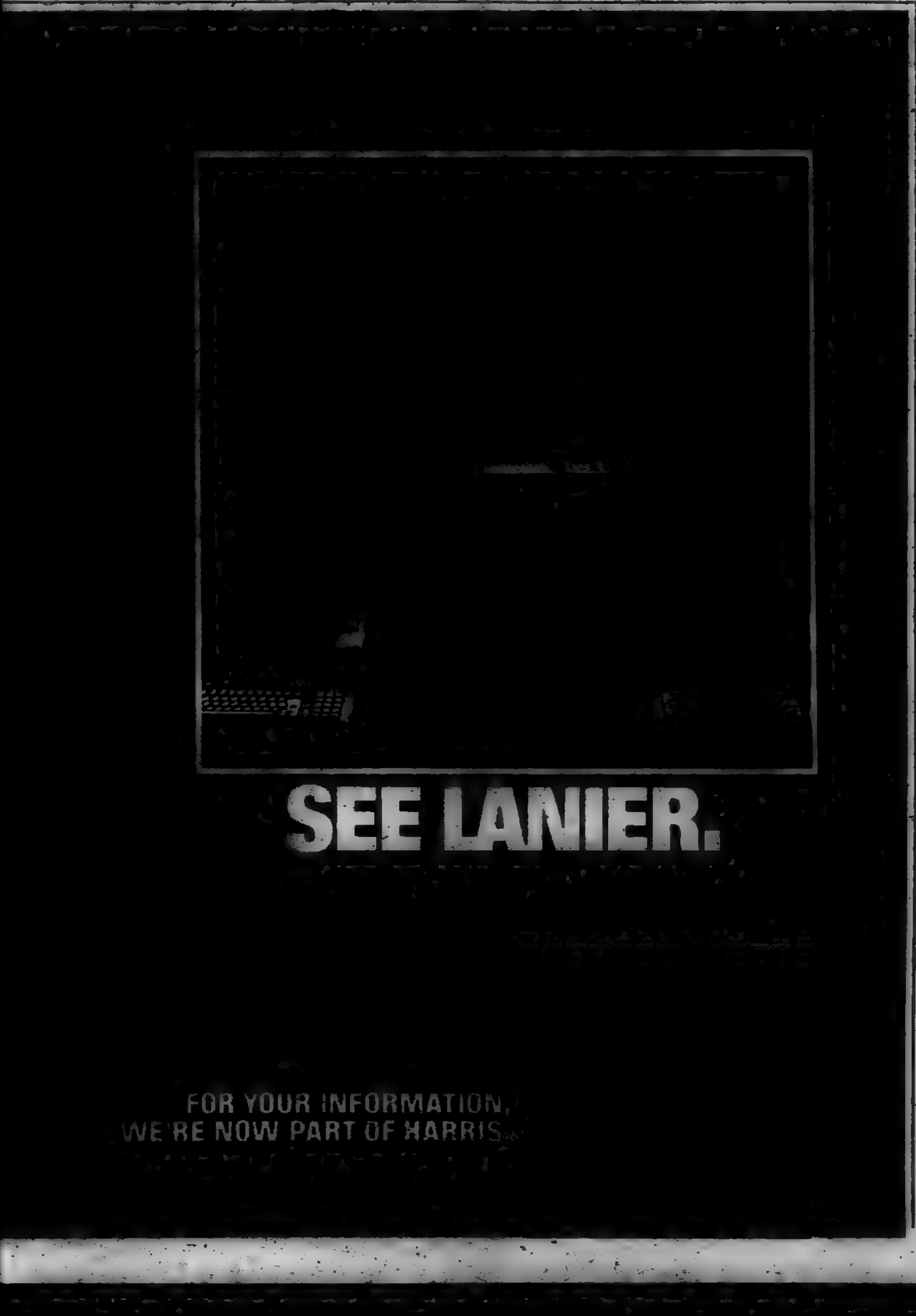
Viewnix reportedly allows the user to configure up to 10 windows on the screen of the AT, each of which can contain any standard Xenix application. The product is said to provide cut-and-paste capability for integrating data between different applications.

The product reportedly offers a programming interface to allow applications to control specific windows and to write directly to the window memory buffers.

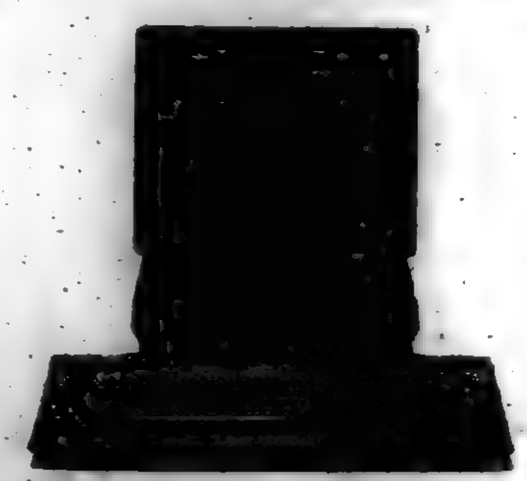
The vendor is also offering the Unimove integration facility and the Unilink communications program for use with Viewnix. With Unimove and Unilink, users can reportedly communicate with other terminals through a single window and selectively move data from the remote machine into an application running in another window.

Viewnix is priced at $249, and Unimove and Unilink each cost $149.

Five Paces Software is located at 9636 Wendell Road, Dallas, Texas 75243.



18 Reasons We're Uniquely



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3 We human-engineered the Ampex 210 with a full 14" screen that tilts and swivels to just the angle you need. So it's comfortable to use, no matter how you're positioned.

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9 The Lear Siegler ADM 3, ADM 3A, 3A+ or ADM 5*...

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14 And if you need a more powerful terminal with even more features, consider the next step up in our family of terminals: the Ampex 230.

15 We back every Ampex terminal with a six month warranty and a worldwide service network.

*TeleVideo, Lear Siegler, Esprit and Qume are trademarks of TeleVideo Systems Inc; Lear Siegler Inc; Esprit Systems Inc; and Qume Corporation respectively.

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6 But ergonomics are just the beginning. The Ampex 210 is as beautifully engineered inside as outside. With line graphics and a bidirectional printer port as standard features.

10 The Esprit (Hazeltine) 1400, 1410 or 1500*.

11 ADDS Regent 20, 25 and Viewpoint.†

12 And Qume's QVT 102*

16 How can we pack all that into the Ampex 210 for just $549? We're in a position to be competitive. We can take advantage of over 25 years of video, computer peripheral and offshore manufacturing experience.

17 So if you need a well-designed, full-featured terminal, call us at 800 621-0292. Or 800 821-9473 in California. We'll show you how you can be very comfortably situated for just $549.

AMPEX

18 The Ampex 210 is from the Computer Products Division of Ampex Corporation. One of The Signal Companies

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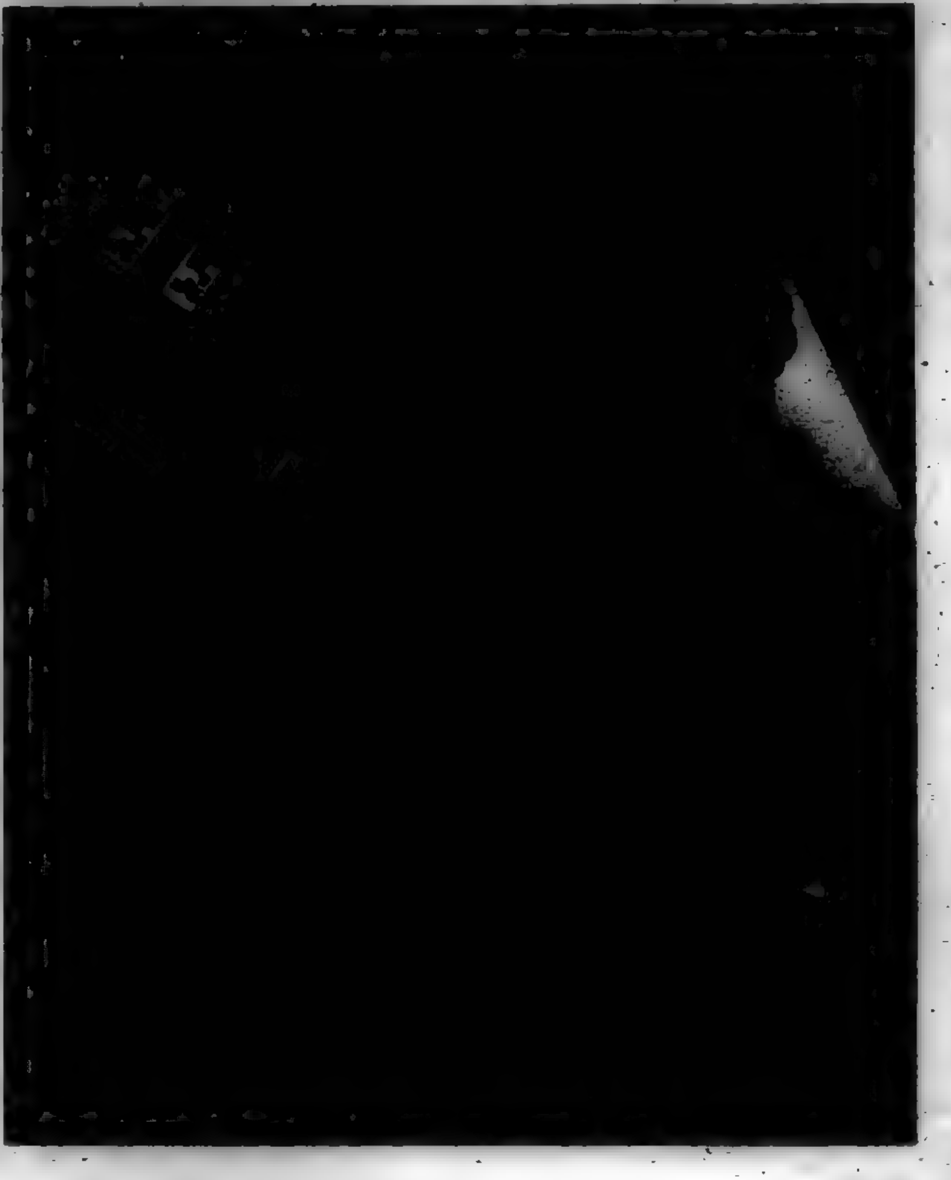

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CDC introduces engineering applications systems

MINNEAPOLIS — Control Data Corp. has announced Cybernet*Express engineering applications systems, a series of five software packages designed for IBM Personal Computers or compatibles with 10M-byte Winchester disk drives. The workstations are designed for engineering applications in structures, piping, power systems, electronics design and petroleum reservoir simulation (Basin).

Four of the five packages reportedly incorporate CDC Connect communications software to allow engineers to use the systems in a stand-alone micro environment or to migrate to a local CDC Cyber 800 mainframe or off-site CDC Cyber 205.

The Cybernet*Express Piping System reportedly generates input files for stress analysis, support optimization and analysis drawings for complex piping systems. It costs $7,500.

The Cybernet*Express Power System is designed for stand-alone micro use. It reportedly may be used for design specification and analysis of industrial, commercial and institutional electrical power systems. The Power System software is priced at $8,300.

The Cybernet*Express Structures System is said to be a finite element analysis system that allows design engineers to solve sophisticated structural analysis problems. The Structures System costs $4,500.

The Cybernet*Express Electronic Designer System is said to combine schematic entry and utility software with Personal Computer XT or compatible hardware. It reportedly features design capabilities such as pan and zoom, multiple windows, naming and identification, rubber banding, bus-through points, multiple-width components and net list extraction. It is priced at $7,150.

The Cybernet*Express Basin Access System allows petroleum engineers improved access to the CDC VIP series of Basin software applications running on the CDC Cyber 205. The software is said to provide data entry and editing, automatic dial-up and login procedures that allow the micro user to set up job parameters and I/O files for VIP applications running on the host Cyber 205. Basin Access is priced at $650.

More information is available from Control Data, 8100 34th Ave. S., Minneapolis, Minn. 55440.

Enhanced Entrypoint bows

SAN FRANCISCO — Datalex, Inc. has announced an enhanced version of Entrypoint software for data entry on the IBM Personal Computer, Personal Computer XT and Personal Computer 3270.

Version 4.3.1 is said to provide screen-based data entry with unlimited data validation logic, reference data files and Help screens for every field on every form. The new version allows users to move data entry and validation from overloaded mainframes to microcomputers, according to the vendor.

The new features are said to allow users to build self-documenting applications that prescreen data entered by untrained personnel for transmission to the mainframe. Version 4.3.1 reportedly allows data entry at more than 15,000 keystrokes per hour with special keyboard buffering and disk management.

Entrypoint supports single or multiple tree-structured forms, according to the vendor. Its output files are said to be standard PC-DOS files that can be transmitted to the host mainframe with communications hardware or software products, such as Datalex's Passport software.

Entrypoint requires 256K bytes of main memory and 640K bytes of floppy or hard-disk storage.

More information is available from Datalex at 650 Fifth St., San Francisco, Calif. 94107.

GRAPHICS

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resolution film recorder in the service center. The price is considerably lower than the cost of buying your own equipment.

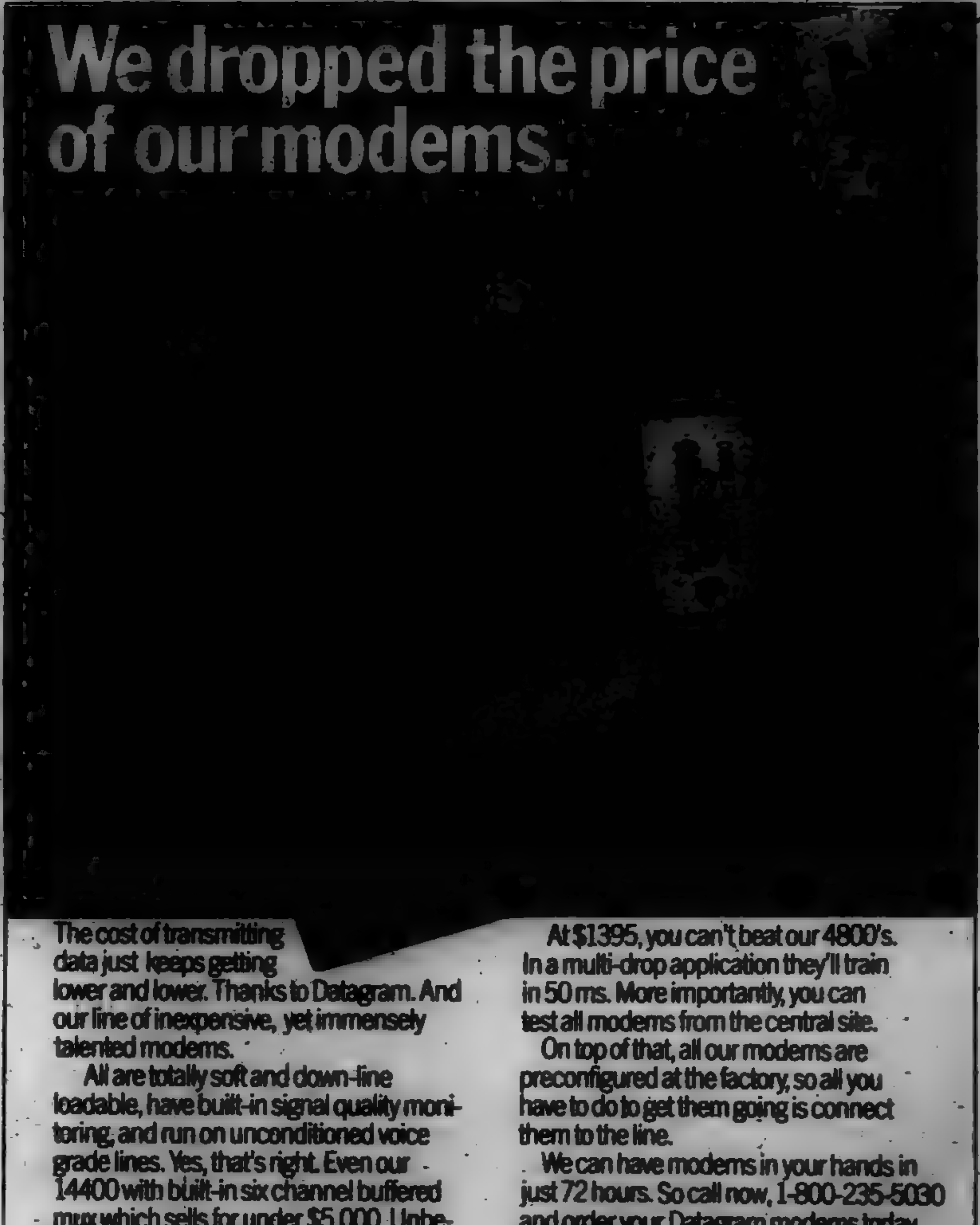
The only catch with enhancement services is that only certain types of graphics can be enhanced — free-form drawings and realistic images often cannot.

For the best of both worlds, there's Presenter PC. It requires some hardware (the higher resolution graphics adapter board) but also provides an enhancement service with a new twist.

Pictorial images and symbols can be added to your charts and graphics via a collection of electronic clip art.

You select the images to be added to your slide and the graphic comes back enhanced up to 8,000-line resolution — complete with the colorful image that you selected.

Nothing is perfect. But for a price that is within the budget of many organizations, microcomputer graphics are able to achieve an appearance that was once reserved for systems costing five to 10 times more.



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FALL

from page 69

business microcomputer market, IBM believed that it would be able to capture the home and educational markets simply by unleashing a low-priced machine with an IBM logo.

"IBM forgot that when it released its Personal Computer, [the Personal Computer] was a leading-edge product," noted William Bowman, chairman of Spinnaker Software Corp., a Cambridge, Mass.-based educational software vendor.

IBM took a technical step backward when it released the PCjr, which was merely a low-budget Personal Computer. The stripped-down machine was able to run some Personal Computer software but would not threaten its sales.

This attempt was similar to taking a Cadillac, ripping out some of the extras, lowering the price and marketing it as a competitor to a Volkswagen. Rather than following this approach, IBM should have looked to its own product line.

When IBM noticed minicomputers threatening its markets, it designed new product lines such as its 4300 and System/34. IBM did not strip down its 3033 mainframes and market them as competing machines. Machines must be designed for specific markets and price points.

For whatever reason, $400 to $1,000 seems to be the price range consumers will accept for an electronic gadget. For years, analysts claimed that the VCR market was poised for an explosion. It was only last fall — when VCRs dropped in price to approximately $500 — that the market rapidly expanded.

When the PCjr was first announced, a complete system cost approximately $1,300. Home users will only purchase complete systems — not typewriter-like systems that plug into television sets.

The closest any manufacturer has come to providing this type of system was Coleco Industries, Inc. Priced at approximately $700, Coleco's Adam included a tape drive, word processing software and a letter-quality printer. Coleco realized the importance of the $700 price. The company unsuccessfully tried to solve Adam's technical problems and keep that price.

If consumer price points had been understood at IBM, IBM would have attempted to design a complete $1,000 home computer.

Today, IBM should realize the importance of pricing. When it dropped the price for a complete PCjr to approximately $1,000 last Christmas, the machine became a best-seller. But each machine cost IBM approximately $450, so Big Blue was not making much money, according to Future Computing, Inc., a Richardson, Texas, market research firm.

Some analysts predict that the Personal Computer's price will drop, and it will be positioned to compete at the low end of the market. However, each Personal Computer costs IBM approximately $600, which does not leave sufficient margins to position the machine at the low end.

To reenter this segment, IBM must design a complete computer priced at approximately $1,000.

Will IBM do this? Aaron Goldberg, director of microcomputer system services at International Data Corp. in Santa Clara, Calif., claimed that IBM will introduce a new machine because the educational market is too important for IBM to ignore.

While talk has centered on home computers, few realize that the real treasure buried at the low end of the market is in educational sales. Digital Equipment Corp. propelled itself to its position as the second largest computer manufacturer largely through the university market. When MIT students graduated, they had a thorough knowledge of DEC equipment, and they purchased it for their companies.

Last summer, IBM announced a "Writing to Read" campaign to position the PCjr as a competitor to the Apple and Tandy entries. "IBM must have spent at least $10 million on the Writing to Read program," Bowman said. "That commitment demonstrated how important the educational market is to IBM. I don't think that IBM can afford to abandon that market forever."

TAPE

from page 69

after-write verification with one pass, a method offering greater verification speed than the three-pass method provided by units with one head, according to CMS. The QIC-60 units are said to require two minutes to do mirror-image backup of a 10M-byte hard disk and two minutes, 14 seconds to do file-by-file backup of the same disk.

Both units are said to allow users to back up a file or group of files selectively without typing in a name. By scrolling through the tape directory, users can choose a file or group of files for backup, push one key and have them backed up automatically. When restoring backup data to a disk, the process is reversed.

The Q60H, a 60M-byte tape unit, costs $2,144. The Q60W20, the QIC-60 with 60M-byte tape and 20M-byte hard disk, costs $3,495.

Tecmar is located at 6225 Cochran Road, Solon, Ohio 44139.

WP

from page 69

text formatting information from the original document, including format lines, centering and tabs. No extra return characters are added to the converted file.

Transferring documents between the micro and the mini requires separate communications tools.

The conversion program is free to current Multimate users and is not for sale.

Multimate International is located at 52 Oakland Ave. N., East Hartford, Conn. 06108.

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Design—The ERGO330 is ergonomically designed with an adjustable monitor and smaller footprint than the DEC VT220. The detached, low-profile keyboard is shorter than the DEC VT220 keyboard and has an easy-tilt adjustment.

Graphics—Upgradability. The ERGO330 can accept an optional graphics board ([illegible]) which will perform all Plot-10 and ReGIS functions and can be added to existing ERGO330s. The small footprint is maintained when adding graphics to an ERGO330 but must be forfeited when purchasing a VT240. In addition, our graphics can function as much as seven times faster than the VT240.

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2. Where can you buy an IBM PC XT or AT, AND have it installed, AND get on-site warranty for it? ____
3. Who will educate IC personnel or end-users at their site or yours? ____
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation? ____
5. What provides a micro software facility that allows you to customize a system to your specific requirements? ____
6. Who are the premier micro consultants to the *Fortune* 1350 companies? ____
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals? ____
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10. Name the companies that can provide all of the above? ____

*(Turn Page Upside Down for Answers)

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TI from page 60

tasking version of the Business-Pro, running Microsoft's Xenix, reportedly will be available in the third quarter.

The basic single-user Business-Pro will include the system unit, keyboard, serial/parallel interface and a 1.2M-byte diskette drive. An enhanced model will have the features of the basic machine and a 21M-byte hard disk drive. Users may choose from a variety of data storage configurations, including 360K-byte or 1.2M-byte diskette drives; 21M-, 40M- or 72M-byte hard disk units; and/or a 60M-byte cartridge tape backup system.

The Personal Computer AT-compatible version of the Business-Pro will also debut in June and will feature a 1.2M-byte diskette drive, 21M-byte hard disk and a Personal Computer AT-mode CRT controller.

Network server versions to be available

Two network server versions of the Business-Pro will also become available in the second quarter. Each reportedly will include the 512K-byte system unit; a 128K-byte expansion board; high-resolution color monitor; Novell, Inc. Netware software; MS-DOS 3.0; and 3Com Corp.'s Etherlink network hardware.

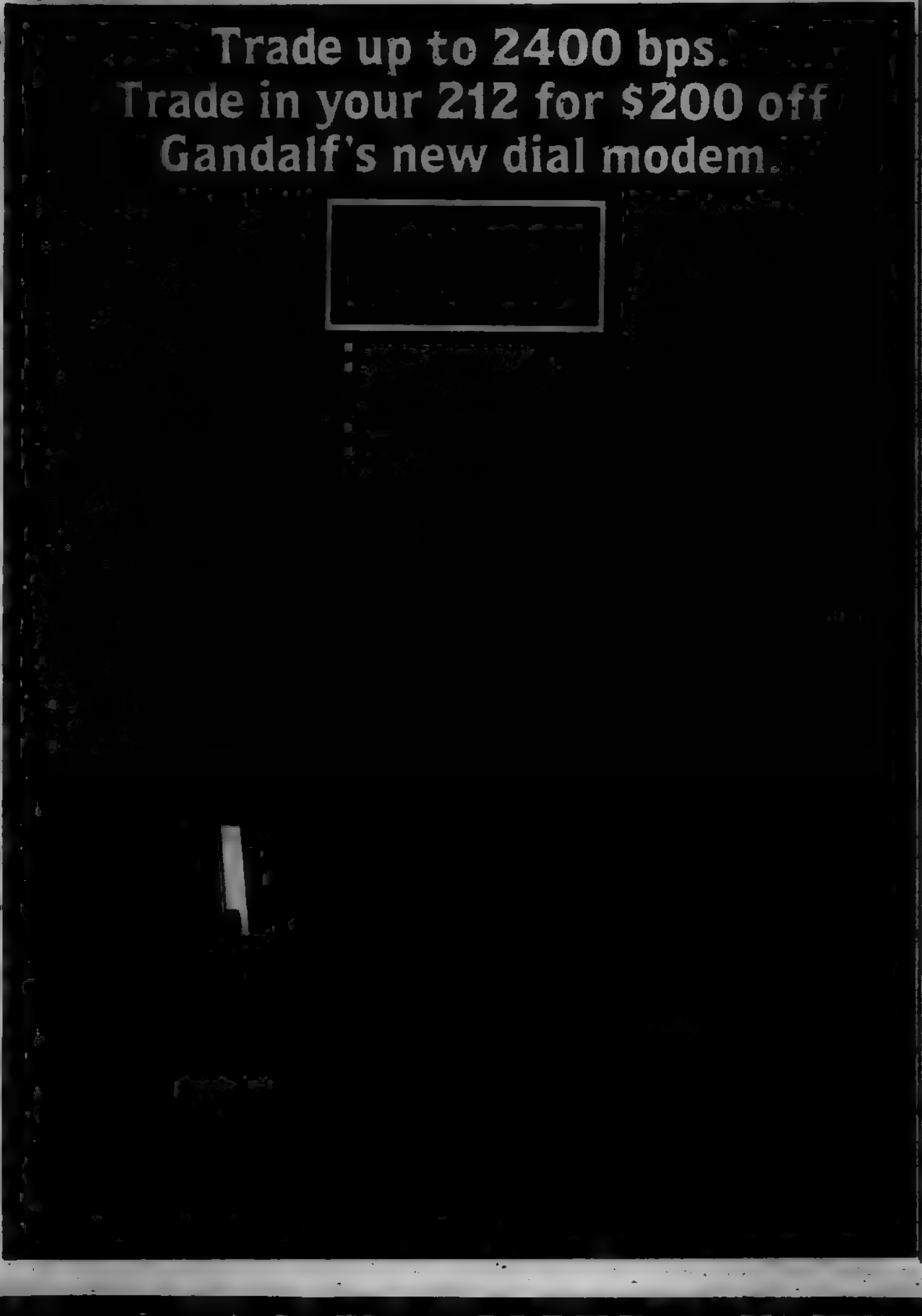
As a network server, the Business-Pro will support up to 50 personal computers sharing up to 144M bytes of disk storage, a 60M-byte cartridge backup system and up to three printers, TI said.

Other options for the Business-Pro include a tilt-and-swivel monitor with a 13-in., bit-mapped display, the Intel 80287 math coprocessor and two user interfaces — the mouse pointer and TI's Speech Command speech recognition system.

The single-user Business-Pro will be priced at $3,995; the enhanced model will cost $5,795. The Personal Computer AT-compatible configuration carries a price of $6,040. The AT-mode CRT controller alone will be priced at $495 and reportedly will operate in any of the other configurations of the Business-Pro. Other configurations are priced from $4,440 to $10,785, based on user's choice of storage devices.

Prices for the network server version of the Business-Pro are $12,200 for a model with a 40M-byte hard disk and $13,700 for one with a 72M-byte hard disk.

TI's Data Systems Group can be reached through P.O. Box 809063, Dallas, Texas 75380.



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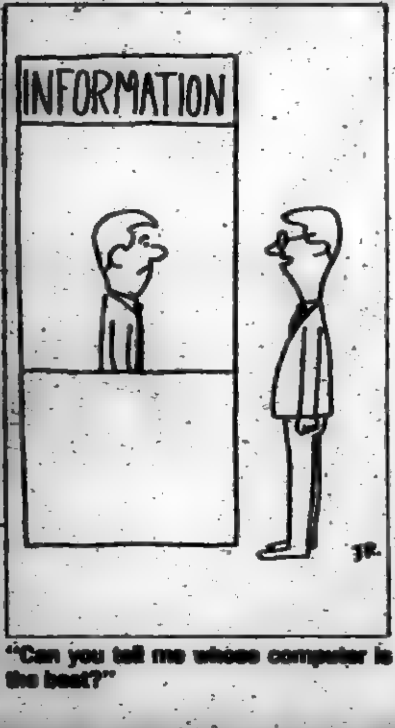

"Can you tell me whose computer is the best?"

COMMUNICATIONS

Backup needs merit attention

WIRE TAP
Daniel Minoli

Major disasters that can put a large organization out of business happen more often than one would like to believe. The threats include fires, floods and physical security infractions of a criminal or terrorist nature.

The issue of backing up a data center has received considerable attention in the past few years, but less attention has been given to the communications system that would support a postdisaster backup site.

Recovery systems for communications vary by application. Clearly, if the communications requirement is centralized, as in a large batch environment where all major users are close to the system, the likely solution will differ substantially from the solution for a geographically distributed, transaction-based teleprocessing network.

When planning for disasters in a distributed DP environment, a regional center may be nominated as the backup site. In a centralized DP environment there are several options: construction of an alternate site; use of a corporate parent or sister division's data center; or use of a disaster recovery service. The first option requires choosing a location. Should the site be some nearby suburban site for both staffing and communications reasons?

Several communications technologies can accommodate access to the alternate site from the dispersed population of users:

- Packet-switching networks provide access to the alternate site by making

See [illegible] page 96

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities in New York.

Local Data releases enhanced converter, emulation packages

ATLANTA — Local Data, Inc. has announced an enhancement for its Versalynx/3278 Model 3 protocol converter that offers customer-definable terminal personalities. The company also announced file transfer support for the Data General Corp. DG/One personal computer and the IBM 3270 Personal Computer.

A spokesman said Versalynx/3278 Model 3 allows an IBM 3278 or equivalent terminal to emulate any of five factory-provided Ascii terminal personalities or customer-definable terminal personalities. A Model 3 user can define both the output sequences and the keyboard key sequences making up each 3270 key function. The defined personality can be transmitted from one Model 3 to another Model 3, Model 2 or Model 1 Versalynx/3278 as well as uploaded to Ascii mainframes for subsequent downloading to other Versalynx units.

Versalynx/3278 Model 3 costs $795 for stand-alone units.

With Filelynx/3278-PC software, a DG/One workstation allows the device to appear to the host as either an IBM 3278 or 3287, or as both devices on one communications channel when used with the company's Datalynx/3274 or Interlynx/3278 protocol converters. Filelynx/3278-PC costs $200 for the first copy and $100 for each additional personal computer. An unlimited-use license costs $1,000.

The Filelynx/3270-PC software makes an IBM Personal Computer, XT, AT, PCjr or compatible microcomputer, such as AT&T's 6300, function like an IBM 3270 Personal Computer using the Datalynx/3274 or Interlynx.

Filelynx/3270-PC costs $300 for the first copy, $200 for each additional personal computer and $15,000 for a single-customer unlimited-use license.

Finally, Local Data announced Datalynx/3274 Release 2.31 for 3270 bisynch-

See LOCAL page 94

IBM controller only product for T1 nets

By John Dix
CW Staff

Although 1.54M bit/sec T1 digital communications facilities can be used in IBM networks today, the only product the mainframe manufacturer has announced that enables these links to be controlled within its network architecture is an adapter for its 3725 Communications Controller.

The high-speed adapter for the 3725 was announced last September but will not be shipped until the third quarter of this year. It will reportedly enable users to transfer data between hosts through 3725 front-end processors at speeds up to the maximum T1 rate of 1.54M bit/sec.

Initially tariffed last year, T1 can offer an economical alternative to individual leased lines for large users who have enough data or voice traffic between two points to justify the wide-bandwidth digital pipe.

But the only way T1 links can be used within IBM environments today is by placing T1 multiplexers in front of IBM's 3705 or 3725 Communications Controllers. In this type of configuration, the capacity of a single T1 link can be subdivided into multiple channels operating at different speeds, with the maximum single-channel speed being 64K bit/sec, the fastest rate supported by the IBM communications processors.

IBM does not offer a T1 multiplexer, nor does its Systems Network Architecture (SNA) recognize other manufacturer's T1 multiplexers. This cripples, to some degree, IBM's diagnostic programs. "If you want to keep your end-to-end problem diagnosis and troubleshooting via IBM software, then you have to use IBM products," according to George DeSalvo, director of Communications Technology Service for the Washington, D.C., office of International Data Corp., a Framingham, Mass.-based research firm.

Although IBM's host-based programs such as the Network Problem Determination Application can monitor and control remote IBM hardware through T1 multiplexers and facilities, the programs are blind to the condition of the multiplexers

See T1 page 97

- Forest Computer has announced a communications processor that is said to be a gateway to the IBM SNA network for non-IBM terminals and printers/92
- KMW Systems has announced a device that reportedly allows the attachment of up to seven parallel or serial asynchronous devices to IBM System/34, 36 or 38 machines/92
- Universal Data Systems has introduced its 14.4 Trellis modem, which is said to operate at 14.4K bit/sec over unconditioned private lines/94

INSIDE

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Network puts data at immigration agency's fingertips

WASHINGTON, D.C. — Nearly 200 million immigrants and visitors pour across the borders and through legal entry points each year to enter the U.S.

The Immigration and Naturalization Service (INS) here, chartered with the investigation of noncitizens who come into the U.S., determines whether an immigrant shall be granted citizenship.

The INS also investigates temporary workers, diplomats and other visitors who want to live in the country for a length of time. The service runs the border patrol, intelligence operations, investigations, deportation proceedings and detention facilities.

Keeping track of this continuous information flow is a huge job. Yet only two years ago, the INS manually registered immigrants and visitors, processed naturalization cases, followed the movement of aliens and checked a lookout hot list of terrorists and saboteurs.

To improve the agency's timeliness and accuracy, in the fall of 1982 the INS began investigating the possibility of using a data communications network to tie its 110 regional offices into two central data bases, according to John Murray, associate commissioner of information for the INS, who was responsible for the investigation and eventual implementation of the net.

Installed network

By the fall of 1983, INS had installed a Tymnet, Inc. network that enabled its regional offices to enter and retrieve information on individuals from the central data bases.

The system employed to track undesirable aliens is currently being installed in major air and sea ports in the U.S. It is also being placed at checkpoints in foreign ports.

Unlike the old lookout book, this system has a response time of three to five seconds and can be updated instantly.

Originally, INS used Tymnet's public network, but as the INS increased its reliance on the service, a fully dedicated custom network evolved, which Tymnet will manage.

Currently, the INS has two major data centers, one in Washington, D.C., and the other in Dallas. These centers have a combination of various size packet-switching nodes, including Tymnet Engines, Mini-Engines and Micro-Engines.

Tymnet has also furnished modems and lines for the system. The total mileage of the lines in

See INS page 94

COMMUNICATIONS

CONTROLLERS

■ Forest Computer, Inc. has announced the 1KS/SNA communications processor that is said to be a gateway to the IBM Systems Network Architecture (SNA) network for non-IBM terminals and printers.

The 1KS/SNA hardware reportedly consists of a Hewlett-Packard Co. HP1000 A series minicomputer and Programmable Serial Interface (PSI) cards. The software in the A series handles SNA control, frame processing and data stream conversion, according to the vendor. The PSI cards are reportedly programmed to handle a variety of protocols.

The product is capable of allowing more than 1,000 terminals to communicate with both IBM and non-IBM hosts, according to a spokesman.

The Forest 1KS/SNA software is priced at $35,000, and hardware prices also begin at $35,000.

Forest Computer, 1749 Hamilton Road, Okemos, Mich. 48864.

VOICE/DATA COMMUNICATIONS

■ General Datacomm Industries, Inc. has announced the Datx Integrated Office System (IOS) hardware for transmitting voice and data simultaneously over existing twisted-pair telephone wiring.

The Datx IOS system includes Datx 2000 line interface units and the Datx Switching System. Datx 2000 desktop units provide an RS-232 interface and support transmission of asynchronous and synchronous data at speeds up to 19.2K bit/sec at up to 8,000 feet. The Datx Switching System provides links for up to 1,320 terminations, expandable in 24-channel increments from a base capacity of 360 lines.

Datx IOS costs $11,000.

General Datacom, Rt. 63, Middlebury, Conn. 06762.

PROTOCOL CONVERTERS

■ Fibronics International, Inc. has announced Pascii, a line of four protocol conversion tools.

FC3000 provides an RS-232 attachment to an IBM 3274 controller or 4331 Display Printer Adapter. A pass-through feature supplies communications to an Ascii host.

FC3008 converts up to eight 3274 coaxial ports to RS-232 ports which can be used to support Ascii terminals, printers and personal computers. The product enables each terminal to be configured for IBM 3278 or 3279 terminal emulation.

FC3001 enables a user to attach an IBM 3278, 3279, 3178 and 3179 terminal to an RS-232 line. With the product, a user connects directly to a 3274 controller.

FC3500 allows an RS-232 serial or parallel printer to be attached to an IBM controller. The product uses a generic print mode to support any hard-copy device, the vendor said.

The RS-232 port supports transmission speeds from 300 to 9.6K bit/sec. Product prices range from $500 to $1,000 per port.

Fibronics International, 325 Stevens St., Hyannis, Mass. 02601.

■ KMW Systems Corp. has unveiled the Series II+ Twinax protocol converter that reportedly allows the attachment of up to seven parallel or serial asynchronous devices to the IBM System/34, 36 or 38.

The Series II+ Twinax communicates with the host system via standard twinaxial, two-conductor shielded cable. The device emulates a 5250 Model II terminal or a 5225 printer. The converter has the cable-through feature used with the peripherals in these processor families, enabling it to be used as a station on cable stringing together many devices or as an interface.

The product supports any combination of parallel and asynchronous RS-232C devices, but at least one of the ports has to be asynchronous.

The Series II+ Twinax costs $1,995 for a single port converter and $550 for each additional port.

KMW Systems, 8307 Highway 71 W., Austin, Texas 78735.

SOFTWARE

■ Motorola/Four-Phase Systems, Inc. has introduced communications software that allows its Series 4000/6000 minicomputers to communicate with Wang Laboratories, Inc. word processing systems.

Word-Share allows the two systems to communicate via RS-232 connections or remotely over telephone lines. Documents can be transferred in both directions. Centering, tabs and underscoring WP functions are maintained during the exchange.

Word-Share is priced at $3,000.

Motorola/Four-Phase Systems, 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

MULTIPLEXERS/ MODEMS

■ Nokia-Kinex Corp. has introduced its 48/208AB Models 2 and 3 modems that operate as either an AT&T 208AB or as a 201C modem.

Model 2 offers manual selection of 208AB or 201C modes and Model 3 offers automatic selection of the modes. Features include autospeed detection and leased/switched operation selectable from the front panel.

Prices start at $1,195.

Nokia-Kinex, 6950 Bryan Dairy Road, Largo, Fla. 33542.

See [illegible] page 94

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CW

MUXES

from page 92

■ Nokia-Kinex Corp. has announced its 48/27 4.8K bit/sec modem, said to be capable of operating on both domestic and international circuits over leased and dial-up facilities accommodating point-to-point or multipoint networks.

An echo protect feature reportedly allows operation over satellites. The modem is said to be fully compatible with CCITT V.27. The 48/27 provides independent two-wire and four-wire line interfaces for simultaneous connection to both leased or dial-up facilities, the vendor said.

Features include fallback to 2.4K bit/sec, automatic antistreaming alarm, unattended autoanswer/disconnect capability and local and remote controlled diagnostics.

The unit costs $2,100.

Nokia-Kinex, 6969 Bryan Dairy Road, Largo, Fla. 33543.

■ Universal Data Systems has introduced its 14.4 Trellis modem, said to operate at 14.4K bit/sec over unconditioned private lines.

The modem, which uses trellis modulation, comes in both a stand-alone package and a 56-sq-in. card. It includes an automatic adaptive equalizer that is said to compensate for line distortions without the need for manual strapping of preequalizers. The modem provides for fallback rates of 12.2K bit/sec and 9.6K bit/sec and is CCITT V.29-compatible at 9,600 bit/sec.

The price of the 14.4 Trellis stand-alone modem is $3,960. The card version costs $1,530.

Universal Data Systems, 5000 Bradford Drive, Huntsville, Ala. 35805.

■ Astrocom Corp. has announced its Asim-3 statistical intelligent multiplexer that multiplexes data from three asynchronous terminals onto one line at synchronous speeds up to 9.6K bit/sec.

The multiplexer features a menu-driven screen that allows the network manager to set all multiplexer parameters from a terminal keyboard rather than using internal switches and straps, the vendor said. A remote setup capability allows the selection of parameters from any customer-selected location. The three-port system costs $640.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

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INS

from page 91

the network has increased from 500 to 32,000 circuit miles in the past year.

Last year, of the 200 million individuals who were inspected, 1.2 million were apprehended for entering the country illegally.

On a record inspection day, 3,560 entrants were apprehended, according to Murray.

Naturalization process begins

The naturalization or permanent resident procedure starts when an applicant first enters the country and fills out a standard form that requests basic information. This information is then fed into one of the INS' data bases.

The central data base contains 60 million records on 18 million individuals.

"The Tymnet custom network will simplify and expedite the naturalization process and give us positive control," Murray said.

"In the past, without the data communications and centralized data bases, it was possible that we would try to naturalize a person in one city when he was scheduled for deportation in another city," Murray continued.

Even before the installation of the network, the INS was working to improve the rate at which aliens are naturalized. The backlog is still 1½ to two years.

"The optimum would be about six months from the time they apply to when they are eligible," Murray said.

Antismuggling data base

Some of the more complex files in the data base involve law enforcement. An antismuggling data base is currently used to prevent the smuggling of people.

The system is cross-referenced by aliases, soundalike names, alternate spellings, telephone numbers, addresses and relationships.

INS employees can search this data base in approximately 60 seconds.

"We stopped 37,000 smugglers last year," Murray said.

A number of states, including California and Colorado, have contracted with the INS to tie in to certain parts of the INS data bases to check whether an alien is legally eligible for government benefits.

Before the distributed network existed, there was no link between the INS and the states.

"The state clerks had to send the forms to us and hope to get them back," Murray said. "They were stacked up in a lot of offices, and the volume was more than we were able to handle."

LOCAL

from page 91

ronous emulation. According to a spokesman, Release 2.31 enables the user to add up to three personalities to the emulation package of more than 50 standard factory-configured terminal personalities.

Datalynx/3274 is available in three to nine ports, in Binary Synchronous Communications or Systems Network Architecture. The product costs from $3,000 to $9,000, depending on model and number of ports.

Local Data is located at 2771 Toledo St., Torrance, Calif. 90503.

SITE from page 94

that site a major network node.

■ With two-way, direct broadcast satellite networks — consisting of dispersed small dishes and a master earth station usually connected to the CPU site via a set of leased lines — provision of alternate access is achieved by connecting the alternate site to the master earth station using a duplicate set of leased lines.

■ In a teleprocessing network with major concentrator nodes, provision of alternate access is achieved by connecting the concentrators — presumably a small number — to the alternate site via duplicate leased lines.

Cost factors

The cost of the solution will be greatly influenced by the speed of recovery desired. The most practical approach is to postulate a target recovery time of 24 hours. A one-hour requirement would increase the cost considerably; a three-day requirement would lower it.

The practical approach is to relax all such parameters to a lower, but not unreasonable, level of expectation. For example, a two- to five-second normal response time may be relaxed to 10 to 15 seconds.

In the throughput area, consider what flows and applications are really crucial to the business, and limit all others for the duration of the contingency. In addition, it may be possible to temporarily replace some data flows with tape transfers, dial-in facilities and so forth. Systems development staff may be moved to the new location.

Other design factors will also affect cost. Can backup equipment be located on company premises, or must it be placed off-site? What are the secondary risks? Will postdisaster facilities that may be affected by the contingency, such as bypass technologies, local networks and private branch exchanges, also be used?

Issues that also must be considered include the following: How extensive will the damage be? What safety systems are in place? How conservative should the backup technology be? How important, feasible or desirable is reusability of disaster facilities for nondisaster use?

Basically the costs associated with contingency planning and actual disasters are composed of three elements: initial costs, recurrent costs and cost at recovery.

Naturally, a solution that has a low initial cost, low recurrent cost and low cost at recovery would be most desirable.

In practice, the situation is more challenging. A solution with low initial cost — for example, use of dial-up lines for backup — would involve a higher cost at recovery. A solution with higher initial cost, such as alternate dedicated lines, would entail no cost at recovery. A solution with low recurrent cost, such as high-capacity multiplexers, would cost more initially.

"You might see better if you took off the dust cover!"

MUXES from page 94

■ Timeplex, Inc. has announced Prophet Network Manager software that runs on the IBM Personal Computer XT and provides configuration and management capabilities for the company's Link/1 T1 multiplexer.

Prophet Network Manager is said to assist in designing, implementing and controlling private integrated digital networks for voice, data, video and digital facsimile information streams.

The software provides menus and prompts for all control functions of Link/1, including the ability to configure port and data link parameters; make clock selections; execute system commands; conduct diagnostic routines, such as hardware and firmware tests; count statistics that indicate the quality of T1 transmission facilities in the network; and display any alarm condition on operator request.

THE SMARTEST MOVE
YOU CAN MAKE

FOR DUMBBELL MODEMS.

The Link/1 Prophet Network Manager software is priced at $1,500 and is compatible with Link/1 models L1340 and L1840.

Timeplex, 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07645.

LOCAL-AREA NETWORKS

■ Applitek Corp. has announced Lantest software, said to enable users to measure response time and throughput of the company's Unilink local-area network as the load is increased to 100%.

Lantest shows the effect of running a network under different access methods, including carrier-sense multiple access with collision detection (CSMA/CD), token passing or Unilink. Unilink is said to combine CSMA/CD response with the access of token-passing systems.

Reportedly, Lantest includes a starter kit consisting of four Applitek network interface units, software and an appropriate baseband, broadband or fiber-optic cable. An IBM Personal Computer or compatible micro with 128K bytes of memory and a serial RS-232 port is required.

The price for Lantest software is $2,000.

Applitek, 107 Audubon Road, Wakefield, Mass. 01880.

T1

from page 91

and the T1 link connecting them. This is because "IBM's Byzantine set of systems management programs for communications require the device that they work with — down to the controller and terminal level — to have microcode, hardware or something built in that can respond to a diagnostic inquiry," DeSalvo said. "IBM's software can't interrogate T1 multiplexers."

IBM's high-speed adapter for the 3725 does not provide the full functionality of a T1 multiplexer, but it can provide a high-speed connection between remote hosts or between a host and a 3725 configured as a remote concentrator under the full control of SNA. "SNA does the multiplexing for you over the T1 link, carrying on multiple sessions on a given trunk," said Francis X. Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C. "The T1 trunk is just acting like a digital pipe."

Use of the 3725 adapters and T1 facilities to interconnect computer sites might be justified by the volume of data required or by application. Although DeSalvo said that you need a "tremendous amount of traffic to justify T1," Dzubeck pointed out that in the SNA Distribution Services and Distributed Office Support Systems environments, moving documents — which may contain graphics — between locations can eat up a lot of bandwidth.

Adapters may be necessary

Where it is desirable to transfer files between remote processors faster than the maximum 64K bit/sec channel rate supported by IBM's 3705 and 3725, the high-speed adapter may be the only alternative; host computers do not have the intelligence to break a file down to send it out through multiple 64K bit/sec T1 multiplexer channels, according to DeSalvo.

The other primary application for the T1 communications controller adapters is the support of remote 3725s that are acting as concentrators for a cluster of hardware. "If your computer was in [Tampa, Fla.], you could have a 3725 in Cleveland acting as a giant intelligent controller supporting the whole Midwest," DeSalvo explained.

IBM uses 3725s in this manner in its Information Network, DeSalvo noted, although it does not currently interconnect the communications processors with T1 facilities.

The traffic needed to justify the hardware — the 3725 adapters cost roughly $100,000 on a request-for price-quotation basis — and the T1 links in a remote concentrator configuration is higher than in host-to-host applications. "The whole idea of why you front-end something in a remote city is to reduce that traffic, and once you do that, often you no longer have 1.54M bit/sec to transmit," DeSalvo said. "It's like the old adage: 'What am I going to do with one elephant?'

'Well, I'll sell you two.'

'Okay, now you're talking.' "

Photo: [illegible]

UNCOMMON

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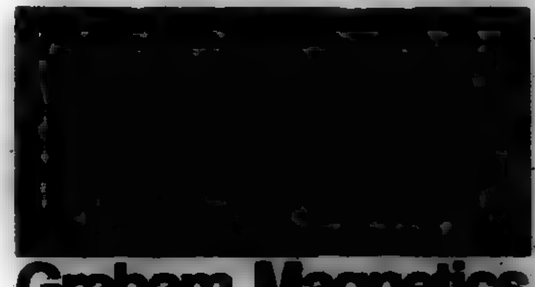

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SYSTEMS & PERIPHERALS

Prime 9955 earns early user's praise

By Susan [illegible]
CW Staff

DANBURY, Conn. — "I was optimistic going into it, but I was totally floored when I saw the results," said one of the first users of Prime Computer, Inc.'s 9955 superminicomputer, who claimed the firm's recently conducted benchmark tests exceed Prime's performance claims for the system.

The Comstock Group, Inc. here installed its 9955 on Friday, March 22, and performed benchmark tests of its payroll application program on the following Saturday, according to Cynthia McFarland, the firm's DP manager. The program, which processes payroll records for the firm's 1,000 employees, took nearly 6¼ hours to run on Comstock's Prime 750. McFarland said the package ran in just under 1½ hours on the 9955. In previous benchmarks run on a Prime 9950 at Prime's Natick, Mass., headquarters before the 9955 was available, the program ran in just under 2¼ hours, she said.

McFarland had expected less dramatic results. Prime told potential users of the machine that if they were running Fortran 77 programs, they could expect a 60% increase in performance over the 9950 model, she said. Fortran 66 users — like Comstock — were told to expect a 30% increase in speed, which was considerably less of an increase than what actually happened in the benchmark tests, she said. "If we move to Fortran 77 now, it will be phenomenal," she said.

Comstock Group's information system needs grew rapidly as the company expanded through acquisitions and start-up companies, said Charles McFarland, vice-president and treasurer of the firm, which was originally founded as L. K. Comstock & Co. in 1904.

The Comstock Group — a holding company with several subsidiaries — is engaged in electrical and mechanical construction, communications and engineering, he said.

Comstock removed the payroll application and a labor distribution package that goes hand in hand with the payroll from its two IBM System/3 Model 12 minicomputers and placed them on a Prime 750 about 1½ years ago, he said. The company had ordered a Prime 550 to back up the 750, but because the payroll and labor distribution packages were becoming so immense, it became apparent that they would outgrow the combined capacities of the 750 and the 550 too fast, he said.

Applications requirements and the number of users had increased so rapidly that the planned system was inadequate even before it was delivered, he said, and

See PRIME page 106

■ Sony Communications Products unveiled a line of videotex products/196

■ Uniq Digital Technologies enhanced its PDP-11-based minicomputer/192

■ Topaz announced a microprocessor-controlled line of power conditioners for minicomputers and other devices/196

INSIDE

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Data Storage/192
Graphics Systems/192
Power Supplies/196

SHOP TALK
David Friend

Graphics boom affecting MIS

Managers are realizing that the ability to compress, track and control vital information gives them a cutting edge in today's business environment. MIS departments can help managers hone this edge with computer graphics systems that allow them to access information quickly and easily — information displayed in a graphics format that is instantly recognizable and useful.

Many MIS departments are now beginning to formulate systems to supply managers with the information they need in the formats that they desire. The MIS department traditionally served primarily the financial and accounting functions of the organization. These functions called for massive reports that detailed transactions and financial conditions. That role has changed.

Managers are not interested in wading through long printouts. Instead, they want to be able to capture the information they need quickly and graphically. In many companies where the MIS department is not supplying them with the information, managers are learning to access it independently on their desktop systems.

The MIS department must keep in mind that managers are information users, not information analysts. They do not manipulate information — they have people to perform that function. What they do need is improved access to the information that allows them to carry out their decision-making responsibil-

See MANAGE page 106

Friend is chairman of Pilot Executive Software, Inc., a Boston-based developer of executive information systems.

Burroughs MICR unit debuts

DETROIT — Burroughs Corp. has unveiled the DP 1800, a document processing system aimed at financial users.

The DP 1800 is a magnetic ink character recognition (MICR) system designed to process up to 1,825 documents/min and communicate with Burroughs' B2900, B3900, B4900 and V series of processors. The unit is said to have local intelligence that, when combined with a parameter-driven fine-sort program, allows the unit to execute sorting decisions without using host processor resources.

The DP 1800 is also reportedly capable of endorsement printing, microfilming and captured data formatting without host intervention. These capabilities, the vendor said, can reduce the DP 1800's dependence on the host system by up to 15%.

A secondary feeder feature is said to eliminate the need to halt the document processing system to insert control documents. An integrated terminal display and keyboard allows an operator to use menus, keyboard input commands and system messages. The terminal also provides a graphic display of the document tracking system that notifies the operator if an item is not pocketed properly or has been delayed in the sort track, the vendor said.

Available this month, an entry-level DP 1800 system with 200K bytes of memory, four pockets, dual feeders, an MICR reader and mobile-carrier tray costs $105,168. A configuration with 712K bytes of memory, 16 pockets, dual feeders, an MICR reader, mobile carrier tray, nonimpact endorser and a microfilm unit costs $320,710.

Burroughs is located at One Burroughs Place, Detroit, Mich. 48232.

Quest for calculator paved IBM's path

THIRD IN A NINE-PART SERIES

By Tom Henkel
CW Staff

Exactly when IBM entered the mainframe computer business is a matter of interpretation. Some said Big Blue's involvement began when it helped fund early electronics research projects at Columbia University in the early 1930s and at Harvard University in the 1940s. Others contend that IBM was not really in the business until the first 701 processor was rolled out in 1952.

But the exact date aside, IBM has done more than just participate in the development of the computer industry. The company's competitive sales tactics, outstanding marketing techniques and hell-bent drive for success have had a profound influence in molding modern computing.

Having established a presence in roughly 70% of the world's mainframe installations, IBM's formidable power appears to have developed into both a blessing and a curse. On the one hand, since no other manufacturer has been able to match the influence wielded by IBM, most new IBM products have traditionally become instantly successful, and strategic IBM moves can become industry standards overnight.

Alternately, by its popularity, IBM has condemned itself to function perpetually under the close scrutiny of the masses. Hundreds make their living by watching IBM's slightest move and by attempting to predict the company's next step. Still others prey on the niche markets that IBM's rumbling bureaucracy passes by. The result has been lost business either from the uncertainty generated by speculators or from the parasitic nature of IBM-compatible vendors.

IBM was researching the potential of then-experimental electronic business machines in the early 1930s when work done by Wallace J. Eckert, a Columbia astronomy professor, caught the eye of Thomas J. Watson Sr., IBM's president. At the time, IBM had already developed the electromechanical

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IBM

from page 99

400 and 600 series calculating machines (the latter was born out of previous Columbia research), but Eckert had an idea he felt would improve their capabilities. Eckert's plan was to enhance the 600 series to permit automatic sequencing that would allow the calculator to perform complex calculations automatically. To accomplish this, Eckert developed a series of specialized devices that allowed an IBM Type 601 multiplying punch card reader to be programmed for automatic operation.

Eckert's research also drew the attention of Howard Aiken, a Harvard physics professor who had also been developing plans to build an automatic calculating machine, which later became known as the Mark 1. IBM was also interested in Aiken's ideas, and in 1939 it agreed to custom-build the Mark 1 for Harvard. The project was completed in 1944.

According to the *Encyclopedia of Computer Science and Technology*, "The Mark 1 was a parallel synchronous calculator that could perform table lookup and the four fundamental arithmetic operations, in any specified sequence, on numbers up to 23 decimal digits in length. It had 60 switch registers for constants, 72 storage counters for intermediate results, a central multiplying [and] dividing unit, functional counters for computing transcendental functions and three interpolators for reading functions punched into perforated paper tape. Numerical input was printed by electric typewriters or punched into cards. Sequencing of operations was accomplished by a perforated tape."

But despite IBM's early experimental ventures into the emerging computer business, it lost the race to be the first company to deliver officially a computer system to a commercial end user. That garland went to rival company Remington Rand Corp., which delivered its first Univac 1 processor to the U.S. Bureau of the Census in 1951.

Remington Rand had pulled off a coup in 1950 when it acquired the Eckert-Mauchly Computer Corp., apparently from under IBM's nose. In his book chronicling the development of J. Presper Eckert and John Mauchly's Eniac system (*From Dits to Bits*, Robotics Press, 1979), Herman Lukoff, who worked on the Eckert-Mauchly development team, said that when Eckert-Mauchly was working to develop the successor to the Eniac, the Univac 1, development costs started to get out of hand. When one of the firm's key financiers was killed in an airplane crash, it became clear the company would have to sell out to a larger firm in order to finish development of the Univac 1. Lukoff said there were rumors at the time that both Remington Rand and IBM were interested in acquiring the company, and Eckert and Mauchly chose Remington Rand because it was a smaller company that they believed offered higher chances for success.

Thomas J. Watson Jr., in an interview with *Computerworld* [CW, June 13, 1983], recalled that "IBM quickly realized from the minute the [Census Bureau] put in the first Univac, our drive was totally commercial. I don't know whether Univac's drive was commercial, but in any case, they got two machines in there.

"I always managed through being terribly afraid of failure. I had been in Washington and had a long talk with the vice-president. I was at the airport and called him back for something and he said, 'And by the way, I forgot to tell you that Remington Rand has two Univacs at the Census Bureau.'

"I was absolutely panicked. We had some machines under development, and we had built the 701, but we had nothing, really nothing, commercial."

IBM photo

The Mark I, IBM's first computer

The shock of Remington Rand's success apparently was the impetus for change within IBM. In the 1983 *Computerworld* interview, the younger Watson said that shortly after the first Univac 1 was installed, IBM significantly increased its research and development expenditures from less than 4% per year to roughly 9% or 10% several years later.

The move worked. By 1964, IBM had readied the 360 line of mainframes, which despite some early problems, revolutionized the computer industry because, as one IBM spokesman noted, it was the first line of computer systems aimed at a general marketplace. Prior to the 360, he added, computer manufacturers were basically tailoring computer systems to fit the user's needs.

The 360 was succeeded in 1970 by the 370 series, which proved immensely successful for IBM but angered 360 users who were forced into making a painful operating system conversion. Some industry watchers contend that those irate 360 users had a profound influence on IBM's large-systems architecture when, seven years later, IBM chose to maintain 370-compatibility by announcing the 3030 series instead of the highly rumored Future Systems (FS).

Jack Hart, an IBM watcher with International Data Corp., a market research firm in Framingham, Mass., contends the FS project was killed because its developers could not develop a reasonable bridge product that would allow 370 users to migrate to the object-oriented FS system.

Since the 3030 line, IBM's mainframe strategy has remained fairly straightforward. Additional models in the 3030 line replaced the high end of the 370 series, and the 4300 line, which was announced in 1979, replaced most of the low end of the 370 line. The 3080 series, which made its debut in 1980, basically replaced the 3030 models, and IBM's newly announced 3090 series processors appear likely to succeed the 3080s.

Sony division adds videotex workstation, printer, modem

By Donna Raimondi
CW Staff

PARK RIDGE, N.J. — Sony Communications Products Co., a division of Sony Corp. of America, has announced several videotex products: the KTX-1350N videotex workstation, the Sony Frame Creator System 1000, the MDM-1200 modem and the UP-103 video/graphics printer.

The KTX-1350N, which uses Microsoft Corp.'s MS-DOS operating system, is said to offer videotex users a method of interfacing with both North American Presentation-Level Protocol Standard (NAPLPS) and Ascii data bases.

The $3,750 desktop system accesses NAPLPS information through its terminal function and processes and stores the information with its computer capabilities, the vendor said.

Features include a built-in NAPLPS decoder, a 13-in. diagonal color monitor, two standard RS-232C communications ports, Centronics Data Computer Corp. and video/graphics printer ports and dual 3½-in. floppy disk drives. The KTX-1350N was designed to operate with Sony's MDM-1200 modem and UP-103 video/graphics printer.

Composite video display

The unit can be used to display composite video signals and can interface with a laser videodisk player, according to the vendor. The Digital Research, Inc. CP/M 86 operation system is available as an option.

The Sony Frame Creator System 1000 is said to create pages of NAPLPS videotex information either by using a camera to input already created artwork or by creating a graphics image from scratch. The basic system costs approximately $35,000 and includes graphics inputting devices, camera stand, printer and red-green-blue color videotex workstation equipped with dual 3½-in. floppy disk drives. The system comes complete with software.

The Frame Creator System 1000 digitizes video sources and encodes into 256- by 210-pixel NAPLPS-standard videotex graphics. Once encoded, the data can become part of a local or telephone-distributed videotex data base, the vendor said. Input sources can be either the self-contained Sony DXC-1821H camera that comes with the system, a color camera such as the Sony DXC-M3 or another video source such as a videocassette recorder or videodisk player.

Composition options include the ability to add text with independent control of character height, width and angle; enlargement of the picture for detailed retouching; creation of windows to permit sections of the image to be treated separately and special effects such as mosaics, according to the vendor.

Sony also announced its MDM-1200 telephone modem and the UP-103 video/graphics printer, both of which were designed to operate in conjunction with Sony's KTX-1350N videotex workstation and the Frame Creator System 1000.

The modem reportedly allows Sony videotex and microcomputer terminals to communicate over standard telephone lines at multiple data speed rates — 110 to 300 bit/sec and 1.2K bit/sec.

The MDM-1200 is compatible with AT&T 103, 113 and 121A full-duplex asynchronous modems and uses standard RS-232C modem cable. The MDM-1200 features both automatic dialing and answering for unattended workstation operation, the vendor said. The modem costs $529.

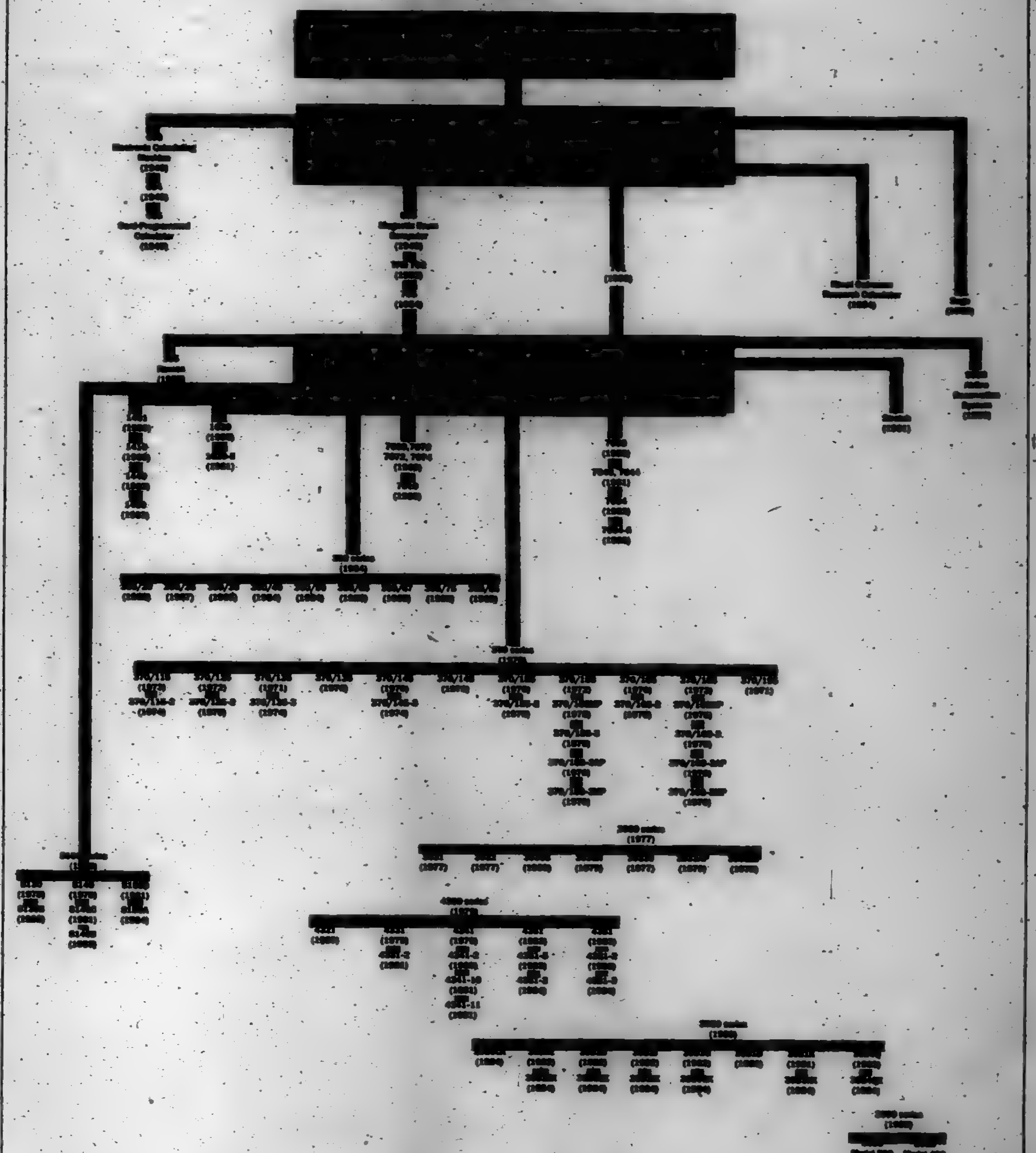
Prints from video sources

The UP-103 printer is a thermal graphics printer that prints out a screen of text and graphics from any video or videotex source in 9 seconds or less, the vendor said. Videotex sources include NAPLPS or Ascii pages, video cameras, videotape recorder and videodisk players, the vendor said.

The printer provides resolution of 210- by 512-pixels for NAPLPS pages, 250- by 512-pixels for Ascii and 236- by 512-pixels when printing video sources. It prints on 4-in. wide paper and offers a two-times enlargement mode, according to the vendor. It produces either positive or negative images in 16 shades of gray. The printer costs $639.

More information on these products is available from Sony on Sony Drive, Park Ridge, N.J. 07656.

IBM Family Tree


370/115
370/125
370/135
3030 series
(1977)
4300 series
4341-10
4341-11
3080 series
3090 series
Model 200
Model 400

PROCESSORS

■ Uniq Digital Technologies has introduced an enhanced version of its Uniqorn minicomputer, which is based on Digital Equipment Corp.'s PDP-11 series.

The Uniqorn 11/73 system combines U. S. Design Corp.'s Virtual Information Processor mass storage subsystem, DEC's LSI-11/73 microprocessor and Release 2 of AT&T's Unix System V operating system.

The system features up to 4K bytes of main memory, 128K bytes of fixed disk memory (expandable to 512K bytes), 100M bytes of tape storage and a cabinet.

The basic Uniqorn system price is $24,995.

Uniq Digital Technologies, 28 S. Water St., Batavia, Ill. 60510.

■ Telesis Systems Corp. has introduced its EDA-600 coprocessor, a 32-bit plug-in hardware option for its computer-aided design workstations.

The coprocessor, based on National Semiconductor Corp.'s 32032 microprocessor, runs under AT&T's Unix System V operating system. It executes at speeds of up to one million instruction/sec., according to the vendor.

The EDA-600 consists of a CPU and a 2M-byte memory board connected over a bus.

The coprocessor plugs into the backplane of any existing Telesis CAD workstation or remote processing unit, according to Telesis Systems.

The EDA-600 is priced at $19,000.

Telesis Systems, Two Omni Way, Chelmsford, Mass. 01824.

DATA STORAGE

■ Xylogics, Inc. has announced enhancements to its 450 and 451 Multibus storage module drive (SMD) disk controllers that are said to allow a disk manufacturer's media defect map to be read directly from disks that contain standard format defect information. This is said to eliminate special power connections and allows users to integrate enhanced 9-in. SMD disk drives.

The Xylogics 450 and 451 are said to enable a programmer to read the defect list from the disk prior to formatting. This information can then be used to create bad-block tables. Manufacturers currently supporting the standard format for disk defect information include Ampex Corp.; Control Data Corp.; Fujitsu America, Inc.; Mitsubishi Electronics America, Inc.; NEC Information Systems, Inc.; and Pertec Computer Corp.

The company has added a 5V, dc, on-board regulator to the 450 and 451 to eliminate special power connections. Xylogics has also added its own custom very large-scale integration parts, which are said to provide the flexibility to integrate the 9-in. enhanced SMD disk drives.

The 450 costs $2,295, and the 451 costs $2,495.

Xylogics, 144 Middlesex Tnpk., Burlington, Mass. 01803.

GRAPHICS SYSTEMS

■ MNC International has introduced its IBM Personal Computer-compatible Mcad family of workstations for computer-aided design.

The Mcad 1000 has a 10M-byte disk drive and 256K bytes of random-access memory (RAM), an amber monochrome graphics adapter and Autodesk, Inc.'s Autocad 2 software. The unit costs $4,850.

The Mcad 2000 is the same as the Mcad 1000 but uses two monitors — a monochrome display as a systems console and a graphics design medium-resolution color display. The Mcad 2000 costs $6,995.

The Mcad 3000 is a two-monitor combination that uses a 1,024- by 768-pixel resolution combined with 16 simultaneous colors. Disk memory is 22M bytes, half of which is available on a removable cartridge. The basic model also includes 512K bytes of RAM. This unit costs $11,995.

MNC International, MNC Building, 2817 Anthony Lane S., Minneapolis, Minn. 55418.

■ Evans & Sutherland Computer Corp. has unwrapped its PS 350 three-dimensional computer graphics system, an addition to its PS 300 family that runs under a proprietary operating system.

The PS 350 includes a refresh buffer that allows for the separation of display update and display refresh. In highly structured design environments, this component is said to yield greater display capacity. A designer reportedly can view a complete airline design and zoom in on a specific rivet without loss of image quality or degradation of data resolutions.

The PS 350 provides up to 127 line textures to help clarify the model, in addition to the 3-D visual queues of perspective, depth-queuing and smooth display dynamics.

The basic system — with 1M byte of memory — starts at $49,250 for a monochrome version and $57,050 for a color system. Both are upgradable to 4M bytes of main memory.

Evans & Sutherland, P.O. Box 8700, 580 Arapeen Drive, Salt Lake City, Utah 84108.

■ Color graphics, on-line help, dual synchronized displays and testing capabilities have been added to Calma Co.'s turnkey Tegastation 3.0 computer-aided engineering workstation, based on Apollo Computer, Inc.'s DN300 processor. In addition, the firm said it cut the base price of the DN300-based model of the Tegastation 3.0 by $9,000.

A spokesman said larger model li-

Continued on page 166

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tem can widen your company's horizons.

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Honeywell
100
Years

Together, we can find the answers.

Honeywell

SYSTEMS & PERIPHERALS

Continued from page [illegible]

braries give designers access to more than 1,200 system-level simulation models for circuit board design. A T-scope color waveform analysis package incorporates two screens.

Computer-aided engineering and testing tools include schematic capture, logic and verification simulation, simulation net lists, Taskmaster applications supervisor and file managers and T-cat, a computer-aided test system for automatic test pattern generation, the vendor said.

The DN300-based Tegastation 3.0 costs from $38,000 to $44,000. Other models of the Tegastation 3.0, based on Apollo DN460 and DN660 workstations, cost from $74,500 to $108,000, depending on configuration.

Calma, 501 Sycamore Drive, Milpitas, Calif. 95035.

POWER SUPPLIES

■ International Power Machines has announced expansion of its Endless Power transistorized uninterruptible power supply (UPS) family.

The Endless Power UPS is now available in 100-kVA, 133-kVA and 167-kVA versions. The UPS conditions raw utility electrical power for computer use while protecting against sags, blackouts, surges, spikes and oscillatory voltages. Prices range from $69,000 to $84,000 for the 100-kVA unit, $74,000 to $90,000 for the 133-kVA unit and $76,000 to $92,000 for the 167-kVA unit.

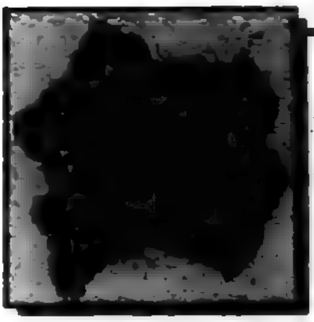
International Power Machines, 11534 Pagemill Road, Dallas, Texas 75243.

■ Topaz, Inc. has announced its Line 2 zero-current tap-switching power conditioners that protect minicomputers and other electronic equipment from electrical noise and voltage fluctuations.

The conditioners feature Topaz' Powerlogic microprocessor for voltage regulation. Power fluctuations are said to be corrected in less than one cycle of line frequency. The Line 2 power conditioners offer common-mode noise attenuation of 140 db (10 million to 1) and normal-mode noise attenuation of 60 db (1,000 to 1). The conditioners are available in 50Hz and 60Hz models, with power ratings from 10 kVA to 30 kVA.

Prices of the 50Hz model range upward from $545; and prices of the 60Hz model range upward from $410.

Topaz, 3855 Ruffin Road, San Diego, Calif. 92123.



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PRIME

from page 99

management decided to go for the 9955.

By May 1, the company will be using two 9955s, he said. The firm will upgrade its existing 750 to a 9955 as soon as its first 9955 is ready.

The original decision to go with Prime was based entirely on software requirements, he said. Comstock had chosen construction software from Profitool of Denver, which ran on Prime equipment. IBM had inadequate construction software that ran only on the System/36, which was too small for Comstock's needs, he said, adding that there was no satisfactory software for the System/38.

Comstock had a significant amount of software written in RPG-II, so Prime helped the company find a software vendor — Data Base Systems Corp. of Phoenix — to recompile the IBM RPG-II for Prime machines, according to Cynthia McFarland. Data Base Systems' Escape/34 recompiling package was originally written for conversion from IBM System/34 to Prime but also worked for the conversion from IBM System/3 to Prime, she said.

To transfer pertinent payroll information like master files or a file listing every check withdrawn, Cynthia McFarland said, a tape transfer from the IBM to the Prime 750 worked out well. Other items, like a labor distribution package that included more than 250 programs, had to be recompiled. The 9955 did this without problems.

MANAGE

from page 90

ities quickly. Unlike traditional software functions that focus on the storage and processing of large amounts of information, managers need a system that focuses on the retrieval of specific pertinent information. They want to reduce the number of logical decisions they must make to obtain information that is useful.

A manager's work is time-intensive. They do not have blocks of time to invest in learning to use new computer systems. That is why graphics is an important element. Graphics communicate relationships that give contextual information that can be absorbed quickly.

Critical success factors are elements that managers identify as being the most important for achieving their business objectives.

Having identified the critical success factors, the information system must be realigned to support management activities. This process involves examining the information that is now available to managers and testing each piece for its relevance to these critical success factors.

In some cases, the information may need some transformation, such as expressing it as a ratio to some other number or as a trend in its historical context. Graphics representations of information allow for easier tracking and reviewing of critical success factors.

Graphics has become an effective managerial tool to compress, track and control information.

As managers continue to emphasize planning and control, information systems that alert managers to trends and events will give managers more of a competitive edge.

COMPUTER INDUSTRY

Industry slowdown seen short lived

But current impact on firms widespread

By Clinton Wilder
CW Staff

The computer industry sales slump that has marked early 1985 is concentrated in the mini- and microcomputer markets and is only short term, according to several vendors and analysts.

"Our customers spend the first quarter kind of catching their breath," said one branch manager of IBM, which last month predicted its first declining growth quarter since 1961. "My gut feeling is that it's just a first-quarter downturn."

Analysts tracking IBM pointed to the "product cycle theory," attributing the current Big Blue downturn to a wait-and-see customer reaction to the recent unveiling of the 3090 Model 400 (Sierra). "IBM is a cyclical growth company, operating in distinctive cycles that follow the product lines," said Harry Edelson of Edelson Technology Partners in Saddlebrook, N.J. "When they announce a major new product, they have a downturn. It happened in 1964, and it happened in 1970, so this is no surprise."

But IBM is not immune to the current drop in office automation orders that has halted the fast-paced growth of OA leader Wang Laboratories, Inc., analysts said. "Everyone thought this would be a year when large-scale OA would catch on," said David Moschella of Framingham, Mass.-based International Data Corp. "But there's still a lot of evaluation going on. People are looking at the Wang VS65 or the IBM System/36 and trying to make a decision."

Cautious customers also appear in the traditional markets of Digital Equipment Corp. and Data General Corp., whose pessimistic first-quarter forecasts preceded IBM's. "Sales interest seems to be continuing at a high rate, but people are looking very hard before spending their money," said DG spokesman Ken Donahue. "It's a very curious thing. Orders are traditionally flat early in the year, but this has continued into mid-February. There seems to be a pause, a feeling of 'Let's take a rest and see what happens.' "

DEC spokesman Mark Steinkrauss said DEC has felt the current downturn the hardest in its midrange to low-end products — the PDP-11 mini series and the lower end models in the VAX-11 series. The most sluggish traditional DEC markets, he said, have been industries using

See SLOW page 117

- The micro Winchester disk drive industry is suffering 'a severe case of indigestion,' but more reasonable growth rates will enable the top eight vendors to survive a shakeout, according to a recent report/110
- Trilogy recently linked up with GM's Electronic Data Systems in an attempt to generate revenue from facilities that were idled by Trilogy's failure to execute its original business plans/111
- The sales slump apparently has spread to telecommunications equipment, with Intecom reporting the layoff of 200 employees/114

CDC cites Ohio bank crisis as one reason for layoffs

MINNEAPOLIS — Control Data Corp. said last week it has not yet set a target for work force reductions that will be implemented to cut operating costs in the face of a sales slump and potential losses associated with the Ohio thrift bank crisis.

In a letter to employees dated March 28, CDC President Robert M. Price said the company will cut its 54,000-person work force and sell off nonstrategic assets in an attempt to improve profitability. Price said he no longer expects CDC to meet his earlier profit projection of $4 per share this year, but the company declined to issue a revised projection.

Price informed employees of planned work force adjustments and said he hopes to manage the reduction without across-the-board layoffs. The company has halted most external hiring and hopes to cut costs through attrition, reassignments and retraining. "If these gradual processes fail, there will be some terminations," a CDC spokesman said.

The spokesman also said no target figure has been set for the

See CDC page 117

Intel execs predict slowing of semiconductor sales slump

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — Intel Corp. executives told shareholders recently that the semiconductor industry should shake off its current sales slump in coming months, but price declines will continue to slow revenue growth.

Intel Chairman Gordon Moore told shareholders at the company's annual meeting that semiconductor manufacturers are still "caught in the greatest industry collapse since 1974's oil crisis."

According to Moore, the semiconductor industry worldwide will show no revenue growth in 1985 over 1984. He said the industry will continue "bumping along the bottom" before traditional growth rates resume during the second or third quarter of this year. But, he added, even when orders pick up, price declines will continue to slow revenue growth from the rapid pace of 1983 and early 1984.

See SLUMP page 118

Despite PCjr flop, IBM still has momentum on its side

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Following the sudden expiration of the IBM PCjr, the view in this corner sides with those who predicted that IBM's withdrawal from the consumer electronics market is just a short-term strategic retreat.

Although there is much temptation to rejoice at the image of mighty Big Blue humbly stepping back from one of the very few mistakes in its history, such an attitude would ignore what they aptly label on *Monday Night Football* as the Big Mo.

At this point in time, IBM undeniably has momentum on its side. It has a lock on the corporate mainframe environment, calls the shots in the workstation industry and is eagerly eyeing the markets traditionally dominated by the likes of Digital Equipment Corp. and Wang Laboratories, Inc.

Not lazy

Unlike the U.S. economic gargantuans of the past, IBM has not noticeably stagnated and grown lazy. It is pouring an enormous amount of wealth into research and development to protect and increase its share of the information processing industry. It is avidly staking out near-term growth markets such as automated manufacturing and seems poised to pounce if U.S. academia again becomes the focus of technological leadership, as history said it must.

To continue toward its obvious goal of being the biggest and most profitable world corporation in the next decade, IBM must become all things to all people as society begins to drape itself in the creature comforts of microtechnology.

Those who see IBM abandoning the consumer market perhaps have forgotten about Trintex. That partnership, formed with CBS, Inc. and Sears, Roebuck & Co., is quietly embarking on developing commercial videotex services. IBM is also the majority partner in Satellite Business Systems (SBS), which someday will surely hold a leading role in the satellite delivery of consumer communications and services.

Credit card of the future

A subsidiary, IBM Credit Corp., already issues credit cards for the purchase of IBM micros. Sears has made recent moves to turn its in-store credit card into a Mastercard type of instrument. Who is to say that IBM doesn't envision the day when red-blooded Americans key in their IBM credit number into an IBM keyboard linked to a Trintex line or Rolm PCX (private consumer exchange) for transmission by SBS to IBM mainframes that route purchase orders via a Systems Network Architecture network to who knows what future partnerships.

If at some point the dreams of science fiction writers are realized and the factory and office commerce is essentially automated, somebody is going to have to fill the leisure time of idle workers. And who would be better qualified than the company that created so much leisure time and finds itself faced with creating new markets or dying of self-induced obsolescence?

All this may seem a little far-fetched, but who can remember the time when IBM actually gave up a project? History shows that, when thwarted in one plan, IBM simply adopts Plan B, or Plan C or . . .

User bugged by distribution of defective packages

[illegible]
L. J. Kutten

According to a study commissioned by the Association of Data Processing Service Organizations (Adapso), more than 50% of microcomputer software packages in use are unauthorized copies. I do not doubt the validity of the study; Adapso is a fair and honest organization whose goal is to protect the good name of the industry. So I am sure that for Adapso's next project, it will seriously consider going after another type of pirate: the software companies that knowingly distribute defective (bug-ridden) software.

I am not complaining about the random, obscure bug (I know how hard it is to create bug-free software) but rather the bugs that come out and defeat the software program's entire purpose; the bugs that are so bad that any half-awake person could have and should have discovered them before the program went out the door. Take the following five examples:

■ First there was the telecommunications program that could not communicate. In 1979, I bought a program to retrieve data from Compuserve Corp. and the Dow Jones & Co. network. It came with instruction manuals and passwords for both networks. Unfortunately, it could not communicate with Dow Jones. For more than a year, the company denied in writing there was a problem. I was told the problem was with my hardware. Finally I contacted the actual programmer. He told me he knew of the problem and how to solve it. I made his patches and the program worked. Of course, in the meantime, I had bought another program to communicate with Dow Jones.

■ In 1980, I bought a checkbook maintenance program. Its bug was that it rejected 1% of the numerical entries as being invalid numbers. For three months the company denied there was a problem. Only after I sent it a disk containing the actual program did the company admit a bug existed. Their excuse — they had accidentally distributed a number of beta versions to paying customers.

■ Then there was the word processing program that was advertised and sold as being able to work with documents up to 170K. Its problem was that it worked fine with small files, 15K to 20K, but with anything above that it crashed and destroyed the document file.

■ Next there is a spelling checker that was advertised as working with a word processor whose file size is limited only by the size of the diskette. However, the speller can only handle a maximum file size of 32K, a point that I discovered by trial and error. It is not mentioned in the documentation. To add insult to injury, this program has a unique form of error trapping; after it discovers the error it puts itself into a continuous loop. The only way to get out of it is to restart the computer.

■ But my favorite bug is the most recent. I was given a data base program to review for the Apple Computer, Inc. Macintosh. I received both a demonstration diskette and a working diskette. After working with both, I decided to copy the data files from the demo to the working diskette in order to manipulate them. Unfortunately, the data files on the demo were too big for the real program. I wonder how the company got the demo to work?

And what happens if I complain to the company? Regardless of its size or reputation, I was always given the same two replies: "All programs are sold as is," and "Buy the upgrade."

"What protection?"

This got me thinking — "What protection do I get from the software industry?" As far as I can tell the only thing any software developer promises is that the physical diskette is not defective. If it is bad, it will be replaced. Could it be that the software industry has finally achieved the American businessman's dream of being able to take the consumer's money and then walk away, free of all liability?

Now I learn a considerable segment of the industry wants to develop hardware locks on the software. If the master diskette dies or the key breaks, the user is to contact the developer who will gladly sell him — for a price — another master copy or key. This assumes these companies will be around in the foreseeable future. But what happens if they are not? I wonder, what is the average life of a software company?

Somehow this cry of woe is not very convincing to software consumers like myself who depend daily on those programs for Apple, IBM or [Tandy Corp.] computers developed by companies that are now just part of fond memories and history.

Kutten is a writer specializing in computer law topics. He is a member of the Illinois and Missouri bars. His book, Computer Buyer's Protection Guide, *was published last year by Prentice-Hall, Inc.*

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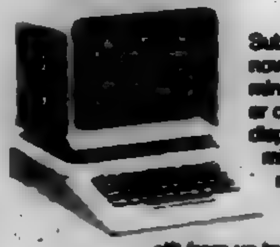

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As if that's not enough, the operator can do full-screen windowing without changing a program to fit the screen. At the same time, two more windows, which can overlap and vary in length and width, can be opened. The screen also can be divided into four independent windows which act as viewports into the terminal's 9600 character memory.

With 38 downloadable function keys and 16 screen labels, the 5425, which is also VT102* compatible, opens new levels for productivity. And the optional integrated intelligent modem features five programmable autodial keys to speed the dialing and logon functions. The modem also permits remote transmission from a standard phone jack.

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Report: Hard disk drive industry 'alive but suffering'

NEW YORK — The industry for small-size Winchester disk drives "is alive but is suffering [from] a severe case of indigestion caused by overcapacity, overordering and overinventory," according to a two-part industry review released recently by Shearson Lehman/American Express, Inc.

Despite the current problems, the investment firm predicted that a 30% growth rate in 1985 and a 20% to 25% growth in 1986 will enable the top eight vendors to endure a shakeout and return to high revenue levels.

Noting that the top eight firms control 80% of the market for the 5¼-in. and smaller Winchester disk drive products, Shearson Lehman predicted "that the eventual shakeout will occur mostly among the small, private companies."

The investment firm said the market for the drives grew at an 80% rate in 1984 to $1.2 billion on shipments of 2.4 million units. By 1987, the firm projected, industry revenue will double to $2.4 billion, but shipments will treble to seven million.

The most uncertain factor facing the industry is IBM, which currently buys 30% to 40% of all output, the report said. However, Shearson Lehman said it is likely that IBM will, in a worst-case scenario, manufacture only one-third of its requirements and probably will manufacture only 20% to 25% of all drives used in IBM equipment. Citing IBM's recent willingness to buy components, particularly for its Personal Computer, and that smaller firms with lower overhead can probably deliver lower cost drives, the report predicted that IBM will focus on manufacturing disk drives that require "unusual technology."

'IBM may overorder'

IBM, according to the report, will probably require as many disk drives from other vendors in 1985 as it purchased in 1984. However, the report cautioned, "In order to assure sufficient drives, IBM may overorder and subsequently cut back the lower performing vendors."

Evaluation of the disk drive industry is difficult because it is only four years old and marked by rapid technological changes and the injection into the market of new products, the report said. "Most vendors are completely revamping their lines, and by early 1986, more than 80% of the micro-Winchester revenue will be from new products," the report stated.

The report, "Winchester Disk Drives: Rotating Into a New Cycle," was prepared by the research division of Shearson Lehman/American Express, 101st Floor, Two World Trade Center, New York, N.Y. 10048.

Burroughs signs order

WASHINGTON, D.C. — The Securities and Exchange Commission (SEC) recently charged Burroughs Corp. with overstating its earnings in 1981 by not writing off obsolete equipment in a timely manner. The company signed a consent order agreeing to reduce 1981 earnings and to increase by an identical amount earnings reported in 1982 when the company wrote off inventory by $154 million.

The settlement came as part of an administrative action by the SEC; Burroughs neither admitted nor denied the charges.

The settlement resulted in Burroughs' pretax income increasing by $35.2 million in 1982, and decreasing by an identical amount in 1981. The actual changes spread over two fiscal years amounted to the shifting of more than $60 million in income.

Burroughs said it chose to settle the matter because stockholders would be ill served by incurring litigation expenses and a diversion of management resources.

Trilogy reports losses; EDS to run computer facility

CUPERTINO, Calif. — Trilogy Ltd. recently announced it had contracted with Electronic Data Systems Corp. (EDS) for the operation, management and marketing of Trilogy's computer facility here.

The company also released its 1984 financial report, posting an $82 million loss on revenue of $11.8 million.

EDS, the Dallas-based computer services company that was acquired last year by General Motors Corp., will integrate Trilogy's data center into the EDS nationwide network, spokesmen said.

Trilogy built its data center and various production facilities to develop and produce wafer-scale integrated circuits and an IBM plug-compatible mainframe that would have used those wafers. However, both projects were canceled.

Henry C. Montgomery, president and chief executive officer of Trilogy, said the agreement with EDS reflects Trilogy's "business strategy to find revenue-producing uses for our facilities."

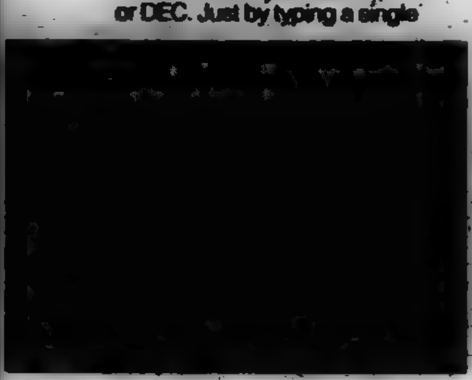
The agreement calls for EDS to leverage engineering and scientific applications software developed by Trilogy.

Trilogy's 1984 loss of $82 million, or $2.19 per share, compares with a loss of $21.7 million, or $1.22 per share, in 1983 on revenue of $44.8 million.

In the fourth quarter, the company posted a loss of $2.9 million, or 8 cents per share, on revenue of $1.6 million; in the year-earlier quarter, the company posted a loss of $15.3 million, or 68 cents per share, on revenue of $13.8 million.

All of the revenue in the fourth quarter and a total of $2.2 million during the year, were derived from development services provided to Sperry Corp. under a contract that Trilogy previously announced was to be terminated last month.

Included in the loss for the year was a previously announced reserve of $48 million recorded in the second quarter relating to the cancellation of the mainframe project. Trilogy said it charged against that reserve expenses related to the discontinued activities amounting to $2.7 million in the fourth quarter.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Tektronix

Pansophic reports rise in revenue

OAK BROOK, Ill. — Pansophic Systems, Inc. recently reported revenue increases for the third quarter ended Jan. 31.

The software vendor said third-quarter revenue rose to $20.1 million, compared with $16.1 million in the previous year — a 24% increase.

The company cited strong growth in product and license revenue from the introduction of three software products in 1984. Product and license fees increased 56% in the third quarter, the company said.

Profits for the third quarter rose 29% to $4.4 million, or 52 cents per share, compared with 40 cents per share in the same quarter last year.

Operating costs up

The Nov. 1 acquisition of Telon software from Christensen Systems, Inc. contributed to slightly higher operating costs during the quarter, Pansophic said.

Income from operations was 26% of revenue during the quarter, compared with 30% of revenue in 1984.

Joseph A. Piscopo, Pansophic's chairman and chief executive officer, said he expects the firm's improved domestic sales to continue in 1985. Piscopo said Telon software and other new products have met with favorable market acceptance, and the Pansophic sales force has shown improved productivity.

Bell subsidiary to market Centrex nationwide

SUNNYVALE, Calif. — Ameritech Communications, Inc., the marketing subsidiary of the Bell system's midwest regional holding company, has announced an agreement to distribute nationwide a Centrex voice and data enhancement product that is manufactured by David Systems, Inc., located here.

Ameritech Communications will distribute the David Information Manager through the Ameritech Bell companies' unregulated equipment subsidiaries and through a national sales force. The agreement took effect March 15; terms were not disclosed.

The voice and data enhancement product reportedly provides Centrex service with asynchronous terminal communications, high-speed local-area networking and enhanced telephone features.

Daniel Latham, Ameritech Communications vice-president of marketing, said the David Information Manager will strengthen the company's product offerings and give existing Ameritech Communications customers added service capability.

Ameritech Communications is the national marketing subsidiary of Ameritech, the Chicago-based parent of the Bell companies providing telephone service in Illinois, Indiana, Michigan, Ohio and Wisconsin.

[redacted]

Onyx + IMI, Corvus set merger plan

SAN JOSE, Calif. — Corvus Systems, Inc. and Onyx + IMI, Inc., both headquartered here, recently announced they had reached an agreement in principle for a merger of the two companies.

Corvus is a manufacturer of mass storage products and the Omninet local area network. Onyx + IMI is the parent company of Onyx Systems, Inc. and a manufacturer of 8-bit and 16-bit microcomputers including multiuser workstations using AT&T's Unix operating system.

Under the terms of the preliminary agreement, stockholders of Onyx + IMI will receive between 1½ and 1½ shares of Corvus stock for each of their current shares. The merged company will be named Corvus Systems, Inc.

The management of the merged company will comprise Michael L. D'Addio, current Corvus chairman and chief executive officer serving in the same positions in the new entity; Onyx + IMI President Herbert J. Martin serving as vice-president of marketing and sales; and Roy A. Wright, current Corvus executive vice-president and chief operating officer, retaining those titles.

"This merger is a good business fit," D'Addio declared in a prepared statement. "Our complementary management strengths, strong combined financial resources and increased operating efficiencies will give us the muscle and expertise to compete more aggressively in the computer, communications and peripherals markets."

The board of directors of the merged company will comprise the four current members of the Corvus board and three of the four current members of the Onyx + IMI board.

The companies said the agreement is subject to final approval of a definitive agreement and the receipt of opinions from investment banking firms as to the fairness of the transaction to the shareholders of each company.

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For more information, contact Ed Marecki, National Sales Director, *Computerworld Focus*, 375 Cochituate Rd., Framingham, MA 01701. Or call (617) 879-0700.

*A minimum size of 7" x 10" (500 lines) is required for ads to be eligible for a Starch study.

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CAI reorganizes operations

JERICHO, N.Y. — Computer Associates International, Inc. (CAI) recently announced that it has divided its sales and support operations into four divisions for the fiscal year beginning April 1.

The mainframe and micro software vendor has set up a systems products division, applications products division, international products division and Sorcim/IUS micro software division. Each division has its own sales, development/support and marketing departments.

CAI President Charles B. Wang, said the changes were prompted by greater specialization within the company. "Bringing together these groups under a single umbrella should increase the cooperation, coordination and efficiencies that we seek always to improve," Wang said.

Wang announced the appointment of the following four executives to serve as divisional presidents: David J. Wardle, systems products; Arnold S. Mazur, applications products; Stefan R. Bothe, international products; and John J. Callanan, Sorcim/IUS micro software. He also named Abraham Poznanski as president of corporate services and Russell Artzt as president of corporate R&D.

The firm has reportedly installed more than 40,000 mainframe software products and more than 600,000 Sorcim/IUS microcomputer products.

Fourth-quarter downturn ends year of divestiture at ITT

NEW YORK — ITT, in the midst of an aggressive divestiture program, recently reported a sharp drop in profits for the fourth quarter and for fiscal year 1984.

The company announced that profits for the year dipped 34% to $448 million, or $2.97 per share, compared with $675 million, or $4.50 per share, in 1983. Total revenue increased to $19.6 billion in 1984, up 5.2% from 1983. Excluding the company's insurance and finance operations, revenue increased to $12.7 billion from $12.5 billion in 1983.

In the fourth quarter, ITT reported profits of $175 million, or $1.16 per share, down 37% from profits of $278 million, or $1.86 per share, in the year-earlier period. Excluding finance and insurance activities, revenue was $3.7 billion, up from $3.6 billion a year earlier.

Net income for the fourth quarter and the fiscal year fell $76 million, reflecting the sale of ITT's telecommunications manufacturing facilities in Argentina. Profits increased by $124 million from the sale of a food products subsidiary and by $65 million from recognition of a gain in the value of ITT's investment in Standard Telephone and Cables PLC of the UK.

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* Upon receipt of this form, detailed information will be sent to you for selection of specific tutorial sessions.

Registrations cancelled later than April 5 are subject to a $50.00 service charge. Registration may be transferred at no charge.

82

Intecom reduces work force, cuts overhead outlay

ALLEN, Texas — Intecom, Inc. recently announced the layoff of 200 workers, mainly in manufacturing positions, and reduced overhead spending in all company departments.

The layoffs reduced the number of Intecom employees to 1,450. The company said field service, engineering and sales personnel were not affected.

The telephone equipment switching manufacturer blamed its lower revenue projections on customers' concerns about the U.S. Department of the Treasury's tax reform proposals and consideration of new distribution channels created by the AT&T divestiture.

C. Michael Bowen, Intecom's chairman and chief executive officer, cited "general economic circumstances that are affecting most major corporations in the computer and telecommunications [industries]."

Intecom reported profits of $11.7 million on revenue of $131.7 million in 1984.

Sperry obtains Mnemos stock

WEST TRENTON, N.J. — Sperry Corp. recently exercised an option to purchase five million shares in Mnemos Ltd. and obtain license rights for Mnemos's technology for a total price of $5 million.

Part of that price was credited against a five-year limited license previously granted to Sperry.

Mnemos, which is headquartered in Bermuda, operates sales and manufacturing subsidiaries here and in the UK that specialize in serving data base management requirements by combining optical and digital products and systems.

Sperry also was granted the right to acquire an additional five million shares in Mnemos during the next three years at $1.50 per share or the market price, whichever is lower.

SPECIAL REPORT

Micros in Big Business

In the April 29th Computerworld Special Report we'll report on management strategies for integrating micros into corporate information systems; offer users' experiences with micros; discuss the emergence of the Personal Computing Manager; provide overviews of business-related microcomputer hardware, applications software, and systems software; look into security risks; and examine how large MIS/DP organizations are networking their micros.

If you market business-related micro products, tell Computerworld's 600,000 readers in the April 29th issue. Our readers are heavily involved in the purchase of business-related micros, services, and supplies. For example, our subscribers at end-user organizations are personally involved in purchase decisions for the following products:

Product	Percent involved in purchase decisions
Microcomputers	84%
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Micro-peripherals	74%
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Microcomputers	57%
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Portable personal computers	34%
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COMPUTER INDUSTRY

NICKELS AND DIMES

An agreement licensing Xerox Corp. to use Savin Corp.'s Landa III Electroink technology for a variety of copying and printing applications has been signed. The agreement calls for an immediate payment by Xerox of $18 million, which could escalate to as much as $28 million in the first year, depending upon the commercial uses that Xerox decides to make of the technology. Additional payments will be made to Savin upon commercialization of the process.

■

The Society of Manufacturing Engineers (SME) has announced the opening of its Center for Professional Development, a hands-on, state-of-the-art learning facility at SME's world headquarters. Designed primarily to train manufacturing managers, the center will offer classroom instruction in computer-integrated manufacturing management. The center is the latest addition to the SME's broad range of continuing education services for manufacturing engineers.

■

Seven industry pioneers have been named to the Information Processing Hall of Fame, which has been established at Infomart in Dallas. The new Hall of Fame recognizes the most significant scientific, technological and business contributions made by individuals in the information processing industry.

The first seven members are Dr. John von Neumann, the mathematician who promoted the advantages of binary numbers in computer construction; John Mauchly and J. Presper Eckert, codevelopers of the Eniac system that incorporated many of the components of modern computers; Commodore Grace Hopper, developer of the Cobol computer language and a leading technological exponent; Gene Amdahl, considered the father of high-end plug-compatible computers; Jack St. Clair Kilby, inventor of the integrated circuit; and Sen. Frank Lautenberg, founder of the first major worldwide computer service company.

■

Wicat Systems, Inc. an

See SUPER page 116

Industry directory published

DALLAS — Bob McGrath & Co., an executive recruiting firm based here, has announced the publication of a biannual directory of more than 4,000 sales and marketing personnel in the computer industry.

The first issue of "Who's Where? Sales and Marketing Management in the Computer Industry" includes the names of field management personnel from IBM, Wang Laboratories, Inc. and other large vendors.

The directory is said to list the names and business addresses of management personnel from 1,500 computer companies. It is priced at $30.

Bob McGrath & Co. has published the "IBM Alumni Directory" since 1971.

Comlease '85 set for fall

FALLS CHURCH, Va. — The Information Exchange will sponsor Comlease '85, a computer leasing conference and exposition scheduled for Sept. 30 through Oct. 2 at the Marriott Marquis Hotel in New York.

Comlease will provide computer leasing companies with the opportunity to present their products and leasing options to financial and DP executives.

The conference program will include addresses by industry leaders, panel discussions between computer users and leasing experts and special speakers to be announced.

Space rate for exhibitors is $15.50 per square foot. Final payment to the Information Exchange is due by April 2.

Information can be obtained from Comlease at 3025-I South George Mason Drive, Falls Church, Va. 22041.

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SLOW

from page 107

those products in automatic test equipment applications, such as the oil and semiconductor industries.

"We've been slowing in those domestic markets for some months," Steinkrauss said. "We felt it initially in our smaller customer base — commercial OEMs and industrial distributors. During the current quarter, that trend has continued and become a little more pervasive."

Steinkrauss said DEC has not felt the downturn among CAD/CAM and CAE users, government customers, scientific and technical users and technical OEMs.

Hewlett-Packard Co., which has seen its second-half 1984 slowdown continue into 1985, said its sluggish sales are an across-the-board phenomenon, with the exception of brisk first-quarter peripherals business in printers and plotters.

"We feel this is an economy-based slowdown," HP spokeswoman Barbara Kommer said. "A lot of [customers] with good growth last year did a lot of ramping up and are now slowing down. We're being very, very cautious about predicting a pickup."

Other vendors, however, are echoing IBM, which expressed optimism for the full year in its recent first-quarter announcement.

"We're doing a big volume of orders for the Venus [DEC's high-end VAX-11 8600 supermini], and our new products anticipated for the next quarter are moving along on schedule," DEC spokesman Steinkrauss said. "We are well poised to participate in a resurgence."

Analyst Thomas Crotty of the Stamford, Conn.-based Gartner Group agreed that user caution should mean only a temporary slowdown for the major vendors.

CDC

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reductions, which will include management personnel, and no deadline has been established.

Burning the midnight oil

"It will be a matter of the managers analyzing and then reporting what they might be able to do. It certainly is a prime project, . . . There will be some midnight oil burned around here in the next few days and weeks," the spokesman added. CDC will hold its annual shareholders meeting on May 1.

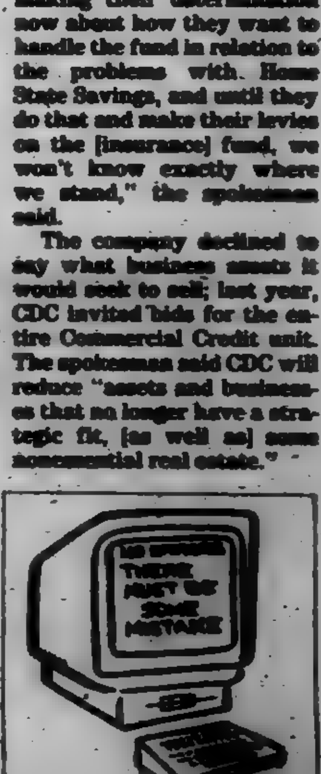
CDC said it does not expect a good first quarter and has experienced shipment rescheduling and partial orders cancellation for peripherals products. It also said sales were poor in the first quarter and overall negative trends in the computer industry contributed to problems. Analysts had recently projected negligible earnings for the first quarter.

> ***'If gradual processes fail, there will be some terminations.'***
>
> **— CDC spokesman**

The Ohio savings and loan bank crisis could cost CDC $21.4 million, the amount that its Commercial Credit Co. unit had contributed to Ohio's state insurance fund for thrift deposits. That fund was depleted when the Home State Savings Bank in Cincinnati collapsed in March. Commercial Credit owns the second-largest thrift in Ohio, the City Savings and Loan Association.

"The state officials are making their determination now about how they want to handle the fund in relation to the problems with Home State Savings, and until they do that and make their levies on the [insurance] fund, we won't know exactly where we stand," the spokesman said.

The company declined to say what business assets it would seek to sell; last year, CDC invited bids for the entire Commercial Credit unit. The spokesman said CDC will reduce "assets and businesses that no longer have a strategic fit, [as well as] some noncommercial real estate."



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SUPER

from page 116

nounced a license agreement with IBM, granting IBM the rights to market certain newly developed Wicat educational software. The license is exclusive to IBM for a limited period of time. Financial terms were not disclosed, but according to Dustin Heuston, Wicat chairman, "revenues from this contract will begin immediately and will impact Wicat's current quarter; in addition, Wicat expects to realize ongoing revenues from this contract for several years."

■

Yourdon, Inc., a New York-based corporation, and Cadware Group Ltd., a New Haven, Conn., firm, announced the formation of a partnership to be known as the Yourdon Software Engineering Co. The joint venture will be providing personal computer-based design tools utilizing structured techniques to the software engineering market.

■

Boeing Computer Services Co. graduated its first class of artificial intelligence students at company headquarters in Bellevue, Wash. The group, made up of nine employees from various Boeing companies, completed one year of academic study and research in the AI field. Boeing started its own university-level program last year when it was unable to hire enough AI experts to diffuse the new technology throughout the company.

■

Litton Industries, Inc. and a group of private investors have signed a letter of intent for the purchase of Litton's Itek Graphics Systems division. The prospective purchasers are Adlinger & Co. and a group of the Itek division's senior management led by R. Patrick Forster. Terms of the proposed transaction were not disclosed.

SLUMP

from page 107

Earlier this year, Intel announced the layoff of 900 workers — about 4% of its work force — after predicting that first-quarter sales would be down as much as 25% from the $416 million recorded in the fourth quarter [CW, March 4].

At the annual meeting, Moore said that although customers are still flushing out excess chip inventories, first-quarter income will be stronger than predicted earlier in the year. Orders are increasing and the current quarter will be better than expected, Moore and other executives said.

Moore asserted that the industry's prolonged slowdown was due to an overly enthusiastic venture capitalist community that funded too many personal computer and disk drive operations during the boom years of 1983 and early 1984.

He said that 40 personal computer manufacturers each thought they would capture 20% of the market and ordered chips based on that premise. Now that the shakeout in the personal computer and peripherals market has begun, Moore said, Intel is paying the price for the excess ordering.

Judgment error

Intel President Andrew Grove said Intel made a similar error in judgment during 1984 when it ramped up production for its System 310 computer, which ended the year with disappointing sales. Intel had to lay off several hundred workers in its computer operation earlier this year as a result.

Grove said the industry's present slowdown differs from the slump in 1982, when Intel chose to cut staff salaries rather than furlough workers. Grove said the current slump is more prolonged and impacts several nonuniform semiconductor product lines. "The earlier recession was shorter and more evenly balanced over all products, so it was easier to keep people," he said. "The problems are different now and require a different solution."

Grove said that Intel spent approximately $500 million to increase manufacturing capacity during 1984, and will spend approximately the same amount on capacity increases this year. Grove said the expansion is required to keep pace with Japanese and Korean semiconductor manufacturers who will flood the market with semiconductor products this year.

Moore said the increased capacity will generate $1 billion to $1.5 billion in revenue for Intel during the next three years. However, he said, if the recession extends longer than forecast, the firm will have to borrow money to finance the capacity.

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■ Data Processing Equipment Configuration Specialists ■ IMS Database Specialists ■ IMS Systems Programmers ■ MVS, VTAM, NCP Systems Programmers ■ Performance Specialists ■ Scientific Programmers/Analysts (Engineering and Manufacturing) ■ Change & Control Management ■ Computer Aided Design (CAD) Specialists ■ Data Control Systems Specialists ■ Network Design Specialists ■ EDP Auditors

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Relocation assistance is available.

The involvement, scope and dimension of these career pursuits are further heightened through some of the most tangible, comprehensive personal benefit arrangements available. Please send your resume to the appropriate contact person at: Computer Systems Employment Office, Dept. CW [illegible], P.O. Box 1138, Pico Rivera, CA [illegible].

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[illegible] Arizona Bank Building
Phoenix, AZ [illegible]

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This challenging position offers an excellent salary/benefits package and continuing opportunity for career development. For additional information, call (814) 261-6292 or direct your resume, including salary requirements to:

Lawrence Kutsch
Manager, Salaried Employment

BROCKWAY, INC. (NY)
McCullough Avenue, Brockway, PA 15824
DEPARTMENT 59

Brockway

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Auxton Computer Enterprises, Inc. is a [illegible] in the development of [illegible] software for the communications industry.

We are presently expanding our technical [illegible] to meet the increasing demand for our software products and are seeking qualified professionals with the following backgrounds:

SYSTEMS-PROGRAMMERS

Should have 2+ years experience with MVS/XA internals. Familiar with JES 2 internals and SNA communications.

GRAPHICS SYSTEMS-PROGRAMMERS

Candidates should be familiar with [illegible] graphics and JES 2 internals.

PROGRAMMERS/ ANALYSTS

Candidates must have a minimum of 3+ years experience programming in COBOL with CICS (COMMAND or MACRO-Level).

PROGRAMMERS/ ANALYSTS

Individuals must possess 3+ years experience in the design and programming of business applications using PL/1. Experience in IMS DB/DC, Data Dictionary, TSO/SPF, CICS/VS helpful.

PROGRAMMERS/ ANALYSTS

Most candidates will have 2+ years experience using "C" Language and UNIX or XENIX Operating Systems.

PROGRAMMERS/ ANALYSTS

Candidates should possess 2+ years programming experience in FOCUS. Exposure to ADABAS, NATURAL, RAMIS, OR MARK IV helpful.

Opportunities exist in the following locations:

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- North & Central N.J.
- Philadelphia, PA
- Washington, D.C.
- Los Angeles, CA

These positions offer an ideal opportunity to progress with one of the fastest growing software and consulting service organizations in the telecommunications industry. Competitive salaries and excellent benefits are also included.

If you are interested in a challenging position with professional career growth, please submit resume, in confidence, to:

Jan [illegible]
Auxton Computer Enterprises, Inc.
Dept. CW
901 [illegible] Court
Suite [illegible] W
Maitland, FL 32751
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Computer

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Amtrak's expanding ACP shop with excellent opportunity for advancement and expansion of programming skills is seeking Programmers or Programmer/Analysts with 1-8 years experience. Areas of expertise should include real-time applications, communications, or systems programming in an ACP operating system environment.

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Several positions, all requiring COBOL &/or PL/1. Positions range from 2 yrs. P/A, 4 yrs. S/A & 5 yrs. D.B.A. Excel. benefits. Relo paid. To $35,000

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Hands-on FORTRAN skills in a Data General MV10,000 environment, along with supervisory background will qualify you for this high level opportunity. Move up in the data processing world! Fee Paid. $50,000

SENIOR PROGRAMMER ANALYST

Large manufacturing firm. 4+ years DP experience. 2+ years coding in RPG III are required. 1+ years in manufacturing a plus. On-line opportunity. Performance tuning also a plus. Fee Paid. $35,000

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Grab this opportunity to run your own show in this TEXTILE CO. Take charge and automate this manual system. If you have experience in converting a totally manual shop to an on-line situation this is the opportunity for you. Midtown location. Fee Paid. $60,000

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Large security trading firm has opportunity for Data General Operators. Any MV series required. Excellent benefits and bonus plan. Fee Paid. $20,000

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2+ yrs EDP Auditing experience in a Domestic or Foreign Bank along with COBOL or PL1 will land you this highly visible position in this International Bank. Midtown location makes this spot ideal for commuters. 4 week Bonus! Fee Paid. $30,000

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(212) 221-6060

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Expanding prestigious 38 shop seeks a talented RPG III programmer/analyst to be groomed for next DP manager. Strong analytic talents required. Salary to $38,000

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Expansion position is state-of-the-art data base department. Be responsible for the physical/logical design integration of new IMS data bases. Heavy user interface. Prior IMS DB experience required. Salary to $38,000

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Several positions available! Fortune 500 firm needs seasoned Series 1 programmers with EDX/EDL to develop new financial applications. Will have responsibilities throughout the systems life-cycle, working in a team environment. High visibility. Financial applications background preferred. BS Degree required. Excellent benefits. Salary to $38,000

IDMS PROGRAMMERS

Excellent opportunity for a 2+ year IDMS and COBOL programmer. Some analysis involved, financial systems are best, but any business will be considered. You will do some training, some on-line, a real good mix! Salary to $36,000

SPECIALIST NETWORK COMMUNICATIONS

Fortune 500 service organization has a rapidly expanding effort in telecommunications. At least 3 years experience in Telecomm, IBM hardward and software, SNA, 37X5's, Front-End Processing and Large Networks. Some exposure to LAN'S & PC networking helpful. Oral & written communications skills a must. Salary to $40,000

Randy Pace or
Warner Coffman
ROBERT HALF
of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

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SENIOR EDP AUDITOR

Hi-tech manufacturing co needs auditor with technical background to participate in all phases of DP Audit. IBM OS/MVS, TSO & Utilities req'd. IMS, CICS, DYL260 a plus. To low $40's

ROBERT HALF
of L.A.
3600 Wilshire, #2000
Los Angeles, CA 90010
(213) [illegible]

FLORIDA

SR PROG ANALYST

National industry leader with corp offices in Ft Lauderdale is expanding Data Processing Development Staff. Your technical skills must include CICS, MVS, COBOL. A 4 yr degree is strongly preferred. Excellent career opportunity. Salary to $40,000

ROBERT HALF
of Miami
2665 LeJeune Road, #614
Coral Gables, FL 33134
(305) 447-1757

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Mark David or Tim Smith
ROBERT HALF
of Minnesota
3636 IDS Center
Minneapolis, MN 55402
(612) 339-9001

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PROGRAMMER ANALYST

Large IBM OS/MVS shop needs someone with 2+ years COBOL experience. Any IMS DB/DC or CICS a plus!! Lots of growth! DOE

ROBERT HALF
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1101 Kermit Dr., Ste 407
Nashville, TN 37217
(615) 361-4900

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Milwaukee, WI 53202
(414)271-HALF (271-4253)

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Seeking bright, aggressive project lead for state-of-the-art systems level development. Exp using C & data base, graphics, or language processor exp helpful. To $50,000

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Marjie Peterson
ROBERT HALF
of Seattle
600 University St., #2226
Seattle, WA 98101
(206) 624-9000

HARTFORD

TELECOMM'S

Network design, voice/data tariffs protocols bkgrd & exposure to TCM, VTAM, SNA prod qualifies for CT oppty. Full relo. To $40,000

VTAM SYSTEMS PROGRAMMER

Position involves installation & maintenance of VTAM & NCP s/ter. Exp in NCP GENS, VTAM table creation; problem ident and resolution; and SMP/4 is req. To $40,000

SR ANALYST/PROG

CT corp expanding on-line sys devel proj! Min 2+ yrs COBOL gen bus apps bkgrd w/desire to move into analysis. Co sponsored training prog in IMS & CICS. Relo paid. To $39,000

SYSTEMS PROGRAMMER

Major div of billion dollar corp actively seeking DP pro. Min 4 yrs exp in a lge multi-IBM-MVS environ. Outstanding career oppty. Relo paid. To $43,000

DATA BASE CONSULTANTS

Nat corp w/growing market seeks indiv's w/strong data base bkgrd. (IMS, IDMS, TOTAL etc). Oppty's nationwide for those seeking growth & fin'l rewards. To $50,000 + bonus

S/38 RPG III

Area oppty's for all lvls — mgrs, S/A's, P/A's w/exp in S/38, RPG III environ. Apps incl MAPICS, fin's, distribution & hospital. Relo paid. $25-50,000

ROBERT HALF
of Hartford
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

SAN ANTONIO

SYSTEMS ANALYST

Degree preferred. Financial and marketing applications are a big plus. The qualified person will have good experience and COBOL and DL/1 (minimum of 2 years). Also DOS/VSE, CICS and VSAM are required. Good benefits in a large corporate structure. $30-36,000

APPLICATIONS PROGRAMMER

We need 2 sharp programmers with professional and energetic work habits. The ideal candidates will be well versed in COBOL, data com data base, CICS and will be from a DOS environment. $25-27,000

DATA PROCESSING MANAGER

Heavy IBM Systems 38 background is mandatory. Technical expertise in RPG III and management skills. Degree in finance or business preferred. $35-45,000

These and many more positions in the heart of Texas. Excellent weather, good people, central locations.

ROBERT HALF
of San Antonio
8343 IH 10 West, Ste. 880
San Antonio, TX 78201
1-800-531-5402
In TX dial (512) 736-3467

PROVIDENCE

IBM SYSTEM 38 PROJECT LEADER

Lge mfr seeks Sr SA w/ strong IBM S/38 bkgrd. Indiv will assist in the installation of IBM S/38 Model 8 & Order Distribution apps devel. Solid user, communications & people leadership abilities. Degree in Computer Science desired. MBA a +. $38,000

ROBERT HALF
of Providence
900 Turks Head Building
Providence, RI 02903
(401) 274-8700

BUFFALO

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Fabulous NY Southern tier mfr seeks hi-profile sr analyst to round out a team developing new mfg/order svc sys. Involves extensive user interface. Must be promotable to mgmt! Co wants stable candidates who enjoy hard work & prefer rural living conditions. Outstanding career oppty. To $42,000

ROBERT HALF
of Buffalo
420 Main Street
1310 Liberty Building
Buffalo, NY 14202
(716) 842-0801

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SENIOR P/A – PL1

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SENIOR P/A

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SYSTEMS PROGRAMMERS

IMS DB/DC

Security Pacific Information Systems, a subsidiary of Security Pacific Corporation, is a major data service and software development company for the financial services industry. We support a telecommunication network of several thousand on-line terminals run in a large scale multiple CPU environment, utilizing MVS/SP, JES2, CICS, ACT/VTAM, NCP, and TSO. As a result of our increased growth we're seeking experienced IMS DB/DC Systems Programmers. Must have 3-5 years experience in installation and support of IMS database and data communications. Experience in large scale IBM/MVS environment a must. Responsibilities include IMS GENS, tuning, debugging, and DC network support.

Our facilities represent one of the most advanced computer complexes in the country. Security Pacific offers highly competitive salaries and benefits, excellent working conditions, and state-of-the-art technology. For confidential consideration, please send resume and salary requirements to:

Security Pacific Information Systems, Inc.

Attn: Manager, Human Resources
1401 Del Norte Street
Denver, CO 80221

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As a $4-billion enterprise, we offer specialized training, very attractive compensation and benefits programs, and a growth oriented environment. To find out more about this position, please send your resume and salary history to: Mark A. [illegible], Region Personnel Manager, NCR Corporation, [illegible] Road, S. Plainfield, NJ [illegible]. An equal opportunity employer.

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Opportunities exist to join a leader in the telecommunications industry. Play a critical role in the development and direction of our brand new Data Center.

Ours is an IBM 3081J MVS, IMS DB/DC, CICS environment with ambitious plans. Current needs include:

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- Use our new performance monitors ([illegible], MICS), in optimizing our Data Center productivity.
- Position requires a BS in Computer Science or equivalent work experience and 5 to 7 years of data processing experience.

SYSTEMS PROGRAMMER

- XA Environment with both IMS and CICS.
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If you would like to join a large company that creates technology and is located in the Princeton, NJ area, please forward your resume and salary history to:

Box #CW-[illegible]
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P.O. Box 880
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S/38 PROGRAMMER/ANALYST

[illegible], Incorporated is a rapidly growing, [illegible] employee owned, [illegible] located in a small [illegible] South Dakota community. We are a nationally recognized leader in our industry with challenging and informal working environment and progressive management.

We are installing a new IBM System/38 in a [illegible] environment with enthusiastic users who are hungry for more information and tools.

The ideal candidate will have 2 to 5 years P/A experience, including 1 to 3 years RPG III and CL. Degree and [illegible] systems experience preferred.

Send resume and salary history to:
[illegible]
[illegible]

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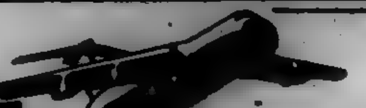

TANDEM SYSTEM SOFTWARE SPECIALIST

Lockheed-Georgia Company, the acknowledged leader in airlifter technology, is seeking a TANDEM SYSTEMS PROGRAMMER to join its rapidly expanding Information Services Technology Division.

This position requires two to five years experience in System Software Support for TANDEM TNSII/TXP with skills in System Resource Management, PATHWAY, TAL System Tuning and general data communications. Knowledge of COBOL, FORTRAN and BASIC will be helpful.

The Lockheed-Georgia Company, located in Marietta, Georgia, an attractive suburb of Atlanta, offers excellent salaries and a comprehensive benefit program, including Company-paid relocation to the Atlanta area. For immediate confidential consideration, please forward your resume, including salary history to:

Lockheed-Georgia Company
Professional Employment
Dept. [illegible]-31- 432
Marietta, Georgia 30063

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Primary responsibilities include management of the administrative systems [illegible]

Qualifications include 3-5 years [illegible] as well as experience with HP3000 systems and HP150 microcomputers.

Apply by sending your resume, including salary history, to Director of Personnel, The University of the South, Sewanee, Tennessee 37375.

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PROGRAMMER

Lorex Pharmaceuticals, a rapidly growing G.D. Searle venture with the French firm Synthelabo, has an immediate need for an additional programmer to support an expanding clinical research program. The qualified person will have experience in Relational database and FORTRAN programming. Experience on HP3000 helpful.

LOREX is located in Skokie, IL, a suburb of Chicago and offers outstanding compensation, benefits and career advancement opportunities to qualified candidates. Interested candidates, please submit resume and salary history to: Director of Administration, Lorex Pharmaceuticals, 5200 Old Orchard Rd., Skokie, IL 60077. EOE/M/F.

LOREX

TOOLS PROGRAMMER

Waltham, MA software development and consulting services company.

Includes maintaining and enhancing existing IBM, Prime, and IBM-PC tools and designing and implementing new tools as needed.

Requires: Degree in C.S. or math or equiv. exper.; program. exper. under Primos and/or VM/CMS - micro's a plus; and exper. with various kinds of tools (editors, file-directory managers, data communic., etc.).

Salary, benefits and prospects for career development are excellent. Please send resume to [illegible]

Management Decision Systems, Inc.
[illegible] Fifth Avenue
Waltham, MA [illegible]

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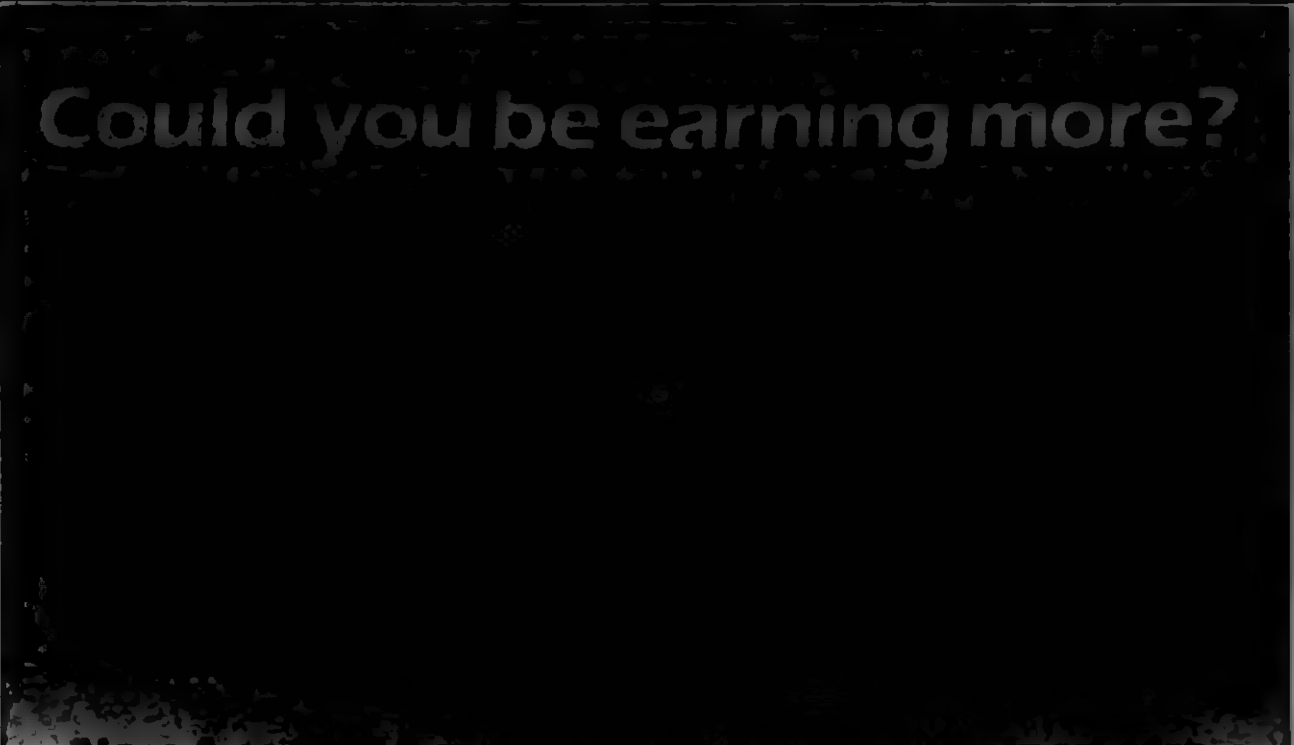

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In addition, the new Survey includes a number of comprehensive charts, exhibits and graphs which are designed to help you get a thorough understanding of emerging career trends and what you could do to capitalize on them.

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Nashua	[illegible]
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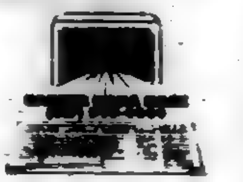

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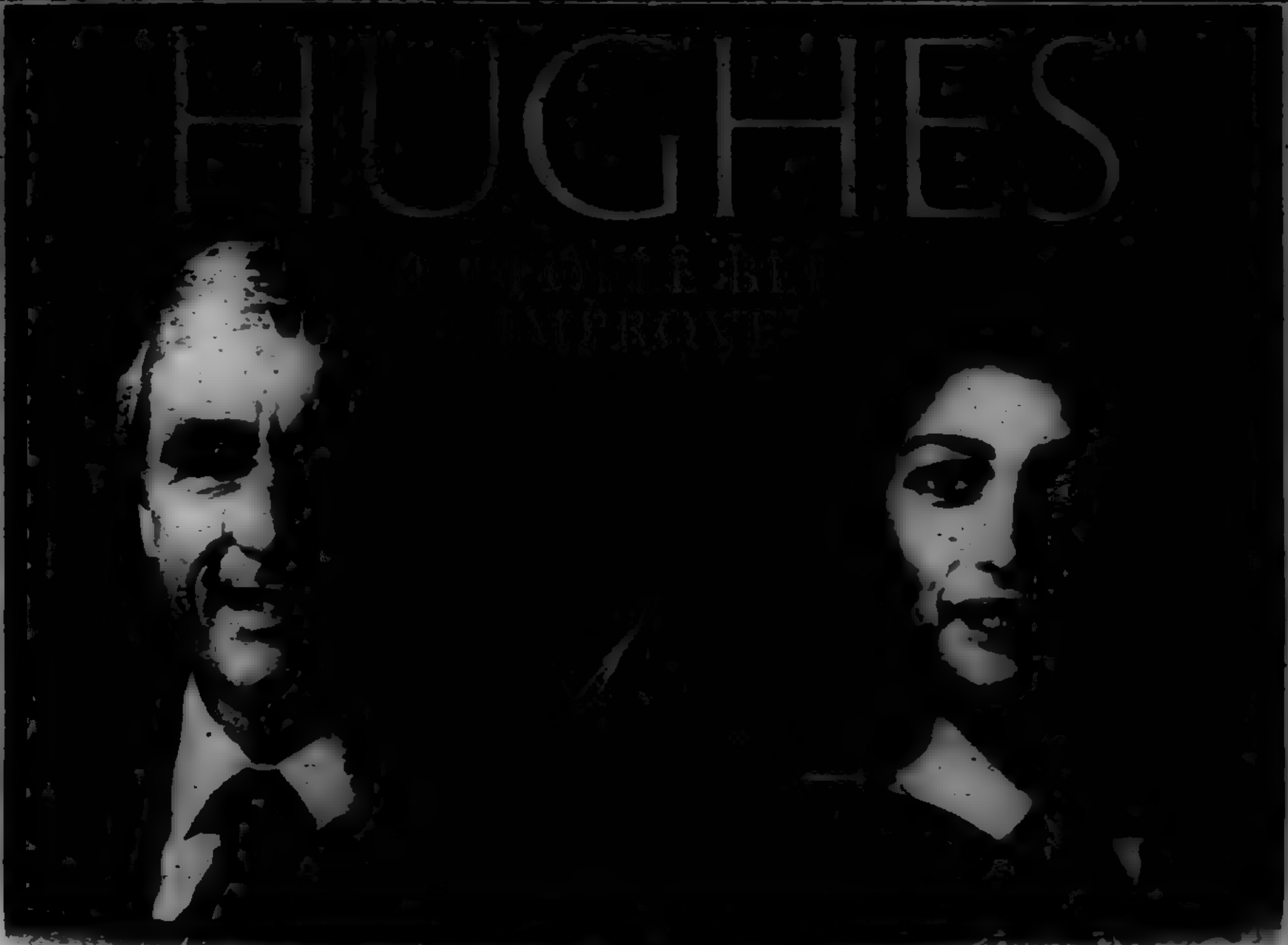

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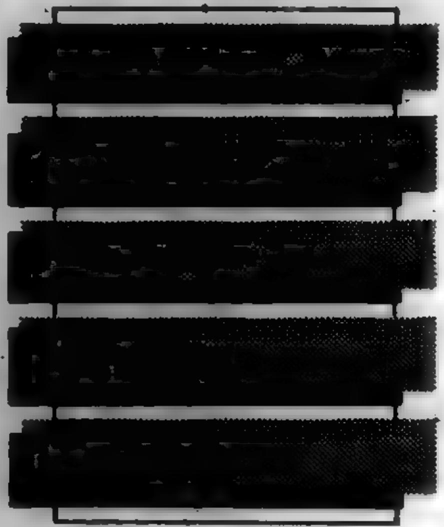

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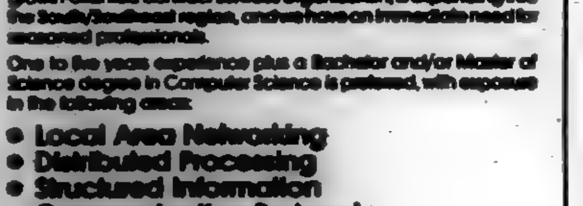

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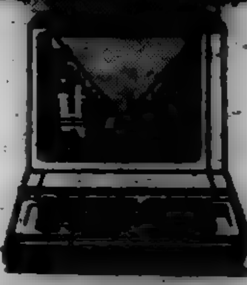

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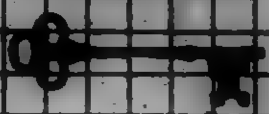

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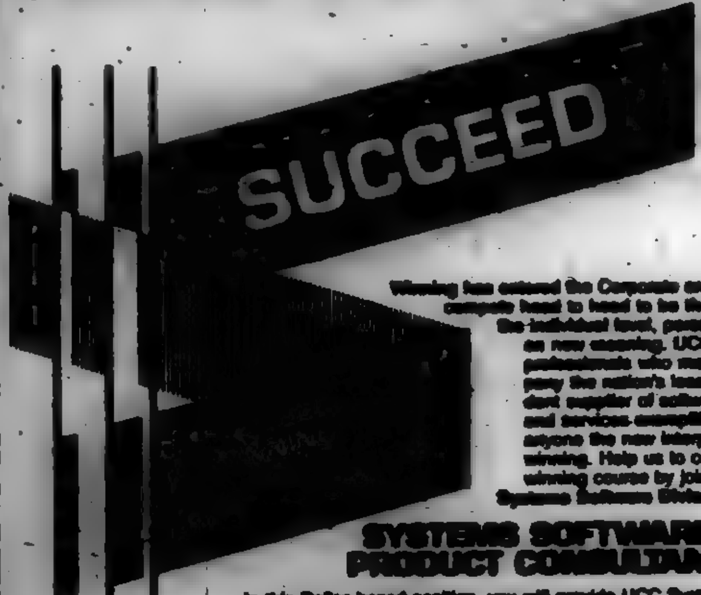

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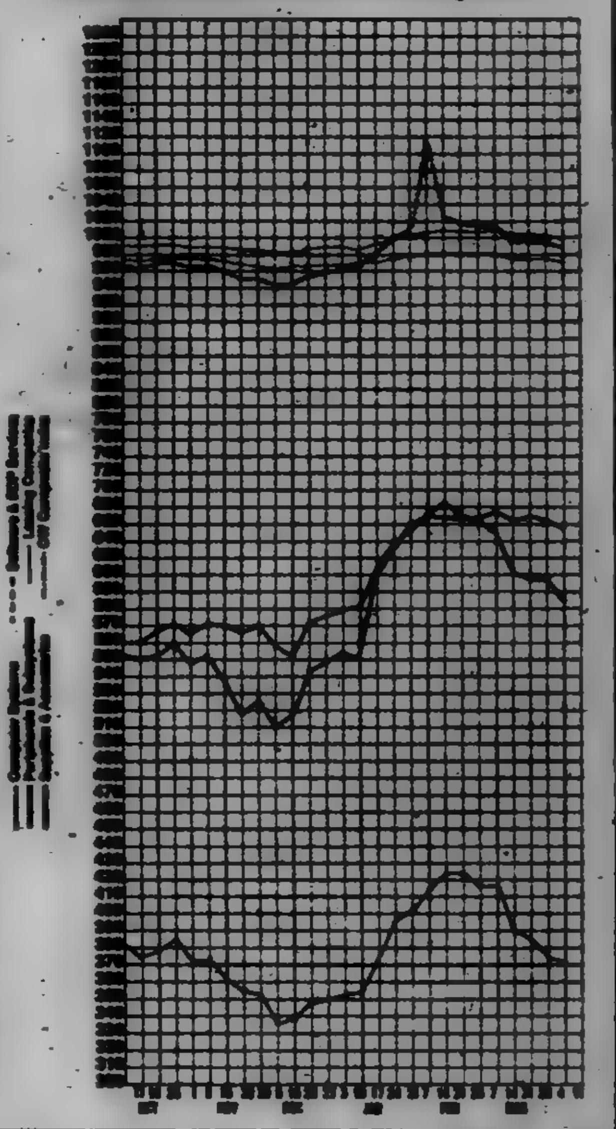
Computerworld Stock Trading Index



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Closing Prices Wednesday, April 3, 1985

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Prime's link to MCI gives local bypass

First in a four-part series on how individual companies are benefiting from communications bypass.

By John Dix
CW Staff

NATICK, Mass. — Prime Computer, Inc. migrated most of its long-distance communications traffic from AT&T to MCI Communications Corp. more than a year ago and, in doing so, implemented a bypass system that reduced its dependence on the local telephone company.

Prime is headquartered in this suburb west of Boston, near its research and development complex and multiple manufacturing plants, which are located in surrounding towns. A proponent of local bypass, the minicomputer manufacturer has long used private microwave voice/data links for communication between its many facilities.

In October 1983, the company took local bypass one step further. It dropped AT&T, selected MCI as its primary long-distance carrier and installed a direct microwave link between its headquarters and MCI's access point in Boston, according to Bill Hawkins, Prime's manager of corporate telecommunications.

All long-distance carriers maintain access points within the Local Access and Transport Areas they serve. Latas are geographic areas that determine whether traffic is carried by a local or long-distance carrier. The former Bell operating companies can only carry traffic within Lata boundaries, not across them. All traffic flowing between Latas is funneled through access points of the various long-distance carriers.

See BYPASS page 11

Low end pumped up

Stratus unveils entry-level CPU

By Donna Raimondi
CW Staff

MARLBORO, Mass. — Stratus Computer, Inc. unwrapped an entry-level, fault-tolerant computer that is upgradable to all other members of the Stratus/32 product family.

The basic Stratus FT250 contains 4M bytes of main memory. Each major component of the systems hardware has a twin so that the system has a total of 8M bytes of physical memory, according to the vendor. The hardware also includes two 143M-byte disk drives, one 1,600/3,200 in./min tape drive and a fault-tolerant communications subsystem.

The FT250 — geared to business applications such as banking and brokerage

See STRATUS page 6

Tandem releases Nonstop EXT

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — Tandem Computers, Inc. today introduced an entry-level processor that reportedly allows the company to serve its users in branch offices as well as in their corporate headquarters for the first time.

In processing power, the Nonstop EXT roughly equals the firm's existing Nonstop II CPU, according to Tandem sources. But in its environmental needs and for its targeted users, the just-announced EXT reportedly differs sharply from the Nonstop II and Tandem's top-of-the-line TXP processor.

The entry-level EXT extends Tandem's product line downward because it reportedly needs no protected environ-

See TANDEM page 6

TOP OF THE NEWS

Mass layoffs and plunging profits bear witness to the slowdown in the computer industry that has affected several major vendors. Page 4.

■

Sperry unveiled a relational data base machine that is said to integrate a Britton-Lee processor and one or more Sperry mainframes. Page 6.

■

Does e-q-u-a-l a-c-c-e-s-s spell trouble for AT&T? Figures show that some customers are switching to AT&T's competitors in areas where equal access has been implemented. Page 16.

■

When E. F. Hutton talks about designing a computer room, experience plays the leading role. Page 19.

■

Honeywell unwrapped a turnkey videotex system based on its DPS/6 mini. Page 81.

■

Lotus will acquire Software Arts and its Visicalc package in a deal that will also bring Visicalc's authors to Lotus. Page 89.

FYI

Changeover creates taxing delay

IRS system upgrade slows processing of tax returns

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — It's a case of "hurry up and wait." You struggled, fumed and fretted your way through your federal tax return to meet the April 15 deadline, but you may have a long wait for that refund check this year.

The wait is the result of a modernization program that replaced 1960s vintage Honeywell, Inc. 2050A and Control Data Corp. 3500 processors with Sperry Corp. 1184 multiprocessors and that converted 1,500 Internal Revenue Service programs — 3.5 million lines of code — from assembly language to structured Cobol.

A wide variety of hardware and software problems have meant that, as of March 29, the IRS had processed 26% fewer individual tax returns than it did at the same time last year, according to IRS spokesman Steven Pyrek.

Consequently, some taxpayers will get their refund checks four to six weeks later than usual. Although the IRS runs the risk of having to pay 13% interest if refunds are not sent by June 1, Pyrek said the computer centers are steadily reducing the backlog and are processing refunds first to avoid paying interest.

In a speech last month, IRS Commissioner Roscoe L. Egger Jr. expressed his frustration with the computer problems in the Service Center Replacement System: "With any computer [breaking-in] period, there are software and hardware problems and personnel adjustments. Machines break down. People push wrong buttons. . . . The results are terribly frustrating for taxpayers and us."

See REFUND page 8

Marathon man

Honeywell has an 11-year veteran of the Boston Marathon who has never run in the race, unlike last year's winner above, Geoff Smith. Story page 18.

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NEWSPAPER

Logic bomb brings agency's DP operations to standstill

By Kathleen Sullivan
CW West Coast Bureau

LOS ANGELES — A saboteur's logic bomb, which paralyzed the central computer at the city Department of Water and Power (DWP) here for five days, did not destroy any data. However, it did "rearrange" information in the department's IBM mainframe, according to the Los Angeles Police Department.

"Apparently, the person who programmed the logic bomb into the computer wanted to create some havoc," said police Lt. Fred Reno, who is in charge of the Police Department's computer fraud unit.

Reno described a logic bomb as a software program designed to destroy, remove, replace or rearrange information stored in a computer at a given date and time.

The investigation into the incident is continuing, Reno said. To date, no criminal charges have been filed, but Reno said the Police Department is "considering some possible suspects."

The problems began one Monday morning in early March when the DWP's IBM 3081 began crashing continually, said Robert Giffrow, director of management services at the department. "We had brought the system up, but every time it was used, it went down," he said.

Giffrow, citing the sensitive nature of the investigation, would not elaborate, except to say the management services department had so far discovered that an as yet unidentified person had planted a logic bomb in one of the DWP's software programs. "We know it was deliberate sabotage," he said.

Steve Hinderer, DWP's director of public affairs, described the incident as an inside job. "We feel someone from the inside, who knew the system well, got in and brought the system down," he said.

> *'We know it was deliberate sabotage.'*
>
> — Robert Giffrow
> Department of Water and Power

Giffrow said it took 20 people "the best part of a week" to track down the problem and bring the system back up to stay. During that time, DWP personnel were unable to enter orders for new water and electricity connections.

Although Giffrow said he did not know what security precautions might have prevented the alleged saboteur from placing the logic bomb in the system, he said the department will be rethinking its security measures as a result of the incident.

The cost of making up for lost production time will be substantial, he added. The DWP's on-line system handles data for personnel transfers, promotions and payroll deductions, inventory transactions and purchase orders for equipment, as well as requests for new power connections.

Reno said that, if arrested, the suspected saboteurs will be charged under a state penal code section that covers tampering with computers.

Police hit high-tech bookies

By Clinton Wilder
CW Staff

BOSTON — A multimillion-dollar computerized bookmaking operation uncovered here last week was possibly based on telephone banking technology, according to one computer crime expert.

The national sports betting syndicate, described by law enforcement officials here as the most technologically sophisticated operation ever uncovered in Boston, included the use of personal computers, telephone call diverters and scramblers.

Jean Troy, a computer security specialist at the National Bureau of Standards in Gaithersburg, Md., said the bookmaking system probably took wagers from bettors entering bettor codes and wagering information on Touch-Tone telephones, much as a telephone bank customer would request account information or fund transfers.

"It's a fairly straightforward program," Troy said. "[People] dial up and uses Touch-Tones to enter [their] account number. Then a voice response system gives instructions for entering the information — codes for a specific racetrack, race and horse, for example. It would be layed around a data base management system to call up various canned voice modules."

Boston investigators refused to comment on the types of computers involved in the operation but did describe call diverting and voice scrambling devices confiscated in a 1984 raid in East Boston. The equipment was allegedly used to transfer bettors' calls to the downtown Boston computer operation to avoid having the calls traced. "The individual bookie or bettor would be talking directly to the computer that records the bet," Troy said.

Published reports said the operation's leader allegedly purchased computer and call diverting equipment from a suburban computer retail store, Computer Showcase of Norwood, Mass.

The store's owner was one of eight arraigned on April 9 for the charges, which included illegal gaming, conspiracy, money laundering and state tax evasion.

[redacted]

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NEWS SUMMARY

IBM reported that first-quarter profits were down 18% from one year earlier and more than 50% below the fourth quarter of 1984/4

U.S. trade associations had assorted reactions to an announced plan by Japan's prime minister to open the Japanese market to foreign imports/4

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Competitors are putting it to Ma Bell in the scramble for new equal-access customers, but AT&T still may get a majority of those customers, by default, if they do not choose a carrier/10

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A firm's publishing division staged a data center disaster to test its backup procedures/14

An Arizona city government has taken a novel approach to implementing office automation from the top down/15

The name of Honeywell's marathon man may not be on the sports page, but he will be running the computerized results system for the 11th consecutive year at today's 89th annual Boston Marathon/16

A motorist in Alaska was mistakenly ordered to spend a night in jail because of an improperly programmed computer system/17

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SUSPENSE

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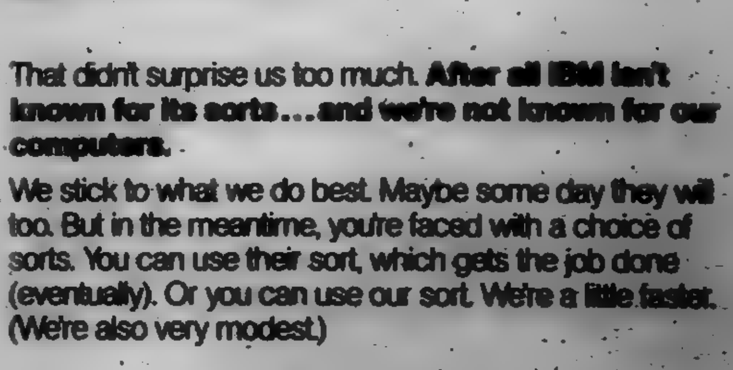

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IBM quarterly profits slump as slowdown continues

ARMONK, N.Y. — IBM reported April 11 that first-quarter profits were down 18% from the year-earlier quarter and revenue increased by only 2%. On a quarter-to-quarter basis, revenue declined 32.6% from the fourth quarter of 1984 and profits dropped by 54.6%.

The profit decline, which IBM had projected but had not specified two weeks earlier [CW, April 1] marked the first such drop for IBM since the last quarter of 1981.

Revenue for the first quarter from sales, services and rentals was $9.76 billion, up from $9.56 billion in the same quarter a year earlier and down from $14.49 billion in the last quarter of 1984.

Profits were $986 million, down from $1.2 billion a year earlier and $2.17 billion in the fourth quarter of 1984; pretax profits were down 20.6%, and the company paid 23.7% less in income taxes. The company said earnings per share were $1.61, down 18.2% from $1.97 in the first quarter of 1984 and down 54.6% from $3.55 in the fourth quarter.

John F. Akers, president and chief executive officer, said in a prepared statement that revenue and profits were adversely affected by the strength of the U.S. dollar against foreign currencies and by "a slowdown in installation activity in our high-end storage and processor installations as some customers paused to evaluate our recently announced IBM 3090 processor and enhanced IBM 3380 storage devices."

Even if currency rates had remained the same as a year ago, IBM said, first-quarter profits would still have declined 7.1% to $1.11 billion, but revenue would have increased 9.2% to $10.46 billion.

The first-quarter results highlighted IBM's policy in recent years of discouraging rental of equipment. While revenue from both sales and services increased more than 11%, revenue from rentals dropped 26.6%.

Despite the quarterly results, Akers reiterated that IBM is still optimistic about its financial outlook for fiscal year 1985, a view that has been shared by most leading securities analysts who follow IBM. During the first quarter, Akers said, "total worldwide shipments were higher than [they were in] the first quarter of 1984 with substantially all of the growth in the non-U.S. portions of the business." He said the company continued to make significant investments in R&D and plant capacity in anticipation of future growth.

Computervision, Honeywell announce work force cuts

By [illegible]
CW Staff

BEDFORD, Mass. — Computervision Corp. last week dismissed 14% of its worldwide work force in an attempt to bring operating costs in line with an abrupt first-quarter revenue decline.

In a related development, Honeywell, Inc.'s Massachusetts-based Small Computer and Office Systems Group (SCOS) said it will close operations for four separate weeks in 1985 and cut 120 salaried employees from its 4,100-member work force. The company attributed the moves to "a softening in the small computer systems market since the fourth quarter."

Computervision, a manufacturer of computer-aided design and manufacturing equipment, said it dismissed about 950 employees from its 6,800-member worldwide work force. The company also said 50 top executives will take cuts in salaries and bonuses this year.

Computervision had geared operating costs to a projected 1985 revenue increase of 30% to 40% after giving a stellar performance in 1984 when profits increased 35% over the previous year, but that revenue growth failed to materialize, according to spokesman James Barr.

Early last month [CW, March 18], the company unexpectedly projected break-even profits for the first quarter and revised that projection on April 1 to a loss of up to $15.7 million. Instead of anticipated revenue in the area of $160 million for the quarter, the company now expects a 10% to 20% decline from the $121.8 million reported in the first quarter of 1984.

Craig Symons, a CAD/CAM analyst with the Gartner Group in Stamford, Conn., said the general decline in orders experienced throughout the computer industry during the first quarter affected CAD/CAM vendors but to a lesser extent than it did minicomputer vendors. Symons said IBM and Intergraph Corp., Computervision's chief rivals in CAD/CAM, continued to gain market share at the expense of Computervision, even though Intergraph's revenue for the first three months will probably be less than earlier expectations.

Symons said Computervision's 5000 system, based on an IBM host, has not been well received by users and that Computervision "has not added a tremendous amount of value to the IBM mainframe at this point." The system is targeted at MIS executives who already "have a tight relationship with IBM" and see no need to pay Computervision's markup.

Although the company soared to the top of the CAD/CAM industry via sales of its CDS 4000 series, it failed to transport its popular Cadds 4X software to the IBM-based 5000 or to the Sun Microsystems, Inc.-based 3000. Symons said Computervision needs to unbundle its software but that could take 12 to 18 months, during which time the competition would continue to gain market share.

At Honeywell's Small Computer and Office Systems Group, all operations will be closed down during the weeks of April 29 to May 3, May 20-24, Aug. 26-30 and Dec. 23-27. Employees will be asked to take vacation time or unpaid leave or a combination, the company said. The December shutdown includes three paid holidays.

Honeywell said the 120 employees affected by the work force reduction will be notified May 10, and their last day of employment will be June 7.

"We are taking these difficult actions because, like many of our competitors, we have seen a softening in the small computer systems market since the fourth quarter of 1984," said Eugene Manno, group vice-president of SCOS.

Honeywell's SCOS includes operations in Billerica, Mass., and Puerto Rico.

Japan's pledge to open markets draws mixed response in U.S.

WASHINGTON, D.C. — Japanese Prime Minister Yasuhiro Nakasone's pledge last week to open Japan's domestic markets to foreign imports drew mixed responses from U.S. trade associations representing high-technology companies.

Brian Wynne, manager of international trade affairs with the American Electronics Association (AEA), said his organization "is less interested in policy pronouncements than in how things are implemented [by] lower level officials."

Although the AEA found little of anything new in the recent Japanese proposal, Wynne declared, "it is very important that Prime Minister Nakasone articulated the critical nature of the problem in terms of access" to the Japanese markets.

No surprises

Charlotte LeGates, a representative of the Computer and Business Equipment Manufacturers Association (Cbema), agreed there were no surprises in the proposals but added that Nakasone's pledge was very positive. According to LeGates, Nakasone has been "very committed in negotiations with U.S. trade representatives and in his statements [concerning] opening up more markets."

One measure that was included in the Japanese proposal would enable foreign telecommunications companies to participate in establishing standards for telecommunications equipment, a market that U.S. manufacturers believe could absorb billions of dollars of U.S. imports due to the recent deregulation of Japan's Nippon Telegraph and Telephone Corp.

"Now that that ordinance is in place," Wynne said, "we can start talking about market access issues." But, he added, the bottom line for U.S. electronics firms is the end result of the Japanese liberalization efforts and whether those efforts actually do increase imports from non-Japanese manufacturers.

Software copyrighted

The Japanese also said they will consider eliminating tariffs on imported electronics goods and will apply copyright protection to computer software.

Recent calls for U.S. trade retaliation [CW, April 8] seem unlikely to be dampened because the Japanese government has failed to implement specific goals and timetables for erasing entry barriers to imports.

LeGates said Cbema is urging restraint on the part of U.S. industry and is opposed to protectionist measures. Cbema believes that more action is needed by the Japanese, LeGates said, "but clearly you can't change an entrenched system overnight."

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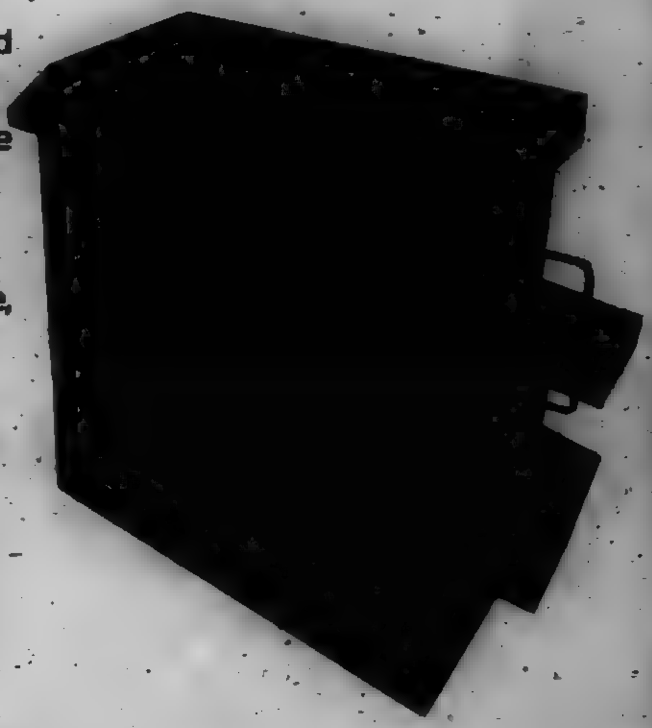


Sperry unwraps mainframe relational data base system

By [illegible]
CW Staff

BLUE BELL, Pa. — Sperry Corp. has announced a relational data base processor system that integrates a Britton-Lee, Inc. Relational Data Base Processor and MPI disk drives with one or more Sperry 1100 series mainframes running under Sperry's OS11 operating system.

An IBM mainframe running under IBM's VM/CMS operating system can also be linked to an initial configuration consisting of Sperry's newly announced Shared system and a Sperry 1100. The system will be marketed overseas under the name Relational Server RS 1000.

The basic configuration of the Sperry Shared system consists of a Britton-Lee Intelligent Data Machine (IDM) 500/2 processor with 2M bytes of main memory, an 1100 host interface (block multiplexer channel interface board), a system console, a data base administrator's workstation — which is a Sperry Personal Computer equipped with Sperry's SQL software — and two 340M-byte disk drives. This basic system costs $250,000 and includes data base administration software, console software, 1100 Shared Control software and Britton-Lee's IDM internal software for its relational data management system, Sperry said.

The basic system includes everything a user needs to access the data base machine except for the user interface software, the vendor said.

The Shared system is said to store information in up to 50 data bases. It can provide information to one 1100 mainframe, share information with two 1100 systems or share information with one 1100 and one IBM mainframe, the vendor said. The system attaches to 1100 and IBM mainframes through block multiplexer channels.

Sperry and IBM micros can be directly attached to the system through RS-232 ports, the vendor said. The system can deliver information directly to the personal computers without going through a mainframe if the personal computers are equipped with Sperry's Shared PC Support board, which costs $2,000.

Users with Sperry's Mapper system must install the Mapper Shared Interface data extract facility software on their 1100s to access data in the data base system. The system costs $9,000 or may be leased for $200/mo.

Shared IPF SQL software — the Sperry version of IBM's SQL — resides on the 1100 host and is the user's query interface, the vendor said. It costs $6,750. Adding a second 1100 to the configuration, the Shared control software package costs $60,000 and another block multiplexer board costs $17,200. Adding an IBM machine to the configuration requires an SQL software package developed by Britton-Lee and available from Sperry for a one-time license fee of $35,000.

The system's internal memory can be expanded to 6M bytes in 1M-byte increments at $9,000 per megabyte, the vendor said. Up to 15 workstations — Sperry Personal Computers with a minimum of 512K bytes of memory, which range from $3,000 to $6,000 each, depending upon configuration — can be attached via RS-232 interface ports, with one port reserved for a data base administrator that comes with the system.

Mass storage is said to be expandable in two-drive increments at a cost of $26,000 for two disk drives and $56,000 for a four-drive cabinet of up to 4.8G bytes.

More information is available from Sperry, P.O. Box 500, Blue Bell, Pa. 19424.

TANDEM

from page 1

ment and can be installed in a typical business office, although users would be well advised to place it off to one side in the manner of photocopiers, according to Tandem officials. "It puts out enough heat and noise that you probably wouldn't want to have it next to your desk," according to Gerald Peterson, vice-president of Tandem's product management.

Both the Nonstop II and the TXP machines require a computer room with air-conditioning and other special amenities and are geared for the central offices of large corporations.

In addition to running independently of a computer room, the EXT differs from its two sister systems in its packaging. In a standard configuration, all the machine's systems hardware — including its 8-in. Winchester disk units — is integrated in one cabinet that occupies 11.8 sq ft of floor space and stands 55.5 in. high.

The combination of the EXT's relatively small footprint and its ability to operate without special environments reportedly makes the processor well suited for users in the field or in district offices of major corporations.

The advent of the distributed processing system will enable Tandem to address a huge user class that would otherwise lie beyond its technological reach, according to Tandem Product Manager Doug Ricketts.

The EXT uses the same Guardian control program, Encompass relational data base management system and Expand networking software as the rest of Tandem's processor family. An EXT system operating in the field can be incorporated in the same teleprocessing network with a TXP or Nonstop II back at headquarters, Peterson said.

In a minimum configuration containing two processors, the EXT executes roughly 1.6 million instructions per second, more than twice the throughput of its nearest IBM equivalent — the base model of the recently introduced Stratus Computer, Inc.-based System/88, Ricketts said.

In addition to two processors, a base EXT configuration incorporates 2M bytes of main memory per CPU, two disk units with 128M bytes of formatted storage per drive and all the requisite system and networking software. All the above modules fit in the same cabinet, which has enough expansion room to hold up to 8M bytes of internal storage per processor, two additional disk units and a tape system.

To upgrade the EXT still further, for a maximum system capacity of four processors, 32M bytes of main memory and eight 128M-byte disk units, users can attach a second cabinet.

Shipments of the EXT, which will be sold both through Tandem's direct sales force and through third parties, will begin immediately.

A minimum two-processor EXT costs $120,000, compared with $180,000 for a similarly configured Nonstop II.

Tandem is headquartered at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

STRATUS

from page 1

age — offers fault-tolerant computing by monitoring itself for component failure; switching to the backup, or twin, component; and notifying the user and vendor that a problem exists, the vendor said.

The system also offers fault-tolerant communications through self-checking, twin controllers and redundant buses. The system is said to support a variety of communications protocols, including IBM's Systems Network Architecture and Binary Synchronous Communications, Burroughs Corp.'s Poll/Select and X.25/X.29 and Ascii. It also supports the Society for Worldwide Interbank Financial Telecommunications and Visa networks, Stratus' Stratalink intermodule bus and Stratanet global communications network.

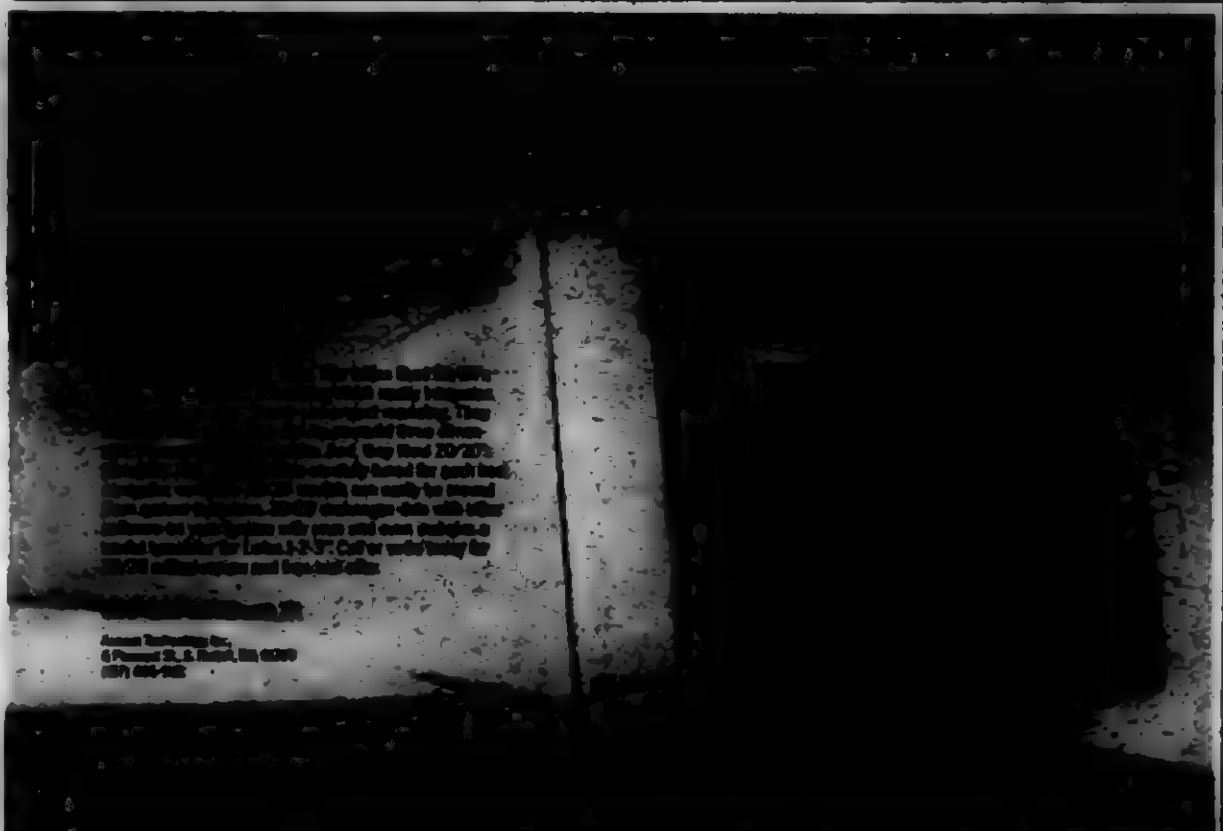
The FT250 includes the Stratus VOS operating system, a transaction processing facility, a forms management system, a text editing package and one of six languages: Cobol, Fortran, Basic, C, Pascal or PL/I. It is software- and application-compatible with every other Stratus system, the vendor said.

Can use Unix-based applications

Users can add Stratus' Unix system facility (USF), which allows the use of AT&T's Unix-based applications on machines running Stratus' VOS operating system, the vendor said. The addition of USF is priced in accordance with AT&T regulations and costs approximately $8,000 for a 16-user system.

The $115,000 4M-byte basic configuration of the FT250 can be expanded to 8M bytes of duplexed memory (or 16M bytes of physical memory) in 2M-byte increments, at $11,000 per 2M-byte board, and 21G bytes of on-line disk storage. Four tape drives and 64 communications ports can also be supported. Upgrades from the FT250 to Stratus' XA400, doubling the power of the system, costs $64,000, the vendor said.

The system is available immediately. More information can be obtained from Stratus at 55 Fairbanks Blvd., Marlboro, Mass. 01752.



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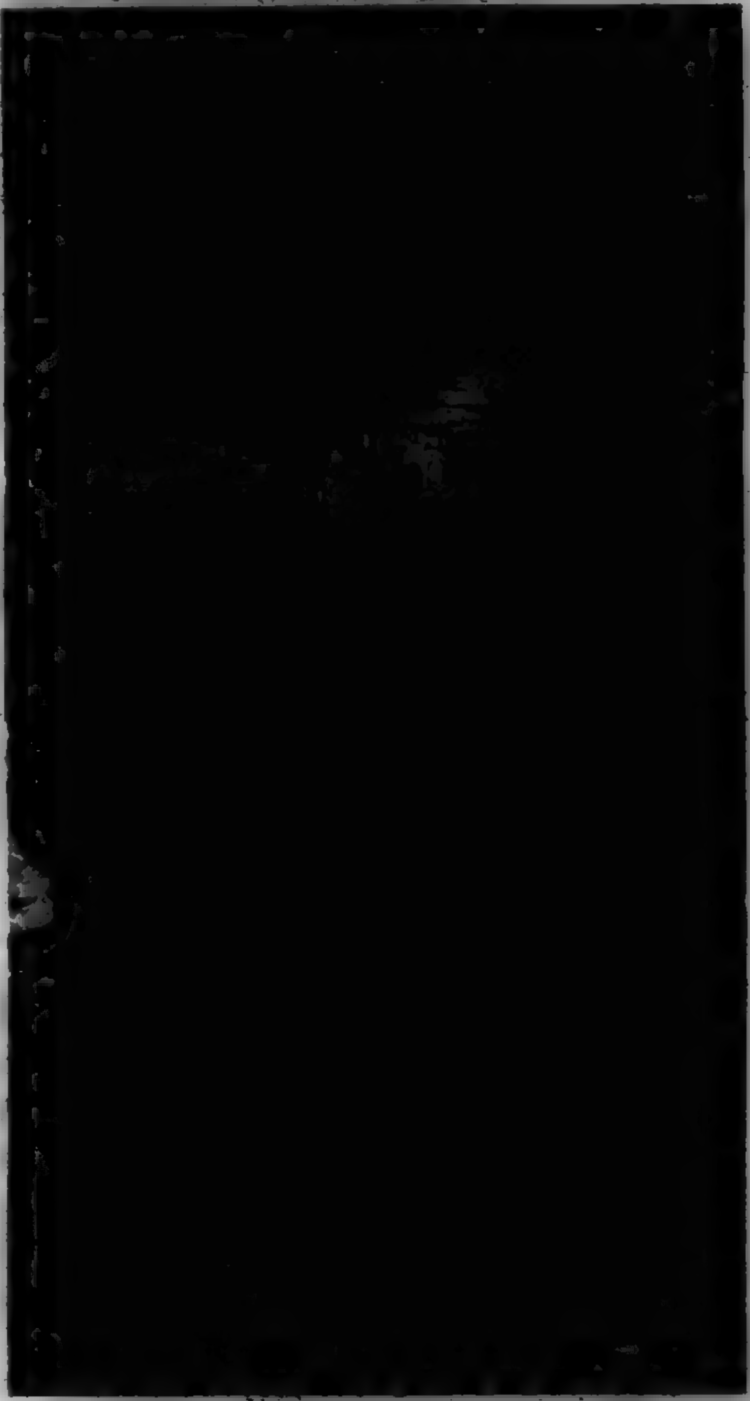

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Swamped IRS Tele-Tax service lines keep callers on hold

WASHINGTON, D.C. — Want an exercise in futility? Try calling the Internal Revenue Service to find out when your tax refund will be mailed.

Using the IRS' Tele-Tax service, trumpeted in the instructions for completing tax forms, taxpayers in 46 U.S. cities can do just that for the price of a local call. When they make the call, however, they are likely to get a busy signal.

A television station here recently tried to call as part of a newscast. No go. A *Computerworld* reporter tried a dozen times. Zilch. Even Tele-Tax project leader Bob Hare said he sometimes cannot test the service because of busy signals.

"The [Tele-Tax] program has been so successful that users are tied up," acknowledged IRS spokesman Steve Pyrek.

Tele-Tax, he explained, was computerized this year but has been unable to answer the number of calls pouring in — as many as 200,000 per week — because of the limited number of phone lines connected at each of its 26 regional sites, he said.

The Tele-Tax computer serving the New York metropolitan area, for example, has only 50 lines connected.

Taxpayers who get through encounter a high-tech system that allows them to use their Touch-Tone telephone's keypad to query the Sperry Corp. mainframe at the nearest IRS regional Service Center and find out when their refund will be mailed.

The keypad can also be used to key in the code to call up recorded explanations, in digitized speech, of any of nearly 200 sections of the tax form.

Rotary-dial phone users restricted

Callers with rotary-dial phones, however, are not so fortunate. Though they can receive the same assistance, they must go through a Tele-Tax operator, which means they must call during business hours. Touch-Tone callers, on the other hand, can call at any time.

Also, callers using rotary-dial phones who do get through only to be put on hold are automatically disconnected by a Tele-Tax computer if they wait longer than five minutes.

Tele-Tax is based on a $2.5 million system of Vocom data entry/voice response computers from Perception Technology Corp. of Canton, Mass. The Vocoms are based on a Digital Equipment Corp. LSI-11 minicomputer board, with an attached unit that supports either 25 or 50 telephone lines.

The computers, installed in November, replaced operators who, in the previous three years of Tele-Tax's existence, had answered calls and played tape-recorded explanations of sections of the tax form. The recorded explanations are now digitized and stored on each Vocom's 10M-byte hard-disk unit.

The IRS computerized Tele-Tax as a means of reducing the cost of additional operators if the volume of calls kept growing, according to Phil Russo, assistant director of IRS taxpayer service.

Russo said taxpayers who want to find out when to expect their refund check should hold off on calling until ten weeks after filing their tax form. They are most likely to get a busy signal, he cautioned, if they call Tele-Tax around midday, its most busy time. He also advised calling in the later part of the week.

As it is for many taxpayers, Monday is the system's worst day.

— [illegible]

REFUND

from page 1

The delay in processing returns has not been the only problem caused by the Service Center Replacement System (SCRS). At congressional hearings last month, IRS officials said SCRS problems had caused the backlog of unanswered taxpayer correspondence and adjustments to triple and had contributed to other snafus because the changeover distracted computer staff from regular duties [CW, March 18].

Tom Laycock, assistant IRS commissioner for computer services, said the SCRS problems fall into the following three categories:

- Frequent problems have arisen with the 48 heavily used tape drives, such as creased tapes and tapes that are created on one drive but cannot be read on another.
- When hardware problems occur, the IRS frequently must redo hours of input work because the operating software's checkpoint/restart feature does not always work. (This feature saves the latest block of input in memory and repositions the tape to begin work again.)

"Instead of having to redo a half-hour of input, we've had to go back sometimes to redo six or 12 hours [of input]," Laycock explained.

- IRS programmers are working to correct bugs in the applications software. "[Last year] we recognized that those Cobol programs were not running anywhere near as fast as we needed, so we launched an optimization effort that we had never planned on needing. That caused us not to do as much system acceptability testing as we had wanted to do," Laycock explained.

The Philadelphia and Brookhaven, N.Y., centers have experienced the most trouble and consequently are about two weeks behind in processing tax returns, Laycock said.

"It all seems to boil down to the fact that those centers that had hardware problems [also] had restart problems and got behind," he said.

IRS awards Sperry contract

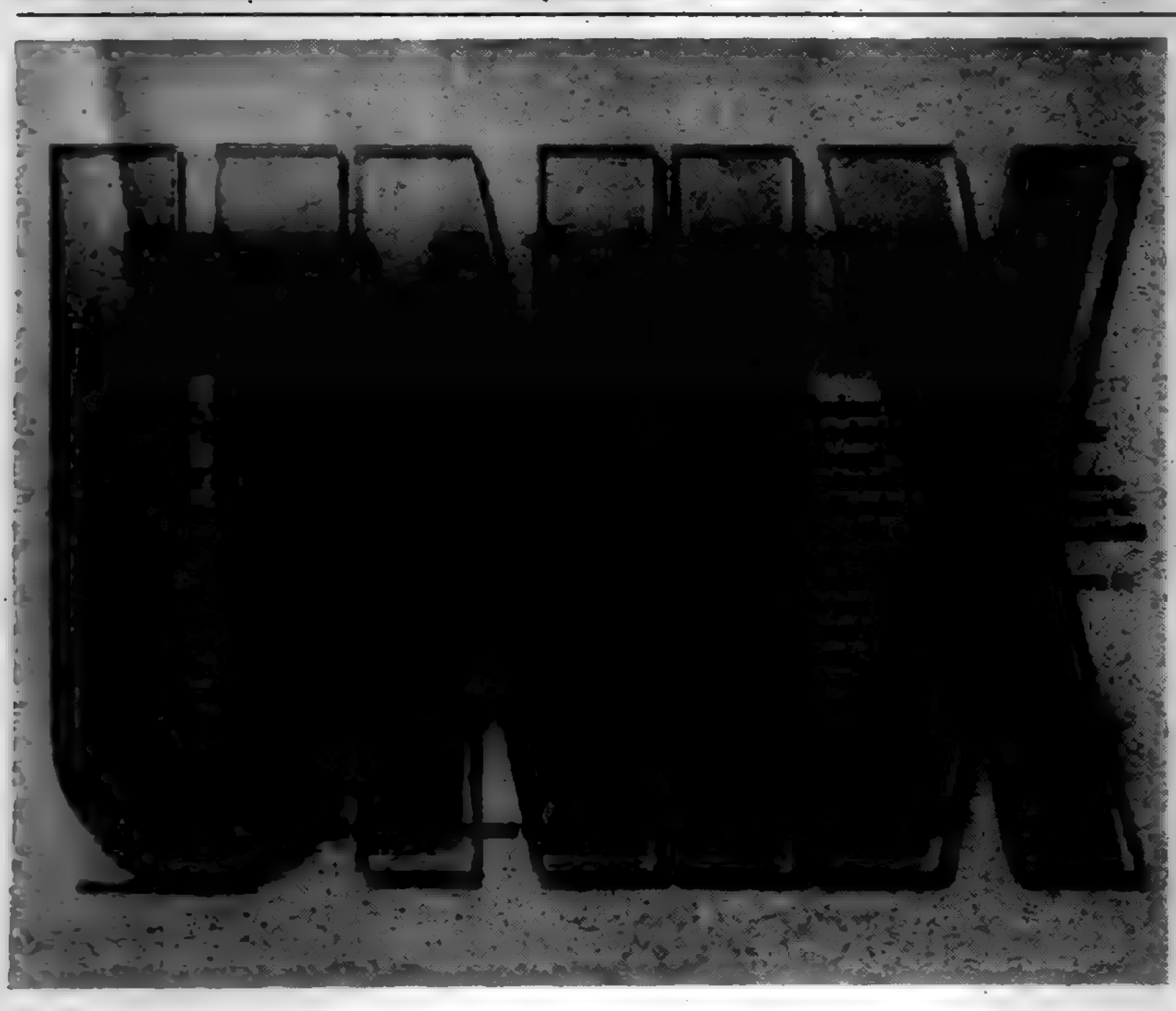
The replacement process began in June 1981 when the IRS awarded a $102.6 million contract to Sperry for new equipment and maintenance — the largest single computer purchase in IRS history.

At the time, the IRS said the hardware change was needed because "the equipment being replaced is up to 16 years old and is no longer manufactured, so it cannot be further upgraded."

Laycock added that it was hard to get spare parts for the old mainframes and virtually impossible to find experienced engineers who would work with the outdated system.

The IRS was ready to make the conversion last November and had to choose between entering the 1985 tax season with old computers unable to handle the load or going ahead with the new system in spite of the impending glitches, officials explained.

"We chose the second option, and, despite the transition problems, we will ultimately increase our capacity and speed dramatically," Egger said recently.



IRS brings up 6000-terminal multiuser Unix system

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — It has taken four years to implement, but an AT&T Unix-based distributed processing system is now being used by a branch of the Internal Revenue Service in its 10 offices.

The project began in 1981 — before distributed processing in a multiuser environment was a popular concept — when IRS planners opted to implement such a system in 10 IRS branch offices.

By 1983, a contract was awarded for the installation of 400 minicomputer systems that would support dumb Ascii terminals and would run under both Digital Research, Inc.'s CP/M and AT&T Unix operating systems software. These specifications were spelled out, to the consternation of vendors, by IRS planners.

A year and a half later, 400 Zilog, Inc. Model 31 systems have been installed, more than 6,000 terminals are hooked up, and Eugene Barbato Jr., chief of the IRS' Consulting Services branch, is a happy man.

Barbato's shop has a healthy library of more than 2,000 AT&T Unix applications programs. Most important of all, the headaches common to incompatible systems installation that the federal government often suffers as a result of contracting laws have been few.

No alternatives to multiuser system

"In 1981, we decided there were no alternatives to a multiuser system, since we knew we could not become locked into one vendor's solution," Barbato commented last week at an AT&T Unix users meeting held at the IRS' main headquarters. "The other vendors' products were dead in the water as far as meeting our requirements. They couldn't because they did not have [an AT&T Unix] capability, and Zilog did."

The Zilog machines are used across the country at district and branch offices of the IRS, where they support administrative jobs such as tracking correspondence and the examinations of delinquent taxpayers, the collection of payments, the resolution of problems, inventory controls such as the tracking of liens placed on delinquent taxpayers' property and word processing.

Barbato's shop serves as a clearinghouse, or a broker testing Unix applications products developed by vendors or at universities.

One AT&T Unix application product, the Multi-Channel Memo Distribution Facility, was developed at the University of Delaware for the U.S. Army and modified to fit the IRS offices. It delivers mail to addresses on the IRS's 400 systems automatically through designated routes lodged in the memory of the system.

To Barbato, one of the main advantages of the Unix environment is the ability to control local processing rather than using a centralized management system. Yet this advantage has led to the major problem now facing the system — the inability to perform micro-to-mainframe processing.

"We can download but can't upload [data]. This capability was not built into our requirements when we ordered the current system, and privacy regulations dictate that we can't access the main data processing centers [where taxpayer returns are processed for errors and delinquencies], much as we would like to," Barbato said. He added that the agency is currently working on uploading processed data from the Zilogs to a stand-alone front-end processor that will check the data for accuracy prior to mainframe entry.

The IRS' AT&T Unix system is currently using a data base management system developed by Informix Corp. in which the requirements for applications development are clear-cut. "We are trying to proscribe the use of C, except on a waiver basis, when writing applications," Barbato said. He justified this move on the grounds that programmers at government salary scales who are proficient in C programming are snapped up by private-sector "Beltway Bandits," firms in the Washington, D.C., area that pay wages four times higher than what the IRS pays. "We would just get lines of code no one could later make sense of," he said.

Experiments order of the day

Other developments at Consulting Services, where experiments are the order of the day, are the variety of terminals hooked up to the Zilogs, such as Apple Computer, Inc.'s Lisa and Macintosh, Texas Instruments, Inc.'s Professional workstation and the IBM Personal Computer. Additionally, Zilogs are being linked in clusters at large district offices, where processing needs are greater, by private branch exchanges acting as data traffic cops.

Barbato spoke wryly of the current fascination in the marketplace with local-area networks. "You may really need a local-area network when your users really need the power of the personal computer; otherwise, what's wrong with distributed processing?"

Despite this demurral, Consulting Services does have a local-area network that is used for applications development. Comparing the mini-terminal emulation approach with the network-micro approach, Barbato said the costs are equal.

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If you want to learn to code effective job-control language for a DOS/VSE system, you've got your work cut out for you. The information you need is spread through more than a dozen IBM manuals. And because the manuals have to cover everything, the important points are often hidden by the details.

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Figures show equal access eroding AT&T market share

By John Dix
CW Staff

Preliminary figures have indicated that competitors are taking business from AT&T in the scramble to capture customers in areas upgraded for equal access, but fewer than half of the customers in these areas are choosing carriers.

Under terms specified in the divestiture of AT&T, the former Bell operating companies have to upgrade their systems to provide all long-distance carriers with the same kind of access to their local facilities that AT&T has always enjoyed. Upgraded access enables carriers like MCI Communications Corp., GTE Sprint Communications Corp. and Western Union Corp. to provide service access by dialing a single digit, service use from rotary telephones and more accurate billing.

As the divested Bell companies upgrade for equal access, users are being asked to choose a primary long-distance carrier. This carrier will be accessed in the same manner that AT&T is today, by dialing "1." Other carriers can be used — providing the customer has a business relationship with each company — by dialing "10" and then a three-digit carrier code used to distinguish the carrier.

Conversion to equal access started nine months ago in Charleston, W. Va., and is scheduled to be completed by Sept. 1, 1986 [CW, May 28]. The former Bell companies will only upgrade metropolitan areas with 10,000 lines or more. This means roughly 52 million to 56 million customers — roughly 65% to 70% of all Bell lines installed — should have equal access, an MCI spokesman estimated.

Equal access availability unknown

By the end of 1984 equal access was available in 5% of the country, serving more than two million people, the long-distance carriers generally agree. But none of the carriers know for certain the number of customers today that have equal access available to them. An AT&T spokesman estimated that figure to be 15 million people.

The former Bell companies notify customers 90 days before equal access is cut over in a given area. Customers who do not presubscribe before that date still have 180 days to pick a carrier. After that period, choosing a carrier costs $5.

Of the 15 million customers who now have the equal-access option, only 46% have chosen a primary long-distance carrier, according to a study by Market Viewpoint, Inc., an Armonk, N.Y., research firm commissioned by AT&T.

Department of Justice figures back up that study's findings. In a survey of the divested Bell operating companies, the department found that, depending on area, only 5% to 24% of customers presubscribed to long-distance carriers.

"Although additional consumers made affirmative choices after their end offices were switched to equal access," the report said, "in no case did 80% make an affirmative choice."

> **"**
>
> ***Judging by some preliminary numbers, AT&T appears to be losing market share to its competitors.***

While it is still too early to guess the outcome of this high-stakes scrum, judging by some preliminary numbers, AT&T appears to be losing market share to its competitors.

According to AT&T's study, an estimated seven million of the possible 15 million people in equal-access areas have actually signed with long-haul carriers. Of this seven million, 80% have signed with the nation's three largest carriers, according to carrier claims and *Computerworld* calculations:

- AT&T has signed 65%, or four and a half million equal-access users, a company spokesman estimated.
- MCI, AT&T's largest competitor, may have 13%, or 900,000 new equal-access customers. This number was calculated by applying MCI's 1984 10% capture rate against the total number of customers who now have equal access and adding it to the 200,000 customers MCI signed in 1984.
- GTE Sprint reports that it has 160,000 new equal-access customers, which is about 2% of the equal-access user base.

The remaining 20%, roughly 1½ million equal-access customers, have presumably signed with other long-distance carriers.

While these figures would indicate that MCI, going head-to-head with AT&T in competition for those seven million customers, captured 20% as many users as AT&T, they do not tell the whole story.

What will become of the other eight million customers that have not chosen a carrier? Under the system predominantly used today, if these customers do not pick a carrier they will, by default, become AT&T customers.

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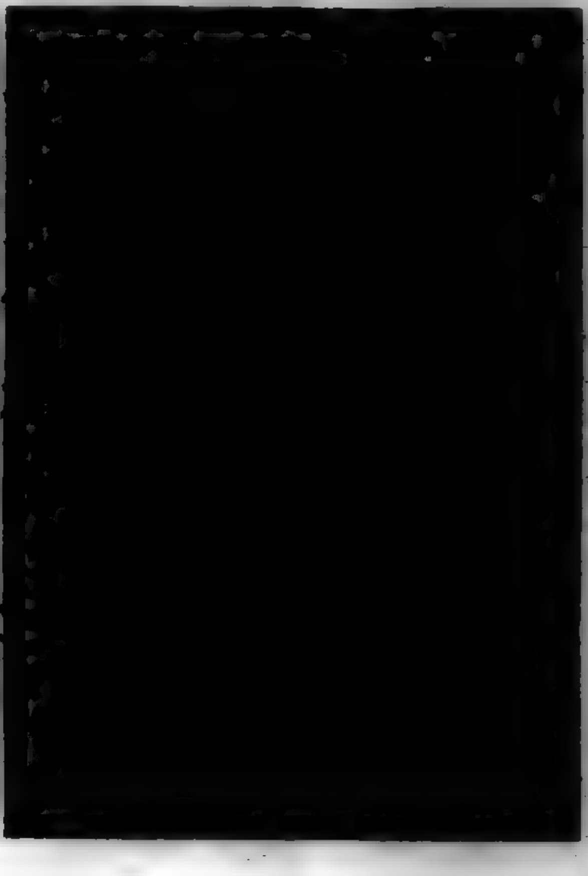

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BYPASS

from page 1

By establishing a private link to MCI's access point in Boston, Prime completely bypassed New England Telephone Co., which would normally provide the connecting circuits to the long-haul carrier. Hawkins estimated that the MCI link will pay for itself in 3½ years.

This direct-connect option was a key consideration that led Prime, in its search for a more cost-effective long-distance solution, to cut its use of AT&T's Wats service in favor of MCI, he said. At the time, AT&T did not offer the direct-connect option. Today, MCI carries 70% of Prime's long-distance traffic; the balance of Prime's needs are met by Wats.

> *The MCI microwave link will pay for itself in three and a half years, Prime estimated.*

Prime uses a 2-GHz digital microwave radio system, made by Avantek Corp., to connect its headquarters here to MCI's access point on top of Boston's Prudential Center, 16 miles away. Through a package lease, Prime has a cubicle-size, environmentally controlled room in the Prudential building, two floors above MCI's facilities, and rights to roof space for microwave antennae.

The Avantek radio can support 16 1.544M bit/sec. T1 links, but currently Prime uses only three T1s. Each of these are multiplexed down into 24 voice channels, using Northern Telecom, Inc. SL-1 remote peripheral equipment. This fulfills Prime's present need for 58 voice channels to MCI and provides the capacity to expand the system to 384 64K bit/sec. voice channels.

Hawkins said the remote peripheral equipment was used because Prime already owned it and because it "gives us some maintenance diagnostics that some of the other multiplexing techniques do not." He admitted, however, that the remote peripheral equipment, which he described as similar to a private branch exchange, is not as bandwidth efficient as some other T1 multiplexers.

Hawkins

Approximately 60% of the traffic multiplexed over the link to MCI runs to and from a Northern Telecom SL-1 PBX in Prime's headquarters. The rest of the traffic is routed to other facilities over Prime's local 12-GHz microwave bypass system.

Although the remote peripheral equipment system breaks the T1 capacity down to the single-circuit level, Hawkins said Prime is studying the possibility of using a Northern Telecom Digital Trunk Interface that would enable T1 links to be interfaced directly with the SL-1.

Asked if there was an appreciable difference between the sound quality of MCI's services and AT&T's, Hawkins said Prime has noticed minor differences in the quality but they are "not sufficient enough for us to bear the burden of the higher charges."

C-85 conference slated for May

SAN FRANCISCO — The first international conference devoted to the C programming language, C-85, is scheduled for May 13-15 at the Ramada Renaissance Hotel here.

The conference is intended to be a noncommercial forum for software developers, programmers and others concerned with the future of the C language. The conference will include a day-long session on the Ansi X3J11 standard and workshops on writing graphics, business and database applications in C.

The conference sponsors are Lifeboat Associates, PC World Communications, Inc., Microsoft Corp. and the *C Journal*. The registration fee for the conference is $190.

More information is available from Lifeboat Associates, 1651 Third Ave., New York, N.Y. 10028.

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ICMS adds little to existing abilities, Cullinet users say

By [illegible]
CW Staff

Cullinet Software, Inc.'s recent introduction of software for the corporate information center appears to be little more than window dressing for existing products, users of other Cullinet products told *Computerworld*.

Announced last month, the Information Center Management System (ICMS) is based on Cullinet's Information Data Base (IDB) [CW, April 1]. ICMS is sold as a stand-alone product and incorporates Cullinet's query and reporting tools, links to minicomputer environments and microcomputer software packages.

At the time of the product announcement, Cullinet executives said ICMS provides mainframe access to all levels of computer users. The strength of ICMS, according to ICMS product manager Jack Armstrong, is that for the first time "it characterizes software as a management solution." The product repackaging is aimed at "the rest of the IBM community to whom the concept of providing an information center management system is different," Armstrong said.

But Cullinet users interviewed by *Computerworld* are not jumping to buy ICMS because they believe many of its tools are available in the products they are already using.

"ICMS is an overall name for the package of the Cullinet products without the Cullinet data base," said Rudy Lobou, assistant director of MIS at the City University of New York (Cuny). "ICMS is for people who don't have IDMS, [Cullinet's Integrated Data Base Management System]."

Cuny uses an array of Cullinet's software products, including the latest release of IDMS/R, ADS/Online and Online/English. The school purchased IDB, but has not installed it yet, Lobou said.

According to Lobou, the most interesting portion of the Cullinet announcement is the introduction of software links that will tie ICMS with Cullinet's Goldengate and Lotus Development Corp.'s 1-2-3 and Symphony microcomputer software, giving users mainframe data access within the IDB environment. Universal Link and Symphony Link will be available in the fourth quarter.

The university is not yet downloading mainframe data to personal computers. However, Lobou said he expects end users to start calling for mainframe access once applications now being developed are put onto the school's computer system.

Mike Intille, vice-president for information services at Central & South West Services Corp., a utility holding company in Dallas, said ICMS "sounds redundant. . . . It does the same thing I can do with IDB and Goldengate now."

Like Cuny, Central & South West Services uses a full array of Cullinet tools, including IDMS, IDB Goldengate and ADS/Online. Current 1-2-3 users are using products other than Cullinet's to get access to mainframe data, Intille said.

At Comerica, Inc., a bank holding company, Cullinet's announcement was met with some skepticism stemming from past problems with Goldengate micro software. According to John Hundiak, Comerica's manager of systems technology, Goldengate has poor response time, and users have to go through several screens when trying to perform relatively simple functions.

Comerica planned to use Goldengate for the creation of departmental budgets, but problems with the product forced the company to revert to using 1-2-3, isolating departmental budgets on individual disks. Thus, it was the software links to 1-2-3 that piqued Hundiak's interest. "When it comes down to budget time, there's a lot of disk trading that goes on."

Although not interested in the entire ICMS system, Hundiak said, "We're trying to pick the pieces [of software] that apply to us."

Business user expo slated

ANAHEIM, Calif. — The first 1985 Information Management Exposition & Conference for business system end users of Fortune 1,000 corporations will be held June 12-14 at the Anaheim Convention Center.

Info conferences have also been scheduled in New York at the New York Coliseum Oct. 14-17 and in Dallas at Infomart Jan. 7-9, 1986.

The conference reportedly focuses on the latest management and technology issues of concern to business end users. Topics to be covered include communications management, information management, personal computers, office automation, hardware and software technology.

The keynote speaker at the Anaheim conference will be Stephen T. McClellan, author of *The Coming Computer Industry Shakeout*.

The cost of each of the three conferences is $10 for preregistrants or $20 for on-site registrants.

More information is available from Cahners Exposition Group, P.O. Box 3833, 999 Summer St., Stamford, Conn. 06905.

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Why key DP/MIS managers are keeping RCA Cylix a secret.

Early users give thumbs-up to TI's expert systems tool

By Eric Bender
CW Staff

Texas Instruments, Inc.'s Personal Consultant is a good software kit for creating small knowledge-based systems on microcomputers and educating developers about expert systems, beta site users reported.

At a Westinghouse Electric Corp. research and development facility in Pittsburgh, advisory scientist Neil Pessall and senior engineer Jan Schreurs have employed Personal Consultant to develop prototype systems for material sciences investigations.

Although unfamiliar with the software and the TI Professional Computer at the start, Pessall said he and Schreurs in one week "developed three small demonstration programs to show to management." One of these, designed to select materials for nuclear steam generators and including more than 100 production rules, will be expanded, he said.

Another small, knowledge-based system developed with Personal Consultant assists first-time computer purchasers at Infomart, a Dallas market center for computer and information systems. Customers go through a 15-minute session and receive a three- to five-page report suggesting how they should proceed, said Tom Jones, Infomart's marketing vice-president.

The Infomart system, a turnkey job from Boeing Computer Services Co.'s Education and Training Division in Seattle, currently works with 147 production rules, according to Boeing computer instructor Chet Rindfuss. He described Personal Consultant as an excellent tool "that saved us a lot of time."

At Boeing Commercial Airplane Co., a weights risk-assessment system first developed with a version of Teknowledge, Inc.'s S.1 software on a Xerox Corp. Dolphin system is being fine-tuned with Personal Consultant on a TI Professional Computer, according to Boeing software engineer Sheldon Whitman.

The greatest problem during the migration "was not with the software but with the documentation," he said. He anticipates that the software, with 268 rules, will evolve into a production system.

All the users gave the $3,000 Personal Consultant package a thumbs-up for overall design and ease of use. "The system itself, from the standpoint of a developer, is fairly straightforward and clean," Rindfuss said. "There were a few areas where we had to get our fingers dirty doing Lisp code."

End-user interface

Aiming at potential Infomart clients who are unfamiliar with computers, Rindfuss found the program's end-user interface "not as clean as we would want it to be." However, he added, "If you used it on a regular basis or took a day to learn the program, you'd have no problem."

Schreurs described both developer and end-user interfaces as "marvelous" and stressed the ease of developing graphics that help users understand what the expert system is examining.

Personal Consultant is also appropriate for developers who are unfamiliar with expert systems, Whitman said. "You can start building knowledge bases, since you already have an inference engine," Schreurs said.

The software handles systems with up to 400 production rules, according to TI.

However, Pessall noted that his own work in evaluating materials covers "a very large field, and there's no way you can put a significant program on [Professional Computers]." Here, instead, the micro's value "is in letting the customer understand what it is when you talk about expert systems," he said. "It's important to have something you can see."

Based on Integral Quality, Inc.'s interpretive IQ Lisp language, Personal Consultant sometimes runs slowly, Rindfuss said. "When IQ Lisp goes into garbage collection, the program can go into sudden and unpredictable delays" that alarm unsophisticated users, he pointed out.

Terry McMullen, TI artificial intelligence applications marketing manager, said compiled versions and an upgraded text editor will be available this year. The vendor is also moving toward a Common Lisp standard on Personal Consultant, and users eventually will be able to move programs from the Professional Computer to the Explorer, or vice versa, without recoding, he said.

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'This is only a test: Your local data center is on fire'

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — For Fred Wahlstrom, the trouble began with a telephone call that rousted him out of bed at 2:30 in the morning.

At the other end of the line was Wahlstrom's coworker, Emilio Estany, disaster recovery administrator for ARA Services, Inc.'s magazine and book publishing division.

Estany's call brought ill tidings: A few hours earlier, a fire had broken out in the air-conditioning unit of ARA's local data center and had reduced most of the company's hardware to cinders. Estany directed Wahlstrom, an ARA telecommunications programmer, to stand by and await further instructions.

Sometime after 4 a.m., a second phone call from Estany again forced Wahlstrom out of bed. This time, however, the telecommunications programmer was ordered to go to the conference room of a local hotel, where ARA's suddenly homeless MIS department was establishing a temporary command center.

Thus began a frantic effort to replicate ARA's data center at an alternate site and to resume the firm's processing operations as quickly as possible. As the day progressed, nearly every facet of the company's disaster recovery plan was tested under fire. By 7 p.m., 13½ hours after the temporary command center officially went into operation, ARA's systems department had activated a backup data center and was back in business.

Leslie Feasey, the firm's vice-president of management services, voiced satisfaction with ARA's speedy return to MIS production. Feasey said he felt gratified for a second reason: The day-long exercise had been nothing more than a drill, and the destruction of his company's data center was wholly make-believe.

Many corporations have drafted detailed plans for restoring their processing resources in the event of an emergency. On a modest scale, many firms have also taken steps to test their plans' effectiveness, Estany said. But only a handful of user organizations have rigorously tested their recovery procedures under conditions that reasonably approximate a genuine emergency, according to Jack Chapman, a manager with Comdisco Disaster Recovery Services, Inc.

Of Comdisco's roughly 2,000 clients, only five have simulated a data center shutdown and then conducted an impromptu drill to test their ability to activate a backup processing site, Chapman said.

Included among those five atypical customers, he added, is ARA's Southern California office, whose dual IBM 4341 Group I machines supply computing services for the company's 18 operating units throughout the U.S.

ARA's intent in staging a mock disaster and conducting a full-scale drill was to find out whether its recovery procedures work as well in practice as they do in theory.

To satisfy themselves that their plan could withstand even the most dire of emergencies, ARA officials deliberately made the circumstances of their drill as challenging as possible. "We chose to conduct our test on a Thursday night because that's when we have our heaviest production and when we're most likely to lose our data," Estany said.

"We wanted to test the ability of our people to determine what data had been lost, and we wanted an idea of how long it would take us to catch up before we could resume production," he said.

No contact with data center

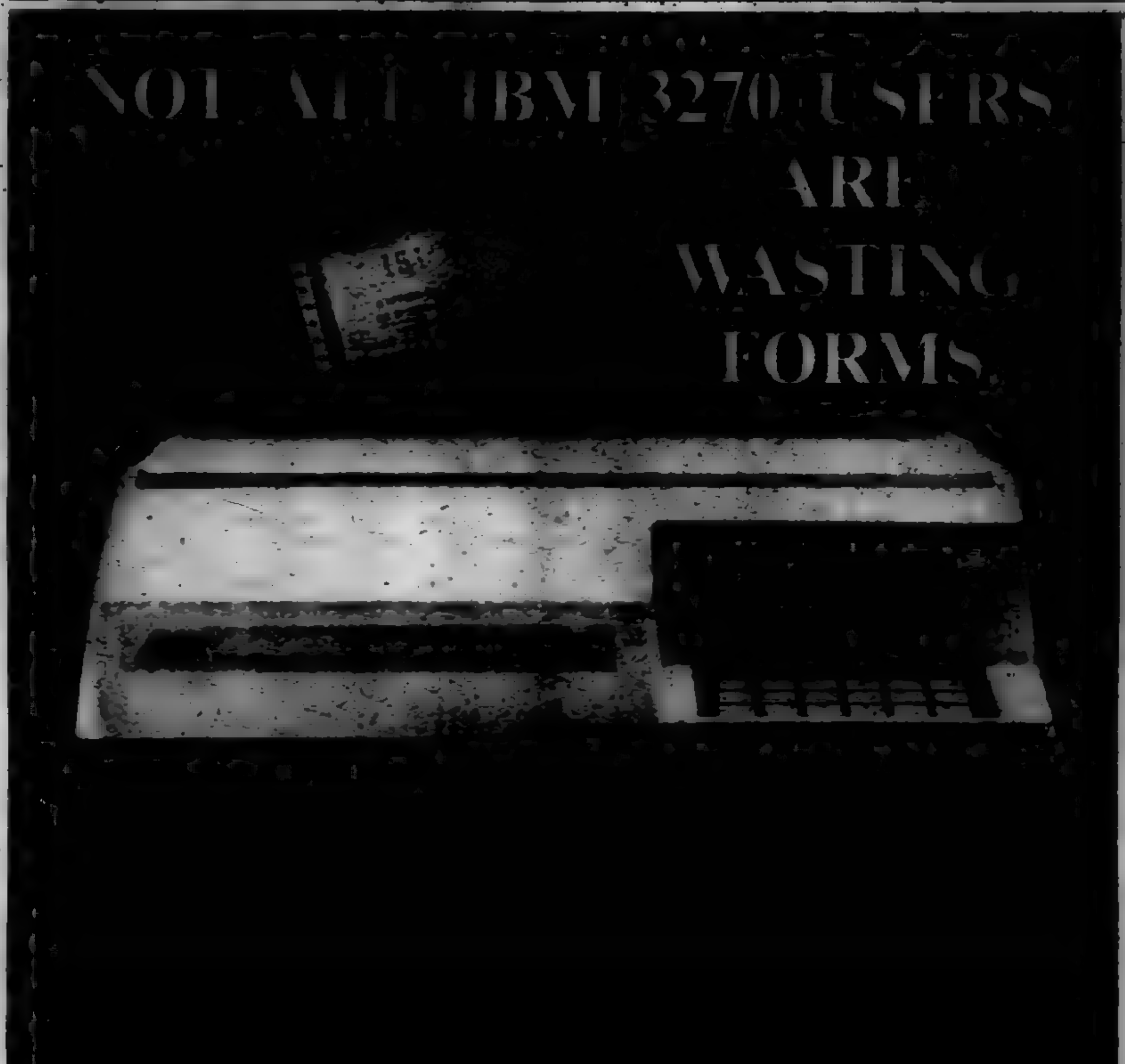
To add a further touch of realism to its exercise, ARA strictly forbade any of the drill participants from making contact with the company's data center, which all the while continued to operate as usual. "We had to make do with what we had at the time because that's exactly what would happen if we had a real disaster," Estany said.

Except for a few minor hitches, ARA's test of its disaster recovery procedures went just about according to plans, Feasey said. After the company secured its temporary command center at approximately 5:30 a.m., Feasey dispatched a group of employees to ARA's backup processing center, which is maintained by Comdisco in Lodi, Calif.

Traveling by commercial airliner, the employees were assigned the task of preparing Comdisco's IBM 3033 Model U to assume the duties of ARA's "destroyed" 4341s. Included in the group was Wahlstrom, whose assignment was to establish the necessary communications links between ARA's 18 operating units and the 3033 Model U's front-end processor, an IBM Series/1.

At the same time, Feasey also dispatched a second group of MIS specialists to ARA's off-site data storage facility in nearby Burbank, Calif. At Arcus Off-Site Storage Corp., the team members retrieved a set of magnetic tapes containing a duplicate copy of their company's key business data, which ARA routinely backs up and stores remotely every day.

By early afternoon, the employees had begun transporting the tapes from Arcus to Comdisco, where they were loaded into the 3033 Model U.



Arizona city takes top-down approach to OA installation

By Edward Warner
CW Staff

SCOTTSDALE, Ariz. — It should only be expected that an original implementation of office automation should come from this Phoenix suburb's municipal government. After all, Scottsdale pioneered the use of garbage trucks operated by one person and a fire department that is privately owned.

Today, Scottsdale city government is using its penchant for innovation to lend a twist to the ongoing implementation of its new OA system.

Although in most OA implementations, computer terminals are given first to secretaries and clerks and only later put on the desks of the bosses, the city of Scottsdale gave the terminals first to managers. The implementation has worked so well that others have taken notice; early this year the city's OA system received a gold medal award from an industry publication for supporting the best OA implementation.

Scottsdale's OA system, dubbed Comstar, got under way in August with the installation of 150 Sperry Corp. terminals, half of them on the desks of managers. The second phase of the implementation took place in February when the city council and the mayor installed terminals in their homes.

The top-down implementation was spawned, according to Management Systems Director Terry Peterson, by the city government's organizational culture, which he said values sensitivity to employee needs and emphasizes originality.

Understanding the technology

Such a strategy was critical to Comstar's acceptance, elaborated Deputy City Manager Dick Bowers, because administrators have a better understanding of computer technology, and "when we see a problem we don't tend to blame the system."

Had Comstar terminals first been given to secretaries and clerks, Bowers continued, those workers could have been infuriated by the fits and starts that marked Comstar's birth and might have avoided using it.

Comstar, based on a Sperry Corp. 1172 dual-processor mainframe with three Sperry 8480 disk storage systems, is the city's first OA system. Nearly all of the 150 terminals have twin diskette drives and 256K bytes of random-access memory. Implementation is still in progress, Peterson said, and by year's end, as many as 400 terminals could be in use.

At that point, he added, nearly all of the city's 300 administrators will have terminals in their offices.

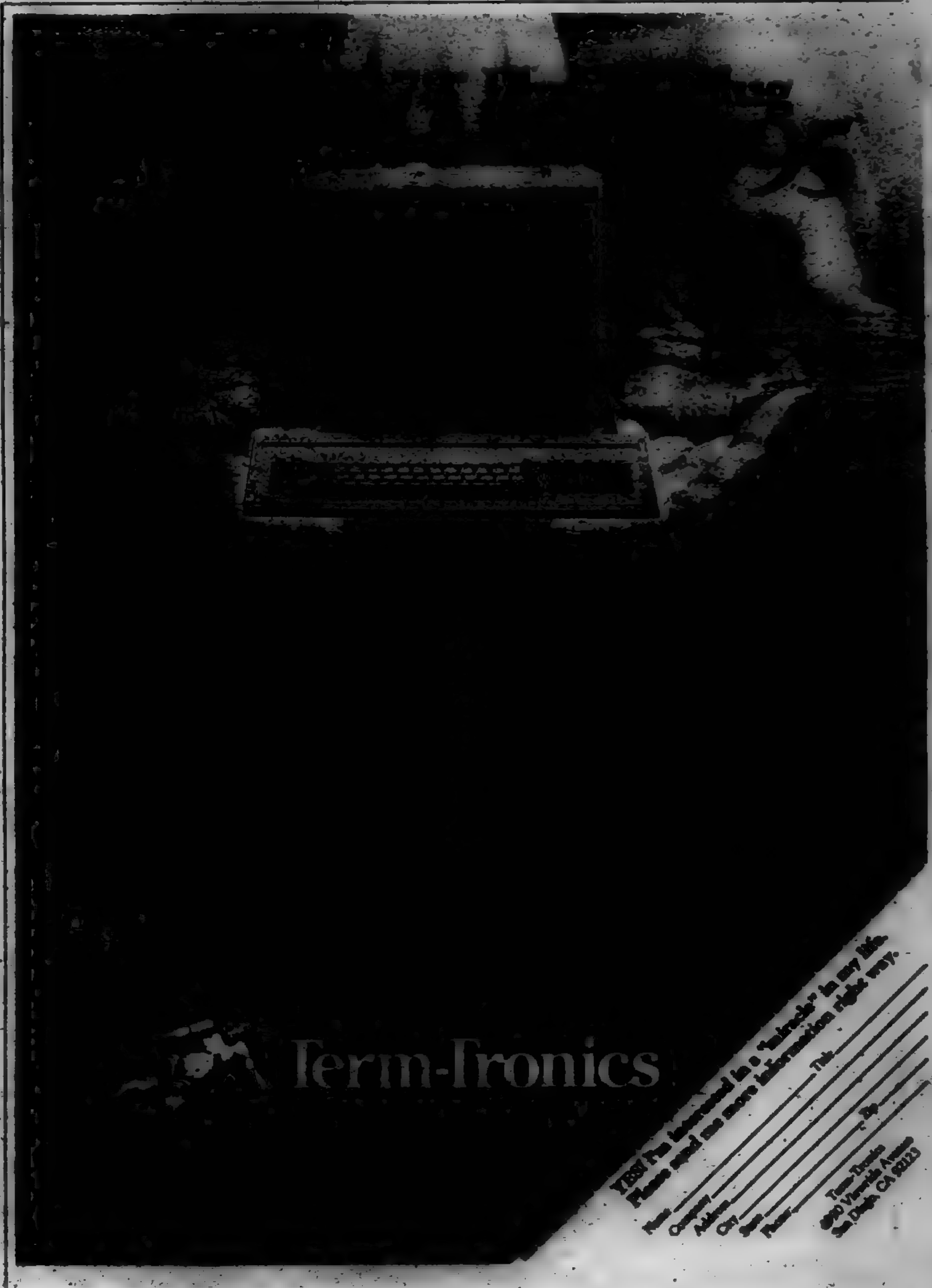
Peterson said users can switch to Sperry's Mapper data base management system, which the city will use for its records management. One of Mapper's uses will be to track false alarms phoned into the police and fire departments.

An additional benefit of the city's top-down implementation, Peterson added, is that it put computing power in the hands of those who could initially best use it. Although OA may be "a good tool for clericals, it's a super management tool," Peterson said. Comstar's calendaring and E-mail features were the most useful ones for administrators, he said.

"The biggest single thing it does is improve communication, giving managers access to timely information," Peterson added.

No assessment of Comstar's impact on the city has yet been made, but Peterson claimed that a $2 million annual reduction in paper use will accrue by the end of 1986.

Bowers, meanwhile, said Comstar was likely to join the ranks of what he called the city's other trend-setting innovations: one-person garbage trucks and privately run fire departments. The city, he said, takes risks on new ways of doing things "because we choose to think that way. It's fairly entrepreneurial here."



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Custom system takes marathon timing task in stride

By [illegible]
CW Staff

BOSTON — Tom Casson will be in his 11th straight Boston Marathon today, but you won't find his name on the sports page.

Casson is the designer and supervisor of the Honeywell, Inc. computer system that logs and prints out the finishing times of the 5,540 official entrants who will make the 26-mile, 385-yard trek from Hopkinton, Mass., to downtown Boston starting at noon today. Casson will be monitoring Honeywell's marathon computer center in a 40-ft van at the finish line, and he could not imagine being anywhere else.

"It's a paid holiday [Patriots' Day in Massachusetts], but I don't think I'd know what to do with myself otherwise," said Casson, manager of technical support for Honeywell's small computer and office systems division. "It was more of a challenge in the beginning than it is now, but that's because we've conquered it."

With a few upgrades over the years, Casson's system essentially works the same way it did when Honeywell first offered its computer technology to the Boston Athletic Association (BAA), the sponsor of the marathon, in 1975.

Casson wrote the Cobol and Assembly language "marathon software" to run on an on-site Honeywell DPS/6 minicomputer, supported by four Honeywell 4300 terminals, 768K bytes of main memory and two 67M-byte hard disks, one of which is used solely for backup. Completing the configuration are three bar-code readers that read codes off the runners' number bibs and a 90 line/min printer for the final results.

The computer's central task is to merge three data bases: the list of runners' names in finishing order from the bar-code readers; the list of finishing times, entered on a push-button cyclic timer device plugged into a terminal keyboard port; and a data base containing select times.

The select times data base comes into play when a crowded pack of marathoners approaches the finish, which means 10 or more runners per second crossing the line. Since it is physically impossible for the timer operator to push the entry button 10 times per second, this is where the computer takes over.

Instead of vainly trying to click the timer every time a runner finishes, the timer operator selects specific runners crossing the line alone, at 10- or 15-sec. intervals, and records their times. An algorithm developed by Casson then processes the runners who finished in a pack and assigns them finishing times between those of the timer's select runners, who finished just before and just after the pack. It may not be accurate down to the millisecond, but it is much more accurate than any manual system could be, Casson said.

'Fudging a bit'

"We call that algorithm the fudge, because when it synchronizes 40 runners with, say, 37 finishing times, it's fudging it a bit," Casson said. "But I would say we're never more than a second off."

The computer's final job is to coordinate the entrant's number and finishing time with information in the data base, entered about a month before the race, listing each entrants' name, address, age, sex, running club affiliation and qualifying time. When that is completed, the official results are printed and delivered to the marathon press room — in 20 minutes for the top finishers, and usually within one hour for the "pack."

The most intricate part of the programming, Casson said, is the backup system. So far, it has never been used.

"We only have three or four programs running the day of the race, but we have five times that many in case anything goes wrong," Casson said. "Our error recovery software is far more expensive than what we run."

Expo theme: micro-mainframe links

WASHINGTON, D.C. — "Integrating Micro/Mainframe Technologies" is the theme at the Government Computer Expo scheduled for June 10-13 at the Sheraton Washington Hotel here.

The conference is designed to furnish government managers, DP professionals and end users with information concerning microcomputer-to-mainframe connections.

A number of seminars on topics such as communications concerns, software products and integrating data are scheduled.

The conference is sponsored by the Federation of Government Information Processing Councils and the Information Resources Administration Councils.

There is no charge for attending the expo.

Conference information is available from Government Computer Expo, 1630 Elton Road, Silver Springs, Md. 20903.

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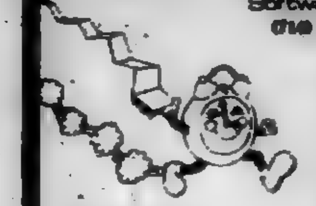

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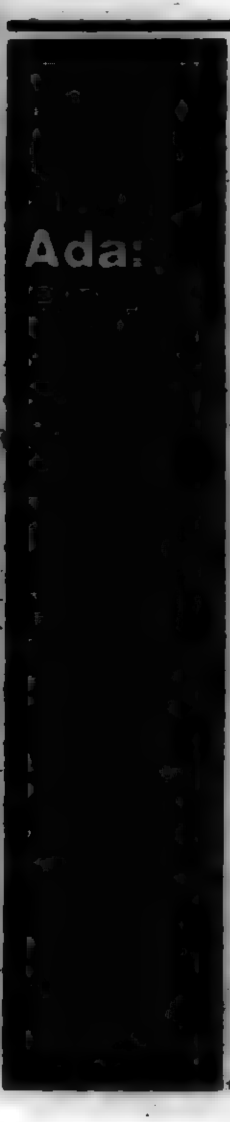

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DMV computer error puts innocent motorist in jail

By [illegible]
CW West Coast Bureau

ANCHORAGE, Alaska — A motorist here was mistakenly ordered to spend a night in jail last month because of an improperly programmed computer system that was supposed to reward safe drivers for violation-free driving.

An IBM 3081 computer located at the state government's computer data center here narrowly missed suspending 400 driver's licenses after it began tallying noncurrent traffic violations and demerits and adding them to current data, said Jay Delany, chief of driver improvement at Alaska's Department of Motor Vehicles (DMV). Agency staff intercepted the notices before they could be mailed out, he added.

Due to a miscommunication . . . the system looked back too far, recording violations that should have been erased years ago.

As a result of the error, an Anchorage resident, C. R. Griffin, spent one night in a Fairbanks, Alaska, jail last March. Griffin was arrested by Fairbanks police following a minor traffic violation after a computer search of the newly programmed Alaska Public Safety Information Network (Aspin) system indicated he was driving with a suspended license. Following his night in jail, Griffin was released and the charges against him were dropped, Delany said.

The Aspin data base stores statewide records, including current criminal and driving records, on all Alaskans over a five-year period, he explained. Aspin is used by Alaska's police departments, court agencies and state trooper offices. It is accessed via IBM 3270 terminals connected to an IBM 3081 mainframe located in the state's data center. The 3081 operates within IBM's Systems Network Architecture and uses the Adabas/Natural fourth-generation language from Software AG of North America, Inc.

The mishap occurred when the state began transferring driver information into the Aspin system last year.

According to Delany, the computer was reprogrammed in December to look at past records and ensure that drivers were not escaping penalties and to record credit points for violation-free drivers within the last five years. Both functions were previously handled by several computers, he noted.

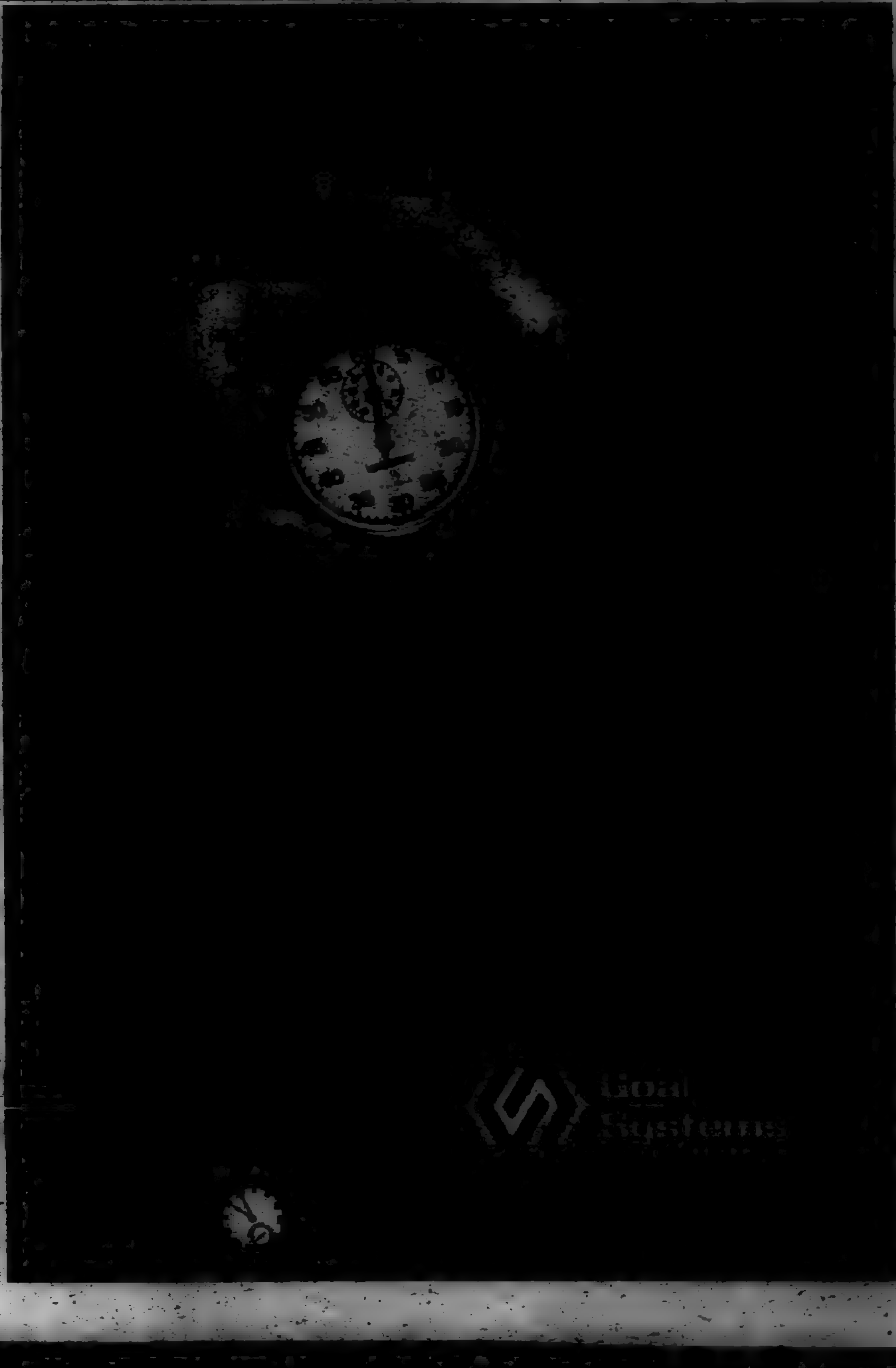
System looked too far

Due to a miscommunication between the DMV and the state's data center, however, the system looked back too far, recording violations that should have been erased from the system years ago, Delany said.

Alaska's demerit point system calls for a 30-day license suspension for drivers convicted of traffic violations with a specified number of penalty points over a two-year period, he explained. The drivers targeted by the computer should have had their licenses suspended several years ago, but the suspensions were no longer current, he observed.

Delany said DMV officials became aware of the problem in February, six weeks after the program had begun operating, but no action was taken then because the DMV's administrative committee did not consider it a priority.

Since Griffin's arrest, however, the computer has been reprogrammed by adding a special edit to the display program to suppress drivers' noncurrent records, noted Richard Judd, a programmer in the technical services group at the state of Alaska data center here. He said the cost of correcting the mistake was insignificant.



Planning methodology helps Atlanta set DP priorities

By Paul [illegible]
CW Staff

ATLANTA — In 1984, the city of Atlanta's data processing department found itself in an all-too-common position: plenty of user projects but few resources.

"There was absolutely no way we could have completed all the projects that our users requested," noted Isaac T. Simmons Jr., manager of systems and programming at Atlanta's Office of Management Systems (OMS).

A principal reason for the problem was that each city department assessed its DP needs and submitted them to the Computer Applications Priority Board (CAPB), which selected the applications to be completed. The board consisted of the city's chief executive officer, commissioner of finance, commissioner of public safety, clerk of council, director of management systems and a city council representative.

"There were so many different priorities — such as the use of personal computers and a new payroll system — that the board had no method to determine which projects were most important to the city," Simmons said.

Rather than allowing city politics to determine which projects were undertaken, Simmons said, the board decided to implement the Business Planning System (BSP), a corporate information planning methodology devised by IBM in 1966. The methodology lists the steps a corporation should take to determine its most important DP needs. BSP attempts to transform the responsibility of setting DP priorities from the MIS manager to the executive task force.

The keys to BSP implementation are top-level management commitment and participation. "BSP would fail without top-level commitment," noted Keith Collier, an independent consultant who worked with the municipal government.

'Great vision or severe problems'

"Top-level managers have to delegate their responsibilities and work strictly on BSP for long periods of time. Because this sacrifice is needed, a company must have great vision or severe problems to implement this system," Collier said.

Forming a task force of top-level managers is the first step in the BSP process. "The use of a committee allows a business to look at itself rather than have an outsider try to determine how it functions," Simmons said.

The Atlanta task force consisted of the director of the Bureau of Motor Transport Services; the director of the Bureau of Budget and Management Analysis; the assistant chief at the Bureau of Fire Services; the deputy director at the Bureau of Police Services; the deputy director at the Bureau of Sanitary Services; the director of the Office of Engineering; the management services officer at the Department of Parks, Recreation and Cultural Affairs; and the acting director at OMS.

The committee's first meeting was held last June. For 10 weeks, task force members interviewed 45 top city officials and asked them to explain how they worked and to identify data vital to their jobs. "We talked to the head of each department including Mayor [Andrew] Young," Simmons said.

With this information, the task force attempted to determine the DP needs of the city rather than those of one department. A number of meetings were held and committee members discussed the city's most important information needs. "BSP helps a company break out of its file-based system mentality and think in terms of integration and a data base," Collier noted. When priorities were established, each committee member wrote one section of a BSP report.

List of corporate goals

The report listed corporate goals that included adding two members to the CAPB, scheduling CAPB meetings in the summer and the fall, defining the relationship between the DP department and its user departments and increasing end-user computing among employees.

The next phase of BSP, which will be completed this month, establishes man-power and work requirements needed to implement BSP recommendations.

Simmons said the MIS department's next two projects are creating a personal computer support center and writing a new system for the city's fire department.

Although the study established these priorities, it did not hamper existing high-priority projects. The city planned to migrate from IBM's DOS/VSE to its MVS/XA operating system. "We know that the migration has to be completed, so as we finish it, we will begin to implement BSP recommendations," Simmons noted.

A BSP drawback is that it does not bring immediate results. "Atlanta won't even begin to realize BSP benefits for at least one and probably two years," Collier noted. "Before beginning BSP, a company should realize that it takes a great deal of effort to break out of 20-year-old thinking and technology. But BSP has supplied Atlanta with a framework for system development that will last for the next five to 10 years."

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E. F. Hutton underscores practicality in backup plan

By [illegible]
CW Staff

Experience was the lead architect when E. F. Hutton & Co. built a new computer room as part of its disaster recovery plan.

The New York-based brokerage added a new computer facility that houses a backup IBM 3081 a few blocks away from its main computer room, according to John Newe, vice-president of data processing at E. F. Hutton.

The alternate site contains an IBM 3081, several printers and a microfilm center. It provides backup protection in case of fire, flood or other disasters, Newe said. The system is also on-line every day and is used in E. F. Hutton's worldwide operations, he said.

Newe's prime concern in building the new facility was putting in adequate floors, he said. The company's main computer space in Battery Park Plaza has a 6-in. raised floor, which has become inadequate for the increasing number of cables in the growing operation, he said. The new facility has a 12-in. floor, which will be able to handle the number of bus and tag cables needed for the 96-channel IBM 3090 machines that the company will eventually have, he said.

Three factors that contribute heavily to a successful computer room are space, power and air-conditioning, according to John Breyer, environmental field support manager at Digital Equipment Corp. "And the concept of margin is very important.

The major problem in the computer environment is that the computer site outgrows the air-conditioning or power," he added.

Air-conditioning control

When a site outgrows its air-conditioning capacity, the room becomes overheated, said Leroy Anderson, manager of air-conditioning at General Air-Conditioning and Heating Inc. in Boston. Heat is the No. 1 enemy of computers, Anderson said.

In the summer when outside temperatures exceed the range in which computers can function, inadequately air-conditioned computer rooms start having overheating problems, he said.

E. F. Hutton solved its air-conditioning concerns by buying the most modern system it could find and by adding cooling towers on the roof of the new room's building, Newe said. Humidity for the room is controlled through the air-conditioning system, he said, so he did not have to add equipment for that.

Physical security for the system is important too, Digital's Breyer added, but that should be driven by the user's needs. Some companies expose their systems through glass walls so that the company's clients can see how high tech they are, he said. The fishbowl spaces are much harder to protect than strictly functional rooms, and the costs can get very high, he said.

E. F. Hutton's backup site is functional, not beautiful, Newe said. "Our security people have done away with the glass-walled computer room," he said. "We even took the name 'computer room' off the elevator wall" because of the bombings of computer rooms in New York a few years ago.

Newe's system is physically protected by a card key system that cost less than $35,000 to install. It is also protected by a guard system that costs approximately $15,000 per month, he said.

Fire plan — gas vs. water

As fire protection, Breyer recommended a well-documented fire emergency plan that everyone in the area knows, he said. "In my experience, most fires I've seen have not been in the computer — they've been in the trash," he said. Some larger sites even separate the printers from the main system to decrease the chance of serious damage from a paper fire, he said.

The decision to use either gases, like Du Pont Co.'s Halon, or water sprinkler systems rests with the user, Breyer said. Water dumped in the computer room makes a terrible mess to clean up, he said, but he still recommended a Halon-type system backed up with a water sprinkler system for large installations.

"I wouldn't agree with him," Newe said. "That has got to be a very expensive way to do it," he added. The Halon system in Newe's main computer location cost more than $1 million and took two years to install, he said. In his new room, he followed IBM's specifications and installed a dry sprinkler system that took two to three months to install and cost less than $100,000.

Another source of problems can be the power distribution, Breyer said. Surges of current can disrupt the flow of electricity. "Do not bother with an uninterruptible power source unless your business would be critically affected by a few minutes shutdown," he added.

Uninterruptible power sources are expensive and space consuming, although they are necessary for critical-function machines, he said. Running one feeder wire from where the power comes into the building to the computer room is optimal. If that cannot be done, power should be connected to the nearest main power point to the computer room, he said.

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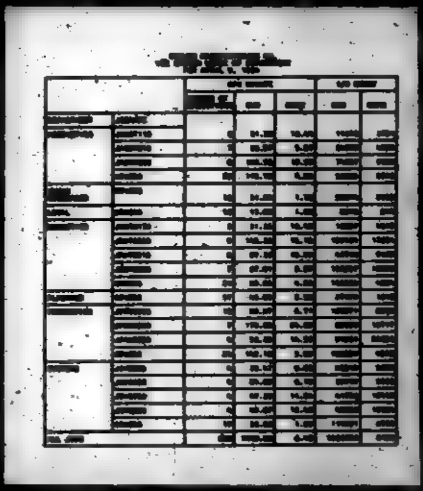

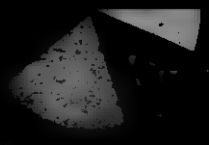

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Insurance firm sells its agents on buying their own micros

By Charles Babcock
CW New York Bureau

NEW YORK — New York Life Insurance Co. agent Leon Slotin remembers when he had to maintain a file of client names manually and write a letter to the home office when he needed a sales illustration.

That's not the case anymore. Slotin is one of 3,000 agents affected by New York Life's drive to place an IBM Personal Computer or Personal Computer XT on each of its agents' desks. With it Slotin does his own sales illustrations, maintains an electronic client file and taps New York Life's mainframes for information.

"If you told me I would be doing this three years ago, I would have laughed at you," he said recently from his office in Savannah, Ga.

Slotin was one of the first at the company to buy a Personal Computer. Getting 3,000 of the 10,000 New York Life agents to take the step has been no pushover, company officials said. Although closely tied to the home office, the agents are still self-employed and must buy their own desktop systems. A year ago, a Personal Computer XT, software, printer and modem purchased through the company cost $6,500, according to New York Life.

Driscoll

New York Life encourages the agents to make the purchase by buying Personal Computers in volume and passing on an IBM discount. The company is also willing to finance the purchase over three years at 6% interest, said James P. Driscoll, the New York Life vice-president in charge of the personal computer drive. Two price cuts of from $600 to $1,900 on the Personal Computer and Personal Computer XT since last April have been passed on to the agents, Driscoll added.

According to Driscoll, the agents receive three software packages that enable them to put their Personal Computers to work with minimum training. They use programs tailored by independent software houses for sales illustrations and client and prospect files, Multimate International Corp.'s word processing software and a communications program.

The nature of life insurance has changed drastically in recent years, with such financial packages as the industrywide universal life or New York Life's version of that package, Target Life, introducing annual variables into a policy, Driscoll said. "My feeling is you can't sell that product without an automated illustration package," Driscoll said.

Having placed some of the tools an agent needs on his desktop, New York Life is trying to enhance these tools by tying them more closely to the home office's mainframes.

As the Personal Computer drive got under way, New York Life had in place its Facts network, which linked its Clinton, N.J., data processing center to 220 New York Life general offices around the country. IBM 3270 terminals in the general offices could exchange data with the center's mainframes.

Network upgraded

New York Life is now upgrading the network by putting an IBM Series/1 minicomputer in the general offices — 70 have been installed so far — and linking the agents' Personal Computers to it through a terminal-emulation package.

"Now an agent can dial into the Series/1 at the cost of a local telephone call and talk to a host computer," Driscoll said.

New York Life has five IBM 3080 series mainframes in its data center: two 3084s, two 3081s and a 3083. It built its network around the Series/1s and Personal Computers to ensure that they can communicate with the mainframes, Driscoll said.

New York Life may upgrade the agents' options by offering them the Personal Computer AT with multiuser capability. But the company is not certain the AT will run all elements of its software package, and it could not obtain as many ATs as it needed at this stage, Driscoll said.

Of its 10,000 agents, only 3,500 have the four years experience recommended before buying the Personal Computer system. Most of the 500 or so agents who do not yet have a Personal Computer will get one by the end of the year, Driscoll predicted.

The company has mimicked the tactics of independent micro owners by forming user groups within the company, putting out a newsletter that troubleshoots problems and even establishing a home office hot line.

Slotin said he encountered a few glitches in the early days of using the software but that now there is no turning back from the Personal Computer path:

"I couldn't exist without one," he said.

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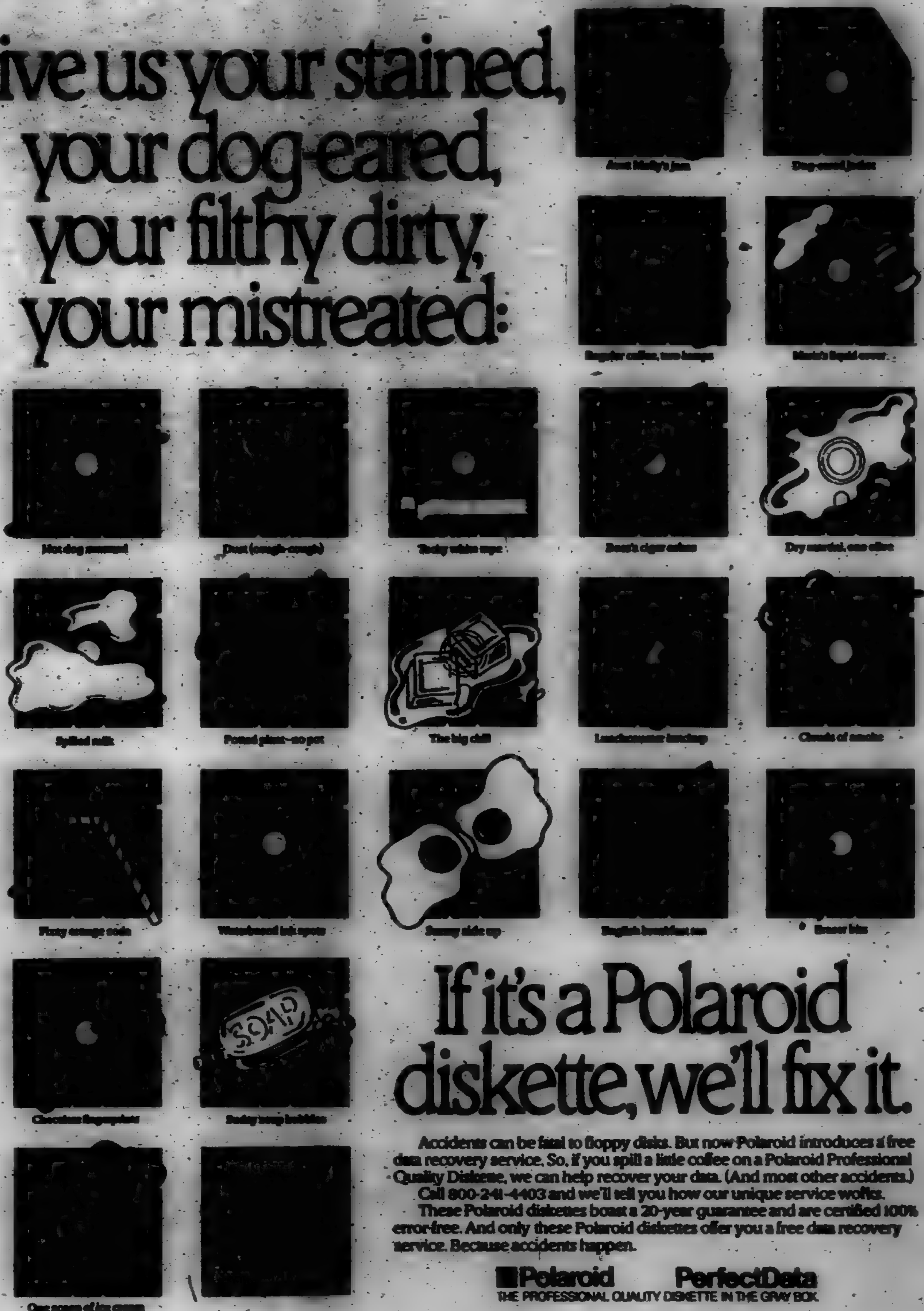
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INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

MELBOURNE — An exploding applications backlog has got Telecom Australia chomping at the bit for Honeywell, Inc.'s latest high-end mainframe release.

The vendor's DPS 90 system, priced at $6 million, is in the country and being readied for installation at Telecom. A spokesman said Telecom could not wait the anticipated two years for other vendors, including IBM Australia Ltd., National Advanced Systems Pty. Ltd. and Burroughs Ltd., to provide similar high-end power. The Honeywell machine is thought to be the first IBM Sierra-equivalent to be delivered outside the U.S.

■

PYMBLE — A pioneer among Australian hardware manufacturers, Digital Electronics Pty. Ltd., has been acquired by General Robotics Corp. of the U.S. The new owners are expected to continue to build and support Digital Electronic's product line.

CANADA

TORONTO — Changes in Canadian copyright legislation that reduce to five years the length of copyrights, could seriously hamper the country's growing software industry, according to the Canadian Business Equipment Manufacturers Association. The association prepared this statement for a parliamentary committee now studying prospective changes to copyright law. The group argued that Canada has the potential for a booming software industry but only if developers receive the same protection afforded them in other countries.

CHINA

BEIJING — Hitachi Ltd. has signed an agreement with China's Railway Science Academy to develop jointly a Chinese version of the Hitachi microcomputer. This announcement followed a similar agreement struck by Japan's NEC Corp., which will assist the Huabei Terminal Co. in mass-producing the NEC PC-9801 microcomputer for the Chinese marketplace.

■

CHANGCHUN — China's first Software Fair will be held here April 20-26. More than 100 software companies are expected to have exhibitions at the show, including representatives from Hong Kong and U.S. firms.

■

GUANGZHOU — The Chinese Computer User's Association recently held its first conference. The conference reportedly brought together approximately 40 domestic and 15 foreign computer manufacturers to hear from the Chinese user community.

A spokesman from IBM China, Inc. called the event "the most valuable meeting [we've] ever attended in China." During the meeting, good-service certificates were awarded to IBM, Wang Laboratories, Inc., Digital Equipment Corp., Hewlett-Packard Co., NEC Corp., Hitachi Ltd. and Honeywell, Inc.

DENMARK

COPENHAGEN — Low salaries paid by Denmark are making it very difficult to hire qualified personnel to develop the newly formed Financial/Computer Science Institute at the Copenhagen School of Economics and Business Administration. Denmark needs people with practical and scientific expertise from the commercial community, but, according to industry figures, such people would have to take an average $500 per month pay cut to work for the government.

FRANCE

PARIS — Nearly 1,000 people convened here recently for the European Unix Users Group (Euug) meeting. In France, it is estimated there are 6,000 sites operating with AT&T's Unix system, but the most popular version of Unix appears to be the Fortune 16/32 system from the French company Thomson. Olivetti Corp., which sells AT&T's 3B system in Europe along with Unix, recently lost its largest OEM distributor here, Metrologie, and is having trouble moving the products, according to sources.

■

PARIS — France recently approved a software protection law that automatically prohibits all software from being copied. Prior to this law, it was only illegal to copy software for resale. Industry insiders said they are anxious to see how the law will be received by the computer community and how it will be enforced.

JAPAN

TOKYO — Japan produced 12,752 mainframe units during 1984, valued at $2.6 billion, according to a recent Ministry of International Trade and Industry report. Japan also produced some 54,000 office systems, estimated to be worth $500 million, and one million micros valued at $900 million. The peripherals industry amounted to 10 million units and is worth $4.8 billion, the report stated.

■

TOKYO — NEC Corp. has unveiled a 32-bit high-end office system called the System 150/85. The machine features up to 8M bytes of main memory, integration of micro and mainframe functions, compatibility with Japanese office and color serial printers and extensive communications capabilities, according to the vendor. A typical configuration costs $65,000.

NORWAY

OSLO — Norsk Data AS and Ericsson Information Systems, Inc. are cooperating on a contract from Norwegian Post Office Administration. The order initially calls for 2,000 workstations to be installed in Norway's 450 larger postal branches, with other equipment phased into the country's remaining 2,350 post offices.

SWEDEN

STOCKHOLM — Apple Computer, Inc.'s business is booming here, according to Soeren Olsson, Swedish company president. During the last quarter of 1984, Apple claimed a microcomputer market share of approximately 30%, with sales of 1,780 units valued at $5 million.

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BAINBRIDGE, Ohio — As owner of the only pharmacy within 20 miles of this town of 1,000 residents, John Knisley provides a much-needed service for the 3,000 families here and in surrounding communities. Although the relaxed, small-town setting allows Knisley to know his customers by name, the pace is often hectic at Knisley Pharmacy.

Knisley fills more than 100 prescriptions a day — nearly 50% more than most one-pharmacist operations, he claimed. Until recently, that meant 65- to 70-hour workweeks, with take-home paperwork.

Knisley spent a great deal of time each week filling out forms for third-party billings. "Approximately 45% of the prescriptions I fill are billed to third parties, such as Medicaid, various insurance companies and the State Industrial Commission," he said.

The complexity of third-party billings led Knisley two years ago to consider purchasing a computer system for the pharmacy. Although Knisley Pharmacy had annual sales of $400,000, Knisley said he was at first doubtful that he could afford a computer for his business.

"But if it provided help with third-party billing, then the time savings would help justify the expense of a computer," he said.

Knisley considered pharmacy software systems from several companies before selecting the Retail Pharmacy Package from RNA, Inc., a Texas Instruments, Inc. reseller in Dayton, Ohio. RNA's software included third-party billing, inventory control, prescription filling and price updating.

> ‚ 'After I got the computer, I saw how lax [with price updates] I really was.'
>
> — John Knisley

Knisley's hardware requirements included large mass-storage capabilities in order to keep detailed records for insurance and legal purposes. He also needed a printer that could withstand constant use.

Knisley purchased a TI Business System 372 minicomputer with a single terminal, 512K bytes of random-access memory and 43M bytes of mass storage. Knisley also chose TI Model 810 and Model 850 printers.

'It was simple'

Knisley said he taught himself how to use the Business System 372 by working at home with it in the evenings. "I loaded a lot of the information I needed at home over a period of several months. Then I brought it into the store one morning and hooked it up myself. It was simple."

Now, when a new prescription is called in, Knisley enters patient, medical and billing information on the Business System 372. For refills, he keys in only the prescription numbers. The Model 850 printer prints the prescription label, while the Model 810 prints a cash receipt or third-party billing form.

Knisley said, "Things were a little slower initially while I adjusted to computerization, but I can now fill two or three prescriptions in the time it used to take to fill one. Medicaid billing now takes about 10 minutes a week instead of eight hours," he added. "The time savings are phenomenal. My average workweek has been reduced by about 16 hours."

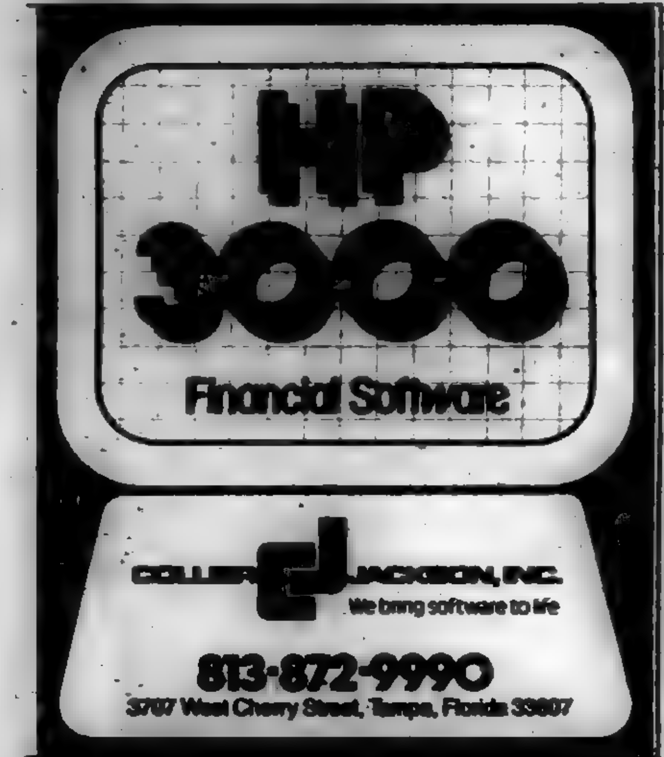
Increased profitability

Computerization has also provided an unexpected, measurable increase in profitability because of automatic price updates for prescription drugs. "I didn't know I had a problem with price increases until I purchased the RNA/TI system," Knisley said. "I thought I was really efficient with price updates. But after I got the computer, I saw how lax I really was."

Knisley discovered that he had been losing nearly 20 cents on each prescription filled because he was not passing price increases on to his customers. Now he receives monthly price updates from RNA that automatically change prices in the computer. "I've increased my gross margin of profit by approximately 2% in the prescription department just by keeping up with price increases," Knisley claimed.

Future plans for the system include the installation of a microcomputer that will connect with local nursing homes which can transmit pharmaceutical orders over the phone.

Knisley said the profit margin increase alone will cost-justify the system in 3½ years. "In fact," he said, "when I look at the profit increases, tax breaks, investment credits and the savings in my own personal time, the computer really doesn't cost me. I'd say it's making me money."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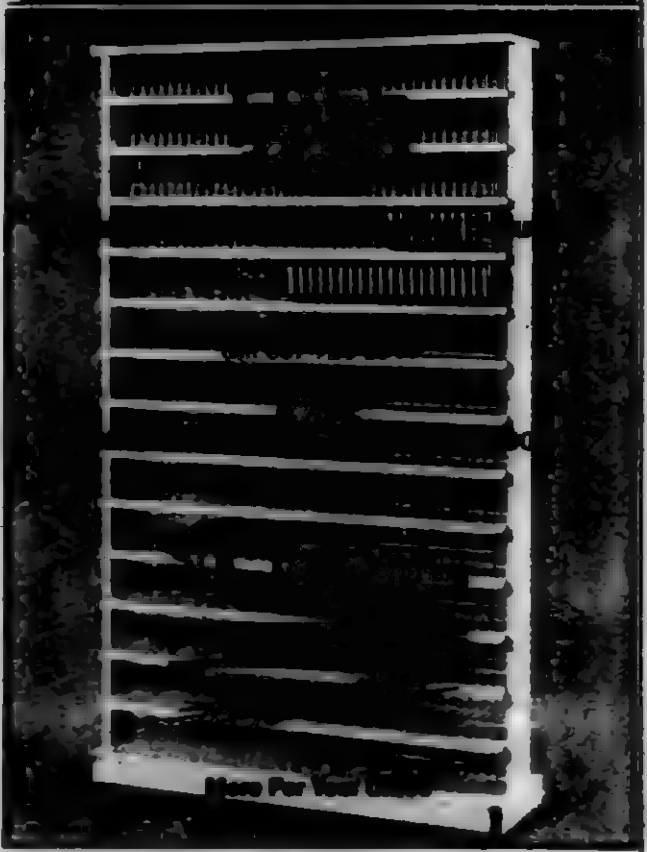
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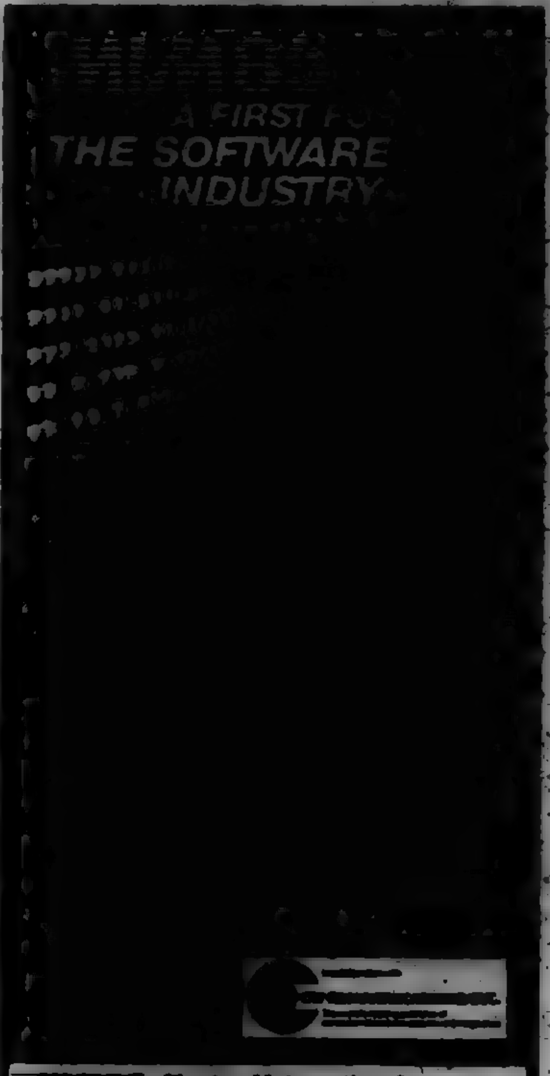
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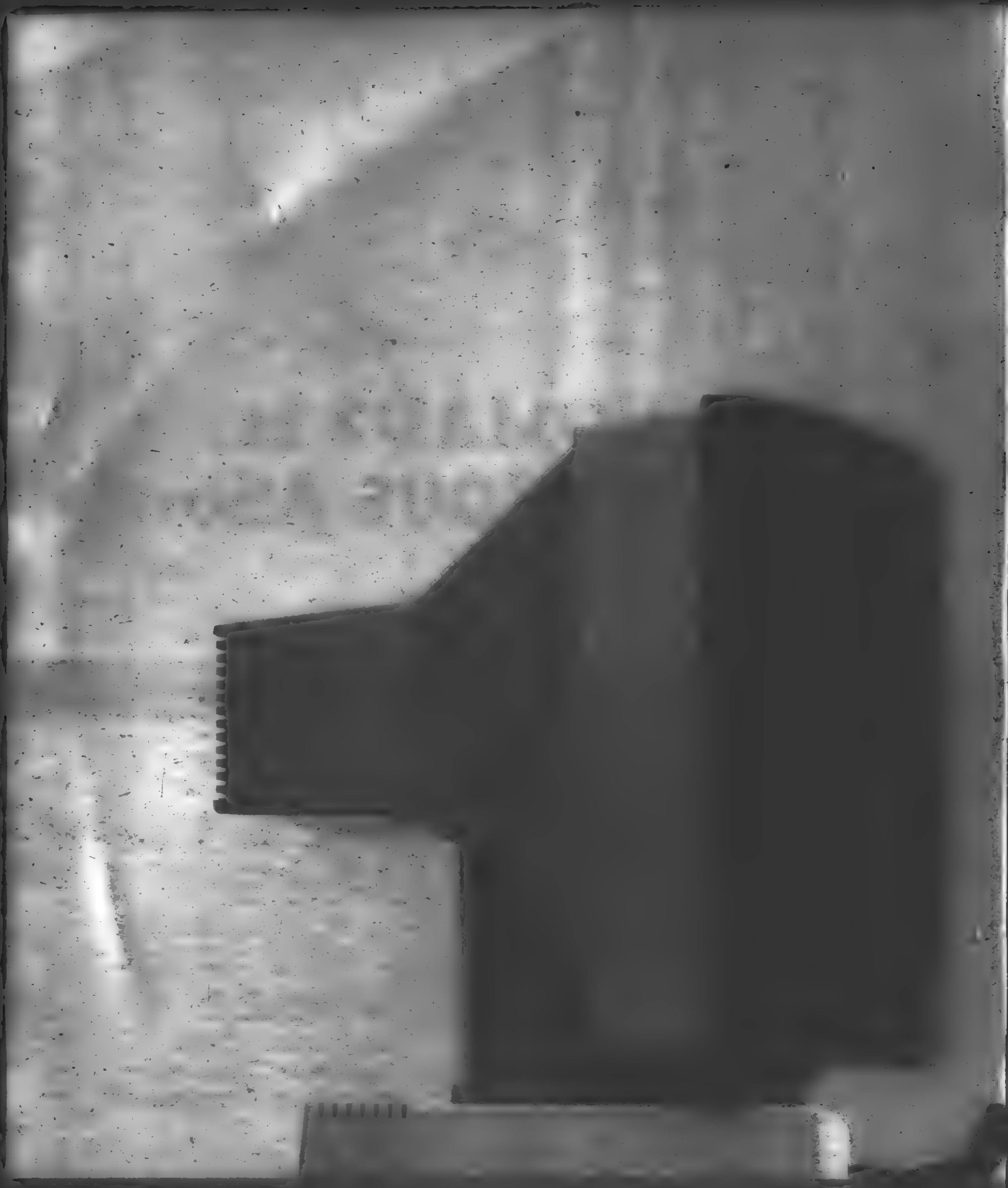

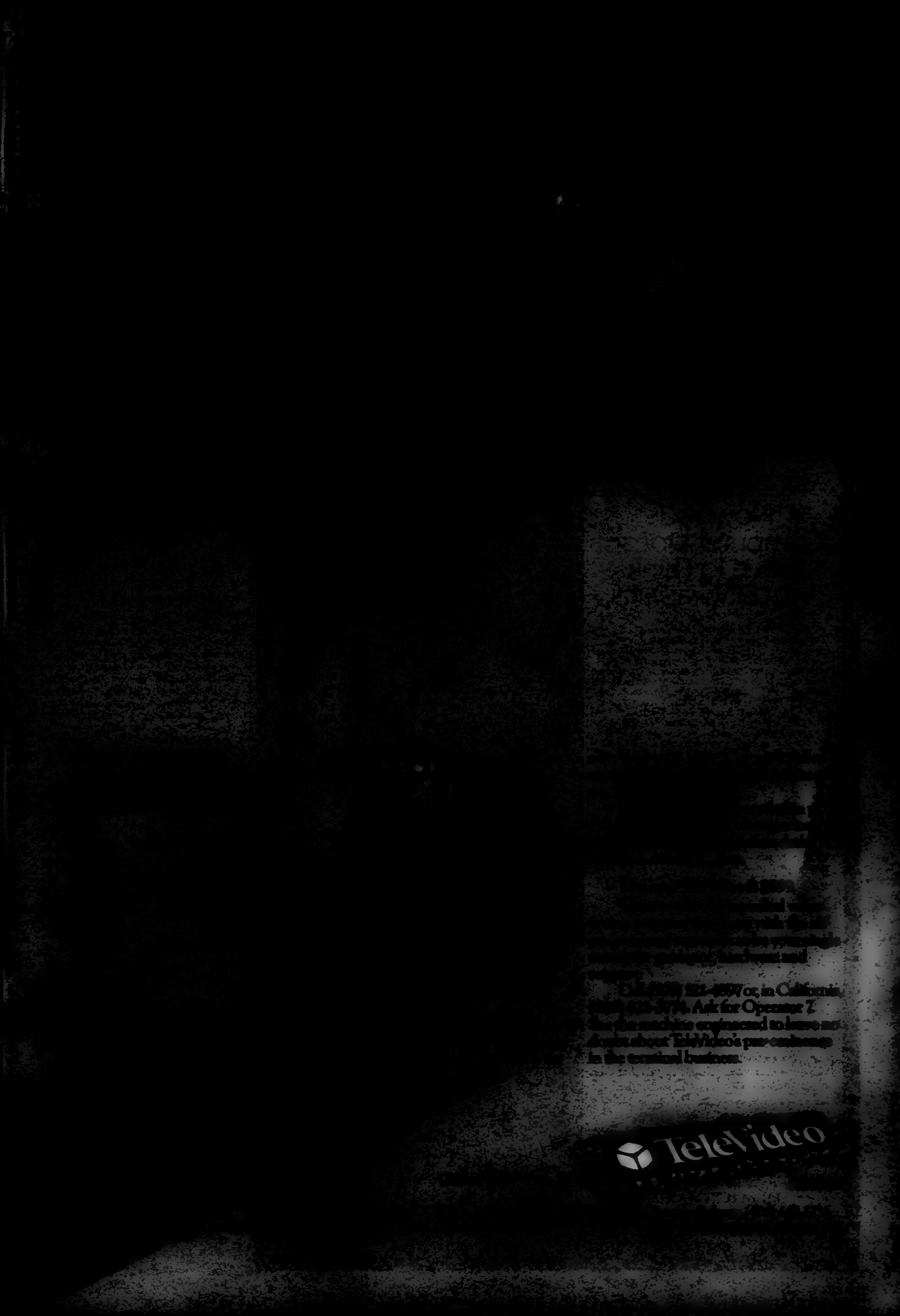

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Shipping workers tell it like it is to hand-held computer

ST. PAUL, Minn. — In the movie *2001: A Space Odyssey*, the spaceship crew talks to the Hal 9000 computer to give it instructions. The 3M Distribution Center here has no Hal 9000, but it does have a voice recognition system used by truck drivers and forklift operators to input data in a manner that is reminiscent of the stuff of science fiction.

The plant is a central receiving center for outside vendors and 3M-supplied material for 3M manufacturing facilities in all states. The task of distribution center workers is to transfer incoming raw materials, parts, tools and assemblies to their destinations as quickly as possible.

Material should be shipped immediately after it is unloaded from incoming transport, but paperwork, coupled with ineffective data collection, was causing typical delays of two to eight hours in reporting and routing information to its proper destinations, according to Ron Johnson, data processing supervisor at St. Paul Manufacturing Services.

A team was selected to search for the solution to this problem. It was decided that an on-line computer system was required to streamline the paperwork bottleneck, but traditional video terminals did not seem best for data input, Johnson said.

It would have been difficult for warehouse personnel to enter data manually on incoming shipments at a keyboard while efficiently moving boxes and pallets from unloading areas to staging areas for reshipment. In addition, errors made in such manual data entry could result in misplacement or loss of loads or pallet information for hours, if not days. An effective technique was also needed to label the material for reshipment, Johnson said.

The team found that the solution required a number of technologies. All material coming into the facility needed bar code labels that could be generated on the unloading dock by a dot matrix printer. The labels could be read with hand-held data entry reading wands that feed data to a central computer for tracking and routing purposes. But traditional manual data entry methods to produce the labels were not practical on the receiving dock, Johnson said. He decided that a voice recognition system was the most practical. Employees could move or unload shipments by hand while directly providing data to the computer. And it would mean that labels could be printed immediately and affixed to loads.

The distribution center had a Hewlett-Packard Co. HP3000 processor on site, with dedicated time and in-house systems expertise for the Reship Order Tracking System (Rocs) devised by 3M. A vendor search identified MSI Data Corp. of Costa Mesa, Calif., as a leading supplier of hand-held computer terminals with bar-code scanning capabilities and Printronix Corp. of Irvine, Calif., as a leading supplier of high-speed dot matrix line printers that could generate the bar code labels.

Interstate Voice Products was identified as the supplier of voice recognition and synthesis equipment capable of withstanding the harsh environment of the warehouse, while providing the accuracy required to translate operator voice input into data for the computer.

Electronically spoken prompts

Communication between the MSI hand-held computer and the HP 3000 was facilitated by SAM, a speech-aided modem manufactured by Processing Innovation in Anaheim, Calif. With SAM, the operator is provided with electronically spoken prompts telling when to download the data and acknowledging successful data transmission. Communication between the operator and the voice recognition system was provided by an FM radio link with equipment supplied by Communications Applied Technology of Oakton, Va.

The system was installed a year ago and is working well, Johnson said. When a trailer arrives at the dock, its pallets are unloaded and placed in a receiving area. At that point, an operator reads the invoice number, origin of the load, destination and number of pallets into the headset microphone. The operator uses a 54-word vocabulary that includes all alpha and numeric characters, "yes" and "no," "dash" and control words like "enter," "send," "backspace" and "verify."

The computer voice confirms each item through the operator's earphones and enters the data into its memory. The computer then activates a printer that prepares pallet labels needed to get the shipment on its way. Besides the lettered information, the label also will have two identical bar code strips, one of which the loader tears off and affixes to the shipping documents.

The shipping document with the trailer identification number goes to a receiving clerk, who scans the bar code with a laser unit wired to the computer. The computer is then able to pass all of the information into its own storage.

"Our Rocs system has put us back in control of our operations. Employee morale has never been higher, and the transition from complaints to praise on our service levels and capabilities has been gratifying," Johnson said.

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NEWS

Concentrators let gas firms cash in on bank's network

PITTSBURGH — For Mellon Bank N.A. to make its Cashstream network available to customers at Amoco Oil Co. and Gulf Oil Corp. gasoline stations here, Mellon's mainframes had to communicate with point-of-sale (POS) terminals used by the petroleum firms.

In June 1984, Mellon, in conjunction with 15 Gulf retailers and six Amoco retailers in Pittsburgh, began a pilot program to test the feasibility of a retail debit network with oil companies. The bank had to find a cost-efficient way to handle dial-up protocols and concentrate the lines before the program could start.

At that time, Mellon's Cashstream system, one of the nation's largest shared electronic funds transfer networks, served 129 financial institutions, including commercial banks, savings banks, savings and loans and credit unions in Pennsylvania, New Jersey, Delaware, Maryland and West Virginia.

Mellon's switch transaction processors, four Tandem Computers, Inc. TXPs and four Tandem Nonstops, operated under IBM's 3270 bisynchronous protocol, while the POS terminals worked under Ascii asynchronous dial-up Visa protocol, a standard devised for credit card transactions.

"At that time, we decided not to modify the Tandem to facilitate dial-up protocols. We wanted to find the least expensive way to use the Visa protocols and concentrate the lines without modifying our present equipment," said Beverly Gross, product line manager in the product and development research section of Mellon's Network Services Division.

Solution found

Mellon's solution to the network problem was Icot Corp.'s Crystalink credit authorization/debit concentrators. The concentrators perform remote protocol conversion while concentrating multiple incoming local lines into a single leased line for transmission to the mainframe.

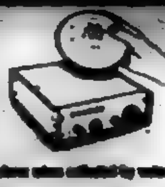
Tasks that can overload the host, such as answering incoming calls, polling terminals, sending error-checking messages and other simple functions, are performed by the Icot Crystalink box.

Gross said that Icot modified the box's software to support the Visa dial-up standard so that a retailer could conduct several transactions on a single call.

In describing the present network, Gross said that the 15 Gulf stations have Attala Secure Electronic Banking and Business Systems clerk-activated POS terminals, while four Amoco stations have customer or clerk-activated POS terminals from the Datatrol Division of Addressograph of Farrington, Inc. All the terminals are autodial, with printers and personal identification number (PIN) pads.

After the customer pumps the gasoline, the attendant passes the card through the reader. Then the customer enters the PIN number and the merchant enters the amount of the sale. The message travels through a 300 bit/sec. dial-up telephone call via AT&T 103 modems.

When the Icot Crystalink box receives the message, it converts the Ascii asynchronous Visa protocol to Ebcdic 3270 Binary Synchronous Communications protocol. The Tandem front end polls the Icot Crystalink box, which forwards the message. The Tandem then routes the transaction to the appropriate end point fpr authorization. The Icot Crystalink box receives the authorization response from the Tandem in Ebcdic 3270 protocol and returns it to the POS terminal in the Ascii asynchronous Visa protocol. The response time is from 20 to 25 seconds, Gross said.



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T/Maker Integrated on a VAX?
MS BASIC on a Micro VAX?
Milestone on a PDP-11?
Palantir on a PDP-11?
SpellStar on a PRO?
MailMerge on a PDP-11?
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dBASE II on a PDP-11?
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Open Access on a PRO?
MS FORTRAN on a VAX?
Condor on an MV10000?
Multiplan on a PDP-11?
WordStar on a VAX?
SuperCalc 2 on an Eclipse?
PertMaster on a PRO?
Palantir on a VAX?
QuickCode on a PDP-11?
DISC-DBL on a VAX?
PerfectWriter on a PD
WordStar on a PDP-11?
Spellbinder on an Eclipse?
Friday! on a VAX?
PerfectWriter on a PRO?
RM/COBOL on a PDP-11?
RTCS/UDI on a VAX?
Mass-11 on a PDP-11?
Milestone on an Eclipse?
Lotus 1-2-3 on a Micro VAX?
Peachtree on a VAX?
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ASM three-day seminar offered in three cities

CLEVELAND — Richard Pinket, senior associate with Bauer & Associates, Inc., a consulting firm, will conduct a three-day seminar on Systems Project Management.

The conference is sponsored by the Association for Systems Management (ASM) and will be held May 6-8 in Sacramento, Calif., May 20-22 in Cincinnati and June 10-12 in Chicago.

Topics to be discussed include the approach to project management, project management organization, the project manager, network development and project plan development, implementation and analysis.

Registration for the program is $495 for ASM members and $575 for nonmembers.

More information is available from the Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

WIP international meet scheduled

WASHINGTON, D.C. — Congresswoman Barbara Vucanovich (R-Nev.), a member of the Republican Task Force on High Technology Initiatives, will deliver the keynote address at the international conference of Women in Information Processing (WIP), to be held May 8-10 at the Watergate Hotel here.

Other speakers on the agenda will include M. Mitchell Waldrop, a writer for *Science '85* magazine; Paula Brooks, president of Unitech Software, Inc.; and Louise Utsinger, assistant director of Source EDP, the national data processing employee recruiting firm.

The final day of the conference will feature a tour of Haar Industries' Paperless Office Technology Center, a facility reportedly used to acquaint managers with new trends in office technology.

Registration fees for the conference are $240 for WIP Forum members, and $290 for nonmembers. Additional information is available from the WIP International Conference, Lock Box 39173, Washington, D.C. 20016.

CALL FOR PAPERS

Sixth Annual System 1022/1032 Users Conference.
September 23-25, 1985, Boston, Mass.

Papers and user demonstrations are being solicited for presentation at the sixth annual System 1022/1032 Users Conference.

Topics include, but are not limited to, the following: large data sets; nonstandard host language, network or graphics interfaces; performance issues; data set integrity; security; data base design; and educational use.

Abstracts on the various topics should be sent by May 31 to one of the following people: 1022 — Stan Braer, Harvard Business School, Bakers Library 21, Soldiers Field Road, Boston, Mass. 02163; 1032 or General — Nancy Meyer, Monsanto Agricultural Products, 700 Chesterfield Pkwy., St. Louis, Mo. 63137; 1022 user demonstrations — Barbara Bersack, Software House, 1105 Massachusetts Ave., Cambridge, Mass. 02138.

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II. Incorporates highly automated budgeting processes to the maximum practical extent.
III. is capable of producing standard and ad hoc hardcopy reports either on-line or off-line.
IV. is capable of producing numbered camera ready printed budget pages, containing both text and dollar amounts.
V. is either
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  B. personal computer based, but interactive with the mainframe (See VI-A & B)
  C. entirely PC based (See VI-B only)
VI. is compatible with:
  A. IBM equipment: DOS/VSE Operating System; CICS teleprocessing monitor and VSAM or IDMS file structures and/or
  B. either: 1. Wang OIS 140 word processors
    2. Wang VS 100 word processors
    3. IBM PC/XT
    4. IBM 3270 PC

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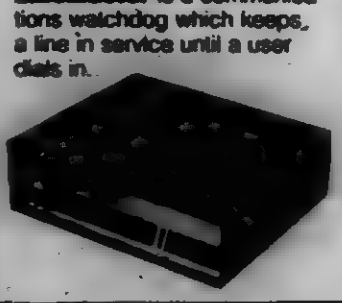

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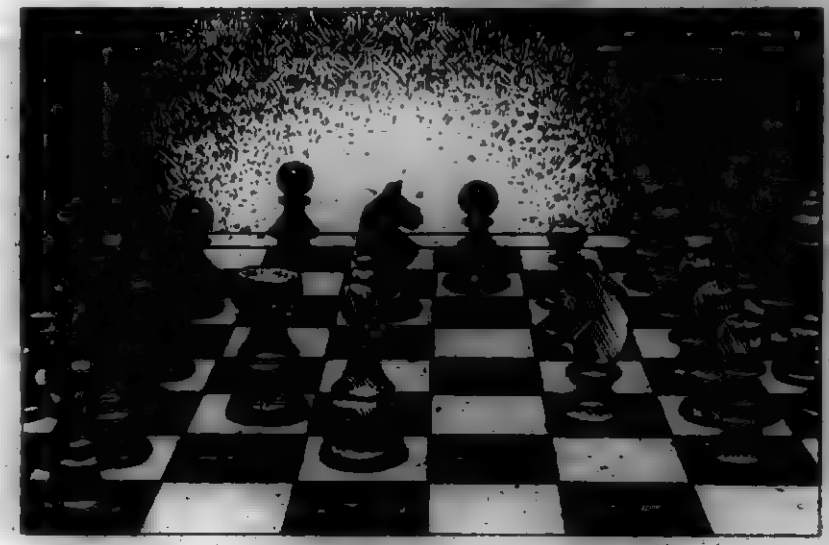

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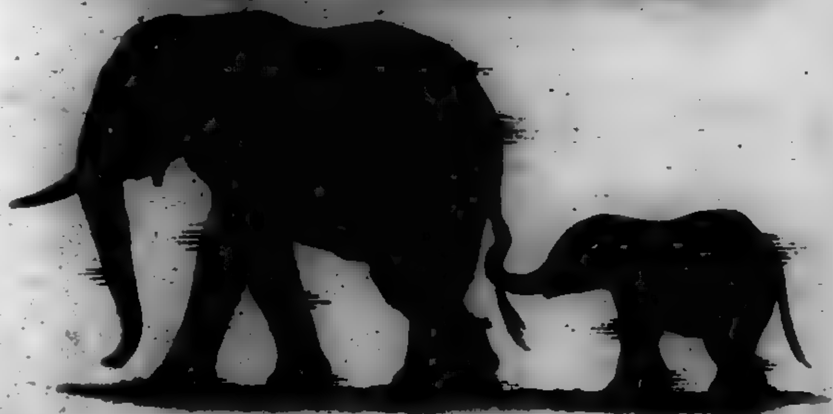

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Emulation package ensures data access for firm's agents

INDIANAPOLIS — When American Life Insurance Co., located here, began searching for a terminal emulation product to link its agencies to American Life's mainframe, there was one feature that distinguished various vendor offerings.

"We wanted to allow agents to print data locally from the mainframe," said Karen Spears, network analyst at American. American Life did not want to require that a user complete a complicated file transfer routine to do that.

When the evaluation took place, there was one product that provided the necessary feature: Bluelynx 3270 — a communications plug-in card and software package that permits an IBM Personal Computer to emulate an IBM 3276 terminal — from Techland Systems, Inc., located in New York. "We examined communications products from [other vendors]," Spears said. "They promised to offer the printing feature, but Techland was the only company that could deliver it."

Before the Techland Bluelynx 3270 products were added, American Life agencies across the U.S. had been equipped with Teletype Corp. 4240 remote terminals connected to American Life's IBM 3083JX mainframe by leased lines and modems.

Leasing expenses shared

The insurance company and the agents shared the leasing expense, and the agents used the remote terminals to access the mainframe for client data and to prepare policy sales proposals and applications, according to Spears.

Spears cited a number of limitations to the remote terminal system. Mainframe software limited the types of proposals that agents could create. For example, she said, sales illustrations with data, such as age and state of health of individual customers, had been produced by mainframe software. With a dumb terminal, an agent would key in the codes for a particular policy.

There was little opportunity for variation of personal data or cash values. If an agent wanted to develop policy information that deviated from a standard policy, he had to do the calculations by hand. Also, remote terminals were so limited that a policy had to be processed and printed at the main office overnight rather than printed at a remote location.

Logical solution sought

Dumb terminals did not provide stand-alone processing capabilities, Spears said. Tasks such as editing, typing, filing and billing, which are performed most efficiently on a word processor or personal computer, were completed manually, Spears noted. Consequently, acquisition of microcomputers that could communicate with American Life's host seemed to be a logical solution to these problems.

After the evaluation, four agents were supplied with IBM Personal Computers and Bluelynx 3270. American Life developed a software package that provides for more than 10 variations for a life insurance policy, allowing agents to be creative in their sales illustrations, Spears said.

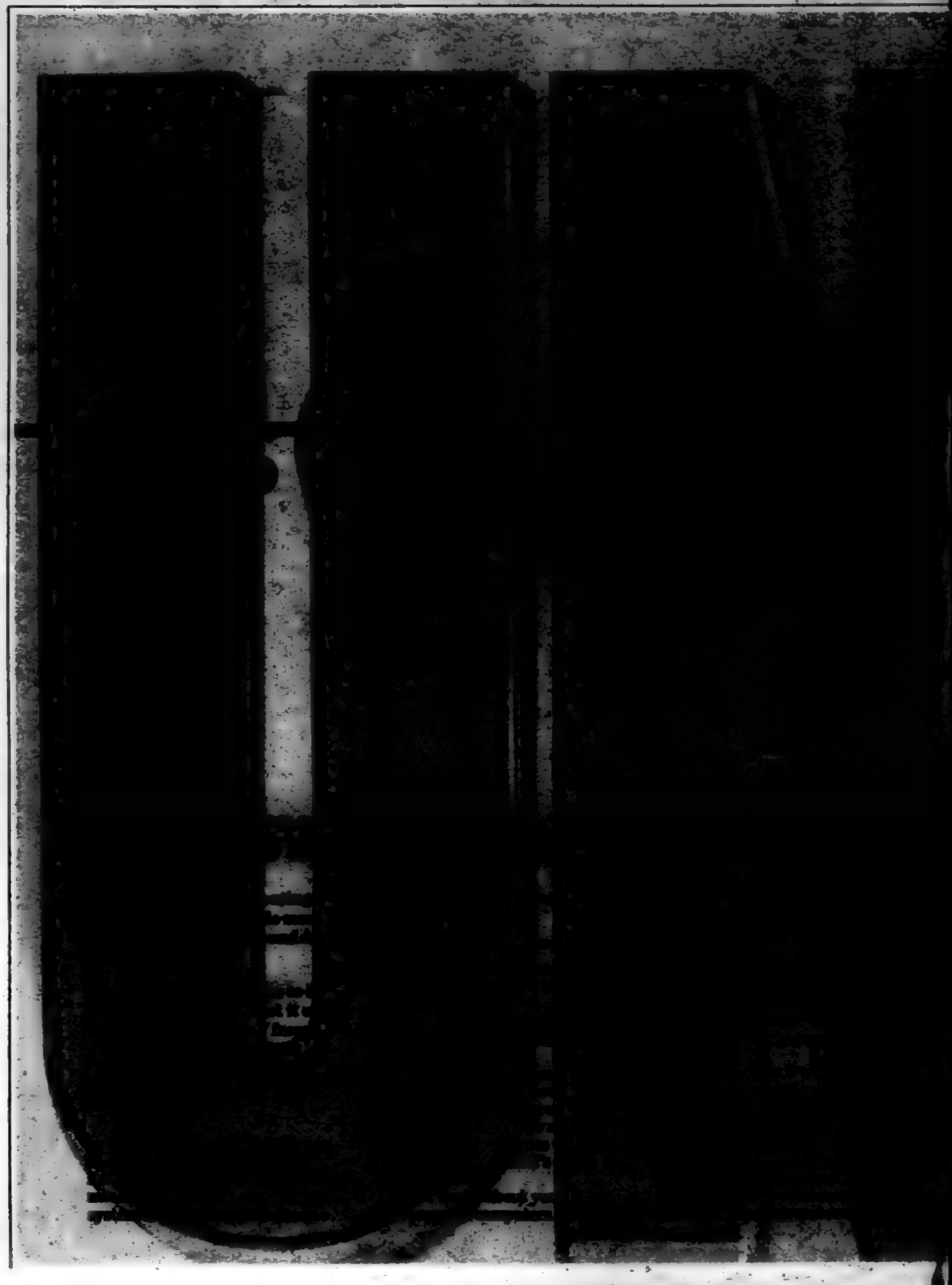
The insurance company also began offering seminars to familiarize the agents with the software package, the Bluelynx 3270 and the IBM Personal Computer.

Leased terminals eliminated

American Life saved money by eliminating leased terminals, according to Spears, and agents benefited by declaring their Personal Computers as tax deductions.

The four-agent pilot program was deemed successful, so American Life replaced 35 agencies' terminals with microcomputers.

As an added benefit, "we have signed some agents who previously were working for our competitors," Spears said, attributing that growth to American Life's new system.



Pilot project presses publisher's conversion to minis

SAN FRANCISCO — A publisher of legal treatises used a pilot project to guide its conversion to a minicomputer-based automated system.

Matthew Bender & Co., a wholly owned subsidiary of Times Mirror Co., publishes information on statutes and court cases for attorneys and accountants.

In mid-1981, the company decided to automate and establish the pilot project at its offices here, where approximately one-third of the firm's editorial activity takes place.

Pamela Sallender, vice-president of the company's western editorial department, assumed responsibility for the project. For six months a team of executives studied more than 40 computer systems vendors.

'Not computer people'

"We needed a system that was large enough to handle the volume of data" produced at Matthew Bender, Sallender said. Other requirements included upgradable hardware and flexible and easy-to-learn word processing software. "Ninety-five percent of the people who work here are not computer people," she said.

The field of vendors was narrowed to five. The company selected Wang Laboratories, Inc. minicomputers, integrated with customized editorial software, to plan and produce its publications.

Matthew Bender began the pilot project with a Wang VS80 running 20 workstations, three printers, two 288M-byte disk drives, a tape drive and 512K bytes of memory.

For the next four months, a training program for users was developed, procedures for writers and editors were established, and the first chapters of manuscripts were put onto computer tape and encoded for use directly by outside compositors.

Five months after the pilot project began, Matthew Bender purchased two Wang VS100 computers with a combined 1M-byte memory. The company added 140 Wang Ergo II workstations, four 288M-byte disk drives and eight printers, and the upgrade went smoothly, Sallender said. "The files that we had created on the VS80 were directly loaded onto the VS100," she said.

Ten months later, the company added another VS100, four 288M-byte disk drives, a tape drive and 75 Wang Professional Computers. Finally, a Wangnet broadband local-area network was installed to connect the computers and peripherals into a system allowing communications among different computer systems.

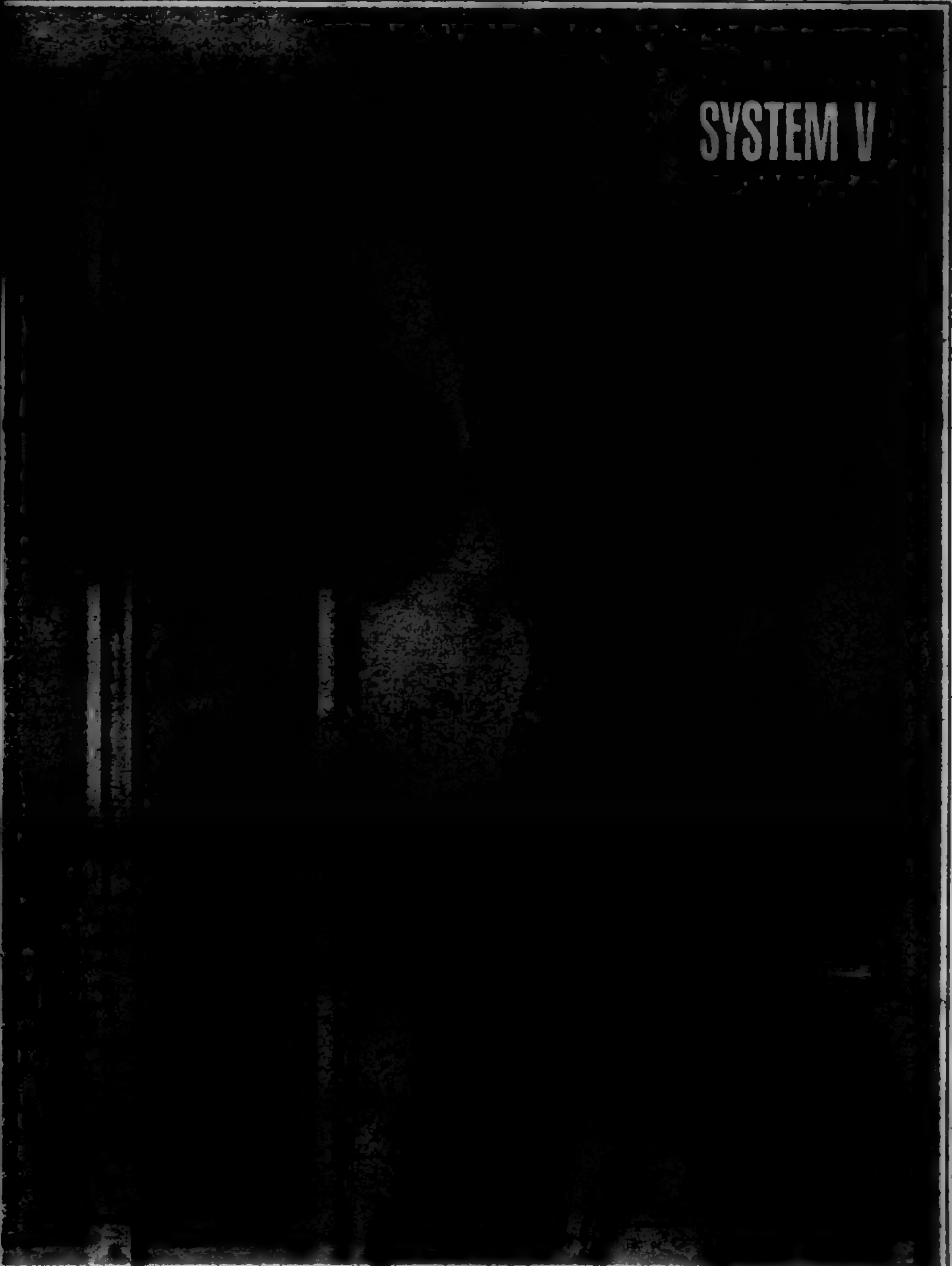
Tag changes electronically

Writers can store research notes and outlines on the system and compose and edit manuscripts on the workstation display screen. Editors call up a writer's manuscript on another display screen and critique it using a glossary feature to tag the suggested changes electronically for a particular section.

The process eliminated the old "cut-and-paste" method for editorial changes and the time-consuming procedure of sending piles of pages back and forth between editors and writers for review and approval, she said. "All the writers, editors and copy editors can access files on the VS system when necessary."

Automation also streamlined a proofing procedure with the company's New York production department, Sallender said. By eliminating the compositor's input, "We are saving six to seven dollars a page," she said. "With a productivity savings on top of that, we expect the installation to pay for itself in three to four years." The Wang system has also cut product delivery time from 15 to 10 weeks, Sallender said.

The San Francisco project has spurred a similar effort at the company's New York offices, where Wang VS100 computers were installed and have been in full operation since March.



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CALENDAR

WEEK OF MAY 12

MAY 12-16, SEATTLE — APL '85. Contact: Robert J. Gailer, Apartment C, 2416 E. Madison St., Seattle, Wash. 98112.

MAY 13-14, DALLAS — Using Dbase II and Dbase III to Manage Information. Contact: Professional Development Institute, North Texas State University, P.O. Box 13288, NT Station, Denton, Texas 76203.

MAY 13-14, WASHINGTON, D.C. — Software Rapid Prototyping. Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Department SRP, P.O. Box 3606, Torrance, Calif. 90510.

MAY 13-14, CHICAGO — Understanding Telecommunications Technologies for Non-Engineers. Contact: Telestrategies, Inc., Suite 102, 6842 Elm St., McLean, Va. 22101.

MAY 13-15, LOS ANGELES — Relational Data Base. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

MAY 13-15, WASHINGTON, D.C. — Introduction to Data Communications. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015. Also being held May 29-31 in San Francisco and May 29-31 in Houston.

MAY 13-15, NEW YORK — The Associated Information Managers Fourth Annual Conference. Contact: Associated Information Managers, 1776 E. Jefferson St., Rockville, Md. 20852.

MAY 13-15, NEW YORK — Local-Area Networks. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 13-15, TORONTO — Controlling Software Projects: Management, Measurement and Estimation. Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

MAY 13-16, FORT LEE, N.J. — CICS/VS Logic & Debugging. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MAY 13-16, DENVER — Vtam: From Start to Finish. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MAY 13-16, DENVER — The Fifth International Conference on Distributed Computing. Contact: Earl Swartzlander, TRW Corp., Defense Systems, One Space Park, Redondo Beach, Calif. 90278.

MAY 13-17, SAN FRANCISCO — Data Base Development Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

MAY 13-17, HOUSTON — Structured Systems Analysis Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

MAY 13-17, WASHINGTON, D.C. — Hands-On Programming in Ada. Contact: The George Washington University, Continuing Engineering Education Program, Washington, D.C. 20052.

MAY 14-16, PARIS — International Ada Conference. Contact: Hans Horst, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

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MAY 14-17, ST. LOUIS — The Association for Integrated Manufacturing Technology's 22nd Annual Technical Conference and Exposition. Contact: Association for Integrated Manufacturing Technology, Suite 800, 111 E. Wacker Drive, Chicago, Ill. 60601.

MAY 16-18, LOS ANGELES — The Southern California Computer Faire. Contact: David Small, Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

MAY 15-16, AUSTIN, TEXAS — MVS System Tuning. Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727. Also being held August 22-23 in Dallas.

MAY 16-17, ATLANTIC CITY — Software Maintenance. Contact: Data Processing Management Association Educational Foundation Seminars, c/o Technology Training Corp., Department SMA, P.O. Box 3605, Torrance, Calif. 90505.

MAY 16-17, WASHINGTON, D.C. — Personal Computer Local-Area Network Software. Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55425. Also being held May 22-23 in San Francisco.

MAY 17, LOS ANGELES — Independent Computer Consultants Association (ICCA) Interconnections '85. Contact: ICCA, P.O. Box 27412, St. Louis, Mo. 63141.

WEEK OF MAY 19

MAY 19-23, NASHVILLE — Software Jamboree. Contact: Software AG of North America, Inc., 11800 Sunrise Valley Drive, Reston, Va. 22091.

MAY 20-21, MONTEREY, CALIF. — How to Manage Data and Information as a Resource. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 20-21, FORT LEE, N.J. — CICS/VS Performance & Tuning. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MAY 20-22, HILTON HEAD, S.C. — Audit Managers Symposium. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

MAY 20-22, SILVER SPRING, MD. — 1985 Trends and Applications Conference: Utilizing Computer Graphics. Contact: Trends and Applications '85, P.O. Box 639, Silver Spring, Md. 20901.

MAY 20-22, WASHINGTON, D.C. — Vtam Concepts and Facilities. Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727.

MAY 20-24, HOUSTON — Structured Systems Design Workshop. Contact: Elise Rabelais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

MAY 20-23, VIRGINIA BEACH, VA. — Navy/Micro QA '85. Contact: Bostron Corp., Suite 716, 1511 K St. N.W., Washington, D.C. 20005.

MAY 20-24, BELLEVUE, WASH. — C Programming Workshop. Contact: Kathy Howard, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

MAY 21-24, PARIS — Intelligencia International Exhibition and Congress. Contact: Sietec Communications, 211, Rue Saint-Honore, 75001 Paris, France.

MAY 21-22, TARRYTOWN, N.Y. — Technology and Market Forecasting in Electronics. Contact: Futurecast Learning Center, 40 Birch St., Redwood City, Calif. 94062.

MAY 22-24, MONTEREY, CALIF. — How to Build and Use a Data and Information Resource Directory. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 22-24, WASHINGTON, D.C. — Management Skills and Techniques for New and Prospective Managers. Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.

MAY 22-24, KYOTO, JAPAN — International Conference on Foundations of Data Organization. Contact: Yahiko Kambayashi, Department of Information Science, Kyoto University, Kyoto 606, Japan.

MAY 23-24, NEW YORK — Network Protocols and Standards. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 23-24, WASHINGTON, D.C. — Vtam Internals. Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727.

WEEK OF MAY 26

MAY 28-30, KINGSTON, ONTARIO — 15th Annual Symposium on Multiple-Valued Logic. Contact: H.T. Mouftah, Department of Electrical Engineering, Queen's University, Kingston, Ontario K71 3N6, Canada.

MAY 28-31, NEW ORLEANS — The Seventh National DEC-Compatible Industry Exposition (Dexpo South '85). Contact: Angela Wright, Expoconsul International, Inc., 55 Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

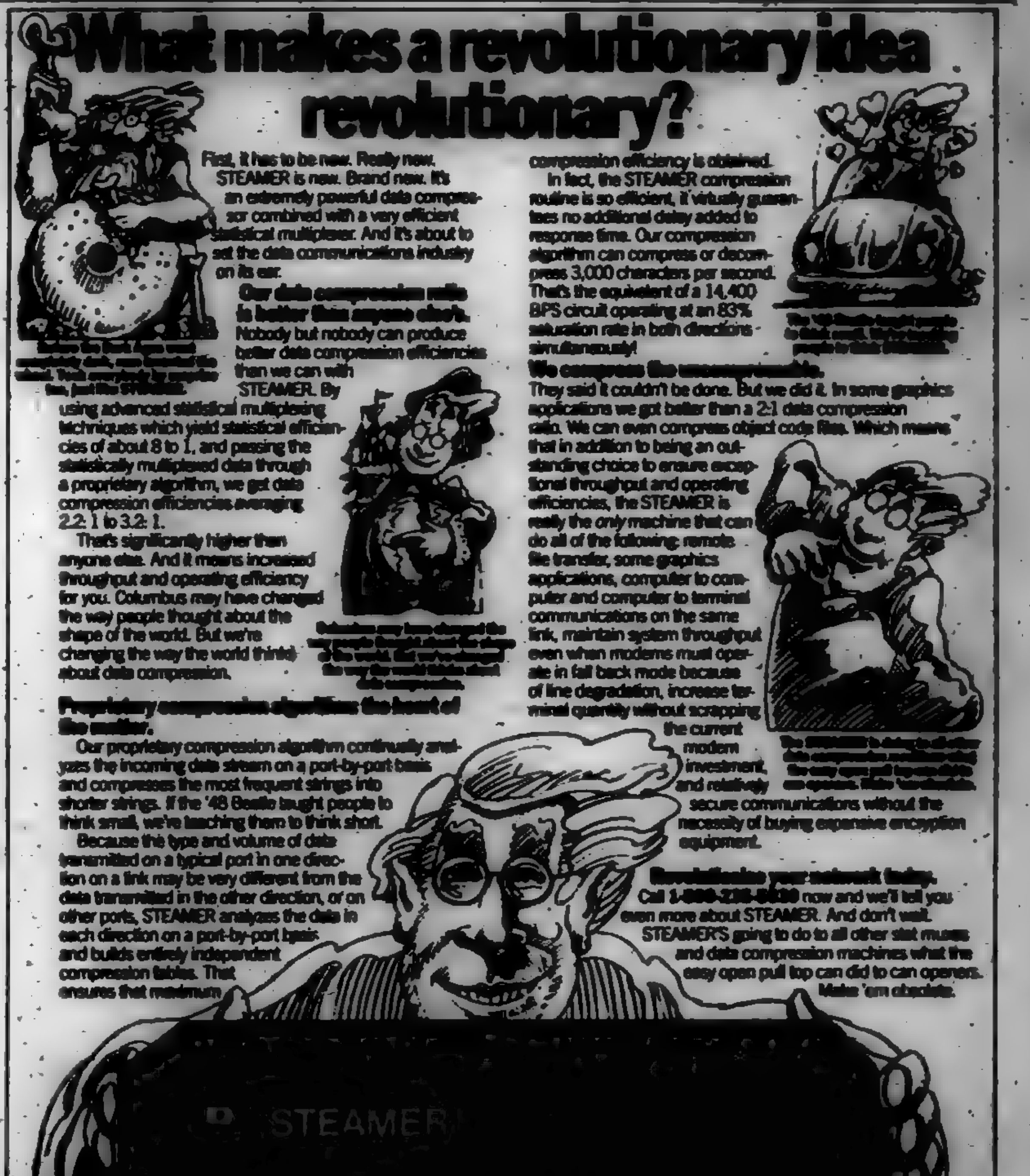
MAY 28-29, CHICAGO — VS Cobol II. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held May 30-31 in New York.

MAY 28-31, SAN FRANCISCO — CICS Application Design. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held May 28-31 in New York.

MAY 28-31, NEW YORK — TSO ISPF. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

MAY 28-31, NEW YORK — CICS Application Design. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

MAY 29-30, DALLAS — Opportunities and Pitfalls. Contact: Ken Orton, Future Computing, Inc., 8111 LBJ Freeway, Dallas, Texas 75251.


What makes a revolutionary idea revolutionary?

First, it has to be new. Really new. STEAMER is new. Brand new. It's an extremely powerful data compressor combined with a very efficient statistical multiplexer. And it's about to set the data communications industry on its ear.

[illegible]

Our data compression ratio is better than anyone else's.

Nobody but nobody can produce better data compression efficiencies than we can with STEAMER. By using advanced statistical multiplexing techniques which yield statistical efficiencies of about 8 to 1, and passing the statistically multiplexed data through a proprietary algorithm, we get data compression efficiencies averaging 2.2:1 to 3.2:1.

That's significantly higher than anyone else. And it means increased throughput and operating efficiency for you. Columbus may have changed the way people thought about the shape of the world. But we're changing the way the world thinks about data compression.

Columbus may have changed the way people thought about the shape of the world. But we've changed the way the world thinks about data compression.

Proprietary compression algorithm: the heart of the matter.

Our proprietary compression algorithm continually analyzes the incoming data stream on a port-by-port basis and compresses the most frequent strings into shorter strings. If the '48 Beetle taught people to think small, we're teaching them to think short.

Because the type and volume of data transmitted on a typical port in one direction on a link may be very different from the data transmitted in the other direction, or on other ports, STEAMER analyzes the data in each direction on a port-by-port basis and builds entirely independent compression tables. That ensures that maximum compression efficiency is obtained.

In fact, the STEAMER compression routine is so efficient, it virtually guarantees no additional delay added to response time. Our compression algorithm can compress or decompress 3,000 characters per second. That's the equivalent of a 14,400 BPS circuit operating at an 83% saturation rate in both directions simultaneously!

The '48 Beetle taught people to think small. [illegible]

We compress the uncompressable.

They said it couldn't be done. But we did it. In some graphics applications we got better than a 2:1 data compression ratio. We can even compress object code files. Which means that in addition to being an outstanding choice to ensure exceptional throughput and operating efficiencies, the STEAMER is really the only machine that can do all of the following: remote file transfer, some graphics applications, computer to computer and computer to terminal communications on the same link, maintain system throughput even when modems must operate in fall back mode because of line degradation, increase terminal quantity without scrapping the current modem investment, and relatively secure communications without the necessity of buying expensive encryption equipment.

The STEAMER is doing to all other data compression machines what the easy open pull top can did to can openers. Make 'em obsolete.

Revolutionize your network today.

Call [illegible] now and we'll tell you even more about STEAMER. And don't wait. STEAMER'S going to do to all other stat muxes and data compression machines what the easy open pull top can did to can openers. Make 'em obsolete.

STEAMER

On March 4, 1985 Datagram revolutionized the data communications industry with STEAMER.

Datagram We make networks work harder.

EDITORIAL

PC2 arrival no cause for panic

"PC2 is coming, PC2 is coming."

The air these days is charged with speculation about the forthcoming introduction of IBM's Personal Computer successor. The decibel level of the hype is approaching that of hysterical New Englanders who believed themselves under attack in the film *The Russians Are Coming, The Russians Are Coming.*

Does IBM's recent record warrant this excitement? Will PC2 repeat the undeniable success of the Personal Computer or the undeniable failure of PCjr? IBM's spotty record provides few hints of PC2's reception in the market. Consider the following:

- Two years ago, IBM came out playing hardball in the personal computer market. Now it's the dominant player, having legitimized and effectively taken command of a nascent market. The IBM Personal Computer has become the definitive personal computer — no flash, no splash, but setting the standard and the direction for the entire market. A month ago IBM discontinued production of PCjr [CW, March 25]. Born in November 1983, the machine was unable to secure significant market share in the treacherous home market.
- IBM in early February rolled out its two top-of-the-line mainframes, one available in seven months, the other in 24 months. Less than eight weeks later, Burroughs Corp., Honeywell, Inc. and National Advanced Systems Corp. served up processors that were faster, cheaper and generally available quicker than IBM's Sierra models.
- Early indicators of IBM's plans for global data processing — the 4300/8100 distributed processing scheme, for instance — seem to have been put in abeyance, waiting for more complete cabling and network schemes, while IBM focuses on the office, tying together its Personal Computer and the System/36.

When you're the biggest kid on the block, you don't have to play the game by anyone else's rules. If you're big enough you can change the rules, change the game. With a strong enough position, IBM doesn't have to compete with its market rivals; it merely has to change the market itself.

This is clearest in the mainframe market, where the large-scale competition doesn't breathe without looking at IBM. In that game, the color of the home team is blue. It has been a long time since IBM actually had to compete against anyone in that market: IBM does what it does, and everyone else reacts.

- The minicomputer market grew up without IBM and for a long time was nothing but boisterous and lively. But now that market is maturing rapidly. The numbers are changing: mini makers are facing down profit figures. And as IBM accelerates the pace with its links between the System/36 and its Personal Computer, that market probably faces the most radical change when the PC2 is born.

In mainframes and in personal computers, IBM is the dominant marketplace force. But as the PCjr pointed out, being the biggest guy on the block with the lowest cost production capabilities, the fattest advertising budget and the greatest market exposure doesn't spell success every time.

IBM has accumulated the power and the influence to sway certain marketplaces. The home market so far has been impervious to IBM's attentions; after all, IBM's middle name is *Business* — not *Home*. The PC2 will be a business machine, targeting a market where IBM stands tall, and its introduction should be marked by calm appreciation, not by panic among competitors or surprise among users.

CONGRESSIONAL HEARINGS
ON
FBI
NATIONAL CRIME DATA BASE
EXPANSION

'Don't worry, gentlemen — no data on suspected criminals will be input that's not at least third-hand, unverified, speculative hearsay!'

LETTER

Computer crime council supported

The article "Theft of $100,000 traced to credit bureau system tap" [CW, Jan. 14] underscored the comments that Walter R. Kurth, president of Associated Credit Bureaus, made in *USA Today*. He said there is a "mounting sense of urgency. . . . It's time to look at additional steps" in security and legislation to put a cap on computer crimes. He suggested that credit bureaus in the U.S. establish a council to fight computer crime.

As a former member of the Committee on Computer-Related Fraud and Abuse of the President's Council on Integrity and Efficiency, I support such a council.

In this age of information, people and machines are in a direct, continuous partnership, forming information systems that are highly effective and productive. However, today's on-line information systems bring added risks that many executives fail to recognize.

The American Institute of Certified Public Accountants recently surveyed financial institutions and insurance companies to determine the extent of computer-related fraud in those communities. Not all those organizations responded: only 5,127 banks and 854 insurance companies. But those that did provided the following alarming statistics:

- Most reported that computer-related frauds were perpetrated by insiders.
- Twenty-six percent of the reported cases had been on-going for more than a year.
- Sixteen percent of the reported cases involved dollar amounts greater than $100,000,

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VIEWPOINT

Users trail galloping progress of technology

LECHT ON SCIENCE
Charles P. Lecht

We'd be hard pressed to consider the technological progress in the computer industry anything less than spectacular during the first half of the 1980s. Just about all the good things we wished for came true, including incredible increases — along with commensurate decreases — in systems power. As 1985 began, more than 60 million computer systems were on the desktops of Americans, and that just begins to reflect the progress. In 1980, many systems were considered so powerful that the U.S. government prohibited their sale abroad to all but America's closest allies. The recent emergence of desktop systems that integrate the power of computer technology with telephone, teletype and facsimile systems confirms that, in the first half of this decade, such progress has indeed been spectacular.

By comparison, the technological progress made by computer users in all industrial sectors appears dismally poor. The previously stable, if not perfect, computer technology that once serviced user needs has changed so fast that the manufacturer community seems to have forgotten the devastating effects this can have on its operations. Nothing is more upsetting to managers than the pressure to keep up with the competition caused by endless change in the tools they must use to do so. It's no wonder that many users secretly wish for the good old days when the life cycle of computer-based systems was at least five, and frequently, 10 years. And the life of the manufacturer that produced the hardware and software environments could be expected to last at least as long then.

In those good old days horrendous conversions were required when new systems were brought in. Today's data center managers tell me that, as the new, "almost" compatible gear flows into their facilities at ever faster rates, the rapid-fire — albeit less troublesome — conversions they face have not comprehensively lessened one bit the degree of trauma they previously faced.

Because of all the industry's technological progress, some computer facility managers I know have had to endure the embarrassment of awaiting the delivery of a newly procured system at the same time its vendor was announcing its replacement — calling the purchased system obsolete and discontinuing its manufacture. Faced with unanticipated decay in the residual values of the systems they bought, some managers have had to face the unhappy consequences of being the bearers of any bad news to management. And upon seeing its effect on assets, the management may have preferred to write down the career of the bearer instead of the value of the systems.

> *Users are doggedly trying to cope with a technology that, once contained in a single room, is now spread all over the place: a technology whose parts, made by international vendors, may defy connection.*

Yet other managers — pressured into buying the latest "cheapie" system from a company that, for a short period of time, lost its capability to distinguish between a toy and a computer — have been fired when the company from which they purchased the system retained its senses, discontinued its computer line and went back to making toys. The data center manager was charged with not being able to distinguish between a toy and a computer.

It would be hard to locate a user facility in which one or more of the above events or others of the same genre have not occurred during the first half of the '80s. In view of this, it is not surprising that some users — especially those who experienced the problems described above — think this period of accelerating technological progress has done nothing to make their computer systems chores easier. And it is also not surprising that users do not consider progress the computer industry's most important product.

Many users have hoped that such progress would summon the arrival of user-friendly, truly symbiotic systems so that the time they previously spent getting these systems to work might be reapplied to the affairs of their companies, but these hopes remain unfulfilled. Instead, they are doggedly trying to cope with a technology that, once contained in a single room, is now spread all over the place: a technology whose parts, made by international vendors, may defy connection, except by a bright young engineer who holds the key to the technology's continued operation.

If this view on the effects of galloping technological progress on the user community during the first part of the '80s seems pessimistic, I apologize and offer the following forecast to raise the spirits of those who must carry on. The second half of the '80s will bring far better days. As the grand plans of our industry leaders unfold, we cannot help but

See LECHT page 44

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Fitting deadlines to resources cuts project failures

THE DATA CENTER
John P. Murray

The reasons for project failure in information processing are numerous. Some failures result from technical difficulties, some result from poor management. In some cases, the reasons for failure are valid, but in other cases they are simply excuses.

Project failure, to some degree, is in the eye of the beholder. A project that some organizations consider a failure may be considered at least a qualified success by another organization under identical circumstances. Let us consider the criteria for project failure as exceeding the original time and budget schedule and not delivering what was originally outlined in the specifications.

It can be argued that the preceding criteria are too rigid, given the often-sorry record of project completion in many organizations. Yet information processing projects can be successfully managed based upon such criteria. Projects can be consistently brought in on time, within budget and in accord with the specifications.

Arbitrary deadlines a problem

There is at least one all-too-common situation that almost guarantees project failure: the arbitrary imposition of project deadlines. It is not unusual to find the number of deadlines in an organization set in an arbitrary fashion. The above-specified project failure rate in these organizations is usually rather high. There is a correlation between the method used to set the deadline and the likelihood of project success.

Not only are these deadlines set arbitrarily, but often they are also set by someone who is not sufficiently knowledgeable in what to do to meet the deadline. For example, the vice-president of marketing meets the MIS director in the hall and says, "Oh, by the way, we will need support for our new marketing program that starts in three months. I guess I should have told you sooner, but it just slipped my mind. This should only be a minor system. It's not a real problem, is it?"

"We can handle that," the director replies, and then he approaches the systems and programming manager. "Marketing needs a new system, you better get someone to talk to them; they need it in three months," the director says.

Many of us are painfully familiar with the rest of the story. The new system is anything but minor. The new marketing program is indeed scheduled to begin in three months, but no one knows yet precisely what will be required. In fact, the plan for the new marketing program is now under revision, and until that is completed, no one can provide any concrete direction. Information processing goes into a wait state on the project, yet the meter continues to run toward the three-month completion date.

[illegible]

In time, the necessary detailed information about the system requirements are obtained, and the serious work begins. By now, of course, there is no way the original project deadline can be realized. The project, originally scheduled for completion in three months, is completed in seven or eight months. The marketing department is upset because the system took too long to complete, the information processing director is unhappy because the project exceeded the original schedule, and the project team is generally demoralized.

Project deadlines should never be arbitrarily imposed upon the project team. The project leaders must be given the time to analyze carefully what is required to complete the project, and they should set the deadline.

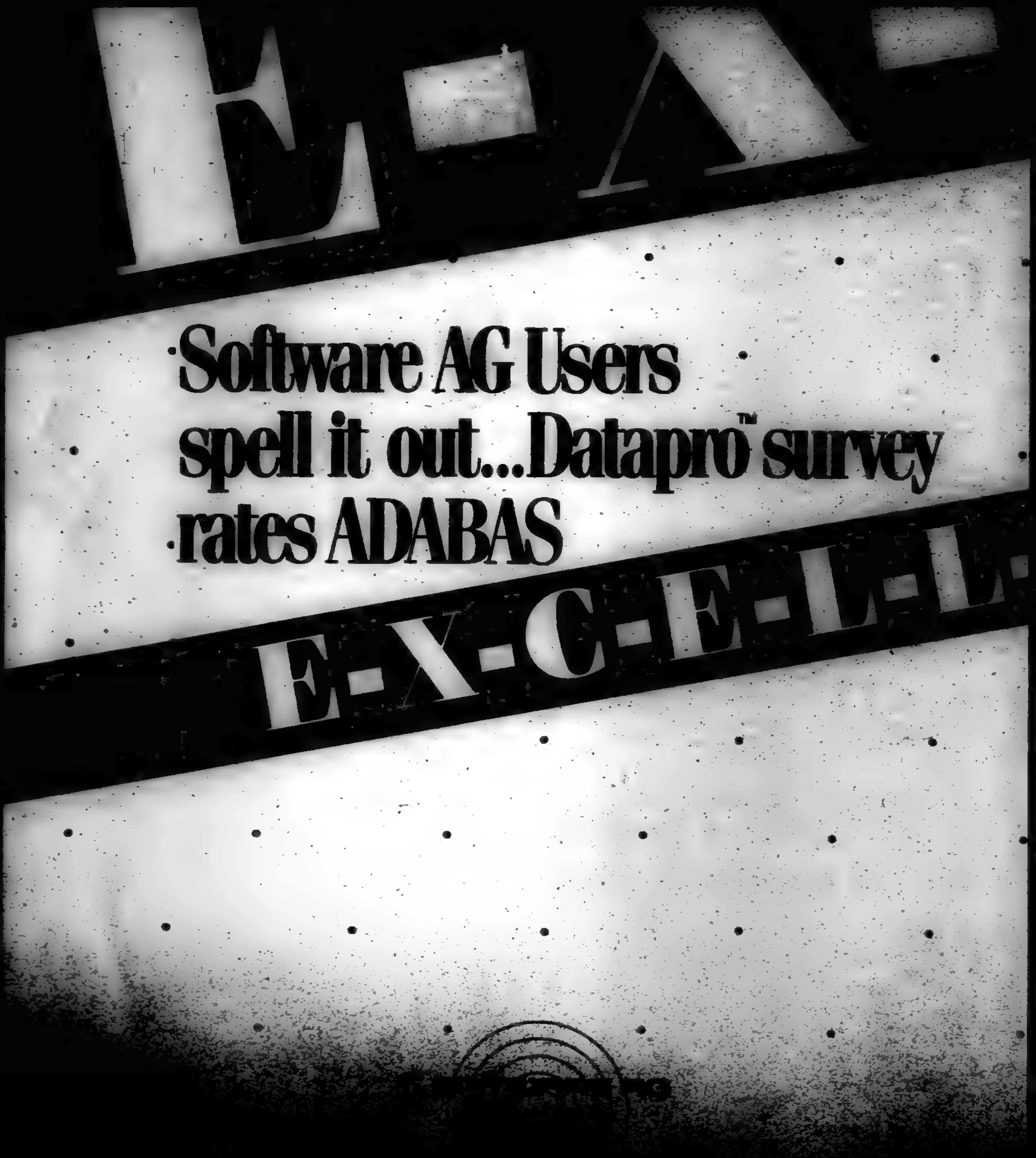
This does not mean the project leaders can set arbitrary deadlines any more than anyone else. The deadline should be achievable, based upon sound knowledge of the required results and must agree with those who use the system. This may require a general compromise to meet a reasonable deadline, but once set and agreed upon, the deadline should become fixed. Don't set the project deadline until you fully understand what is to be accomplished, whether or not you can do it and are certain of a reasonable degree of success.

'Crash' [illegible]

Of course, in some situations project needs are immediate, and a "crash" effort must be mounted. These instances should be rare in a well-managed organization. When they do arise, however, any deadline should be based on a "best guess," and appropriate senior management should be so informed. Sometimes, once clients understand that crash projects get immediate attention, a great number of such projects will be proposed. If information processing management accedes to these demands, many of its projects will end

See [illegible] page 44

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*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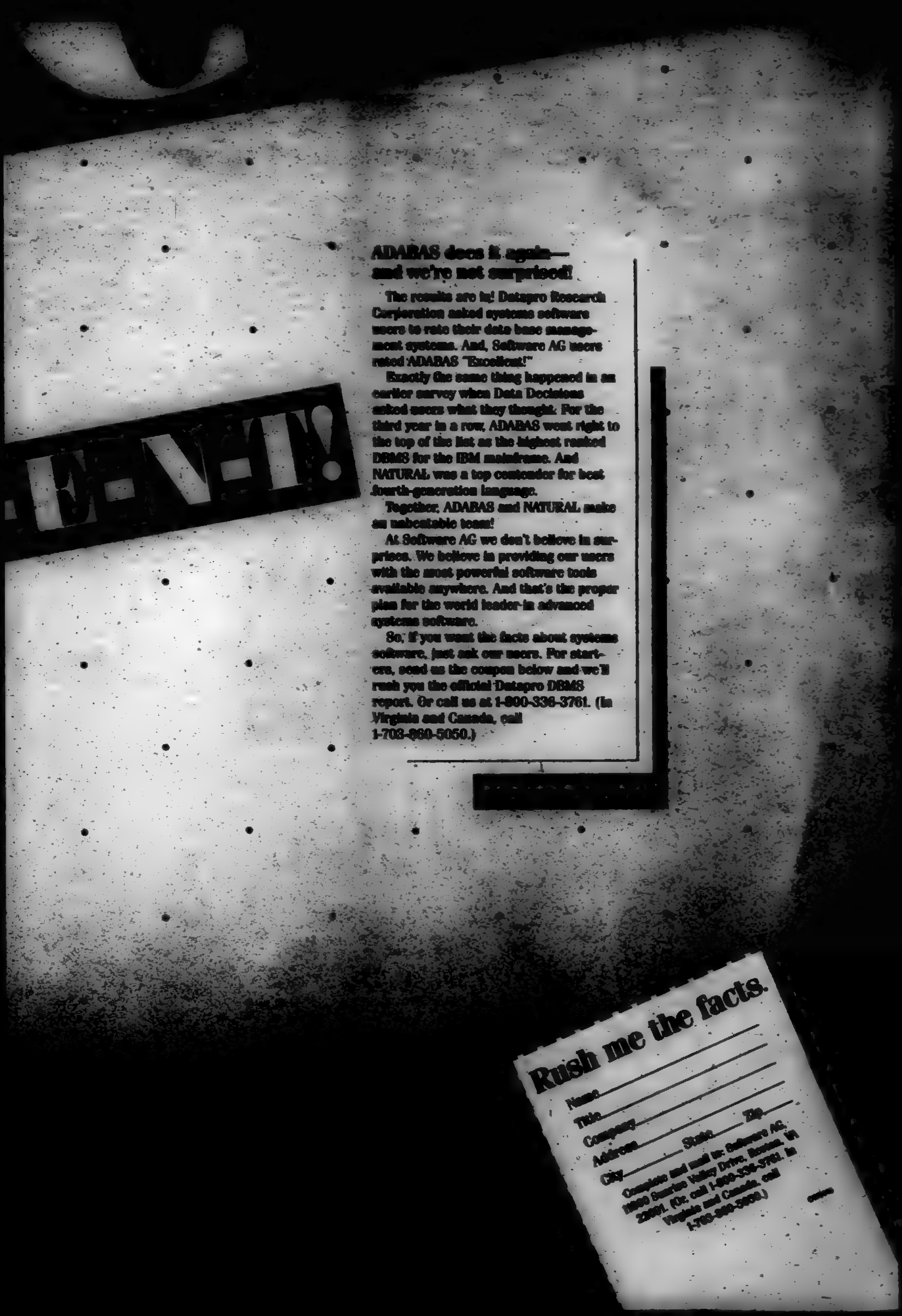

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The results are in! Datapro Research Corporation asked systems software users to rate their data base management systems. And, Software AG users rated ADABAS "Excellent!"

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Complete and mail to: Software AG, 11800 Sunrise Valley Drive, Reston, VA 22091. (Or, call 1-800-336-3761. In Virginia and Canada, call 1-703-860-5050.)

System error messages, manuals need some cleanup

READER'S PLATFORM
Hutch Deloach

In the explosive evolution of information management, some of the simplest and most important aspects of the technology have been drastically ignored. This is particularly true in respect to the need for continued research and solutions for those long-term issues and problems that have gone unresolved. Such problems can be expected in a dynamic and changing environment but must not be allowed to continue and complicate future growth and development.

One example of such a problem is the "owner's mess," short for "unknown errors and messages." I would suggest that a vendor association be established to resolve once and for all the weaknesses and extreme diversities of error messages and manuals.

The following is a recommended list of questions that should be addressed by the association early in its existence:

■ Why must users face messages such as "an unexpected error has occurred"? Is the vendor trying to tell users that all other errors can be expected to occur on a regular basis? How many times must an unexpected error occur before the system begins to consider it an expected error?

■ Why is it that when a serious error occurs, the computer usually performs an automatic system reset followed minutes later by a local power failure so that there is no chance of debugging the problem?

■ When a message such as "Please notice that an error has occurred — error code = 111B" appears, why does the explanation of error codes in the manual skip from 111A to 111C?

■ Why are some of the error messages left out of the manual?

■ Why are error messages printed on the console when the error manual says to ignore them?

■ Why do we get error messages that say "error has occurred" only to find the explanation in the error manual says "self-explanatory"?

■ Why does the manual instruct the user to ignore errors that lock up the entire system?

■ If I am a systems programmer, what do I do when I am having a problem and the error manual says "contact the systems programmer for more assistance"?

■ Why are error messages that say, "This program has been canceled due to program request" used? Few of us have ever written a program requesting itself to cancel before completion.

■ Why do most error manuals contain complex errors that never occur and could not be fixed by a programmer even if they did occur — for example, "temporary surge to transistor on circuit board 13-C"?

■ Why do most common problems not give error messages, and why do they eventually wind up bombing the system?

■ Why are some error manuals written as if the user had experience in designing operating systems? For example, "An improper value has been encountered by the extraneous logic detector inside one of the pseudorandom registers — please locate and correct the value in error and restart the program."

■ Why do vendors come up with noncommittal messages that do little more than keep nice people awake at night? For example, "An error has occurred; all data on the data base may have been destroyed." If such error messages must continue, it would be helpful to be told what chance exists that the data has survived. For exam-

See ERRORS page 44

Deloach is a systems programmer for the Georgia Ports Authority in Savannah, Ga.

ARE IBM'S NETWORK DIFFICULTIES INTERRUPTING YOUR REGULAR PROGRAMS?

There's a lot of talk abo local area netw ing at IBM. Unf tunately, that's a there is.

That's becaus IBM doesn't

have local area networking [illegible] yet. And who knows when they will.

The question is, why wait for IBM to catch up with technology that Wang has today?

WANG OPENS COMMUNICATION CHANNELS WITH LOCAL AREA NETWORKING.

When you use Wang computers, including any of our VS family of minicomputers, you can have local area networking today. It's called WangNet. And it's already in use in hundreds of businesses. WangNet permits the concurrent exchange at up to 10 megabits per second of data, text, graphics, electronic mail, even video. It can tie all your organization's departments together, whether they're in one building or several.

And WangNet is just one part of Wang Systems Networking, a complete communications framework for sharing information among Wang systems and with other systems, too. WSN's three-tiered design is flexible enough to meet any company's communications needs.

FEATURES	WANG VS [illegible]	IBM SYSTEM 36
[illegible]	Yes	No
32-bit Architecture	Yes	No
Cache	Yes	No
Object Code Compatibility	[illegible]	36 only
Virtual Memory Operating System	Yes	No
[illegible]	Yes	No
Local Area Networks	Yes	No
[illegible]	Yes	No
[illegible]	Yes	No
[illegible]	Yes	No

JUST GIVE US ONE SHOT.

WangNet may be the beginning. But as the chart in this ad suggests, there are lots of other reasons we'd like to tell you about why you should let Wang handle your distributed data processing. Including Wang's worldwide service and support program.

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LETTER

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many involving millions.

■ Only 26% of the reported cases were detected by internal controls or routine audits.

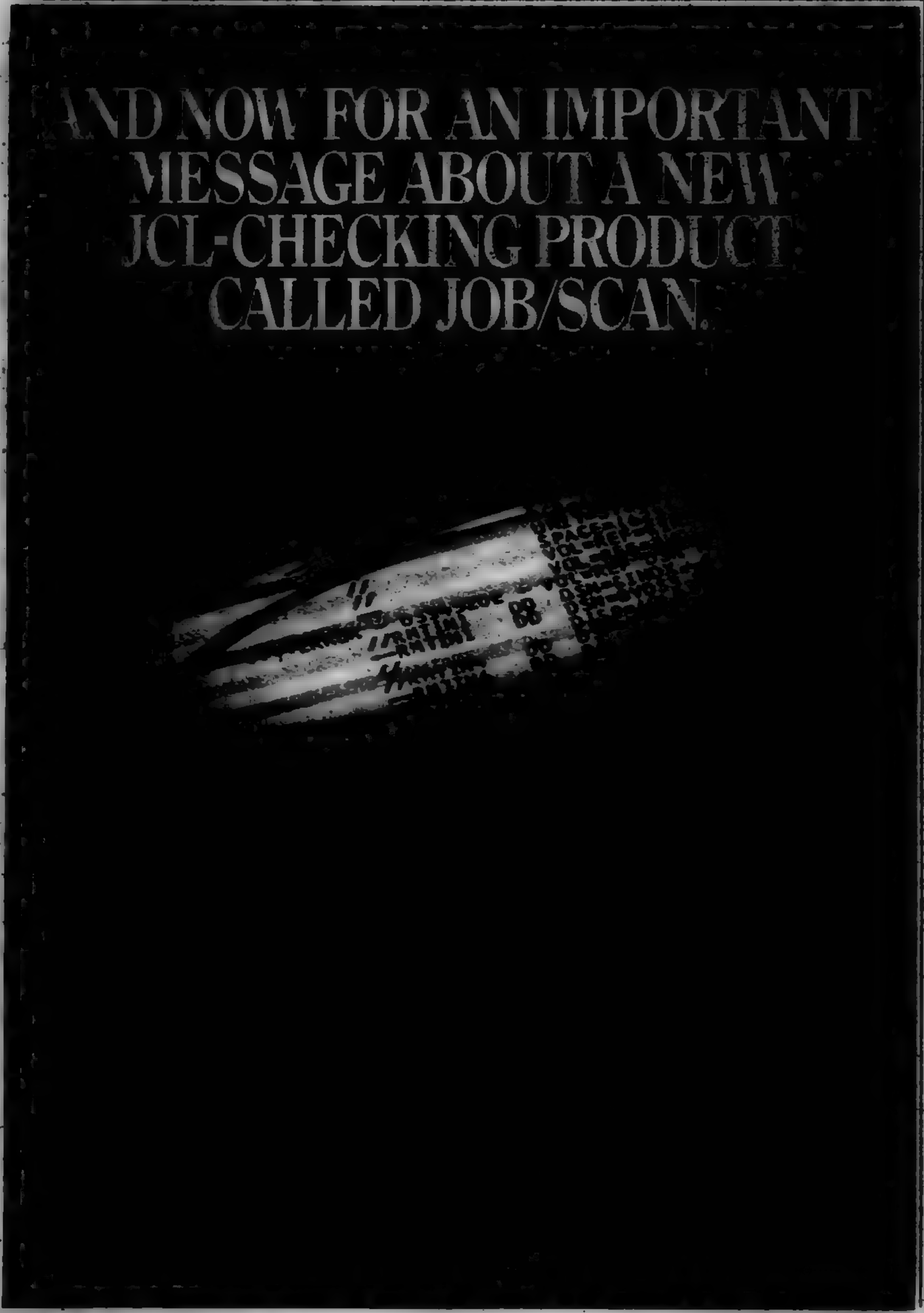
These statistics reflect only detected and reported cases. Obviously, no statistics exist on the numbers or dollar value of losses for those cases that go undetected. However, it is a general consensus among law enforcement officials that such losses are in the billions. With losses of such magnitude, Kurth's "mounting sense of urgency" can be considered an understatement.

A few years ago, a small group of us in the computer security community attempted to establish a nonprofit organization to foster advanced research and disseminate information on ways and means of protecting information resources. We considered this proactive approach vital to any effort aimed at attacking the computer crime problem and related security issues. However, we were not able to generate the necessary interest or financial support within the business community.

Such an organization is needed today more than ever. However, the issues involved are too numerous and complex for any single association or professional society. Today, it is possible for the federal government to take the leadership position in establishing a council of public and private sector representatives to include, among others, those in computer science, security, communications, business, legal and social science.

Although such a council can be organized in many different ways, it is important that the problems involved be addressed from a broad interdisciplinary perspective across institutional lines.

Robert G. McKenzie
Alexandria, Va.


AND NOW FOR AN IMPORTANT MESSAGE ABOUT A NEW JCL-CHECKING PRODUCT CALLED JOB/SCAN.

LECHT

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reach this conclusion.

At the heart of the plan of attack is the massive integrated services digital networks (ISDN), to which data processing devices will experience increasing connection. The evolutionary process during the earliest days of telephone systems will reveal itself as having been operative for some time, but its domain of operability, to our astonishment, will be discovered to exist in equal measure from chip to ISDN and everywhere in between. And the forces that created the ultimate standardization achieved in the telephone networks of the past will mount to do the same once again.

This will lead to an astounding technosynthesis that will end today's galloping technological progress in the computer industry by transferring it to the user community. I see victory for the user community at the end of the decade.

FAIL

from page 39

up being classified as failures.

When the team is allowed to select a reasonable deadline for project completion, it has a responsibility to meet that deadline. Meeting the deadline should be understood to mean completion on time, within budget and in accord with the project specifications.

Information processing is a finite resource chased by infinite demand in many organizations, but it is simply impossible to be all things to all people. Those in charge of the function must determine project deadlines by moving from arbitrary imposition to considered practicality. This improves the success record of the installation, and the entire organization will be better served.

ERRORS

from page 42

ple, "There is a 78% chance that all data on the data base has been destroyed."

For the sake of operators' and programmers' sanity, hardware and software vendors need to take a serious look at their technological priorities. It is very difficult to explain to your boss that "No error occurred" when the system crashed, or that the error has not been corrected because the error manual said, "Ignore it".

It is difficult to understand how problems like "unknown errors" can exist in a technology where program executions occur at a rate of billions of units per second. Perhaps vendors integrate unknown errors as a means of training for their technical support centers. ‡

SOFTWARE & SERVICES

Micro-mainframe links cater to data downloads

By John Desmond
CW Staff

PHILADELPHIA — For some companies using micro-mainframe links here, data paths are a one-way street.

That was the consensus of three micro-mainframe link users who are employing communications software to download host data to micros but not allowing users to manipulate the information and update mainframe data bases.

The Computer Task Group, Inc. (CTG), a consulting group based in Buffalo, N.Y., called together information systems executives from several area companies for a discussion of data sharing via micro-mainframe links. According to Nancy Kuivila, end-user support manager for CTG, "There is a lot of talk about uploading and downloading, but many companies are just downloading reports. It is similar to reading a piece of paper rather than doing any real processing and then uploading to the data base."

Link users indicated that to manipulate production data on personal computers and subsequently upload it to the mainframe, they need micro-mainframe link software that is easy to use and that ensures data security. In addition, the purchases of such packages should be justified through cost-benefit analysis.

See LINK page 54

Links provide quick fix

But problems can arise from simple data link solutions, users told

By John Desmond
CW Staff

ANDOVER, Mass. — In lieu of a long-term strategic plan, DP and MIS managers with hordes of microcomputer users clamoring for links to the mainframe should provide a quick solution, visitors to a seminar on micro-mainframe links held here recently were advised.

But both the consultant and the micro-mainframe link vendor who offered that advice cautioned that such a "quick solution" approach often causes problems. Both were speakers at the seminar titled "Micro to Mainframe Links" sponsored by Software Institute of America, Inc.

Approximately 350 types of micro-mainframe links are currently available, said Kenneth Rau, a partner in the Winchester Consulting Group management consulting firm of Woburn, Mass. But during the 18-month period in which most of the links were introduced, the promise of the products has gone unfulfilled and user enthusiasm has faded to skepticism, he said.

Rau said terminal emulation and what he labeled file-loading-type links, allowing data downloading from a mainframe to a mi-

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- Informatics General announced enhancements to its Mark IV and Mark V IBM mainframe application tools/47
- Performance measurement and charge-back software from Computer Associates International is now available for IBM VM/CMS users/47
- Are relational products really data base management systems?/48
- IBM unveiled the Information Development/VSE package for application development by DP professionals and end users/50
- Applied Data Research announced Release 5.4 of its Roscoe program development system for MVS/52
- Honeywell introduced an on-line conference system for its DPS 8, DPS 88 and DPS 90 processors/52

HP enhances DBMS for 3000 supermini

PALO ALTO, Calif. — Hewlett-Packard Co. has announced an enhanced version of the HP Image/3000 data base management system for its HP 3000 superminicomputer. HP Turbo Image is said to offer improved storage capacity and data recovery in all HP 3000 series machines and improved performance for larger HP 3000 processors.

An HP spokesman said HP Turbo Image doubles the storage capacity of the HP Image/3000 data base and provides up to a 300% increase in the number of DBMS files and up to a 100% increase in the number of data items per set. The enhanced DBMS also increases maximum records in the data set from six million to two billion and increases maximum records in a data chain from 6,000 to two billion.

HP Turbo Image improves recovery time with a roll-back recovery method and is fully compatible with all HP Image/3000 applications, according to the spokesman.

HP also announced HP Database Tools, performance

See HP page 58

Solo software shows falter

SOFTALK
John Gallant
CW Senior Editor

Can the software-specific trade show survive?

If you attended two of the recent software-specific trade shows held this year you will consider that a valid question. One can assume that most people consider the concept of a software-specific trade show a good one. But the way those shows actually turn out is often a different matter.

Consider the 1985 Softcon conference held in the fair city of Atlanta. It seemed to promise so much: a winning locale, a gala kick-off with ABC's Ted Koppel — reportedly for the tidy sum of $25,000 — chairing a panel of industry heavyweights musing on the future of software, an arm-long list of exhibitors and an agenda of sessions and workshops hosted by a bank of experts, pundits and seers.

What happened?

The show was a bore. Plain and simple. First, attendance was low. Unlike some of the claustrophobic cross-industry shows such as the National Computer Conference and Comdex, visitors could easily pass along the aisles between the booths on the Softcon conference floor. In fact, there was so little traffic at Softcon that it would have taken some real effort to bump into anyone on the floor.

And it was not just attendees

See SHOWS page 60

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IBM SQL/DS and DB2 relational DBMS now on PC

ORACLE, the relational DBMS compatible with IBM's SQL/DS and DB2, is now available on the IBM PC/XT and PC/AT. While SQL/DS and DB2 run only on IBM mainframes, ORACLE runs on IBM mainframes as well as on DEC, DG, HP and most other minis and micros. Any application written for SQL/DS or DB2 will run without modification on the complete range of systems supporting ORACLE, including PCs.

SQL/DS and DB2 are relational database management systems; ORACLE is a relational DBMS plus an integrated set of 4th generation software tools for application generation, report writing, color graphics and network communications.

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■ **The ORACLE Personal Information Center** extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

■ **The ORACLE Distributed Information Center** provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

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ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 2043.

DAVOX

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Informatics General enhances applications tools

WOODLAND HILLS, Calif. — Informatics General Corp. has announced enhancements to its Mark IV and Mark V IBM mainframe applications development tools.

Enhancements to Release 10.0 of the Mark IV batch applications development tool include improved program documentation and error diagnosis, including cross-reference and execution-trace reports, a spokesman said.

Other added features include improved IBM DL/1 and Vsam support for file browsing and generic key functions and improved reporting capabilities such as changeable fonts for laser printers and overstriking.

Enhancements to Release 5.0 of the Mark V nonprocedural applications development system, for developing on-line applications under IBM's IMS/DC and CICS, include IBM Fast Path data base support for IMS/DC and improved screen design capabilities including 3270 extended attribute support.

Improved processing capabilities reportedly include simplified date and numeric field validation, flexible selection and branching and diagnostic messages.

Release 5.0 of Mark V also provides enhanced debugging aids such as troubleshooting screens, CICS command-level program generation and run-time file definitions.

Mark IV Release 10.0 is priced at $78,000 and $96,000, respectively, for the DOS and OS versions. Mark V Release 5.0 is scheduled for delivery in the second quarter and is priced at $36,000 for the DOS/CICS version, $45,000 for the OS/CICS version and $100,000 for the OS IMS/DC versions.

Informatics General is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

CAI extends its CA-Jars for VM/CMS

JERICHO, N.Y. — Computer Associates International, Inc. (CAI) has extended its CA-Jars performance measurement and chargeback software to IBM VM/CMS users with CA-Jars/CMS. The company also announced Release 5.0 of CA-Jars/CICS, an on-line job accounting tool for IBM DOS/VSE and OS/MVS users.

CA-Jars/CMS includes five components: project accounting, interval resource logging, product accounting, a historical data base and a report writer, the vendor said.

The project accounting component reportedly allows the VM/CMS user to assign any portion of a CMS session to a specific project and charge individual projects for the resources consumed.

The interval resource logging feature allows the VM/CMS user to capture resource consumption data at specified intervals for managing peak load periods.

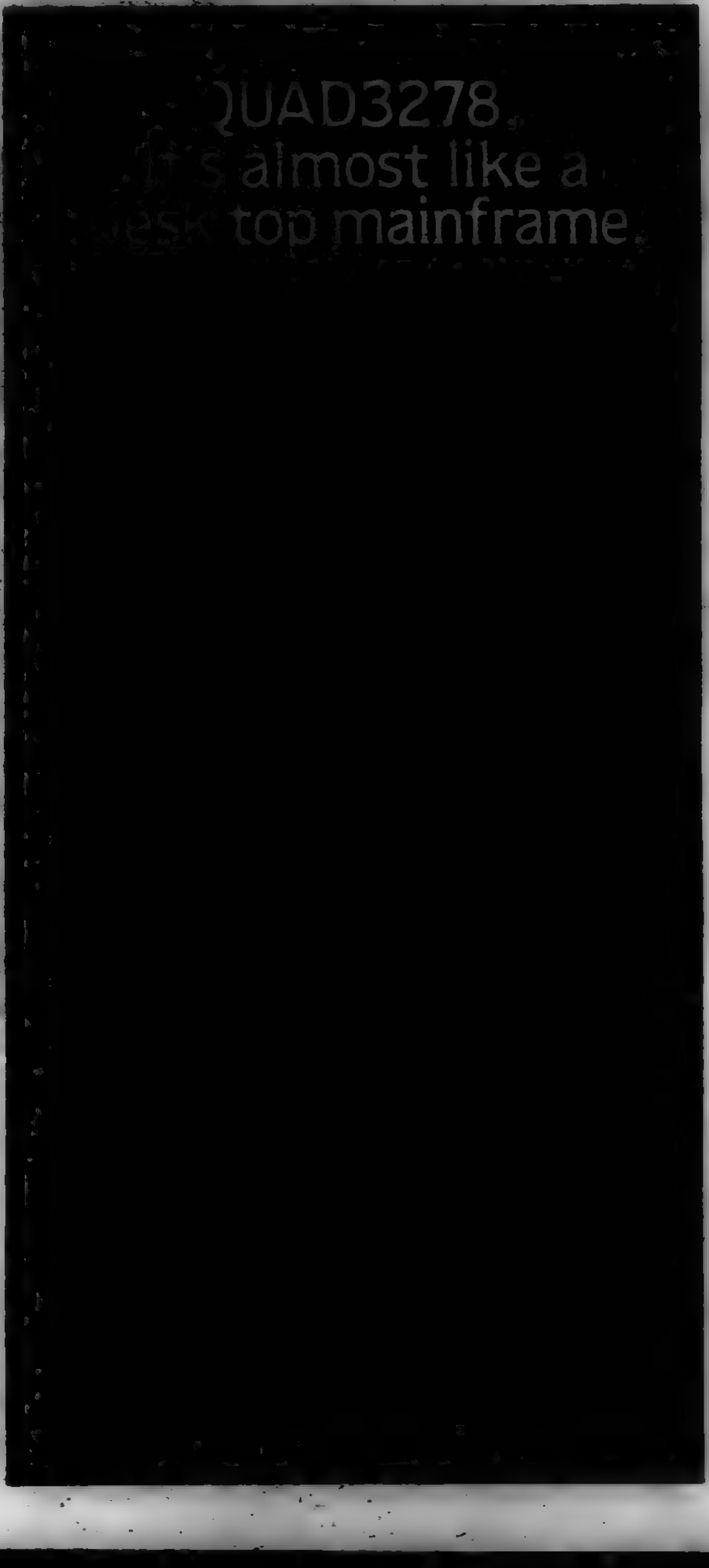
Product accounting allows CA-Jars/CMS users to track software products for cost distribution.

A permanent license for CA-Jars/CMS is priced at $15,000.

Enhancements to Release 5.0 of CA-Jars/CICS include response time degradation analysis for trouble-shooting an on-line network, menu-driven graphics, on-line displays, report language and the company's Wizard graphics report generator.

Release 5.0 supports IBM's CICS 1.6 and 1.6.1. A perpetual license for CA-Jars/CICS is priced at $10,500 for DOS/VSE and $14,250 for MVS.

CAI, 125 Jericho Tpk., Jericho, N.Y. 11753.



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Relational products failing to meet basic DBMS criteria

SOFTLINK
Bob Morison

When is a relational product not a data base management system? The answer, unfortunately, is most of the time. In their rush to market products that qualify as relational, vendors are delivering products that fail to qualify as DBMS in the first place. This is true of even the flagship relational offerings of some major hardware and software vendors.

Meanwhile, encouraged by data base theorists and by a marketing blitz, users are catching relational fever. Unless they select products carefully, they risk trying to build information systems on relational products that simply do not meet their needs.

Of the three most common models for data base systems — hierarchical, network and relational — relational offers the greatest flexibility in data access. Relational products have the powerful capability to relate records by matching data values without regard to defined data relationships or data base paths. In so doing, however, they often forfeit the essential ability to relate records with regard to defined relationships. The latter is the essence of a DBMS.

By accepted definition, a DBMS models and manages not only an organization's raw data but also the relationships among that data. In fact, the relationships themselves are an essential part of an organization's data. A DBMS must support defined relationships between logical data types and enforce them automatically. In a true DBMS, for example, you can tell the system that purchase orders are associated with vendors and the system will put that knowledge to work for you.

Sophisticated file managers

Products that fail to support defined relationships may qualify as sophisticated data or file managers, but they are not DBMS. Moreover, they probably disqualify themselves from use in complex, integrated applications — such as accounting, manufacturing planning and control and order service — where data types are many and logical relationships must be enforced. Without a true DBMS, you can model a business' raw data, but you cannot fully and accurately model the business itself.

This lack of support for defined data relationships underlies many of the fundamental problems besetting relational products today. Most relational products fail to support the essential function called referential integrity. Referential integrity dictates, for example, that a purchase order may not be written for a nonexistent vendor. Conversely, a vendor may not be removed from the data base if purchase orders are assigned to it.

If this logical relationship between vendors and orders is not defined, the system cannot enforce it. Instead, programmers must be aware of the implied relationship and write applications code to enforce it.

The more complex the application's logical data relationships are, then the greater the exposure to data inconsistencies when programmers fail to enforce logical relationships.

The most commonly cited drawback of relational products is their inefficiency in production environments, especially in terms of I/O. A partial remedy is to use the knowledge of defined data relationships to reduce I/O.

For example, a purchase order is logically associated with a single vendor. Having

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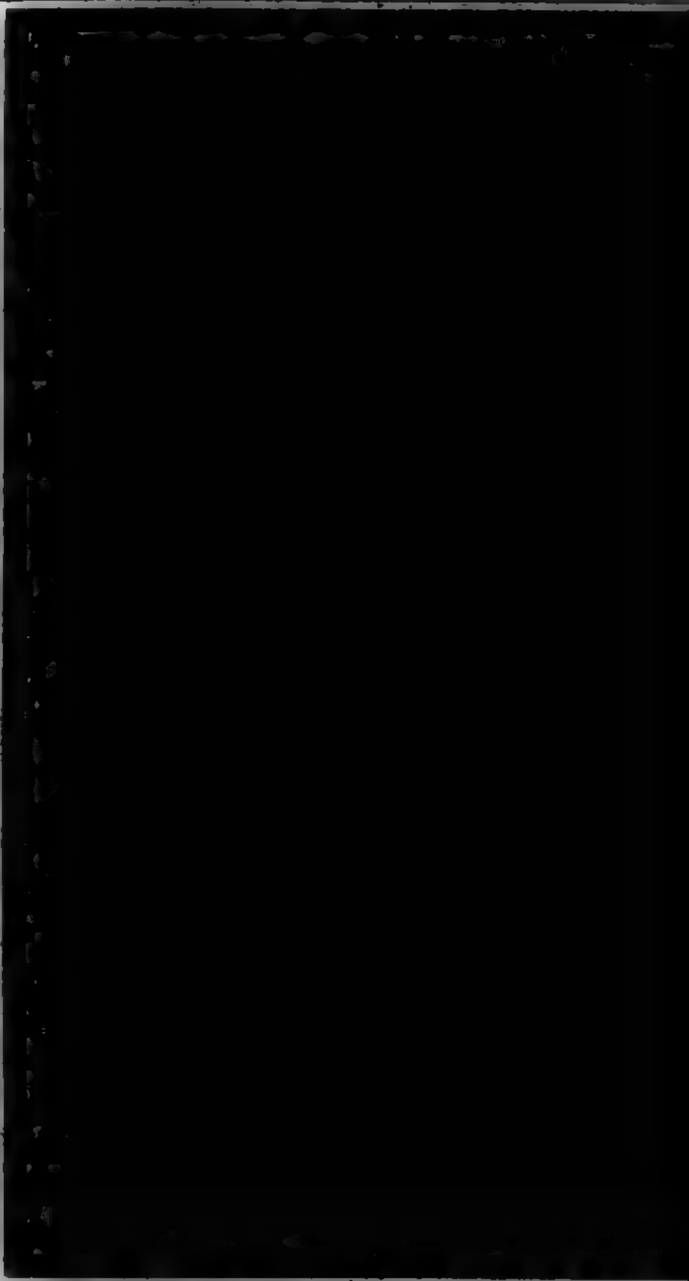
Morison is manager of technical consulting at Mims Systems, General Electric Information Services Co., in Burlington, Mass. Mims is a hybrid network/relational DBMS and nonprocedural programming language.



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accessed an order record, the DBMS should be able to access the associated vendor record with no more than one additional I/O action. This can be done via an embedded pointer in the order record containing the exact address of the associated vendor record.

But most relational implementations do not employ interrecord address pointers. They do support forms of indexing, so, at best, locating a logical owner record requires an index search. At worst, if the necessary index is missing, it requires a data file search.

Inability to update views

Another drawback of relational products is the frequent inability to update views. A view is a virtual table, or file, containing selected records and fields from one or more base data tables. A view may represent data about open purchase orders and selected data about vendors and line items.

Most relational products support multitable view for reporting but not for updating. Because the logical relationships among data types are not defined and enforced, the system cannot automatically decompose — or sort out — an updated view into appropriate updates to the underlying records.

Therefore, relational products usually impose the restriction that a view to be updated must be a subset of a single data table. But disallowing updates to complex views forfeits much of the advantage of the relational approach. A multitable update requires a multistep program, a procedure reminiscent of the data base pathing that relational proponents abjure.

In practice, many views are logically updatable — if data relationships themselves are defined. The DBMS should be able to use defined relationships to decompose views. It should then perform the appropriate updates or else warn the user if the resulting updates would be ambiguous or contradictory.

Complex data structures

Relational products also have difficulty handling certain complex data structures, notably recursive relationships in which a file is related or cross-referenced to itself. For example, financial accounts related to other accounts form a chart of accounts; parts related to parts form a bill of materials.

Representing bills of materials normally involves two logical data tables, a master parts table and a product structure table. Each record in the product structure table is logically related to two records, one assembly part and one component part, in the parts table.

Modeling this dual relationship can provide essential functionality currently missing from many relational products. A robust DBMS handles operations such as parts explosions efficiently. Its programming language includes concise, nonprocedural commands to do both reports and updates. And it supports low-level code integrity, whereby the software prevents, for example, product structure loops.

By failing to admit this type of defined relationship and to support even simple explode actions, many relational products disqualify themselves from production applications that rely heavily on recursive data structures.

Convenience, confusion

Why do most relational products fail to provide basic DBMS functionality? There seem to be two related causes: convenience and confusion.

The relational model calls for data represented to the user as simple tables. The most convenient implementation of the model is to restrict physical data structures to stored data tables, one per record type, and their indexes. In the rush to market relational products, vendors have avoided the more complex but more functional internal architectures associated with network and hierarchical systems.

Theoretically, relationships could still be maintained dynamically, but with extra I/O, by these relational systems. However, most vendors have not developed the sophisticated software to do so.

The confusion is over the exact meaning of relational. The word refers to a model of data for the user and to a language based on that model. The logical model itself

See DBMS page 60

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IBM unveils tool for applications development on VSE

RYE BROOK, N.Y. — To complement its recently unveiled Version 2.1.1 of DOS/VSE/SP [CW, April 8], IBM has announced Information Development/VSE 1.1 (ID/VSE 1.1), aimed at improving the productivity of application developers who use VSE.

At the same time, IBM announced Interactive Composition and Editing Facility Version 2 software for composing documents containing text, computer-generated graphics and scanned images.

The program can be executed from the IBM 3270/3290 display terminals with graphics capability under the VM/CMS Release 2 operating system.

Four programs

According to a spokesman, ID/VSE 1.1 is an applications package composed of four programs. The package runs on processors that support VSE/SP 2.1 or SSX/VSE Release 4.

Features of ID/VSE 1.1 reportedly include applications development functions in a CICS/VS environment, query support for Vsam files and support of data transfers from the host to the operating system's host transfer file for further processing at intelligent workstations. The package is also said to expand VSE/SP and SSX/VSE Intelligent Workstation Support (IWS).

The ID/VSE's productivity facility program provides menu panels to help users select and move between programs. Movement of data to the IWS transfer file is aided by menus, from which tasks can be selected.

Other programs in the information development package provide functions for generating and executing applications, setting up queries on VSE/Vsam files and supporting graphics applications.

Interactive interface

Cross System Product/Application Development (CSP/AD) Version 1 provides an interactive interface for defining, testing, maintaining and generating application programs. The product is said to allow users with limited data processing skills to define and generate applications via question-and-answer techniques. CSP/AD Version 2 adds support for DL/1 data bases and large terminal networks.

CSP/Application Execution provides the ability to execute any application defined and generated via CSP/AD.

CSP/Query is a query language product that permits selection, display or printing of data from Vsam files.

The Graphical Data Display Manager (GDDM) program and its Presentation Graphics Feature provide graphics drawing, display and printing capabilities that coexist with current applications.

Reformatting data

In another feature, ID/VSE provides utilities that reformat CSP Vsam data prior to moving it to the operating system's IWS transfer file. From the IWS transfer file, the data can be transmitted to workstations. Users can select from two data reformat options: that used on the IBM Personal Computer with Basic and Software Arts, Inc. Data Interchange Format structure.

ID/VSE Productivity Facility is available for a one-time charge of $1,800 for a basic license or $1,630 for the distributed system license option. The one-time charge for GDDM is $715.

Features of the Interactive Composition and Editing Facility Version 2 include the ability to create tables and bibliographies and to embed graphics and images in documents.

The product also includes a processor for viewing and printing mathematical formulas and a dual-screen mode that allows the user to edit a document on one screen and view the formatted result on another. The one-time charge for Interactive Composition and Editing Facility Version 2 is $25,000.

Further information is available from IBM at 900 King St., Rye Brook, N.Y. 10573.

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INFORMATION SERVICES

General Electric Information Services Company, U.S.A.

Honeywell launches Forum 8 Interactive Meeting System

PHOENIX — Honeywell, Inc. has announced the Forum 8 Interactive Meeting System, an on-line conference system for the company's DPS 8, DPS 88 and DPS 90 processors running the Gcos 8 operating system.

Honeywell also announced the Solution Center Menu System for the integration of the company's Solution Center software with the Gcos 8 Time-Sharing System, also running on Honeywell processors.

The Forum 8 software allows Gcos 8 users to conduct an electronic conference. Forum 8 maintains, sequences and controls access to conference transactions, a spokesman said. Users can participate through dial-up connections. Forum 8, to be available in the second quarter, costs $180 per month for a one-year minimum agreement.

The Solution Center Menu System allows end users to pass data between Solution Center products and corporate data bases, a spokesman said. The software displays a hierarchy of menu screens listing user options. Selections are translated into system commands. The product is available for $200 per month for a minimum of 12 months.

Honeywell, P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

Bytel menu-driven tool allows for generation of Cobol queries

BERKELEY, Calif. — Bytel Corp. has announced Quepro, a menu-driven program that allows users to generate their own Cobol queries and reports. Quepro runs under IBM's PC-DOS, Microsoft Corp.'s MS-DOS, AT&T's Unix System III, V and VII and NCR Corp.'s Imos, IRX and ITX.

Features of Quepro include a query system that allows users to select items by positioning report and data element titles on a screen, or by placing the report in an 80- or 132-column format for printing. The list format can be used to examine a group of records that share common criteria, such as invoices of the same date.

Both report formats allow calculations of data elements including addition, subtraction, division, multiplication and ratio percentages. The list method can sort records in ascending or descending order and provide totals on numeric fields. Before users can use Quepro to design queries and reports, a programmer must use the product's customizer to establish the link between data files and the run-time processor.

Quepro is available at the following prices: $595 for the microcomputer version; $785 for the Microsoft Xenix and AT&T's Unix System III versions; $2,285 for the Unix System V and OSM Computer Corp. Zeus versions; $3,150 for the NCR Imos, IRX and ITX versions; and $9,500 for systems running Unix System VII.

Bytel is located at 1029-D Solano Ave., Berkeley, Calif. 94706.

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ADR enhances Roscoe release for IBM's MVS

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced an enhanced release of its Roscoe online program development system for IBM's MVS operating system.

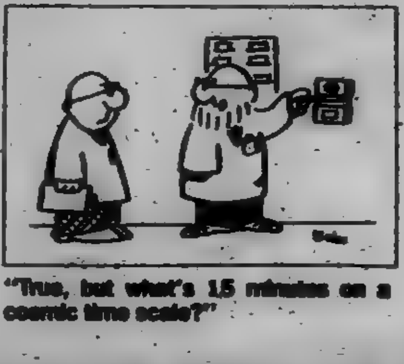
Roscoe 5.4 now includes a transaction response/resource monitoring subsystem, a system spool browse facility, a screen painter for IBM IMS/DC applications and an interactive Roscoe Programming Facility training tutorial, a spokesman said.

The response time monitor now allows resource use and response times to be collected by transaction for the entire system. On-line displays report the information for the whole system or selected users. The system spool browse facility extends the single-mode environment.

Roscoe's screen painting facility, called Sketch, which previously supported CICS, now supports Message Formatting Services of IMS/DC. The Sketch user is prompted to paint full screen panels and to define fields. Sketch can be integrated with ADR's DL applications development system for IMS/DB/DC, ADR's Datacom/DB and CICS applications, according to the spokesman.

Roscoe 5.4 is available on IBM mainframes and plug compatibles running under OS/MVS and MVS/XA. Roscoe is licensed for $60,400.

ADR is located at Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.



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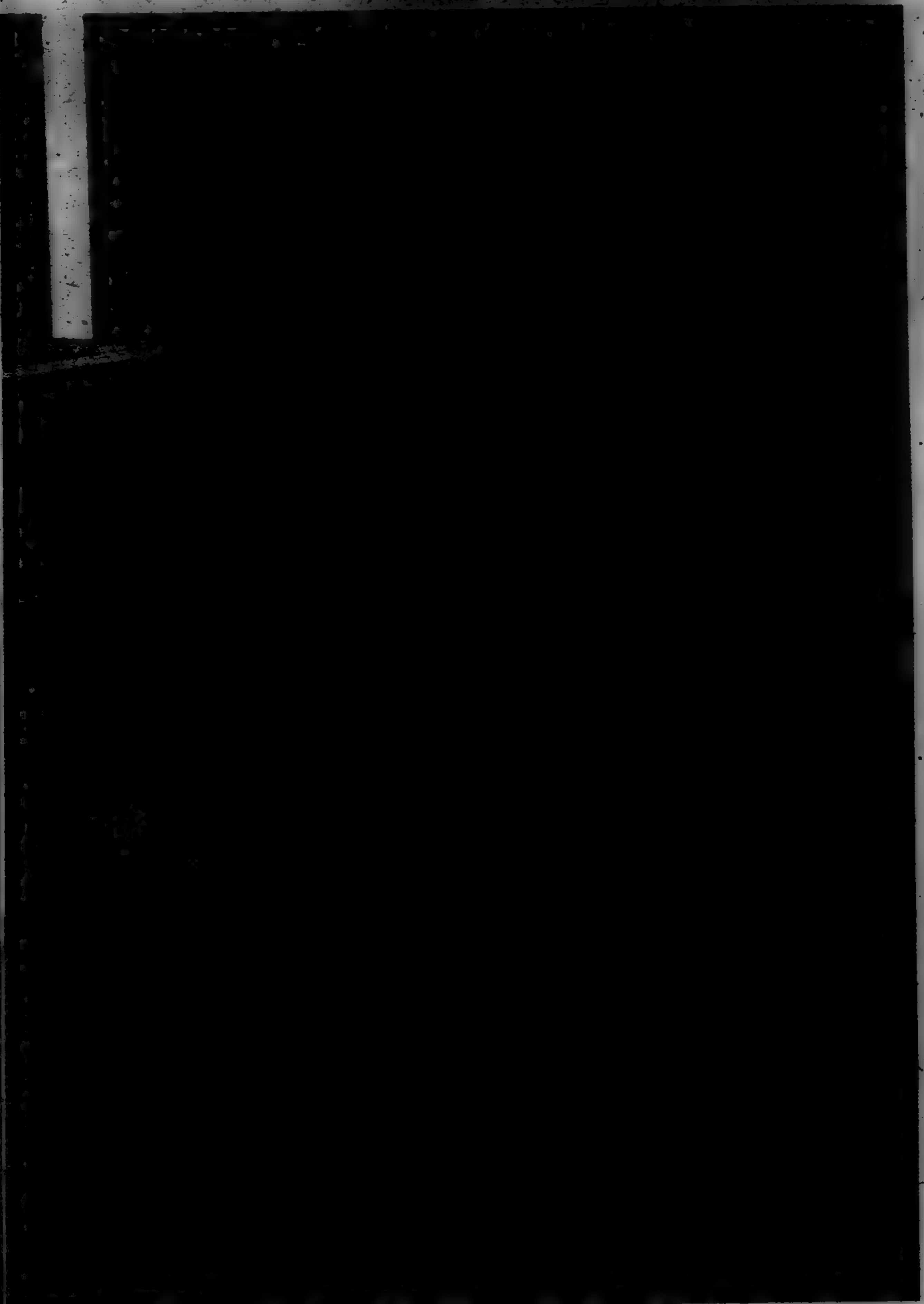

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LINK

from page 45

The nature of micro-mainframe link use cited by the users was consistent with a recent survey of 155 computer sites conducted by International Data Corp. (IDC), a Framingham, Mass.-based market research firm. IDC found that 38% of the respondents were using some type of micro-mainframe communications software.

Of those, 29% — the largest group — allowed read-only access and data downloading only, while 7% permitted only read-only access via terminal emulation [CW, March 18].

According to Gerry Schloss, manager of financial systems and of the information center at FMC Corp. here, FMC currently has no need to upload data from its local micros to corporate data center mainframes in Dallas. FMC uses IBM 3270 terminals and some IBM Personal Computers, ATs and XTs to communicate with its IBM 3080 series mainframes via dial-up lines.

Ramis II data converted

Portions of FMC's IBM IMS data base authorized for viewing by end users are copied into a Ramis II data base from Mathematica Products Group, Inc. The Ramis II data is then converted to Ascii files for downloading to the personal computers by Software Corp. of America's Gateway. Microrim, Inc.'s R-Base 4000 data base manager and Clout simplify end-user access to the data base. Clout allows nontechnical users to formulate inquiries to the data base using English language commands, according to Tim Postlewaite, systems engineer at FMC.

In a typical application, sales representatives may want to gauge the effect on customers and regional sales of eliminating a certain product. They can get the required data from the mainframe using Gateway, load it into a Lotus Development Corp. 1-2-3 spreadsheet and manipulate the data to answer questions.

FMC currently does not allow data uploading. When FMC first looked for software to facilitate uploading from micros to the mainframe, the company could not find a product that accommodated both its dial-up and coaxial cable access methods.

But, according to Postlewaite, "the industry is so new that things are changing daily." Thus the company is now reviewing Pansophic Systems, Inc.'s Panlink micro-mainframe link in hopes of providing uploading capabilities.

Ensure data security

Before permitting uploading to the mainframe, however, FMC must also ensure data security. "We can't have people going into live files and making changes at will," Schloss said. The company currently limits end-user download access to data relating to an individual's job area.

Arco Chemical Co.'s data center here has an IBM 3081 Model K running MVS/XA and a 3033 Model N running VM/CMS communicating via IBM's Systems Network Architecture over coaxial cable to IBM 3270 Personal Computers. The company has nearly 100 microcomputers in three main locations nationwide, according to Carl Weber, manager of Arco's information center. Arco uses Information Builders, Inc.'s Focus and PC/Focus fourth-generation languages to provide end-user access to mainframe data.

Like FMC, Arco is using its micro-mainframe links only for data downloading due to "concerns with control of the application being uploaded." Specifically, Arco is concerned about identifying where the uploaded data originated, according to Weber. He has not yet found a product that can identify the origin of transactions sent to the mainframe IMS data base from a micro.

Present system limitations

In the absence of such a product, Weber said he would be forced to modify existing mainframe applications to provide for the identification of data origin.

For new applications, Weber is considering Informatics General Corp.'s Answer/DB end-user data retrieval tool as a method of uploading and downloading to the IMS data base. Citing a limitation of his present system, Weber said, "I would like to see it be easier to use than it is for the casual or first-time user."

A cautious approach to microcomputer-mainframe links has been adopted at Philadelphia Life Insurance Co., where only three microcomputers in the information center are linked to the company's IBM 3083 mainframe. Philadelphia Life uses some 60 micros on a stand-alone basis. According to Tom Peterson, information center analyst, the restriction on the number of links "is a method of determining what training is required, the impact on the rest of the 3270 network and what reliability issues arise."

Philadelphia Life's link allows users only to download reports from the mainframe to the micros in the information center. Data is moved into Lotus' 1-2-3 spreadsheets and graphics packages for analysis. Peterson described the downloaded reports as "another kind of paper." The system is limited to small file transfers of under 100K bytes, Peterson said. Before uploading from the micros is allowed, he said, the company must develop a security system that limits users to accessing only their own files.

Philadelphia Life currently has no plans to link all its micros to the mainframe, but link availability is considered on an individual basis. "We're not trying to push hardware; we're trying to answer business needs," Peterson said.

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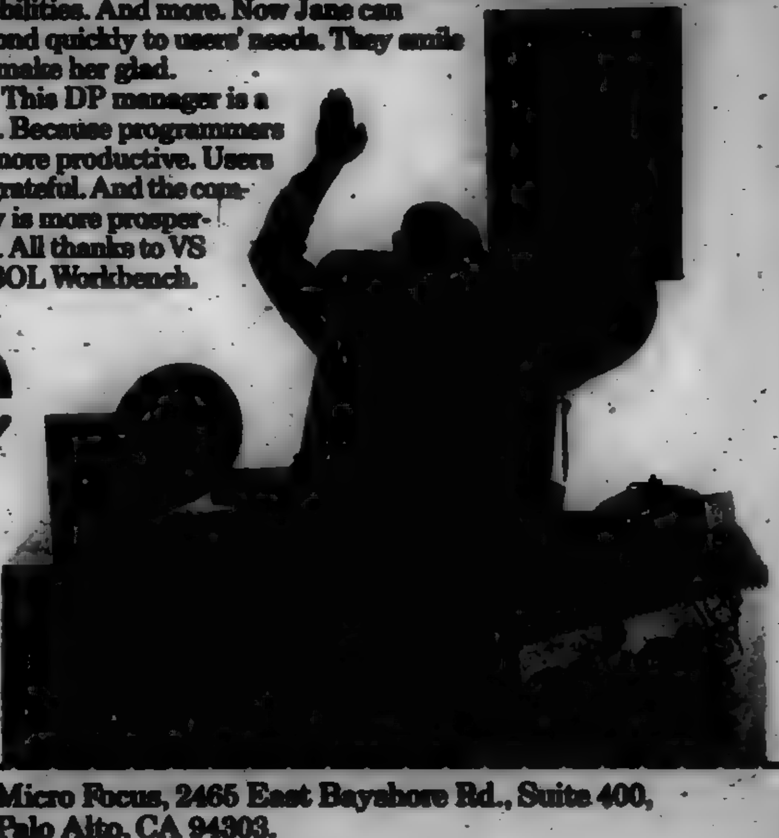

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QUICK

from page 45

cro, are available now and can be implemented quickly. In addition, file transformation links that translate data on the mainframe into the format required for use with micro software products such as a spreadsheet are also available — though they may take more time to implement. However, links that facilitate real information exchange, or data downloading for processing and uploading to a variety of hardware environments, are only beginning to be developed, Ran said.

Larry R. DeBoever, president of Linkware Corp. of Waltham, Mass., a vendor of the Linkware package for linking IBM and Digital Equipment Corp. micros to larger IBM or DEC systems, seconded Ran's advice. "It is sound to get users off your back while you think about a strategic solution," he said.

Issues to be addressed when considering a quick solution include performance, data transformation and implications of end-user access to production data.

"The single biggest disappointment for a personal computer user [using a link] is the performance aspects of file transfer," DeBoever said. "The user evaluates the file transfer by how fast the screen comes back."

In the IBM world, he said, performance is limited by the 19.2K bit/sec. maximum bandwidth of the IBM 3274 controller used to link terminal-emulating micros to the mainframe. "You [have to] splice up that 19.2K [bit/sec.] bandwidth and share it with other users," he said.

He contrasted that performance with links to DEC VAX processors, which allow for 19.2K bit/sec. channel speed per terminal instead of per controller. "DEC [machines] will be faster [than IBM's], but they will not [deliver] the kind of performance that users expect," DeBoever said.

The data transformation issue arises when micros appear to the mainframe as an IBM 3270 device. "The IBM world is designed for screen transfer and not file transfer. The IBM world is completely ill-equipped to deal with the idea of moving files through a network. So the vendor makes a screen look like files, and some funny things happen when you do that," DeBoever said.

Boards providing 3270 emulation are often plugged into the micro to allow for the mainframe link. But because the boards often cost from $800 to $1,000 per micro, some shops use one protocol converter to provide the same capabilities for as many as three micros. Shops that use protocol converters in this way often run into problems, such as data misinterpretation that results in changed or lost files. The converters can also adversely affect performance.

Links allowing end users access to mainframe data are most successful when host data resides on a single processor in a single data base, DeBoever said. Those links are successful because data location is transparent to the end users, the issue of accessing different hardware types is avoided and data security is easier to ensure, he said.

DeBoever advised managers who are testing micro-mainframe link products to require the vendor to move company data and files, not canned data, through the link in a prepared demonstration. He also recommended the following: asking the vendor to transfer a greater number of characters than allowed by the link to see what impact it has; timing transfer execution; checking file size after the transfer if the data is moved through a protocol converter; and testing an emulation board in a micro before buying.

[redacted]

HP

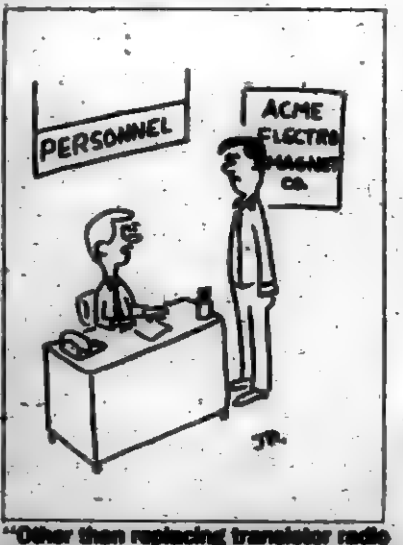
from page 45

analysis software designed for use with HP Turbo Image. The products reportedly provide performance and usage statistics to help determine the optimal Turbo Image data base and applications design.

The HP Turbo Image Profiler tool is said to gather data while applications are running and provide a range of statistics reports on request: reports on system resources used by each data base request in an application, reports on which programs demand too much of the system's resources, reports on the most efficient way to structure relationships among files in a data base, reports on minimizing I/O operations during data base processing and reports on time programs put on hold while information is being updated.

HP Turbo Image will be distributed free to current HP 3000 users and will be part of the fundamental operating software of HP 3000s. HP Database Tools is priced at $3,500 for a perpetual license.

HP is located at 3000 Hanover St., Palo Alto, Calif. 94304.



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SHOWS

from page 45

who decided to skip the show. Softcon literature listed nearly 20 vendors that canceled out of the show. With just a quick walk around the floor of the Georgia World Congress Center, one could see at least 25 vacant booths with only chairs for the weary visitor. Some of those booths were good-size chunks of prime floor space — sans vendor.

A Wang Laboratories, Inc. representative at the show was overheard saying that the Lowell, Mass., company had committed several thousand dollars to obtaining floor space before deciding to pull out. Wang's Booth 1917 was empty, although the vendor was listed in the conference guide. Apple Computer, Inc. was also listed as an exhibitor, but instead of erecting its usual snazzy booth, the Cupertino, Calif., microcomputer giant held only a room off an upper floor for "third-party demonstrations and meetings for those interested in software development for the Apple IIe or IIc, XL and Macintosh."

> *The show was a bore. Plain and simple.* ”

In addition to the vacant booths, visitors also had to deal with vendors whose relationship to the software world was questionable at best. Among them was an orthopedic products vendor — complete with cross-sectional models of the human foot — who offered limb-weary visitors a free footprint analysis.

The remainder of the booths — those erected by real software companies — resembled a bus station for marketing representatives. So many people were just standing around. Booth attendants gathered in small groups chatting among themselves; one woman even knitted in between passersby. Vendor representatives confided that they were disappointed with the turnout, especially those with the few mainframe software companies that chose to attend. The mainframe vendors were hard-pressed to locate their target buyers — the MIS and DP managers — who were noticeably absent from the primarily micro software show.

What of the sessions? It is hard to criticize the speakers who gave their time to expound upon the topics Softcon planners covered. But it is about time speakers divorced themselves from their company's products and services and objectively discussed the topics at hand. One very high-level executive of a leading software company apologized for using slides with his company's product logo emblazoned all over them, yet his presentation could easily have been given without the self-promoting visual aids. Several other speakers pawned off their marketing pitches by explaining that they were only using their products "as an example of one way to approach a problem."

Same problems for other shows

This is not to single out Softcon. The recent Info/Software conference exhibited many of the same problems. In fact, the same company president used the same slides to give the same presentation at Info/Software. As at Softcon, no major products were unveiled at Info/Software, and attendance was low. A superb session on software maintenance was attended by seven — count 'em, seven — people, and an excellent presentation on prototyping boasted only a handful more listeners.

All this means that you, the potential conference visitor, must be cautious in deciding just where to allocate your limited show time. Review that agenda. Do you really need to hear Ted Koppel make disparaging remarks about computers and software vendors? Will it help you to go to yet another session on strategic planning and hear yet another vendor make another product pitch under the guise of a technology overview? Are the companies on the conference list really the vendors of products that interest you?

Some aspects of the trade show circuit will likely be restructured in light of how recent software-specific shows have fared. Some consolidation and some trimming of fat are in order. It is time for you — the audience — to tread carefully.

DBMS

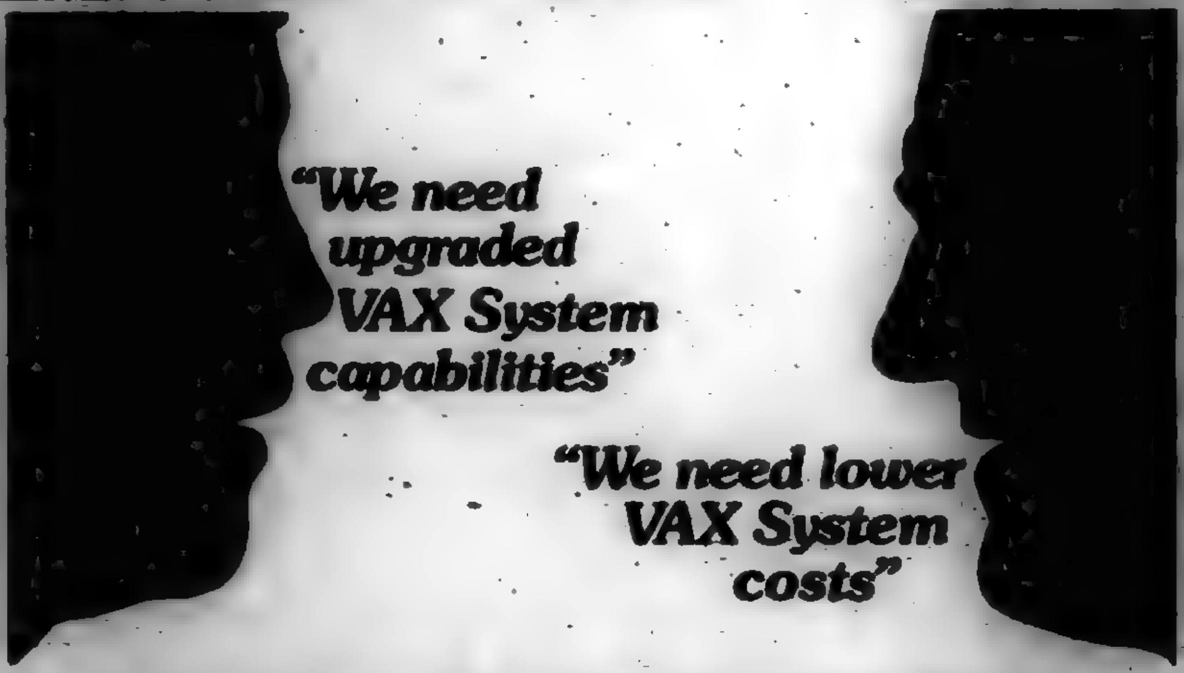
from page 40

implies no stipulations regarding physical implementation. Thus, behind the model can be whatever implementation works best.

Builders of relational products have tended to blur the distinction between logical and physical designs and they have mistakenly rejected techniques proven useful in network and hierarchical DBMS.

To work as a true DBMS, a relational product should be able to model all common data relationships. It must allow definition of data relationships and utilize these definitions to support referential integrity. It should also use relationship data to promote I/O efficiency.

Builders of relational products must break out of their 'newer is better' and 'different is better' syndromes. They should implement the relational model in conjunction with whatever physical structure offers greatest functionality and efficiency. They should embrace those elements of network and hierarchical models that can make their products full and production-worthy DBMS.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Power from the products

By Pieter Mimno

Fourth-generation language tools offer both end users and DP professionals major gains in productivity and ease of use. However, there is a great deal of confusion about how to select those tools and use them effectively within a specific computing environment. The competing claims of vendors make it difficult for prospective buyers to sort out the advantages and disadvantages of specific products. In addition, there is uncertainty about how to manage these new tools within a distributed, end-user-driven environment.

Business executives are becoming increasingly frustrated with traditional information systems departments. DP is often chronically late in delivering application programs, and when they are delivered, the applications frequently do not match the end user's needs. It may take weeks to get urgently needed information from the data base to solve immediate business problems.

Business professionals are aware that alternatives to the traditional DP process are now available. End users have become excited by the potential of high-productivity tools such as 1-2-3 from Lotus Development Corp., Focus from Information Builders, Inc., Express from Management Decision Systems, Inc. and others. However, many potential buyers of these tools are confused by the competing claims of vendors and are unable to evaluate which tool would best suit their specific requirements.

Many information systems departments are equally frustrated and

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The first part of this series [CW, April 8] summarized recent developments in fourth-generation languages.

unhappy. Often the department head has constant confrontations with end users and is aware that they are attempting to bypass DP by purchasing personal computers and fourth-generation language tools. The department frequently attempts to react to this situation by providing advice on selecting personal computer hardware and by answering questions on the use of personal computer tools such as 1-2-3. However, many information systems department heads are deeply worried about the consequences of losing control over the proliferation of end-user computing capability.

This discussion focuses on three specific areas:

Overall strategy for end-user computing. What are the business goals, needs and information processing requirements that are to be met through the use of new, high-productivity tools? What overall end-user computing strategies will best meet these needs?

Hardware/software strategy. What categories of hardware and software tools best achieve the goals of the end-user computing strategy?

Tool selection. What are the most important issues that drive the tool selection process? What specific tools should be recommended?

End-user computing

Prior to selecting fourth-generation language tools, it is important to develop a clear strategy for end-user computing. A common mistake is to place a great deal of emphasis on evaluating and selecting tools without defining an overall strategy. This approach often leads to the selection of inappropriate tools. A more effective technique is to define strategic objectives first, then to identify categories of hardware and software that meet these goals and finally to select the tools.

Index Systems, Inc. of Cambridge, Mass., has developed techniques that lead to the development of an effective strategy for end-user computing. The following components of the strategy are developed:

- Overall end-user computing strategy..
- Data, applications and tools.
- Technology architecture.
- Support strategy.
- Management framework.

Overall strategy

The function of an overall strategy for end-user computing is to identify the areas of an organization that offer high-impact potential to the business and would benefit from the introduction of end-user computing facilities. In developing an overall strategy, it is important to determine what end users are doing and how they could make better use of information to run the business.

Typically, the strategy focuses on key areas within the corporation that would benefit greatly from improved access to information. For example, a strategy might be based on the conclusion that executive-level decision making has the highest dollar-value impact on the corporation and that end-user computing facilities should be oriented initially toward improving the quality of decision making at the executive level. The overall strategy for end-user computing would be to target the support of fourth-generation language tools to get information into the hands of managers in high-value departments.

Changing role

Once an overall strategy has been defined, the next step is for the information systems department to take an active lead in helping end users solve their business problems. This involves a significant change in the department's role. Typically, the department is reactive: It responds to the external pressures applied by user departments. Instead of leading and controlling the evolution of end-user computing, the information systems department often reacts to the spread of personal computers by solving individual problems as they arise.

The department has to become less reactive and more proactive if it is to exert effective management and control over end-user computing. The department should be an active leader in helping users define their needs and solve business problems. Information systems has to evolve away from its traditional role of applications system development. It needs to have a greater understanding of the business side of the corporation and the information processing requirements of the business. Information systems should help users develop priorities for applications, define corporate policies that fit the needs of end users, educate and train end users and provide an officially supported kit of high-productivity tools for end users.

For traditionally oriented information systems departments, the evolution from a reactive to a proactive stance may be extremely difficult. It is hard for any department to admit it has been wrong for years. However, such an evolution can benefit both information systems and end users.

The information systems department could become proactive by working closely with end-user departments to define an advanced computing strategy that meets the business needs of these departments. A proposal from the information systems department for improved end-user computing facilities is likely to be met with an enthusiastic response such as: "Great idea — glad you finally asked for it. Let's work together on implementing the approach."

If information systems leads the movement toward effective end-user computing, the user organizations will benefit, and information systems will once again provide a highly valued service to the business.

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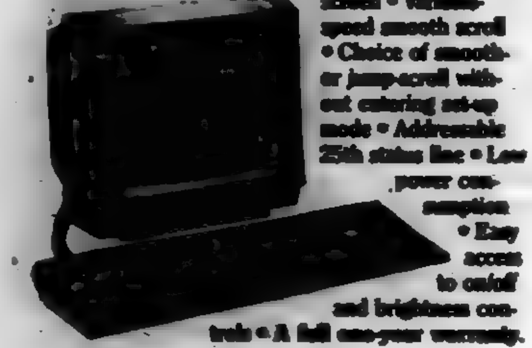

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DEC VT240
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As part of the technology strategy, the information systems department should clearly identify the issues being addressed by an end-user computing facility:

- What types of user requirements are to be supported: office automation, word processing, system modeling, financial analysis, decision support, reporting, graphics, applications development, file management?
- What types of applications are to be supported: ad hoc query and reporting applications, personal computer-oriented individual applications, shared applications that may be used by several organizations or corporate applications requiring close information systems support and involvement?
- What are the factors driving the tool selection process: required categories of tools, integration of tools, compatible personal computer and mainframe tools, data collection and extraction facilities, transparent communications links, distributed computing networks?

Technology architecture

After an overall strategy for end-user computing has been defined, the next step is the identification of a hardware/software architecture that best meets the goals of the end-user computing strategy. In many cases, a distributed processing environment is recommended to support end-user computing.

Figure 1 illustrates the architecture of a distributed processing environment that has proven to be highly effective for end-user computing applications. The architecture consists of a mainframe computer (or departmental minicomputer) supported by a distributed network of personal computers or intelligent workstations. Corporate data is stored on the mainframe data base, and personal data bases are maintained by end users at the workstation level.

Access to data on the mainframe is greatly simplified through the use of compatible fourth-generation language tools on both the mainframe and personal computers. This software structure permits personal computer users to extract required data from the mainframe data base, transmit the data transparently to the personal computer and format the data for immediate use by standard tools such as 1-2-3 and Ashton-Tate's Dbase III. Alternatively, the data could be routed to the personal computer version of the fourth-generation tool for customized analysis and processing.

This architecture for end-user computing has several major advantages:

- The system provides a flexible, user-friendly environment that is well suited to the changing needs of end users.
- End users do not need programming knowledge to extract data from the central data base and process the data locally with standard personal computer tools or with personal computer versions of mainframe fourth-generation language tools.
- The personal computer version of a fourth-generation package can

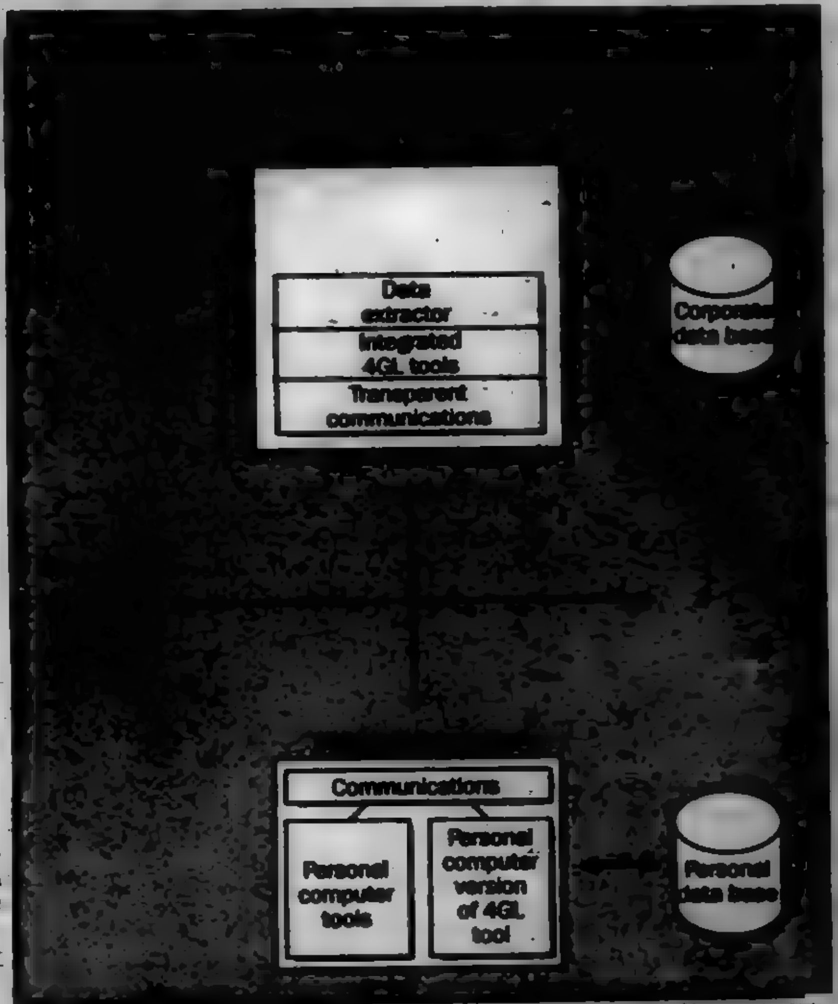

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Figure 1

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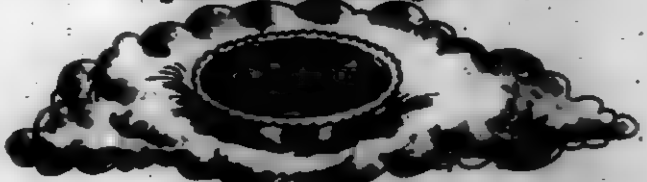

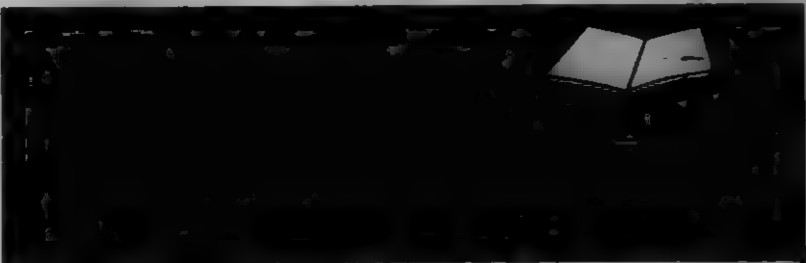

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be used to support customized local information processing such as data query, report generation, graphics generation, decision support and application development.

- Applications developed in the personal computer environment can be run on the mainframe without reprogramming.
- The information systems department can maintain effective control over end-user computing facilities as well as over access to the corporate data base.

Support strategy

Successful implementation of an end-user computing strategy often requires major changes in the structure of both management and service organizations. Information systems management should be an aggressive proponent of end-user computing. It needs to form a partnership with end users in order to ensure that computers are used effectively to solve business problems.

Many companies have undertaken major reorganizations of the functions and responsibilities associated with information services. A significant organizational change is the growing requirement for business experience in the information services staff. Frequently, the chief information officer of a large organization is both a savvy businessman and an experienced MIS manager. Information systems is being reorganized to support front-end business functions rather than back-end computational functions.

The new information systems organizations tend to be staffed with professionals who have a blend of business knowledge and technical skills. Emphasis is placed on attracting professionals with good interpersonal and communications skills who are capable of working effectively with end users.

The support of end-user computing requires many different roles, including business specialists, account executives, technical specialists, consultants on specific tools, training and education personnel and word processing specialists.

Support may also involve a telecommunications coordinator, data administration coordinator, external data base coordinator, time-sharing coordinator, hardware specialists and so on. All of these roles will occur naturally in an end-user computing environment. The challenge for information systems is to provide the specific mixture of support roles and skills that is appropriate to meet the business needs of the corporation.

Selecting the tools

The end-user computing strategy described above defines the users to be supported, the information processing needs of those users, the hardware/software architecture to be provided and the organization of support services. These elements of the end-user computing strategy should be defined prior to selecting specific tools.

Tool selection appears to be a confusing process because of the large number of competing fourth-generation products. However, selection can be simplified by making use of the end-user computing strategy defined above. The objective is to identify the small number of critical factors that differentiate appropriate from inappropriate tools for a specific end-user computing environment. For the environment shown in Figure 1, the critical factors affecting tool selection are summarized in the box below.

The function of the selection procedure is to identify tools that incorporate as many critical factors as possible. The tools that support these capabilities may then be compared and evaluated in detail.

Integrated functionality

An objective of the end-user computing strategy is to determine the primary needs of the end users. Do they need tools primarily for standalone personal computer applications, distributed processing, ad hoc queries, graphics, decision support or application development? The first step in selecting the tools is to match the primary needs of the end users to specific categories of fourth-generation language tools.

The tools can be divided into general application categories:

Local Data Protocol Converters

DataLynx/3274 connects 1 to 9 async CRTs and printers to a 3270 multipoint network, SNA or BSC.

VersaLynx/3278 allows an IBM 3178/3278 terminal to access ASCII systems using asynchronous protocols.

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InterLynx/3278 attaches low cost ASCII CRT terminals or PCs to Type "A" ports.

DataLynx/3780 connects asynchronous devices or minicomputers to 2780/3780 BSC networks, and has CRT and printer port and file transfer utility.

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Product functionality matrix

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ADRS II	■	□	□	□	□	■	■	■	■	■	■	□	□	□	□	□	□	□	■	3	■	□	□	■	■	□	□
INTELLECT	■	□	□	■	□	■	■	■	■	▨	■	□	□	□	□	□	□	□	■	5	■	■	□	■	■	■	□
QMF	■	□	□	□	□	■	■	■	■	▨	■	□	□	□	□	□	□	□	■	4	■	□	□	■	■	■	□
TELL-A-GRAF	■	■	□	■	□	■	□	■	■	□	■	□	□	□	□	□	□	□	■	4	■	■	□	□	□	□	□
SYSTEM W	■	□	□	■	■	□	■	■	■	■	■	□	▨	□	□	□	□	□	▨	3	■	■	□	■	■	■	□
NOMAD2	■	□	□	■	■	■	■	■	■	■	■	■	■	□	□	□	□	■	■	3	■	▨	□	■	▨	■	□
ADS/ON LINE	■	□	□	■	□	■	■	■	□	□	■	■	■	□	▨	□	■	▨	■	3	■	□	□	■	■	■	□
IDEAL	■	□	□	□	□	□	■	■	□	□	▨	■	■	□	■	□	■	■	□	3	■	□	□	■	■	■	■
MANTIS	■	□	□	■	■	□	□	■	■	■	■	■	■	□	▨	□	■	▨	□	3	■	□	□	■	■	▨	□
USE.IT	□	■	□	□	□	□	▨	▨	□	□	□	■	■	□	■	■	□	▨	□	2	□	□	□	□	□	■	□

■ — function available □ — function not available ▨ — function partially available

Figure 2

- Integrated personal computer tools.
- Query languages/report generators.
- Graphics generators.
- Decision support/financial modeling.
- Application generators suitable for end users.
- Application generators suitable for DP professionals.
- Provable specification languages.

Many leading fourth-generation packages provide support for multiple application categories within a single integrated environment, as shown in Figure 2. This figure illustrates the major differences between products in terms of support for integrated functionality.

For example, query languages such as IBM's Query by Example and SQL/DS are limited to data base query and report generation applications. More integrated query language products such as ADRS II and QMF from IBM, Datatrieve from Digital Equipment Corp. and Intellect from Artificial Intelligence Corp. provide an additional graphics-generation capability.

Fully integrated products provide an even wider range of supported functions. Among these are Express from Management Decision Systems, Focus from Information Builders, Inc., Ramis II from Mathematica Products Group, Inc., Nomad2 from D&B Computing Services, ADS/On Line from Cullinet Software, Inc. and Natural from Software AG of North America, Inc.

Many of these products incorporate a query language, report generator, graphics generator, decision support system (DSS), application generator, personal computer version and other facilities within a single, integrated, end-user-oriented environment.

For most end-user applications, a highly integrated tool is a better choice than multiple specialized tools. With an integrated tool, the user needs to learn only one command language rather than several languages.

Moving data

In addition, the movement of data within an integrated tool is much easier than the transfer of data between multiple tools that were not designed to operate within a single integrated environment. For example, for decision support applications, it is far more efficient to use a single integrated tool such as Express or System W than three separate tools such as Focus, Tell-a-Graf and IFPS from Execucom Systems Corp.

Similarly, for users requiring data base query, reporting, graphics and application generation capability, it is much simpler to use an integrated application generator such as Focus, Nomad2, Ramis II, ADS/On Line or Natural, rather than a combination of less integrated tools such as SQL/DS, Tell-a-Graf and DMS. The objective should be to select a small number of powerful, highly integrated products rather than a larger number of specialized tools.

In addition to matching a fourth-generation language tool to the range of user requirements, it is important to determine whether the underlying data base model of the tool matches the application. This is particularly important in comparing DSS such as Express and System W with application generation systems (Focus, Nomad 2, Ramis II, Natural, ADS/On Line, Mantis and Ideal). There are major differences between the data base structures utilized by DSS and application generation systems.

DSS were designed to utilize array-based data models such as spreadsheets and multidimensional data structures. These data structures are ideally suited to complex strategic planning and financial analysis applications. In contrast, application generation systems are based on relational, hierarchical or network data models, which were designed for record-oriented transaction processing applications. Many of the characteristics of DSS are diametrically opposed to the characteristics of application development systems.

In general, DSS such as Express or System W should be considered for financial applications such as strategic planning, policy calculations, marketing analysis, financial analysis, financial modeling, budgeting and financial consolidation. These applications require the aggregation of data from a wide variety of sources and the analysis of this data in multiple dimensions.

Application development tools are appropriate for more routine, short-term, production-oriented applications, such as transaction processing, file sorting, file updates and specialized reporting. These applications require a record-oriented data base model that is fundamentally different from the array-based data models used in DSS. If the data model utilized by the tool does not match the application, then it is not an appropriate tool.

> ❞
>
> *In addition to matching a fourth-generation language tool to the range of user requirements, it is important to determine whether the underlying data base model of the tool matches the application.*

The conclusions that can be drawn thus far in the selection process may be summarized as follows:

- Whenever possible, select highly integrated tools that support multiple categories of applications rather than specialized tools that support only a few application categories. The most highly integrated tools are Focus, Nomad2, Ramis II and Express, followed by ADS/On Line, Natural and System W.
- Array-oriented DSS such as Express and System W are fundamentally different from record-oriented application generation systems such as Focus, Nomad2 and Ramis II.

In general, these application categories should not be mixed. For example, Express and System W should be used primarily for DSS applications, while Focus, Nomad2, Ramis II, ADS/On Line and Natural should be used primarily for application generation.

Distributed computing

A representative distributed processing system that is well suited for end-user computing was presented in Figure 1.

The recommended software components of the system on the mainframe include the following:

- Integrated fourth-generation language tool.
- Data extraction and transparent data communications facility.

Recommended software components on the personal computer include:

- Personal computer version of

the same fourth-generation language tool that is on the mainframe.

■ Interface to standard personal computer tools such as 1-2-3, Dbase III and Micropro International Corp.'s Wordstar 2000.

Recent advances

Within the past year, vendors have made significant advances in supporting the distributed processing environment shown in Figure 1.

Five fourth-generation language tools now are available in both a mainframe and a personal computer version: PC/Focus, Ramis II/PC, Nomad2/PC, Cricket (a personal computer version of Mantis) and Micro W.

Micro W is a restricted, two-dimensional personal computer version of System W.

A personal computer version of Express, capable of multidimensional data manipulation, is scheduled for release in the third quarter of 1985.

Two of these products (PC/Focus and Micro W) are available on the IBM Personal Computer, Personal Computer XT or Personal Computer AT.

The other three are available only on the IBM Personal Computer XT/370.

In general, the Personal Computer, XT or AT are a better choice of machine than the XT/370 for the following reasons:

■ Personal Computers and IBM-compatible Personal Computers are much more widely used than XT/370 Personal Computers.

■ Software for the XT/370 is simply a version of a mainframe program running under VM/CMS that has been downloaded to the XT/370. Because of the limited paging space on that machine, these programs tend to run slowly and inefficiently.

■ XT/370 programs generally operate in emulated 3270 mode and do not make effective use of the graphics capability of the Personal Computer.

■ Software written specifically for the Personal Computer, XT or AT can be made to run efficiently on the Personal Computer and can use its full graphics capabilities.

Extensive use of color and multidimensional window displays can significantly enhance the human interface to the Personal Computer.

At the present time, Focus is the only full-function application generation tool available both on a mainframe and on a Personal Computer, XT or AT. Ramis II, Nomad2 and Mantis are secondary choices because of their reliance on the XT/370 Personal Computer for the Personal Computer version of the tool.

ADS/On Line and Natural are in the third rank, since they do not provide a Personal Computer version of the mainframe product.

However, they do support an integrated interface to standard Personal Computer tools. DMS, Ideal and Application Factory do not provide any integrated support for a personal computer.

Human interface

The Personal Computer versions of these languages generally are easier to use than their mainframe counterparts. The flexibility, speed and graphics capability of the Personal Computer enable vendors to implement much more user-friendly interfaces incorporating multiple alternative command interfaces, rapid on-line interaction, two-dimensional display dialogues, overlaid display windows, graphics symbols and mouse interfaces.

The Personal Computer provides vendors with an opportunity to rethink completely the human interface to the tool.

The Personal Computer version of Focus incorporates some of the best new ideas in human factoring. Although it does not compare to the ease of use of Apple Computer, Inc.'s Macintosh, PC/Focus does support a window-driven command interface that greatly simplifies data base query, data extraction, data download and reporting operations.

Query languages and report generators such as

M[illegible]
R[illegible]
C[illegible]
for THE IBM S/36
For more information
Contact Charles White at:
michaels, ross & cole, ltd.
P.O. Box 4333
Oak Brook, IL 60521
(312) 986-9116

ADRS-II, Datatrieve, Easytrieve, Inquiry and SQL/DS require a rigid command syntax that is difficult to remember. The QBE component of QMF provides a simpler end-user interface based on table layouts. Intellect is the simplest query language to use because it utilizes the syntax of natural English.

It is the only data base query tool that enables a non-DP professional to solve business problems at a considerably high level of abstraction.

At present, Intellect is limited to read-only queries for well-structured, well-defined data bases.

Some of the leading DBS and application generators offer a variety of human interfaces. Express, Focus and Ramis II provide the widest choice of end-user interfaces, including natural English, menu structures and near-English commands. Natural, Mantis and Ideal provide a choice between a menu and a command language interface.

Most fourth-generation languages provide only a command language interface.

In order to support a spectrum of end users with widely varying levels of experience, it is important to select tools that offer a variety of human interfaces, preferably including natural English, window-driven menu structures and near-English commands.

For DP professionals, a well-structured procedural language used for specifying detailed logic is also essential. The procedural language should incorporate structured facilities, such as action diagramming techniques, that simplify the specification of complex logical procedures.

Choices ahead

There are now relatively few integrated fourth-generation languages that support the distributed end-user computing facility described in Figure 1.

Selection factors for this facility include the following: The tool should enable personal computer users to query and extract mainframe data, download the data to the personal computer and manipulate it locally with standard personal computer tools or with a personal computer version of the mainframe tool.

The choice of integrated tools for this end-user computing facility was narrowed to five: System W for decision support applications and Focus, Ramis II, Nomad2 and Mantis for application development.

Leading contenders

System W and Focus were considered to be the leading contenders for the facility, since the personal computer versions of these products run on the IBM Personal Computer rather than the less desirable XT/370.

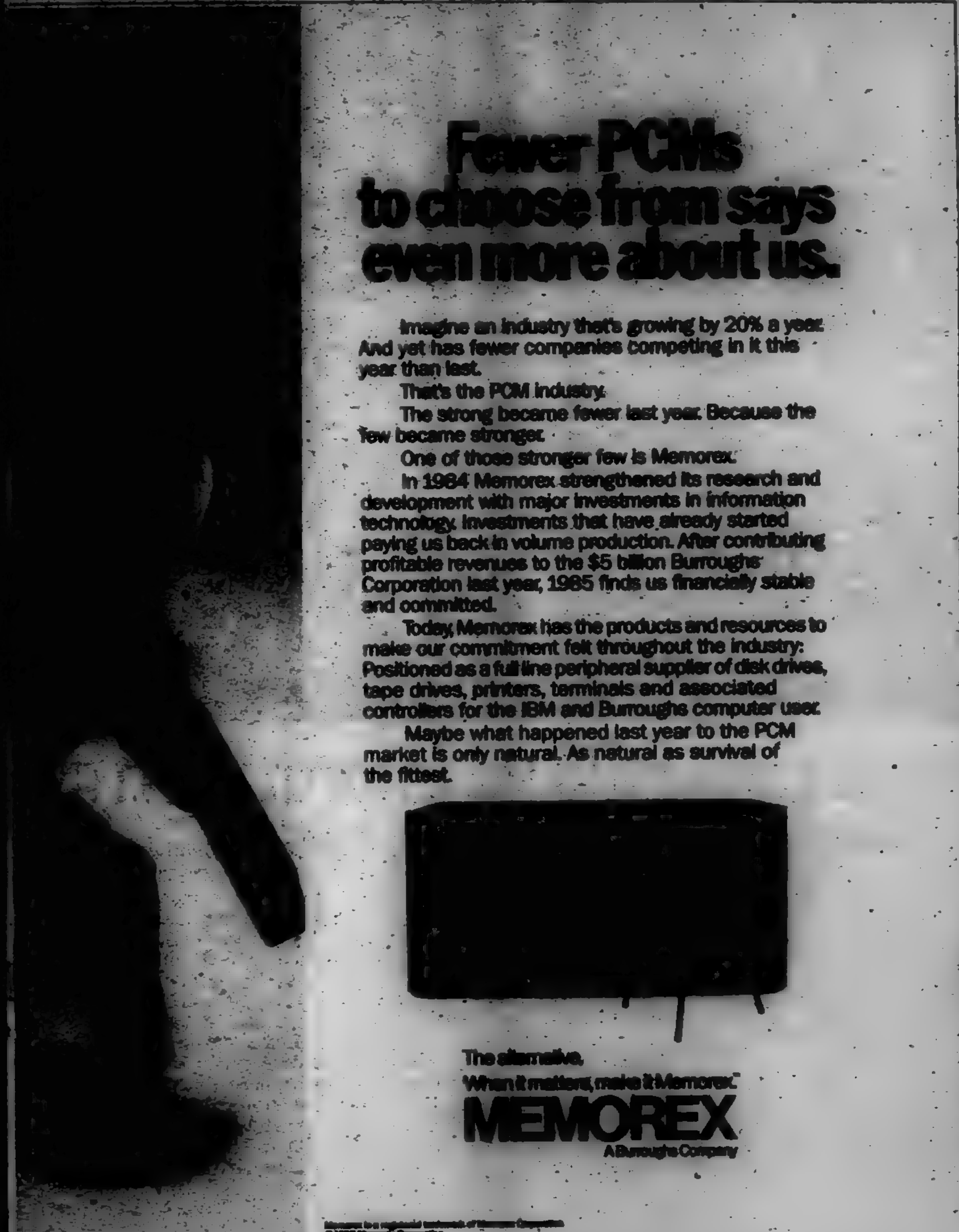
ADS/On Line and Natural would be considered for the facility if a personal computer version of the mainframe tool were not required.

The field of fourth-generation languages is changing rapidly as vendors add end-user-oriented capability to their products.

Changes are particularly rapid in the area of personal computer/mainframe integration. Organizations can expect a much broader choice of products for a distributed end-user computing environment in the near future.

About the author

Pieter Mimno is president of Technology Insight, Inc. of Marblehead, Mass., which publishes The James Martin Report on High-Productivity Languages. *The Martin Report is a new information service that provides continually updated information on high-productivity tools. Editor and coauthor of The Martin Report, Mimno has 24 years of experience in the computer field and does independent consulting.*



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IN DEPTH

Information Centers Information Systems

Divided They Stand

By Robert Head

There are strong arguments for separating the functions of the information resource center from the activities of the information systems department. An organizational separation helps ensure that the individuals or unit responsible for assisting users will not be distracted by other assignments. Those in charge will not be pulled away by the fire fighting that goes on continuously in most information systems departments.

There is a more compelling reason for the separation: to overcome

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the sometimes formidable psychological inhibition that some users have built up toward dealing with technicians. In the past, a closed-shop environment discouraged users from dealing with the information systems department except for analyzing requirements at the inception of a systems development project.

Aside from this interaction, the user interface has been minimal. There are, of course, problem situations when user projects are not receiving sufficient priority, reports from the center are not on time, response time from mainframe to terminals is degraded and so on. Too often, a gulf has grown up between the systems staff and the user community, and the relationship is sometimes marked by an attitude of mutual suspicion and even hostility.

To overcome these barriers, it is best to make a bold psychological statement by divorcing the information resource center from the systems department. This separation may involve putting the information resource center director on the same reporting level as the information systems director — that is, both reporting to the senior vice-president for administration, or placing the information resource center in an entirely different organizational entity, such as the personnel department. Users can then take advantage of information resource center capabilities without the inhibitions that they sometimes feel when dealing with computer professionals.

Regardless of where the center is lodged organizationally, it should cultivate active participation and involvement by representatives of the key line departments served by the center. A good way to do this is to establish an advisory board of senior executives from the line organization. The board should function much like a board of regents for an educational institution, working with the information resource center staff to ensure the right mix of activities.

Site selection

One of the most critical decisions in launching the information resource center is the selection of an appropriate location. The center must be made attractive and accessible to all categories of users who will be encouraged to visit and take advantage of the center's capabilities. It should be in a highly accessible, heavy traffic location so that users can conveniently stop by.

Demonstrations do not have to be provided on the spot for the drop-in visitor, but an initial contact can be made and the visitor scheduled to return for a tutorial or demonstration. The size and layout of the center will be dictated by the types of services to be provided.

Demonstration and work area. There should be several workstations, typically anywhere from three or four to a dozen, where personal computers and software packages can be displayed and demonstrated. If hardware has been standardized, these stations can be configured identically; otherwise, they must accommodate a variety of hardware and software products from different vendors.

Space planning for this area should emphasize flexibility. A given workstation may at one time be used by an individual working on his own and at other times by small groups of up to a half-dozen people who gather around the device for a demonstration.

Users, especially neophytes, want considerable privacy when working on their own or with a center staff member. Top executives are especially sensitive in this regard. Many of them are older and less attuned to computer technology, more hesitant to get their feet wet. Moreover, top executives may be reluctant to demonstrate their lack of knowledge in front of peers and subordinates.

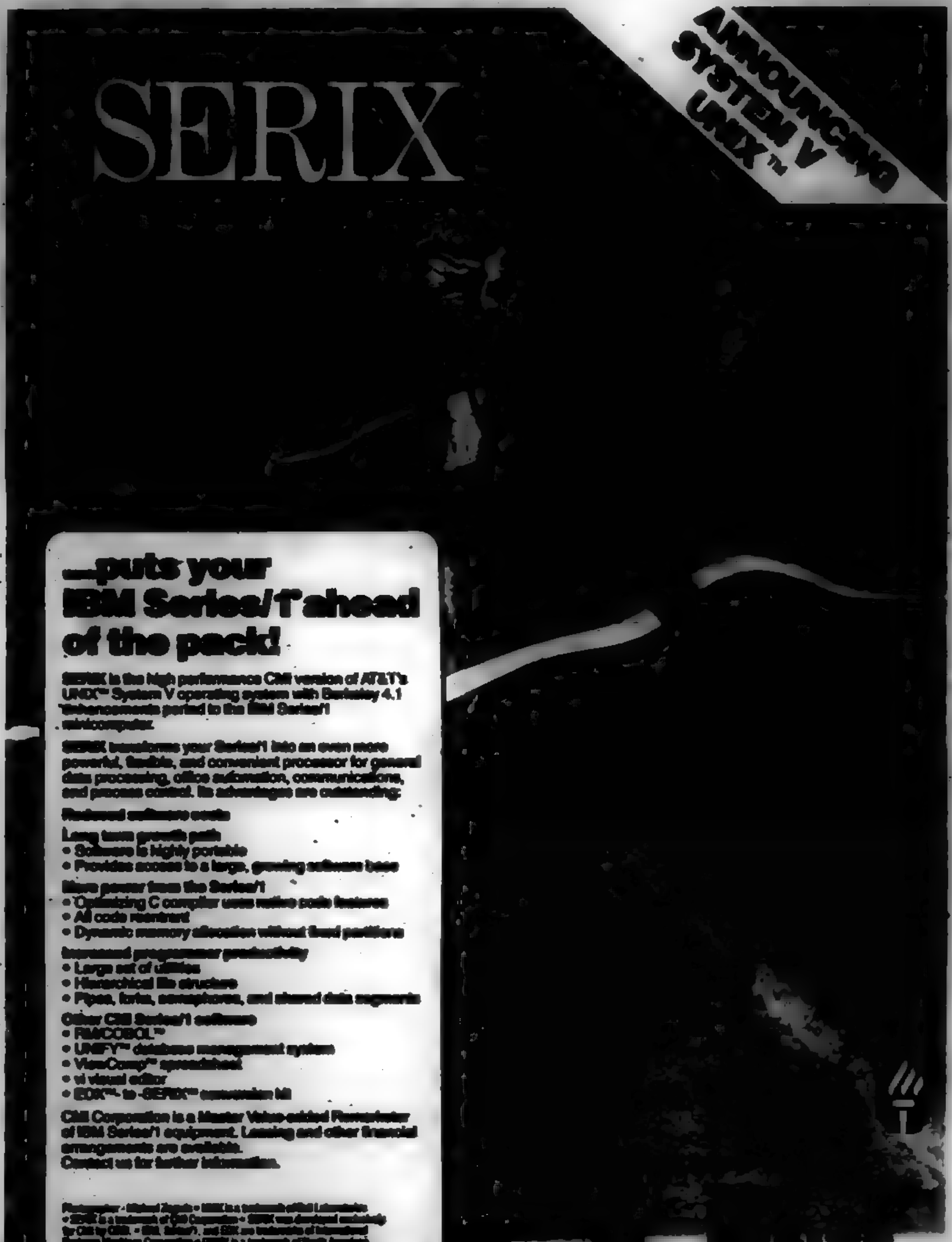
These considerations make it desirable to have private rooms or carrels that can be partioned for privacy. Easily movable partitions are a possibility, but care should be taken that there are adequate electrical outlets and conduits to permit panels to be shifted. If a large open room is to be partitioned, it should be done intelligently. The center, as well as the sides of the room, should be devoted to workstations.

One poorly planned center consisted of a large room in which all the equipment was placed against the four walls with nothing but a large open space in the center. This represents not only poor use of space but deprives users at the various workstations of much-needed privacy.

Training and conference facilities. Besides space for demonstrations and hands-on use of equipment, there should be facilities for conducting courses and seminars. Some information resource centers may be able to take advantage of training rooms already available, but it is desirable to earmark at least a small training or conference room physically associated with the center. Classroom facilities should have the capability of presenting live demonstrations of hardware and software. Personal computers or terminals should be installed or brought into the facility for particular training purposes.

Large screen displays are mandatory in training situations involving more than a handful of people. Also, the well-equipped information resource center should contain videocassette equipment and a videocassette recorder (VCR) library of instructional materials.

There is a wealth of video instructional material available from a number of training organizations, including introductory and advanced self-instruction courses in personal computers and in a variety of programming languages and application packages. Many of these courses permit the student to combine video



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presentations, written instructional material and computer-based training (CBT) exercises.

Library. Users of the information resource center will benefit greatly from the availability of a well-stocked, well-organized library. Besides books, periodicals and vendor literature, the library could contain a variety of VCR and CBT courses and, even more important, copies of software packages. A visitor could browse through the written material, select a training cassette or diskette containing a programming language, data base management system or other software to use at one of the personal computer stations.

> ”
>
> *Security is especially important for valuable VCR course materials or proprietary software packages.*

Care must be taken in determining what goes into the library. Ground rules for withdrawal and use of library materials should be established. Security is especially important for valuable VCR course materials or proprietary software packages. Some information resource centers do not permit users to remove library materials from the premises. Other centers allow users to withdraw materials, including software packages and even hardware, to work with in their offices or homes.

If loans are permitted, there must be rigorous controls. Most software vendors have strict prohibitions against copying proprietary packages. The information resource center could be vulnerable to legal action if piracy occurs.

Once the basic layout of the center is decided, attention must be paid to ordering furniture and equipment and planning detailed layout. There are several sources for special partitions and furniture designed to facilitate computer usage. For instance, panels may contain the necessary wiring for the equipment, which helps avoid the problem of loose wires or electrical conduits on walls or floors.

Because most centers try to attract the executive computer user, furnishings should reflect the kind of environment appropriate for an executive visitor.

This setting includes not only comfortable furniture but such amenities as subdued lighting, plants, paintings and premium carpeting.

In laying out the information resource center, it is wise to consult an interior designer who can assist in space planning, layout and selection of furniture and fixtures. Expert advice should also be sought about such environmental aspects as adequate electrical wiring, air-conditioning and the need for special cabling to interconnect center equipment.

The foregoing has focused on site selection and planning for a single information resource center. Typically, such a center would be located at company headquarters. In most organizations, this raises the question as to what, if any, type of facility should be made available at other locations.

Should there be carbon copies of the center located at branch offices or should field employees be encouraged to come to headquarters to take advantage of the information resource center? If we are talking about a large bank located, say, in New York City, then a single information resource center may be conveniently accessible by most employees.

But if we are dealing with a large federal government agency with tens of thousands of employees dispersed throughout the country, or perhaps even worldwide, it may be productive to duplicate the facilities of the information resource center in multiple locations.

If duplication is a requirement, it is advisable to start out with a pilot information resource center at the headquarter's location to gain operating experience before branching to other locations.

Staff requirements

The information resource center is intrinsically different from other information services that have been offered in the past. Most well-managed information systems departments have, in recent years, gone to some pains to train systems analysts to become more adept at working with users in defining their requirements.

In some instances, this has involved setting up an information center where users can retrieve information and interact with mainframe computers, assisted by a trained technical staff. The information resource center goes beyond these service concepts.

Typically, the staff of the center is quite small compared with the professional staff found in the information systems department. Usually,

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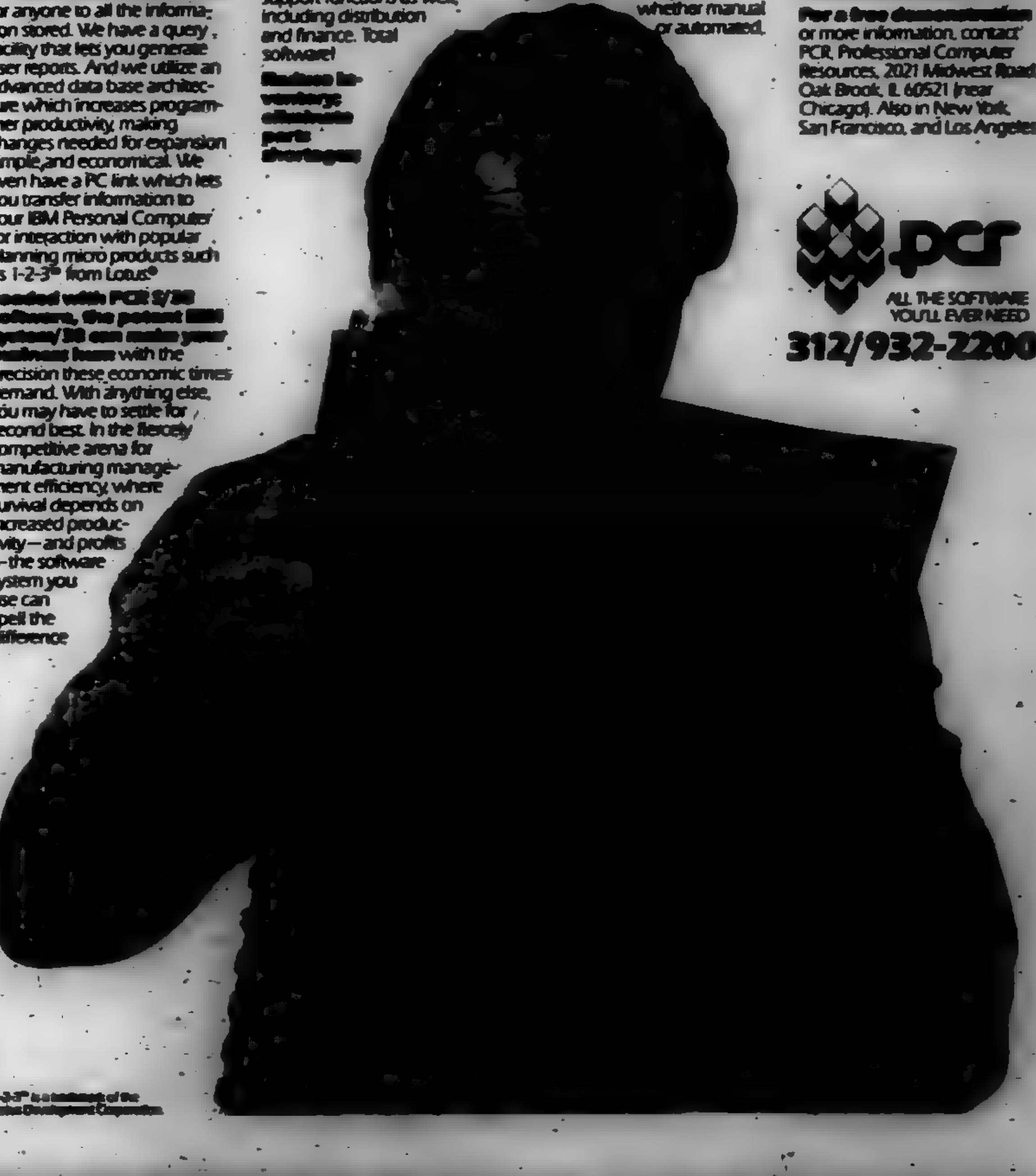

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the center is operated by a staff of from three to a dozen employees. The number of employees depends upon the level of demand for service, the types of services provided and the extent to which outside part-time consultants are used for training and technical support.

Regardless of size, information resource center staff members should either individually or in combination possess a blend of training and interpersonal communication skills along with a good knowledge of hardware and software technology and applications. Most important is a sensitivity to the special needs of managers and employees throughout the organization. The most successful centers have a director with good communication skills and the ability to interact with top management and build networks of supporters and clients.

Most information resource centers offer an array of services with heavy emphasis on training and familiarity with a variety of hardware and software. Before the services can be identified and planned for a particular organization, several issues must be weighed. Resolution of the following issues will define the services to be offered and help set budget and staffing requirements.

Will the center be reactive or proactive? This issue has to do with whether the organization wishes to encourage acquisition and use of microcomputers or prefers to react to demand for them as it arises. Under the reactive approach, those responsible for the information resource center can plan its services around identifiable user demand.

If users have begun requisitioning IBM Personal Computers in large numbers, for instance, then training and assistance for this product should be available in the center. If the engineering department has a strong interest in graphics, or the accounting department has made a commitment to acquire a certain spreadsheet package, these preferences would provide leads to what the information resource center should emphasize.

The reactive approach is often coupled with a micro acquisition policy that is intended to discourage rampant use of personal computers for whatever reason, for example, spare capacity available on the mainframe or lack of budgetary resources for equipment purchase.

In the proactive operating mode, the center is committed to technology push. It aggressively seeks to introduce new technology that offers the potential for increased productivity and enhanced employee performance. The center tends to be out in front of user demand. It may offer training on the Unix operating system — even though most users are content with Digital Research, Inc.'s CP/M — in anticipation of the need for handling multiple jobs on a 32-bit supermicro. Windowing may be highlighted as an attractive feature for executive workstations. And a mouse may be provided for the personal computer, along with the requisite software, to demonstrate interaction without keyboarding.

A decision on this issue involves a judgment as to the best way to deal with technology transfer. A proactive stance, while interesting and exciting, may encourage unneeded expenditures by users and run counter to efforts to achieve standardization and interoperability among equipment. The reactive approach, on the other hand, reduces the information resource center leadership role in technology transfer because the staff must wait for strong user demand before responding.

This demand may be engendered through vendor marketing, articles in the popular and business press and other outside pressures that do not necessarily contribute to the company's best long-range information processing interests.

Will the center stress packages or classroom training? As the information resource center phenomenon gains momentum, the problem of providing high-quality training at a reasonable cost becomes acute. Classroom training in certain subjects is undoubtedly desirable, but the issue is the amount of classroom training that can be provided.

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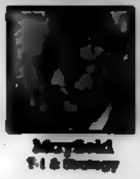
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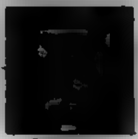
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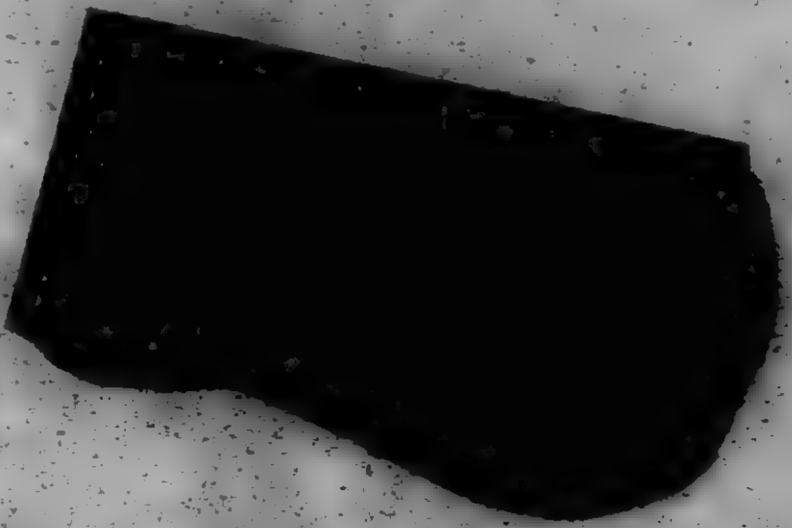

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There is usually a shortage of qualified instructors, especially if the information resource center staff is small. And these instructors obviously cannot be skilled in all the software packages of potential interest to clients. Even though in-house training skills can be augmented by outside professional instructors, many information resource centers are turning to other instruction modes to get the maximum leverage from the center's resources.

Video instructional packages are widely used in information resource centers. Another popular aid is computer-based training, in which the computer itself takes the user step by step through self-instructional material. As a practical matter, most centers try to combine the best aspects of formal classroom training, automated training programs and one-on-one personal tutoring. The issue is which method to emphasize.

Will the information resource center be single product or multiproduct?

If management decides to standardize on the IBM Personal Computer, for example, the information resource center's hardware selection can be simplified: The center will support any kind of hardware device so long as it is an IBM Personal Computer (or perhaps one of the IBM-compatible computers).

Of course, things can still get complicated when it comes to software, even in a one-product center. Should Lotus Development Corp.'s 1-2-3, for instance, be adopted as the standard data base management package for the microcomputer, or should another package with similar capabilities be acquired? For every leading brand of personal computer, a wide selection of software packages is available for spreadsheet analysis, word processing and the like, with new — and presumably improved — versions becoming available almost daily.

If there is no companywide hardware standard, the center must determine which products to acquire and support. In this case, it may be prudent to standardize on software so that users are permitted to acquire any computer they desire provided it runs under, say, Unix, or are free to order their own computers but must use Microsoft Corp.'s Multiplan if they wish to do spreadsheet work.

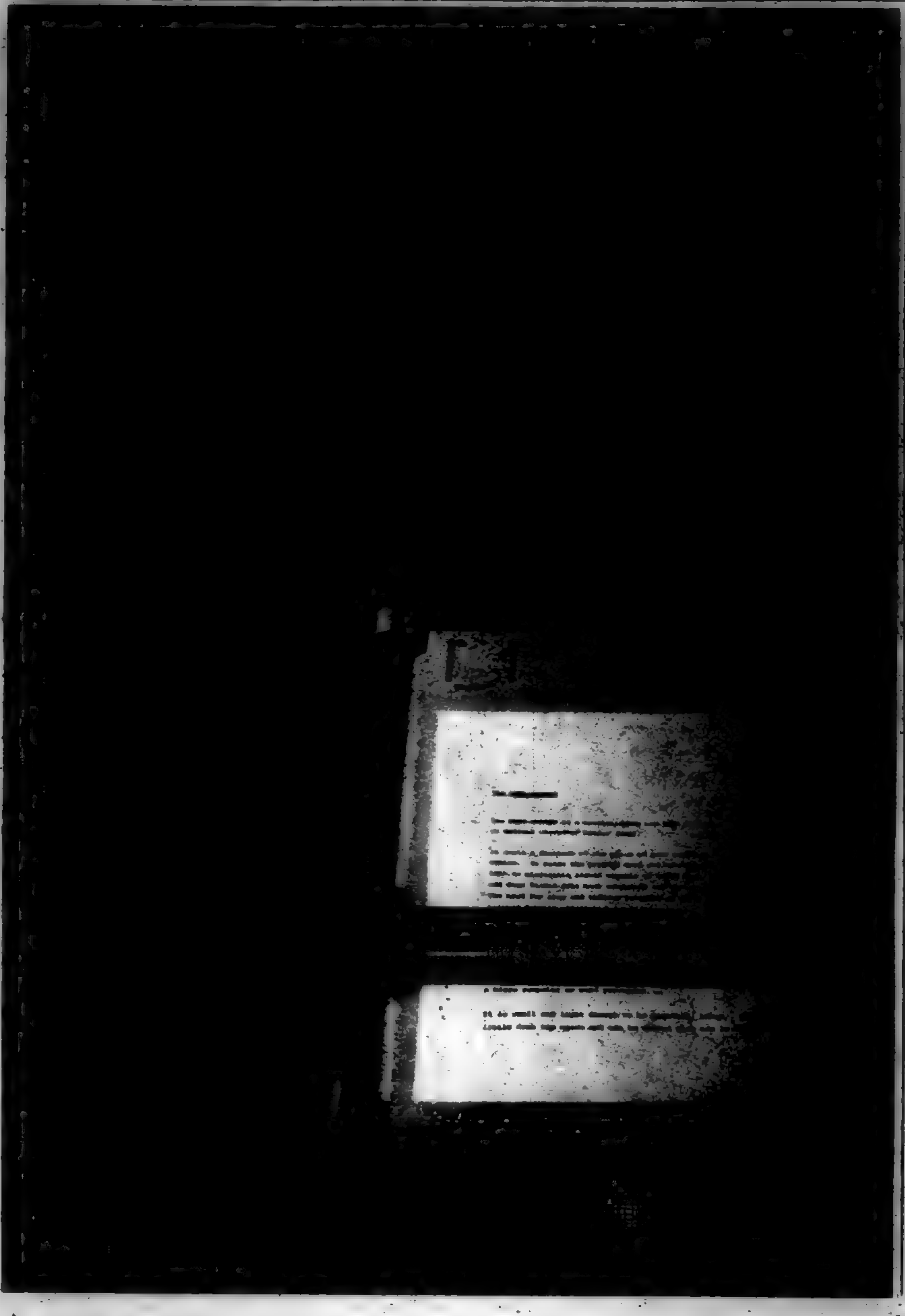
The multiproduct vs. single product decision is complicated by the fact that significant new product offerings are common in today's rapidly changing microcomputer marketplace. An equipment standard that makes sense today may seem archaic a year from now.

As with the other issues we have cited, compromise strategies may prove the most effective. One brand of micro may be showcased in the information resource center, for example, as the preferred system for the organization, along with a half-dozen or so software packages falling into generic categories such as word processing and spreadsheets. However, other product offerings may also be supported by the center for those who cannot satisfy their requirements through use of the standard configuration.

Will the center support both mainframe and microcomputer processing? Most of the information resource centers being opened today are microcomputer-oriented, though the demarcation line between micro use and use of the facilities at a remote mainframe computer center is not always clear.

The microcomputer is being viewed increasingly by users and experts as both a stand-alone computational device and an intelligent terminal that can be operated on-line to a remote computer for certain processing tasks. This means that the information resource center, if it is to stay abreast of technical developments and user interests, must be able to train its clients in remote as well as stand-alone computing.

Thus, microcomputers in the center may be interconnected to form a local-area network or networked to a remote larger host that could be either a departmental minicomputer or a mainframe operated by the information systems department.



About the author

Robert Head is president and principal consultant of Capit (a Company for the Analysis and Planning of Information Technology), in Stafford, Va. He has more than 20 years of experience in information systems planning.

MICROCOMPUTERS

Grid launches plasma-display portable micro

By Kathleen Sullivan
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — Grid Systems Corp. last week broke new ground in the computer industry with the introduction of a briefcase-size portable computer that features a plasma display. Known as the Gridcase III, the magnesium-encased unit includes a 3½-in. disk drive and is fully IBM compatible, the firm said.

The company also introduced enhancements to its Grid Server network. The products will provide mainframe communications capabilities and offer support for Microsoft Corp. MS-DOS file sharing, the company said.

The Gridcase III is one of a trio of IBM-compatible systems that will make up the Gridcase family, the company's newest computer line. Also included in the lineup are the Gridcase I and II, which feature two types of LCDs. The Gridcase portables weigh about 12 pounds.

The Gridcase line, which is based on a 16-bit Intel Corp. 8086 microprocessor

See GRID page 72

Digital Research announces GEM application programs

Enhance graphics, WP on IBM, MS-DOS micros

By Kathleen Sullivan
CW West Coast Bureau

MONTEREY, Calif. — Digital Research, Inc. last week announced a set of applications packages designed to run under its Graphics Environment Manager (GEM), an operating system extension that is said to provide a visual interface for IBM Personal Computers.

Introduced last November, GEM is said to give users access to the world of icons, pull-down menus, windows and mice championed by Apple Computer, Inc. with its Macintosh computer.

GEM provides a Macintosh-like user interface to Microsoft Corp.'s MS-DOS and Digital Research's Concurrent DOS-based systems, the company said. One of GEM's strong points, the firm said, is that it brings a graphics interface to systems with color screens. By contrast, the Macintosh uses a black-and-white monitor.

Digital Research also unveiled six software programs, including GEM Desktop, GEM Paint, GEM Draw, GEM Write, GEM Graph and GEM Wordchart. The firm also announced plans to bundle three of the programs — Desktop, Paint and Write — as the GEM Collection.

The GEM Desktop's visual interface eliminates the need for users to learn operating system commands, the company said, because it replaces commands with icons that represent various computer functions. The GEM Desktop includes icons for a wastebasket, file folders and disks, the firm said.

With a few keystrokes or clicks on the mouse, users can create a file, delete a file or run a software program using the GEM Desktop, the company said. The GEM Desktop is also said to include a calculator and a clock.

The company described its GEM Paint software as a graphics design program that allows users to paint pictures on the screen. The program offers users a choice between a variety of brush sizes and fill patterns. The company said users will also be able to edit pictures by altering individual pixels on the screen.

The GEM Draw program is said to allow users to create and edit charts and diagrams. It includes a library of predesigned

See GEMS page 74

- Ericsson Information Systems announced a 15-lb IBM-compatible system with a high-resolution plasma screen/66
- IBM unveiled PC/Colorview, a videotex access package for the IBM Personal Computer/76
- Whitesmiths upgraded its C compiler for micros based on the Intel 8086 chip family/76

INSIDE

Software/76

Packages for Macintosh grab limelight at Softcon meeting

By John Gallant
CW Staff

ATLANTA — Software for Apple Computer, Inc.'s Macintosh paced the product introductions at the 1985 Softcon conference here early this month.

Intermatrix unveiled several Macintosh products, including its Macdesk desk accessory program. According to a company spokesman, Macdesk operates as a desk accessory running in the background, so its functions are available regardless of the application running on the micro.

Macdesk is divided into four components: desktop organization, telecommunications, personal information files and office productivity.

Desktop organization features include calendar/appointment books, multiple appointment alarms, a calculator, an analog clock, a "things-to-do" list and bank account and credit card listings.

Personal information files are reportedly maintained as a set of Rolodex-like cards.

Telecommunications capabilities include both background terminal software for use with all modems that are Hayes Microcomputer Products, Inc. compatible and autodialing of standard telephones with Intermatrix's Phonelink accessory, which al-

See SOFTWARE page 74

Sytek gives net overview

MICRO BITS
Thomas Madron

At the winter meeting of the Sytek Network User's Group (Snug) in Portland, Ore., Sytek, Inc. provided some interesting insights into the development directions it would like to see for IBM's PC Network, which is a version of Sytek's Localnet/PC.

Sytek's fundamental perspective is that the personal computer market is driven by IBM, which dramatically influences Sytek's view of the market for the PC Network. "IBM offers [high-performance] products that define de facto standards and provide software interfaces and support to third-party developers," according to Phil Edholm, Sytek's manager of market development.

While Sytek recognizes the importance of IBM's endorsement of Localnet/PC, the company also recognizes the need for a broader perspective. The PC Network is part of

See SYTEK page 73

Madron is manager of computer services at North Texas State University in Denton, Texas.

Ericsson portable features plasma screen

Built-in printer, RAM disk optional

GREENWICH, Conn. — Ericsson Information Systems has introduced the Ericsson Portable PC, an IBM Personal Computer-compatible system that features a high-resolution plasma screen and weighs 15 lb.

The plasma screen, which generates its own light rather than depending on reflected light as LCD screens do, provides 25-line by 80-col. text or 640- by 400-pixel graphics display, according to the firm.

Ericsson Portable PC

Built around an Intel Corp. 8088 microprocessor, the Ericsson Portable PC costs $2,995 and includes a single third-height 360K-byte floppy disk drive, 256K bytes of random-access memory (RAM) expandable to 512K bytes, a detachable keyboard and serial and parallel ports.

Limited deliveries will begin this month, and volume shipments will start in the fall, the company said.

Options will include a 512K-byte RAM disk priced at $900, a $395 built-in 40 char./sec. printer that adds 2 lb to the overall system weight, a 300/1,200 bit/sec. modem that will cost $300, a $450 external floppy disk drive and a $500 expansion box that accepts two IBM-compatible boards.

More information may be obtained from Ericsson Information Systems, Greenwich Office Park 1, Greenwich, Conn. 06836.

CXI unveils coaxial connection

PALO ALTO, Calif. — CXI, Inc. has announced the 3278/79 Standard coaxial connection, an IBM 3270 terminal emulation board that is said to be compatible with the Digital Communications Associates, Inc. (DCA), Irma board.

The CXI product reportedly performs full 3278/79 emulation to enable the IBM Personal Computer, Personal Computer XT and AT to access and process IBM 3270 mainframe applications. The 3278/79 Standard supports micro and mainframe applications software and file transfer software designed for the Irma board, according to the vendor.

The product is said to be software loadable to allow future product enhancements to be provided on diskettes.

The 3278/79 Standard also provides an interface that is reportedly compatible with the DCA Irma Decision Support Interface, allowing it to run Irma-compatible micro applications programs such as emulators, file transfer programs and micro-to-mainframe links. The interface board links the micro to an IBM 3274 or 3276 cluster controller and requires 96K bytes of memory with DOS Version 2.

In addition to basic 3278/79 functions, the 3278/79 Standard coaxial connection is said to provide screen print, screen save to disk and a screen control applications program interface.

The CXI 3278/79 Standard coaxial connection costs $895.

The vendor is located at 3606 W. Bayshore Road, Palo Alto, Calif. 94303.

ITT cuts micro prices up to 40%

SAN JOSE, Calif. — ITT Information Systems lowered prices on its IBM-compatible personal computer systems by up to 40%.

The price of the Xtra Model II, with 256K bytes of random-access memory (RAM) and dual 360K-byte floppy drives, dropped from $1,895 to $1,595.

The Model III, which includes 256K bytes of RAM, a single floppy disk drive and a 10M-byte hard disk drive, has been lowered to $2,595 from $4,395.

The price of the Model IV, with 640K bytes of RAM, one floppy disk drive and 10M-byte hard disk drive, was cut from $5,095 to $3,095.

Pricing on a 14-in. color monitor dropped from $695 to $545, and the color adapter card cost was lowered from $275 to $195. Cost of a 14-in. monochrome monitor was cut from $315 to $225, and the monochrome adapter card cost dropped from $225 to $145.

ITT Information Systems is located at 2041 Lundy Ave., San Jose, Calif. 95131.

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C compiler enhancements out

CONCORD, Mass. — Whitesmiths, Ltd. has announced enhancements to its C compiler for personal computers based on the Intel Corp. 8086 family of microprocessors.

The Whitesmiths C compiler Version 3.0 reportedly allows applications to be ported to other central processing units through a recompiling of the source code and offers the option of an enhanced version of Pascal. Among other enhancements is support for hybrid memory models previously available only to assembler programmers, the vendor said.

More enhancements of Version 3.0 reportedly include source-level interactive debugging, with breakpointing and variable display, and full International Standards Organization Level 1 implementation of Pascal.

The Whitesmiths C compiler allows programmers to pick the memory addressing scheme best suited to each part of an application, the vendor said. Selecting or mixing memory models within an application allows an application that must manipulate a few large data objects to avoid the penalty of dealing with the many small data objects that must also be addressed.

The compiler is priced at $1,000. With optional Pascal, the cost is $1,300.

For more information, Whitesmiths is located at 97 Lowell Road, Concord, Mass. 01742.

IBM announces videotex access for Personal Computer line

RYE BROOK, N.Y. — IBM has introduced PC/Colorview, a videotex access package for IBM Personal Computers.

Priced at $105, the program is the first IBM offering to enable Personal Computer users to display videotex information stored in the text-only Ascii color format, according to the company.

PC/Colorview is said to permit users to view videotex information interactively with a host or to retrieve stored videotex information from local files resident on floppy or fixed disk.

The program uses the standard Personal Computer character set, and graphics are not supported, IBM said.

PC/Colorview reportedly provides automatic or manual dial capability for asynchronous communications and main-menu capability for five user-defined options of file names or telephone numbers.

PC/Colorview complements PC/Videotex, an existing IBM program that displays both text and graphics stored in the North American Presentation-Level Protocol Syntax format. Both programs can be used with IBM's Series/1 Videotex System, according to the company.

PC/Colorview operates on the PCjr, Personal Computer, Personal Computer XT and AT, Portable Personal Computer and 3270 Personal Computer.

More information may be obtained from IBM at 900 King St., Rye Brook, N.Y. 10573.

SOFTWARE

■ **Esprit Computer Products, Inc. has announced multiprocessor networking software, based on Digital Research, Inc.'s Concurrent DOS operating system, for the vendor's multiuser DBS 16 supermicrocomputer.**

Concurrent DBS-NET allows the DBS 16 with three Intel Corp. 80186 processors running Concurrent DOS to support up to 12 users, expandable to 28, the vendor said.

Concurrent DBS-NET costs $9,295 in a package with a four-user Esprit DBS 16 with a 40M-byte Winchester disk drive, two 80186 processors, 1M byte of random-access memory and Concurrent DOS.

Esprit Computer Products, P.O. Box 425, Montgomeryville, Pa. 18936.

■ **Anex Technology, Inc. has upgraded Multi-DOS, an operating system enhancement to IBM's PC-DOS operating system for the IBM Personal Computer.**

Multi-DOS reportedly allows up to four workstations to access data, software and processing concurrently on a Personal Computer. Multi-DOS Release 2 offers a time-slicing algorithm, menu-driven system configuration and new parameters for fine tuning, the vendor said.

The software also is said to support random-access memory enhancements up to 2M bytes.

Multi-DOS Release 2 is included with Anex Technology's Multi-PC system, which includes an expansion chassis, cable and one workstation expansion module. Multi-PC costs $1,895.

Anex Technology, 151 N. Route 9 W., Congers, N.Y. 10920.

■ **Jyacc, Inc. has introduced its Formaker screen and window management utility software for use on the IBM Personal Computer, Texas Instruments, Inc. Professional and several minicomputers.**

Formaker is said to allow forms to be created and saved and to permit

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development of a library of routines for form display, data entry and applications program access to screen data.

It reportedly allows users to draw a form directly on the screen and permits modification of screens.

Under Formaker, screen handling is removed from the program under development, the vendor said.

Formaker for personal computers is priced at $650.

The product also runs on the following minicomputers: NCR Corp.'s Tower series and Digital Equipment Corp.'s PDP-11 and VAX-11 series machines.

For those machines, the product is priced at $900.

Jyacc, 12 Rt. 17 N., Paramus, N.J. 07652.

■ Softcraft, Inc. has announced Btrieve/N, file management and data base server software for the IBM PC Network.

Btrieve/N can reportedly reside on one or more servers in a Personal Computer local-area network. The product is said to provide full multikey access to files, record-locking capabilities and coordination of data base access.

Btrieve/N for the PC Network requires an IBM Personal Computer AT or Personal Computer XT with PC-DOS 3.1 and IBM network hardware and software. The product is said to allow up to 24 keys per file and a maximum file size of 4G bytes. It can reportedly be used for applications development in Basic, Pascal, Cobol, C, Fortran and APL languages.

Btrieve/N is available for $595.

Softcraft, P.O. Box 9802, No. 917, Austin, Texas 78766.

■ Terak Corp. has introduced a version of its Minn-Draft software for the IBM Personal Computer and Personal Computer XT for instruction in computer-aided design and drafting (Cadd).

The Minn-Draft/PC package requires a minimum of 256K bytes of memory, dual 360K-byte floppy disk drives and a color or monochrome graphics card and monitor. Minn-Draft/PC also supports the IBM 8087 coprocessor and hard disk, according to the vendor.

Originated by the University of Minnesota, Minn-Draft is said to be a three-dimensional system for teaching the concepts, principles and operations of Cadd. It reportedly incorporates features of large Cadd systems for easier learning.

Included with the software is a digitizing tablet that reportedly emulates the terminal screen for 3-D graphics.

Minn-Draft/PC costs $2,995.

Terak, 14151 N. 76th St., Scottsdale, Ariz. 85260.

■ KDS Corp. has announced KDS-Autologic software that reportedly creates expert system programs using the IBM Personal Computer. The product is said to allow expert users to teach novice users about a specified topic through the use of knowledge modules.

According to the vendor, an expert user creates a knowledge module by entering case histories in English and poses a series of questions to the novice user in applications such as training for decision making, diagnosis and administrative management. With KDS Playback Module software, the knowledge module can reportedly be transferred to other microcomputers without recoding.

KDS-Autologic, written in assembler, is said to produce up to 16,000 rules from up to 4,096 case histories. As many as 512 conditions in any combination may be used to distinguish one case history from another, according to the vendor. It requires 512K bytes of internal memory.

The KDS-Autologic Development System, in which the user creates knowledge modules, costs $795. KDS Playback modules cost $495.

KDS, 934 Hunter Road, Wilmette, Ill. 60091.

■ Microsoft Corp. has announced an enhanced version of its Microsoft C Compiler for the IBM Personal Computer. Version 3.0 reportedly improves the execution speed and compactness of C programs.

A vendor spokesman said Version 3.0 is the first C compiler developed internally by Microsoft. Previous versions of the Microsoft C Compiler are reportedly easily recompiled with Version 3.0 using conversion tools provided with the package.

The compiler automatically optimizes programs when they are compiled or allows the user to select alternative optimization procedures with command line options, according to the vendor. The user can reportedly turn off optimization entirely in the early stages of program development and utilize register variables for improved performance.

The Microsoft C Compiler is said to include more than 200 runtime library routines. The compiler requires 256K bytes of random-access memory, two double-sided disk drives and Microsoft's MS-DOS Version 2.0 or higher.

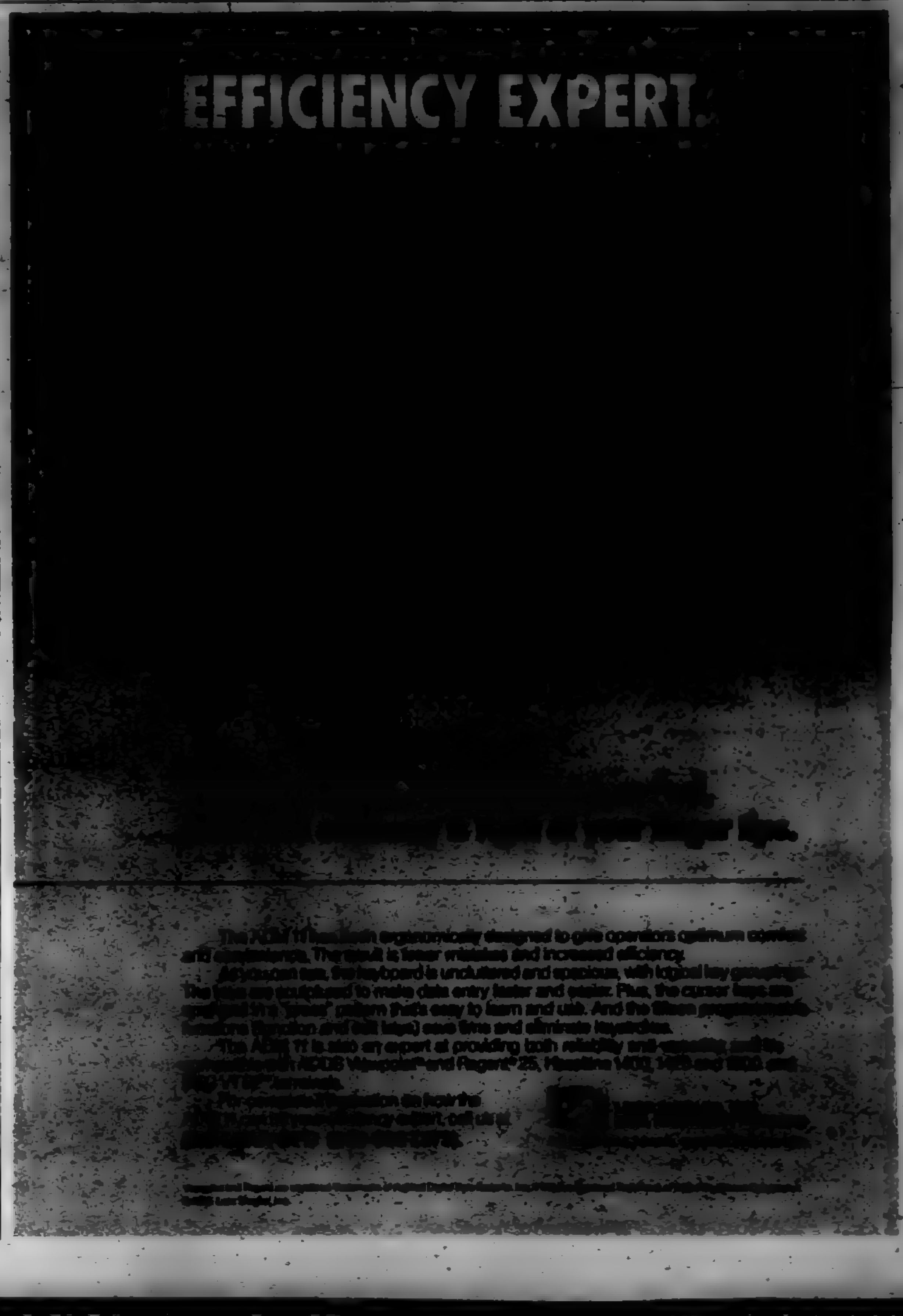
The compiler costs $395. Upgrading to Version 3.0 from earlier versions costs $100.

Microsoft, Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

■ Micro Solutions, Inc. has announced an enhancement of its Uniform utility software for users of personal computers under Digital Research, Inc.'s CP/M operating system.

Uniform software reportedly permits users to read and write data diskettes directly from different CP/M-based personal computers and to

Continued on page 72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Continued from page 71

initialize or reformat program or data diskettes for those machines. Enhancements offered in Version 3.0 are said to include expanded user prompts. Uniform is designed to permit businesses to use a variety of personal computers.

The software is priced at $69.95.

Micro Solutions, 125 S. Fourth St., De Kalb, Ill. 60115.

■ Information Concepts, Inc. has introduced FSP software, a full screen processor for use in software development on systems under AT&T's Unix or Microsoft Corp.'s Xenix operating systems.

FSP is said to permit developers to incorporate full screen form and menu displays and editing features into their applications. Its screen-oriented form, FSP Panel, can contain protected and unprotected fields, field initialization and validation criteria and post-response processing instructions.

The software is priced at $950, or $250 per year on an annual lease.

Information Concepts, 9th Floor, 1331 H St. N.W., Washington, D.C. 20005.

■ Unipress Software, Inc. has announced Phact-RG, a report generator for the IBM Personal Computer, Digital Equipment Corp. VAX-11 series minicomputer or computers using the Motorola, Inc. 68000 microprocessor.

Phact-RG reportedly supports multiline titles and column headings, grand totals and subtotals, page headers and footers, level breaks and both default and absolute positioning of data. It is said to run in either interactive or batch mode. The product is designed to format reports in conjunction with data bases in Unipress' existing Phact base record management software.

Phact-RG is priced at $165 for the Personal Computer running MS-DOS, $275 for small 68000-based machines, $420 for large 68000-based machines and $575 for VAX-11 machines running the DEC VMS or AT&T Unix operating systems.

Unipress, 2025 Lincoln Highway, Edison, N.J. 08817.

■ Genesis Microsystems Corp. has introduced its Genescope full screen debugger for debugging Intel Corp. 8086-based applications

Continued on page 73

GRID

from page 65

that runs at 4.77 MHz, provides a built-in 3½-in. disk drive with 720K bytes of memory, said Alan Lefkof, Grid's vice-president of marketing. The systems are said to feature 80-char., 25-line screens with 600- by 200-pixel bit-mapped displays.

The company introduced three displays for its Gridcase family. The Gridcase I features a traditional LCD with black letters on a gray screen. The Gridcase II comes with an LCD that features blue-gray characters on a yellow screen. The Gridcase III is said to include a plasma screen.

Basic Gridcase systems come with 128K bytes of Cmos random-access memory (RAM). Also available are 256K-byte and 512K-byte versions of each system. In addition, Lefkof said, each computer in the Gridcase line can accommodate up to 512K bytes of user installable read-only memory cartridges.

Each Gridcase computer is said to include an RS-232 serial communications port and Centronics Data-Communications Corp. parallel communications port. An external bus connector allows users to hook up a Gridcase portable to an IBM expansion chassis, Lefkof said. Another port allows users to connect an IBM keyboard or a 10-key keypad to the Gridcase, he said.

The Gridcase line will run Grid's operating system and its related applications software packages, Lefkof said. The company will offer the MS-DOS operating system as an option.

Included with MS-DOS is the company's PC Master/Slave software, which allows users to exchange files with an IBM Personal Computer without installing a hardware card. In addition, the firm will offer remote communications software for the Gridcase line, Lefkof said.

In standard configurations, the Gridcase I costs $2,975; the Gridcase II costs $3,150; and the Gridcase III costs $4,350. All are available now.

Grid also introduced two products for its Grid Server, which functions as the hub of Grid's local and remote networking system.

The firm announced support for MS-DOS file sharing and print spooling. With Grid's support for MS-DOS files, the Grid Server's shared disk drives appear as local devices, Lefkof said. Applications software running on Grid computers or IBM Personal Computers will be able to gain access to data files on the Grid Server using the software, the firm said.

Grid, which has priced the MS-DOS operating system at $150, will bundle the file sharing and print spooling software at no extra charge. The firm will sell the same package for Personal Computers for $100.

The company also announced Grid 3780, which will provide a communications link with host mainframes for systems on the Grid network. Grid 3780 uses IBM's Binary Synchronous Communications protocol running at 1.2K bit/sec. to 9.6K bit/sec. over leased or switched lines, he said. Files that have been downloaded to the Grid Server are automatically reformatted for use with Grid or MS-DOS software packages.

The Grid 3780 hardware and software kit, which will be priced at $3,250, includes a communications processor card and 3780 software.

Grid Systems is located at 2535 Garcia Ave., Mountain View, Calif. 94043.

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SYTEK

from page 69

an overall networking scheme that includes the Localnet/20, Sytek's large-scale, general-purpose broadband network for terminals, mainframe computers, IBM Personal Computers and other personal computers, Edholm said.

Edholm suggested that while the personal computer local-area network market is driven by IBM, it is nevertheless applications oriented, with both "top-down and bottom-up installations."

Typical large-scale networking is structured from the top down, but personal computer networks frequently appear from the bottom up. First one department and then another within a large organization will see a need for a network.

With the ability to go to the corner computer store and order a network, end-user departments are becoming less dependent on central DP organizations to solve all their data processing needs.

But if networking is done from the bottom up, sooner or later the question of how the networks can be joined together arises. Broadband nets can then be seen as a solution. Based as it is on CATV technology, broadband provides the most flexible communications medium now available in tested, off-the-shelf products.

As Edholm noted, "broadband is a unique medium." A multichannel broadband system can support a de facto personal computer network standard as well as many other standard and nonstandard channels, with plenty of room for growth.

Sytek's Localnet/PC essentially provides layers one and two, the hardware and protocol layers, of the International Standards Organization's Open Systems Interconnect model. Using Localnet/PC in the PC Network, IBM essentially has provided layers three through six — the software that works with the hardware and protocols for a network system. The seventh layer, the applications layer, is not yet extensively developed, although IBM will offer some applications for that level as well.

Sytek's stated objectives are to create "a base technology to develop a family of products," an infrastructure to "develop connection products to maximize the number of devices talking to the network" and a set of applications to provide "value-added end-user services."

Potential applications include file and print serving, electronic mail, distributed data bases, time management and other personal productivity software. The approach is to provide a networking environment, since the provision of an extended number of value-added network devices and services will involve more than just Sytek.

Localnet/PC is an open network, and "Sytek is working with the third-party community to provide value-added network products," Edholm said.

Sytek claims that Localnet/PC will provide a total network system solution with a three-pronged approach: internal development, joint ventures and OEM relationships. In a practical sense, this means that third-party software developers can also produce networking software with the potential of including not only IBM micros but personal computers made by other vendors.

Continued from page 72

using the IBM Personal Computer.

Genescope is said to provide a file-viewing window that allows source or listing files to be referenced during a debugging session.

It also allows users to switch from other displays to the text file with one keystroke and to let them patch programs with an on-line symbolic assembler. Assembly language mnemonics and program label names can be used instead of machine language.

A full screen debugger, Genescope displays the code as it executes. It is priced at $995.

Genesis Microsystems, 196 Castro St., Mountain View, Calif. 94041.

■ Phoenix Computer Products Corp. has introduced Pmaker software for the management of program development. It runs on the IBM Personal Computer and compatibles.

Pmaker is said to be similar to the AT&T Unix make utility in that it can automate any process in program development that requires repetitious steps to produce a single result. It also reads text files created by either a text editor or its built-in Make Pmaker File utility. That utility automatically generates all Pmaker commands needed to produce a program.

The software also reportedly tracks and updates every file in a program.

Pmaker is priced at $195.

Phoenix Computer Products, Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

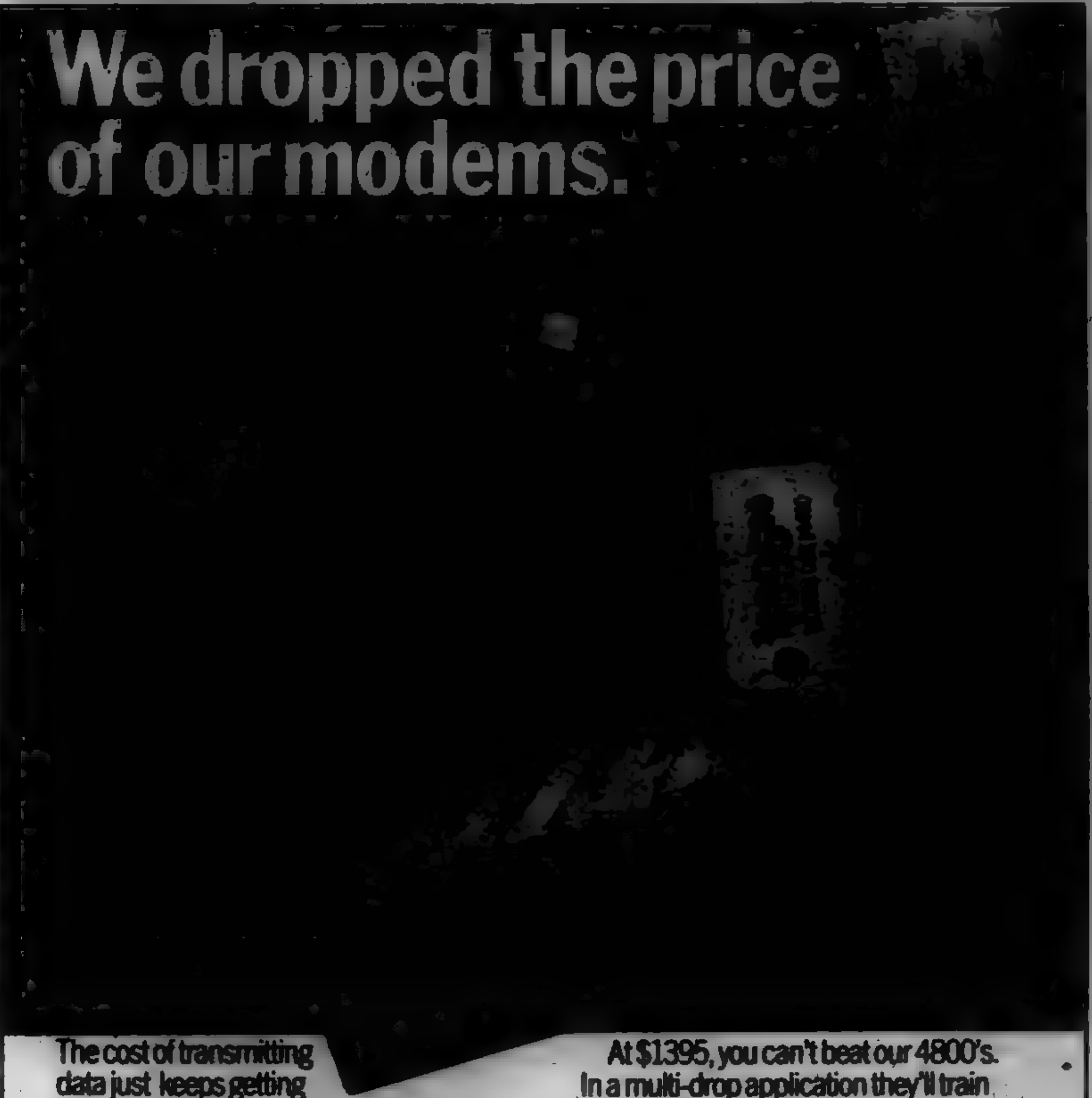
■ Omicron Software, a division of Engineering-Science, Inc., has announced an enhancement of its Plan/Trax project management software for the IBM Personal Computer.

Plan/Trax 3 Version 3 reportedly allows users to rely on either the Gantt or Critical Path methods of project management to support up to 700 tasks and track up to 10 resources. Enhancements include a summary information system and a holiday calendar.

The summary information system reportedly allows users to control overall office management functions. The holiday calendar allows users to specify up to 175 holidays to be deleted from the working schedule.

The software is priced at $795.

Omicron Software, Suite 590, 57 Executive Park S., N.E., Atlanta, Ga. 30329.



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SOFTWARE

from page 65

lows for autodialing without a modem. Macdesk also includes Memowriter, a miniature word processor that creates Macintosh word processor-compatible memos and letters. Macdesk costs $99.95 with Phonelink and $89.95 without it.

Desktop telecommunications

Intermatrix also introduced Computerphone, a fully integrated desktop telecommunications system for the Macintosh, the Apple Computer, Inc. Apple II and the IBM Personal Computer.

Computerphone bundles an AT&T 212A-compatible modem that provides asynchronous data communications capabilities at 300/1,200 bit/sec. transmission rates. It supports autodial, autoanswer and autospeed detect features, the vendor said.

Computerphone supports two separate telephone lines and can be used in either the single- or dual-line voice/data mode. The product's handset and base unit with monitor speaker reportedly can be mounted directly on the computer or used on a desktop.

Computerphone's software is a complete communications program with the Macdesk organizer and includes calendar, appointment alarm, memo pad and electronic filing system. It costs $399.95.

Intermatrix is located at 5547 Satsuma Ave., N. Hollywood, Calif. 91601.

Hayes announced its Please data base management software for the Macintosh. A vendor spokesman said Please can manipulate up to 1,000 char./field, 100 fields, 2,000 char./record and several million records per data base.

In addition to character fields, Please supports numeric data indicator fields. The package offers five report formats, merge capabilities, automatic dialing, on-line Help and data protection capabilities.

The product's output plans support nine levels of sorting, 30 calculated fields per report and 200 calculations. Users can design formats and output plans with the mouse pointer, and as many as 300 words, sentences, symbols or Apple Macpaint pictures in any Macintosh style or size can be used to identify groups of related data. Please will be available in the second quarter for $199.

Hayes is located at 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

Softguard Systems, Inc. introduced an enhanced version of its Superlok software copy protection program for IBM Personal Computers and compatibles. Superlok 2.0.3 was reportedly enhanced to allow for the development of copy-protected disks that can be used over a broad range of IBM-compatible systems and third-party hard disks.

A Superlok 2.0.3 user can transfer a protected program to IBM Personal Computer hard disks and most compatible disks and between hard and floppy disks, the vendor said. Other features include simplified screen interfaces and confirmation messages, making the product easier to install and operate. Users can also customize installation prompts and error messages. A Superlok kit is priced from $295 to $2,125, depending on the number of floppy disks to be protected.

Softguard is located at Suite 201, 2840 San Tomas Expwy., Santa Clara, Calif. 95051.

Utility disk with graphics support

Execucom Systems Corp. announced a utility disk for its IFPS/Personal IBM Personal Computer-based decision support system. The Sidelight utility disk provides additional communications and graphics support for users of IFPS/Personal in a distributed micro software and hardware environment, a vendor spokesman said.

Sidelight interfaces and exchanges data with several popular spreadsheet, data base, word processing and integrated packages, including Lotus Development Corp.'s 1-2-3 and Symphony, Ashton-Tate's Dbase II and Dbase III, Micropro International Corp.'s Wordstar and Microsoft Corp.'s Multiplan.

Sidelight reportedly also supports a direct interface with any Graphics System Extension-supported graphics device. IFPS/Personal is available for the IBM Personal Computer, AT and XT. The Sidelight utility disk costs $95.

Execucom also announced that IFPS/Personal is now available for Hewlett-Packard Co.'s Touchscreen personal computer at $1,500.

Execucom is located at 3410 Far West Blvd., Austin, Texas 78731.

GEMS

from page 65

graphics and can edit graphics and charts produced by GEM Graph and GEM Wordchart, the firm said.

GEM Write is a word processing program designed by Lifetree Software, Inc. Users will be able to merge graphics created in other GEM applications into GEM Write documents, a Digital Research spokesman said.

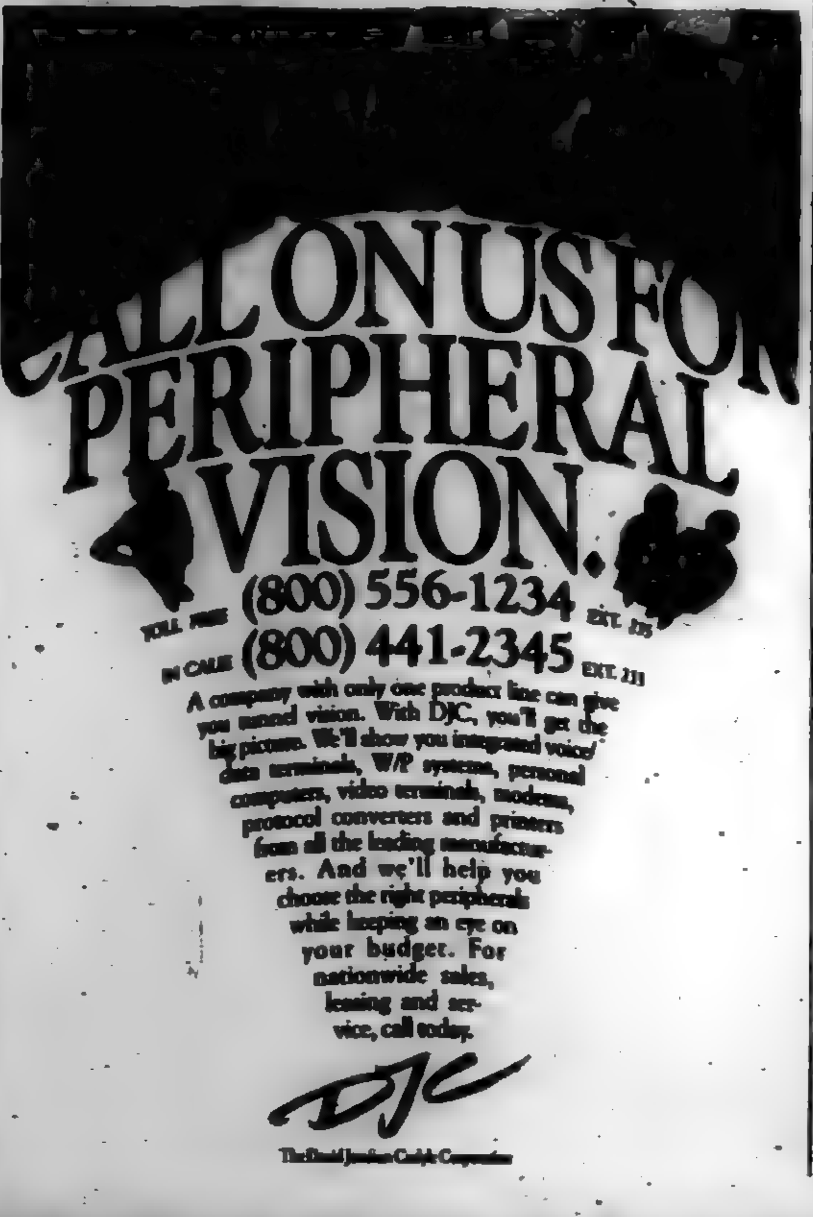
The GEM Graph program is said to offer users a choice between a variety of chart templates — pie, line, bar and map. Symbols drawn with GEM Draw can be merged into charts, the company said.

GEM Wordchart was designed to help users produce text charts. It is said to include a selection of templates for quotations, tables, bullets and outlines. Artwork developed using GEM Draw reportedly can be added to GEM Wordchart files.

GEM Desktop and GEM Draw will be available this month. GEM Desktop will cost $49.95. GEM Draw will carry an introductory price of $149; the firm plans to raise the price to $249 in September.

According to the company, the GEM Collection, which includes the Desktop, Write and Paint software, will cost $199 and will be released in mid-June. Users who buy the Desktop will receive a coupon that will allow them to purchase Write and Paint for $99.95 until Aug. 31. Both GEM Wordchart and GEM Graph will ship by July 1. Wordchart will cost $149, and Graph will cost $199.

Digital Research can be reached at Box DRI, Monterey, Calif. 93942.



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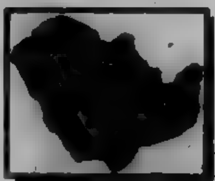

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COMMUNICATIONS

DATA STREAM
John Dix
CW Senior Editor

AT&T to boost service costs?

Renowned industry consultant and lecturer Harry Newton recently received in the mail a plain white envelope that contained a copy of an executive internal memo from AT&T Communications.

The missive, penned by Gus Blanchard, AT&T Communication's vice-president of custom services, outlined problems the company is having installing and maintaining special services, such as leased, Wats and toll-free lines, and painted a gloomy picture of prospects for improving the problem.

Written as an update on the state of service provisioning for Randall Tobias, the company's chief executive officer since Feb. 1, the memo was circulated electronically to a number of employees with little heed paid to its secrecy, a company spokesman admitted.

One copy ended up in the mailbox of *Teleconnect*, an industry magazine published by Newton. He ran a copy of the memo in his April issue, prefacing it with the question, "Is it a 'leak' or a 'plant?' " If the memo was planted, Newton reasoned, AT&T may be trying to put pressure on the Federal Communications Commission, the divested Bell operating companies and perhaps AT&T management.

The gist of the memo is that Blanchard believes AT&T does not currently recover the cost of installing and maintaining special services and that, in the future, efforts to recover these costs will drive up end-user fees. It also indicated that predivestiture installation periods for these types of services are unrealistic and costly.

Here are some highlights from Blanchard's memo:

- "Although prior to divestiture the provisioning process delivered to our customers what they wanted — short delivery intervals, dependable due dates and low price — it was terribly inefficient and extremely costly for the [divested operating companies] and [the former Long Lines division]."
- "There was never any suggestion that the tariffed, one-time, nonrecurring costs of installing, moving or disconnecting such services even remotely covered actual costs."
- "A general willingness on the part of [the divested Bell operating companies and the former Long Lines division] to put on-time delivery of services before internal expense or efficiency concerns gave our customers what they wanted at a price which did not — in my opinion — begin to accurately reflect our provisioning costs."
- "I believe the end result [of access interfaces and ordering procedures] to the customer will be higher costs and longer intervals than [they] experienced predivestiture."
- "The recently filed private-line tariffs, by allowing the customer to order

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WIRE TAP/DANIEL MINOLI

Scenario for network backup

Adapting communications systems to switch between a primary host site and backup facilities when a disaster strikes is relatively straightforward and economical when state-of-the-art network technologies such as packet switching, two-way direct broadcast satellites and digital termination systems are used.

Planning for disaster recovery where traditional IBM Binary Synchronous Communications or Systems Network Architecture multidrop teleprocessing networks are used requires special attention.

Besides long-distance networking, the disaster recovery plan must accommodate communications within and between buildings that may be supported by local networks, local distribution networks with limited-distance modems or bypass facilities.

A desirable characteristic of disaster recovery plans is low risk. One low-risk approach may involve the use of central office multiplexing as provided by local telephone companies. With this scenario, a user's primary host site is connected to an alternate site through a telephone company switching center using high-speed communications lines.

Central office multiplexing reduces points of vulnerability that are created when in-house communications equipment is used to back up a processor site. As an example, dependence on a private branch exchange to switch communications lines from a processor located in the same room to a backup site creates a secondary vulnerability instead of eliminating the risk.

Also, with central office multiplexing, the maintenance and availability of the equipment destined for use in disasters — in this case, the telephone company switches — rests on the shoulders of a knowledgeable third party.

See MINOLI page 79

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities in New York.

- Tymnet and Satellite Technology Management have signed a joint venture agreement to offer a satellite network service/78
- Comdesign has announced hardware and software products for interconnecting local- and wide-area networks/78
- AT&T has added audio and audiographic capabilities to Alliance, its teleconferencing bridging system/79

Rolm offers tools for PBXs

SANTA CLARA, Calif. — Rolm Corp. recently announced call routing and call restriction software for its CBX II and VSCBX private branch exchanges.

The features, which are part of Rolm's Integrated Call Management, include support of equal-access dialing options, 10-digit call screening and the ability to use dial-up circuits for tie-line-like applications.

With Route Optimization II, users are said to be able to use the 10XXX dialing option created with equal access to route calls over different long-distance carriers. As local telephone companies upgrade for equal access, they are asking customers to choose a primary long-distance carrier that will be accessed as AT&T is today — by dialing a single digit. Carriers other than the primary supplier can be accessed by dialing 10 and a three-digit carrier specification code.

Route Optimization II is said to enable users to select carriers manually by keying in access codes or by having the switch insert the code automatically. The package consolidates the capabilities of least-cost routing, queuing and toll restriction in one system, Rolm reported. The software costs $1,200 for the VSCBX, $6,000 for CBX II Model 8000 and $22,000 for the CBX II 9000.

Rolm's new Call Screening software is said to enable call restriction by seven- or 10-digit telephone numbers. This capabili-

See ROLM page 78

Firms to test cellular data communications

BASKING RIDGE, N.J. — Are cellular mobile telephone systems practical for data communications? Bell Atlantic Mobile Systems, Inc. and AT&T are undertaking a three-month trial to determine the answer to that question.

At the end of April, 50 customers located in the Washington, D.C. area will begin testing the service from their cars. These customers represent a cross-section of businesses including banking, insurance, media, telecommunications, manufacturing, hotel, professional services and government companies.

Bell Atlantic will provide the mobile service, and AT&T will supply the cellular telephones, special modems, the switching equipment for encrypted voice and data communications and, in some cases, portable computers from Data General Corp. or Hewlett-Packard Co.

The trial will test how well the equipment deals with fading, a condition that occurs when a car moves away from a cellular broadcasting tower that is said to

See TEST page 78

AT&T seeks to expand DDS to UK market

MORRIS PLAINS, N.J. — AT&T has filed a proposal with the Federal Communications Commission that would expand the telephone company's international Dataphone Digital Service (DDS) to the UK.

The service would connect AT&T's DDS service with British Telecom International's Kilostream service. The expanded international DDS would allow businesses to transmit data 24 hours a day, seven days a week at 2,400, 4.8K, 9.6K and 56K bit/sec.

International DDS, introduced in 1974, is available in 104 U.S. cities and Canada.

AT&T proposed that the service become available on May 18. If approved, a user would receive monthly service charges from AT&T and British Telecom International. AT&T's monthly rate would be $1,800 for a 2,400 bit/sec. channel, $2,400 for a 4.8K bit/sec. channel, $3,000 for a 9.6K bit/sec. channel and $12,000 for a 56K bit/sec. channel.

More information is available from AT&T Communications, International Department, Atrium One, 203 Johnson Road, Morris Plains, N.J. 07950.

Firms pen satellite pact

SAN JOSE, Calif. — Tymnet, Inc. and Satellite Technology Management (STM), Inc. have signed a joint venture agreement to offer Tymstar, a public satellite network service.

Tymstar will be a two-way service using micro earth stations designed to replace leased lines, Tymnet said. The system, based on STM's Starmux technology, will be a full-duplex digital communications service featuring a packet-oriented, time-division multiple-access design.

A Tymnet spokesman said that the earth stations, which will measure approximately six feet in diameter each, will have between four and 24 ports. Initially, the product will support asynchronous, X.25 and IBM Synchronous Data Link Control protocols. The earth stations will feature transmission speeds up to 96K bit/sec., and the receive capacity will range up to 15M bit/sec.

The agreement stipulates that STM will supply technical support, and Tymnet will market the service, distribute earth stations and support customers. The system should be available at the beginning of 1986. The first master hub will be placed in Southern California; additional hubs in the Midwest and East are planned.

Tymnet estimated that prices for a two-way earth station will start at $25,000, and one-way station prices will begin at $5,000.

Tymnet is located at 2710 Orchard Pkwy., San Jose, Calif. 95134.

ROLM

from page 77

ty enables telecommunications managers to block calls to certain numbers, such as time and weather reports and dial-it services. The feature costs $1,600 on the VSCBX, $3,000 on the CBX II 8000 and $6,000 on the CBX II 9000.

For organizations with multiple business locations, Rolmnet II includes a capability known as Virtual Private Lines. This feature is said to enable dial-up circuits to be used in lieu of tie lines. It provides direct called-party access without Direct Inward Dialing.

Rolmnet II is initially available on the VSCBX for $6,000 and on the CBX II 8000 for $12,000. The company said the feature will be available on the CBX II 9000 in the future.

Shipments of the software will begin in June.

More information is available from Rolm at 4900 Old Ironside Drive, Santa Clara, Calif. 95054.

TEST

from page 77

be nearly imperceptible in voice conversation but which can cause errors in data transmission. The test will also see how well the equipment for data communications can maintain connections when the signal is handed from one geographic broadcasting cell to another as the user travels.

Customers will reportedly be able to transmit data at speeds of 300, 1,200 and 2,400 bit/sec.

Bell Atlantic Mobile Systems is located at 180 Mount Airy Road, Basking Ridge, N.J. 07920.

Futurecom 2000 components released

GOLETA, Calif. — Comdesign, Inc. has announced the Futurecom 2000 Integrated Area Network hardware and software products for interconnecting local- and wide-area networks in a single net. Futurecom 2000 supports Ethernet networks and RS-232 interfaces.

According to a spokesman, Futurecom 2000 is based on Comdesign's Compatible Communications Architecture protocol, which utilizes features of several different protocols to provide network integration.

Futurecom's components include:

- The LS-2000 Local Server concentrates data traffic from as many as 32 devices onto an Ethernet local-area network.
- The RS-2000 Remote Server connects up to 32 user network channels with four composite RS-232 concentrated links to support distributed devices.
- The NS-2000 Network Server is a gateway node bridging normally incompatible transmission media. An NS-2000 on each node group provides remote access from local network-based resources residing in physically separate networks such as CPU ports, terminals, printers and data collection devices. The NS-2000 functions as an Ethernet controller with one Ethernet link and up to four RS-232 wide-area links.

Any of the Futurecom components can function independently, and the network can be configured and monitored from any user channel on any Futurecom node, with password authorization to the supervisory control logic.

Security is provided by programmable resource access and password protection. Futurecom supports data transfer speeds of up to 19.2K bit/sec. on RS-232 links and asynchronous speeds from 300 to 9.6K bit/sec.

The Futurecom product line is scheduled to ship in production quantities in the third quarter of 1985. Prices are as follows: NS-2000, $5,800; LS-2000, $4,300 to $7,700; and RS-2000 $3,800 to $10,300.

Comdesign is located at 751 S. Kellogg Ave., Goleta, Calif. 93117.

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AT&T adds audiographics, audio capabilities to Alliance

MORRIS PLAINS, N.J. — AT&T has added audio and audiographic capabilities to Alliance, its teleconferencing bridging system that is said to be able to connect 59 domestic or 134 worldwide locations.

The service enables users to place audio or audiographic calls. The audiographic capability enables graphics equipment to transmit data or graphics images at speeds up to 4.8K bit/sec. simultaneously to a number of locations.

With a push-button telephone, customers can establish an Alliance conference. The customer or an operator can then connect the calls to Alliance bridges located in Chicago, Dallas, Los Angeles and White Plains, N.Y.

Originators of conference calls pay long-distance charges for the call to the nearest bridge. If the call is established by an attendant, there is a $3 charge for each location.

International Alliance calls are billed at the same rate as international calls from the bridge.

Additional information on the Alliance service is available from AT&T Communications International, which is located at Atrium One, 202 Johnson Road, Morris Plains, N.J. 07950.

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Typically, the facilities used between the telephone company central office switch and the primary and backup sites will be T1 digital pipes.

Once that bridge has been established, the problem becomes how to route communications traffic from the afflicted primary site out to the switch so that the traffic may be directed to the backup facility.

Three types of links need rerouting

There are three major types of links that must be rerouted: links between in-house controllers and processors; links between processors; and incoming multidrop lines used to support geographically dispersed locations.

In-house controllers crucial to the business should be relocated in user areas rather than in the processor room. This can be achieved using limited-distance modems and other patches. An A-B switch is then added to each controller.

Under normal operating conditions, the switch provides a connection to the primary processor, but when a disaster occurs, the switch can be thrown to connect the controller to the T1 facility serving the backup site through the local central office.

Computer-to-computer links can be handled by engineering a three-point circuit, the third leg of which is either brought on-line by the telephone company at the time of disaster or is packed into the T1 pipe.

The switching of multidrop lines from the primary site to the backup location is most efficiently handled using a local telephone company option called 3DY. This is a central office switch-bridging technology that permits dynamic merging of multiple lines into fewer lines.

For example, instead of having to switch over all multidrop lines to the backup site, 3DY enables multidrop lines to be merged while continuing to provide support to each remote location.

Each line would support more drops — perhaps one for two or one for three — and service would be degraded, but the rationale is to pack the total number of drop sites into the smallest number of circuits consistent with the channel capacity on the long-haul pipes, the affordable number of duplicate modems at the backup site and the permissible level of service.

Of course, switching all multidrop lines to the backup site on a one-for-one basis is also possible, but expensive.

Where the number of multidrops is reduced by the merge, a subset of the dispersed controllers must be regenerated with the appropriate address. This can be done locally at recovery time or, where dual port controllers are used, remotely from the second port.

MEMO

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his own access from the [local exchange carrier] or provide his access by other means, have created additional layers of complexity, which must surely add to the cost of the provisioning process for the foreseeable future."

■ "Today we alone bear the single managerial and financial burden of coordinating the activities of all [local exchange carriers] involved in providing access. We — rather than the customer — accept each access line when our local people and the [local operating company] can install it, and we begin receiving a bill from the [local operating company] when that happens — even if the entire circuit is not working and therefore is not bringing us revenue from the customer."

■ "[AT&T Communications] does not now possess the tools to accurately tie costs to such customer-valued attributes as intervals and on-time reliability. As the would-be value-added end-to-end provider [of custom services], we are squarely in the middle and faced with the extremely difficult and dangerous task of 'weaning' our customers away from unrealistic prices and intervals."

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SYSTEMS & PERIPHERALS

Honeywell releases Infonow for DPS 6

Videotex system allows graphics, text transfer

By Donna Raimondi
CW Staff

WALTHAM, Mass. — Honeywell, Inc. has unwrapped a turnkey videotex system based on its DPS 6 minicomputer family. The Infonow Videotex System uses the French Teletel, or Antiope, information exchange protocol to allow transmission of graphics as well as text.

The videotex system offers nontechnical staff access to information that could include company's price lists, product catalogs, job postings, internal purchase orders, company policies, benefit plans, engineering standards and directories, the vendor said.

A typical 500-user system would cost approximately $500,000. The system includes a central DPS 6 running under Honeywell's Gcos 6 MOD 400 operating system, with different models ranging from $93,000 to $173,000. Also included is an Information Provider workstation priced at $4,635, a System Administrator terminal priced at $795 for a Honeywell VIP7201 and $1,900 for a VIP7301 and Telic-Alcatel's monochrome Minitel terminals priced at $650 each for users. A printer is required for system statistics; the prices are $3,300 for a 160 char./sec. dot matrix printer and $11,500 for a 300 line/min printer.

The Honeywell Microsystem PC, IBM Personal Computer and Personal Computer XT can be equipped with a Microlog, Inc. VT-Link adapter board, priced at $720, and terminal emulation software, priced at $25, that comes on a 5¼-in. floppy disk, the vendor said, to allow them to function as Minitel terminals with a color display.

Access public data networks

The adapter board does not affect the personal computer's existing capabilities, the vendor said. When personal computers are linked to the system, they can access public data networks such as The Source, Dow Jones & Co. and Nexis Service. The Minitel terminals cannot access such data networks because the public data bases are Ascii-based, 80-char., formatted services, and Minitel terminals are Antiope-based, 40-char. screens, the vendor said.

The videotex system requires a staff member to load information into the information base, organize it logically, keep it current and determine which mnemonics and keywords may be used for access. Such people typically are non-DP employees and need not know operating systems, data bases or command languages, the vendor said.

A system administrator is responsible for central system functions, such as user registration, password assignment, statistics printing and disk backup. System administrators require little or no data processing background, the vendor said.

Users may retrieve and display pages of information but cannot alter the contents of a page. A series of menu displays and multiple choice selections guide the user, and mnemonic codes allow the user to enter abbreviated forms of the menu selections to bypass the menu, the vendor said. The system has built-in tutorial screens. Single key words and key words linked with AND, OR and NOT allow the user to search for information. The system also provides electronic messaging capabilities, the vendor said.

An optional Ordernow software applications package allows customer orders to be entered into the system and stored for later transfer to the main data processing system. This option is available for an ini-

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■ Bell & Howell unwrapped a computer output microfilm system for Honeywell equipment that is capable of supporting concurrent paper and microfilm printing from the same source data file/86

INSIDE

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Soemi bridges Multibus, 4361

HILLSBORO, Ore. — Intel Corp. has announced its ISBC 561 Soemi Controller Board — a dedicated I/O controller on a standard Intel Multibus I board — which serves as a bridge between Intel Multibus systems and the IBM 4361 computer.

The board permits use of a 4361 in applications such as real-time process control, computer-aided engineering and manufacturing, factory automation, voice synthesis and recognition, laboratory automation and measurement, the vendor said. It includes a 5-MHz Intel 8086 microprocessor, an 8-MHz microcontroller, 16K

See BOARD page 86

NCR unveils 6480 laser printer

By Donna Raimondi
CW Staff

DAYTON, Ohio — NCR Corp. has released its NCR 6480 laser printer, which features a printing speed of 103 page/min on 8½-in. fanfold paper and a dot matrix density of 57,600 dot/sq in. The printer is available for use with the NCR VRX operating system on NCR V-8575 II, V-8585 II and V-8595 II mainframe processors and costs $210,430 for a unit with four character fonts.

The 6480 uses the cold-fusion print adhesion process in which a chemical agent is used to fuse the toner onto the paper, as opposed to a heat-fusion process. The cold-fusion process is said to make pregummed paper labels and forms with cellophane address windows that are less likely to wrinkle or stick during printing.

Optional memory expansion units cost $6,600 each. One memory expansion unit is needed to go from four to 16 fonts, another is needed to go from 16 to 32 fonts. Above 32 fonts, one memory expansion is needed for every 12 additional fonts. As many as 64 character sets can be loaded into the 6480. Fonts added to the basic four cost $150 each.

Users are said to be able to custom design simple graphics and character sets, modify characters within a set and create their own custom forms.

More information can be obtained from NCR, V Systems, U.S. Data Processing Group, Dayton, Ohio 45479.

Recent CPU releases reflect similar technology

HARD TALK
Tom Henkel
CW Senior Editor

Since February, IBM, National Advanced Systems Corp. (NAS), Honeywell, Inc. and Burroughs Corp. have each announced high-end mainframes. Although the architectures employed by the four vendors are different, the product announcements bear some striking similarities. For example, the systems announced by all four firms offer about twice the performance and occupy approximately 30% to 40% less floor space than their respective predecessors.

This is hardly a coincidence. Researchers from IBM, Burroughs, Hitachi Ltd. — which makes NAS' CPUs — and Honeywell's CPU supplier NEC Corp. all went to work about five years ago determined to develop successors to their top-end products. What is interesting is that all four manufacturers managed to come up with processors on the same basic technological level.

In each case, the dramatic performance and floor space improvements on the newly announced processors rest, in large part, with the density of the circuits used in them. Howard Dicken, president of DM Data, Inc., a research company in Scottsdale, Ariz., noted that every 10% of a micron reduction in the circuit-packaging process translates into a squaring of the circuit-packing density and performance of the chips. Consequently, vendors can develop CPUs that are smaller, more reliable and less expensive to manufacture.

These developments in circuit packaging are quite interesting considering that a few years ago many industry watchers said they believed that to develop processors capable of internal performance in the 40

See CPU page 86

More channels, faster exchange mark IBM's 4381

RYE BROOK, N.Y. — IBM has expanded from eight to 12 the number of channels on its 4381 Model Group 3 mainframe that can transfer data at 3M byte/sec. This, the vendor said, allows the 4381 Model Group 3 to use more top-end IBM peripherals.

In addition, IBM said all 4381 Model Group 3 channels that previously could exchange data at 1M byte/sec. can now operate at 2M byte/sec.

Both no-charge features will be installed on all 4381 Model Group 3 processors shipped after April 3. A field-installable engineering change for currently installed systems will also be available this month.

More information is available at any IBM sales office.

SYSTEMS & PERIPHERALS

PROCESSORS

■ **Applied Digital Data Systems, Inc. has announced its Mentor 5500 business computer system, which is based on an enhanced version of Pick Systems' Pick operating system.**

The 5500 provides from 512K bytes to 1.5M bytes of memory and supports up to four 167M-byte, 8-in. disk drives, with ½-in. magnetic tape (16K/32K bit/in.) backup. The system has four Centronics Data Computer Corp.-type parallel printer ports and can support up to 64 terminal ports.

The system is said to provide 70% improvement in speed over the the firm's 4000EP. This is because the 5500's terminal controller allows offloading of I/O tasks, thus freeing the CPU for processing, the vendor said.

Typical configurations of Mentor 5500, including terminals and printers, range from $80,000 to $150,000.

Applied Digital Data Systems, 100 Marcus Blvd., Hauppauge, N.Y. 11788.

DATA STORAGE

■ **Megatape Corp. has announced that a cache option incorporating an error-correction capability is now available for use with its 300M- and 600M-byte streamers.**

Both the full-wide and half-wide versions of Megatape Model MT-500 and MT-300 cartridge tape drives can be supplied with the 128K-byte cache buffer.

Error-correction coding is said to be an integral part of the cache. The 128K-byte cache buffer eliminates interfacing problems and permit use of Megatape drives with the standard magnetic tape drives that are available with the various computer operating systems, according to the vendor.

Full-wide drives with cache having 300M- and 600M-byte capacity are priced at $4,075 and $4,725, respectively, in OEM quantities. Half-wide versions cost $4,725 and $4,925 respectively, for the same capacities.

Megatape, P.O. Box 317, 1041 Hamilton Road, Duarte, Calif. 91010.

TERMINALS

■ **Amtron Corp. has announced the CD1920 series, a 19-in. color graphics display monitor series for OEMs that can be interfaced to graphics generators by vendor customization of the OEM's horizontal and vertical synchronization signals requirements.**

The CD1920 series' features include 150-MHz bandwidth, automatic vertical synchronization up to 180 Hz and 0.31mm dot pitch, resulting in a display of 1,280- by 1,024-dot resolution. Its color and paint schemes can be customized for OEMs. The series, available with a tilt-and-swivel base, meets all Underwriters Labs and Canadian Standards Association standards, the vendor said.

The models are priced from $2,800 to $3,800 for quantities from 200 to 500.

Amtron, 2990 De La Cruz Blvd., Santa Clara, Calif. 95050

POWER SUPPLIES

■ **Basic Measuring Instruments has released its Model 4800 Graphic Environmental Monitor, which supplements written description of voltage and disturbance data with a picture.**

The 4800 monitors common AC power sources, including single-phase, three-phase delta and three-phase wye. It monitors 50Hz, 60Hz or 400Hz lines without hardware changes. With external probes, users can configure the eight environmental channels that handle temperature, humidity shock, vibration, particulates, contact closure and other parameters.

The picture of the disturbance is printed on thermal paper. The report format includes site, time, date and other user-determined information. Prices for the 4800 Graphic Environmental Monitor start at $7,200; shipments will begin in May.

Basic Measuring Instruments, 408 Lincoln Centre Drive, Foster City, Calif. 94404.

■ **Sola, a unit of General Signal, has introduced its intermediate-model power line monitor, including printer, that plugs into a wall outlet to analyze line power quality as it comes into a room.**

The unit can determine power protection requirements of potential electronic installation sites or can check existing installations to ascertain whether electronic malfunctions are being caused by incoming power. The G82X plugs into any electrical outlet. It features user-adjustable disturbance thresholds and detailed readouts of disturbance values.

The unit's clock/calendar is supported by rechargeable batteries that provide a minimum of two weeks of power when line power is absent, the vendor said.

The intermediate-model power line monitor costs $1,595.

Sola, 1717 Busse Road, Elk Grove Village, Ill. 60007.

■ **SL Waber, a division of SL Industries, Inc., has introduced its Linegard 300 line of uninterruptible power supplies that protect computers ranging in size from microcomputers to minicomputers.**

The Linegard 300 is a continuous-duty power supply designed to protect computer data loads in the event of irregular voltage conditions, blackouts, voltage surges and sags and noise.

Initial models include a 300-kVA unit for $995 that protects micros and small minis and a 600-kVA unit for $1,495 for stand-alone or networked minis.

SL Waber, 300 Harvard Ave., Westville, N.J. 08093.

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USER FRIENDLY?

If logging on to online systems is a threatening experience for your users, you should know about CL/MENU™. CL/MENU makes online systems less intimidating, even to the novice or casual user. It replaces the traditional "Welcome to Our Network" screen with a menu, showing applications and their status (available or unavailable). If an application is unavailable, CL/MENU can be used to tell the users *why* it is unavailable and when it will be available. Requests for automatic logon or notification *when* an application becomes available can also be queued within CL/MENU.

CL/MENU includes an "Electronic Bulletin Board", with a "Hot News" area on the menu screen and a browsable Bulletin display. Both may be viewed without logging on to an application.

The most important benefit of CL/MENU is better user communication. If an application becomes unavailable while in use, the user automatically returns to CL/MENU rather than the "Welcome" screen. There, the DP staff might use the "Hot News" to post a message, such as "Order Entry temporarily out of service due to hardware problem – back up at 10:15 am". Without CL/MENU, the application would simply disappear, probably causing a flood of Help Desk calls and annoying the users.

CL/MENU executes without system modification in an MVS/370 or MVS/XA environment, under all versions and releases of ACF/VTAM. Any 3270-family or compatible display with at least 80 columns is supported in single or multi-domain networks. Since CL/MENU uses standard operating system and ACF/VTAM facilities, the installation and customization process is simple and straightforward.

In short, CL/MENU makes using online systems simpler and more convenient, thus less intimidating. The result is better customer service, reduced Help Desk traffic, and a better image for your data center. For more information on CL/MENU, call (213) 207-1400.

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Bell & Howell microfilm division unwraps shared-file COM system

IRVINE, Calif. — Bell & Howell Co.'s computer output microfilm (COM) division has announced a COM system capable of supporting concurrent paper and microfilm printing from the same source data file.

The 6400H COM printer provides on-line microfilm output through a Honeywell, Inc. Level 6 minicomputer in conjunction with paper output from a Honeywell Page Printer, Bell & Howell said.

A paper document can be produced from the page printer while a microfilm version of the same data is generated on the 6400H COM printer.

The system is also said to access different files at the same time so that one job can run on fiche while a different file is printing on paper. Printing is executed at a speed of 26K line/min, according to the vendor.

The system is available in either a cut-fiche dry system for $93,500 or as an archival processing scroll system for $77,500.

The 6400H can operate off-line directly from the Level 6 minicomputer or through the Level 6 to a Honeywell mainframe in real-time, on-line mode.

More information on the system is available from Bell & Howell, which is located at 16691 Hale Ave., Irvine, Calif. 92714.

BOARD-LEVEL DEVICES

■ Hewlett-Packard Co. has released its HP 64340A hardware logic analyzer for software designers. The unit allows users to make specific real-time measurements and to display the results in terms of source code.

The analyzer is housed on three circuit boards that are installed with a host emulator in an HP 64100A development station. The HP 64340A — a subset of the HP 64000 software design center — allows software designers to work on applications that are real-time dependent, the vendor said. The analyzer offers Enable/Disable functions for troubleshooting and evaluating operating systems written in high-level languages.

Six measurements allow the designer to trace modules, data flow, statements and variables and to count statements and time modules.

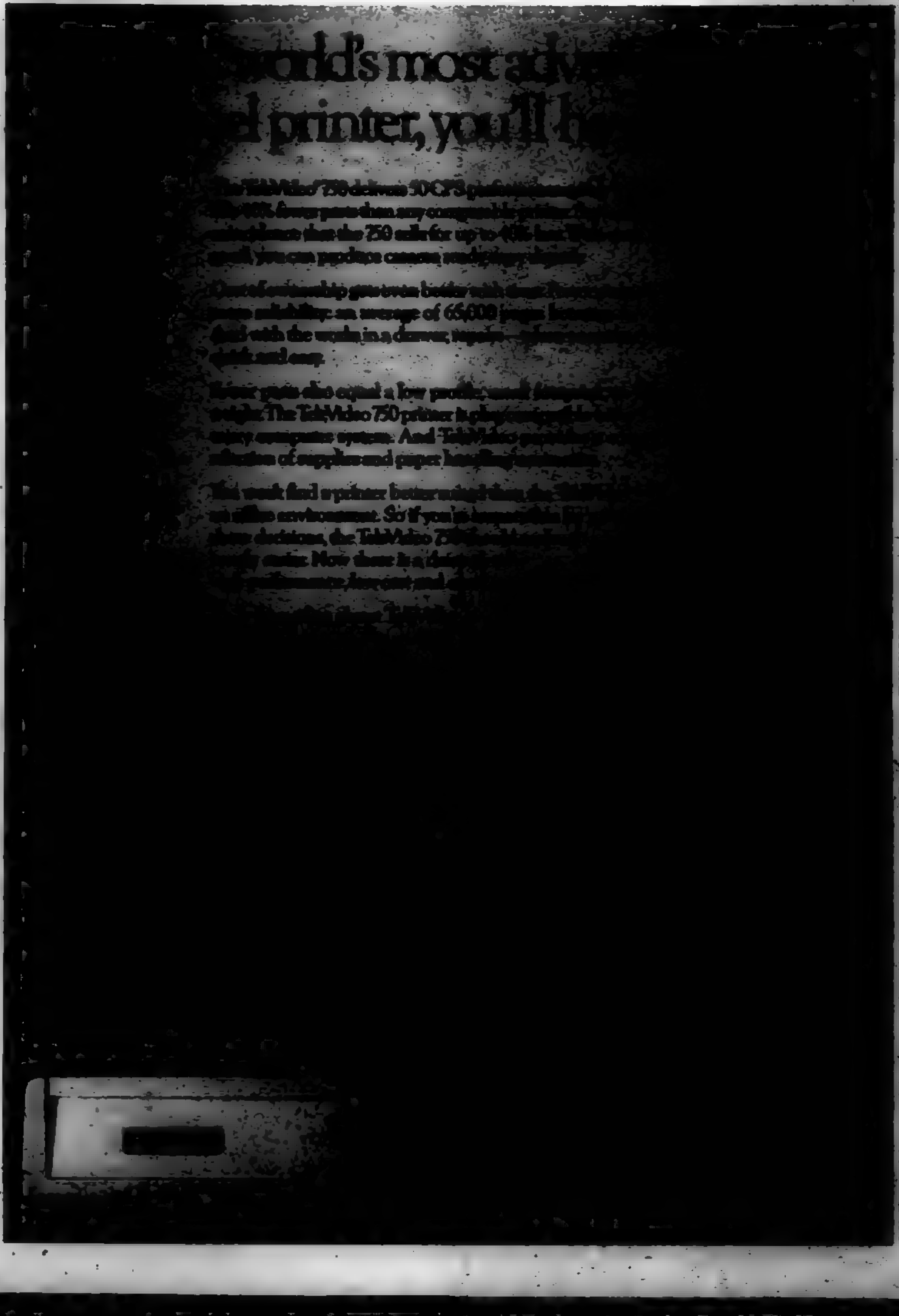
The unit costs $11,000, and the software — available for Motorola, Inc.'s 68000 and 68010 and Intel Corp. 80186 and 80188 microprocessors — is an additional $1,000.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

AUXILIARY EQUIPMENT

■ Intermec Corp. has released its 9165 System Control Unit, which lets IBM mainframe users implement Intermec bar code equipment and Ascii CRT terminals and print-

Continued on page [illegible]



CPU

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to 50 million instructions per second (Mips) range, most mainframe manufacturers would have to use something besides the traditional bipolar silicon circuit substrates. But with better packaging, researchers now believe that bipolar silicon still has about 10 years of life left in it before another substrate will have to be used.

It is a long-standing tradition that after IBM announces a high-end mainframe, the rest of the industry makes a hurry-up effort to catch up. But in the latest round of mainframe announcements, it looks like the opposite has happened. Judging from how quickly Hitachi, NEC and Burroughs reacted to IBM's 3090 announcement, it looks like all three firms had already developed processors and were waiting for IBM to tip its hand before making the formal announcements.

The holdouts

Three holdouts have yet to unveil answers to the 3090: Amdahl Corp., which gets its hardware from Fujitsu Ltd.; Sperry Corp. and NCR Corp. Amdahl is officially contending that its 580 series processors match IBM's 3090 Model 200 in performance. But now that Hitachi has unveiled its top-end machine, the pressure is on Fujitsu to follow suit.

The latest speculation about Sperry is that it will wait until September to unveil its next high-end product line. Some analysts contend the firm will announce a series of systems offering performances ranging from 27 to 90 Mips. It is unclear whether NCR will attempt to counter IBM's 3090. Control Data Corp., in spite of recent financial and directional difficulties, matched IBM's 3090 announcement before the fact. The upper end of CDC's Cyber 180 line offers performance in the same range as the 3090 Model 200 and 400.

Another interesting aspect of the most recent round of mainframe announcements is that they all offer some degree of scientific processing capability and cost several million dollars. It was not too long ago when many DP executives looked upon the multimillion-dollar supercomputers offered by Cray Research, Inc. and CDC as oddities of computing that were used by an eccentric few. Now it seems multimillion-dollar systems are the standard, and scientific processing capabilities are necessary.

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IDEAcomm 5251 is a trademark of IDEAssociates, Inc.

SYSTEMS & PERIPHERALS

Continued from page 85

ent without host software changes.

The unit is said to perform the functions of an IBM 3274-51C cluster controller and to allow Intermec bar code readers and printers (and Ascii components) to emulate IBM's System Network Architecture/Synchronous Data Link Control interactive devices. The devices are said to appear to the IBM mainframe as standard 3270-type terminals.

The 9165 System Control Unit has up to 16 ports that are predefined and electronically set up to handle a selected number of Intermec bar code readers, printers and CRT terminals. Users may change port configurations to tailor the unit to their needs.

Both RS-232C and RS-422 interfaces are available. When RS-422 is used, Intermec readers and printers may be located up to 4,000 ft from the 9165. The unit supports data rates up to 19.2K bit/sec. The single-quantity price is $9,800.

Intermec, P.O. Box 360602, 4405 *Russell Road, Lynnwood, Wash., 98046.*

■ The Graphics Division of Symbolics, Inc. and Evans & Sutherland, Inc. (E&S) have jointly developed a parallel interface between the Symbolics 3600 family of symbolic processors and the E&S PS 300 line of computer graphics display devices.

A user can download large vector display lists or transformation matrices from the Symbolics computer and manipulate them using the real-time interactive capabilities in the PS 300. The parallel interface comes in components from both companies. The hardware consists of a bus board that costs $7,900 and a unibus interface card that costs $2,090. Components from E&S are two boards and a cable that cost $11,500.

Symbolics, Graphics Division, 1401 Westwood Blvd., Los Angeles, Calif. 90024.

■ Dennison Kybe has unwrapped a series of tape cleaner and tester systems for maintaining and evaluating the condition of computer tapes used on 800, 1,600 and 6,250 bit/in. drives.

The Model 6100 tape cleaner cleans, retenses, removes static charge and rewinds a 2,400-ft reel of tape in less than two minutes. The unit costs $9,995. A cleaner/tester module, Model 6300, evaluates tapes by emulating characteristics of a user's drives. The testing module costs $16,495. The Model 6440 cleaner/tester/communicator, which has RS-232 ports to link to printers or other devices, costs $16,995.

Options include a static eliminator for $250, a strip chart printer for $995 and an erase-after-read option for $275.

Dennison Kybe, 132 Calvary St., Waltham, Mass. 02254.

■ Honeywell, Inc.'s Test Instruments Division has introduced a test management system with the H.TMS 3000 series, an integrated system that allows setup, measurement, analysis, reporting and communication within physical testing environments.

The H.TMS 3000 test management series consists of three models, the H.TMS 3000/10, 20 and 30, which range from $19,900 to $32,900, depending upon configuration. The units each include internal keyboards, thermal printers, test management software, engineering unit conversion software, math operations software as well as the Regulus operating system by Alcyon, Inc.

Honeywell, Test Instruments Division, P. O. Box 5227, Denver, Colo. 80217.

BOARD from page 81

bytes of random-access memory and a local memory section consisting of four 28-pin sites for byte-wide components. The Scout board communicates with the 4361 through either the IBM 3270 Display Printer Adapter or Work Station Adapter. The physical link is a serial coaxial line with a maximum length of 1.5 km and a maximum transfer rate of 2.36M bit/sec.

The single-quantity price is $2,500. Shipments are scheduled to begin in May.

More information is available from Intel's Literature Department, W-214, 3065 Bowers Ave., Santa Clara, Calif. 95051.

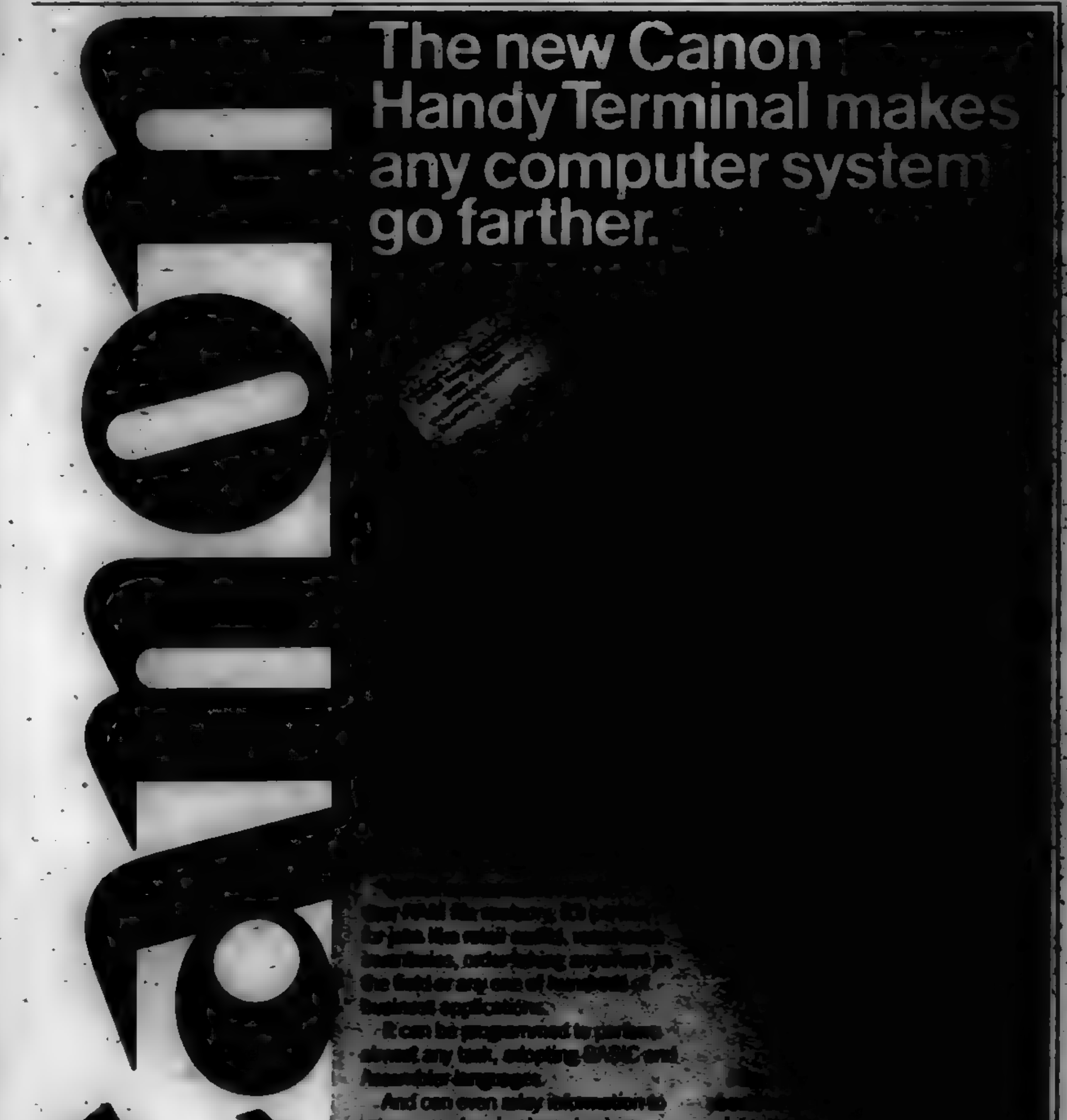
VIDEOTEX from page 81

tial license fee of $2,500. A synchronous communications adapter, priced at $1,500, and protocol software, priced at $440 for Honeywell and $220 for IBM, enable the Infonow central system to transmit captured orders to Honeywell or IBM host order processing systems.

Honeywell is offering this system built around three expandable DPS 6 central systems. The computers range from two 16-bit minis to a 32-bit machine. One port is assigned to local and remote Information Provider workstations and the rest to dial-in lines for user terminals.

Each communications port reportedly can support a total terminal population of 10 users. The basic system includes 11 ports for up to 100 user terminals and can be expanded to 27 end-user ports. The largest central system, with 90 user lines, can support connections for up to 1,000 user terminals.

Honeywell has set up a videotex demonstration and support center in Schiller Park, Ill. where it supports information bases for clients engaged in 60-day business videotex trials. Information on the system and the center is available from Honeywell at 260 Smith St., Waltham, Mass. 02154.


The new Canon [illegible] Handy Terminal makes any computer system go farther.

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It can be programmed to perform almost any task, adopting BASIC and Assembler languages.

And can even relay information to your computer via phone hookup.

Portability is also the key word of the 5000, because Canon's Handy Terminal was especially designed for traveling light.

At a weight of less than 2 lbs., it can operate on a rechargeable battery and can be carried by neck strap or in an attache case. Yet it's highly durable, water resistant and shock resistant. Which means it can take its fair share of hard knocks.

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Canon Systems Division

COMPUTER INDUSTRY

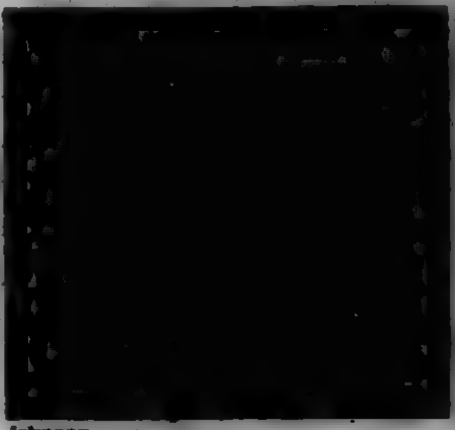
Mosaic reports hybrid wafer test successful

TROY, Mich. — Mosaic Systems, Inc. said last week it had successfully produced and demonstrated a 22-chip version of its hybrid wafer-scale semiconductor technology.

Mosaic's technology directly bonds commercially available logic and memory semiconductor chips to a 4-in. silicon wafer, essentially replacing conventional circuit boards and wiring with the wafer.

In contrast, the unsuccessful attempt by Trilogy Ltd. to develop wafer-scale integration focused on incorporating a massive number of circuits directly in the wafer.

Mosaic said it spent three years developing and proving its proprietary Wafer Hybrid Interconnection Packaging (Whip) technique. Mosaic applies two layers of perpendicular metallized lines upon its wafer, creating a grid or network on the wafer that provides more than 1.5 million interconnections. The two layers are separated by a thin insulating layer of amorphous silicon that becomes conductive at the crossover points when an electrical pulse is applied.


Johnson

The I/O points of unpackaged logic and memory chips are ultrasonically wire bonded to the metallized grid, according to Mosaic.

Robert R. Johnson, president of Mosaic, said the 22-chip wafer demonstrated here "opens the way for computer manufacturers to start planning for this new wafer-

See MOSAIC page 98

Slump pushes Columbia Data off stock listing

By Clinton Wilder
CW Staff

COLUMBIA, Md. — Plagued by sluggish sales, Columbia Data Products, Inc. was recently removed from a stock listing system because of the low value of its shareholders' equity.

One of the many vendors of IBM Personal Computer-compatible microcomputers, Columbia said it will report 1984 losses substantially higher than the $28.7 million posted for the first nine months. The company was taken off the National Association of Securities Dealers' Automated Quotation (Nasdaq) system after dropping below Nasdaq's minimum requirement of $375,000 in equity.

The firm also announced that its founder and chairman, William Dias, has resigned from the company.

The spate of bad news came after a rocky 1984 for Columbia, which went public and was listed on the Nasdaq system in January 1984. After earning $3.7 million on $56.3 million in revenue in 1983, Columbia was forced in 1984 to lay off 20% of its work force and to report a $1 million loss because of uncollectible accounts. Shareholders filed a federal class action suit against the firm in December.

A company spokesman said Columbia's fiscal report for the year ending Dec. 31, 1984 would be delayed until at least May 31 because of "a reduction in personnel available to assist in the audit" and the introduction of additional accounting procedures.

Columbia currently has an estimated $38 million in outstanding debts consisting of $16 million to trade creditors and $22 million in bank debts. The company is attempting to convert outstanding debt into equity by negotiating with its creditors and hopes to regain its Nasdaq status.

Nasdaq officially stopped listing Columbia stock under the symbol CDPI on April 1. Nasd spokesman George Sierant said the company must petition the exchange sys-

See SLUMP page 97

- A Massachusetts firm recently announced two agreements to provide Ada software technology to Japan's Nippon Telegraph and Telephone/94
- Microcomputer pioneer Vector Graphic scrapped one plan to turn over control of the company in exchange for debt guarantees and instead announced a plan to merge with and turn over control to a manufacturer of AT&T Unix-based systems/96
- Ashton-Tate reported 1984 revenue more than doubled from the previous year, but Micropro International said its revenue in the second quarter was just more than half of revenue for the year-earlier period/96

Lotus to absorb Software Arts

Deal includes acquisition of packages, exec moves

CAMBRIDGE, Mass. — Lotus Development Corp. announced last week it had reached an agreement to acquire the assets of Software Arts, Inc., including the Visicalc software package. Additionally, the coauthors of Visicalc agreed to join Lotus.

Lotus said that Chairman Daniel S. Bricklin and President Robert Frankston of Software Arts, headquartered in Wellesley, Mass., had signed letters of intent to join Lotus and turn over the assets of Software Arts to Lotus. In addition to Visicalc, Software Arts developed and markets the TK!Solver and Spotlight packages.

Visicalc was originally marketed by Visicorp, but following a year-long legal battle with Software Arts, Visicorp agreed to pay Software Arts $500,000 in contested royalty payments and relinquish all trademark and marketing rights to the Visicalc name and product [CW, Sept. 24].

With approximately 750,000 packages sold, the Visicalc spreadsheet program is widely credited with spurring the popularity of microcomputer usage. Lotus Chairman Mitchell D. Kapor said, "Today, the fathers of the micro software industry join the leading company in the industry."

Frankson termed the agreement "a perfect marriage." Lotus will provide "significant new support for [Software Arts] products," he said.

Lotus said Spotlight and TK!Solver will

See ASSETS page 97

Equity plans can boomerang when execs dump stocks

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

When business is good, equity compensation is a powerful personnel retention tool. When business slumps, the practice of rewarding executives with stock ownership tends to boomerang.

Stock bonuses and stock option plans enable key management personnel to obtain equity holdings in their companies at no cost or at undervalued prices that guarantee a paper profit. It is a relatively inexpensive tool, particularly for younger companies, used to entice valued employees to build a career with the company, rather than job-hop to ever higher salaries.

But, as the recent experiences of three Massachusetts-based companies showed, the accumulation of stock by executives creates a massive public relations problem when a company suffers a setback.

Wang Laboratories, Inc., Digital Equipment Corp. and Data General Corp. have all acknowledged below-target profits for the quarter just ended and their stock prices have slumped. Another Massachusetts firm, Apollo Computer, Inc., has not projected any profit slump but has experienced a decline in the price of its stock.

Hundreds of thousands of shares sold

During the past few months, 56 executives and directors at those four companies reportedly sold hundreds of thousands of shares in their companies.

This is not a unique situation; in fact, it happens very often. Executives at public companies can sell stock they own in those companies only at specified times of the year. Probably for tax purposes, the insider trading of stock tends to be heaviest toward the end of the year. It makes sense for somebody holding a large portion of his paper wealth in one company to diversify those holdings into a realistic, planned portfolio.

This goes on all the time, in good times and in bad. But when times are bad — or even just not so good — the practice becomes all the more noticeable and such trading becomes heavier.

Executives are prohibited from trading based on inside knowledge of the fortunes of their companies. But, to be realistic, executives don't have to have advance knowledge of the next financial report to realize that things are getting less rosy. Chief executive officers, chief financial officers and top sales executives are paid to know the week or even the day that sales stop meeting projections.

So a certain amount of insider knowledge goes with the job. The public relations problem is that human nature being what it is, personal financial considerations tend to outweigh company loyalty. The person hasn't been born yet who can

See STOCK page 98

The HP 3000 compu

However much you change, you're going to need both office automation *and* distributed data processing. Fortunately, one company gives you both in a single system.

Hewlett-Packard's HP 3000 is a fully compatible family of computers, ranging from a new system that handles as few as two users to a distributed mainframe that connects up to 400. You can run the same software right up the line.

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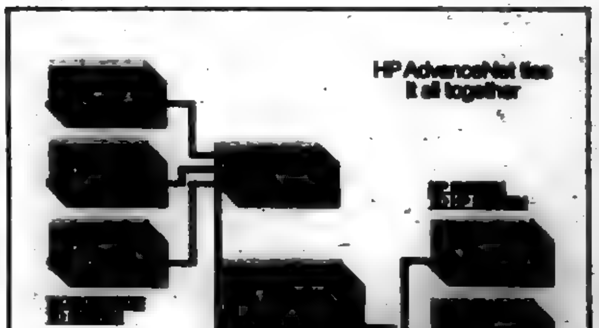

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M&D acquires RSSP, aims to expand product offerings

By [illegible]
CW Staff

NATICK, Mass. — McCormack & Dodge Corp., a division of the Dun & Bradstreet Corp., has acquired Rath and Strong Systems Products, Inc. (RSSP) of Dallas, a manufacturing software business, in an effort to widen the M&D product line.

Complete terms of the agreement were not disclosed, but published estimates indicating that the deal involved between $3 million and $4 million were low, according to Woodrow Chamberlain, former president of RSSP and now vice-president of manufacturing sales for M&D. Frank Dodge, M&D's president, agreed that the reported figures were low and added that the deal was a cash transaction.

The Dallas company brings its Production and Inventory Optimization System (Pios) manufacturing information systems software to M&D, a business applications software house, according to Dodge.

M&D has missed sales opportunities because it did not have a manufacturing system, a spokeswoman for M&D said. "One trend we noticed is that companies are looking to go to one software company for all their systems," she said.

RSSP broke even in 1984 after a very tough year in 1983, Chamberlain said. The marketplace has attracted big players, he noted, citing Cullinet Software, Inc. and Management Science America, Inc. as examples of the competition. "The best strategy for our people and product to prosper was to find a partner," he said.

Current users of the eight-module Pios manufacturing package — which runs on IBM and Digital Equipment Corp. equipment — will be supported as they always have been by RSSP, which will drop its name to become integrated with M&D, Chamberlain said. RSSP will maintain its Dallas location and its employees, he said.

Sales and marketing functions of the two companies will be integrated, Dodge said. He plans to add support and development personnel to the Dallas operations, he added.

M&D will incorporate the Pios package into its Millenium series of business-applications software products and will market the system worldwide, spokesman explained.

Net deal arranged

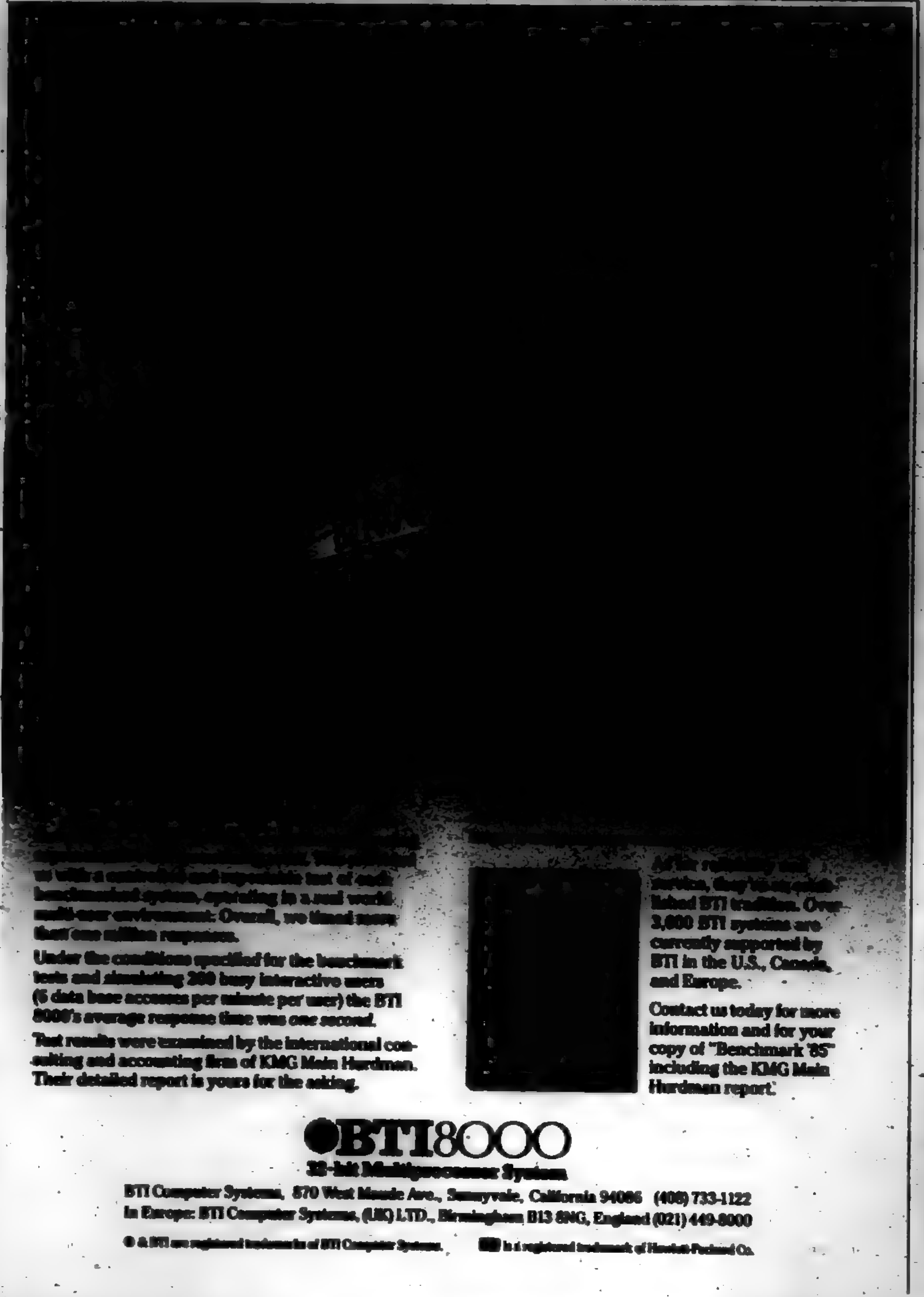
MOUNTAIN VIEW, Calif. — 3Com Corp. and Microsoft Corp. recently announced an agreement to provide IBM PC Network compatibility to 3Com's Etherseries local-area network products.

The two companies also agreed to cooperate on customer contacts and sales.

Under the terms of the agreement, future Etherseries network software products will incorporate a portion of Microsoft's Networks software called the Redirector. That module, used with Microsoft's MS-DOS 3.1 operating system, provides IBM PC Network-compatible file and resource sharing across a local-area network, according to spokesmen for the two companies.

The spokesmen said that both the IBM PC Network and Etherseries use software developed by Microsoft and possess a level of applications and network compatibility.

Steve Balmer, vice-president of operating systems software at Microsoft, said the incorporation of the Microsoft module into Etherseries "will allow network applications developed for the IBM PC Network to run without modification on future Etherseries networks. In addition, PC Network-compatible products can be designed in such a way as to take full advantage of Etherseries' advanced networking features."



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NTT consents to license Softech's Ada Language System

WALTHAM, Mass. — Softech, Inc. announced recently a license agreement for Nippon Telegraph and Telephone Corp. (NTT) to use Softech's Ada Language System.

Softech also signed a separate agreement to provide NTT with functional design specifications on rehosting and retargeting the Ada Language System at the NTT Dendenkosha Information Processing System (Dips) computers.

Softech's Ada Language System is an Ada programming support environment including software tools such as an Ada compiler, linker debugger, performance analyzers, configuration management and data base maintenance. It was originally developed by Softech for the U.S. Army and is hosted on and targeted at Digital Equipment Corp.'s VAX processors.

Softech said the license agreement was effective immediately and provides NTT with use of Ada Language System as well as maintenance services.

NTT, according to Softech, will use the Ada Language System internally to develop software and services for its customers and may sublicense the Ada Language System in Japan to people involved in contractual agreements with NTT for the purpose of developing hardware and software for NTT's use or for the customer's internal use.

NTT is the developer and operator of most of the telecommunications systems in Japan and is considered one of the largest telecommunications companies in the world. NTT was officially deregulated by the Japanese government early this month and is at the center of a U.S.-Japan trade dispute concerning the ability of U.S. electronics companies to compete in the potentially lucrative Japan telecommunications market that is expected to develop as a result of deregulation.

Justus F. Lowe, president and chief executive officer of Softech, said his company's agreements with NTT represent a milestone both for the company and for the future of the Ada language.

Softech said the Ada Language System was designed to enable simplified rehosting and retargeting at a multitude of computers. Under the terms of the design specifications agreement, Softech said, NTT is preparing to host the Ada Language System on Dips computers operating under AT&T's Unix and NTT's original operating system, Dipos.

Burroughs buffs corporate identity to celebrate firm's centennial

DETROIT — Burroughs Corp. recently unveiled a corporate "image" to mark the company's centennial.

Unveiling a new logo and corporate colors to shareholders at the annual meeting, Burroughs Chairman W. Michael Blumenthal declared, "It is a statement of our strong position in the industry. Overall, this new corporate identity will bring a coherence and discipline to our image and our communications and will reinforce the world's understanding of Burroughs as a strong and growing force."

In contrast to the wide array of companies projecting reduced earnings for the quarter just ended, Burroughs shareholders were told to expect some improvement over the year-earlier quarter, when the company reported profits of $43 million, or 95 cents per share.

Blumenthal said the new logo and colors of crimson and gray were needed because of "evidence that Burroughs is fast becoming a new and more formidable factor in the information processing industry."

But, he added, "Our goals will remain the same — to achieve total customer satisfaction, to deliver error-free competitive products on time and to provide service second to none."

In recent years, Blumenthal said, "We have quite literally built a new company. . . . We have made substantial progress in our financial health, in strengthening and redirecting our management team, in research and development, in quality and service and, of course, in our product line."

In 1984, Burroughs posted a 24% increase in profits to $244.9 million on only a 6% revenue increase, compared with 1983. However, Blumenthal asserted, "Our results worldwide were negatively impacted by the continued strength of the U.S. dollar, despite the growth in operating results by our non-U.S. operations." Entering its second century, Burroughs "will continue to be innovative and imaginative," Blumenthal declared. He added, "We will continue our strategic commitment to targeted lines of business and to maintain our leadership in our own areas of excellence."

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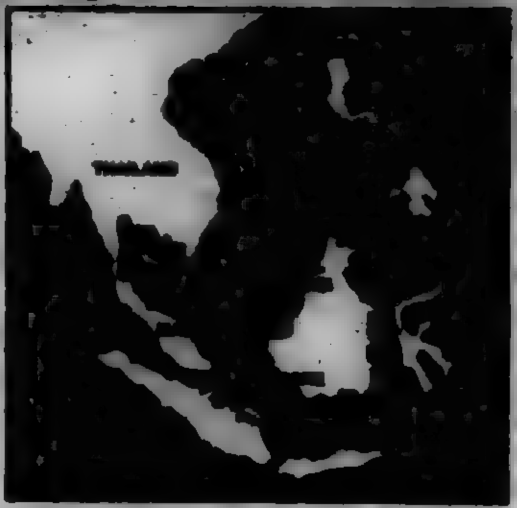

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Vector Graphic drops deal, merges with Dual Systems

THOUSAND OAKS, Calif. — Microcomputer manufacturer Vector Graphic, Inc. announced recently, it has abandoned a plan to offer majority control to a group that would guarantee repayment of the company's debts. Instead, Vector Graphic has agreed to merge with a privately held manufacturer of AT&T Unix-based products.

Earlier this year Vector Graphic had announced a plan to turn over a majority voting position to Eric Tang, representing a group of Hong Kong- and U.S.-based companies, in exchange for guaranteed repayment of $1.7 million of Vector Graphic's total $2.09 million debt [CW, Feb. 18]. The company has been in default on the debt.

Under the agreement in principle announced recently, Vector Graphic will merge with Dual Systems Control Corp. in an exchange of stock that will provide Dual Systems shareholders with 77% of the new company's stock. The new company will retain the Vector Graphic name.

Pending final approval of the merger, day-to-day operations of Vector will be managed by Dual Systems under the supervision of the Vector board of directors pursuant to terms of a management contract and a joint operating plan.

That management contract stipulates the resignation of Bernard Horn, chief executive officer and president of Vector, and Richard A. Hahn, senior vice-president of marketing and sales. Horn will retain his position as a member of the board of directors, but Hahn resigned his seat.

Dual Systems manufactures and markets a 16/32-bit Unix-based multiuser computer system and board-level products. According to spokesmen for the companies, Dual Systems earned profits of $1 million in 1984 on revenue of $10 million.

Olivetti offers to buy equity of ailing firm

DALLAS — Italian computer manufacturer Ing. C. Olivetti & Co., a 46% shareholder of slumping Docutel/Olivetti Corp., recently offered to acquire Docutel/Olivetti's remaining equity at $6.50 per share in a cash merger transaction.

The deal is subject to approval by Docutel/Olivetti's board of directors and shareholders.

The Dallas-based manufacturer of automated teller machines reported a loss of $41.9 million, or $6.16 per share, for the fiscal year ending Dec. 31. Revenue dropped from $221.8 million to $164 million during the year. The firm had lost $18.3 million in 1983.

Fourth-quarter loss

Docutel/Olivetti's fourth-quarter loss was $12.4 million, or $1.81 per share, compared with a loss of $17.5 million, or $2.57 per share, in the fourth quarter of 1983.

A spokesman blamed the fiscal 1984 results on decreased sales, losses related to start-up and operating costs of off-premises ATM networks and the loss of tax benefits that earned $8.1 million in 1983. Revenue for 1983 also included $5.4 million earned from the sale of the company's maintenance operations.

In addition to its ATM manufacturing, Docutel/Olivetti markets Ing. C. Olivetti microcomputers, electronic typewriters, financial work stations, word processors and office equipment in the U.S.

SLUMP

from page 89

tem for reinstatement after it meets the equity requirement. Columbia's stock will continue to be traded over the counter without the Nasdaq listing, he said.

Aaron Goldberg, an analyst with International Data Corp. in Santa Clara, Calif., said Columbia went public at a time of slow microcomputer market growth, IBM Personal Computer price cuts and increased competition in the IBM-compatible market.

"Columbia got caught in a triple whammy," Goldberg said. "In late 1983 and early 1984, dealers were discounting their IBM products and demanding that the compatible makers discount, too. For a company accustomed to higher pricing in an expanding market, it's hard to change expectations that quickly. Columbia had an overgrown asset base to support its level of business."

Goldberg said a lack of company name recognition also dampened Columbia's sales of its IBM-compatible portable, desktop and hard-disk micros. "Brand names became important, and Columbia suffered," he said. "When they reported quarterly losses later in the year, they were under a microscope, and when that happens, the customer base gets a little leery of buying the product. Bad news propagates itself, and it's hard to turn around."

Goldberg said he believes Columbia's prospects for a 1985 recovery, however, are not impossible. "As in the case of Osborne Computer Corp., anyone with good astute management can recover," he said. "It depends on how well they can reshape the company to work at a different revenue level, with a different corporate philosophy."

ASSETS

from page 89

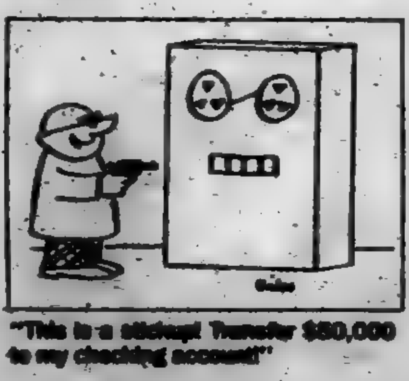
be distributed through its regular authorized dealer channels.

Final terms of the agreement are being negotiated, and Software Arts will continue to market and support its products pending a final agreement, Lotus said.

Marketing responsibility for TK!Solver will be assigned to a division created recently at Lotus, the Engineering and Scientific Products Division.

Under the direction of Lotus Vice-President Sandra Gunn, the division will develop microcomputer software products focusing on the analytical and task-oriented computing needs of engineers and scientists, the company said.

Appointed director of product planning and development for the new division was Glenn Patch, formerly director of new technology and product development at Interactive Data Corp.



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MCI, U.S. West agree on access terms

WASHINGTON, D.C. — MCI Communications Corp. and U.S. West recently announced an agreement between MCI and the three U.S. West regional telephone companies that were named in MCI's 1979 antitrust suit against AT&T, the Bell system and various independent telephone companies.

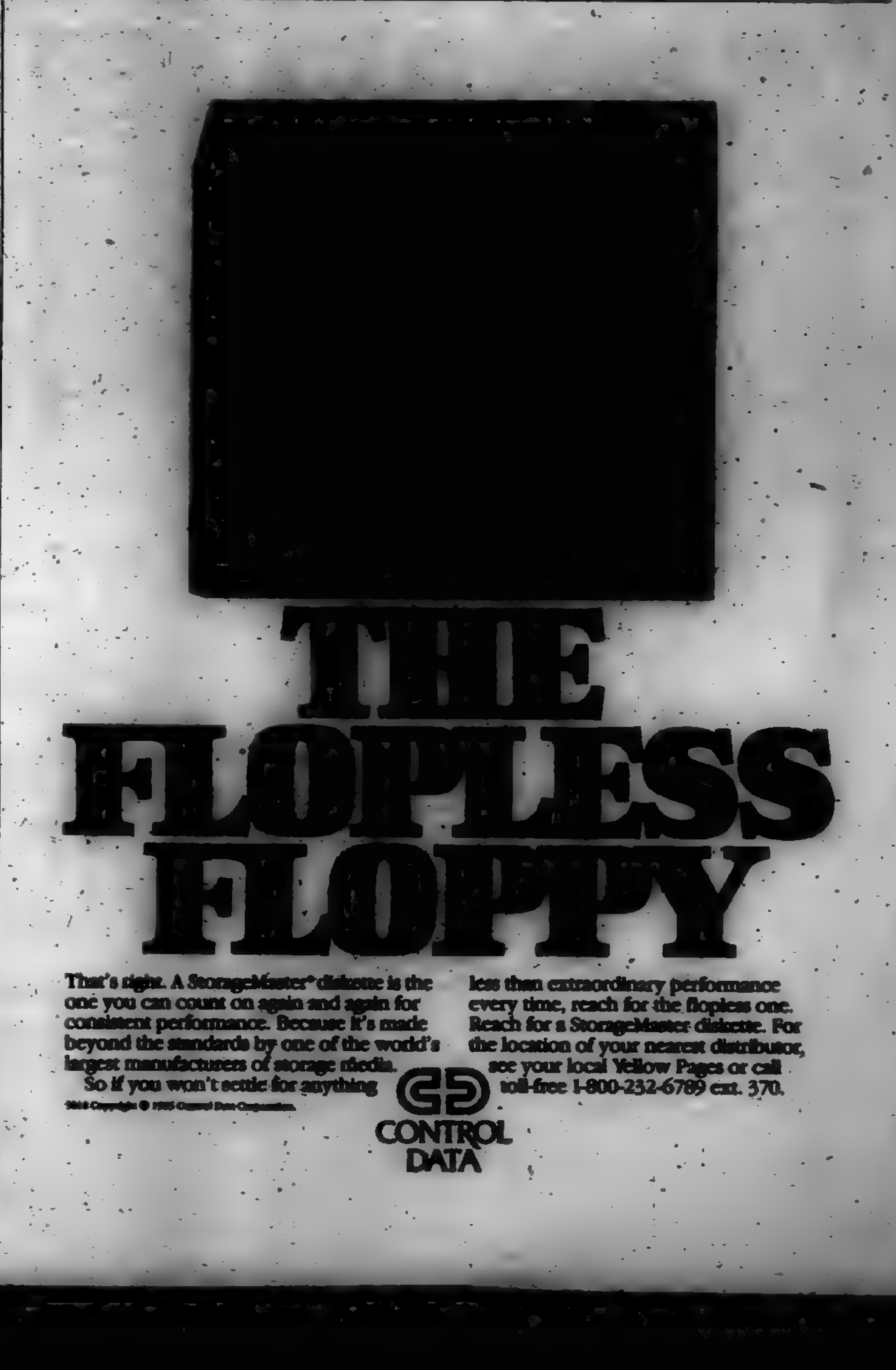
Under terms of the settlement, the defendants — The Mountain States Telephone and Telegraph Co., Northwestern Bell Telephone Co. and Pacific Northwest Bell Telephone Co. — agreed to perform long-distance billing services for MCI and to purchase MCI's long-distance and other telecommunications services for their official use. The agreement also included cash payments of an undisclosed amount.

Further terms specified that Mountain Bell and Pacific Northwest Bell will adopt a customer equal-access conversion plan already used by Northwestern Bell. The plan gives customers two chances to select a long-distance telephone company from among those offering long-distance services in their area, including MCI. Customers who do not respond are assigned randomly among the alternative companies in the same percentages as those who did make a selection.

MCI and U.S. West said the agreement should increase customer understanding of the conversion process and promote long-distance competition. "We have healed old wounds, and the principal beneficiaries will be the millions of telephone customers in the 14-state area served by U.S. West," said MCI President and Chief Executive Officer V. Orville Wright.

The settlement does not affect the other parties named by MCI in the 1979 suit, which has not been concluded. MCI reached agreement in January 1985 with another defendant named in the suit, Continental Telecom, Inc.

A retrial is pending on MCI's initial 1974 civil antitrust suit against AT&T, the Bell system and independent telephone firms.



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CONTROL DATA

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STOCK

from page 89

resist the temptation to cut losses.

So when the executives sell off a portion of their holdings during bad times, other stockholders and the public in general can hardly be blamed for reconsidering their view of the affected company.

Some people believe that when insiders turn bearish, it can only mean the situation is going to get worse. That in turn leads to lowered expectations for the companies and to reconsideration by potential customers. And when customers hesitate, sales slump even further, leading to more insider trading and so on. Considering the amount of money spent on advertising and public relations, perhaps companies should devote some attention to restricting further the ability of executives to sell.

MOSAIC

from page 89

scale interconnection technology in their commercial products."

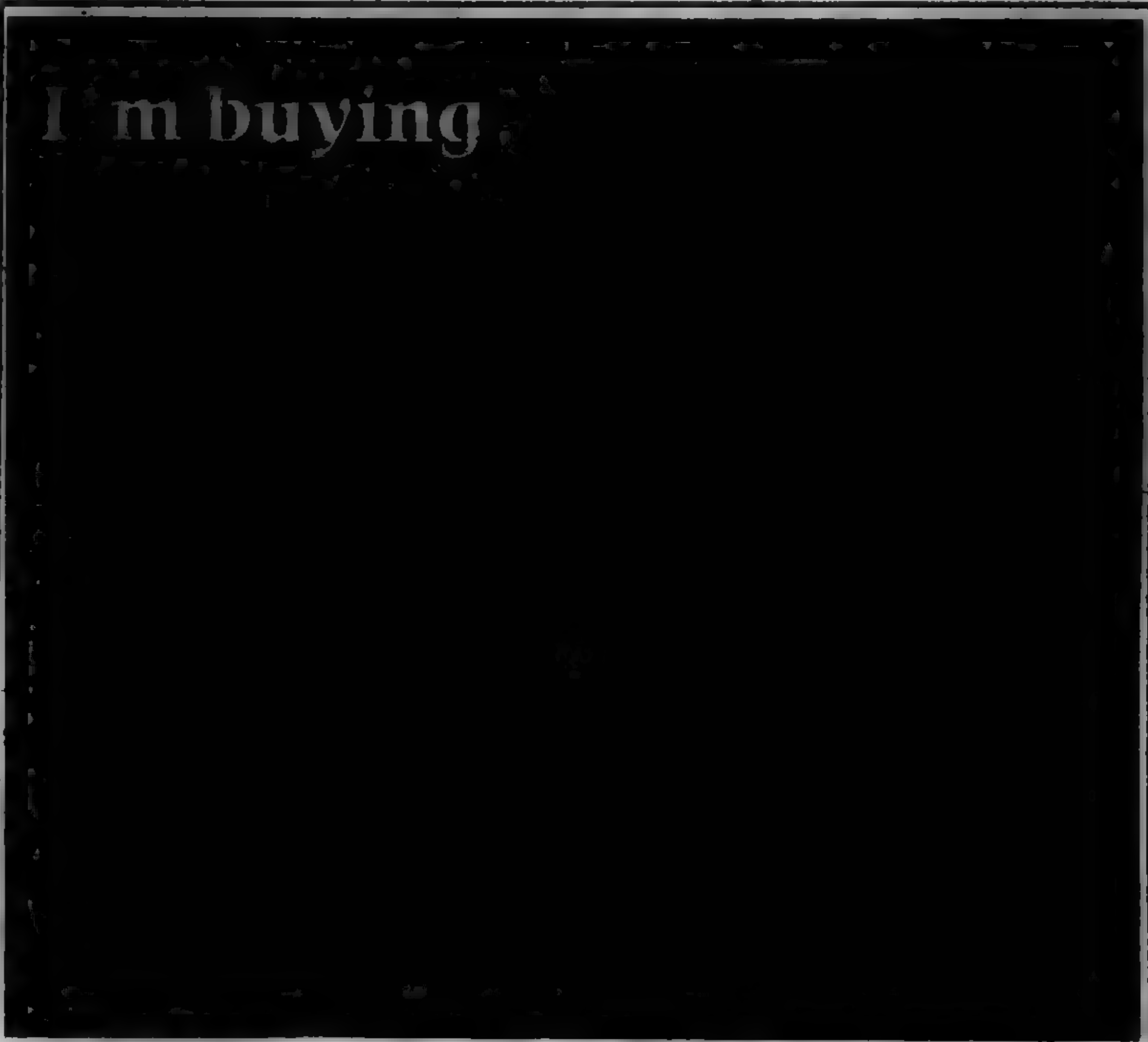
Attending the demonstration were representatives of Floating Point Systems, Inc., the Beaverton, Ore.-based vendor of array processors and scientific computers. Lloyd D. Turner, president of Floating Point, said his company "will begin immediately to work with Mosaic to identify possible ways of incorporating Whip technology into future Floating Point products."

According to Johnson, Mosaic plans to deliver a 50-chip wafer this spring to Evans & Sutherland Computer Corp. located in Salt Lake City; reportedly, the chip will be a wafer-scale equivalent of the visual display driver used in Evans & Sutherland's advanced flight simulator supercomputer. Mosaic also plans to ship wafers to Siemens AG of West Germany and other firms for evaluation.

Mosaic said the technique will enable computer designers to specify a combination of chips for a wafer, including Cmos, bipolar, gallium arsenide and analog chips.

According to Floating Point Systems's Turner, the Mosaic development of 50-chip wafers "promises to give the computer industry very important new options for designing high-performance computers and producing them at competitive costs."

Mosaic is a privately held company financed by a syndicate of venture capital firms, including Evans & Sutherland, Advanced Technology Ventures of Boston and Venrock Associates of New York and other investors.



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Ashton-Tate earnings rise

CULVER CITY, Calif. — Ashton-Tate recently announced fiscal 1985 revenues of $82.3 million, more than double its $39.8 million sales for the previous year.

Ashton-Tate reported earnings of $7.5 million for the fiscal year ended Jan. 31, a 20% increase from $6.2 million the previous year. Earnings per share were 80 cents, up from 73 cents per share in fiscal 1984.

The earnings reported by the company included a nonrecurring, extraordinary income item of $1 million, reported in the third quarter, from life insurance proceeds after the Aug. 10 death of company cofounder George Tate.

Ashton-Tate's fourth-quarter revenue in fiscal 1985 was $27.2 million, a 102% increase from $13.5 million in the same quarter of 1984. The company earned $3.1 million, or 34 cents per share, in the fourth quarter, surpassing by 72% its fourth-quarter 1984 earnings of $1.8 million, or 20 cents per share.

Micropro posts second-quarter loss of $669,000

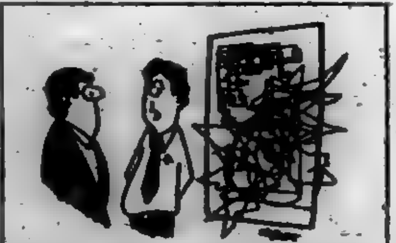
SAN RAFAEL, Calif. — Citing a continued slowdown in microcomputer hardware sales and increased competition in word processing software, Micropro International Corp. reported a loss of $669,000, or 5 cents per share, for its second quarter ended Feb. 28.

Micropro reported revenue for the quarter was $9.9 million, down from $13.5 million a year ago. The company earned $3 million, or 26 cents per share, in the second quarter of 1984.

The maker of Wordstar said its sales to OEMs have declined because of domination of the micro market by the IBM Personal Computer, Personal Computer XT and AT.

Micropro said domestic sales of Wordstar 2000 and Wordstar 2000+, its latest products, accounted for 50% of its sales in the quarter. The company plans to market these products more extensively to OEMs and in foreign language versions in the future, according to a spokesman.

The company reported its working capital position increased to $23.1 million during the quarter, the fourth such quarterly increase since its stock went public in March 1984. The figure included cash and cash equivalents of $14.6 million, according to the company.



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[illegible] Dr. Suite 1100
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[illegible] City Parkway West Suite 314
PHILA., PA [illegible] [illegible]
The [illegible] Bldg. 133 S. Broad
[illegible] [illegible]
4 Gateway Center
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The Chair will be responsible for the development and evaluation of [illegible] [illegible] and development of computer facilities, and supervision of faculty [illegible] teaching [illegible] credit hours or equivalent during the academic year.

The successful candidate must possess a Master's degree from an accredited institution, must possess a broad background in data processing and computer science, must have teaching experience and experience in business or industry, must have experience in managing a major computing function including supervising personnel and managing a budget, and must possess [illegible] background in curriculum development.

The position is available July 1, 1985; salary range: $[illegible] - $[illegible] depending on experience and qualifications. A letter of application which addresses the candidates qualifications along with transcripts and resume should be sent to the Personnel Office, Anne Arundel Community College, 101 College Parkway, Arnold, MD 21012 postmarked no later than May [illegible], 1985. Three letters of reference should be available upon request.

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Candidate should have experience and confidence in dealing with advanced systems design issues; good skills in managing system programmers; ability to coordinate with industry personnel; an interest in educational impact of computing; and an expansive view of his or her responsibilities.

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The Information Systems Development Committee, Studies and Organization Department, King Saud University, Riyadh, Saudi Arabia, is offering employment opportunities on annual contract basis for appropriately qualified and experienced persons to fill the vacant posts listed below.

Applications for these posts, together with full detailed and updated resumes (indicating three references and [illegible]) and photocopies of the candidate's diplomas and experience certificates should be mailed to:

Fahad Al-T[illegible], Ph.D.
ISD Committee Coordinator,
Department of Studies and Organization
King Saud University
P.O. Box 2454
Riyadh 11451, Saudi Arabia

PROGRAMMER ANALYSTS

Structured Design of Online Real-Time Information Systems
Information Systems Implementation in high level languages such as COBOL, PL/1, etc.
Development of test cases and testing procedures to test system's modules and their interfaces
Development of systems, operation, and user documentation
Database model and logical design to support systems' data structure requirements
Design of Applications - Hospital, Finance, Students Admission and Registration, Budget and Planning, Human Resources, Inventory Control, etc.
Design of applications performance and efficiency benchmarks
Software packages study and evaluation
Data definition for hardware and system software requirements

SYSTEMS ANALYSTS

Overall Planning of the Development of Online Information Systems and Database Support
Online Real-Time Information Systems Requirements Definition, analysis, design and implementation
Distributed and Centralized Database requirements definition
Structured Database and Systems Design
Systems integration requirements definition and design
Hardware and systems software detail requirements definition
Information systems requirements support, user interface, performance, and benchmarking study and evaluation
Hardware cost/performance analysis and evaluation
Systems development and maintenance development personnel resources definition, planning, and analysis
User communication, interaction, and feedback
Applications functional requirements - Hospital, Students Information, Financial, Budget and Planning, Human Resources, Purchasing, Inventory Control, Library, Maintenance, etc.

DATA BASE ADMINISTRATORS

Development of standards for database design, implementation, testing, and operation
Implementation database requirements definition and implementation scheduling
Database development planning and scheduling
Database security and access control definitions
Database models, logical, and physical design, evaluation, implementation, and testing
Database applications requirements supports
Database present and future storage requirements
Quality and data integrity assurance of the databases
Database documentation standards
Database guidelines for maintenance, updating, and modification
Guidelines for database security, privacy, and auditability control
Database performance study and analysis
Control of usage of DBMS tools and utilities
Development of database backup, recovery, and restart procedures
Management of DBMSs - ADABAS, IDMS, IMS, or other general purpose data base management systems

SYSTEMS PROGRAMMERS (IBM or VAX)

Operating Systems and Utilities installation, testing, and maintenance
Operating Systems tuning and trouble shooting
Systems programming support for applications and database development
System performance evaluation, trouble shooting, and balancing
Development of physical structures for databases
Database physical structure performance evaluation and enhancements
Selection of access methods and physical organization support to satisfy performance level requirement
Development of backup, recovery, and restart procedures
Installation and testing of System, Utilities, Languages, and DBMS packages
Development of Basic Input Output Systems and drivers to support the installation of I/O devices
Development of macros to support applications development
Develop and implement procedures for performance measurement and evaluation
Disk storage utilization checking
System utilization and projection for performance improvement
Hardware and software requirements to support present and future application development and production
IBM 370 or VAX 11/780 Assembler macro routine coding and JCL support for application development
System programming in IBM or plug compatible hardware or VAX hardware using - MVS, VM in conjunction with TSO, CMS, or CICS, or VAX/VMS

CAD/CAM SYSTEMS/PROGRAMMER

Development of graphic routines to support CAD/CAM users
Design and implementation of I/O graphic devices drivers (e.g. Tektronix and DEC graphic workstations and plotters)
Operation of a VAX based graphic computer system
Operating System, Languages, and Graphic Application packages installation and maintenance on VAX 11/780
Backup, recovery, and start up procedures and implementation
System utilization, performance evaluation, and projection for performance improvement
CAD/CAM users support

Candidates applying for any of the above five positions must have 2 to 5 years work experience in the areas stated in each description and a university education in Computer, Information Management Science, or related areas of study. In addition, all the areas of studies specified above are highly technical, and the candidate must have practical experience in some of the areas listed in each position.

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Academic Computing Services at the University of Delaware is reopening the search for two positions: Manager of Technical Services and Data Communications Senior Systems Programmer. The positions are available immediately.

The University of Delaware is embarking on major enhancements to academic computing: an IBM 3081D running VM/CMS, three VAX 11/785's running UNIX, development of microcomputer use and additional staff for Academic Computing Services. These changes are part of a plan to provide computing as an integral part of all academic programs at the University, both in research and instruction.

The two persons sought will participate in providing a good computing software and hardware environment for the academic program. In addition, the two persons will assist with the orderly transition from the current equipment to the new.

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Candidates for Manager of Technical Services should have 3 to 5 years experience in operating systems or communications support, preferably in an academic computing environment. A Master's degree or equivalent is required as are strong management and technical skills. VM/CMS experience is highly desirable.

The Data Communications Senior Systems Programmer will join other staff in supporting a diverse communications software environment involving the 3081, VAXes, ASCII terminals, IBM PC's, and a variety of network components including port selectors, multiplexors, protocol converters and local area networks.

Candidates for the Data Communications Senior Systems Programmer should have a Bachelor's degree or equivalent, and 3 to 5 years experience in communications support, including IBM, DEC and Microcomputer environments.

Resumes and the names of three references should be sent by May 1, 1985 to Ms. Jane S. [illegible], Director, Academic Computing Services, UNIVERSITY OF DELAWARE, 015 Smith Hall, Newark, DE 19716.

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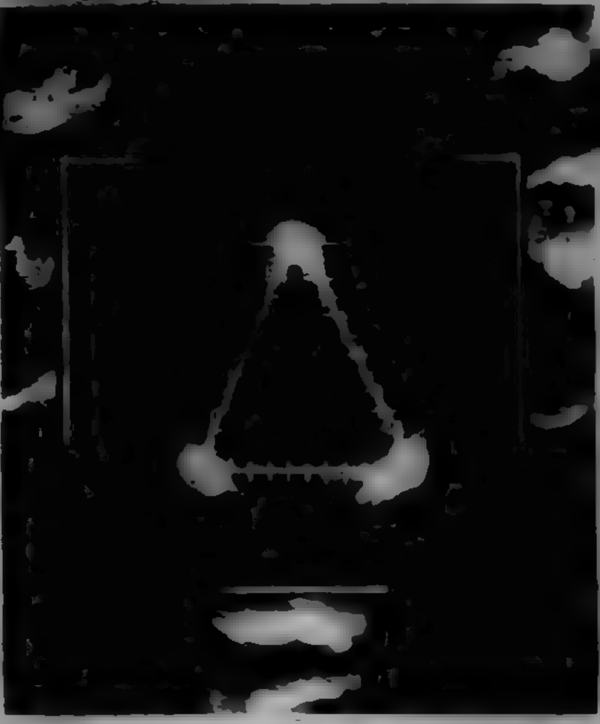

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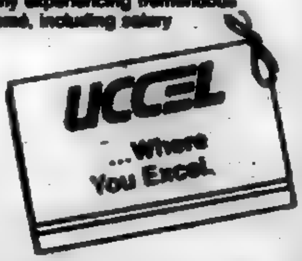

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Greensboro, North Carolina 274[illegible]
(919) 373-[illegible]

PHILADELPHIA: Systems Personnel, Inc.
115 West State Street
Media, Pennsylvania [illegible]

PHOENIX: Professional Career Consultants
4725 N. Scottsdale Road, Suite 200
Scottsdale, Arizona 85251 (602) 274-[illegible]

PITTSBURGH: [illegible], Lipson & O'Brien, Inc.
P.O. Box [illegible]
Allison Park, Pennsylvania [illegible]

SAN FRANCISCO: The Computer Resources Group, Inc. Agency, 303 Sacramento Street
San Francisco, California 94111 (415) [illegible]

SEATTLE: [illegible] & Associates
1940 116th Avenue N.E.
Bellevue, Washington 98004 (206) [illegible]

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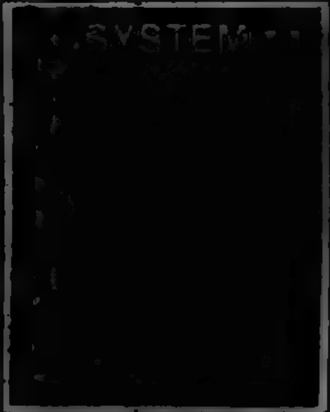

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Peter Roll
Vice President for Information Services

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- Cobol, SPL, DS, X.25 experience a plus

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Requires excellent organizational, analytical and supervisory skills with experience on large IBM hardware utilizing COBOL, TSO/SPF, OS/UTILITIES and IMS DB/DC. Prefer degree with 3 years experience.

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Responsible for planning, organizing and controlling the activities of the MIS Production Systems Group which includes implementing newly developed systems, implementing user training and managing documentation and reducing maintenance hours. Must have excellent organizational and communication skills to meet with all levels of user management. Prefer BS degree and 7 years experience (2 years as Maintenance Manager) with COBOL, IMS, OS/MVS on 308X IBM computers.

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Government Electronics Group

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APR provides an excellent salary ($35-45K range), along with fully paid company benefits. If you feel you want to join the leader, please call and/or send your resume in confidence, to: ADVANCED PROGRAMMING RESOURCES, INC., 6680 North High Street, Worthington, Ohio 43085, (614) 885-3968. An equal opportunity employer, m/f.

APR
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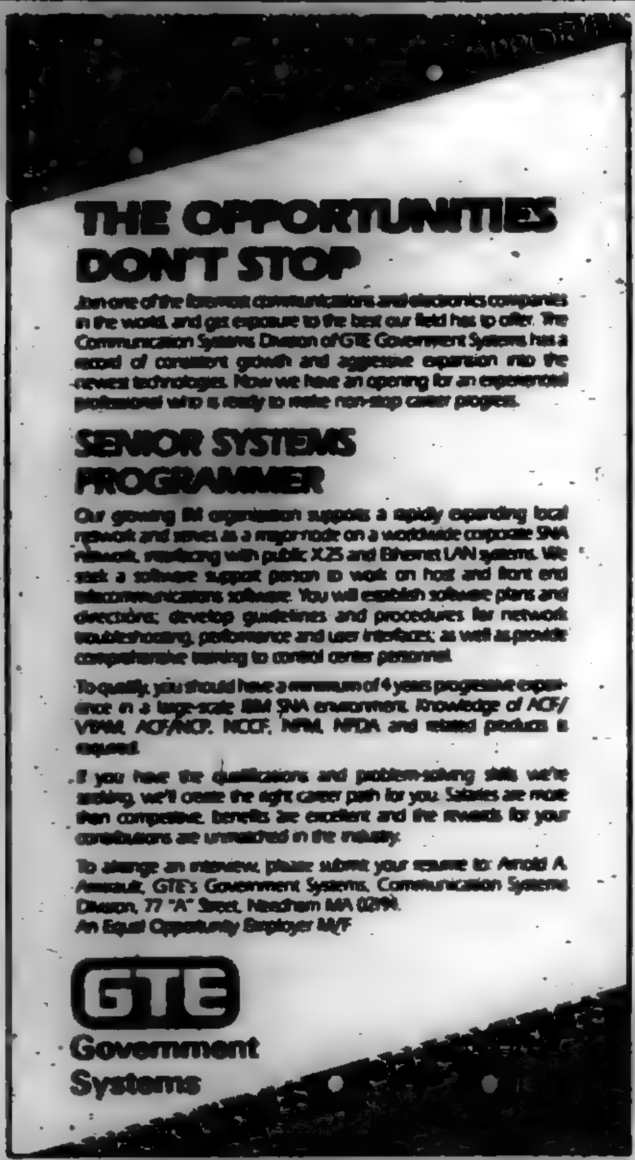

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*Previous computer software vendor experience.
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Salary: [illegible]
Hours: [illegible]

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[illegible], GA [illegible]
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McGladrey Hendrickson & Pullen, the nation's 10th largest CPA firm, is seeking two results-oriented, highly skilled individuals for its Information Systems development team in Davenport, Iowa. Positions provide an opportunity to be involved in design and implementation of integrated information systems identified in our recently developed long-range plan. Current environment is a large scale IBM mainframe communicating with microcomputers. Candidates must have strong interpersonal communication skills.

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Will coordinate all phases in the development of major business applications and supervise teams of technical professionals. Must be able to define and evaluate design strategies and alternatives.

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Responsible for extensive systems analysis and design while working with users to translate business needs into system requirements. Experience with designing application systems in an on-line distributed environment is required.

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Scientific Information Center

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PROGRAMMER/ANALYST (PICK)

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A combination of 2-4 years as a project leader together with 2-4 years of programming experience in at least two languages must add up to a minimum of five years experience in order to qualify. Also required is 2-4 years with VAX/VMS and database software. Should also have a B.S.B.A. or Math.

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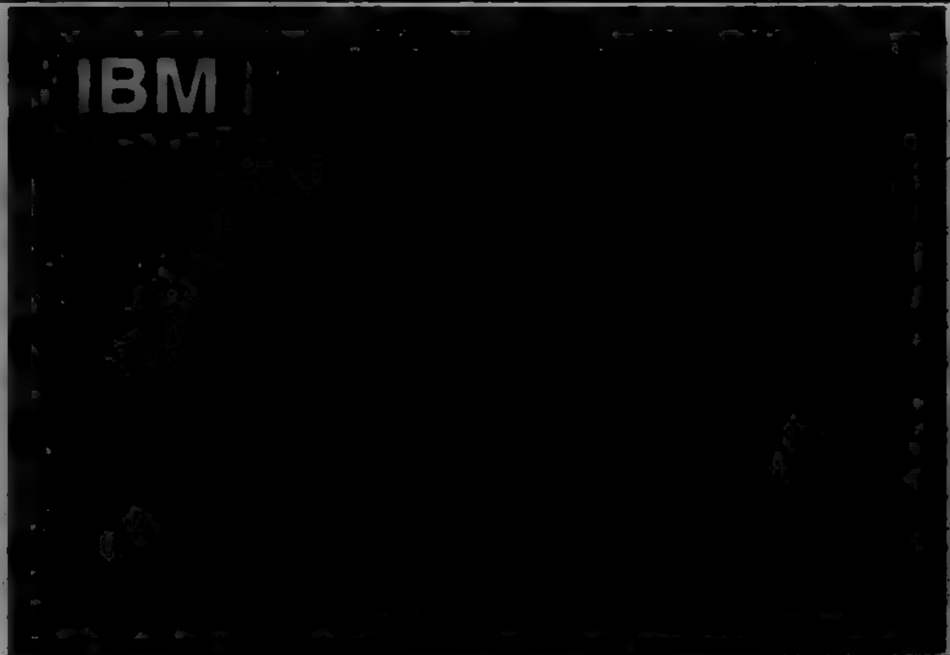

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4331-1	0.25	0.5 to 1	3083E	4.2	[illegible]
4331-11	0.38	1 to 2	3033N	4.2	[illegible]
4331-2	0.50	1 to 4	3083X	4.4	[illegible]
4341-9	0.52	4 to 4	3033UP	[illegible]	[illegible]
4361-3	0.70	2 to 4	[illegible]	[illegible]	[illegible]
4341-10	0.75	2 to 4	[illegible]	[illegible]	[illegible]
4341-1	0.88	2 to 4	[illegible]	[illegible]	[illegible]
4341-11	1.1	2 to 8	[illegible]	[illegible]	[illegible]
4381-4	1.15	2 to 12	[illegible]	[illegible]	[illegible] to 24
3031	1.2	2 to 8	[illegible]	[illegible]	[illegible] to 32
4381-5	1.46	2 to 12	[illegible]	[illegible]	16 to 32
4341-2	1.5	2 to 16	[illegible]	[illegible]	16 to 48
4341-12	1.85	2 to 16	[illegible]	[illegible]	16 to 64
3031AP	2.0	2 to 8	[illegible]	[illegible]	16 to 48
4381-1	2.1	4 to 16	[illegible]	16.5	16 to 64
3032	2.5	2 to 8	[illegible]	26.6	32 to 96
4381-2	2.7	4 to 32	[illegible]	28.7	32 to 128
3033S	2.9	4 to 16	[illegible]-200	29.4	64 to 192
•3083CX	3.3	8 to 32	[illegible]-400	52.9	128 to 384

•First [illegible] installation 1987

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470[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] 32
[illegible]	[illegible]	[illegible] 64
[illegible]	[illegible]	[illegible] to 64
[illegible]	[illegible]	16 to 64
[illegible]	[illegible]	24 to 64
[illegible]	[illegible]	32 to 128
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[illegible]	26.6	32 to 128

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AS/9050	9	8 to 48
AS/9060	11.2	16 to 64
AS/9070	16.2	16 to 64
AS/9080	20	16 to 64
†AS/XL-60	28	32 to 256
†AS/XL-80	50	64 to 256

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The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However.

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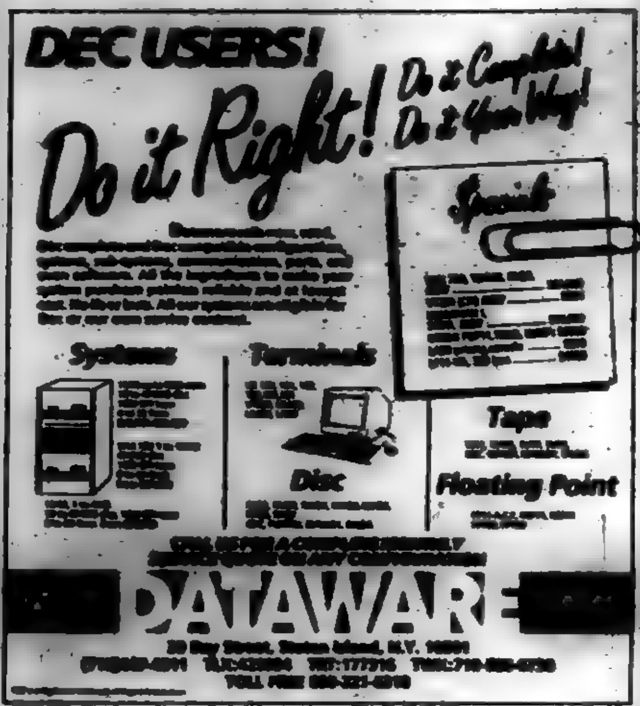

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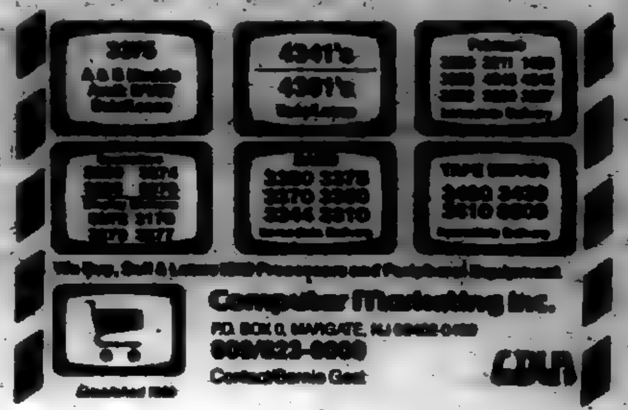

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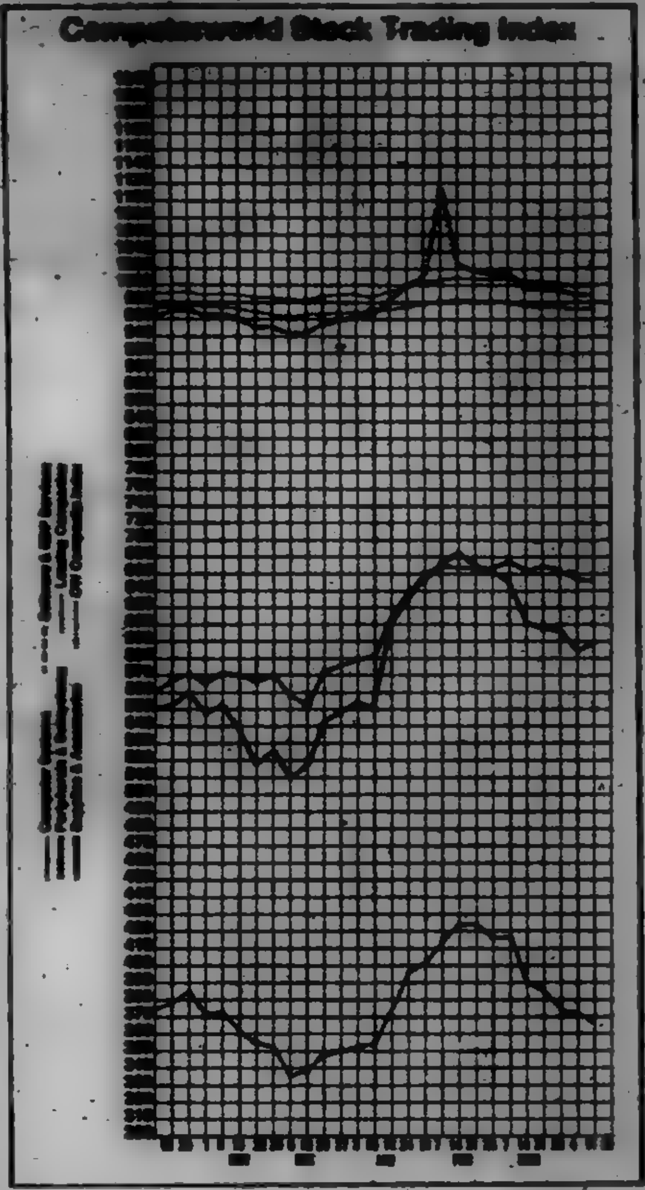

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	SEMICONDUCTORS				
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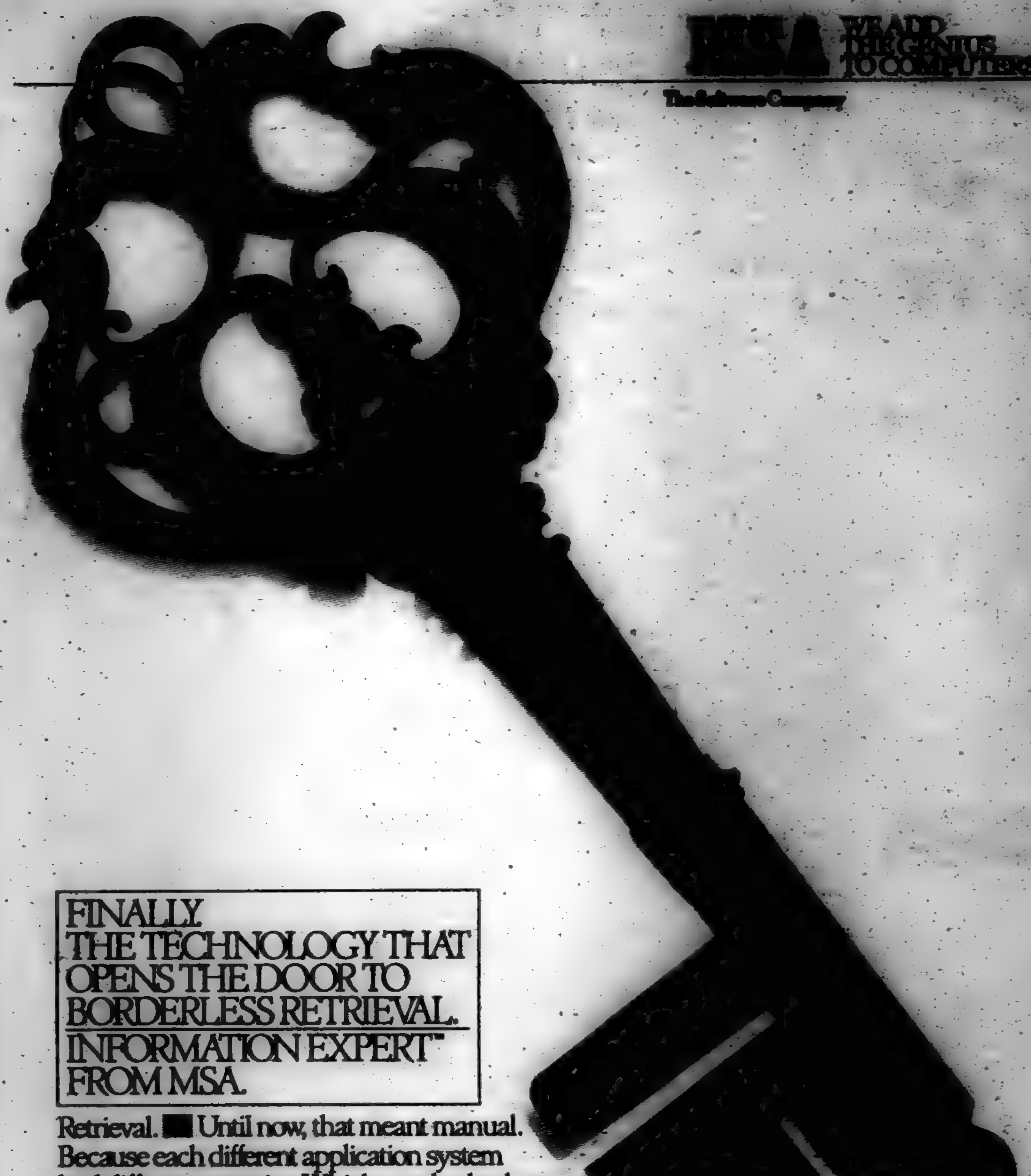

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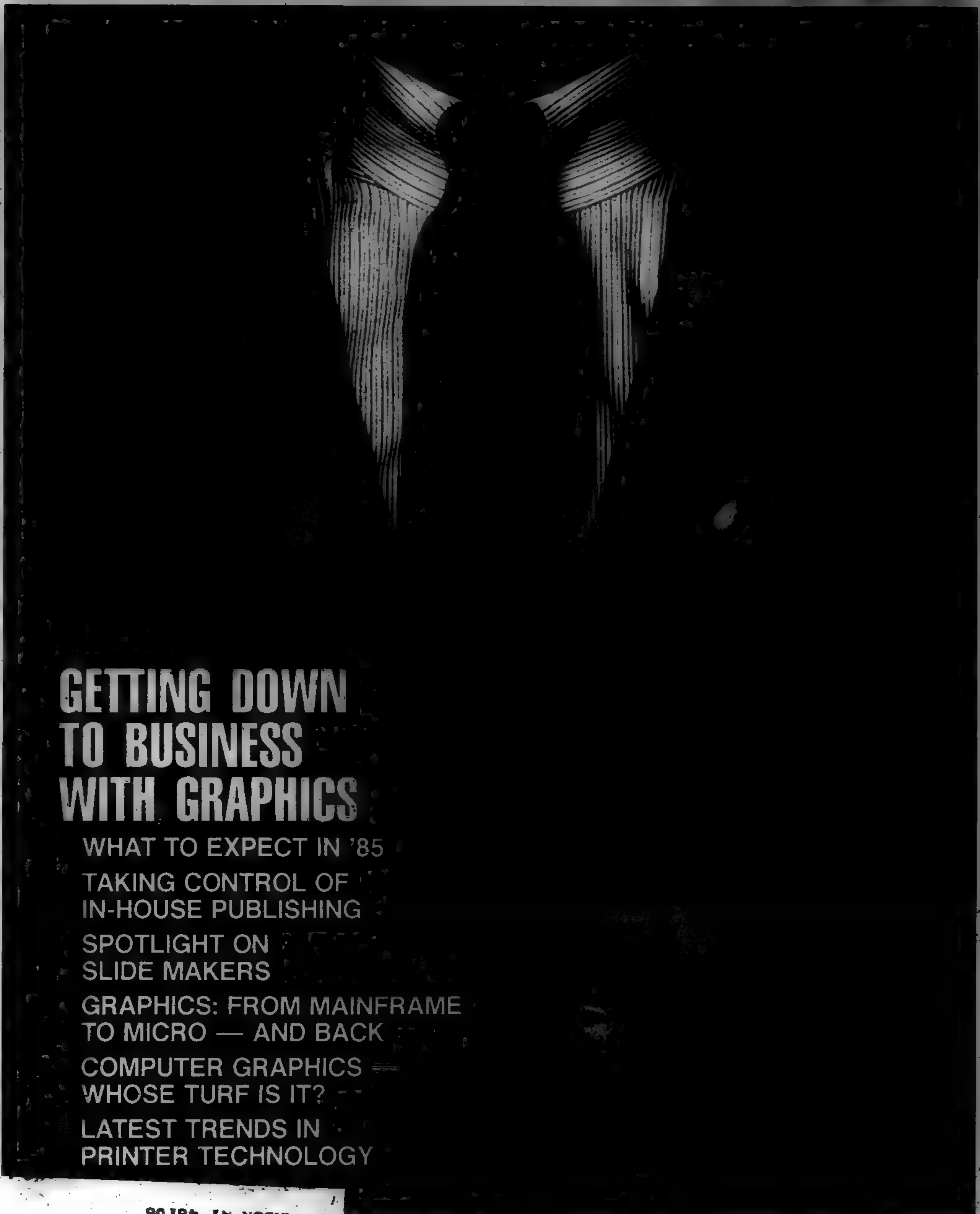

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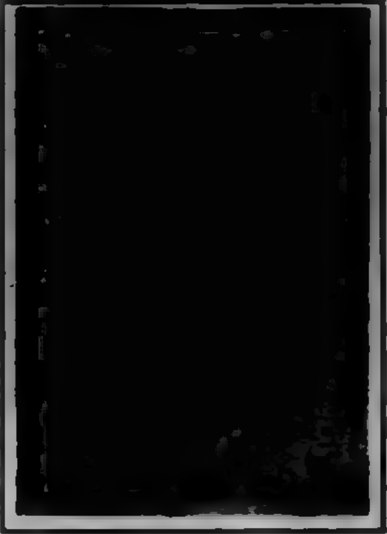

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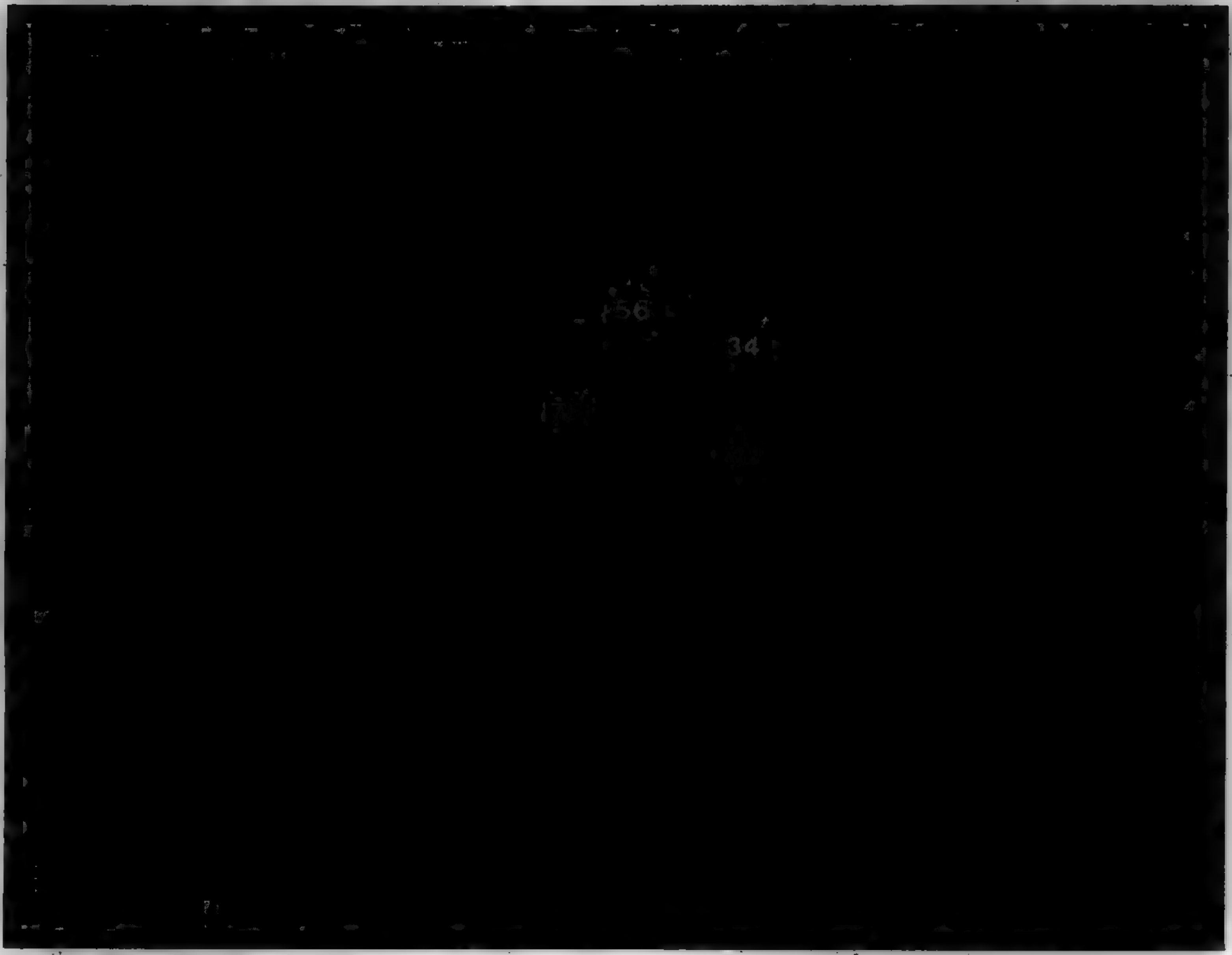

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Editorial

Not-So-Personal Computers

The day of the personal computer has come and gone. That's not to say that organizations will stop buying microcomputers in large numbers or that micro vendors should throw in the towel. It does mean that organizations across the country are finding out that the personal computer is not really so personal, after all. The dream of a computer on every white-collar worker's desktop may be just that — a dream. And a growing number of vendors are painfully waking up from that dream — some more abruptly than others.

Instead of opting for one-for-one purchases, organizations are utilizing micros as shared resources. A recent study by Future Computing, Inc. discovered that one quarter of the personal computers in use by businesses are shared by 10 or more users. The study showed that on the average, 2.3 people shared an office personal computer.

The micro, once considered so inexpensive it could be written off as a miscellaneous expense, has grown more costly as end users become more sophisticated and require more training, more memory, more peripherals and more software and support. In reality, the executive has not yet endorsed microcomputers by using them himself. Professionals don't need to use micros eight hours a day, and organizations have found it increasingly harder to cost-justify full-time access for every office worker.

Shared usage, departmental computing, more active use of minis as links between micros and mainframes all place less emphasis on micros as single-user tools and more emphasis on their role as part of a shared, integrated system. Recent announcements from the vendor community bear witness to this trend. This year has already proven to be one of the most eventful the industry has ever experienced. Not only are micro software vendors dropping off in record numbers, but traditional mini and mainframe vendors are suffering as well.

IBM's decision to drop the PCjr, although not unexpected, is a jolt to its reputation of being able to successfully pull in market share, almost regardless of product. The demise of the PCjr also raises grave doubts over the future of the home market; the machines are virtually being given away by retailers that have been left with large inventories. Declining growth rates, layoffs or temporary shutdowns have been reported by IBM, Data General Corp., Apple Computer, Inc., Digital Equipment Corp., Intel Corp. and even Wang Laboratories, Inc. Although a number of factors in the market conspired to produce these events, the evolution of the personal computer is also having its effect. And this time, the users seem to be calling the shots.

Insider

At Least 1,000 — Maybe More!

By Tom Willmott

Several years ago, during data processing's medieval period, I attended a product seminar held at the local sales office of a minicomputer vendor. This session was held to demonstrate new, supermini-based software that automated engineering drafting and design applications. I was not well versed in the range and power of computer-aided graphics offerings, and I felt it was important to see a representative sample, 1980-style.

It was a straightforward drafting package, although undoubtedly quite crude by today's standards. The software vendor's marketing representative capably demonstrated how the program could be instructed to create lines and a variety of shapes from a draftsman's template. A previously completed file was brought to the screen after several rudimentary exercises were completed. The file presented an architectural rendering of a house — a New England-style, Royal Barry Wills cape, complete with massive chimney and multipane front windows. So far, so good. This was a useful, if relatively uncomplicated, piece of graphics program code.

Then, without warning, the woman at the terminal tapped one or two keys. In an instant the image on the CRT had zoomed in on the detail work around the front door, including a complete schematic of the front doorbell. I was completely unprepared for this turn of events. In fact, I was awestruck.

At that moment in time the full power and potential of computer graphics became clear to me.

In fact, computer graphics coupled with simulation and modeling software has been at the heart of the dramatic progress of integrated circuit design.

The graphics market divides rather neatly into the following four major segments:

- Low-end, personal computer-based — These are typically business graphics applications, notably Visicorp.'s Visiplot, BPS Information Services, Inc.'s Business Graphics, Lotus Development Corp.'s 1-2-3 and a variety of products running in the IBM PC environment. This generation of products works beautifully with multipen plotters, many of which sell for less than $2,000. We also include the innovative Macpaint software in this category. This program, coupled with the Apple Computer Inc. Macintosh's high-resolution screen and Apple's new laser printer, is clearly a giant leap for the market's low-cost end.
- High-end, personal computer-based — With a hardware upgrade of the generic personal computer, including high-resolution screen and expansion boards, it is possible now to achieve most of the two-dimensional drafting and simulation capability I described in that 1980 minicomputer offering. Clearly, IBM is targeting the engineering and design market as a major business opportunity. It would not be surprising to see enhanced PC ATs in 1985 as one way to meet the needs of this market segment.
- High-resolution, microprocessor-based terminals — These devices have been used as workstations attached to a host, shared-logic architecture since Tektronix, Inc. captured major market share with its terminals in the 1970s. Now companies (such as Ramtek Corp., Tektronix, Inc. and Lexidata Corp.) sell workstations, or companies (such as Computervision Corp., Applicon, Inc., Integraph Corp. and GE Calma) sell complete systems or companies (such as Prime Computer, Inc.) sell some combination of products through OEM and systems integrator arrangements (such as Prime's price performer, the 9955).
- High-resolution, microprocessor-based independent workstations — The fourth in the catalog of products describes the ability of the workstation to go it alone. Sun Microsystems, Inc. and Apollo Computer, Inc. come to mind immediately as independent workstation offerings with software sufficient for all but the most sophisticated of graphics applications.

It is, perhaps, at the workstation level where the most exciting developments continue. Refresh rates and memory-to-screen bus speeds boggle the imagination. The new terminals may offer megabytes of main memory. And the common instruction sets of a handful of popular microprocessor designs have led to a wealth of excellent software.

The future should hold continued price performance improvements, nearly unbelievable advances in the sophistication of the software environment and a broad impact on the ability of vendors in every industry that uses graphics equipment to bring new products more quickly and efficiently.

■

Willmott is vice-president of user research for International Data Corp. in Framingham, Mass., and a regular columnist for Computerworld Focus.

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To Our Subscribers

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Q&A

James R. Warner is president of Precision Visuals, Inc., a graphics software supplier headquartered in Boulder, Colo. After spending seven years at the University of Colorado as a teacher and applications developer, Warner joined with three university colleagues to form Precision Visuals in 1980. He shared with* Computerworld Focus *some thoughts on what the management information systems (MIS) manager should look for in computer graphics.

What's the first thing an MIS manager should ask of a graphics vendor?

The first thing should be, "Solve my problem." Instead of all the bells and whistles, users first need a package that services them. It should be easy to use and functional, with good documentation. And if I were an MIS manager, I'd look for a command-driven system instead of a menu-driven one.

Why do you favor command driven over menu driven?

A menu-driven system, if I can use a car metaphor, gets you from zero to 20 very rapidly. Then it gets very sluggish. A command-driven program, along with an on-line Help facility, may take a little longer to learn, but once you get up to speed, you get lots of functionality without having to tab through all the menus.

What else is important?

Machine and device independence. Once the users get acclimated to a particular graphics package, you want to be able to shift them over to another set of hardware, if necessary. You want to be sure the package will run on other kinds of hardware. And, ideally, it should port down to the personal computer. If the whole package won't port down, it should at least be accessible from the personal computer.

All right. We've zeroed in on functionality, ease of use and portability. What comes next?

Performance. Some packages can chew up a lot of computer resources. There's a myth going around that you can rely on virtual memory to solve all your problems, but eventually it's going to drain the resources on the CPU. There's a balance that vendors must be concerned with. Do you need something that can slice bread and puree carrots, or do you need something that draws good-looking graphs and charts?

You haven't mentioned training. Don't you think, especially with a command-driven system, that training is important?

Training for the project leader is important; for the rest of the users, it's critical that documentation be excellent — documentation, plus on-line Help and a good tutorial. It's best if people can leaf through the documentation while they're using the package, and then access the Help facility if they get into a snag. You know, there are no really user-friendly packages out there. The menu-driven system is more user-friendly, but you lose functionality. And MIS managers should be cognizant of the 80-20 rule: 80% of the use is by people who enter material into predefined layouts, and 20% is by layout designers. Generally, the layout designers don't require a lot of training.

What about compatibility with mainframe data base formats?

The graphics package should be compatible with a variety of formats. What we're talking about is a character-type format instead of a binary format.

There are so many different packages on the market today. If functionality, ease of use, data base compatibility and portability are there, what would be a deciding factor?

All other things being equal, the MIS manager should choose the vendor that has a reputation for delivering quality products. Look for a company that's been in business for a while, one that can supply good customer references and provide local support. Support is really important. The manager needs a technical person who will come in to install the product and will fix problems as they occur. MIS directors are looking for a safe decision, and you can't blame them for that.

There's one criterion that's notably absent. What about price?

Price comes in pretty low on the totem pole. If you look at a fully costed programmer going for $6,000 to $8,000 a month, the cost of the graphics software seems incidental when compared with the productivity of these people. Usability is much more important; you don't want to spend too much trying to find out how to use it.

Do you have one final qualifier for the poor MIS manager who can't catch a breath between buying decisions?

Yes. Look for superior customer service. From a vendor's point of view, the money is to be made from the sale of multiple systems. Technology sells the first system, but great customer service is what sells multiple systems. Get those references from satisfied customers.

Manager's Corner

By Michael E. Lawson

Between six million and eight million computers are currently in use in the U.S. alone, and over the next few years these numbers should grow even higher. Although most people expect this technology to offer real increases in productivity and efficiency, the arrival of the technology is often accompanied by negative reactions.

These negative feelings can be frustrating for management information systems (MIS) professionals who are very comfortable with the existing technology and who often constitute a driving force for innovation. When resistance is high, the implementation of systems can be impeded and the effective use of the technology impaired, resulting in frustration for users and developers alike.

When any new technology or system is introduced, a number of concerns will be present, whether they are voiced by the affected people or not.

The first of these concerns is that people will be worried about their jobs. It is irrelevant whether the concerns are based on fact; if the fear is real, people will be affected.

Second, people are often intimidated by machines. They will be concerned about possible changes that may occur in the work place. They will also want to know how the value of their contributions will be affected, and if they will be able to cope in the new environment.

Third, computers can lead to a situation in which more work is done at home or in other isolated environments. This in turn can adversely affect interpersonal relationships and create a sense of separation from the organization.

Finally, the new technology offers an increased ability to monitor and measure performance. This may sound terrific if you're a supervisor, but it can create real apprehension for those who are supervised.

An MIS manager will be aware of these concerns. Armed with this information and the knowledge that the technology can, in fact, improve the quality of work and the work place, you can take the following steps:

- Insist that management take the necessary steps to ensure that users' interests and needs are fully incorporated. Up and down the reporting channels, people need to know what is going on and what they can expect. They need to be involved from the start.

Fears and concerns can be turned into very positive and helpful attitudes if people believe their input is actively sought, listened to and, where appropriate, incorporated into the planning and implementation process.

- Encourage managers to address the issues of job security and intimidation. Candor and commitment to career reorientation are essential when particular jobs are to be eliminated. Companies must develop educational programs that can bring users up to speed and, to reduce anxiety, must emphasize the positive aspects of using the technology.

MIS professionals can also help make sure that other managers do not develop unrealistic expectations about the amount of time it takes people to become comfortable and productive with the new technology.

- Help management to clarify the specific reasons and goals associated with the introduction of the technology. Clear goals and objectives make it easier for everyone to understand the importance of the change and to rationalize some of the short-term disruptions.
- Share with other managers your understanding of the impact of change. The effective implementation of any new system will proceed more smoothly and will lead to long-term gains in productivity when the company is committed to understanding the impact change can have on people. The information systems department has had more experience with systems and technology — and perhaps with change — than other parts of the organization have had. This experience and knowledge must be shared with those who will be responsible for the implementation process and ultimate use of the technology.

In combination with good decisions about hardware, software and systems, these additional steps can lead to a better implementation process and a more productive system.

Lawson is director of the Masters Program in Management Information Systems at Boston University's School of Management.

Correction

An editing change in an article in last month's issue ("Integrated Software — Past, Present and Future," *Computerworld Focus,* March 20, 1985) inadvertantly caused the vendor names to be interchanged on two products. The correct references follow: Enable is from The Software Group, Inc., and Electric Desk is from Alpha Software Corp.

In the News

Belt-Tightening At Apple, IBM and Wang

In mid-February, Steve Wozniak, one of the founders of Apple Computer, Inc., announced he was leaving Apple to pursue other interests. It was widely reported that Wozniak had disagreed with the company's overall direction. At the end of February, Joseph Graziano, Apple's chief financial officer since 1981, resigned. Soon after these bulletins, Apple announced that the company would stop production for one week at each of its three Apple II plants and its Macintosh plant, citing large dealer inventories and soft sales as reasons for the shutdowns.

Greg Kelsey, partner in L.H. Alton and Co., a research and consulting firm in San Francisco, stated he wouldn't try to read more into it than meets the eye, and the three events are pretty unrelated. Kelsey said he was surprised when Wozniak went back to Apple a year ago, but that he knows Graziano well and was aware [illegible] wanted to get out of the high-pressure fray, which he'd been involved in for a number of years.

Perhaps the personnel changes are coincidental. But a larger problem looms on the horizon. Lotus Development Corp.'s Jazz, the long-awaited and much-heralded Lotus 1-2-3 lookalike for the Macintosh, is going to keep its heralders waiting a bit longer. Jazz was originally to ship in March, then April. Now the date is set for May 27. The uncertainty surrounding Jazz could mean fewer Macintosh machines sold and a more difficult fight in entering the offices of big business.

Apple doesn't hold the patent on bad news. The latest word on the home computer market comes from IBM, and that word is "halt." The decision to cease production on the PCjr as of this April comes hard on the heels of Apple's week-long moratorium on manufacturing the Apple II and Macintosh computers. An estimated 100,000 PCjr computers are still in inventory.

Evan Moltz, director of Microservices for International Data Corp., a research firm in Framingham, Mass., said the decision indicates that IBM has finally admitted there is no such thing as a home computer market — except in December. "You can sell almost anything at Christmas," Moltz said. Bob Miller, president of Computerland of Worcester County, Mass., expressed disappointment at the news, especially in view of the tremendous number of PCjrs sold in the last quarter of 1984. "There's an installed base out there expecting more software products, especially educational products. A lot of customers purchased the PCjr for that reason." However, Miller has not sold any units since Christmas. He has a reason for disappointment that goes beyond the store's balance sheet: He bought a PCjr for his family for Christmas.

And to round out the news, all employees in the domestic manufacturing facilities of Wang Laboratories, Inc., in Lowell, Mass., will take a common vacation — the first two weeks of July 1985 — according to Paul Henning, director of Public Relations at Wang. When asked whether a common vacation was a common occurrence, Henning replied that it only occurred once before, "sometime in the mid-70s."

In Brief

NATICK, Mass. — The hard-copy graphics market will reach $12.3 billion by 1990, and of the three segments of the market — plotters, printers and camera systems — camera systems will experience the greatest growth with a forecasted compounded annual rate exceeding 68%. Venture Development Corp.'s market study, entitled "The Multicolor and Single-Color Hard-Copy Graphics Industry through 1990," also reported that drum plotters will continue to grow at a compounded annual rate of 30.4% and moving media flatbed devices will demonstrate the highest rate of growth with dollar shipments expected to be nearly 10 times the 1984 rate in 1990.

Further information regarding this 300-page report, which is available for $7,500, can be obtained by writing to Venture Development Corp., 1 Apple Hill, Natick, Mass. 01760.

FAIRFAX, Va. — The revolution in printing and publishing is on-line text editing and page makeup, combined with computer-generated charts and graphs, and this revolution will be given in-depth coverage at the National Computer Graphics Association Conference in Dallas, April 14-18, 1985.

Among the participants is Alan T. Paller of AUI Data Graphics/Issco, who will head a special printing and publishing track on Thursday, April 18. In addition, there will be extensive tracks dealing with visual arts and design and business and management graphics. In special sessions on Sunday, April 14; Wednesday, April 17; and Thursday, April 18; biomedical technical sessions will be held. There will also be a concurrent exposition featuring over 200 vendors of hardware, software and services spread over seven acres of floor space at the Dallas Convention Center.

Details and registration information are available from the National Computer Graphics Association, 8401 Arlington Blvd., Fairfax, Va. 22031.

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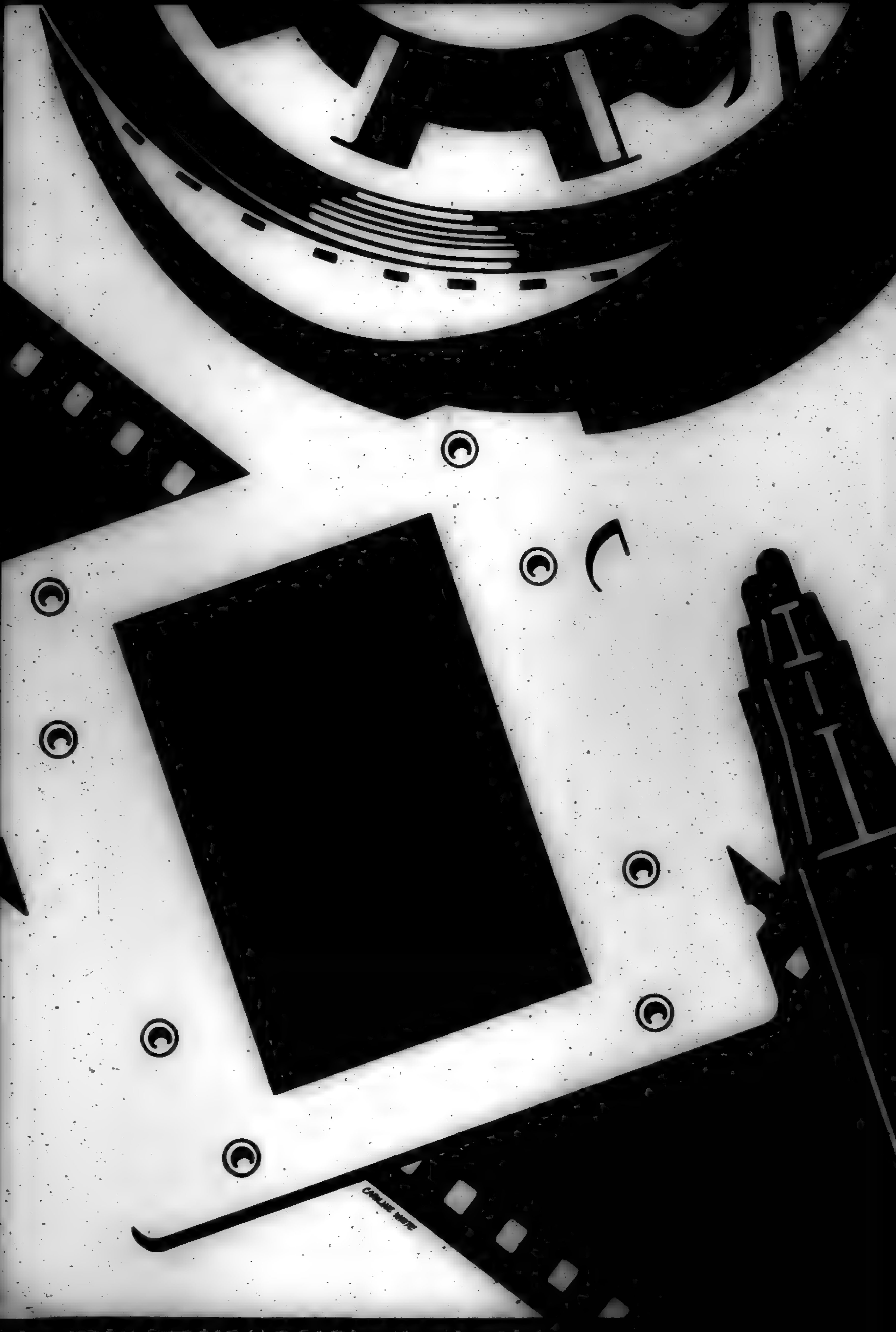
CAROLINE WHITE

What's New In Slide Makers?

What's new in slide making? Two authors present their views: Kathryn Alesandrini focuses on technology and Lee White compares some products.

By Kathryn Alesandrini

With microcomputer graphics, what you see is not always what you get. Have you experienced the letdown of dreary dots when printing out colorful screen graphics on a dot matrix printer? Or maybe you've suffered from the giant jaggies when the little jagged edges of screen graphics turn into giants when projected on a large screen. Don't give up! Now you've got connections — new combinations of hardware and software can transform you and your microcomputer into a graphics workstation, turning out snappy full-color graphics at a fraction of the cost of traditional graphics. Truly state-of-the-art graphics is usually created on mainframe and minicomputers, complete with high-resolution film recorders that create picture-perfect slides. But now with the addition of communications capabilities, you've got the ingredients for a micro graphics workstation that results in perfect output. All you need is your IBM Personal Computer with a standard color card, graphics software and a modem (optional if you'd rather use postal communications).

Computer graphics is good for business. Studies show that when visuals are used in a presentation, the audience remembers about 90% of the information. Remove the graphics, and they remember only 10%. The added bonus of using graphics software is that you don't need to be an artist or programmer to create eye-catching graphics that look like they came from the art department.

Be careful not to overdo it, however. Although colorful visuals attract attention, they can do more harm than good if images are oversimplified, distorted or irrelevant to the points you are trying to make. Some people use decorative graphics to liven up presentations and to add interest value. Decorative graphics can backfire when they distract attention from the important information and direct it to the frills. Dressed up word slides (ornamentation added to verbal slides) are an example of the misuse of graphics software. They may be cute, but they can do more harm than good in a presentation. Always use graphics to drive home the most important points. Keep in mind that word slides are not graphics. Too many presentation visuals are actually all words. Word slides do not capture the attention of the audience the way graphics presentations do. Images are much more memorable and fun to view. The quickest and cheapest way to get color slides from your personal computer is to point a camera at the screen and take a picture. Several available products make it nearly foolproof to shoot color slides from your color monitor in a matter of minutes. The main drawback to shooting from the screen is that slides will be no sharper than what you see on the monitor. Also, the monitor is slightly curved, and photographing a curved surface gives the slide a wraparound look. The real problem is the lack of high resolution.

Resolution refers to the number of dots or pixels (picture elements) in the image. The finer the detail in the image, the higher the resolution. As a point of reference, IBM PC color graphics is 320 by 200; Apple Computer, Inc.'s Macintosh has an impressive 512- by 342-display screen, although it sacrifices color. IBM's new Enhanced Color Display is 640 by 350 pixels, with a price tag of $849 for the monitor and $524 for the upgraded graphics card. With the standard color monitor, the new graphics card gives you a resolution of 640 by 200.

But for perfect-looking graphics, you need to have 2,000 by 2,000 for print graphics and 4,000 by 4,000 for slides that will be projected. You cannot approach the truly high resolution of mini-

(Continued on Page 8)

By Lee White

As anyone involved in computing knows, the name of the game — the fun game, anyway — is graphics. And the best part of graphics is not looking at pictures on the color monitor, but showing the pictures to others.

Most people agree that color graphics gives a presentation more punch. Users haven't done much in this area because color printers and low-cost plotters are relatively new to the marketplace and outside slide makers are expensive. What has had to suffice until now for most presenters is the transparency (also known as the overhead or foil). These were rarely in color because they were usually created on a transparency maker or copier/duplicator. However, transparency film is available in color, so users had the distinctly exciting choice of black print on green, yellow, red or blue.

Transparencies have been the bane of many a speaker: At a crucial point in the presentation it would be discovered that the slides were stuck together from static electricity, or were placed upside down on the projector table or, more than once, a whole batch would slide to the floor, sucking up rug dust. Another disadvantage with transparencies is the inability to duplicate innovative art. The presenter was limited to printer output and, even if there were a color printer or plotter available, color choice was limited by the number of bands on the printer ribbon or the number of pens on the plotter.

Recently, there has been a rash of announcements of slide makers in price ranges wide enough for any user's pocket. Some slide makers utilize their own graphics software; others are compatible with most readily available graphics software packages. Some of the more expensive and sophisticated equipment offerings have tablets that enable the creation of original art; even the less expensive ones allow some variations in color choices.

The great dividing line on the slides themselves is resolution. The better models eliminate the jagged lines seen on computer display monitors. Slide resolution capabilities of 4,000 line/in. is equal to excellent photographic reproduction.

Following is a sampling (six products, which fall into four categories) of what's available in slide makers. The first three products, AVL's Starburst and Genigraphics Corp.'s SG2 and Series 1000, are full-function slide presentation systems. They not only allow for immediate slide (or hard-copy) output from computer-generated graphics, but also provide for artistic input. The second two, Calcomp Imaging Products' Samurai and Matrix Instruments, Inc.'s Matrix PCR, are quite sophisticated and are capable of fine slide resolution output, but do not provide the user with the capabilities of freehand-art input. The third, Polaroid Corp.'s Palette, does not give high-resolution output, but does offer the user some good flexibility for color choices. The last product, Eastman Kodak Co.'s slide maker, which is actually a collection of products, photographs the display monitor. The price differential from the first group to the last product is great, but to compare them without explanation would be like comparing Rolls Royces with Rabbits.

AVL (formerly called Audiovisual Laboratories) of Tinton Falls, N.J., recently announced the Starburst Computer Graphics Presentation System. Starburst offers a turnkey system comprised of a 512K-byte CPU with a 10M-byte Winchester hard disk drive and a 5¼-in. floppy disk drive, a puck (similar to a mouse) and digitizing tablet, keyboard and 12-in. monochrome monitor. Users may select either a 12-in. or 19-in. color display monitor and either of two high-resolution film recorders.

(Continued on Page 10)

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computer and mainframe graphics, even if you spend money on upgraded graphics capabilities for your micro. Of course, one way to get high-resolution output from a personal computer is to buy software that takes away the rough edges and a film recorder that creates a high-resolution slide.

If visual appearances are very important to you but you are on a limited budget, you might consider a graphics enhancement connection service. Other than your standard color personal computer, your only investments are the software and a standard modem for data communications. The graphs created with your graphics package (within limits) can then be transmitted to a service center for enhancement and returned as 4,000 by 4,000 picture-perfect slides. Imedia Corp.'s support package, PC Presents, automatically converts Lotus Development Corp.'s 1-2-3 graphs into code that can be communicated to the high-resolution film recorders in the service center network. The cost is $350 for software, $15 for one-day service to image an original slide and $23 for an overhead transparency. You don't even need a modem; the centers accept graphics on disk. This service is good for word slides and the standard business graphs, but lacks free-form graphics.

The more sophisticated Genigraphics Corp. Series 1000 system (based on an IBM PC) does not even allow freehand drawing. It does, however, include a digitizer that lets you create original graphics that can be transmitted to a Genigraphics Production Center for high-resolution slide output. The Genigraphics system allows a wider range of graphics for high-resolution imaging than does PC Presents, but the upgrade kit for the PC costs $12,500 and you still can't get the kind of images you can create with the standard draw-and-paint software in lower resolution.

Another entrant in the area of graphics enhancement services is Dicomed Corp.'s Presenter PC. With the addition of a high-resolution graphics adapter card to your personal computer, you can use Presenter PC ($995) to create presentation graphics that can be imaged up to 8,000-line resolution. Presenter PC software allows the full range of charts and graphs, text with 360-degree rotation and original (but not freehand) graphics.

With Presenter PC you can tie into the Dicomed system through phone transmission using the high-quality image recorder. Slides can even be enhanced by top-of-the-line graphics workstations if you want special effects or graphics symbols added to your slides. A library of prestored images and symbols can be added to your slides for a set fee. For a price, your slides can include the full range of graphics including free-form graphics.

However, it's not what you can do with graphics enhancement services, it's what you cannot do that may be a problem. The limitations stem from the fact that not all graphics are alike. Only certain types of personal computer graphics can be transferred for enhancement — the kind that can be reduced to device-independent and resolution-independent primitives (lines, rectangles, polygons and so on) and their attributes (such as color, width and texture). What about most of the pictures created with the draw/paint graphics software and microcomputer libraries of predrawn images? The images from those packages cannot be enhanced because they are bit-mapped graphics. They are composed of a collection of dots that our eyes can organize into recognizable shapes, patterns and objects, but there is no organization or meaning to the dots for the computer. A curve cannot be smoothed unless the computer knows that a series of dots is supposed to be a curve. When an image has been created with individual dots rather than objects, the computer does not know a line from a circle. The main limitation of enhancement services is that they cannot act on graphics software that stores images as a collection of dots. Many of the business graphics

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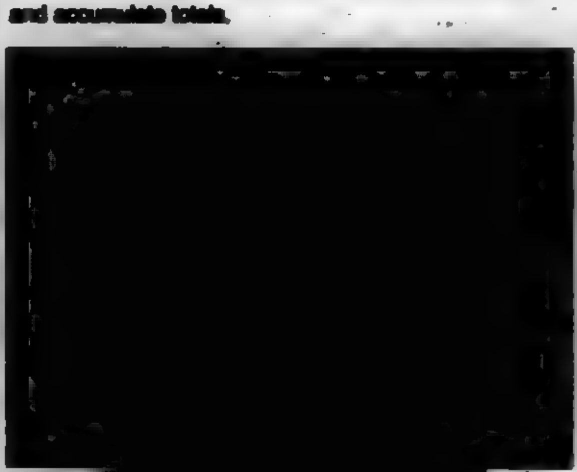
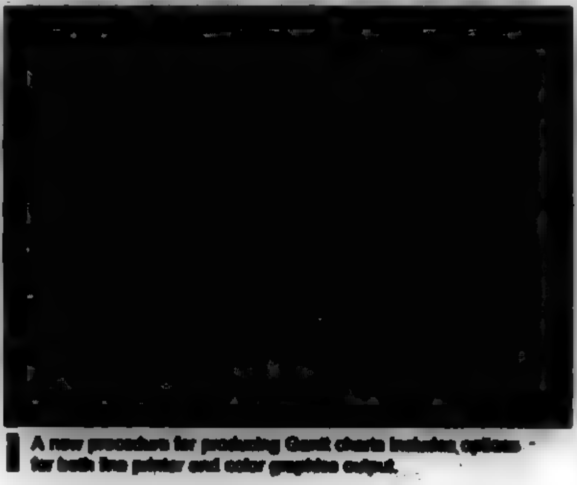




A new procedure for producing Gantt charts includes options for both line printer and color graphics output.

Easy Report Generator. Once you perform your analysis, you can present the results in easy-to-understand graphics. The SAS System has procedures for routine lists, tables, reports, charts, plots, and maps. New tools let you annotate your displays and put multiple graphs on the same page.

Above: Full-screen editing tools help you keep records and track information.

Below: You can graph results from the Version 5 survival analysis procedures for easy comparison.

The SAS System runs on these minicomputers: Digital Equipment Corp. VAX™ 8600 and 11/7xx series under VMS;™ Prime Computer, Inc. Prime 50 series under PRIMOS;® and Data General Corp. ECLIPSE® MV series under AOS/VS. The SAS System also runs on IBM 370/30xx/43xx and compatible machines under OS, TSO, CMS, DOS/VSE, SSX, and ICCP; IBM XT/370 and AT/370 under VM/PC, and IBM PC XT and PC AT under PC DOS. Note: Not all products are available for all operating systems.

software packages in use today use bit-mapped graphics and cannot be transmitted for enhancement.

Why does everyone want such high-resolution graphics anyway? People enjoy viewing realistic colorful graphics. Yet there is another, perhaps more important source of realism. The nature of the information being imaged may be realistic or abstract. Numerical data and words, for example, are inherently abstract. Objects, events and people are concrete and realistic.

Images are realistic and concrete compared to abstract verbiage. That's why graphics presentations are interesting and easy to remember. There's nothing dull or abstract about graphics — or is there? Actually, not all graphics are created equal. Some are more realistic than others. Charts and graphs, for example, are more abstract than realistic drawings of objects. Yet realism is important in visual displays because people enjoy viewing concrete, realistic images.

The advantage of including truly realistic graphics in your representations is that people will pay closer attention to your ideas.

The good news is that you can make your presentations more interesting and influencial if you spruce up your abstract graphics with realistic images.

Abstract graphics such as bar charts and pie charts may elicit fewer yawns than verbiage and data tables. But if you really want to catch people's interest, you need realistic images of people, places and things.

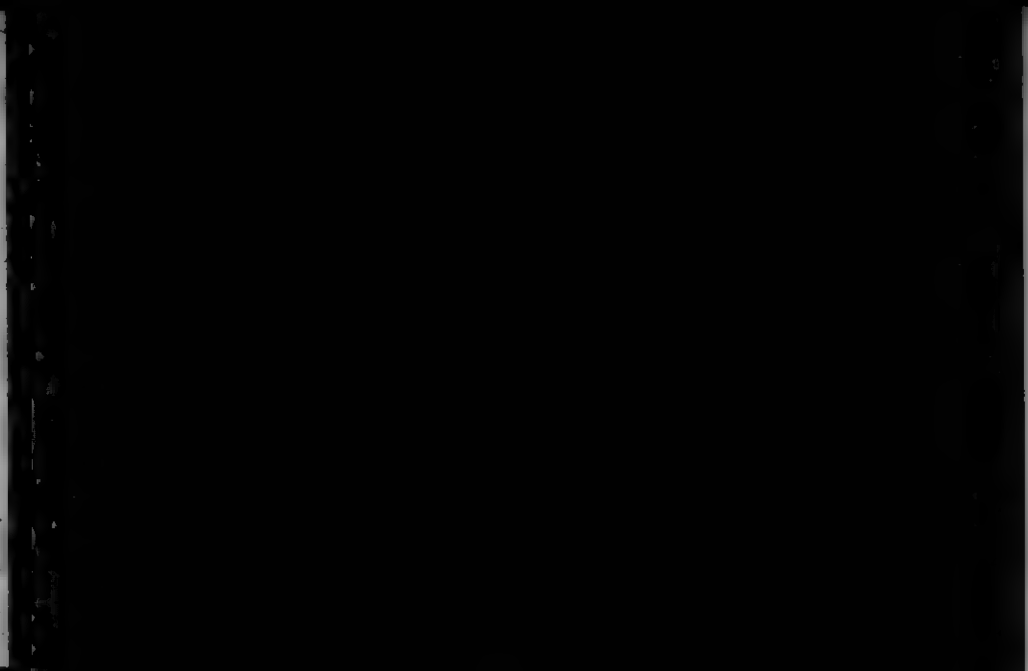
By providing hundreds of predrawn figures, some of the new software packages make it easy to add realism to a presentation. All you do is electronically cut and paste the images, changing colors and adding other personalised touches. The result is colorful, realistic graphics with a customized look. But for now, you must give up high resolution to achieve this look with your personal computer. Software such as Prentice-Hall, Inc.'s VCN Execuvision provides collections of realistic graphics and symbols called libraries that you can pick and choose for your own use. The library collections include borders, initials and decorative designs; an industry and business catalog; the world's faces and figures as well as maps and international symbols. Other libraries scheduled to be released include health and fitness, finance (banking, stocks and bonds, taxes and so on), transportation (vehicle and travel-related images) and computer and computer applications.

With predrawn graphics, you can spruce up a boring bar chart by combining it with a realistic drawing that depicts the topic of the data. You not only increase the interest value with realistic images, but you also make the information easier to remember.

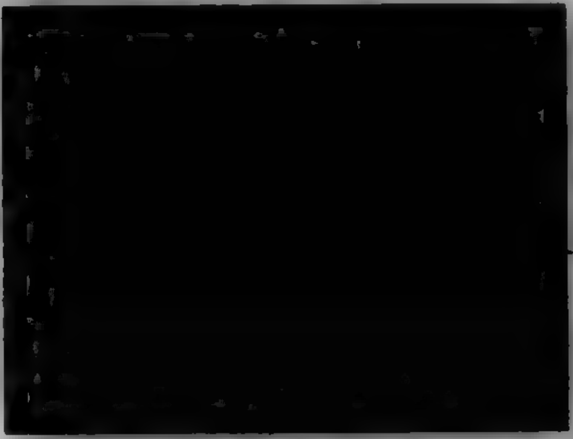
Nothing is perfect. Although you can connect your personal computer to a graphics service center for perfect slide output, the process is flawed by the restrictive range of visuals that can be created. Dicomed's enhancement service is one solution to the restrictive range of visuals — at a price. Basic enhancement services are well suited for those who use only word slides and standard graphs in their presentations. Yet, anyone using only those options may be missing much of the potential benefit of graphics. Word slides and standard graphs may not be interesting enough to hold your audience's attention. If you go to the time and expense to include graphics in your presentation, you want the full benefit. There is no guarantee that by getting rid of giant jaggies, you can also eliminate the so-called audience-eyelid-saggies.

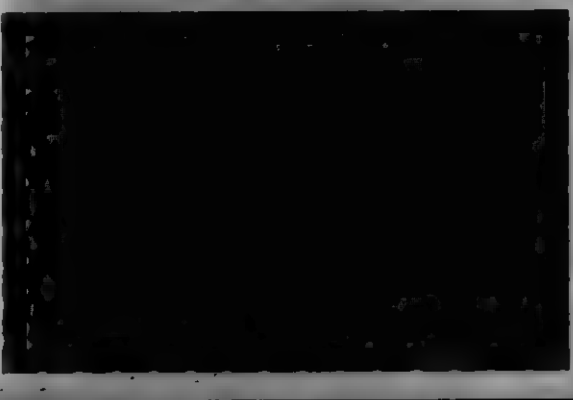
■

Alesandrini is a professor at California State University and heads Microconnect, a consulting firm in Santa Monica, Calif., which specializes in informational graphics for training and management. She is author of the book, Business Graphics for Information Management *(Prentice-Hall, Inc.).*



Above: New facilities in Version 5 let you customize your graphics presentations.
Below: Version 5 handles your quality control applications too.





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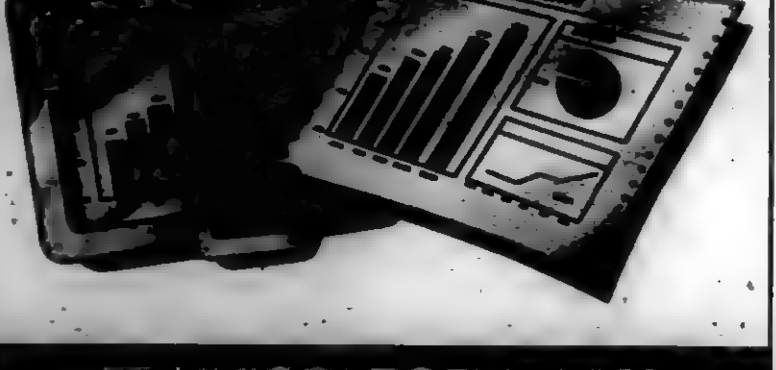

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Three major software programs are included: Artgraphics, for creative free-form designing with the puck and digitizing tablet; Chartgraphics, for creation of three-dimensional horizontal and vertical cumulative bar charts, three-dimensional pie charts and area and line charts; and Quick Show, which allows the user to sequentially arrange all design files and then review them in presentation sequence for rehearsals or final edit analysis. Also built into Quick Show is the ability to design during the day and allow the system to record finished material on film at night through the system's high-resolution film recorder control routines.

Starburst Computer Graphics Presentation System, priced at $42,000, has many features that were previously available only on systems costing well in excess of $100,000. Output includes combinations from 256 displayable colors from a palette of 16.7 million colors, and slide resolution is 4,000 lines. The drawback to Starburst is that it is a pure stand-alone system with no ability to access either information from data bases or other graphics packages on mainframes or personal computers.

Ron Rudolph, of Ducks, Unlimited, a private conservation group involved with funding for wetland habitats, creates the slide presentations used for various fund-raising and meeting functions. Before his group got Starburst, slide presentations were done manually. "We had to do keylining and pasting, do a [Eastman Kodak Co.] Kodalith, then we stripped gels and then we shot it on a light table. It was pretty time-consuming." Although the volume of slides produced has not been high, word of Starburst's existence at Ducks, Unlimited has gotten around, and Rudolph figures they could be creating 1,000 original slides this year. They will create multiples of the originals so sets of slides can simultaneously be used by people in different locations. In addition, they program the Starburst to operate unattended at night. "In the past we've been up 16 to 18 hours each day for a week to get the job done. This time it was just 8:30 to 4:30. So we enjoyed it." More information about Starburst is available from AVL, 56 Park Road, Tinton Falls, N.J. 07724.

Late in 1984, Genigraphics Corp., in Liverpool, N.Y., announced the Genigraphics SG2000, a self-contained computer graphics console and film recorder priced at under $100,000. Operational features of the system include a palette of 16 million colors with 64 colors available for use in a single slide; four type fonts; and complete file management for reading, writing, reviewing and copying records. Special software is available for freehand art, additional type fonts, texture and black-and-white hard-copy output.

If potential customers decide not to purchase the film recorder as part of the Genigraphics package, they may purchase the SG2 alone at a cost of $36,850. A communications feature enables users to transmit work to the film-recorder for production as 2,000-line or 4,000-line high-resolution slides, viewgraphs and transparencies. Genigraphics also has 23 service centers nationwide to which tapes can be sent for slide production. Although the SG2000 system is primarily a stand-alone system, it is compatible with Integrated Software Systems Corp.'s (Issco) mainframe graphics software.

At the other end of the Genigraphics spectrum is the Series 1000. The Series 1000 is available as a total hardware and software package, based on the IBM Personal Computer XT, which sells for $17,000, or as an upgrade to the IBM PC or PC XT for $11,000. Neither of these prices include the film recorder.

The Series 1000 is able to read Dif files from other software packages, so a spreadsheet created in Lotus Development Corp.'s 1-2-3 can be brought down to the Series 1000 software for chart creation. If a decision is made not to purchase the film recorder, the Series 1000 can be hard-wired or telecommunicated to an in-house Genigraphics film recorder for slide production. The 23 Genigraphics service centers can also be used for slide production needs. There is generally a 24-hour turnaround time to the service centers.

The Series 1000 is in beta test sites now, and no further information could be obtained. Genigraphics Corp. can be reached at P.O. Box 591, Liverpool, N.Y. 13088.

Calcomp Imaging Products, which was called Image Resource Corp. before it was bought by California Computer Products, manufactures the Samurai, a complete business presentation graphics system. According to Calcomp, Samurai was named to conjure up images of skill, precision, swords and cutting edge and costs $11,950 plus $495 for the optional Image I graphics package.

Samurai is compatible with the IBM Personal Computer, PC XT, XT 370 and the 3270 PC. In addition, drivers will soon be available that render compatible mainframe graphics systems, including IBM's Graphics Display Data Manager (GDDM), Issco's Tell-A-Graf and SAS Institute Inc.'s SAS/Graph.

Roberta Aronoff is project coordinator for Samurai in the Decision Support Department at GTE Service Corp. in Stamford, Conn. Her group has responsibility for installation, implementation, documentation and training on a variety of mainframe software products. GTE is awaiting delivery of the driver, which will allow Samurai to work directly with its mainframe software product, Tell-A-Graf. Aronoff used the driver with Samurai at Issco Week in San Diego in late February, 1985. "I had an opportunity to run out slides [at Issco Week]. They looked very, very good."

Samurai is also compatible with most microcomputer graphics packages, with the notable exceptions of Zenographics, Inc.'s Mirage (for which a driver will soon be available) and Decision Resources Co.'s Chartmaster. The limitation to Samurai is that any graphics package must download to the personal computer to which Samurai is attached, and Samurai can only reside on one personal computer.

Samurai's ease of use should balance out any disadvantages, however. To generate a slide, all the operator has to do is develop an Image I chart form and display an image on the monitor. If the image is correct, the operator commands the computer to output the image to film, paper, display screen or communications network.

Slide resolution of 4,000 lines is very high for an inexpensive system, but Calcomp claims the Samurai produces such a result.

More information about Samurai is

available from Calcomp Imaging Products at 733 Lakefield Road, Westlake Village, Calif. 91361.

The Matrix PCR is Matrix Instruments, Inc.'s entry in the automated film recorder market. The Matrix PCR sits on the floor at desk side, and the controls are at desk height.

The Matrix PCR interfaces with the IBM PC, PC XT, PC AT, XT 370, 3270 PC and IBM PC-compatible computers as well as many mainframe networks and minicomputers. It is also compatible with most major microsoftware packages including Lotus' 1-2-3 and Mirage. In addition, it runs with Tell-A-Graf, SAS/Graph and GDDM mainframe graphics software. The PCR produces slides in the 2,000-line resolution range. As with Samurai, the personal computer is used as controller.

The Matrix PCR is presently in advanced beta sites for Matrix's OEM customers. One of those advanced beta sites is Images II Graphic Systems in Lincoln, Neb. Images II designs and produces three-dimensional graphics systems for slide, video and color hard-copy. They have developed a series of software programs and hardware processor boards that offload the personal computer while still allowing the universal interface of the IBM world. Reg Johnson is general manager of Images II and has been using the PCR since early January. Johnson said that results of the tests they've conducted have shown the PCR to be much superior to the Matrix QCR in shading and handling of colors. Although the slide output is only 2,000-line resolution, the shading and linearity of colors is much better than the QCR running the same slides side by side, according to Johnson.

Although the PCR's technology is similar to Matrix's more expensive QCR, which operates directly with mainframe software via a black box interface, Johnson stated that, "between the two, I think the technology and the things that [Matrix] has done in the PCR are a significant improvement over the level of technology that's in the QCR."

Jack Russell, supervisor of computer graphics for the New York Treasurer's Office of General Motors Corp., has been using the QCR for almost two years. "We're doing all the presentations for the Board of Directors in N.Y. We probably do 2,000 slides a month from Tell-A-Graf," Russell explained. They are using the Lasergraphics, Inc. rasteriser because the Matrix QCR does not speak the same language as the mainframe graphics program. The QCR produces slides with a 4,000-line resolution, but Russell said that if slide production is the only need, the 2,000-line resolution is more than adequate. The New York General Motors office has no color hard-copy output equipment. Russell stated that color from a printer or plotter is not as crisp as that on a slide, and he much prefers black and white, noting that "it's a well known fact that 10% of the male population is color-blind, anyway." Russell, who has been doing color slides for over four years, is color-blind.

The Matrix PCR sells for $11,000 plus $2,000 for the coprocessor. For more information on the product and delivery times, contact Matrix Instruments, Inc., 1 Ramland Road, Orangeburg, N.Y. 10962.

One of the more interesting products, primarily due to its low price, is the Polaroid Palette. For $1,799, Palette gives you a combination of software and hardware which does not provide the resolution available with the higher cost systems, but is moderately sophisticated.

What Polaroid has done is replace the microprocessor in the film recorder of the higher-priced systems with software. Because Palette is a software-driven system the operator is not limited to the colors that appear on the color monitor. Instead, a set of controls are fed to the Palette exposure unit down an RS-232C cable line from the computer's color graphics adapter board. Because of this, even a monochrome monitor can be used; the operator can define by software menu what colors are to appear. For further convenience — and for those to whom pleasant blending of color is not a natural ability — a series of lookup tables in the software gives immediate access to a series of color sets. There is also a color key, comprised of 72 colors, which are accessed with two keystrokes (one alpha and one numeric) to define a specific color that the operator wants to appear somewhere in the image.

Palette is compatible with the IBM PC, XT, AT and Portable; the Digital Equipment Corp. Rainbow 100, 100 Plus, and Professional 300 Series;, AT&T Personal Computer; Compaq Computer Corp.'s Compaq and Compaq Plus; and Apple Computer, Inc.'s Apple II Plus and IIe. The list of software packages compatible with Palette is a long one, and includes Mirage, Digital Research, Inc.'s DR Draw and DR Graph, Lotus' 1-2-3, and Graphic Communications, Inc.'s Graphwriter.

Although resolution on the resulting slide does not approach the 4,000-line number on the more expensive systems, several software graphics designers have built Palette device drivers that double the resolution on the screen. As an example, on the IBM color monitor the resolution is 320 by 200, but some graphics software packages increase this resolution to 640 by 400.

Polaroid's Palette is being sold by computer retailers. For more information, contact Polaroid at 575 Technology Sq., Cambridge, Mass. 02139.

The last item to be looked at is the Eastman Kodak Co. slide maker. The entire outfit necessary to make slides consists of a slide imager, camera, monitor adapter, slide mounter and slide module. All of the above can be purchased for less than $700. And what you get for $700 is a picture of the graph on the color monitor of your computer. The resolution on the slide will be no better than that on the monitor. The colors will be the same as those on the monitor because there is no facility to change colors. In addition, because the monitor is curved, there will probably be some distortion around the edges.

Kodak's slide makers are sold through audiovisual equipment dealers. For information about dealers in specific areas, contact Eastman Kodak Co., Motion Picture and Audiovisual Markets Division, 343 State St., Rochester, N.Y. 14650.

The emerging range of products enables users to determine their needs and then balance them against the cost and performance levels available in the product groups.

■

White is senior writer at Computerworld Focus.

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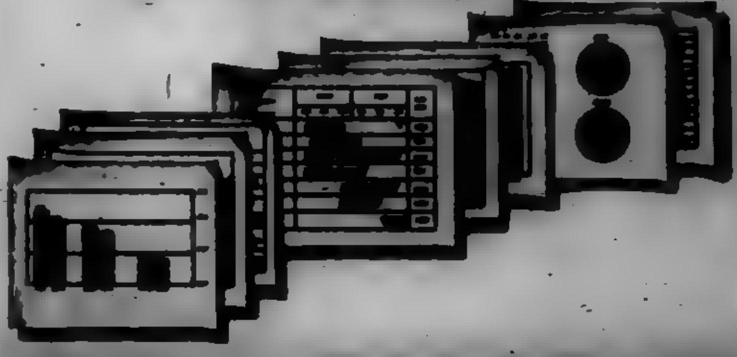

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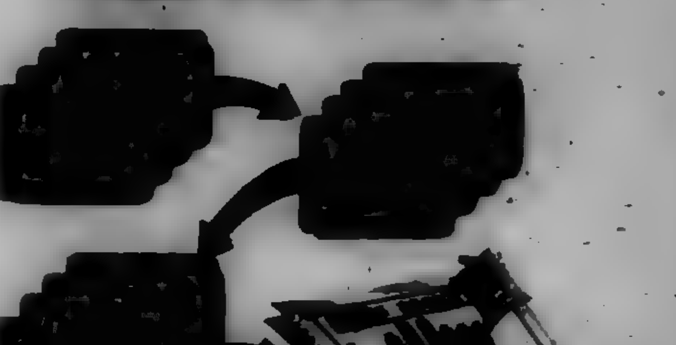

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The ~~Ten~~ Top Graphics Trends For '85

By Alan Paller

The next 12 months will be a watershed year for computer graphics in business. The technology is no longer considered a frill. Today, nearly every large company recognizes that computer graphics can be a powerful competitive tool for research, marketing, planning, engineering, data processing and financial management. Most companies have targeted this coming year as the time to expand their investment in computer graphics.

Rapid growth and change in the computer graphics field leads some potential users of the technology to delay making decisions. They wait for the day when choices are fewer and more certain. While they are waiting, however, their competitors are moving forward, using available technology, learning from it, isolating high-payoff applications and gaining competitive advantages.

Acting confidently is difficult when equipment that was new only months earlier is made obsolete by new announcements. To help decision makers in large organizations take advantage of this fast changing market, some trends will be identified and some recommendations for action will follow.

Leading-edge users are pioneers that have already begun using equipment and applications that will be important for four to five million new users of computer graphics over the next three years. Some trends can be seen in the way these leading-edge users run their offices. Other trends are not yet in common use but can be seen in the directions currently showing up in the new products of leading U.S and Japanese vendors. Some of these products will alter the technology we use for computer graphics. A clear picture of major trends in business graphics emerges when the experiences and desires of leading users are combined with the announced and soon-to-be-announced products of the leading vendors.

Low-cost laser printers: The new laser printers are fast, reliable and inexpensive. A single printer, costing less than $15,000, can serve the high-quality, black-and-white graphics needs of dozens of users.

Although the printer is not making charts, it does excellent text printing. It can even integrate text and graphics. The key to its effective use is its installation as a peripheral on a shared computer. There it can be accessed from terminals, communicating personal computers and batch jobs.

(Recommendation: In 1985, the acquisition of one or more graphics laser printers would be wise.)

Ink-jet printers and color thermal printers: Ink-jet printers have had little success in the business graphics market. In 1985, however, their fortunes should begin to improve because of three developments:

- More speed — up to one page per minute.
- More resolution — up to 180 dots per inch.
- Hardware rasterizers that offload picture processing.

A high-speed ink-jet printer with a hardware rasterizer provides reasonable quality color charts and can be used as a shared graphics printer. It will be found alongside laser printers in many organizations. The laser will provide high-volume black-and-white graphics; the ink-jet will meet color requirements.

PHOTO © 1985 GEORGE DILLON

The Japanese color thermal printers are an emerging threat to ink-jet printers because they provide similar speed, resolution and price. Several new varieties are scheduled for 1985. Look at both kinds of printers when you look for color hard copy.

(Recommendation: Organizations that are not providing shared color graphics hard copy now might consider action in this area in 1985.)

Micro-mainframe graphics linkages: The majority of today's personal computer users have no access to high-quality graphics hard-copy equipment. Only about 10% of the personal computer users purchased digital plotters, and most of them found they were forced to stand by the plotter feeding it paper when they needed charts. Their time was too valuable to become plotter operators.

One major trend attempts to solve the problem of access to high-quality hard-copy equipment by linking micros to mainframes for graphics. In 1984, users created the link by making the personal computer into a graphics terminal by means of software or hardware extensions to their personal computers. They requested charts from the personal computer, previewed them there and routed them to high-quality shared graphics equipment like film recorders, laser printers and continuous plotters.

In 1985, the trend of personal computer-as-graphics-terminal will continue, but it will be complemented by a new trend linking programs such as Lotus Development Corp.'s 1-2-3 directly to mainframe graphics programs such as Integrated Software Systems Corp.'s (Issco) Tell-A-Graf. Lotus' 1-2-3 and Symphony will be used in their standard fashion under the new links. Users will look at data and view instant charts in standalone mode on the personal computer. When Lotus users make a chart they want to show to others, however, they will use a new "button" inside those packages that will automatically instruct the personal computer to send the Lotus Worksheet to Tell-A-Graf on the mainframe. There it will be converted into a high-quality slide or chart.

(Recommendations: Be sure the personal computers you buy have communications capabilities. Be sure the high-quality graphics hardware you buy for your mainframes is installed as shared devices. Acquire the linkage software when you need it.)

Interactivity: Interactive capabilities will begin to emerge in business graphics software, offering users the ability to point to the location where labels and messages are required. Interactivity is the strength of paint programs such as Dr. Halo and Macpaint. Now, bar chart, line chart and pie chart programs will also begin to have this interactive capability.

The interactivity trend, which was apparent in personal computer packages in 1984, will also be seen in 1985, especially in mainframe graphics software.

(Recommendation: None. No action is needed in this area because software vendors will offer interactivity as an update to existing software.)

Graphics standards surprise: Graphics Kernal System (GKS) has now officially eclipsed Core, the old Siggraph proposal. The leading graphics software vendors have embraced GKS, offering graphics software package options that comply with the GKS standard.

Because GKS is perceived as a device-independent standard, most buyers think GKS will make their software support all graphics equipment. However, users are in for a surprise when they learn that GKS software in no way guarantees that any particular graphics device will be supported. Unless the software vendor supplies a device driver, each graphics device will be incompatible with GKS software.

(Recommendation: When buying new hardware, users should ask their software vendor, not their hardware vendor, whether a graphics device is supported by the software.)

The mainframe on the desk: IBM Personal Computers will appear offering more power and new operating systems. Today's IBM PCs will soon be eclipsed by new waves of IBM equipment and software.

The IBM Personal Computer AT will soon be joined by a series of new IBM PCs that will run the VM operating system. VM is one of IBM's most popular mainframe operating systems. With the new operating systems, these PCs will be target machines for mainframe graphics software, especially Tell-A-Graf and Disspla, both from Issco. User organizations will then be able to offer a uniform family of graphics software tools on all machines from the mainframe to the desktop.

(Recommendation: This trend will not lead to a need for action item until late in 1985. However, many large organizations have delayed acquisition of PC graphics packages, other than Lotus and paint programs, until they learn which desktop computers will run the mainframe graphics software they already have.)

In-house publishing: Billions of dollars are spent each year in typesetting, line art, plate making and printing to prepare documents for publication. Until 1985, automation played a small role, but new hardware and software will allow the computer to do more of the job. When it comes, automation will lower costs and increase responsiveness of the publishing process.

Some commercial publishers — *Time* magazine, for example — have already automated the color control and page layout process. In-house publishers, particularly those in the automotive and aerospace industries, are next. Commercial publishers bought systems that were oriented toward color and that cost millions of dollars. Newer systems for in-house publishers are oriented toward black-and-white publishing. They solve the publishing problems of technical documentation, and their prices are plummeting as low as $100,000 or less. Organizations with multimillion-dollar publishing bills find these lower cost systems cost effective.

Design workstations and mainframe-based publishing systems will both gain from this trend. Stand-alone design workstations will be purchased for smaller jobs. Mainframe-based publishing systems will be acquired where large numbers of pages must be created. Mainframes will also be used where text and graphs are created on word processors and graphics software and need to be brought together for final publication.

Most buyers think GKS will make their software support all graphics equipment.

(Recommendation: Search for applications immediately. Wait for new product announcements before you buy.)

Graphics project management systems: Project management systems are among the oldest management application of computers. These packages calculate schedules and budgets. They report on tasks that need to be completed by a particular date, and they determine the critical path. Most large companies have project management systems, but they are not as effective as they should be.

A new class of graphics project management software is being recognized as an important improvement over older systems. Organizations have found that graphics project management systems are being used 10 to 100 times as much as the older project management systems. Where older systems were used only for the largest projects, the new tools are popular for every project on which schedules are important: auditing, computer systems development, research, marketing and dozens of others. Part of the difference is ease of use; the new system can be learned and used very quickly by secretaries and managers. A more important reason is the ability of the new system to produce presentation quality charts that show management the schedule and cost status of projects.

(Recommendation: Adding graphics project management to your computer is an action item for 1985 if you have a Digital Equipment Corp. VAX, Prime Computer, Inc. or IBM mainframe. If you have only a personal computer, you may

Graphwriter

want to wait for the next generation personal computers. The personal computer software does not offer the needed flexibility and quality.)

Graphics expert systems: Few of the millions of users of graphics are experts on design, so new software tools have been created to assist those users make charts that look right. The new tools offer three knowledge-based functions: chartbooks, layout intelligence and color palette selection. Chartbooks are predesigned graphics. Users tell the computer, "Make chart 25." The computer looks up the data or asks for it and then makes the chart. Because the charts were designed by professionals, they look good.

Layout intelligence relies on a data base of facts about how to format charts. Examples are how big to make charts so they will fit inside overhead transparency frames, what the length-to-width ratio should be for 35mm slides and how large to make the chart and the lettering for quarter-page or half-page publication charts.

Color pallette selection solves the problems created by new graphics systems that offer thousands of colors. Smart graphics software chooses combinations of colors that look good together. The user asks for a "look" such as spring or winter. The software selects a pleasing set of colors.

(Recommendation: No action is necessary on this trend. Leading graphics software vendors are adding these capabilities to their products. You will get the new capabilities with updates of those products.)

Visual early warning systems (graphics decision support systems): Software tools
are beginning to offer push-but
ton graphics management fo
executives. The new tools mee
the needs of executives. Tradi
tional computer graphics soft
ware packages served the peopl
who created charts, but didn'
serve the needs of manager
who just wanted informatio
and wanted it graphically.

Today, organizations from
London to Los Angeles ar
building or buying new system
that instantly deliver informa
tion in graphics formats at th
touch of a button. Of the 10
largest organizations in th
U.S., 20 have already built or o
dered such systems, and half c
the rest plan to put them in du
ing 1985.

The new software tools meet the needs of executives.

The systems are variousl
called visual early warning sy
tems or graphics decision su
port systems (DSS). They co
sist of libraries of charts an
tables, automatically update
whenever the underlying dat
changes. Every chart is availab
at the touch of a button. Anot
er button starts automatic cr
ation of 35mm slides, overhea
transparencies and paper chart

Visual early warning system
have been created on compute
ranging from Altos Comput
Systems, Inc. micros to IB
mainframes, but the trend is t
ward the mainframes for this
plication. The mainframe
needed because the data is
the mainframe and becau
many people need to share t
information in those chart
Only the mainframe offers t
combination of data, graphi
software, storage capacity a
network, all essential for t
success of these systems.

(Recommendation: Impl
mentation of a visual ear
warning system should be t
first priority for compu
graphics in 1985. Pent-up d
mand for these systems is en
mous.)

≡

Paller is president of A
Data Graphics in Washingto
D.C., a consulting and traini
company specializing in co
puter graphics and visual inf
mation systems. He is also
rector of Issco, a graph
software company, and a dir
tor of the National Compu
Graphics Association.

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Th[illegible]s Of C[illegible] Ideas

By [illegible] L. [illegible]

places the number of micro users in excess of the estimates for users of the leading mainframe software. If three micro users per copy are assumed — still a conservative estimate — the ratio rises above 2:1.

Perhaps the most interesting aspect of the way the boom in business graphics has hit the world of micros is how recently it has all taken place. The growth of micro-based graphics came just in time to save the reputation of a number of forecasters. Articles predicting the business graphics boom began to appear in 1982, shortly after the introduction of the IBM Personal Computer and Hewlett-Packard Co.'s two-pen plotter. At that time, many of the industry prognosticators outlined a strong case for rapid growth in micro-based business graphics. They cited the increased number of micros going into business, the low cost of equipping those micros with business graphics capability, the increased speed with which graphics could be produced and the ability of users to produce (and, when necessary, quickly change) their own graphics.

The graphics boom predicted by this reasoning did not materialize in 1982 or in 1983. In fact, by year-end 1983, the installed base of dedicated business graphics software packages for micros was only about 100,000 units, and the fastest growing software program with graphics capability was an integrated product, Lotus' 1-2-3.

The reasons the boom did not materialize are not well understood. Most forecasters simply claim their forecast was slightly premature. Hindsight, however, can identify four basic hindrances to the growth of the business graphics market for micros during the period 1982 to 1983:

- **Low Awareness and Priority** — The first micro users cut their teeth on spreadsheets, data bases or WP. The micro was primarily viewed as an analytical tool, and most business users did not think of graphics as part of the constellation of applications that migrated easily to micros. Business graphics were still perceived as a luxury: expensive, made by an expert and reserved for special occasions.

- **Software Mismatch** — Most micro-based graphics products available in early 1982 had been designed to create charts from the data in a spreadsheet. This application, specifically referred to as analytical graphics, was the dominant force in the first micro-based graphics products. These products were being used as extensions of a spreadsheet; the next step was to integrate directly with the spreadsheet itself. The success of Lotus' 1-2-3 attests to that fact.

With analysis graphics dominating the market for micro-based graphics, the use of micros for presentation graphics was slower to develop. Software developers perceived analysis graphics as the dominant market opportunity, so they were less concerned about producing software that could be used as a presentation graphics tool. Many products were described as presentation quality simply because they produced reasonably legible bar, line or pie charts.

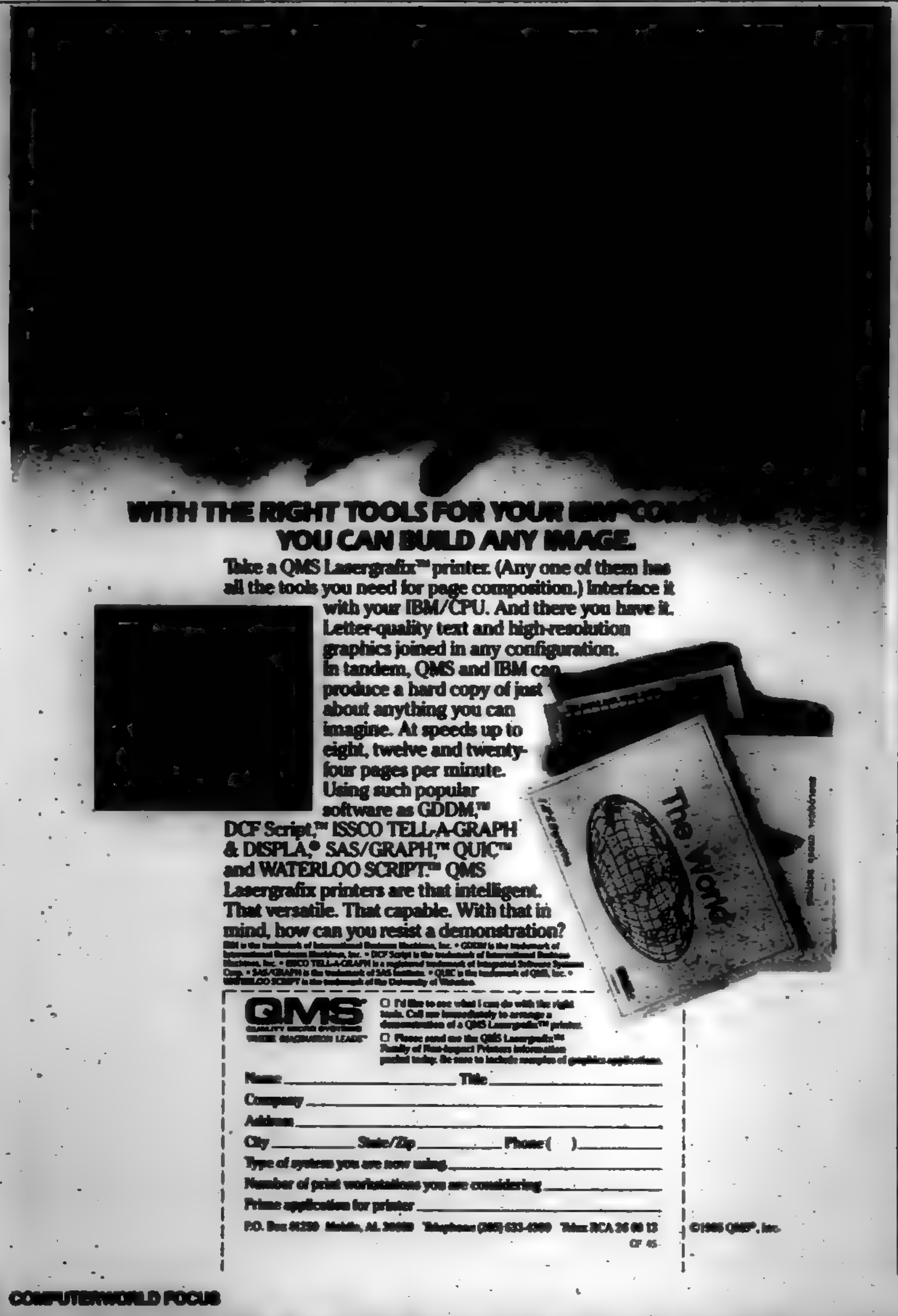
The software available before 1983 had no understanding of what is needed to prepare a presentation. Many products were misused as presentation tools and did cause some embarrassment and frustration. Besides lacking the quality required for a presentation, these products failed to address the most simple of presentation requirements: projection options (overheads or 35mm slides) or the variety of chart types needed to produce an entire presentation. Essential requirements such as word charts, Gantt charts and organization charts were completely missing. Changing data might have been easy enough, but changing the graph was not. Early users tried to do a highly sophisticated task with packages not designed for that purpose, and the products they needed were simply not available.

- **Limited Output Options** — The predicted boom in graphics could not happen in the absence of products that addressed the need for both analysis graphics and presentation graphics. Because the orientation of most micro packages at that time was analytical, most products were screen-oriented. The ability to produce hard copy was a minor concern. In addition, most low-priced output devices that could be reasonably used with a low-cost micro were not capable of producing the quality required for presentations.

In late 1982, a low-cost, high-quality pen plotter became available and ink-jet and other higher quality printing technologies began to appear. This was a major step toward a noncentralized graphics capability. However, it was mid-1983 before these products were adequately supported by software, and their impact on the market was therefore delayed.

- **Price Sensitivity** — For those competing in the microcomputer arena, the dramatic drop in price for output devices in 1982 to 1983 was a major breakthrough. Microcomputer buyers, however, who were already spending $2,000 to $3,000 for initial hardware and software, found the additional $2,000 needed to turn that micro into a graphics workstation relatively expensive. The use of micros had not yet risen to the level in the corporate hierarchy where presentations are considered crucial. In 1982 the willingness of early adopters to spend those dollars was lower than would be the case a year later.

In mid-1983, many of these barriers began to fall. The awareness and priority given to presentation graphics increased dramatically. By early 1984, the boom in micro-based graphics had begun. The early adopters had had time to develop



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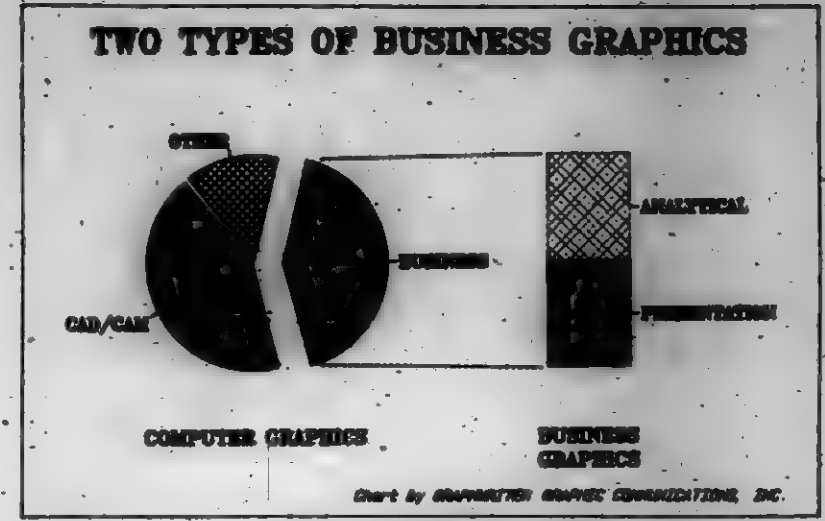

Chart by GRAPHWRITER GRAPHIC COMMUNICATIONS, INC.

Figure 1. Presentation vs. Analytical

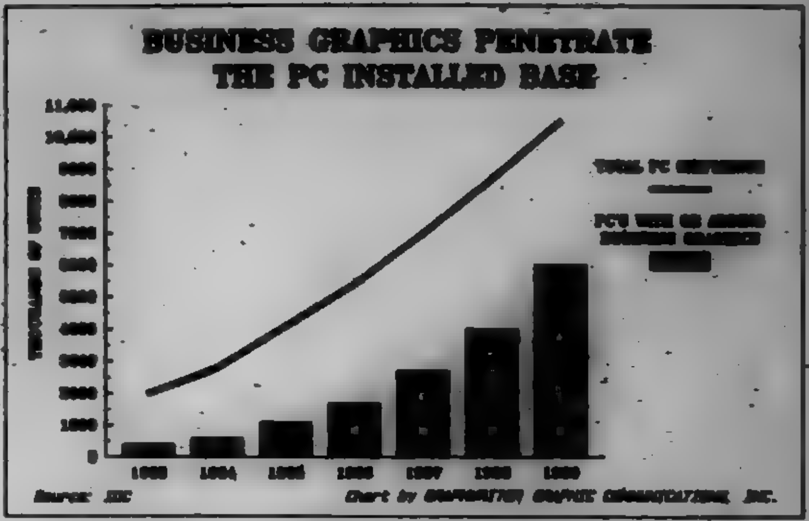

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Chart by GRAPHWRITER GRAPHIC COMMUNICATIONS, INC.

Figure 2. Micros Sold With or Adding Business Graphics

applications with their spreadsheets, data bases and word processors; now they were looking for more things to leverage the power of the micro. The awareness and use of micros had risen to a higher level in corporate America — a level at which presentations and presentation preparation were given a much higher priority.

The enormous success of Lotus in 1983 forced graphics software developers to reevaluate their strategies. Some companies (Mosaic Electronics, Inc. and Peachtree Software, Inc.) focused their resources on producing integrated products; some (BPS Information Services, Inc.) tried to beef up their analytical capabilities; and others (Decision Resources Corp.) attempted to make their charts better looking than Lotus' and moved toward a more presentation-oriented product.

The year 1983 also saw the introduction of the first micro packages designed exclusively for doing presentations, some complete with high-quality output; a full array of chart types (including important capabilities such as word charts, Gantt charts and organization charts); and the ability to produce presentation materials on slides, transparencies and hard copy using the new low-cost output devices. Since that time, numerous presentation graphics products have been introduced for micros. These products offer the micro user a wide choice of presentation tools ranging from freehand draw to symbol libraries to highly structured programs.

Presentation graphics software developers focus on getting output, not integrating with a spreadsheet. Because they devote development resources and constantly improve the quality of their graphics, graphics capability today is significantly better than anything previously produced on a micro. For the first time, the quality of inexpensive charts produced on a microcomputer can be compared to the quality of mainframe graphics.

Plotter technology has brought high-quality hard-copy capability into the domain of the individual user. The introduction of the Polaroid Corp.'s Palette Image Recorder has lowered the price of 35mm

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Microcomputer Software Developer will design and develop software for microcomputers. A bachelor's degree in computer science or equivalent experience is required. Applicants must have in-depth knowledge of 8086 assembler language, C language, and IBM PC DOS BIOS. Experience with full-screen and graphics drivers is highly desirable. Applicants must provide samples of related work experience.

Graphics Developer (Device Driver Support) will design and implement device driver software. Applicants must have a bachelor's degree, preferably in computer science, or equivalent experience. A minimum of 1-2 years' experience in computer programming and some experience with device driver software and graphics devices (plotters and terminals) are required. Applicants must have familiarity and experience with the IBM MVS/TSO environment, IBM 370 assembler language, PL/I, and C language.

Graphics Developer (Testing and Documentation) will work with other developers in testing and documenting graphics software. Extensive experience with base SAS and SAS/GRAPH software is required. A bachelor's degree in computer science is preferred.

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slide production 75% compared with previously available technology. Several packages can produce the Palette slides at four times the resolution of the IBM PC screen (640 by 400 pixels) using standard IBM hardware. For those environments where the highest resolution is required (2,000 by 2,000 pixels), some packages support Matrix Corp.'s PCR and QCR Image Recorders.

The dramatic drop in the price of presentation-quality output devices was essential to the boom in microcomputer graphics in 1984. But another major impact on the readiness of the market has been the success of integrated software. IDC stated that most customers for Lotus' 1-2-3 claim they purchased the software because it was the most powerful spreadsheet on the market. As mentioned earlier, only 40% of the Lotus installed base use the graphics. But the sheer availability of graphics in every copy of 1-2-3 and other integrated software has had a significant impact.

As Figure 1 on Page 19 shows, more than half the dollars spent by business graphics users (for mainframes, minis and micros) are for presentation graphics. As the microcomputer environment moves toward that industry norm, future expenditures for micro users will be more focused on presentation graphics.

Trends seen in 1984 can be extrapolated to give some understanding of the future role of microcomputers in relation to mainframes in the business graphics market. In a recent study, IDC predicted that the percentage of personal computers sold with business graphics capability will increase dramatically over the next four years. (See Figure 2 on Page 19.) In addition, during 1984 only 5% of the personal computers shipped were sold with or added business graphics software. The study predicted a rise to 27% by 1989. Based on these assumptions, IDC predicted the installed base of micro-based business graphics packages will rise from 248,000 in 1984 to 9.8 million by 1989, seriously dwarfing the number of mainframe installations. As this occurs, personal computers will become the dominant graphics workstations in business. As the use of business graphics is democratized, the effect will spill over to spur continued growth and demand for mainframe-level packages as well, though not at the same rapid rate. The mainframe suppliers will discover — just as IBM did — that what is good for the personal computer is good for the mainframe.

Instead of micro products buying market share by interfacing with popular mainframe graphics packages, mainframe graphics packages will buy market share by interfacing with popular microcomputer packages. Mainframe packages will become part of a distributed graphics network, providing the ability to produce the highly specialized visuals not supported by the micro packages. In this manner, the user from a single workstation can produce a presentation using the local microcomputer software as well as the mainframe software on the host.

Microcomputer software companies will increasingly support the expensive, high-end output devices that can be shared through a variety of personal computers via a network. Priced well above the single-user price, these products will become popular elements of personal computer networks with the appropriate software support.

The sheer availability of graphics in every copy of 1-2-3 and other integrated software has had a significant impact.

But the most important future trend is that microcomputer software will continue to improve. These advances will come about as current leaders in the micro market improve their offerings and as mainframe companies attempt to squeeze their products onto micros as well. Because of the difficulty in doing the latter, the microcomputer vendors will most likely continue to lead in terms of both usability and technical innovation. This innovation will include the integration of what are now separate presentation graphics applications into a single family of graphics products that can work together. This increased power will enable users to combine art, graphics, fonts and symbols into individual visuals and documents. This integration could have the same impact the merging of WP, spreadsheet, data base and graphics has had in the multifunction market.

Organizations that can afford to offer users the expensive mainframe graphics capability and the inexpensive desktop alternative will continue to spend resources on both approaches. But as the gap between mainframe graphics and microcomputer graphics grows smaller, the issue will simply be one of cost. When presentation graphics are used as frequently and easily as a business letter, increased use alone will warrant a system that can produce high quality at a low price. Micros with appropriate software can meet those demands today.

■

Wilcox is vice-president of Graphic Communications, Inc., located in Waltham, Mass.

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Florida Power and Light Turns On With Graphics

By Lee White

At Florida Power and Light, business graphics has been elevated to a high art. Graphics plays an important role in the day-to-day operations at FP&L, as does most other end-user computing. The Systems and Programming departments in the Miami and Juno Beach, Fla. facilities consist of more than 300 systems professionals who service 13,000 employees who in turn service a customer base of 2.5 million people.

The company's primary mainframe is an IBM 3084, with 105 3350 disk packs and 1,200 Conversational Monitoring System (CMS) users. Computer planners expect a 100% increase in use by 1987, requiring 90 more disk packs. The demand on the [illegible] is enormous — in the [illegible] there are 125 [illegible]

mainframe terminals and 500 personal computers, most of which communicate with the mainframe. Since they charge back all Direct Access Storage Device (Dasd) time and CPU time, justification falls alone to user departments. According to one department representative, "The user departments create applications as fast as we can supply the disk space and the mips [millions of instructions per second]. They know what they want, and we give them the tools."

Twenty-five people staff the User Access Services group of Systems and Programming, and it is there [illegible]

ing CMS, Focus and Tell-A-Graf. We supply training to meet any kind of need, and most of it we've developed ourselves." FP&L even trains the trainers via a three-day course which uses videotape to point out the rights and wrongs of each trainer's style.

Cross-training is another key ingredient in User Access Services. Personal computer specialists are proficient with mainframe tools, and Information Builders, Inc. Focus specialists learn their way around personal computers. User Access Services staff members see themselves as extremely [illegible], and new employees are required to have good people skills. [illegible]

University in Miami, is the graphics guru at FP&L.

Goldsmith preaches graphics with an evangelistic zeal that could make a believer out of almost anyone. His office walls are papered with graphs in every size and shape imaginable, all of which were created on the mainframe using Integrated Software Systems Corp.'s (Issco) Ivis Manager with Issco's Tell-A-Graf software. FP&L was an alpha test site for Ivis; and the day *Computerworld Focus* visited, Issco was putting up Version 1.0.

While Goldsmith's enthusiasm for his subject is infectious, he gives credit to the company itself for the [illegible] of the User Access Services group. [illegible]

With a team made up of members from various other departments in the company, including an engineering manager from Fort Lauderdale, a district general manager in the Northeastern division and Marta Carvajal, the Focus expert in User Access Services, they had a comprehensive budget system up and running within eight months, including training of all personnel.

Goldsmith said the team spirit at FP&L is frequently bottom up. "Individuals get a lot of satisfaction from creating something that will really help out the company." Individual computer creativity can result in redundant keyboarding, especially when graphics use is high. FP&L has overcome the data entry duplication problem with the use of comprehensive shadow files. Records that come in through the field, bill processing, work orders or other means, are keyed by data entry personnel and stored as copies on four 3380 disk packs in Focus. These copies, or shadow files, are available to all users.

Since users do not have to concern themselves with many of the labor intensive tasks, their time is freed up, and they are able to learn and make use of sophisticated tools like graphics. "Sometimes you give the user just enough training to leave the horizons open. If you overtrain, you put blinders on the user. When you don't, you go back a couple of months later and see things the user has done alone that you would never have thought of yourself," Goldsmith said.

The user community at FP&L has responded very positively to graphics training. One employee who had been trained on the graphics package in a one-day class the previous week, created her own graph easily. The only problem she had was getting dropped once or twice from the dial-up line. Once the line held, she routed her graph to a Hewlett-Packard Co. plotter and had the finished product in a matter of minutes. "It was so easy," she enthused. "You can't believe what we had to go through when we did them by hand."

It was not always thus at FP&L. Nancy Klose is Manager of User Access Services and has been at FP&L for over 10 years. "Prior to 1981, when we had the Univac, we had an older graphics package called Zebra, which came from Emory University and was very programming-oriented. When we moved to the IBM environment, we decided that we had to update our tools so we selected Tell-A-Graf. It has really caught on very fast."

Klose is concerned that graphics has caught on a little too fast. FP&L has limited the number of graphics terminals in order to ensure that the controllers to which the terminals are attached can handle the load placed on them without impacting other users. And once the graph has been created, the user must dial into one of the 25 asynchronous dial-up lines for hard-copy output on one of the available plotters. FP&L is using many different plotters, including California Computer Products, Inc. (Calcomp) machines in the power plants, but has not yet added color printers to the lineup.

The volume of graphics output at FP&L is staggering. The new Quality Improvement Program group is gearing up to create 600 charts per month. Departments such as Economics and Divisions Planning and Administration have entire books of graphics indicators which are updated monthly and are available company-wide for presentations.

Even as cumbersome a task as strategic planning has been eased with graphics. Goldsmith explained how Tell-A-Graf, tacked on via a file connection to a strategic planning model written by Electric Power Research Institute in Applied Data Research, Inc.'s Empire language code, reduced mounds of paper and reports into a 60-slide presentation. "Graphics didn't totally replace numbers in the strategic plan, but it helped to see things instantaneously instead of going over spreadsheets."

Goldsmith may be the pied piper of graphics at FP&L, but Jose Luciani, in Divisions Planning and Administration, is surely one of its great champions. Luciani has been working

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for years on his department's indicators book.

"We have certain indicators that we keep track of, data bases and on-line systems that are accessed to track and better manage our resources. This is particularly important to a utility because even though we have to service every customer, we must plan for what's coming. This year we were able to connect everyone in a reasonable amount of time," Luciani explained. Planning is critical to utilities since an unexpected and unplanned increase in services necessitates building new power plants, which are extremely expensive.

Graphics also helps track the cost per customer. "Top management wants the company to grow and the customers to be happy with the service we provide, but it is also important for investors to be satisfied with the amount of profit that they're making from their investments. Even though we are a monopoly, we do have to compete with other industries for monies from investors," Luciani said, adding that graphic presentation of such material to stockholders and potential investors can be a good selling tool.

Luciani is particularly pleased with the capabilities of the Tell-A-Graf package. He has even written execs, which call up one graph after another with one keystroke. Under VM/CMS, an exec is a group of procedures placed into a file. When the file is called up, each of the procedures executes automatically. "There's no front-end work involved, it's all driven by the execs. It actually goes to the data base, gets data and puts it into some coding that Tell-A-Graf understands," Luciani said. Because the book of indicators is so complete, and graphs can be called up on the screen so easily, viewing the graph with no hard copy required is often satisfactory.

The Economics department uses business graphics in order to do customer forecasts on the residential and commercial side. For residential customers, the department uses a model which includes household size and population in the census territory; to model commercial customers, variables include population and economic ratio. Graphs are also put into a book, which is produced once a year; information contained in the book allows FP&L to do energy forecasting with five- and 10-year projections for each classification.

Although traditional business graphics are the problems most in need of solving, FP&L has used graphics to service customers in a very special manner. Jim Fothergill, manager of Customer Systems, conducted a guided tour through their graphics system, which is IBM's Graphics Data Display Manager (GDDM), running on MVS under CICS Multi Region Option (MRO). They have built a model of the entire electrical distribution network from every substation to each of the 2.5 million customers in their service area. Every transformer, line switch, fuse and major component in the electrical distribution network was represented. The model enables FP&L to track the path the energy takes from the substation to every customer.

"As we have a problem in the network, we can analyze the probable cause of that problem based on the geographical location and how those customers are being served. We then can go to the lowest commdn component in the network that serves any particular group of customers that is out of service, and isolate that as the probable cause of the problem. Instead of sending a crew out to find the problem, as we used to do, now we send them to a specific location. From a graphics standpoint, we have every service territory broken up by boundaries, and we have every boundary broken up by every crew that works within that area. As a problem is isolated and found, we know exactly in the geographic location of that particular county or that township or that service territory where the problems are occurring, and we show that graphically on a CRT. Based on that we can then move crews around to flood an area that has more trouble than others, all in the name of better service," Fothergill explained.

Ed Baron of the Production Systems group added that as a

printheads and thermal-transfer ribbons were developed and engineered together with the hardware to work as a team. The result is a unique print technology that "paints" ink onto the page.

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by-product, the system would also tell how many customers are affected by each device. "We can prioritize our calls based on the number of customers that are out of service, but we also have in this network every customer that is on life-sustaining medical equipment, like kidney dialysis machines or respirators, and we can accelerate service restoration to those customers. Anytime a problem is diagnosed that we know affects that customer, we will send somebody out immediately to make that repair." The system also can prioritize by catastrophic problems, so that a building fire takes precedence over somebody's lights flickering.

Fothergill added that the system is brand new and not yet fully implemented, although full implementation is scheduled for third-quarter 1985. "We felt that our customers deserved and needed this system because of the number of thunderstorms we have in the summertime, the potential for tropical storms or even hurricanes and the danger these storms pose for the large number of elderly people in our service area."

Information regarding trouble calls is brought up on various screens, but all this information translates to graphics in the form of maps showing all the trouble spots. There are division maps, two-hour total maps and division-status maps. In total, there are 400 miles of service territory, serving most of the populated area of Florida with the exception of Orlando, St. Petersburg and Tampa. The map is divided by major east/west and north/south natural boundaries (such as highways and rivers), which give some indication of location at any given time.

Baron demonstrated how the mapping system could work in a given test situation in which the map showed three problem areas. Two of these areas were assigned to the same crew. In a case like this, the dispatcher for the troubled area would communicate with the dispatcher for a contiguous area and arrange to have a crew from the second area cover one of the trouble spots in the first. In this way, routing and sequencing of trouble calls is done quickly and efficiently.

Another graph which is used frequently is called division status, a line graph which tracks continuity from midnight to present. A red line indicates new calls, a blue line denotes calls completed and a yellow line is reserved for active calls that have not been completed. Comparison of the three lines gives graphics representation on status: if the incoming (blue) calls are exceeding the completed (yellow) ones, the dispatcher's supervisor would most likely call a neighboring division and cover the area with new crews from other counties.

Before FP&L had this system, it took days longer to restore service. With the new system, crews are not sent out to the same problems over and over again; instead, the new system takes all the calls and reduces them to one trouble ticket.

Even the colors tell a story. When a ticket comes up that the dispatcher hasn't seen previously, it is red; once the dispatcher looks at it and sends it to another screen, it changes to yellow. When the problem is assigned to a crew, it turns green, but if further work is necessary by a service center, it then becomes blue. As a fail-safe, only dispatchers can enter information although any number of people can log on simultaneously in order to ascertain status.

But it is not always a disaster that shows up on the screens and maps. One trouble ticket on the actual production system noted a wire cut. That particular ticket belonged to a "current diversion" customer who was stealing electricity from the company. The worker to whom the ticket was assigned was to go to that location and actually cut the service, not at the meter but at the pole. Interestingly, one of the highlights of a large exhibit on display in the FP&L atrium was a number of examples of how some customers had employed rather sophisticated means to access electricity without paying for it. All were caught.

Graphics appeared to be the most used, most usable and most desirable feature in use at FP&L. But Klose was quick to add caveats. "Everybody in the company is not on Tell-A-Graf. We don't have that many graphics terminals out there yet, and that growth will be purposely slow because of the network impact." Klose said the company is looking at the departmental computer concept in order to offload graphics and lessen the impact on the mainframe, but she added that it would take a large computer to handle a graphics program as big as Iviss.

Whatever future direction FP&L chooses, there is no question that graphics will see greater use as time goes on. When an entire strategic plan for a company of this size can be reduced to a 60-slide presentation with supporting written documentation, word gets around.

And Goldsmith continues to preach the word. "Everybody from Personnel to Energy Management, Quality Improvement, Systems, Divisions Planning, power plants, the nuclear side, everybody and their brother is using this product. Sometimes the vendor walks into my office and says, 'What are you using for that?' not even recognizing his own product. We kind of stretch and sometimes break the envelope that the product was supposed to be."

◆

White is senior writer at Computerworld Focus.

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What's Best For Graphics – Mainframe Or Micros?

By Ellen M. Knapp

The introduction of personal computers in today's offices is bringing computing and computer graphics to more people than ever before. This does not mean that mainframe graphics will be left behind. The computing power we have come to rely on is more important now than ever before because of the challenge of increasing volumes of information to collect, manage and put to use. As the personal computer continues to offer more computing power, many of the sophisticated graphics applications that today work only on mainframes or minicomputers will eventually be available on the typical desktop computer. The IBM Personal Computer AT, introduced last year, is setting a new de facto standard for low-cost but powerful desktop systems and microcomputer-based graphics workstations.

It's no surprise that business graphics is one of the most dynamic areas of the computer graphics industry.

This growth, however, has not taken place in a vacuum. It is therefore important to understand the role and potential of business graphics within the context of other rapidly expanding capabilities, such as personal computers.

The recent significant increase in the use of personal computers is probably the one most important development affecting the use of graphics for business and management applications. Advances in semiconductor technology and better applications-oriented software tools have contributed to this increase, as has the fact that prices in the computer graphics market are about half what they were 18 months ago. Increasingly, functionality is being migrated first to the programmable read-only memory (Prom) level and then to the chip level, raising the potential rate of progress in the industry.

Graphics applications are being downloaded from mainframes as more intelligence and local graphics processing are being made available in desktop computers, workstations and intelligent terminals. Recent and current reductions in price and increases in performance of computing and memory resources are going to be key in supporting the widening range of required applications. The impact of 256K-byte memory chips and second-generation 16-bit microprocessors has already been felt, and great progress should accompany the widespread penetration of 32-bit microprocessors. The introduction of the personal computer has also had an impact on the cost of graphics peripherals; prices of digitizing tablets, plotters and film recorders are coming down.

Nevertheless, a critical need remains for mainframe computing power for large data base related, batch processing applications. In large companies, expenditures for mainframe software continue to be far greater than for either minicomputer or microcomputer software. In situations such as this, the desktop computers can be used either as stand-alone graphics tools with microcomputer software or as terminals providing lower-cost access to more sophisticated packages and large data sets resident in the host mainframe.

The division of labor between mainframes and micros may well parallel the division of graphics applications into high- and low-performance categories. Many presentation graphics applications require mainframe support either for the computing power required for special effects (including animation) or for access to large data sets that need to be translated into graphic images. Lower-level peer and personal graphics and applications that require smaller data sets fit the capabilities of a micro in a stand-alone mode.

Despite rosy predictions and innovations in the use of business graphics, certain problems remain. The biggest problem in migrating business graphics applications from mainframes to micros lies in the relative limitations of the personal computer. Other impediments to the successful implementation of business graphics include insufficient user knowledge, limited access to the system and its peripherals and less than complete integration of computer graphics with data bases and other information management systems.

Most of these problems will be resolved in time. A trend toward more interest in integrated software packages already exists. Vendors are recognizing that they have an obligation to their customers and their products to ensure that users are trained to access the entire set of available capabilities. As the cost of computing power and of input and output devices continues to decrease, limitations on access will be alleviated.

The solutions on the horizon seem to be approaching with amazing speed. Increased availability, including lower prices, will support the impact of the 32-bit machines in bringing mainframe-type graphics to the desktop. In the meantime, users and vendors can do a number of things to handle the present situation.

The software required to migrate graphics applications to micros can come from two obvious sources — current mainframe graphics suppliers and the growing number of micro software companies. Some of the established software vendors recognize that they face a major challenge. They would like to avoid redeveloping their entire line of mainframe software. One choice these vendors could make is to wait until the capabilities of the micro catch up with the requirements for running their graphics products. Vendors that make that choice are likely to face intense competition from software developers that are tailoring their new products directly to personal computers.

An alternative solution for current mainframe graphics software vendors is to provide products that help their customers in the interim. Integrated Software Systems Corp.'s IBM PC Graphics Interface is an example of a mainframe-to-micro link that enables the IBM Personal Computer to operate as a low-resolution graphics terminal in conjunction with almost any mainframe.

More than ever before, customer demand is playing a significant role in guiding vendor efforts in research and development. When computers and computer graphics were available only to a few select technical personnel, there was less variety in users' needs and requirements. Now, however, the typical user of computer graphics is anyone and everyone — from graphic artists to accountants to managers and professional staff. This variety is creating greater demand and better responses in the area of human factors engineering of computer systems. The use of icon-based interface systems, window-management software and English-language dialogues between the computer and the user are among the most visible methods currently used to improve the ease of access to mainframe and micro capabilities. Computer graphics developments play an important role in improving these and other types of user interfaces.

Not many simple statements can be made about migrating graphics applications from mainframes to micros. It has been done, it is being done today and it is working to varying degrees, depending on the particular situation — kinds of hardware and software used, applications already in place, new applications required, size of the applicable data bases and requirements for shared resources.

The companies that have been successful are those that have replicated their mainframe applications on the microcomputers while maintaining them on the mainframes. Some of the more successful companies have approached the problem with a two-step solution. As mainframes came down in price, these companies were able to place additional mainframes in individual departments rather than relying on only one centralized computer. The first step in the process of making graphics available to more users was to replicate the software on all of the departmental mainframes. The second step, which is a continuing process, is identifying capabilities for the personal computer that will put these same graphics facilities in the hands of an even greater number of users.

In the ideal world, of course, one software package or family of packages could run on all sizes of systems — mainframes, minis and micros. This kind of arrangement has particularly important benefits. With only one kind of software, only one kind of training is required. Technical support is also suddenly far easier to arrange and manage, and decisions about what devices to connect to the system are far easier to make. If rumors in the personal computer magazines are to be believed, IBM will soon release a product that could take us a long way toward that ideal world.

Yet, whether in the current world or in an ideal world, users planning for the migration of applications to different computer systems within a company should consider certain points. Obvious keys to success are planning, cooperation, communication, compatibility and flexibility. It would be wrong to underestimate the need for planning this aspect of automating an office, just as it would be foolhardy to buy 50 personal computers, install them and then figure out what you want to do with them. Bringing graphics applications to new levels of users is yet another case of introducing new resources into present work methods. Those who want to get the most out of those resources will find the first step is to establish and communicate clear plans on how the resources will be put to use.

Among the first decisions to be made when applications are migrated from a central computer to departmental mainframes will be who needs what kinds of information and which applications will be used to manage and display that information. One of the most important challenges of distributed processing is that we have not yet reached the point of having fully successful methods and mechanisms for distribution of data or of software among users. The various departments involved have to agree on such things as formats and methods for data collection, maintenance and exchange. This points to another important challenge — protecting the integrity of data in a distributed processing environment. In addition, someone has to be responsible for making sure all the equipment is compatible. Decisions also have to be made on how control of the system will be managed, whether by one centralized entity or separately by departments.

One of the most visible benefits of planning is protection against the potential chaos of ending up with a variety of stand-alone personal computers selected independently by various departments. Not only is there the potential for these personal computers to be incompatible, but other problems could result in the process of trying to migrate one kind of mainframe graphics to a variety of different desktop computers. The potential benefits of a network of compatible devices are still just around the corner as the industry continues its efforts to establish standards to make this fully functional. Planning for this kind of change is critical. Communication among the various players is equally important throughout the process, from planning through implementation and on into the future development and expansion of capabilities.

Many users who were introduced to graphics at the micro level now expect more in terms of graphics capabilities. They have done all that can be done on the micro and, in many cases, they have been exposed to more sophisticated capabilities. They want higher resolution, access to larger data bases, more power and more flexibility. On the one hand, their demands are a driving force behind advances in micro graphics development. On the other hand, some of these users won't wait for those advances and will turn to available 32-bit workstation systems and even to mainframe packages. This reverse migration is essentially another measure of the general demand for mainframe-quality graphics.

In recent years, the number of companies using business graphics has steadily increased. We can expect progress in the area of integrating business graphics with existing data bases and systems on the very near horizon. And just around the corner are advances that will help introduce greater numbers of people within organizations to the benefits and productivity improvements promised by business graphics. The migration of graphics applications from mainframes to micros is probably the most important of these advances, and the horizon is coming closer every day.

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Knapp, a principal in the MIS division of the consulting firm, Booz, Allen and Hamilton, Inc. based in Bethesda, Md., is responsible for technical and management consulting in the areas of interactive computer graphics, human engineering and pattern recognition.

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[illegible] Emerge: Implementing the Technology

By Mark Grover Rawlins

Graphics has had an interesting past. Initial efforts to standardize a set of graphics primitives for programmers were plagued with problems, and it's amazing we've come as far as we have. In those early days of graphics, the California Computer Products, Inc.'s (Calcomp) off-line plotter collected dust in the corner of the computer room because only one person knew how to use it. Graphics programmers from the old school could recite from memory the "X, Y, Ipen" commands that were the basis of most graphics software.

The technology of drawing pictures rather than listing columns of numbers on printers required a software interface from the application program. Hardware manufacturers (Calcomp and Tektronix, Inc., for example) found they had to supply assisting software if they were to sell their hardware. The margins available to hardware manufacturers meant that the engineering effort for the supporting software was nowhere near what it would be for the hardware.

The capabilities of these original graphics devices (erase the page, move, draw, change color or pen) were relatively simplistic. Nevertheless, efforts to produce software of a higher quality and functionality began in earnest, in universities and graduate schools, government defense agencies and the private sector. The software that emerged, whatever its source, had one characteristic: It was highly idiosyncratic.

Every routine to draw an axis was different, as was every command to change the line style and every method for drawing text. Software suppliers started to call their libraries "graphic languages" because of the specifics associated with each graphics subroutine library. The skills for using the software were so specific that it wasn't uncommon for recruiting advertisements to ask for "programmers with three years of experience using Disspla." Professional software companies had made an inordinate effort and investment in writing, supplying and debugging proprietary code. The last thing they wanted was for a generic graphics standard to be available. Such a standard would undermine proprietary products and would offer a clear and inexpensive alternative for users who wanted the mystique removed from the graphics area. The first barrier to an endorsement by the graphics community of a highly functional graphics standard was that sales of existing proprietary software packages would be impacted and invested dollar lost.

In the U.S., the force behind many efforts to define a graphics standard came from academicians, who had access to powerful computers and were not fully aware of the impact of implementation concerns. These academicians set about to define a set of robust concepts and functions that could be the underpinnings of all future applications. However, a standardization process can take up to 10 years. The slow-moving standardization effort often fails to keep pace with fast moving technology, especially when the life cycle of that technology can be as short as three years, as was the case with the Graphics Kernel System (GKS) and its associated standards. Regardless of how hard the promoters pushed graphics standards, the technology was going to have a significant impact on their efforts; this problem was the second barrier.

As more hardware and software manufacturers got involved in the standardization process and the direction became more focused, it became clear that a standard would not be a standard unless it became an implemented international standard. The international standardization effort was parallel to the U.S. effort, but not on a one-to-one correspondence. The international standards efforts defined a graphics model that was superior to the one proposed to the U.S. While Europe was defining the GKS, the U.S. was struggling with Core. Politics finally raised its head. The Association for Computer Machinery (ACM) Special Interest Group on Graphics (Siggraph) as well as some software manufacturers were supporting the Core proposal and trying to have the American National Standards Institute (Ansi) adopt this proposal. It soon became evident that the progress of the Europeans to standardize GKS coupled with its superior design were going to make acceptance of the Core proposal difficult. This politicking was an important process in the standardization effort, but it had an unfortunate result: It slowed the process and continued to allow the definitions of technology that would make the implementation of GKS even more difficult. When GKS was initially considered, the concept of an IBM Personal Computer or Unix-based workstation never existed. How could a standard growing out of the IBM 370 era be viable on an Intel Corp. 8086 or even a Motorola, Inc. 68000? Another barrier had been created by technological enhancements!

When the Ansi committee decided to drop its efforts to propose Core as the standard and in turn accepted GKS as the most viable graphics model, some software developers and special interest groups clouded the issue by continuing to try to force Core as the new de facto standard. Core-based software packages still exist, but for all practical purposes Core is just another nonstandard implementation of graphics routines.

Today, many GKS libraries are advertised in the technical journals and, more important, commercial applications are being written on top of this recently emerging standard.

Many areas of graphics have had their separate standardization efforts. Just as there is no such thing as the ultimate compiler, there is no such thing as the ultimate graphics standard. Both the international and the national standard communities are therefore proposing modular graphics standards based on singular functionality.

For example, one might want to transfer machine-part definitions from one computing system to another. The Initial Graphic Exchange Standard (Iges) could be considered in this instance. If one wanted to draw this machine part using very high-level graphics concepts called primitives, GKS could be used. If device independence were a major issue, GKS might invoke a virtual device interface (VDI) routine.

If this graphic image of a machine part were to be transferred across phone lines, a North American Presentation Level Protocol Syntax (Naplps) device driver might be used. And if, instead of sending this image across phone lines, the engineer wanted to save it for future reference, a Virtual Device Metafile (VDM) might be considered.

As can be seen, different aspects of an application could draw upon different graphic tools. Because of the singularity of many of these tools, the standards community is trying to separately define the functionality and to promote them as standards. The overall application might then be put together along the lines of the construction of a stereo system from components.

However, many things look good on paper but never fly. The implementation concerns of creating a viable GKS subroutine library is more involved than just writing routines that match the calling sequences found in the

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standards document. An extreme example is a very sloppy implementation running on a Cray I mainframe. That same implementation would be totally unacceptable on a 16-bit microcomputer. In the first case, machine power and memory is of no concern, but in the second it is a major bottleneck. Just how a software manufacturer implements GKS is dependent upon the targeted environment. If the two primary problems are speed and size, a number of suggestions can help guarantee a successful implementation.

All graphics, including GKS, require heavy use of mathematics. The mathematics of graphical transformations needs to be in floating-point notation. The graphics to be drawn exists in world coordinates. This image, whether a machine part or a bar chart, could be scaled, translated or rotated. Trigonometry can take a terrible toll on machines that have slow floating-point arithmetic.

Graphics applications require significant resources on the part of both the computer and the programmer.

One technique employed to bypass this bottleneck is the use of fractional integers. Fractional integers represent floating-point numbers in a format that allows integer mathematics to produce the same output produced with floating-point mathematics. The enhancement of this technique rests in machines that do not have floating point hardware support. As more machines have coprocessors or supplemental circuitry to enhance floating-point arithmetic, software manufacturers will use this technique less. Designers who have used this implementation will have to remove their code if their customers are not to be penalized as they advance to better machines.

Another mechanism that increases execution speed is the use of look-up tables instead of mathematical series approximations. Segmentation manipulations found in higher levels of GKS can require significant matrix multiplication in order to rotate or otherwise manipulate an object. Trigonometric functions such as sine and cosine are normally implemented as a series of mathematical calculations that approximate the correct value. To get around this, look-up tables can be considered. What might be gained in speed, however, can be lost in memory.

Graphics manipulation can require significant mathematics. A concept called clipping is one of them.

Graphics entities that extend past a barrier need to be clipped off or mathematically removed. In GKS, multiple areas require clipping. Some implementors combine or merge the clipping rectangles into one rather than clipping graphics entities serially. More initial effort is required, but after the merged clipping window has been defined, the graphical elements can be examined and clipped much faster. The common thread that runs through the above tricks is the implementation of a significant tool on a machine that physically cannot adequately support the software. Microcomputers and the sophistication and power of GKS may very well not be suited for each other. Professional decision support or engineering graphics that requires machine and device independence also requires substantial horsepower. Many people question the viability of having an 8086 engine. The second area of implementation concerns size. Computer memory (or the lack of it) has always been a plague. The primary law of software functionality states that the more memory consumed by the supporting routines, the less there is for the application. Professional graphics applications do require memory. They require significant resources, on the part of both the computer and the programmer.

Many things can be considered to cut down memory requirements. The first is limiting the size of device drivers. The device driver is a module of code that takes somewhat generic graphics commands and converts them to a series of bits that can be understood by the actual output device. The more intelligence built into a device, the smaller the device driver.

The older software manufacturers who have the 1970-based "X ,Y, lpen" technology imbedded in their first generation products find it difficult to adapt to the more intelligent equipment. Today, the graphics information that needs to be communicated to the device can be of a much higher concept. No longer is a circle defined as a series of straight vectors that constantly turn in on themselves so that a closed loop is finally visualized. One can now communicate to the device the message that "I want to draw a circle with this radius and that center point." Less data is required to define the graphics element and in many cases it is drawn magnitudes faster.

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Because the attached displays found on microcomputers have very little intelligence, it is not unusual to find device drivers that exceed 20,000 bytes. On the other hand, detached displays normally found on Unix-based machines have a much higher intelligence. In the latter equipment, a device driver exceeding 5,000 bytes would be surprising.

Microcomputer software manufacturers counteract the problem of large device drivers by dynamically loading and unloading the driver. This has the benefit of making resident only the device driver that is going to be immediately used. In many circumstances, the overhead in communicating with this dynamic driver will slow down the system.

Interprocess communication found in Unix can communicate from the main application to a second process running the device driver. Interprocess communication can in itself require tremendous resources. The gain in memory conservation is counterbalanced by a loss in overall throughput. Software products that have implemented small device drivers have a clear advantage. The drivers can be linked in line with the main application with little or no concern for size constraints and with no speed degradation due to multiple processes vying for the processor.

Perhaps the best memory management scheme comes from the use of the language C. When used to create a GKS library, C can make special memory management tools available to the graphics modules. These tools allow different areas of the application to use the same block of memory for data storage. This capability is unfortunately not available to GKS libraries written in Fortran. GKS implementations stemming from machines with proprietary operating systems are quite often written in Fortran.

C offers more than just memory management tools; it produces very compact code. In addition, C's portability across Unix systems gives the porting of a GKS library great ease. It was not unusual in the days of mainframe proprietary graphics software packages to take six months to adapt to a new environment. Today, Unix-based GKS written in C can be moved easily from machine to machine with no more effort than it takes to compile and link a library.

The last area of concern for memory management lies in the manipulation of segments. Segments are graphics objects that can be treated as a single unit. They might be made of text, simple vectors or more advanced primitives. They can be manipulated as one unit, not as a series of single entities. A number of applications that require segmentation require a significant amount of segmentation. To maintain the initial definition of a segmentation and then make multiple copies on the workstation requires that this information be saved and reused. Some software manufacturers are creating specialized data manipulation regimens that will off-load large amounts of data to disk in a manner similar to the way a virtual operating system works. This ability to automatically save segments frees the application writer of many programming concerns. Again, throughput will be affected. As more and more intelligent hardware devices supply their own internal segmentation capabilities, segment storage and manipulation can be done locally on the display device rather than in the main processor.

Perhaps the best memory management scheme comes from the use of the language C.

An event is about to happen — the marriage between GKS and the Unix operating system. Unix is designed not only to be processor independent, but also to allow for portable applications. An application running on a small Unix workstation can run without modification on a Amdahl Corp. computer also running Unix. GKS has the same design criteria and is designed to allow applications written using a standard implementation of GKS to run unmodified on any machine. As GKS can take advantage of the machine and processor independence of an operating system like Unix, a true marriage will take place. A subroutine library designed to accept machine-independent and device-independent source routines sitting on top of an operating system that masks the particularities of the processor and other machine constraints will make GKS the truly international standard that by all rights it deserves to be.

Rawlins is vice-president of marketing for Visual Engineering, based in San Jose, Calif., a firm that supplies a range of graphics software tools, utilities and applications for engineering and business needs.

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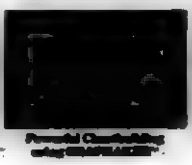

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Visual Information Systems: New Hope For Decision Makers

By Mark Borgmann

If you had a nickel for every hour employees analyze printouts produced by your corporate data processing department, you'd probably be very wealthy. What is the hourly cost when a person analyzes those printouts? And what's the object of all that analysis? Is the employee looking for just one or two numbers, adding some numbers together or trying to identify relationships between columns or rows? Whatever the object, the printouts are actually being used as data. The data on the printouts needs further manual processing before it becomes information — the meaningful kernel that can stand alone.

What's happening? We in DP thought we were providing information. We're supposed to use data, not generate it. Executives have better things to do than trying to second-guess the computer wizards in DP's ivory towers. Aren't DPers paid to meet the executive's information needs, anyway?

Can we honestly say today that DP produces the information the corporation needs? Rarely. It's a Herculean task to analyze the boxes of printouts produced on a daily basis. We've developed many new technologies to enhance data input and processing, but we've overlooked the most visible component — output. The need for rapid comprehension and transfer of information to decision makers becomes greater every minute.

Visual information systems (VIS), the next frontier in the computer-based graphics arena, offers hope for these decision makers. It also offers the potential for the wizards to redeem themselves and reclaim some long-lost organizational support, credibility and perceived value.

A VIS is an application that allows executives to monitor the current state of various kinds of corporate information (financial, performance, personnel or project-related). A VIS offers access through one or two keys to meaningful charts that can be easily and quickly digested. These charts are often presented in a hierarchical structure.

For example, a VIS might provide production charts at various levels of detail: corporate, regional, district, plant and building. Most of these charts are never seen and come into play only when hints of a problem arise in one of the high-level charts. The low-level charts allow the executive to identify the cause of the problem and take corrective action. Most of these applications are fed directly from actual corporate data (the same data that generates all those printouts). Notes that tell how current the data is, where it came from and whom to contact for more information are available for each chart by touching another key. This is information an executive can use immediately with no additional processing.

Because VIS charts have generic titles and annotations, executives must be able to change chart features to highlight problem areas. For example, a title might be changed from "Product B Sales Performance" to "Product B Sales Are Falling." After changes are made, another keystroke allows the user to produce a high-quality hard copy, transparency or 35mm slide in support of his position or for use in strategic planning sessions designed to correct the situation.

To be successful, a VIS must become a widely accepted and relied-upon corporate information tool. You must make the system a familiar and indispensable part of the managerial environment. No better, more visible way exists for a DP shop that views itself as a service organization to serve its company. If your DP shop doesn't view itself as a service organization and see information processing as its role, perhaps some probing questions are in order.

Ambiguity in VIS charts is simply not acceptable.

As with any application, a VIS must be tailored to meet the specific needs and constraints of an organization. Although some variation exists in component selections, at the generic level, a VIS should consist of the following:

- Continuous corporate backing and commitment.
- VIS users.
- VIS support consultants.
- VIS support methods and procedures.
- CPU.
- Data bases.
- Input devices.
- Output devices.
- VIS software.

Management backing and commitment are the most critical parts of a VIS. When the system is working, most people love it. But all the "attaboys" your VIS may have earned can be wiped out by just one voice with the right authority. You must continually work to deserve and preserve your backing, and the more you've made your VIS an integrated indispensable management tool, the better your system's chances will be of weathering the occasional storms. If the system meets your clients' expectations, your backing should remain intact.

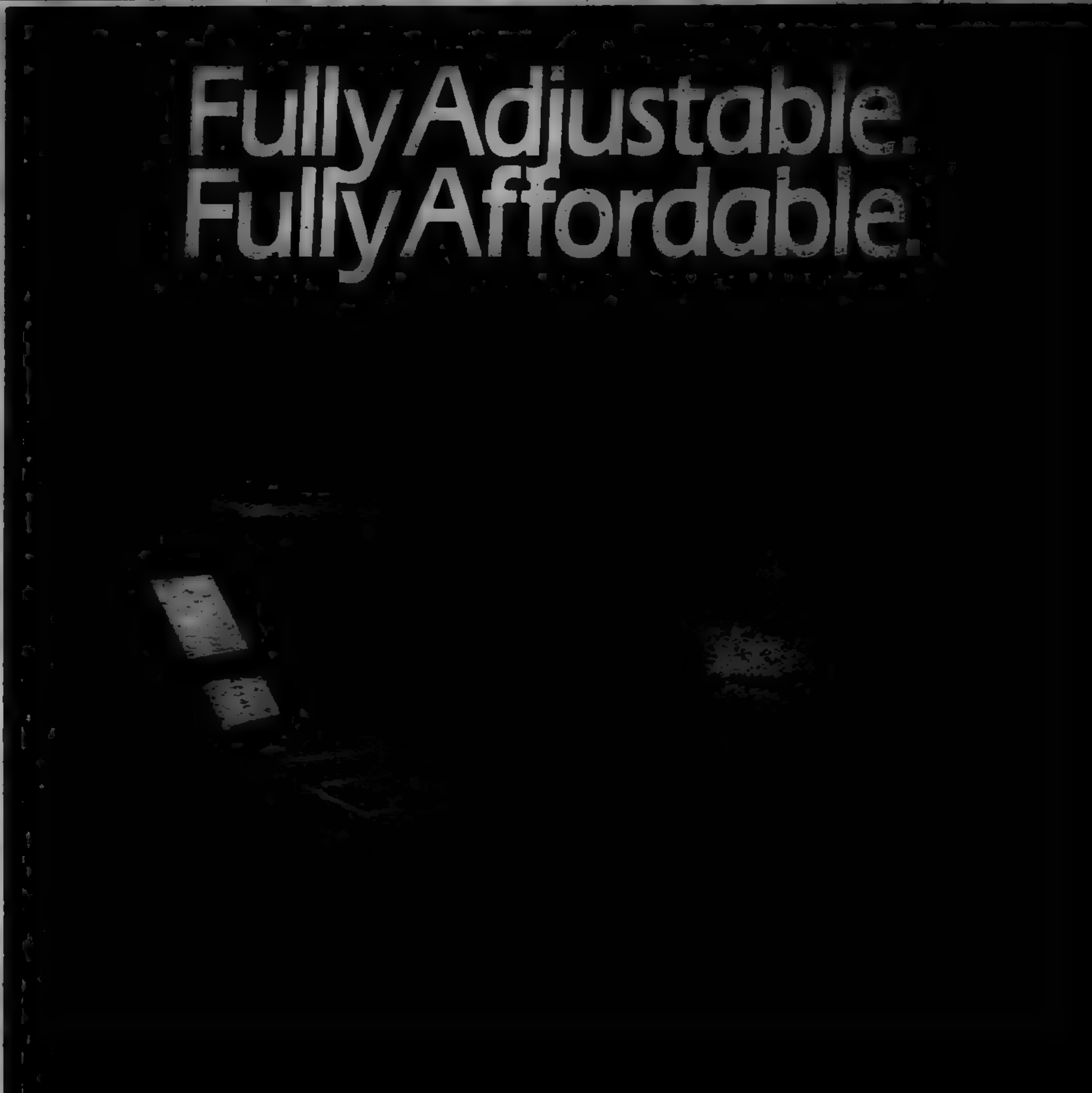
VIS clients (and they don't appreciate being referred to as end users) are the people who determine whether your system will succeed or fail. A VIS is designed to meet their information needs as they define them. Contrary to some people's thinking, VIS clients will not accept "Merlin-management" decisions. VIS clients expect the VIS to be:

- Reliable (and always available when needed).
- Predictable (so it will operate the same way every time).
- Quick to use.
- Easy to use (one- or two-key access).
- Even simpler to learn (preferably no training at all).
- Easy to understand.
- Equipped with meaningful, up-to-date information.
- Able to meet output quality requirements.

Criticisms of VIS clients include "They don't understand what's involved," or "They want it when?" The old adage, "Nothing's impossible to the man who doesn't have to do it himself," applies here. The VIS targets and was designed for just such a man — and woman. VIS clients interact with the VIS to monitor business functions and to identify and solve business problems. It is strictly a tool to help those people carry out their daily responsibilities more effectively. If it isn't a reliable and effective tool, it won't be used. The requirements are not easily met or sustained, but they are well worth the effort to your company.

VIS output must be easily understood. Ambiguity in VIS charts is simply not acceptable. In addition, these clients will not appreciate being insulted by a chart they can't understand. The Kiss rule — Keep it simple, stupid! — is applicable here. A chart can raise questions, but they should be something like "Why aren't we meeting our sales commitments," not "What does this green line near the top of the chart mean?"

Rather than appear ignorant



by asking the latter kind of question, clients will just stop using the system.

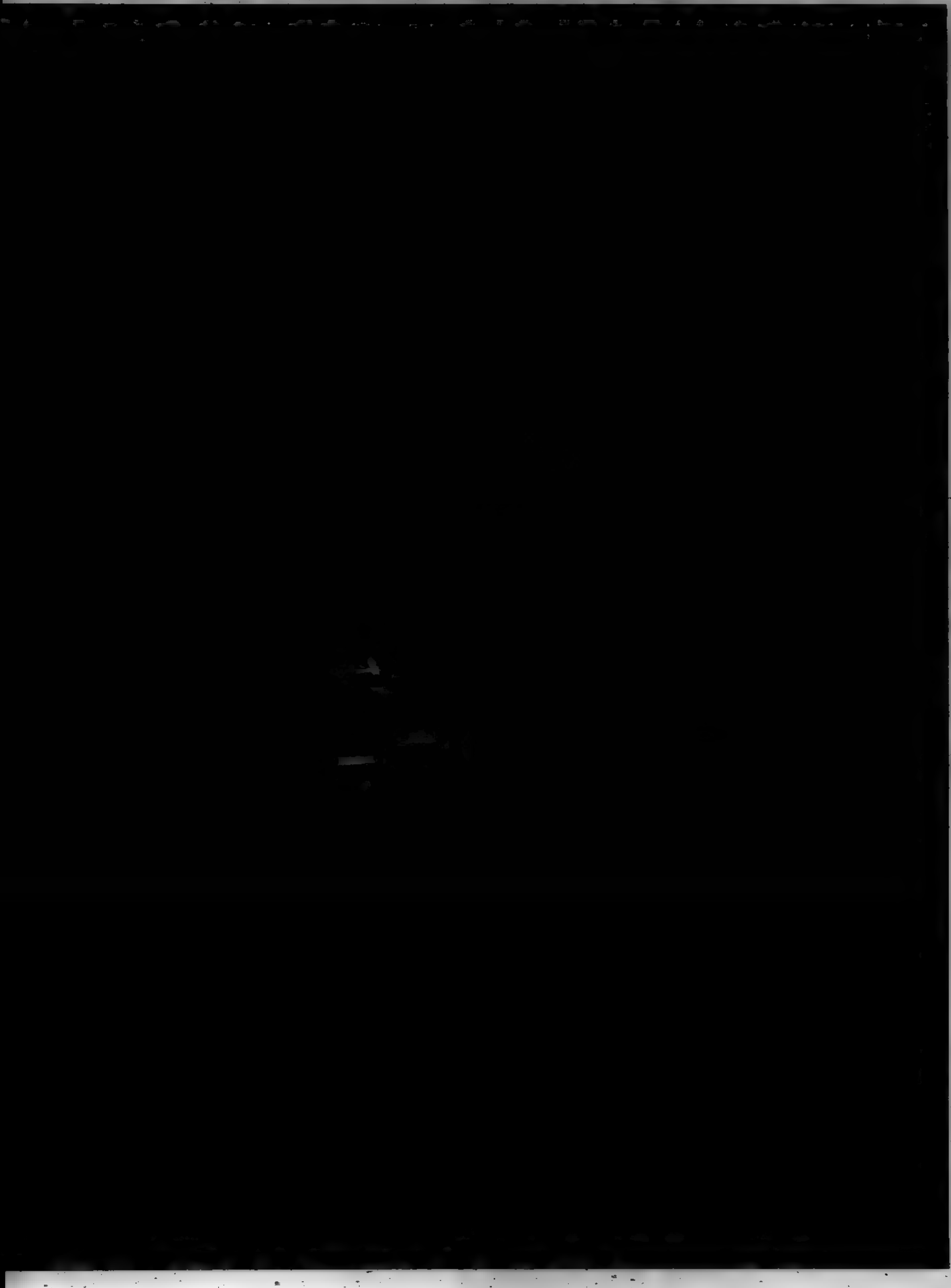
To make the system work, VIS support consultants will be needed. These people are responsible for the day-to-day care and feeding of the system. Among their responsibilities are the following:

- Creating new chart layouts.
- Setting up data base linkages.
- Interviewing clients and assessing their needs.
- Implementing changes in the system.
- Maintaining system components.
- Researching and developing functions to identify further needs and system enhancements.

The most important task these people perform is to maintain their perspective on the client's role in the VIS. Each support person must remember the VIS is there for the client and — even if it is sometimes difficult — must resist the urge to be defensive.

Friendly, cooperative client-consultant relationships are essential. Support consultants must be people-oriented and able to adapt their personality and delivery as necessary to communicate effectively with all levels of the corporation.

To be effective, consultants must understand the clients' needs and responsibilities. The qualities of a renaissance man would be ideal. Your support staff must not only have the necessary technical skills, but also must be familiar with corporate structure and functional operations. They must ease the clients' transition to visual thought and decision-making.



What are the necessary technical skills? They will vary, depending on the VIS implementation. Some areas of skill will be needed only occasionally; others will be part of the support consultant staffing requirements. Applications experts will be needed to help establish appropriate linkages to corporate data bases. Other technical skills to be represented are the following:

Each support person must remember the VIS is there for the client.

- Data base administrators.
- Data communications specialists.
- Graphic artists.
- Graphics software specialists.
- Graphics hardware experts.
- Human factors (client interface, documentation and workstations).
- Systems software specialists.

Most problems that arise in this area will result from forgetting the client's role or from poor intergroup communications.

The rules your support consultants will live by are your VIS support methods and procedures. Accepted procedures are necessary to ensure that clients are responded to in a timely fashion and that nothing falls through the cracks. Procedures should ensure that system maintenance will have no adverse impact on the clients. These procedures also define responsibilities and policies to be followed for:

- Client contacts and responses.
- Controlling work flow in the support group.
- Follow-up client audits.
- Problem tracking and resolution.
- Requests for changes or additions to chart libraries.
- System enhancements.
- System maintenance.
- System testing.

One important policy you should insist upon is that all system maintenance will be conducted during off shifts and will be fully tested before actual implementation takes place. Do not neglect this important system component. Well-conceived and enforced rules for VIS operation and support are essential if clients' expectations are to be met.

The VIS will need a processing unit, and CPU selection will depend on the type, location and volume of data; the number of clients using the system simultaneously; the anticipated future system expansion; the desired system response time and reliability; your output requirements; and the quality threshold of your clients.

The CPU and its operating system should be able to support batch processing for updating the chart libraries and data bases associated with the VIS. Creating charts during VIS viewing sessions takes longer than most clients are willing to wait. If charts are created and stored in a batch process, clients can play back individual chart selections as they need to view them. The display process takes only a fraction of the time needed to create and store the charts.

Data bases are the driving force behind visual information systems. The biggest considerations here are data base-to-VIS linkages and data currency. If you cannot (or will not) provide access to the data, don't even consider offering a VIS to your clients. You would just be wasting their time and yours.

Software for data base linkages exists in the commercial marketplace, or you can write your own. The key point to remember is that the linkage software should allow enough flexibility to be used for most if not all data base linkages. This allows quick response to changing demands for information and requests for new charts in the VIS libraries.

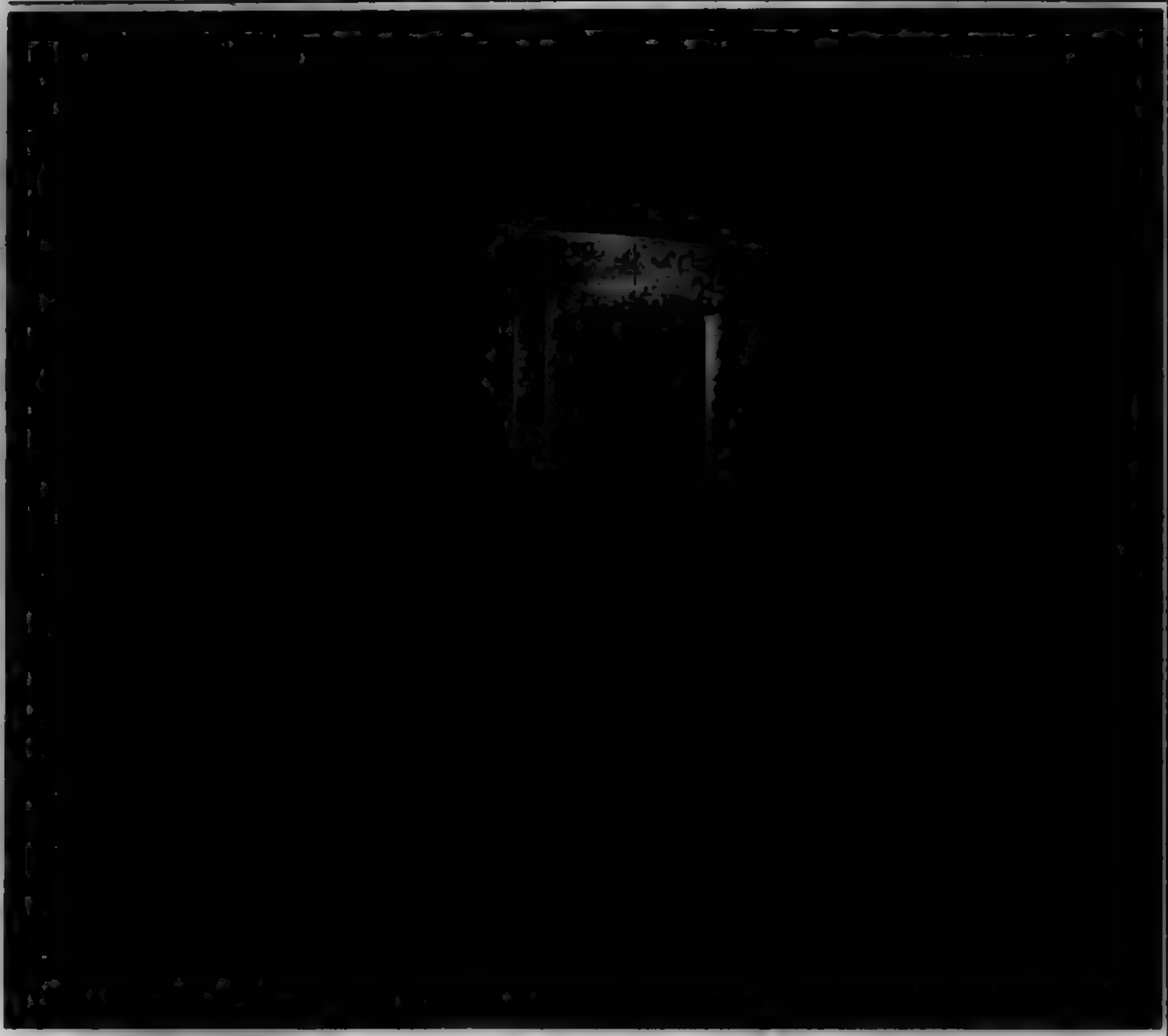
Again, if clients are to find the VIS useful, the data must constantly be refreshed as it is updated. Refresh cycles don't necessarily have to mirror the frequency of updates to the data base. Often, off-shift computer time can be used for updates. If decisions require the most current data, however, make sure the VIS has the new chart with each update.

If you cannot provide access to the data, don't even consider offering a VIS.

VIS input devices allow clients to control their access to the system. The input devices should be tailored to the needs of the individual client as much as possible. For example, some clients don't mind typing on a keyboard. Others who believe typing isn't their function or strength might prefer a joystick, two buttons instead of a keyboard or, in true executive fashion, just pointing at the desired item on the screen. Your system should provide some flexibility for input devices while retaining the full functionality of the system.

VIS output devices fall into one of two categories: soft-copy or hard-copy devices. Soft-copy devices are the terminals VIS clients use to view their charts. Clients should have their own viewing screens in their offices, and color devices are usually preferred. These individual screens eliminate many problems for the clients, not the least of which is being out of the office when trouble rears its ugly head. Select devices for their compatibility with your system as well as for performance and fit into the client's work environment. Projection systems that display images on large screens also qualify as soft-copy devices.

Hard-copy devices give you something to take with you: a piece of paper, a viewgraph or a 35mm slide. For example, hard copy of charts is useful in presenting results or status to associates or as an aid in correcting problems.



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Hard-copy devices should be shared, for the following reasons:

- Client needn't worry about how to use output devices.
- Client needn't bother with supplies, ink, toner and film.
- Capital outlays for output devices are lower.
- Shared devices can be better maintained.
- Higher quality devices can be easily cost-justified.
- Client terminal isn't locked out while waiting for hard copy; client can continue with other functions.

One of the most important attributes of VIS software should be device independence.

In a shared environment, many devices can be used, including black-and-white and color laser printers, pen plotters, color ink-jet printers, dot matrix printers, color thermal printers, electroerosion printers and film recorders.

Many of these devices will require some kind of vector-to-raster conversion, which involves taking a linear image and converting it to a dot-matrix form for display on the device. Special hardware rasterizers are available to do this conversion; host CPU software can also be utilized.

You will need to evaluate the expense and efficiency of each alternative relative to the number of physical hard-copy devices planned for your system.

IBM installations are slightly more involved when it comes to most of the above hard-copy devices. The overwhelming majority of these devices utilize an asynchronous Ascii communications protocol. To use these devices in IBM shops you must convert either Systems Network Architecture or bisynchronous protocols to Ascii. Several vendors make effective, low-cost protocol converters for this purpose.

The VIS software delivers all this to the client in a neat, easy-to-use package. It controls all client interaction with the chart libraries, library update functions, chart security, chart viewing and all hard-copy production while protecting the client from everything else.

One of the most important attributes of VIS software should be what is commonly referred to as device independence. Device independence means a system should be able to support not just one but many different types of output devices. More than half of the 20-plus device types we support were not available five years ago. Device independence lets your system keep pace with the rapid technological advances of the computer graphics industry.

The client interface should be easily understood and should have Help functions available at any point during a session. These qualities will let the client become self-sufficient and also reduce support and training. Try to make your system simple to use so formal training will be unnecessary.

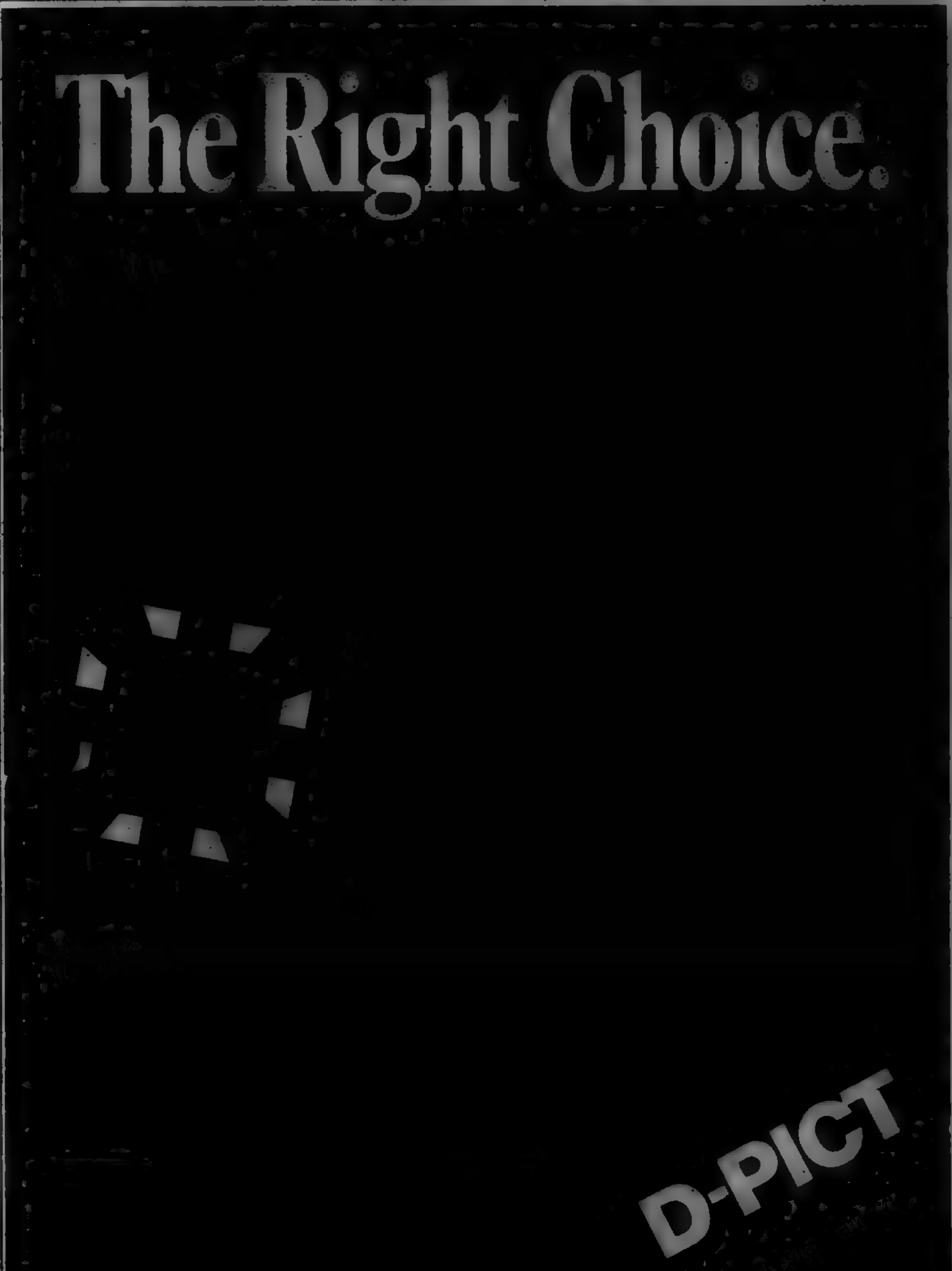
If several graphics software products are used in the company, the system should be capable of displaying information from all products during the VIS session. This could include such diverse information as thematic maps, product design specifications, logos, business graphics, art, document images and electronic schematic diagrams.

By now you're probably wondering how anyone could have such a utopian view. The fact is that VIS technologies are rapidly reaching performance levels executives have demanded in vain for years.

Will VIS fulfill every executive's information dreams? If your DP organization is up to the challenge, the answer this time may well be yes.

■

Borgmann is a systems analyst for New England Telephone based in Boston.



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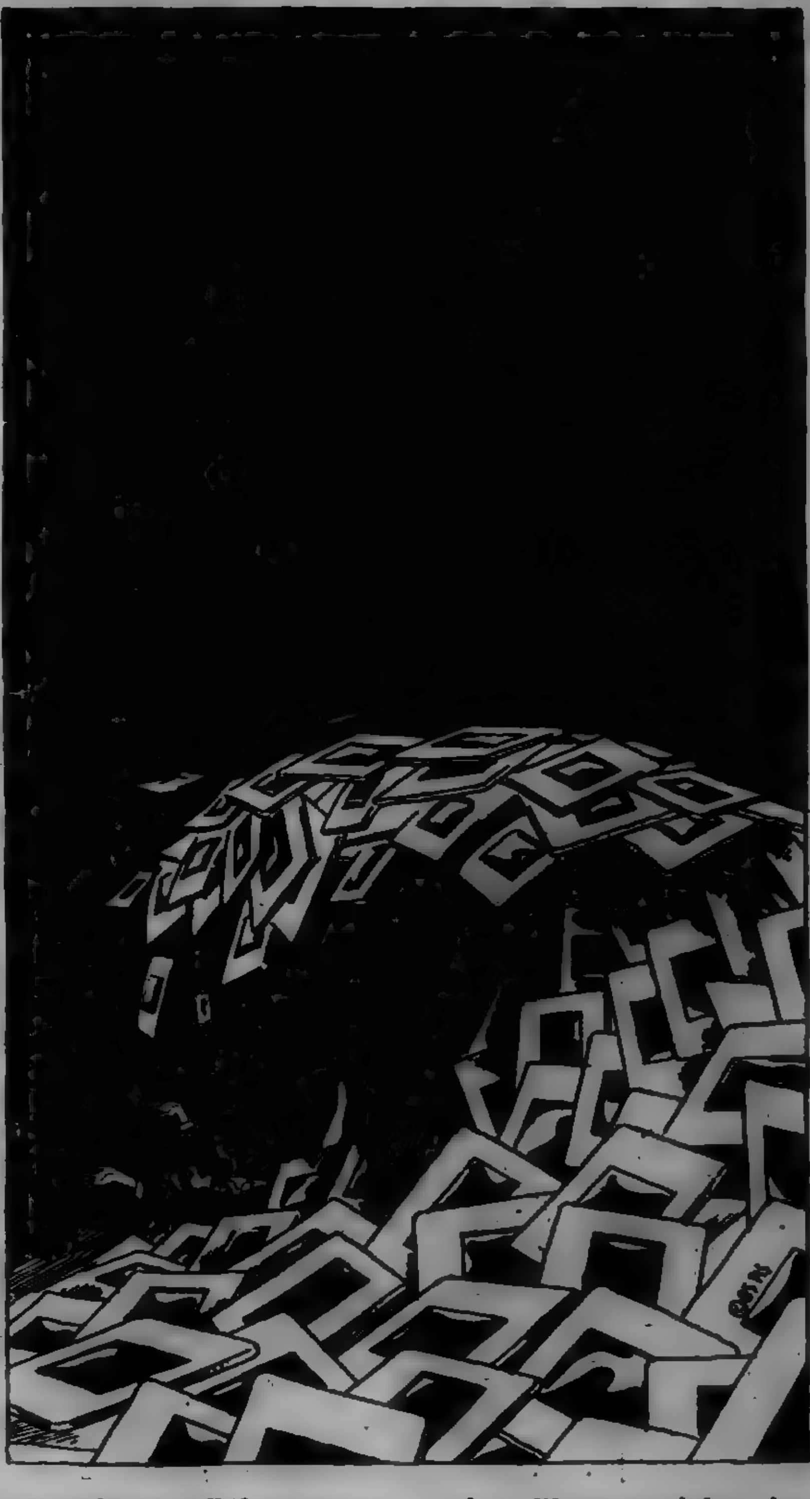
Who Copes With The Graphics Deluge?

By Betsy Riley



ROB SAUNDERS

Much has been written about the hardware and software planning necessary for successful computer graphics projects. Frequently overlooked, however, is the area of human relations. Because no purchasing decisions are made in that area, it is often not considered a potential problem and so no planning is done. Many organizations find this is a big mistake and discover several areas where human relations problems can make or break a computer graphics project.

The first problem that can arise is where to place the computer graphics function in the organization. That sounds simple, but can turn into a major political struggle. The problem in many companies is that these groups have grown up separately. Computer graphics came after graphics and computers already existed. In very few places are these groups anywhere close to the same part of the organization. The result is two groups, each with a vested interest in these new techniques, often in totally separate parts of the organization. Nobody wants to give up any turf, but both groups need to communicate and work together. The programmers have to recognize that the field of graphics has been around for a long time and that the experts in that field are the people in the graphic arts departments. On the other hand, the artists have to recognize that they are no longer going to be the only ones doing graphics. The tools are there, particularly with chartbook systems which offer predesigned graphics. These systems will let managers, secretaries, clerks or scientists do some graphics on their own.

There are after all two basic functions being provided: the systems function (providing software and so on that works) and the service function (providing graphics for customers).

In many organizations these functions are separated (with the systems function in the computer department and the service function in the art department). This can work very well if proper communication is established so the groups can work together.

Suppose a decision is made to keep the systems functions in the computing department and place the service function in the art department. Everything should be fine, right? Wrong. The biggest problem we had was introducing computer graphics into the graphic arts department. Most of the problems were created by programmers' mistakes. We have identified five causes of problems we had in the course of the project:

- Jargon differences created a communications barrier. Computer science is full of violent sounding terminology. The illustrators (like any users unfamiliar with computers) were somewhat wary of the system and afraid that dire consequences would ensue if they pushed the wrong button. There they sat in the terminal room moving a cursor around, having just been warned that the operator would kill them if they were quiet too long. We reassured them that "The worst that can happen is that your job will bomb. But don't worry, after you crash and burn a few times you'll get the hang of it." That was just the beginning. We realized we shouldn't use abbreviations (for example, .GE. for greater than or equal to) after one illustrator asked what, "General Electric zero" meant. Another term — defaulting — was discovered to be jargon. A prominent feature of our front-end software is defaulting to preset values when arguments were skipped. On checking with the illustrators, we found that they had not been taking advantage of this feature. Reading the dictionary definition of "default" had caused them to interpret the description of a special feature as a warning of a potential problem. However, jargon was not the only communication problem.

- Unintentional insults were frequent because of each group's ignorance of the other. Again the programmers were the main offenders. In promoting computer graphics to those outside of graphic arts, we often stressed the superiority of computer graphics over visuals done by hand. This argument was valid for researchers and managers, who usually had no artistic training. However, the same presentation was a slap in the face to illustrators who did all of their work by hand. A less serious offense was referring to all members of the graphic arts department as artists. The terms artist, illustrator and designer had job-level connotations, and a senior designer was not pleased to be introduced as a graphic artist. Problems were created not only by things that were done, but also from things that were not done.

- Ignoring the fears and prejudices of the illustrators caused those feelings to grow. The introduction of a computer to perform tasks formerly done solely by manual methods will cause concerns for job security in almost any profession, and the graphic arts department was no exception. In addition to being afraid they would lose their jobs, some members worried they would lose the job level they had attained through years of hard work and training. There was also the fear that everyone would be forced to use computer graphics. That fear was especially strong among those who had chosen design as a career because they disliked mathematics and other similar sciences.
- Overselling of computer graphics fueled these fears and caused resentment. Be aware of praising the software too highly, claiming that computer graphics can do anything and that anyone can use computer graphics because it is so easy. Riding into the graphic arts department on a white horse waving the banner of computer graphics and expecting to be welcomed with open arms is a mistake. A new system may seem easy in comparison to old software, but the new system is not all that easy. As one illustrator said, "It's not easy. It's hard, but it's worth it." The claims that computer graphics could do anything arose from another cause, the last problem we discovered.
- Computer scientists have not been trained to recognize presentation- and publication-quality graphics. Too often in computer graphics (especially graphics produced by programmers) the medium was the message. We had not learned moderation. We had not realized that the audience should not notice the slides, but rather the information on the slides. We were like children with their first boxes of paints — too enthralled in splashing colors around to worry what the final product looked like.

Identifying all these problems was a learning experience. In retrospect, we identified necessary actions for establishing good relations in a project of this type. (This is fortunate for us because there are still other graphic arts departments within Martin Marietta Energy Systems, Inc. that have not yet added computer graphics to their services.) We eventually took all of the following actions, but we might have taken them sooner if we had identified them as potential problems from the beginning:

- Identified jargon so it could be explained or removed. We did this by consulting a technical editor unfamiliar with graphics or computer terminology.
- Found someone in the graphic arts department with whom we could have an egoless discussion to determine our areas of ignorance.
- Identified the fears and prejudices that existed and set up an open forum to discuss them. Management did much to relieve the fears, especially by pointing out that the graphic arts department was not converting to computer graphics, but merely adding it as a new service.
- Realized the limitations of computer graphics. Because of the effort involved, some things just weren't worth doing. And because of software and hardware limitations, some things couldn't be done.
- Tapped the resources of the graphic arts department (and of photography and reproduction) to learn publication- and presentation-quality requirements.

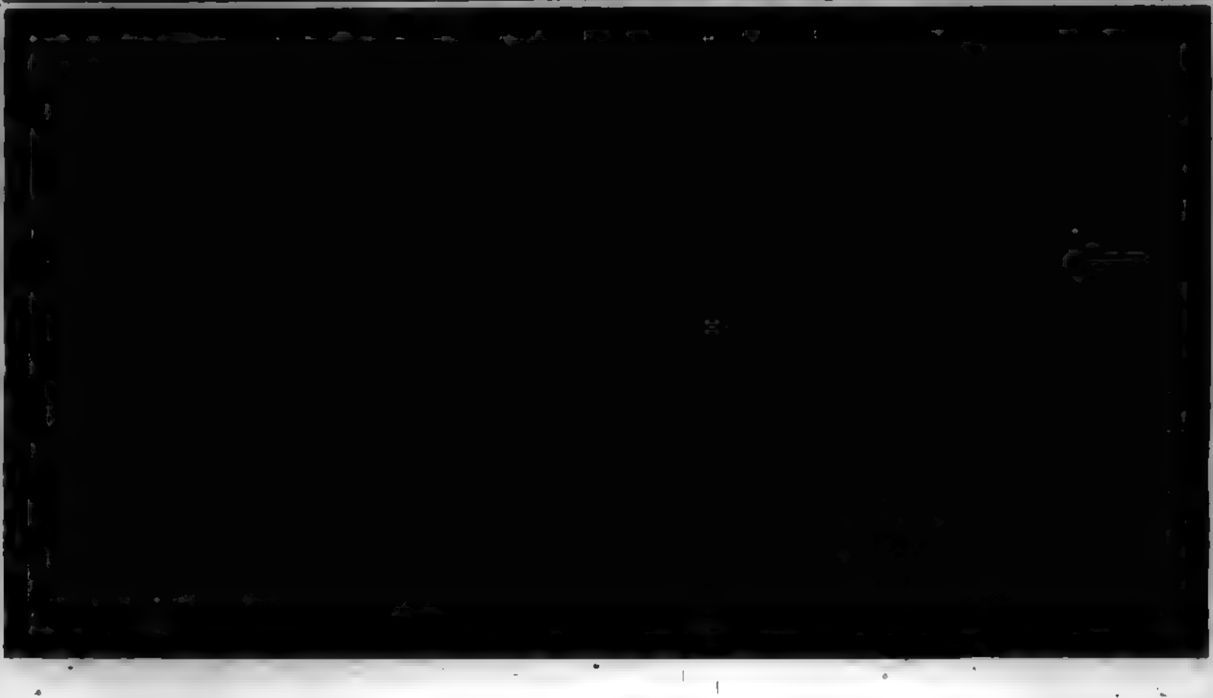
Following the steps we took can get you in the door more smoothly. However, if you do split the system and service functions organizationally, you will have to work at keeping communications open. Here are some techniques we used:

- Hold regular formal interface meetings between the two groups (with top management included) to discuss goals and needs and to develop timetables for meeting them.
- Have frequent informal meetings (for example, drop by to ask if there are any problems).
- Trade people occasionally (for example, sit in with the other group for a day to see what their work load and daily problems are like).
- Establish an automatic exchange of schedule information (for example, programmers notify artists in advance about any changes to the system; artists notify programmers of any scheduled rush or critical jobs).

Many other decisions need to be made in the course of establishing a computer graphics function and over the life of a project (for example, open vs. closed shop and what level of service to provide). Just remember that there is more to computer graphics than the hardware and software. Careful consideration of potential human relations problems can help make your project a success. ‡

* * *

Riley is head of graphics development for the computing and telecommunications division of Martin Marietta Energy Systems. The division provides services to three plants operated by Martin Marietta for the U.S. Department of Energy in Oakridge, Tenn.



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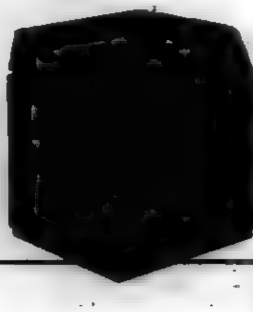

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KEVIN-CONKLIN

Bringing In-House Publishing Up To Date

By Bernard Peuto

Most chief executive officers who are asked how much the company is spending on telecommunications hardware and services will recite a figure for capital equipment expenditures. Asked how much the company is spending each year on printed documents — newsletters, forms, sales manuals, training manuals, price lists and, particularly, engineering documentation — these same CEOs will probably draw a blank.

This situation typifies the problems most U.S. companies' publications departments face today. More than 80,000 domestic firms currently produce documents in-house under the administration of technical documentation, publications or graphic arts managers. The average company is a division of a Fortune 2000 firm with divisional revenues of $50 million to $100 million. This company is probably spending between 1% and 3.5% of its annual sales on printed materials, generally well in excess of $1 million annually, according to some studies. In high-technology-based industries such as software, communications, aerospace and health care, the level of complexity for most documentation is extremely high.

The document creation process is often dated, serial in work flow, labor-intensive and extremely cumbersome. The serious loss of productivity, rampant inaccuracies and drain on expenses that result is a situation that most corporate management has not, as yet, acknowledged. The problem is multifaceted and begins with management's perceptions of technical documentation. In many ways, documentation has been viewed as an undesirable but necessary offspring of research and development. Products are often referred to as document-dependent and, although in most cases the documentation is not the company's primary product, it plays a critical role in the R&D and manufacturing phases. Moreover, a company's ability to produce high-quality accurate user support materials when the product is on the market is increasingly being linked to a company's competitive edge. Poor performance and product recalls are commonly traced to faulty documentation.

Savings can be anywhere from $25 to $300 per page using a computer-aided publishing system. A company that produces 2,000 to 5,000 pages annually, as most companies do, can find the savings staggering.

Since specialized computer-aided design (CAD) and computer-aided engineering (CAE) systems have become established fixtures in the engineering and design phases, product development phases have been reduced to fractions of the man-hours once required. However, because typewriters or word processors are the sole support for most technical editors, writers and illustrators, the document related to the product may take dramatically longer to create — and have considerably more errors — than the product itself.

Traditionally, those creating the documentation have little understanding of engineering specifications. Skills in writing, paste-up and illustration are emphasized more than technical accuracy. Therefore, errors are difficult to spot immediately and are easily introduced into the later stages of the publishing process.

As errors slip into the early stages of the publications process, corrections become a nightmare to reverse. Individuals must make their contribution to a project at specific steps: the writer finishes writing and forwards the project to the graphic artist, and it is then forwarded to be typeset and, finally, boards are pasted up. Illustrations represent still another step.

When corrections must be introduced, they constitute almost a complete reversal of the step-by-step process; worse still, corrections are usually not localized. A correction on one portion of the page can easily affect the entire page or even the entire document, which may run hundreds of pages. Due to their very nature and the various skill groups required, these changes cannot be made in any timely fashion. A simple correction in text, for example, can require hours or days to correct and then may be kicked back again for another correction in the illustration. Errors are not the only changes that are introduced. Often, while the document is being created, the product is being enhanced; faults in design are corrected, and immediate revisions to the documentation are required.

The problems of in-plant publishing are not new. In-plant publishing is an age-old problem that has been ineffectively addressed in the past.

Several manufacturers introduced a range of hardware aimed at automating specific tasks in the publications process: WP for the writer, specialized graphics systems for the artist and computerized typesetting machines for the typographer. This localized automation meant that skill groups and their machines remained isolated and, in effect, the step-by-step publishing process remained intact. With relatively few standards among manufacturers, hardware purchasing becomes an investment decision offering a limited return under these conditions. In short, the publications manager trades a human problem for an electronic problem.

Among the recent reports that indicate the computer-aided publishing (CAP) market is poised for explosive growth in the years ahead is one from Frost & Sullivan, Inc., which expects the total amount of CAP hardware sold from 1985 to 1988 to reach $9 billion. This market projection includes the total CAP market: service bureaus, in-plant technical publishing, ad agencies, books, newspapers and magazines. The demand for in-plant technical publishing hardware is by far the fastest growing of these various market segments.

It is clear that users want more than a partial or localized solution. However, it was crucial for CAP system manufacturers to understand the importance of integration in order to best approach the user with a total solution.

From the publication manager's point of view, integration is characterized by three important points:

- Most managers need integration of text, graphics and composition on one system that offers users "editable-what-you-see-is-what-you-get." This allows anyone in the publications department to view, adjust and manipulate any combination of text and graphics from any workstation, on any page and at any stage of a publication's development cycle. This CAP system capability means documents are not locked into the serial steps of the publishing process. They can be viewed and manipulated at any time, and changes can be made instantly at any point in the publishing process.

Writers, for example, can enter text at a workstation and view it in typeset form, composed on the page as it will appear in the completed document. Heads, subheads and body copy will appear in the correct typeface and point size. Indexes and tables of contents are generated automatically as the writer develops new chapters, sections and subsections. In addition, because form and content are independent, the writer has the option to change the appearance of a page at any time by selecting new properties such as typefaces or number of columns.

Illustrators can scan images, use a graphics puck on certain CAP systems to draw freehand or select symbols from a variety of graphics palettes. As a result, illustrators can create line art including schematics, flow charts and timing diagrams. Designers, typesetters and production people might enter specifications on a style sheet, and the CAP system will completely reformat an entire document when this style sheet is applied. When a document is paginated, page breaks, graphics positioning, headers, footnotes and other elements of the final piece are handled automatically.

Because each document is created in camera-ready form, reviewers see each page fully composed in final form. Text, graphics, captions, footnotes and all the other elements appear just where they would in the final pass.

- Integration of the various skill groups on the CAP system working within the publications department has a favorable impact on the publishing process in several important ways.

The traditional one-step-at-a-time or serial production process that inflexibly caused projects to move in a rigid progression from one skill group to the next (for example, from writers to illustrators to production) is eliminated. Instead, this fragmented process is replaced by a system that joins all the players into a unified team — all the publications professionals bring their skills to the project at the same time or in parallel. As a result, the time needed to bring the project to camera-ready art is dramatically reduced. This in turn greatly reduces the cost of the publishing project on a per-page basis.

Because of the independence of content and form, type changes, for example, can be made to the form without any impact on content. Revisions or last-minute modifications to the project no longer cause a ripple effect throughout the entire document. Also, fewer users become involved in the revision process with a corresponding decrease in the likelihood of new errors being introduced through a revision.

- The integration of input/output sources is crucial. A substantial capital investment usually exists in WP systems, personal computers, in-house phototypesetters and similar devices that are used to create corporate documents. The system should be designed to work with this equipment, rather than making these devices obsolete or ignoring them. Ideally, the CAP system's user interface should be modeled after the traditional publications organization. Users should be able to operate the system using plain English rather than special typographical markup codes or computer programming commands.

Similar to the management control factor that is the impetus behind many forms of today's office automation technologies, CAP systems also offer management the opportunity to oversee in-plant publishing with a degree of control over a typically unruly process.

The publications manager is better equipped to monitor time, costs and materials on a per-project basis. Delays due to approvals, revisions, errors or modifications can be tracked. Managers are better able to handle a greater number of projects and to work toward multiple deadlines without the fear of bottlenecking as several projects near a completion date simultaneously.

Savings can be anywhere from $25 to $300 per page using a CAP system. A company that produces 2,000 to 5,000 pages annually, as most companies do, can find the savings staggering.

Depending on the number of pages produced and the level of complexity, CAP systems in general provide a viable total solution to the problems of cost, productivity and time management associated with technical in-plant publishing — bringing it out of the Dark Ages.

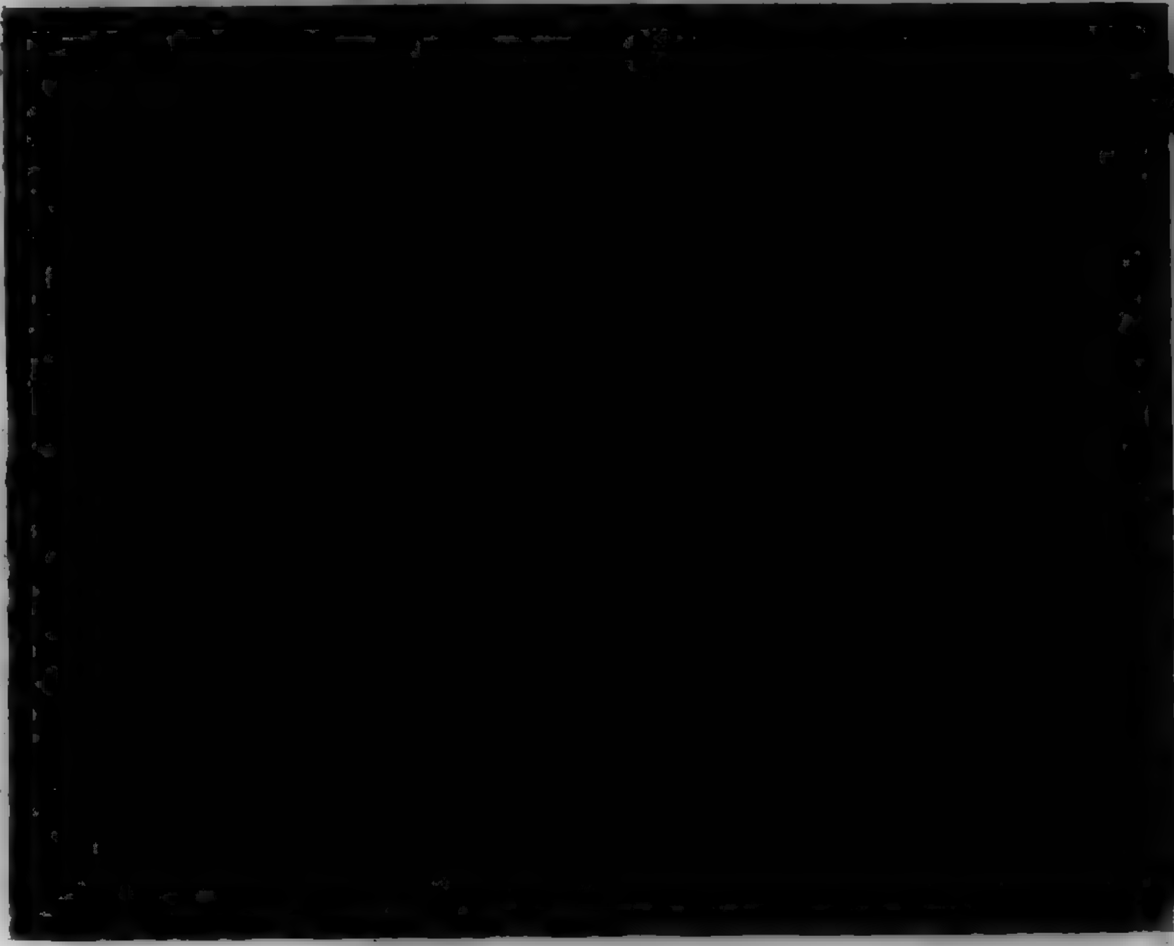
■

Peuto is president of Viewtech, Inc., a company that manufactures computer-aided publishing systems, based in San Jose, Calif.

CAP system lets users see pages and make changes on the screen.

Turning Hard Facts Into Hard Copy

By Gary P. Laroff



Computer graphics has become a valuable corporate tool because the technology can display business information in a format that looks like graphics, not computer graphics. Hard-copy devices have played an important role in raising computer graphics to the level it now occupies in an organization.

Anyone planning to purchase a hard-copy device should do some legwork before signing on the dotted line. Potential purchasers should not only review performance variables but should also make an attempt to understand what current products are being offered. Those who take the trouble to do so will be able to secure the printer, plotter or film recorder best suited to their particular business graphics environment.

Five major variables — image quality, resolution, speed, equipment cost and cost per copy — are key ingredients in an evaluation of the major criteria and trade-offs that exist among color or high-resolution monochromatic hard-copy units.

- Image quality, although the Number One priority, is often very subjective. Some aspects of image quality are the ability of pie charts to come out round, regardless of the aspect ratio of the copy; line and edge definition; area-fill ability; and color accuracy.

Pen plotters and the more expensive film recorders generally provide excellent line quality. Raster-oriented devices plot with closely spaced dots and, if the dot size is small (high-resolution) and the dots can be overlapped to smoothen the raster stair step, these devices can offer a quality of line definition equal to or surpassing that of a standard desktop plotter. Devices with a minimum of 240 dot/in. do a superb job; these devices are frequently laser printers.

Area filling is necessary for bars, pies, shading between lines and shaded character fonts. Solid areas should be free of streaks and voids, and shaded areas should be uniform. Uniform filling is most important in business graphics where aesthetics are a major consideration. Color raster nonimpact printers such as thermal transfer and ink-jet plotters appear to have the advantage at uniform area fill on paper and transparencies.

Sometimes color accuracy is not so important as color purity, for example, for those who would be satisfied with an 8-pen plotter. Often, however, color accuracy is important for visual impact. Recent advances in ink-jet, thermal transfer and film recorder technologies allow more than 64 different colors through rasterizing techniques. Some devices support anywhere from 256 colors to as many as 4,096 colors, depending on the hardware or software rasterization algorithm. Near-photographic quality will soon be available on the new nonimpact printers because of ever-increasing resolution and color saturation.

- Resolution is the number of discernible line pairs per inch. Dot/in. and addressable dot/in. are terms that are more often published, especially for the raster technologies. However, they are not true measures of resolution. Dot/in. describes potential resolution. If the dots overlap, as they often do with electrostatic, ink-jet, thermal transfer and laser technologies, curves and lines will look smooth and not stair stepped. As a result, the visual appeal of the image will be increased. This appeal is not without cost, however, and will be counterbalanced by a loss of resolution. If the dots are wider than their spacing, closely-spaced line pairs will not be discernible.

Any decisions about business graphics image resolution have to be based on two pieces of information: who will view the pictures and what output or display medium will be used.

A low- to medium-resolution terminal with screen-resolution copy is sufficient for preparing and creating charts. An A-size (8½ in. by 11 in.), 8-color, 480 by 360 pixels (about 50 lines per in.) ink-jet plot provides a good quick look for working copy, but it is far from photographic quality.

For corrections and content review (a typical middle-management function) peer graphics take the form of slides, overhead transparencies or paper hard copies. Peer graphics work well with screen-resolution slides (512 or more lines) or almost any

	Impact		Non-Impact						
	Pen Plotter	Impact Printer	Electro-Photographic	Color Electrostatic	Thermal	Thermal Transfer	Ink-Jet	Laser	Camera Systems
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pure colors	up to 10	8	1	8 Versatec ECP-42	1	8	8	8 (Xerox 6500) 1 (others)	unlimited
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Speed (8½ in. by 11 in.)	3 to 10 min. or more	3 min. approx.	20 sec	1 min. approx. 8 min. (E-size)	20 sec	45 to 120	1 to 5 min.	.2 to 6 sec (B&W) 20 sec (color)	1 to 2 min. (Polaroid) hrs to days (processing)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Approximate equipment cost	$700 to [illegible]	$4,450 to $11,500	$4,400 to $7,900	$98,000	$1,000 to $6,000	$4,500 to $5,000	$800 to $17,500	$39,000 (color) $22,000 to $390,000 (B&W)	$8,600 to $200,000

Figure 1. Hard-Copy Specifications Comparison

color copy page or transparency with over 100 dot/in.

For presentation to management and outside clients, presentation graphics generally requires higher resolution. Slides with 2,000-line resolution are usually sufficient, but the 4,000-line versions are noticeably crisper. Paper hard copy and backup in black-and-white from a 240 dot/in. laser printer, 100 dot/in. color Xerox Corp. 6500 CCP or computer-driven ink-jet or thermal transfer plotter are appropriate.

- Speed is specified by any number of misleading terms. In./sec and maximum acceleration (Gs) are useful for comparing pen plotters with each other, but not for comparing a pen plotter with any other technology. Line/min describes some impact and thermal printers. In./sec is not uncommon for some electrostatic printers. Char./sec is borderline useless, unless the graphics are being generated from the character X. These specifications may show up on data sheets, but they don't state how fast the charts will be finished.

The only truly important statement of speed is how long it takes from the time a user pushes the button until he receives the copy in hand. Whether one copy is timed in units of seconds, minutes and hours or by the production graphics view of pages per minute, the time it takes to get the copy is the time that really matters.

- Equipment cost should include the price of interfaces, rasterizers and driving software. Remember, when a hardware module is used to overcome the speed of the bottleneck of software rasterizing on the computer, the cost of the add-on modules to perform the local rasterization must be added to the device cost.

- Cost per copy is variable and should include the cost of all expendables — paper, pens, toner and film. Host software rasterization cost should also be added.

The wealth of devices available today is awesome, but buyers must consider their present and future needs in order to meet the final objective of a graphics system. Figure 1 rates each of the nine major technologies on image quality, number of pure colors supported, resolution, speed (time for an A-size copy), cost per copy (not including computer overhead) and approximate equipment cost.

Hard-copy devices available to the potential buyer of a graphics system fall generally into one of the following seven categories: pen plotters, impact printers, electrostatic printer plotters, thermal transfer plotters, ink-jet plotters, laser printers and other high-resolution black-and-white printers and film recorders.

Pen plotters have traditionally been used for hard-copy continuous lines rather than the dot structure produced by various raster print technologies.

Features that differentiate pen plotters are: pen speed (usually measured in in./sec), pen acceleration (usually measured in Gs), manner and time required to change pens in order to change color and start plotting again, reproducibility (accufacy) and continuous roll or sheet feed of paper and transparencies. Another variable, of course, is price. Six- and eight-pen plotters are available in the under-$2,000 range with an acceleration of 4 Gs and pen speeds in the 15 in./sec range.

Slightly more costly are the production workhorse plotters that run essentially unattended; they either advance roll paper or automatically feed sheet paper. Plotters such as Nicolet Zeta Corp.'s Zeta 8 and Hewlett-Packard Co.'s 7550A are priced at $5,950 and $3,900, respectively. Both are 8-pen plotters with acceleration from 4G to 6G and pen speeds in 20 to 30 in./sec range.

Impact printers are essentially line printers with either multiple ribbons or one multicolored ribbon that can address individual dots and permit the printing of graphics and not just lists of alphanumeric characters. The main advantage of the impact printer is its low cost per copy.

A number of color impact printers have been on the market for some time. IBM offers some of the most popular printers, including Model 3287 and its somewhat faster replacement, the 3268 Model 2C. The 3268 Model 2C is a 4-color wire matrix ribbon impact printer that can operate at a maximum of 340 char./sec and prints approximately 2.7 times faster than the 3287 at a comparable price of $8,900. Graphics plots are generated in about two minutes at a cost of approximately 15 cents each.

Electrostatic printer plotters have traditionally produced black-and-white copies with images produced electrostatically by electrodes placing charges on dielectric paper, which is then passed through a toner.

At present, the Versatec Co. Colorplotter Model ECP42 is the only color electrostatic plotter available. The ECP42 is a good performer, producing full-color copy with a high 200 dot/in. resolution over a large 34 in. by 44 in. page in only eight minutes at a cost of $1.44 per copy. This model costs $98,000.

Thermal transfer plotters, which compete with ink-jets as the two major innovative nonimpact technologies, are becoming more reliable and less expensive. Most use a low-melting-point wax transfer ink instead of liquid ink. On the surface, the products hold the promise of simplicity, reliability, quietness and low-cost hardware. Most of these devices are manufactured in Japan, and not all of them are available in single quantities to end users.

The Seiko Instruments U.S.A., Inc. Model CH-5201B, priced at $10,950, has a resolution of 150 dot/in. and makes copies at the rate of one each minute. The Gulton Industries, Inc. CP-80C has a resolution of 100 dot/in., takes 45 seconds for a copy and is priced around $4,950. Shinko Electric has two families of thermal transfer plotters. Toshiba Corp. has Model TN-5400, which produces 200 dot/in. A-size plots in a minute. Most of these models are supported by the Lasergraphics, Inc.'s UI-100 series of vector-to-raster converters.

Ink-jet plotters output high-quality color paper and transparency graphics. The major variables are resolution; the number of colors of ink from which all other colors are mixed (four colors are better than three); and convenience issues such as speed, single paper sheet handling and so on.

Ink-jet units using line-printer-like paper feed are available from Advanced Color Technology Co. and Printacolor Corp. Tektronix, Inc. has three units covering the full range of ink-jet capabilities with prices from $1,595 to $12,950. The high-resolution winner, with 203 dot/in., is the Benson-Varian, Inc. Colorscan 800, which makes A-size copies in 3.5 minutes but can also produce B-size plots (11 in. by 17 in.) and is priced around $17,500.

A large number of devices with varying prices and throughput rates fulfill the need for high-resolution black-and-white printers in production graphics as well as publication-quality graphics. At the lower price end are Quanex Management Systems, Inc.'s Lasergrafix series, Digital Equipment Corp.'s LN-01 and LN-03 and Xerox Corp.'s 2700. They are characterized by a speed in the range of five to 10 pages each minute. At the higher price end are the high-volume (100 to 300 pages per minute) laser printers such as Xerox 8700 and 9700 and IBM 3800. Also available are the computer output microfilm (COM) recorders from Information International, Inc., known as Models Comp 80 and Comp 80/3 and the IBM 4250 (600 dot/in.) electroerosion printer.

Most people use film recorders to produce slides, but some devices also produce other format films and some produce 8 in. by 10 in. Polaroid Corp. prints directly. There are three generic types of film recorders: terminal-driven film recorders, stand-alone film recorders and direct-drive film recorders.

Terminal-driven film recorders are independent of the computer and graphics software and are not discussed here. Stand-alone film recorders are intended for high-volume, photo-ready, high-accuracy output. Typical devices in this category are produced by companies such as Celco, Dicomed Corp., Genigraphics Corp. and Information International.

Direct-drive film recorders or slide composition systems are becoming quite popular and are available in even lower price ranges. Typical products include the Dicomed Dicomedia family and the Genigraphics 100C, 100D and 100V at the higher performance and price end. The newer desktop systems tend to cost from $1,500 to $25,000 without rasterizing equipment. Examples are Matrix Corp.'s QCR-D2000 (resolution 2,048 by 1,366) and QCR D4/2 (resolution 4,096 by 2,732); Polaroid Corp.'s Palette Mark II, which is supported as the Lasergraphics MPS-2000 (resolution 2,048 by 1,366); and California Computer Products, Inc.'s (Calcomp) Samurai, which produces anti-aliased slides with a resolution approximately 4,096 by 2,732. One of the more recent announcements is the self-contained Bell & Howell Co.'s Color Digital Imager IV film recorder, one of the lower cost offerings with a resolution of 832 by 630.

The end product of business graphics is usually a paper chart, overhead transparency or 35mm slide. Choosing the right hard-copy device is critical to getting the right output. There are a number of very fine color output devices available today, and a little effort at the time of purchase will pay dividends every time you make a hard copy.

◆

Laroff is marketing manager for Integrated Software Systems Corp. (Issco) and author of the recently published book Choosing Hard Copy Devices for Visual Information Systems.

Products

PRINCETON, N.J. — **Execustat, Inc.** has introduced a software package for the IBM Personal Computer or PC-compatible with at least 256K bytes random-access memory, two disk drives, a graphics card and a high-resolution graphics board.

The package, called Execustat, integrates statistical and graphics procedures designed to make use of modern data analysis techniques. Execustat retails for $495.

For more information contact Execustat, Inc., Research Park, 2 Wall St., Princeton, N.J. 08540.

BOULDER, Colo. — **Precision Visuals, Inc.** has introduced a new software package that reportedly enables casual and experienced users to create presentation-quality graphics. Picsure, the new interactive package, is machine and device independent and supports the full hardware capability of more than 80 graphics output devices, according to the vendor.

Picsure is available immediately for IBM systems running under VM/CMS or MVS/TSO, for the Digital Equipment Corp. VAX with VMS and with Unix System V. A standard Ascii version is also offered. Picsure is priced from $6,500 to $25,000, depending on machine class.

For more information contact Precision Visuals, Inc., 6260 Lookout Road, Boulder, Colo. 80301.

IRVINE, Calif. — **Infographics, Inc.** recently announced Choice, a business color graphics package that incorporates the rudiments of artificial intelligence (AI). By incorporating certain AI elements into the package, the graph can be determined by the data.

Choice can accept data directly from many popular spreadsheet programs and runs on any computer with MS-DOS, PC-DOS, CP/M 80 or CP/M 86 operating systems, the vendor said. Choice requires no graphics board or color monitor; the graph cannot be viewed on the screen, but will output to any of seven plotters and 25 printers.

Choice retails for $395. Memory requirements are 64K bytes random-access memory (RAM) for 8-bit microcomputers and 128K bytes RAM for 16-bit microcomputers. Dual disk drives are also necessary..

For more information contact Infographics, Inc., 17961 Cowan St., Irvine, Calif. 92714.

MERRIMACK, N.H. — **Facit, Inc.** has introduced two-pen plotter systems designed to meet the requirements of Hewlett-Packard Co.'s Graphic Language, which has become a standard in graphics printing.

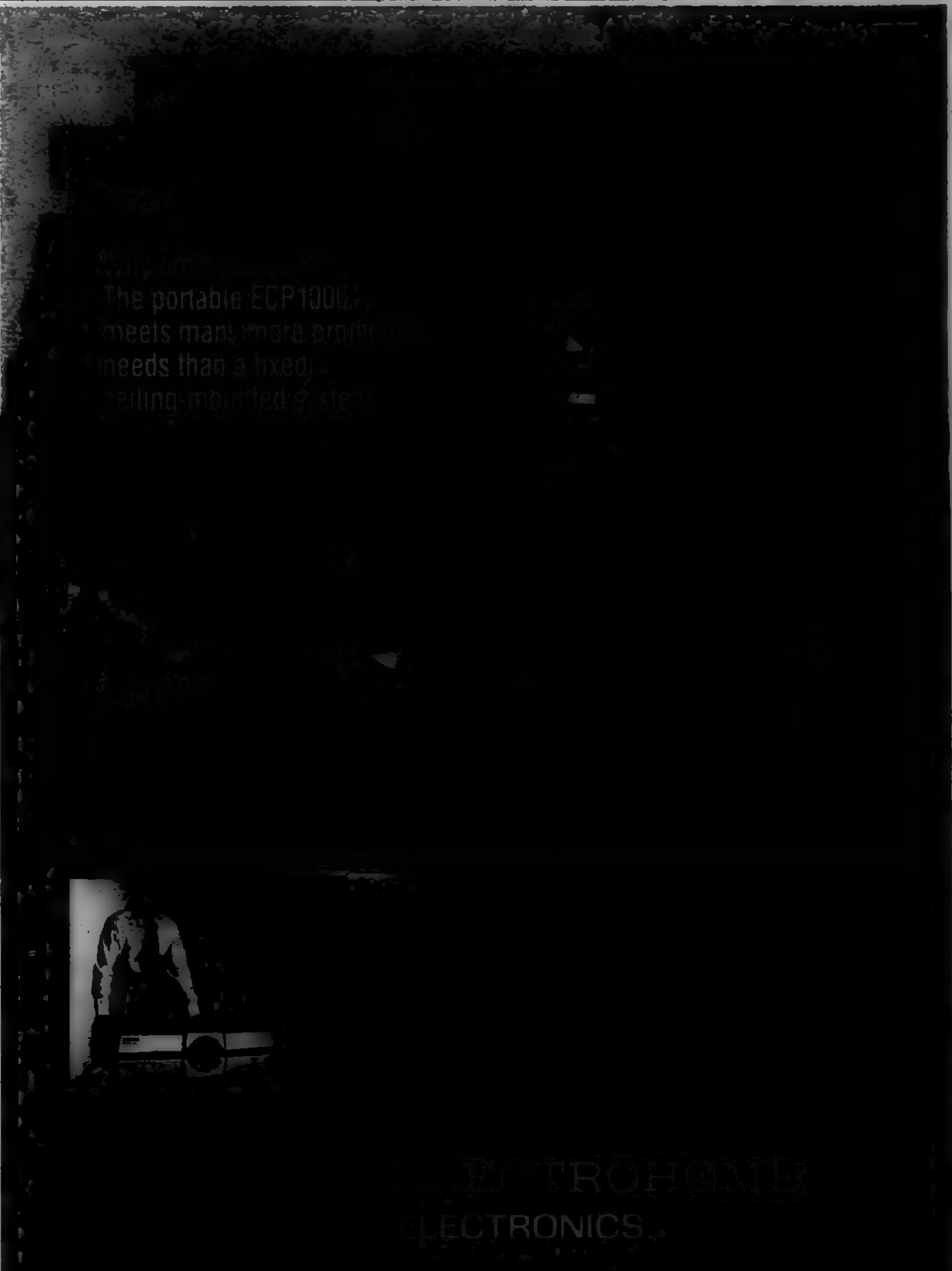
The 4550, priced at $795, accepts media in sizes up to 8½ in. by 11 in., and the 4551 accepts media sizes up to 11 in. by 17 in. Because of their HP GL emulation capability, the Pacit 4550 and 4551 run a wide variety of software for business graphics and computer-aided design/computer-aided engineering applications, the vendor said.

Further information is available from Pacit, 9 Executive Drive, Merrimack, N.H. 03054.

SANTA CLARA, Calif. — **Viewtech, Inc.** introduced its new Viewtech System, a third-generation computer-aided publishing system designed for corporate publications departments or in-plant users. The Viewtech System reportedly handles the publication process from copy to camera-ready art by allowing users to create, display and edit pages with both text and graphics in typeset form on screen.

The Viewtech System uses a 17-in. high-resolution screen monitor with detachable keyboard and three-button mouse. The system's software, written in C programming language, is comprised of over 160,000 lines of code. The cost of a six-workstation system is approximately $200,000, with each additional workstation costing in the $15,000 to $25,000 range.

For more information about the Viewtech System contact Viewtech, Inc., Suite 101, 2880 San Tomas Expressway, Santa Clara, Calif. 95051.



Calendar

April 16-19, Boston — **Network Management/Technical Control Conference and Exposition.** Contact: Network Management/Technical Control Conference and Exposition, Box 880, Framingham, Mass. 01701.

April 17-24, Hannover, W. Germany — **Hannover Fair.** Contact: Deutsche Messe-und Ausstellungs-AG, Abt. 311/RS, Messegelande, D-3000 Hannover 82, W. Germany.

April 23, New York — **Integrated Office Systems: User Needs and Vendor Response.** Also, April 25, Chicago; and April 30, San Francisco. Contact: Arthur D. Little Decision Resources, 17 Acorn Park, Cambridge, Mass. 02140.

April 23-25, Chicago — **Understanding Modern PBX Systems.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

April 24-26, San Francisco — **Unix Systems Expo/85 Spring.** Contact: Computer Faire, Inc., 181 Wells Ave., Newton, Mass. 02159.

April 24-26, New Orleans — **Spring '85 Seminar.** Contact: American Production and Inventory Control Society, Inc., 500 W. Annandale Road, Falls Church, Va. 22046-4274.

April 24-26, Washington, D.C. — **Computer Graphics for Business.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

April 25, New York — **Executive Briefing On Managing Information Resources for Competitive Advantage.** Contact: Research and Planning, Inc., 215 First St., Cambridge, Mass. 02142.

April 29-30, Chicago — **Local-Area Networks.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

April 29-May 2, Washington, D.C. — **Experts On Networks.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

May 1, San Jose, Calif. — **AT&T, IBM and Unix: Desktop Directions.** Contact: Yates Ventures, Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.

May 6-8, Los Angeles — **Micro-Mainframe Strategies.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

May 6-8, Boston — **Relational Data Base.** Also, May 13-15, Los Angeles. Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

May 6-9, Atlanta — **Comdex/Spring.** Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

May 8-10, San Francisco — **Local-Area Networks.** Contact: Technology Transfer Institute, 741 Tenth St., Santa Monica, Calif. 90402.

May 8-10, Washington, D.C. — **Advance '85 — The Information Age.** Contact: Advance '85, Women in Information Processing, Lock Box 39173, Washington, D.C. 20016.

May 14-15, New York — **Data Networks: New Solutions.** Contact: The Yankee Group, 89 Broad St., Boston, Mass. 02110.

May 20-22, Silver Spring, Md. — **1985 Trends and Applications Conference Utilizing Computer Graphics.** Contact: The Institute of Electrical and Electronics Engineering, Inc., P.O. Box 639, Silver Spring, Md. 20901.

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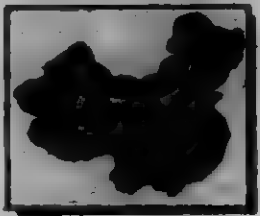

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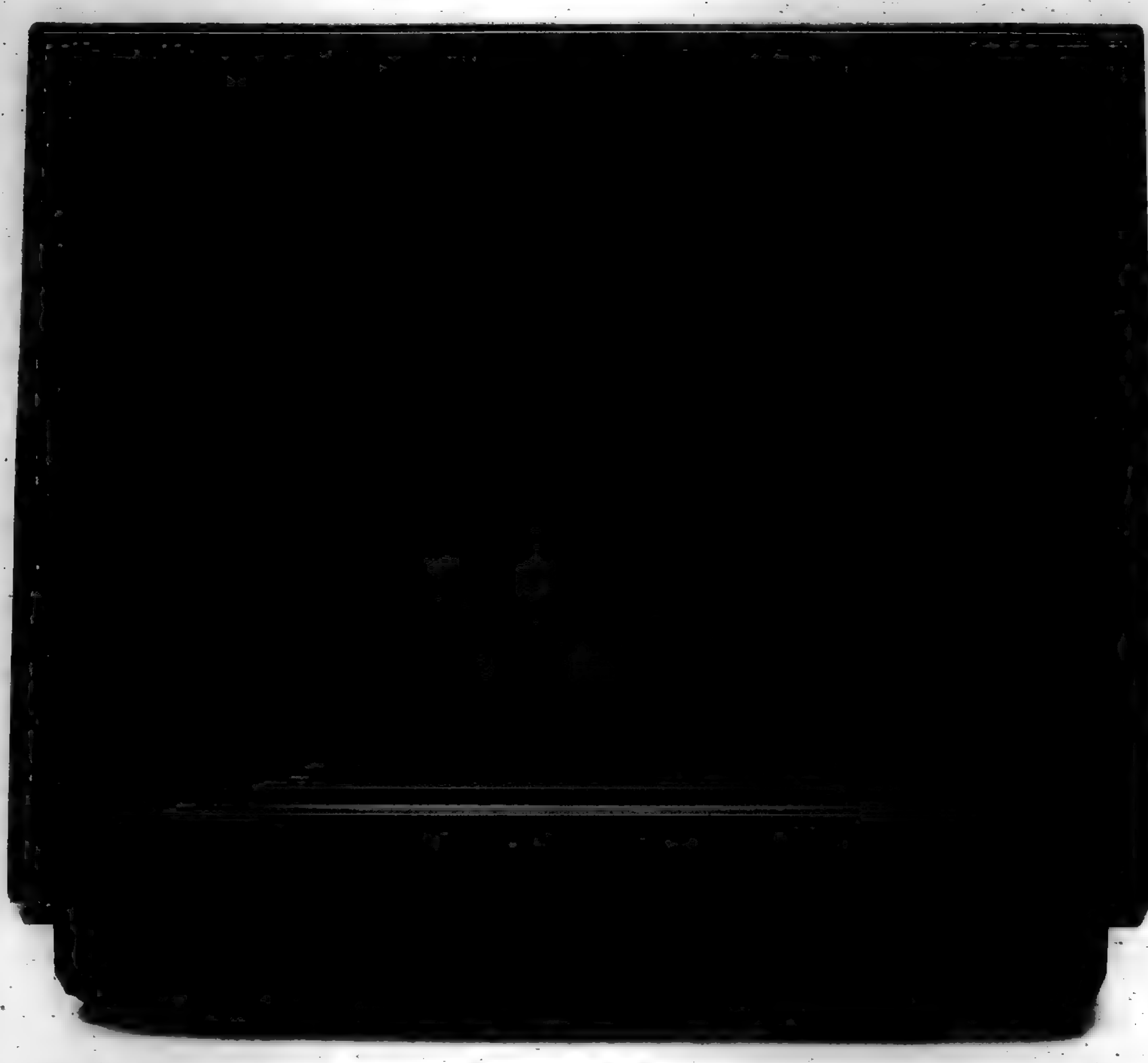

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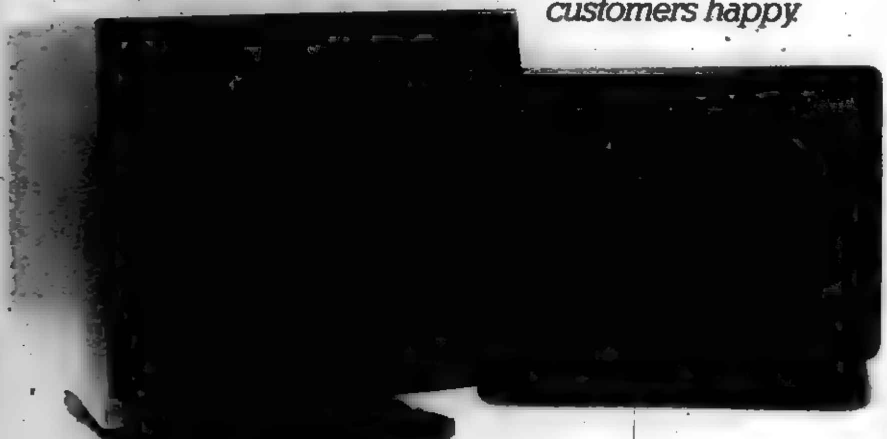

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E. F. Hutton to cut transmission costs with satellite network

Second in a four-part series on communications bypass strategies.

By John Dix
CW Staff

NEW YORK — E. F. Hutton & Co. is installing a bypass satellite communications network that will save the company $9.3 million over a seven-year period and pay for itself in roughly a year.

This diversified financial services company will use the satellite network provided by Equatorial Communications Co. of Mountain View, Calif., to broadcast information to its regional and branch offices and to update distributed data bases, according to Bernard A. Weinstein, E. F. Hutton's first vice-president of communications and branch information systems.

The data carried on the one-way network will provide branch offices with, among other things, current customer account information, product facts, technical research, news, market analyses and bond inventories, Weinstein said.

Roughly two-thirds of the broadcast traffic to be carried via satellite is currently transmitted over dial-up circuits; the balance is bundled into the company's interactive leased-line network. The benefits will be twofold: Using the Equatorial network will save money over dial-up connections, while "off-loading the broadcast traffic from the terrestrial network will help response time," Weinstein said.

That leased-line network costs E. F. Hutton $4.8 million each year and is used to interconnect a hierarchy of processors that includes the following:

- A host complex with two IBM 3081 Model Ks at corporate headquarters and

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TOP OF THE NEWS

Highlights and lowlights. Although some bright spots have appeared in the computer industry, quarterly financial results continue to reflect turbulent times. Page 2.

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Seeking stronger ties with the IBM world, DEC announced communications products including software that allows IBM micros to be used as Decnet nodes. Page 4.

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Sperry unwrapped a scientific processor for its 1100/90 series mainframes and added two entry-level machines to the series. Page 8.

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Seven software packages joined the ranks of the $100 million sales club at the annual International Computer Program's awards gala. Page 11.

■

Hostile takeover in the making? After Informatics rejected a takeover offer by Sterling Software, Sterling said it would continue with its plans and hired an investment firm to help. Page 97.

■

Software execs top pay survey

By John Desmond
CW Staff

WILLOW GROVE, Pa. — Managers of software systems programming are the highest paid DP employees in the U.S., while applications programming managers are a close second, according to a recent salary survey of 20 DP positions conducted by the Administrative Management Society.

The "Third Annual Data Processing Salaries Report," which surveyed 2,360 companies with 57,479 data processing employees in 114 U.S. and Canadian cities, revealed that systems programming managers in 1984 earned an average of $40,400 in the U.S., an increase of 5.8% over 1983 figures. Applications programming managers earned an average of $40,000, an increase of 3.4% over 1983.

Of U.S. DP employees, data base administrators earned the third highest average salary at $36,400, while lead programmer/analysts and computer operations managers averaged more than $35,000, and senior software systems programmers and systems analysts earned more than $30,000.

In Canada, a manager of applications programming was the highest paid DP employee, earning $42,500 ($31,335 in current U.S. dollars) annually, while managers of software systems programming earned $41,700, managers of computer op-

See REPORT page 4

IBM compatibles: They're making memories

NAS 7900 combines speed with data loss protection

By Jeffry Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — National Advanced Systems Corp. last week announced an IBM-compatible external storage unit that reportedly combines the speed of semiconductor memory with the nonvolatility of magnetic disks.

NAS' 7900 Semiconductor Disk Subsystem, which holds from 32M bytes to 512M bytes, backs up solid-state memory circuitry with integrated 8-in. Winchester disk modules, according to Kenneth Page, the company's peripherals marketing director.

If the flow of electricity is suddenly interrupted, the external storage unit automatically activates a built-in battery pack, which can nourish the 7900's volatile semiconductor memory for up to 15 minutes, Page said. While the battery furnishes emergency back-up power, the storage unit's contents

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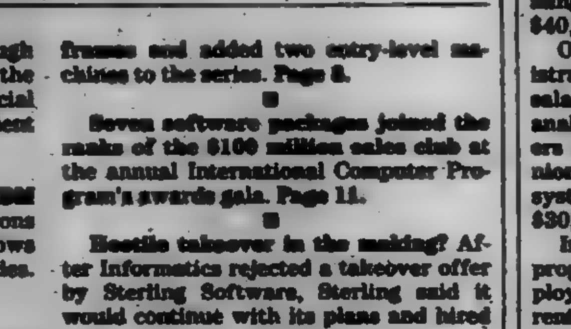

Memorex counters IBM 3380 with high-density 3680

By Charles Babcock
CW New York Bureau

NEW YORK — Memorex Corp. last week unveiled its response to IBM's recently announced double-capacity 3380 disk drive and year-old 3480 cartridge tape unit.

Memorex introduced the following five products:

- A double-deck configuration of the Memorex 3680 disk drive that is said to offer 10G bytes of storage and occupy roughly 45 square feet of computer room floor space.
- A tape cache processor that Memorex claimed offers an alternative to users who do not want to migrate from the 10½-in. IBM 3420-type tape unit to IBM's newer 3480 cartridge model.
- Two tape drive control units said to be replacements for IBM's 3803 tape controllers, commonly used with IBM 3420-type tape drives.
- An eight-port communications con-

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Quarterly financial results reflect turbulent industry

Vendors report varied profit, revenue gains

Financial results for the latest quarter continue to highlight the turbulent waters in which computer companies are operating, although reports of revenue gains and profits from Burroughs Corp., Honeywell, Inc., Amdahl Corp. and Apollo Computer, Inc. go against the tide of recent industrywide declines.

Meanwhile, Apple Computer, Inc. reported that second-quarter results were up from year-earlier levels but were well below the results posted in the company's record first quarter of 1985 and fourth quarter of 1984, and Gould, Inc. reported profits were off 18% with a 4% revenue decrease.

Storage Technology Corp. (STC), engaged in bankruptcy-court-supervised reorganization, reported a loss of $505.5 million in 1984, which included fourth-quarter write-offs of inventory and expenses related to the reorganization.

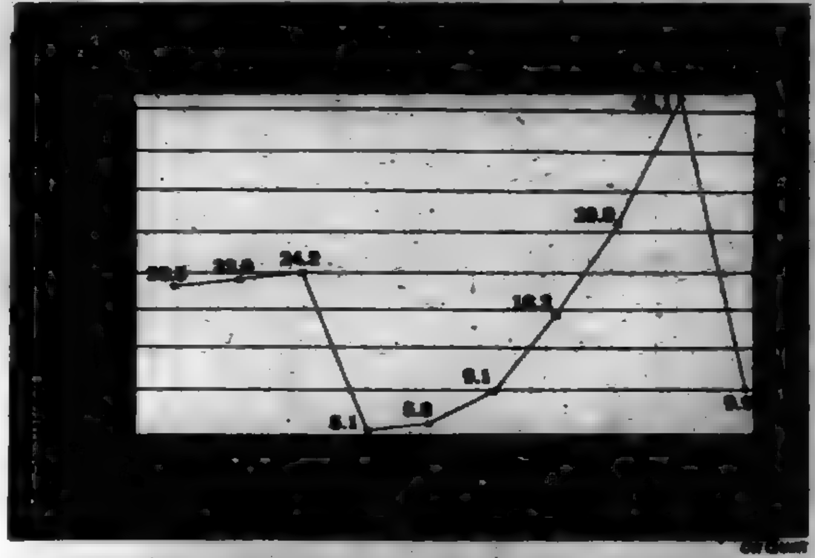
Burroughs posted profits of $46.6 million, or $1.08 per share, up 8.4% from $43 million, or 95 cents per share, in the first quarter a year earlier. Revenue was $1.16 billion, up 7.8% from $1.08 billion a year earlier; sales revenue was up 15.1%, however, while rental income declined by 17.7%.

Honeywell reported profits of $46.2 million, or $1 per share, up 16.7% from first-quarter 1984 profits of $39.6 million, or 96 cents per share. Revenue for the quarter was $1.48 billion, up 7.6% from $1.37 billion a year earlier. The company said growth in large-systems orders more than offset a significant decline in small-systems orders; it recently announced production halts and the elimination of some jobs at its Billerica, Mass.-based Small Computer and Office Systems Group [CW, April 15].

Plug-compatible mainframe vendor Amdahl reported first-quarter revenue of $177.5 million, up almost 2% from $174.5 million a year earlier. The company posted profits of $47.5 million, or 9 cents per share, compared with year-earlier profits of $46.1 million, or 9 cents per share.

Rounding out the positive results, Apollo doubled its profit of the first quarter a year ago, posting earnings of $8.8 million, or 26 cents per share. Sales revenue in the first quarter jumped to $82 million, compared with sales of $37 million the same quarter last year.

Apple, which earlier this year [CW, March 11] announced scheduled production halts to reduce inventories, said second-quarter revenue was $435.3 million, up 45% from $300.1 million in the second quarter of 1984. Profits were $9.5 million, or 16 cents per share, up 9% from year-earlier profits of $7.4 million, or 15 cents per share.



CW Chart

At the time, second-quarter 1984 results were considered disappointing, slumping from the first quarter of 1984, and second-quarter 1985 results were also well below Apple's performance over the previous six months. In the fourth quarter of 1984, Apple posted profits of $30.8 million on revenue of $477.4 million; in the first quarter of 1985, the company posted profits of $46.1 million on revenue of $698.3 million.

Gould said first-quarter revenue from continuing operations was $343.3 million, compared with $363.1 million a year earlier; profits were $18.1 million, or 41 cents per share, down from $20.9 million, or 46 cents per share.

STC, which last fall filed for protection under Chapter 11 of the U.S. Bankruptcy Act, reported 1984 revenue of $808.6 million, compared with $886.6 million in 1983. It posted a $505.5 million loss, or $14.62 per share, compared with 1983 losses of $40.9 million, or $1.19 per share.

STC's fourth-quarter results showed a loss of $419.2 million, or $12.13 per share, on revenue of $151.9 million; in the fourth quarter of 1984, STC showed a loss of $35.4 million, or $1.03 per share, on revenue of $226.9 million. The firm said it posted in the fourth quarter $279.7 million in nonrecurring expenses and inventory write-offs relating to divestiture and the reorganization.

Paradyne files opposing response to pending HHS ban

LARGO, Fla. — Paradyne Corp. has filed its response and opposition to the U.S. Department of Health and Human Services' (HHS) proposal to disbar the company from supplying equipment to the federal government.

In March, an HHS task force determined that Paradyne misrepresented the status and availability of data communications equipment in a $118 million contract with the Social Security Administration (SSA) [CW, March 18]. The SSA's "allegation was that we [had] described the product in the present tense, [but] we had not put it into production yet," said George B. Pressly, Paradyne senior vice-president. "They said that was a contradiction and we misled them."

In its response, Paradyne said that "all proposals and products are described in the present tense," Pressly said. "The only requirement was that we put together off-the-shelf components that were commercially available, and we did that. We conformed to the requirements of the [request for proposal]."

Asked whether the product was in fact available when shown to the SSA, Pressly said Paradyne "had done a lot of testing of the device, but it was actually put together and integrated at some point after that."

NEWS SUMMARY

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DEC tools pump up integraton to IBM environments

By John Dix
CW Staff

TEWKSBURY, Mass. — Digital Equipment Corp. last week announced software products reportedly aimed at integrating DEC and IBM environments at the personal, departmental and corporate levels.

Products unveiled include software that enables IBM Personal Computers to be used as nodes in Decnet networks, software that facilitates the programming of DEC applications that need to cross into IBM domains and protocol emulators for DEC's family of multiuser Micro/PDP-11s, with which attached terminals can emulate IBM 3270-type terminals.

The announcements, which complement earlier products and commitments, were viewed by analysts as building blocks in DEC's communications strategy. "This is the centerpiece of DEC's internetwork strategy," said Kim Myhre, director of communications industry research at Framingham, Mass.-based International Data Corp. (IDC). "DEC wants to penetrate IBM accounts, and they need IBM compatibility to do that."

The introduction of Decnet-DOS comes on the heels of the Decnet-Rainbow communications software package announcement last month [CW, March 11]. With Decnet-DOS, IBM Personal Computers and Personal Computer XTs can be integrated as end nodes in Decnet networks and communicate with other nodes, according to the company.

"Decnet-DOS gives high-horsepower network functions to the IBM Personal Computer," noted Eric Killorin, president of Hyatt Research Corp., a research firm in Andover, Mass.

The IBM processors are tied into Decnet through IBM's Asynchronous Communications Adapter, which provides an RS-232 interface at 9.6K bit/sec., using DEC's Digital Data Communications Message Protocol. A caveat is that the micros must be connected through a DEC minicomputer that acts as a network router. "This is a less expensive way to interface the personal computers to the network, but less functional," Killorin said.

Decnet-DOS is said to provide file transfer and remote data-access capabilities for sharing data across a network, remote resource access to shared peripherals, virtual disk capability to expand storage, task-to-task communications to develop distributed applications and network management for tracking the status of a network, DEC reported.

Slated to be available in September, Decnet-DOS will cost $500.

Software announcements

Three software packages were announced that are said to lessen the complexity of integrating DEC environments with IBM Systems Network Architecture (SNA) environments. IDC's Myhre said these products enable users to maximize DEC applications in other processing environments.

- Decnet/SNA VMS Advanced Program-to-Program Communications/LU6.2 (APPC) Programming Interface. This package enables VMS-based applications on VAX and Microvax systems to communicate on a peer-to-peer basis with IBM host applications via the previously announced Decnet/SNA Gateway , the company said.

The APPC Programming Interface reportedly insulates programmers working in VMS environments from underlying SNA concerns, freeing them to concentrate on applications development. All Decnet/SNA interconnect functions are transparent to the programmer, the company said. Available in June, the product costs $2,500.

- Decnet/SNA VMS Application Programming Interface (API). API is said to enable user-written applications running on VAX/VMS and Microvax/Micro VMS systems within Decnet to exchange files and data with IBM host applications. Also available in June, API costs $1,500.
- Decnet/SNA VMS 3270 Data Stream Program Interface. This package enables user-written applications on VAX systems running VMS or Micro VMS to exchange messages with IBM 3270 applications. Designed like the APPC Programming Interface to insulate programmers from the inner workings of SNA, the program is said to send and receive 3270 data streams as defined by IBM. The product will be available in June for $2,500.

Finally, the Micro/RSX 2780/3780 and Micro/RSX 3271 Protocol Emulators are said to be layered software products for DEC's multiuser Micro/PDP-11 processors that provide support of IBM's Binary Synchronous Communications protocol in a batch or interactive manner.

The former product, available next month, costs $1,200. The Micro/RSX 3271, also available next month, costs $900.

REPORT

from page 1

erations averaged $40,900, and data base administrators earned $39,500.

The lowest paid DP employees were data entry operators, who were paid $13,200 in the U.S. and $18,200 ($13,419 current U.S. dollars) in Canada.

Among the five U.S. regions included in the survey, the lowest salaries were reported in the West Central U.S., an area including Wisconsin, Minnesota and Kansas, where 11 of the 20 positions averaged the lowest salaries.

Highest salaries

The highest salaries were reported in the western U.S., including Washington, California, Oregon and western Texas, where nine of the 20 positions studied posted the highest salaries.

The highest paying industry for DP employees is utilities, which paid the top salary average in 17 of the 20 positions surveyed. The utility industry was followed by the manufacturing and processing sector in average pay. The top-position industry area, an applications programming manager working for a utility in the West, averaged $47,600.

Other businesses represented in the survey were banking and insurance, retail/wholesale sales and distribution, DP service bureaus and a composite group including government, education and medicine.

Raises based on merit

The AMS survey found raises are most often awarded on merit, with 78.8% of U.S. companies relying on that method. Less than 8% gave raises based on longevity, cost of living or equity.

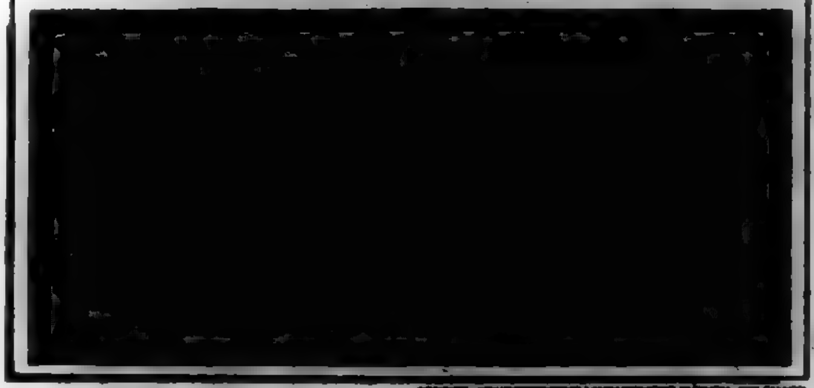
A workweek of 40 hours or more was reported by 68.6% of U.S. DP managers, only 1% of whom said they are union members.

Findings in the current survey were consistent with past findings. Last year, applications programming managers were the highest paid, with average salaries of $36,700. U.S. managers of software systems programming, with average salaries of $36,160, were the highest paid professionals in the 1983 survey.

Applications programming managers at the Los Angeles Water and Power Co., who fit the profile of the highest paid by industry and location, at $50,000 yearly earn more than the survey's top average, according to Dale Benske, assistant MIS director at the utility.

"We get recruiters calling here two to three times a week asking for the names and phone numbers of these guys," Benske said.

The 1985 salary survey is available for $55 for AMS members and $65 for nonmembers from AMS at 2360 Maryland Road, Willow Grove, Pa. 19090.



SOURCE: ADMINISTRATIVE MANAGEMENT SOCIETY; CW CHART

Salaries of IEEE members up 15%

WASHINGTON, D.C. — The median annual income of members of the Institute of Electrical and Electronics Engineers, Inc. (IEEE) was $46,100 as of Feb. 1, according to a survey of 11,000 IEEE members in electrical and computer engineering, electronics and computer science professions.

The "1985 IEEE U.S. Membership Salary and Fringe Benefit Survey" revealed that the median annual income of IEEE professionals increased more than 15% over that of the previous year, while the U.S. Consumer Price Index increased 8%.

Individual salaries ranged from $28,900 to $72,000, and only 0.4% of the respondents reported being unemployed. Salaries increased commensurately with experience, with median incomes ranging from $28,000 with one year of experience to $56,000 with 30 years or more.

Electrical engineers in the San Francisco-Oakland, Calif., area earned the highest median income at $53,000.

The 135-page study, prepared by Abbott, Langer & Associates of Crete, Ill., under contract to the IEEE, is available for $29.95 for members and $49.95 for nonmembers before May 10. After that date, rates are $49.95 and $69.95, respectively. Inquiries can be sent to the IEEE Service Center, Publications Sales, 445 Hoes Lane, Piscataway, N.J. 08854.

— John Desmond

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SUSPENSE

How did IBM's rookie sort (Rel 7.0) do in its first meeting with "Lefty" SyncSort? Read all about it!

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It is one of those historic moments in the Annals of Sort! The very first appearance in competition of IBM's new DFSORT, Release 7, in the tough-as-nails MVS/XA League. Will the kid be able to live up to his advance press notices?

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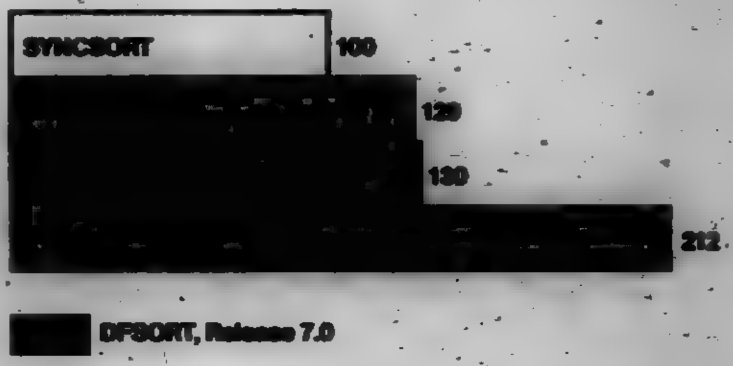
Then, as sorting fans everywhere gasp in amazement, he lifts his arm lazily and points toward the centerfield flagpole, thousands of bytes away. The kid is going to try to emulate Babe's mighty homerun shot!

Moments later, SyncSort winds up… a curving white blur is seen… and… and…

There is no joy in Armonk! DFSORT7 struck out every time it came to bat against the latest release of SyncSort (Release 2.SE) in a recent series of MVS benchmark tests. (In sorting, as in most other forms of human endeavor, it's a long way from *baby* to *Babe*.)

The bar charts below tell the story more eloquently than we can:



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MEMOREX from page 1

troller, reportedly a low-end alternative to the 16- and 32-port communications controllers offered by IBM.

■ An enhanced version of Memorex's 2078 CRT terminal, called the 2080.

The 3680 High Density Package (HDP) uses eight single-density head disk assemblies with thin-film read/write heads to provide 10G bytes of storage within a 26-sq-ft footprint. It is 82 in. high, compared with the 50-in. standard 3680 disk drive. With service clearances, front and rear, the 3680 HDP requires 44.5 sq ft of floor space, company spokesmen said.

Each of the eight head disk assemblies in the 3680 HDP has two actuators, each capable of independently addressing half, or 630M bytes, of the total physical module. This, Memorex said, prevents a decrease in performance compared with the original single HDA 3680.

In addition to thin-film read/write heads, the 3680 HDP uses 4mm-thick substrate media, independent microprocessors for each actuator and an additional microprocessor for diagnostics and monitoring.

Although Memorex is touting the 3680 HDP as its response to IBM's dual-density 3380s, Memorex officials said last week that the company still hopes to unveil a double-density version of the 3680 at an unspecified date.

The purchase price of the 3680 HDP is $310,310, with shipments to begin in the third quarter, spokesmen said.

Memorex also announced a 3520 tape cache processor, an intelligent I/O device that can exchange information with IBM mainframes at channel speeds of 3M byte/sec., while allowing users to retain the slower Memorex 3420-type tape drives, which offer a 1.25M byte/sec. data transfer rate.

The 3520 is built by Intellistor of Longmont, Colo., a manufacturer of solid-state storage devices that is serving as an OEM to Memorex. The purchase price for a one-module configuration of the 3520 is $85,000. A two-module version costs $170,000. Both units will be available in the fourth quarter, the company said.

In addition to the tape cache processor, Memorex also bolstered support for IBM 3420-type tape units with two tape control units: the 3201 single magnetic tape controller and a 3202 dual tape controller. Each unit features its own power supply.

Made for Memorex by Fujitsu Ltd., the tape control units are compatible with IBM 370, 3033, 3080 and 4300 processors, spokesmen said.

The 3201/3202 models reportedly are also able to serve both the Memorex 3220 line and its smaller 3265, 3266 and 3288 tape drives.

The 3201/3202 microprocessor controls transfer of data at 1.25M byte/sec., and each cabinet has a floor space requirement of 5.63 sq ft. Two 3202 units (or four control units) can work in unison, allowing a maximum of eight CPUs to operate with up to 16 tape drives.

The Memorex controllers also are said to offer fault-tolerant capabilities. For example, if one controller in a maximum configuration becomes inoperative, the remaining three will be able to support all 16 drives.

The 3201 and 3202 controllers will be available in June and cost $41,390 and $62,780, respectively.

An eight-port remote cluster controller, the 2174-8, operates within IBM's Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) communications protocol. Manufactured by McData Corp. of Boulder, Colo., the unit is compatible with the IBM 3274-51C cluster controller and can control communications to IBM 370, 3033, 3080 and 4300 series hosts. Available immediately, it costs $5,595 for a single unit, spokesmen said.

The 2080 display station was also announced for bisynchronous or SNA/SDLC 3270 environments. It can connect to a Memorex or IBM controller via a Category A interface and communicates with IBM's 360, 370, 3033, 3080, 4300 and 8100 processors. Its tilt screen rotates 360 degrees. Available in 30 days, it costs $1,995, spokesmen said.

Memorex is a subsidiary of Burroughs Corp., San Tomas at Central Expwy., Santa Clara, Calif. 95052.

NAS from page 1

are dumped from random-access memory (RAM) to disks. After the 7900's primary power source is restored, the data is reloaded from nonvolatile disk to the subsystem's semiconductor memory, which uses 256K-bit RAM chips with 0.3-msec access times, according to Page.

Transfer rate

A fully configured 7900 subsystem transfers an aggregate of 12M byte/sec. and can be expanded to hold up to 512M bytes, he said.

Part of NAS' Alliance generation of products, the external storage subsystem consists of three main components — a controller, storage unit and battery backup unit.

The Model 7970 controller contains two storage directors, an equal number of 3M byte/sec. data paths and a choice of two- or four-channel switches.

With an optional "quad-porting" capability, a 7900 can reportedly be upgraded to hold a second controller, for a total of four data paths into the subsystem.

In addition to the two controllers, a fully configured system can incorporate up to four Model 7990 storage units, each ranging in capacity from 32M to 128M bytes. When equipped with both the quad-port option and the four-channel switch, the storage units can support a total of up to 16 data paths and can allow 7900 users shared access to as many as eight CPUs, Page said.

Floor space requirements

Both the 7970 controller and 7990 storage unit reportedly occupy 1,024 square inches of floor space per unit, compared with 576 square inches of space for the Model 7995 battery backup unit.

Depending on the configuration, the 7900 emulates IBM's 3330, 3350 and 3380 disk systems or their NAS equivalents.

A typical 7900 configuration with a controller, one 128M-byte storage unit and battery backup costs $498,000, according to the vendor. Shipments of the subsystem begin in August.

More information is available from NAS, which is located at 800 E. Middlefield Road, Mountain View, Calif. 94040.

STC from page 1

pacity 3380 disk drives, 5.04G bytes, and will cost roughly 71% more than STC's single-capacity 8380 models offering 2.5G bytes of storage. For example, a single-capacity 2.5G-byte 8380 Model B4 currently costs $63,150; a dual-capacity model would cost roughly $107,986.

Current users of the 8380 will reportedly be able to field-upgrade to the dual-capacity models by swapping the unit's single-capacity head disk assembly with a dual-capacity head disk assembly. Current users of IBM 3380 disk drives cannot upgrade to the dual-capacity 3380s.

When it announced the dual-capacity 3380 in February, IBM also announced two 2.5G-byte disk drives, the Models AD4 and BD4 [CW, Feb. 11]. Only these models are field upgradable to the 5.04G-byte, dual-capacity models. That upgrade will be available in the fourth quarter.

Because STC's dual-capacity upgrades may not be available until mid-1986, the company may have trouble making a significant dent in IBM's installed base of 3380s. IBM reportedly told industry analysts at a recent seminar in Poughkeepsie, N.Y., that since March 1, it has shipped roughly 6,000 spindles, or 3,000 units, of its single-capacity 3380 drives (Models AD4 and BD4).

— [illegible]

Logic bombs a 'people problem'

By Kathleen Sullivan
CW West Coast Bureau

LOS ANGELES — In the annals of computer crime, there are only a handful of cases involving saboteurs who planted logic bombs in computer systems. Among the 1,500 sabotage cases recorded since 1958, no more than five or six were associated with logic bombs, said Donn Parker, a computer security consultant at SRI International, Inc., a Menlo Park, Calif.-based research firm.

In early March, the Los Angeles Department of Water and Power joined this elite group of computer crime victims when its central computer was paralyzed for five days by a logic bomb [CW, April 15].

Parker noted that the statistics on logic bombs may be misleading, since firms are reluctant to call attention to such incidents. "Among the known cases, logic bombs are not very common, but they are also the kinds of cases that are not ever reported."

Logic bombs — software programs designed to destroy, remove or rearrange information in a computer at a given time — are usually placed by employees who have the skill, knowledge and access necessary to plant the bomb, he said.

"It's . . . not a technological problem, even though its manifestation is technological," Parker said. "This is a 'people problem,' so attention must be turned to human controls.

"It is not opportunity that motivates people to plant a logic bomb; it is the presence of intense personal problems," Parker said.

To deal with the problem, Parker suggested the following:

■ Develop an intelligence network within the organization to identify unhappy employees.

■ Train on-line managers to be more sensitive to employees' personal problems.

■ Offer employees access to confidential counseling services to help them deal with emotional problems.

■ Garner employee support for computer security policies by including it as an item in performance and salary reviews.

■ Develop a code of conduct and make sure that each employee signs the document once a year.

■ Limit physical access to the computer.

■ Maintain dual control over sensitive functions.

■ Implement good logging procedures so that a computer security manager will be able to track who performed certain functions on the system. Analyze the log's contents regularly for deviations.

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Storage announcements underscore vendor strategies

By Tom Henkel
CW Staff

An interim step for Memorex Corp., another open door for Fujitsu Ltd. and a new niche market for National Advanced Systems Corp. (NAS) was how industry watchers viewed a series of IBM-compatible storage products announced last week.

The three most significant products announced by Memorex appeared to be an admission that the Burroughs Corp. subsidiary is not ready to counter IBM's recently announced dual-capacity 3380 disk drives and year-old 3480 cartridge tape unit.

Memorex unveiled the 3680 High-Density Package (HDP) disk subsystem, capable of storing up to 10G bytes of data in roughly the same computer room floor space as similarly configured dual-capacity IBM 3380 disk drives. The 3680 HDP reportedly occupies 40% less floor space than than the older single-capacity 3380s available from IBM.

"It's a gap filler," noted Raymond C. Freeman Jr., president of Freeman Associates, Inc. in Santa Barbara, Calif. He added that Memorex does not want to lose its current footing in the IBM-compatible marketplace and must therefore maintain at least the appearance of parity with IBM.

Freeman made it clear that he does not view the 3680 HDP as Memorex's final answer to IBM's dual-capacity 3380s. He expects Memorex will eventually announce a disk drive similar to the dual-capacity 3380.

If Memorex does unveil a dual-capacity 3380-type product, it will probably mean the end of the 3680 HDP. Neither Freeman nor E. F. Hutton & Co. analyst Michael Geran viewed the 3680 HDP as a long-term strategic product for Memorex. However, both admitted that the unit may be an attractive option to Memorex users who must expand disk capacity and have floor space restrictions.

As with the 3680 HDP, both Freeman and Geran viewed Memorex's tape cache processor and tape control units announced last week as an admission that Memorex is unable to develop a direct response to IBM's 3480 tape drive anytime soon.

By taking the interim step of bolstering its support for its IBM 3420-type tape units, Memorex may be able to accomplish two things: It could strengthen its position in the IBM 3420 disk drive marketplace by offering additional products to IBM users who are not prepared to buy 3480s; and by offering the tape cache processor, it can offer some of the features of the 3480 and improve its marketing position vis-a-vis IBM.

Memorex broadens Fujitsu ties

An aspect of the Memorex announcement that may not have a major impact until several months down the road is the company's broadened relationship with Japanese hardware manufacturer Fujitsu. Last week, Memorex announced two tape control units based on Fujitsu units.

Memorex's increased dependence on Fujitsu implies that Memorex will probably turn to Fujitsu as a supplier of a 3480-type tape unit, E. F. Hutton's Geran noted. If this turns out to be the case, Fujitsu may run into some problems supplying the same unit to Amdahl Corp., a longtime domestic remarketer of Fujitsu products and a company the Japanese firm half owns.

While Memorex was trying to keep up with IBM, NAS jumped into a marketplace heretofore dominated by Memorex and Storage Technology Corp. (STC). NAS unveiled a solid-state external memory subsystem for IBM and NAS mainframes that features a battery-powered disk backup.

The idea of solid-state memory subsystems is not new. STC first offered such a device to IBM mainframe users in 1979, when it announced the 4305. Memorex followed suit with the 3864 in 1983. The units were designed as high-speed random-access memory (RAM) external storage for applications requiring swapping and paging. The high cost of the units has limited the demand for solid-state memory to specialized applications, Freeman noted.

But with the increasing overall cost of mainframe computer systems and spiraling user demands for system resources, more users appear to be able to justify the price for solid-state external storage. Spokesmen for both Memorex and STC said the demand for their solid-state devices has been steadily increasing. Memorex's 3864 product manager, Harold Stanley, noted that in the past month Memorex has received twice as many orders for the 3864 than normal.

The NAS 7900 offers two advantages over the older 4305 and 3864. The 7900 uses 256K-bit RAM chips vs. 64K-bit chips in the 4305 and 3864, and it includes a battery-powered disk drive to store information in the event of a power failure. The others contain only volatile RAM, which means that if the power is lost, so is the data in the solid-state external storage device.

David Vellante, an analyst with Framingham, Mass.-based International Data Corp., noted that STC and Memorex could easily add a drive to back up their solid-state external memory devices as well. Both will also probably offer versions of their devices with 256K-bit memory chips.

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Sperry introduces scientific multiprocessing system

Operates with 1100/90 CPUs for high-speed computations

By Donna Raimondi
CW Staff

BLUE BELL, Pa. — In a trio of announcements last week, Sperry Corp. unwrapped a scientific processor capable of supporting both high-speed vector and scalar computations and introduced two entry-level 1100/90 mainframes and announced sweeping price cuts on its entire 1100/90 processor line and related products (see story below).

The Integrated Scientific Processor (ISP) is said to operate with the company's 1100/90 series mainframes as a tightly coupled multiprocessor. The ISP functions can be added to a user's existing Sperry 1100/90 series machine or purchased complete with the 1100/90 computers, the vendor said. The ISP reportedly is capable of supporting both high-speed vector and scalar computations.

The basic ISP system includes a Sperry 1100/90 CPU, an ISP, an I/O unit, an instruction processor cooling unit and a 36-bit-word scientific processor storage unit that is shared by the 1100/90 CPU, the I/O unit and the ISP.

The price of the system is approximately $3.5 million as an enhancement to an existing 1100/90 processor, with volume shipments slated between April 1986 and June 1986, the vendor said.

The basic 1100/90 machine costs approximately $2.4 million, the vendor added.

ISP's target areas

The ISP was designed for use in areas that include physical systems simulation, structural analysis, reservoir modeling and seismic processing, the vendor said. The system executes under the Sperry OS 1100 operating system.

The ISP shares residence in the host Sperry 1100/90 CPU and accesses its job queue and data directly from memory without crossing a channel interface, Sperry said. The 1100/90's main memory is replaced by high-speed memory that is essentially the same as the 1100/90's but that is said to be twice as fast. Users with 1100/91 machines can add the high-speed storage to existing memory, the vendor said.

Peak performance of a single ISP is said to be 133 millions of floating-point operations per second (Mflops) in single precision (36-bit words) and 67 Mflops in double precision (72-bit words). Average performance of the ISP is said to be in the 20- to 30-Mflop range for single precision and twice that for double precision, the vendor said. Instruction sets for both single and double precision are included.

Two ISPs can be connected into a single 1100/90 host system. The memory supporting the ISP is capable of transferring data to the processor at 133 million words per second for single precision or 67 million words per second for double precision.

The ISP is said to perform six to nine times faster than a Sperry 1100/90 in a scientific environment. Livermore loops and other benchmark tests qualify the ISP system for the Class VI supercomputer category, the vendor claimed.

The configuration of the ISP reportedly allows system performance to be tailored so that more general processing, more I/O processing or more scientific vector processing is possible. The system can be expanded to the maximum configuration of four 1100/90 CPUs, two ISPs, four I/O units and as much as 64M bytes of storage.

Included with the software for the machine is a Fortran 77 compiler with extended vector syntax, an automatic vectorization facility that permits Fortran source maintenance in Ansi Fortran syntax and tools for performance measurement, interactive debugging and simulation software support. All program development software developed for the 1100/90 is supported in the ISP environment, the vendor said.

Sperry joins National Advanced Systems, Inc., Amdahl Corp. and Honeywell, Inc., each of which has announced specialized processors or processor attachments aimed at scientific users in the past six months.

More information can be obtained from Sperry, which can be reached through P.O. Box 500, Blue Bell, Pa. 19424.

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Encore unveils first products

HANNOVER, West Germany — Nearly two years after its founding, Encore Computer Corp. introduced its first two products — a high-resolution interactive display station and a software development environment — here last week at the Hannover Faire.

The Hoststation 100 can access up to three hosts and display data in three Hostwindows simultaneously, Encore said. The windows can support Digital Equipment Corp. VT100, Tektronix, Inc. 4010 and 4014 and the Remote Graphics Instruction Set protocols.

The Hoststation's 19-in. noninterleaved monochrome monitor provides 1,056- by 864-pixel resolution, the company said. Priced at $3,495, the system is shipping now.

Encore's Ally environment, designed to automate routine software development tasks, reportedly will run on any operating system and file access method. Any Ally-written application will run without recompilation on any machine equipped with Ally, the firm said. An Application Development Dialog can be used by nonprogrammers and developers.

Ally, available now, will range in price from $100,000 for a development license on a large mainframe to $200 for a runtime license on a personal computer, Encore said.

The supplier called the products the first in the Encore continuum, "a framework for integrating computers, programs and methods of access."

More information is available from Encore at 15 Walnut St., Wellesley Hills, Mass. 02181.

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BYPASS

from page 1

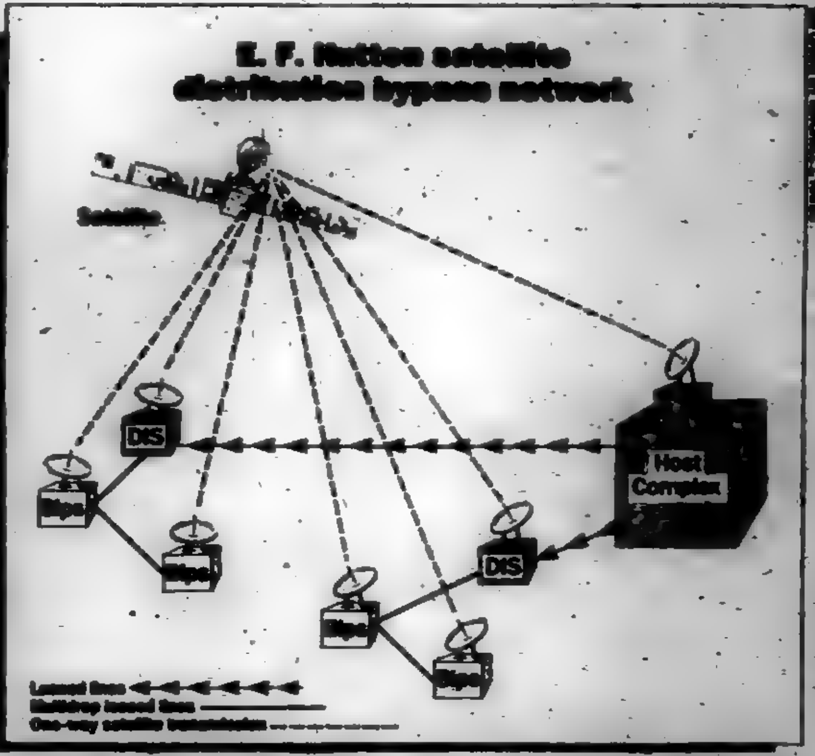
an IBM 3081 Model Q at an alternate site that can be used for disaster recovery.

- A mix of 40 Data General Corp. Eclipse MV/4000s, MV/8000s and MV/10000s that makes up DG's Distributed Information Systems (DIS) as used at E. F. Hutton regional centers.
- Four hundred DG MV/4000s that are being installed in branch offices as Branch Information Processing Systems (Bips).

The 40 regional DIS systems, which are tied into the host complex with point-to-point leased lines, act as distributed data bases as well as communications concentrators for up to 20 surrounding branch offices, Weinstein said. Branch offices with Bips systems, roughly 100 of which have been installed, are supported with multidrop leased lines. When completed, the system will reportedly have in excess of 10,000 terminals.

Because all of the systems are integrated into the same architecture, "an inquiry from a broker can be served locally by a Bips computer at the regional level or at the host level," Weinstein explained. This also provides for the isolation of failed processors.

"If you lose a processor, its load is handled at the next level up," he said. "If we lost a regional DIS system, that inquiry would be serviced by the host. The host replicates all the data bases." The switch around failed nodes is done manually at the site.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DIS
Bips
Host Complex
DIS
Bips
Bips
Bips
Leased lines
Multidrop leased lines
One-way satellite transmission

The Distributed Information Systems are Data General Corp. Eclipse MV/4000s, MV/8000s or MV/10000s. The Branch Information Processing Systems are DG MV/4000s.

The leased-line network is typically used to place orders originating from branch offices with a stock exchange, transmit data regarding confirmation of trades, collect information used to update central records, and support interactive inquiry/response applications. It does not make sense to use the leased-line network, which was designed to carry high-speed traffic for short periods of time, to do updating, Weinstein said. That update traffic is now destined for the satellite network.

Installation of the roughly $1.25 million Equatorial system was started this year and is slated to be complete before year's end.

When finished, a single transmission will be able to update every distributed computer by beaming the signal from an antenna on top of E. F. Hutton's headquarters here up to a satellite and down to all the remote locations simultaneously.

A $2,500, 24-in. receive-only satellite dish antenna will be installed at each of 400 E. F. Hutton sites, providing 19.2K bit/sec. worth of bandwidth to every office. C-band satellite technology is used in this system because with it one does not have to worry about atmospheric interference, Weinstein noted. He also said that broadcasting data out of New York in the C-band frequency — which can interfere with terrestrial microwave, particularly in cities — is not a problem.

While the system can easily be cost-justified as a replacement for dial-up circuits used to broadcast one-way traffic such as reports and research needed by brokers in the field, other applications might accelerate the payback.

Weinstein said E. F. Hutton is building its own ticket plant to take stock, bond and commodity ticket feeds from the various exchanges, process them and then beam them out to branch offices.

Additionally, the network may be used to replace what is known on Wall Street as the "Hoot and Holler" system.

"Hoot and Holler" is a type of nationally broadcast audio show of opinions on financial markets, providing such features as a morning market comment. It is currently carried on an AT&T service called SS1, which is essentially a terrestrial intercom line, Weinstein said.

Experiments to see if the Equatorial system can be used to replace the SS1 service have proved very promising, Weinstein claimed. E. F. Hutton is spending in excess of $1.5 million a year on the SS1 system today.

"We would save nearly the whole amount using the Equatorial system in its place," he noted, pointing out that these savings alone would more than pay for the Equatorial system.

Syncsort files claim against IBM

NEW YORK — Syncsort, Inc. has filed a complaint with the Federal Trade Commission charging that IBM misrepresented a new sorting utility hardware and software product.

The Englewood Cliffs, N.J., firm filed the complaint April 15 after it conducted tests that placed IBM's DFSort Release 7 against its predecessor, DFSort Release 6. Syncsort claimed the tests indicated that hardware improvements to the IBM 370/XA, designated "Sorting Assists" in a Feb. 5 announcement of Release 7, offered no performance improvement over Release 6.

Syncsort is IBM's major competitor for the sorting utility program sales, according to figures from International Data Corp., a Framingham, Mass., market research firm.

IBM spokesmen in Rye Brook, N.Y., said Syncsort had brought its claims to IBM's attention but filed the complaint before IBM could respond.

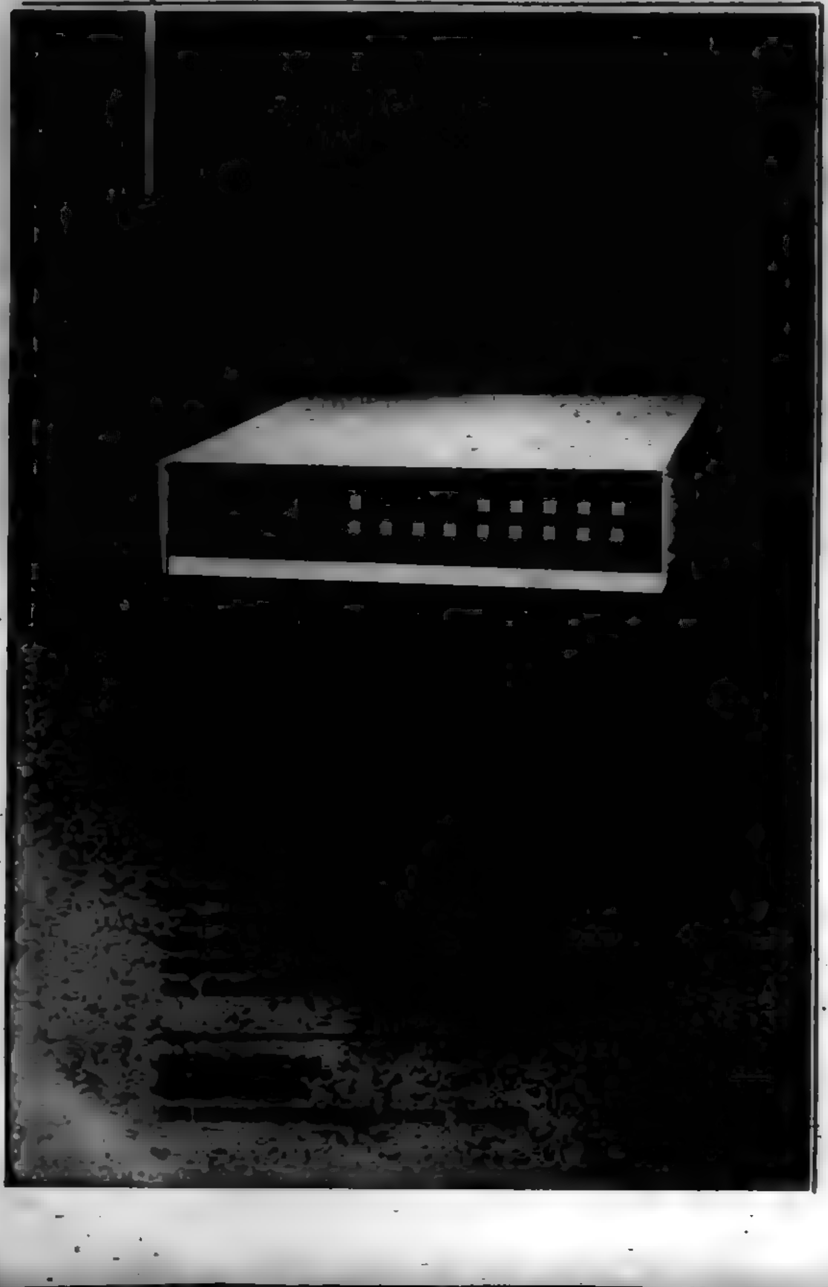
Syncsort President Aso Tavitian said Syncsort did not want sorting customers "to fall for the romantic allure of Sorting Assists" if they offered no improvement in performance over other sorting packages.

AT&T $1.9 billion transfer OKed

WASHINGTON, D.C. — The Federal Communications Commission last week approved AT&T's request to transfer $1.9 billion in facilities and equipment from AT&T Technologies to AT&T Information Systems.

The decision confirms the FCC's recent direction in easing the separation conditions of the Second Computer Inquiry decision, which bars sharing resources between the unregulated AT&T Information Systems and the Technologies division.

Comments about, but not opposition to, the waiver requests AT&T filed in February [CW, Feb. 18] were filed with the FCC by equipment manufacturers concerned that network and customer proprietary information would be disclosed to AT&T Information Systems. The FCC said it was satisfied that AT&T would follow specific guidelines on improper disclosure of information.



ICP gives awards to top-selling software tools

SCOTTSDALE, Ariz. — The software industry staged its own version of Hollywood's Academy Awards ceremony last week, and seven software packages walked off with International Computer Programs, Inc.'s (ICP) prestigious $100 Million Award.

The seven packages, which were recognized for achieving at least $100 million in aggregate sales, were among the more than 270 software products honored at the 14th Annual ICP Million Dollar Awards and Executives Conference held here.

The awards are presented to the vendors of packages that have achieved various sales milestones since the product's introduction — beginning at the $1 million sales mark and extending to $250 million or more.

This year's $100 Million Award winners joined only nine other products that have garnered that distinction since the ICP awards were instituted in 1972.

Management Science America, Inc.'s (MSA) payroll system became the third MSA product to earn the $100 Million Award. It joined MSA's general ledger and human resource systems in that elite club.

Other $100 Million Award winners honored last week included the following: Applied Data Research, Inc.'s (ADR) ADR/The Librarian source program management system; Execucom Systems Corp.'s Interactive Financial Planning System decision support system; Information Builders, Inc.'s Focus fourth-generation language; McCormack & Dodge Corp.'s G/L:Millenium general ledger system; Software International Corp.'s General Ledger and Financial Reporting System; and Syncsort, Inc.'s Syncsort sort/merge utility.

Despite the widening of the ranks of $100 Million Award winners, no product this year garnered ICP's rarefied $250 Million Award, which has only been bestowed on one product — Cincom Systems, Inc.'s Total data base management system — to date. Cincom earned that award in 1982.

A total of 15 products entered the ranks of ICP's $50 Million Award winners. Included among those winners were MSA's accounts payable system, Cincom's Total Information System, ADR's Datacom/DB and two products each from Computer Associates International, Inc. and Ucccel Corp. Earning the award for Computer Associates were the CA-Dynam Family for DOS and CA-Optimizer MVS packages and for Ucccel, the UCC-1 and UCC-7 packages.

Computer Associates also walked away with three of the 22 $25 Million Awards handed out at the ceremony. Among other $25 Million Award winners were three McCormack & Dodge packages and two products from American Software, Inc. Computer Associates also garnered four $10 Million Awards, which were given to 31 packages this year.

Two packages each from American Management Systems, Inc., American Software, ADR, Data Design Associates and MSA also received $10 Million Awards. ICP also recognized more than 60 winners of the $1 Million Award.

Thirty-six software products won ICP's Million-in-One Award, which recognizes products that have achieved $1 million or more in sales in their first year of release. Cincom's Mastext and Net/Master products both earned the award, as did Distribution Management Systems, Inc.'s DMS-100 IBM Distribution System and DMS-2500 Distribution and Warehouse System packages.

In addition to recognizing software products and vendors, ICP handed out more than 215 Super Software Seller Awards to sales representatives who sold $1 million or more of software products in 1984.

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NEWS

Indispensibility tops graphics systems requirements

CW AT NCGA

By Edward Warner
CW Staff

DALLAS — There are seven commandments when it comes to implementing a corporatewide presentation graphics system, and the first is that the system be truly useful.

So said systems analyst Mark L. Borgmann of New England Telephone Co., who made his remarks in a panel presentation at the National Computer Graphics Association's (NCGA) conference here last week.

Borgmann told his audience to make whatever graphics system they establish indispensible. "Make it part of your business environment."

The second commandment said Borgmann, who is the graphics specialist at his firm, is that system developers must know the prospective users' needs and requirements for output quality. After such a needs assessment, he said, those who implement the system will have a better idea of the mainframe graphics package to buy, whether additional terminals will be needed and, most important, what information users will want to pull from the corporate data base for charting.

The other requirements for a successful graphics system implementation, he noted, are the following:

- Never make a promise that you cannot keep. Users cannot afford to have the system down when they are in a rush.
- Balance product, price and performance. "It's got to be worth what you're going to charge for the service."
- Set up high-payoff applications. "They are going to get you visibility."
- Do internal marketing — but only after the system is in place.
- Establish the proper support mechanisms once it is up and running. All output devices require maintenance, and the high-volume machines require it most of all, he warned.

To find a high-payoff use for graphics, Borgmann said, those who implement systems need to look no further than the desktops of corporate decision makers who need the quick briefing on data that a chart can provide. Because of their authority, though, Borgmann advised that chief officers not be the beta testers for a new graphics system.

The executive who has charge of approving the system's purchase will want to hear a cost-justification of it, Borgmann warned. When that critical moment arrives, he said, the proposal's defenders should not turn to a hard-dollar justification for graphics. Instead of claiming that such a system will save on outside production costs, proponents should emphasize the "soft dollar" benefits from such advantages as improved understanding of corporate data.

[illegible] USE [illegible] VAX [illegible]
USE [illegible] Better [illegible] software [illegible] faster [illegible]

IBM rolls out XT version

RYE BROOK, N.Y. — IBM last week launched the IBM 4700 Personal Computer, a version of the Personal Computer XT designed for use in financial institutions.

The machine, available in May, acts as a workstation for the IBM 4700 Finance Communications System (FCS), a family of display stations, printers, controllers and programs. The 4700 Personal Computer can reportedly combine data from stand-alone personal computer programs with 4700 FCS applications.

The workstation features a 107-key financial keyboard and can work with keypads for entering personal identification numbers, magnetic stripe readers and other devices in the 4700 FCS family, IBM said.

A system unit with 256K bytes of internal memory will cost $3,065. A configuration with color display and keyboard will cost $3,969.

A $625 output option, available in May, allows the 4700 Personal Computer to attach to a 4700 financial printer. A $550 security option that encrypts and decrypts data is scheduled for September delivery. Both of these add-ons also work with the Personal Computer and Personal Computer XT. A $650 input option permits those machines to accept FCS keyboards and other input devices.

Additionally, IBM announced two financial programs for the 4700 Personal Computer, Personal Computer and Personal Computer XT. Both packages are scheduled for September availability.

The $300 IBM 4700 Personal Computer Application Services program permits transfer of data to and from the 4700 FCS controller and storage of personal computer files on a 4700 controller disk drive.

Ampersand Corp.'s Branchbanker 4700, which provides customized financial projections, will cost $500, the company said.

More information is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

Early warning systems touted as exec desktop tools

CW AT NCGA

By Edward Warner
CW Staff

DALLAS — Desktop computing power in the hands of a manager usually means spreadsheets and "what-if" analysis. In the hands of the corporation's top executives, desktop computing can affect a firm's overall strategy.

But how does MIS get computing power onto the chief executive officer's cherrywood credenza? Three experts in a panel forum here at the National Computer Graphics Association (NCGA) conference last week addressed that problem.

Alan Paller, an analyst and president of AUI Data Graphics, a market research firm, urged his audience to develop systems that would keep their firm's top executives abreast of key indicators of the corporation's health. Calling this type of tool "the ultimate application," Paller said that desktop computing systems given to top executives should display those indicators graphically in what he referred to as a visual early warning system.

One company that adopted such a system for its strategy-making executives in 1981, the UK's Imperial Group, reversed a precipitous revenue downturn after a visual early warning system was installed. In the next year, Paller said, the Imperial Group's stock rose 180%.

System played a part

No one can say for sure that the visual early warning system was responsible for the turnaround, Paller observed, but the firm's chief executive officer "thinks the system had something to do with it," and that has ensured the system's acceptance at Imperial.

When developing a strategy to put computing power on top executives' desks, Paller advised, system designers should ignore the hardware and concentrate almost exclusively on what information needs to be presented. Though that information must be displayed in a manner that can be understood quickly — hence the emphasis on graphics — Paller maintained that the executive should be able "to go [into the corporate data base] and find out where the answer is."

The need for access to the most current of the corporation's data favors executive workstations over stand-alone personal computers, he said.

Another of the panel's members, Jon Rockeman, an engineering support systems analyst with Northrup Corp.'s Aircraft Division, said a terminal-based system of executive workstations is being used by the division's chief engineers.

The Northrup system, called the Executive Management Information Network (Emin), gives executive engineers access to the company's nationwide data base, limited by their need for password access to each level of it.

Since the network runs on an IBM 3033 mainframe, the executives also won access to mainframe software including IBM's Professional Office System for office automation applications including electronic mail, Mathematics Products Group's Rs-ais II and Isaco Graphics, Inc.'s Tell-A-Graph for graphics creation.

The system is on-line with each of the top engineer's offices and with their conference room. "Now we have staff meetings, and [the executives] can pull up a particular piece of data on the terminal," Rockeman said.

Paller

CW photo by E. Warner

The Emin system has succeeded to the point where its terminals will be replaced with IBM 3270 Personal Computer/Gs, machines with built-in IBM terminal emulation and graphics capabilities. Though the 3270-PC/Gs can support a windowed display of up to four simultaneous mainframe sessions, Rockeman said it is likely that only two of the windows will be used — one for data and one to convert that data quickly to a chart.

What the developers of a corporate executive workstation system can pay far less attention to is the user interface, Paller observed. Pointing to the results of user studies, Paller said that "function always beats form, regardless of how hard it is to use it."

Light pens, mice and voice input, he noted, are all great ideas, but none is a replacement for the keyboard, despite the popular belief that executives fear such an interface.

Paller urged his listeners to push for systems of executive workstations, if not for their corporation's sake, then for their own. Such systems give the MIS department high visibility and offer a high payoff for everyone involved. Good MIS managers are often anonymous, he said. Executive workstation networks "are going to keep you from being anonymous."

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CDC, Applicon announce CAD software workstations

CW AT NCGA

DALLAS — At last week's National Computer Graphics Association (NCGA) conference, two computer-aided design systems vendors rolled out stand-alone engineering workstations based on 32-bit technology, which run each firm's proprietary CAD software.

Control Data Corp. announced its first intelligent stand-alone engineering workstation, the 793 Icem, so named because it runs CDC's Integrated Computer-Aided Engineering and Manufacturing software.

That software has previously run only on CDC's mainframes, said Gerald Barret, manager of marketing support programs in CDC's Computer-Integrated Manufacturing (CIM) marketing group.

Applicon's Aria II out

Meeting CDC's challenge, Applicon, Inc. introduced its Aria II family of engineering workstations at the conference. The Aria II line is the successor to Applicon's Aria line of workstations and, according to an Applicon spokesman, each workstation is based on a version of Digital Equipment Corp.'s Microvax supermicrocomputer.

Each Aria II workstation is said to include a minimum of 3M bytes of memory and 160M bytes of disk storage. The engineering workstations range in price from $99,000 to $125,000 and come bundled with Applicon's Bravo! CAD software, keyboard and monitor.

The CDC 793 Intelligent Workstation is reportedly based on a Data General Corp. minicomputer and includes two displays: color for CAD and monochrome for alphanumerics.

Standard memory offered

A second pair of displays can be added to a CDC Intelligent Workstation, resulting in a configuration that the vendor calls the Icem Workstation Cluster.

According to the vendor, the Intelligent Workstation offers standard memory of 2M bytes, expandable to 8M bytes, and from 70M bytes to 340M bytes of disk storage. It is priced from $86,775 to $116,335, depending on the software selected.

The Icem Workstation Cluster is priced at $6,265, based on entry-level Tektronix, Inc. 4109 graphics terminals, or $127,635, based on two CDC displays.

CDC's CIM Division is located at P.O. Box 0, Minneapolis, Minn. 55440.

Applicon is located at 32 Second Ave., Burlington, Mass. 01803.

—Edward Warner

HP launches bevy of products at NCGA conference

By Edward Warner
CW Staff

DALLAS — Hewlett-Packard Co.'s HP 9000 Series 500 engineering workstations received a local-area network, a graphics display station and a server device for sharing peripherals in a product rollout at the National Computer Graphics Association (NCGA) conference here last week.

A graphics accelerator for the HP 9000 Series Model 550 engineering workstation, a 32-bit supermicrocomputer, was also announced. The accelerator is one of a new breed of products for computer-aided design and reportedly includes in its read-only memory (ROM) several CAD functions usually found only in software. Having such functions as the conversion of images to three-dimensions embedded in ROM enables applications to run faster, HP said.

The lead product for the Series 500 workstations was the HP 9000 LAN, a network supporting both Ethernet 1.0 and the IEEE 802.3 standard for baseband communications. Based on HP's Advancenet architecture, the HP 9000 LAN reportedly can link up to 100 devices in a 500-meter daisy chain in which the failure of one device would not cause the entire network to fail.

The LAN replaces HP's 2285A LAN and reflects HP's growing confidence that 802.3 will become an industry standard, according to a HP spokesman. The HP 9000 LAN uses interface cards that plug into each networked device. The cards replace the bulkier box interface used by the HP 2285A LAN. Users of the latter can return their interface boxes and receive a $700 credit for each toward the purchase of each of the HP 9000 LAN's $2,200 interface cards under an offer good until November.

Software for the HP 9000 LAN is priced at $1,700 for the first single-user computer attached and $850 for each additional single-user machine. For multiuser computers, the software is priced at $4,000 for the first machine and $2,000 for each additional processor. The graphics display station introduced at NCGA is said to feature a display controller interface that plugs directly into the memory processor bus of the Model 550, making possible 2M byte/sec. transfers of data. The Model 550 will support three such display stations, HP said.

The display station, without a Model 550 processor, is priced at $15,000 in a package that reportedly includes a keyboard, controller, cables and a 19-in. color graphics monitor. A single-user display station, with a Model 550 having 2M bytes of memory, is priced at $45,000. An optional graphics accelerator for the Model 550 is said to include a bit-slice processor as well as floating-point mathematics chips and is priced at $7,250.

In addition HP introduced, the HP 50960S, a file server for its Shared-Resource Management system, under which HP 9000 machines can share files and peripherals. The server consolidates on one circuit board the work for which its predecessor required five boards. The HP 50960S, available in May, carries a price tag of $6,995, reportedly 32% lower than the unit it replaces.

HP is located at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

ITT ushers in two versions of IBM XT-compatible processing system

By Kathleen Sullivan
CW West Coast Bureau

SAN JOSE, Calif. — ITT Information Systems last week introduced the ITT Xtra XP, an IBM Personal Computer XT-compatible system that the company said offers users 3½ times the processing speed of the XT.

According to the company, the ITT Xtra XP derives its speed from an Intel Corp. 80286 microprocessor running at 6 MHz, coupled with a "zero-wait state architecture."

The ITT Xtra XP's zero-wait state memory is an architectural design that eliminates the need for wait states because the system's memory is able to respond to the 80286 microprocessor as fast as the microprocessor makes demands of it, according to Chris Le Tocq, product marketing manager.

Expansion board

ITT's Xtra XP is said to include 512K bytes of zero-wait state random-access memory (RAM), which can be expanded to 640K bytes. In addition, users can install a proprietary expansion board that offers 1M byte of zero-wait state memory, the company said.

The firm said the expansion board also provides support for Vdisk, a RAM virtual disk option that provides high-speed access to regularly used software. The board can also be used as expansion memory for programs that take advantage of the virtual address mode of the 80286 microprocessor, the firm said.

The computer is said to include 64K bytes of read-only memory (ROM) Bios, which houses a diagnostic monitor. The monitor, which is controlled from the keyboard, reportedly provides diagnostic capability for the central processing unit, interrupts, direct memory access, video and memory.

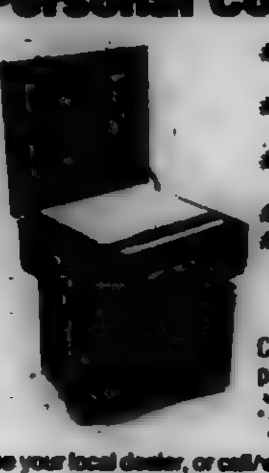
Printer port included

In a standard configuration, the system includes a parallel printer port, an RS-232 serial port, a socket for an 80287 math coprocessor and five IBM Personal Computer-compatible expansion slots, the company said.

The ITT Xtra XP line includes two models: the Model III and the Model V. Each is said to include a 360K-byte floppy disk drive. The Model III comes with a 10M-byte hard disk drive, while the Model V comes with a 20M-byte hard disk drive, the company said.

The firm said the ITT Xtra XP will support "almost all third-party software written for the IBM [Personal Computer] and the IBM [Personal Computer] XT." The computer includes a speed switch that allows users to slow the system down to 4.77 MHz (the speed of the IBM Personal Computer's and XT's 8088 microprocessor), ensuring compatibility with programs that are sensitive to speed, the company said.

In a standard configuration, the Model III is priced at $3,995, while the Model V is priced at $4,595. For more information, contact ITT Information Systems at 2350 Qume Drive, San Jose, Calif. 95131.



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Group proposed to study computer's impact on society

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Two U.S. senators recently introduced legislation to create the Information Age Commission, which would conduct a comprehensive study of the present and future effects of information systems on the U.S. and its citizens.

The commission apparently would make recommendations to Congress about such issues as computer crime, the effects of automation on labor and computer education.

The proposal (S. 786), introduced by Sens. Sam Nunn (D-Ga.) and Frank R. Lautenburg (D-N.J.), was quickly endorsed by the Association of Data Processing Service Organizations, Inc. (Adapso).

"If the U.S. is to maintain its technical leadership, we must be prepared to plan for, rather than react to, changes brought on by computers. The Information Age Commission has the opportunity to provide us with a window on the future," commented Jerome L. Dreyer, Adapso president.

Nunn and Lautenburg lamented the fact that policy development regarding the information age has been a piecemeal effort and cited recent legislative efforts on computer crime, copyright and privacy. The senators called for a comprehensive review of the problems, benefits and critical policy choices posed by information technology.

Ride wave of change or be swamped

"We can ride the wave of this technological change, or we can be swamped by it," Lautenburg said.

The proposed commission would function for two years and would send a final report to the president and Congress. The bill authorizes $3-million to cover the commission's expenses, and substantial financial support from the computer industry is anticipated.

Under the bill, the commission would focus on at least the following topics:

- The resources needed to maximize the benefits of computer and communications systems to society,
- The resources needed to maintain the U.S. lead in the world information marketplace.
- The education and re-education required to prepare citizens for the information age.
- The effort and resources needed to encourage new technological innovations.
- The impact of computer and communications systems on labor and employment.

The commission is to be composed of 23 members: six from Congress, six from the executive branch and 11 from the private sector, which includes the information industry, state and local governments, labor and academia.

The bill was referred to the Senate Committee on Governmental Affairs for further action. Nunn said he hopes it will be enacted this year.

WASHINGTON UPDATE
Mitch Betts
CW Washington Bureau

IRS union blames tax delays on staff cuts

WASHINGTON, D.C. — The labor union at the Internal Revenue Service last week charged that staff reductions — caused by budget cuts and automation — contributed to the major delays the IRS experienced this year in processing tax returns.

Robert M. Tobias, president of the National Treasury Employees Union, said the Reagan administration has cut the IRS tax processing staff by more than 5,000 positions, whereas tax returns have increased by 41 million since 1980. Consequently, he said, IRS employees have been overworked, and "America has just witnessed the most disastrous income tax processing season in history."

IRS officials said the delays were caused by a rash of computer hardware and software problems associated with a major computer system replacement program [CW, April 15]. But Tobias said that at least 1,100 employees must be added in the tax processing offices "to ensure promptness and quality in processing."

NBS to adopt Ada as standard

WASHINGTON, D.C. — The National Bureau of Standards (NBS) recently announced it plans to add Ada, the high-level programming language developed by the U.S. Department of Defense, to the roster of standard languages recommended for use by U.S. government agencies.

NBS said it plans to adopt Ansi 1815A Ada as an official Federal Information Processing Standard, thus adding it to the current family of NBS-approved languages: Minimal Basic, Fortran, Cobol and Pascal.

The agency said Ada is suitable for those programming applications that involve control of real-time or parallel processing, very large systems requiring modularization, systems requiring very high reliability and systems developed with reusable software packages.

Furthermore, NBS said Ada is strongly recommended in situations where portability among different models of hardware is needed, where the program must be understood and maintained by programmers other than the original ones, and where an application or program is subject to frequent updates.

SBA begins computer security program

WASHINGTON, D.C. — Taking its first step toward implementing the Small Business Computer Security and Education Act of 1984, the U.S. Small Business Administration (SBA) last week appointed a nine-member advisory panel.

In announcing the appointments, SBA administrator James C. Sanders said, "The advisory council will advise me on small business' computer security problems and needs. SBA will then design and make available several standard training programs."

The 1984 law requires SBA to educate small businesses about computer crime and security. However, the budget drafted by the Reagan administration and U.S. Senate leaders would terminate the SBA, so the fate of the agency and the planned computer security programs are unclear.

The advisory council has representatives from the SBA, the Institute for Computer Sciences and Technology and the U.S. Departments of Justice and Defense, in addition to private sector computer security specialists.

AT&T to buy Honeywell factories

By Clinton Wilder
CW Staff

PITTSBURGH — AT&T announced last week that it intends to acquire four of Honeywell, Inc.'s integrated circuit factories and that it will begin selling its 32-bit Unix microprocessor commercially.

AT&T Chairman of the Board Charles L. Brown also announced that the company has filed for a 5.6% overall reduction or a $1 billion annual reduction in long-distance rates. The reductions will coincide with the reduced local-access charges AT&T pays the former Bell operating companies that go into effect June 1. Brown made the announcements at the company's 100th annual shareholders' meeting here.

Brown said AT&T has agreed to negotiate for the purchase of Honeywell's Synertek manufacturing facilities in Santa Cruz, Calif.; Bangkok, Thailand; Singapore; and Munich, West Germany. The two Asian assembly and test facilities are currently Synertek's largest, employing 460 workers in Bangkok and 140 in Singapore.

Brown refused to disclose terms of the acquisition, saying the agreement was still in the negotiation stage.

If approved, the deal will be AT&T's first acquisition of another computer vendor's component manufacturing facility. AT&T has traditionally made chips and other electronic parts for its own computer and communications equipment but is now seeking to "underscore its intent to be a major player in the worldwide components business," according to John Nemecek, executive vice-president of AT&T's Technology Systems Group.

Company officials refused to comment on target market applications for the AT&T 32-bit Unix microprocessor until it is officially unveiled as a commercial product at the Institute of Electrical and Electronics Engineers, Inc.'s annual exposition in New York this week.

'About what we expected'

Additionally, the company reported first-quarter net earnings of $354 million, or 31 cents per share, on $8.3 billion in revenue vs. $227 million net, or 20 cents per share, on $8.1 billion in revenue a year earlier. Brown said of the results, "They are about what we expected."

The company told its shareholders that first-quarter revenue was $8.30 billion, a modest gain from the $8.14 billion reported in the first quarter of 1984. Earnings, however, jumped 56% to $354 million, or 31 cents per share, in the first quarter, compared with $227 million, or 20 cents per share, in the comparable quarter one year ago.

In response to a question about the potential impact on shareholders of the pending MCI Communications Corp. $1.8 billion antitrust suit against AT&T, Brown said he did not believe MCI would win the amount of damages sought. Retrial of the suit began earlier this month in Washington, D.C.

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AEA: 17% job turnover for engineers

PALO ALTO, Calif. — The job turnover rate for engineers in the electronics industry was 17% in 1984, according to the first such survey by the American Electronics Association (AEA).

By contrast, the electronics industry's total employee turnover rate was 21.4% in 1983, the most recent year for which the data is available.

The engineers survey, based on data from 663 AEA member companies nationwide, found that 22.2% of software engineers switched jobs, compared with 15.2% of hardware engineers.

In a regional breakdown, the survey found metropolitan New York's 46 member firms had the highest overall turnover rate, 20.7%. Northern California, by far the largest region in the survey with 225 member companies, had a 20.1% turnover rate, as did Washington state's 27 member companies. Orange County, Calif., and New England were next on the list with turnovers of 19.3% and 17.6%, respectively.

Only 11.9% of the engineers in Florida's 14 member companies switched jobs during the year. The other lowest rates were Oregon's 20 member companies with 12.1%, Colorado's 18 member companies with 13.1% and Minnesota's 19 member companies with 13.5%.

Twenty-one companies in Texas experienced both the highest turnover among software engineers (25.7%) and the lowest among hardware engineers (5.5%). Orange County had the highest hardware engineer turnover at 20.8%, while software engineers in Oregon changed jobs the least (12.7%) in 1984.

AT&T files for short-haul rate increases

WASHINGTON, D.C. — AT&T Communications has proposed tariffs that would increase its short-haul interstate traffic rates, which it said will better align the price it charges for calls with the cost of providing them.

The tariff increases would impact customers making interstate calls over distances of 55 miles or less and would go into effect April 26 if approved by the Federal Communications Commission.

AT&T said the proposed changes would affect approximately 13% of its interstate traffic and would generate $74 million annually in additional revenue.

The rate increase request comes at the same time that the FCC is ordering AT&T to reduce interstate message telephone service rates by an average of 6% across the board to reflect the $1 monthly access charge revenues that will be collected from customers starting June 1.

AT&T said that, for calls over distances of up to 10 miles, the day rate for the initial minute would increase from 20 cents to 28 cents and for each additional minute from 15 cents to 18 cents. For calls over distances of 11 miles to 22 miles, the one-minute day rate would increase from 38 cents to 46 cents and the additional-minute rate from 21 cents to 25 cents.

For calls over distances of 23 miles to 55 miles, the proposed rates would increase the cost of the first minute from 45 cents to 51 cents and the additional-minute rate from 25 cents to 30 cents. AT&T Communications said that the rate changes would still be discounted for night and weekend rates at the 40% and 60% levels, respectively, that are currently in effect.

AT&T Communications said the principal reason behind the request for rate increases for short-haul interstate calls comes from investments in transmission technology that make distance sensitivity less important. It said that past tariff restructuring proposals before the FCC sought to bring these shorter haul rates up to the costs of providing the service, but the FCC required changes in these proposals to lessen customer impact.

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application development report: MARK V

MARK V® HELPS AIRCRAFT MANUFACTURER ENTER ONLINE PROGRAM DEVELOPMENT WORLD

Use of MARK V at Beech Aircraft Corporation has not only increased the productivity of the firm's programmers and analysts — it has given them a whole new capability for online program development.

Prior to acquisition of MARK V, an Implementation System from Informatics General Corporation for generating online applications, Beech had largely limited itself to purchasing ready-made packages for its online systems. "Until we acquired MARK V, greater levels of technical expertise and manpower were required to develop online systems," explained Craig Young, MARK V Coordinator in the Beech Computer Services Department.

"We're an IMS/DC shop, and in this environment a COBOL programmer has to be thoroughly versed in IMS and DLI in order to write online programs," he added. "We're talking about months and months before you develop enough expertise to be productive. But a programmer using MARK V doesn't have to learn IMS or DLI, and this shortens the learning curve tremendously. We can take recent hires, or people who for one reason or another have not been involved with IMS, and almost immediately put them to work developing online systems."

Beech, a leading manufacturer of business and commuter aircraft, employs about 40 programmers and analysts, nearly three-quarters of whom have learned to use MARK V, Young noted. Total employee count for the firm is approximately 7,500. The company uses an IBM 3084 mainframe, running under the OS/VS MVS operating system.

Their pilot MARK V project — the first online system ever developed by the firm in-house, Young noted — was an interactive Industrial Relations System linking the functions of Personnel and Payroll with a common online data base.

This system allows Personnel to load information on new hires into the data base from their online terminals, with control of employee data being automatically transferred to the Payroll Department after employment begins.

Coding for the Industrial Relations System was performed by two Beech programmers who attended the MARK V training class but had no prior experience in data communications or online system development.

In addition to MARK V, Beech also uses MARK IV®, an Informatics Implementation System for generation of batch application, and SHRINK, an Informatics data compression system.

"The online data base for the Industrial Relations System has to interface with our existing batch payroll system," Young explained. "To facilitate this we're using MARK IV on the front end, to load the online data base from the existing batch personnel files — and we're also using MARK IV to read the online data base and update existing personnel files that are used in writing paychecks. In effect, we've got MARK V in the middle and MARK IV on both sides of it."

Beech has implemented a number of additional online systems since completion of the pilot Industrial Relations System, Young pointed out. "MARK V has made us a lot more responsive to user requests than we used to be," he noted. "For example, we recently put up an online Telemarketing System for our marketing people that has met with enthusiastic approval from the users.

"We had not had a Telemarketing System in the company before, and when we began developing this online system the user was making his best guess at what he wanted, but really wasn't sure," Young explained. "Here, the flexibility MARK V provides in prototyping a system really came to our rescue. It was a tremendous asset to be able to quickly change or add the things the user wanted."

Other online systems recently developed using MARK V include:

- An Inventory Management System used by Procurement to maintain information on manufacturing inventory. This system was originally purchased from an outside vendor, and was written in COBOL; Beech programmers have added a number of sections and screens to it using MARK V.
- A Production Inventory Control pick list system.
- A Tool Control System to track location of tools.
- A Quality Assurance System that keeps track of periodic calibration of tools and certification of personnel as required by FAA.
- A system to cross-reference vendor part numbers with the company's in-house material code numbers.
- A report distribution control system for the Computer Services Department.
- A system to track reliability of target missiles manufactured by Beech for the military services.

"There's a lot of enthusiasm among our programmers to use MARK V," he said, "because it's a way for them to get into the world of interactive programming quickly, without having to learn all the ins and outs of IMS data communications. They consider it a real break from the humdrum of batch systems, to be able to work on an online application."

"The advantages to the company of having information available online are obvious — and now that we know how easy it is to get an online system up, we're much more inclined to look at writing an application in MARK V and putting it online," he added.

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ACM/SIG meet slated for May 1

DANVERS, Mass. — The Association for Computing Machinery's Special Interest Group (ACM/SIG) for Small and Personal Computing will hold its 1985 symposium at the Sheraton-Tara Hotel here May 1-3.

Two tutorials will kick off the symposium. The first, by Richard F. Sincovec, professor of computer science at the University of Colorado, will examine "How to Use Modula-2 to do Object-Oriented Design in Small Systems." Allan Schwartz, a software engineer at Bridge Communications, Inc., will present the second tutorial, "An Introduction to Using Unix."

Registration for the symposium costs $120 for ACM/SIG members, $130 for ACM members and $140 for nonmembers, if received by April 10. After that date, registration prices are $140, $150 and $160, respectively.

Registration for the tutorials is priced separately at $115 for ACM/SIG members, $115 for ACM members and $120 for nonmembers, if received by April 10. After that date, registration prices in each category rise by $10. Student registration, however, remains priced at $50.

Inquiries about the conference may be directed to Howard A. Sholl, EECS Department, U-157, University of Connecticut, 260 Glenbrook Road, Storrs, Conn. 06268.

IEEE autumn meeting set

WHISTLER MOUNTAIN, Canada — The Ninth Data Communications Symposium will take place Sept. 9-13 at the Delta Mountain Inn here. This event is jointly sponsored by the Institute of Electrical and Electronic Engineers, Inc. (IEEE) Computer Society and the IEEE Communications Society.

Ed Sussenguth, an IBM Fellow who was a principal architect of IBM's Systems Network Architecture, will be one of two keynote speakers at the symposium, according to the sponsors.

The second speaker will be Shen Lin, Bell Laboratories' executive consultant, who is said to be a leading designer of voice/data communications networks.

Advance registration fees for the Ninth Data Communications Symposium are $190 for members, $225 for nonmembers and $115 for full-time student members.

Late registration fees are $225 for members and $260 for nonmembers with the student price remaining the same, a spokesman said.

Additional information about the IEEE symposium is available from B. W. Stuck, Technical Program Chairman, Ninth Data Communications Symposium, Vistel Corp., 344 Raritan Center Pkwy., Edison, N.J. 08837.

Justice: Reallocate long-distance callers

AT&T against change, could lose customers

WASHINGTON, D.C. — The U.S. Department of Justice last week threw its weight behind a plan to allocate undecided long-distance callers among all carriers. The move would change the terms of the original divestiture agreement, which accorded the traffic to AT&T Communications.

The Federal Communications Commission is currently considering the allocation plan, which AT&T is opposing.

The Justice Department filed its comments with the FCC last week.

MCI Communications Corp., GTE Sprint Communications Corp., Satellite Business Systems and other long-distance carriers that compete with AT&T have recently criticized the original divestiture plan. Under that plan, telephone users who did not presubscribe to a particular carrier after equal access was implemented within their local telephone exchange area were automatically directed to AT&T Communications.

According to the Justice Department, as many as 50% of the telephone users in areas where equal access has been implemented have not selected any long-distance carrier and, as a result, were routed by default to AT&T Communications.

The Justice Department asked the FCC to implement a plan instituted by Northwest Bell, where ballots are sent to customers asking them to select a long-distance carrier. Customers who do not choose a carrier are then allocated among all carriers serving the exchange according to the percentage originally selected by customers in the first balloting.

The Justice Department said that under the Northwest Bell plan, 65% to 70% of customers are selecting a carrier on the first ballot. The department added that the changes in allocating default traffic would promote competition in the long-distance markets.

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Surveys split on Apple's demand in corporate mart

By Edward Warner
CW Staff

Two recent surveys of corporate personal computer users have reached opposite conclusions as to whether Apple Computer, Inc. will be able to penetrate significantly the corporate personal computer market in 1985.

A survey by Future Computing, Inc., a Dallas market research firm, found that roughly 32% of office workers who expect to be getting an office personal computer this year want an Apple. However, a survey by Software Access, Inc., a Mountain View, Calif., market research firm, found that only 6% of those who plan to buy an office personal computer this year want an Apple.

> ”
>
> *The Future Computing and Software Access surveys agreed, though, that regardless of Apple Computer's 1985 market penetration, the corporate personal computer mart will remain IBM's ball game.*

Both surveys agreed, though, that, regardless of Apple's 1985 market penetration, the corporate personal computer mart will remain IBM's ball game. The Software Access survey of 100 microcomputer managers in Fortune 500 companies found that 95% of its respondents planned to buy IBM Personal Computers this year. The survey did not specify which models. The Future Computing survey found 42% of office workers who expected to get a personal computer this year preferred IBM.

The Future Computing survey, which used data from 45,000 mail questionnaires and 3,000 follow-up telephone interviews, differed from the Software Access survey in that it received responses from both future users and from those with the resources to buy corporate personal computers. The survey found a major difference between the two groups: The future users wanted Apple micros almost as much as IBM micros, but the buyers — by a 72% margin — planned to buy IBM.

Such a conclusion was not surprising to several corporate microcomputer managers contacted by *Computerworld*.

"I agree with the IBM dominance [revealed by the Software Access survey]," said Doug Richardson, program coordinator of the Microcomputer Managers Association of Michigan and micro manager for a Detroit-area manufacturer. "I'm also surprised at the number of users who want to buy Apples," he added, citing the lack of software for the Apple Macintosh — the product with which Apple has said it hopes to crack the corporate market.

Richardson had his own theory on why the respondents of the Future Computing survey reacted as they did. The future users probably have an Apple computer at home, he said. "The MIS directors, on the other hand, have a Big Blue box in the other room."

The vice-president for personal computing for a New York bank, meanwhile, said he could find no evidence of such extensive support for the Macintosh among those at the bank who would be new users this year. A similar response came from the MIS manager of State Street Bank in Boston.

Inevitable collision

According to Future Computing President Egil Juliussen, the disparity between the expectations of this year's new users — many of whom want Apple machines — and the intentions of corporate buyers who favor IBM means "there is a collision that's going to take place."

The Software Access survey is said to be part of a larger, ongoing research effort that involves responses from 10,000 households and 100 corporate microcomputer managers. When completed, it will be available in modules costing $4,000, $5,000 and $6,000. The entire study will be available for $14,500.

Further information is available from Software Access, which is located at Suite 1320, 2685 Marine Way, Mountain View, Calif. 94043.

The Future Computing survey is also part of a larger project involving an omnibus survey sent to 70,000 households, half of which responded. From that sample, Future Computing said it telephoned 986 people it identified as "next users" — those who expected to be using an office personal computer for the first time this year.

Data from the survey is contained in the Future Computing report "Office Personal Computers: The Customers," which costs $3,000. For more information, Future Computing is located at 811 LBJ Freeway, Dallas, Texas 75251.

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"MORE MANUFACTURERS CHOOSE US BECAUSE OF WHAT WE CHOSE: VAX."

Mark W. Ciotek
CEO and President
NCA Corporation

American manufacturers are facing a fiercely competitive and highly aggressive environment that's global in scope.

The key to survival in the face of all this is control. Control over shrinking profitability, increasing costs and reduced planning times. Which means automation through computerization.

But computerizing the manufacturing process is no guarantee of survival. Choosing the wrong approach could be just as costly as not automating at all.

As one person intimately involved with manufacturing, Mark W. Ciotek, explains: "Manufacturing today has to be treated as an integrated process instead of as isolated functions. Successful manufacturers are discovering that with the right approach to computer-integrated manufacturing (CIM), you can produce goods quickly without sacrificing quality."

Mark is CEO and president of NCA Corporation, a leading software developer and marketing company that's helping manufacturers stay competitive with a manufacturing resource planning (MRP II) system called MAXCIM.™

With 20 integrated modules, MAXCIM is designed to handle everything from financial planning in the executive office to job tracking on the factory floor.

"Our comprehensive approach requires a flexible computer system with a wide range of solutions," Mark points out. "That's why we chose Digital's VAX™ computers for MAXCIM. And that's why manufacturers are choosing us."

"VAX GIVES YOU THE WORLD'S MOST FLEXIBLE ARCHITECTURE."

Digital designed the VAX computing environment in a unique way – around one architecture and Digital's VMS™ operating system. "They're the only ones who have done this," Mark states. "As a result, we know we're working with the most flexible system available."

Included within the VAX computing environment is the VAX Information Architecture, a comprehensive system of integrated information management software products. From this vast array of products, NCA's customers can select those best suited for their needs.

Three of these VAX Information Management products – FMS™ forms management system, DATATRIEVE™ query language and report writer, and Common Data Dictionary – are used in conjunction with MAXCIM. By incorporating these products, MAXCIM optimizes the user-interface, and provides easy access and universal definitions for all of your data.

Customers also have the option of adding other Digital software such as DECnet™ networking software. The tremendous communications capabilities between Digital systems allows for unequalled distributed processing power. So you can access and exchange information –

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whether it's stored across the plant or at a plant across the country.

"Digital's approach to software is ideal for MAXCIM because the performance of an MRP II package is enhanced by the degree of integration between modules," Mark says. "And the superior integration within both MAXCIM and the VAX Information Architecture gives manufacturers the most flexible solution possible."

"AS [illegible] [illegible], SO CAN THE [illegible] OF VAX."

"The economies of manufacturing demand standardization and growth," Mark points out. "With VAX computers, our customers have both."

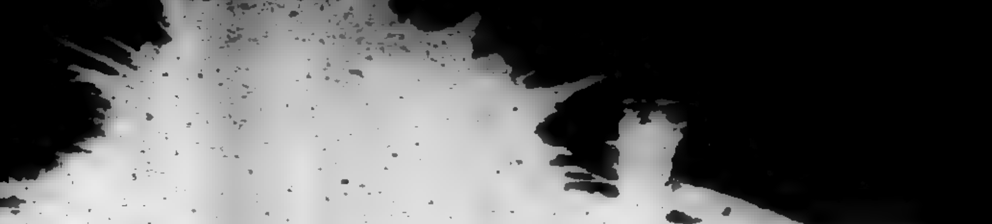
Every model in the best-selling 32-bit architecture, from the MicroVAX I™ system right up to the largest VAXcluster™ system, is compatible, providing an economical growth path from desktop to data center.

"Because of this compatibility, you can use MAXCIM across the entire line of VAX systems," Mark says. "So when our customers upgrade, they can bring their existing applications right along with them."

This eliminates the need to convert databases, retrain people or totally abandon your investment. And VAXcluster systems provide enough computing resources to meet virtually any requirement.

"VAX computers let us meet the needs of just about any manufacturer," Mark says. "The low end of the VAX family is ideal for smaller manufacturers, while clustering makes our solutions attractive to much larger companies. Some of our business now comes from existing customers who are upgrading their Digital systems to meet their growing needs."

The Compatible VAX family



"[illegible]"

"Digital has a solid reputation among manufacturers," Mark states. "After all, they're the leader in distributed processing and are committed to CIM with dedicated resources. And the VMS operating system provides an unparalleled path for growth."

In fact, Digital anticipates and meets manufacturers' needs so successfully that NCA developed MAXCIM to run exclusively on Digital systems.

"We've never felt the need to offer MAXCIM on any other system," Mark says. "They're the experts in systems and we're the experts in MRP II software. Together, we can offer manufacturers the most comprehensive solution.

"Our customers have found that this is the ideal solution for them. With this kind of success," Mark concludes, "we'll never second-guess our choice of VAX computers."

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[illegible]

Bank's aggressive high-tech plan coins new MIS role

By D. Peter Vanderlee
Special to CW

TORONTO — "The necessary strategic edge" is what the Royal Bank of Canada is after, according to one bank executive.

With assets of $88 billion and more than 36,000 employees spread over 46 countries, Royal is Canada's leading financial institution. To maintain its lead, the bank will spend $2.5 billion to implement new technology and construct a worldwide electronic network.

The bank's basic goal is to develop electronic means of delivering services and information.

"What's happening now is that the MIS function is becoming diffused," said Jim Grant, senior vice-president of systems. "We no longer face the task of trying to move MIS into the mainstream of the organization. We've gone beyond that."

Grant claimed Royal's strategy is a reflection of how aware senior officers of the bank have become of the importance of technology. "Everyone at the senior level recognizes our growing dependence on computer communications," he noted. Royal has 170 officers.

MIS is "an equal partner" in day-to-day business at the bank, according to Grant, and systems professionals are increasingly involved in the very early stages of business ventures.

"This is significant," he said, "because it proves MIS is an active player, across the board, in the bank's business."

MIS challenges

As active players, MIS professionals face entirely new challenges that lead directly into areas of revenue responsibility, Grant pointed out. "What we have to ask ourselves is, 'how do we move knowledge from MIS to the marketing side? How do we move capabilities provided by today's technology to the customer?'

"Our challenge is to package all that capability so that it is acceptable, even desirable, to the customer and so that it leads to new business," Grant added.

Grant said three things must be done: "You have to move the systems staff closer to the customer. You also have to find some way of tying that staff back to the knowledge base by giving them the tools that allow them to define business requirements — like business modeling tools — in a form that can be processed by the central computer communications group. With that done, you create solutions and then automate the hell out of it."

In the long term, Grant claimed, you aim to devise ways that make interaction with the system a comfortable, normal part of the daily work routine.

Grant also maintained that because information processing is no longer a peripheral issue, the people involved in handling the processing of that information, especially the veterans of the '60s and '70s, must consider doing things differently in the 1980s.

"They have to realize how mainstream MIS functions are," Grant said. "They have to organize and structure projects from a management perspective and, most important, they have to realize the impact of what they're doing."

Management for MIS

Grant said the value of systems experience can also be proven by the number of management positions becoming available to MIS professionals.

At the Royal Bank, for example, a member of Grant's staff was recently promoted to a vice-president position in the retail banking sector of the organization.

"If we're any kind of example, there's a growing need to fill management positions with people who understand the strategic value of computers. This trend is accelerating, and more and more of my systems staff [members] are taking on management responsibilities throughout the bank."

Grant maintained the systems staff members are not necessarily leaving him, but rather they are taking technology closer to the bank's customers — something he views as helping provide a competitive edge for the bank.

'Fine-tuning systems'

"What we're doing as systems professionals is fine-tuning systems for markets," he noted.

Although the bank is not presently considering buying its own satellite or cabling as part of its overall network scheme, an exclusive electronic highway is under way.

It has to be exclusive, according to Grant, "because providing a secure network is not only a priority — it's critical."

A faultless and secure network will be built, Grant said, because it will also become the Royal's principal competitive edge. "You can bet," he concluded, "that security is becoming as much a product as credit is becoming a commodity."

Vanderlee is the editorial director for Computerworld Canada, *a sister publication of* Computerworld *based in Mississauga, Ont.*

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"Enable is everything Symphony hoped to be."

PC Magazine *February 19, 1985*

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Computer Buyer's Guide and Handbook
November, 1984

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March, 1985

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PC Magazine
February 19, 1985

"Enable, a five-function integrated system from The Software Group, merits a close look by any individual or organization interested in a solid package that is well balanced in all of its applications."

Popular Computing
March, 1985, Paul Goldner, Raymond Heid, Yoram Lirtzman, Michael Wilding

"Quite simply, this package has so many outstanding attributes that even the worst skeptics of integrated software have to be impressed. The spreadsheet is very close to 1-2-3; the word processor combines the best thinking of WordStar, MultiMate, Volkswriter, and EasyWriter; the data base offers the functionality of dBASE II, but with many of the ease-of-use features of PowerBase; and the program offers business graphics and telecommunication. Taken as a whole, Enable surpasses the functionality of Symphony, Framework, Aura and Open Access."

IBM PC Update
December, 1984

Enable first in "Performance" rating—including speed and capacity of all modules tested. Enable first in "Versatility" rating—including power and functionality of all modules tested. Enable rated first in overall evaluation of the word processor module.

Software Digest Ratings Newsletter
Rating of 15 Integrated Products
December, 1984

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Infoworld
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Insurance firm customizes DP with net management

SURREY, England — A health and life insurance firm here, with branches scattered throughout England, Scotland, Ireland and Wales, prides itself on being the technology leader in the industry.

"We were into on-line systems very early, and the size and complexity of our system is growing," said Steve Randall, systems engineer with Friends Provident Life Office (FPLO).

FPLO has 600 IBM 3270 terminals, 300 in its branch offices and 300 at corporate headquarters. These communicate with two mainframes, an IBM 3033 and a 3083.

A second network is a Viewdata Corp. of America system. This system communicates through British Telecom and its Prestel videotex service to provide a gateway to FPLO's corporate data bank, giving branch offices and their brokers an interactive quotation and policy inquiry system. To replace FPLO's time-consuming manual methods for tracking system reliability and invoices, a Netman data center and communications network management system from California Software, Inc. was installed in mid-1983.

When FPLO's system was smaller, elaborate manual tracking methods were used, which did the job reasonably well, according to Randall. Price changes were noted on index cards. Problem tracking was handled by writing incidents on standard forms that were kept in what FPLO calls the Incident Book. At the end of the week, an employee would look through the Incident Book, add up the downtime and try to allocate it to the appropriate functional area. A summary was kept showing the number of incidents that affected different vendors and inventory items and the total time lost when a piece of equipment was down.

As the system grew, the manual methods became impractical. They took too long, were not comprehensive enough and only one person at a time could look at the listings.

In addition, information such as the number of specific types of terminals in a certain location and whether equipment was purchased or leased was difficult to obtain. Some of this information was stored on the system, but it was unstructured.

Pinpointed system weaknesses

With Netman installed, this information was fully organized and readily available. Reports, generated on request, pinpointed areas where the system was weak and why, and traced downtime to vendor response or operator failure.

Netman's four modules covered most of FPLO's needs. The finance module, patterned after IBM's invoicing system, stores computer-related invoice information. When FPLO's external invoices arrive, Netman generates a report that is passed on to the accounting department for invoice confirmation. The configuration module helps an inventory of hardware, software and other network components according to their relationships and interaction with each other. The problem management module tracks breakdowns, the methods and time of resolution and downtime for hardware, software and connecting links as well as environmental control devices, which include fire alarms, air coolers, generators and backup equipment. This information remains in permanent records, providing a performance history for each component.

Randall chose to customize several Netman reports. "When we wanted to customize, it was fairly easy," he said. "In all cases we were able to take a Netman-provided report and adjust it slightly to do what we wanted."

Unique requirement

One of FPLO's fairly unique requirements was a need to track the efficiency of the computer services the company provides to each of its branches, he said. The branches wanted to know, for example, whether the Scottish city of Aberdeen was getting better service than Belfast, Northern Ireland.

Randall customized Netman to generate reports with information from the data center. Netman also provides a link to British Telecom and handles word processing. Downtime is recorded against these functions as well as an on-line system that produces the policies and the network control program. The on-line system and the network control program were treated as links in the chain of components to the branch offices, since the entire operation is affected when they are down.

FPLO has not only customized some Netman capabilities to meet its unique needs, but has gone one step further, Randall said. It built a Netman report that generates Vtam definitions, obtaining the addresses of the terminals and the systems users will log on to from Netman. This virtually eliminated the painstaking systems programmer task, he said. Using this implementation, network operators simply type in two pieces of information — what system the user logs on to and what systems are available to the user. A Netman report defines to the IBM MVS operating system what terminals users are on and what they are to do.

See FPLO page 28

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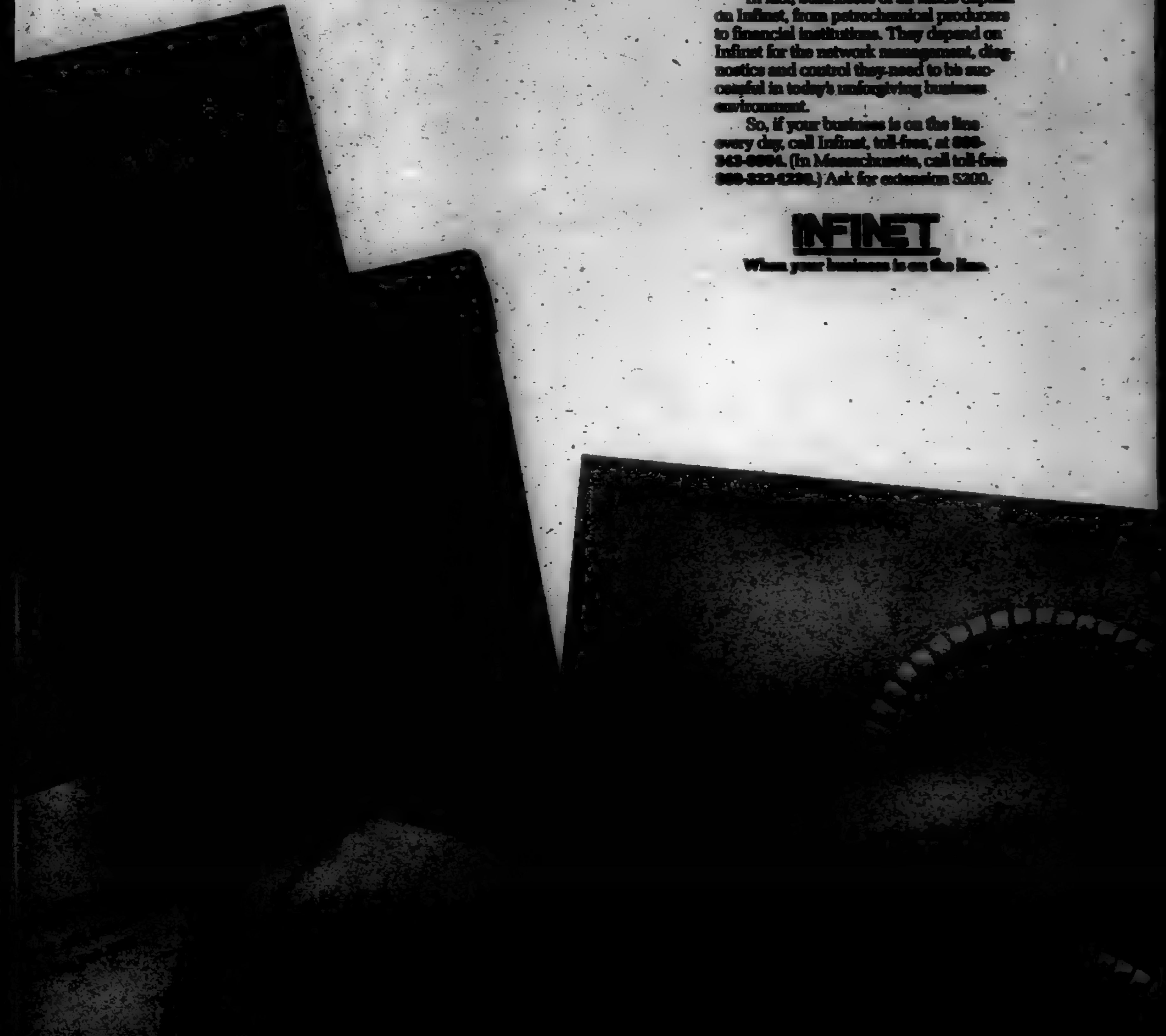

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INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

BRISBANE — The favorite, Datapoint Corp., has been beaten by an office automation dark horse, Digital Equipment Corp. Pty. Ltd. in the race for a lucrative government contract here with the Queensland Premier's Department. The contract calls for DEC to automate the entire state government over an unspecified duration of time.

■

CAMPERDOWN — Following an emerging trend set by nonbanking financial institutions, the Computer Bureau Joint Services Pty. Ltd. has opted for an Olivetti Corp. CPS 32-Electronic Funds Transfer switch, despite the dominance here of Tandem Corp.'s Base 24 EFT switch product.

One of the reported advantages of the CPS 32 is that it is compatible with Tandem's Base 24 format, according to Martin Calvey of Joint Services.

SINGAPORE

SINGAPORE — Since Singapore's first electronic bulletin board broke local telecommunications regulations when it opened for business last November, the number of bulletin boards in this country has grown to seven. The list includes the computer user groups in the Association of Private Licensed Aircraft Engineers, the Singapore Armed Forces Microcomputer Society and the Singapore Monitor, the daily newspaper here. The growth of bulletin boards has been attributed to the recent relaxation of rules preventing private ownership of modems.

SWEDEN

STOCKHOLM — Ericsson Information Systems, Inc. launched a 16-lb plasma screen portable computer aimed at the European marketplace.

The portable reportedly features a 512K-byte memory, a 5¼-in. floppy disk drive, a detachable keyboard and a thermal printer, for approximately $3,900. The company also announced that its Alfaskop terminal is now available in three versions: with either a black-and-white screen, a yellow-on-brown screen or a color display screen.

WEST GERMANY

HANNOVER — As of 1986, there will be two Hannover Faires: one exclusively for data processing professionals and one for the rest of the manufacturing community.

The Hannover Faire, considered to be the world's largest industrial trade show spanning 13 exhibition halls, has traditionally showcased industrial and agricultural equipment along with information processing equipment.

The information processing segment of the show, known as the World Center for Office and Information Technology, is thought to have outgrown the show: Ten years ago, there were 770 computer vendors at the show, but this year, that number grew to 1,220 firms, with another 300 companies on the waiting list for exhibit space.

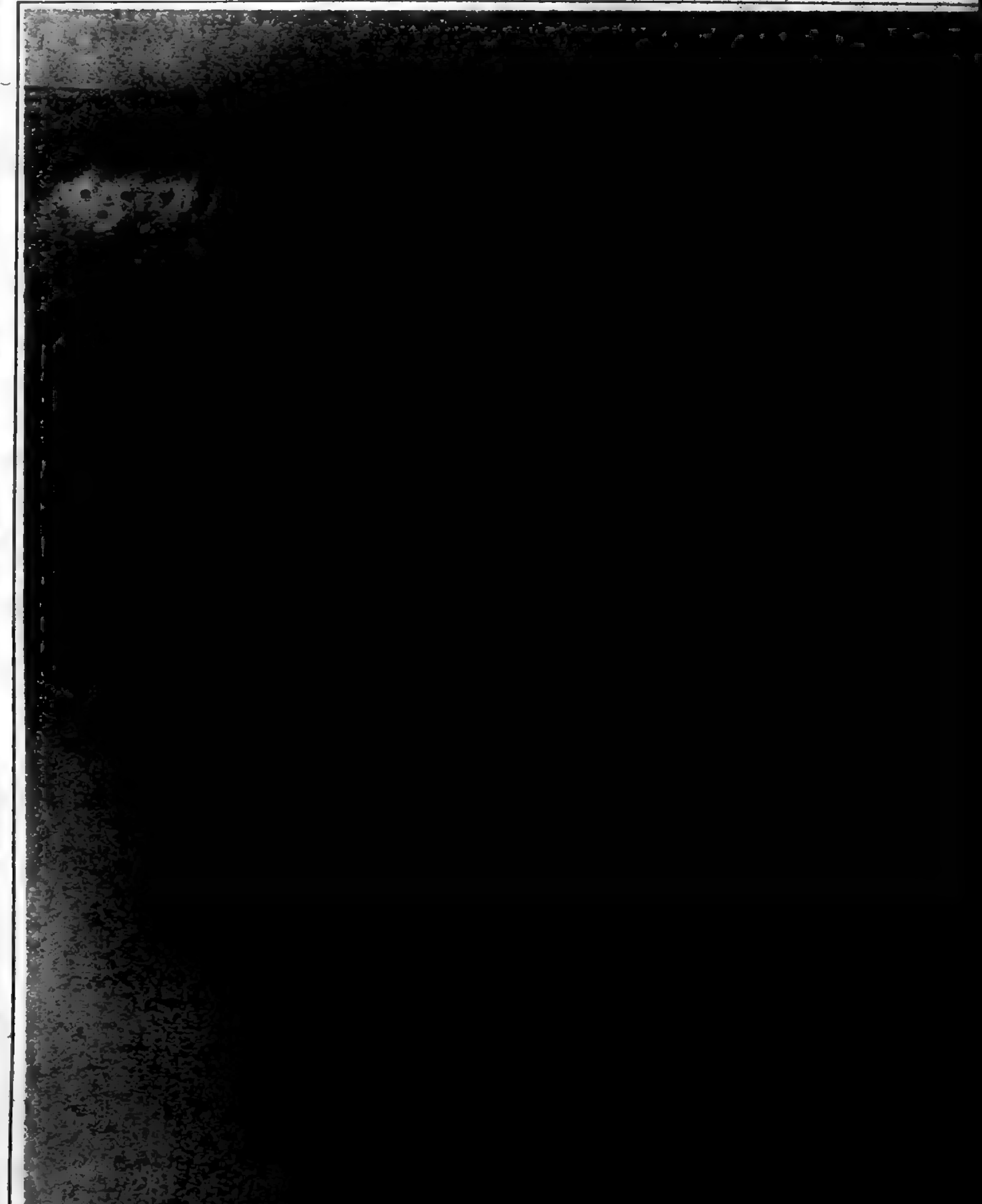
FPLO

from page 24

Randall also runs Netman on ISPF, which was ". . . just a matter of tailoring the menus," he said. This allows Netman users to look at multiple menus on-screen to see problems and how they might impact the configuration.

It also enables users to get into other functions that run under IBM's TSO as well as submit report JCL. According to Randall, with this capability, users do not need to know any JCL at all. FPLO also uses Netman to perform a tape library function for IBM products and fix distribution tapes.

The Netman system has been in operation for more than a year and has had a real impact on FPLO's operations. "It reduces the hassle in managing an elaborate network," Randall said. "It provides ongoing, reliable systems information and statistics so that we know what is going on out there all the time."



Airline's hardware upgrade keeps operations cruising

By Abdul Rahman
Special to CW

KUALA LUMPUR, Malaysia — Hot on the heels of a $9 million upgrade of its passenger reservations system, the Malaysian Airlines System (MAS) has announced a four-year computer development program estimated to cost an added $14 million.

Earlier this month, MAS implemented its recently purchased Kosmos-II system, an integrated passenger service system developed by Swissair. The system provides information on all MAS flight schedules, schedules of 300 other airlines, travel data on the 57 cities served by MAS and currency conversions.

MAS is now bringing up additional options of this system, including ticket printing, automatic fare quotations, seat selection, departure control and check ins, weight and baggage control and hotel reservations. It is expected to be fully operational by October.

The newly announced development project will handle some 30 management functions, including the computerization of the airline's cargo operations. The system will also add a passenger revenue accounting system, an engineering and maintenance system and a personnel and payroll system.

MIS manager Ahmad Rosdi b. Mohd Razali said much of the money earmarked for the new project will go toward upgrading MAS' existing hardware — an IBM 4341 and two 3031s. MAS has already installed a high-end IBM 3083 mainframe with 16M bytes of memory and 16 communications channels. Razali said he intends to buy two more.

"We are looking at the 3083 series because they can be upgraded to the 3084, giving us speeds up to 27 Mips [million instructions per second]," Razali explained.

The airline did not consider the IBM 4381 for a number of reasons, Razali said. "The 4381 Model 2 can give us only about 2.7 Mips maximum. And we cannot use the Model 3 — the dual-processor unit — because our existing Airline Control Program can't run on a dual-processor machine," he said.

> *The newly announced development project will handle some 30 management functions, including the computerization of the airline's cargo operations.*

Razali said future purchases at MAS will include an IBM 3800 laser printer, newer models of the IBM 3380 disk drive that can be upgraded for dual-density storage (doubling the existing 2.5G-byte capacity) and some uninterruptible power supply devices.

Information center

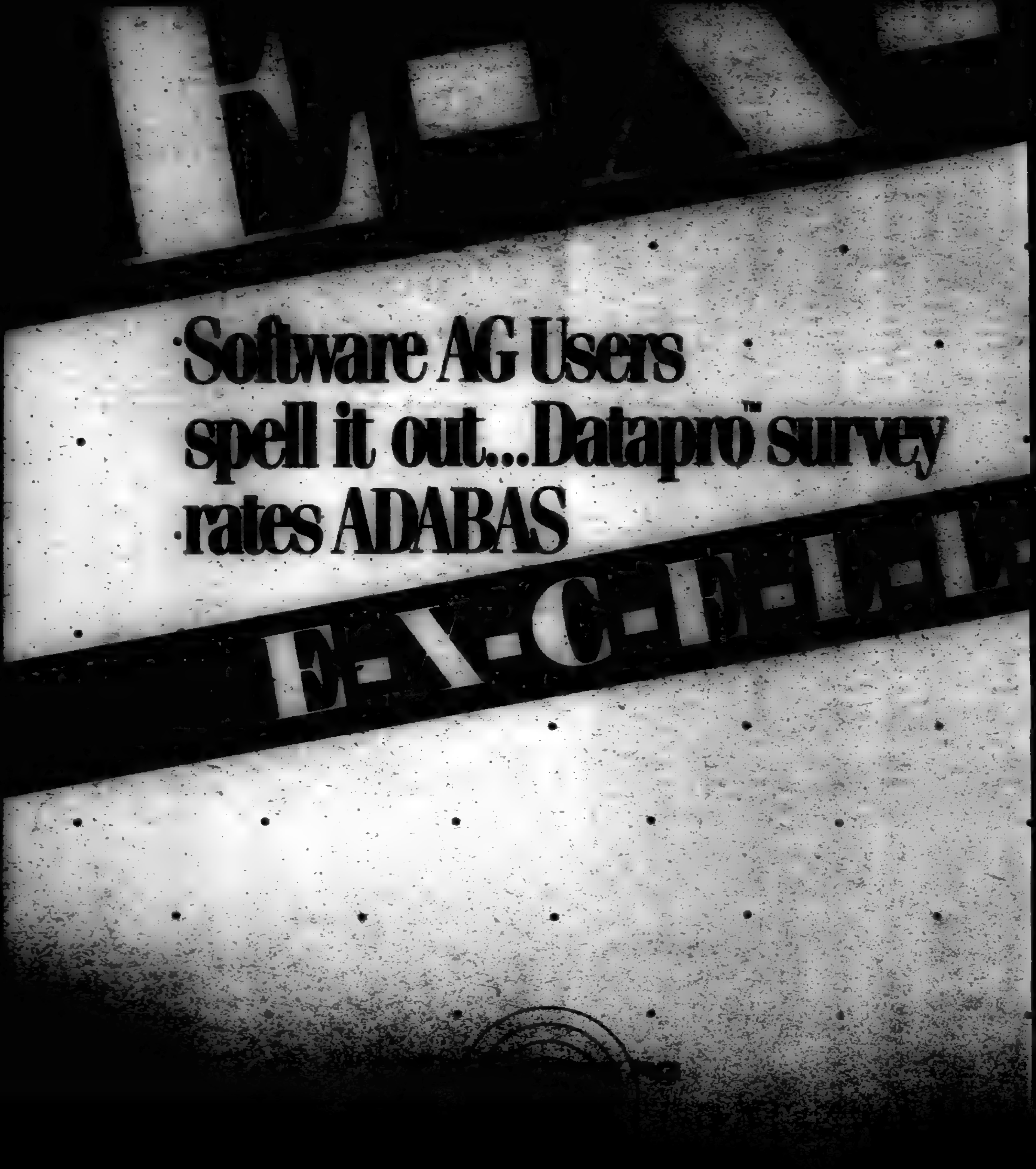
The airline has also recently formed an information center to help introduce personal computers to the company. Ten micros have been installed to date, and 10 more are on order.

The current stock includes seven IBM Personal Computer ATs, which are believed to be the first in Malaysia, and three Wang Laboratories, Inc. personal computers, Razali said.

"The [personal computers] are primarily being used for word processing and spreadsheets, but we are also evaluating graphics packages and micro-mainframe links," he said.

And to encourage computer literacy at MAS, the company has also instituted a computer loan scheme for its staff, Razali concluded.

Rahman is associate editor of The Asian Computerworld, *the Singapore-based sister publication of* Computerworld.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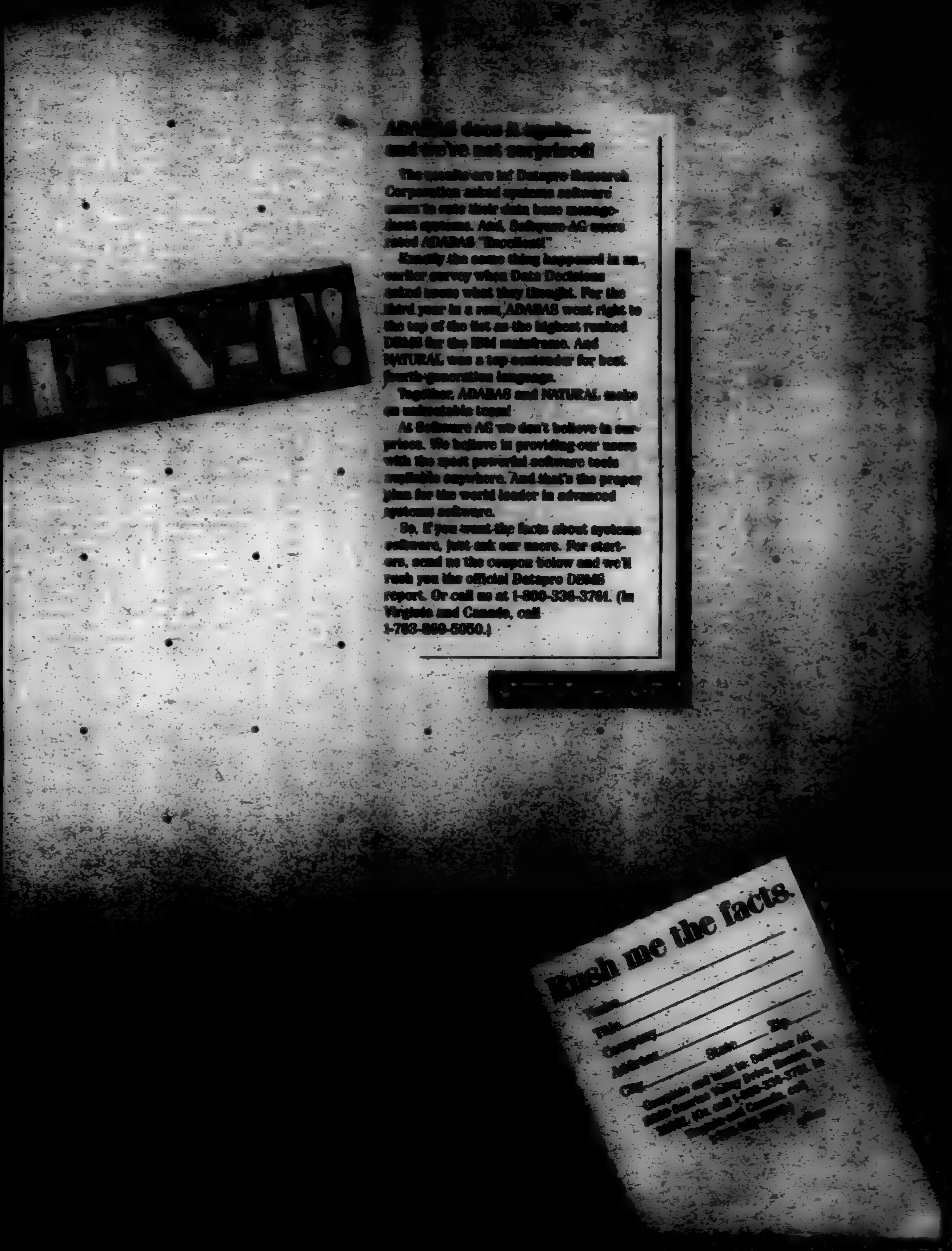

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The results are in! Datapro Research Corporation asked systems software users to rate their data base management systems. And, Software AG users rated ADABAS "Excellent!"

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TURNAROUND TIME

Larry Long

***Q** I am currently involved in developing the structure for the use of part-time, at-home programming resources. No organizations in my area are doing this. I would be very interested in your opinion of such hiring practices and if any organizations have now or in the past been involved in such part-time, at-home work programs.*

This proposed structure is for part-time employees only. Full-time employees will continue doing program development work in the office.

You are one of the pioneers in an employment arrangement that I feel will be very popular in a couple of years. At present, companies needing to supplement their programming resources rely on contract programmers. Contract programming agreements are usually between two companies. What you propose is a unique employment relationship between your company and an individual.

Companies routinely hire part-time programmers, but relatively few permit them the flexibility of working at home.

Nevertheless, I think it is a grand idea whose time has come. The personality of programmers has never been to work 8 a.m. to 5 p.m. And programmers often tell me that their allegiance is more to their work than to their company. A self-motivated programmer could be content and probably more productive working at home.

Having praised the possibilities of such an employment arrangement, I should speak to the practicality of implementation. I am afraid that we, as an industry, are going to have to experience the steep part of the learning curve before this type of arrangement can be a profitable reality.

A policy that permits only part-time employees the flexibility of working at home will breed discontent and will eventually backfire. Also, contrary to popular belief, effective programmers engage in considerable personal interaction. This means that some time must be spent on-site.

Then there are the logistical, legal and security considerations. For example, does the company provide the hardware, or does it reimburse the part-time employee for the use of a personal workstation?

In a nutshell, I would recommend that you require that 25% of the work be done on site, that full-time employees be rewarded for exceptional performance with a work-at-home option, that the organization pay pro rata (at $200/month) for the usage of a part-time employee's workstation and telephone line, and that you set up rigorous procedures for quality control and time accounting.

***Q** For the last three years, I've shared a cubicle with a delightful and capable programmer/analyst. It is often hard to believe that we work for two different companies. She and other contract programmer/analysts now outnumber our permanent staff, 23 to 17. They attend all company parties and even play on the company's basketball team.*

My office mate and I have about the same level of experience, and our compensation level is about the same. She makes slightly more than I do.

My compensation, including benefits and salary, is X dollars. My organization pays the contractor approximately 2X dollars for the same services from my office mate.

Our department has at least a three-year backlog of work. My boss has proposed that we phase out the contractor over the next 18 months and triple the size of our current staff, all while holding the programming budget at the current level. This proposal would result in 25% more programmer/analysts. With this number we could begin some new projects rather than trying to keep everything from falling apart.

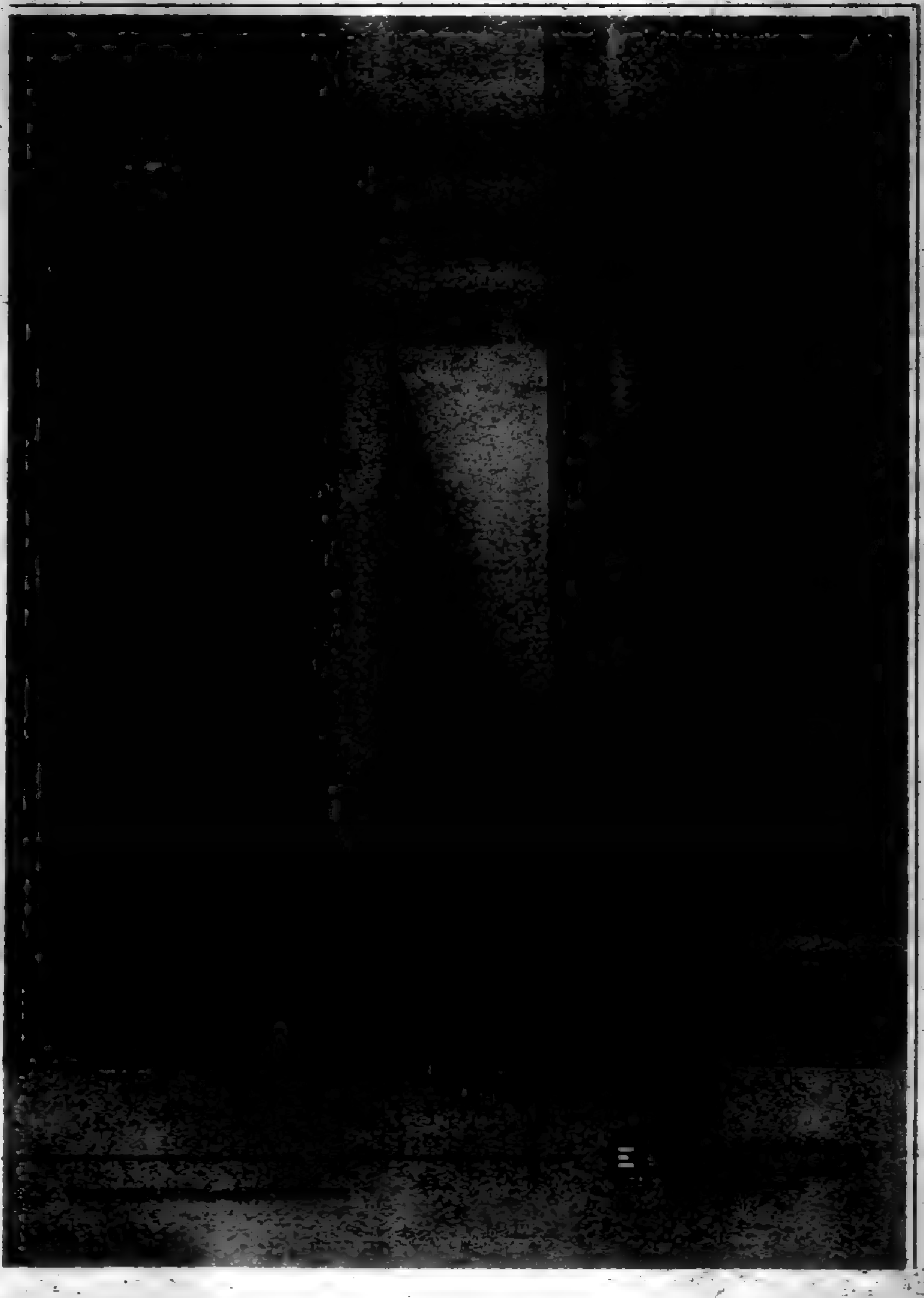
All the proposals to cut back on contractors or increase staff have been turned down. At what point should our company begin to expand its programming staff?

You pay a premium for the flexibility offered by contract programmers. When a company such as yours no longer needs this flexibility, it should consider moving the work in house.

The decision to replace contract programmers with additional in-house people is based more on political considerations than it is on economic or operational considerations. Once hired, the contractor fees become a line item in the budget that can be carried forward without much hassle.

But increasing the internal head count is another question altogether. Even though such a move can be shown to have a positive effect on the bottom line and on responsiveness to users, upper and lower level managers within the organization may be concerned that an inordinate increase in the head count will reflect poorly on personal performance evaluations.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*



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Vendor support helps timber firm cut upgrade time

SAVANNAH, Ga. — A timber company here credited the support it received from a software vendor with chopping months from its development and conversion efforts during a recent hardware upgrade.

Last summer, the Woodlands Division of Continental Forest Industries (CFI), a subsidiary of the Continental Group, Inc., upgraded its hardware system from four 16-bit Data General Corp. C/330s running under AOS to four 32-bit DG MV/4000s running under AOS/VS.

The firm relied on one of its software vendors, Computer Associates International, Inc., to convert most of its programs. CFI sent one of its senior systems analysts, Tom Jacob, to Computer Associates' office to work out the software conversions for the upgrade with two vendor representatives.

In five days, the team had the software — including accounts payable, general ledger and personnel management modules — ready for installation, a task CFI estimated would have taken at least half a year without the vendor representatives' help. "They saved us a great deal of time," Jacob said.

CFI owns and manages approximately 1½ million acres of timberland throughout the South. It grows and sells trees to sawmills, plywood plants and paper mills to be turned into paper and wood products.

Before the upgrade, rapid system growth at the company had pushed the 16-bit machines to their limits. In the previous two years, CFI had added land and timber management applications, spreadsheet modeling, office automation tools and a number of new users to its system, according to Don Dickerson, CFI's manager of systems and data processing.

The additions to the system caused problems with throughput and response time. "The more we put on [it], the more it slowed down," Dickerson said. Running the firm's payroll application, for example, took five to six hours.

"We knew that to stay productive, we had to expand our data processing capabilities," Dickerson said.

CFI set a rapid schedule for its conversion. "We anticipated paralleling both systems for only about one month," Dickerson said. "That's not only ambitious, it's aggressive." He said the firm was confident that its software and operating system would stand up to the schedule.

According to Jacob, the firm's confidence rested mainly on the support it expected from Computer Associates. "They went beyond the scope of their own products," Jacob said. "They offered to help us convert our whole system. They also offered to convert our system on their own machine at their own office. This demonstrated to us a genuine concern on their part to see us succeed."

Jacob said that besides concern, the vendor representatives offered solid technical advice. One of the representatives was the software developer, and he explained some of the reasons for the program structures and pointed out how changes in portions of the software would affect other parts.

This approach "helped us take a moment to comprehend the new system before the full load of the responsibility was shifted to us," he said. "As a systems analyst, that was important to me. It gave me some breathing room before it was my turn to push the keys."

After the conversions had been worked out at the vendor's office, CFI brought the software to its office and ran it parallel to the old system for three days before letting it run on its own. The new system has fixed the company's throughput and response problems, Dickerson said. The payroll system now takes only half an hour to run.

CFI is currently working on bringing up an accounts receivable package and on interfacing some in-house sales software with the Computer Associates programs. The firm also plans to install a fixed assets module for its system by the second quarter of the year.

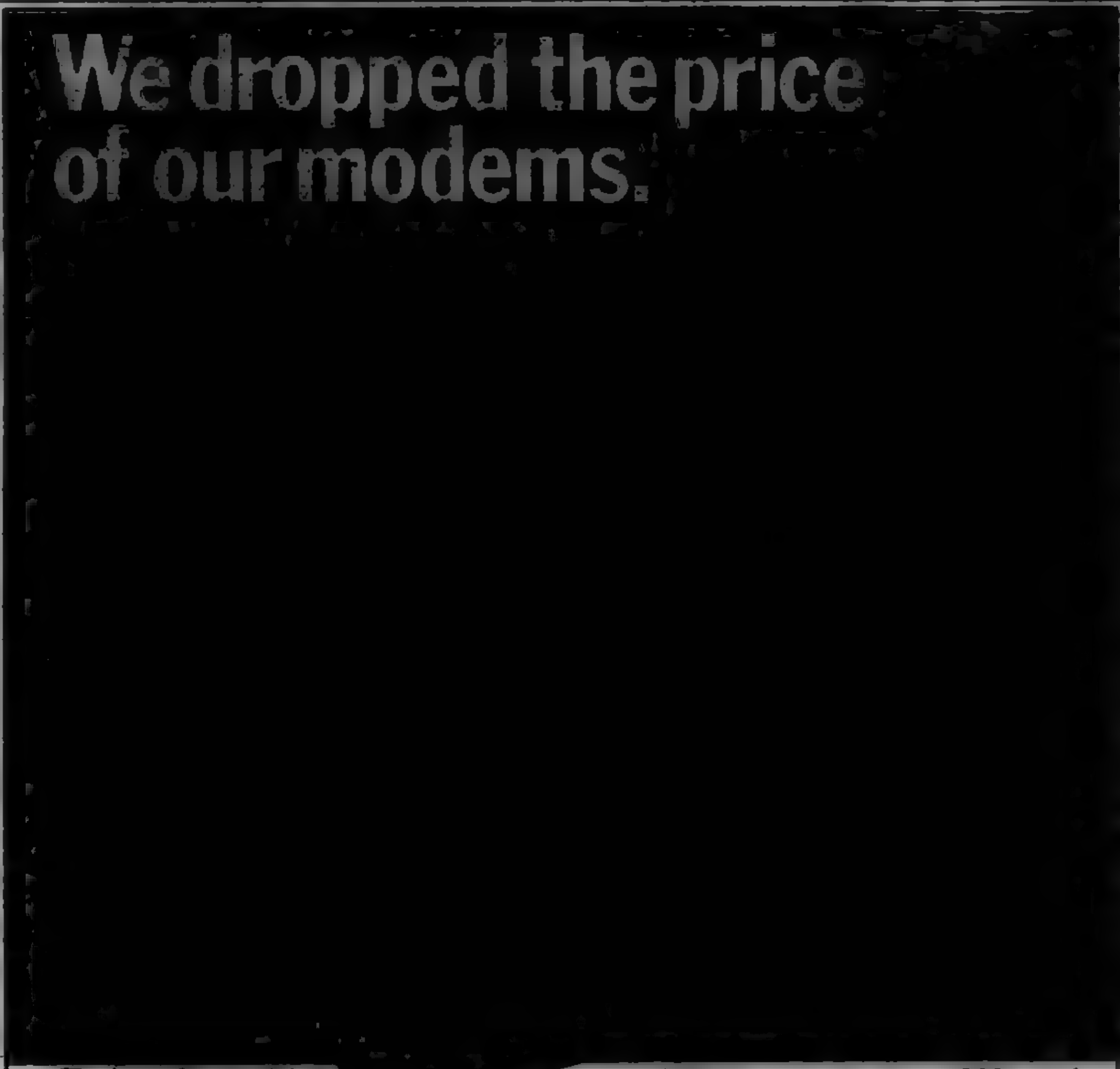
May ACM meet to focus on APL

SEATTLE — The Association for Computing Machinery (ACM) will hold APL '85 May 12-16 at the Westin Hotel here. The topic of the conference and exhibition is "APL and the Future."

The conference — sponsored by ACM, its Puget Sound Chapter and its special interest group on APL (SIGAPL) — will include the presentation of 45 technical papers, four tutorials, seven panel discussions and a variety of optional activities.

Conference fees are $190 for ACM or SIGAPL members, $220 for nonmembers and $55 for students, with discounts available for registering before April 10. Professional development fees are $100 for conference attendees and $125 for nonconference attendees and $50 for students, according to the sponsor.

More information is available from APL '85, P.O. Box 33123, Seattle, Wash. 98133.



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NEWS

CALENDAR

WEEK OF MAY 19

MAY 19-23, NASHVILLE — Software Jamboree. Contact: Software AG of North America, Inc., 11800 Sunrise Valley Drive, Reston, Va. 22091.

MAY 20-21, MONTEREY, CALIF. — How to Manage Data and Information as a Resource. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 20-21, FORT LEE, N.J. — CICS/VS Performance & Tuning. Contact: On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

MAY 20-22, HILTON HEAD, S.C. — Audit Managers Symposium. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

MAY 20-22, SILVER SPRING, MD. — 1985 Trends and Applications Conference Utilizing Computer Graphics. Contact: Trends and Applications '85, P.O. Box 639, Silver Spring, Md. 20901.

MAY 20-22, WASHINGTON, D.C. — Vtam Concepts and Facilities. Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727.

MAY 20-24, HOUSTON — Structured Systems Design Workshop. Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2900 N. Loop W., Houston, Texas 77092.

MAY 20-23, VIRGINIA BEACH, VA. — Navy/Micro OA '85. Contact: Bostron Corp., Suite 716, 1511 K St. N.W., Washington, D.C. 20005.

MAY 20-24, BELLEVUE, WASH. — C Programming Workshop. Contact: Kathy Howard, Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

MAY 21-24, PARIS — Intelligence International Exhibition and Congress. Contact: Simtec Communications, 211, Rue Saint-Honore, 75001 Paris, France.

MAY 21-22, TARRYTOWN, N.Y. — Technology and Market Forecasting in Electronics. Contact: Futurecast Learning Center, 40 Birch St., Redwood City, Calif. 94062.

MAY 22-23, SAN FRANCISCO — Personal Computer Local-Area Network Software. Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55425.

MAY 22-24, MONTEREY, CALIF. — How to Build and Use a Data and Information Resource Directory. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 22-24, WASHINGTON, D.C. — Management Skills and Techniques for New and Prospective Managers. Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022. Also being held June 26-28 in New York.

MAY 22-24, KYOTO, JAPAN — International Conference on Foundations of Data Organization. Contact: Yahiko Kambayashi, Department of Information Science, Kyoto University, Kyoto 606 Japan.

MAY 22-24, NEW YORK — Network Protocols and Standards. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

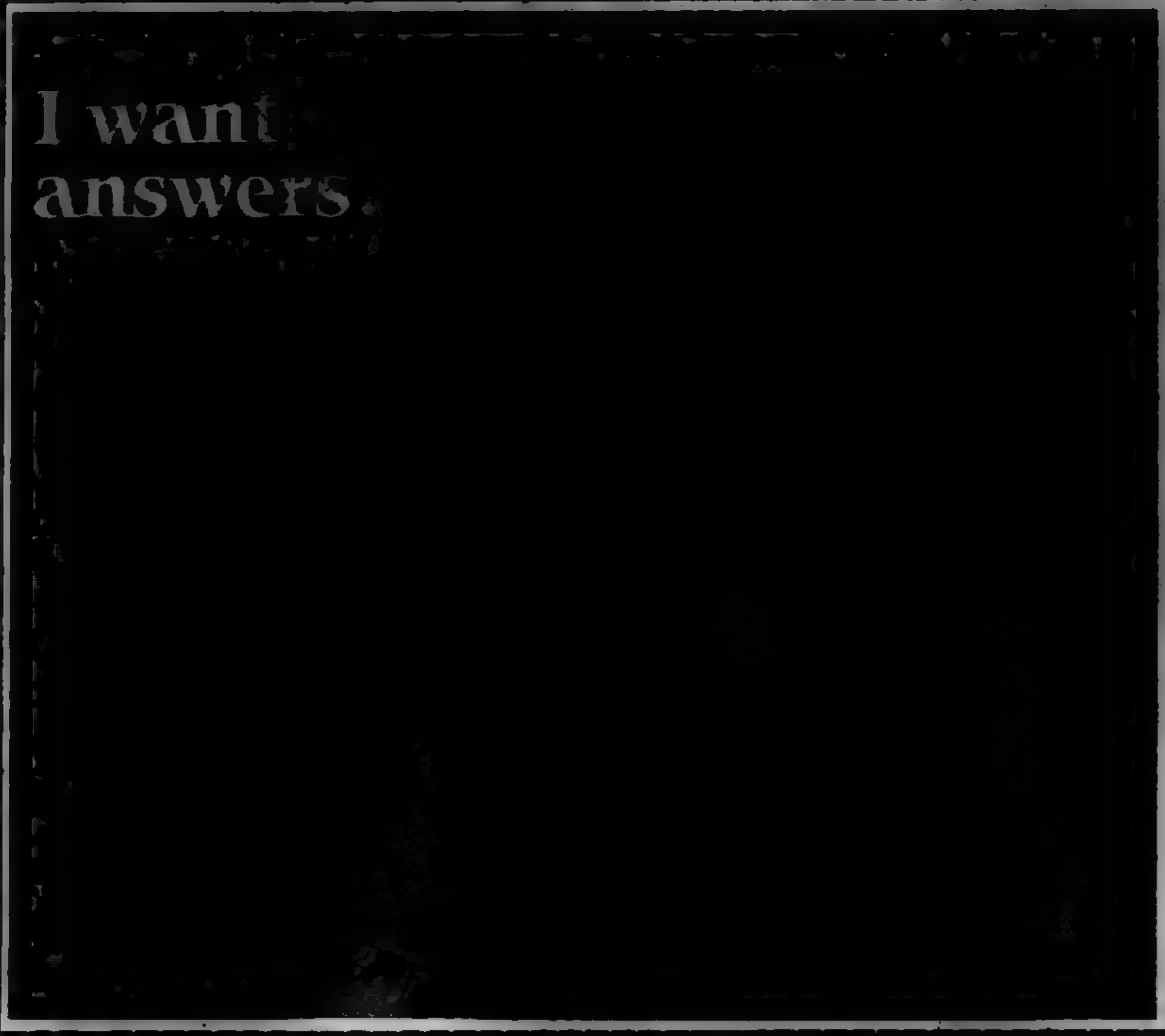
MAY 22-24, WASHINGTON, D.C. — Vtam Internals. Contact: Acts Corp., 11910 Gate Way, Austin, Texas 78727.

WEEK OF MAY 26

MAY 28-30, KINGSTON, ONTARIO — 15th Annual Symposium on Multiple-Valued Logic. Contact: H. T. Mouftah, Department of Electrical Engineering, Queen's University, Kingston, Ontario K7L 3N6, Canada.

MAY 28-31, NEW ORLEANS — The Seventh National DEC-Compatible Industry Exposition (Dexpo South '85). Contact: Angela Wright,

See MAY page 38



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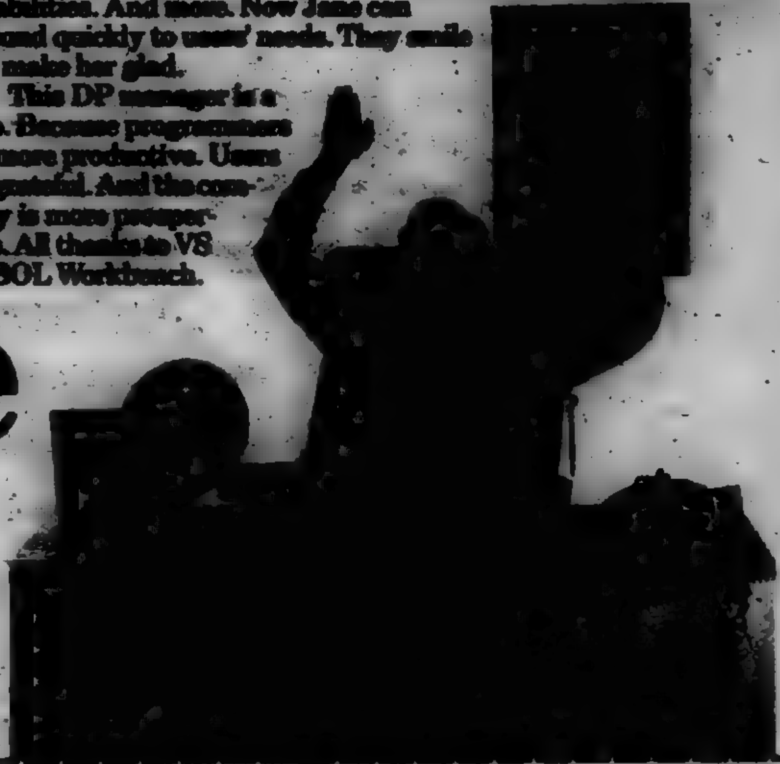

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MAY

from page 38

Expoconsul International, Inc., 55 Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

MAY 28-29, CHICAGO — VS Cobol II. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held May 30-31 in New York.

MAY 28-31, SAN FRANCISCO — CICS Application Design. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016. Also being held May 28-31 in New York.

MAY 28-31, NEW YORK — TSO ISPF. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

MAY 28-31, NEW YORK — CICS Application Design. Contact: Sysed, Inc., One Park Ave., New York, N.Y. 10016.

MAY 29-30, DALLAS — Opportunities & Pitfalls. Contact: Ken Gering, Future Computing, Inc., 8111 LBJ Freeway, Dallas, Texas 75251.

MAY 29-31, SAN FRANCISCO — Introduction to Data Communications. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015. Also being held May 29-31 in Boston.

MAY 29-31, BOSTON — International Conference on Computerization of Medical Records. Contact: Peter Waegemann, The Institute for Medical Records Economics, Inc., 121 Mount Vernon St., Boston, Mass. 02108.

MAY 30-31, WASHINGTON, D.C. — Legal Issues in Acquiring and Using Computers. Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.

MAY 30-31, SAN FRANCISCO — Managers' Roundtable. Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

MAY 30-31, BOSTON — Negotiating Computer Contracts. Contact: Law & Business, Inc., Harcourt Brace Jovanovich, Publishers, 855 Valley Road, Clifton, N.J. 07012. Also being held June 17-18 in San Francisco.

WEEK OF JUNE 2

JUNE 2-5, DALLAS — American Bankers Association 1985 National Operations and Automation Conference. Contact: American Bankers Association, Communications Group, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

JUNE 3-4, BOSTON — Fundamentals of Data Processing for Administrative Assistants and Secretaries. Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022. Also being held June 20-21 in San Francisco and June 27-28 in Los Angeles.

JUNE 3-5, MONTREAL — Canadian Information Processing Society Congress '85. Contact: Canadian Information Processing Society, Fifth Floor, 243 College St., Toronto, Ontario M5T 2Y1 Canada.

JUNE 3-5, SAN FRANCISCO — Long-Range Information Systems Planning. Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020. Also being held June 17-19 in Boston.

JUNE 3-6, CHICAGO — IMS/DB (DL/1) Application Programming. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 24-27 in Washington, D.C.

JUNE 3-6, CHICAGO — Vsam From Start to Finish. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 17-20 in Boston and Atlanta and June 24-27 in Los Angeles.

JUNE 3-6, FORT LEE, N.J. — CICS/VS MRO/ISC. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 3-6 in Los Angeles, June 17-20 in San Antonio and June 24-27 in Fort Lee, N.J.

JUNE 3-6, WASHINGTON, D.C. — CICS/VS Applications Design. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 11, 12, 13 and 20 in New York, June 17-20 in Fort Lee, N.J., and Los Angeles, and June 24-27 in San Antonio.

JUNE 3-6, DENVER — Vsam Its Structure and How to Use It. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held on June 10-13 in Fort Lee, N.J., and June 24-27 in San Antonio.

JUNE 3-6, LOS ANGELES — CICS/VS Logic & Debugging. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held on June 17-20 in Fort Lee, N.J., and June 24-27 in Atlanta.

JUNE 3-6, NEW YORK — IMS/DC (Data Communications) Programming. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 17-20 in Chicago.

JUNE 3-7, MONTREAL — Montreal International Software Market, MIM '85. Contact: Montreal International Software Market, P.O. Box 1119, Suite 1919, 800, Leo-Pariseau, Place du Parc, Montreal, Quebec H2W 2P4 Canada.

JUNE 3-7, FORT LEE, N.J. — CICS/VS Internals. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 10-14 in Atlanta, June 17-21 in San Antonio and June 24-28 in New York, Chicago and Los Angeles.

JUNE 3-7, ATLANTA — CICS/VS Application Programming — Command Level. Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 10-14 in Boston, Chicago and Los Angeles; June 24-28 in Fort Lee, N.J., and San Antonio.

JUNE 3-7, MONTREAL — Fourth-Generation Languages: Paths to Productivity. Contact: National Seminar, Canadian Information Processing Society, Fifth Floor, 243 College St., Toronto, Ontario M5T 2Y1 Canada.

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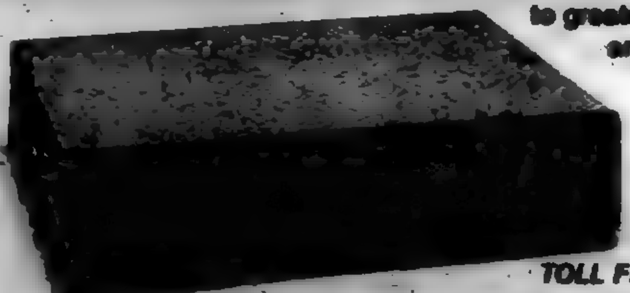

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EDITORIAL

Opportunity calling

If you sampled the opinions of telecommunications managers on the AT&T divestiture a year ago, they would have likely expressed skepticism at best and, at worst, fear and loathing. We did this at various communications conferences, and this is what we found.

Despite its inherent inefficiencies, the monopolistic communications monolith was, after all, everything in communications most managers had ever known. And at that time, AT&T was mired in lengthy backlogs providing new service installations, so much so that some communications equipment makers like Rolm Corp. blamed sluggish sales on AT&T's inability to quickly provide the phone lines that are the main arteries of private branch exchanges and the like.

Perhaps worst of all, last year's divestiture made clear that managers would face potentially great changes in internal corporate telecommunications strategies. Exactly what changes and challenges, no one knew for sure.

If those same managers were polled again today, they'd likely sing a cheerier tune about divestiture. The reason is opportunity, which came pounding on managers' doors before the smoke of the Jan. 1, 1984, bomb had begun to clear.

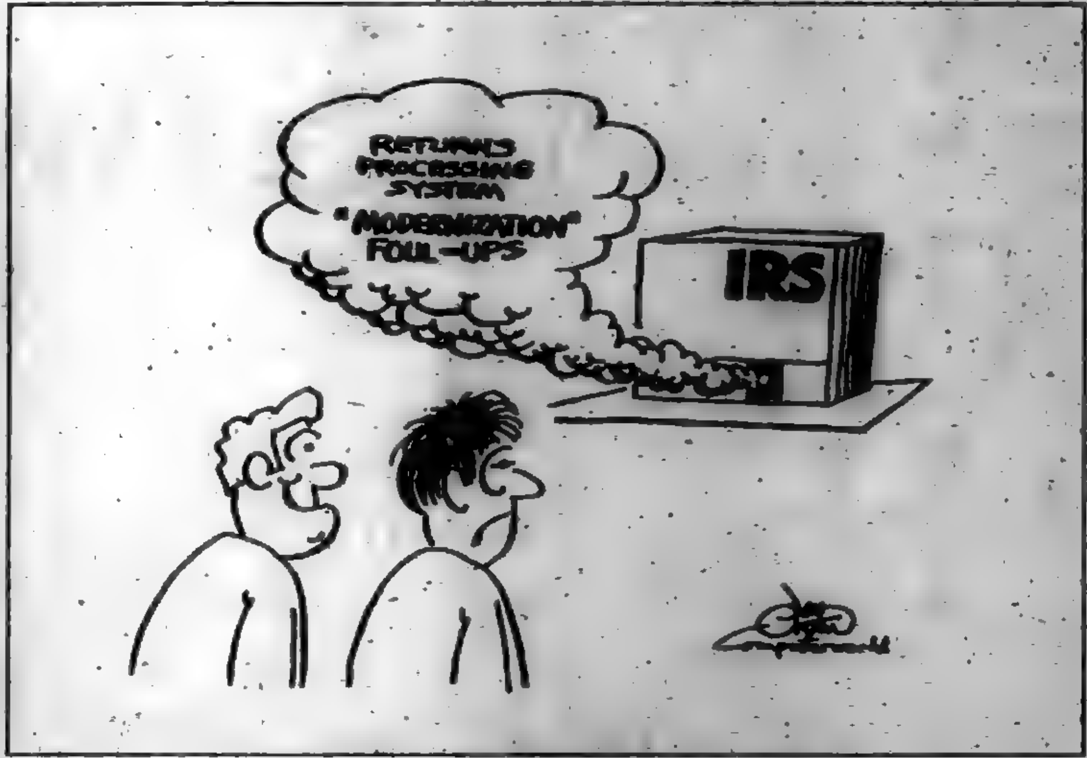
Figures compiled by government and private sources show that AT&T is losing some old customers to other long-distance providers in areas where equal access is already in place [CW, April 15]. Apparent cost savings has prompted the customer migration — at least now in early days of divestiture. But when the government has all long-distance providers paying the same for local access, firms like MCI Communications Corp. and GTE Sprint Communications Corp. will simply have to do what they do much better to remain competitive with AT&T — another divestiture side benefit for managers.

But divestiture has significantly and indirectly ushered in a new climate. It appears that telecommunications managers, forced to make at least token changes in deference to divestiture, are generally more amenable to change. The spirit of divestiture is becoming the spirit of dynamism. Managers are becoming less wary of change — especially when it saves their companies money — and communications suppliers are reaching for greater efficiencies than ever before.

Case in point: the four-part series on bypass strategies launched last week in *Computerworld*. Divestiture did not make bypass possible, but the tariff revisions, vendor service and plummeting communications equipment costs it left have given it a big boost. Just ask Bell Atlantic, whose recent study predicted "pervasive" adoption of bypass and the potential demise of large blocks of the former Bell operating companies' businesses.

One recent tariff revision will give large users in particular the chance to see how much of their long-distance bill accrues to AT&T and how much accrues to the operating companies for local interconnect. Knowing the cost of local interconnect, these users can make a clearer cost/benefit analysis of bypass options, which will at least get managers thinking about their options.

Despite the tariff structure's instability and the uncertainty in these early days of divestiture, a new communications infrastructure is taking shape: one in which the range of services is more harmonious with the frenetic pace of business. This infrastructure will be much to the liking of aggressive, nimble telecommunications managers.


RETURNS PROCESSING SYSTEM "MODERNIZATION" FOUL-UPS
IRS
Computerworld

Which taxpayer owes the IRS and which is owed a refund?

LETTER

Discrimination still a salary factor

I found the letter "DP salary gap citing called invalid" [CW, March 25] interesting, to say the least. Obviously, the author has been under a rock for a number of years. What else could account for his entire lack of knowledge regarding sex discrimination in the DP job market?

I, for one, have been in data processing since 1958, and *I* do mean programming and analysis. The discrimination I have seen in that time would take weeks to record.

Just to give you an idea of what has gone on and what may still be going on in the DP job market, consider the following scenarios:

- A female DP professional gets to break in the new chief programmer (male), who is earning $10,000 more a year than she is and doesn't know anything about the system or operations but has been hired to run the show.
- The woman's boss tells her she cannot be promoted to chief programmer, not because she does not have the qualifications, but because the vice-president in charge of DP doesn't want a woman in that position or in any other position of management if he can avoid it.
- When it comes to raises in DP operations, men get very generous raises, but women get the bare minimum, and when women should want to know why they are being "shortchanged," they are told that women don't have to work; they are employed as a hobby and therefore should not expect to get equal pay for equal work. But the day a woman hands in her resignation to take a job with another company at a generous increase in pay, just watch

See LETTER page 44

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Query DP staff moves with 'up, over or out'

[illegible]
William F. Cobrin

It's an executive-quandary situation. You're busy occupied by wandering around in the programming pit when one of your top programmers "wants to talk." The topic turns out to be "career paths" — meaning that this person thinks it's time to move up, over or out.

First of all, you're lucky. You must have been doing something right in the past or you would have a resignation and two-week notice instead of a talk. Now you have some options.

Your first problem is to distinguish between up, over and out. Anyone who loves the work but hates the job is an up or over candidate. The talk of moving out to another company often stems from an employee's lack of perspective. Somebody down in the pit has a completely different outlook, and usually a foggy one, on what is available and what is possible. You have the perspective and should have the ability to offer options to someone you want to keep [illegible].

What kind of options? You probably have the most flexibility in the area of assignments. Your best people instinctively recognize the difference between experience and time on the job. In other words, does five years with the company represent five years of experience or just the first year's experience repeated five times? Keep the work fresh, and you'll keep the people. You'll also keep the productivity up.

The goals of the employee are important; frankly, they are more important in this context than your goals or the department's goals. Find out what those goals are and match them to what you have available or what you can create.

Granted that someone from time to time is [illegible], pure and simple — not simple requests for a raise, but outrageous demands and veiled threats. This one is an automatic "out" candidate. If the wealth of King Midas is truly this person's primary motivation and goal in life, immediately write him a glowing reference and send it anonymously to the headhunter who has been trying to raid your shop or, better yet, send it to your chief competitor.

> **"**
>
> *The goals of the employee are important; frankly, they are more important in this context than your goals or the department's goals. Find out what those goals are and match them to what you have available or what you can create.*

You might wonder whether all of this trouble is worth it. Why not just let this programmer go and find yourself a replacement? That saves you the trouble of tweaking the assignments. It's cheaper, and besides, it's good, old-fashioned Ebenezer Scrooge show 'em who's boss business, isn't it?

All right, Ebenezer, let's look at some numbers. Suppose that you're paying $2,500/mo ($30,000/year) for this position, exclusive of fixed overhead. You can expect it to cost you at least 15% of the annual salary to fill the position — either in agency fees or recruiter costs — and hold the line while you're waiting for the personnel department to find someone, or both. That's $4,500. The productivity of your new hire is going to be a little short of the mark at first. Let's say you get [illegible] of the current performance the first month, [illegible] the second, 90% the third and a return to the current productivity level by the fourth month. Compared with your existing employee, that's a cost [illegible] of [illegible], [illegible] and [illegible], respectively, [illegible] first three months, costing you a total of [illegible] in reduced productivity alone. The grand total of your additional cost is now [illegible].

These numbers are really pretty conservative considering that they assume you will find a replacement quickly, that the new hire has equivalent ability and experience and that there is no cost to you in backed-up schedules. Of course, we have assumed that you are offering the same salary to the replacement. Couldn't you get away with less?

You might be able to save 10% or so, but even if you could you'll still be out about [illegible]. And besides, it is likely you will have to offer 10% more than the current rate. It would be nice to break even, but that means you will have to find a $22,000 replacement for a $30,000 position. You simply won't be able to do that unless something is wrong with your existing salary scales. When you look at it this way, it actually is possible to offer your current programmer a modest raise.

At this point, some managers say that "corporate policies" prohibit creating new positions or offering raises. If that is really true, if the policies are really that inflexible, if, as a manager, you are really forced to take responsibility without authority, then there is one last option for you: [illegible]. Look in a mirror and recite the following every morning and as needed until you do something about it: "What's it going to be: up, over or out?"

Cobrin is a senior associate with Nicholas De Maio Associates in Bryn Mawr, Pa.

Micro madness on the user end finally winds down

[illegible]
Jack Stone

At long last, it appears that the widespread craziness over personal computers in the user sector — illustrated by the inadequate and incessant demands for features and functions far in excess of need or understanding — is winding down, and more rational DP minds are prevailing.

This trend is illustrated by the following items:

A bright, young business acquaintance and competent user of a complex office system told me this about acquiring a micro machine for personal use: "I have a number of colleagues who have purchased their own systems, some loaded with all the bells and whistles and quite expensive. When I query them on how they are being used and how effective they are, their answers rather astounded me: 'Oh, it takes more effort to get some work out of it than by not having the machine at all. But they're so much fun to play with, you know, just like at the office!'"

A senior systems manager in a large organization offered these comments about personal computer use: "Certain of our user departments with a high degree of political clout put all sorts of pressure on my boss to get me to order personal computers with the works — [illegible] for each member of a group in several instances. And I'm talking maximum memory (RAM), disks, hard disks, multiple printer ports and most of the integrated programs — every 'hot' item in the industry. I held out for a time, then launched an order and made the order with the caveat to my boss that in three months these machines would be sitting in the corner gathering dust.

"So guess what?" he added. "Three months later I wandered through the user area — the area that cried most for the machines — and, sure enough, a half dozen of them were sitting in the corner gathering dust."

> **"**
>
> *"We can get you a 99% IBM clone with a much faster processor, twin floppy drives, RAM, naturally high-resolution monitor and the requisite printer ports, DOS, Basic, a top-notch word processor and 12-month warranty on parts and labor for a mere $1,495 — and for another $100 we'll toss in a 384K-byte RAM upgrade!"*

For the first time in nearly five years, IBM's profitability fell. An IBM spokesman attributed this to a decline in large system orders. After the debacle with the PCjr, figure your own conclusions.

A close friend, one who really knows what he is doing in the DP arena, is on the prowl for a new, shiny 16- or 32-bit machine for his own use after being an 8-bit machine aficionado for years. He said, "I am luxuriating in personal computer nirvana."

The retailers even have difficulty giving the stuff away. It seems that every week when I check on the latest price, it's dropped another $50 to $100, or "free" peripherals are offered worth the same amount.

My supplier, who is not even a wholesaler, said, "We can get you a 99% IBM clone with a much faster processor, twin floppy drives, RAM, naturally high-resolution monitor and the requisite printer ports, DOS, Basic, a top-notch word processor and 12-month warranty on parts and labor for a mere $1,495 — and for another $100 we'll toss in a 384K-byte RAM upgrade!"

A computer center director who has his act together said, "With us, the personal computer madness in the end-user areas never exploded because we simply would not let it. Our business is such that we must run a tight ship; allowing users to order DP equipment or control the ordering of it is a certain path to a horrific waste of resources.

"We evaluate personal computers for our organization the same way we do for any terminal or stand-alone machine destined for a user department. I hope that other DP shops have gotten their personal computer procurement under control, but I doubt it."

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personal development.

VIEWPOINT

LETTERS

Some recognition, please

I concur with the column "Technical support staff deserves a fair shake" [CW, March 25]. At last, an MIS manager who understands at least some of the basic problems the technical support members face in their day-to-day chores. Underpaid (yes, it's true — some micro programmers do earn more), understaffed and being forced to work all weekend are just a few of the problems.

I have always preferred to use the analogy of a "cop" to describe my relationship with my peers: No one likes a cop except when you need one. We technical support members are the heroes of the day when we help an application programmer solve a problem, but we quickly turn into villains when we ask the same person why he is using 10,000 tracks for a 2-track file.

Our public awareness campaigns probably need to be refined, but in all honesty, we do give our best shot. This is true with any MIS group that must interface with a user. Our users are educated and know what goes on inside a computer. They cannot be easily fooled with such lines as, "The computer will take care of it." Our users want to know why, but they are usually unwilling to look up the answers for themselves.

My operation strives for 100% online uptime. When the 100% turns to 99% we are "down" too much. This causes an unbelievable amount of pressure on the poor souls who have to maintain the MVS, the CICS and the Vtam. There is no room for an error, and if you must make one, make sure it's on Saturday at 2 a.m.

But one should never overlook the positive aspects of the job either. There is nothing like coming in on a weekend to install something new and having the machine to yourself, with all that power at your fingertips and no one asking, "Is it up yet?" To see your installation work is a thing of beauty and great satisfaction. To somehow put all the pieces together and get them to work makes all the hours away from home and all the daily interruptions and frustrations worthwhile.

We are what we are because of the demands made upon us, and it's nice to hear that someone higher in the corporate ladder understands and appreciates our efforts.

Richard P. Tapp
Jamestown, R.I.

Escrow transfer a mistake

In the article "Agent arbitration effective in software escrow pacts" [CW, Feb. 11], a fundamental mistake was made in assuming that the "solution to [the software escrow] problem is to have your escrow agreement specify that title in the media be transferred on the execution of the agreement to the escrow agent."

If anything, this is worse, because it creates a different set of problems. It weakens the trade secret claim of the software developer. The developer may have a harder time convincing a judge that the software is a trade secret because it has already sold a copy of the software to the escrow agent. Additionally, if the escrow agent violates any secrecy term, the developer may have no other recourse, because it has already given up rights to the specific copy of the software.

It also assumes a bankruptcy court would not see through the fiction of claiming there is a separation of ownership rights in the magnetic media and intellectual property. I can see no legal reason why a bankruptcy court could not order the escrow agent to return the intellectual property to the bankruptcy trustee while allowing the escrow agent to retain its property: the blank magnetic media.

However, if this dichotomy of ownership interest exists, what happens if the escrow agent itself goes bankrupt? The agreement between the agent and the user can be rejected by the bankruptcy trustee as an executory contract. The developer has no claim (it already sold the agent the copy). The developer and the user could find the magnetic media being sold at a public auction to the highest bidder, free and clear of any contractual claims.

L.L. Sutton
St. Louis

New uptime record claimed

In the column "One year between CPU failure within reach" [CW, March 11], the writer stated he would claim the world record for 4,500 hours without a CPU failure until someone says he's done better. Well, we have done better.

He said his IBM 3083 Model E was installed Dec. 30, 1983, and had not failed as of September 1984. Integon Corp. of Winston-Salem, N.C., installed its 3081 Model G on Oct. 15, 1983, and has not recorded a failure as of March 15.

I claim this world record until, again, someone says he's done better.

James E. Stockdale
Winston-Salem, N.C.

LETTER

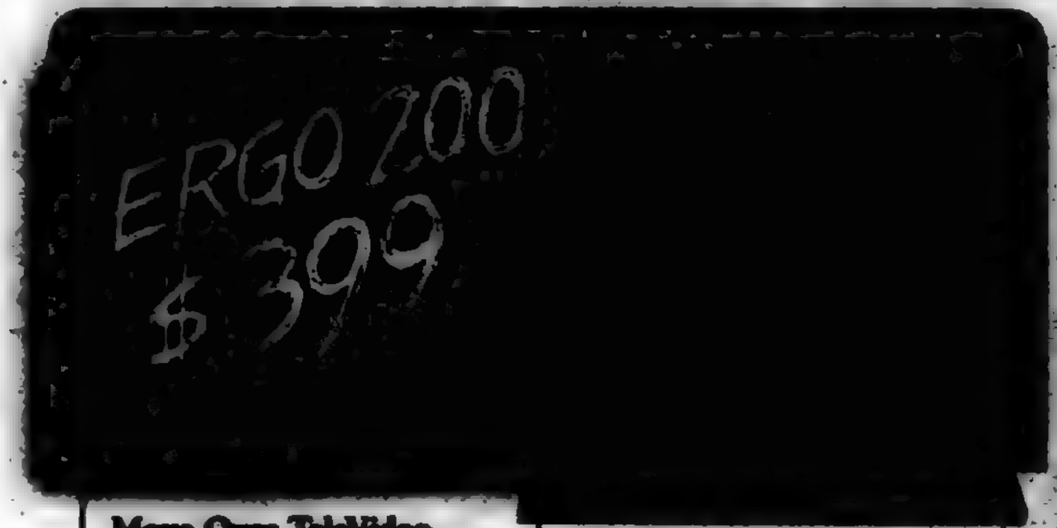
from page 40

her current employer offer to match the salary. All of sudden she's worth the money!

Perhaps in the author's next life he can return as a member of a minority and learn how the other half lives.

Judith Shaffer
Oakland, Calif.

WE'VE TAUGHT THE COMPETITION A LESSON IN ECONOMICS.



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SOFTWARE & SERVICES

MSA gives Expert Series tools DBMS support, offers modules

By John Desmond
CW Staff

NEW ORLEANS — Management Science America, Inc. (MSA) has announced that its Information Expert fourth-generation productivity and reporting tools, introduced last year [CW Oct. 1], will support IBM's IMS, Applied Data Research, Inc.'s Datacom/DB and Cullinet Software, Inc.'s IDMS data base management systems.

At the company's Interact users group meeting here, MSA also announced an enhanced release — the MSA Expert Series for Manufacturers — of its manufacturing system software. Added modules in Release 6.2 include advanced inventory management, manufacturing accounting, product costing and purchasing.

In addition, MSA said it plans to market all of its integrated applications software under the label of the MSA Expert Series in market areas including manufacturing, government and health care. According to John P. Imlay, MSA's chairman and chief executive officer, "MSA's plan for the future is to continue to provide software solutions for general business problems while expanding our offerings to specific industries."

The Information Expert products of the Expert Series reportedly enable users to retrieve information from a range of MSA and non-MSA software systems. Information Expert products currently include Information Expert Reporting and Retrieval and the Expert Data Dictionary. Information Expert products designed for screen painting and data base query are still under development, MSA said.

The Information Expert Reporting and Retrieval and Data Dictionary components

See EXPERT page 62

SOFTLINE/JOSEPH CROWLEY

RPG-III ideal for System/38

You are not making full use of the architecture of the IBM System/38 minicomputer if you are using converted software. It is like driving a Jeep on city streets — the machine's performance is not being maximized.

Since IBM's RPG-III language was developed concurrently with, and for, the System/38, the most effective software for that processor is written in RPG-III. A variety of features that makes the Sys-

See RPG-III page 60

Crowley is senior education instructor for RTC Systems, Inc., a North Attleboro, Mass.-based vendor of System/38 software.

- Boeing Computer Services unveiled combined microcomputer-mainframe spreadsheet software for the IBM Personal Computer and IBM mainframes/48
- On-Line Software International linked IBM's Personal Computer and the System/34 and System/36 minicomputers through its Omnilink 34/36/48
- Higher Order Software released a version of its Use.it automated software development tool for IBM mainframes/48
- AGS Computers announced a software development environment that allows users to create, test and debug C programs before compilation/62

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SOFTALK
John Desmond
CW Staff Writer

MSA gears up for IBM moves

At its recent Interact users group meeting in New Orleans, which attracted some 3,300 users, Management Science America, Inc. (MSA) positioned itself not against oft-mentioned competitors such as Cullinet Software, Inc., McCormack & Dodge Corp. and Walker Interactive Products, Inc., but squarely against IBM.

"IBM is coming," insisted John P. Imlay Jr., MSA's chairman and chief executive officer in an interview with Compu-

See MSA page 58

Software aids in machine 'birth'

By Mitch Betts
CW Washington Bureau

ANNANDALE, Va. — When the Nolans talk about their latest accomplishment — transporting hundreds of programs and records from an IBM 4341 to a newly acquired Digital Equipment Corp. VAX in just one month — they sound like the parents of a newborn baby.

Daniel and Barbara Nolan, president and vice-president, respectively, of Heuristic Developments, Inc., based here, even went so far as to send cards announcing that their VAX-11/750 "baby" was "born" March 25 at 2:25 a.m., measuring 60 in. long and weighing in at 1,005 lb.

The hardware conversion, the card noted, was made possible by the use of Adabas, a relational data base management system (DBMS), and the Natural fourth-generation programming language, as a bridge from the IBM to the VAX. Both software products are from Software AG of North America, Inc., based in Reston, Va.

CW photo by [illegible]

Nolan

"We actually moved systems from an IBM to a VAX with no apparent changes [or problems]," Nolan said. "That means that our VAX users can utilize the elaborate software that was running in the IBM environment."

"In theory," he explained, "a fourth-generation language coupled with a relational DBMS should make the type of computer [being used] a trivial matter. What we did is put that theory into practice, and we found that it is true."

Nolan said all the IBM source programs and applications were written in Natural and all the files were under Adabas control. Drawing on some 20 years of experience and planning, he used Natural

See NATURAL page 60

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Data base tools released

DOWNERS GROVE, Ill. — Consumer Systems Corp. has announced Databasic-II programmer productivity software that reportedly allows nontechnical users to perform data base functions with the IBM DL/1/IMS data base.

Databasic-II accesses data bases without control blocks or a special data dictionary, a spokesman said. A structured programming facility menu allows the user to control access to the 17 functions of Databasic-II, according to the vendor. Functions include subsetting, printing with Cobol field names and loading, unloading and comparing utilities.

The product allows users to create extract files of DL1/IMS data bases, produce before and after comparison reports, create new data base segment data, correct invalid numeric data fields and produce reports using 30-char. Cobol field names.

With a subsetting function, Databasic-II extracts user-selected data from any DL1/IMS data base family and delivers it to a test file. The subsetting function allows data base subsets to be based on specific keys, generic keys, nonkey fields, a portion of a nonkey field or percentage of a data base with no special prework. The compare function produces a difference report with only the inserted, deleted and changed segments. The output can be produced with Cobol field names for verification of test results.

Databasic-II is priced at $32,000 for a perpetual license in IBM OS environments.

For more information, Consumer Systems is located at 1100 31st St., Downers Grove, Ill. 60515.

BMC rolls out Loadplus IMS reload utility

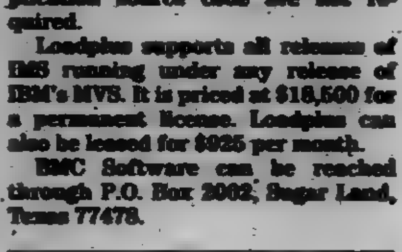
SUGAR LAND, Texas — BMC Software, Inc. has announced Loadplus, which is said to allow IBM IMS installations to reload IMS data bases more rapidly.

A spokesman said Loadplus is a replacement for IBM's IMS Hierarchical Direct Reorganization Reload utility. Loadplus does not require any changes to JCL or applications. Data bases created with the product are identical to those created by the IMS utility, with logical relationships, secondary indices and data base recovery control fully supported.

In addition to improving processing efficiency, Loadplus is said to give IMS users more control over data base free space for better data base tuning. It supports error-handling options that can prevent production run failures. The product features a Load Program Interface that allows an application, written to load a data base in the standard manner with IBM's DL/1, to use the facilities of Loadplus instead. Changes to the application source code are not required.

Loadplus supports all releases of IMS running under any release of IBM's MVS. It is priced at $18,500 for a permanent license. Loadplus can also be leased for $925 per month.

BMC Software can be reached through P.O. Box 2002, Sugar Land, Texas 77478.



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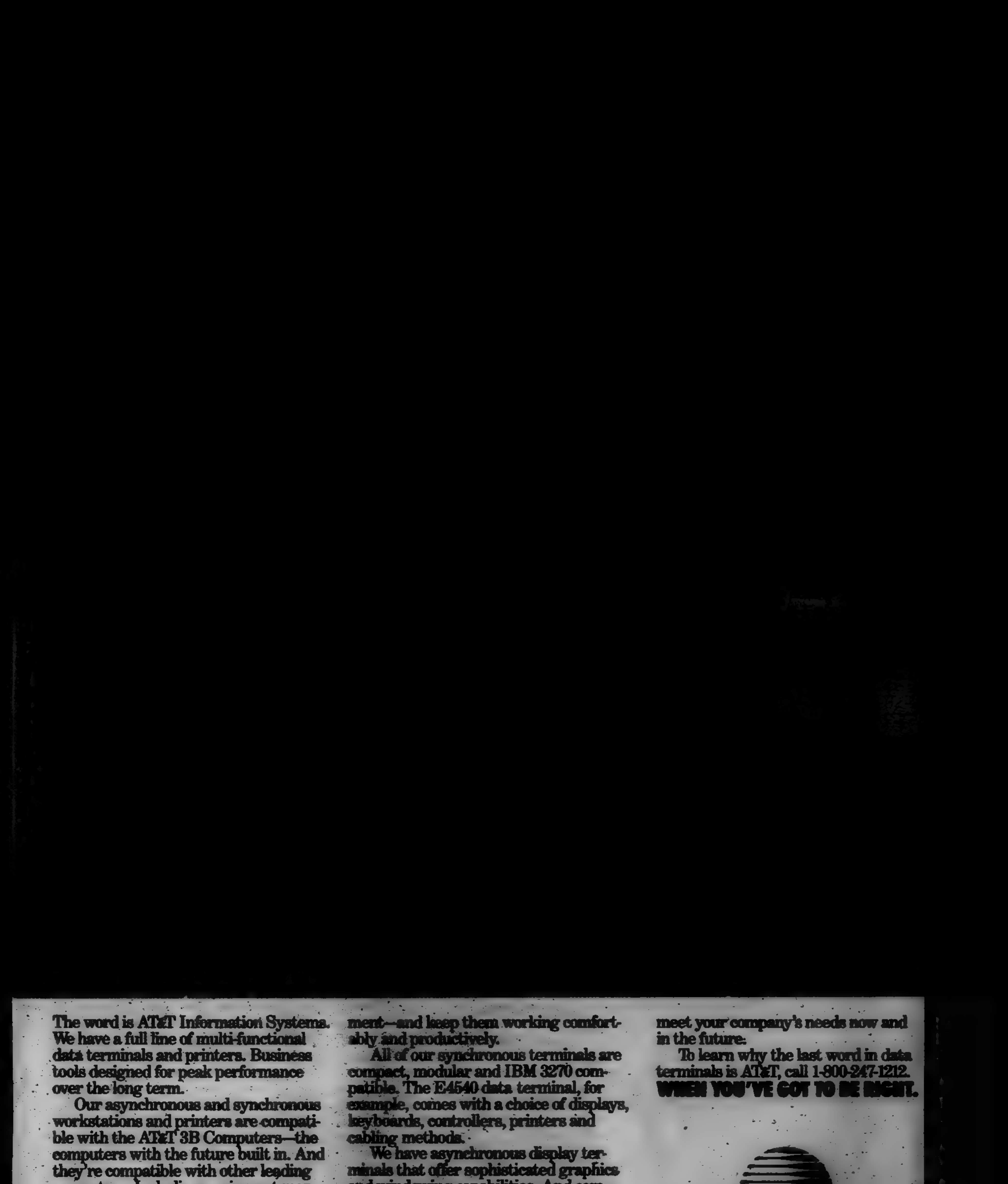

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Use.It out for IBM hosts

CAMBRIDGE, Mass. — Higher Order Software, Inc. has announced that its Use.It automated software development tool is now available for IBM mainframes.

Use.It is said to allow systems developers to create specifications in graphical format with a graphics editor. The system automatically analyzes the specifications to detect logical errors. When error correction is complete, Use.It automatically generates program source code.

Already available for the Digital Equipment Corp. VAX processor environment, Use.It is now available for IBM mainframes under IBM's MVS using Cobol. Interfaces to IBM's IMS and CICS are available.

Use.It implements the firm's mathematical Software Development Methodology to reduce the incidence of logical errors. The system allows the developer to run prototypes of systems descriptions at any stage in development to verify systems operation. The product also generates all documentation for the developed system. Maintenance can be done by changing specifications and regenerating code, including documentation, to match the restructured specs.

Use.It for the IBM mainframe environment costs $95,000 for a perpetual license.

Higher Order Software is located at 2067 Massachusetts Ave., Cambridge, Mass. 02140.

Boeing Computer unveils micro-mainframe spreadsheet

VIENNA, Va., — Boeing Computer Services Co. has introduced combined microcomputer and mainframe spreadsheet software that allows users to create spreadsheets on micros and upload them to the mainframe, where they can be merged into a centralized corporate spreadsheet.

The Boeing Calc spreadsheet software is reportedly available for IBM 4300 and 3030 series mainframes under IBM's MVS/TSO operating system and for the IBM Personal Computer XT and AT. Boeing Calc provides for the use of on-line host storage, allowing users to create spreadsheets with a maximum size of 20M bytes.

Boeing Calc can read standard Software Arts, Inc. Document Interchange Format files and work files in Lotus Development Corp.'s 1-2-3 spreadsheet package. The product is available for use with stand-alone micros, on multiple personal computers in a local-area network or in a micro-mainframe configuration.

Boeing Calc costs $399 per copy for the micro and $8,899 for the micro-mainframe package, which consists of both the personal computer version and the mainframe module.

Boeing Computer Services is located at 7980 Gallows Court, Vienna, Va. 22180.

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to prove it.

IBM System/34, 36 tied to micros with Omnilink

FORT LEE, N.J. — On-Line Software International, Inc. has introduced communications software that allows data to be selected and retrieved from IBM System/34 and System/36 minicomputers and transferred to IBM Personal Computers and compatibles.

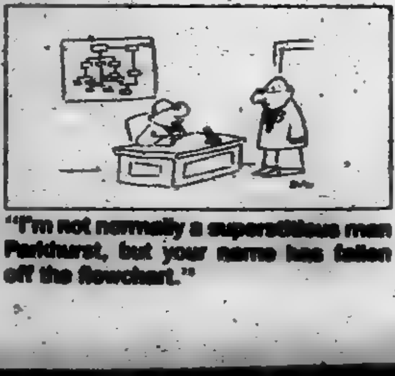
A spokesman said Omnilink 34/36 allows users to select and sort data from as many as 16 minicomputer files simultaneously. Data can be transferred to the microcomputer after selection or saved and transferred when needed. Omnilink 34/36 also offers tools that allow users to integrate downloaded data directly into a spreadsheet or other micro software.

Included with the product is the company's Executrieve query system, its File Reformatting Facility and its Data Entry system for the IBM Personal Computer. Data Entry provides screen design features that enable users to create and maintain micro-based applications. The File Reformatting Facility provides automatic data reformatting with a variety of micro packages. Executrieve is an ad hoc query system that enables users to access micro files with English commands.

Omnilink 34/36 features 10 levels of security for dictionary, data field, procedure and function levels. Users can define access to data dictionaries and what data fields can be transferred, the spokesman said.

Omnilink 34/36, including one copy of Executrieve, Data Entry and File Reformatting, is licensed for $3,750.

On-Line Software International is located at Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.



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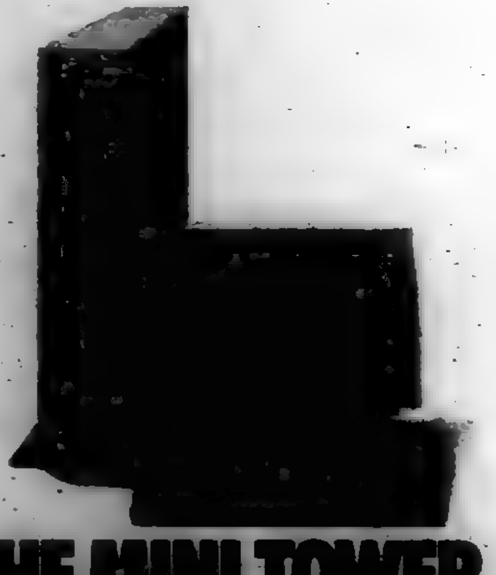

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Development aid tests C programs before compiling

MOUNTAINSIDE, N.J. — AGS Computers, Inc. has announced an applications development environment for the C programming language.

A spokesman said Smart/C allows users to create, edit, test and debug C programs before they are compiled. With Smart/C, users can develop a program, have the program interpreted, suspend interpretation, edit the program and resume interpretation without reloading files.

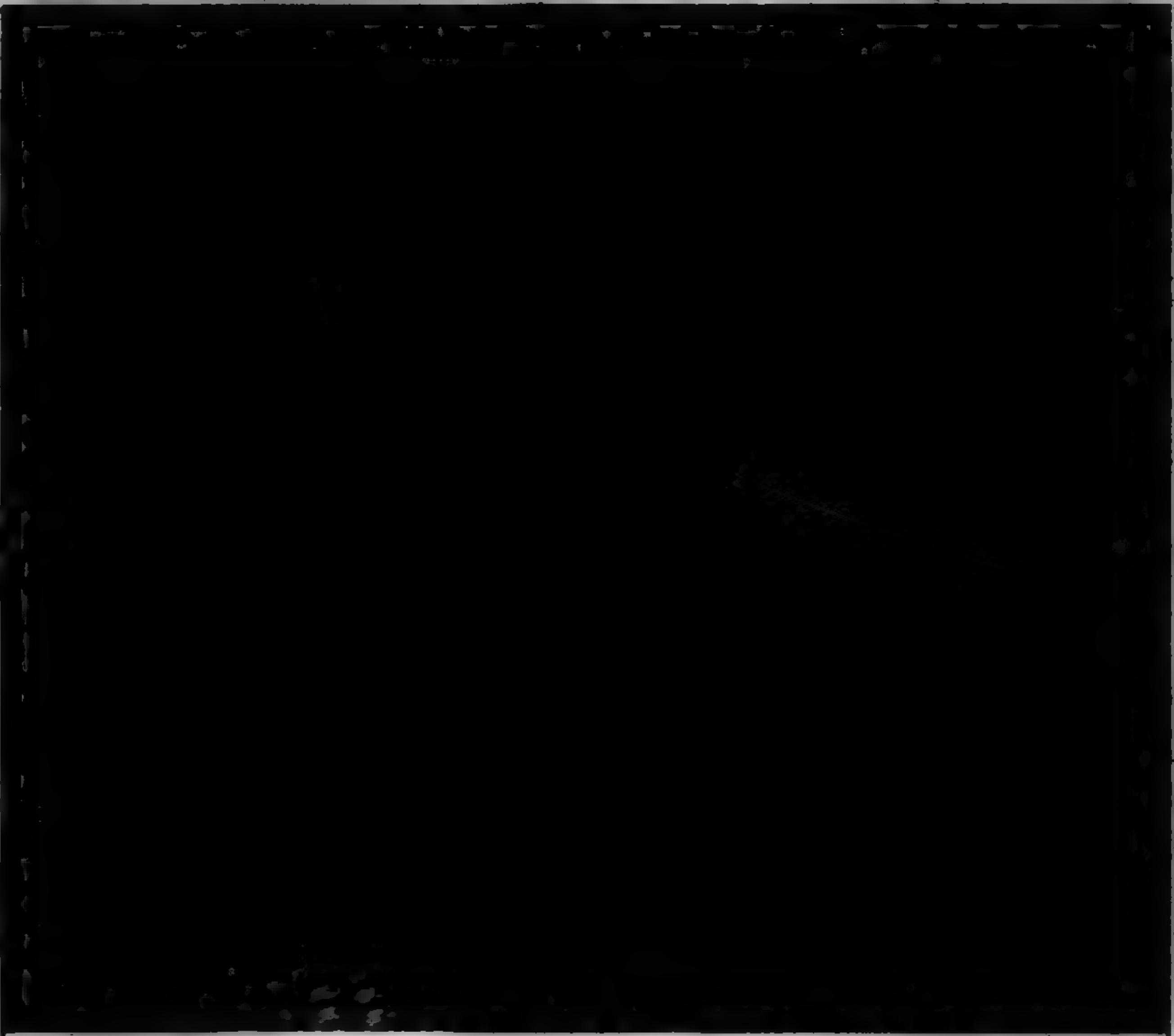
The product consists of an Environment portion and a Migrator portion. Environment facilitates syntax-directed editing and interpretation of C source code and prompts users to enter appropriate syntax elements. Once the program has been created and tested, it can be sent to any chosen compiler.

Environment output consists of C language Ascii files compatible with most C compilers, the spokesman said.

Migrator reportedly allows C programs not developed under Smart/C to use its editing and debugging capabilities. It takes C language Ascii files and translates them into forms that can be used by the Environment portion. Testing can be done on a module-by-module basis.

According to the vendor, Smart/C is available on a range of systems from personal computers to minicomputers running versions of AT&T Unix, including Microsoft Corp.'s Xenix, University of California at Berkeley BSD 4.2 and Unix System V, Release 2. It also runs under Microsoft's MS-DOS operating system. Prices range from $500 for the IBM Personal Computer version to $10,000 for Digital Equipment Corp.'s VAX 11/780 running Ultrix.

AGS Computers is located 1139 Spruce Drive, Mountainside, N.J. 07092.



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SYSTEMS SOFTWARE

■ **Software Information Services, Inc. has introduced a program generator for IBM mainframes under OS.**

Protool/Online produces IBM CICS Basic Mapping Support screen mapping source code and CICS command-level Cobol source programs, a spokesman said. Both the CICS screen maps and the Cobol programs are standardized in both logical structure, format and coding standards.

Protool/Online is designed for non-CICS programmers executing conventional on-line inquiry and update programs. The product includes a screen painting program for designing screen layouts.

Protool/Online costs $2,995.

Software Information Services, 901 Birch Hill St., Thousand Oaks, Calif. 91320.

■ **Ken Orr & Associates, Inc. has introduced an enhanced version of its Structure(s) program design software that is said to offer improved performance through better utilization of available memory and refinement of the Cobol code generator.**

The package reportedly features a 50% increase in the maximum number of conditional statements supported and the addition of a status page listing the number of errors, warnings, messages, sets and values that have been used for options.

Version 3.4 is priced at $10,000 for a perpetual license. The vendor's Structure(s) Code Generator is priced at $5,000. The combined package costs $12,500. Current Structure(s) users under contract will receive Version 3.4 free of charge.

Ken Orr & Associates, 1725 Gage Blvd., Topeka, Kan. 66604.

■ **Landmark Systems Corp. has introduced Version 6.1 of its IBM CICS monitor for IBM's MVS, OS/VS1 and DOS operating systems.**

The Monitor for CICS Ver-

Continued on page 66

OF THE BIG THREE IN BUSINESS SOFTWARE, WHO'S THE REAL NUMBER ONE?

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Continued from page [illegible]

sion 6.1 now includes an on-line index that allows transaction data from previously run CICS programs to be reviewed on-line. When the system abends, Version 6.1 generates collection records for all transactions in the system at the time of the abend, a spokesman said. When the system is restarted, data from the prior run can be displayed and the transaction that was active when the abend occurred can be identified.

The product also includes increased capacity for batch reports, on-line exits that allow users to access collection records before they are written, capabilities for exclusion of selected transactions, suppressed printing of cover pages on reports and generation of a selected fields summary. The Monitor for CICS Version 6.1 also includes command-level return codes.

The Monitor for CICS Version 6.1 costs $16,000 for MVS and OS/VS1 systems and $8,000 for DOS.

Landmark Systems, 19570 Club House Road, Gaithersburg, Md. 20879.

■ Software Partners/32, Inc. has introduced Tapesys 3.0 for Digital Equipment Corp.'s VAX systems.

According to the vendor, Tapesys 3.0 includes maintenance facilities for a VAX tape library, an automatic system and user backup and restore procedure and a first-in/first-out scratch pool for recycling tapes.

Tapesys 3.0 allows users to query the system for files, save sets and reel numbers, a vendor spokesman said. An on-line directory and inquiry facility provides a history of cataloged files. Tapesys reportedly uses a VMS Backup function that ensures standard tape creation from one VMS site to another.

Built-in tape volume accounting for allocating tape library costs are included. Capabilities for alphanumeric tape identification are also provided.

Tapesys 3.0 is priced from $3,200 to $6,500, depending on processor.

Software Partners/32, Suite 11, 18 Keys Drive, Peabody, Mass. 01960.

■ Communications Research Group, Inc. has announced that its Blast communications software now runs on Prime Computer, Inc. minicomputers and mainframes.

Blast allows Prime users to transfer data to and from computers from other major vendors running Blast software, a spokesman said. The product reportedly allows asynchronous data transfer among minis, micros and mainframes via modems and dial-up connections through RS-232 ports, without add-on boards.

For Prime users, Blast prices range between $495 and $895 for minis and start at $2,495 for mainframes.

Communications Research Group, 5939 Jefferson Highway, Baton Rouge, La. 70809.

■ Catalytix Corp. has announced the Safe C Interpreter for the execution of C programs under AT&T Unix and Microsoft Corp.'s MS-DOS operating systems.

Safe C does not require any alterations to or special formatting of a C program, the vendor said. It can be used in conjunction with existing development utilities, such as editors, window managers and program analysis tools. It reportedly allows breakpoints to be set into the source code, the values of variables to be displayed and modified and the program to be "single-stepped."

The price of the Safe C Interpreter ranges from $400 for MS-DOS running on the IBM Personal Computer to $4,000 for use with the Digital Equipment Corp. VAX-11/780.

Catalytix, 55 Wheeler St., Cambridge, Mass. 02138.

■ McHugh, Freeman & Associates, Inc. has announced enhancements to Version 2.4 of its Menu/Authorization Processor System (M/APS) for Digital Equipment Corp. VAX processors under VMS.

M/APS, which provides secured access to system applications, now executes VMS command files and provides access to command procedures and to many VMS utilities. It also performs terminal identification and manages terminal I/O.

M/APS Version 2.4 costs $1,500.

McHugh, Freeman & Associates, 1135 Legion Drive, Elm Grove, Wis. 53122.

■ DGC, Inc. has introduced system software for the IBM System/38 minicomputer.

According to a spokesman, Qsys2 offers users capabilities to enhance System/38 job descriptions, physical and logical files and system values. The product includes 18 functions, 15 System/38 commands and three System/38 subprograms.

An RPGINDENT command provides indented listing of Do and If groups within IBM RPG programs, while an SCRLIST command will list any or all members within a source file in a single batch job. Qsys2 includes subprograms that can be called from any System/38 high-level language. A subprogram called Mony can return a character string representation for a specified numeric value. Qsys2 sells for $695.

DGC, 1450 Preston Forest Sq., Dallas, Texas 75230.

■ Gejac, Inc. has introduced an enhanced version of its resource management and charge-back system for Digital Equipment Corp. VAX under VMS Version 4.

Arsap Version 4.07 is designed to control data center operations. Arsap can produce itemized invoices for al-

Continued on page [illegible]

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MSA

from page 45

terworld. "They're going to be in our business, and we need to prepare for that."

'Going into every phase'

Imlay predicts that IBM's Information Programming Services division will be competing against MSA in the applications software market within four years, once it develops the appropriate products and gears up the required marketing and support forces. Imlay referred to IBM's stated goal of becoming a $185 billion company by 1994 — up from $47 billion last year — and said, "We know they are going into every phase of computing."

Statements of direction by MSA executives at Interact illustrated the strategy the giant applications software company, which boasted some $140 million in revenue last year, has adopted for meeting its existing and anticipated competition.

Dennis Vohs, MSA's executive vice-president, outlined five directions for the Atlanta-based firm, the first being a commitment to a "data base-orientation" in all MSA applications.

Vohs said MSA is committed to supporting IBM's IMS, Applied Data Research, Inc.'s Datacom/DB and Cullinet Software, Inc.'s IDMS data base management systems. Vohs said IMS is the leading DBMS in use by MSA customers, with IDMS second and Datacom/DB third and gaining ground.

Later this summer, Vohs said, MSA will announce its strategy with respect to supporting IBM's DB2. The strategy will depend on whether IBM markets DB2 as an information center-type DBMS or as a production system. "The [key] word is production," Vohs said.

No MSA DBMS

Vohs offered two primary reasons why MSA has chosen not to offer its own DBMS. First, he said, attempting to market an MSA DBMS would alienate IBM salesmen who currently help MSA in many ways. Second, and more important, IBM could decide to bury key portions of IMS and DB2 in microcode on future processors, leaving the IBM-compatible DBMS vendors "out in the cold." He pointed to the use of microcode on the recently announced Sierra processors as evidence of IBM's direction.

> *'[IBM is] going to be in our business, and we need to prepare for that.'*
>
> — John P. Imlay Jr.
> MSA

Vohs said MSA will provide both on-line systems, in which data is entered from a terminal and the data base is updated at intervals, and real-time systems, in which the data base is updated instantly.

Vohs said that because it costs more to process in real-time, users will need such combined systems.

Plans to strengthen link

MSA is committed to ensuring that its programs are functionally integrated, Vohs said, so that applications can share data and allow, for example, one function to reconcile accounts payable, payroll and general ledger modules simultaneously. MSA plans to strengthen further its micro-mainframe link product, Expert Link, to allow users to decide whether processing should occur on the host or on a personal computer. "We want to allow [users] to make that decision," Vohs said.

Imlay predicted that by 1995, 90% of all corporate processing will be performed on microcomputers linked to a host. With Expert Link, MSA plans to provide data downloading to micros for all its applications, distributed data entry capabilities and shared host-micro software applications.

"We are selling off the retail side of our micro software business while concentrating on the micro-mainframe link side," Imlay said, referring to MSA's sale of three of the four micro software divisions obtained in its unprofitable acquisition of Peachtree Software, Inc.

One micro supported

MSA has no plans to support any micro except the IBM Personal Computer with Expert Link, Vohs said. Only if Apple Computer, Inc.'s Macintosh achieves more penetration into the corporate world will MSA spend any money trying to accommodate it in the micro-mainframe link, he said. Nor does MSA have any plans to provide for AT&T Unix-based micros in its link, according to Vohs. He predicted that the AT&T machines will someday operate under both Microsoft Corp.'s MS-DOS and Unix simultaneously, making a pure AT&T Unix link unnecessary. And he added, "We do not know if large corporations will accept [AT&T Unix] on desktop computers."

Finally, MSA plans to provide a common user interface to its applications through its Information Expert fourth-generation productivity and applications development tools.

To protect user investment in applications software, MSA allows Information Expert to be used against "foreign" data bases of either in-house products or MSA's competitors' products.

The company's presentation of its strategic directions, including the focus on Information Expert tools, was slick indeed — complete with a New Orleans marching brass band and a multimedia marketing show. If that strategy was formulated as carefully as the Interact users group meeting, look out for MSA.

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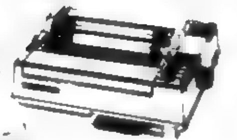

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SOFTWARE & SERVICES

NATURAL

from page 45

to write the utilities, or bridges, that transferred the programs and files from the IBM to the VAX, which was also running Adabas and Natural.

"I wrote the utilities in Natural and simply pointed them at either the IBM or the VAX, depending on which machine I was [using]. It minimized the differences [between the hardware]. I did not have to code anything in VAX- or IBM-specific code," Nolan said.

Moreover, he said, the whole process — from the placement of the order for the VAX to the start-up of an operating system with 1,676 programs and 250,000 records — took only one month.

"Everybody said we would not be able do that in even six months," he said.

"When we told the [DEC] users group [members] about this, their mouths just dropped open," Barbara added.

Heuristic Developments is a software development company that specializes in applications customized to individual client operations.

> *'When we told the [DEC] users group [members] about this, their mouths just dropped open.'*
>
> — Barbara Nolan
> Heuristic Developments, Inc.

The firm needed a VAX to undertake development projects in-house, rather than relying on client machines that often ran too slowly and were tied up with high-priority production jobs, Nolan explained.

To bring the VAX up quickly, he relied on the same unconventional approach to software development that he employs for clients. Called the heuristic or natural approach, it stresses flexibility over initial design precision [CW, Aug. 3, 1981].

For example, instead of going through a lengthy process to create a precise system design document, Nolan begins with a rough design plan and then undertakes development and installation work as soon as possible in order to discover and address user requirements and problems.

This learn-as-you-go process also involves users in all phases of the software development, he added.

RPG-III

from page 45

tem/38 a high-productivity tool are lost if software written in other languages or converted from other hardware is used on the System/38.

The way the System/38 functions explains why RPG-III software, rather than home-grown or adapted code, makes use of the System/38's capabilities more effectively. System/38 architecture provides sophisticated functions that are an integral part of the processor's firmware.

For example, System/38 files are constructed using logical views. Information can be retrieved from the data base in a variety of formats and sequences. In addition, information can be updated through one logical view and the results immediately made available to multiple users through other logical views.

Complaints

Thus, speed of update and ease of inquiry are two key System/38 features that are lost if converted code is used rather than RPG-III. Major user complaints regarding converted IBM RPG-II code are that the machine runs slower and less efficiently and that System/38 features such as Query are bypassed, which reduces the system's functionality.

Converted code is especially inefficient because it does not utilize the System/38's built-in data base management system. The DBMS, designed for use with RPG-III coding techniques, is actually part of the system — not add-on software. It conceptually eliminates flat files through externally defined data elements that are stored only once, eliminating redundancy. Old programs converted from other hardware have program-defined files that will not utilize the externally defined file advantages that are such a big part of the System/38 DBMS.

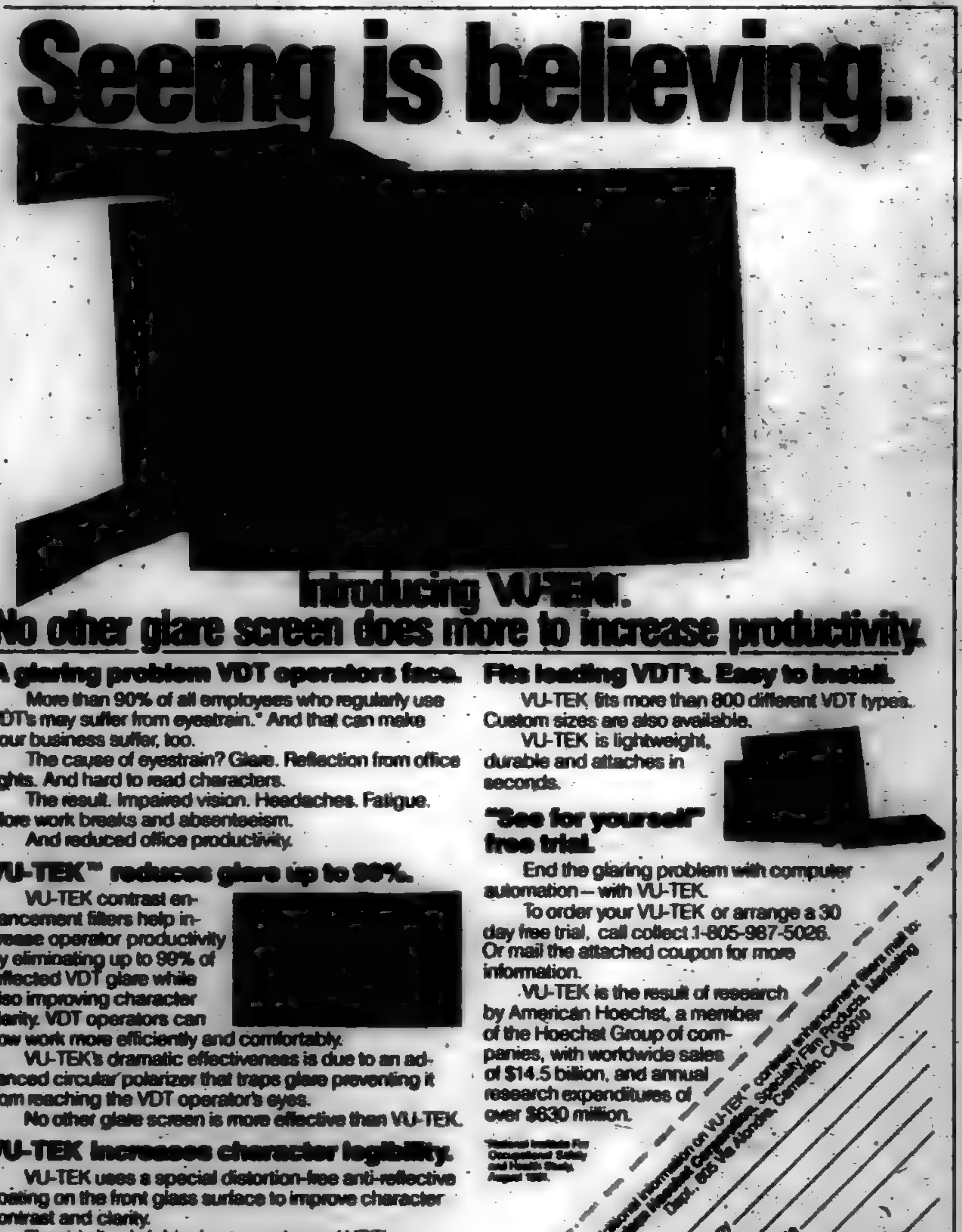
Thus, the high-productivity, high-utility potential of the System/38 is lost whenever converted-code software is employed. Software programmed for IBM's 370 series, System/34, System/36, Hewlett-Packard Co.'s HP 3000 and other processors was specifically designed to use features of those machines. To convert such programs to the System/38 ignores features that IBM's Futures Project built into the system.

Advantages now clear

One reason interest in the System/38 has been slow in building is that true RPG-III software is only now becoming available. When IBM introduced the System/38, the only software available was converted RPG-II programs. It has taken several years for software in the newer language to be developed. But with the increasing availability of RPG-III applications, the productivity advantages of the System/38 are now becoming clear.

RPG-III uses fewer indicator entries than RPG-II because an RPG-III indicator can condition self-contained groups of statements. It also supports subfiles and data areas and has other programmer and user conveniences. Because System/38 features are married to RPG-III, it is the fastest language for coding and the easiest to maintain.

While it would be stretching a point to describe current superminis and mainframes as user friendly, the System/38 running RPG-III software is a major step toward that goal.



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*National Institute For Occupational Safety and Health Study, August 1981.

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SOFTWARE & SERVICES

Continued from page 85

locating costs of computer resources to internal departments, projects, users, contracts and grants. It can be used for departmental budgeting, to control project costs or to bill time-sharing customers, a spokesman said.

On-line project switching allows projects to be changed from within batch or command files. System managers can track usage of proprietary software packages and transactions performed from a batch or command file, the spokesman said.

Arcap for VMS is licensed for $4,995.

Gejac, P.O. Box 188, Riverdale, Md. 20737.

■ **Boston Systems Office has introduced a file transfer system for Digital Equipment Corp.'s PDP-11-based development systems.**

BSO/Com-1 is said to facilitate the transfer of source and object files from DEC PDP-11 computers to and from Intel Corp.'s Intellec and Motorola, Inc.'s Exorciser microprocessor-based development systems.

A spokesman said the bidirectional communications facility allows an engineer to develop programs on a PDP-11 and then transport the debugged software to the microprocessor-based system for software/hardware integration.

BSO/Com-1 runs under DEC's RSX-11M Version 3.2 or higher and RSX-11M+ Version 1.2 or higher. The product costs $800.

Boston Systems Office, 469 Moody St., Waltham, Mass. 02254.

■ **Cap Gemini Dasd Corp. has announced the S34 SGRF on-line screen handler for translating SGRF screens on the IBM System/34 and System/36 to CICS screens on the 4300, 3080, 3090 and 3030 series processors under VSE or MVS.**

The screen handler runs in conjunction with Cap Gemini's RPG/RPG II-Cobol translator. The S34 SGRF translates RPG programs to CICS command-level Cobol programs and basic mapping support maps.

A perpetual license for the S34 SGRF and the RPG/RPG II-Cobol translator costs $34,900.

Cap Gemini Dasd, Suite E-1A, 9160 Red Branch Road, Standard Court E., Columbia, Md. 21045.

PRODUCTIVITY AIDS

■ **ASE Services, Inc. has announced the System/38 Utilities Package for the IBM System/38, with tools aimed at improving productivity.**

A spokesman said features of System/38 Utilities Package include menus with advanced functions; help text entry and display; spool file control; computer-aided design for menus, screens and reports; interactive system simulation; printed systems specifications; enhanced object manipulation; cross-reference and search utilities and debugging aids.

System/38 Utilities Package, written in IBM's Control Program Facility, costs $2,500 to $3,500.

ASE Services, 58 Hamlet Ave., Woonsocket, R.I. 02895.

APPLICATION PACKAGES

■ **Business Software Technology, Inc. has announced Run Time Evaluator (RTE) software for performance analysis with Cullinet Software, Inc.'s IDMS and IDMS/R data base management systems.**

According to a spokesman, RTE provides facilities for IDMS/R run-time performance evaluation and tuning, IDMS/R applications chargeback and billing and IDMS/R resource use analysis. RTE also provides performance statistics for on-line tasks, batch jobs and IBM CICS transactions.

Compatible with IDMS Release 5.7 and IDMS/R Release 10.0, RTE costs $7,500 per CPU.

Business Software Technology, 950 N. Main St., Randolph, Mass. 02368.

■ **Al Lee & Associates, Inc. has introduced a Westinghouse Corp. Teleprocessing Interface System (Westi) teleprocessing monitor version of its Magec applications development system.**

A spokesman said Magec includes capabilities for applications generation, on-line production of documentation for generated applications, on-line security features, audit trails and activity logging.

The Westi version of Magec costs $28,000.

Al Lee & Associates, 2334 Seedling Lane, Dallas, Texas.

EXPERT

from page 45

are currently available for IBM CICS and Vsam sites at no cost through maintenance agreements. For Cullinet IDMS users, the Information Expert tools are currently available only with MSA's human resource software. For $50,000, MSA said, users can obtain a logical interface module that enables the Information Expert products to work with in-house and third-party software.

Features of the advanced inventory module of the Expert Series for Manufacturers include lot tracing, random storage, inspection control, allocation and kit picking and cycle count control.

The manufacturing accounting module reportedly estimates the cost of completing an order, tracks actual costs, analyzes variances from estimates, accounts for orders and inventory and supplies financial information from the production area to the financial systems.

The purchasing module provides capabilities for processing requisitions, vendor quotations, purchase orders, receipts and inspections. The module is integrated with a requirements planning module to provide a long-range view of material needs, a spokesman said.

Pricing for the Expert Series for Manufacturers ranges from $100,000 to $500,000. The manufacturing system runs on IBM mainframes and compatible processors under IBM's DOS or OS operating systems.

MSA is located at 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

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IN DEPTH

Executive Interview

Jim Sutter
Rockwell
International

By George Harrar
Senior Editor, Features

Rockwell International Corp., maker of bombers, space shuttles, satellites, truck axles, newspaper presses and much more, is a $9.4 billion company heavily reliant on information systems for engineering design.

Jim Sutter oversees five worldwide data centers and the pure SNA network linking them and 33,000 end users. Rockwell is a strong IBM shop that has thrust itself to the leading edge of telecommunications but finds itself lagging in office automation.

Sutter sets the direction for systems corporatewide and sits on a high-level engineering policy group. He was interviewed at the Seal Beach, Calif., Information Systems Center.

What is your responsibility as vice-president of information systems? What projects and functions do you oversee?

I have three major responsibilities. The first is to set the direction for this corporation in terms of information technology, that is, as it applies to business data processing, telecommunications, office automation and factory automation. That really comes down to having an explicit architectural road map and a set of policies. We work hard on trying to define roles and policy and standards.

The second is to manage a very large data processing environment. At the end of 1985, we will have the equivalent of 55 IBM 3033s in our data centers here, and we have 33,000 users throughout Rockwell. To operate cost effectively and provide responsiveness to our users is a major responsibility.

We have five data centers. The one here is the largest; the others are in Dallas, Cedar Rapids [Iowa], Pittsburgh and outside the airport at Heathrow in London.

Each of those has a separate manager?

There's a director over each one. I have a vice-president of operations who reports to me, he's next door, and they report to him. We directly control all of the mainframes, and those 33,000 users are registered users of those data centers.

> **"Aerospace systems are among the most complex machines built. . . We spend almost 4% of revenues on computers."**

Do those data centers correspond to the four business lines?

Originally they lined up that way. But in recent years — in fact, in recent months — we've done a lot to eliminate, more or less, that direct association. We have common billing rates, we have common naming conventions.

The data center in Dallas originally looked after the needs of the Collins division and the electronics part of Rockwell. Now we do all our corporate work there from Pittsburgh. I pay 60,000 people out of Dallas. All the defense electronics from Anaheim is handled in Dallas. We try to look at it as a virtual computer environment.

What is the network that ties the centers?

That is the third responsibility — telecommunications and networking. We are very proud of

ROCKWELL INTERNATIONAL

Corporate headquarters - Pittsburgh
Annual revenue (1984) - $9.4 billion
Employees - 107,000
MIS employees - 2,800
Main businesses - Aerospace, electronics, automotive, general industries

what has been achieved. We have one of the first and truly integrated voice/data networks, which connects all of these data centers as well as all of our phone users.

We digitize all of the voice. All of the voice calls in this building or in El Segundo first come to a switch on the first floor of this building. It's Rockwell equipment, a Rockwell-manufactured digital tandem switch. We first go through a little multiplexer, a digitizing multiplexer, then we go through our switch and go out on broadband T1 circuits from here to wherever either the data or voice call has to go. Where these data centers are we have these digital tandem switches. We go from here to Dallas over these T1s or from here to Pittsburgh either directly or through Dallas, depending on the load.

So the network is basically a combination of a very highly structured SNA, pure SNA, network for data processing, but we take advantage of the T1s by combining the SNA traffic, all of the terminal traffic and all of the printing traffic with all of our voice traffic.

We make a million calls a month on the voice side and combine all of that traffic with those 38,000 users. There are actually 60,000 voice subscribers domestically. We don't do any voice processing here for the European operations. There are about 107,000 employees, before Allen-Bradley, of which 63,000 are office-type workers and of whom almost 63,000 have telephones in the U.S. And they are all on a private communications system we call Comnet, which allows us to do desk-to-desk dialing across the country.

In addition, I handle corporate applications. I have a group on the floor below, about 100 people, who are involved in all the classic corporate kinds of applications — financial, the closing of the books, paying a lot of people, fixed-asset control — a number of fundamental, corporate-level things. We run a few applications that are used jointly by the different big operations of the company. But we do not go in and try to write manufacturing applications for individual plants. We don't go in and write accounts payable applications for individual divisions. The lion's share of the applications people in Rockwell International are decentralized to these divisions to do that. Every so often there's an application that is obvious that is used by a number of divisions.

As an example, many of our divisions bid on government contracts. And there is a fairly precise way we want to ensure that costs are accumulated and contracts are priced. There is a pricing system developed years ago by North American people, and I look after it and enhance it.

On your network, what is the relative load between voice and data?

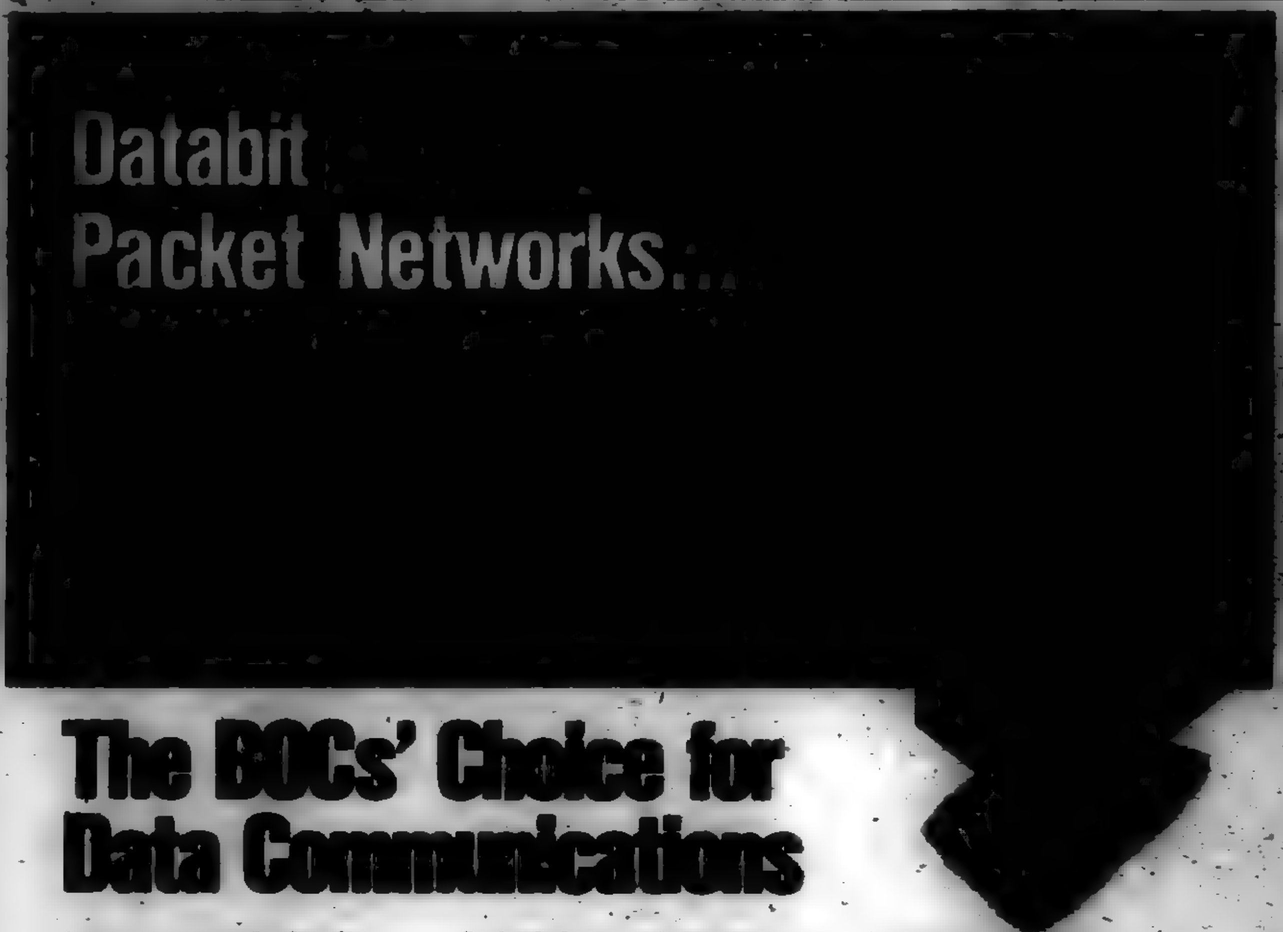
It's about 75% voice, 25% data.

Do you see that ratio changing?

It has changed already. I would say that for all of the talk and the anxiety over data networking, it has been more or less 85% voice in terms of cost. That has very slowly begun to change to the point where we are about 75% to 80% voice today. And it will continue to change, although as far as to the end of the decade, voice will still be the majority in terms of the cost and utilization.

You find that the network handles both equally well for your purposes?

You know, this is a balance that you go through.



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We did this integration of voice and data on the network to save money. It didn't improve the quality of anything at all; it really didn't. We saved a lot of money.

How much?

We eliminated 214 intermachine trunks. We had individual leased lines. We saved in 1984, once we got to a fully steady state, upwards of $200,000 a month in terms of communications costs, or a little over $2 million a year. So we did it primarily for cost saving.

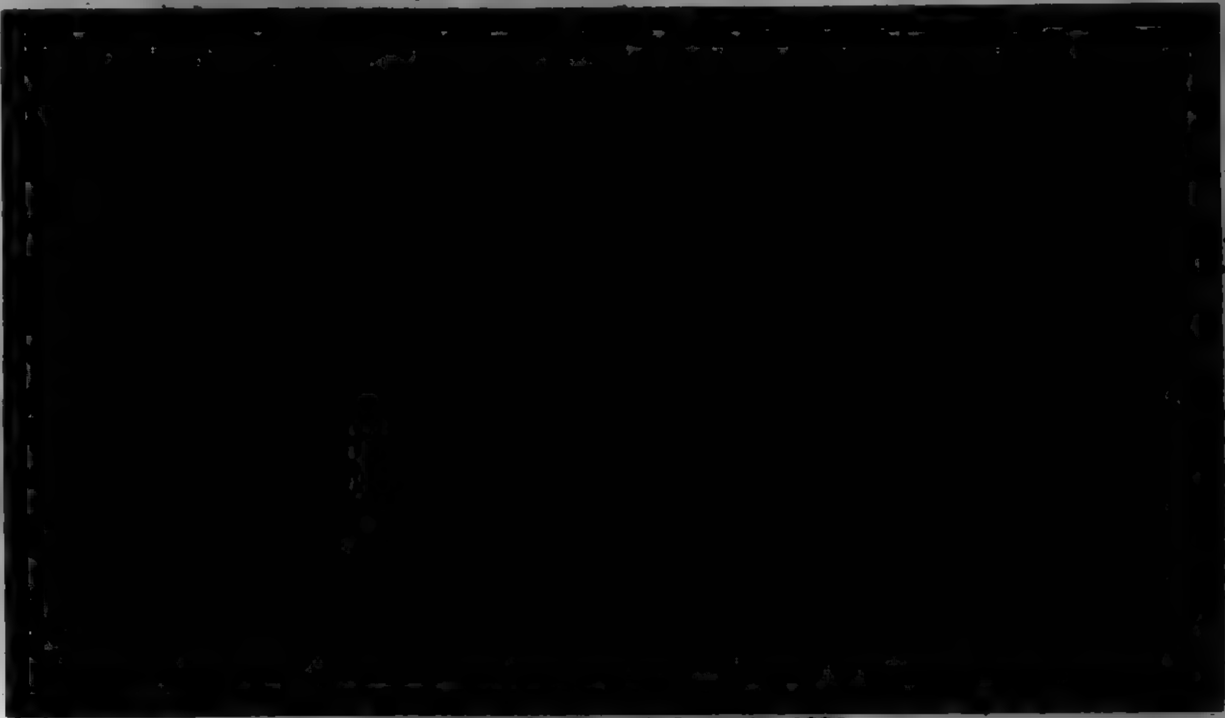
When did you make the change?

As soon as AT&T announced the T1 tariffs in the spring of '83, we decided that we would convert from these individual intermachine trunks to the T1s. We've been told that we were the first to really commit ourselves entirely to that.

By early '84, we were totally converted. By the end of '84, we were looking at savings in the neighborhood of $200,000 a month. In the process, we made a conscious trade to reduce our costs, and there are some things we give up.

What did you give up?

To this day you can design a voice system that is totally optimized for voice users — and, if you're not as concerned about costs, provide a far higher level of service on voice: no blocking, no busies, that type of thing. So, by definition, we think we've made a trade consciously to try to balance the costs with quality here.



Rockwell's B-1B rolled out in September 1984.

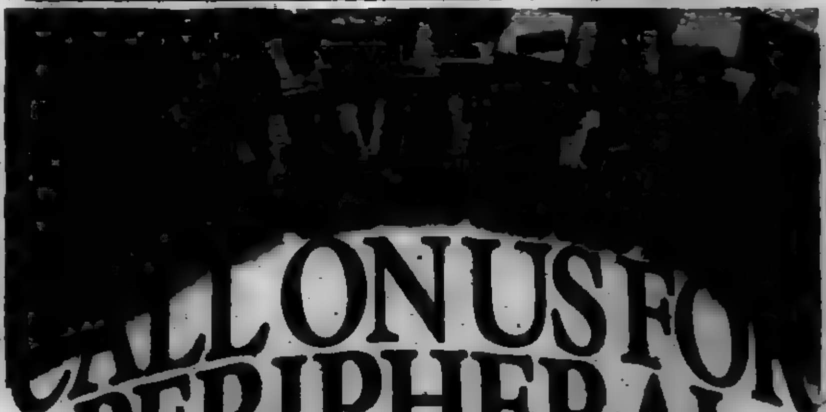
Do your end users understand this trade-off?

Top management does, and I guess I would have to say that some of our end-instrument telephone users have put up with some discomfort, although it's getting better. There are lots of ways to attack that problem. Having gotten the basic network in place and gotten a lot of the cost down, we're working hard now to improve the response time on our terminals as well as give users more functionality in a voice sense. In our corporate headquarters, both in Pittsburgh and El Segundo, we're just this summer going to put in brand new PBXs, all digital PBXs. Right now we use a telephone operating company-supplied Centrex service.

By putting in a digital, modern PBX, we will give back a lot of that functionality.

Do you consider yourself on the leading edge in telecommunications?

There isn't any question in my mind that IBM and AT&T both cite this installation as one of the most comprehensive networks in the country. That was the case even before we did the integration. North American Rockwell, going back to 1975, was one of the companies that really committed to SNA before a lot



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of other people were willing to. And over the years, it stuck pretty religiously to naming conventions and standards and things that make that kind of implementation work.

That's almost from the time of SNA's existence.

Yes, exactly. Whereas I could take you to some very large corporations, and they will tell you they have lots of networks. They were kind of reluctant to commit to something like SNA, and SNA had all kinds of restrictions to it in the early days. It was not supported by a lot of equipment. And so people grew into SNA gradually. But in the meantime, the business had to be conducted, so they kept creating networks to deal with specific problems at the time. And then about 1980 or so, they looked around and they found that they had about 30 or 40 discrete networks with discrete protocols. You can go to some of the most, on the surface, advanced companies and find out they have a lot of different networks.

And you don't.

We have one data network in Rockwell. It's probably as pure as it can get.

You're an IBM shop.

Very much so.

So you were very interested in the mainframe announcement, the 3090 series.

We're working with IBM very closely on the 3090.

Are you on the delivery list?

Oh yes.

Do you have an expected date of delivery?

Yes. I really don't want to go into much detail there because we're actually an early support site for the Sierra.

You were a beta test site?

We are, and we have signed . . . I want to be careful here, because we have actually signed a legal document with IBM so that information doesn't become public.

Is the Model 200 powerful enough for you?

It's all we can get now. No, we're anxious, obviously. We have some very, very tough problems that we can only solve with very large processors. I should mention that we are taking delivery of a Cray [Research, Inc.] X-MP, which will give us some relief. We need large-scale processing. Some of the problems that are presented to us in this industry are only really handled well on large-scale computers. I'm talking now about aerospace kinds of work.

Will that be your first supercomputer?

Yes. That's an area where we're late, frankly. The Cray on the fourth floor here is nested behind, on the one hand, a cluster of 3081s, and on the other hand, we have a dual [Control Data Corp.] Cyber system. I'm going to hire two operating systems people and that's it. People in the Rockwell company all over the world, anyone who is a previous user — all the aircraft engineers, all the electronics engineers who are current users either of TSO on the IBM side or the Cyber — if they have a job they want to ship over to the Cray, it's a matter of identifying that resource and that procedure. But no [new] wiring, terminals, network. It slips right into the [existing] network.

What will you use the Cray for?

There's a whole range of applications. The most prominent probably is finite element analysis in support of airplane design.

Did you look at the Japanese suppliers or Control Data?

We've looked at CDC constantly over the years, and we are a good CDC customer here. We have not looked at a Japanese machine. As a matter of fact, in the past, there really has not been a machine available. They are just now announcing deliveries. Up to now, that's been more speculation than it has been a real delivered product here in the U.S.

On the other hand, it's unlikely we would. We haven't really been, at Rockwell, a user of Japanese computing.

Is it a "buy American" philosophy?

Well, I think it's partly a concern that I have personally. For example, on our supercomputer, a good part of that work load is classified work for the government. We have a restriction here, even about any field engineer or any systems engineer from any vendor who comes into this building: he has to be a U.S. citizen, first of all. We have that requirement in all of our locations. I'm providing a room here for a number of permanently based Cray support people. It's probably unlikely that I would enter into an agreement with a foreign supplier on something where we know that a large percentage of the applications are going to be devoted to classified work. That could change, but that's my position.

If you are on the leading edge in terms of telecommunications, where are you in terms of office automation at Rockwell?

Well, I guess I'd characterize it . . . We're very far along in the introduction of industrial-strength word processing. We have fully implemented clustered word processing throughout the company, so from the standpoint of having the facility to create and distribute documents, we've made quite a sizable investment and we've pretty much covered the office. In addition to word processing, at the end of '85, there will be in the

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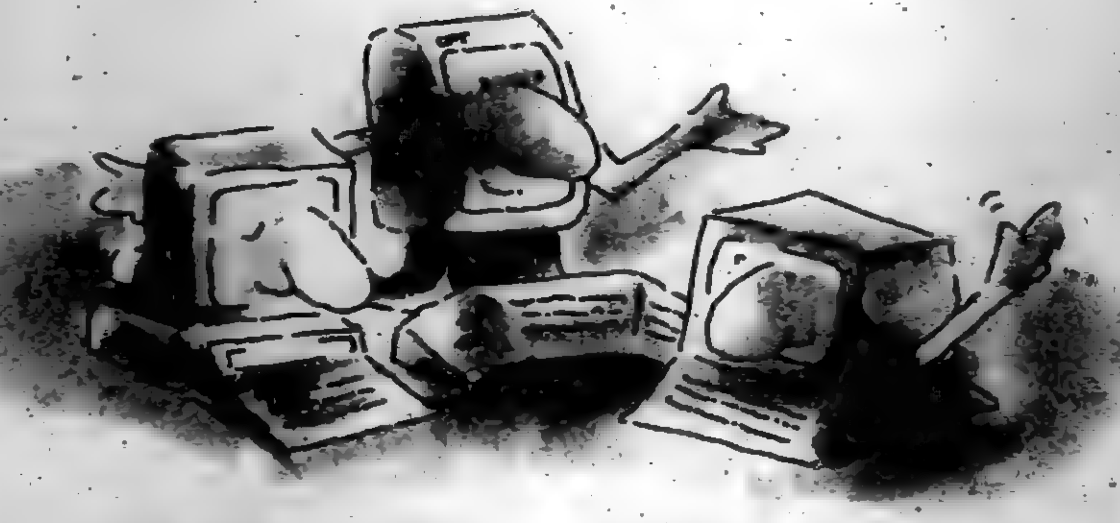

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neighborhood of 5,000 or so desktop workstations that are used by professional people, by analysts. They are, for the most part, IBM and Apple personal computers, and they're used to help analytic people with spreadsheets and things of that nature.

What kind of personal computer or local-area network do you have?

Well, that's where we've really dragged our feet somewhat. We have a number of local-area networks installed, but we have not made any commitment as a corporation to some overall local-area network scheme at this point.

Is that something you are pushing for?

I don't know, I came to Rockwell after almost 18 years at Xerox. At Xerox, of course, we were very dedicated to Ethernet and we had installed, by the time I left, 80 Ethernets, and there was never any question in the minds of our users as well as the systems planners what we were going to do about office automation at Xerox.

Here at Rockwell, we have a group of people in my telecommunications area that head a companywide group where we are attempting to standardize or at least reduce the variability in local-area networking options, both in the office as well as in the factory. But we've really not arrived at a position yet where we can see a product out there that really addresses the problem set that we see. These local-area networks that are offered to tie various personal computers together are quite limited in our minds in terms of their ability to handle the whole range of applications.

So while we have some of those installed, and we're doing some testing, we don't really expect that in the long run that technology is going to represent the main thrust for integrating office workstations. We think, frankly, when the dust settles, the protocols that will be used to interconnect our word processors and our office desktop computers and so on, that protocol will be an IBM-based, IBM-compatible protocol, and the document transfer and interchange arrangements will conform to this DCA/DIA [Document Content Architecture/Document Interchange Architecture] world.

All the vendors keep telling us that they agree with us and that they are promising — that is to say the DECs, the Wangs, Data General, even Xerox — that they are going to support those IBM protocols. On the other hand, they don't today. They say so, but they really don't. Even IBM has offered us very limited kinds of things to interconnect our office equipment. So I guess our posture is that we feel that people who are plunging into brick and mortar, when it comes to local-area networks, may be premature.

You would have obviously preferred something more from IBM than its cabling strategy.

Oh, I'll say.

Will that surprise you, because there was some expectation of a local-area network to be announced?

[illegible]

> ***All the vendors keep telling us that they agree with us and that they are promising — that is to say the DECs, the Wangs, Data General, even Xerox — that they are going to support those IBM protocols. On the other hand, they don't today.***

Particularly in this area of the office, we have been disappointed. We are very much of an IBM mainframe shop from the standpoint of the data center, peripherals. But when it comes to the office, both in terms of the networking approach and in terms of the appliances themselves, the devices IBM has offered us up until now have been very limited and very complicated and very expensive. And so they have not been popular in Rockwell.

Up until the IBM Personal Computer AT?

Up until now . . . First of all, in October, IBM really gave most users a clearer picture of how it hopes to correct some of those problems, both from the standpoint of marrying the Personal Computer with some of the other products and using the System/36, for example, as a lower cost, departmental clustering device, something that up until now we used minicomputers for. So there are some indications that we are going to see IBM really flesh out the line better than it has in the past.

So you're opting for an IBM System/36 rather than a mini from DEC or Prime or DG?

We've not bought any of those yet. We're getting a lot of indication from IBM that's what it will offer. And we're very interested. In the office, for the most part, at Rockwell, the major commitment made to this day has been to Wang. We have a very comprehensive, very extensive implementation around the

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Why key DP/MIS managers are keeping RCA Cylix a secret.

world. We have Wang equipment in virtually every Rockwell office, and our headquarters site just finished upgrading the little Wang host minicomputer that controls all of that. Wang has committed to me that it is going to support those IBM protocols.

So your investment in Wang is not in jeopardy?

And Wang's future with us is dependent on its doing that. I think Wang knows that. I think it would be safe to say that we wouldn't characterize ourselves as being on the leading edge in any way in the office. That's not to say we haven't done anything, not at all, because you can't go anywhere in Rockwell without seeing a fairly advanced implementation of word processing, and we can transfer documents all over the world. And we do have electronic message systems and a wide use of personal computers.

Let's move on to the factory floor and Project Map from General Motors Corp. Can you address this area?

I will, I'd like to. Let me go back for a second and say that I spend a lot of time with both the top management people and the systems people in Rockwell. I constantly focus on the fact that if this were an airline, we would have to be awfully good at reservations systems or else all the other things we might tackle would kind of pale into insignificance.

Here at Rockwell, we have to be very good in our MIS world in supporting our engineers, in giving them the finest tools and the highest degree of connectivity we can. We also have to be very good at delivering manufacturing systems because we are a big, big manufacturing company. We're more than just an assembler. There's a lot of manufacturing companies in this country devoted to defining configurations and ordering a lot of material from suppliers and then just simply doing final assembly. But Rockwell is much more of an intense, integrated manufacturing company from the design all the way through. That's the first point I want to emphasize.

I'm not saying we don't have important applications in finance, in marketing; but when you look across the portfolio, when you prioritize things, you really have to recognize that this is an engineering company and that we compete out in that marketplace on the strength of our engineering and manufacturing know-how much more so than we do with clever advertising.

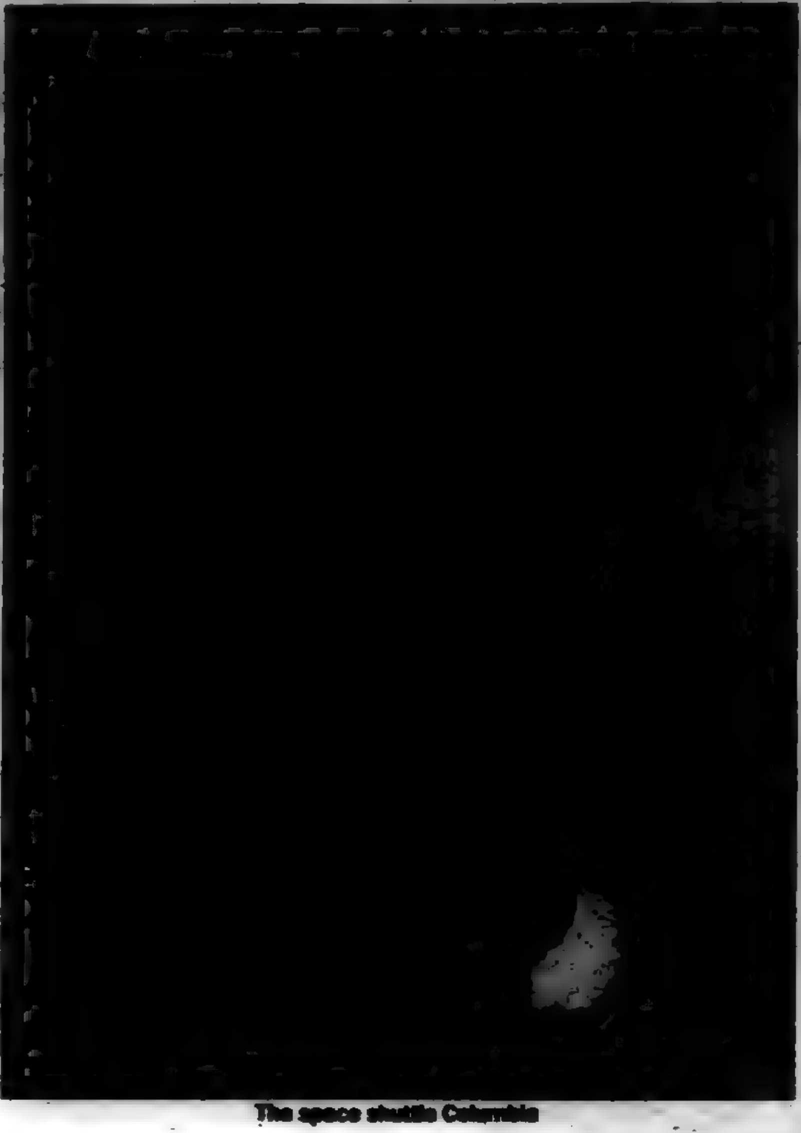
Even the set of customers we deal with is more limited. We deal with Nasa, the Defense Department and General Motors.

That brings up an interesting question, because Rockwell posted record profits in the first fiscal quarter. How does information systems contribute to the bottom line?

I don't want to overstate the case. I would like to think that in every aspect of the company's business, the systems are making a major contribution.

I do believe strongly that in the short time I've been here, I've seen computers and the systems people work very effectively helping with the whole problem of bidding on contracts and supporting proposal work. We do iterations on configurations and proposals, and then there's the pricing thing that I talked about.

We just won the largest Defense electronics contract ever awarded, in Cedar Rapids. I distinctly remember around the holidays having several of our people here from Seal Beach going to Cedar Rapids and helping at the 11th hour, so to speak, with reruns and iterations. So proposal generation, preparation is something where we make a major contribution.



The space shuttle Columbia

> ***"We're not at all satisfied with our degree of progress in implementing networking inside the factory."***

That's an intangible that is hard to show general management.

Very definitely. Another example, however, where you can see the impact of information technology on Rockwell — we have over the years put in a huge investment, and it's going to be in the neighborhood of $170 million to $180 million, in CAD/CAM (computer-aided design and manufacturing), interactive graphics support to engineering designs. Again, that follows the whole philosophy of making the investments where they have the most leverage. Together with the Cray, together with our Cybers and our Univac system and all of these departmental interactive graphics systems, it's a huge investment Rockwell has made in information technology tools to engineering and manufacturing.

Do you look to companies such as Apollo and Sun Micro?

We have, lately, but up until now, the lion's share of even those CAD systems have been supplied by the conventional Computervision, IBM, Cadam kinds of systems. But there's a growing number of individual workstations — Apollo, Daisy.

Is there a real need to integrate those CAD/CAM systems with the factory floor, or is that not so crucial for you?

There is a need. We are very fortunate because part of our business now is Allen-Bradley, and Allen-Bradley brings a lot of expertise in helping move information from manufacturing engineering departments right out onto the factory floor. We're just starting to exploit that.

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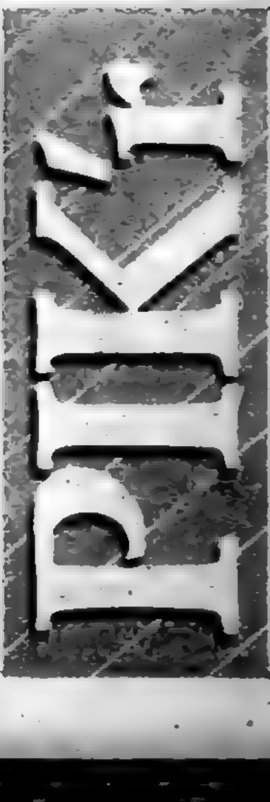

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You mentioned earlier the MAP effort. Let me say, again, we're not being at all satisfied with our degree of progress in implementing networking inside the factory. But there is tremendous potential for us, and it's good to know that as we move forward now, we have a direction there by virtue of having Allen-Bradley as part of our business. It's pretty clear that we'll be heavy supporters of the MAP protocol on the one hand and the use of Allen-Bradley products. They have, as far as we can tell, most of the [illegible] controllers that you can buy.

They have about 60% of the market.

Yes, something like that. It looks to me that in the factory we're going to have less of a debate within Rockwell about which way to go. We're going to go through a classic discipline of looking at needs and scrubbing them and making sure that these kinds of things are justified. At least I think we know what direction we'll head in.

Do you use programmable controllers now?

I know that Rockwell, even before this merger or acquisition of Allen-Bradley, was a big customer of Allen-Bradley's anyway. I was just at our plant in Carpentersville, Ill., and you walk through that plant, and it's full of Allen-Bradley controllers already.

One other thing you might find interesting, along the same lines, is that in supporting that part of the business that is so central, we find ourselves now interconnected with other companies. We are interconnected now with about eight different companies.

Suppliers?

Mostly customers — General Motors, Ford, Mack Truck. We're the leading supplier of heavy-duty axles, and so we are, out of our data center in Bridgeville, Pa., connected to our automotive customers for the purpose of providing order entry, shipping, that kind of information electronically.

As it turns out, we've got a customer at Cape Kennedy these days, where the shuttle is processed and ready for launch. There are more than 200 engineers who aren't Rockwell employees — they work either for Nasa or Lockheed, and they're on-line to this data center. They use applications that reside here, and they use configuration data bases about the shuttle to look at payload integration and to look at how the shuttle would perform under certain situations. There's a growing amount of interfirm communications beginning to occur.

What is the network?

Well, I'm afraid it differs. The Lockheed people are on our network, SNA. And they go through a special [illegible] here from a security point of view. That's really our heritage; that's how we intend to deal with our vendors. The associate contractors on the B-1B, for example — there's an interest the Air Force has in having us do the same thing. We've started to, and that will follow the network we have in place already.

When it comes to our customers, we pretty much have to do what they have asked us to do. We've taken the position that if General Motors says it wants to communicate with us on, let's say, an older 2780 kind of remote-job-entry-type protocol, well, that's what we'll do, whatever our customers ask.

Security has to be a major concern. Have you had any significant breaches?

Not in recent times. We have probably put more effort into security in these data centers than most companies have.

What specific measures have you taken?

I have a security officer and a seven- or eight-person department right down the hall here, and the job they have is to define basically the baseline for security, what the standards of that security will be throughout the company and to organize a network of what we call Isso's — information systems security officers — in every division throughout the company. Their job is to ensure that everybody who signs into Rockwell, first of all, who becomes a user of computers, has been registered and is issued a user ID, password.

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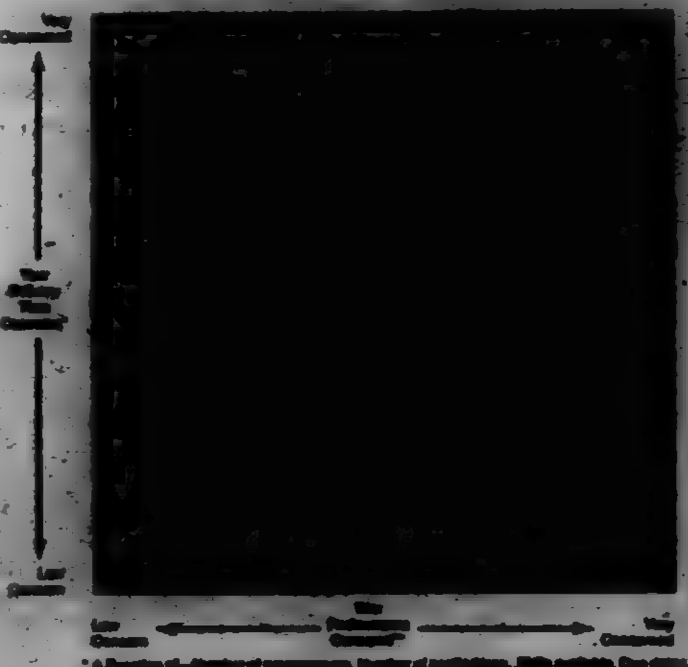

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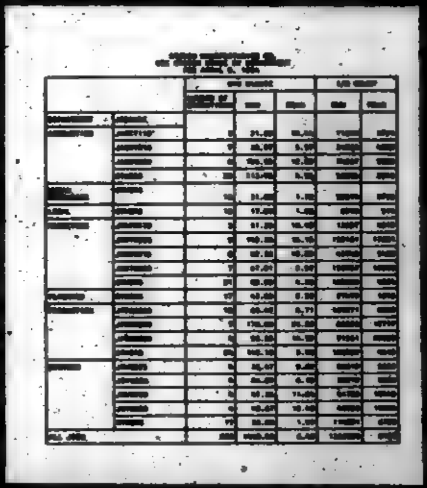

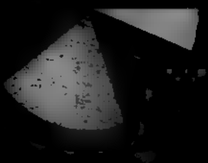

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Throw them off the system?

We suspend them if they don't do that. We're able through the system to observe people who are either inadvertently or mistakenly putting a password in incorrectly — or even worse, we absolutely record any reoccurring attempts to come on to the network.

You're monitoring that in real time or after the fact?

Both. Actually, we can monitor it in real time, and every morning there are reports that come up. We can tailor those reports, raise or lower the threshold on how many attempts have been made before we want to see it.

We also monitor the use of the computer. People could be authorized as registered users, and if we detect through monitoring that it is being misused, we're able to get back to their management on those things, too. Overall we have a product, ACF2 [IBM's Access Control Facility 2], installed in every site and a very explicit baseline in terms of what features are implemented. We have a team of EDP auditors who spend more than half of their audit devoted to security, physical security and access control kind of security. I was just last week going through a review, and in the last year or so, there have been no reported incidents of any consequence. That is not to say there aren't any, but we don't know of any.

I wanted to talk a little bit about your background. How many years have you been at Rockwell?

I've been at Rockwell a little less than two years, and I came here in this capacity.

To whom do you report?

I report to the chief financial officer.

That's a traditional placement of systems.

Very much so. And that's true throughout the corporation. I mentioned earlier that we have applications people in the divisions, so that if you went to the division that produces the B-1B, you'll find an MIS head reporting to the chief financial executive in that division.

The people who report here directly are the people in all those data centers and the telecommunications people and all the people who do the corporate applications work — those people report to me. The people who do applications work in the divisions, whether it be automotive or aerospace, they report in to those divisions hard line, and they have a dotted line here.

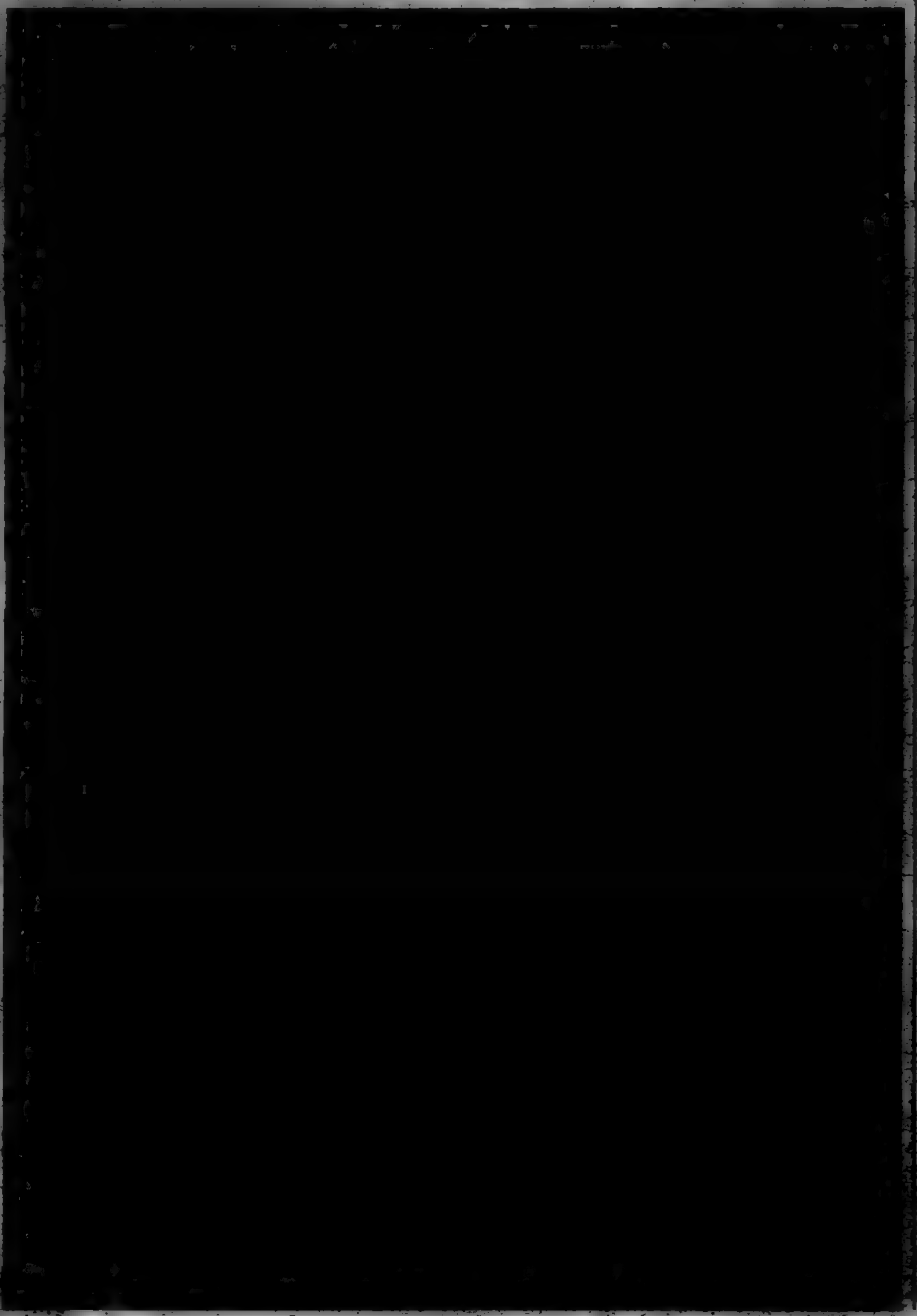
How many report to you directly?

About 1,100. That would represent about a third of the total head count in information systems and communications in the company. There are about 2,800 people in this function, of whom 1,700 are outside the Information Systems Center, and they have a dotted line here.

I want to talk about the type of people you hire in systems.

We do a lot of hiring. I have 60 openings right now. We hire all kinds. We hire applications people right out of school. We're always looking for good telecommunications people — very hard to find. We're always looking for skilled operating systems people. And we look for IMS [Information Management System] people. You know, IMS was invented here, this is the home of IMS. IMS was a joint project of IBM and North American Aviation people.

For your entry-level



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people, are you willing to take a smart liberal arts person? Do you need to do that — are there not enough qualified computer science graduates?

Yes, yes and yes. There are lots of qualified computer science people, and I think we've had success in hiring them and, particularly, growing them through operating systems, more in the technical side. A computer science graduate who is successful tends to have an interest in pursuing the technical side. So we find them tending to be more immersed in operating systems and data base management systems and language constructs. Liberal arts students and business students, more from the verbal communications world, tend to have interests that relate to dealing with users and they are apt to end up in applications.

So they end up more in general management?

Yes, I would say that's true.

Do you have a separate technical ladder?

We have a dual ladder for our technical people. They do very well at Rockwell. It's a tradition here; it's not just in information systems.

How high can one go on the technical side?

In our terms, it would be just a little bit above our management level.

What title would the position have?

Consultant. Like a lot of companies, just a little bit past our first level of manager, a technical person can rise without taking on the burdens of administration or having people report to him.

What about AT&T's move into the computer industry? Is it a viable vendor? Are you looking at the minis or the personal computer?

We are really a big customer of AT&T Communications. That Accunet T1 world is fundamental to us. On the information systems side of AT&T, we have a good number of AT&T PBXs installed, and I think we'll continue to see that grow.

So far, I personally have not been able to identify a real need for, or an application for, the 6300 Personal Computer. We have done very little on that side of it. We've also done very little on the 3B side so far.

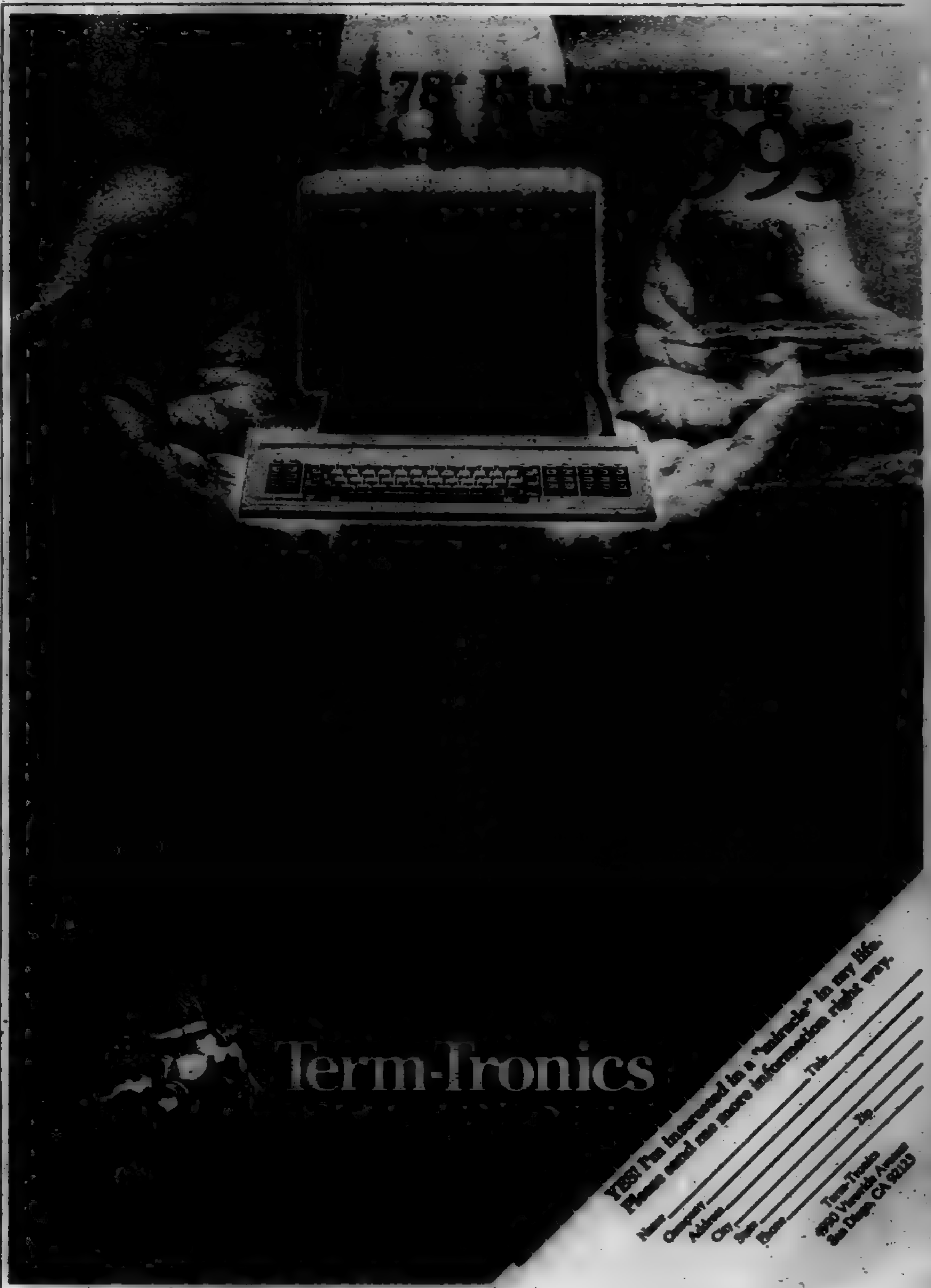
Do I think it's viable? I think that AT&T's efforts to date on the information systems side, outside of its traditional PBX world, haven't really shown much promise. In the future, as our engineers and others find software packages, as Unix grows as sort of a prerequisite, I guess I would predict some increased level of business will be done with AT&T.

So AT&T's hope that its strong communications customers will become computer customers hasn't really materialized?

I would say not in Rockwell to date. They have maintained their position with us through a lot of hard work, because we were not entirely happy at the outset, and they put a lot of effort into maintaining their relationship with us as a communications supplier. But as an on-premise equipment supplier, from my perspective, the major product set we will continue to work with will be in the PBX area.

Will information systems for the foreseeable future continue to report through the chief financial officer? Is there any thought of creating a chief information officer?

> ”
>
> *There's talk [about a chief information officer], and we consider it from time to time, but I don't see anything formal in the way of a fundamental change.*



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> ”
>
> *We're having a heck of a time as we come up the ramp trying to give a wide number of people access to the Cray and at the same time preserve the classified work for people who have to have a highly secure environment.*

I haven't seen anything formal. One of the things I spend time doing is making an effort to get our information systems community more visible and to relate better with our top engineering people. In doing that, I try to take a little bit of the lead and associate as much as I can with our engineering side of the house.

Recently I was gratified that our chief engineering executive, who is the senior vice-president of research and engineering and runs a top-level engineering policy group, invited me to be a member of that group. So I find myself at meetings where I'm the only person there who isn't really leading one of the big engineering groups. But the reason I'm there is that they are increasingly dealing in software-based kinds of technologies, and their whole engineering community is sitting at terminals all of the time. I represent the entity that delivers all of the computational support.

There's talk [about a chief information officer], and we consider it from time to time, but I don't see anything formal in the way of a fundamental change.

There are some important advantages in having the custodian of all this data within the purview of the chief financial officer.

It really takes the systems people themselves being aggressive and proactive. I don't think it's necessarily the case that it has to be reorganized. Because no matter where they end up, they're really there to support every function. It wouldn't seem to me we were going to fix much by putting all the systems people in engineering.

How does information systems contribute to the development of something like the B-1 Bomber?

There are more than 100,000 parts in that ship. The configuration control problems of pulling together something as complex as the B-1 — and there are five other associate contractors, and they all work on part of it, they all have a subsystem, and all the configurations have to tie together.

Computers are used, first of all, to design it. We build effectively what's called an electronic wind tunnel. We can test the performance of that machine through simulation using computers. Then to build it, to order all the materials, to do all the scheduling . . . All the project management is done through computers. I'd say that thing is as computer-intense as any product.

It could not be built without computers?

It could not be built; neither could the shuttle. For the space shuttle and all the space programs, all the iterations of the design are based on intensive computer modeling, simulation. These aerospace systems are among the most complex machines built. The number of parts, the number of suppliers and the materials are, almost in every case, things that have never been built that way before. They use computers to simulate their behavior and their components under different conditions.

I can get worked up about this subject. We have a heck of a lot bigger computer programs for the size of our business here. We spend almost 4% of the company's revenue on computers.

How many supercomputers could you use — not how many do you want?

In realistic terms, we probably should have two. We should be able to devote one supercomputer almost entirely to classified work and isolate it. Right now, we're having a heck of a time as we come up the ramp trying to give a wide number of people access to the Cray and at the same time preserve the classified work for the people who have to have a highly secure environment.

You have the Atlantis rolling out.

That will be the final shuttle.

So there's the shuttle and the B-1 Bomber. What else is computer-intensive?

The other one is the Navstar program, the Global Positioning System, I guess the largest satellite contract ever awarded. Now we have the ground equipment to go with it. Both of those systems never existed until Rockwell people invented them. You talk to those engineers and ask them how far they could get without a computer, how competitive would they be compared with Hughes or somebody else if Hughes was over there doing iterations on a large-scale processor and all they had was a calculator.

In this business, to be competitive, to even be in the game, you have to go out and hire a really top-notch engineer, and he won't come to work for you unless you tell him that what he's going to have at his disposal is a fairly rich library of mathematical software and a fairly [illegible] data center.

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Realia COBOL. What a relief.

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Can imposing design standards actually promote the freedom to experiment and innovate? In the case of the proposed Computer Graphics Interface standard and other accepted software standards, the answer is emphatically yes.

Needed: graphics standards

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By Thomas Clarkson

The cost of hardware often is blamed for inhibiting the growth of computer graphics. But in fact, component costs dropped substantially during the past decade. The problem lies instead with the lack of software standards. Just as the acceptance of Microsoft Corp.'s MS-DOS as a de facto standard contributed to a dramatic rise in the availability of applications for personal computers, graphics standards will increase the use of graphics in all application areas.

In the early days of computer graphics, users were obliged to write their own systems and application software. Without a standard interface to graphics functions, adding on a new device meant developing new software so the components could talk to each other.

Because of the cost of software development, early de facto software standards emerged with the dominance of successful hardware products such as California Computer Products, Inc. plotters and Tektronix, Inc. graphics terminals. When these companies added software support (Tektronix Plot-10, for example), their implementation of graphics utilities became the common graphics language for applications. But as the industry grew, that wasn't enough.

Work on two levels

Current efforts in standardization are the result of more than a decade of work by European and U.S. organizations. These efforts apply to two main interface levels: the applications programmer interface and the hardware device interface.

The programmer interface is a conceptual model as well as the syntax that a programmer uses to incorporate graphics into an application program. The device interface refers to the protocol between the device-independent and the device-dependent graphics functions. The programmer-level interface standardizes the calling conventions and functions in a graphics subroutine library, while the device interface defines a device driver protocol that is consistent for all graphics devices.

The Graphical Kernel System (GKS) is considered the programmer-level interface. GKS originated in Europe but has felt the influence of many national organizations, including the American National Standards Institute. GKS has nearly been accepted by the International Standards Organization and is now in the process of being adopted as an American National Standard.

GKS achieves source code portability. It allows graphics applications programs to be transported between different computer installations by providing a consistent interface in high-level languages such as Fortran, C or even Basic.

Programmers will be able to work on different hardware without going through a costly learning curve. IBM recently introduced the Graphic Software Systems (GSS) implementation of GKS as part of its IBM Personal Computer Professional Graphics Series.

Two emerging standards address the hardware driver interface level. The first, North American Presentation Level Protocol Syntax (NAPLPS), is based on the concept of videotex. Developed in Europe and modified in Canada, this idea was adopted by AT&T as a standard for transmitting graphics over telecommunications lines. The second is the Virtual Device Interface (VDI).

NAPLPS is aimed primarily at providing a way to connect television sets and other very low-cost raster devices to telephone lines so that consumers can access public commercial data bases. Providing only one-way at a time communications, it precludes interactive graphics applications. However, its data compactness allows small amounts of information to be transmitted quickly over low-cost communications lines.

At this point, it looks as if NAPLPS will be used only in low-cost home terminals.

Although NAPLPS is important because of the number of devices that could potentially use this standard, it is not an optimal interface for general computer graphics applications. It is parallel to another, more general, device interface called VDI or, its newer name, Computer Graphics Interface (CGI). A related emerging standard is the Computer Graphics Metafile (CGM).

Attributes of CGI

CGI makes all devices appear as identical graphics devices by defining a standard I/O protocol that results in device-independent applications. The protocol isolates the unique characteristics of the physical graphics device in the device driver software module. CGI is being developed by the Ansi X3H33 Technical Committee as a standard interface between device-dependent software and graphics devices. The GSS implementation of the emerging CGI standard was recently introduced as the IBM Graphics Development Toolkit.

CGM is at the same level as CGI. The power of CGM lies in its ability to store the graphics information in a compact form on disk or other media. Because the applications software speaks in only one form of generic graphics commands, the design of CGM must also be able to accept this information. The application is not aware of the physical output device because the input to CGI and CGM is the same. The design of both must take into account future technological enhancements of devices.

Industry benefits

For the graphics peripheral equipment manufacturer, the benefits of these standards are substantial. Their adoption means that a CGI driver for a particular graphics device need only be written once. All CGI-conforming graphics applications will then be able to utilize the standard device driver.

Eventually, peripheral equipment and semiconductor manufacturers will implement more of the software driver functionality directly in their hardware — in effect moving the CGI interface down into the graphics device or display controller itself.

This approach offers many benefits to the peripheral industry: less design effort expended, numerous second sources, higher reliability with a proven design, reduced costs and larger markets.

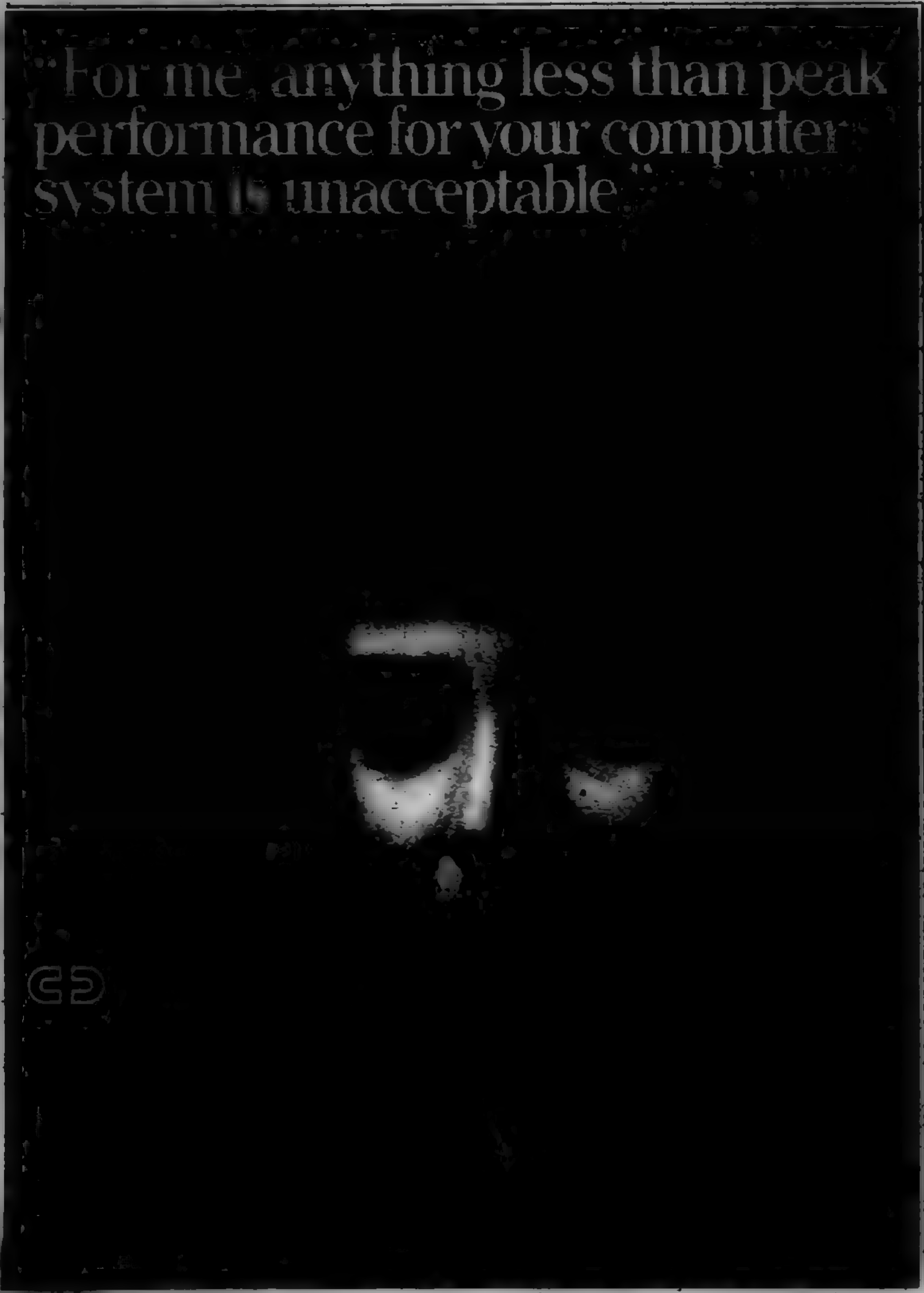
To software developers, graphics standards allow portability for applications programs. Not only will they see a consistent interface to graphics functions at the language level, but graphics runtime libraries can be generic, with device dependencies residing in the operating system.

To the computer manufacturer, this means installing the graphics portion of an operating system only once. Compilers and other utilities that reference the CGI standard will then be able to access the system peripherals without special adaptation. Higher level functions will be put into the device hardware (or firmware) and, eventually, graphics devices may incorporate a full CGI interface, eliminating the need for device drivers entirely.

For end users, more graphics solutions for their productivity problems will be created and available on a wide range of hardware. End users will no longer have to worry about exact system configuration or lack of software support for new peripherals.

Realizing standards

For a standard to be meaningful, it must be widely implemented, which requires a thorough understanding of computer graphics as well as the details of the standard specification. An intimacy with the internals of the target operating systems, the computer hardware and graphics peripheral devices is required. The graphics standards implementation should be consistent with the general architecture of the target system and as transparent to the user as possible. Unusual operational procedures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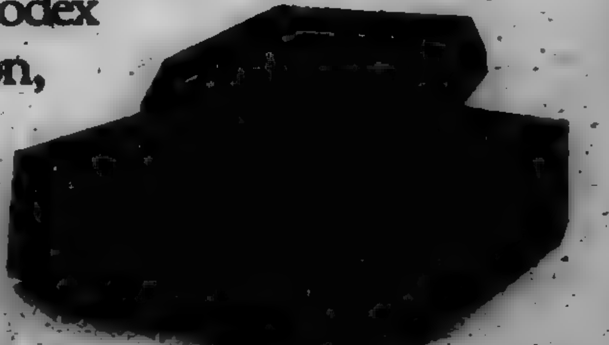

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*McGraw Hill's "Data Communications" magazine rated us as having the best technology and price/performance.

unique to graphics applications should be avoided.

Finally, for standardization to be realized, the software must get out into the marketplace. The issues of distribution and support need to be addressed.

Freedom to experiment

Can imposing design standards actually promote the freedom to experiment and innovate? In the case of the proposed CGI standard and other accepted software standards, the answer is emphatically yes.

Take, for example, the microcomputer industry. Computer manufacturers rely on semiconductor manufacturers for advanced products that are still compatible with other equipment the computer manufacturer makes. The independent software vendors can only hope that their software will run on what the manufacturers are making. Peripheral vendors must remain compatible with their previous lines to interface with what is already available in the marketplace. End users can only hope that the computer industry will produce coordinated products that will work together.

Each major group in the industry is, in a sense, locked in to what the other is doing. A breakthrough by any one group — no matter how beneficial — could be unusable if the other three were unable to interface with it.

> *Users are no longer dependent on a single software vendor or a small handful of vendors that are specifically promoted by the hardware manufacturer.*

Open market

The full impact of the proposed CGI standard is difficult to predict this early. But it's already clear that its importance will be far-reaching and that it will open new markets.

When the standard is in general use, customers can select software or hardware on their own merits, rather than by the hardware on which the software operates. They'll be able to use the latest hardware or the most up-to-date software that includes graphics, for example, instead of being restricted to only the software that runs on their installed equipment.

The flip side of this change is more intense competition, with the industry itself being revitalized. Manufacturers will be able to design and make products based on the latest technology, without regard to their own or other manufacturers' compatible products. Through the CGI, compatibility will be ensured.

MS-DOS freed programmers from the constraints of coding directly for the hardware. The proposed CGI standard frees them from the design constraints and characteristics of a particular microcomputer graphics system or peripheral.

Until now, the applications programmer had to write and debug the graphics elements and I/O interfaces for the specific devices to be used. That work is already done in the GSS products that IBM is using in its Professional Graphics Series. The IBM Graphics Development Toolkit lets the programmer interface to the CGI, which in turn provides access to independent device drivers that interface with peripherals.

The designer can now write software to output computer graphics or alphanumeric data to a logical device, such as a printer, or for input from a logical device, such as a mouse.

This ability to create device-independent software benefits computer manufacturers and independent software vendors alike.

Users are no longer dependent on a single software vendor or a small handful of vendors that are specifically promoted by the hardware manufacturer. A wide range of application software will be available.

Because of a lack of standardization in the past, manufacturers of computer graphics peripherals could sometimes find themselves constrained by their own products. For example, Epson America, Inc., Centronics Data Computer Corp. and other printer manufacturers had to design new products that were compatible with their original lines so that users could upgrade their systems without penalty.

Fostering innovation

The value of the CGI standard goes beyond a new freedom to develop state-of-the-art products. The quality of computer graphics is enriched as well.

Because applications programs can be developed faster and used by more people on the equipment they have available, graphics will become far more powerful and pervasive.

Computer graphics were not used in the past because they were difficult to incorporate. Now they can conveniently be used.

About the author

Thomas Clarkson is president and co-founder of Graphic Software Systems, Inc. in Wilsonville, Ore. Prior to that, he played a key role in enhancing Tektronix, Inc.'s Plot-10 interactive graphics software library. He was also a software project leader and computer analyst at Jet Propulsion Laboratory.

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MICROCOMPUTERS

Microrim unwraps enhanced DBMS

BELLEVUE, Wash. — Microrim, Inc. has announced R:Base 5000, a $700 data base management system for the IBM Personal Computer line, designed for both first-time users and professional programmers, according to the company.

Among its enhancements over Microrim's existing R:Base 4000 package, R:Base 5000 provides a menu-driven front end that gives "a visual way of defining data bases," said Wayne Erickson, Microrim's chairman.

The Application Express front end gives users graphics presentations of data base tables, which they may then fill with data. Developing an application, users walk through a series of prompts and menus, and R:Base generates the application code, Erickson explained. Automated screens, menu builders, data entry forms and reports and prewritten commands for many functions are provided.

Program development tools

For experienced users, the package also offers a set of program development tools including a procedural language, custom macros, a report writer with multipage and multitable form capabilities and a compiler, according to Microrim President Kent Johnson.

In addition to speeding execution times, the compiler locks the application code so that programs developed by an MIS department cannot be modified by users, Johnson emphasized.

R:Base 5000's Filegateway allows users to load data from Lotus Development Corp.'s 1-2-3, Software Publishing Corp.'s PFS:File, Ashton-Tate's Dbase II, Data Interchange Format, Sylk or Ascii files, the company said.

Data bases are limited only by operating system and hardware constraints, according to Erickson. The package handles up to 40 files per data base, with the number of records per file limited by PC-DOS file size.

The program runs on the IBM Personal Computer, Personal Computer XT, Personal Computer AT and compatible machines. It requires PC-DOS 2.0 or higher and 256K bytes of internal memory, and works with Microrim's Clout natural-language soft-

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■ A random-access memory disk for Apple's Macintosh was offered by Western Automation Laboratories/66

■ Leading Edge adds a spelling checker to its word processing program for the IBM Personal Computer line/66

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Kaypro laptop joins crowd

By Kathleen Sullivan
CW West Coast Bureau

SOLANA BEACH, Calif. — Kaypro Corp., which bills itself as the "Volkswagen of computer manufacturers," last week joined the bevy of companies offering IBM-compatible briefcase-size computers by introducing a portable with a $1,995 price tag.

The Kaypro 2000

Called the Kaypro 2000, the new system is based on an Intel Corp. 8088 microprocessor running at 4.77 MHz, Kaypro said. The unit reportedly comes with 256K bytes of random-access memory, which is expandable to 768K bytes.

According to the company, the Kaypro 2000 features a built-in 3½-in. disk drive with 720K bytes of memory. The system is packaged in a brushed aluminum case and weighs 11½ lb.

The Kaypro 2000 includes a 25-line LCD that reportedly features tilt adjustment, contrast control and a low-glare lens. Its

See KAYPRO page 76

Microsoft offers upgraded Pascal, Fortran versions

BELLEVUE, Wash. — Microsoft Corp. has introduced enhanced versions of its Pascal and Fortran languages for programming on the IBM Personal Computer and compatibles.

Running under the MS-DOS operating system, the enhanced releases reportedly include such multiuser network support features as file-sharing, file-locking and record-locking. They also offer code portability, enabling users to transport source code between MS-DOS and Microsoft's Xenix operating system.

Both Fortran Version 3.3 and Pascal Version 3.3 are said to interface with other Microsoft languages, including Microsoft C and Microsoft Macro Assembler, as well as with each other. Both of the enhanced languages also make calls to C routines through C calling conventions, start-up routines and memory management routines, all of which are similar to those used in C itself.

The upgraded Fortran reportedly includes a character substring function that

See UPGRADES page 75

SMALL TALK
Eric Bender
CW Senior Editor

Vendors climbing memory barrier

Like farmers who want only the land next to their own, personal computer users are always looking for a little more memory.

A few years ago, the 640K-byte direct-address range for Microsoft Corp.'s MS-DOS seemed to stretch beyond the horizon. But today, for users running giant spreadsheets or multiple applications, that 640K-byte limit looms like a brick wall, forever requiring a slow trudge over to the disk drives.

The limit's not really written in cement, however, and rumor has it that this week we'll hear from Intel Corp., Lotus Development Corp. and maybe even Microsoft on how to get around it.

Intel's 8088 processor can directly address 1M byte, but the space above 640K

See LIMIT page 76

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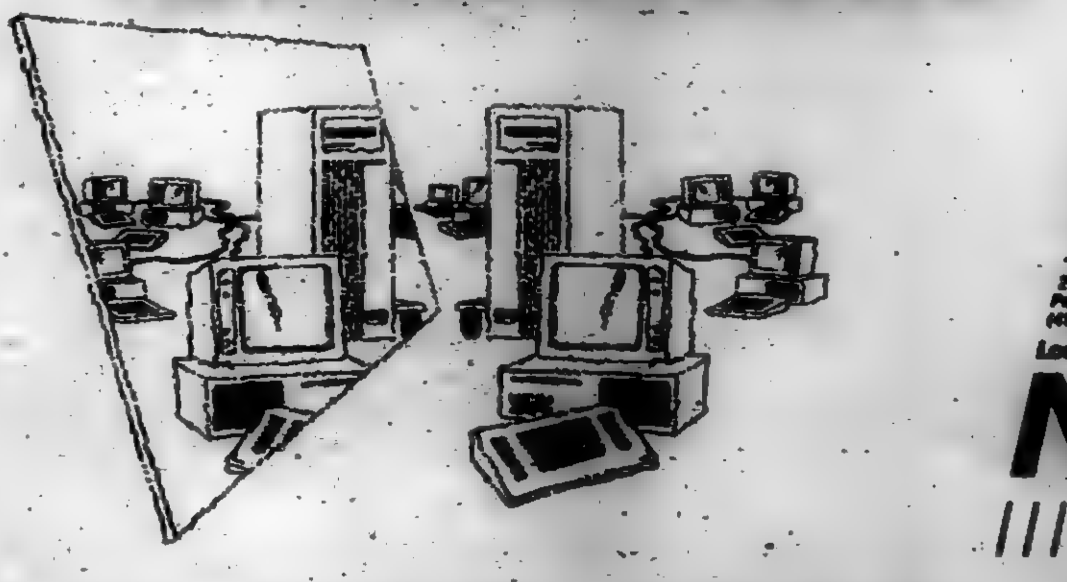

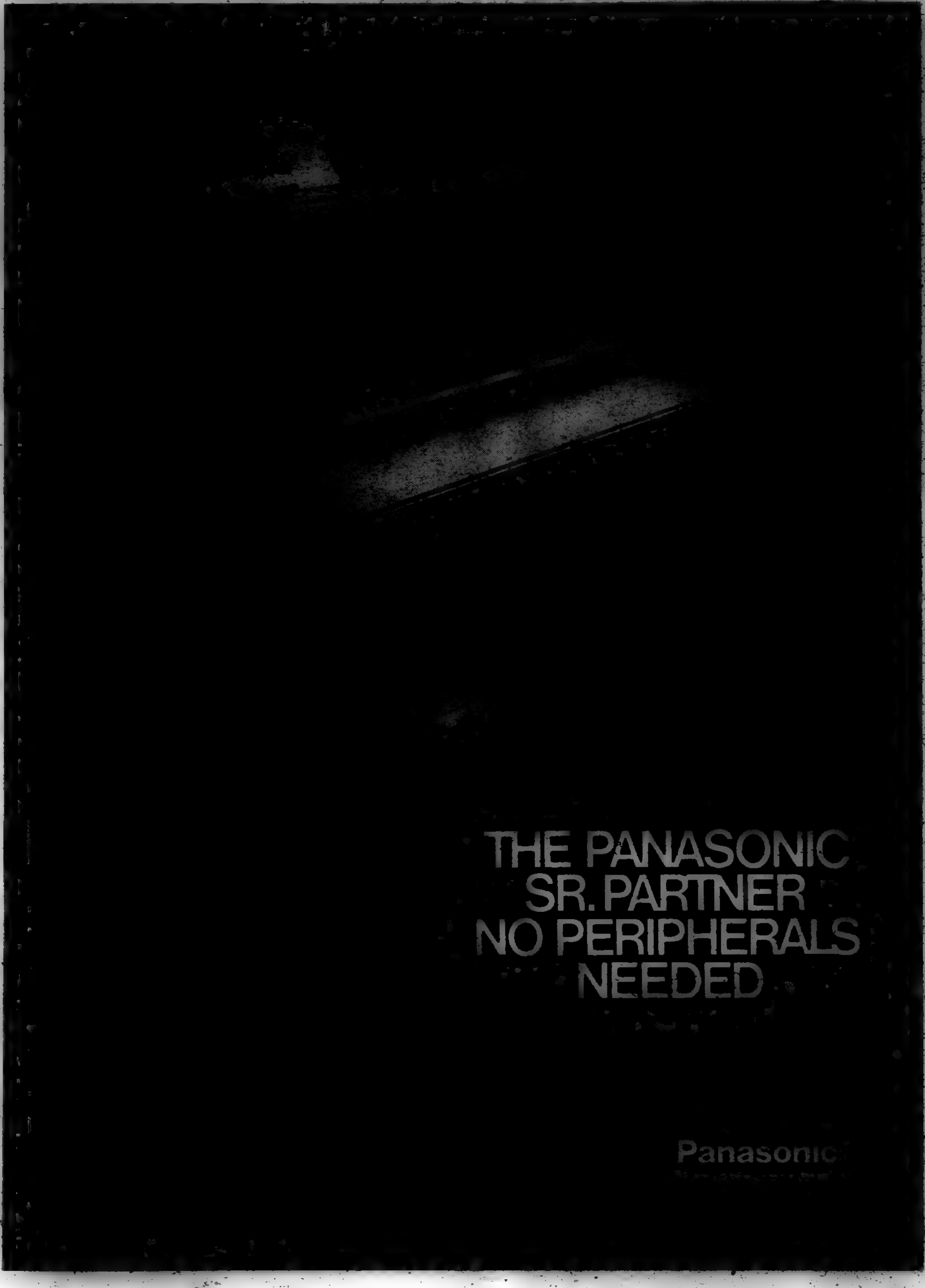
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Dasch storage system bows from Western Automation

By Kathleen Sullivan
CW West Coast Bureau

BOULDER, Colo. — Western Automation Laboratories, Inc. recently introduced the Disk Acceleration/Storage Control Hardware (Dasch) system for the Apple Computer, Inc. Macintosh microcomputer.

According to the firm, the Dasch is a random-access memory disk system that stores data electronically in a RAM array rather than mechanically on a tape or disk.

To hook up the Dasch system, users plug in a cable to the Macintosh's Imagewriter printer port, the company said. The Dasch system's bypass mode allows printer commands to pass through the Dasch to the printer, while storage and retrieval commands are intercepted, the firm said.

The system can also be attached to the Macintosh's modem port, which will allow computers on the Appletalk network or computers connected to other printers to use the Dasch system, the company said.

The Dasch unit comes in three sizes, offering 512K bytes, 1M bytes and 2M bytes of storage. All Dasch units can be upgraded to the 2M-byte maximum, the company said. Up to eight Dasch units reportedly can be daisy-chained together.

The 512K-byte Dasch costs $495, the 1M-byte version will be priced at $975, and the 2M-byte version costs $1,785.

For more information, Western Laboratories can be reached at P.O. Box 3436, Boulder, Colo. 80307.

Voice form-filling out for TI micros

WINSTON-SALEM, N.C. — Software that would permit users of Texas Instruments, Inc.'s Speech Command system for its Professional personal computer to fill out forms using spoken commands has been introduced by Micro Nova Systems, Inc.

The Micro Nova Multiform Solution series reportedly would allow users to create their own vocabulary for form completion. Each package consists of standard forms for a specific industry. Among the industries included are real estate, appraisal, mortgage banking and insurance.

According to the vendor, prices for the forms in the Multiform Solution series range from $195 to $395, depending on whether automatic math calculation is included in the package.

The package requires 512K bytes of internal memory and the TI Speech Command hardware.

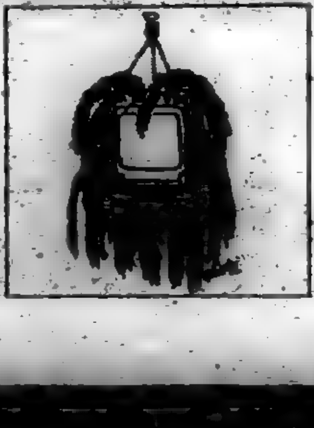
Micro Nova Systems is located at Suite 102, 3410 Healy Drive, Winston-Salem, N.C. 27103.

Zenith cuts prices for Z-100 micros

GLENVIEW, Ill. — Zenith Data Systems has cut suggested retail prices for three models in its Z-100 PC line of IBM Personal Computer-compatible systems.

Cost of the hard disk drive Model ZW-151-52 has been reduced from $4,499 to $3,899. Price of the ZF-151-52 desktop version, with two floppy disk drives, dropped from $2,799 to $2,699. Cost of the Model ZFA-161-52 portable system was cut from $2,999 to $2,899.

Zenith Data Systems is located at 1000 Milwaukee Ave., Glenview, Ill. 60025.



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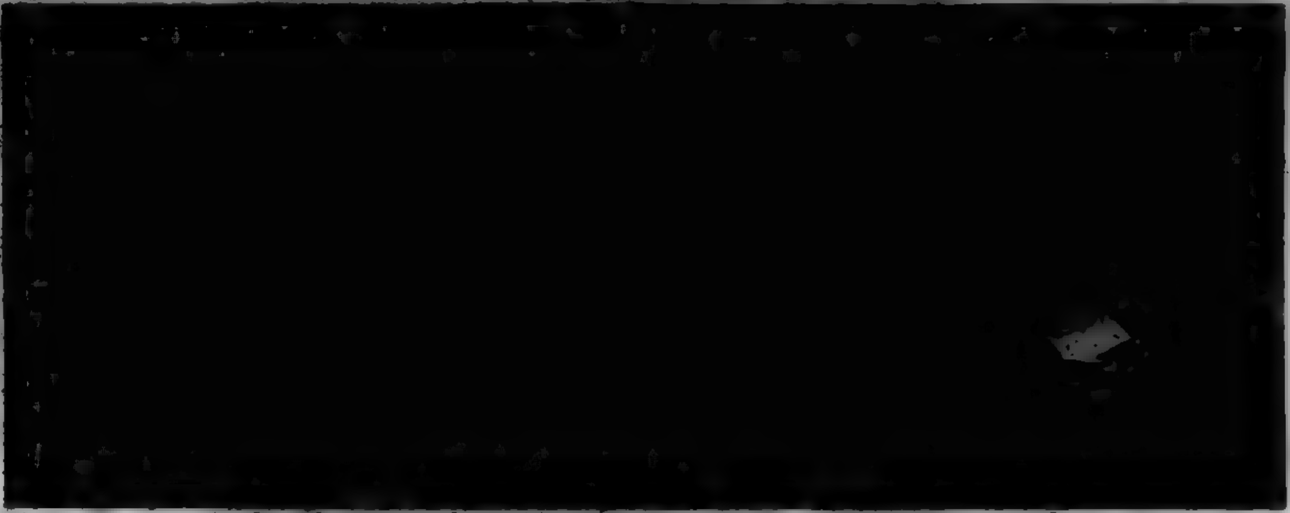

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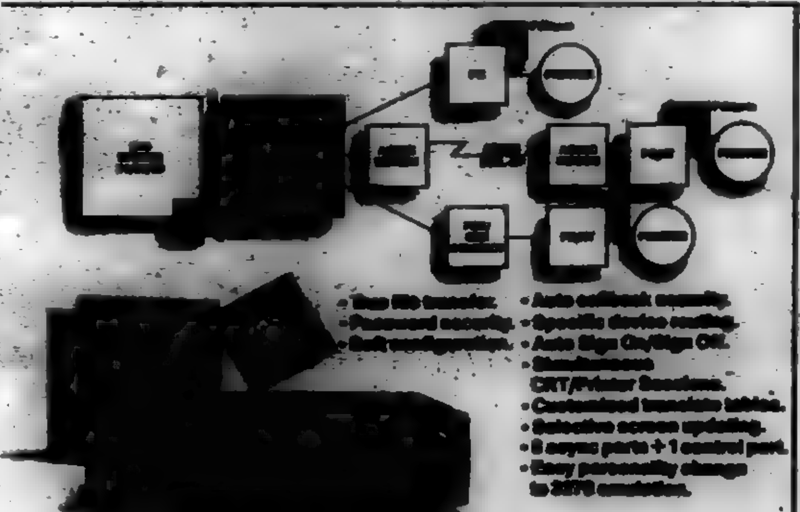

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Cadmus introduces graphics file server for Macintosh

LOWELL, Mass. — Cadmus Computer Systems, Inc. has announced the Cadmus workstation, a graphics development file server for the Apple Computer, Inc. Macintosh in the Appletalk network.

The system, priced at $35,100, is said to provide the graphics development features of the Macintosh in a high-performance workstation. Cadmus windows reportedly support multiple applications for developing icon-oriented user interfaces and graphics applications.

The Cadmus hardware features a monochrome graphics controller with raster operations hardware, a 17-in. noninterlaced bit-mapped display, bit-mapped keyboard and three-button mouse. The workstation configuration includes the graphics subsystem with a Motorola, Inc. 68010 microprocessor, 1M byte of random-access memory, a 32M-byte streaming tape drive, a 65M-byte hard disk, two asynchronous ports, the AT&T Unix operating system and C compiler.

Tektronix, DEC emulation

The Cadmus software is said to emulate Tektronix, Inc. Tektronix 4014 graphics and Digital Equipment Corp. VT-100 terminals and to run Core and Graphical Kernel System graphics in Cadmus windows.

The software is reportedly compatible with Macintosh graphics standards, emulating Apple's user interface — Toolbox — to coordinate windows, pop-up menus, mouse manipulation and text fonts.

For more information, Cadmus Computer Systems is located at 600 Suffolk St., Lowell, Mass. 01854.

Leading Edge adds to WP tool

WELLESLEY, Mass. — Leading Edge Products, Inc. introduced a version of its Leading Edge Word Processing software that contains a spelling checker.

The spelling checker reportedly scans a document, detects errors and suggests possible correct spellings. Its dictionary contains 80,000 words. If a word is not in the dictionary, it is flagged as a misspelled word, the vendor said.

Users reportedly can also create their own dictionary, with an upper limit of 4,000 words on diskette-based systems and no upper limit on hard disk-based systems.

Leading Edge Word Processing software, with print merge and spelling checker, is $250. Leading Edge Word Processing without these features costs $100.

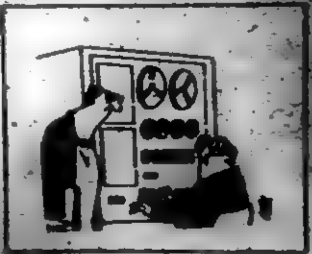
Leading Edge Products is located at 110 Cedar St., Wellesley, Mass. 02181.

Epson cuts printer costs

Epson America, Inc. has reduced prices by 10% to 20% on several of its dot matrix printers for personal computers.

The prices are as follows: LX-80, $299; FX-80+, $499; FX-100+, $699; LQ-1500, $1,295; and JX-80, $699. They had been priced, respectively, at $349, $569, $849, $1,495 and $799.

Epson America can be reached at 2780 Lomita Blvd., Torrance, Calif. 90505.



MICROCOMPUTERS

SOFTWARE

■ Control Data Corp. has introduced three modules for the construction of instructional software on its Plato authoring system. The tools also run on the IBM Personal Computer and the CDC 110 and Plato Personal Training Station.

The Advanced Tutorial Model (ATM) reportedly offers graphics, student interaction and branching capabilities in a tutorial structure. It also includes three methods of reinforcement, including multiple-choice and short-answer.

The Graphic Simulation Model (GSM) reportedly integrates the Advanced Tutorial Model with static, dynamic graphics simulation and representation. It offers monitoring of user-initiated events, multiple learning paths based on a student's responses.

The Certification Testing Model (CTM) reportedly features passing scores for test and subtest, question review and skipping and flexible testing strategies.

ATM and CTM are priced at $4,500 each. GSM is priced at $12,000.

CDC, P.O. Box 0, 8100 34th Ave. S., Minneapolis, Minn. 55417.

■ Execucom Systems Corp. has introduced a version of its IFPS/Personal decision support software for the Hewlett-Packard Co. Touchscreen Personal Computer.

The product reportedly includes corporate planning and analysis tools such as description of nonprocedural modeling language, data management, goal seeking, color business graphics and programming.

IFPS/Personal costs $1,500.

Execucom Systems, 3410 Far West Blvd., Austin, Texas 78731.

■ Computer Cognition has announced that its Acuity set of 14 accounting modules is now available for the AT&T 3B series microcomputers running Unix.

A spokesman said the integrated Acuity modules are tailored to general business requirements, engineering or contracting firms, wholesale and distribution and manufacturing support.

Applications are designed for the Unix environment, including Systems III and V, University of California at Berkeley 4.1 and 4.2 and Microsoft Corp.'s Xenix.

Acuity modules are priced from $1,000 to $2,000 for object code.

Computer Cognition, 225 W. 30th St., National City, Calif. 92050.

■ Structured Software Systems, Inc. has announced Complex Math 3.0, a language enhancement that is said to add complex numbers to the Hewlett-Packard Co. Series 200 Basic 3.0 operating system running on HP Series 200 micros.

The product reportedly adds built-in functions to the Basic 3.0 system, including hyperbolic trigonometry and array operations such as element-by-element arithmetic, matrix multiplications, vector dot product, matrix inversion and determinant, matrix transpose and reorder, sum of a complete array and matrix row and column sums.

Complex Math 3.0 allows complex numbers and operations to become an integral part of the Basic language, according to the vendor.

The product costs $795.

Structured Software Systems, Box 1072, Irick Road, Mount Holly, N.J. 08060.

■ Level Five Research, Inc. has introduced Insight 2 software, a development and runtime environment for expert systems. It runs on the IBM Personal Computer, the Digital Equipment Corp. Rainbow and the Victor Technologies, Inc. model 9000 personal computer.

The software, available May 1, will offer the ability to use objects, with single or multiple attributes, to describe facts that in turn describe a domain of knowledge, according to Level Five.

It will also reportedly of-

Continued on page 69

"Which came first, the chicken or the egg?"

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*(Turn Page Upside Down for Answers)

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Continued from page 67

for the ability to provide each conclusion of a rule with its own confidence factor.

The software costs $495.

Level Five Research, 4980 South A-1-A, Melbourne, Fla. 32951.

■ Oasis Technologies, Inc. has announced an enhanced version of its Version 7 Basic 86/87 graphics software that is said to incorporate a virtual device interface (VDI) graphics translation program. The product, VBasic 86/87, is designed for use with the Oasis 86 operating system running on the IBM Personal Computer XT.

The VDI program reportedly translates commands generated by VBasic 86/87 statements into an output device command sequence to produce the required graphics image. The same program statements are said to generate pictures for different graphics devices, regardless of the resolution.

VBasic 86/87 reportedly supports high-resolution (640- by 200-pixel) black-and-white graphics or medium-resolution (320- by 200-pixel) four-color graphics on the Personal Computer XT. High-resolution (660- by 720-pixel) black-and-white graphics are supported on the Printronix, Inc. P300 and high-resolution (640- by 560-pixel) eight-color graphics on hardware from other manufacturers, according to the vendor.

The VBasic 86/87 is priced at $695. The upgrade cost for Version 7 Basic 86/87 users is $150.

Oasis Technologies, Suite 100, 201 Lafayette Circle, Lafayette, Calif. 94549.

■ Software Toolworks has introduced Toolworks C, a C language compiler for personal computers under Microsoft Corp.'s MS-DOS operating system.

The compiler reportedly supports integer and character data types and is a translation and upgrade of the C/80 compiler, which Software Toolworks markets for systems under Digital Research, Inc.'s CP/M operating system.

Toolworks C requires no assembler and directly produces object modules compatible with the MS-DOS linker. Other special features include an execution profiler, which lists the number of calls and time spent in each subroutine, and a program trace facility.

Toolworks C costs $49.95.

Software Toolworks, Suite 1118, 15233 Ventura Blvd., Sherman Oaks, Calif. 91403.

■ Golden Software, Inc. introduced the Golden Graphics System, an integrated software package for the production of contour maps and three-dimensional surface plots using the IBM Personal Computer line.

The graphics package reportedly permits users to visualize the implications of multivariate data. It consists of five applications with functions that include the ability to create XY graphs, bar charts, pie charts, line graphs and scatter plots.

The software is said to be able to create plots from plotting commands that have been placed in a data file and to give the ability to create a regularly spaced grid from irregularly spaced data.

The package costs $299.

Golden Software, P.O. Box 281, Golden, Colo. 80402.

■ Computer Innovations, Inc. has introduced its Introducing C software package for self-paced instruction in C language programming using the IBM Personal Computer.

The program is said to consist of a self-paced training manual and a C interpreter. The C interpreter provides the user with immediate feedback.

The training manual is modular and offers a reference section. When finished, the user will be able to write and understand C language programs and will know how to use the standard C library, Computer Innovations said.

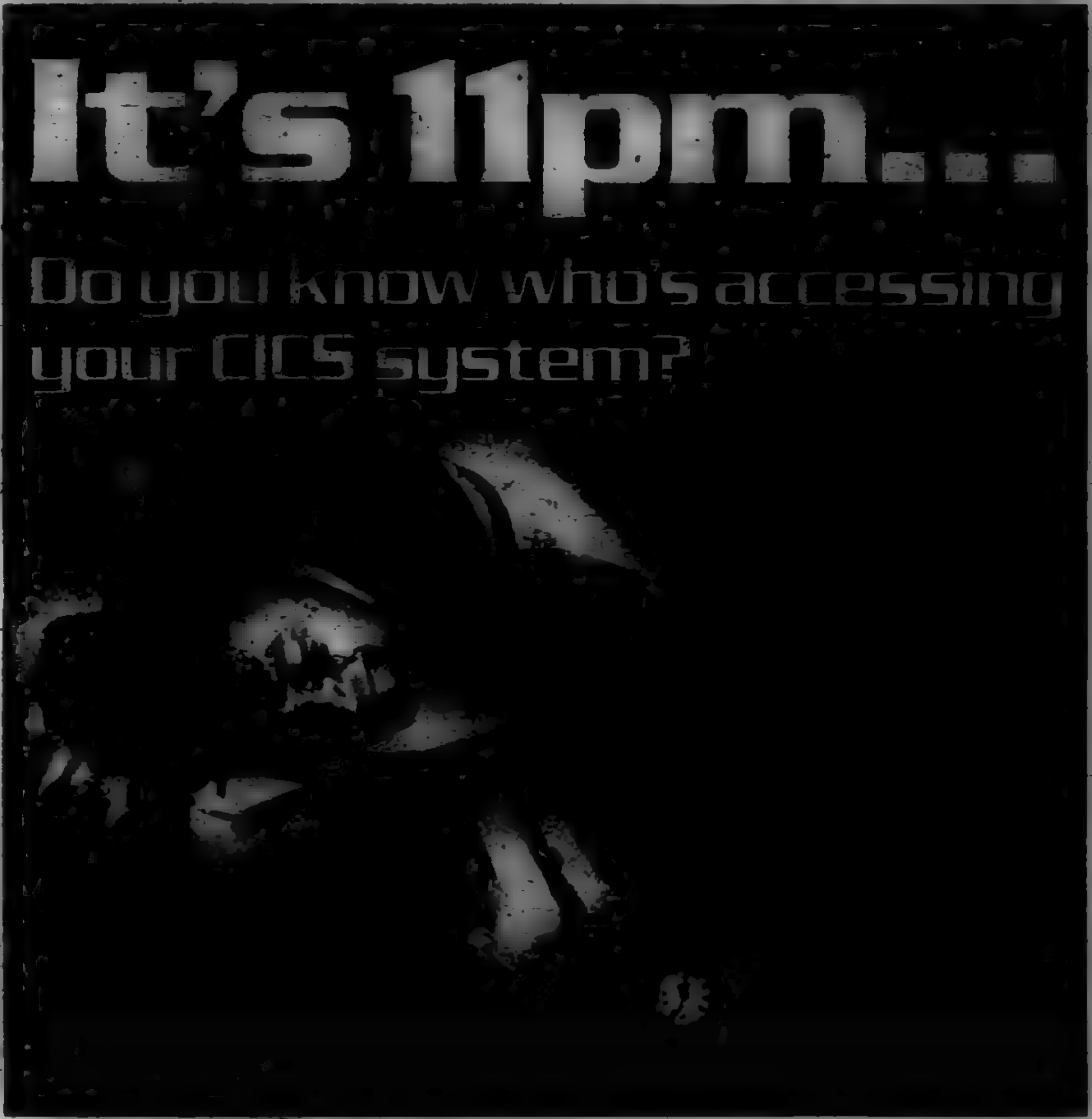
The software requires IBM's PC-DOS 2.0 or higher and at least 192K bytes of internal memory.

The package costs $95.

Computer Innovations, 980 Shrewsbury Ave., Tinton Falls, N.J. 07724.

■ Central Information Systems, Inc. has announced that its [illegible] relational data base management system is now available for the IBM Personal Computer.

Continued on page 70



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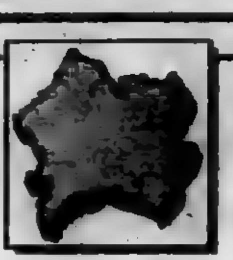

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MICROCOMPUTERS

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The product is said to include all features and capabilities of versions of Rtfile for Digital Equipment Corp. PDP-11 and VAX series computers.

Rtfile features reportedly include data base definition, CRT display form generation, transaction processing, list processing and report generation.

The single CPU price of Rtfile for the PC-DOS operating system is $500. A site license to allow the user to run the software on all on-site CPUs is $5,000. A corporate license for multiple designated sites is $10,000.

Contel Information Systems, 4330 East-West Highway, Bethesda, Md. 20814.

■ Softcraft, Inc. has announced Rtrieve, menu-driven report writer software for users of Softcraft Xtrieve data base management software on the IBM Personal Computer, Personal Computer XT, Personal Computer AT and Texas Instruments, Inc. Professional computer.

Rtrieve reportedly allows data to be generated in user-defined formats for custom-designed reports, form letters, statements and other applications.

Rtrieve costs $85 for a single-user version and $175 for a local-area network version.

Softcraft, P.O. Box 9802, No. 917, Austin, Texas 78766.

■ Hewlett-Packard Co. has announced the HP 30558 software that reportedly links the HP 3421A or 3497A front-end data acquisition system to the HP Touchscreen or Touchscreen Max or to the IBM Personal Computer, Personal Computer XT and AT.

The product is said to allow personal computer users to gather data on up to 30 channels with the HP 3421A for small to medium applications and up to 100 channels with the HP 3497A for medium to large applications.

The software is reportedly menu driven to allow users to quickly set up experiments and acquire, store and analyze their results. The microcomputer and the data acquisition front end communicate via an HP-IB interface (IEEE 488).

The HP 30558 software costs $400 for the HP 3421A and $500 for the HP 3497A. For the HP Touchscreen and Touchscreen Max, the 30558 requires the HP 14957AA I/O library, which costs $295. For the IBM Personal Computer series, the product requires the HP 61602AA I/O library and HP-IB card, at $395.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

■ Real Time Computer Science Corp. has announced the enhancement of its RTCS/UDI software to support the IBM Personal Computer AT.

The RTCS/UDI applications development software is said to be an implementation of Intel Corp.'s Universal Development Interface specification for Microsoft Corp.'s MS-DOS operating systems. The UDI specification reportedly allows programs written for one operating system to run on other systems compatible with the UDI.

RTCS/UDI reportedly contains all 31 of the Intel UDI procedures. It runs on top of MS-DOS and IBM's PC-DOS and allows MS-DOS and PC-DOS commands to be accessed from a UDI command line.

The software requires two 360K-byte diskette drives or one diskette drive and one hard disk drive and 256K bytes of internal memory. It costs $500.

Real Time Computer Science, Unit E, 1390 Flynn Road, Camarillo, Calif. 93010.

■ Graphic Communications, Inc. has announced enhancement of its Graphwriter software for the IBM Personal Computer line.

Graphwriter now reportedly supports the Hercules Computer Technology graphics card, the Hewlett-Packard Co. Laserjet printer, Integral Data Systems, Inc.'s Prism color printer and the Houston Instrument DMP29 plotter.

Version 4.3 also reportedly can change chart text to a variety of different type fonts. Graphwriter uses preprogrammed formats and is menu driven.

Version 4.3 requires 192K bytes of internal memory.

Graphwriter costs $595. Registered users can upgrade to the new release for $25.

Graphic Communications, 200 Fifth Ave., Waltham, Mass. 02254.

■ Sof-Tools has announced Engineering Tool Kit (ETK) software for Apple Computer, Inc.'s Macintosh.

ETK reportedly allows the recording of numeric engineering data and generation of statistical analysis reports from the data. Features are said to include multiple linear regression, analyses of variation reports and a scientific calculator with logarithmic, arithmetic and trigonometric computation capabilities. The software also includes base conversion capability of up to base 16, according to the vendor.

The package requires the Microsoft Corp. Basic 2.0 operating system running on a Macintosh.

ETK costs $90.

Sof-Tools, P.O. Box 8751, Boise, Idaho 83707.

■ Infotools has announced an enhanced version of its Bakup storage management software that backs up hard disk drives residing in the IBM Personal Computer XT and AT.

Release 3.0.4 reportedly supports any size hard disk, is copy protected to allow portability between installations and uses the keystroke buffer resident in the IBM Personal Computer.

Bakup 3.0.4 is said to run on any version of IBM's PC-DOS or Microsoft Corp.'s MS-DOS Version 2 or 3. The software requires 256K bytes of memory to support hard disks of up to 20M bytes. It needs 384K bytes to support 30M-byte and larger disks.

The product costs $149.95.

Infotools, 10044 S. De Anza Blvd., Cupertino, Calif. 95014.

■ Readiware Systems has introduced Readiwriter document formatting software for the IBM Personal Computer.

Readiwriter Version 2.0 reportedly was designed for use in creating

Continued on page 75

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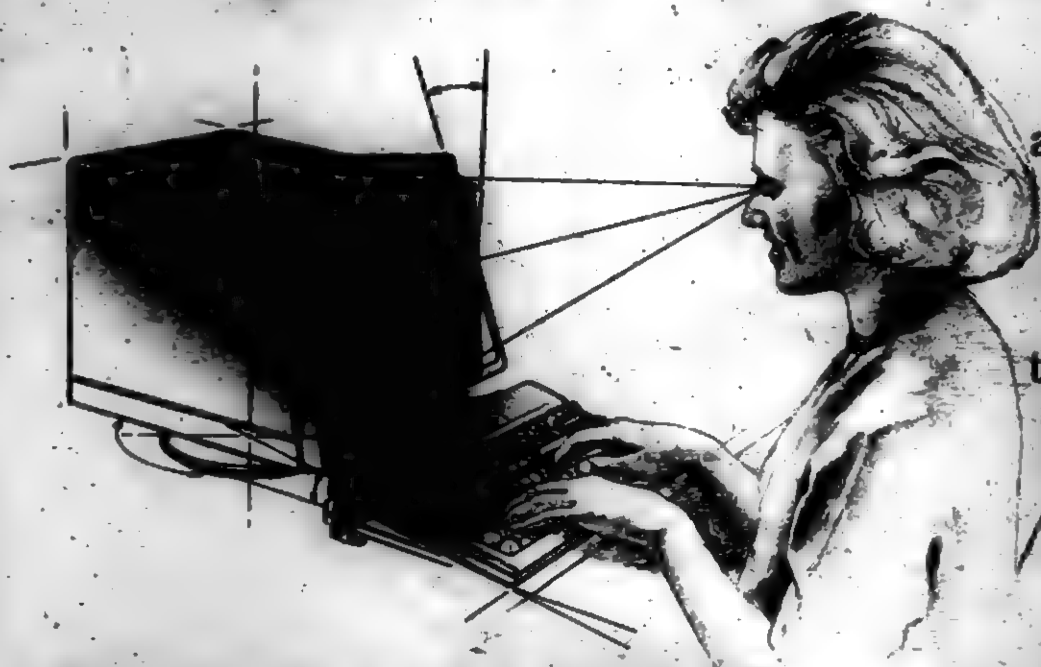

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Continued from page 70

forms, letters, books or manuals. Its formatting capabilities include proportional spacing with microjustification, parametric printer definitions and user-level compatibility with IBM's DCF and Script languages.

Readiwriter requires at least 128K bytes of internal memory and two diskette drives. It costs $395.

Readiware Systems, P.O. Box 515, Portage, Mich. 49081.

■ Liberty Bell Software Co. has announced Dwindow, software that is said to provide users with a windowing index system for Ashton-Tate's Dbase II Versions 2.4 and 2.41 on the IBM Personal Computer, Personal Computer XT and AT.

Written in assembly language, Dwindow is said to add 25 windowing syntax statements to Dbase II. Specific improvements make Dbase's line zero available for SAY or GET statements and line 25 available for SAY statements and provide a split screen modify command and syntax error processing compatibility, according to the vendor.

Dwindow reportedly runs 32 full screens per second and occupies 9K bytes of memory. It requires IBM's PC-DOS Version 2.0 operating system and 192K bytes of internal memory.

The product costs $135.

Liberty Bell Software, P.O. Box 69306, Suite 150, 4640 S.W. Macadam, Portland, Ore. 97201.

■ Major Software has introduced Pascalpac, multifunction software to aid programmers working on the IBM Personal Computer in Microsoft Corp.'s Pascal or Borland International's Turbo Pascal.

Pascalpac reportedly can generate a cross-reference table of all symbols in a Pascal program, except reserved words. It allows programmers to browse through a cross-reference table and the associated Pascal program at one time.

The software also is said to contain a listing program for printing Pascal programs, cross-reference tables or any other text file.

Pascalpac is priced at $195.

Major Software, 66 Sylvian Way, Los Altos, Calif. 94022.

■ CMBS Technologies has announced enhancement of its Wordpatch printer interface software for use with Micropro International Corp.'s Wordstar program on IBM Personal Computers and machines running Digital Research, Inc.'s CP/M operating system.

Wordpatch, Version 3, reportedly has been rewritten in the C language for greater speed. Also new is support for printers such as the Epson America, Inc. MX-80 and JX-80, Anadex, Inc. WP-6000, Star Micronics Co. Gemini and others.

The program is said to feature the ability to expand Wordstar's printer instruction area and to write the appropriate instructions for the specified printer into that expanded instruction area.

It also can rename Wordstar program files to show that they have been affected by Wordpatch.

The software costs $49.95.

CMBS Technologies, P.O. Box 3061 Walnut Creek, Calif. 94596.

See [illegible] page 76

UPGRADES from page 63

allows programmers to manipulate strings. Also added are addressing options, including one that allows users to pass and locate a common block in the default data segment. The Alias function aids interlanguage calling by allowing programmers to get around Fortran's six-character limit on program names. Other addressing options in the Pascal release allow the return of the full address of a procedure or function.

Among enhanced utilities, the two languages reportedly give the capacity to let programmers create, organize and maintain object module libraries. Another added function in both releases packs executable files, reducing their size and decreasing loading time.

The enhanced versions of Microsoft Pascal and Fortran are priced at $300 and $350, respectively. Both require systems with at least 192 bytes of internal memory and two double-sided diskette drives.

Microsoft can be reached at Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

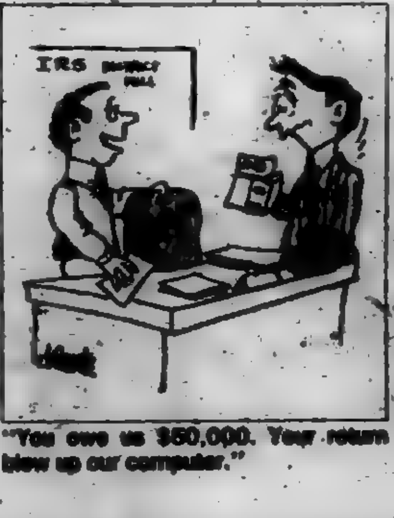
MICRORIM from page 63

ware, the vendor said.

Microrim is developing a local-area network version of R:Base 5000 for the IBM PC Network, Johnson said. The package is scheduled for September shipment and will be priced at $2,100 per network.

The company will continue to sell R:Base 4000, a spokesman said. Registered R:Base 4000 users can upgrade for $245 through July 31.

Microrim is located at 3380 146th Place S.E., Bellevue, Wash. 98007.



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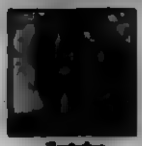
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21

TOOLS

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■ Global Technologies Corp. has introduced two software development tools for use with Ashton-Tate's Dbase II and Dbase III on the IBM Personal Computer line, including the Personal Computer AT.

One of the products, the Voice Command System, is a hardware and software combination that is said to offer voice recognition capabilities to Dbase II and III programmers.

Users may control the Edix and Dbase functions of Dbase programming, as well as several of the Dbase utilities, by speaking the commands they would otherwise type, Global Technologies said.

Also available is Dbase Configured Programmers Editor, which reportedly enables the editing and viewing of four different command files at once.

The Dbase Configured Programmers Editor carries a price of $245. The Voice Command System is priced at $895.

-Global Technologies, 16572 E. Louisiana Drive, Aurora, Colo. 80017.

COMMUNICATIONS

■ AST Research, Inc. has introduced its AST-SNA/Cluster and AST-BSC/Cluster, packages that reportedly allow an IBM Personal Computer to emulate an IBM 3274 cluster controller.

Such emulation is said to permit the Personal Computer to communicate with a remote IBM mainframe using either Systems Network Architecture/Synchronous Data Link Control or Binary Synchronous Communications line protocols.

Each controller package reportedly supports up to four Personal Computers or asynchronous terminals attached to the single Personal Computer running the package.

Each AST cluster package includes four built-in asynchronous communications ports and RS-232C connector cables.

The AST-SNA/Cluster costs $2,190; the AST-BSC/Cluster costs $1,990.

AST, 2121 Alton Ave., Irvine, Calif. 92714.

LIMIT

from page 65

bytes is mapped out for graphics displays and other odds and ends in the IBM Personal Computer and most MS-DOS machines. (There are exceptions; the Texas Instruments, Inc. Professional Computer can address 768K bytes.)

Naturally, there are any number of ways to get around this barrier. The most common is setting up additional memory with a random-access memory disk, which speeds things up considerably but does not offer the instant gratification of direct address.

Some add-on board manufacturers supplement this approach by remapping memory for specific application packages. Dallas-based Mega-Omega Systems, for example, pushes the video address up 256K bytes and writes software for memory hogs, such as Lotus' Symphony, that lets the packages grab 896K bytes in extended mode.

Another tack, widespread in the 8-bit world, is bank switching. An 8-bit processor such as Zilog, Inc.'s Z80 can directly address only 64K bytes, so techniques were developed to link larger files and programs divided into 64K-byte chunks dynamically.

Of course, developers must write or modify these programs with these memory management schemes in mind.

Whatever pixie dust the software wizards throw at the problem, and whatever the practical upward range is, the benefits will be limited unless there's a single MS-DOS extended-memory development standard backed by Microsoft and everyone else.

If there's a standard in the works, however, most software firms were unaware of the details early this month.

On a quiet night, you can almost hear developers whimpering at the thought of meeting yet another standard — they're already grappling with IBM's Topview or Virtual Device Interface or with Microsoft Networks or whatever.

But the alternative is chaos, and it would be nice to minimize that, for once. And crossing the memory barrier could give thousands of MS-DOS programs new life on the next-generation machines built around the 80286 chip, which can directly address 16M bytes.

KAYPRO

from page 65

bit-mapped display is said to feature a resolution of 640 by 200 pixels.

The product includes a detachable keyboard. In its standard configuration, it comes with an RS-232 serial port, one expansion port and a built-in rechargeable battery pack. It reportedly runs for four hours before its batteries need to be recharged.

The Kaypro 2000 comes bundled with Microsoft Corp.'s MS-DOS 2.11 and GW-Basic and with Micropro International Corp.'s Wordstar, Mailmerge, Infostar Plus and Calcstar, Kaypro said. Users reportedly can run software designed for the IBM Personal Computer or Data General Corp.'s Data General/One on the Kaypro 2000.

Kaypro also plans to offer peripherals for the new system, including a base unit, a disk adapter and modem.

The Kaypro 2000's base unit is said to contain a 5¼-in. disk drive that can read or write standard IBM diskettes. It also includes a serial and parallel port and two expansion slots for Personal Computer cards, the firm said.

The base unit, which will cost $795, reportedly can also accommodate an additional 5¼-in. disk drive, a 3½-in. disk drive or a hard disk drive. Kaypro said it will rely on third-party vendors to supply 3½-in. drives and hard disk drives for the unit.

By adding a specially designed Kaypro card to a Personal Computer, users will be able to connect a Kaypro to a Personal Computer and use the IBM's drive as a second disk drive, the company said.

The disk adapter will be priced at $115, while the Kaypro card for the Personal Computer will be priced at $45, a spokeswoman said. The firm will also offer a 1,200 bit/sec. modem for $295, a spokeswoman said.

The company plans to begin shipping the Kaypro 2000 in late May or early June.

Kaypro is located at 533 Stevens Ave., Solana Beach, Calif. 92075.

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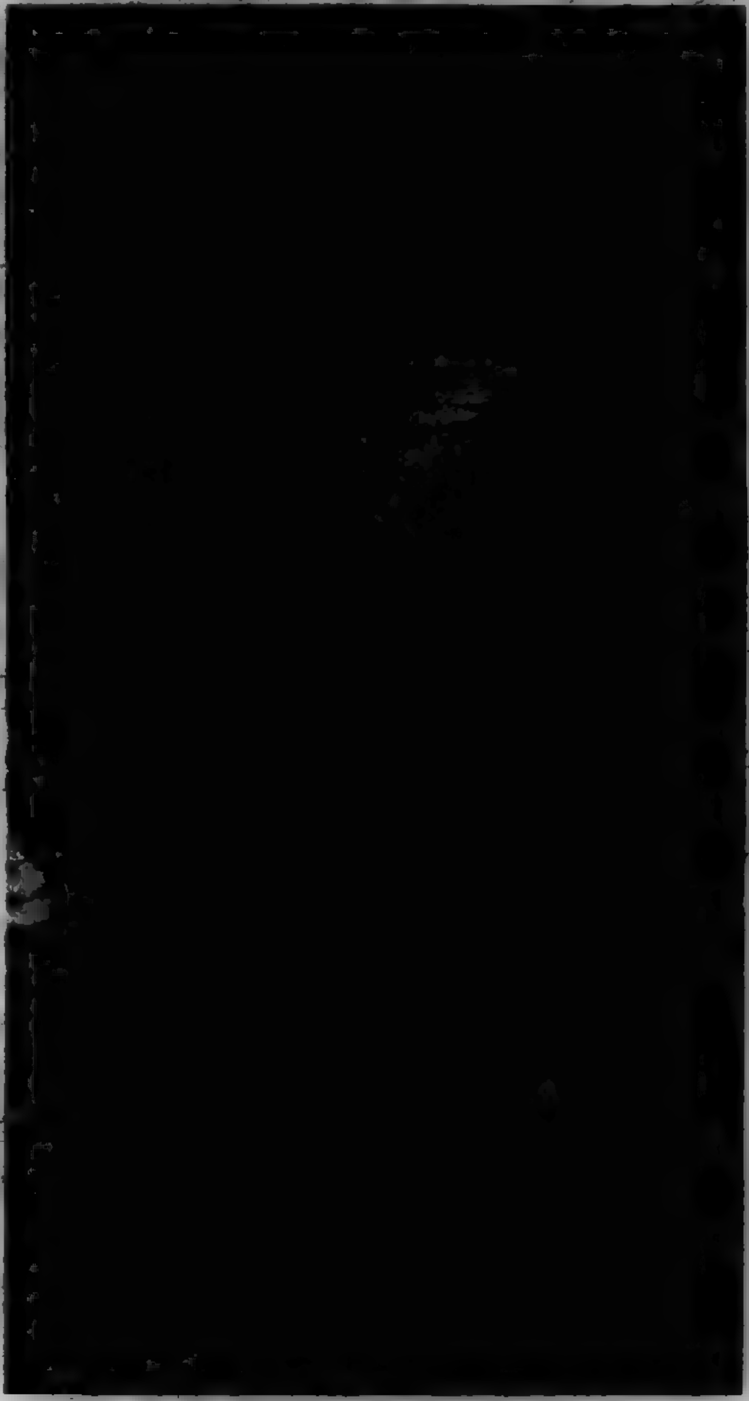

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April 18
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Boston, MA
April 17
Boston Marriott Long Wharf

Calgary, AB
May 1
Calgary Centre Inn

Chicago, IL
May 8
The Westin Hotel

Cincinnati, OH
April 30
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Cleveland, OH
May 30
Stouffer's Inn on the Square

Dallas, TX
April 24
Loews Anatole Hotel

Denver, CO
May 8
Sheraton Denver Tech Center

Detroit, MI
April 4
The Dearborn Inn

Houston, TX
April 10
The Westin Galleria

Kansas City, MO
April 2
Adam's Mark

Los Angeles, CA
April 3
Pacifica Hotel

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May 22
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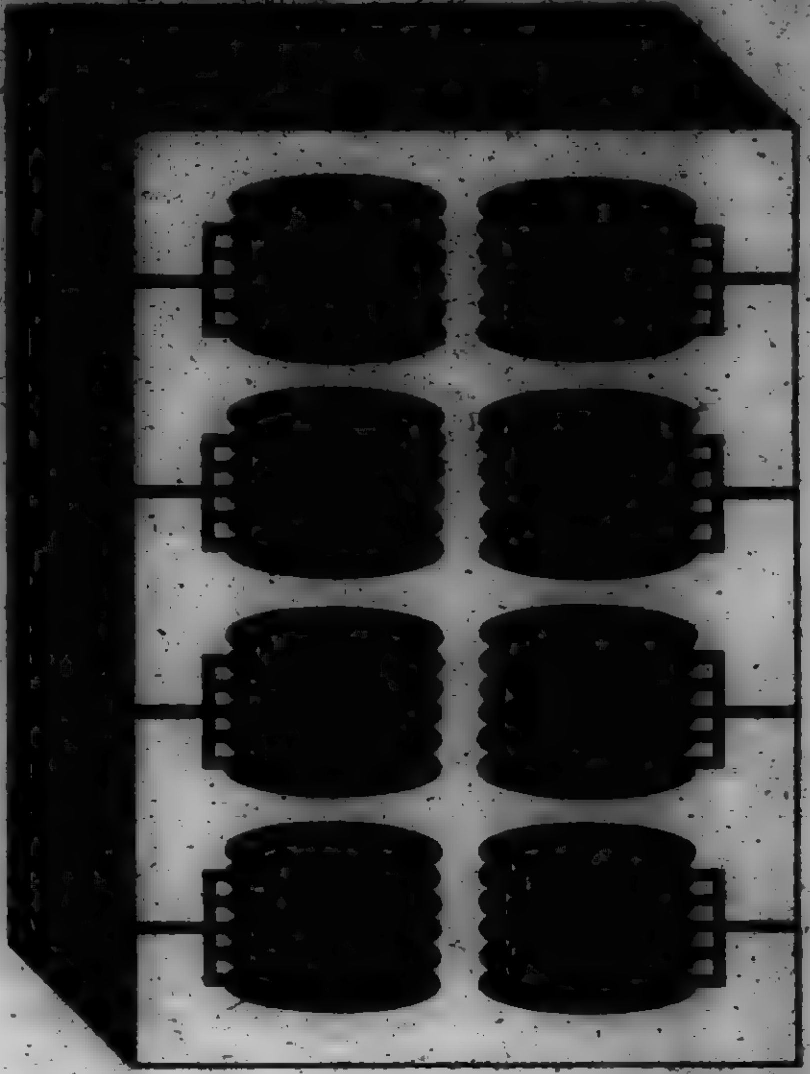

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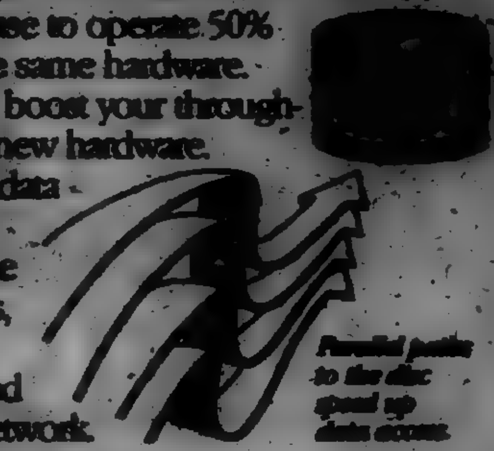

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COMMUNICATIONS

DATA STREAM
John Dix
CW Senior Editor

Local packet nets heat up market

Value-added network carriers such as GTE Telenet Communications Corp. and Tymnet, Inc. may face stiff competition from the former Bell operating companies, which, under relaxed regulations, are beginning to offer local packet-switching services.

The Federal Communications Commission recently loosened restrictions of its Second Computer Inquiry decision to permit the regulated local telephone companies to offer protocol conversion. Computer Decision II distinguished between basic and enhanced services and concluded that AT&T and its then-affiliated Bell companies could only offer enhanced services through separate subsidiaries.

Under the revised decision, the former Bell operating companies can offer packet-switching services with asynchronous-to-X.25 protocol conversion as basic regulated services. These networks can only be offered locally within Local Access and Transport Areas (Lata). The former Bell operating companies cannot carry traffic between geographic Latas.

The North American Telecommunications Association, a group that follows competitive developments in the industry, reported that Pacific Telephone and Telegraph Co., Southwestern Bell Telephone Co., New York Telephone Co., New Jersey Bell Telephone Co., Southern Bell Telephone and Telegraph Co. and Michigan Bell Telephone Co. "have all indicated they plan to include protocol conversion and packet switching in upcoming tariffs."

Establishing the services as regulated offerings will enable the telephone companies to market the networks along with their standard services. This means all customer information — including customer names, addresses, billing histories and equipment inventories — are available to the salespeople peddling the packet nets. In addition, because the services are regulated, standard network facilities can be used.

See NET page 85

Trim the cost of talking

Look at phone bill for telecom savings

By Paul Korzeniowski
CW Staff

TROY, N.Y. — Interested in a simple way to cut communications costs? Then take a close look at your telephone bill. Doug Mitchell, president of Consultel, Inc., a Wayland, Mass., communications consulting firm, claimed that 90% of all businesses spend too much money for telephone services because most phone bills contain numerous errors.

Mitchell made the claim at "Turning Telephone Costs into Profits," a two-day seminar sponsored by Rensselaer Polytechnic Institute of Troy, N.Y., and held recently in several cities.

Auditing telephone equipment is a simple first step in trimming telephone costs. "Often, when a company alters its telephone system, equipment or lines are eliminated," Mitchell noted. "Sometimes, these changes are not noted by the phone company. Consequently, the company will be billed for lines that are no longer in use."

The seven regional holding companies can supply a company with a computer tape that lists all telephone equipment. The tape's name differs with each former Bell operating company; some tape names include Cris, Pcab and SN819. "Companies should attempt to get these tapes as soon as possible, for they are property of AT&T," Mitchell warned. "When AT&T starts billing customers directly rather than relying on the [divested Bell operating companies], it will be more difficult for a company to get a copy of the tape."

> *'An accounting system clearly identifies telephone abusers.'*
>
> — Doug Mitchell
> Consultel, Inc.

This tape can be used to produce a printout with code names or numbers for different types of equipment. For example, TLN represents manual-type tie line termination point. Mitchell noted two methods for translating these codes. A book called the *Uniform Service Order Codes* is available from the former Bell operating companies which lists the codes, and "there are plenty of retired Bell employees who are able to translate the codes," the consultant said.

Once the audit is completed, a company should compare its list of equipment with the telephone company's list. "A company is entitled to retroactive payment for any billing errors," Mitchell

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- Renex has announced a communications controller that can emulate both IBM's 3274 and 5251 Model 1 terminals/82
- Xyplex has introduced the Xyplex Step 1 communications system that is designed to link a DEC VAX computer to up to 16 terminals/82
- Racal-Milgo has unveiled a stand-alone version of its Communication Management series of network management systems/82
- Manage has introduced a device that multiplexes eight asynchronous channels over a single fiber-optic cable/85

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Protocol Converters/84

Multiplexers/Modems/85

NSF grants Columbia, others telecommunications funds

NEW YORK — Columbia University will receive $20 million in the next five years from the National Science Foundation to operate a center for research and education in telecommunications.

Columbia's center will be part of the university's School of Engineering and Applied Science. Research will center on telecommunications systems, services and networks, and much of the work will be conducted with the aid of Columbia's Magnet network, which handles data, facsimile, graphics, voice and video communications.

The research effort will be led by Professors of Electrical Engineering Mischa Schwartz and Thomas Stern. Eighteen Columbia faculty members from four engineering departments and a number of students will take part in the project.

Five other schools received awards: MIT, University of California at Santa Barbara, University of Delaware, University of Maryland and Purdue University.

Search for E-Mail suitor fails in initial round, USPS reports

WASHINGTON, D.C. — The U.S. Postal Service (USPS) announced recently that its initial effort to divest itself of its electronic mail service has failed to turn up any acceptable suitors.

Several firms submitted acquisition proposals after the USPS' Electronic Computer Originated Mail (E-Com) service was put on the block last October, but none of them were acceptable, the USPS reported.

Discussions with other firms that have expressed an interest in the service continue, and for a limited period, the USPS will evaluate new offers as well.

In late 1984, E-Com had 1,000 customers and was carrying about two million messages a month, according to a report by Booz-Allen Acquisition Services, Inc.

The report indicated that the Postal Service has invested more than $50 million on the system, including the construction of special facilities and equipment in 25 serving post offices.

The Postal Service has been attempting to sell the service to private industry since last year, saying the "E-Com system could be operated more effectively by a private [vendor]."

Applitek introduces enhanced line of local-area networks

WAKEFIELD, Mass. — Applitek Corp. has enhanced its Unilan line of local-area networks adding an Ethernet bridge, an RS-449 interface, a 32-port version of its NI10 network interface unit and support for a number of synchronous protocols.

The line of bus-oriented local-area networks reportedly supports baseband, broadband and fiber-optic media, transmission speeds up to 10M bit/sec.

The Ethernet bridge is said to allow an Applitek network to connect to a number of Ethernet-like networks. Data packets destined for remote Ethernet networks are transmitted at speeds up to 4M bit/sec. The bridge reportedly can operate on any channel of a broadband network and supports subsplit, mid-split, high-split or dual-cable plant.

The RS-449 interface provides synchronous connections for devices using CCITT LAP B data-link-level protocol. On top of LAP B or an Ethernet data link layer, the product provides a file transfer facility with a transmission speed of 56K bit/sec.

The 32-port version of the NI10 doubles the maximum number of ports the device can support and provides each port with a maximum

See NETS page 85

Codex adds synchronous modem, cuts prices on 2231, 2232 models

MANSFIELD, Mass. — Codex Corp. has added a 9.6K bit/sec. synchronous modem to its product line and has cut prices on its 2,400 bit/sec. modems.

A vendor spokesman said that the Codex 2206 operates in either two-wire half-duplex or four-wire full-duplex modes. The product uses double sideband, eight-phase, quadrature amplitude modulation.

Supports self-testing

The modem falls back to 7.2K or 4.8K bit/sec. transmission with poor line conditions. According to the vendor, the Codex 2206 features self-testing and local analog, remote digital or remote analog loopback.

The Codex 2206, available now, sells for $1,995.

Codex cut the price of its 2231 by 25% and its 2232 by 30%. Both full-duplex modems are said to support asynchronous and synchronous transmission and are switch selectable to transmit data at either 1,200 or 2,400 bit/sec., the vendor said. The 2232 includes automatic dialing software.

The 2231 sells for $795; the 2232 costs $895.

Codex is located at 20 Cabot Blvd., Mansfield, Mass. 02048.

Wolfdata rolls out PM1600 designed for X.25 networks

CHELMSFORD, Mass — Wolfdata, Inc. has announced PMC-1600, a four- to 16-port communications processor and data concentrator designed for X.25 networks.

The Motorola, Inc. 68000 microprocessor-based product accommodates asynchronous and synchronous X.25 devices and concentrates up to 16 channels into one or more 64K bit/sec. X.25 lines.

PMC-1600 is said to feature support for multiple protocols, dynamic port configuration, programmable network diagnostics and routing and port-to-port switching. Protocols supported include synchronous high-level data link control, CCITT X.25 Level 3 and asynchronous protocols.

The product's port-to-port switching enables a user to design a network with 16 personal computers or workstations. The product's multiple virtual circuit capability enables one X.25 cluster to communicate with a second cluster over a single telephone line. The communications processor was designed to support file transfer software between personal computers or from a personal computer to a host.

The products call control capabilities include abbreviated addressing, automatic calling capability and subaddressing.

PMC-1600 costs $5,695.

Wolfdata is located at 187 Billerica Road, Chelmsford, Mass. 01824

CONTROLLERS

■ Renex Corp. has announced TMS-One, a communications controller that can emulate both IBM's 3274, which is used primarily with IBM mainframes, and IBM's 5251 Model 1, which is used for IBM's System/34, System/36 and System/38.

A vendor spokesman said the TMS-One handles up to 32 physical ports and five sessions for each port. The product supports binary synchronous, asychronous and Synchronous Data Link Control protocols.

TMS-One supplies terminal emulation capabilities for more than 150 types of terminals, including IBM's 3270 series, Digital Equipment Corp.'s VT100 and Tektronics, Inc.'s 4100 line. The product supports password security and costs $7,990.

Renex, 1513 Davis Ford Road, Woodbridge, Va. 22192.

VOICE/DATA COMMUNICATIONS

■ Xyplex, Inc. has announced the Xyplex Step 1 communications system that is designed to link a Digital Equipment Corp. VAX computer to up to 16 terminals. RS-232 asynchronous devices can reportedly be connected to Step 1 via eight-port terminal cluster controllers, which can be rack-mounted or distributed.

Reportedly, front-end processing provided by the product reduces the VAX CPU time dedicated to communications overhead. The product can be upgraded to the full Xyplex system with a single board host interface added to the Xyplex Step 1 to provide switching for multiple VAX users. Xyplex Step 1 is available for $8,100 for 16 terminals and $2,200 per each eight additional ports.

Xyplex, 100 Domino Drive, Concord, Mass. 01742.

■ Racal-Milgo has announced System Performance Analyzer (Spa), a stand-alone version of its Communications Management Series of network management systems.

Spa monitors each channel data

Continued on page [illegible]

What makes a revolutionary idea revolutionary?

First, it has to be new. Really new. STEAMER is new. Brand new. It's an extremely powerful data compressor combined with a very efficient statistical multiplexer. And it's about to set the data communications industry on its ear.

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Because the type and volume of data transmitted on a typical port in one direction on a link may be very different from the data transmitted in the other direction, or on other ports, STEAMER analyzes the data in each direction on a port-by-port basis and builds entirely independent compression tables. That ensures that maximum compression efficiency is obtained.

In fact, the STEAMER compression routine is so efficient, it virtually guarantees no additional delay added to response time. Our compression algorithm can compress or decompress 3,000 characters per second. That's the equivalent of a 14,400 BPS circuit operating at an 83% saturation rate in both directions simultaneously!

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COSTS

from page 31

noted. In addition to identifying nonexistent equipment, the audit supplies a company with an up-to-date list of its equipment.

Eliminating excess telephone trunks represents a second method of decreasing telephone costs. How does a company determine if it has too many trunks? "Don't expect your telephone bill to provide an accurate assessment of trunk usage," Mitchell maintained. "AT&T takes the total [number of] minutes [that] you use all trunks and averages that number for each trunk."

For example, in one month, five trunks may carry a total of 200 hours of conversation. A telephone bill will show approximately 40 hours of talking for each trunk.

With least-cost routing, a feature found on most private branch exchanges, telephone systems route calls first through the cheapest trunk.

If that trunk is full, the call spills over to a second trunk. "The primary trunk obviously carries the bulk of the telephone traffic," the consultant said.

Small portion of calls

So, the secondary trunks may carry only a small portion of the calls. Mitchell recommended graphically depicting trunk usage. The picture may illustrate the busiest calling periods and show how seldom some trunks are used.

The customer's type of business determines if a trunk should be eliminated. "An airline company found that 5% of the incoming callers were hanging up rather than waiting on hold," he said. "I recommended that the company install more telephone trunks. Each time a caller hung up represented potential lost revenue." Companies for which phone calls are not as vital may be able to eliminate seldom-needed trunks.

A telephone call accounting system also helps to trim telephone costs. A call accounting system identifies every employee's long-distance calls. "An accounting system clearly identifies telephone abusers," Mitchell noted. "Usually, they will stop making a number of calls when they are warned. If they persist in making unnecessary long-distance telephone calls, one should try to find a way to charge them for the calls."

Often, a call accounting system can act as a deterrent. Mitchell recommended publicizing the purchase of one of these systems.

"Word will quickly travel and some abusers may be unwilling to make those long-distance calls," the consultant said.

Continued from page 32

from terminals, modems or private branch exchanges at a central or remote site and enables a user to analyze network performance and expansion requirements.

A vendor spokesman said that the software supplies reports for on-line use, response times and alarm conditions by monitoring RS-232 interfaces. Reports can be displayed on a terminal or a printer.

The product's alarm feature supports three alarm types: user-selectable response-time thresholds, negative acknowledgment conditions and Span card status.

Span can be integrated with Racal-Milgo's Communication Management Series (CMS) network management systems. With CMS, the system monitors analog as well as digital data.

The product costs $32,000.

Racal-Milgo, 8600 N.W. 41st St., Miami, Fla. 33166.

PROTOCOL CONVERTERS

Syntax Corp. has enhanced its Gateway 34/36/38 protocol converter, which supplies IBM Personal Computers with IBM 5251 terminal or 5256 printer emulation.

One Gateway 34/36/38 enhancement includes a write-to-diskette facility that enables a user to route printer data to a diskette. While data is being sent to a diskette, a user can work with the Personal Computer.

Another enhancement reportedly supports a number of communications ports including an asynchronous port or an internal modem.

Gateway 34/36/38 costs $750 for the file transfer software, $22,000 for communications front end and $195 for each Personal Computer copy.

Syntax, 1763 Technology Drive, San Jose, Calif. 95110.

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COMMUNICATIONS

MULTIPLEXERS/ MODEMS

[illegible], Inc. has introduced Mux-8, a device that multiplexes eight asynchronous channels over a single fiber-optic cable.

The product supports transmission speeds up to 20K bit/sec. for each channel and has a maximum aggregate link speed of 160K bit/sec. Mux-8 features full-duplex operation; frequency [illegible] availability and support for data formats.

Mux-8 costs $1,095.

[illegible], P.O. Box 275, 40 Nichols Road, Chicopee, Mass. 01014.

Anderson Jacobson, Inc. has announced AJ Data Modem/2400, a full-duplex, 2,400 bit/sec. modem.

A vendor spokesman said that the modem operates in either asynchronous or synchronous modes and transmits at speeds of 1,200 bit/sec. or 2,400 bit/sec.

The modem automatically adjusts to incoming data transmission rates. The product's diagnostic features include digital loopback, analog loopback and remote digital loopback.

AJ Data Modem/2400 costs $795 and is available in either rack-mounted or stand-alone models.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

HEAT

from page 61

Some companies, however, are opting to offer the services through nonregulated subsidiaries. This will remove the need to file service tariffs and will give added pricing flexibility.

Northwestern Bell Information Technologies, the nonregulated subsidiary of Northwestern Bell Corp., has just announced the availability of its public packet-switch network (PPSN) service in Omaha. In June, a similar service is scheduled to be cut over in St. Paul, Minn., and at a later date service will also be provided in Des Moines, Iowa.

Service not regulated

Because the service is not regulated, the switching hardware cannot be located within the central office switching centers used by Pacific Northwest Bell Telephone Co. to provide standard telephone services. The node in Omaha will be installed in a Northwestern Bell Information Technologies office, according to Don Lewis, product manager of the service.

But besides providing pricing flexibility, Lewis said nonregulation enables the company to install packet assembler/disassembler equipment on customer premises, providing the most economical type of network access for large companies. For firms that cannot justify support of an on-premise packet node, Northwestern Bell's PPSN, like most other packet net services, can be accessed in three ways: through dial-up circuits; with analog leased lines; or via digital private lines.

The rate structure for the service is also similar to established value-added networks, Lewis said. Dial-up access carries an hourly connect fee and a charge for packet transmission. The private-line options have a flat monthly port fee and a throughput charge. Lewis claimed the rates for PPSN are lower than those for nationwide packet networks because those carriers have to offer averaged, distance-insensitive prices.

Customers that have concentrated local traffic might find these new services attractive. Some of the major questions remaining are, How will the new services compare with established, experienced carriers? What kind of gateway facilities will be established between the local telephone company services and long-haul services provided by companies like GTE Telenet and Tymnet?

NETS

from page 61

19.2K bit/sec. transmission speed.

Protocols supported include Synchronous Data Link Control, High-Level Data Link Control and bisynchronous, according to the vendor.

The Ethernet bridge sells for $11,250 for baseband or fiber-optic nets and $12,750 with broadband media. Prices average $420 per port for baseband or fiber-optic networks and $470 per port for broadband networks.

Applitek is located at 107 Audubon Road, Wakefield, Mass. 01880.

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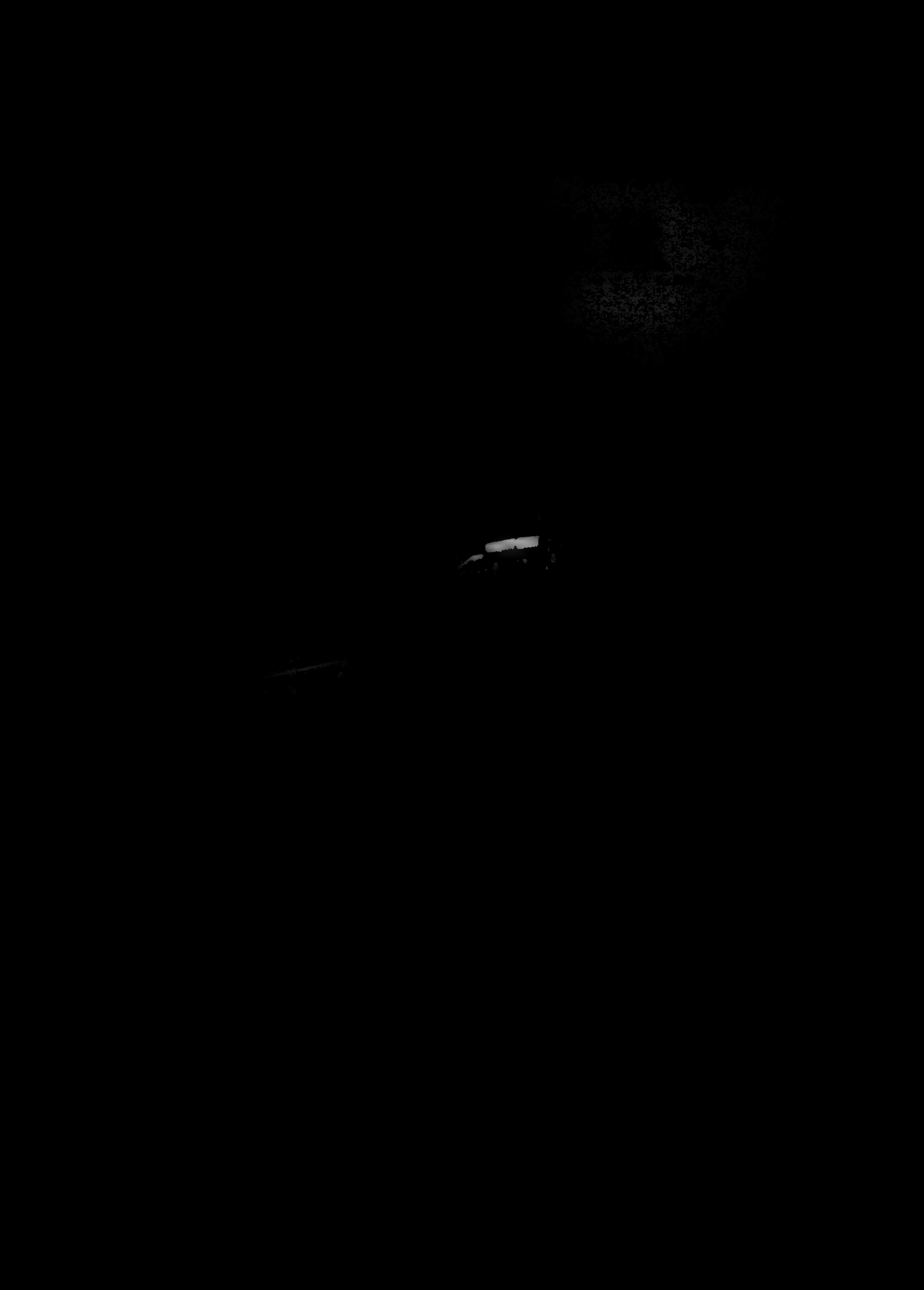

SYSTEMS & PERIPHERALS

NCR 9400 beats 9300's processing rate by 50%

By Donna Raimondi
CW Staff

DAYTON, Ohio — NCR Corp. has unveiled a 32-bit superminicomputer that is said to provide a 50% increase in performance over its NCR 9300 32-bit computer. The machine reportedly is targeted at medium- to large-systems users of NCR or non-NCR interactive computer systems and multisystem environments with communications requirements.

The NCR 9400, which uses NCR's very large-scale integration technology, has a processing cycle speed of 150 nsecs, the company said. It comes with 1M byte of main memory; a 40M-byte Winchester disk drive, three CRTs, a 125 line/min printer and NCR's Interactive Transaction Executive operating system.

The system reportedly can support up to six users simultaneously in its basic configuration and is upgradable to a maximum of 210 users. It can be configured with up to 4M bytes of main memory and eight system peripherals, the vendor said.

Included is the Link-Level Communications Subsystem 2, an integrated communications controller said to support protocols such as TTY, International Standards Organization, asynchronous, integrated remote batch subsystem and distributed data processing. IBM's Systems Network Architecture can be supported with the addition of a front-end processor, the vendor said.

The basic NCR 9400 costs $67,000. Current users of the NCR 9300 can field upgrade their processors to a 9400 for $19,895.

NCR is located at 1700 S. Patterson Blvd., Dayton, Ohio 45479.

DEC's specialized VAX configurations debut

By Tom Henkel
CW Staff

MAYNARD, Mass. — Digital Equipment Corp. has unveiled three specialized packaged configurations of its top-end VAX 8600 superminicomputer and a series of hardware options for the system. At the same time, the company said its version of the AT&T Unix operating system, called Ultrix-32, can now be used on the 8600.

The packaged configurations include the following:

- An entry-level version of the 8600 aimed at users with limited floor space whose primary concern is expanding processing power. The configuration includes a single-processor 8600 with 8M bytes of main memory and integrated disk and tape drive controllers. The configuration supports either DEC's VAX/VMS operating system or Ultrix-32. It costs from $350,000 under VAX/VMS and from $355,500 under Ultrix-32, the vendor said.
- The VAX 8600 Vaxcluster System Building Block configuration, designed to provide the nucleus of a Vaxcluster configuration based on the 8600 processor. The configuration includes a CPU with 8M bytes of main memory, a DEC HSC50 storage controller, an 8-node star coupler, connecting hardware and the VAX/VMS operating system. It costs $446,000, the vendor said.
- A Vaxcluster Upgrade configuration designed to enable users to add an 8600 processor to an existing Vaxcluster system. It includes a CPU with 8M bytes of main memory, interconnection

See DEC page 91

IBM scientists said they have developed the densest logic and memory chips ever built/88

- Charles River Data Systems unveiled a ruggedized supermicrocomputer compatible with the VME bus/88
- Apollo Computer has added an 86M-byte disk drive to its low-end DN550 workstation/90
- An ion deposition, nonimpact printer debuts for IBM System/34, 36 and 38 users/90

INSIDE

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Auxiliary Equipment/92

Gould introduces Unix-based text search processor

By Mitch Betts
CW Washington Bureau

BETHESDA, Md. — Gould, Inc.'s Computer Systems Division introduced at a recent press conference here an AT&T Unix-based external search processor called Hypersearch, which reportedly has an architecture optimized to search large textual data bases.

Gould said the coprocessor runs on Gould's Powernode 6000 and Powernode 9000 superminicomputers and consists of one board and integrated software to manage the text-search function. The product uses the UTX/32 operating system, which is Gould's version of AT&T Unix.

The vendor said Hypersearch provides text retrieval, inherent security features and data compression of 2:1 or 3:1 to reduce the number of disk drives required for data base storage.

The data compression that occurs dur-

See GOULD page 91

Nonstop EXT limits upgrading

HARD TALK
Jeffry Beeler
CW West Coast Bureau

With the introduction of its first low-end system for branch or district offices, Tandem Computers, Inc. has deviated somewhat from its traditional product and marketing strategy, according to industry analysts.

In the past, Tandem's procedure for acquiring new accounts has been to start with a small configuration and then, if the customer is satisfied with the results, modularly expand the system by attaching additional processors. To date, such a strategy has served the vendor "fantastically well," according to Tandem watcher Omri Serlin, president of Los Altos, Calif.-based Itom International Co.

Echoing Serlin's assessment is Stephen Smith, a vice-president at Paine Webber, Inc. "Modular multiprocessor systems [of the sort supplied by Tandem] are much better suited than conventional mainframes to the transaction processing market, where volumes may quintuple during the next 10 years," Smith said.

But with the just-introduced Nonstop EXT, the modular expansion usually associated with Tandem's systems family is relatively restricted, Serlin said. Unlike the Nonstop II and its TXP sister system, both of which can be configured with as many as 16 processors, the EXT supports only up to four CPUs in a single complex.

This "limited expandability," Serlin said, may make the entry-level Tandem system "a little less effective [than the Nonstop II or TXP] in terms of attracting new customers."

Because the EXT supports only a quarter as many processors as its sister systems, Tandem probably regards its latest product as just a "short-term solution" for the machine's intended users, he said. In the long run, the vendor will probably have to develop a follow-on system that costs even less than the current EXT and

See [illegible] page 91

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Pacific Northwest: (206) [illegible]

*Based on revenues for Vehicle Leasing and Services Division, which does business as Ryder Truck Rental. Source: 1983 Ryder Systems, Inc. Annual Report and Third Quarter Report 1984.

Charles River Data unveils supermicro

By Donna Raimondi
CW Staff

FRAMINGHAM, Mass. — Charles River Data Systems, Inc. has unwrapped a 32-bit, VME-bus-based supermicrocomputer designed for harsh surroundings such as shop floors, remote locations or aboard ships. The Universe 2400 supports two Charles River operating systems: UN/System V, an implementation of AT&T's Unix System V; and Unos, the company's AT&T Unix-compatible, real-time operating system.

The Universe 2400 has been designed to operate at temperatures up to 104 degrees Fahrenheit, to repel liquid and solid contaminants and to resist electrical connection failures that can be caused by vibration, rough handling and corrosive atmospheres, the vendor said.

The system is built around the 12.5-MHz Motorola, Inc. 68000 microprocessor and the VME bus. Its 32-bit internal data path and 4K-byte cache are said to enable the system to execute 1¼ million instructions per second with no wait states.

The system can be networked into Charles River's International Standards Organization-compatible local-area network, Universenet, by installing a VME bus network interface module available for $3,600.

Two models of the Universe 2400 are available. Both models can support up to 360M bytes of peripheral disk storage and can accommodate from four to 64 simultaneous users, the vendor said.

The basic Universe 2402F, which costs $9,990 in single quantities, is equipped with 512K bytes of random-access memory, a 20M-byte formatted Winchester hard disk and a 320K-byte floppy disk drive.

The Universe 2403FT, which costs $17,500 in single quantities, has 1M byte of main memory, a 35M-byte Winchester hard disk, a 320K-byte floppy disk drive and a 45M-byte ¼-in. streaming tape unit.

Charles River Data Systems is located at 983 Concord St., Framingham, Mass. 01701.

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IBM facility's chip research progressing

YORKTOWN HEIGHTS, N.Y. — IBM researchers reportedly have developed experimental memory and logic chips that offer a tenfold increase in circuit-packing density over chips currently in use. The development, IBM said, could lead to chips with more than 100,000 logic elements and memory chips capable of storing up to 16M bits of data.

Scientists at IBM's Thomas J. Watson Research Center here built the chips using a fully scaled, half-micron fabrication process based on an n-channel metal oxide technology. The process, which uses a focused beam of electrons to write the circuit patterns in a thin polymer film directly on the silicon surface, is said to be the first to use half-micron line widths throughout a chip.

Previously, IBM said, half-micron line widths had only been used in critical parts of a chip. As a result of the process, IBM said it was able to pack circuits into an area 16 times smaller than can be accomplished using 2-micron line widths, which are currently used in many chips.

IBM reports it has built both logic and memory chips. The memory chips use a one-transistor memory cell that IBM claims is the smallest memory array ever built. The 3¼-sq micron memory cell is about one-fourth the size of the memory cells used in 1M-bit chips, also under development at IBM.

The logic chips contain a variety of standard circuits. One such circuit, a programmable logic array, contains 1,700 transistors in one-tenth of a square millimeter of silicon. This, IBM claims, is roughly 2,500 times smaller than a dime.

Seek Systems offers tape unit

BELLEVUE, Wash. — Seek Systems, Inc. has released a triple-density tape drive with storage capacities of 800 bit/in., 1,600 bit/in. and 6,250 bit/in. that was designed for Wang Laboratories, Inc.'s VS series processor environments.

The tape drive, which is integrated with the Seek Storage Subsystem, costs $19,500. It operates on a standard Wang disk I/O processor, the vendor said.

The triple-density start/stop tape drive is self-loading and can automatically adjust, verify and assign the proper read density, according to Seek Systems.

The 50-in./sec. unit can be mounted in the cabinet with up to two Winchester-type drives.

According to the vendor, the tape drive requires no scheduled preventive maintenance.

Additional information can be obtained from Seek Systems, which is headquartered in Suite A-5, 13401 Bel-Red Road, Bellevue, Wash. 98005.

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SPERRY

GBT printer compatible with IBM

IRVINE, Calif. — General Business Technology, Inc. (GBT) has released an ion-deposition, nonimpact printer that is compatible with IBM System/34, System/36 and System/38 processors.

The GBT 6610XP — a Southern Systems, Inc. Mercurian printer with GBT's proprietary controller for compatibility with IBM machines — costs $69,500 and has a print speed of 60 page/min or 5,280 line/min and 240 by 240 dot/in. resolution, the vendor said. The unit can print horizontally or vertically, and it uses 8½-in. by 11-in. or 8½-in. by 14-in. paper. The printer can use smaller type sizes so that material normally printed on standard 11-in. by 14-in. computer paper can be printed on 8½-in. by 11-in. cut sheets, the vendor said.

The printer has a resident 256-char. set with subsets having up to 65 language variations for accents, subscripts and superscripts. Two on-line fonts are standard; eight are optional. User features include self-test diagnostics; status display panel; user-selectable length, number of copies, font, forms overlay buffer and top and left margins.

An optional forms overlay buffer — which costs $3,500 — permits loading a complete form image, including rotatable alphanumerics, from the computer memory. Both standard forms, such as Internal Revenue Service schedules and insurance documents, as well as custom forms, can be used, with up to four forms used at the same time.

The printer's ion cartridge has a 125,000 page life, the vendor said. More information can be obtained from GBT at 1891 McGaw Ave., Irvine, Calif. 92714.

System 86 released for CAD/D applications

LANDOVER, Md. — Maxum Technologies, Inc. has unwrapped its System 86 computer-aided design and drafting (CAD/D) system — based on Hewlett-Packard Co.'s HP 9000 series supermicrocomputer running under HP's Basic 3.0 operating system — that was designed for architectural, engineering and construction industries.

The stand-alone, single-workstation configuration System 86 costs $39,950 and consists of a Motorola, Inc. 68010-based 32-bit microprocessor with 1M-byte internal memory, a 19-in. color design monitor, a 13-in. color command monitor, a keyboard, two-button mouse and dual-diskette drives and an ink-jet printer for text and graphics, all of which is housed in a workstation desk.

Multiples of the System 86 can be interconnected in a network with a shared data base and common peripheral devices, the vendor said.

Architectural and engineering drawings generated on the System 86 may be reformatted for direct transfer into Intergraph Corp. and Auto-Trol Technology Corp. minicomputers in the data base format of those systems, according to the vendor. The data can be transmitted via magnetic tape for both those systems, and the Intergraph system can also receive data through a modem over the phone.

More information is available from Maxum Technologies, 8301 Corporate Drive, Landover, Md. 20785.

DATA STORAGE

■ Bering Industries, Inc. has released two Winchester disk subsystems for Hewlett-Packard Co. microcomputers with the HP-IB (IEEE-488) interface that feature 10M-byte removable cartridge disks and an optional 3½-in. floppy drive.

The Topsecret-1 and -2 subsystems require customized software to work with non-HP computers with an IEEE-488 interface. The disk subsystems can be plugged in and out, the vendor said. The Topsecret-1 consists of a 5¼-in. Winchester disk cartridge drive with controller and power supply. The hard disk is said to be normally formatted to 256 byte/sector for a formatted capacity of 10.4M bytes. It can sustain an average data transfer rate on the HP-IB of 174K byte/sec.

The Topsecret-2 includes an additional 3½-in. double-sided floppy disk drive in addition to the cartridge hard disk. Under HP microdiskette formats 256, 512 and 1,024 byte/sector, formatted capacities of the floppy drive are 630K, 710K and 788K bytes, respectively. Average seek time is 185 msec, and the average data transfer rate is 13K byte/sec.

The Topsecret-1 costs $3,990; the Topsecret-2 costs $4,190.

Bering Industries, 1400 Fulton Place, Fremont, Calif. 94539.

TERMINALS

■ NCR Corp. has announced a multipocket proof and encode workstation that features proof and supervisor modes for small banks.

According to the vendor, in the proof mode, the NCR 7770-1001 station performs stand-alone proof functions such as encoding, endorsing and pocket distribution. In the supervisor mode, the unit can access functions to create or modify item sets, diagnose system faults and load item sets from cassette.

Hardware and software for the 7770-1001 costs $25,595, and the unit will be available in second-quarter 1985.

NCR, Dayton, Ohio 45479.

■ Lexidata Corp. has unveiled a line of monitors and freestanding enclosures for display processors in its LEX 90, Series 2000, Series 3000, Solidview and Imageview product lines.

The monitors can be moved to different viewing angles with one hand, the vendor said. All controls are reportedly accessible on the monitor's front panel.

Cables are connected at the monitor's stationary base, and the monitors have built-in power supplies in addition to built-in connectors for peripherals.

Prices start at $4,995 for the 1,280- by 1,024-pixel model operating at 30Hz and the 640- by 512-pixel model operating at 60Hz. Costs for the 1,280- by 1,024-pixel model operating at 60Hz begin at $6,995.

The display processor monitors will be available for shipment in June 1985.

The freestanding enclosures cost $495.

Lexidata, 755 Middlesex Tpk., Billerica, Mass. 01865.

PRINTERS/PLOTTERS

■ Xerox Corp. has unwrapped a letter-quality, dot matrix printer and an extended character daisywheel printer.

The 132-col. Companion 34LQ dot matrix printer produces letter-quality printing at speeds up to 60 char./sec., the vendor said. In draft-quality mode, the 34LQ operates at speeds up to 70 char./sec. The printer has both serial and parallel interfaces and operates in both a Diablo 630 mode with extended character set capability and an alternate, IBM-compatible mode. It uses fanfold and single-sheet paper. A dual bin automatic sheet feeder — the F24 — is available for an additional $595.

The Companion 34LQ printer costs $1,595.

The Diablo 630 ECS daisywheel printer has an all-purpose interface and an IBM interface, the vendor said. It has an extended character set

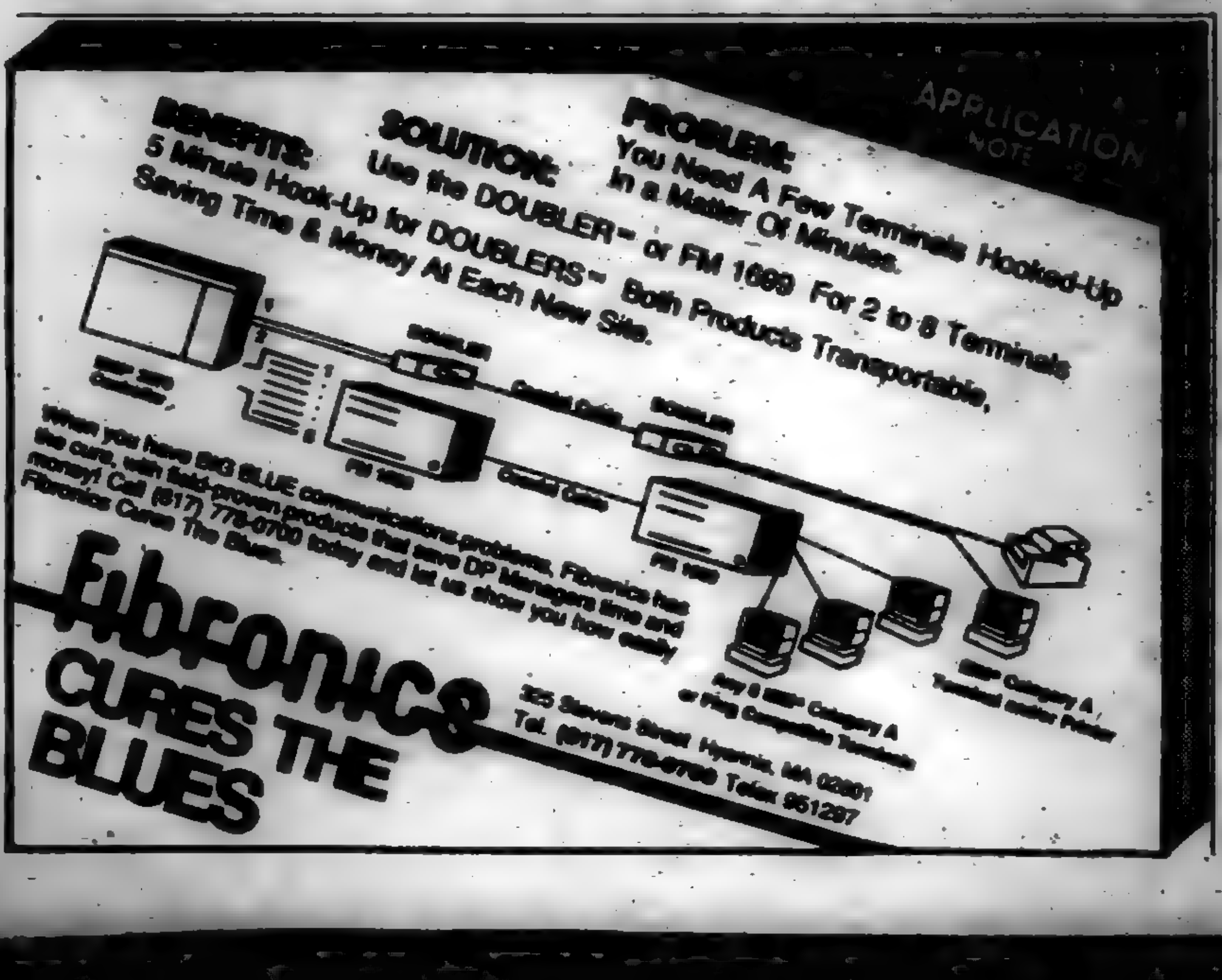
Continued on page 91

Apollo unwraps Winchester disk

CHELMSFORD, Mass. — Apollo Computer, Inc. has announced an 86M-byte Winchester disk for its low-end DN550 color workstation. The disk is said to provide a greater than 60% increase in formatted data storage capacity over the currently available 50M-byte unit, the vendor said.

According to the vendor, two versions of the disk are available: the Model MSD-86M, which includes a 5¼-in. Winchester disk and controller, costs $9,500; and the Model MSD-86M-TC, which includes the disk, controller and a 45M-byte, ¼-in. cartridge tape unit, costs $11,600.

More information about the DN550 color workstation is available from Apollo Computer, 330 Billerica Road, Chelmsford, Mass. 01824.



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DEVIATE

from page 87

is even better suited for operation in ordinary business offices.

The EXT's debut comes less than three weeks after the introduction of IBM's System/88, a family of on-line transaction processing systems manufactured by Stratus Computer, Inc. [CW, April 1]. Because both the EXT and the System/88 are optimized for transaction processing and were announced at roughly the same time, the tendency is to regard Tandem and Stratus as direct competitors. And to an extent they are.

> *The tendency is to regard Tandem and Stratus as direct competitors.*

But for the most part, Stratus' products and the EXT are aimed at fundamentally different classes of users, Smith said.

The former is intended mainly as a low-end starter system for small applications and small businesses, he said, while the EXT is geared for the outlying locations of major accounts.

"My own feeling is that the real market for the EXT, from Tandem's point of view, is as a remote node in a large network," Smith added. Because of their sheer numbers, branch offices of big corporations loom as a highly attractive market for Tandem.

But until now, that market has remained largely off limits to the company because its existing systems are too expensive for most small nodes and require special computer rooms, which are usually available only at network hubs.

In different ways, both Tandem and Stratus are well positioned in the rapidly expanding transaction processing marketplace, Smith said. "There's definitely room for both companies."

Although the EXT lacks the expansion capacity of the rest of Tandem's systems line, it still boasts several virtues, according to another analyst.

First, the machine has "lowered the entry-level price point" for on-line transaction processing systems, according to Sandra Gant, an analyst with Info Corp., a market research firm headquartered in Cupertino, Calif. A basic EXT configuration reportedly costs a third less than an equivalent Nonstop II.

Second, because of its ability to operate in typical office conditions, the low-end Tandem system has overcome "an environmental hindrance" that has previously thwarted the company's efforts to sell to outlying corporate sites, Gant explained.

TANDEM COMPUTERS, INC.

[illegible]	[illegible]	[illegible]	[illegible]
Mips¹	1.8	1.8	[illegible]
[illegible]			
Purchase Price (Memory Size)	$120,000 (4M)	$1[illegible],000 (4M)	$322,000 ([illegible])
[illegible]			
Machine Cycle Time (Nsec)	100	100	83.3
[illegible]			
Cache (buffer) size	None	None	128K-1M
[illegible]			
Price per 1M byte of main memory²	$7,500	$7,500	$7,500

1. Vendor claims
2. Available only in 2M-byte increments costing $[illegible].

CW Chart

DEC

from page 87

hardware and the associated VAX/VMS software. It costs $395,000, the vendor said.

All three configurations will be available in September. However, the Ultrix-32 version of the stand-alone 8600 configuration will be available in November.

In addition, DEC unveiled the following three hardware options for the 8600:

■ The RB86 integrated disk and tape controller, said to provide 8600 users with a mass storage capacity of up to 1.8G bytes of disk storage and 140M bytes of tape storage. The RB86 is said to support up to four disk drives and a streaming tape unit. The option was designed to provide Vaxcluster users with storage in addition to shared Vaxcluster memory for processor-specific and stand-alone applications. The option is field installable and costs $18,400.

■ A floating-point accelerator, called the FP86, is available as an option for the newly announced specialized packaged 8600 configurations. Standard equipment on the original 8600 configurations, the FP86 provides accelerated processing for calculations using any of four VAX floating-point formats. In addition, the unit is said to accelerate integer-multiply instructions, a capability DEC claims can increase systems performance. The FP86 is available as a field-installable option or can be factory installed. It costs $20,000, the vendor said.

■ A field-installable computer interconnect adapter allows an entry-level 8600 stand-alone system to be upgraded to serve as a Vaxcluster node. The adapter consists of a circuit board and a cable and costs $21,450, the vendor said.

All three options will be available in September, the vendor said.

In making the announcement, DEC also reported that it has lowered the price of its conversion kits for VAX-11/780-to-VAX-11/785 upgrades by 18%. The kit allows users to increase systems performance by up to 70%, according to the vendor. The upgrade kit costs $75,000. It previously cost $95,000.

The Ultrix-32 operating system is a native-language implementation of the University of California at Berkeley Version 4.2 of Unix. Ultrix-32 is compatible with AT&T's Unix System V operating system and Version 2.0 of DEC's Ultrix-11 operating systems.

The Ultrix-32 operating system is said to provide a uniform programming environment for the VAX family of superminicomputers, including DEC's Microvax supermicrocomputer.

More information is available from DEC, Maynard, Mass. 01754.

GOULD

from page 87

ing the data-encoding process enables Hypersearch to read a data base at 150,000 to 300,000 English words per second, with words consisting of six to seven characters, Gould spokesmen said.

A query can be constructed with up to eight search words with no performance penalty, and order, proximity and range searches can also be performed, the vendor said. Every word is encoded, so that time-consuming indexing is eliminated, the spokesmen added.

They said marketing efforts will initially focus on military and other government agencies, the news media and electronic publishing organizations, and medical and legal data bases.

The product costs $60,000 and will be available in August, according to the vendor.

Gould's Computer Systems Division is located at 6901 W. Sunrise Blvd., Fort Lauderdale, Fla. 33313.

Continued from page [illegible]

that allows the printing of up to 400 characters.

The Diablo 630 ECS costs $2,295.

Xerox, Xerox Square 006, Rochester, N.Y. 14644.

■ Dataproducts Corp. has added four models to its Series 8000 dot-matrix printer line that are said to give IBM Personal Computers and compatibles both IBM graphics printer and IBM color graphics printer capabilities.

The models announced — the 8012, 8022, 8052 and 8072 — supersede the 8011, 8021, 8051 and 8071 models, which were introduced in September, the vendor said. These IBM-compatible printers enable users to apply software written for either the standard IBM monochrome graphics protocol or the IBM color graphics protocol.

The 8012 is an 80-col. unit that prints at 160 char./sec. in draft mode, 90 char./sec. in text mode and 30 char./sec. in near-letter-quality mode. It costs $469. The 8022 is a 132-col. version of the 8012 and costs $749.

The 8052 is a 132-col. color model that prints at 200 char./sec. in draft mode, 110 char./sec. in text mode and 35 char./sec. in near-letter-quality mode. It costs $1,599.

The 8072 is a 132-col. color model that prints at 400 char./sec. in draft mode, 300 char./sec. in text mode and 100 char./sec. in near-letter-quality mode. It costs $2,099.

Dataproducts, 6200 Canoga Ave., Woodland Hills, Calif. 91365.

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SYSTEMS & PERIPHERALS

GRAPHICS SYSTEMS

■ Auto-Trol Technology Corp. has announced two color graphics workstations and review/edit software for the company's graphics workstations and Digital Equipment Corp. VAX-based computer-aided design and manufacturing systems.

The Advanced Graphics Workstation 50 (AGW/50) is a general-purpose workstation for engineering design, analysis and drafting. It is based on the Apollo Computer, Inc. DN 550 workstation and includes 1M byte of main memory, a detachable keyboard, a 19-in. color monitor with 1,024- by 800-pixel resolution and a mouse cursor control, a 50M-byte disk, Apollo's Aegis 8.0 operating system and a choice of Auto-Trol's Series 5000 software for architecture, engineering or construction or Series 7000 software for mechanical design and manufacturing.

The company also released its AGW/55 accelerated display color graphics workstation. It is said to be suited for the creation and manipulation of large drawings and three-dimensional models. The unit is said to incorporate a bit-sliced graphics processing unit into its CPU module.

The system includes a 19-in. color monitor, 1.5M bytes of main memory and an integrated 300M-byte disk.

The AGW/50 costs $75,000, and the AGW/55 costs $94,000.

Auto-Trol also released menu-driven annotation software that runs on IBM Personal Computers, Personal Computer XTs and ATs under IBM's PC-DOS 2.1 or above operating systems. The Redliner package comes in two parts, one that is installed on the Personal Computer and one that is installed on the host. The host software — whether installed on a Digital Equipment Corp. VAX series under DEC's VMS 4.0 or a node in the AGW network under Apollo's Aegis SR 8.0 — costs $10,000, the vendor said.

The Redliner package allows Auto-Trol users to view and annotate drawings that were created on their AGWs or VAX-based systems. Annotations are stored separately from the original drawings and can be displayed as a reference file over the original at the host workstation. The Redliner terminal does not provide access to the original drawing but rather displays a copy of that original for annotation.

Auto-Trol Technology, P. O. Box 33815, 12500 N. Washington, Denver, Colo. 80233.

BOARD-LEVEL DEVICES

■ CXI, Inc. has released an IBM 3270 terminal emulation board that is said to emulate an IBM 3278 or 3279 CRT terminal. The board was designed to enable users of IBM Personal Computers, Personal Computer XTs, ATs and compatible machines to access and process 3270 mainframe computer applications.

The CXI 3278/79 Standard coaxial connection is hardware, I/O-port and command-code-compatible with IBM. It is also said to be soft-loadable and to work with any file transfer software designed to work with Digital Communications Associates, Inc.'s Irma board. With IBM's PC-DOS 2.0, the product requires 96K bytes of memory for full operation.

File transfer software for IBM's TSO or CMS host systems is an upgrade option. Another option is the 3278/79 Plus windowed software that is said to allow viewing of one host session, one personal computer session and two notepads simultaneously.

The CXI 3278/79 Standard coaxial connection costs $895, the file transfer option costs $100, and the Plus software costs $195.

CXI, 3606 W. Bayshore Road, Palo Alto, Calif. 94303.

AUXILIARY EQUIPMENT

■ Intermec Corp. has introduced its 9165 System Control Unit bar code control unit that is said to let IBM users implement Intermec bar code equipment, Ascii CRT terminals and printers without any IBM host software changes.

The 9165 unit performs the functions of an IBM 3274-51C cluster controller and allows Intermec bar code readers and printers to emulate IBM's Systems Network Architecture/Synchronous Data Link Control interactive devices. The unit features up to 16 user-definable ports that are set up to handle Intermec bar code readers, printers and CRT terminals.

Both RS-232C and RS-422 electrical interfaces are available. Use of RS-422 allows readers and printers to locate up to 4,000 feet from the 9165. The 9165 supports data rates of up to 19.2K bit/sec.

The cost for a single unit is $9,800.

Intermec, P. O. Box 360602, 4405 Russell Road, Lynnwood, Wash. 98046.

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COMPUTER INDUSTRY

Stratus chief downplays effect of IBM resale deal

By [illegible]
CW Staff

MARLBORO, Mass. — IBM's decision to resell fault-tolerant computers made by Stratus Computer, Inc. may have been a unique event in the industry, but it means few changes for Stratus, according to the company's president.

"I don't view [the IBM contract] as anything that's going to change the character of Stratus or make us a different company," William Foster, president of the five-year-old company, said in a recent interview here.

Foster

IBM will not squeeze Stratus out of large IBM-dominated DP shops because that has never been the company's primary market, according to Foster. "We've sold a lot to large companies, but generally [to] a division, a satellite of the MIS department that has a specialized transaction processing project," he said.

But, he added, IBM has the opportunity and resources to forge a new market for fault-tolerant [illegible].

Despite skepticism from some observers about IBM's ability to snatch away revenue from its partners after building them up on huge orders from Big Blue, Foster sees little likelihood that Stratus will be left stranded on the beach a year or two from now by IBM releasing a fault-tolerant box. Disclaiming any knowledge of IBM's internal plans, Foster said, "I think it is unlikely that IBM would sell this product into [its] accounts and then drop support of it. . . . This isn't like buying a disk drive from somebody, then switching vendors; this is a complete computer system that [IBM] customers are going to develop applications for and become very dependent on."

See STRATUS page 98

Ashton-Tate to buy Forefront

CULVER CITY, Calif. — Ashton-Tate recently announced an agreement in principle to acquire Forefront Corp., the Sunnyvale, Calif.-based developer of the Framework software program marketed by Ashton-Tate.

The announcement came less than one week after Lotus Development Corp.'s announcement of its intention to acquire the assets of Visicalc developer Software Arts, Inc. [CW, April 15]. Various microcomputer software analysts have been predicting a consolidation in the crowded ranks of micro software developers.

Ashton-Tate said Forefront will continue to operate in Sunnyvale as part of Ashton-Tate's research and development activities. Forefront has 17 employees and is headed by company cofounders Robert Carr and Marty Mazner.

The relationship between the two companies dates back to August 1983, when Ashton-Tate funded Forefront's work on Framework and acquired a minority interest in the company.

Edward M. Esber Jr., president and chief executive officer of Ashton-Tate, said the acquisition is part of the company's strategy "to expand our developmental strength and capture the best and the brightest of the industry's technical resources."

Workweek cut at Motorola wins state OK

By [illegible]
CW West Coast Bureau

PHOENIX — Motorola, Inc. received state approval to implement a work-sharing program that could idle the company's 15,000-member semiconductor work force in Arizona from half-a-day to two days a week, Motorola officials said.

Motorola also reduced staff during the last five months in Arizona and in Austin, Texas, by almost 1,000 workers, mostly through attrition and the elimination of 150 contractor positions.

According to Ken Phillips, Motorola's director of communications, the reduced workweek and staff were in response to the prolonged softness in the semiconductor industry, which has plagued semiconductor makers since the second half of 1984.

First-quarter earnings figures released April 12 revealed that Motorola's semiconductor sales were down 6% from the same period a year ago and that new semiconductor orders were down 53%. First-quarter profits were $41 million, down from $78 million a year ago. Company officials said the slowdown was due to the decline in semiconductor profits.

Under Arizona's state-run work-sharing program, which was designed to help manufacturers avoid layoffs, eligible Motorola employees will receive unemployment benefits of up to $23/day to help offset lost wages, Phillips said. Employees could also use accrued vacation time to make up some of the lost pay, he added.

The work-sharing program began at Motorola's Chandler, Ariz., operation last month, Phillips said.

Implementation will depend on the individual fiscal requirements of Motorola's various operating units and will be applied at the discretion of each Motorola unit manager, Phillips said. The plan will be used by most, but not necessarily all, of Motorola's Arizona operations, he said,

See WORK page 98

■ [illegible] Research said it had made two layoffs in the past month/96

■ Arbitrageur Asher B. Edelman moved to spin off into a separate company the service divisions of Datapoint Corp. and Mohawk Data Services Corp., both of which he previously bludgeoned into adopting liquidation strategies/96

■ A hostile takeover attempt appeared to be developing last week when Informatics General announced it had rejected an offer by Sterling Software, and Sterling countered that it would pursue the effort and had already acquired substantial Informatics stock/97

NCR chief foresees slow year in wake of first-quarter dip

DAYTON, Ohio — NCR Corp. reported last week that first-quarter profits declined to $43.5 million, down 4% from $45.5 million a year earlier. Earnings per share were 43 cents, which equaled the year-earlier figure due to stock repurchase programs in 1984.

NCR reported that revenue declined 3% to $642.7 million, down from $661.4 million in the first quarter of 1984.

Charles E. Exley Jr., chairman and president of NCR, said, "While we remain optimistic about long-run prospects, first-quarter results suggest that 1985 will be a difficult year in which to produce significant growth in revenue and earnings." He added that several products to be introduced this year provide "the prospect of renewed growth in the future."

NCR said that first-quarter results were "severely depressed" by the strength of the U.S. dollar in foreign currency markets.

Tough times for micro software firms

INDUSTRY INSIGHT
Eric Bender
CW Senior Editor

There's a fencing term that translates from the French as "the two-widows lunge." That's a good description of the lawsuit between micro software pioneers Software Arts, Inc. and Visicorp that killed both companies.

Last fall Visicorp was folded into Paladin Software Corp. This month Software Arts announced plans to sell off its product line and fade quietly into the night.

While disappearances are common in the software industry, it's a shame to see Software Arts and Visicorp go, because they both kept coming out with unusual packages.

In the case of Software Arts, the revolutionary Visicalc was followed by TK!Solver — another genuinely innovative and useful package, which labored under an awkward name and uninspired marketing. Spotlight, a capable desktop organizer, never emerged from the shadow of Borland International's Sidekick, which was much more aggressively priced and pushed.

These, and perhaps the upcoming Visicalc package for the Apple Computer, Inc. Macintosh, were sold down the river — literally, a few miles down the Charles River — to Lotus Development Corp.

Lotus may provide a comfortable home for these and, more important, future products from the Software Arts founders if it can minimize the marketer vs. developer battles that doomed Software Arts and Visicorp.

The issue will be just as critical for Lotus, which will depend on alliances with software stars and start-ups for much of its future growth, as it was for the two vanished firms.

While the Visicorp-Software Arts debacle was unusual, other microcomputer software firms continue to walk a tightrope. "I know of only four micro software companies that aren't for sale,"

See SOFT page 98

WHEN YOU WARE [illegible]
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AND YOUR DATA CENTER ALMOST RUNS ITSELF.

Digital Research trims staff

MONTEREY, Calif. — Digital Research, Inc. has made two staff reductions totaling 42 people during the past month, according to the company.

Acknowledging that business from many of its OEM customers, the microcomputer software vendor decided in March to shut down its manufacturing operations, giving a three-month notice to 18 employees, a spokeswoman said.

On April 1, Digital Research laid off another 24 people. The cuts primarily hit employees involved with language products. Roughly 450 people currently work at the firm.

Digital Research recently began delivering its first Graphics Environment Manager applications. The Concurrent 286 and Concurrent 68000 operating systems are scheduled for first delivery to OEMs in May and June, respectively.

Merger spurs Priam layoff

SAN JOSE, Calif. — Priam Corp. will trim its work force of 1,150 by 100 employees, the company announced April 9.

According to the maker of Winchester disk drives and other storage systems, the layoffs were primarily because of consolidation measures after Priam's Feb. 28 merger with Vertex Peripherals of San Jose, Calif. A Priam spokesman also cited the current slowdown in the computer systems industry.

The company also said it has scrapped plans to produce previously announced 115M-byte and 152M-byte 5¼-in. disk drives. According to a Priam spokesman, elements of the technology developed for the drives would be incorporated in future 5¼-in. products.

Priam currently manufactures 14-in., 8-in. and 5¼-in. drives ranging in capacity from 36M to 500M bytes.

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RAMIS II... THE LEADER BY DESIGN

Datapoint, Mohawk plan service division merger

SAN ANTONIO — Datapoint Corp., based here, and Mohawk Data Sciences Corp. of Parsippany, N.J., recently announced an agreement to combine the service divisions of the two companies into a separate company.

Both Datapoint and Mohawk were liquidation targets of New York-based arbitrageur Asher B. Edelman, who acquired substantial holdings in the companies and then convinced them to appoint him to their boards of directors and accept his proposals for selling off the assets of the companies.

Edelman was vice-chairman of Mohawk, but relinquished that title when he was appointed chairman of Datapoint last month [CW, March 25]. He remains a member of both boards.

Datapoint said that, pending a favorable tax ruling, it intends to spin off its service organization to become a separate public corporation owned by Datapoint shareholders. Edelman will probably be named chairman of that company, according to Datapoint spokesman Jack Milne.

Following its formation, the new company will acquire the service operations of Mohawk for an undisclosed price financed either publicly or privately, Milne said.

The new company will be headquartered in San Antonio and will include 2,000 employees currently employed in Datapoint's service organization, and 850 employed in Mohawk's service organization. Milne said the new company will probably increase its work force fairly quickly following completion of the deal.

Datapoint also announced recently that Richard A. Hahn had rejoined the company and was named senior vice-president for marketing and sales.

Hahn was a sales and marketing executive with Datapoint from 1978 to 1980 and for the past two years was senior vice-president and a member of the board of directors with Vector Graphic, Inc.

IBM to sell Milspec

NEW YORK — Complying with its legal obligation, IBM has agreed to sell the Milspec Computer Division of Rolm Corp. to Loral Corp. for $100 million in cash.

The U.S. Department of Justice had ordered the divestiture in its 1984 approval of IBM's acquisition of Rolm for $1.26 billion. The Santa Clara, Calif.-based Milspec division is the market-share leader in the military applications computer business with sales of $85.9 million in 1984. Milspec accounted for approximately 15% of Rolm's revenue for the year.

The sale to Loral, pending Justice Department approval, is expected to be completed next month. The government had ordered IBM to sell the division by May 19.

The Milspec acquisition is expected to broaden the military-related sales of New York-based Loral Corp. Loral acquired Hycor, Inc., a manufacturer of radar and other electronic defense systems, on March 11.

Loral primarily manufactures electronic systems and components for military applications. The firm posted approximately $500 million in revenue for the year ended March 31, and expects $100 million in sales from Milspec in the current year.

IBM selected Loral from among several bidders, including Data General Corp. DG currently licenses the technology of its Eclipse series minicomputers for Milspec computers. "Their computers are based on Eclipse architecture and ruggedized for military use," said DG spokesman Ken Donahue.

Donahue did not confirm that Loral outbid DG for Milspec. "IBM was not bound to choose the highest bidder," [illegible]

WHAT WE
BELIEVE

Informatics rejects Sterling's 'inadequate' takeover bid

By [illegible]
CW Staff

WOODLAND HILLS, Calif. — Informatics General Corp. announced last week it had rejected an unsolicited takeover offer made by Dallas-based Sterling Software, Inc. Sterling spokesman said the firm would continue to seek to acquire Informatics.

Informatics also reported it had formed a committee to explore ways of maximizing shareholder values. Ray Hannon, director of investor relations at Sterling, said his company is hopeful that negotiations will continue. Sterling has acquired [illegible] of Informatics' common stock since March 13, Hannon said.

Informatics reported that Sterling had offered $25 per share, or more than $120 million. Informatics posted revenue of $[illegible] million and profits of $[illegible] million in 1984.

Walter F. Bauer, chairman and president of Informatics, said the company's board of directors "rejected the offer as inadequate and not in the best interests of the shareholders. The Sterling Software proposal was conditioned upon the satisfactory completion of due diligence and Sterling's ability to secure financing."

Hannon said, however, that Sterling had already lined up financing for the acquisition and had retained the investment firm of Drexel Burnham Lambert, Inc. to manage the effort. He also said Sterling had "at an earlier time invited Informatics to demonstrate that a price of more than $25 per share was justifiable."

Informatics reported that it formed a three-member committee to "explore various alternatives to maximize shareholder values" and will be advised on such matters by its investment banker, Smith Barney, Harris Upham & Co. Informatics spokeswoman Carol Kaye said that the committee was established to explore options, and "we are not saying that we are now for sale."

An analyst of mergers and acquisitions in the software and services industry, George Grodahl of Fort Lee, N.J.-based Broadview Associates, Inc., said that with Informatics holding about $60 million in cash assets, the purchase offer of $128 million actually represents an $60 million bid, which he called attractive.

Although Sterling's revenue for fiscal 1984 was $18.7 million with profits of $1.1 million, Grodahl said he did not think Sterling's chairman, Sam Wyly, would have any trouble raising the financing for the deal.

Regarding the likelihood of Sterling proceeding with a hostile offer, Grodahl noted, "There never has been a concluded unfriendly [takeover] in this industry to the best of our knowledge."

He pointed out that software companies are not asset rich and that because personnel of such companies are their most valuable assets, "the goodwill of management is very important in this industry."

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STC: No sale

DENVER — Hathaway Corp. announced last week the termination of discussions for the purchase of Storage Technology Corp.'s majority interest in Global-Ultimacc Systems, Inc.

Hathaway said the companies were unable to agree on terms other than price.

STC is presently involved in Chapter 11 proceedings under the Federal Bankruptcy Act.

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STRATUS

from page [illegible]

The IBM connection is also likely to spur third-party software developers to write applications packages for the IBM-labeled Stratus architecture, Foster said. "We've seen some of that already; I think some of the third-party companies might see the Stratus architecture becoming the standard fault-tolerant architecture," he said.

After building up to revenue of $42.1 million in 1984, based mainly on end-user sales — except for an OEM deal with Ing. C. Olivetti & Co. that provided 15% of Stratus' total 1984 sales and most of its international sales — Stratus has inked OEM deals with Honeywell, Inc. and IBM and this month with the Systems Development Corp. subsidiary of Burroughs Corp.

The addition of "alternative sales channels" will enable Stratus to devote more resources to its own end-user sales, Foster said. As far as competition from its OEM partners and particularly IBM, Foster said the burgeoning fault-tolerant market is big enough for many players.

> ''[Fault-tolerance will] become a standard feature in all multiuser systems.'
>
> — William Foster
> Stratus Computer, Inc.

Stratus' own sales force was immediately supportive of the IBM deal, but a minority was initially nervous about the prospect of competing with Big Blue, Foster said.

The agreement, he added, "has given Stratus a large amount of credibility; it certainly has gotten us a lot of attention . . . people feel . . . the company is going to be here 15 years from now."

Foster said he believes the fault-tolerant market will be large enough to support many companies, even though Stratus and industry leader Tandem Computers, Inc. are the only ones to have significant market share to date.

Established vendors of general-purpose computers have been very slow developing fault-tolerant features, but Foster said fault-tolerance will at some point "become a standard feature in all multiuser systems."

The IBM agreement, he said, will increase demand for fault-tolerant systems, even those from Stratus' chief competitor, Tandem. "If IBM has decided to do a very unusual deal like this, [it] obviously views the market as a very important market," Foster said.

FADE

from page [illegible]

said Carl Gritzmacher, Ashton-Tate's sales vice-president, recently.

"One of the biggest concerns is that most street prices keep sliding. You can hear a lot of good reasons why this shouldn't happen, but Borland's success with under-$100 packages flatly contradicts them.

The good news in the software shakeout for customers is the potential for fire sale software buys. The bad news is that the choices may be narrowing. Even established firms face an uphill battle, because "the distribution channels are so screwed up," noted Tony Morris, president of Morris Decision Systems, a New York reseller. Innovative software may not make it because the dealers that showcased new products can't compete against the discounts available from volume distributors, he explained.

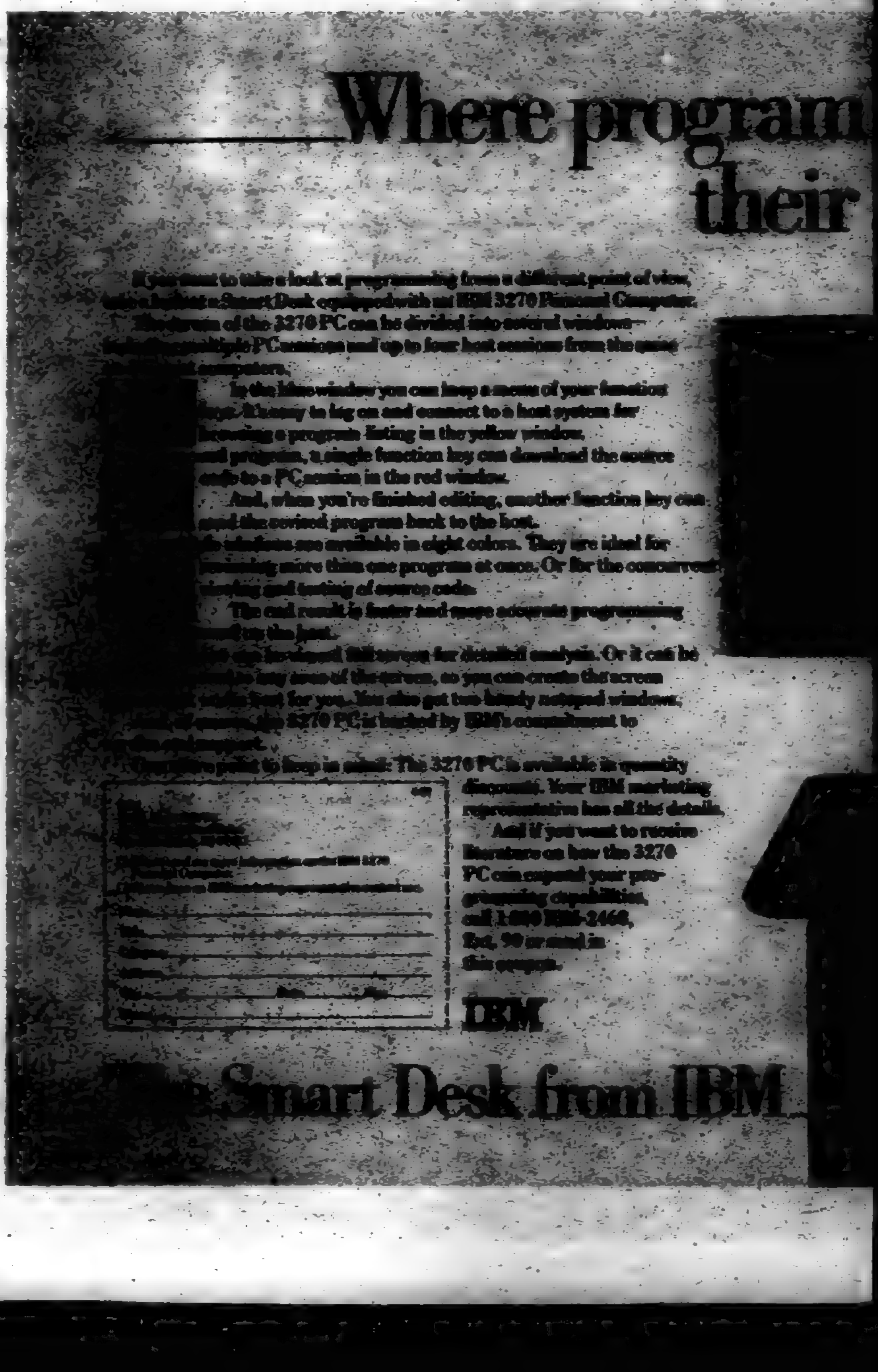
WORK

from page [illegible]

but it has not yet been determined which operations will continue to operate at full capacity. Motorola's discrete Tempe semiconductor products are still in full production, however, and the program might not be implemented as much in those areas, he added.

The program now in effect is the same one Motorola used in 1982 to reduce expenses during that year's industry slowdown. Phillips said Arizona's work-sharing program was used sporadically throughout 1982 and, at its peak, affected 9,000 of Motorola's then 13,000-member Arizona work force, saving the company $1.5 million in 1982's fourth quarter.

Phillips said Motorola recently applied for a similar work-sharing program in Texas, but the proposal is still pending in the state legislation.


Where program
their

If you want to take a look at programming from a different point of view, take a look at a Smart Desk equipped with an IBM 3270 Personal Computer.

The screen of the 3270 PC can be divided into several windows—including multiple PC sessions and up to four host sessions from the same [illegible] computers.

In the blue window you can keep a menu of your function keys. It's easy to log on and connect to a host system for browsing a program listing in the yellow window. [illegible] program, a single function key can download the source code to a PC session in the red window.

And, when you're finished editing, another function key can send the revised program back to the host.

[illegible] windows are available in eight colors. They are ideal for [illegible] more than one program at once. Or for the concurrent viewing and testing of source code.

The end result is faster and more accurate programming [illegible] on the job.

[illegible] can be enlarged full screen for detailed analysis. Or it can be [illegible] to any area of the screen, so you can create the screen [illegible] works best for you. You also get two handy notepad windows. [illegible] the 3270 PC is backed by IBM's commitment to [illegible] and support.

One more point to keep in mind: The 3270 PC is available in quantity discounts. Your IBM marketing representative has all the details.

And if you want to receive literature on how the 3270 PC can expand your programming capabilities, call 1-800 IBM-2468, Ext. 90 or send in this coupon.

[illegible]

IBM

[illegible] Smart Desk from IBM

COMPUTER INDUSTRY

EXECUTIVE CORNER

Gale Carr has been appointed to the post of president at Rising Star Industries. She has been with the company since 1982 as vice-president and chief financial officer.

■

Vernon Fransen has been appointed president and chief executive officer of ANA Tech Corp. Fransen was president and chief executive officer of Data Com Systems, Inc. before joining ANA Tech.

■

Robin White has been named vice-president and general manager of the Systems Division of Applied Digital Data Systems, Inc.

■

Vermond E. Crane has been named president and chief executive officer of Mips Computer Systems, Inc. Previously, Crane was president and chief operating officer of Computer Consoles, Inc.

■

AT&T Communications has announced the appointment of Frank Blount, executive vice-president, network organization. Blount will head the company's nationwide network organization replacing Robert Kleinert, who is retiring as president and chief operating officer after 44 years of service. Other executive changes were announced as follows: Robert Beck, vice-president, operator services; Richard Jacobsen, vice-president, international; John Healy, vice-president, network services; John Blanchard, vice-president, custom services; and Kenneth Garrett, vice-president, network.

■

Syscon Corp. has announced that Jose J. Thieslas has been named chairman and chief executive officer and has also announced the appointment of Edwin E. Tritsch to president and chief operating officer.

■

Ramesh K. Mehta has been appointed president and chief operating officer at Inspiration Systems, Inc. Mehta was chairman and chief executive officer of American Business Systems, Inc. for the past 2½ years.

■

Michael Kappel has been elected vice-president of Mediflex Systems Corp.

■

Amdahl Corp. has announced the appointment of Bob M. Olsen to the position of vice-president, marketing, of the company's communications systems division based in Marina del Rey, Calif.

■

Paul R. Hessinger has been promoted to the position of vice-president of research and technology at Computer Task Group, Inc.

■

Dwayne L. McAfee has been elected corporate vice-president of Recognition Equipment, Inc.

■

Sperry Corp.'s Information Systems Group has announced the promotion of David C. Dreschel to the newly created post of vice-president for product management and marketing in the microcomputer products division.

■

Storage Technology Corp. has promoted Walter E. Meyers to corporate vice-president and general manager of the company's tape division.

■

Robert D. Bowman has been appointed senior vice-president of development for Xerox Computer Services.

■

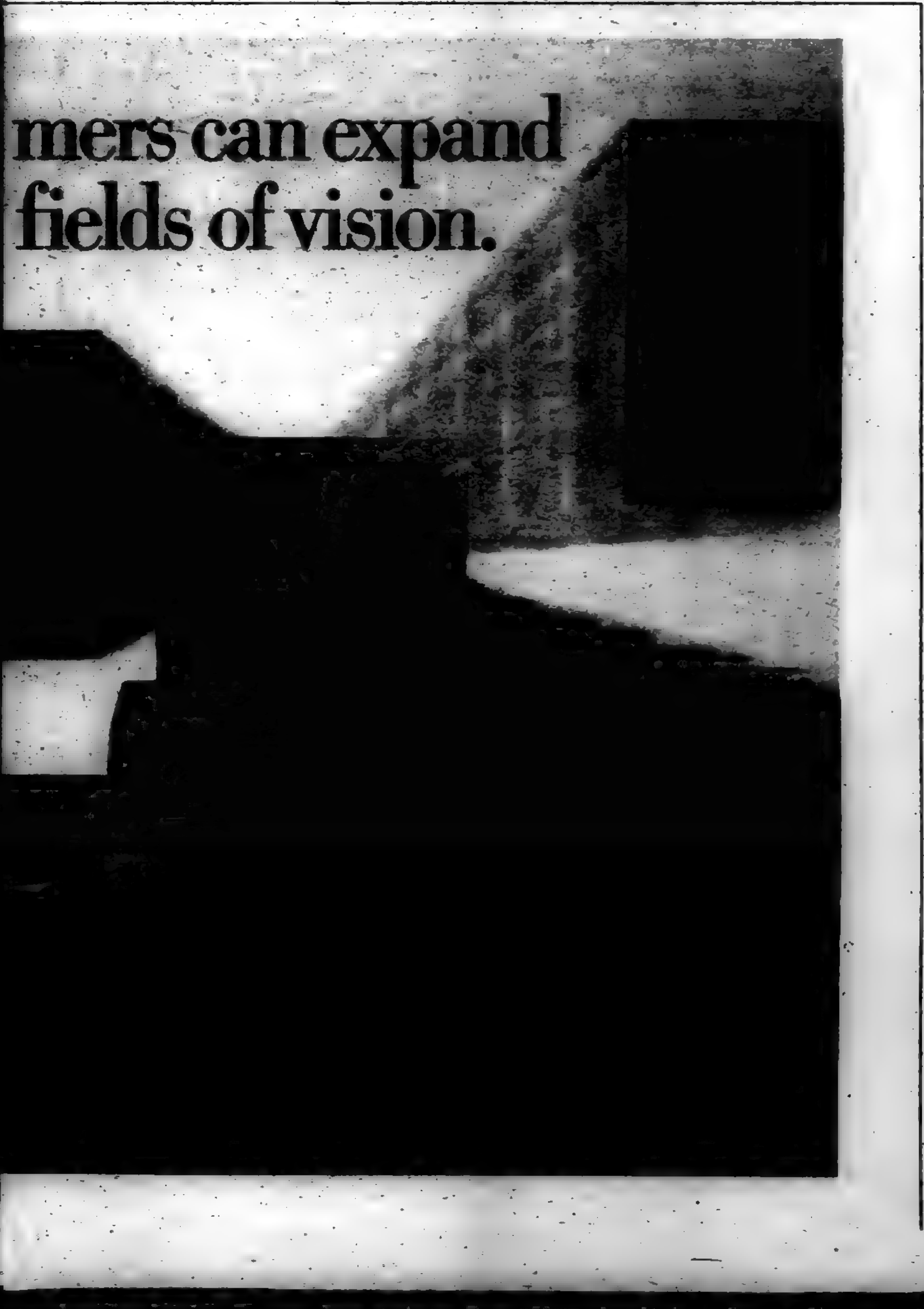
William O. Mehuron, deputy director of the National Security Agency's research and engineering organization, has joined Ampex Corp. as corporate vice-president of engineering, a newly created position. Michael Felix has been appointed senior scientist for Ampex, also a newly created post.

■

Software Design Associates, Inc. has announced the following appointments: Michael Ornstein will assume the position of regional vice-president for the New York and Long Island branch office locations. Marty Aronow will be taking on the responsibilities of regional vice-president for the Chicago, Philadelphia, New Jersey, Cincinnati and Connecticut branches.

■

Corvus Systems, Inc. has announced that Roy A. White has joined the firm as chief operating officer.



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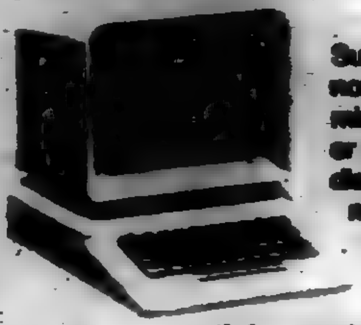

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COMPUTER INDUSTRY

MERGERS AND ACQUISITIONS

Information Solutions, Inc. (ISI) announced it has completed the purchase of 45% of Software Development and Sales Co. (SDSC), a Colorado partnership.

ISI's investment in SDSC totaled $1.52 million in cash, preferred stock and common stock. As part of the agreement, ISI is granted a perpetual right to renew its marketing rights with SDSC.

■

Computer Task Group, Inc., Buffalo, N.Y., announced it has acquired Berger, Verney & Co., a professional computer services firm headquartered in Houston. Terms of the acquisition were not available.

■

First Amarillo Bancorporation, Inc. and Systematics, Inc., Amarillo, Texas, announced they have completed the sale of Western Data Centers, Inc., formerly a wholly owned subsidiary of First Amarillo, to Systematics. The purchase price was approximately $3.2 million.

■

Interactive Data Corp., Waltham, Mass., has purchased Telstat Systems, Inc. from Western Union Corp. Interactive Data will merge Telstat with its subsidiary, Interactive Data Services, Inc. Terms of the sale were not available.

■

Automatic Data Processing, Inc., Roseland, N.J., has acquired Commodity Communications Corp. (Canada) Ltd. (CCC), for an undisclosed amount of cash plus contingent payments based on future business results.

CCC, headquartered in Ontario, provides services for dissemination of real-time futures quotations to more than 100 Canadian companies.

■

Software Distribution Services (SDS), Buffalo, N.Y., has acquired a substantial interest in one of Canada's largest software distribution firms, Aviva Software Corp. Aviva will be operated as a subsidiary of Wincorp, the parent company of SDS. The purchase agreement gives SDS the option to purchase the remaining shares of the Canadian firm.

■

Intergraph Corp., Huntsville, Ala., has reached an agreement in principle to acquire The Band Group, Inc. Under the terms of the acquisition, The Band Group will become a wholly owned subsidiary of Intergraph Corp. and will be responsible for the development of finite element-based analysis and design software for Intergraph computer-aided engineering and design systems. No financial details of the agreement were released.

■

Northern Data Systems, Inc. announced it has reached agreements in principle to acquire three computer-related companies: Lehigh Data Systems, Paradata, Inc. and Cams, Inc.

The products and services of these three companies are complementary to those of Northern Data Systems, a supplier of turnkey computer systems and a developer of proprietary vertical software. Terms of the acquisition were not disclosed.

NICKELS AND DIMES

Symbolics, Inc. reported revenue for the second quarter ended Dec. 30 of $15.7 million, a 75% increase from $8.9 million for the same period in the prior year. Profits were $815,000, or 4 cents per share, a 203% increase from $269,000, or 2 cents per share, for the comparable period last year.

■

Comshare, Inc. announced results for the second quarter of fiscal 1985 and said it is planning to sell its Chicago-based Computer Research Co. subsidiary. Comshare has accordingly adjusted its investment in Computer Research to estimated net realizable value, resulting in a book loss of $3.6 million and a reduction of $3.8 million in goodwill investment.

Revenue for the quarter, exclusive of discontinued operations, was $15.5 million, compared with $16 million one year earlier. Loss from continuing operations was $1.4 million, or 42 cents per share, compared with a profit of $166,300, or 4 cents per share, in the like period one year earlier.

■

Protocol Computers, Inc. announced a net loss for the first three months of fiscal year 1985 of $455,000, or 8 cents per share, compared with a profit of $255,000, or 5 cents per share, in the like period one year ago. Revenue was $2.6 million, compared with $3.4 million for the same period one year earlier.

■

Computer Memories, Inc. reported revenue for the third quarter of fiscal year 1985 of $20.1 million, compared with $12.6 million in the like period one year earlier.

The company reported a net loss of $3.8 million, or 80 cents per share, compared with a net loss of $120,000, or 1 cent per share, in the year-earlier period.

■

Nestar Systems Corp. announced fourth-quarter revenue of $9 million for the period ending Dec. 31, an increase of 21% over revenue of $7.4 million in the same period a year ago. Operating losses were $2.1 million, or 21 cents per share, down from $3.2 million, or 26 cents per share, in operating losses in the like quarter one year earlier.

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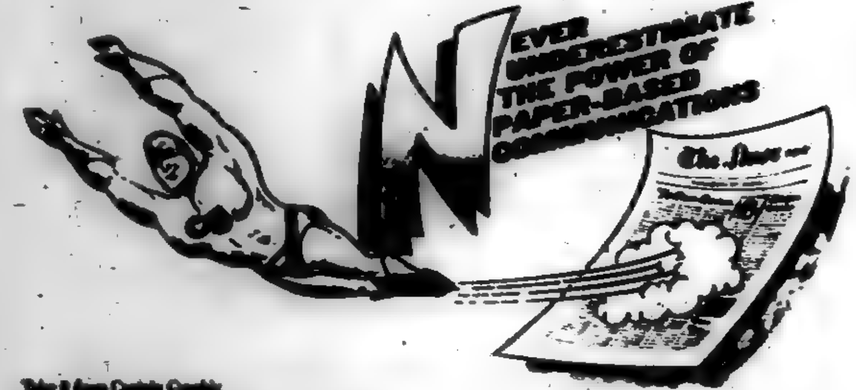
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Operating Systems & Tools Development

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- Consult with users to isolate and troubleshoot problems
- Enhance and maintain operating systems (UNIX™, VMS, MS-DOS and Domain)
- Positions require BSCS, EE or Math with strong knowledge of "C" language

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NEW PRODUCT DEVELOPMENT

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There are several lead technical positions in new product areas which are just beginning and which represent outstanding challenges and growth opportunities:

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- Editors

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Lead position on graphics subsystem.

- Define next generation products
- Technical liaison between groups
- Mature design judgement
- BSCS and at least 4 years' experience

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NEW BUSINESS DEVELOPMENT

Principal/Senior Software Engineers

Several senior positions available. You should possess the following skills and capabilities:

- Micro-based software development
- Graphics/text software background
- Familiarity with Assembly, "C" or Pascal
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- Device Drivers, systems supervisors and file systems

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Senior Software Quality Engineers

Will assist in establishing start-up software QA function by tracking progress and resolving product problems from specification through delivery to customer. Will participate in qualification of new products and control technical functions throughout the development process. Requires:

- BSCS
- At least 3-4 years' experience with diagnostics and/or applications/test of new software
- 68010, "C", UNIX™ (4.2) experience
- Knowledge of software development and test methodologies
- Knowledge of software measurement techniques
- Administrative/project leadership experience desirable

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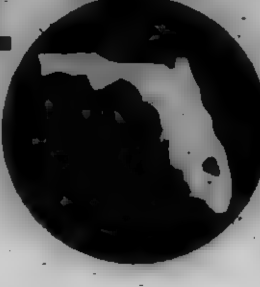

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If you are interested in an outstanding opportunity along with our progressive compensation program that includes an excellent relocation package to our headquarters in Columbus, Ohio, our state's largest city, forward your resume and salary history to: Dee Cummins, Executive Recruiter, GOLD CIRCLE STORES, P.O. Box 68, Worthington, OH 43085.

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Data Communications test equipment manufacturer is seeking an individual with sales and sales management experience for the position of Eastern Region Sales Manager. Applicants should have technical and sales experience with data communications products. Duties will include supervision and support of individual sales representatives, product demonstrations and sales. This position requires the applicant be located near the major eastern markets and be willing to travel.

Interested individuals should send their resume to:

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Statewide Office of Human Resource Development

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Colorado

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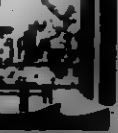

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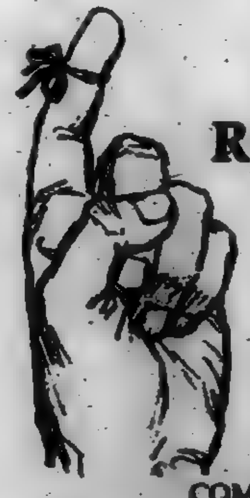

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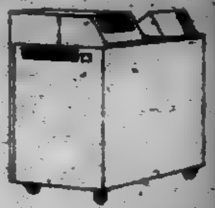

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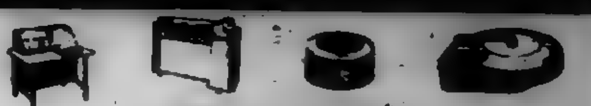

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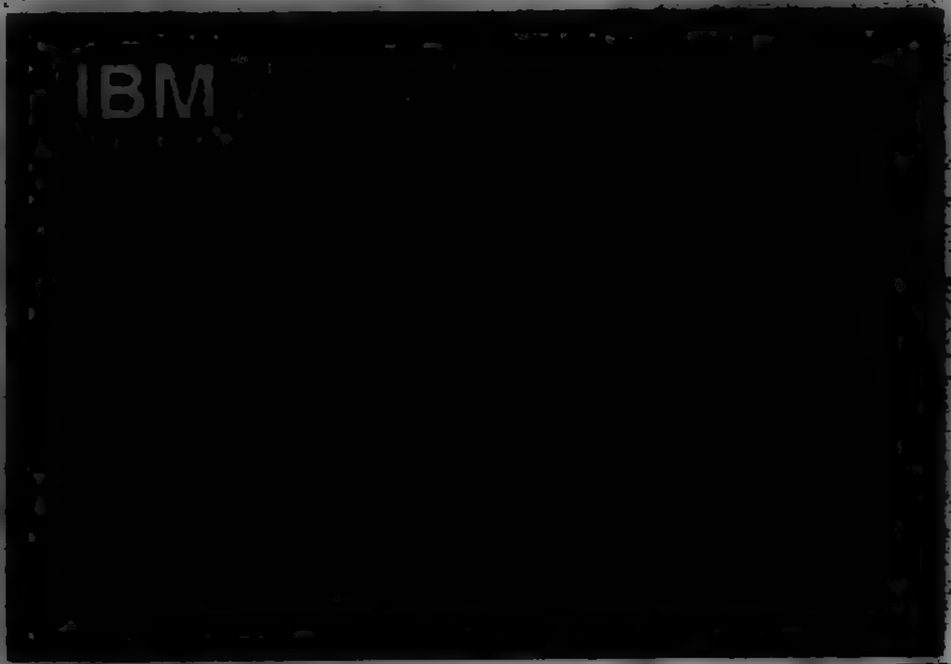

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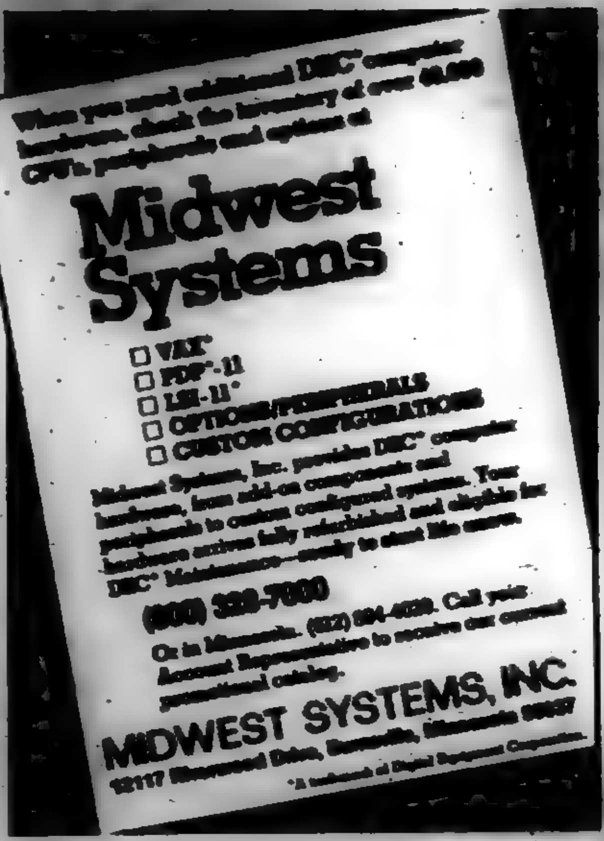

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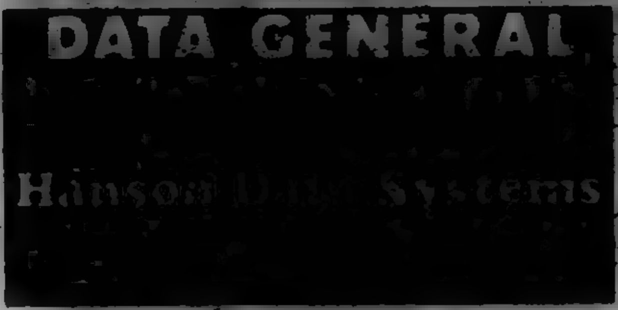

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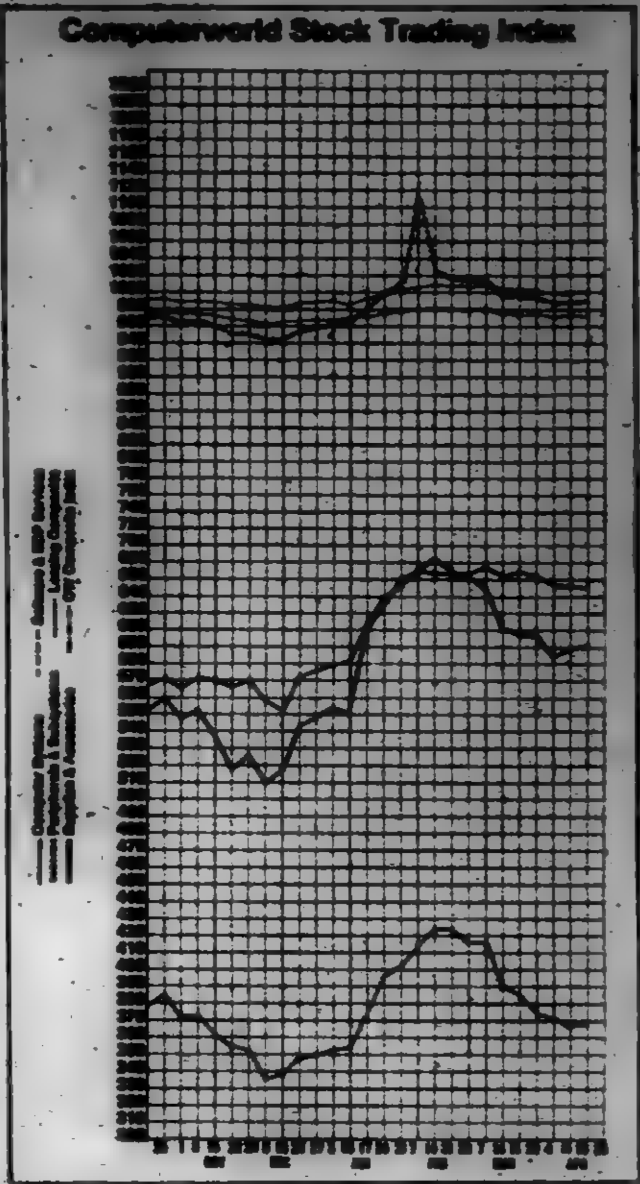

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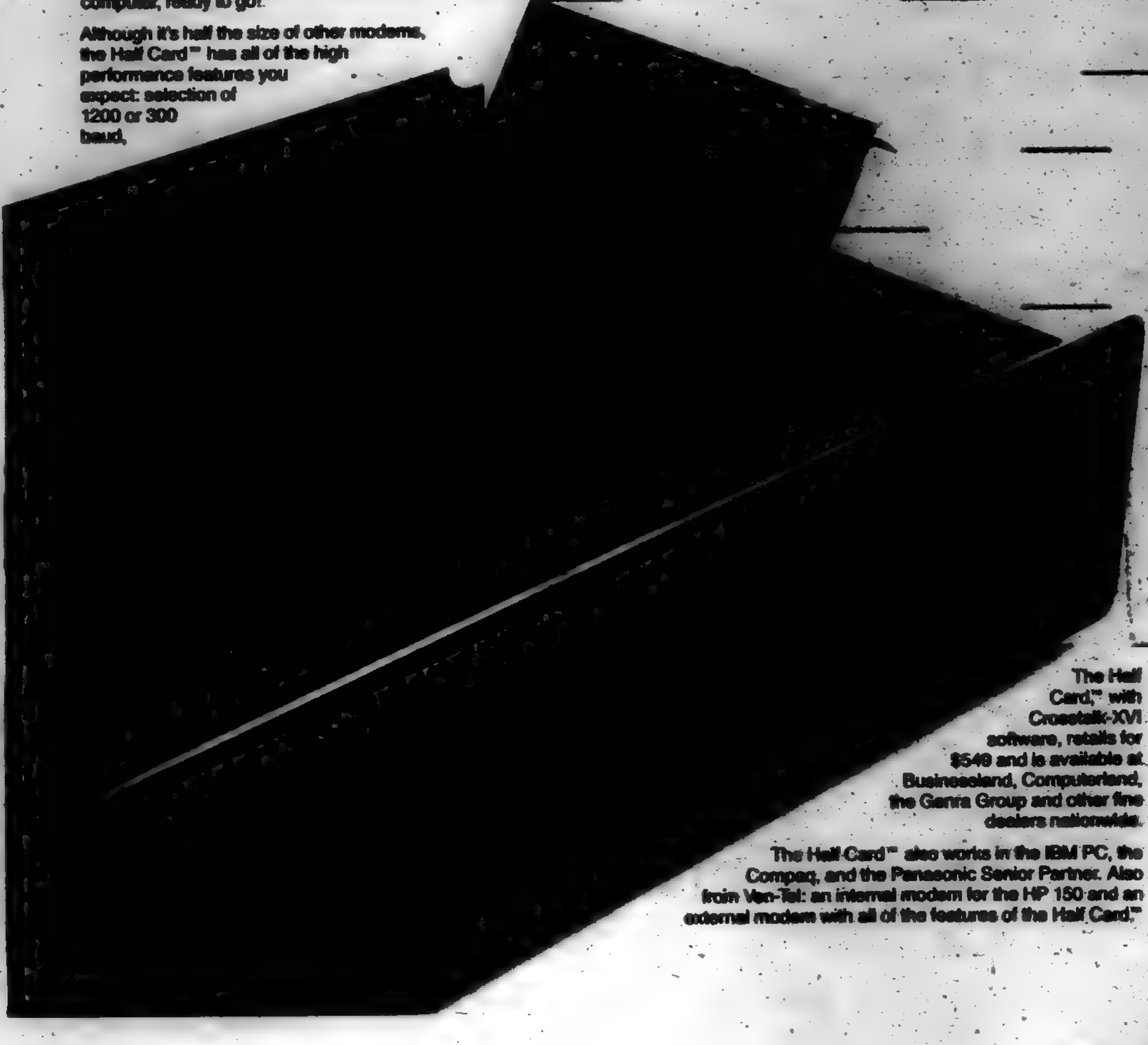

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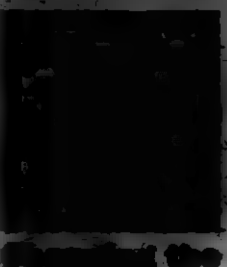

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Study finds users plan hefty power increases

By John Desmond
CW Staff

FRAMINGHAM, Mass. — Users of large-scale IBM and compatible computers expect to increase their processing power by 20% to 30% during the next three years — a rate that equals or exceeds expectations of users prior to the industry's boom years of 1983 and 1984.

The findings are based on a survey of 1,100 sites, or 6% of the U.S. installed computing base, by International Data Corp., a market research firm here that has been conducting the survey since 1972. The survey addressed users of IBM 370, 4300, 3030 and 3080 series mainframes and compatibles.

According to IDC, 1984 was the first year that personal computer sales revenue surpassed that of mainframes. "The days when mainframe was the market will never return," the study stated. Personal computer penetration at large-scale processor sites will continue at a rapid pace in 1985; IDC projected a 60% increase in the installed microcomputer base this year.

> ”
>
> *Micro sales in 1984 surpassed those of mainframes for the first time.*
>
> — International Data Corp.

Despite personal computer growth, machines and software based on IBM's 370 architecture — or von Neumann one instruction per cycle processing — account for more sales than any other architecture. Sales of 4300 and 3080 series mainframes in 1984, combined with associated peripherals and software, brought IBM three times the revenue that sales of personal computer products did, the report said.

See IDC page 10

TOP OF THE NEWS

Mini bucks for mini makers. With the exception of Prime, a string of minicomputer vendors reported plummeting quarterly profits. Page 2.

■

Still a gulf between them. Micro-software vendors may think otherwise, but the Micro Managers Association said the rift between itself and the vendors over proposed antipiracy standards remains. Page 5.

■

Bottoms up. Arco Chemical Co. reaped hefty rewards when its DP department began listening carefully to microcomputer end-user complaints. Page 8.

Send in the clones. Televideo, Zenith and Corona each rolled out desktops compatible with IBM's Personal Computer AT. Page 11.

■

Corporate users with private-line networks may save up to 30% on existing communications bills using a recently announced AT&T service. Page 52.

■

Twenty years and running. IBM's 1964 vintage 1800 Data Acquisition and Control System still commands a flock of proponents, despite company plans to discontinue support. Page 61.

■

Broker picks fiber optics for bypass

Prudential-Bache turns to T1 channels for data

Third in a four-part series on corporate bypass strategies.

By John Dix
CW Staff

NEW YORK — Prudential-Bache Securities, Inc. uses a fiber-optic bypass system between two of its buildings here that saves the company 60% to 80% of the cost of standard local facilities while providing advanced data communications capabilities and insulation from rate hikes.

Prudential-Bache, one of the largest worldwide investment firms, last year moved its corporate headquarters from Gold Street in Manhattan to the new Prudential-Bache building a few blocks away on Water Street.

Because the company's data center and some other company assets and personnel remained at the former location, the move created a massive communications need between the two sites, according to Daniel Minoli, associate vice-president of systems planning and engineering with the corporate communications department.

Communications is a cornerstone technology in the financial services industry, and this holds true for Prudential-Bache. The company spends close to $100 million a year on communications — a corporate expense surpassed only by compensation, according to Steven Steinberg, an associate vice-president with corporate communications in

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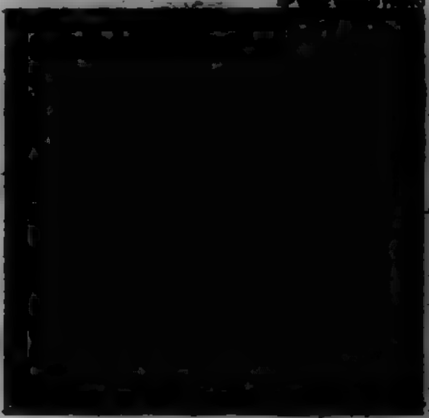
AP WIDE WORLD PHOTO



Digital draft

This year's regular and supplemental NFL pro football draft, featuring the University of Miami's Bernie Kosar, will be aided by a pair of DEC VAXs. Page 15.

Symphony, 1-2-3 get face-lifts

By Eric Bender
CW Staff

NEW YORK — Lotus Development Corp.'s 1-2-3, the all-time champ of IBM Personal Computer software charts, will get its first major face-lift when an upgraded version is shipped this fall, the company announced here last week. Lotus also introduced a second release of its Symphony desktop productivity program, scheduled for delivery this summer.

The most striking enhancement for both packages is the ability to bypass the IBM micro's 640K-byte limit on directly addressable memory, reaching up to 4M bytes of additional random-access memory under a bank-switching memory management scheme jointly developed with Intel Corp. (see story page 6).

The added memory capability is a response to requests from veteran spreadsheet users who keep hitting the 640K-byte barrier, Lotus Chairman Mitchell Kapor said. He estimated that users who add 2M bytes of RAM will be able to build spreadsheets five to 10 times their present maximum size.

Lotus also introduced Symphony Link, a software add-on product that offers IBM 3270 terminal emulation within the Symphony environment and allows MIS departments to create their own micro-to-mainframe connections, Kapor said.

The announcements are good news for Lotus users, industry analysts generally agreed, although some felt the moves overemphasized Symphony at the expense of the earlier package. "I'm disappointed that [Lotus is] trying to push Symphony first," commented Aaron Goldberg, director of Microsystems Services at International Data Corp. in Santa Clara, Calif. "Most people are still using 1-2-3."

See LOTUS page 6

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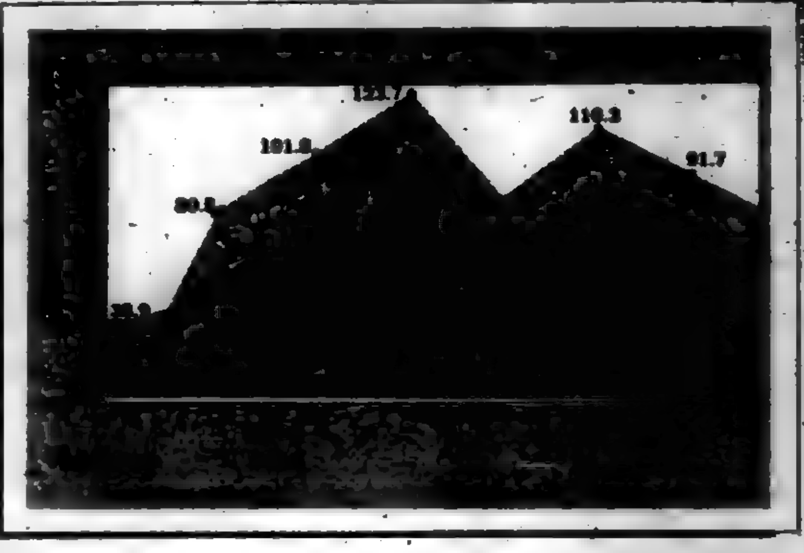
NEWSPAPER

Mini slump deepens: DG profits down, closings planned

By Peter Bartolik
CW Staff



Capping off a generally bad week for minicomputer companies, Data General Corp. last week posted lower than expected second-quarter profits and said it will shut down production for two weeks this summer in anticipation of a continued slump.

A few days earlier, Wang Laboratories, Inc. reported that its third quarter was worse than earlier projected, with profits down 66% and revenue growth of only 2%. Last week, Digital Equipment Corp. reported third-quarter profits were down 10% and hinted that fourth-quarter revenue may not meet expectations.

Going against the tide of bad news was the 19% profit increase reported last week by Prime Computer, Inc., which historically has been less dependent on OEM customer sales than DEC and DG.

In other developments, Burroughs Corp.'s Memorex Corp. subsidiary announced layoffs, and Control Data Corp. announced a first-quarter loss of $9.2 million.

DG announced in February that second-quarter profits might not exceed year-earlier profits. But the news last week was significantly worse, with profits falling to $9.1 million, or 34 cents per share, down 36% from the second quarter of 1984, when profits were $14.2 million, or 55 cents per share. Revenue in the second quarter increased to $320.2 million, from $273.9 million, but the increase did not offset increased expenses.

Furthermore, DG President Edson D. de Castro said, "Earnings for the [fiscal] year may not exceed those of fiscal 1984, and earnings for the 1985 third quarter may not exceed those of the just-reported second quarter."

He said the company has reduced hiring plans and will shut down U.S. manufacturing operations for two one-week periods coinciding with the Memorial Day and Fourth of July holiday weekends.

Like DG, Wang announced financial results much worse than the company had earlier projected. Wang had earlier announced plans to shut down manufacturing for two weeks. Instead of the 30% to 40% drop it projected last month, Wang's profits dropped 66% to $17 million, or 12 cents per share, from $49.8 million, or 36 cents per share, a year earlier. Revenue inched up to $552.7 million from $543.5 million, short of Wang's earlier 10% growth projection.

DEC posted profits of $91.7 million, or $1.52 per share, down from the third-quarter 1984 profits of $101.8 million, or $1.77 per share. While that was within the range of projections made by securities analysts in recent weeks, it was far below the $125 million projections of about one month ago. DEC said revenue increased to $1.14 billion from $978.9 million a year earlier.

Contributing to DEC's results was the early delivery of 140 VAX 8600s the company said were shipped before the scheduled April 1 date. However, the company noted, it may not be able to ship new products fast enough to meet demand over the next few months, and "this may have a short-term effect on revenue."

In contrast, Prime posted profits of $11.9 million, or 25 cents per share, an increase from the year-earlier profits of $10.2 million, or 21 cents per share. Revenue for the quarter just ended was $175.8 million, up 21% from $145.5 million a year earlier.

Peter Lowber, minicomputer analyst with the Yankee Group in Boston, said the sudden downturn in vendor fortunes was somewhat surprising in light of user surveys indicating relatively strong purchase plans and the need to serve large numbers of personal computers. But he said the trend toward greater MIS involvement in departmental systems planning may be slowing down user purchases.

CDC charged off $11.5 million against profits in anticipation of the likely loss of its Commercial Credit Co.'s deposits in the deposit guarantee fund for Ohio-chartered savings and loans banks.

CDC, which acknowledged but declined to specify the size of "a significant reduction" of the work force in its computer peripherals group, said its information services and products group posted a pretax operating loss of $16.3 million, compared with pretax profits of $15.9 million a year earlier. The $9.2 million loss, or 24 cents per share, compared with profits of $31.7 million, or 82 cents per share, which included a nonoperating gain of $11.9 million. Revenue for the quarter inched up to $1.2 billion, from $1.19 billion a year earlier.

Informatics nixes second bid

WOODLAND HILLS, Calif. — Informatics General Corp. said last week that it had rejected a second cash offer for the company by Sterling Software, Inc., which had raised its original bid by $1 a share.

Following the rejection of the original $25 a share bid [CW, April 22], Sterling's subsequent offer raised the total acquisition value of Informatics to about $135 million, although Sterling already had acquired almost 10% of Informatics' outstanding shares. Informatics rejected the latest offer as inadequate and reiterated its intent to explore other alternatives.

Sterling, which markets some 20 software products for IBM mainframes, last week reported second-quarter profits of $641,000, or 14 cents per share, on revenue of $6 million. A year earlier, it posted profits of $340,000, or 8 cents per share, on revenue of $4.8 million.

Informatics offers a diverse product line of software and services and reported revenue of $193 million in 1984. Profits for the year were $4.7 million, down from $8.5 million in 1983.

CORRECTIONS

The Series II+ Twinax Protocol Converter recently announced by KMW Systems Inc. of Austin, Texas, emulates a 5251 Model II, not a 5250 Model II as was reported [CW, April 8].

The contact for seminars attributed to Technology Solutions, Inc. [CW, April 22] is On-Line Software International, Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.

Starting wages for data processing personnel in Hawaii are 15% lower than the national average, not 15% higher than the national average as reported in the article "DP salaries up 5.9%, study reports" [CW, March 4].

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CW at DP Expo: Federal DP systems are unfairly criticized, according to the keynote speaker . . . Another speaker advocated abandoning the government requirement that federal agencies prepare formal computer security risk analyses . . . An official from the Office of Management and Budget defended the federal DP contracting policy/13-14

The National Football League has added two DEC VAX-11 superminis to its team as part of a plan to link diverse hardware at all team offices/15

A manufacturing firm solved its report distribution problem by borrowing an idea from a supermarket/16

A seminar of business executives discussed what information MIS managers should be trying to produce/17

To prosper in the 1980s, software vendors were told they must teach the world what data really is/19

IBM's increasing focus on software creates some unique opportunities and hazards for vendors, an industry analyst said/22

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SUSPENSE

How did IBM's rookie sort (Rel 7.0) do in its first meeting with "Lefty" SyncSort? Read all about it!

or Call (201) 568-9700.

Get the inside scouting report.

It is one of those historic moments in the Annals of Sort! The very first appearance in competition of IBM's new DFSORT, Release 7, in the tough-as-nails MVS/XA League. Will the kid be able to live up to his advance press notices?

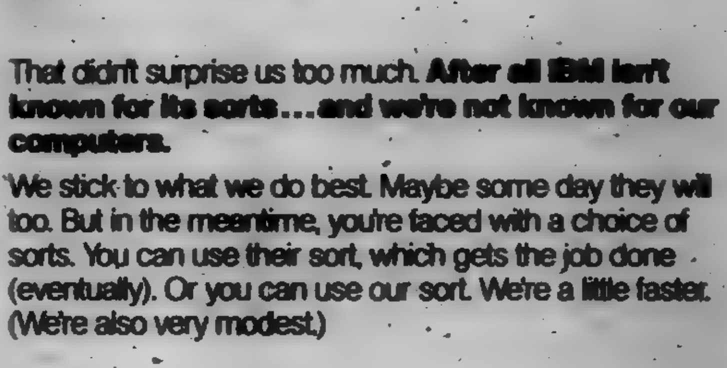
Confidently DFSORT7 strides to the plate… knocks the dirt out of his spikes… hitches up his britches… raises his sort assists.

Then, as sorting fans everywhere gasp in amazement, he lifts his arm lazily and points toward the centerfield flagpole, thousands of bytes away. The kid is going to try to emulate Babe's mighty homerun shot!

Moments later, SyncSort winds up… a curving white blur is seen… and… and…

There is no joy in Armonk! DFSORT7 struck out every time it came to bat against the latest release of SyncSort (Release 2.SE) in a recent series of MVS benchmark tests. (In sorting, as in most other forms of human endeavor, it's a long way from *baby* to *Babe*.)

The bar charts below tell the story more eloquently than we can:



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BYPASS

from page 1

charge of the financial analysis group. Much of that money is spent supporting Prudential-Bache's 300 branch offices with voice, data and value-added communications services, such as the Dow Jones News & Retrieval Service.

Prudential-Bache's trader and operation divisions are even more dependent on communications than the branch offices. With the move to Water Street, the company anticipated traffic between the buildings that included intracompany voice communications and data flowing between the host information processing systems — which include IBM 3084 Models Z and X duplex, an IBM 3081 Model K, an IBM 3033 Model MP and an IBM 4381 Model II — and a large population of users in headquarters.

Although microwave and infrared bypass technologies were considered as means to connect the two buildings, a housing complex sitting between the locations made their use impractical, Minoli said.

Aware of the situation, New York Telephone Co. offered to link Prudential-Bache's buildings with a fiber-optic bypass network that would be made available on a 60-month lease. "Telephone companies are going that way," Minoli said. "They are saying, 'If you want to go bypass, go bypass, but come with us. We'll give you the state of the art, the digital feature, the noise resilience, the good bit error-rate statistics, diversification, constant monitoring and dual fallback positions.' "

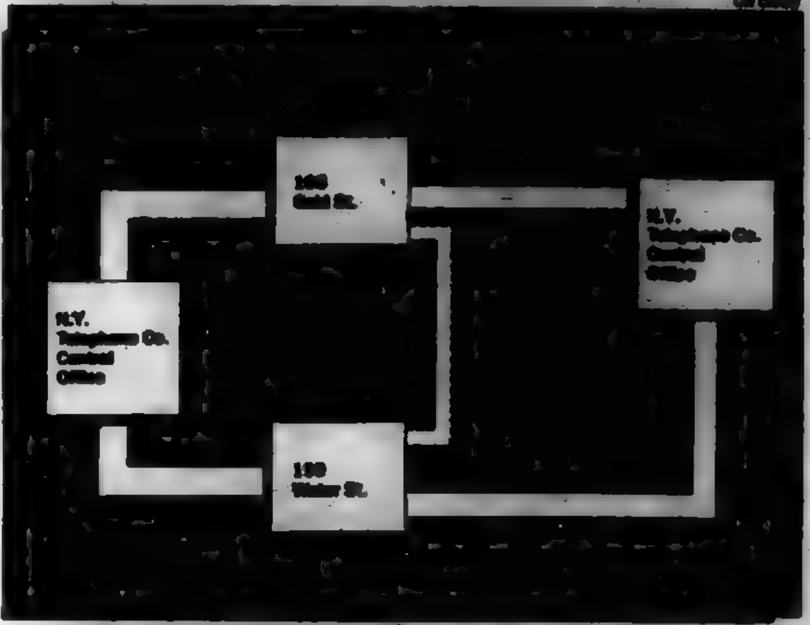
Six months to complete system

Six months after the project was conceived, designed and approved, the system was complete, Minoli said.

Today, primary and backup fiber-optic cables run between the Gold Street and Water Street complexes through different New York Telephone switch offices, ensuring service even in the event of a switching office failure. For reasons of physical security, the cables enter the respective Prudential-Bache buildings on opposite sides.

The fiber-optic cable has a total capacity of 45M bit/sec., but today the company only uses 12 1.54M bit/sec. T1 links, Minoli said. Other strands of fiber can be brought up by adding terminating equipment.

Because it was initially uncertain how the fiber-optic system would perform, Prudential-Bache contracted Manhattan Cable TV to install three additional T1 links as the system was being installed. These services are provided over tried-and-true CATV coaxial cable facilities and give Prudential-Bache alternate communications routes that further safeguard availability.


100 Gold St.
N.Y. Telephone Co. Central Office
N.Y. Telephone Co. Central Office
100 Water St.

Of the 12 T1 links now used, roughly nine carry voice traffic, and three carry data. Voice traffic at headquarters is supported by a Northern Telecom, Inc. SL-1 private branch exchange; the Gold Street facility uses Centrex service provided by New York Telephone. Intracompany voice traffic is provided between the buildings by tying the Water Street SL-1 to a switching module dedicated to the task at Gold Street. The PBX and switching module — which directly interface with the digital bypass links — partition the T1 trunks into 24 64K bit/sec. telephony standard channels.

For data communications over the fiber-optic network, Prudential-Bache terminates the bypass trunks with channel banks from Rockwell International Corp. that divide the T1 capacity into 24 circuits similar to analog leased lines.

The Manhattan Cable TV bypass link used for data communications (the other two are used for voice) is terminated using multiplexer equipment from Datatel, Inc. of Cherry Hill, N.J. This hardware derives 96 9.6K bit/sec. channels out of the 1.54M bit/sec. T1 link. Minoli said T1 multiplexers provide the most cost-effective use of the T1 facilities and that the company is considering using them with the fiber plant as well.

When the cost of the fiber-optic and coaxial transport systems is compared with the New York Telephone leased-line services that otherwise would have been needed, savings range from 60% to 80%, Minoli said. Copper leased facilities for the application would have cost roughly $100/circuit/mo. The T1 bypass systems cost roughly $40 per equivalent channel per month — including lease of the facilities and amortized equipment costs — and as little as $17/channel/mo when T1 multiplexers are used, Minoli said.

But immediate savings are not the only benefit of the system; equally important are advanced data communications capabilities and protection from rate hikes (see related story left). Minoli anticipates that most future rate hikes will concern the local loop. "Having put the local loops on fiber [under a 60-month lease], I believe that we will be insulated from local rate hikes."

Although leasing the facilities means Prudential-Bache must carry a yearly recurring charge, it has enabled the company to sidestep the high initial cost of installing its own system and puts the onus on New York Telephone to maintain reliability.

"Because of divestiture and the dynamic nature of the industry, you are actually able to cut costs while increasing functionality if you do it right," Minoli concluded.

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Adapso, MMA remain at odds over antipiracy issue

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Contrary to claims made last week by members of a software vendors association, the conflict between the association and a corporate microcomputer users group over antipiracy proposals continues unabated.

At a meeting here, members of the Association of Data Processing Service Organization's (Adapso) software protection committee said there has been an easing of tensions between it and the Microcomputer Managers Association (MMA).

But the New York-based MMA, which claims to have spent more than $100 million on micro software last year, disagreed, labeling Adapso's antipiracy efforts largely a "waste of time."

'Costly inconveniences'

In March, the MMA voted to oppose the software copy protection proposals announced earlier by Adapso [CW, March 11], spearheading user concerns that the proposals would be, according to one MMA member, "legislated and costly inconveniences."

Speaking at an Adapso software protection committee meeting held here recently, Ron Palenski, associate general counsel with Adapso, said that following telephone discussions with Adapso committee members in March, only some relatively minor technical concerns — such as keeping track of software keys on a hardware "key ring" protection device — stood in the way of declaring a philosophical cease-fire between the MMA and Adapso.

The MMA's major concern — that the adoption of protection standards by users would be legislated — was laid to rest during these discussions, Palenski claimed. "The MMA now knows we can't recommend marketing methods to them because of antitrust considerations."

'We're hoping they'll attend'

Palenski also said that Adapso had invited the MMA to a standards review meeting at Adapso this week, and "we're hoping they'll attend."

But MMA President Alan Gross, when reached in New York, said, "There has been absolutely no softening with Adapso on our part." Gross said Adapso was "merely going through the futile exercise" of creating standards that would "never be implemented by large-scale users."

According to Gross, "Adapso is just wasting their time." If the implementation of standards were forced, he explained, large-scale users would vote against them with their purchasing dollars.

Wanted involvement at the beginning

Gross said his organization did not attend last week's Adapso technical review meeting to discuss the proposed standards because "we wanted to be involved at the beginning, not at the middle." The MMA might attend future meetings, however, he added.

"At times we'd like to treat some of these user group issues lightly and keep them at their highest level of abstraction," said Mitchell Kapor, president of Lotus Development Corp., who spoke at the Adapso conference. But, Kapor explained, since user groups represent a significant portion of the community, "we have to get involved."

> ”
>
> *'[Adapso is] merely going through the futile exercise.'*
>
> — Alan Gross
> Micro Managers Association

"Adapso is not stonewalling the MMA or any other users group," Kapor insisted. "The committee is very concerned about what users say, but it has no plans to refocus its copyright protection strategy to achieve a rapprochement with MMA or any other disenfranchised users, he said.

Adapso has given MMA many chances for input into Adapso's decision-making process, he added, including invitations to discuss issues with Adapso executives and to join Adapso's committee and technical evaluation groups, but so far, "the MMA has chosen not to become directly involved."

Kapor said he did not think Adapso's aggressive strategy had backfired by alienating the MMA. "If anything, it's speeded up constructive dialogue between our two groups and caused volatile issues to get on the table more quickly," he said.

Dan Fylstra, an Adapso committee member and president of Customer Solutions, Inc., a software consulting firm in Palo Alto, Calif., said that disgruntled MMA members should attend Adapso meetings to understand that technical protection is merely a small part of Adapso's overall educational and legislative goals.

Fylstra said a recent Adapso mailing of 120,000 issue-oriented brochures to corporate decision makers across the U.S. has yielded 5,000 positive responses since January, "so the committee is really taking the MMA reaction in its stride."

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RECOVERY

Intel boards push IBM micro memory over 640K

By Kathleen Sullivan
CW West Coast Bureau

HILLSBORO, Ore. — Anticipating the release of memory-intensive applications programs and operating environments, Intel Corp. last week announced a set of circuit boards designed to expand the memory of the IBM Personal Computer family beyond its current 640K-byte memory capacity.

With Intel's Above Board memory boards, an IBM Personal Computer's memory can be expanded to up to 8M bytes, the firm said.

Rich Bader, comanager of the Intel operation that developed the add-on boards, said Above Board uses a new implementation of bank-switched memory architecture in order to provide access to the expanded memory.

Expanded Memory Manager

The boards are said to include Intel's Expanded Memory Manager (EMM) software, which is a DOS driver.

EMM supervises the expanded memory and allows programs such as a random-access memory disk and print spooler to concurrently share the expanded memory with applications programs, the vendor company said.

Existing software packages will not be able to take advantage of Above Board's expanded memory without modification, Bader said.

Two lines introduced

Intel announced two product lines: the Above Board/PC, designed for IBM's Personal Computer and Personal Computer XT, and Above Board/AT for the Personal Computer AT, which the firm said it will offer with a Piggyback Memory board.

In the Above Board/PC line, Intel will offer a 64K-byte board, which can be expanded to 512K bytes, and a 256K-byte board, which can be expanded up to 2M bytes.

Above Board/AT memory boards will include a 128K-byte board, which can be expanded to 512K bytes, and a 512K-byte board, which can be expanded up to 2M bytes.

The Above Board/PC with 64K bytes of memory costs $395; the 256K-byte version costs $595, the company said. The Above Board/AT with 128K bytes of memory costs $595; the 512K-byte version costs $995. An Above Board/AT Piggyback Memory board with 128K bytes of memory costs $295, and a 512K-byte version costs $795, the company said.

More information can be obtained from Intel, 5200 N.E. Elam Young Pkwy., Mail Stop TOC-03, Hillsboro, Ore. 97124.

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LOTUS

from page 1

In addition to the boosted memory capability, which requires add-on boards designed to the new specification, both programs will feature a more efficient memory allocation scheme, Kapor said. They also will support Intel 8087 and 80287 numeric coprocessors.

The revamped 1-2-3's spreadsheet will be compatible with the new Symphony spreadsheet, except for differences in macros and some command-level functions, Kapor said.

Priced at $495, the enhanced 1-2-3 reportedly will feature additional macros, the ability to access MS-DOS without exiting the application, regression analysis and other functions. File translation to and from the current version of 1-2-3 also will be provided.

Customers who purchased 1-2-3 after April 24 will be eligible for a free upgrade, but details of upgrades for current users were not disclosed. The enhanced release will require more than 192K bytes of memory.

Symphony enhancements

Among other enhancements offered by Release 1.1 of Symphony, a Macro Library Manager reportedly will permit users to store macros, numbers, labels and named ranges outside the work sheet.

Available for $695, Release 1.1 also includes a file translation facility for moving Symphony files to 1-2-3. Additionally, the installation, documentation and tutorial reportedly have been redesigned to make Symphony easier to learn.

Release 1.1 of Symphony requires 384K bytes of internal memory and runs on the IBM Personal Computer line, Compaq Computer Corp. systems and the AT&T Model 6300 Personal Computer. Upgrades for current Symphony owners will cost $75.

While Lotus did not announce versions for specific local-area network products, the packages "will provide support for [MS-DOS] 3.1 networks in the form of remote file access and support for printing devices attached to the network," Kapor said.

Micro-mainframe package

Symphony Link, which Lotus President James Manzi called "the backbone of our entire 3270 environment strategy," is a micro-to-mainframe package designed for use with Digital Communications Associates, Inc.'s Irma board.

Priced at $395, the add-on software reportedly provides IBM 3278 Model 9 emulation within the Symphony environment, complete with menus and Help screens. It also gives "the ability to directly capture mainframe screen information into a work sheet," Kapor said.

Symphony Link runs on an IBM Personal Computer, Personal Computer XT or AT with 512K bytes of internal memory.

None of the software was demonstrated at the announcement.

Lotus is headquartered at 55 Cambridge Pkwy., Cambridge, Mass. 02142.

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Arco MIS finds hidden bonus in end-user computing

Chemical firm gets fresh viewpoint on 'dirty' data

By John Desmond
CW Staff

PHILADELPHIA — Soon after Arco Chemical Co. gave its end users access to production data in 1983, an Arco financial reporting manager tried to call maintenance expense data from nationwide Arco plants to his screen.

But John Faulhaber found the data was unavailable, and he wanted to know why. From the inquiry of this management end-user with no previous computer experience, Arco's information center manager Carl Weber learned something about his production data. "Faulhaber began to see problems deep down in the data that were always there, but we never knew it," Weber said.

Consultants said this fresh viewpoint on old and sometimes "dirty" production data is an unexpected benefit of end-user computing.

One consultant said that when end users begin gaining access to production data, DP professionals become motivated to police that data. "User departments are in a position to look at the data and say there is a problem," said Nancy Kaivila, end-user support manager for the Computer Task Group, Inc., a Buffalo, N.Y.-based systems development consulting firm.

According to Kenneth G. Rau, a partner in the Woburn, Mass.-based Winchester Consulting Group, as end-user computing grows, "the analyst types, as opposed to the technicians, will be able to get their hands on the data and make changes."

Larry DeBoever, president of Linkware Corp. of Waltham, Mass., a micro-mainframe link vendor, seconded the notion that end-user computing promotes cleaner mainframe data. "You're seeing the first seeds of a trend that will grow over time. This will almost force the opening of a dialogue between the end user and the DP manager," he said.

Kaivila

That dialogue took place at Arco, where Faulhaber and Weber said they arrived at a solution together. Arco uses Information Builders, Inc.'s Focus retrieval tool to make its IBM IMS data base easier for users to access. Arco has nearly 100 end users accessing data from IBM 3081 and 3033 mainframes.

Faulhaber was using Focus to view production data when he made his observation. "Focus enabled Faulhaber to shift his perspective and to take more of a top-level view of the company operations," Weber said. "When he tried to do so, the data was not well structured for that purpose."

Weber said that since the beginning of DP at Arco, the data had been inconsistently structured across Cobol applications, so that each plant listed maintenance expenses in different accounts. The only way to compare plant expenses directly was to write a program to do so — an impractical job. Since Faulhaber made his suggestion, the giant chemical company has changed the structure of data in its dispersed and inconsistent applications so that Faulhaber's query and others like it can be answered.

Both Arco managers said the impact on the company has been extensive. Arco has used the data in applications and analyses to reduce expenses, to cut time-shared processing needs and to improve its mix of clients and products in the marketing area. Weber estimated that the applications have generated tens of millions of dollars in income and cost reductions for Arco. "It all adds up," he said.

By querying the data base to analyze products sold, Arco sales managers can now cut sales efforts on less profitable products and concentrate on those with greater profit margins. Arco now offers discounts based on sales volume to distributors, which obtain a list of customers by size from the data base. Such applications were never tried before because the programming costs could not be justified, and users would have to wait too long for the applications, according to Weber.

Micro links result in mainframe applications enhancements

Since being linked to mainframe data bases with micro-mainframe software, end users at two firms have enhanced mainframe applications with the help of information center professionals.

Fidelity Systems Co., a Boston investment firm, uses Linkware Corp. software to link micro users to an IBM 3033 under VM/CMS. Frank Diasparra, vice-president of systems engineering, and his staff are responsible for overseeing nearly two million shareholder activity accounts. Funds managers must be able to move money from account to account on a real-time basis and track money invested in a variety of accounts, so Diasparra's unit needed access to production data.

Fidelity copies a controlled extract of its production data into a service processor. Users on the micro-mainframe link access the controlled extract rather than live production data. Data is downloaded to IBM Personal Computers running Lotus Development Corp.'s 1-2-3 spreadsheet software to produce graphs and reports. The micro-mainframe link cut the time needed to produce the reports from hours to minutes, Diasparra said.

"The good news was that the users found a way to build effective reporting tools using the personal computers," Diasparra said. But the users soon found they needed new reporting requirements. "They saw the power of the product, and the focus immediately shifted to getting the reports out more quickly."

Working with the information center staff, the users devised more sophisticated Lotus spreadsheet reports, such as cash projections by type of fund. Diasparra said applications are continually revised as users work with the DP professionals.

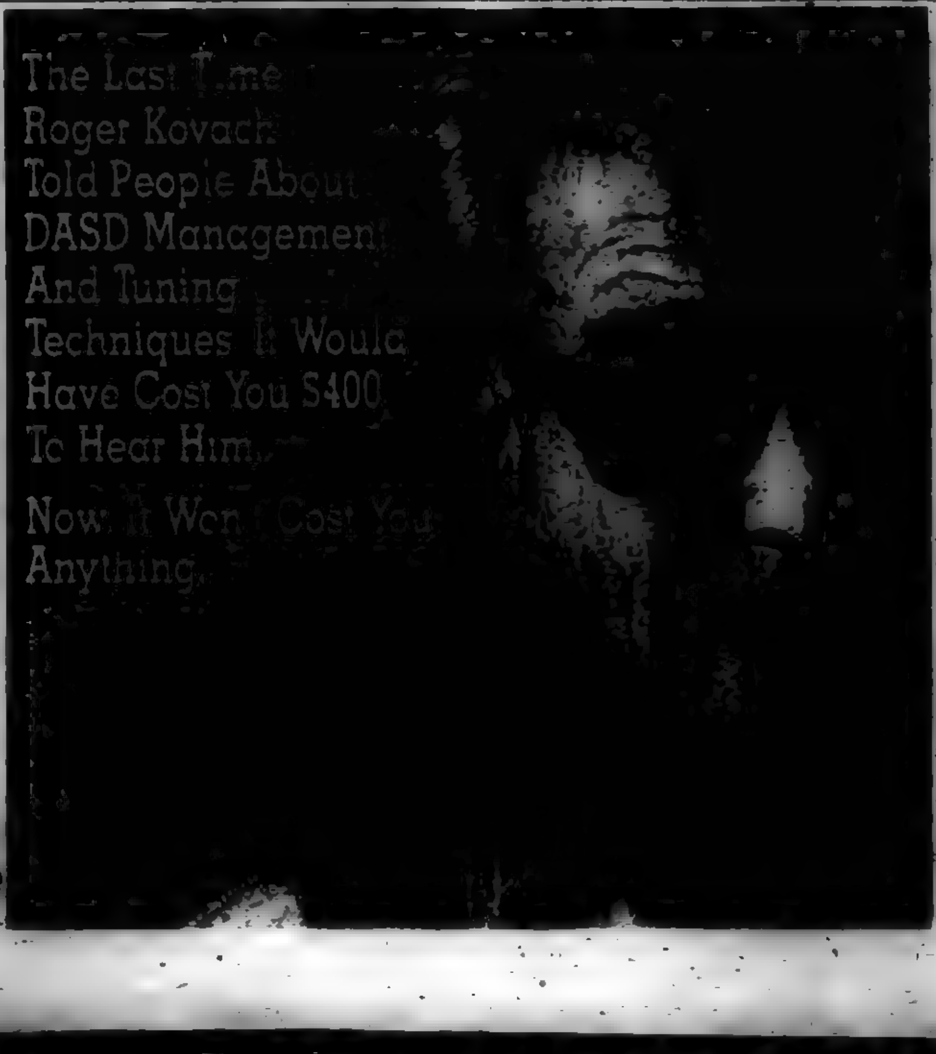
'The good news was that the users found a way to build effective reporting tools using the [micros]'
— Frank Diasparra
Fidelity Systems Co.

End users reaped similar benefits at Philadelphia Life Insurance Co., where information center end users have IBM Personal Computers emulating 3270 terminals linked to the company's IBM 3083 mainframe.

Information center analyst Tom Peterson said that whenever any agent needed mailing labels, the data center would run a batch program to print labels for every agent.

Users came up with the idea of downloading data to micros and printing labels only as needed in a specific state or region. Peterson projects a $40,000 annual savings from the suggestion.

— John Desmond



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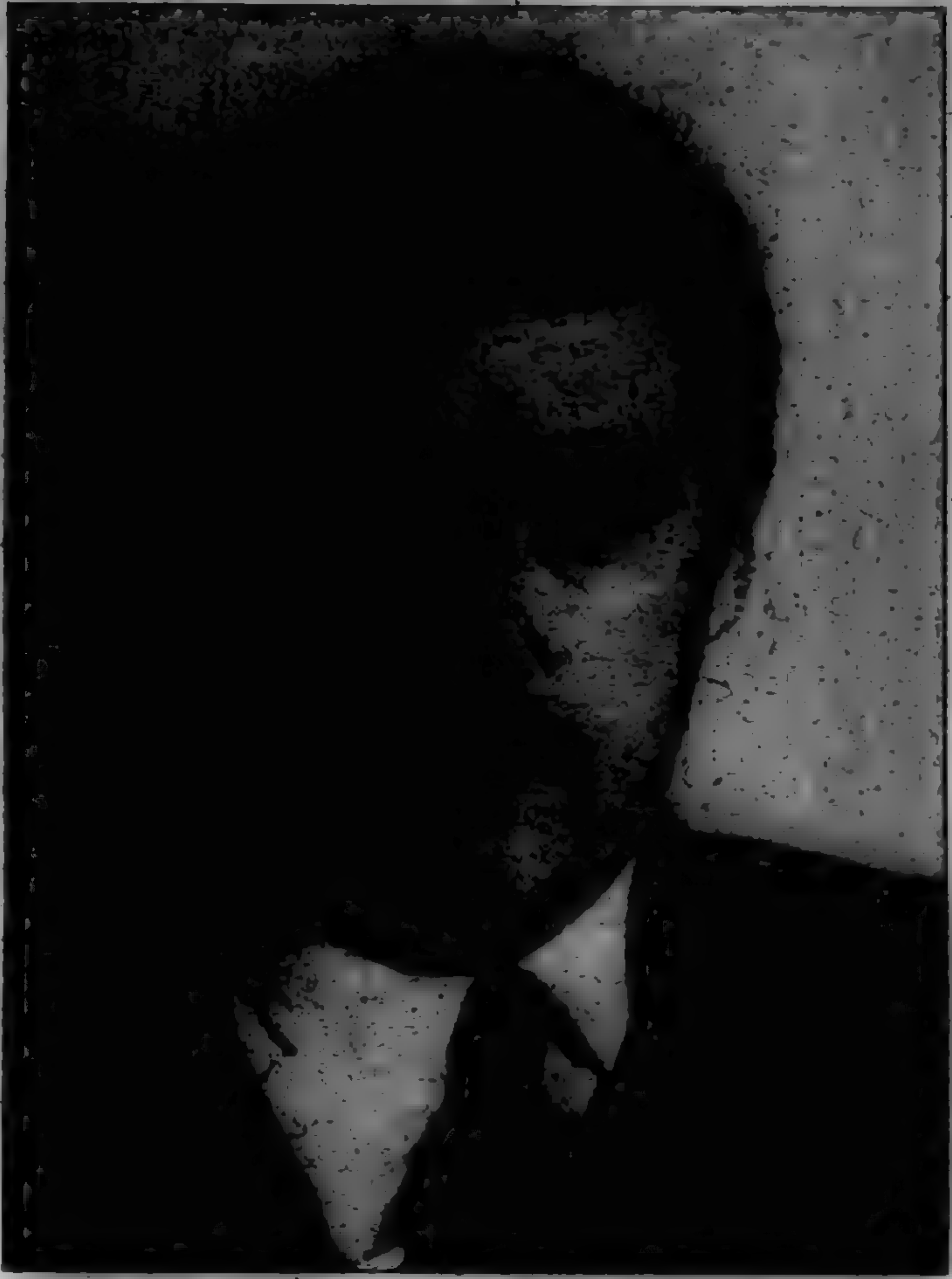
JOHN CULLINANE

On the Information Center Strategy

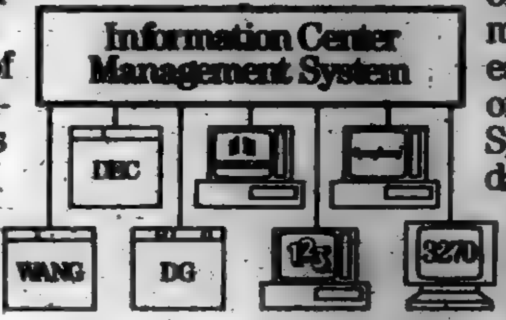


Today, virtually every IBM mainframe user is attempting to implement an information center. Formulating a successful information system strategy for the 80's and 90's requires it.

However, one of the major problems many companies face is the variety of software and databases located on different mainframes, departmental minis and personal computers. The challenge is to create an environment that integrates this diversity, is responsive to the corporate user community in meeting its information needs and, most importantly, provides access that is consistent and transparent. This is why open system architecture is key in implementing an information center strategy.

> "Open system architecture is key in implementing an information center strategy."

It also makes particular sense for a software company like Cullinet to adopt a policy of open system architecture that allows corporations to standardize on Cullinet's products without losing a significant investment in other vendors' products—whether they are mainframe applications, microcomputer software such as Lotus 1-2-3, Symphony and other PC products or departmental minis from companies like Digital, Data General, Wang, Hewlett-Packard and others.



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For more information about the Information Center Management System and the full range of Cullinet products, I encourage you to phone, toll-free, 1-800-225-9930. In Massachusetts, the number is 617-329-7700.

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Cullinet

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IDC

from page 1

The survey also reported the following:

- Large system users are growing faster. Some 10% of 3080 series sites are expected to increase processing power more than 50% per year.
- The installed base of personal computers at the large-scale processor sites is expected to increase some 60% in 1985.
- Forty-eight percent of respondents indicated that personal computers will be responsible for increased demand for mainframe power; 30% said the micros will have no effect.
- Megabytes of installed disk storage will increase 30% in 1985.
- Users continue to embrace IBM's Systems Network Architecture (SNA) across all CPU sizes in 1984. Some 40% of all 370 architecture sites now support SNA; for 3080-class sites, SNA penetration is 80%.

Larger system users are more likely to be SNA users, the survey found. SNA is used by 80% of 3081 and 3084 users and by 21.1% of 4361 users.

- Optical storage is up and coming, the survey found. The use of optical storage by 3081 and 3084 users is planned to increase by 22% for new applications.
- The installed base of 3084 mainframes, first shipped in 1983, will more than double — from 210 in 1984 to 550 in 1985, according to IDC.

IDC projected that from 1984 to 1985, 3081 installations will grow from 1,700 to 1,980; 3083 installations will increase from 1,860 to 2,070; and 3090 installations will reach 200 in the system's first year of scheduled shipping.

The survey showed IBM's MVS/XA strategic operating system is used by 62% of 3084 users, 45.6% of 3081 users and 23.4% of 3083 users.

Increase in upgrades

A strong year for field upgrades was projected by IDC. In the 3083 family, 26.5% of users plan to upgrade in 1985, compared with 24.4% in 1984.

An upgrade from a 3083 to a 3081 is planned by 13.9% of users in 1985, up from 5.6% in 1984. An upgrade from a 3081 to a 3084 is planned by 17.3% of those surveyed, compared with 16.8% in 1984.

The largest percentage of users with plans to increase on-line storage capacity were 3081 and 3084 users. Of those, 48% plan to increase capacity up to 50% over three years. The same mainframe users plan to increase reels in their tape libraries by 60% over three years.

The migration path for disk drives is toward the IBM 3380 and away from the 3330. IDC found a 41% decrease in 3330 installations and a 56% increase in 3380 installations. (The survey predated IBM's announcement of the double-density 3380 drive.) In 1985, IDC projected installations of 12,520 3380 spindles, 9,238 3350 spindles and 1,207 3330 spindles.

Fewer personal computers are stand-alone units, according to the survey. The number of installed personal computers is projected to increase from 30,600 in 1984 to 48,575 in 1985. But the number of installed stand-alone personal computers was projected to decrease from 78% in 1984 to 63% in 1985. Few terminals are dedicated to a single application, and few make use of color or graphics, according to the study. The primary terminal applications reported were inquiry/response, 36.7%, and data entry, 31.7%.

Models	Less than 10%	10% to 25%	25% to 50%	50%+	No response
4361 Class	21.5%	45.8%	23.8%	5.3%	3.7%
3081, 3084 Class	10.3%	38.3%	35.0%	9.5%	7.4%

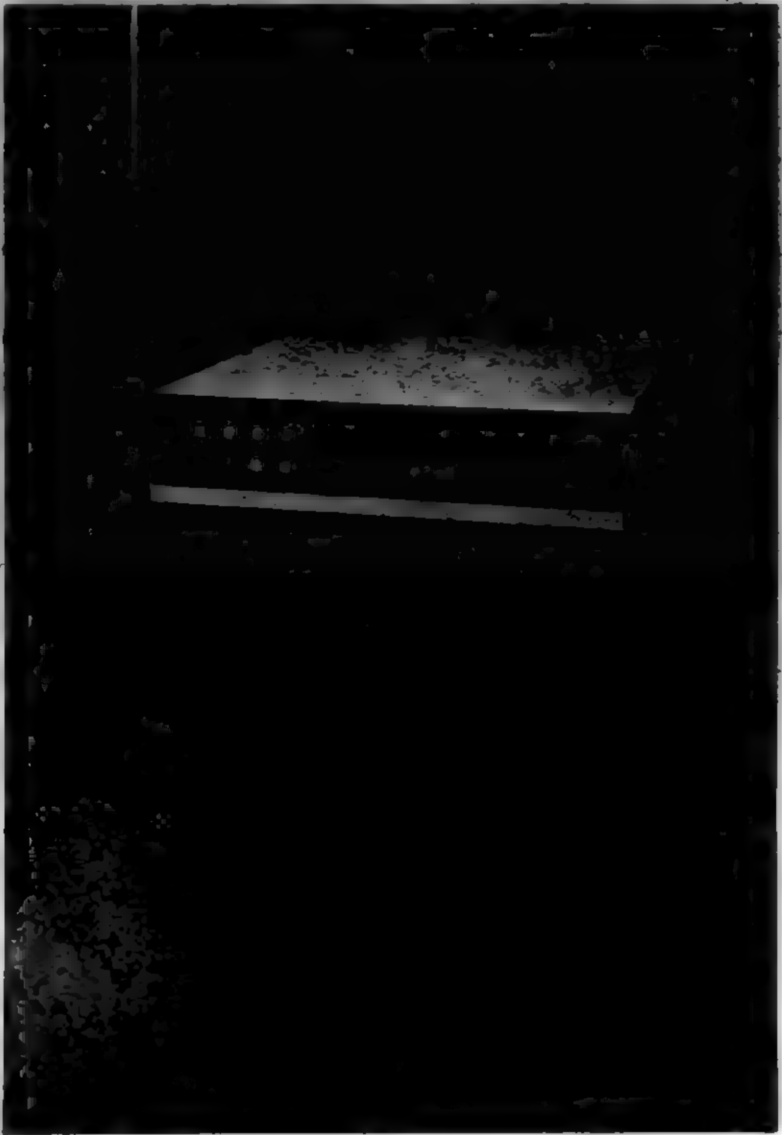
Migration to larger systems down

In the 1983 migration survey, IDC found that 22% of users planned to migrate to a larger machine, whereas 28% had such plans in 1981. The current survey shows that 26% of sites will be adding or replacing processors in 1985.

The large-scale systems market grew at an 8.1% rate in 1984, according to IDC. IDC projected a 4% to 5% growth rate in 1985 and a rebound year in 1986 with an 11% to 15% growth.

Describing the contrast between the survey's optimistic outlook and the current industry downturn, an IDC spokesman said, "The reason the mainframe manufacturers are slow is because they're between product cycles, not because there is no demand." A number of new mainframes have been announced in the past several months but have yet to be shipped by their companies, the spokesman noted.

"1985 IBM Migration Survey and Large-Scale Systems Market Data," is available for $795 from IDC, which is located at Five Speen St., Framingham, Mass. 01701.



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Corona, Televideo, Zenith unwrap IBM AT compatibles

By Edward Warner
CW Staff

The number of IBM Personal Computer AT compatibles doubled last week with announcements by Corona Data Systems, Inc., Zenith Data Systems and Televideo Systems, Inc. of personal computers using the Intel Corp. 80286 microprocessor, the high-speed heart of the AT.

The 80286 chip used in the Televideo AT, however, reportedly operates at 8 MHz, a full 2 MHz faster than the speed of the 80286 chip in the Personal Computer AT and the AT compatibles from Zenith and Corona. A switch in the Televideo AT slows the 80286 chip to 6 MHz to run timing-dependent Personal Computer AT software.

Zenith's Z-200 is said to incorporate "no wait-states" technology, eliminating what John P. Frank, Zenith's marketing vice-president, said were the processing delays built into the Personal Computer AT.

Corona's machine is a 38-lb unit that the company said is the first AT-compatible transportable. The Corona AT Transportable comes with a built-in, 9-in., green-screen monochrome monitor and a color/monochrome video graphics card that reportedly allows it to support an optional color monitor.

Like IBM's Personal Computer AT, the machines reportedly will be offered in standard and enhanced editions, the latter models with 20M-byte hard disks.

Corona's standard machine, the ATP-6-QD, is said to offer one 1.2M-byte drive, one 360K-byte drive, 512K bytes of memory and a price of $4,500. The enhanced version, the ATP-6-Q20, comes with 512K bytes of memory, one 1.2M-byte drive and a $5,500 price tag. Deliveries for both will begin in July.

Corona Data Systems is located at 31324 Via Colinas, Westlake Village, Calif. 91361.

The standard Zenith Z-200, priced at $3,999, reportedly comes with 512K bytes of random-access memory (RAM), expandable to 16M bytes, one 1.2M-byte diskette drive, six AT-compatible expansion slots and Microsoft Corp.'s MS-DOS 3.1. An enhanced version is offered for $5,599.

Zenith Data Systems is located at 1000 Milwaukee Ave., Glenview, Ill. 60025.

The Televideo AT, priced at $3,400 in its standard version, is offered with 256K bytes of memory, a 1.2M-byte diskette drive, a clock/calendar with battery backup, an RS-232 serial port, a parallel printer port and eight bus expansion slots. The enhanced version, priced at $4,995, reportedly comes with 512K bytes of memory. Both machines will ship in July, Televideo said.

Televideo Systems is located at 1170 Morse Ave., Sunnyvale, Calif. 94086.

Televideo claimed another performance advantage over the Personal Computer AT in its use of a special disk controller in the enhanced Televideo AT. That controller has twin buffers that reportedly permit it to read data from one disk track in one pass.

The 20M-byte hard disk in the enhanced version of the Zenith Z-200 reportedly has a 40-msec access time, which is the same as that of the Personal Computer AT.

> "
>
> *The Personal Computer AT's processing delays occur because its microprocessor operates faster than its custom 256K-bit RAM chips.*

Zenith's Frank said that the Personal Computer AT's processing delays occur because its microprocessor operates faster than its custom 256K-bit RAM chips. The Zenith machine, he said, uses 256K-bit "fast chips," eliminating the problem and allowing the Z-200 to expand memory in 1.5M-byte blocks. "To get 3M bytes [of RAM], IBM would have to use all of its AT slots," he claimed, adding that the Z-200 can reach 3M bytes with two slots to spare.

All of the AT-compatibles claim to use keyboards offering design advantages over the keyboard of the Personal Computer AT. The Corona machine's keyboard is said to include number and cap lock keys and an interface to the IBM Personal Computer XT. Televideo has placed LEDs directly on the scroll, caps and numeric lock keys, rather than using the Personal Computer AT strategy of placing the LEDs on the keyboard case itself. The frequently used keys of the Z-200's keyboard, meanwhile, have reportedly been enlarged to avoid data entry errors.

All three of the AT-compatibles reportedly will be shown at the Comdex '85 show next month in Atlanta. Personal Computers claiming AT compatibility have already been introduced by ITT, Kaypro Corp. and Texas Instruments, Inc.

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NEWS

Cincom offers Mantis for DEC's VAX, enhances TIS

CW AT INTERACT '85

By Maura McEnaney
CW Staff

CINCINNATI — In a move confirming its belief in the growing importance of departmental systems, Cincom Systems, Inc. last week announced that its Mantis fourth-generation language-based applications development system now runs on Digital Equipment Corp.'s VAX systems.

Cincom also announced an enhanced version of its TIS, including its relational data base management system, that makes the product available to IBM DOS users for the first time.

The announcements were made at Interact '85, Cincom's annual users group meeting at the Hyatt Regency Hotel here.

Formerly available for IBM OS, DOS and CMS environments and Wang Laboratories, Inc.'s VS operating system, Mantis, now out for the VAX, is fully integrated with Cincom's Ultra Interactive DBMS for the VAX environment, according to a Cincom spokesman said.

The DEC version of Mantis incorporates all of the features of Mantis' IBM and Wang versions, including an interactive program development module that allows users to design prototypes, screens, prompts, files, interfaces and programs.

It supports dynamic Mantis files, DEC's RMS files and Cincom's Ultra files. All files can be accessed by Mantis using the same verb commands found in Mantis' data manipulation language.

Mantis for the VAX includes a VAX/VMS full screen editor that allows users to program the Mantis line editor or the VAX editor. Users can access the VAX editor from a programming mode, the spokesman said.

The product also includes a migration utility that lets users move Mantis entities between IBM and VAX environments. The utility performs necessary Ascii and Ebcdic translations, numeric conversions, selected code conversions and record format conversions, the vendor said.

Mantis can be purchased as a stand-alone product or in conjunction with Cincom's Ultra. Pricing is based on configuration and ranges from $16,000 for Mantis on the VAX-11/730 to $89,000 for Mantis and Ultra on the VAX 8600.

Cincom announced that Release 2.0 of TIS data base products, including its relational DBMS, now supports IBM's DOS environment.

Formerly available for IBM MVS, MVS/XA and VS1 operating systems, TIS 2.0 consists of Cincom's Logical User View (LUV), which is said to insulate programmers and end users from physical changes in the DBMS. It includes the In-Line Directory containing information about data base descriptions, data sets, user and logical views; the TIS Relational Data Base Manager; TIS Relational Data Manipulation Language; and the TIS Intelligent Query facility. TIS 2.0 also incorporates Cincom's Mantis fourth-generation language.

Other enhancements to the product include concurrent update protection at the record level and new space management facilities. DBMS enhancements allow users to access standard Vsam files using other Cincom applications tools without having to reload data to data base files, the vendor said.

TIS 2.0 is priced between $150,000 and $200,000, depending on options and configurations.

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IBM admits using outdated repair data

By Clinton Wilder
CW Staff

ROANOKE, Va. — In court documents filed here, IBM admitted it used outdated inventory information on repair parts when servicing customers in the South until early 1980. IBM, however, refused to say that the erroneous information resulted in overcharges to its customers.

The admission was included in the company's response to a $600,000 lawsuit filed by a former IBM employee in February in U.S. District Court here. Bobby L. Buck, formerly an IBM customer engineer based in Mobile, Ala., has alleged that IBM adopted his solution to the inventory time-lag problem without crediting or rewarding him.

Buck claimed that IBM's parts locator system at its regional District 6 office in Atlanta ran two to four weeks behind in listing inventories at the district's branch offices. Customer engineers from the branch offices allegedly had to rely on the outdated information in Atlanta to request parts availability for after-hours and weekend service calls.

Buck said most of the allegedly unnecessary cost of shipping parts not tracked by the parts locator was borne by IBM because of the terms of maintenance contracts. Customers without those contracts, however, had to bear the added expense of shipping the part by air from Atlanta, according to Buck's attorneys.

Responding to the allegations, IBM attorney G. H. Gromel Jr. wrote, "IBM admits that prior to sometime in February 1980, its parts locator used by the Atlanta Dispatch Center would be outdated to some degree almost from the time it was prepared."

Gromel wrote that IBM "is without sufficient knowledge or information to form an opinion" on Buck's allegation that shipping costs were passed on to some IBM customers.

Wang unveils gateways to IBM office, net products

BRUSSELS — Wang Laboratories, Inc. opened the floodgates last week with the introduction of nine communications products, the most important of which enables documents to be passed between and revised on Wang and IBM systems.

Announced at its executive briefing center in Brussels, the products include the Wang Office/Disoss Gateway, Wang VS Profs Gateway, Wang VS/SNA Gateway, PC SNA 3270 Network, Distributed Management Facility, X.25 General Access Interface, X.3 PAD Emulation Facility, Network Applications Interface and Wangnet Shared Interconnect Modem Service.

The Wang Office/Disoss Gateway reportedly enables editable documents to be passed between Wang and IBM systems with the IBM Distributed Office Support System (Disoss).

Wang gateway

The gateway — which wraps IBM's Document Interchange Architecture protocol around the information to be exchanged — is said to enable users to file, search and retrieve Wang documents in a Disoss library. Access to the function is provided through a menu option on the Wang Office main menu, the company reported.

Available in the first quarter of 1986, the Wang VS and IBM host software components each cost $3,000.

Wang's VS Profs Gateway is said to be an optional feature of the Wang Office, providing VS users with direct access to document libraries within IBM's Professional Office System (Profs).

Document exchange

The gateway performs a number of document exchange functions, including transmitting VS documents to and from specific IBM Profs users and cross-referencing word processing document numbers with Profs document numbers, Wang reported. Additionally, the gateway enables users to determine the status of document processing to maintain user profile records.

The IBM host software for Profs Gateway has a $40,000 license fee, and the VS software costs $2,000. Both are scheduled to be available in the fourth quarter.

The Wang VS/SNA Gateway is said to run on all Wang VS systems, enabling a single VS on a Wang Systems Network (WSN) to act as a network concetrator for Systems Network Architecture (SNA) access. All Wang systems on the WSN can then share SNA resources without requiring each device to have an individual SNA link. The gateway, available in September, costs $1,000 and $600 per link end.

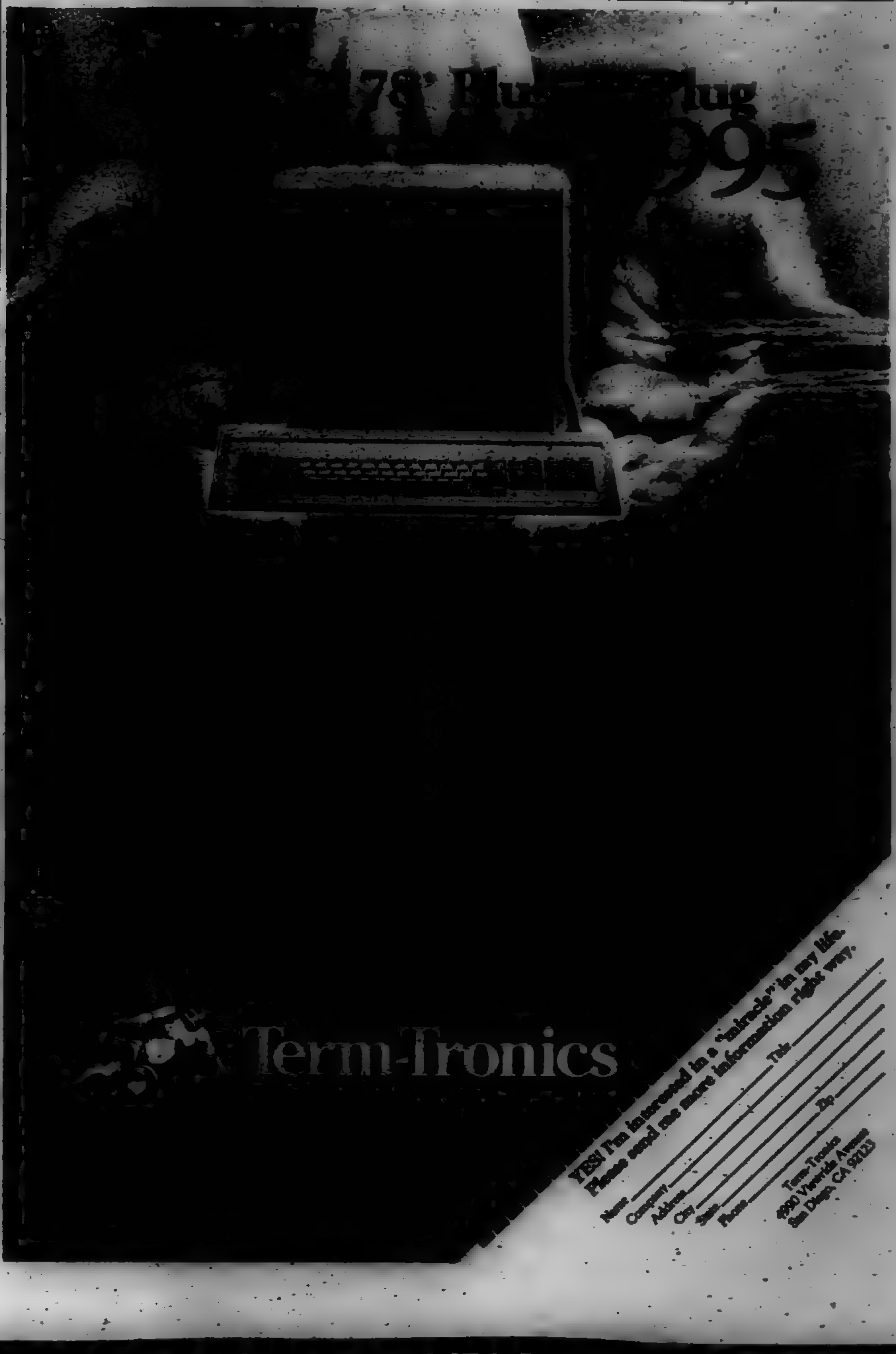
The PC SNA 3270 Network provides a similar function for Wang Professional computers. With the product, a Wang micro on a local network can emulate an IBM 3278 Model 2 workstation and can enable other Wang Professionals on the net to pass through it.

Available in September, the product costs $795 for each 3270 board and $395 for each gateway node board.

Wang's Distribued Management Facility (DMF) is said to enable central site network management for WSN networks and provide the foundation for future Wang management products.

DMF functions include logging and report activities, network data base management, control over network components, interactive access to remote system information and administrative functions. Scheduled to be shipped in July, the standard version of DMF costs $1,500. An optional SNA monitor will be available in September for $1,500; a Wangnet management facility will cost between $17,000 and $24,000 and will be available in September.

Other announcements included the WSN X.25 General Access interface for packet-switched networks supporting the X.25 interface, which will be available in August for $1,000.



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Security pro calls risk analysis reports waste of money

CW AT DP EXPO

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — In a presentation at the 11th Annual Federal DP Expo & Conference here last week, Adolph Cecula made a case for abandoning the government requirement that U.S. agencies prepare formal risk analysis reports on their computer security vulnerabilities.

Cecula, information security administrator for the U.S. Geological Survey (USGS) in Reston, Va., criticized the formal risk analysis approach, which typically uses a mathematical model to calculate the annual cost of possible disasters or security breaches. He said it is very time consuming and expensive, diverts the DP staff from actual risk management and mostly enriches the consultants hired to produce the report.

"I think it's about time we stop wasting money on studies of risk analysis. Instead, spend that money on protecting our information assets," Cecula said.

His paper on the subject received the Hammer Award, presented by computer scientist Carl Hammer, for the best paper at the conference.

Product of guesswork

Cecula said thousands of security professionals have been struggling for 10 years to improve the risk analysis process, without success. Often the calculations are the product of guesswork, he said, because of the difficulty of considering all possible disasters that could befall a computer system or a bevy of micros.

"You're almost pulling numbers out of the air" to plug into the mathematical model, Cecula said, referring to this as "garbage in, garbage out."

Cecula

"After you've done four or five risk analyses, you find that all of your recommendations look the same for similar systems. . . . A formal risk analysis isn't going to tell you anything new," Cecula asserted.

The alternative, he said, is a multifaceted program designed to protect the agency's information assets. At the USGS, a key part of this program is a questionnaire sent to program managers that lists vulnerabilities and then requires managers to state whether they accept a particular risk or are taking action to mitigate it.

"We require people to identify the owners of the computers, the applications, the data bases and the networks. They're held accountable for the protection of those assets," Cecula said.

Minimum security standards, such as off-site backups and documented emergency procedures, are incorporated into manuals distributed to employees, he said.

For systems that need more security than this baseline protection, Cecula said, the USGS uses a structured decision tree process to define security requirements.

Ultimately, the real test of security comes when disasters or hackers strike, he said, adding that "our program has been tested, and it has passed."

He said the USGS has experienced fires, floods, water leakage, disgruntled employees, power problems, unauthorized entry into computer rooms and hackers, but has had virtually no damage to its information assets.

OMB official backs agency's cost review rule

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Office of Management and Budget's (OMB) controversial Circular A-76, a document that requires federal agencies to use private-sector DP services when it is cost-effective, was strongly defended by an OMB official at the 11th Annual Federal DP Expo & Conference last week.

The policy is highly unpopular among the federal DP workers whose jobs are threatened. But David L. Muzio, deputy associate administrator of the OMB's procurement office, maintained that Circular A-76 is a "productivity tool" that encourages federal managers to use innovative methods to provide DP services at lower costs.

Circular A-76 requires federal agencies to review all their support functions, including DP services, to

See OMB page 15

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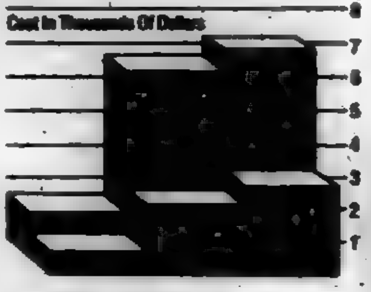

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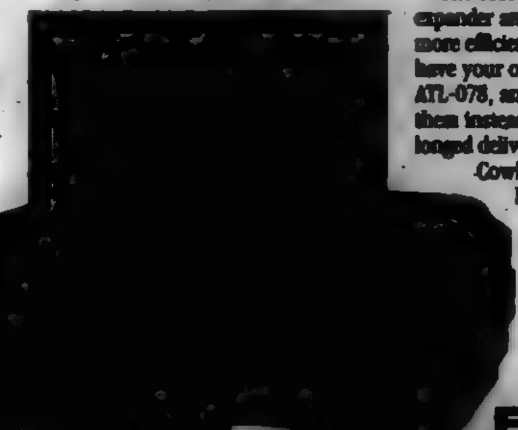

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NFL drafts superminis to link teams to league office

By John Desmond
CW Staff

NEW YORK — When the National Football League (NFL) draft is held at the Omni Center Hotel here tomorrow, sports reporters nationwide will appreciate the fact that NFL headquarters has added two Digital Equipment Corp. VAX-11/780 superminicomputers in the past year.

For the first time, reporters will be instantly supplied with reports listing which players were selected in each round. Prior to and during the season, the system will generate reports on what players have been cut or placed on injured reserve lists. Statistical analyses for use in subsequent player drafts will be made available once the ongoing VAX installation is complete. The new reports are made possible by more diversified DEC software than that running on the NFL's DEC PDP-11/70, which remains in place.

According to Mary Olivati, manager of information processing at the NFL, "We're upgrading the types of programs we have and are adding more functionality to them." But the overall aim of the NFL's processor migration is to improve communications within the NFL, not so much with the outside world. The benefit to reporters is a bonus. "Our intent is to connect each club with the main league office and utilize the electronic mail system" of the VAX-11/780s, Olivati said.

Establishing a link with each club's headquarters will not be a simple task, since many types of hardware are involved. "We chose DEC [equipment for the NFL headquarters] because of its ability to communicate with other hardware," Olivati said. A decision has yet to be made on whether dial-up or leased lines will be used to link NFL offices, she said.

The NFL decided to wait for Release 4.0 of DEC's VMS operating system to become available before having the VAX-11/780s delivered. Thus, the original timetable of completing the installation by this year's draft was pushed back. The advantage of VMS 4.0 is its ability to take advantage of clustered processors and shared disk drives, according to Olivati. The league has also purchased DEC's All-in-1 office and information systems software.

The NFL is more than doubling its installed capacity by adding the two VAX-11/780s. The capacity is needed to handle data processing and office automation functions.

The most labor-intensive aspect of the migration has been programming. Olivati said 500 Cobol programs, written since the league acquired its PDP-11 in 1979, had to be converted for use on the VAXs. As of last week, the task begun in January was 80% complete, she said.

OMB

from page 14

determine if it would be more cost-effective to have them done in-house or by contracting out to private firms. The Reagan administration has given high priority to the program and identified data processing as a major target.

Muzio addressed a conference session called "Private Sector DP Services: Solution or Headache?" — a title he said he disliked.

'A productivity tool'

If federal DP managers can bring their costs down to the level of private-sector DP service vendors, Muzio explained, they can avoid contracting out. "[The] OMB has been unable to communicate to the federal work force that A-76 is not contracting out, but is a productivity tool," he said.

According to Muzio, Circular A-76 puts federal DP managers in competition with the private sector to provide computer services to their clients. He said federal managers are capable of meeting the competitive challenge if they discard old ways of operating and try innovative approaches.

"They ought to be able to win most of the [Circular A-76] reviews," Muzio said.

He added that 40% of the A-76 reviews are now won by federal workers, compared with 40% several years ago.

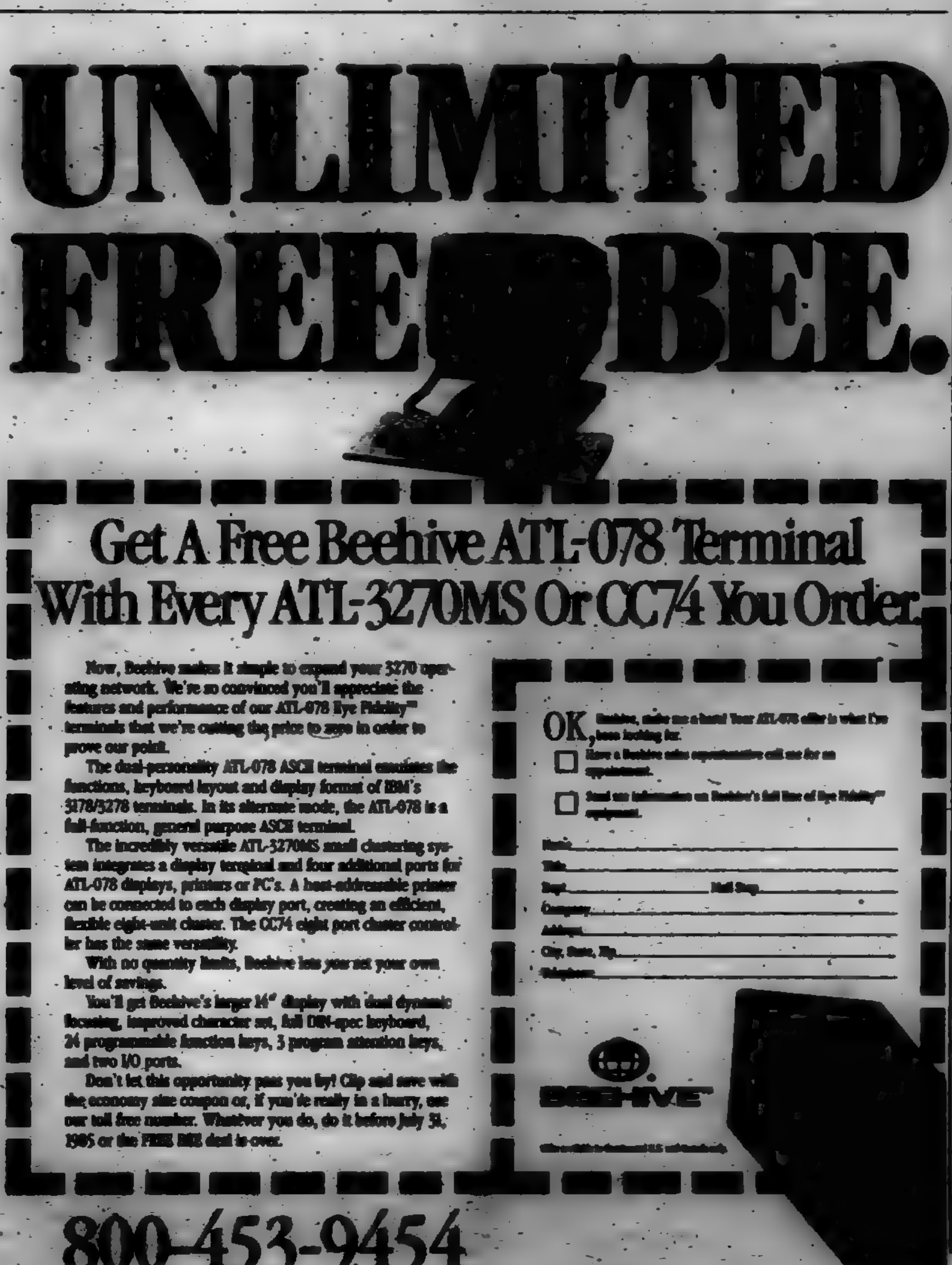
'Taxpayer deserves that break'

Muzio did not specify what innovative steps DP managers could take to compete with private vendors, but he noted that government offices generally must reduce their staffs and salaries to be competitive. "We think the taxpayer deserves that break," he said.

Paula R. Ewen, a computer specialist at the U.S. Department of Transportation, said she conducted two A-76 reviews, and in both cases, the DP services were contracted out. In one case, 32 government jobs were cut and $548,000 was saved in a three-year period.

In the other case, Ewen said, 80 government jobs were cut and $2.2 million was saved in a four-year period.

She urged federal managers to get employees excited about competing with the private sector in order to encourage innovative ideas about providing better DP services at lower costs.



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Manufacturing firm puts wrap on report distribution

By [illegible]
CW Staff

FRAMINGHAM, Mass. — A supermarket meat-wrapping machine inspired the solution to report distribution problems in a company here recently.

The Dennison Manufacturing Co. had rejuvenated its report distribution process during the past few months but had not come up with the final bit of the distribution puzzle, said Gary Kelley, manager of user services at Dennison Manufacturing here — not, that is, until Kelley took a walk through a supermarket.

Dennison produced five million custom forms and used 12.8 million sheets of stock computer paper for reports in 1984, Kelley said. In addition, 1.5 million sheets of paper were printed on an outside service bureau's laser printer at a cost of $34,000 per year, he said. "You could loop the paper we used in one day over Mt. Everest," he said.

Two IBM 3203 Model 5 impact printers (technology circa 1965) produced reports at Dennison's main office that then had to be separated, addressed and distributed to Dennison divisions around the country, Kelley said. "We wanted to be able to print at remote locations, such as Crossville, Tenn., where we have a plant," he said, and overnight deliveries were insufficient.

The company had installed a batch report distribution system that was not meeting its needs when it heard about a software package called VS Dispatch, developed by Value Software, Inc. of Cherry Hill, N.J. The on-line software allowed Dennison to distribute reports to many different plants at the same time for printing at remote locations, Kelley said.

CW PHOTO BY DONNA [illegible]

Shrink-wrap operation

VS Dispatch, which costs $32,000, continually looks at the MVS operating system and the JES2 print queue for any jobs of a particular classification and it builds bundles according to mail drop location, he said.

Before the new system, if user A and user B wanted different portions of a report but had some overlap in what they needed, the report would be printed on two-part paper, separated and distributed, Kelley said. "We threw away 22 30-gal. drums of paper a day in waste," he said. The manual labor was heavy and error prone, he said.

The new system directs the printer to print only what is needed for each person, Kelley said. It prints the user name and location in bold letters on the report, he added.

If a user calls and wants to know where his report is, Kelley can find out where in the print process it is, he said, by logging on and looking the file up on line.

When reports are finished, they are automatically archived onto tape, which Kelley keeps for a month, he said. Dennison has saved $86,000 in rerunning costs because of the archiving system, he said. "If somebody spills coffee on his report, loses it in the mail or just wants an additional copy, we pull it in from tape and print it again," he said.

After solving that part of the report generation problem, Kelley looked at the printers themselves and decided that they were inadequate. He called in IBM, who told him that his company did not have enough volume to justify bringing in the IBM laser printer, he said. He also could not justify $244,000 for a Xerox Corp. laser printer, he said, but he looked around and found a Royal Business Machines, Inc. Royal 8800 ion deposition printer (which is a Delphax Systems S6000 printer) that would meet his needs and costs $82,000.

The company installed the 60 page/min, cut-sheet printer and uses three-hole copier paper in it, Kelley said. The machine, based on a cold fusion ion deposition process in which chemicals instead of heat are used to bond toner onto pages, requires no special air-conditioning and sits out in a hall, he said.

When report generation and printing were taken care of, Kelley thought it was silly that people were still stuffing the already-addressed reports into envelopes and readdressing them, he said. He mulled the problem over without finding a proper solution, he said, until he went shopping in a supermarket one day and saw a meat wrapping machine in action. "I had no idea what the cost would be or if it would be worth it," he said, but he made calls and discovered he could get a shrink-wrap machine from Beseler Corp. of Florham Park, N.J., for $4,000.

Now when the reports come off the printer, a staff member puts a piece of cardboard behind the report and runs it through the shrink wrapper, he said. Users have been sending him notes telling him how much they like the new system, he said.

"We haven't put everything on it yet because we've only had it since September," Kelley said. Manufacturing reports, source data collection data, on-line order entry and internal MIS reports are on-line now, and by the end of the year Kelley hopes to have everything else on the system, he said. The 24 copies of the general ledger reports will be cut down to 12 copies when it goes on the system, he said.

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AMA plans conference

SAN FRANCISCO — An American Management Association (AMA) seminar — "Long-Range Information Systems Planning" — will be held at the Ramada Renaissance here June 3-5. The seminar is geared toward vice-presidents and directors of management information systems and DP and executive teams involved in planning information systems.

The seminar, which will also be held at the Back Bay Hilton in Boston on June 17-19, consists of courses in information systems planning, planning techniques and planning documents.

The registration fee is $775 for AMA members, $890 for nonmembers. Team fees are available. More information is available from the AMA, P.O. Box 319, Saranac Lake, N. Y. 12983.

Panel asks: What information should MIS produce?

By Charles Babcock
CW New York Bureau

NEW YORK — Jack E. Schang, chairman of Ryder/PIE Nationwide, said that when his company has a big problem to solve, he tries not to call on MIS.

"If [MIS] gets involved, it will take too long," he explained to business and MIS executives at the two-day seminar, "New Opportunities in Management Information," organized by the Conference Board, a business advisory research group.

"That's a terrible thing to say because I'm supposed to be leading them," added Schang, one of four seminar speakers.

Nevertheless, his comment prompted seminar attendees to question what information MIS should be trying to provide and how quickly.

Irma M. Wyman, vice-president of corporate information management at Honeywell, Inc., said the Internal Revenue Service and Big Eight accounting firms — rather than a business' top executives — have tended to frame the definitions of what information will be available.

'Certifiable antiques'

She called general ledger and other basic business software "certifiable antiques" but said MIS directors run into protests from operating unit managers if they try to implement change.

She charged that the assumptions behind the business are not available as components in these systems, and they rarely offer the opportunity to pose "what-if" questions. "None of these systems was designed to analyze the organization as a whole," she said.

Two other speakers said MIS managers could resolve the dilemma described by Schang and Wyman by redefining the way they look at information.

Because business conditions can change so quickly, MIS needs to pay more attention to external information as well as internal data, noted Jay W. Lorsch, a human relations professor at the Harvard University Business School.

Lorsch said oil company MIS departments were still struggling to provide information on moving oil supplies to market when their top managers had an oversupply on their hands.

Profitability for a company and its competitor needs to be reported, Lorsch said. Traditional market-share data must include information on whether overall markets are expanding or contracting, he said.

MIS also needs to try to quantify internal information that has been supplied by intuition in the past, he continued.

One of the biggest needs is for "systematic information on how top management is doing; some people are good at growing the business, some are good at squeezing and cost cutting," Lorsch said.

To provide this type of information, the MIS manager needs to stop being a technologist concerned with running data-handling machines and become a chief information officer, said Fenwicke W. Holmes, president of the International Academy at Santa Barbara, Calif., a nonprofit institute studying the transition to an information society.

A chief information officer would be able to integrate into reports external data and text explaining what that data means, because the officer would understand the underlying principles of the business, Holmes said.

The officer would be in close communication with top management and understand what information it needed rather than supplying data based on past practice. The officer would participate in strategy planning and "be perceived as being of vice-presidential caliber," Holmes said.

MIS is becoming "the central nervous system" of a business, but too few corporate executives see it that way, Schang said. In some instances, the "vending machine" approach to MIS prevails, Wyman added. "Push the buttons, and if it doesn't deliver, kick it."

Software AG users meet set

NASHVILLE — Software Jamboree, the 14th annual international user's conference, will be held May 19-23 at the Opryland Hotel here.

The conference will feature tutorials and classes on a variety of information management software products from the conference sponsor, Software AG Systems, Inc. Instructors will discuss technical issues relating to vendor products including the Adabas, Natural and Com-Plete software series.

The keynote speaker is NBC News correspondent Edwin Newman. The guest speaker is Carma McClure, software consultant and coauthor of four books on major structured technologies.

Registration fee for the conference is $595. More information is available from Software AG, 11800 Sunrise Valley Drive, Reston, Va. 22091.

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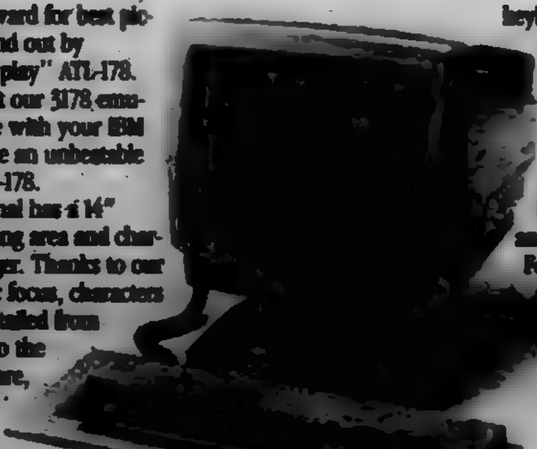

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WASHINGTON UPDATE
Bryan Wilkins
CW Washington Bureau

Bill allows federal agencies to enter multiyear contracts

WASHINGTON, D.C. — U.S. Sen. William S. Cohen (R-Maine) recently introduced legislation that would allow civilian U.S. agencies to enter multiyear contracts for DP equipment and services and therefore take advantage of the price discounts offered with long-term contracts.

Civilian agencies now are restricted to one-year contracts, coinciding with the annual congressional appropriations.

Cohen said the bill (S. 678) permits an agency to enter a multiyear contract if there is a "reasonable expectation" that additional funding will be forthcoming and if a long-term contract benefits the government.

When customers commit to long-term leases, Cohen said, some DP vendors provide discounts ranging from 62% to 75% of the one-year lease rate.

He said a government study found that customers (such as the government) who are restricted to one-year leases have paid as much in two years as other customers pay in five years.

The bill was referred to the Senate Committee on Governmental Affairs. Last year, the U.S. Senate passed the bill by unanimous vote, but it was not enacted by the U.S. House of Representatives.

GSA program to require triennial DP office reviews

WASHINGTON, D.C. — The U.S. General Services Administration (GSA) has established the Federal Information Resources Management Review Program, which requires federal agencies to conduct triennial reviews of their information systems and activities.

As required by the Paperwork Reduction Act of 1980, the reviews will be conducted by each federal agency, supplemented by GSA evaluations, and then submitted to the Office of Management and Budget and to Congress.

The objective is to "determine if each agency is carrying out its information management activities in an efficient, effective and economical manner in support of program missions and objectives," the GSA program regulation said.

U.S. privacy policy board proposed by House bill

WASHINGTON, D.C. — A bill to create a permanent U.S. privacy board to oversee domestic and international privacy policy was recently introduced by U.S. Rep. Glenn English (D-Okla.), chairman of the House Subcommittee on Government Information, Justice and Agriculture.

English said the bill (H.R. 1721) would establish a Data Protection Board as an independent federal agency with 30 employees. Domestically, the board would oversee the government's compliance with the Privacy Act of 1974 and help develop data-protection standards for private industry.

The congressman complained that privacy issues have been neglected by the U.S. Office of Management and Budget and by the National Telecommunications and Information Administration.

In international affairs, the proposed privacy board would help U.S. companies comply with foreign laws, coordinate U.S. policies with those of other nations and consult with foreign data-protection officials. English noted that Austria, Canada, West Germany, France, Norway, Sweden and the UK have established data-protection agencies.

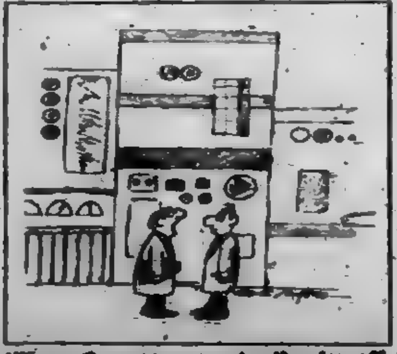
Army to offer guidelines on information center setup

WASHINGTON, D.C. — The U.S. Army's computer research institute is developing guidelines for Army offices to use when starting information centers, Maj. Terry Hilderbrand told the Association of Federal Computer Users last week.

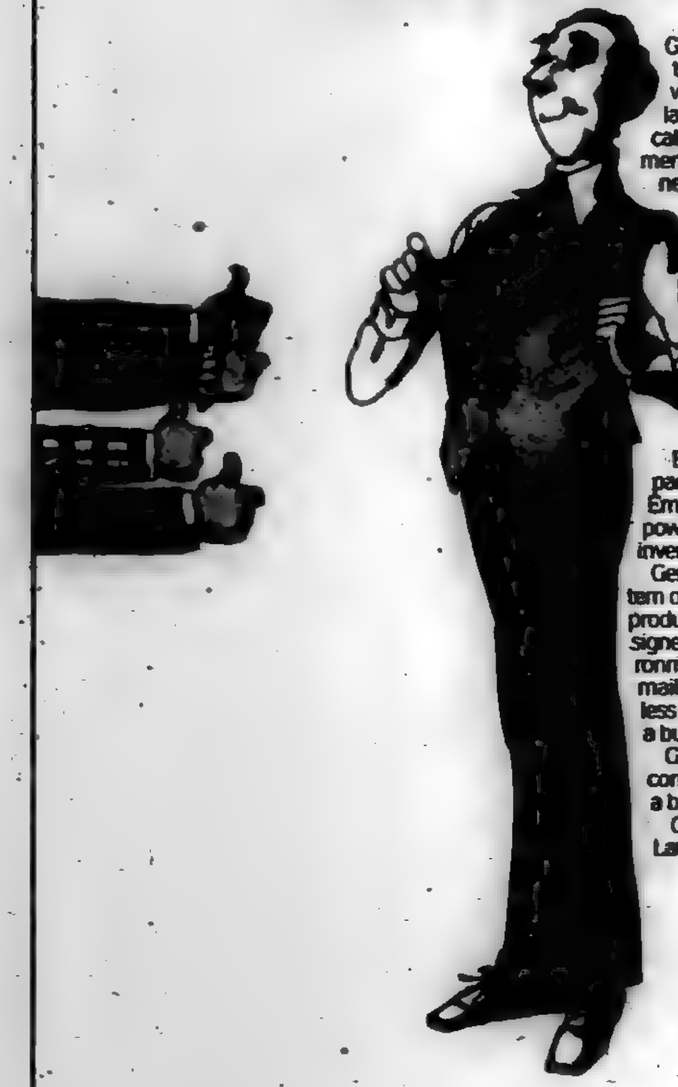
He said the guidelines will outline policy choices about how an information center will be funded, organized and staffed and what functional roles it will play in end-user training, product evaluations, microcomputer standards and consultations.

Hilderbrand said the document, available in about 12 months, will be based on empirical research being conducted at the Health Services Command information center at Fort Sam Houston in San Antonio, as well as on advice from other government information centers.

More information can be obtained from the Army Institute for Research in Management Information and Computer Sciences, 115 O'Keefe Building, Georgia Institute of Technology, Atlanta, Ga. 30332.



"If we give one computer the day off, the other computers will want one!"



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Human Resource Management That Helps Your Bottom Line

Vendors must tell users 'what information really is'

ICP keynote speaker gives advice to execs

By John Gallant
CW Staff

SCOTTSDALE, Ariz. — If they are to prosper in the 1980s, software vendors have to stop selling data "by the pound" and start providing users with more concise and valuable information.

That was only part of the charge made by the keynote speaker to software vendors attending the International Computer Programs, Inc. (ICP) Million Dollar Awards & Executives Conference held here recently. In addition, ICP President Larry Welke said that software developers must take on the job of "teaching the world what information really is.

"The software industry caused information to be as plentiful as it is today," Welke told his audience of software industry executives. "But if we are not careful, users will choke on all that information and that will slow all of you [software vendors] down.

"You must begin to realize that there is such a thing as information precision. You can provide users with less information — information that is more valuable, better controlled and better managed. You must show users that information is a product that can be defined, that has limits. In the coming information society, the power brokers will be those who know what information is and who will pay to get it."

Welke warned industry executives that they must remain cognizant of the changing face of the computer industry if they are to survive in the coming years. One of the most important changes software vendors must deal with today, he said, is the rise of end-user programming, which has been spurred on by the availability of such products as fourth-generation language tools.

"I have seen research that indicates [that] 10% of the programs written in 1984 were written in a fourth-generation language," Welke said. "Four years from now, that figure may be as high as 60%. That will affect you greatly. End-user programming has changed the relationship between end users and data processing professionals, and the relationship between end users, DP and you. It has restructured the DP function."

Welke said end-user programming has spawned the rise of autonomous information, production and development centers within organizations where once the DP department had sole control over information processing.

"That segments the market into which you sell," Welke said. "The organizational decision-making process and the people involved in it are different. The changing environment has even given rise to a new type of person with whom you must work — the chief information officer, who is primarily a businessman where the DP manager was not."

And, Welke cautioned, software vendors must not overestimate the impact of microcomputers on the world of information processing.

"The micro challenge is past tense," he said. "Micros have happened, we have already gone through that revolution. Is the world going to hell in a micro hand basket? No.

"The real value of micros," Welke continued, "is as nodes on a network — not as personal computers but as tools for personal computing. Micros have had an impact on DP but they are only part of the overall picture."

Asis' midyear meeting slated for next month

FORT LAUDERDALE, Fla. — The midyear meeting of the American Society for Information Science (Asis) will be held May 19-22 at the Bahia Mar Hotel here. The theme of the conference is "Telecommunications and Networking."

Topics to be covered at the meeting include telecommunications concepts and terminology, applications of the technology and related governance, policy and management issues.

The keynote speaker will be Stephen B. Weinstein, division manager of the Network Services Research Division of Bell Communications Research, Inc. in Morristown, N.J. The keynote address topic will be, "What Can We Expect from the Intelligent Wideband Communications Network of the Future?"

Other scheduled speakers include Edwin B. Brownrigg, director of the Division of Library Automation at the University of California at Berkeley, and John Coppett, district manager of AT&T in Atlanta.

Registration for the conference is $100 for Asis members and $130 for nonmembers.

Further information is available from Asis, which is located at 1010 16th St. N.W., Washington, D.C. 20036.

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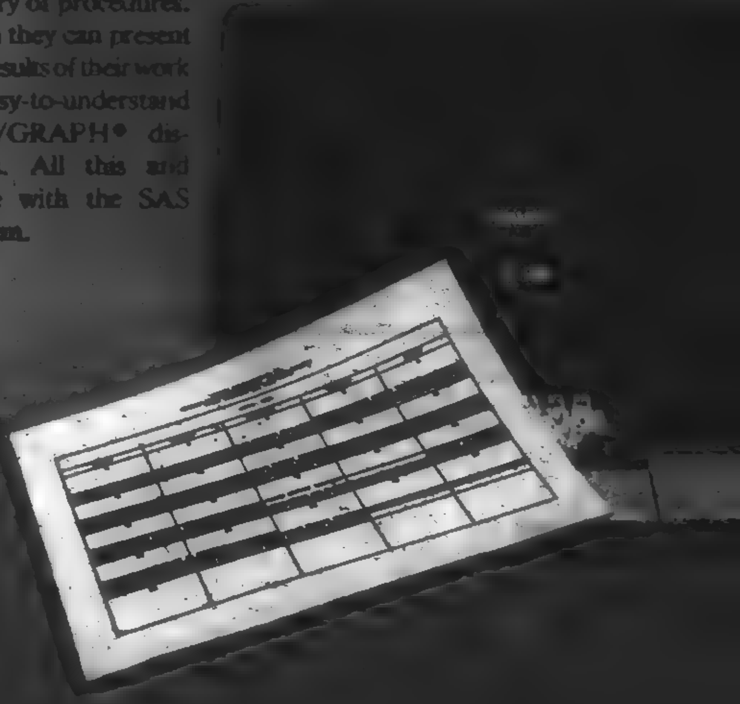

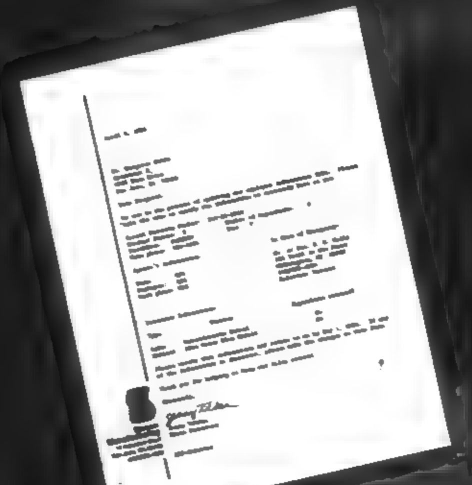

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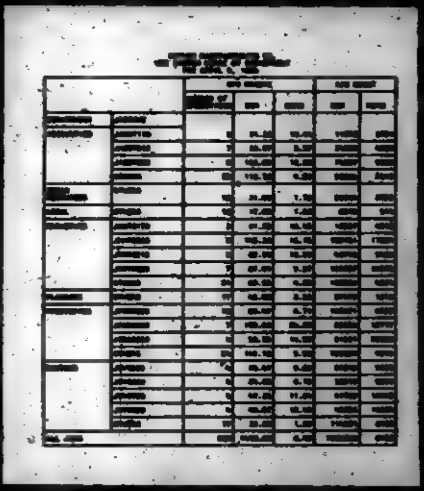

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Long-term view boosts software vendors' survival odds

By John Gallant
CW Staff

SCOTTSDALE, Ariz. — If a software vendor hopes to survive alongside an increasingly software-conscious IBM, it had better develop "well-behaved" products.

Vendors must also sell a "long-term software concept" rather than simply a set of products, said Scott Smith, vice-president of the Gartner Group, Inc. and an IBM watcher. Smith addressed a group of software industry executives at the recent International Computer Programs, Inc. (ICP) Million Dollar Awards & Executives Conference here. He outlined the unique problems and opportunities independent software vendors face in dealing with IBM, which has come to see software as a vital component of its revenue-boosting strategies.

> *'Listen to IBM on its strategic products, and IBM will keep you compatible.'*
>
> — Scott Smith
> Gartner Group, Inc.

Smith identified well-behaved products as software targeted to what IBM considers its own strategic software offerings.

"If you are a well-behaved applications developer, if you use IBM's operating systems and its strategic development tools and write to its user interfaces, IBM will protect you. If you avoid, ignore or tamper with those strategic products, you do so at your own risk," Smith said. "IBM will not worry about you when it announces a hardware upgrade. That will make it very costly for you to upgrade when IBM does."

The trick, according to Smith, is for the independents to divine which products IBM is not only offering but also emphasizing. For example, "VM is much more strategic than [AT&T's Unix] for IBM," he said. "That is an important difference for software developers to recognize.

"IBM is aggressively educating vendors as to where to deliver applications. Listen to IBM on its strategic products, and IBM will keep you compatible. Otherwise, you run the risk of being a plug-compatible software vendor always trying to catch up. Utilizing IBM's strategic products is the key to compatibility and ease of migration."

Marketing a long-term software concept — as Cullinet Software, Inc. has successfully done — can help contrast an independent vendor with IBM, which faces a number of important problems in presenting a consistent, integrated software line, Smith said. IBM simply has too many software products to maintain because these products are provided to users on a leased rather than a sale basis, he explained.

Big Blue is also hamstrung by the complexity of its structure. Thus, he noted, "It is hard for IBM to develop an integrated solution, as many other vendors have been successful in doing today."

Independent vendors should also seek to build recurring revenue streams, Smith advised. Some of the methods he outlined for doing that included value pricing based on the number of concurrent users, transaction-based pricing and renewable rather than perpetual license arrangements.

In the software pricing arena, he said, IBM is actually providing a service to the independents through its emphasis on lease pricing and its regular, periodic price increases.

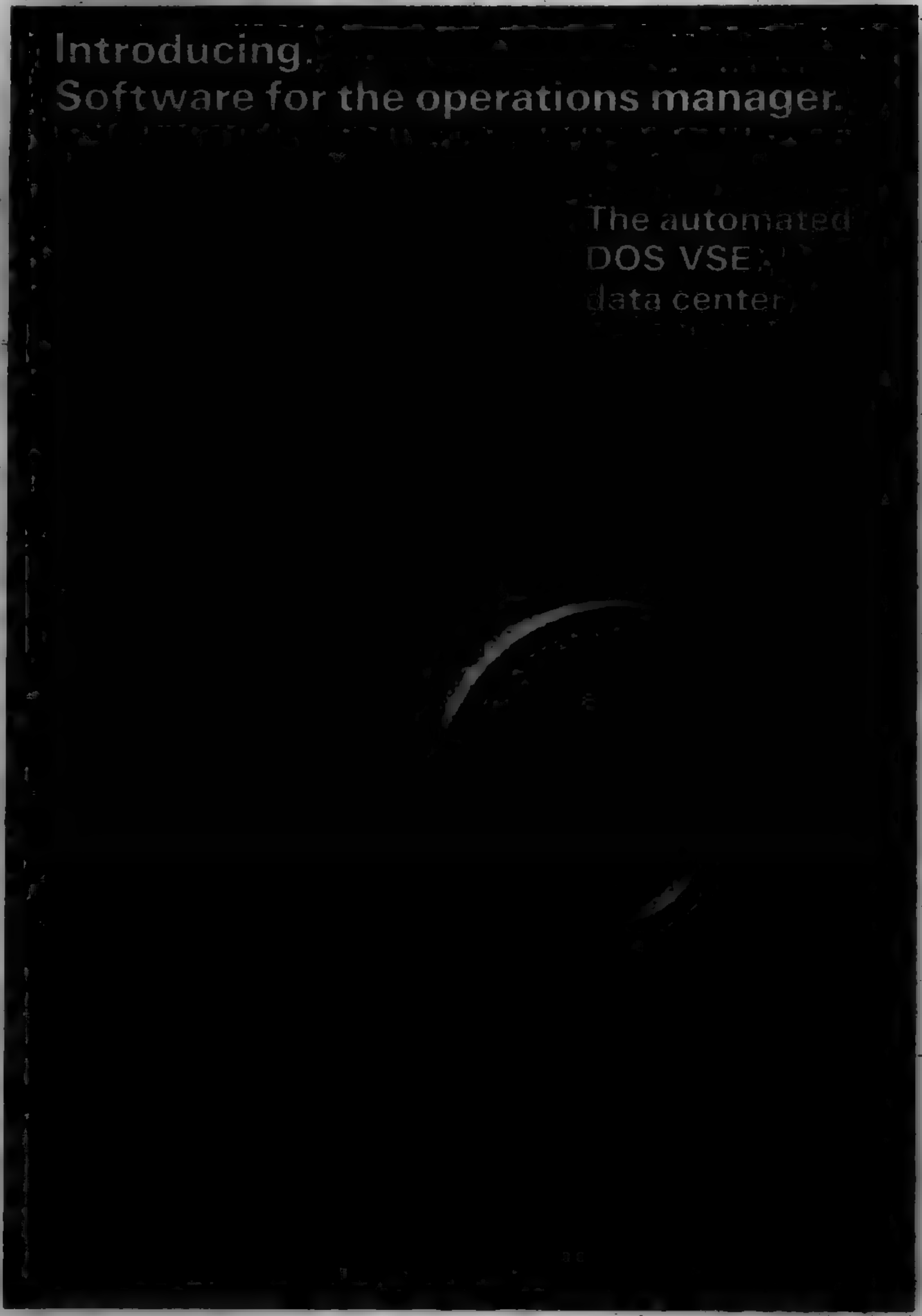
"IBM is educating users to pay more for software as an increasingly important part of the overall product," Smith said. "That helps all of you."

IBM's software strategy

According to Smith, the basics of IBM's software strategy involve the following:

- Narrowing its software focus.
- Providing software that has close ties to IBM hardware.
- Providing software critical to account control.
- Providing software that can be leveraged across the broad installed base of IBM hardware.
- Focusing on market areas where there is little threat of competition.
- Building a consistent set of interfaces for both applications developers and end users.
- Enforcing the standards necessary for distributed processing.
- Educating and encouraging third parties to fill niche needs.
- Enhancing the functions of its software and increasing prices.

"The [independent] software industry has a number of things going for it today," Smith said. "There is no substitute for software, and there is as yet no downward price trend in the software market. There is no evidence that IBM will take over everyone in the industry."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Canadian DEC top vendor in country's computer count

Ontario boasts most installed systems

By [illegible]
CW Staff

TORONTO — The lion's share of the computer business in Canada belongs to Digital Equipment of Canada, and the province with the most computer installations is Ontario.

These are statistics determined by the 1985 Canadian Computer Census published recently by the Canadian Information Processing Society. At the end of 1984, 3,246 computers out of the total of 13,607 computers for all provinces were Digital Equipment of Canada equipment. IBM Canada Ltd. followed closely with 3,118 computers, the report said.

The census contains a list of systems in Canada whose CPUs cost at least $70,000 or which rent for $1,000 or more per month, the report said.

Of the 13,607 computers rented or purchased in Canada, 5,887 reside in the province of Ontario, the study showed. The province of Quebec accounts for 2,480 installations; British Columbia shows 1,602 systems; and Alberta has 1,467.

Trailing the pack was the Yukon, with a total of nine reported computer installations.

Manufacturers account for the largest number of machines (2,501) across all classes of rentals, the report said. A large share of those manufacturers' rentals (850) are in the $2,000 to $4,999/mo range, suggesting computer systems in the $70,000 to $174,999 sales price range, the report said. Machines in the $35,000 to $69,999 class (rentals of $1,000 to $1,999/mo) account for another 701 rentals by manufacturers.

Government leads large system rentals

The Canadian government is the next largest renter in the country, with a total of 1,578 rentals, of which 442 are in the $2,000 to $4,999/mo range, and 578 are in the $1,000 to $1,999/mo span, the study said. The government is by far the biggest renter of large systems. It accounts for 46 rentals in the $100,000/mo and over category, suggesting machines with purchase prices of $3.5 million and up.

Other big-machine users are service bureaus (computer systems and software companies) with 35 rentals of $100,000/mo or more; insurance companies, with 29-large system rentals; and financial institutions, with 28 such rentals, the study said.

Service bureaus rent 1,466 systems, with 533 of those systems in the $1,000 to $1,999/mo range and 435 in the $2,000 to $4,999/mo span. The service bureaus also have 227 systems in the $5,000 to $9,999/mo span, which translates to machines that cost $175,000 to $345,999, the study said.

Wholesale and retail distribution businesses account for another 1,411 rentals in Canada, most of which are in the small systems category. Other industries whose installations are measured by rental class include primary or resource industries (agriculture, forestry, fisheries, mining), construction, transportation, utilities, communications, service (unions, professions and associations), petroleum, educational, medical, legal, accounting and hospitality.

> ”
>
> *The Canadian government is by far the biggest renter of large systems.*

Of the smaller systems rented in Canada, Digital Equipment of Canada leads the pack of vendors with 1,296 of the $1,000 to $1,999/mo machines; 836 of the $2,000 to $4,999/mo systems; and 609 of the $5,000 to $9,999/mo class installations.

IBM trailing in smaller markets

IBM trails Digital in the smaller markets, although it comes close in the $2,000 to $4,999/mo category, with 832 installed systems, the report said.

IBM takes over in the three ranges that bridge the $10,000 to $99,999/mo rental classes, suggesting machines ranging in value from $350,000 to $3.5 million, the study said. It accounts for 371 systems rented in the $10,000 to $19,999/mo range ($350,000 to $699,999 cost); 390 installations in the $20,000 to $49,999/mo rental span ($700,000 to $1,749,999 cost); and 148 rentals in the $50,000 to $99,999/mo range ($1,750,000 to $3.5 million price), the study said.

The census report includes tables on computer installations in Canada by manufacturer within province; by industry within rental class; by manufacturer within rental class; by manufacturer within industry; and rental class by province.

It also contains a historical record from 1964 to 1984 by province or territory and a list of installed computers by province, city, user and type.

The study is available for $150 from the Canadian Information Processing Society, 243 College St., 5th Floor, Toronto, Ont. M5T 2Y1.

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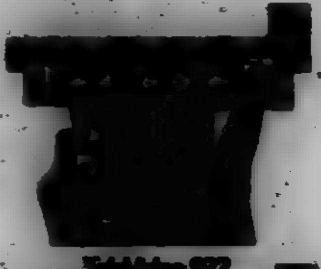

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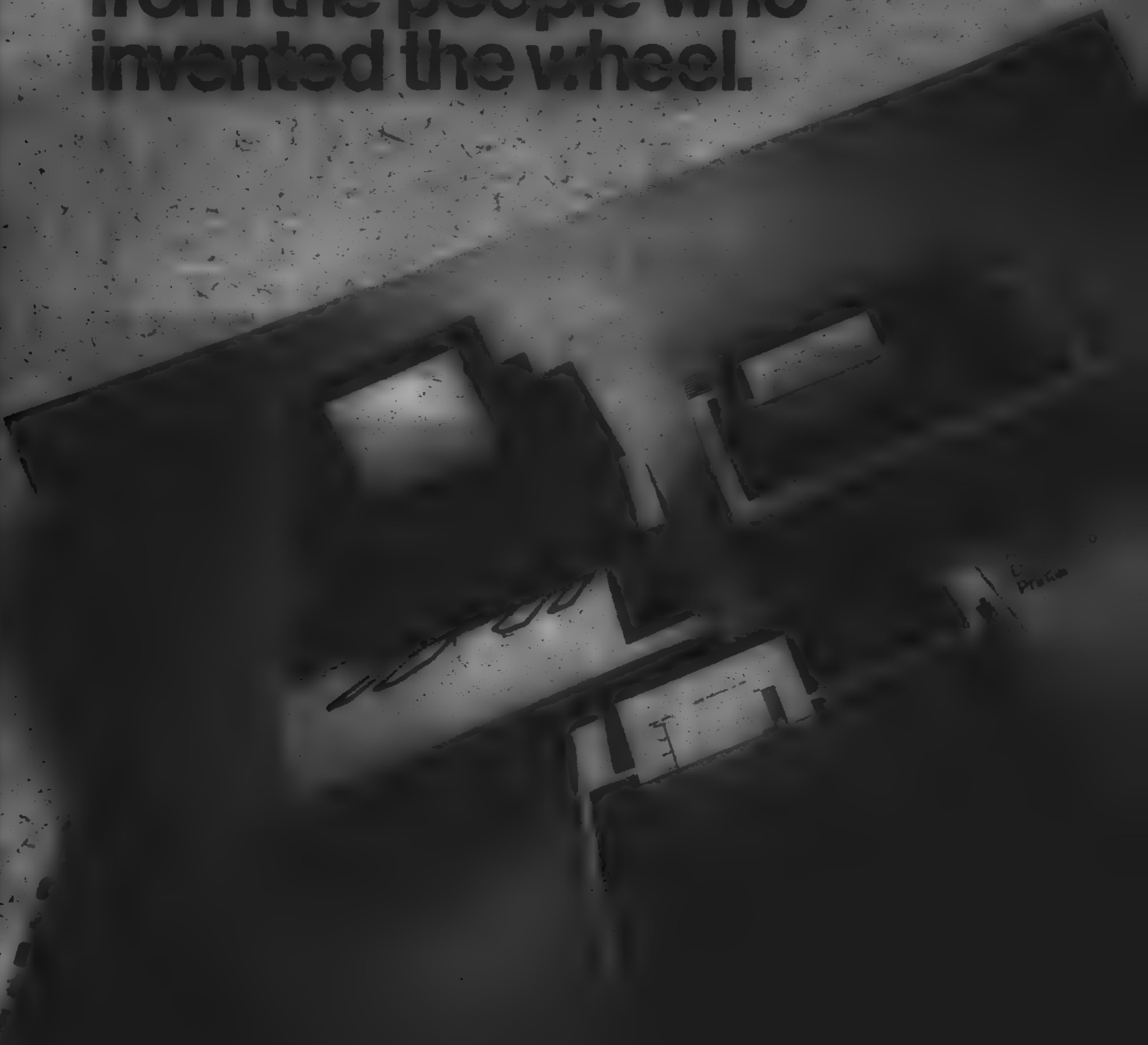

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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

BRISBANE — The first in a stream of Digital Equipment Corp. VAX 8600 systems has been installed here at Queensland Newspapers Pty. Ltd. The Queensland Newspapers' 8600 is thought to be the first such installation outside the U.S.

DENMARK

COPENHAGEN — The Danish state-run telephone company, KTAS, has signed a $14 million contract that spans 10 years with Siemens AG. Under the terms of the agreement, Siemens will provide the phone company with digital switching equipment for telephone exchanges.

FRANCE

PARIS — France's state-owned computer giant, Bull, just signed a $6.5 million agreement with China to be the supplier of Bull DPS 7 mainframe, five DPS 6 minis and 54 Micral 30 micros. The contract, signed with the Chinese National Technical Import Corp. (CNTIC), will provide equipment for 10 Chinese universities and agricultural research centers. In addition to hardware, the agreement calls for Bull to send applications engineers to China for in-house training and to host 59 Chinese trainees in France. Bull is the first European high-technology firm to win an order from CNTIC.

WEST GERMANY

HANNOVER — More and more developers of micro software are turning down copyright protection for their programs. A recent example of this trend was evidenced here by Microrim, Inc. and its German distributor RHV-Softwaretechnik, which refused to protect their relational data base program R:Base 4000. According to RHV spokesman Klaus Spieker, the ratio of purchased software to copied programs for commercial use here does not exceed 1:2.

■

HANNOVER — In spite of the slump in the U.S. semiconductor industry, the German market is booming. Industry insiders expect a successful sales year for 1985, according to Friedrich Ruf, chairman of the Union for Electronic Components. Ruf voiced his opinion at Germany's Hannover Faire, stating that the union predicts increases in semiconductor sales of almost 9%, amounting to $3.6 million this year.

■

MUNICH — A recent user survey conducted here revealed that German DP professionals most often preferred IBM machines to plug-compatible equivalents from BASF, National Advanced Systems, Inc. and Nixdorf Computer GmbH. The "overall satisfaction" survey, conducted during January by Datapro Research Corp. and *Computerwoche*, the German subsidiary of *Computerworld*, polled 800 computer users. The machines that got the highest marks included the IBM 3080 series, Bull's DPS 7 and the Fujitsu Ltd. 7800 system, which Siemens AG sells here. The top-rated mini maker was Tandem Computers, Inc. with its line of Non-[illegible] systems, followed by [illegible]

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Finally, to help our people put our plan into practice, we've recently spent $67 million on personnel training and more than $100 million on service and support facilities.

In an industry where many companies don't last a decade, Burroughs is proud to be launching our second century.

The experience and insights we've gained are helping us develop new solutions that will benefit our customers and their profitability for the next hundred years.

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nomic design and the resulting ease of use were two of the reasons it won the International Design Award, in both 1983 and 1984.

[illegible]

[illegible] looking for a [illegible] VAX,™ DECsystem [illegible] PDP-11™ based system, [illegible] has a rather obvious [illegible] any other termi- [illegible] As well as [illegible]

So it only makes sense that our video terminals are substantially more compatible up and down the Digital family line. Each new generation, for example, brings with it all the important elements from previous generations. Which is why you'll find some of our customers using 10 year-old VT52™ terminals with brand new VAX systems. The simple fact is, Digital has always been committed to protecting your investment with every move you make.

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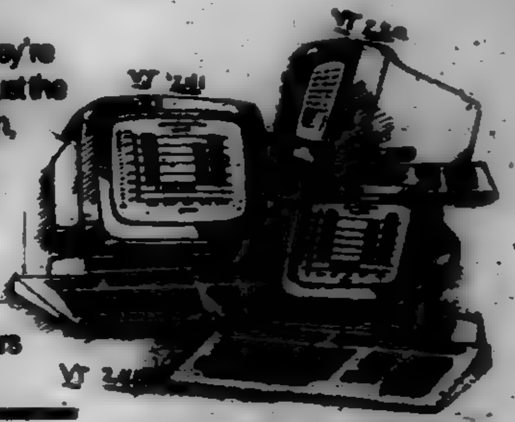


THE BEST ENGINEERED COMPUTERS IN THE WORLD.

Hannover Faire to trim size

By Susan Blakeney
CW Staff

HANNOVER, West Germany — The big news at West Germany's — and possibly the world's — biggest trade show was not necessarily on the product floor but behind the scenes. It was there that the decision was made to make this year's Hannover Faire the last one of its kind.

Billed as "The Fair of Fairs," the Hannover Faire's reputation for drawing mammoth crowds went unchallenged this year as approximately 800,000 attendees from 44 countries flooded through its gates.

The fairgrounds, consisting of 24 seperate exhibition halls and parking for 50,000 cars, showcased a record 6,778 exhibits. And despite its vast proportions, scores of would-be exhibitors had to be turned away this year.

Show size scaled down

This reason, coupled with the city's inability to handle such an infusion of people, forced the consortium of city and state government agencies that sponsors the annual April event to decide to pare the show down.

The hotly debated topic pitted people who wanted the show to remain the same against those that favor taking the World Center for Office, Data and Communications Technology (Cebit) segment out of the show.

This year the Cebit exhibits spanned five exhibition halls, occupied 18% of the show's floor space and attracted roughly 250,000 guests.

The concept behind breaking the Cebit exhibit out from the main show is ostensibly to "make the Hannover Faire more attractive by featuring new technologies and creating a more industrial accent," which is not deemed possible given present space contraints, according to show sponsors. The sponsors decided to hold a separate Cebit show next year on March 12-19. The remaining part of the Hannover Faire, featuring manufacturing, engineering and agricultural equipment exhibits, will take place during the week of April 9-16, 1986.

Critics of the plan to seperate the Cebit show from the main event claim that the Hannover Faire — and thus the city of Hannover — will ultimately suffer. They claim the show's big drawing factors are its size and great mix of people.

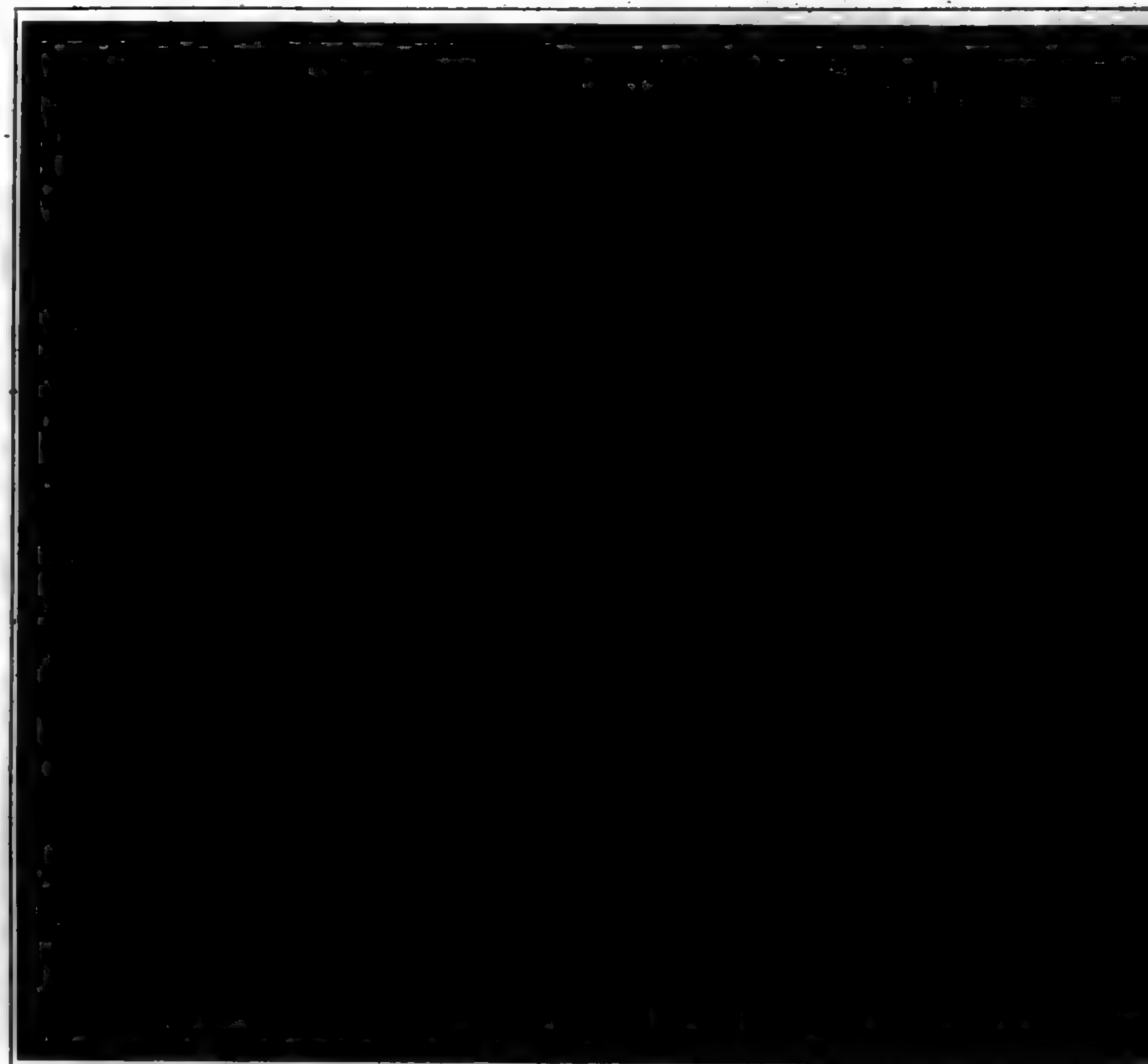
"The best thing about Hannover Faire is that everyone is here. That will not be the case next year. And I do not think people can afford to come to both," according to Wolfgang Veder, a computer engineer with the West German board of agriculture.

"If they could fit more vendors in I think they would keep the Hannover Faire the way it is. But they are losing money when they turn people away," Veder added.

The concerns of show aficionados notwithstanding, city restaurants, taxi lines and hotels will be slightly less populated during next year's Hannover Faire. Show sponsors, steadfast in their decision, argued that future shows will allow "greater emphasis [to be] placed on key target groups," and that the increased display space freed by dividing the Cebit show from the Faire will "improve the character of the Hannover Faire."

CW PHOTO BY SUSAN BLAKENEY

Hannover Faire's exhibition floor



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✓ CALENDAR

WEEK OF MAY 26

MAY 28-30, KINGSTON, ONTARIO — **15th Annual Symposium on Multiple-Valued Logic.** Contact: H. T. Mouftah, Department of Electrical Engineering, Queen's University, Kingston, Ont. K7l 3N6, Canada.

MAY 28-31, NEW ORLEANS — **The Seventh National DEC-Compatible Industry Exposition (Dexpo South '85).** Contact: Angela Wright, Expoconsul International, Inc., 55 Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

MAY 28-29, CHICAGO — **VS Cobol II.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001. Also being held May 30-31 in New York.

MAY 28-31, SAN FRANCISCO — **CICS Application Design.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001. Also being held May 28-31 in New York.

MAY 28-31, NEW YORK — **TSO ISPF.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

MAY 29-30, DALLAS — **Opportunities and Pitfalls.** Contact: Ken Orton, Future Computing, Inc., 8111 LBJ Freeway, Dallas, Texas 75251.

MAY 29-31, SAN FRANCISCO — **Introduction to Data Communications.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015. Also being held May 29-31 in Houston.

MAY 29-31, BOSTON — **International Conference on Computerization of Medical Records.** Contact: Peter Waegemann, The Institute for Medical Records Economics, Inc., 121 Mount Vernon St., Boston, Mass. 02108.

MAY 30-31, BOSTON — **Negotiating Computer Contracts.** Contact: Law & Business, Inc., Harcourt Brace Jovanovich, Publishers, 855 Valley Road, Clifton, N.J. 07013. Also being held June 17-18 in San Francisco.

MAY 30-31, WASHINGTON, D.C. — **Legal Issues in Acquiring and Using Computers.** Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.

MAY 30-31, SAN FRANCISCO — **Managers' Roundtable.** Contact: Systems Technology Forum, 9000 Fern Park Drive, Burke, Va. 22015.

WEEK OF JUNE 2

JUNE 2-5, DALLAS — **American Bankers Association's 1985 National Operations and Automation Conference.** Contact: American Bankers Association, Communications Group, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

JUNE 3-4, BOSTON — **Fundamentals of Data Processing for Administrative Assistants and Secretaries.** Contact: New York University School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022. Also being held June 20-21 in San Francisco and June 27-28 in Los Angeles.

JUNE 3-5, MONTREAL — **Canadian Information Processing Society Congress '85.** Contact: Canadian Information Processing Society, Fifth Floor, 243 College St., Toronto, Ont. M5T 2Y1, Canada.

JUNE 3-5, SAN FRANCISCO — **Long-Range Information Systems Planning.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020. Also being held June 17-19 in Boston.

JUNE 3-6, CHICAGO — **IMS/DB (DL/1) Application Programming.** Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 24-27 in Washington, D.C.

JUNE 3-6, CHICAGO — **Vtam: From Start to Finish.** Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 17-20 in Boston and Atlanta and June 24-27 in Los Angeles.

JUNE 3-6, FORT LEE, N.J. — **CICS/VS MRO/ISC.** Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 3-6 in Los Angeles, June 17-20 in San Antonio and June 24-27 in Fort Lee, N.J.

JUNE 3-6, DENVER — **Vsam: Its Structure and How to Use It.** Contact: Technology Solutions, Inc., 520 Fifth Ave., New York, N.Y. 10036. Also being held June 10-13 in Fort Lee, N.J.

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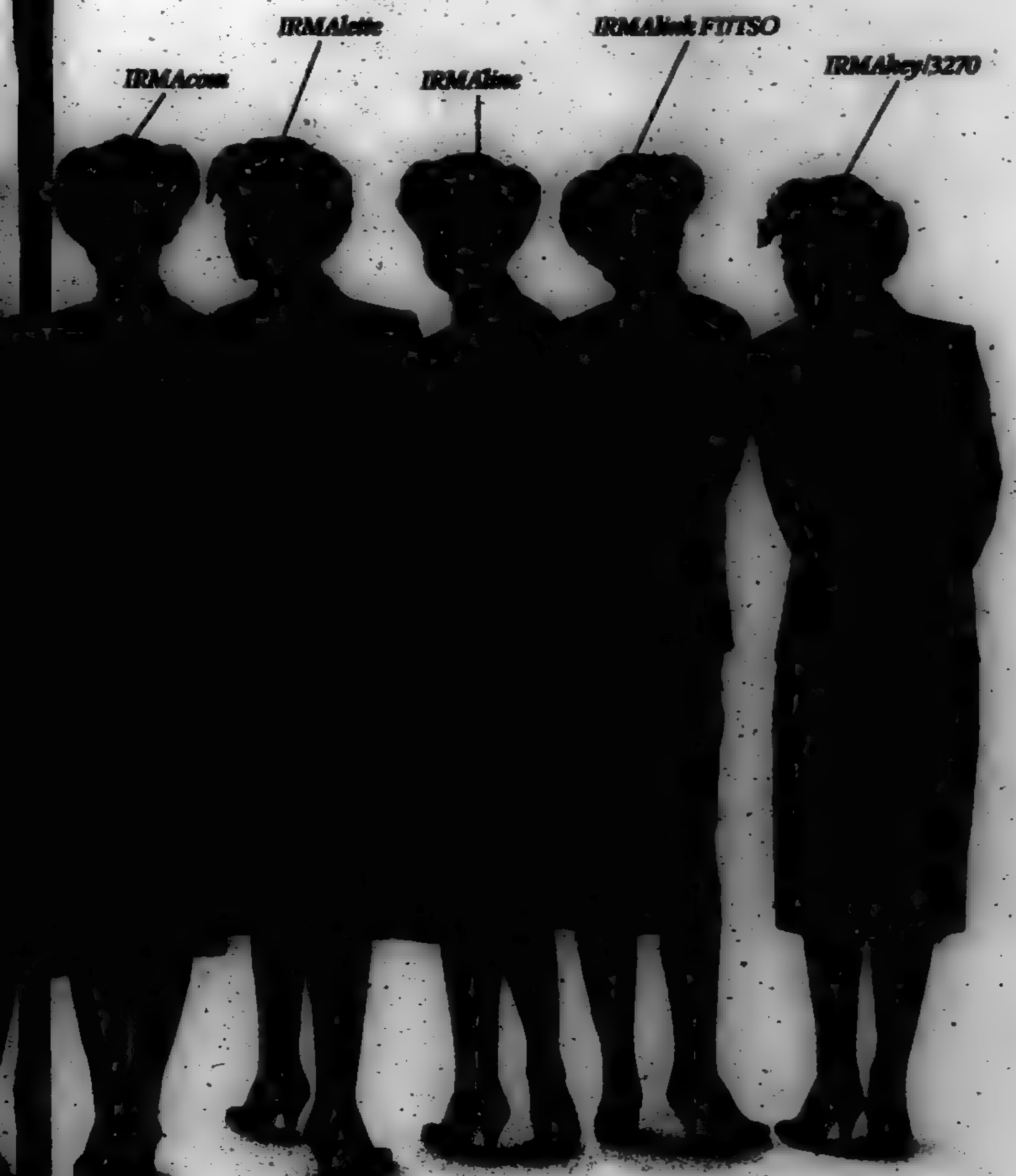

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EDITORIAL

Japan blinks

The doors to the lucrative Japanese telecommunications market are opening, but not wide enough nor quickly enough to satisfy the trade expectations of the U.S. Congress or the U.S. telecommunications industry.

At stake is Japan's $4.5 billion telecommunications market. It is turf the Japanese want to protect and the Americans want to attack. Throw in the wave of protectionist sentiment sweeping through Congress, and the scenario has all the explosive ingredients of a nasty little trade war — unless one side blinks, and Japan has.

Telecommunications is only one market of four key areas that dominate this latest round of U.S.-Japan trade talks. The others are medical equipment/pharmaceuticals, electronics and wood and paper products.

Talks in all areas recessed late last month except for telecommunications. U.S. negotiators had hoped to conclude the telecommunications talks by April 1, but they will likely continue as Japan steps up its effort to resolve disputes before the annual seven-country economic summit next week in Bonn.

Much intense negotiation has taken place amid mounting trade frictions and under the watchful eye of Congress. Japan clearly fears that Congress is in the mood to restrict Japanese imports unless Tokyo moves quickly to open up its markets for U.S. goods and to reduce fees, licensing requirements and other obstacles that prohibit expansion of U.S. industries in Japan. In short, Congress wants Japan to give the U.S. the opportunity to close its $37 billion trade deficit with that country. Or, as summed up by Secretary of State George Schultz: "We want to hear the cash register start ringing."

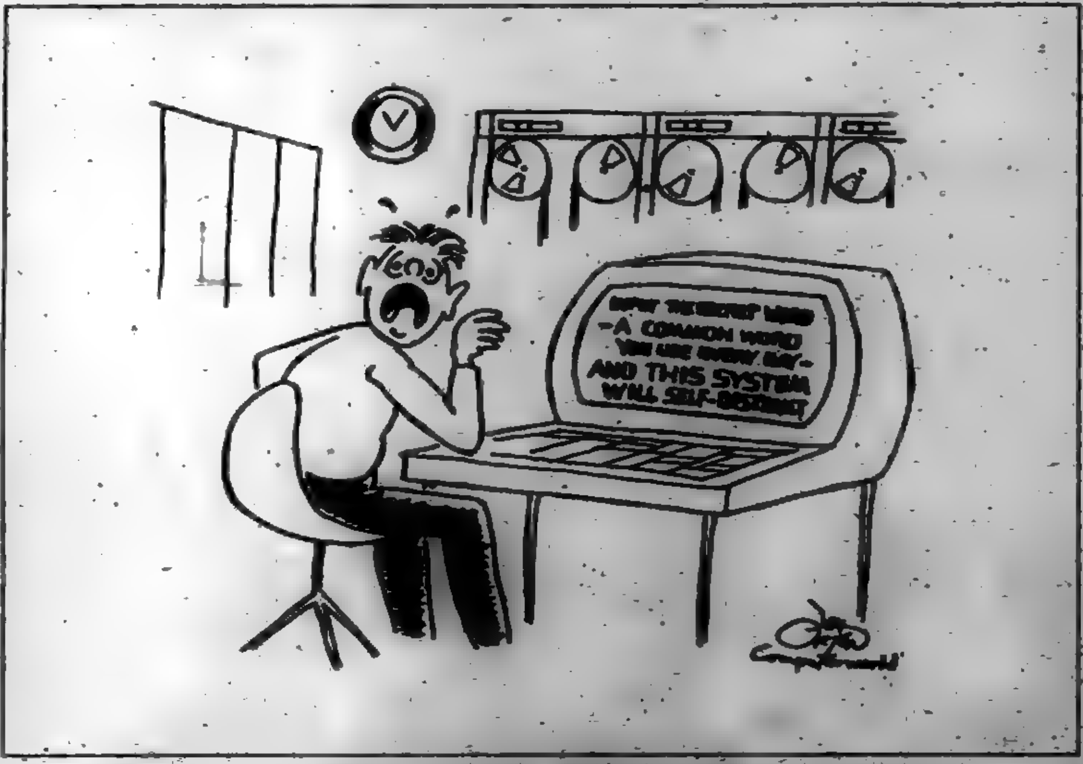
In the telecommunications area, Japan recently has taken the following steps to reduce tension with the U.S.:

- Simplified standards and regulations that American imports must meet in the Japanese market.
- Allowed foreign telecommunications companies to participate in establishing standards for telecommunications equipment.
- Enhanced protection for U.S. patents and copyrighted software.

These measures — and other concessions expected in the electronics and medical equipment/pharmaceuticals industries — have been greeted coolly so far by U.S. legislators, who have called them unspecific and meaningless. Much more progress must be made much more quickly, they said.

The American telecommunications industry, which experienced a trade deficit of about $2 billion with Japan last year, does not appear to have found much solace in Japan's moves. Japan's pledge to open up its domestic markets generally received mixed reviews from U.S. trade associations representing high-technology companies [CW, April 15].

But cautious optimism remains. "Clearly," one industry representative said, "you can't change an entrenched system overnight."



"Logic bomb squad! Logic bomb squad!"

LETTER

Programmers work as problem solvers

Lowell Jay Arthur's proposed metrics for program quality and programmer productivity that he expressed in a recent interview [CW, April 1] are out of step with the role of the programmer in the 1980s.

Quantitative measures of program size and complexity might have helped in evaluating the efforts of coders. Today's programmer, however, is more a problem solver than just a technician grinding out program statements from painfully detailed "specifications." The organizations that have had the greatest success in raising the levels of quality and productivity are those in which the programmer's problem-solving function is recognized and nurtured.

If there was ever a need for the pure coder, the widespread acceptance of structured disciplines in the 1970s certainly put an end to it. An organization that follows sound practice in all phases of program development need not fear losing control of a project during coding and testing or getting stuck with a new maintenance nightmare. In the 1980s, the growing availability and acceptance of higher level tools such as fourth-generation languages are continuing the trend toward a more responsible, solution-oriented role for the professional programmer.

We must encourage and reward the avoidance of large, complex programming efforts. Our programmers should exercise their ingenuity in solving users' problems quickly and by simply using the appropriate tools and techniques. Once they develop a solution, they must not rebuild it from

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VIEWPOINT

Robot pipes technology into the beaux arts

LECHT ON SCIENCE
Charles P. Lecht

He was poised before a triple-keyboarded organ when I first saw him. It was late afternoon and rays from the setting sun streamed into the performace hall through its 50-ft windows, causing his stainless steel parts to sparkle and glisten. He sat motionless, surrounded by the equipment needed to energize the organ and he himself. Around the power supplies, synthesizers, speakers and other components was a railing. Behind the railing a large audience gathered — many of whom whispered words of disbelief at what they were witnessing.

Except for his generally human shape, no attempt was made to employ the customary, expected cosmetics to deceive the eye to make us believe robots are real persons. Before his performance was over, all in attendance had come to believe that a living soul might inhabit the wired network and metal frame called "Wasubot."

Wasubot is a Japanese-made robot. When I saw him perform at the Japanese Government Pavilion at Expo '85, the science exposition currently being held in Tsukuba, Japan [CW, March 4], Wasubot actually read and played organ music. The video lens eye on his head was fixed to gaze at the sheet music set on a stand above the organ in the traditional manner. He stared at the music as a child might during a school performance — a child who had just learned to play and was determined to give a flawless recital.

Wasubot's head — essentially a featureless metal case about the size of a lunch box — was bolted to a neck of steel by cable and rigidly affixed to his incredible torso. His upper and lower arms — independently suspended steel rods welded to ratcheted gears and wheels — were capable of the kind of forward, backward and lateral motions needed to play the organ. These mechanisms provided Wasubot the requisite position shifts and the strength to hold a particular position while his steel hands — with ball joints and socketed finger rods — gently tapped the organ's keyboard.

His right foot rested on the sound-dampening pedal far to the rear of his organ's console, and the left fell directly to the bass octave pedals. The latter foot was skewed to the right in a position you'd would expect from an organist who was about to sound an impossibly deep bass (the sound you might hear in a cathedral at the opening or closing of a fugue).

> *Emulating motions of man when he is engaged in purely artistic pursuits (like playing the organ) is, relatively speaking, new. Wasubot provides us with hope that more such robot uses may be in the making.*

Although most of Wasubot's parts were contained within his 8-ft frame, a great deal of his cabling hung or was strung outside of him. The mechanical veins and arteries that flowed from the back of his metal cranium sent signals to his legs, feet, arms, hands and fingers. His fingers were longer than needed, so that when he moved, they resembled an ever-changing cage of cabling groups fastened at his joints.

Robotized spectacle

For Wasubot's performance, bright spotlights were placed behind and above his shoulders. Their beams were trained upon his sheet music so that his eye could discern the notes and so that his processor could perform the pattern recognition unhampered by variations in natural lighting or those from the flashes of the crowd's cameras.

A Japanese girl placed sheet music on the stand before Wasubot — music in the same form known and played by organists throughout the world. She greeted Wasubot, who responded with a synthesized, "Good afternoon," followed by an announcement of his intention to play the piece before him. He had already read the entire score, shipped it to his memory, processed it and stored the pattern of play in an output buffer. (Thus he "learned" the musical piece faster than any human being could.)

His hands and feet slowly slid to assume their sitting position. His fingers deftly maneuvered across the keyboard and organ music began to fill the hall. The audience was dumbfounded: He was not only playing the music, but his body parts were responding to the melody, as we might expect a human's body to respond. The observers' camera flashes came to an abrupt halt, as if they were feeling the same shame they might in any concert hall.

Awkward clapping began when Wasubot finished his piece. Although the applause was brief and those doing it felt a bit foolish, everyone agreed that something very special had occurred.

So what's so special?

A robot that reads and plays music is significant enough to evoke such awe, but we've heard better performances. Wasubot's robotic movements were a marvel, but other recent robotic feats like assembling cars or delivering mail have impressed us as much. So what's so special about Wasubot?

Wasubot was used to create art. Compare the use of robotics for industrial purposes with use purely for artistic value. Emulation of the motions of the human body in the former category goes as far back as we care to consider — the battering ram and the loom provide us with example enough. But emulating motions of man when he is engaged in purely artistic pursuits (like playing the organ) is, relatively speaking, new.

Wasubot provides us with hope that more such robot uses may be in the making. We cannot underestimate the value of robotics to help us off-load the often dehumanizing but necessary processes we must execute to survive. But survival isn't everything. The use of robotics in artistic expression provides us with a powerful new means to further obtain its humanizing benefits.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Earning a 'good company' status staves off user piracy

READER'S PLATFORM
Gary Nored

Pirates have been with us for centuries. But only recently have many people been given the opportunity to try it out for themselves. Most of these 20th-century pirates are basically good people who rationalize their activities by telling themselves that most software companies are not "good" companies.

If you can convince the public that you're a "good" company, the public will not steal from you. Because a large part of being a "good" company lies in responding to consumer complaints, the following list of complaints stands here for the industry's consideration.

■ Most buyers consider software too expensive. Part of that feeling is intuitive, but part of it is based on historical expectations. Consumers expect new products to cost more — but they also expect prices to drop rapidly as products become established. When popular software packages do not decline in price until competitive products force them to, buyers get the feeling that the producers are greedy and deserve to be ripped off.

> *Fewer than 5% of software firms use the productivity development technology available to them 15 years ago and less than 5% of that group has introduced anything new.*

Software publishers could reduce prices. According to figures in the book *Future Forces: An Association Executive's Guide to a Decade of Change and Choice* (American Society of Association Executives, Washington, D.C.) by Gregg Edwards and David Pearce Snyder, fewer than 5% of software firms use the productivity development technology available to them 15 years ago and less than 5% of that group has introduced anything new.

In addition, advertising expenditures have risen dramatically, and probably excessively, since the spectacular success of Lotus Development Corp. But large advertising budgets are an arguable path to success. Numerous software firms have done quite well on limited or nonexistent advertising budgets. At the very least, these budgets should get scrutinized more closely than they apparently do.

■ Software consumers would like more variety within given product lines. After all, some buyers are penny conscious; others are less concerned about prices. Software publishers could and should offer more of a choice in products and not just more products from which to choose.

For example, by offering budget-conscious buyers simple models of popular packages and selling additional power, user-friendly interfaces or other convenience features separately, producers could give customers more of a choice. This would result in a wider audience for any given product and happier buyers. Happy buyers would be less likely to give away the products of companies with which they are pleased and to whom they feel a sense of loyalty.

■ Buyers want better documentation, but they aren't getting it. For example, two popular microcomputer products come with manuals in which the tutorial and reference functions are inexplicably combined. Can it be that the publishers simply don't know how badly that practice works, or are they just trying to cut corners? No matter. Buyers want bet-

See PIRACY page 38

Nored is a software consultant based in Austin, Texas.

VIEWPOINT

PIRACY

from page 37

ter instructions and it should be easy to accommodate them. Besides, documentation is a wonderful investment — it adds value to a product, makes owning original copies more desirable than owning illegal copies, costs little to produce and is almost impossible to pirate.

■ Customers hate copy protection. The 1978 U.S. Copyright Act specifically gives the purchaser of a copyrighted work the right to use it as he or she wishes, and the buying public knows this. Despite protestations to the contrary, users know that copy protection doesn't work, and manufacturers that use it make them mad. Smart software publishers are beginning to get the message. It is hoped that others will catch up soon.

■ Software buyers believe that software companies are too restrictive in their licensing. Users tend to view software products in much the same way as they view other intellectual properties; they think that any "single-thread" usage should be acceptable, and it is unlikely that they will change their minds soon.

The attitude of "one copy, one user, one machine" is unrealistic and unworkable; it contributes to public perceptions that software companies are avaricious. It is psychologically easier to steal from "avaricious" companies than from "good" ones.

■ Businesses believe that much more liberal provisions should be made for site licenses. In the real world, expensive intellectual properties must be shared among employees in much the same way other costly resources are shared. Software developers should recognize and attempt to meet that need as well. Perhaps by selling first copies with aggressively priced site licenses, software companies could derive real revenue from copies that are currently being made illegally. Industry precedents suggest that most companies may be relied upon to stay honest — as long as it is not too expensive or inconvenient for them to do so.

These are the basic complaints. Software developers who work to resolve them will earn themselves goodwill as well as greater profitability. The much-talked-about industry shakeout will surely take care of the rest. ‡

LETTER

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scratch for every similar problem. In a modern professional environment, measurements oriented to highly repetitive coding tasks are at best irrelevant and at worst harmful.

Arthur is right, of course, in asserting that we have to evaluate both the quality of the end product and the productivity of the problem-solving process. Rather than counting the IFs and the PERFORMs, however, we need to assess the effectiveness and the timeliness of the problem solution. Rather than counting the number of modules and the number of statements in each module, we should try to determine whether a given module performs a well-defined function, whether its scope is too specific or too general and perhaps whether it was needed at all. Rather than counting the GOTO statements or the ratio of comments to code, we ought to assess a program's clarity, its lack of unnecessary repetition or redundancy and its subordination of detail.

Although some of the things we'll have to measure are hard to quantify and harder to automate, they all can be evaluated in a straightforward way by knowledgeable professionals. Because the effort required to perform these evaluations is small in comparison with the programming effort, the cost of making the evaluations, even if primarily done manually, will be repaid many times over by the benefits.

Conrad Weisert
Chicago

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SOFTWARE & SERVICES

Magec works program trick

By Maura McEnaney
CW Staff

DALLAS — Dissatisfied with the applications development tool in use at Natural Resource Management Corp. (NRM) here, Theodore Pohrte decided to try a little magic.

As vice-president of systems operations for the oil and gas investment company, Pohrte has been monitoring NRM's conversion to Al Lee & Associates, Inc.'s Mask and Application Generator and Environment Controller (Magec). NRM's management decided to switch to Magec after the company discovered the applications development product it had been using was not really what it needed.

Two years ago, NRM began using Martin Marietta Data Systems, Inc.'s UFO to develop on-line applications for a newly installed IBM 4341 Group II mainframe running MVS, according to Grover Sherlin, manager of revenue applications. Sherlin's department hoped to use UFO to develop programs to update master files of oil properties and purchases.

But generating UFO transactions for on-line file maintenance of the batch-entry revenue accounting package "took quite a bit of time," Sherlin said. "We

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Dispatches from front: MSA link users speak

By John Desmond
CW Staff

In December 1983, Management Science America, Inc. (MSA) was reportedly the first mainframe software vendor to enter the micro-mainframe link market when it announced its Peachlink product [CW, Dec. 26, 1983].

Since then, MSA has sold off most of its failing Peachtree Software, Inc. acquisition and Peachlink has been given a new name — Expert Link. *Computerworld* talked to two of the approximately 300 customers that MSA said have purchased Expert Link, which runs on the IBM Personal Computer and provides a communications link to MSA's mainframe applications.

Richard Peirce, manager of financial systems corporate accounting for Life Investors, Inc., an insurance holding company and investment firm in Cedar Rapids, Iowa, said the firm bought Expert Link 16 months ago when the product was called Peachlink. Peachlink was then sold as part of MSA's Executive Peachpack micro software, which the company no longer markets.

Life Investors runs an IBM 3033 mainframe under OS with IBM's CICS teleprocessing monitor, under which the Expert Link user functions operate. The company is using Expert Link to download data from MSA's general ledger system to only one IBM Personal Computer, a limitation imposed while the link is being assessed, Peirce said.

Peirce said *Life Investors* encountered a problem with CICS being tied up whenever data was downloaded from Release 21.7 of MSA's general ledger package. The problem slowed the system down and, in a few cases, even caused it to crash. Systems programmers would occasionally have to be canceled off the system until CICS

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- ■ RM/Cobol for IBM's System/36 under SSP is out from Ryan-McFarland/46
- ■ Gould Semiconductor, Mentor Graphics announce gate array design software/46
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Too many tools spoil center

SOFTLINE
Steven Pfrenzinger

If you're looking for a productivity tool for the development center, you don't have to look far. The market is full of vendors and products claiming to have the answers to increased productivity for developing production applications within, or under the influence of, the development center. Although the products may provide some of the answers, their proliferation within the development center, would quickly limit its effectiveness, as has happened in the information center.

The numerous challenges of selecting programmer-oriented productivity tools for the development center are different from those faced by the user-oriented information center. Information center management had to select tools that would be effective in building ad hoc and quasi-production applications. Its decisions often resulted in the selection — and proliferation — of numerous end-user tools.

Why was it necessary to buy so many tools? The answer was simple: Each tool provided a different, specialized function, and numerous functions were required. None of the products could deliver all the required functions and features neces-

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Pfrenzinger is president of IMS Consulting, Inc., an Encino, Calif.-based consulting firm that specializes in IBM's IMS DB/DC and CICS/DL/1. He has 15 years of data processing experience and is a regular contributor to Softline.

Software AG adds E-mail, other aids

RESTON, Va. — Software AG Systems, Inc. has announced Mail/Connection electronic mail software for use with its Adabas data base management system.

The company also announced the Adabas Continuous Processing Option (CPO), a version of Adabas designed to deliver 24-hour data base availability, and Review, a resource tracking and auditing system for Adabas and Software AG's Com-Plete transaction processing system.

According to a spokesman, Mail/Connection is said to provide storage and retrieval capabilities for messages through integration with Adabas. Features of Mail/Connection include program function key orientation, full screen editor and micro-mainframe link. Using Software AG's Natural/Connection micro-mainframe link, users can now send and receive electronic mail messages through personal computers.

Mail/Connection can be accessed through IBM 3270-type terminals or IBM and compatible microcomputers using Natural/Connection. Mail/Connection is priced at $10,000 for IBM's DOS operating system, $15,000 for VS1 and VM and $20,000 for MVS.

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Call for full documentation or free 30-day trial.

Price: OS — [illegible] or [illegible], DOS — [illegible] or [illegible].

[illegible]

Gould, Mentor Graphics unveil gate array software

SANTA CLARA, Calif. — Gould AMI Semiconductors, a division of Gould, Inc., and Mentor Graphics Corp. have jointly announced a software product that is said to allow systems engineers to complete a gate array design process — from schematic entry through simulation and physical layout — using a workstation in their own environment.

Using Mentor Graphics' Gate Station, systems engineers use Gould AMI macro libraries to design gate arrays ranging from 1,000 to 4,000 gates in the 3-micron double-layer metal process. The Mentor Graphics software coupled with the Gould libraries allow schematic capture, logic simulation, automatic physical layout and back annotation and verification during the design process. The information is then sent on to Gould for fabrication, a spokesman said.

The software from Mentor Graphics includes modules for schematic entry, simulation, automatic physical layout and add-delay function. The prices range from $12,000 to $65,000 for the entire package depending upon host. The software runs on Apollo Computer, Inc. workstations ranging from the DN300 to the DN660, under Apollo's Aegis operating system.

The Gould libraries cost $600. More information on the entire system is available from Gould AMI, 3800 Homestead Road, Santa Clara, Calif. 95051.

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System/36 gets RM/Cobol

Supports native SSP, IBM RPG data files

ROLLING HILLS ESTATES, Calif. — Ryan-McFarland Corp. has announced that its RM/Cobol programming language is now available for IBM's System/36 Models 5360 and 5362 under SSP, the minicomputer's native operating system.

The System/36 implementation runs under the most recent release of SSP and on earlier versions. According to a Ryan-McFarland spokesman, the implementation supports SSP data files, so that files created by System/36 utility programs and by other languages on the computer such as RPG can be used in RM/Cobol applications.

RM/Cobol file I/O is said to be efficient because SSP file handling features are built into the System/36. The spokesman said an RM/Cobol benchmark program executes nearly twice as fast on the System/36 as it does on the IBM Personal Computer AT and three times as fast as on the Personal Computer XT.

Through an arrangement with IBM, the System/36 implementation of RM/Cobol will be manufactured, supported and marketed by IBM, the vendor spokesman explained. Licensed applications developers can obtain development systems and runtime integration rights from Ryan-McFarland.

Cross-compilation

In addition to the System/36, IBM processors that run RM/Cobol include the 4300, 3030 and 3080 mainframes under VM/CMS, the Series 1 under AT&T's Unix and the Personal Computer under IBM's PC-DOS and Digital Research, Inc.'s CP/M 86. RM/Cobol-based software can be cross-compiled in any of those environments for use in any other, the spokesman said.

The System/36 RM/Cobol compiler and runtime module is priced at $1,900, and the runtime component alone is priced at $400. The products are scheduled to be available in June, the spokesman said.

Ryan-McFarland is located at 609 Deep Valley Drive, Rolling Hills Estates, Calif. 90274.

Data Kinetics releases DBMS with automatic table handling

OTTAWA — Data Kinetics Ltd. has announced a data base management system with an automatic table handling system for IBM mainframes running MVS and DOS operating systems.

Operating independently of application programs, the Tablebase DBMS stores data in a central library of tables outside the programs, a spokesman said. When changes occur, new entries are input only to those tables affected. Users reportedly can create, access and maintain tables on-line, independent of the programs that use them.

Different tables may be stored in the same library, and table updating can occur while multiple reads are taking place.

Tablebase components include an end-user environment that provides table definition and maintenance for CICS and IBM's Interactive System Productivity Facility, a batch facility and an access facility.

The product can be used with most commercial programming languages, including Cobol, Fortran and PL/I.

The product costs $35,000 for MVS and $15,000 for DOS.

Data Kinetics is located at 97 Norman St., Ottawa, K1S 3SK, Ont., Canada.

Fischer-Innis announces version of productivity aid for TSO users

NAPLES, Fla. — Fischer-Innis Systems Corp. has announced Release 5.0 of its Interactive Output Facility (IOF), a productivity aid for use in IBM JES2 TSO environments.

Release 5.0 enhances users' ability to manage JES2 output under MVS/TSO, a vendor spokesman said. The IOF's display panel reportedly allows users to review JES2 batch jobs and their output.

IOF Release 5.0 is said to allow TSO users to select jobs for review based on an expanded list of criteria, including input and output class, destination, forms and writer name.

Both input and output job characteristics can be modified on the IOF panel, the spokesman said. An added panel is said to display input queue statistics, including queue length, job class and priority. Another panel allows for easier definition of data sets for snapshot output, in which a selected portion of data is extracted so it can be printed without affecting the original job.

Release 5.0 increases the number of Interactive System Productivity Facility (ISPF) variables saved for each user in the ISPF profile, the spokesman said.

Stored variables are said to include scrolling options, condense and compress specifications and default IOF job selection criteria. For snapshot and print data sets, users reportedly may save programmer name and JES2 line count. Additional job access routines enable systems managers to specify who may use certain IOF facilities.

IOF Release 5.0 is available for a monthly lease fee of $250.

Fischer-Innis is located at 4175 Merchantile Ave., Naples, Fla. 33942.

SYSTEMS SOFTWARE

■ MacKinney Systems has announced CICS/CICS Enhanced Master Terminal (CICS/CEMT) for IBM's MVS. The product was previously available only for IBM's DOS.

The MVS version of CICS/CEMT reportedly provides for the allocation of files to IBM's CICS from a batch partition. It also provides verification that the function was successful. Other product functions allow the user to start a task at any CICS terminal or run a CICS program from a batch job and issue a NEWCOPY command to CICS automatically after successful completion of a program.

CICS/CEMT also allows CEMT commands to be passed to a CICS system running on another CPU or virtual machine. The product reportedly allows up to five CICS systems to be defined.

CICS/CEMT is priced at $495 for a perpetual license and $195 for an annual license.

MacKinney Systems, Suite 112, 2674-A S. Glenstone, Springfield, Mo. 65804.

■ Davis, Thomas and Associates, Inc. has announced DTAICCF, which allows users of IBM's ICCF to run a CICS transaction while logged on to ICCF. The software runs in IBM OS environments.

A spokesman said DTAICCF can be used in the command mode or full-screen editor mode of ICCF without disrupting current ICCF activity to run CICS transactions external to ICCF.

DTAICCF is priced at $1,800, plus $225 per year for maintenance after the first year. Lease price is $80 per month.

Davis, Thomas and Associates, Suite 301, 8500 Highway 7, Minneapolis, Minn. 55426.

■ Candle Corp. has announced CL/Menu, an applications menu facility that replaces traditional IBM Vtam screens with menus. CL/Menu runs under IBM's MVS and MVS/XA operating systems.

According to a spokesman, CL/Menu replaces the traditional "Welcome to Our Network" screen with a menu showing available applications

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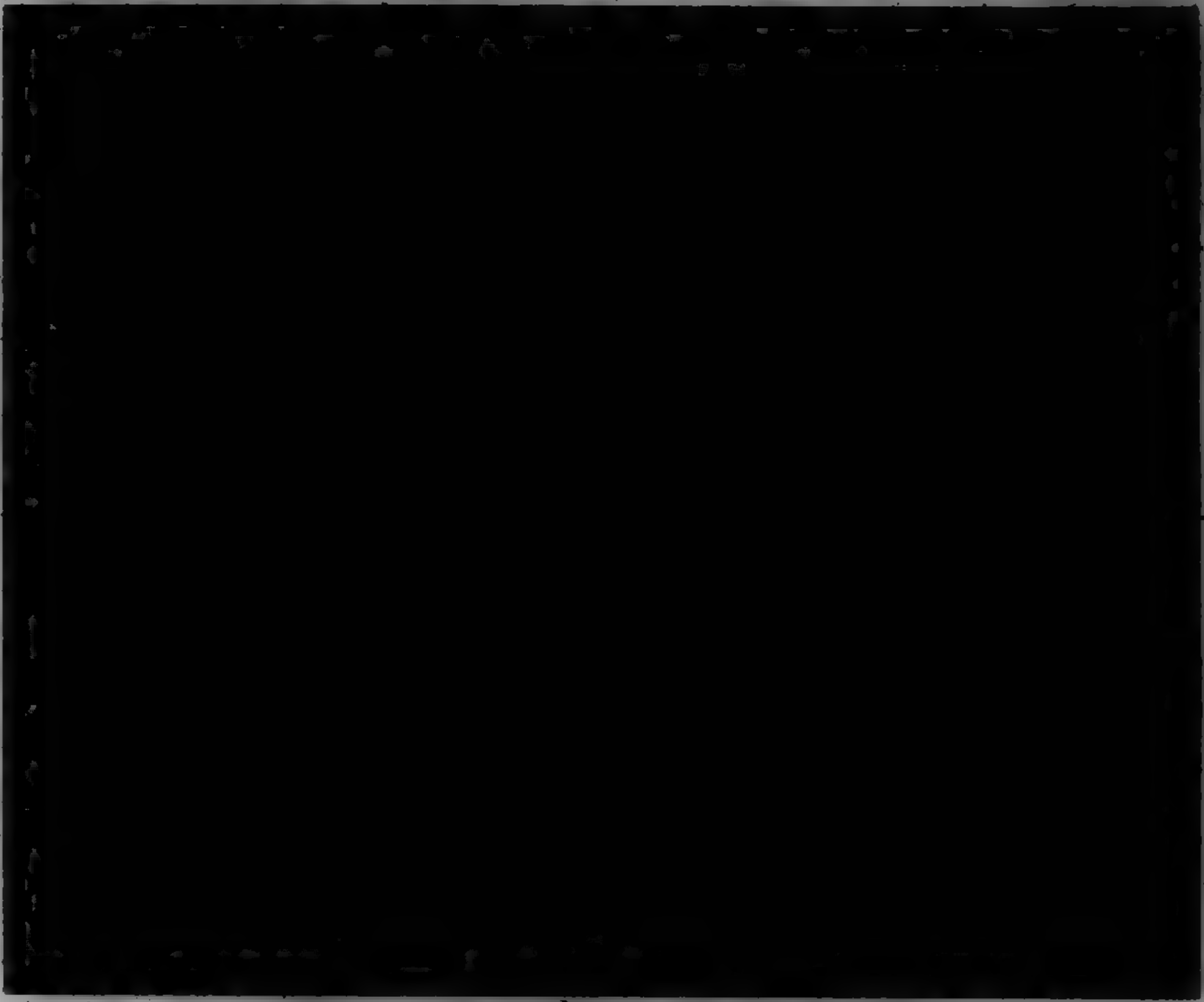

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SSA unwraps enhanced BPCS for IBM System/38, 36

CHICAGO — System Software Associates, Inc. (SSA) has announced enhancements to its software packages for manufacturing, distribution and financial applications on the IBM System/38 and System/36.

Business Planning and Control System (BPCS) 38 Version 2 for the System/38 has enhancements for production planning control environments, a spokesman said. Version 2 supports order entry, planning and control and customer shipment. Among new functions are planning bills of material, order entry features and options, two-level master production scheduling and final assembly scheduling.

BPCS 38 Version 2 is written in RPG-III and reportedly uses all data base and productivity features of System/38. Prices for BPCS Version 2 start at $52,000.

SSA also announced BPCS 36 Advanced Manufacturing Software for the System/36, with enhanced functions for the manufacturing environment, similar to those offered by the BPCS 38 Version 2.

BPCS is written in native System/36 mode, RPG-II, and is said to use all data base and productivity features of System/36. Prices for BPCS 36 Advanced Manufacturing Software start at $25,000.

SSA also announced BPCS 36 Process Industries, Version 2 software for the System/36, with enhancements to the areas of product cost and lot control.

BPCS Version 2 now allows up to nine user-defined cost fields for each item for tracking production costs in quality control, quarantine, fixed and variable overhead and specialized use of material.

The feature is intended to address all product costing and analysis needs of process industries such as pharmaceuticals, chemicals and food processing.

BPCS 36 Process Industries Version 2 includes expanded capacity permitting allocation of product lots to customer orders on the finished-goods level, and allocation of raw material to orders on the manufacturing level.

BPCS 36 Process Industries Version 2 is written in native System/36 mode; prices start at $25,000.

System Software Associates is located at 200 W. Madison, Chicago, Ill. 60606.

[redacted]

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and their status. CL/Menu reportedly improves communications by allowing system status to be displayed on the menu. Users are returned to the menu if an application becomes unavailable while in use.

With an electronic bulletin board feature, the data center can notify users of scheduled interruptions in service or other items of interest. CL/Menu is scheduled to be available in the second quarter. The permanent license fee for CL/Menu is $7,500.

Candle, Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

■ The Cambridge Systems Group, Inc. has announced that its ASM2 Standalone Restore (SAR) facility is now available for IBM's MVS/XA. ASM2 is a disk space management system.

ASM2's Standalone Restore version 3.0.1 is said to be able to restore, in a standalone environment, system volumes that have been lost or damaged. Standalone Restore uses ASM2's full-volume dump/restore facility.

The price for version 3.0.1 of ASM2's SAR facility is $19,500.

Cambridge Systems Group, 24275 Elise, Los Altos Hills, Calif. 94022.

■ Value Software, Inc. has announced Release 11.01 of Vmanager, formerly known as Data Center Management System, for automating production control activities in a data center. Vmanager runs under IBM's MVS and MVS/XA operating systems.

Continued on page 46

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TOOL

from page 39

sary to meet the information center's needs, such as ad hoc queries and reports, statistical information, spreadsheets, data base extracts and business graphics.

Are we faced with the same dilemma of selecting too many tools for the development center? The answer is no. The requirements for development center productivity tools are such that one or two tools will provide all the functions, features and performance required.

The system must be useful for building performance-oriented, predefined applications built around a data base management system. The format and content of screens and reports are well defined in advance, along with data models and applications logic requirements. These characteristics are obviously different from those in the information center.

Also, the decision to use one tool for a one-time or quasi-production application is less significant than the choice of a development center tool for building a major production application that will be used and maintained for many years.

Restricting use

Development center tools currently available can adequately address 95% of the predefined applications waiting to be built. If a development center can restrict the number of tools in use, it can realize tremendous savings in development, maintenance and training costs. Such a restriction also provides an opportunity for standardization within the production development environment.

The difficult part of selecting a single tool for the development center is recognizing that it is a strategic, long-term decision, not a tactical, short-term one. As a rule in software evaluation, tactical decisions are easier and less risky to make than strategic ones.

A tactical approach would have you buying another tool for every new or different requirement. Experience is proving, however, that the individual benefits of numerous tools are almost always offset by the burden of training, maintenance and support. The architectural differences that often exist between tools are an additional hindrance to systems integration.

Strategic decision

What is the answer? Make a strategic decision to evaluate and acquire a productivity tool that can be used to build 95% of development center applications. This is the toughest decision because it requires a commitment to select and implement a tool that could affect the entire DP organization.

A major benefit of this wide-ranging impact is that productivity gains can now be realized by the majority of DP personnel within a consistent and manageable framework. The strategic decision requires that the selected productivity tool have the following minimum characteristics:

- Integrated on-line, batch and report writing functions.
- Features usable by multiple skill levels.
- A minimal learning curve.
- A screen image painter to generate the native screen source statements.
- A nonprocedural field-edit logic capability.
- An early prototyping feature usable soon after screen design.
- High-level commands or macros to simplify native data base and data communications interfaces.
- Features ensuring that developers generate standardized source code.
- A facility for leveraging senior developers with a command or macro writing feature for building reusable code.
- No significant design restrictions that limit architectural functions.
- High-performance processing capability.
- An import facility from existing data dictionaries.
- Automatic documentation generation capabilities.
- No runtime package that would affect portability to multiple CPUs.
- An integrated dictionary facility to control screens, reports, programs, data bases and other components.

The benefits to controlling productivity tools within the development center are significant. Take the time to make the strategic decision during selection, and the entire organization will reap the benefits.

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returned to normal, he said.

Since MSA provided a fix to general ledger Release 21.7, the problem has not recurred, Peirce said. At MSA's Interact users group meeting in New Orleans recently, Peirce said, MSA representatives assured users that Release 21.9 of general ledger, scheduled to be announced this fall, will work more efficiently with Expert Link.

For the future, Peirce said his firm is preparing a project involving the use of micro spreadsheet software to prepare departmental budgets. The budgets would be uploaded to MSA's Easy Plan budgeting tool on the mainframe, which is said to update MSA's general ledger budget master files.

While Peirce said Life Investors is satisfied with Release 4.2 of Expert Link, the company also recently bought a copy of Pansophic Systems, Inc.'s Panlink micro-mainframe link package. An advantage of Panlink, according to Peirce, is its ability to access multiple vendors' mainframe software.

Commercial bank's usage

Fidelity National Bank of Baton Rouge, La., a commercial bank with 19 branches and $750 million in assets, has been using Expert Link for two years.

Susan J. Babin, assistant vice-president and account manager at the bank, said Expert Link has been used to download data to micro spreadsheet software for report generation. The bank ties three IBM Personal Computer XTs to its IBM 4341 mainframe using Expert Link.

Fidelity National is using the link as an aid in budgeting, which Babin described as a nightmare at the bank. Branch managers enter a proposed budget on a diskette, which is forwarded to the accounting department.

If the budget checks out, accounting uploads it to Easy Plan on the mainframe. As a security measure, all uploading and downloading is done by the accounting department.

Link goes down with mainframe

A drawback of Fidelity's link, Babin said, is that when the mainframe goes down, the link goes down. To combat the problem, the bank plans to use Expert Link to download an account cost-center reference file to a micro.

The reference file will be used to validate transactions during the day. At night, the mainframe data base will be updated in batch mode.

The only disadvantage Babin cited of not being on line is the inability to process a new account, but she said most accounts are not opened in one day. An advantage of being off line, she said, is the "freedom from worrying about whether [or not] the mainframe is down."

Since obtaining Expert Link, Fidelity has added four branches and several financial services but has not had to add staff. "We have more to do [but] have taken up the slack with the micros," Babin said.

At the Interact meeting, an MSA spokeswoman said the company will announce a series of distributed personal computer applications to allow reference data bases to be downloaded from MSA mainframe applications to IBM Personal Computers via Expert Link.

Continued from page 42

According to a vendor spokesman, Release 11.01 of Vamanager includes on-line job tracking across multiple processors and increased data set scheduling and job forecasting capabilities.

The latest release also includes XA support for its JCL Validation feature.

An enhanced Vtam communications feature called Vtam Bridge can be used for on-line job tracking in addition to the normal Vtam communications support.

Vtam Bridge is also said to eliminate the need for a shared Dasd environment, and it supports Vamanager on up to 20 CPUs.

The data set scheduling feature of Vamanager can now accommodate up to 600 data sets recorded on the master list.

According to the vendor, the forecasting capabilities of Vamanager have been enhanced to produce a forecasted schedule of the data center's work load for 2,400 jobs in a 30-day period, 4,800 jobs in a 15-day period or 9,000 jobs in a seven-day period.

Vamanager, Release 11.01, is priced at $64,000.

Value Software, 408 N. Kings Highway, Cherry Hill, N.J. 08034.

■ Automotive Computer Extensions, Inc. (ACX) has added support for SAS Institute, Inc.'s SAS/Graph plotter to its ACX-PM Printer Manager for IBM mainframes running under VM.

According to a vendor spokesman, Graf-ACX Graphics Manager allows SAS/Graph users to share plotters and perform spooling functions. It also allows users to print multiple plots per page.

The product allows continuous- and noncontinuous-feed asynchronous Ascii plotters to be managed by ACX-PM.

With ACX-PM, the plotters are automatically shared by all CMS users without system operator intervention, according to the vendor spokesman.

Graf-ACX generates charts, plots and presentation graphics. Plots can be produced from any local, remote or dial-up CMS terminal, the vendor said.

ACX-PM Base Printer Manager sells for $5,000. Graf-ACX sells for $2,000.

Automotive Computer Extensions, 5120 Belmont Road, Downers Grove, Ill. 60515.

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MAIL

from page 39

The product is available immediately.

The Adabas/CPO is said to ensure data base resource availability despite peripheral hardware failures. Adabas/CPO automatically detects and recovers from I/O errors, providing transparent read/write access to current backup data in the event primary data becomes inaccessible.

The Review tracking and auditing system can be used to provide billing for use of data base and teleprocessing resources. Review provides facilities for generating the summary, detail and exception reports needed to manage capacity, to account for system usage, to tune for performance and to detect abnormal or unauthorized activities.

Review is supported under IBM's MVS/XA, MVS/370, VS1 and DOS/VSE operating systems. Adabas/CPO is available for MVS/XA, MVS/370 and VS1 environments.

Adabas/CPO is priced at $50,000 for the DOS version, $65,000 for the OS/VS1 version and $80,000 for the MVS version. Review is priced at $10,000 for all environments.

Software AG is located at 11800 Sunrise Valley Drive, Reston, Va. 22091.

MAGEC

from page 39

had seven people working for the better part of six months to update a relatively small number of master files.

"To do a simple update to one file [took] our users several days of arguing with the computer," he said. "One person [spent] a week building a transaction to do what I would regard as a fairly straightforward update."

Pohrte realized that what NRM needed was a product that used command-level Cobol and not a proprietary development language. It was his job to inform upper management of the problem.

"One of the most difficult chores was to convince management that what we had was not what we needed," he said. A presentation from Dallas-based Al Lee & Associates gave Pohrte ammunition with which to do the convincing.

When Sherlin met with Al Lee, the vendor firm's president, the pair took a UFO application that a CICS programmer had been struggling with for about a month and brought it on-line with Magec in a day and a half, Sherlin said.

"At the end of that day and a half, we were able to have an inquiry screen which allowed people to at least see in real time what was out on that purchase and sales file," he said.

According to Sherlin, Magec applications are developed on-line through nonprocedural specifications entered on a terminal screen. Magec then generates Cobol inquiry, update and browse functions from the nonprocedural specifications stored in its dictionary.

Applications can be customized by entering Cobol code directly onto the development screen, and they can be modified and regenerated without losing that customization. The product's dictionary-controlled security system governs on-line access.

One important benefit, Sherlin said, was that Magec used the same Cobol copy statement that NRM used on its batch programs. Screen editor features have also helped NRM, he said. "If you define a field and you enter a slash and two characters and another slash and two more characters, Magec assumes that it is a date field."

Sherlin said some 40 UFO applications are slowly being converted to Magec. In addition, all new applications are being written in Magec. "We've used Magec to bring up some quick-and-dirty-type screens within a matter of just three or four hours," he said. Al Lee & Associates also developed an interface to the company's Teradata data base machine.

According to Pohrte, the conversion has helped NRM maximize the productivity of its 15-person programming staff. "We wouldn't have been able to do the same things that we did in Magec with the number of people we have," he said.

"I think we ordered the wrong keyboard."

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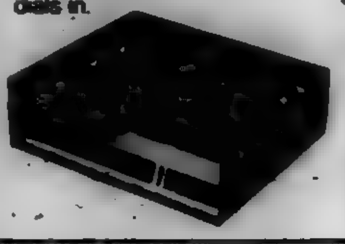

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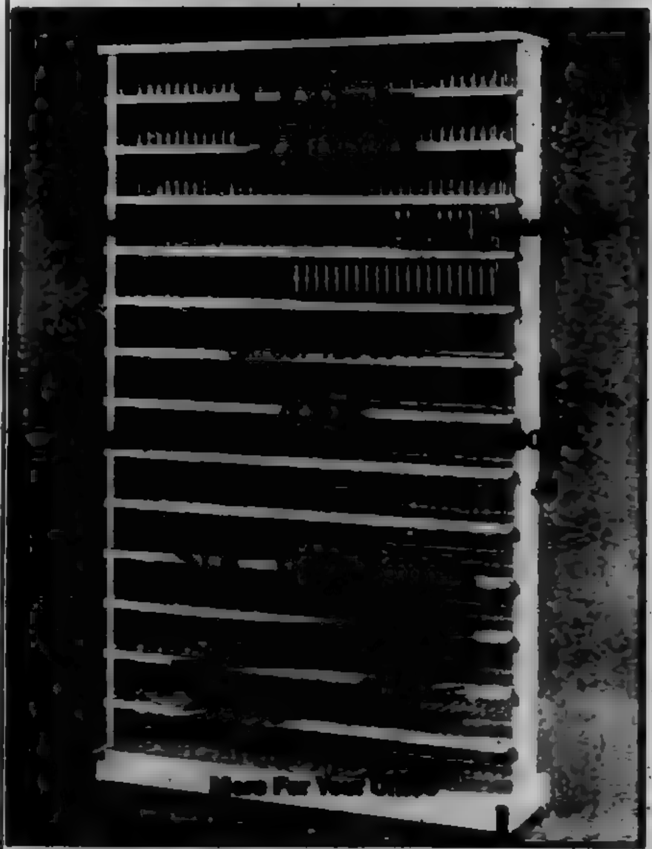

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DTA

IN DEPTH

Understanding the DP professional

A primer for the wives, husbands, friends and lovers of people who speak computerese, Part 1

By Bruce Kala

Does a decade of nested IFs evoke for you the delicate beauty of a mountain waterfall in late spring? Is there nothing in your life so satisfying as tracing a storage chain through a 300-page dump?

If you answer yes, you may presume you are not an easy person to talk to about computers. If you have spent more than a couple of years in the world of DP, it's likely you have a whole vocabulary that is incomprehensible to someone outside that world.

It is impossible to speak computerese all day, then go home and not speak it at all. Words creep into your vocabulary that used to be out of place outside a computer room. Although some bits of computer language work their way into the common language, (such as the word "computer" itself — thirty years ago the laity called any computer "an IBM"), most DP jargon remains beyond the grasp of people who don't use it constantly. There is simply too much of it.

Even two seasoned programmers can easily confuse each other. An abbreviation like CSA means a vastly different thing to an MVS programmer, a CICS programmer and a VAX programmer whose great-grandfather fought for the Army of the Confederacy.

Programmers marry crane operators, and computer operators drink beer with corporate lawyers. Users have to talk to systems analysts, and data base administrators have to talk to management. It may be that the person closest to you doesn't even have a good idea of what you do for a living, much less understand the joys and tribulations of your work.

On top of this language problem, DP is new enough to be widely misunderstood. People with a slight knowledge of computers have some notion of how prosaic work with computers can be but often lack an appreciation for the remarkable technology involved.

More often, the layman's concept of computers comes from magazine articles with titles like "House of the Future" and "Cars That Think."

There are a few things you can do

The second article in this two-part series will describe days in the lives of several computer professionals.

ILLUSTRATION BY JIM VENABLE

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IN DEPTH/UNDERSTANDING COMPUTERESE

to improve the situation. DP professionals, like doctors and lawyers, should work a little harder at speaking English. Few people would have trouble understanding, "He programmed the computer to print calendars"; but most people would be taken aback by "He clobbered register 15 and blew away on an op exception in low core."

Patience is required, of course. Some people are as awed by programmers as they are by particle physicists, but the fundamentals of programming and particle physics are not inaccessible, if someone is willing to explain them.

If you find yourself using a technical term in conversation, stop and explain it. Acknowledging that the word is obscure is bound to be more acceptable to your listener than just using the word and acting as if he should understand it.

On the other hand, remember that DP is not considered universally an interesting topic of conversation. Choose your moments well; don't launch into a lecture on direct-access storage device architecture when your friend is discussing ergotism as a possible cause of the Salem witchcraft scare or how the Detroit Lions will do next season.

> ”
>
> *You who speak computerese have to help here — tear out this article and give it to someone you love.*

This is a specialized article, designed to provide an orientation for people who do not, and may never, program, use, design, operate or fix computers. The realities of your own DP experience will be different from what I've written here; my goal is only to help you to convey those realities better. You may be astounded at what I've left out. There is room for limitless amplification and addition, which I leave to you.

You who speak computerese have to help here — tear out this article and give it to someone you love. Then stand by to guide the person over the rough spots, illuminate with examples and, most importantly, add specific detail to areas that I have carefully generalized.

To the friend of the DP professional: Between 1981 and 1990, the U.S. Bureau of Labor Statistics says, the number of people who program, operate and repair computers will increase by up to 700,000, reaching almost two million. Add in people who enter data for computers to use, those who lack extensive computer knowledge but happen to use computers frequently on their jobs and those millions who have bought their own home model.

All this is to say that you should not be surprised that you seem to know a lot of people who know computers.

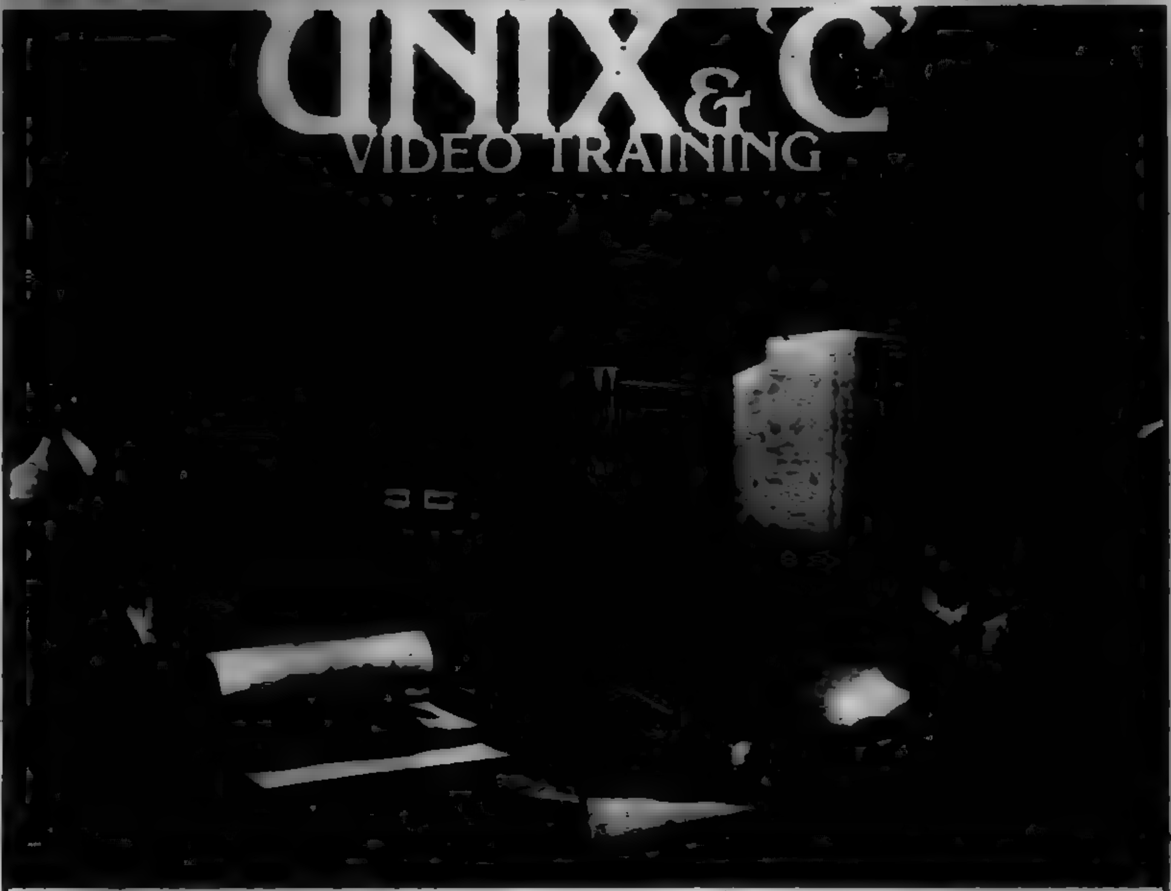
You will have noticed, I think, that people who work with computers speak an esoteric language and do not exhibit much concern that others may not understand them.

This article is a sort of self-defense manual to help those who don't know (or care) much about computers to communicate with anyone who does.

You may skip over any section or ask your personal expert what he thinks would be most useful to you. The object, after all, is to permit the two of you to communicate better, not to make you an expert yourself.

I am presuming that you do not consider computers to be the most exciting subject in the world. It may encourage you to know that the author agrees with you.

Imagine you've come home after a hard day at work. You settle into your favorite chair with a glass of wine and a book. Suddenly, a crazy person explodes through the front door, ranting every bit as intelligibly as the foreman of the crew that built the Tower of Babel: "Trace tables corrupted! Command reject on SYSRES!" the person shouts.



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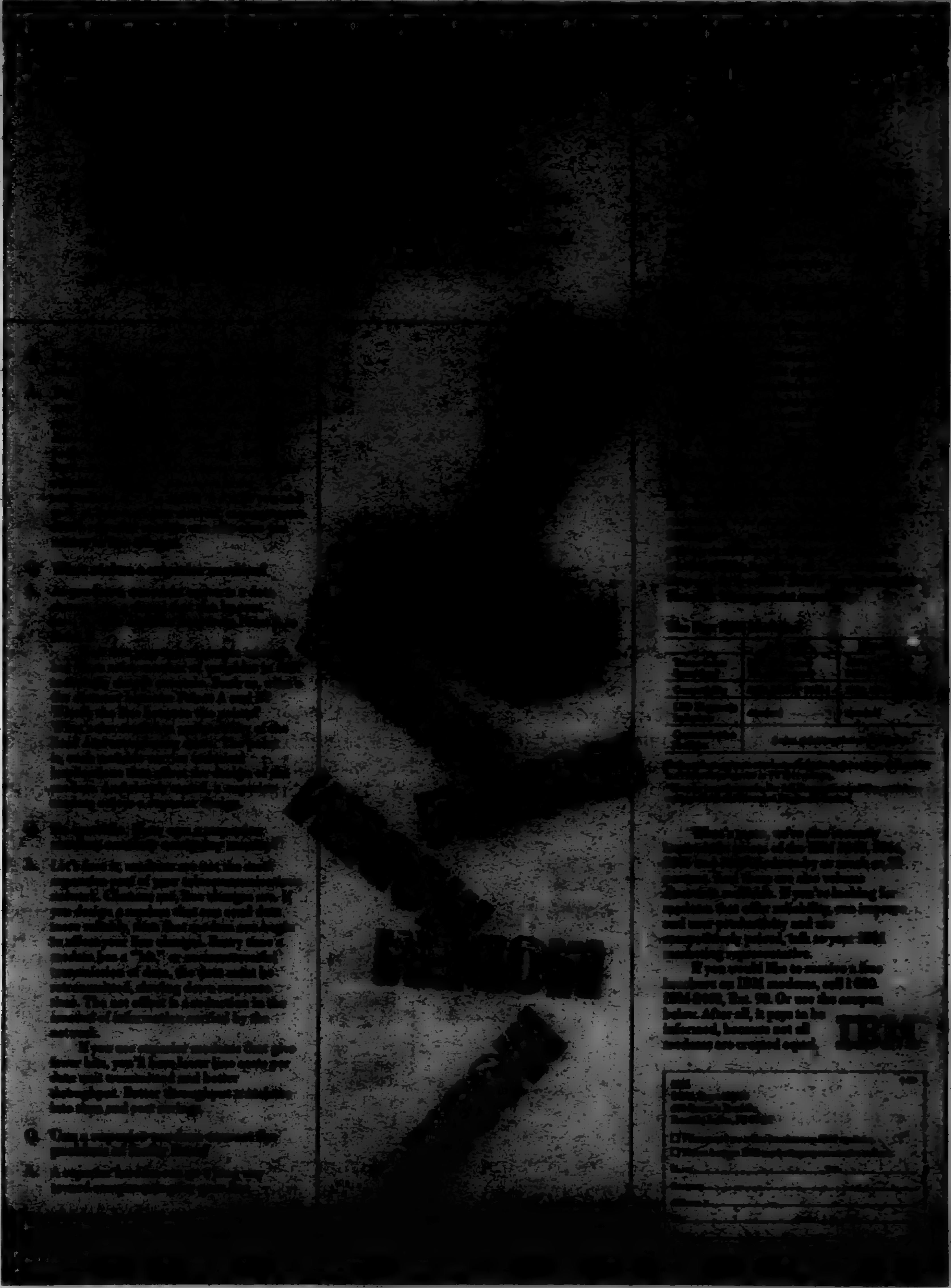

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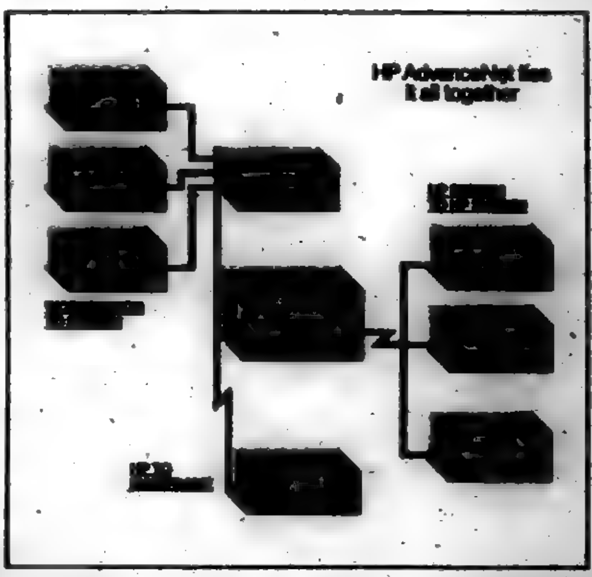

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HEWLETT PACKARD

> ,,
>
> *If you work with or live with someone in DP, both of you will have to work at understanding each other. And because the size of the DP lexicon is growing, it will be a never-ending job.*

"Did you have a bad day?" you ask.

"All I did was add one little transient to the SDL!" the person raves on, swigging copiously from your wine bottle. You carefully move easily broken objects to higher ground.

You may recognize that lunatic as the DP professional in your life. Although things may not get quite so out of control in your household (they do in mine), probably you have noticed some communication problems when it comes to talking about computers. Perhaps you don't even have a clear idea of what that individual does all day.

And it's half your fault.

Oh, I know you've been sympathetic, and sometimes listened to computerese all evening long, without understanding half of it. But that's precisely the point: when you didn't understand, you should have raised a hand and said, "Hold it, Jack!" (or Jill, or Fred or Sue, as the case might be) — "What on earth are you talking about?"

Just as your physician might unthinkingly advise you to "ingest 10 grains of acetylsalicylic acid" instead of telling you to "take two aspirins," people who work with computers sometimes forget which words in their vocabularies will not be found in a standard dictionary. It's up to the people who do not work with computers to remind the ones who do when they have strayed from the realm of comprehensibility.

It is possible you are less confused by people who talk about computers than you used to be. You probably have seen television programs where the hero (or, more often, villain) sits in front of a video display terminal getting at information stored in a computer system. In real life, you probably have seen a ticket agent or a bank teller do the same thing. And when a writer throws out a term like "video display terminal" you probably can visualize just the sort of thing he's talking about.

You have become, believe it or not, more computer literate than you used to be. For example: Do you ever use the word "input" — as in "I'd like to add my input to this discussion"? Were you using that word in 1970? Probably not. You have been exposed to the language of computers by the media and politicians and (of course) the people you know who know computers.

You may have heard warnings from university and government officials that people who don't understand computers will a few years from now have the same status as people who can't read today. Schools are forcing school boards and students to buy computers so the students will be prepared for a future that almost certainly will involve contact with computers.

Actually, the trend in computer technology is to design machines that anybody, with or without computer experience, can operate. The need for formal training to acquire computer literacy has already begun to decrease. Already, anybody old enough to read a simple sentence can use a well-designed computer system.

It no doubt sounds as if I am proposing arguments for not reading an article like this one. I haven't shown you the other side of the coin: The more user-friendly a computer system is, the more complex it must be. To make things easier for us (the users of computers), computer hardware and software engineers have to dig ever more deeply into their bag of technical tricks. It's very easy to design a computer that is difficult for anyone to use — and vice versa.

What this means, clearly, is that people who work in the world of data processing are going to have an even more sophisticated language all their own as the years go on, with more and more new and obscure terms. If you work with or live with someone in DP, both of you will have to work at understanding each other. And because the size of the DP lexicon is growing, it will be a never-ending job.

Is it worth the trouble? That depends on whether you wish to communicate with people in DP or merely listen to them. The purpose of this article is to give you a running start

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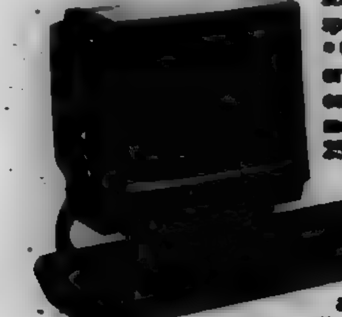

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at the former — and presumes you are tired of the latter.

Answer A or B to the following question: the computer is a useful device primarily because of its (A) speed or (B) intelligence.

If you answered B, or were tempted even vaguely by it, it is possible you have been convinced by magazines, newspapers, films or television that computers have brains. Not so. A computer is, at its roots, only a very speedy electronic calculator. It has no innate intelligence, although some computers may be furnished with instructions and information that allows them to mimic, in a small way, human reasoning.

Bad reputation

Yet somehow computers have developed a terrible reputation. Bank tellers blame them for losing your savings account; customer service representatives point their fingers at them when the summer issue of a magazine arrives in your mailbox just in time for Christmas. In novels and films, computers are found doing everything from taking over the world to harboring indecent thoughts about a sexy heroine.

Actually a computer is not much more likely to lose your savings account than it is to demonstrate a lust for blondes. A computer, on its own, can't lose anything. (In fact, a computer is too ignorant to make any mistake. It requires that a human define the procedures it must follow to make a mistake.) And lust, of course, is an emotion, which is something a computer will never have. But about them taking over — there's some truth in that.

There may be computers skulking about your living room (in your television or stereo) or lurking in the shadows of your kitchen (in your microwave oven) or laying in wait somewhere under the hood of your car (a new car is likely to have half a dozen).

Computers are pervading our world not because they are smarter than you and I, but because there are so many tasks a computer can do more quickly, dependably and efficiently than humans can. Let's take the problem 84,577,506 divided by 56,498. Not so bad. But try performing a million such calculations. It would take a person with average arithmetic skills a couple of years, with no breaks for eating, sleeping or sharpening pencils.

Yet the typical large computer could have the job done in a second — literally. Or let's say you've got to adjust two valves, one controlling gasoline, the other controlling air, making sure the right mixture is going into the cylinders of your car's engine.

The mix has to change according to acceleration or deceleration, the temperature of the engine and the load on the engine, and it has to change quickly and often.

Even if you could keep the valves adjusted properly (which isn't likely), you'd be bored to tears with doing it long before you reached Grandma's house. But a computer would do the job unflinchingly and perfectly for as long as it had current flowing through it.

A computer will do, mindlessly, precisely what it is told to do. Do not accept the explanation "computer error" when your checking account has an overdraft for $6 million. Tell the bank that programmers, keypunchers and computer operators make mistakes, but computers do not.

(I have to admit to one exception to this rule. It is possible for electrical or mechanical malfunctions to destroy or alter information stored in a computer. But a well-designed machine will detect a problem like this and allow a human to intervene and recover the lost information.)

The thousands of ways computers have changed our world testify to the intelligence of man, not computers. A computer that beats a human chess champion at his own game is very impressive, but what should be more impressive is the accomplishment of the person who instructed the computer; that person was either a very good chess player or a very good computer programmer — or both.

And the machine itself? A team of talented and informed people spent years designing it. (Of course, only the names of the chess champion and the computer will make the eleven o'clock news.)

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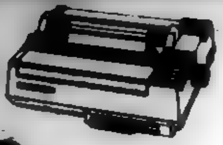

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Glossaries usually are at the end of a book, because a glossary is normally an optional reference — a handy place to look up an unknown word.

Unfortunately, it is virtually impossible to talk about computers without using specialized language, so I have labeled this chapter "Required." You may be surprised at how many words are familiar. However technical a language computerese might be, most of it consists of ordinary English words bent to a special purpose.

The most common word in conversations about computers is data. It means information — and that's all you need to know. Data processing means "doing something with information," but more often it is accepted as meaning "a computer doing something with information." DP can mean the department where the computer is located ("Go see whether DP has any spare rubber bands") or what line of work someone is in ("I'm in DP") or a few other things.

> ”
>
> *However technical a language computerese might be, most of it consists of ordinary English words bent to a special purpose.*

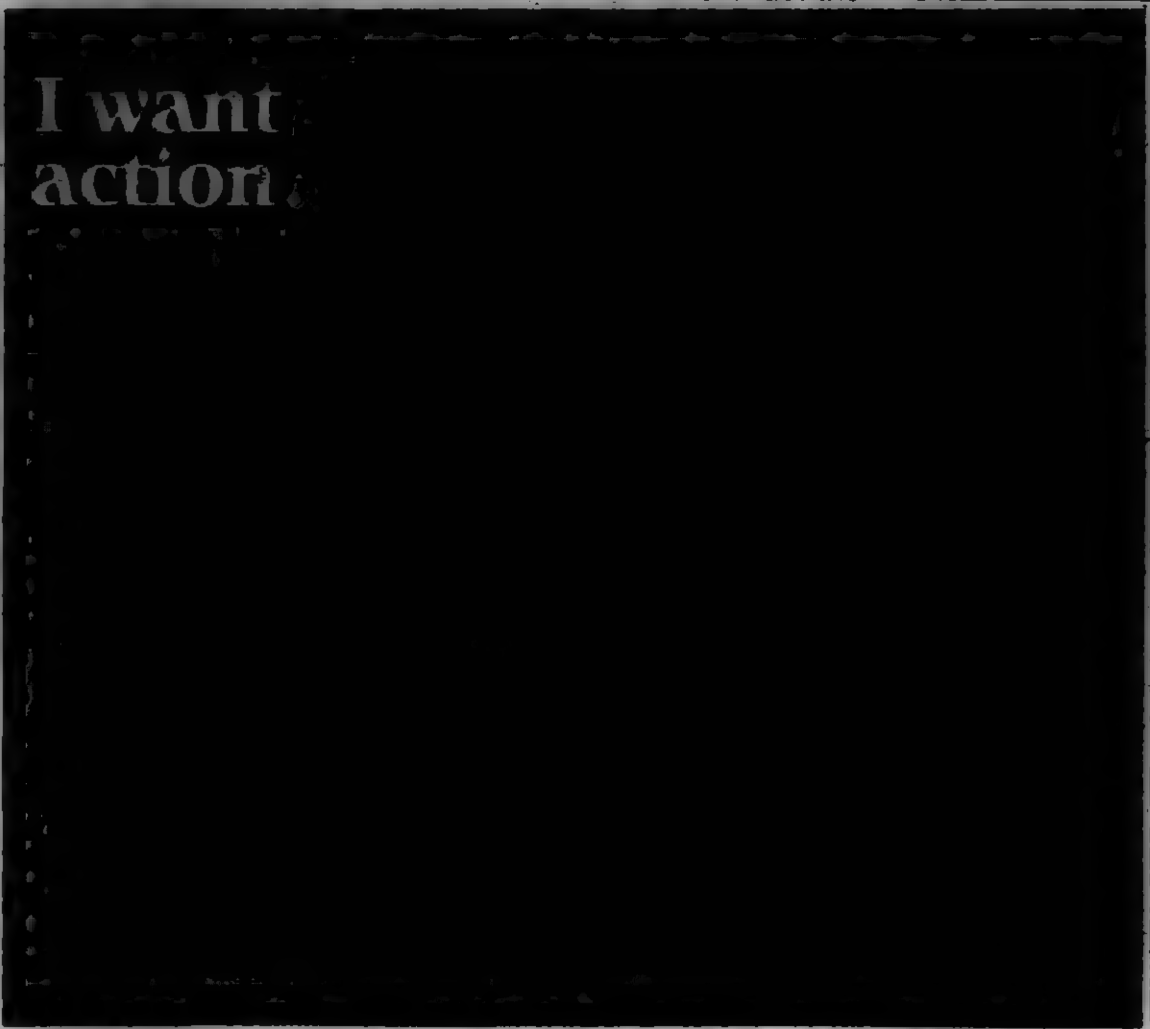
Strictly speaking, the word data is plural, meaning more than one datum. For example, your Social Security number is a datum kept on file by the Internal Revenue Service, and your name and address are among the other data that are kept.

Unfortunately, data has come to be used for both plural and singular, so that one is more likely to hear the phrase "the data is correct" than "the data are correct." In lieu of the word datum, phrases like "piece of data" are in common DP usage.

A large computer is often referred to as a mainframe or a CPU (central processing unit); smaller computers are minis or micros. This discussion relates primarily to large computers, and a computer, as far as we'll be concerned, is a complex electronic device that can be directed to process data rapidly and accurately. Exactly what is meant by "process" depends on the particular application.

One application of computers is performing arithmetic calculations upon data, but there are other things that can be done to data: Data can be printed, tallied, sorted, compared, added to, deleted from, combined and translated, to name a few. And there are any number of ways in which the functions may be combined.

But before a computer will accomplish anything at all, it requires instructions. The act of writing the instructions in a language suitable for computers is called programming. A program is one set of such instructions (which would be written by, of course, a programmer). A program defines the procedures a computer must follow to accomplish some desired result. Usually more than one program is required to perform a job (a job is simply some task, defined by a human, that a computer is required to complete). Several programs that relate to each other — for example, all the programs relating to



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the processing of a payroll — are referred to as a system.

Because the programs that process payroll are applying the computer to a specific problem, they are known together as an application system. Such a system may consist of several jobs. In the example of a payroll system, a job might be run every two weeks to print paychecks, and another job might be run monthly to print a report for the company president showing how much money was spent on overtime.

Another kind of system is the operating system. This group of programs does not produce anything as tangible as paychecks. It is both the servant and overseer of all other programs. A job will not start until the operating system ascertains it has the resources available to run it. An application program — like the one that prints paychecks — really submits requests for resources to the operating system and does not use the resources directly. So the paycheck program will announce to the system it has a check to print, and the system will actually issue the commands that initiate printing.

Notice that "system," with no qualification, usually means "operating system." The operating system designed by one large computer manufacturer is called the Master Control Program, or MCP, a name that sums up the concept of an operating system neatly.

The programs that make up an operating system usually are bought or leased from the same firm that built the computer the system runs on. Application systems usually are written at the installation where the computer is used, but they may also be purchased or leased. Both sets of programs are generally referred to as software, to distinguish them from hardware. Hardware means actual, physical devices, like a printer, or the computer itself. Software, as a rule, is what instructs hardware.

It is doubtful you can have avoided seeing the output of the sort of printer that is attached to a computer. Your monthly bank statement will almost assuredly be generated by a computer, as will any piece of junk mail that has your name inserted in it somewhere ("Dear Mr. Plunkett of Green Falls, Nevada, you may have won One Million Dollars!!").

This sort of printer was designed to accept different kinds of paper (forms) so that the same printer that was used to print the junk mail can later be used to print address labels for envelopes and a report on how many letters have been prepared. To avoid having to put a form in a printer every time a page is done printing, such printers use continuous forms, which are many hundreds of pages attached to each other but perforated in such a way that they may be separated after printing.

A necessary type of attachment to a computer is some external storage device, which allows large amounts of data to be saved and, in some cases, to be transported to some other computer or to a vault for safekeeping. The storage in a computer is not sufficient for large amounts of data and, because it is a special kind of electronic storage, it gets cleared out every time the computer is turned off. That kind of storage — computer storage — is for data and programs that the computer currently is using. External storage is for data that must be saved.

The two most common types of external storage are tape and disk.

Tape drives are much like a home tape recorder in concept: A roll of tape, with iron particles on it, passes by an electromagnet, which aligns the iron molecules on the tape. Of course, a tape drive records and plays back data, not music. A library of tapes — all labeled and numbered — will normally be found somewhere near the tape drives.

Disk drives contain stacks of platters whose surfaces can be read by an electromagnet. The platters revolve at a high speed. When data is to be read or written, a device called a head moves to the proper spot along the radius of one of the disks and waits for the point on the disk to spin by that is to be read from or written to.

The advantage of this technique over tape is that data can be randomly, as opposed to sequentially, accessed. The situation is analogous to a cassette tape vs. a long-playing record. If you wish to listen to a song in the middle of the tape, you have to run the tape until it gets to the middle.

With the record, you could simply lift the tonearm and set it down at whatever song you wish. It works the same way with data: It is possible on a disk to access any datum almost immediately, without first accessing all the data that comes before it.

The advantages of tape over disk are cost and portability. It is cheaper to store large amounts of data on tape. A tape is about the size of two dinner plates, whereas a disk module (containing the platters mentioned above) is usually about the size of a bread box and is far more expensive to manufacture. Moreover, some disk modules cannot be removed from the disk drive itself, so if the owner requires more disk storage, it means a whole new disk drive, not just the platters that go inside it.

Most large computer users have both tape and disk.

When data is stored on disk or tape, it is grouped together according to the way it is used, and each group is called a file. Each file has a unique name, like "BOOK.SUBSCRIBERS" or "EMPLOYEES." A file contains one or more records, each one containing different data. The file called EMPLOYEES might contain a record for each employee, and each record might contain an employee's name, address, Social Security number and pay grade. A group of files that has a

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logical relationship with each other is sometimes called a data base.

In the early days of computing, data was stored on punched cards. Although this technique is considered archaic in most DP circles, it does persist. To use cards for output from a computer, a device called a card punch is used; to use cards as input to a computer, a card reader is used. Card readers are used most often now merely to make the operating system aware of a job to be run, a process requiring only a few cards. This is called job submission.

It is not uncommon for all job submission to be performed from a video display terminal, also called a VDT, a cathode ray tube (or CRT for short), a tube, a terminal or a screen. The fact that there are so many synonyms should suggest just how common these things are. Software is available to allow many functions on a CRT. Programmers may use CRTs to write and change programs and to submit jobs to test the programs. Airline ticket agents use them to find out what seats are available on a particular flight. Entry clerks type in information about you on them when you subscribe to a magazine.

A special kind of CRT is used to monitor and control the computer and the jobs running on it. This is the console, and it usually can be found right next to the computer. The computer operator uses the console to communicate with the system. On most systems, several jobs can run at the same time — or that's the way it looks. Actually, the operating system divides up the use of the computer, doing a piece of this job, then a piece of that job, then a piece of this job again, going back and forth so quickly it appears to be running more than one job simultaneously. This is multiprocessing.

The ability to run jobs concurrently (which is not the same as simultaneously, remember) allows many computer users to make use of the same computer. Two basic kinds of activities may go on: batch and on-line. A batch job doesn't allow much human intervention, short of submitting it to the system. It requires a thorough explanation (to the system) about what data the job will require or write, what programs will be executed and so on. This explanation is submitted in a special job control language (or JCL).

On-line or interactive tasks are initiated by someone at a terminal. The information the system requires, about data and programs, has been supplied to the system already. All the terminal operator needs to do is type in requests and await replies, which will be presented on the terminal screen. In some contexts, the distinction between batch and on-line is denoted by background and foreground.

A different kind of program is required for interactive tasks than for batch tasks. Often a programmer will specialize in one or the other.

Programmers, like any humans, do not all speak the same language. Some write programs in high-level languages like Cobol, PL/I, Ada, Fortran, Basic or Pascal. High-level means "close to human language" (although a French Canadian might vehemently disagree). In Cobol, for example, if one wishes to display the current date upon the console, the correct command is: "DISPLAY CURRENT-DATE UPON CONSOLE."

Other programmers use a low-level language like Basic assembly language. This is a language more directly related to machine language — the language used within the computer — than to English. Any of the programmer languages must be translated into machine language before they are executable — able to be run on a computer. The programmer does not perform this translation by hand, of course; there is a program that does it for him, usually called a compiler.

Even once the program is translated to a series of digits that the computer will react to, there is no guarantee the program will work the

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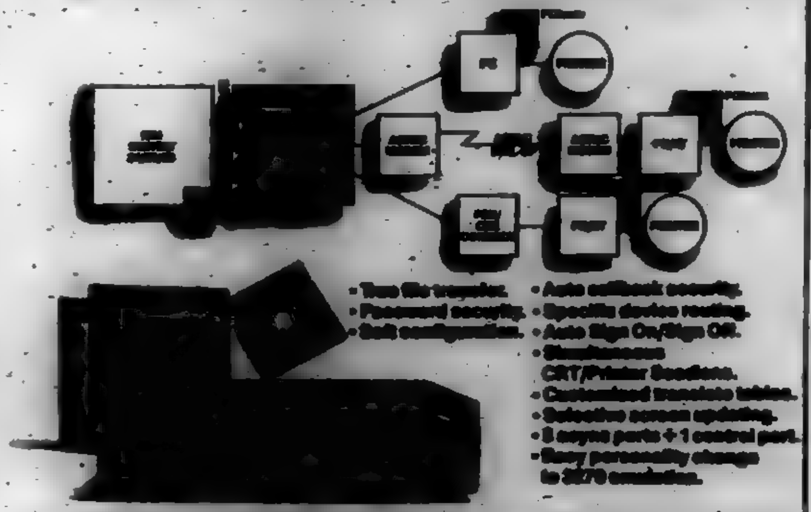

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way the programmer intended. It may not work at all. A program that isn't working properly might produce 1,000 pages of gibberish instead of the Year-End Profit Analysis Summary, or it may end abruptly before it has produced anything at all. The case of the abnormal end (or abend) is familiar enough to programmers that many not-so-technical terms are used to describe it: Programs die, blow up, cancel and crash, not to mention blow away, crap out and take a dump.

Whether the program's output is bad or nonexistent, the programmer must start the process of debugging the program. As the word connotes, this means getting the bugs out of a program, correcting the things that are wrong with it. If the program abended, the operating system may have issued an error message at the time of the abend that describes the problem.

If this is insufficient, the programmer may have to study a dump. A dump is a printed listing of part of the contents of computer storage just as it looked when the program failed. This listing bears little resemblance to the program as the programmer wrote it. It's just page after page of numbers — a symbolic rendering of the machine language of the computer.

For reasons explained in the next section, the numbers are not decimal numbers, but numbers in the base-16 or base-8 system. The programmer must find the offending code in this jumble and relate it to the original program. Needless to say, most programmers look forward to dumps as vampires look forward to dawn.

The languages used by programmers were designed to be understood by humans, not computers, so while a programmer has to know his language, it is rarely necessary for him to have a detailed knowledge of how a computer works. If you find the concepts discussed in this section difficult to grasp, don't feel badly; many DP professionals have the same problem. (Of course, there are plenty of people who find the concepts childishly simple, and loads of fun, too.)

You may have heard a computer described as a vast storehouse of switches, switches which may be on or off. The switches are actually electrical charges of one intensity or another, stored in the complicated circuits of the computer. Both the instructions executed by the computer and the data stored in external devices have this two-digit code of the switches — on or off, or as it is also conveyed, 1 or 0. Since everything the computer processes may be broken down to those two values, 1 and 0, it may seem the variety of information the computer can store and use must be limited — but this isn't so.

We are accustomed to using the base-10, or decimal, system of counting. It uses 10 symbols, 0 through 9, probably based on the fact that we have 10 fingers to count on (and which suggests, since we don't use 20 digits, that shoes were invented before the decimal system). With these 10 symbols, we can write down any number (limited only by our stamina). We understand that in the base-10 system, the rightmost number always means the number of ones; the next digit to the left means the number of tens; the third digit means the number of hundreds and so on. So we know that 237 in decimal is a shorthand way of saying (100 x 2) + (10 x 3) + (1 x 7).

Because the computer deals with only two different values, the decimal system is not a direct and convenient way to represent the contents of a computer. A binary (base-2) system often is used. In fact, the common name for those switches is bits, which is a contraction of binary digits. A bit may be on or off, 1 or 0. That's all.

So how do we make a bigger value than 1 with only those two symbols? By stacking up symbols, much the way we do in decimal. In binary, each column will be a power of 2 instead of 10; so the rightmost digit will mean how many ones, the next digit to the left will mean how many twos, the next digit how many fours, the next digit how many eights and so on. The binary number 1010 means (8 x 1) + (4 x 0) + (2 x 1) + (1 x 0) or, in decimal, 10.

The binary number 0101 means (8 x 0) + (4 x 1) + (2 x 0) + (1 x 1) or what we usually call "five." Four bits allow us to make 16 different numbers. You may have noticed, though, that binary notation is not as concise as decimal; if we wanted to write numbers in the thousands or millions, we'd have so many ones and zeroes lined up it would be awfully inconvenient to read them.

Three numbering systems

Decimal	Binary	Hexadecimal
0	1011	B
1	1100	C
2	1101	D
3	1110	E
4	1111	F
5	10000	10
6	10001	11
7	10010	12
8	10011	13
9	10100	14
10	10101	15

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That's why the contents of computer storage are sometimes symbolized by some larger base than binary: octal (base-8) or hexadecimal (base-16). Hexadecimal is not only more concise than decimal, but it translates very nicely from binary. For every four binary digits, a single hexadecimal digit (also called a hex digit or, rarely, a hexit) can be created.

Sixteen symbols are required in a base-16 numbering system: The symbols 0 through 9, plus A through F, are used. In this system, the rightmost column still represents the number of ones, but the next column to the left means how many sixteens, the next column how many two-hundred-fifty-sixes and the next column (take a deep breath) how many four-thousand-ninety-sixes. So the hex number 72A3 may be translated as (4096 x 7) + (256 x 2) + (16 x 10) + (1 x 3). Each column represents a power of 16. If this is beginning to seem a little murky to you, it will help to compare the numbering systems now:

After all this, it seems there is no way to convey anything but numbers in computer storage. What about the alphabet? Punctuation? The computer does more than process numbers, of course. So the hexadecimal numbers 00 through FF (0 through 255, in decimal), are understood to represent different characters. A set of symbols commonly used has the hex digits C1 represent the letter "A," C2 the letter "B" and so on. The same system uses 5B to mean "$" and 40 to mean a space. Each pair of hex digits is called a byte.

We know then that a byte contains two hex digits (or eight bits), that it will have a value from 0 to 255 and that it can be used to represent some printable character. Three bytes (or 24 bits) of computer storage would be necessary to store the word "cat."

It is not unreasonable to think of a byte as simply one character of storage and to forget about all the smaller components the byte can be divided into. If you think of bits ever again after this paragraph, you can think of them as on/off switches instead of binary digits (if you prefer). And take heart; I'm through talking about numbers.

Most of this article is concerned with what are called mainframe computers. These are large computers, which usually are capable of supporting multiple users, and which contain only the electronics necessary to process data — that is, any storage devices, terminals, card readers and so on are external to the computer; the computer itself tends to look like nothing more than a big metal box. Inside the mainframe are many circuits, logic boards, storage components and, usually, some kind of machinery for keeping everything from overheating.

A microcomputer, in contrast, typically contains a single microprocessor, a compact module about the size of a stick of gum, instead of the many components found inside a mainframe. Any of the personal computers on the market are micros, as opposed to mainframes. In between these two are minicomputers, which sometimes are a small collection of microprocessors combined in such a way that they act like a mainframe. To further confuse matters, some of these minis are powerful enough to be called superminis, some of which have greater processing speed than some mainframes. But generally speaking, mainframes are the most powerful computers, microcomputers are the least powerful, and minicomputers are the machines in between.

Microcomputers are much simpler to design, build and manufacture than mainframe computers. It is possible to buy the necessary parts to build a microcomputer for a few hundred dollars, put them together and sell the assembly for thousands of dollars — and many individuals have done just that. Some large and famous microcomputer companies started as tiny businesses in garages and basements.

Another thing about micros worth noting is that it doesn't require much knowledge of computers to build one; what is more important is a knowledge of electronics.

As a result of these things, the language of microcomputers is very often different from the language of mainframes. For example, a mainframe operator performs an IPL (Initial Program Load) to start the mainframe, whereas the owner of a personal computer will boot the system on the micro (from "bootstrap," which some early microcomputer designer imagined the micro pulling itself up by).

The primary device for storing information used on a micro is likely to be tape or disk (just like the mainframe), but the disk is often really a diskette or floppy disk (a flat sheet of plastic with a special recording surface, contained within a plastic envelope), and the tape can be a perfectly ordinary cassette of the same sort used to record music.

Because some microcomputers were designed specifically for home use, they have special features to make them easy to use. One of these is called a mouse, which is named for its appearance. A mouse is about the size and shape of half a tennis ball and is connected to the micro with a wire — which suggests a tail. It can be pushed around on any flat surface (like the desk the micro is sitting on), and moving the mouse causes some movement on the computer screen.

On the screen might be a list of names; to pick one, the computer user would roll the mouse around until an underscore character on the screen was under a certain name, then punch a button to let the program know a selection had been made. The program then might display information about the person selected. (By the way, that underscore character is known by most

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terminal users — not only microcomputer users — as a cursor.)

Sometimes pictures will be displayed on a microcomputer's screen instead of words. With a system like this, the user might move the cursor to a picture of a printer, rather than typing in commands to initiate a print operation. It is becoming common to refer to these pictographs as icons.

Some micro manufacturers have taken this a step further: Instead of moving the cursor to the icon one wants to select, the micro user can merely touch the desired symbol with a fingertip. Touch screens like this are believed by some to be the most natural way for a human to use a computer and, therefore, may be used eventually for all computers. The touch screen is covered with a touch-sensitive film, or the frame around the screen contains lights and sensors that a fingertip will block.

Whether the touch screen is a hint of the computer's future or not remains to be seen. However, graphics (like icons) will certainly continue to be desirable. Machines allowing the user to create pictures, graphs, architectural renderings and so on are relatively common. The person who creates such graphics usually wants to immortalize them and so requires a special kind of printer.

The most popular type of printer for attachment to a micro is a dot matrix printer. The dot matrix refers to the device that actually strikes the print ribbon or paper: It consists of 35 or more needles, each of which can be retracted or extended to form different characters out of the resulting dots. This allows a printer to be very fast, because the movement of the print head is only back and forth across the paper.

Crude graphics are possible with this type of printer, because it can be programmed to print dots anywhere on a page. Pictures composed of dots, like those printed in newspapers, are possible; however, simple bar charts, pie charts and special lettering are more common applications.

For the printing of more sophisticated graphics, a plotter is used. This is typically a very expensive and fairly large printer that prints with one or more fountain-pen-like devices moving over a stationary sheet of paper.

Word processing applications that demand letter-quality printing (like a business letter, a resume or a freelance writer's manuscript) require a third kind of printer: a daisywheel printer. The daisywheel, usually made of plastic, is mounted between a hammer and a print ribbon. It consists of many spokes, and at the end of each spoke is a raised character, exactly like a hammer on a typewriter.

The wheel spins around when the printer is in use. When a daisywheel printer prints the character "a," it waits until the "a" spoke is in front of the printing hammer, the spinning pauses for an instant, and the hammer comes down.

As a rule, these letter-quality printers are slower than dot matrix printers, because the print mechanism not only moves back and forth across the paper, but it must wait momentarily for a character to come into position in front of the hammer. Their advantage is the appearance of their printing, which tends to be as good as that produced by the best electric typewriters.

All these things may be of interest to a DP professional, even one concerned only with mainframes, because it has become desirable to establish communications between micros and mainframes. Departments of large companies and corporations have purchased microcomputers to help them do their work and are now discovering it would be a great advantage to have direct access to data stored on the mainframe system at the main office; main offices are discovering it is to their advantage to have access to their satellite micros.

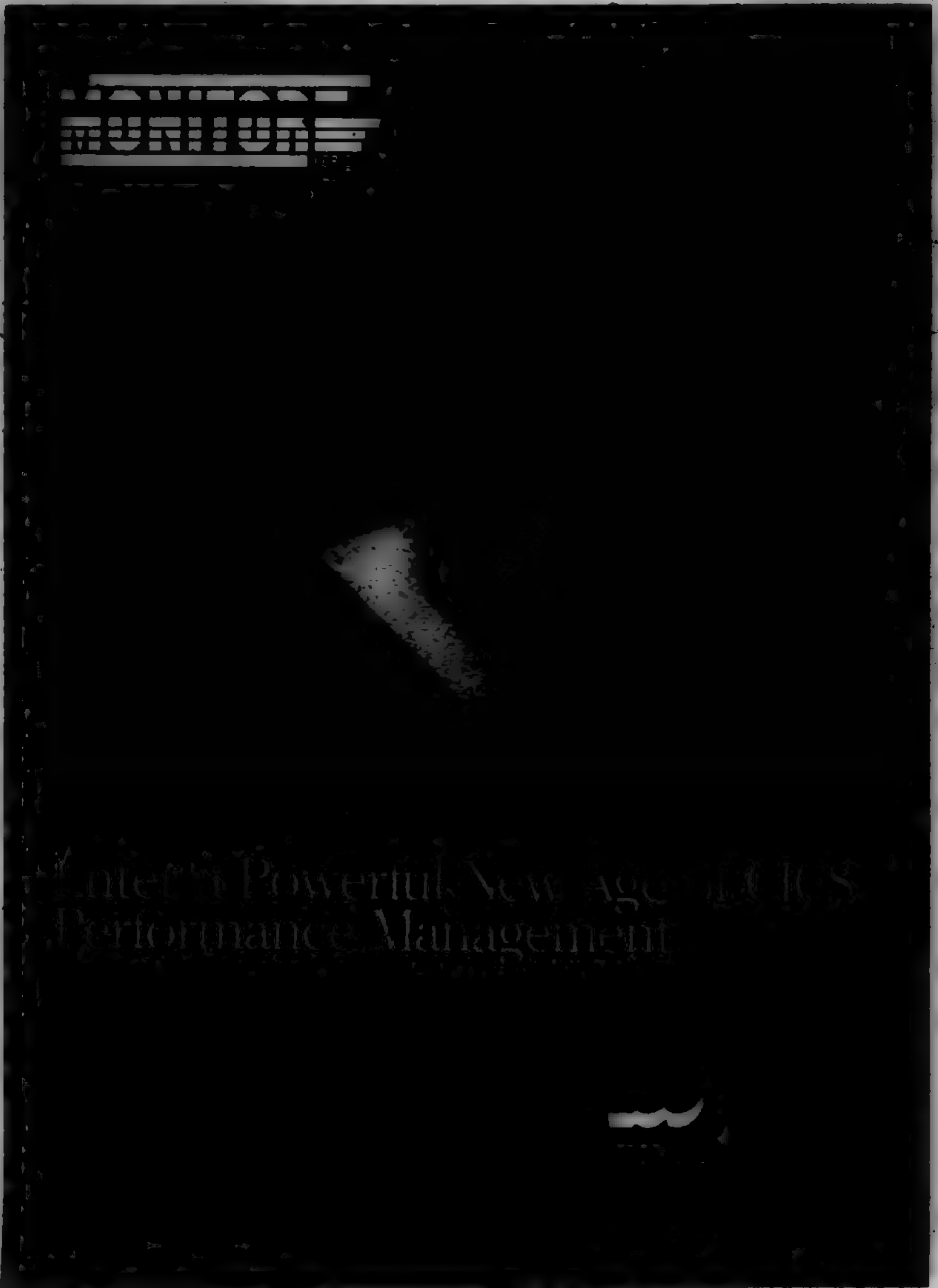
For example, an insurance agent in Indianapolis might work for a company based in Chicago. Every month, the agent is mailed a list of rates for each kind of insurance policy, as calculated by the Chicago office. The agent types the rates into his microcomputer once a month, then uses the micro to create policy declarations for new clients. Then the agent prints a list of new policyholders and mails the list to Chicago.

Obviously the ideal situation would be for the agent to call in to his Chicago office's computer every morning to get the current rates, which would be downloaded to his microcomputer. When he typed in a new policy on his micro, the ideal situation would be for that information to be automatically uploaded to the mainframe in Chicago.

Because this ideal is slowly becoming reality, DP professionals who are accustomed to mainframes are learning the language of micros and vice versa.

About the author

Bruce Kula is currently a software engineer for Paradyne Corp. in Largo, Fla. He has been a truck driver and a high-speed planer operator in Wyoming and a systems programmer near Detroit. He now lives and writes on the shore of the Gulf of Mexico.



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Special Report

Computerworld
April 29, 1985

Micros in Big Business

Changing the corporate landscape

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Special Report

AT&T, Apple, IBM gear up for

By Aaron Goldberg
Special to CW

With the war in the personal computer market fast approaching the apocalyptic battle, it is an important time to understand the strategies and weapons that the major opponents have at their disposal. The present conditions of this conflict have left some of these competitors battle weary or bristling to fight. One thing is for certain, the winner or winners will take home some lucrative spoils.

Each of the three vendors analyzed here, namely AT&T, Apple Computer, Inc. and IBM, is notable not entirely for its present position in the market, but rather for the role that each is playing in the marketplace.

Each has its own operating environment (AT&T with Unix, Apple with Macworks and IBM with PC-DOS), and each company has many resources that it can use to sell the personal computer products that it develops.

It will be an interesting battle, with each opponent having some clear advantages and disadvantages in the competitive marketplace.

AT&T

AT&T is the sword of Damocles that has been hanging over the DP industry's head since Judge Harold Greene divested the company. The promise of the deed, however, has been far greater than the deed itself. AT&T has yet to make its impact.

The company started out by selling an IBM-compatible system for which Olivetti Corp. was an OEM. While this system is a reputable product, AT&T's real entry into the market was with its Unix PC, which has been hailed by many as one of the better personal computers.

AT&T has many market advantages. As owner of the Unix operating system, AT&T is finally gaining support of its System V from the majority of third-party software suppliers. In addition, the Unix PC introduction made AT&T the only one of the big three vendors whose major operating system is compatible with multiuser system operating environments. This is a tremendous advantage in the small-business market, where the upgrade from a micro to a multiuser system is still a major problem.

AT&T has also developed a good user interface for Unix that allows the nontechnocrat to use the system in an economic manner.

The organizational strength of having a large direct sales force already in place and a customer base from the private branch exchange days are also to AT&T's advantage. And the stability of the AT&T name cannot be underestimated in these days of shakeouts, Chapter 11 of the Federal Bankruptcy Act and various other corporate "suicide" techniques. In addition, because its large sales volume from other lines of business contribute to profits and provide working capital, AT&T has the luxury of being able to learn in the personal computer market without the added pressure of seeking instant profits.

On the negative side, AT&T has yet to prove itself to be a major factor in the computer market in general. Its 3B series has received less than enthusiastic responses from customers, and the 6300 does not disguise well the fact that it is an OEM product. The company also suffers from an image problem. Many perceive AT&T as either a less than dynamic monopoly or an information processing company searching for identity.

Apple

Apple is the company that people love to talk about. Whether it is the Macintosh division's 15-minute en-

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Goldberg is director of microcomputer systems services with International Data Corp., a Framingham, Mass.-based market research firm.

Personal computer phone tools await

By Eric Bender
CW Staff

If managers knew what was good for them, the theory goes, they would all want an integrated voice/data terminal — a single desktop device to take them through their daily phone calls and computing tasks, handle scheduling and give other benefits on the side.

More than two years ago, vendors began to blend IBM Personal Computer capability into this cheerful scenario. Currently, more than a dozen products (either add-ons or complete systems) are claimed to combine IBM Personal Computer functions with integrated voice/data communications.

In recent months, major players have joined the fray. One of them, Compaq Computer Corp., predicted that overall sales of this class of machine will approach 100,000 this year and rise to one million in three years.

However, just about everyone agrees that the personal computer phone systems already shipping have made relatively little headway in corporate America to date.

The biggest stumbling block, vendors and analysts say, has been persuading customers that the devices meet important needs that are not addressed elsewhere at a reasonable cost.

More end-user education needed

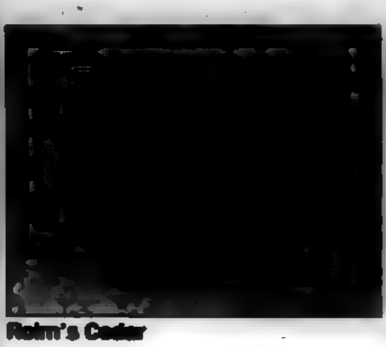
The products "take a lot more end-user education than we'd thought," said Don Cooper, marketing vice-president at Zaisan, Inc. in Houston, which introduced an IBM Personal Computer-compatible voice/data system last July. Market growth is "not nearly as fast as the prognosticators suggested," he said.

Stephen Caswell, editor of "Electronic Mail and Microcomputer Systems" newsletter in Toronto, was more blunt: "Vendors have all these products, but users don't have much interest," he said. Instead, personal computer users buy a modem and a desktop organizer package, such as Borland International's Sidekick, that offers many similar features, Caswell suggested. "Why would anyone in his right mind go out and pay hundreds of dollars extra so [the product] runs a little smoother?"

Additionally, users complained that the first-generation personal computer phone products lacked the general polish and tight integration of functions that were their main selling points. For example, to enter a single telephone listing on the Cosystem offered by Cygnet Technologies, Inc. of Sunnyvale, Calif., users were forced to load a separate program.

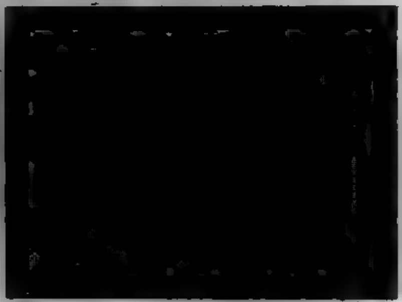
Other technical limitations often arose when the new equipment tackled multitasking. If connected to two telephone lines or integrated into a proprietary digital switch, the devices accommodated simultaneous

A sampling of the personal computer phone



Rolm's Cedar

Zaisan's ES3



Cygnet Technologies' Cosystem

microcomputer war

ployee back massages and first-class travel to anywhere or the new interface ideas provided in its latest product line, the company has no lack of press. But behind all of this flash is a computer company trying to take market share from one of the largest companies in the world.

Apple's advantages in the personal computer war are substantial. The company has developed a strong following in both its own and other user camps. Many personal computer users who started computing before 1981 can claim that they learned computing with an Apple machine.

Apple's image, created by clever marketing, has endeared them to the computer neophyte and the intimidated prospective buyer. In addition, the Macintosh Office concept is the only single-vendor offering of a complete personal computer/local-area network/Laser printer workstation now shipping that actually works.

Also, the strength of the Apple II family cannot be overlooked. Although the current emphasis of this product line is on the consumer market, there are still many Apple IIe products being sold for corporate use, and the software base is more than able to handle any challenge.

The corporate advantages for the company are only now starting to fall into place. As John Sculley guides the company from gangling adolescence into maturity, the internal structure of the company will flower. The skill of Apple's upper-level staff members — including, of course, Sculley — as marketers and builders of opportunities bodes well in the long term, although corporate maturing is still a key factor in the company's future prognosis.

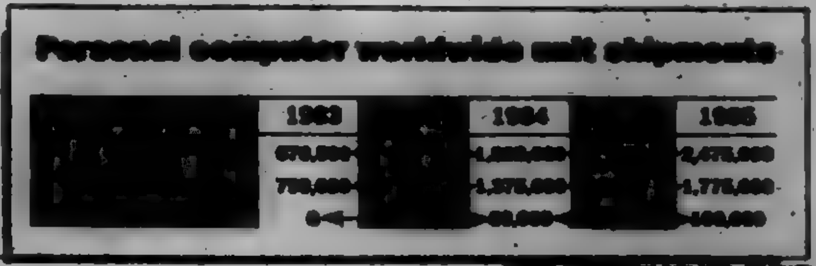
The disadvantages Apple faces are serious. At the present time, the company is a single-product firm centered in the personal computer market. While its position in this market is strong, Apple may find it difficult to match the high-flying history of the early 1980s as margins get squeezed and the growth rate slows. In the past, the company has also set itself up as an IBM antagonist, and in the process, it has antagonized many large user firms. Although this attitude is less prevalent now, first impressions change slowly.

Since Apple is a comparatively young company with a management structure that is still evolving, its management must balance its attentions between the personal computer division (the Apple II product line), which is revenue-producing, and new ventures into business computers (the Macintosh Office concept). If this balance is not maintained, one result could be a significant squeeze on working capital and cash flow.

A stumbling block here is that Chairman Steven Jobs runs one division,

See APPLE SR/5

Personal computer worldwide unit shipments



customers

voice/data calls. But juggling several personal computer jobs in addition often proved impossible.

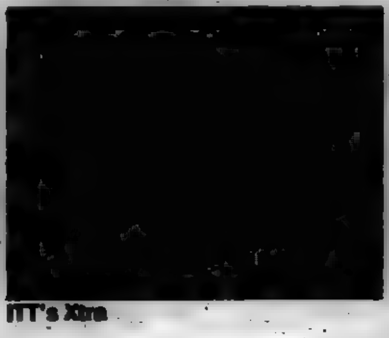
Confusion in the distribution channels created other problems. Both traditional telephone sales representatives, who typically market the system products to customers without microcomputers, and computer dealers who sell peripherals to personal computer users had difficulty figuring out how to push the new devices.

Despite all the potential drawbacks, many users said they were pleased with the new personal computer phone systems.

One large Midwestern aerospace firm with thousands of IBM Personal Computers has installed 10 Zaisan, Inc. ESSs with satisfactory results, according to a communications branch manager of the firm. He described the ESS as a good buy for the money, although he said "it's hard to

See PHONES SR/5

competition



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Special Report

IBM's network scheme prompts critical question: Will

By Brian Jeffery
Special to CW

After nearly three years of selling personal computers largely as standalone business tools, IBM has finally come up with a reasonably coherent software scenario for tying personal computers to its mainframe systems and applications.

The scenario, announced in October of last year, is built around IBM's Distributed Office Support System (Disoss), Professional Office Systems (Profs), System/36 and Personal Computer family. Links between Personal Computers and hosts are provided by Personal Services/PC, Profs/Personal Computer Connection, a new set of Displaywrite word processing software for Personal Computers and hosts and a group of products for tying Personal Computers to IBM's recommended departmental system, the System/36.

The good news is that IBM has finally come up with a workable solution for personal computer-based office automation. The bad news is that committing to the IBM scenario is likely to take end users in directions they do not want to go. In particular, IBM's evolutionary scenario is likely to lead end users into a progressively more complex, inefficient and expensive Systems Network Architecture (SNA)-based environment.

The keynote of the IBM approach is that it is evolutionary. None of the IBM products are new: Disoss is more than a decade old, Profs dates from the late 1970s, the System/36 is a repackaged version of the 1977 vintage System/34 architecture, and the Displaywrite series is repackaged Displaywriter Textpack word processing software.

Also of note is that the scenario pushes end users heavily into the 3270 world, with 5250 series terminal emulation also required to attach to the System/36. SNA is also much in evidence. Disoss is an SNA product, and compatibility between the various components of the IBM scenario has been implemented through the SNA-based Document Interchange Architecture and Document Content Architecture. Future enhancements to the IBM scenario are also likely to be oriented toward SNA and the 3270 interface.

SNA advantage

There is a superficial advantage to this. IBM claims some level of SNA commitment by more than 60% of its large system end users, and for many, the extension of SNA to include Personal Computers will seem attractive in that it is at least coherent and compatible with IBM host environments.

Successive software overlays on the SNA networks will provide the ability to transfer documents across most of the IBM product range. Image, high-resolution color graphics and, ultimately, voice traffic will all be folded into the SNA environment. It will all be a lot easier than trying to put together this type of scenario in a multivendor environment.

> *The trade-off for compatibility will be an ever-increasing processing overhead; under IBM's latest office systems software lies a bedrock of CICS, IMS and Vtam.*

Unfortunately, IBM's solution may be easier, but it also limits the options available. It means commitment to IBM host architecture and applications as the main component of office automation, and as the IBM scenario progresses, it is likely to mean that hosts will determine patterns of personal computer usage rather than vice versa. It also means a long-term commitment to SNA.

By the time that IBM has finished adding further software overlays to support office automation functions, integrated voice traffic and the like, it is going to look even more inefficient. The trade-off for compatibility will be an ever-increasing processing overhead; under IBM's latest office systems software lies a bedrock of CICS, IMS, Vtam and so on.

In the long term, there is also the disquieting possibility that IBM may start hiking SNA software prices much as it has done for 370 series host users with its costly MVS/XA equipment. This may not be planned by IBM now, but SNA is central to IBM's plans; the company has said that it is looking for major increases in software revenue this decade, and an end-user base locked into SNA would certainly be a temptation. By the end of the decade, SNA software costs for the average end user will probably be at least several times greater than their present level, and

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Jeffery is responsible for the IBM Watch program run by International Technology Group, a Palo Alto, Calif., consulting firm specializing in competitive analysis.

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micros suffer from hosts' inefficiencies?

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There are alternatives, of course. Seen in historical perspective, the mid-1980s are going to be a very crucial time for determining the shape of information processing use. Since the late 1970s, the development of the large-organization personal computer market has meant a move away from the old mainframe-based hierarchy and created large-scale decentralized processing for the first time.

Personal computer products and technology have been more closely tuned to real user requirements and work patterns than conventional DP systems have been; personal computers are used predominately for stand-alone purposes. As end users move toward personal computer-to-host links, the manner in which these are affected is going to determine the pattern of information processing in the average large organization for a long time to come.

A time for questions

Perhaps now is the time to be posing some very basic questions. Are personal computers merely intelligent terminals for accessing hosts? Or should central hosts and other systems be regarded as an infrastructure supporting a personal computer-based end-user interface?

The difference involves an important nuance. If the usefulness of a personal computer is taken as the starting point, an information processing environment may be built up that focuses on delivering information and capability to users in a manner which responds to their real requirements.

If the personal computer is a terminal, the emphasis is more on central applications, and the requirements of host compatibility start to become the No. 1 issue. An evolutionary, compatible progression, such as that which IBM offers, is likely to be the easier option. However, the price will halt the possibility of a more decentralized, user-oriented way of structuring large-organization information processing, at least for the time being.

PHONES from SR/3

talk people [in a large corporation] out of an IBM Personal Computer for [one from] a company named Zaisan."

The manager originally intended to give the new desktop micros to directors and vice-presidents. However, the systems lacked some fancy telephone features, and the speakerphone was not quite up to the job, so the machines ended up with engineering and procurement groups, he said. "[The personal computer phones] still need some work, but they're going in the right direction," he concluded.

General Homes in Houston, which bought about 50 earlier Zaisan voice/data terminals to be used by its executives and at field locations, plans to upgrade about a dozen terminals to ESSs this year, said Ken Carnard, director of information systems. This will allow current users to move into personal computing "without trauma," he said.

General Homes also evaluated Rolm Corp. personal computer phone equipment, tailored to the Rolm CBX digital switch, but turned it down for cost reasons, Carnard said.

Cedars, Junipers find homes

Iomega Corp. of Ogden, Utah, however, is finding a role for Rolm's Cedar personal computer phone and its Juniper add-on to the IBM Personal Computer, according to David Norton, vice-president for systems and administration. He said he expected about 26 Cedars and 50 Junipers to be installed by year end.

The company, which supplies computer components and peripherals, needs "an array of workstations," Norton said. Iomega considered meeting these needs internally, but found the Rolm alternative would cost about only 10% more. "We were willing to pay a percentage over to have a proven system instead of a mix and match and hope [one]," Norton said.

Iomega is giving Rolm Cypress voice/data terminals to executives, "who fundamentally require information," Norton said. Cedars are being placed with secretaries and other employees for handling letters or small computing needs. Junipers end up in engineering and financial groups with strong analytical needs. The company's Prime minis and dumb data-entry terminals also are hooked to the Rolm digital switch.

Rolm product suite

Like Iomega, Savers Federal Savings & Loan Association in Little Rock, Ark., is installing Cedars and Cypress as part of a suite of Rolm products, said Michael Flynn, assistant vice-president and telecommunications manager.

Currently, eight Cedars are installed, and they are appropriate "for a person who needs more than a smart terminal; more computer horsepower," he said. In IBM 3278 emulation mode, they access the association's IBM 4341 mainframe through the Rolm Gateway.

Savers has bought 20 Junipers for Personal Computer XT users but has installed only two on an experimental basis. One reason is that Rolm did not build in full document-file communications capability, preventing users from sending documents directly through the CBX for output on laser printers, he said. "It's one of those little things that takes time to work out."

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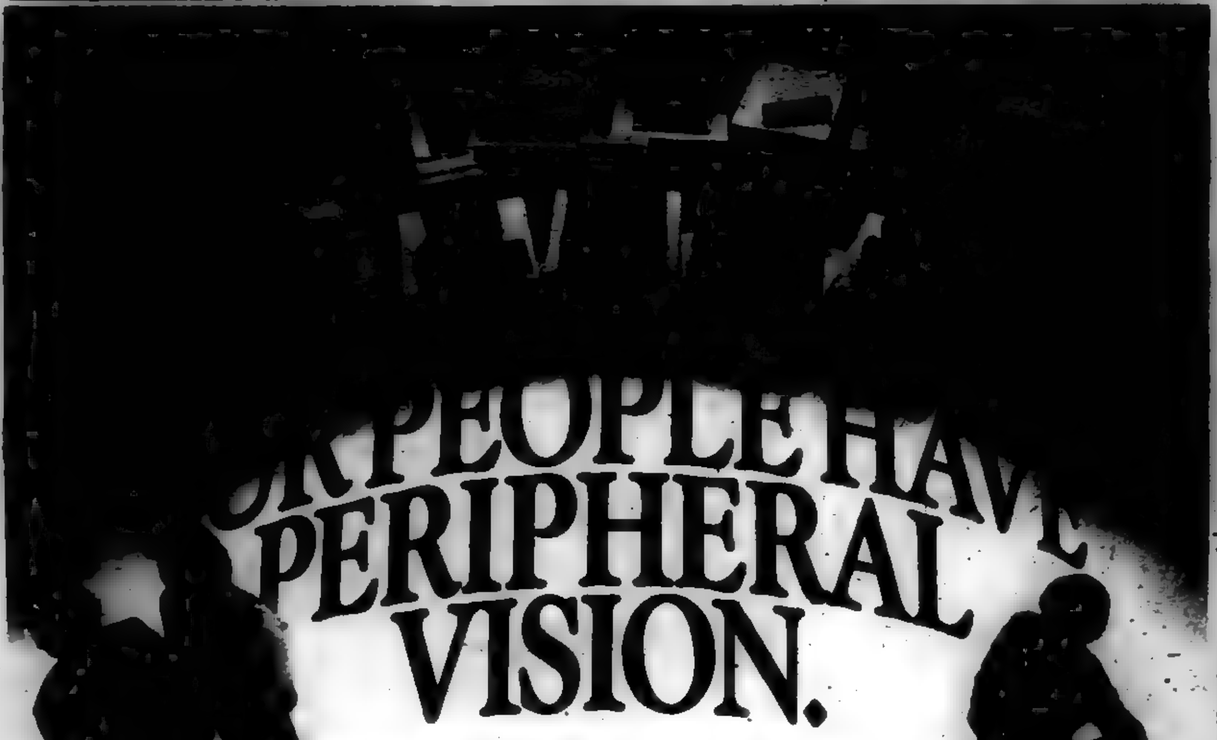

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which may result in a disproportionate distribution of company resources. The attention Apple directs to corporate culture rather than profit could be dangerous.

IBM

IBM hit the ground running in the personal computer market and has not slowed since 1981. While this market dominance and revenue-building trend is not likely to continue in 1985, it is not expected that IBM will suffer more than either Apple or AT&T. The company is, however, in the process of having to introduce a product line this year, which is not an easy task. Despite this, sales of Personal Computer products should rise more than 30% this year, and their position in the larger firm should be solidified.

The advantages of the Personal Computer family are many. The most important of these is the support that the company receives from third-party software and hardware suppliers. This has allowed the Personal Computer to be used for nearly all applications. Also, the IBM Personal Computer AT is a state-of-the-art product.

The advantages of IBM as a corporation is an element that makes other manufacturers jealous. IBM not only has the largest sales force calling on the largest present customer base of computer users but also has the largest number of reseller outlets in the world. In addition, the excellent reputation of the company allows it the luxury of constantly selecting from the top of the pool of talented prospective employees.

Applications software has been a weakness for IBM, and the present set of products offered with the Personal Computer is no exception. One exception is the PFS series software from Software Publishing Corp. These tools, privately labeled by IBM as the Assistant series, are doing reasonably well.

Another problem IBM faces is how to move from the Personal Computer architecture to the Personal Computer AT architecture. Already there are inventory problems both at IBM and the retailers, and it appears that a fire sale could be imminent.

The trials and tribulations of the PCjr are now history but not before IBM was stripped of the demigod status. All in all, IBM is facing challenges that rival both AT&T and Apple.

Special Report

Environment software marketplace heats up

Fourteen-year-old concept catches on, provides users with easy operating environment

By Robert Lefkowitz
Special to CW

This will be remembered as the year that the 14-year-old Xerox Corp. Palo Alto (Calif.) Research Center (Parc) user interface technology finally achieved broad market acceptance.

This technology involves the use of the following:

- Multiple application windows on a single video display.
- A mouse to move a pointer around the display.
- Menus that appear when the user needs to make a choice and that disappear as soon as the choice is made.
- Pictorial representations of objects, such as files, and actions, such as deleting a file, called icons.

This type of interface aims at providing users with a visual representation of the functions to be performed by their personal computers.

The 1983 introduction of Apple Computer, Inc.'s Lisa was the first attempt by a major hardware vendor to attract a large group of users to this new way of interacting with their personal computers. Although Lisa's high price kept it from succeeding in the marketplace, Apple followed with the Macintosh in January 1984. The Macintosh's success has drawn the attention of most major personal computer companies to this new visual interface.

Until recently, these vendors had been reluctant to look at the Xerox Parc interface technology because a number of firms, notably Xerox and Visicorp, lost substantial amounts of money attempting to market the technology to the personal computer user. The Macintosh's highly successful first year has forced major vendors to reevaluate their user interface strategies.

IBM, Digital Research, Inc. and Microsoft Corp., along with a host of small software firms, have invested millions of dollars in developing operating environments for the IBM Personal Computer. These operating environments are based on concepts developed at Xerox's Parc facility, and each is designed to make applications easier to use. Table 1 compares the features of the operating environment products of each major competitor in the environment arena.

Topview

Topview, IBM's offering, is significant for a number of reasons. These include the operating environment's ability to run existing, unmodified applications software, its multitasking capabilities and its method of transferring data between different applications through the use of keyboard filters.

Keyboard filters allow applications to share data by making it appear to the application that the data being transferred is coming from the user's keyboard, rather than from the computer's memory. This means that data can be passed to an application without that application being reprogrammed to accept data from memory.

Topview has been criticized for its inability to handle multiple graphics applications concurrently because it is character-based. However, Topview can run a single graphics application in foreground mode. Furthermore, IBM has targeted Topview to the business user who needs to perform concurrently tasks such as data base searching, communications and word processing. To date, these users have not expressed any need to perform multiple graphics applications simultaneously.

Topview represents the first internally developed major Personal Computer software product marketed by IBM. Since IBM has not yet licensed Topview to other hardware manufacturers, those who have been marketing Personal Computer compatibles are faced with a sizable problem: How do they maintain off-the-shelf software compatibility with the IBM Personal Computer if much of the applications software will be modified to run with Topview?

Before Topview, Personal Computer-compatible manufacturers could license Microsoft's MS-DOS operating system because PC-DOS was developed for IBM by Microsoft on a nonexclusive basis. But now, these manufacturers face a crucial decision. Do they simply maintain complete hardware and PC-DOS compatibility with IBM so that users can purchase Topview to run on their compatible machines, just as Amdahl mainframe users buy software directly from IBM? Do they follow the risky and potentially costly course of attempting to reverse-engineer Topview themselves? Or do they concede the Topview portion of the market to IBM and attempt to look to other market segments with the help of the Graphics Environment Manager (GEM) from Digital Research, Inc. or Windows from Microsoft?

GEM and Windows

This past February, Digital Research began shipping GEM development systems to independent software vendors. GEM is designed to be as user-friendly for IBM Personal Computer users as the Xerox Parc/Macintosh-developed interface is for Macintosh users.

In fact, an early version of GEM shown at the Hannover Faire in West Germany was so successful in its attempt to make the Personal Computer look like a Macintosh that Apple was rumored to be preparing to sue Digital Research. This suit did not materialize because Apple discovered that Digital Research developed GEM entirely from scratch, using the same public domain software technology from Xerox's Parc that Apple used in its Lisa and Macintosh machines. However, Digital Research is not relying only on the Personal Computer to provide the hardware vehicle for GEM. It has signed agreements with major OEMs, such as Atari, Inc. and Commodore Business Machines, Inc. to support GEM.

Digital Research, Inc. is targeting its GEM program at both the business and home markets.

It is positioning GEM for both the business market with the Personal Computer and the home market with Atari and Commodore, in the hope that the Xerox-Macintosh interface will achieve significant market acceptance in at least one of those markets.

Meanwhile, in Bellevue, Wash., Microsoft is quietly retrenching its Windows product. Microsoft's credibility took a major beating when it announced Windows more than a year before it was ready to ship. As of March 31, Windows had not yet shipped. Although Microsoft has said it will attempt to position Windows as a "Macintosh, plus more" for the Personal Computer, Windows appears closer to Topview than to the Macintosh.

Windows uses Topview Program Information Files (PIF) to get the parameters it needs to run an application. In addition, like Topview and unlike Mac and GEM, Windows is multitasking. And whereas the Macintosh and GEM make extensive use of icons for all objects and actions within the personal computer, Windows uses icons in some cases and text in others.

If Microsoft can meet its current targeted shipment date of April, it will provide OEMs with a clear alternative to GEM and will pose a formidable competitive challenge to Digital Research.

Apple Computer

And what about Apple? How will the current attention users are giving products that make the Personal Computer look like a Macintosh affect the Macintosh's sales? At first it might seem that GEM and Windows pose a major threat to Apple. Both products allow corporate users to buy IBM hardware while retaining the advantages of the Macintosh's innovative user interface. However, the number of users ready to adopt mice with windows and icons is relatively small compared with those who prefer traditional character-based applications.

Thus, a good argument can be made that GEM and Windows will help broaden the overall market for applications that use the new visual environments by making more users aware of the advantage of this type of interface.

See [illegible] SR/14

Lefkowitz is director of software research for Infocorp, a Cupertino, Calif.-based market research and information services firm specializing in syndicated services and custom research for the information processing industry.

The new visual environments
Features comparison

[illegible]				
Windows				
Multiple Windows	Yes	Yes	Yes	Yes
Overlapping Windows	Yes	Yes	Yes	No
Pull-Down Menus	Yes	Yes	Yes	Yes
Desktop Accessories	Yes	Yes	Yes	Yes
Use of Icons	Extensive (Optional)	Extensive	None	Partial
[illegible]				
Text Fonts				
Multiple Screen Fonts	Yes	Yes	No	Yes
Multiple Hard-Copy Fonts	Yes	Yes	No	Yes
[illegible]				
Memory Usage				
User Memory Available on 512K Machine	[illegible]	[illegible]	[illegible]	[illegible]

SOURCE: INFOCORP

Table 1

Firms cannot afford casual attitudes toward piracy

By John J. Xenakis
Special to CW

> *'[Managers] have an "everyone seems to be copying, so I can turn a blind eye to it" attitude.'*
>
> — Paul S. Hoffman
> Lawyer and author

Is your company in danger of being exposed to a potentially damaging lawsuit because of software piracy? If it is like most companies, the answer is yes, according to Paul S. Hoffman, a lawyer and author in Croton-on-Hudson, N.Y., who specializes in software contracts.

"The attitudes I have [seen] among data processing managers or information center managers are very casual attitudes toward [personal computer-level] software," Hoffman said. "They have an 'everyone seems to be copying, so I can turn a blind eye to it' attitude, even though they know that probably quite a few of their people are copying software at work and using it at home. That position is not acceptable. The company will end up with a great deal of exposure."

The number of recent lawsuits attests to this. Lotus Development Corp. has won several judgments against companies which freely copied its 1-2-3 program. And the Association of Data Processing Service Organizations and Micropro International Corp. have recently filed litigation against American Brands, Inc. and Wilson Jones Co., complaining of copyright infringement.

Part of the confusion surrounding piracy comes about because the rules of the game are unclear. What is permissible varies from vendor to vendor and from software product to software product.

First of all, a software product is not actually purchased, at least not in the same way a computer is purchased. When software is purchased, a license is bought that allows the buyer to use that product in a certain way. The vendor still owns the software. The purchaser's rights to the software are limited by the license agreement and copyright laws.

Shrink-wrap license

Most microcomputer software products come with what is known as a shrink-wrap license. The packaging instructs the purchaser to read the license before opening the package and implies that the purchaser will be bound by the terms of the license agreements once the shrink-wrap seal is broken.

The restrictions imposed by these licenses vary. Some licenses restrict the use of the software product to only one machine, with as many users on that machine as needed. Others restrict the software to only one user, on several different machines if management wishes. Almost all forbid use on a multiuser machine. Some licenses forbid any copies from being made; others permit copies for backup or archival purposes only.

Are such license agreements binding on the purchaser? "There is a great deal of controversy in the industry about how enforceable these agreements are," Hoffman said. "Some states, like Louisiana, have moved toward statutes that appear to validate shrink-wrap licenses as effective contracts, provided that they offer some minimum protection to the consumer. But nobody really knows at this point how effective these shrink-wrap licenses are, and I am not aware of any litigation in the contract sense."

Even though the shrink-wrap license agreements are not valid in some states, the software still cannot be copied freely. The software is copyrighted, and purchasers are still bound by the federal copyright laws, which permit them to make a copy of the software only for backup or archival purposes.

Copy protection

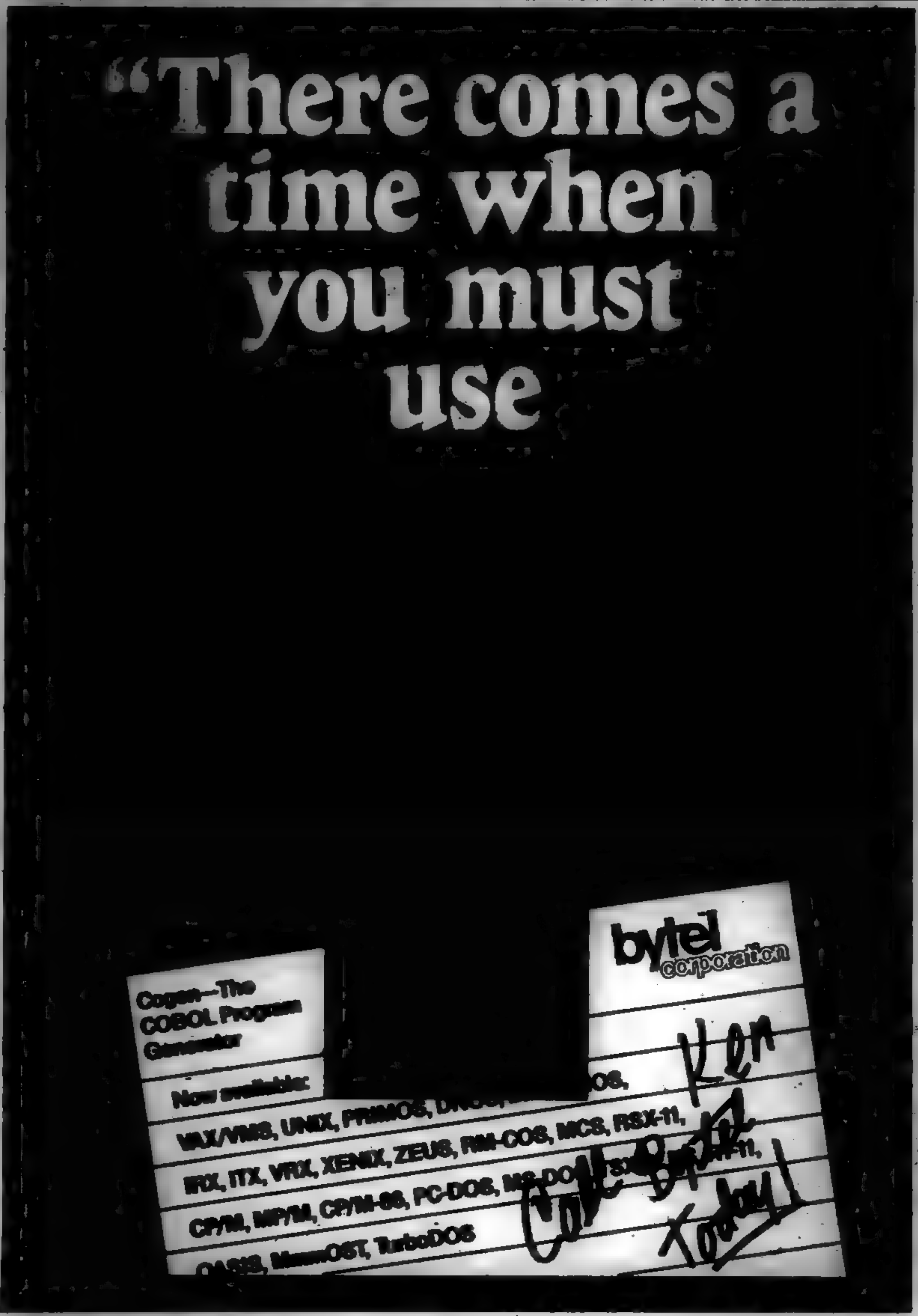
While lawyers are slugging it out in the courtrooms, an even more bizarre battle is being fought by computer engineers. This battle concerns the development of software that cannot be copied.

The original idea was simple. The vendor would put some illegal data on the software diskette so that the standard disk copying programs are not able to make copies of the diskette. That way, the vendor's software is protected from illegal use without having to depend upon legal protection.

In response, along came products called bit copiers. These products are specifically designed to defeat copy

See COPY SR/14

Xenakis is a Framingham, Mass.-based management consultant for the computer industry.



"There comes a time when you must use
Cogen—The COBOL Program Generator

VAX/VMS, UNIX, PRIMOS, DNOS, OS,
IRX, ITX, VRX, XENIX, ZEUS, RM-COS, MCS, RSX-11,
CP/M, MP/M, CP/M-86, PC-DOS, MS-DOS, -11,

Special Report

Micros slash firm's telecom expenditures

Switch from dumb terminals pays off for multinational

SOUTHFIELD, Mich. — A multinational manufacturing firm based here cut its monthly telecommunications costs for international financial reporting from $25,000 to $2,000 when it began using microcomputers rather than dumb terminals to access time-sharing services.

Federal Mogul Corp. makes ball bearings, sealing devices and other parts used in the trucking, construction and aerospace industries and general industrial applications. The firm has manufacturing plants in 10 foreign countries and maintains inventories in 20 warehouses overseas. Its net sales in 1984 were $912 million; international sales accounted for $243 million of the total.

Until November 1983, employees at Federal Mogul's foreign offices keyed financial data about their operations into dumb terminals that were linked on-line to mainframes on General Electric Information Services Co.'s (Geisco) international time-sharing network.

Workers in the firm's international finance department here accessed and processed the information by dialing dumb terminals into a Geisco mainframe in Rockville, Md.

"Using dumb terminals meant that the mainframe did the actual number crunching," according to Wilhelm A. Schmelzer, Federal Mogul's director of international finance. "With each of roughly 30 international locations inputting various types of data, . . . this led to intolerable costs." The firm's headquarters was spending about $25,000 per month for line charges, CPU time and data storage.

The foreign offices were paying between $800 and $3,000 per month in line and connect charges. Employees in each office had to go on-line in order to key data into the system. "That is where the real cost came in," Schmelzer said. The costs varied according to how much time individual employees took to type in data, check their work and make corrections.

After a year's experience with the time-sharing setup, corporate management deemed the charges excessive and instructed the international finance department to cut costs. Schmelzer sent representatives to the foreign offices to check their procedures. He then analysed the time-sharing bills to see where the firm could save money.

'We had to take other measures'

In a series of stopgap measures, his group pulled some foreign offices off the network, eliminated some types of financial reporting and cut back on the frequency of some transactions. The investigations and service cutbacks did not yield sufficient savings. "That's when we finally found that . . . we had to take other measures," Schmelzer said.

In September 1983, the department set up two trial sites for microcomputer-based time-sharing. The trial sites, Federal Mogul offices in Puerto Rico and South Africa, received IBM Personal Computers fitted with modems and financial software.

Employees in the two offices entered financial data on the Personal Computers and used the software, IMRS, Inc.'s Micro Control, to convert the figures from local currencies to U.S. dollars. After they entered, checked and corrected their work, the employees used the software's communications ability to dial in to the Geisco network and transmit their data.

The tests paid off. Because the offices entered and converted their data on the local processors and went on-line only to transmit the information, their combined line charges dropped from about $2,300 to about $600. The managers of the local offices were pleased with the results, as were members of the international finance department. According to Schmelzer, "We jumped through the roof here."

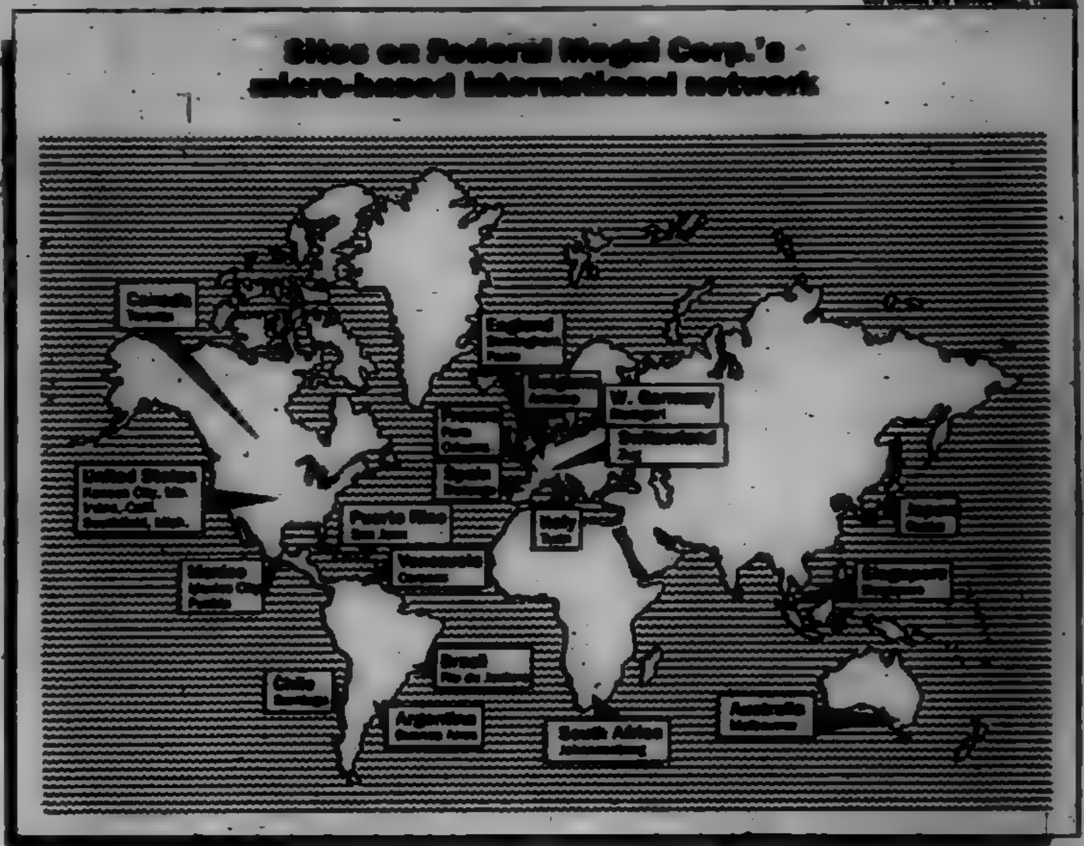


Figure 1. Micros at 23 of Federal Mogul Corp.'s locations currently have access to the firm's time-sharing network. Stuttgart, West Germany — the 24th location — is scheduled to come up soon.

Schmelzer's group recommended to corporate management that Federal Mogul adopt the micro-based setup for all its international accounting transactions. In November 1983, the firm began to install Personal Computers and compatible machines, each running the Micro Control software, in other foreign offices and at its headquarters.

> ***The cost savings from local processing have eased relations between the corporation's international finance department and its foreign office managers, who have to foot the bill for transmitting their data.***

Twenty-three Federal Mogul facilities in 18 countries currently use the system; one more is scheduled to come up soon (Figure 1).

The firm's headquarters brought its monthly time-sharing costs down to about $2,000 a month, about $1,200 of which constitutes charges for data storage. The foreign offices' average time-sharing costs have dropped to between $25 and $100 per month.

With the system, the foreign offices key in financial data on their personal computers and then go on-line to transmit the information to a mainframe on the Geisco network. Employees in the international finance department at the firm's headquarters then dial in to the time-sharing network to call up the information.

They download the data to an IBM Personal Computer XT and use the Micro Control software to compile the information into financial statements and management reports. "We still use the communications link we used prior to installing Micro Control," Schmelzer said. "It's just that every computation we need is done at the office concerned, and the link through the network's timeshare is purely to transfer data."

The cost savings from local processing have eased relations between the international finance department and the foreign office managers, who have to foot the bill for transmitting their accounting data.

The managers had complained about the cost of carrying out reporting procedures with the terminals. Although they complied with corporate guidelines, they did so grudgingly, according to Schmelzer. "You can imagine the support we have now from the managers," he said.

In the foreign offices, employees use their personal computers for tasks other than transmitting financial information. Some small offices have set up inventory and receivables systems, and all the offices use Lotus Development Corp.'s 1-2-3 spreadsheet package, according to Schmelzer's assistant, Mark Gergel, Federal Mogul's international accounting manager. "We've come a long, long way in one year in automating those locations," Gergel said.

By bringing microcomputers to the foreign offices, the international reporting system provided the basis for these other uses of automation, he said. "If it weren't for the . . . reporting system, we'd be light-years behind."

The system's software has given the international finance department a variety of reporting capabilities. Schmelzer's group uses the software to compile 80 separate ledgers each month, including profit-and-loss statements and balance sheets for each foreign location.

Quick closing

With the international reporting system, the department can close its books for any given month within 11 working days of the month's end, Schmelzer said.

At the end of each month, the department transfers compiled financial data to Federal Mogul's corporate general ledger system, which runs on two IBM mainframes: a 3033 and a 3084 Model QX. A terminal emulation board on the Personal Computer XT allows for the transfer.

Gergel said one of the software's greatest benefits is that it allows the department to format reports in-house. When Federal Mogul used Geisco to process its financial data, it had to request format changes and wait for the service bureau to make them. Most requests required a turnaround time of between 10 days and three weeks.

An in-house programmer can now develop reports on the microcomputer in as little as 15 minutes, he said. With in-house development capability, Gergel said, "We're no longer reliant on anybody."

Microcomputers spur interest in telecommuting

By Gil E. Gordon
Special to CW

When Alexander Graham Bell invented the telephone, he probably had no idea it would lead to Dial-a-Joke; home pizza delivery and telemarketing. Those applications evolved because the telephone was available. The telephone affects many aspects of our lives and in a similar manner, the microcomputer is beginning to have the same kind of widespread, unpredictable impact on business today.

One such impact is on the location of work; the micro is one of the driving forces behind telecommuting. It is no longer necessary for all employees to work in one central location.

> *The key to successful implementation is to focus on the human resource and supervisory issues because telecommuting is rarely a technical challenge today.*

Workers can be productive in their homes and other remote locations with payoffs for employees and employer alike.

The basic idea of telecommuting is simple: Employers can allow some of the work force to spend part of the workweek at a remote site, often — but not always — linked to the office via micro or terminal over phone lines. The employer benefits through improved recruiting, a retention of key staff, improved productivity and reduced office space costs.

Employees also come out ahead with less expense and wear and tear from commuting, a more flexible work schedule and greater opportunities for those who, for many reasons, cannot come into the office five days every week. The key to successful implementation is to focus on the human resource and supervisory issues because telecommuting is rarely a technical challenge today.

There are five major reasons why the spread of micros will hasten the spread of telecommuting. Remote work may not have been what the designers of today's micros had in mind, but it is one more way to take advantage of this technology.

- The job is in the machine. Micros are shrinking the geography of the professional's work space. As more white-collar workers begin to rely on micros as integral parts of their jobs, they rely less on the papers, files and other materials spread throughout the office.

This is not another pitch for the paperless office — paper manufacturers should not lose any sleep over the spread of micros. But the fact is that file and data base access, computing power, report and graphics generation, electronic mail, data base management and word processing can all be done in many cases with just a micro and a phone line. The micro frees the office worker from the confines of the office.

Despite the micro's progress, telecommuting's weaknesses are micro-mainframe links and telecommunications links. Those two are the glue that holds micro-based remote work together. Right now, that glue does not always stick too well. Hence, because many actual and potential telecommuting applications involve stand-alone micro work or fairly routine dial-up access with appropriate security features, these weak lines may be problematic. They are not, however, serious obstacles across the board.

- Smaller is (getting) better. We're making headway when a micro can be carried in a briefcase instead of on a luggage cart. "Portable" is losing its status as a euphemism for "luggable" when it comes to micros. For example, the buyer's guide in the March 1985 issue of "Pico: The Briefcase Computer Report" lists 32 models, the heaviest of which weighs 14 pounds. And these are just the ones classified as briefcase models; highly portable machines like the Apple Computer, Inc. Apple IIc or the IBM PCjr are not even included.

The emergence of these smaller machines is a plus for telecommuting even though most people that work at home several days a week use micros or terminals that stay at home. The added advantage of the briefcase or laptop model is to open up remote work possibilities for people who might only want or need to be off site sporadically.

Instead of just taking home briefcases, these people will take home briefcases with micros in them. Once they see the pluses of working at home, some of them will evolve into

See WORK SR/34

Gordon is president of Gil Gordon Associates in Monmouth Junction, N.J., and specializes in implementation of telecommuting programs. He is also editor of the monthly newsletter "Telecommuting Review," published by Telespan Publishing.

Lotus on a VAX?

dBASE II on a VAX?
Friday! on a Micro VAX?
Condor on a PDP-11?
PFS:File on a PRO?
Personal Pearl on a VAX?
QuickCode on a Micro VAX?
Spellbinder on a VAX?
WordStar on an MV10000?
R:base 4000 on a VAX?
Multiplan on a PDP-11?
PL/M on a VAX?
SuperCalc 3 on a PRO?
T/Maker Integrated on a VAX?
MS BASIC on a Micro VAX?
Milestone on a PDP-11?
Palantir on a PDP-11?
SpellStar on a PRO?
MailMerge on a PDP-11?
PMS II on a VAX?
dBASE II on a PDP-11?
Lotus 1-2-3 on a PDP-11?
Open Access on a PRO?
MS FORTRAN on a VAX?
Condor on an MV10000?
Multiplan on a PDP-11?
WordStar on a VAX?
SuperCalc 2 on an Eclipse?
PertMaster on a PRO?
Palantir on a VAX?
QuickCode on a PDP-11?
DISC-DBL on a VAX?
PerfectWriter on a PD[illegible]
WordStar on a PDP-11?
Spellbinder on an Eclipse?
Friday! on a VAX?
PerfectWriter on a PRO?
RM/COBOL on a PDP-11?
RTCS/UDI on a VAX?
Mass-11 on a PDP-11?
Milestone on an Eclipse?
Lotus 1-2-3 on a Micro VAX?
Peachtree on a VAX?
SpellStar on a Micro VAX?
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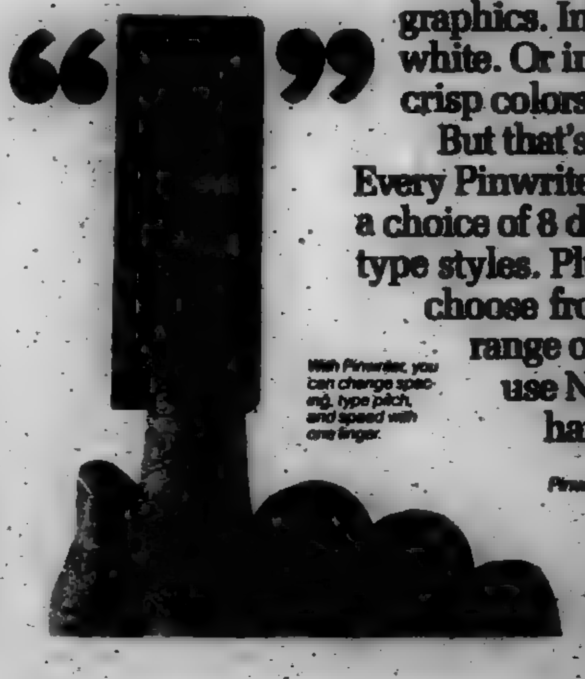

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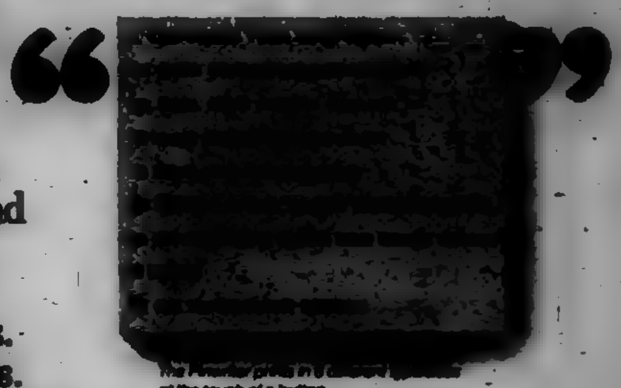

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Special Report

Managers must make building communications nets

By Emily Johnston
Special to CW

If you think that the microcomputer is the bane of the data processing director, that its proliferation spells the end of central control of the information resource, that it is an additional burden on DP people and that it reduces the DP department's authority and importance, think again.

In reality, the microcomputer is the best asset the DP department could have.

Conjure up this scenario: In a large room filled with mainframes people are gathering papers from the printer, looking at CRTs, mounting tapes or reading the latest *Computerworld*.

They have plenty of time to evaluate and plan the installation of the latest operating system release. All of the tapes are hung in their proper slot. Vivaldi plays on the radio.

> 99
>
> *DP managers must sit down with the users and find out what their needs are.*

Hard to do, isn't it? Why, you ask, are these people not tearing their hair out trying to generate that important financial report for the president of the company? Why are there no data entry people or field engineers? Why is the console not beeping that the queues are full? Why is there no three-piece-suit-type person banging his fist on the operations manager's desk? Why is the systems programmer not paging frantically through manuals?

In the usual computing environment, the user may be sitting at his terminal tying up machine resources or patiently explaining to the applications programmer why it is imperative that his output be printed sideways on the page. Perhaps last week the user filled the job and print queues with reports that no one will ever read, and one of those jobs wiped out half the data because he entered the wrong option.

The hypothetical computer room mentioned earlier is quiet because its users are not doing these things. Instead, one user is running a spreadsheet program to generate a financial report. Another is using a word processor to write a proposal for a potential contract. Others are using micros to manage the cafeteria budget, update the spare-parts inventory or sort the customer list by geographic location. In short, the users are being productive.

Can you imagine what those applications would do to a mainframe? Forty people using an interrupt-driven word-processing package, 20 more using rapid-screen-refreshed spreadsheets, 30 people tying up the disks with data base queries, and DP personnel running a payroll for 14,000 people back in the computer room would bring a mainframe to its knees.

From an efficiency viewpoint, the mainframe environment is well rid of these smaller applications. After all, mainframe resources are really needed to do corporate payroll, general ledger, cost allocations across departments, job costing, scheduling and billing.

All these are large batch jobs, requiring input from all the corporate data bases and generating stacks of output measured in feet.

The key to success

The key to achieving the calm computer room environment depicted above is communications — hardware communications — so that users can get current information from the mainframe

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Johnston is president of Carroll Computer Consultants, a Westminster, Md. consulting firm.

IT'S TIME TO STOP PUTTING

a top priority to take full advantage of micros' assets

to work with their micros and clear the lines of employee communication. If these communications networks are to work, planning is vital to their success.

It is in this stage that the DP department becomes the hub of the corporate wheel; it is the DP department that does the planning.

Since the DP staff has provided user services for a while, it's fair to assume they will understand the users' computing requirements.

Determining needs

To facilitate this, DP managers must sit down with the users and find out what their needs are and what control data they will need to do their work.

Armed with this information and its knowledge of the company and its general business plan, the DP group can apply its hardware and software expertise to the determination of systems requirements.

This is not just a matter of selecting microcomputer hardware and software — the DP staff must consider communications protocols and networks, file formats, shared data requirements and security problems.

They must consider the level of sophistication of the users and the psychological and ergonomic aspects of this endeavor. It's not going to be easy.

These plans all center around the communications network — the DP manager must decide whether the company should install a local-area network, use dial-up or dedicated telephone lines, stick with good old-fashioned cabling or implement some mix of these.

Next, the DP group has to set up access procedures, create procedure files, determine read/write authorizations and worry about communications software and data base security.

Problems solvable

A bundle of problems must be addressed, but they are able to be solved with the liberal application of knowledge, research and cooperation.

The benefit of a system such as this is that the users will manage their own department budgets and use a canned procedure to update the corporate budget with department totals.

> ”
>
> *The DP department will only have to concern itself with keeping the facility tuned and working properly, running payrolls and voucher checks and administering the central data bases.*

The inventory or customer list of one department can be cross-checked against such lists of others for duplications.

These lists can be merged on the central facility; the inventory value is an entry in the annual report, and every customer will get a copy.

DP concerns

The DP department will only have to concern itself with keeping the facility tuned and working properly, running payrolls and voucher checks and administering the central data bases.

In addition, the staff will update systems and get hardware fixed or replaced.

At this point, each person is doing the job he knows best and has the proper tools to do so. Each machine is devoted to the tasks it does most efficiently. Nobody is fighting over resources or priority.

The managers have up-to-date information whenever they want it; the secretaries have quadrupled their output but not their hours; the sales force has organized customer lists; and the finance office knows who owes what.

XEROX

from SR/7

> ”
>
> ***Apple will succeed by selling to the growing number of users who want the visual interface but also want an alternative to IBM hardware.***

If this market broadening occurs, Apple will benefit. While IBM captures the character-based users, and Digital Research and Microsoft battle for the graphics-based users of Personal Computers, Apple will succeed by selling to the growing number of users who want the visual interface but also want an alternative to IBM hardware.

In addition, as major independent software vendors begin shipping applications designed to take advantage of the new visual environments, the end user will become the ultimate beneficiary of the competition among the operating environment vendors.

As hardware and software vendors adapt their operating environment offerings to the needs of their target markets, users will have an ever-widening variety of traditional character-oriented and new graphics-oriented applications from which to choose.

Applications aimed at the novice user will continue to become dramatically easier to use. Applications aimed at the sophisticated user will offer an increasing level of speed and power to do complex computing tasks previously performed only on mainframes.

COPY

from SR/6

protection schemes, since these copiers are capable of recognizing and copying illegal data on protected diskettes.

In response, vendors have been developing increasingly sophisticated copy protection schemes, and the bit copier companies have been following with more sophisticated copier programs.

This war has escalated to ridiculous heights. One company has developed a copy protection scheme which will wipe out a system's hard disk files if it detects the use of illegally copied software. In response, a bit copier company claims to have found a way to beat that protection scheme and provide general hard-disk protection from such programs.

The most common objection to copy protection is that it inconveniences the legitimate user. Many software protection schemes require continued use of diskettes, even by a user with a hard disk, such as that on an IBM Personal Computer XT. Others require a lengthy and complex installation procedure, which novice users often find baffling.

Ironically, studies conducted by Future Research, Inc., a market research firm, indicate that copy-protected software diskettes are being copied and used illegally almost as frequently as totally unprotected ones. Users also have complained so loudly about the hassles that vendors are beginning to abandon copy protection schemes.

One of the most spectacular reversals came in January of this year when Micropro decided to remove copy protection from its Wordstar 2000 word processor product. The software had been out only a couple of weeks when user complaints about the lengthy installation period became so great that the firm announced that everyone who had bought the product would be entitled to free unprotected diskettes of the same product. This is probably the most brief copy protection policy in history.

There is a solution in sight, and it has to do with a new form of licensing now being made available to companies by some vendors. Suppose a company plans to buy 30 to 40 copies of a software product. They talk with the vendor to obtain a site license, which gives them the right to make unlimited copies of the software for use at a given site or sites. Many of these site licenses also permit an employee to make a copy to use on his own home computer for noncommercial purposes. They pay one fixed fee for this right.

Purchasers may have to do some research and negotiation to get a site licensing agreement, however.

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(B) Choice of Column or Row Format:	Yes	No
(C) Accessible Tables:	40	10
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Automatic Key Index Maintenance:	Yes	No
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Sporting goods chain scores with in-house budget tools

CARTERET, N.J. — A sporting goods retailer here hiked the efficiency of its budgeting procedures when it switched from an outside time-sharing service to an in-house system based on a general ledger software package and a micro-mainframe link.

Until recently, Herman's World of Sporting Goods, a retailer that operates more than 115 stores, relied on the time-sharing system for all of its modeling procedures and financial analyses. The firm had a homegrown general ledger system that ran in house on a 16M-byte IBM 4381, but the system did not support any budgeting capabilities. When Herman's needed a budget, it sent a tape with its financial data to the time-sharing service bureau for processing.

The cost of the service was prohibitive, turnaround time was slow, and the process was inefficient, according to Debbie Krochalis, Herman's manager of financial systems.

"When we were on time-sharing, actuals had to be loaded into the data base, resulting in duplication of data in the in-house and time-sharing systems," she said. "Additionally, the in-house general ledger didn't have access to the budget data developed on time-sharing."

In April 1983, Herman's began looking for a new general ledger system. Krochalis said the firm had the following two primary goals for the software:

- To replace the outmoded homegrown general ledger — a batch processing system — with software that provided on-line capabilities, a variety of report writers and other sophisticated features.
- To phase out reliance on the time-sharing service by providing budgeting capabilities.

Link support affects choice

Support for micro-mainframe data transfer also weighed as a factor in Herman's choice of general ledger systems, Krochalis said. "It was certainly something I was looking for."

After a five-month search, the firm purchased McCormack & Dodge Corp.'s GL:Millennium general ledger package, which offered support for PC Link, the vendor's micro-mainframe link.

Herman's installed the general ledger software in January 1984 and brought it into full production four months later. Last September, the firm installed PC Link on an IBM Personal Computer in the finance department.

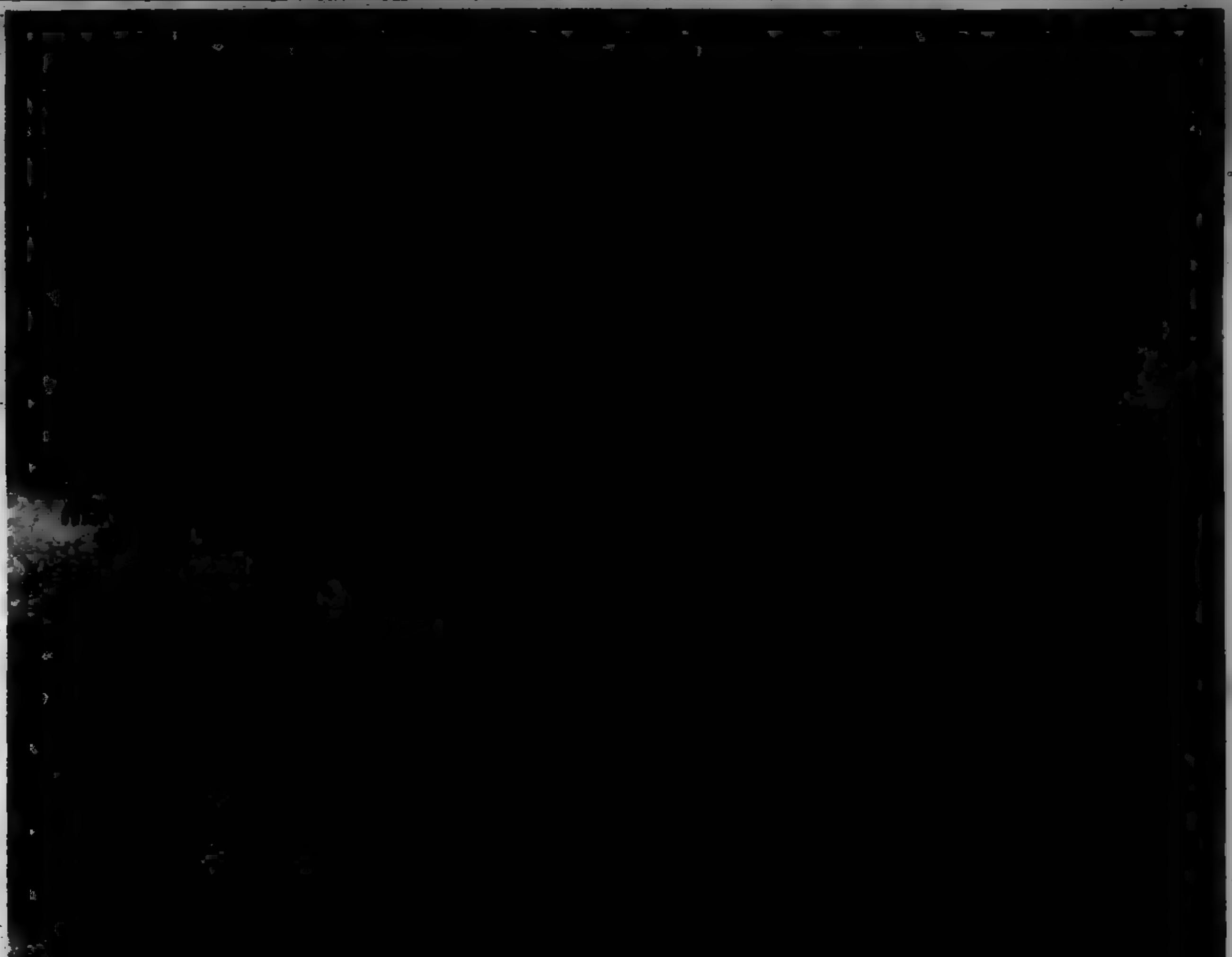
That month, analysts in the department began using the link to prepare Herman's budget for 1985, which was due in early December. They downloaded actual financial data from the general ledger system to the Personal Computer, performed budget analyses with Lotus Development Corp.'s 1-2-3 and uploaded budget data into the general ledger.

Krochalis explained that the procedure was more efficient than the one the company followed with the time-sharing service and that it saved her analysts time.

Herman's maintains PC Link on one Personal Computer, which is hard-wired to the mainframe and fitted with a Digital Communications Associates, Inc. Irma board. During the 1985 budget analyses, workers in the finance department made duplicates of the disk on which PC Link had captured financial data from the mainframe. They then massaged the copied data on stand-alone Personal Computers with 1-2-3.

Herman's
world of sporting goods

The time savings this procedure allowed came from two sources, according to Krochalis. First, because analysts were familiar with Lotus, they could proceed without much instruction. Second, the disk copies allowed a number of people to prepare budgets simultaneously.



Special Report

Terminal emulators conquer space shuttle supplier's

TARRYTOWN, N.Y. — For a firm here that supplies parts for the National Aeronautics and Space Administration's space shuttle and other aircraft, giving microcomputer users access to mainframe data was a matter of finding the right stuff: specifically, the right medium for data extraction and file transfer.

Simmonds Precision, a subsidiary of Hercules, Inc., manufactures fuel gauges, ignition systems and other devices for commercial and military aircraft. A year and a half ago, the firm looked for a way to download operations-related data from mainframes to microcomputers to distribute computing tasks.

According to Dave Fredenburg, manager of product assurance data systems for Simmonds' Instrument Systems Division: "We wanted to federate some of the mainframe processing power."

That task centered on finding a common medium with which to transfer data. "You don't have 5-in. diskettes on a mainframe; on [personal computers] you don't have tape drives," Fredenburg said. "You have to have some [common] medium."

In September 1983, Simmonds purchased a number of terminal emulation boards that allowed coaxial wire to serve as that medium. The emulators, Irma boards from Digital Communications Associates, Inc., allow microcomputers that are hard wired to communications controllers to appear to Simmonds' 8M-byte IBM 4341 mainframe as 3270-type terminals.

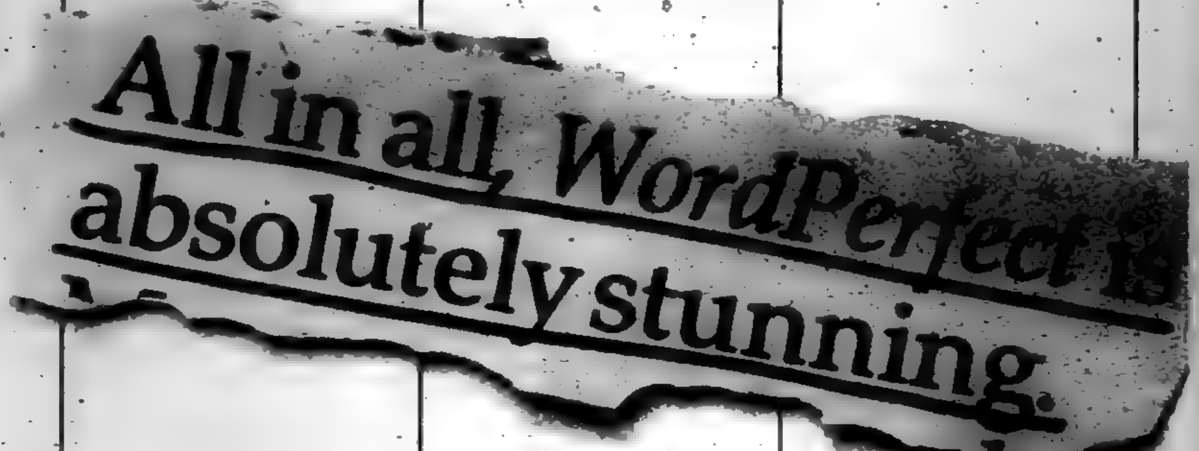
Extract data from mainframe

In terminal-emulation mode, the microcomputers can extract data from the mainframe and use it for local processing tasks. Users whose micros are fitted with the boards can also send files to the mainframe, where other users can access them.

About 25 of Simmonds' 60 IBM Personal Computers, Personal Computer XTs and Compaq Computer Corp. micros are fitted with the emulation boards. Simmonds uses Pansophic Systems, Inc.'s Easytrieve software for data extraction and Panlink for file transfer.

Employees in the firm's headquarters here and at its Instruments Systems Division in Vergennes, Vt., use the extraction and transfer capabilities to help them perform a number of different tasks as follows:

- Financial analysts at Simmonds' headquarters use their micros in terminal-emulation mode to pull cost data from the mainframe. They then switch back to a local processing mode and use Lotus Development Corp.'s 1-2-3 to massage the data and determine pricing strategies.
- Parts inspectors in Vergennes use their machines as personal computers for voice entry during inspections; they call out the results of



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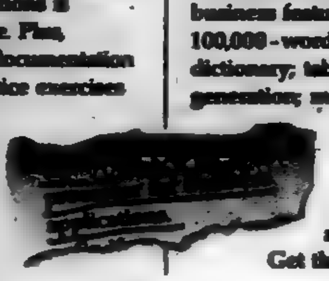

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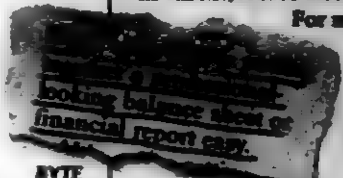

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their inspections, and the machines record the information. The inspectors also use their machines as terminals to query mainframe data bases for scheduling information.

- Clerical workers in the Instrument Systems Division in Vergennes use their personal computers as terminals for data entry to mainframe data bases and as local processors for data entry to personal computer data bases. They also retrieve mainframe files and massage them with microcomputer word processing software.
- Software developers in the Instrument Systems Division use their machines both as micros for microcomputer software development and as 3270-type terminals for mainframe software development.

Fredenburg said that in all these applications, the firm benefits by off-loading processing from the mainframe, by getting dual use out of its microcomputers and by eliminating the need to rekey data.

Saves money every day

By off-loading processing tasks, such as software development, to the micros, the firm saves money every day in CPU time and channel costs, Fredenburg said. Simmonds also saves in the long run because it can distribute its processing load and therefore eliminate the need for frequent mainframe upgrades, he said.

By giving users both terminal and personal computer capabilities at the same workstation, the firm gets a logistical benefit. "You don't have to have two machines there to get the job done," Fredenburg explained.

By eliminating the need to key data into microcomputers, Simmonds has prevented unnecessary labor. But more important, Fredenburg said, the firm has been able to implement applications, such as the generation of reports from mainframe parts lists, that it could not set up without the ability to download data for local processing.

"There is really no way to take a file that has 200,000 characters in it and key it into a [personal computer]," he explained.

Simmonds is a supplier of parts for Nasa's space shuttle.

MIS managers must go with micro network flow

Influx of personal computers presents opportunity to enhance corporate role

By James Y. Bryce
Special to CW:

What was once a slow and almost silent push for communications among micros has suddenly gained momentum. The local-area network has brought the desire for communications to the forefront of the industry.

The MIS professional who attempts to stem the influx of micros and networks is doomed to failure. This resistance, based on the fear of losing power or position, does not address the inevitable change that microcomputer networks portend:

Distributed processing will put substantial power in the hands of users.

Those professionals who view the shift as an opportunity for cooperation and growth, will find their positions substantially improved, albeit different. MIS managers who are willing to change with the new technology will prosper.

The technology of micro-mainframe connection consists of a number of facets, including the following:

- Physical connections.
- Software.
- Security.
- Auditing.
- Data integrity.

MIS managers who want to improve their positions and change with the new technology must consider each of these.

Physical connections. As a beginning, the manager must find some way to connect the micro to the host computer. The first connections to become available, and the ones most frequently used, allow the micro to emulate a terminal and otherwise ignore the power resident at the user's desk. Communications are transmitted from the terminal to the host, which frees the user from the need to have both a terminal and a micro on his desk.

Organizations pay a substantial price for this freedom. The cost of many of the hardware and software packages involved in emulation is a considerable percentage of the cost of a standard terminal, yet the performance of the micro/terminal is much slower than that of a standard tube. From the user's point of view, this disadvantage is compounded by the gymnastics that are required to make the micro keyboard work the way a terminal keyboard does.

Early micro-mainframe communications links relied on existing systems for terminal connection to the host. More current schemes feature channel attachment of local-area networks to the host. These attachments offer wider possibilities to the network manager, including the cabability for peer-to-peer communications among all computers on the network.

Software. Gradually, vendors are developing products that serve to heighten the utility of the connection beyond that of simple terminal emulation.

Several programs on the market permit disks or printers to capture a screen load of information. Other programs allow users to transfer entire files to disk with a few key strokes. More exciting programs emphasize the dominance of either the micro or the mainframe.

Among micro-oriented software offerings, the most exciting for many users is the virtual diskette server. The virtual server, portions of which run on both the mainframe and the micro, turns the mainframe into a giant file server for the microcomputer.

Micro users see the mainframe as an almost limitless collection of disk drives and floppies they can access. More sophisticated versions of these programs allow other mainframe programs to insert and extract data from the virtual diskettes.

This insertion and extraction process is a gray area between the micro and the mainframe orientations. Cooperative processing between the microcomputer and the mainframe, carefully governed by the mainframe, allows micros to extract information contained in complex mainframe data bases.

Currently, programs that offer these capabilities are the top of the heap in micro-mainframe links; as such, vendors demand top dollar for them.

Security. The emergence of links that go beyond simple terminal emulation leads to the need for security measures beyond those available for terminal environments. Security can be obtained at the level of the host, the communications system, the micro and the user.

At each level above user level, the MIS manager can institute passwords, access permits and hidden files to block unauthorized activities.

At the micro level, physical security devices like key locks may be effective. Many networks allow for the use of micros without disk drives and thereby prevent the unauthorized acquisition of entire disks worth of data.

At the user level, the MIS manager can maintain profiles that keep track of the kinds of access an employee typically uses and flag any authorized but unusual access attempts. To provide additional security, managers can require employees to use physical identifications, such as magnetic strip badges, to log on to a micro.

Data encryption also offers substantial protection, but the time necessary for encryption and decryption may offset any gain.

Auditing. When every micro in an organization has access to the corporate data base, the potential for the creation of new ideas is great. Unfortunately, the potential for total confusion is equally as great.

Downloading an original data base, or a portion of the original data base, into a micro produces two copies of the same information, assuming no errors occur during the downloading. The micro user works with his copy, using a spreadsheet or some other projection software, and prints out his results.

Printouts from the micro look just as good to management as those produced by the mainframe, but the data may not be as accurate. Should management then depend on micro analyses of the mainframe data base?

The possibilities for errors in communications or calculations are too great to allow such dependence. But the speed, flexibility and creativity of micros linked to the mainframe data base are vital to the strength of the company. The solution, or at least a partial solution, is to require that an audit trail be produced.

With an audit trail, management can examine the results of micro operations, keeping watch for the limitations imposed by the source and the communications involved.

The only data base an organization should consider accurate is the one that resides on the mainframe. This data base is routinely updated and backed up. Data that is downloaded to microcomputers is synchronized only at the time of the downloading.

Data integrity. Micro-mainframe communications creates a new role for the MIS professional, that of distributed data base administrator. As part of this role, the MIS manager must devise a way to allow users to upload data.

Data that micro users supply to mainframe data bases can serve as a valuable corporate resource. This data, however, is subject to substantial corruption.

At the least, MIS staff members must check data for transmission errors to make sure that the data the mainframe receives is consistent with the data the micro sent. One way of doing this is to isolate data and compare it line by line, using encoding algorithms to detect possible errors.

Final responsibility must rest with the MIS manager, who will provide controls and review users' requests to upload data.

Bryce is president of Netserv, Inc. in Austin, Texas, a consulting, training and service firm specializing in local-area networks.

Special Report

Micro, mainframe software maintenance issues similar

By Girish Parikh
Special to CW

Software maintenance can be defined as corrective, adaptive or perfective labor performed on either custom-designed or packaged software. In the microcomputer software world, software support, such as answering user questions on program functions and documentation, is also included under the umbrella of software maintenance.

Maintaining microcomputer software that was developed in-house can be similar to maintaining mainframe software that was custom developed. Programs and systems developed in-house may suffer from inadequate documentation, lack of modifiability or poor logic and design.

Often at considerable expense, DP managers learned these mainframe software maintenance lessons:

- One way to reduce maintenance problems during software development is to implement better analysis, design, technical reviews and walk-throughs.
- Well-maintained and current documentation is a necessity.
- Selecting and using software maintenance tools, like documentation, is important.
- Programmers and technicians should be educated and trained in software maintenance.
- It is important to find and keep competent maintenance programmers.

If these solutions are not heeded in the development of homegrown microcomputer software, support and maintenance for the software will be very difficult.

One way organizations can support microcomputer software is to form an information center. The information center's technical staff can help users develop and maintain homegrown software. A support group in the information center can develop and provide user training and also work with the vendors of software packages on the upkeep of off-the-shelf software.

While the use of mainframe software packages is growing, comparatively inexpensive software packages are the life of most microcomputer systems.

User support is major issue

Supporting users of popular microcomputer packages is a major issue in microcomputer software support and maintenance. Corporate users may be located at geographically diverse locations.

One maintenance problem unique to packaged software is that of promptly distributing any changes or enhanced versions of software with updated documentation.

In addition to support received from the information center, vendors also can provide users with, to a certain extent, maintenance support. Some of the innovative solutions being used by vendors include electronic bulletin boards and phone support on a pay-as-you-go basis.

Other vendor maintenance options are available. A recent *Infoworld* reported that Solvation, Inc., located in Southboro, Mass., is currently developing an IBM Personal Computer program called The Buddy System, "which allows technicians to provide on-line support without leaving their offices."

Special interest groups (SIG) to support and educate users are also started by microcomputer software vendors such as Borland International and Lotus Development Corp. on Compuserve, Inc.'s Compuserve, the Columbus, Ohio-based network.

Another interesting software maintenance issue is the role microcomputers are playing in mainframe software maintenance. With the micro-mainframe links, micros have already entered the mainframe world. In the future, this link with the mainframes is likely to strengthen. Micros may also be used as stand-alone machines to support mainframe software maintenance. The following are some possible microcomputer applications in this area:

- Moving mainframe applications to micros.
- Managing mainframe software maintenance with the help of micros.
- Estimating time for maintenance work using a microcomputer software package for the estimation.
- Measuring maintenance programming productivity and maintaining productivity data bases.
- Expert software maintenance systems on micros and expert systems for forecasting programmer turnover based on behavior patterns of employees.
- Employee turnover contingency planning system.
- Downloading Cobol programs from mainframe to micro, performing modifications on the micro and uploading to the mainframe.
- Restructuring Cobol (and other language) programs on micros.
- Dedicated micros for documentation.
- Using micros for education and training in software maintenance.

Parikh is a Chicago-based consultant, lecturer and writer. His books include Techniques of Program and System Maintenance *and* Tutorial on Software Maintenance, *with Nicholas Zvegintzov.*

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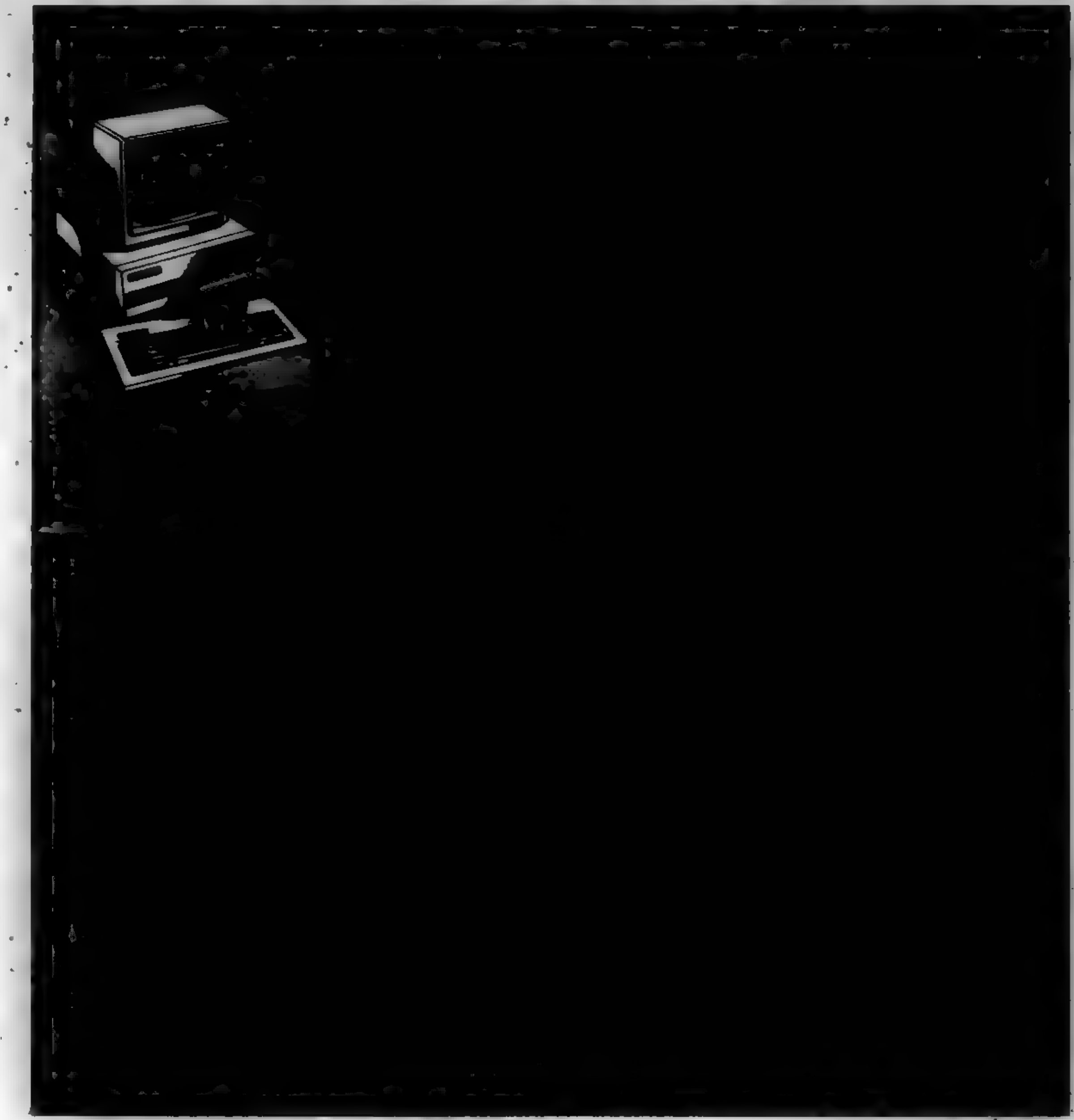

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Special Report

Portables let auditors bring the office to their work

HOUSTON — Auditors at a Big Eight accounting firm's office here take portable personal computers with them when they visit the offices of client companies to examine corporate finances.

The Houston office of Price Waterhouse & Co. maintains a pool of about 50 Compaq Computer Corp. portable microcomputers for its auditors, who spend about 75% of their time working on location. According to Ed Powell, managing partner at Price Waterhouse, "Portable personal computers are a vital productivity tool."

Price Waterhouse has stored proprietary auditing software, as well as Lotus Development Corp.'s 1-2-3 and Visicorp's Visi Word, on the portables' hard disks so that auditors can carry with them the tools they need to perform their work.

Auditors take up residence in clients' offices for anywhere from two weeks to three months while they examine a client's business transactions. They check accounts receivable, for example, by asking the client's customers to verify that they have been billed for the amounts the client recorded. The auditors also count inventories, do check reconciliations with the client's bank and delve into other facets of the client's operations in the same manner.

In the end, Powell said, their analyses attest that the financial statements the client releases to its shareholders are accurate. The software embedded on the portable micros' hard disks helps the auditors choose statistical samples of transactions to examine, test their samples, extrapolate them to the whole, consolidate their findings and format final reports. "It's a great time saver," Powell said.

Proprietary software — the Audit Practice Support System developed by Price Waterhouse for its users — does most of the work and takes up about 6M bytes of the Compaq portables' 10M-byte hard disks, leaving the remaining memory for processing tasks.

The firm chose Compaq portables because they had the hard-disk capacity to support the proprietary software, yet were small enough to move from site to site, Powell said. "They're full-blown, full-powered [personal computers] that can be used . . . in our clients' offices."

He said the ability to carry micros to clients' offices benefits the firm in the following ways:

Productivity. Microcomputers increase auditors' productivity by automating work that they once did by hand. Powell said Price Waterhouse had not calculated exact time savings, but he offered this application as an example. When Powell visited a client's office after hours recently, he saw a Compaq running unattended. A Price Waterhouse auditor working at the site explained that the machine had been programmed to run a series of calculations — a job that required about two hours of processing time — and print out the results overnight so they would be available the next morning. Without the computer, Powell said, all that would be done manually.

Convenience. Portables enable auditors to perform operations wherever they are working. Before the Houston office began using portables two years ago, its auditors had to tap into Price Waterhouse's corporate mainframes, an IBM 4341 and a Digital Equipment Corp. 2060, at the firm's national administrative office in Tampa, Fla., which required that they leave client offices where they were stationed and return to the home office.

Powell said auditors still need to access the mainframes for some complex operations but added that Price Waterhouse is working to make its portables self sufficient by outfitting them with all the programs auditors need. "More and more," he said, "those are going on the hard disk."

If an auditor working out of a client office needs access to the corporate mainframes, he can use a modem and phone lines for dial-up access.

Availability. Many of Price Waterhouse's clients are just beginning to consider office automation and have yet to install micros, Powell said. Clients who have personal computers do not want to lend them to auditors. "They're very stingy," he said, explaining that most firms that have micros use them continuously and cannot give up processing power.

In addition, he said, auditors do not have the time to load Price Waterhouse's proprietary software onto the hard disk of a client's personal computer and erase the programs from the computer's memory after they complete an audit. The software comprises about 15 floppy disks worth of programs and takes about two hours to load onto a hard disk.

Collectively, the benefits have allowed Price Waterhouse to stay competitive with other Big Eight accounting firms, which, Powell said, are "heavily into micros because they're not stupid."

The firm maintains 15 Compaq portables for employees who calculate tax returns for clients, but these personnel use the portables less frequently than the auditors do, Powell said.

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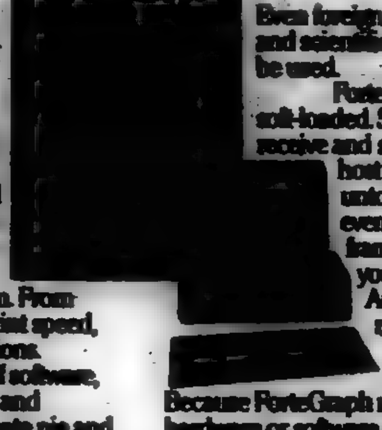

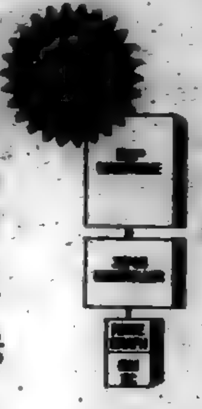

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[illegible]

Special Report

Savings and loan industry reveals DP requirements

Nationwide survey shows preferences for hardware, software, user training

By Kenneth [illegible]
Special to CW

A nationwide survey of savings institutions revealed that this industry overwhelmingly favors the IBM Personal Computer and Lotus Development Corp.'s 1-2-3, purchases 40% of their hardware and software through computer stores and seeks external training programs for user education.

The savings institution industry, which is composed of more than 4,000 savings and loan associations and mutual savings banks, has evolved to meet the home financing and savings needs of households. Historically, these needs were met in a regulated and protected arena.

Today, however, complex variable-rate financial instruments have replaced their fixed-rate counterparts and, due to financial industry deregulation, savings institutions have many new competitors. On the other hand, savings institutions are no longer limited simply to providing mortgages and passbook savings accounts; they are now active competitors for checking account and credit card services.

Savings institutions have had to respond to this competitive and complex business environment with more effective information systems. How the personal computer is being used to meet the institutions' information needs was the focus of an industrywide survey conducted by Intek Management Corp., a financial industries marketing research firm.

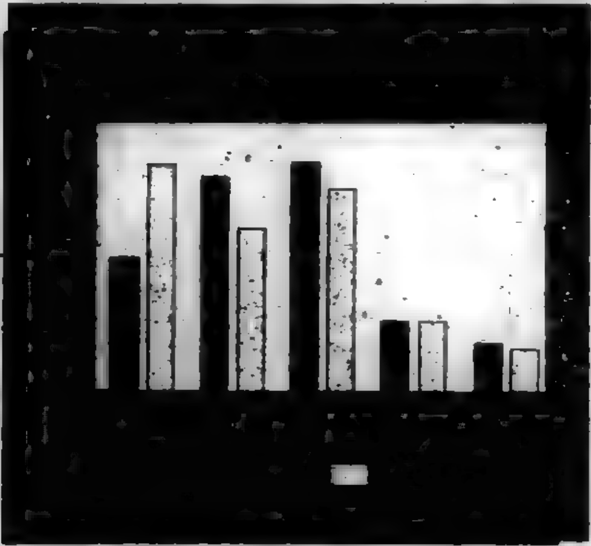

Figure 1. Of the savings institutions surveyed, 80% had at least one micro and 60% planned to add more micros.

Personal computer brands used

IBM	60.1
[illegible]	
IBM-compatible	14.3
[illegible]	
Burroughs Corp.	6.9
[illegible]	
NCR Corp.	3.0
[illegible]	
Televideo Systems, Inc.	2.2
[illegible]	
Sperry Corp.	1.1
[illegible]	

Figure 2. IBM Personal Computers are the most used micro in this market.

Intek mailed questionnaires to senior executives of more than 4,000 institutions. The 434 respondents ranged in size from less than $25 million to greater than $1 billion in total assets. All states, with the exception of Maine, were represented.

Survey results

How many personal computers are in use or planned?

More than 80% of the savings institutions surveyed had at least one personal computer. Nearly 50% had two or more, and more than 60% of the respondents planned to add additional personal computers during the next 12 months (Figure 1).

Which personal computers are being used by savings institutions?

Seventy-four percent of the survey respondents reported that they use IBM and IBM-compatible personal computers.

Apple Computer, Inc.'s Apple computer was the next most popular personal computer among the respondents and was used by 31% of the institutions. Figure 2 identifies which computers are currently installed. Since these institutions typically had more than one system, responses exceed 100%.

What software packages are they currently using?

The spreadsheet application was the most common use for the personal computer. Lotus' 1-2-3 was selected by 46.5% of the sample; Software Arts, Inc. Visicalc was a distant second, with approximately 21% of the institutions using it. Not only is 1-2-3 the leading spreadsheet package, but it was also the most popular data base management and graphics applications package.

Are there formal policies for the selection of hardware and software?

Most institutions lacked formal policies for selecting hardware and software, and they had not established corporate standards. Only about 20% of the end users consulted with the computer staff before purchasing hardware or software. The majority of purchases (40%) were made through retail computer stores. It appears that the retail computer store was instrumental in the hardware and software selection process.

Are there purchasing standards for microcomputer hardware?

Personal computer communications capability

In-house Mainframe/Mini	62.0%	18.0%	8.3%	11.1%
[illegible]				
Other Personal Computers via Local-Area Network	78.9%	7.9%	7.9%	5.5%

Figure 3. Survey results showed that micro-mainframe communications are not a priority for most survey respondents.

Remarkably few of the savings institutions (37%) had corporatewide standards for microcomputer hardware purchases. Of those institutions that had standardized their personal computer hardware, the Personal Computer was the system of choice for 28.2%.

What software standards have they adopted?

Given its popularity within this industry, 1-2-3 was, not surprisingly, the spreadsheet standard selected by approximately 48% of the respondents. Micropro International Corp.'s Wordstar was the choice as the word processing standard for 32% of the respondents, and Ashton-Tate's Dbase II was selected as the data base management standard by 25% of the respondents.

CW Graphs

Personal computer applications
Current and planned

Budget and Financial Forecasting	50.5	27.6
[illegible]		
Investment Analysis	27.0	35.3
[illegible]		
Word Processing	46.5	24.4
[illegible]		
Loan Pricing Models	11.8	24.0

Figure 4. Budgeting and financial forecasting spreadsheets are the most popular applications. The current percentage column depicts the number of survey respondents using each application; the planned percentage column describes those respondents planning to add these applications.

How extensively is the personal computer used for communications?

The savings institutions have been slow to use the communications capabilities of the personal computer. Only 18% of the installations surveyed used their in-house mainframe or minicomputer systems for communications. Even though communications is becoming an important feature of the personal computer, the industry does not plan to become involved in this area.

The smaller and mid-size savings institutions rely upon service bureaus for their processing requirements. This may explain why so few plan to communicate with in-house systems. Figure 3 illustrates the current and planned communications capabilities.

Which external information services are utilized?

The savings institution industry has been slow to use outside data base services. Currently, 17% subscribe to information services. The most popular are Telerate (7.1%), Dow Jones News Retrieval (3.5%) and Interline (2.3%).

What are the applications personal computers are used for?

Spreadsheet applications, such as budgeting and financial forecasting, asset/liability management and investment analysis, were among the most popular ones.

These financial applications are indicative of why 1-2-3 and the Personal Computer are so popular within the savings institution industry. Forty-six percent of the sample group used the personal computer for word processing applications; savings institutions are replacing the dedicated word processors with personal computers whenever practical. Figure 4 describes which applications are being automated by the personal computer.

What are the training methods used and preferred?

Most general office and professional staff at savings institutions rely upon self-training, but few prefer this method of learning. Most users prefer either a formal internal or external training program to assist them in learning to use their automated systems.

It is interesting to note that external training programs were preferred by the majority of professional staff members above all other methods.

The above selections were a sampling of key results from the survey tabulations that were thought to be of special interest to *Computerworld* readers.

A complimentary copy of the complete survey results may be requested from Intek, which is located at Suite 101, 1950 Addison St., Berkeley, Calif. 94704.

[illegible] is the president and founder of Intek Management Corp., which provides market studies and strategic plans for the financial and investment services industries and computer software and services firms.

Increased personal computer use demands new breed of manager

By Constance Knapp
Special to CW

As microcomputers continue to infiltrate the corporate ranks, many large companies are scurrying to find a way to manage the acquisition and use of these machines. In many cases, a management position has been created — that of the microcomputer manager.

Today, there is an increasing interest in this new MIS position. Who are the micro managers? What do they do? And what corporations are using them? After all, barely two years ago, the position did not exist.

What does the micro manager do? This question would be answered differently by nearly every company. For example, at Time, Inc., personal computers are controlled and supported by the information systems development area. This includes training, technical assistance and so forth. Even supplies are "purchased" at the computer store — a Time department.

At *The New York Times*, personal computers are controlled by users, with MIS setting standards and receiving information. Each department has its own micro maven, who, although not called a micro manager, manages all the personal computers for the department. This job includes selecting software, training employees and requesting equipment. Actual ordering and purchasing are done by MIS.

The Equitable Life Assurance Society has moved toward decentralization of all its functions, and micros are no exception. Each subsidiary and operating group has its own micro manager who is truly independent. Some areas use IBM machines only; some use Wang Laboratories, Inc. equipment; and others mix and match as they see fit. All decisions are made at the operating level.

A micro manager at equitable must be fully conversant in all aspects of this new technology. Some departments even publish newsletters to share their hard-won education with others.

As the need varies, so does the position. One microcomputer manager may be familiar with all aspects of this technology, while a coordinating micro manager may use administrative skills, rather than technical skills, to manage this computing revolution.

The future

What does the future hold for these jobs? The mere fact that the title "micro manager" has been created implies definition and, to some extent, standardization, as companies begin to actively fill these positions. Some standards will be set, along with expectations of minimum levels of knowledge.

As the personal computer revolution is controlled, some fallout may occur. Companies will reign in personal computer use, as redundant equipment is identified and eliminated. Too much money is being spent, and the results are too visible for this type of user computing to continue unchecked.

In smaller companies, the micro manager may be absorbed by the systems department. In larger companies, the position may evolve, as has that of the business analyst, as a shared function, requiring people who are well grounded in both systems skills and business knowledge.

As personal computers are taken more seriously by the data processing profession, the micro manager will be considered a professional — the job will be defined, and the wide discrepancies between the job title at different companies will be narrowed.

Knapp is a New York-based computer consultant, specializing in the selection and installation of financial software.

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Project software lets firm keep abreast of DP overhaul

WOODLAND HILLS, Calif. — A microcomputer project management software package is helping the MIS department of a manufacturing firm here manage budgets, meet deadlines and apprise top management of progress during an ambitious DP overhaul.

The MIS department of Dataproducts Corp., a manufacturer of computer printers that logs more than $400 million in annual sales, began to restructure its worldwide information services function two years ago. Dataproducts operates five data centers in the U.S. and one each in Hong Kong, Ireland, England, Paris and Puerto Rico. The restructuring included projects to do the following:

- Standardize the firm's financial and manufacturing software systems.
- Standardize hardware and software and establish an international network to connect the system.
- Create corporate data bases.
- Establish an information center to encourage end-user computing.

"All this was — and still is — a tall order," according to William D. Strowbridge, the firm's vice-president of MIS. "It cried out for an efficient, coherent project management system to give us the planning and control support we needed." The firm's 60-member systems development and support staff handles up to 350 concurrent projects for 35 user departments.

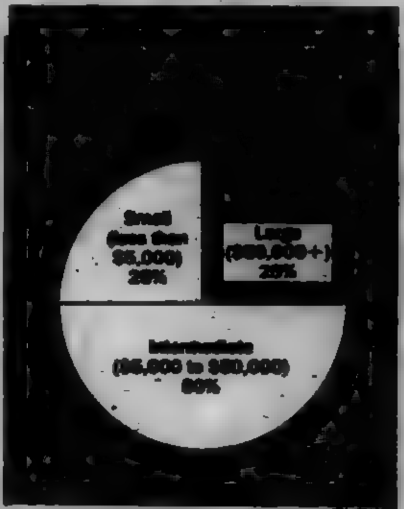
Dataproducts had used a mainframe project management system to keep track of MIS work, but it did not fit the bill. The system was oriented to large projects, which consumed only one-quarter of the MIS staff's time, and required detail that was inappropriate for smaller jobs (Figure 1). Project leaders resisted, and the system fell into disuse.

Strowbridge and his staff set out to find a better system. Besides meeting general criteria, such as cost-effectiveness and ease of use, the system had to do the following:

- Allow for automated scheduling.
- Provide comprehensive project reports and management reports.
- Support cost accounting and user department charge-backs for MIS services.

Strowbridge said he and his staff considered both micro and mainframe software systems. "The problem we kept running into," he said, "was that the mainframe programs were too complicated to use handily, and the micro systems didn't have the functions we needed."

They eventually decided to purchase POC-IT Management Services, Inc.'s Microman, a micro software package designed for MIS project management. Dataproducts has installed copies of the software on two IBM Personal Computer XTs and plans to install a copy at each data center in June. Strowbridge said some features that attracted him to the package were its systems development methodology and its management reporting capabilities.



CW Chart

Figure 1. Dataproducts Corp. categorizes its projects as small, intermediate and large, according to budget. Its mainframe project management system was geared toward large projects, which account for only 25% of the MIS department's work.

Systems development methodology. Microman supports Dataproduct's development methodology, which includes only four project categories: life cycles, phases, tasks and subtasks. As such, Strowbridge said, it is not "a bureaucratic system that overcontrols the project" as Pert charts and other systems do.

Based on this setup, Dataproducts requires its systems development managers to design each of their projects as a series of discrete tasks and subtasks — jobs that require at least one week's work but not more than two week's worth and produce only one deliverable. When a task is complete, the manager receives credit for it on the system.

Strowbridge said that because the methodology is simple, it allows for flexibility. "My managers only manage a task," he explained, and they have freedom to design those tasks any way they want.

Management reports. Measurements of the MIS department's productivity are based on an achieved

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Special Report

Division of labor gives MIS quick turnaround time

By [illegible]
CW Staff

Dataproducts Corp.'s MIS department consists of two separate systems groups, each of which takes responsibility for defined categories of tasks.

The firm's systems development group handles all intermediate and large projects, and its product support group takes care of small development jobs and resolves any day-to-day problems that arise.

William D. Strowbridge, Dataproducts' vice-president of MIS, said the division of responsibility rests on the idea that a man cannot serve two masters.

He said that pulling MIS staff members from a large project so that they may handle a small program fix throws the large project off schedule. Similarly, devoting an entire staff's time to a large project means that problem resolution gets ignored, and users must wait months for quick fixes.

Turnaround time

During a three-year stint as a consultant, Strowbridge found substantial proof for this claim. He discovered that, in 90% of his cases, MIS departments needed about 90 days to turn around user requests for projects that, on average, required 12 man-hours of work.

"Nobody is going to wait 90 days to get 12 hours of work out of anyone," he said. So he set up Dataproducts' MIS department to avoid the frustration that users experience when they have to wait so long.

The firm's systems development and product support groups answer to different types of budget, manpower and project life-cycle restrictions (see chart), and employees in the two groups differ in their qualifications and motivations.

Strowbridge said employees in the systems development group range from entry-level programmers to high-level managers; they plan and execute long-term projects a piece at a time.

The 'green berets'

Employees in the product support group are of a different breed. They are highly skilled systems professionals who have few management aspirations but thrive on marshaling their accumulated knowledge to solve whatever problems occur. "That's a dedicated resource of 'green berets,'" Strowbridge said, "and I don't use them for any other reason."

With the breakdown in responsibilities, the MIS department has managed to meet a strict set of goals for turnaround time:

- The systems development group arranges project budgets and completion dates with user departments. Project managers are required to stay within 5% of their budgets; they have consistently met their deadlines.
- The product support group operates with the goal to turn around all problem resolutions within 24 hours; it has done so 90% of the time.
- Product support staff members also aim to turn around requests for minor development projects within 21 days and to expend between 12 and 14 man-hours on these tasks. They have met these goals 90% of the time.

The MIS department arrangement has effectively reversed the situation Strowbridge saw when he consulted other firms on their operations.

"Ninety percent of the time, [when] the user uses the department," Strowbridge said, "instead of being frustrated, he's satisfied."

MIS development and support organizations
Dataproducts Corp.

	Systems Development	Product Support
[illegible]	[illegible]	[illegible]
Budget	Variable; requires cost justification for each project	Fixed annual budget based on [illegible]
[illegible]	[illegible]	[illegible]
Employee's Professional Qualifications	Range from entry-level to management	All experienced professionals with hands-on knowledge of many different systems
[illegible]	[illegible]	[illegible]

CW Chart

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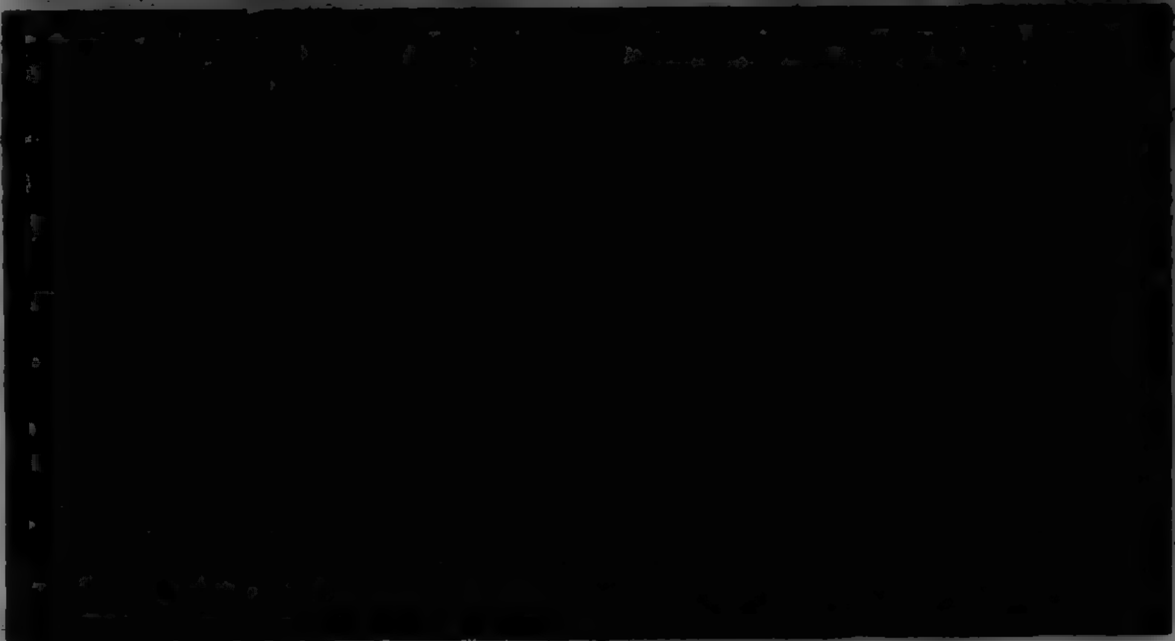

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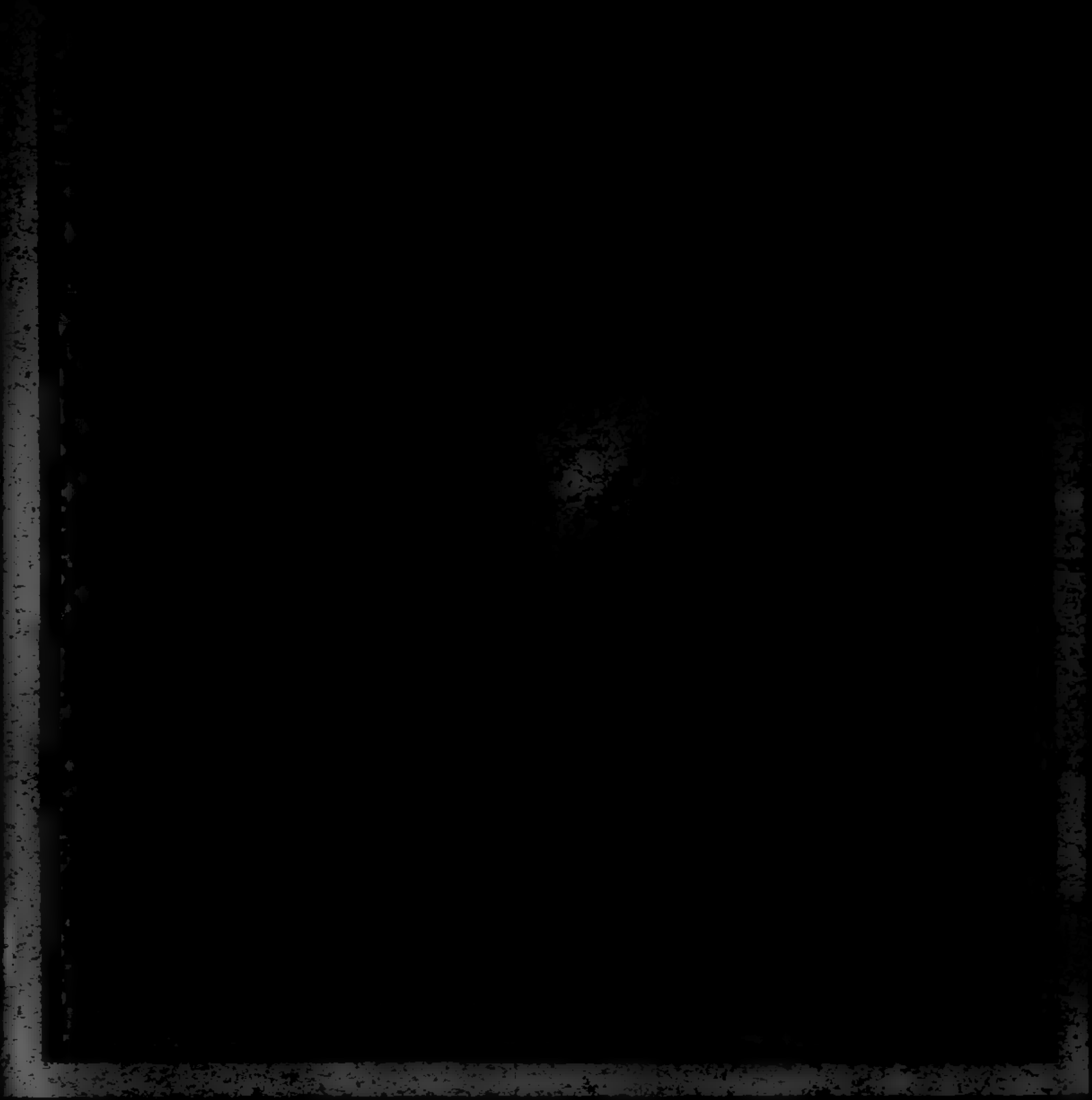

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WORK

from SR/10

telecommuters who regularly spend several days a week off-site.

It is easy to take potshots at some of these smaller micros — by anyone's standard they are not as easy to use or as full-featured as their larger office-based counterparts. If this market is given time to develop, however, small machines priced and designed to be remote-site workhorses will probably be available.

■ The wired work group. There is something new in the products and sales pitches from OA vendors within the last year. They are realizing that there is a middle group between individual work and divisionwide or companywide work. Micros had been aimed at the former and traditional DP systems, with updated OA features, at the latter.

As most office workers know, the immediate work group of 12 or more people is where most of the work gets done and most of the communications flows. Systems that tie together micros, file servers and printers in cohesive local networks will be well matched to the organizational reality of group work.

The advent of new micro-based systems like these — such as Apple's Macintosh Office — is another reason why telecommuting can grow. One of the myths about telecommuting is that it only means work at home; other remote sites, such as satellite offices or so-called neighborhood work centers, are just as likely and offer unique advantages.

■ Micros as commodity items. The initial push for cost-justification of individual micro purchases seems to be over at many organizations. The machines are cheaper, they are less of a novelty, and — most important — it is becoming clear how useful they are.

Ironically, as micros move up the organization ladder, it becomes harder to identify tangible benefits. Dennis Devlin, manager of emerging technologies at American Hoechst Corp., characterizes attempts to measure managerial and executive payoffs from micros as trying to count "insights per fortnight." In most cases, the benefits are there and are obvious to the people who rely on micros. The effort and cost needed to prove this can exceed the cost of the micro itself; thus, within reason micro purchases are almost an act of faith.

This leads to much wider availability of micros and acceptance of their role as necessary business tools for many office workers. Coupled with the reasons above, this means more and more people are potential telecommuters. Their work and their jobs can be as portable as they like.

■ Micros as dumb terminals. It is probably heresy to say this, but many micros are used as dumb terminals much of the time. They are not dumb terminals in the sense of a $500 box with no computing power or internal logic — but what else would you call a micro that is used extensively for E-mail or data base access? Everybody using micros is not creating elaborate Lotus Development Corp. 1-2-3 models or using word processing software to write 20-page reports.

As the cost gap between terminals and low-end micros narrows, there is little reason not to buy a micro when faced with the choice. The computing power is a freebie — if it is used now and then, so much the better.

The person working at home will often use the micro for terminal-like purposes such as E-mail or file access. Many telecommuting professionals, such as financial analysts, certainly need the micro as a computer, not as a terminal. But others do not — much of their work may even be paper-and-pencil tasks for which the micro is only a part-time resource, used mostly for communications with coworkers and others in the central office.

Telecommuting possibilities

Even without widespread use of micros, it is entirely possible for most organizations to have up to 5% of the office work force telecommute at least several days a week.

Actual telecommuting applications today are growing quickly but are still limited, mostly because of its novelty and some misconceptions about its purposes, benefits and implementation.

The growth of micros is one factor that helps explain why some observers say they believe that 15% to 20% of the office work force could be telecommuting by 1990.

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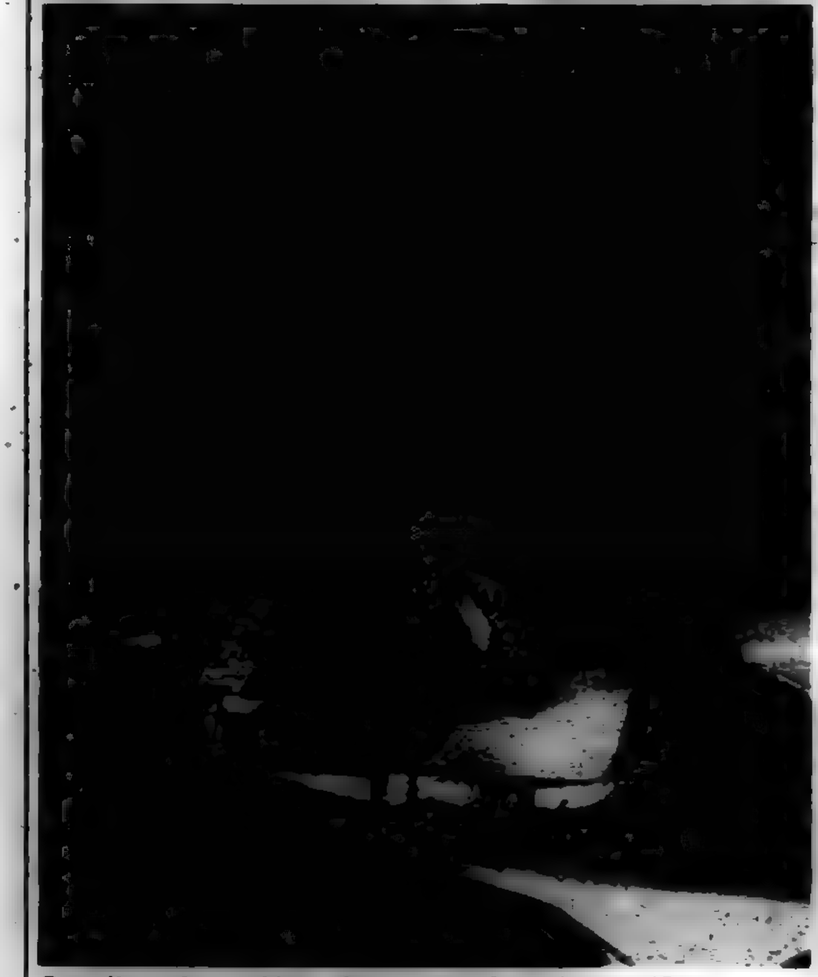

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Special Report

The information center: one approach to data security

By William M. Adney
Special to CW

Security, a challenging problem in the mainframe environment, has an added dimension of complexity with microcomputers: their location. The computing resource is now outside the safe and secure protection of a computer center. Micros can be found in executive offices, on clerks' desks and even on the factory floor.

Another facet of this problem is that these micros are also inexpensive enough to be purchased by individuals for home use. While all of this may be viewed as providing a significant increase in employee productivity, it is a double-edged sword because vast amounts of confidential company data can be copied onto a diskette with little or no chance of detection.

That information can be taken home either by an honest employee for work purposes or by a disgruntled employee for sale to a competitor. And, we usually find that the bigger the company, the bigger the problem.

Control is key

The key to solving the problem is to ensure that senior company management is aware of the size and scope of the problem as well as its potential security threats, such as disgruntled employees, mistakes, lawsuits and fire. The solution is clear: Management should be aware that the microcomputing resource, like any other company resource, must be controlled. And company resources — time, money and personnel — must be dedicated to finding this solution.

One approach used in many corporations to deal with the issue of microcomputer security is the development of an information center. The purpose of the information center is to make data readily available to users. Although this can be accomplished with appropriate training in a mainframe environment, the information center typically includes a mix of small mainframe and microcomputer technology.

The information center provides an appropriate focus for user information processing. One of its primary responsibilities is to centralize the purchase of both microcomputer hardware and software. Standard policies, acquisition procedures and software/hardware support should also be provided.

This centralization process provides the coordination required to ensure that an organization does not end up with a lot of useless hardware and software that simply gathers dust in offices and on desks.

The information center should be an organization that will work closely with, yet independent from, the data processing function. Do not give the already overburdened manager of your major data processing center the added responsibility of the information center.

Information center personnel must also work closely with an information security organization to ensure that the center's policies and standards are consistent with the company security policies and procedures.

In addition, the information center must be user-friendly.

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>
> *The solution is clear: Management should be aware that the microcomputing resource, like any other company resource, must be controlled.*

In order to establish standards, for example, the data processing manager's advice must be considered, but it should not necessarily be the final word. Why? Consider the following scenario. Company X's policy is that all microcomputers must be manufactured by the same company. (This is actually not an unreasonable policy, considering all of the different types of microcomputer operating systems, disk sizes and formats and applications software. Many data processing specialists recommend equipment consistency as a good starting point).

A few months or years later, a user group has a very specific application requirement for some software that only runs on another brand of microcomputer. But the company policy is that only one brand of micro is standard.

In this case, with the current evolution of micro technology, the policies of the information center should be flexible within certain limits. The purpose of microcomputing in the office is to improve productivity, not stifle it.

See SECURE SR/38

Adney is a senior consultant with Total Assets Protection, Inc., a management consulting firm specializing in computer security and disaster recovery, based in Arlington, Texas.

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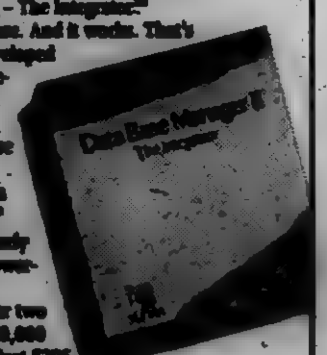

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Simple security precautions ensure information safety

Many of the same security concepts that are available and implemented in the mainframe world also apply to the micro. The basic difference is the way that the security is implemented.

It is important to note that microcomputer security precautions do not need to be complex, in fact, the simpler the better: Simple and effective security requirements are more likely to be implemented. The information protection program for microcomputers contains the same elements — physical security, information security, and disaster recovery — as its big brothers in the mainframe world.

Physical security of the equipment must be ensured. If all of your micro users do not have offices that can be locked, a reasonable policy is to equip them with the appropriate anchoring hardware that will secure the microcomputer systems to their desktops.

If the equipment must also be portable, another alternative is to obtain a locked cabinet specifically designed to protect the equipment.

Information security is more difficult to deal with. Security software for the mainframe can control user identifications, passwords and access to data, but there is no equivalent for the micro. Although there is at least one add-on board for the IBM Personal Computer which provides hardware encryption for all data written to a disk, it is at best naive to believe that this is the solution to information security. Encryption boards can be easily obtained by anyone — an honest or a dishonest employee.

Simple is best

There are still a number of ways to implement effective information security. It can be as simple as a policy that requires that floppy disks be placed in a locked cabinet or desk every night. Hard disk systems are a little more difficult to protect, but simple is best. A key lock on the power supply for the system is an effective measure.

What about the problem of allowing employees to take computerized information home? In the case of micros, that may not be a good policy. But more important, there are legal and security problems associated with home use of computerized information.

Floppy disks may not only contain data; they may also contain the application software used for that data. More and more software manufacturers are bringing lawsuits against large companies for copyright infringements.

How do you control the data that is on these disks? One way is simply to prohibit employees from taking any floppy disks out of the office. This is not a very realistic policy to be sure, but it is one approach. Searching briefcases and purses is not enough — you might have to resort to a strip search to find a 3½-in. floppy disk. This is not the way to maintain a good relationship with employees.

It may be appropriate to have a policy of providing software to employees for home use, particularly when they are working on company business at home.

An effective way to offer this support is to allow the information center to make hardware and software available to employees at reduced cost.

SECURE

from SR/36

One of the most important issues the information center must address is information security.

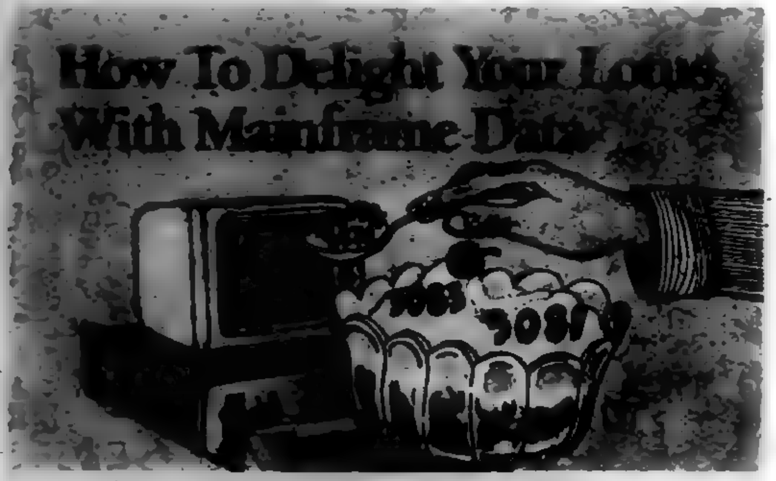
How do you approach this crucial issue? Most companies have established an information protection program that is the responsibility of an information security officer. Within the security context, this officer and the information center must work together to ensure that the required amount of security is available for the microcomputers.

Disaster recovery must also be considered for microcomputer systems. Documented disaster recovery procedures are probably more important for a micro than they are for a mainframe system. A single user mistake in a system command can erase hours, days or weeks of work. All data and software should be copied to backup disks and stored in an off-site location. Additional backups should be available at the work station. And don't forget the documentation itself, especially for user-written application programs.

The final key to the success of implementing microcomputer security is the enforcement of the standards, policies and procedures developed through the information protection program and the information center. In many large firms, it is not unusual to find that many managers have approval authority for purchases that is sufficient to buy a microcomputer system and software without the knowledge of the information center or any other organization.

It is imperative that policies providing strict penalties for the unauthorized purchase of computer resources be implemented and enforced. Since the information center will not have sufficient personnel to accomplish everything, the audit department can help provide the follow-up and reporting during routine audits.

Implementing effective microcomputer security is a complex problem. But it can be solved through management awareness of the problem, dedication of company resources to solving the problem and control of the microcomputer resource.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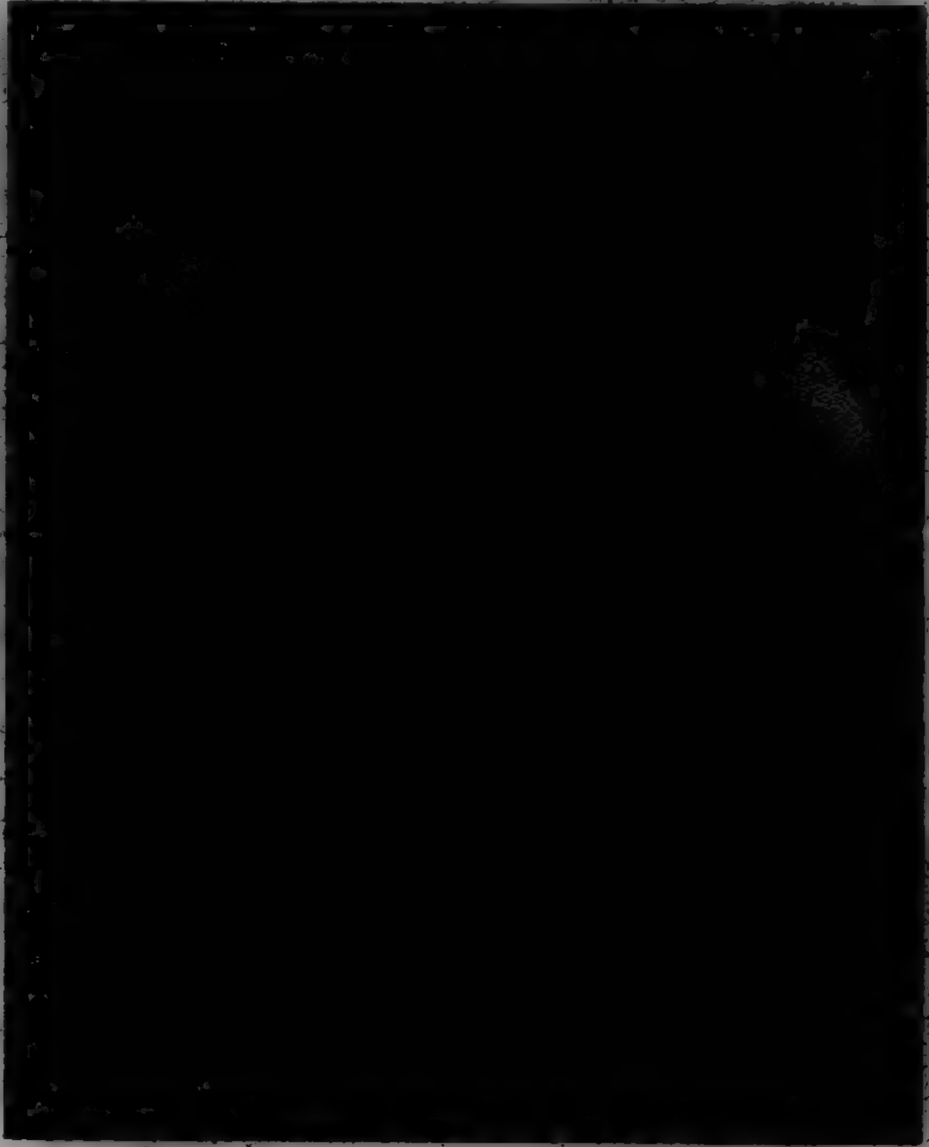

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Identify costs, conduct thorough product evaluation

By James Huling
Special to CW

The selection and acquisition of microcomputer software normally begin with two assumptions: first, that the purchase price of the package represents the total cost of the system and, second, that the selection process does not require the intense evaluation associated with mainframe package acquisitions. Both assumptions are wrong.

These assumptions lead to systems that at best do not meet the needs of the user or at worst do not work. The latter systems are the more costly because the software must be shelved and the entire selection process begun again.

> *Managers should consider hidden costs — such as those associated with conversion, training and maintenance — when they evaluate micro software packages.*

The key to avoiding these problems lies in identifying the costs involved in acquiring and implementing microcomputer software and in understanding the steps necessary to conduct a thorough evaluation.

Identifying costs

The purchase price of micro software is so low that total project cost is seldom examined closely. Often, hidden costs become visible only when a decision is made to abandon a particular package and start again. The need to identify these costs in advance is a strong recommendation for a careful selection process.

Conversion costs. One cost that is easily overlooked is that of conversion. Many projects involve replacing existing applications with new and better systems. To implement the new system, MIS managers and their selection teams must devise some means of transferring information.

Means of transferring data range from having users re-enter information to developing programs that will perform conversions and transfer data. Either method brings on significant costs, particularly if programming must be done on a contract basis.

Training costs. Another cost that managers seldom evaluate in advance is training, for which methods range from simply studying vendor documentation to completely relying on vendor-supplied courses.

Although the costs for vendor training at first seems higher, hindsight often reveals that the other option, the trial-and-error approach, exacts a heavy toll in terms of frustration and problems that may require significant effort to correct. Thorough and informative training, whether by the vendor or by in-house personnel, will save time and money over the life of the system.

Support costs. A final cost the manager must consider before acquiring a particular software package is support. Many vendors will support their systems for an annual fee, usually some percentage of the purchase price. This can be a great advantage, especially if the system must incorporate changes such as those in tax laws or in government-imposed reporting.

Managers and their acquisition teams, however, must give careful consideration to the contractual maintenance agreement. The purchaser's expectations usually exceed the vendor's obligations.

In the absence of a maintenance agreement, the manager must set up some means of in-house support. This may involve hiring a full-time programmer or using contract programmers as problems arise.

The hardware manufacturer or computer retailer that sold a firm its microcomputers can provide the names of individuals who are familiar with the system and perhaps with the software under consideration.

If managers consider hidden costs — such as those associated with conversion, training and maintenance — when they evaluate micro software packages, they will avoid problems that might otherwise arise after the purchases are made.

Conducting an evaluation

Although the total cost of microcomputer software is significantly less than that of mainframe software, the evaluation and selection processes should be no less thorough. According to H.L. Mencken, "For every problem, there is one solution [that] is simple, neat and wrong." When an organization does not understand its requirements, a software package may appear to be a simple and neat solution. It can also be wrong.

Huling is a systems analyst and project leader with Vulcan Materials Co., a Birmingham, Ala.-based chemicals and materials company.

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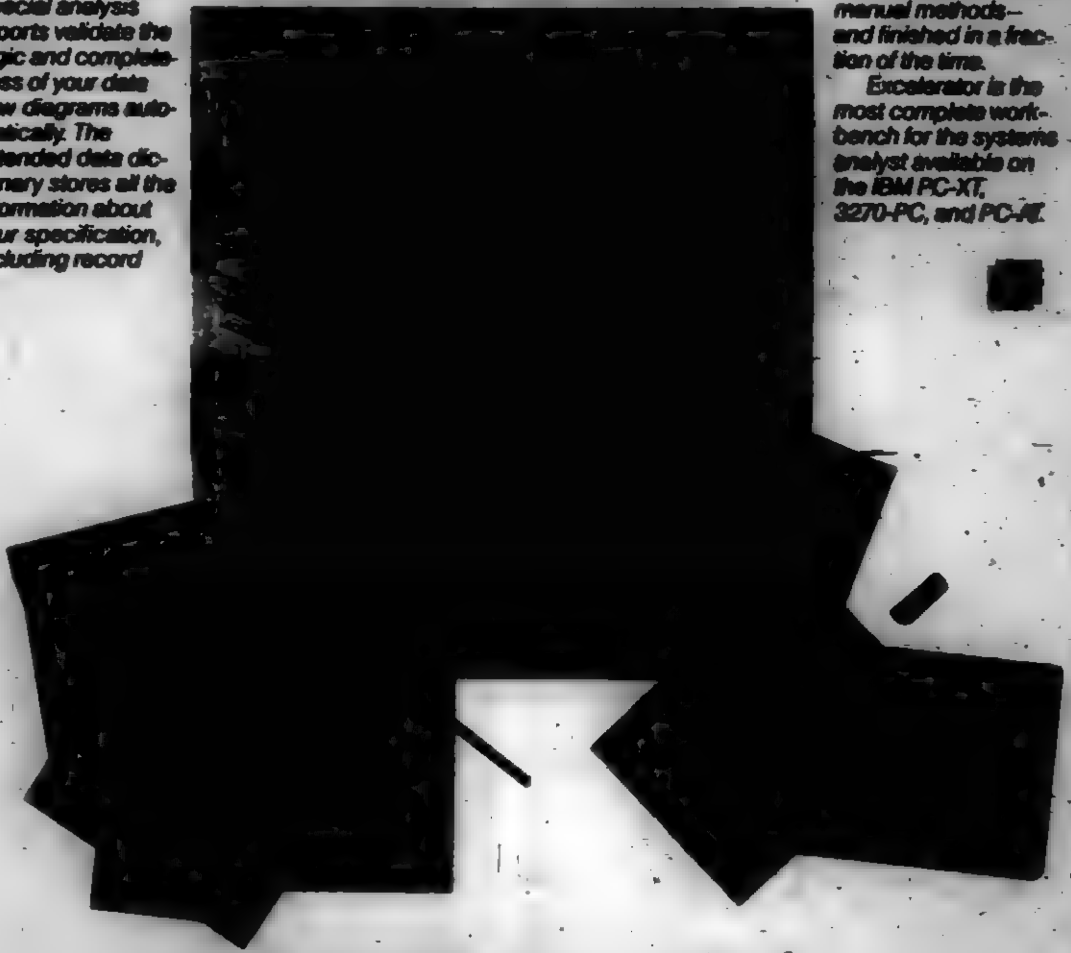

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before picking microcomputer software packages

Requirements study. The first step toward a successful package selection and acquisition is a requirements study. MIS managers' documentation of the needs of their businesses is essential to the selection of the right system for a particular application.

The most useful sources of information are the individuals who will use the system. Managers and members of their acquisition teams should conduct interviews with as many potential users as possible.

If the new system is to replace an existing one, interviewers should note both the problems and the benefits of the current system. During this stage, they should particularly aim to uncover the current system's assets; it is more difficult to determine what is right about a system than what is wrong.

Requirements checklist. After the team conducts user interviews, its members should document requirements in the form of a checklist, grouping them in three categories: "absolutely must have," "would like to have" and "interested if available." A checklist enables the manager to determine quickly whether a particular system meets the organization's needs.

Vendor selection. After the checklist is prepared, managers should obtain from their organizations' micro hardware manufacturers a list of vendors that supply software for the machines. Magazines, retail computer stores and computer organizations provide additional sources for this information.

The critical element is that the software must run on the hardware an organization has on hand. Managers and their acquisition teams should eliminate any software that is not already operating on that hardware. Software vendors may offer their packages at reduced prices, but the effort and frustration of being a test site will outweigh the savings.

Another aspect of this phase of software selection is evaluating vendor reliability. This is particularly important with microcomputer software; many vendors will not be in business six months from now when needs change and enhancements are required. A careful choice of vendors helps ensure that a package's quality will be maintained in the future.

If an organization obtains information from knowledgeable and reliable sources, it will reduce the risk of selecting the wrong vendor. Managers and their acquisition teams should select from the list of available software no more than five packages for evaluation. Any more than five will encumber the evaluation and delay the results. As one of the five is eliminated, another may be substituted.

Software selection. Managers and their acquisition teams should make use of as many means as possible (see story SR/42) for evaluating a particular micro software package against their organizations' requirements checklist.

After various software packages have been examined, only two areas of evaluation will remain: hardware limitations and cost.

Hardware limitations. To evaluate the new system's impact on an organization's hardware, the manager must estimate the space needed to store data, the memory needed to execute programs and the resources needed for capabilities that are not currently in use.

Costs. Managers and their acquisition teams should examine costs only after all other phases of the evaluation are complete. Only then will they know for what they are paying.

After each system has been evaluated as to its capabilities and costs, the manager can make comparisons and choose a software package.

Acquisition project managers should also consider two final points:

First, if a system does not fit the needs of an organization, the manager should resist the temptation to change the software and should, instead, look for changes that can be made in business procedures and administration to accommodate the package. Any modification to the system increases the difficulty of support and moves the firm away from the vendor's basic product.

Next, an organization should not make a purchase decision completely based on software capabilities but should give ample consideration to the vendor that will supply the product. A responsive and supportive vendor can overcome some system weaknesses and will, in the long run, make a micro software installation a success.

> ”
>
> *The most useful sources of information are the individuals who will use the system. Systems acquisition teams should conduct interviews with as many potential users as possible.*

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User contacts, other aids help shoppers pick software

There are three methods for obtaining the information necessary to compare microcomputer software packages to the requirements on an organization's checklist:

- Watching presentations and demonstrations.
- Contacting other users of a system.
- Reviewing a package's documentation.

Watching vendor presentations. Presentations are an excellent introduction to a system.

Major vendors are experts at marketing their products and will have a well-developed presentation prepared. Smaller vendors may be willing to demonstrate the system at a prospective customer's site or to send a demonstration package.

If an organization supplies a requirements checklist, the vendor will be able to address specific requirements and to direct its presentation toward those areas. Prospective buyers should bear in mind that caution is the key word at this stage — all systems look terrific in a presentation.

The organization's acquisition team should not accept a glossy, high-level presentation as being completely representative of a system but rather should ask specific questions and require the vendor to give detailed answers.

Contacting system users. The most reliable sources of information about a particular system are the individuals who use it, and the software acquisition team should contact as many users as possible, particularly those in the same industry.

Most vendors will furnish a complete listing of their clients, and prospective buyers should be wary of those that will not, especially those that insist on contacting their clients before the prospective buyer does.

These vendors may have made special arrangements to provide extra support or reduced prices to a group of users in exchange for recommendations.

Before an acquisition team speaks with other users, it should establish a set of direct questions about the operation of the system, the quality of the vendor and the usefulness of the documentation.

When the team actually contacts other users, it should note even casual references to problems. One user may have learned to live with problems that the prospective buyer would find unacceptable.

The acquisition project manager should ask the vendor to respond in writing to reported problems and should carefully evaluate the vendor's willingness to discuss and correct these problems.

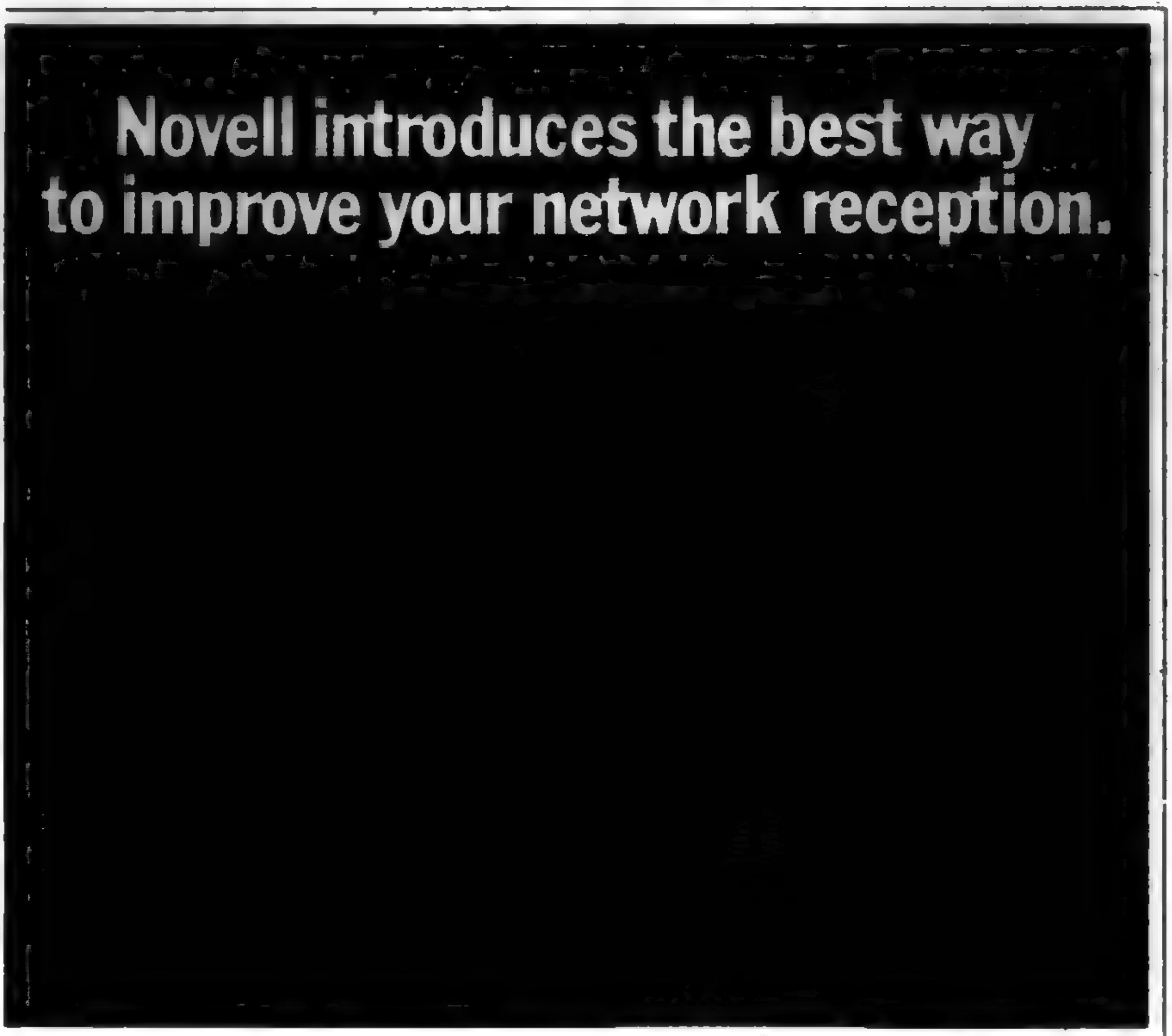
The manner in which a vendor responds will indicate how it will respond when problems arise after a software package has been installed.

Reviewing documentation. Documentation is one of the most important and most overlooked areas of system evaluation. It is important because it serves as the primary source of information on using and understanding a system once it has been installed.

Prospective end users should review selected portions of a vendor's documentation and evaluate them for accuracy and readability. Documentation that cannot be understood cannot be used.

With microcomputer software, the rush to get a product on the market often results in little, if any, time for thorough documentation. A prospective buyer should not hesitate to point out problems to the vendor and to request that sections of the documentation be rewritten or clarified.

Documentation is a good yardstick for measuring a vendor's reliability. A vendor that has invested significant effort in the documentation of a system is likely to be a vendor that is concerned about ease of use and, in turn, about the user's satisfaction.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*LAN Benchmark Report, May, 1985, Novell, Inc. and "Software, Not Hardware Key to LAN Performance," *PC Week* 1/15/85.

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Special Report

Aluminum parts firm finds time savers during stint

SMYRNA, Tenn. — A manufacturing firm here developed two time-saving applications in a CICS test environment while it served as a beta site for both a micro-mainframe communications software package and a mainframe program on which the link is based.

The user, Better Bilt Aluminum Products Co., ran beta tests with Cincom Systems, Inc. for the vendor's PC Contact micro-mainframe link and Mantis 4.0, a recent upgrade of Cincom's Mantis applications development software.

PC Contact works through Mantis 4.0 to give micro users access to on-line mainframe data.

Better Bilt, a subsidiary of Indal Ltd., manufactures a line of aluminum windows and doors. The firm began beta testing the two products last September, running the mainframe software on its 5M-byte IBM 4361 and a copy of the link on an IBM Personal Computer XT. The company's mainframe runs CICS and DOS/VSE under VM.

Better Bilt is the manufacturer of a line of aluminum doors and windows.

Glitches found

According to Jeff Borsini, Better Bilt's information center manager, the beta tests pointed out some glitches — most of which were problems with Mantis 4.0 that the vendor fixed with mainframe code patches — but proved in general that the link would meet the manufacturer's needs.

Borsini said PC Contact provided "a way of formatting and transferring mainframe data to a [personal computer], while being transparent to the user."

During the beta test, Better Bilt's MIS staff loaded some production data into a test CICS environment and programmed the link to perform two tasks.

In one application, the link software gave end users the ability to transfer information from intelligent time clocks through the Personal Computer XT to the mainframe. In the other application, the link provided console operators on the firm's 4361 with information about the status of an operation that ran on the XT.

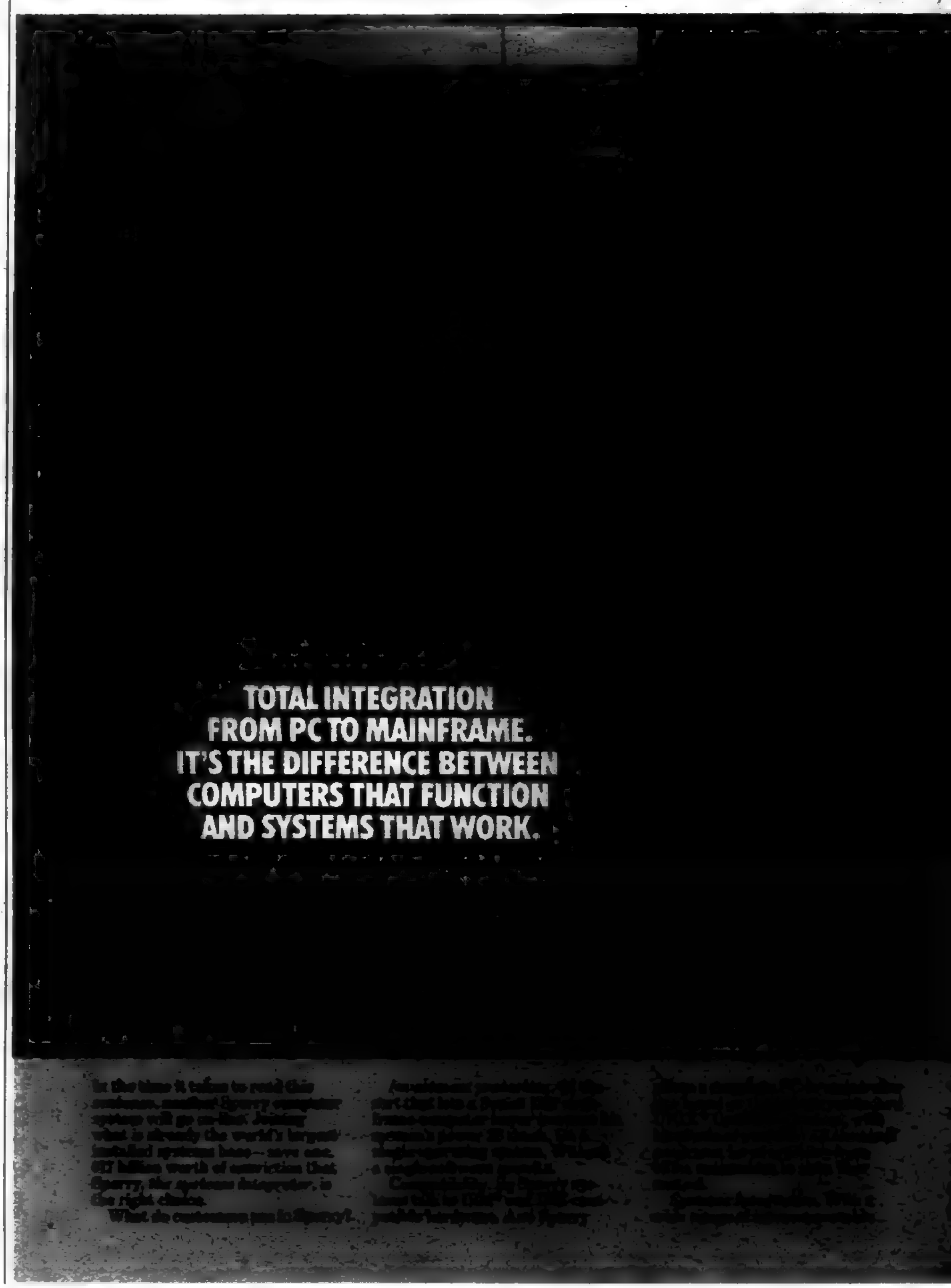
Time clock data transfer. For this application, Better Bilt loaded a copy of its on-line payroll system into the test CICS environment. Borsini and his staff then programmed PC Contact to call Mantis programs that read data from a file on the Personal Computer XT and wrote it to an on-line mainframe file.

With the link in place, end users call a PC Contact menu option and the software invokes all the data transfer steps.

The system transfers data from between 600 and 700 time cards to the mainframe in about six minutes, according to Borsini. Without the micro-mainframe link, the task took between three and four hours.

Micro status report. For this application, Borsini used a feature of the link that allows users to play back a series of keystrokes programmed into the software. With the keystroke-saving feature, he programmed a series of messages that the Personal Computer XT sends to the mainframe console.

The messages tell the console operator the status of a



as test site for link package

daily electronic check reconciliation procedure that Better Bilt uses to transfer information between its headquarters and Pittsburgh's Mellon Bank. Every day at 7:20 a.m., the Personal Computer XT automatically dials into a mainframe at Mellon to transfer check reconciliation data.

If the line is busy or the mainframe is unable to accept data, the link software plays back a series of preset keystrokes that sends a message about the problem to the console operator. The messages tell the operator, for example, that the line was busy and the micro will try to dial again later or that the modem on the Personal Computer XT needs to be turned on before the data transfer can begin.

Borsini said the setup lets the firm run the check reconciliation procedure without keeping an operator at the Personal Computer to check for problems.

Better Bilt employees load aluminum strips for painting.

For the two applications, Borsini and his staff programmed the link software so that operations would be transparent to users. For the time clock data transfer, for example, information center staff members had to create command strings in PC Contact so the link would invoke Mantis read and write formats.

Users, however, see the application as a simple procedure: They call for one menu option, and the transfer from the micro to the mainframe takes place.

Once users invoke PC Contact, Borsini said, they just "sit and watch it go." Because the link software relies on Mantis to access data, programmers at Better Bilt have found it easy to use, he said. "If you know Mantis, there's very little to learn."

Borsini added, however, that he finds both Mantis and PC Contact too difficult for end users to program. For future applications, Better Bilt will follow the same procedure it did for the two test applications: Programmers will develop software and give users an easy interface to the system.

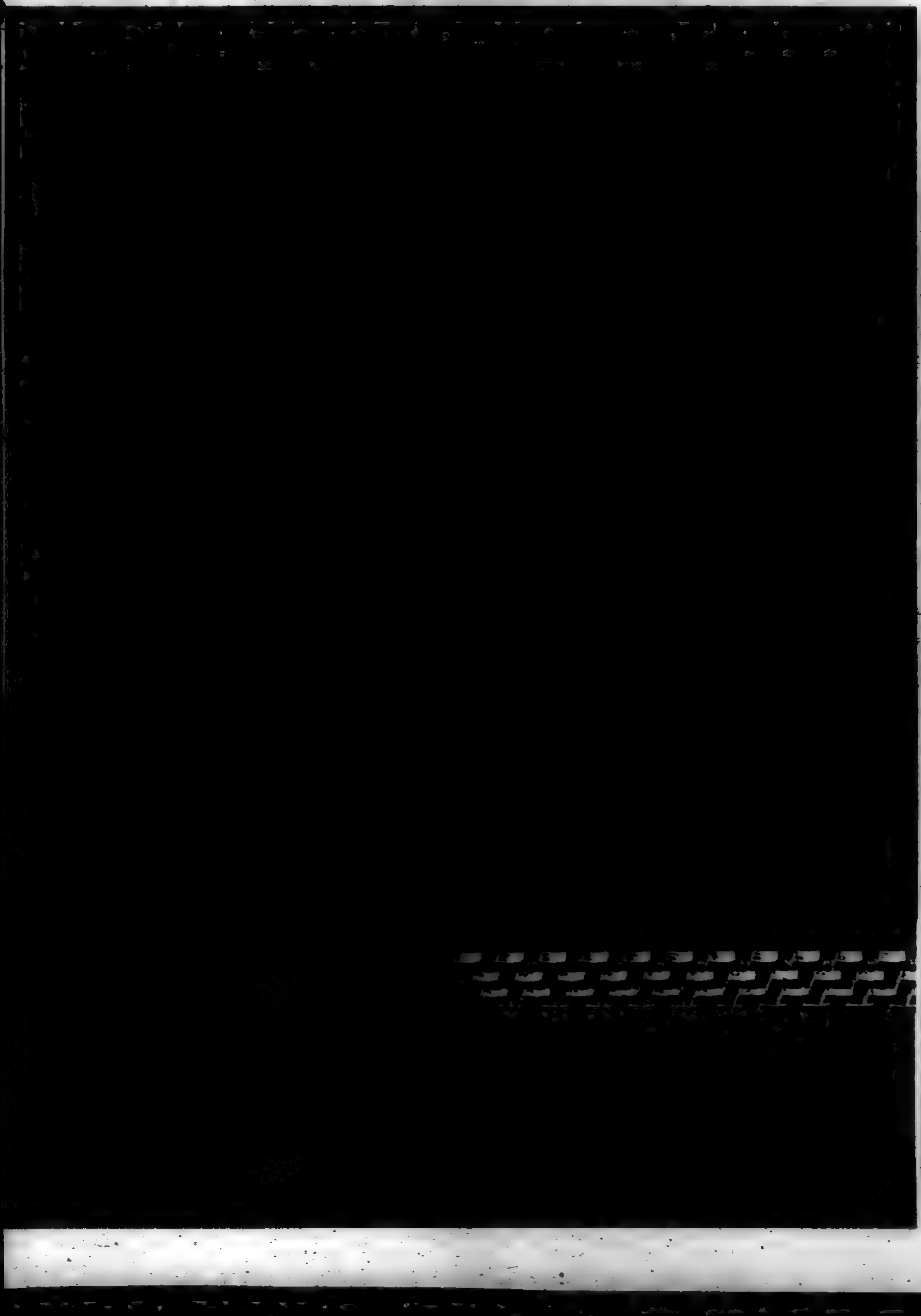
> *'The idea is to eliminate the technical part so the [micro] user can deal in an environment that he understands.'*
>
> — Jeff Borsini
> Better Bilt
> Aluminum Products Co.

"The idea," he said, "is to eliminate the technical part of accessing the mainframe so that the [micro] user can deal in an environment that he understands."

Better Bilt has just received its production version of Mantis 4.0 and plans to expand its PC Contact applications soon. With the beta test version of the software running in a CICS test environment, Borsini said, "We cannot get to any of our [live] data." The firm expects to initiate an executive inquiry system as its first micro-mainframe link application, he said.

Seven of the nine Personal Computer ATs and XTs the firm owns are fitted with terminal emulation boards, making them candidates for connection to mainframe via the link.

Cincom officially released Mantis 4.0 in January; PC Contact became available for users outside of test sites on April 19.



Touch-screen input emerges from specialty markets,

By James Logan
and Ben [illegible]
Special to CW

Touch-screen input to microcomputers, which has gained some popularity in a number of vertical markets, is coming into more general use as a facet of video-based training programs in large corporations.

The technology has found comfortable niches in process control, where touch screens reduce the size and complexity of control panels; in point-of-sale settings, where they provide shoppers with a way to browse through video catalogs and shop via computer terminals; and in restaurants, where touch screens have already replaced membrane overlays on cash registers.

Now, in large corporations, the touch screen is being wedded to another technology, the interactive videodisk, to offer a new generation of training systems. Innovative managers are developing interactive videodisk-based courses to replace traditional centralized classroom instruction. These systems offer managers the ability to set up geographically dispersed learning centers where self-paced instruction is delivered via easy-to-use, interactive touch-screen monitors.

Interactive videodisk training systems are being employed in a wide range of settings. In the executive suite, they are training managers by modeling and acting out business situations that require critical decision-making skills. In hazardous shop environments, they are teaching workers safety procedures through video simulation. Auto manufacturers are using interactive videodisk systems throughout their dealership networks to deliver up-to-date training for mechanics and salesmen.

Touch screens are becoming a standard input feature in such videodisk-based training programs, and there are three reasons for this:

- They substantially reduce the time it takes users to learn to interact with the training system.
- They reduce or eliminate keyboard usage, thereby helping focus students' concentration on course content rather than on how to communicate with the system.
- They offer a more direct and intuitive way of interacting with visual information than keyboards do.

Controlled studies have been performed to test the efficacy of touch-screen videodisk systems. One study, done at the University of West Florida, pitted touch-screen videodisk training programs against manual ones in an effort to teach Florida Department of Health employees to administer a social program. Employees who received conventional instruction learned the task in 160 hours; those who used the video-based system learned in 120 hours, or in 25%

Piecing together a training station

By James Gobhais
and James Logan
Special to CW

The basic building blocks of an interactive videodisk-based learning station are the microcomputer, the touch-screen monitor, the videodisk player and the software.

The micro. The main engine of the workstation is usually a general-purpose microcomputer. It may contain 64K to 2M bytes of memory, depending on the kinds of peripheral devices that will be attached to it and the system environment that will exist to support software development.

For practical reasons, these systems usually come packaged with disk storage subsystems that start at 10M bytes. At least one form of diskette drive for removable media is also standard. System support for displays, monitors, printers and I/O devices are usually packaged as options.

The touch-screen monitor. Touch-screen monitors generally use one of three technologies:

- Infrared.
- Resistive.
- Capacitive.

Vendors of all three currently offer similar pricing options.

The videodisk player. Optical storage technology has made the videodisk a practical storage medium for large amounts of visual and audio information. The disks come in a limited number of sizes and formats, so compatibility among disk players and disks is rarely a problem.

The predominant medium used in training applications is the 12-in. disk with a constant angular velocity format. A 12-in. disk has 54,000 concentric tracks (or frames) on each side, and each track can hold video information for one National Television Standard Code (NTSC) full screen image. At a normal playing speed of 30 frame/sec., this storage capability represents one-half hour of motion video per disk side.

Depending on the application, the disk side may consist entirely of

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Gobhais is vice-president of software development at Telematic Systems, and Logan is president of Microtouch Systems, Inc.

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enters mainstream as aid for video-based training

less time than their coworkers.

The previous generation of computer training systems did little more than emulate manual environments: They substituted the process of striking the Return key for that of turning the page. The current generation of videodisk-based systems, however, offers an array of capabilities (audio, still frame, motion video and computer-generated graphics, for example) to the learning environment.

These capabilities allow the system to simulate realistically anything from sales situations to assembly line operations. Course designers can create varying levels of dynamic feedback through audio and video effects and can set up a training program that closely monitors student actions. If a training application is well designed, it allows students to control the pace, direction, depth and style of their instruction.

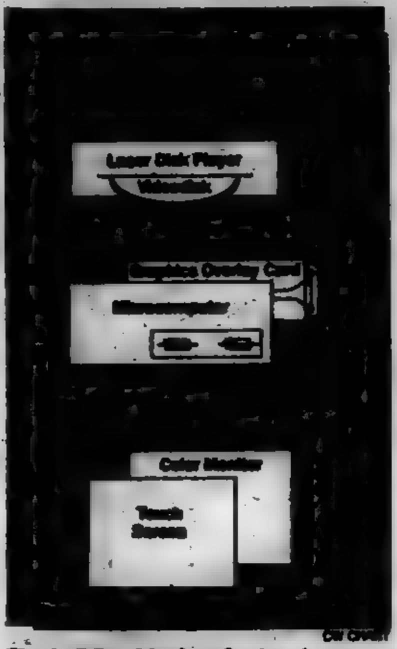
Microcomputer-based video learning stations allow training to be scheduled in a flexible manner with respect to time and geography. The result can be significant reductions in the costs associated with travel and with the time that employees spend away from the office.

In addition, videodisk training allows companies to get leverage from the expertise of their instructors. In many disciplines, the supply of qualified instructors has not kept pace with demand, and this is particularly true in technical fields. The ability to capture expertise on a videodisk and in software for distribution throughout a company can yield tangible savings for strained corporate training budgets.

Most large companies have several areas where touch-screen videodisk systems can be used for training. The most cost-effective applications will involve a repetitive task and will affect a large number of employees. In a manufacturing setting, such applications might be training programs for machine maintenance, process control or work assignments. In a service environment, video-based training might teach workers new procedures and methods or might explain personnel policies.

As corporations are faced with a competitive business climate in which rapidly changing technologies may make skills of the labor pool in certain industries obsolete, the need to retrain workers will be critical. By all indications, interactive videodisk training systems will play a major role in meeting this need.

Logan is president of Microtouch Systems, Inc. in Woburn, Mass., a firm that develops touch-screen technology. Schlieben is sales manager for Telematic Systems in Cambridge, Mass., which specializes in videodisk systems.



CW Chart

The building blocks of a touch-screen video training station.

motion-video sequences, a combination of motion-video and single-frame images or all single-frame images. Videodisks also support two channels of audio information the disk player can access independently.

The software. The microcomputer controls the videodisk player by sending software instructions. These instructions may start or stop the player, find a particular frame on the disk, display a frame or series of frames or manipulate either of the two audio channels.

Some advanced applications require the ability to overlay computer graphics and text on the video image. This capability is usually implemented as a board-level add-on to the microcomputer. The add-on boards accept input from the videodisk player (an NTSC television signal) and convert the signal to red-green-blue (RGB) components before sending it to the video monitor. This way, graphics and text are synchronized for output with RGB signals. Systems developers must have appropriate software to make use of this advanced capability.

The software development environment required to produce the control program for these systems is referred to as the authoring system or the language. It is usually hardware-dependent, and different packages offer varying levels of instructional features, touch-screen support, videodisk player support and graphics.

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Info centers focusing on user experience, concerns,

By Naomi Karten
Special to CW

Conceptually, the information center's training function seems simple: Put users through a course or two in a package or two and set them loose to raise their productivity through the roof. Then sit back and be available to lend a hand when questions arise.

The reality, however, is that probably no facet of user support has information centers as overwhelmed as user training. The sheer number of people banging down the door for training exceeds the capacities of many companies.

In the DP world — so the complaint goes — there is never time to do it right but always time to do it over. In user training, however, there is no time to do it over. Yet because so many trained users subsequently need refresher training — and repeat refresher training in some cases — it seems appropriate to question the effectiveness of their first go-around.

One possibility is that training products and services are selected based on an assessment of their relative merits, to the near absence of attention to the needs and preferences of the users to be trained. But as training backlogs grow, recognition of individual differences in learning may become the key to the success of the micro support function.

Users are as different from each other as they are from DP. Certain users in certain business environments learn more effectively from one form of training than other users in other business environments in the same company.

Information centers are generally familiar with the gamut of training alternatives. Users are not. Simply put, users may not know much about computer training, but they know what they like.

Unswayed by vendor or trainer perceptions, these users have their own preferences. Some want and need to pace their own training; they function poorly in the midst of classroom-generated peer pressures and cannot sustain an attention level high enough to see them through two full days of training. Others take well to both the discipline and the camaraderie of the classroom and much prefer the personalized nature of human interactive training.

It is beneficial, therefore, to consider user concerns in terms of learning styles, business priorities and scheduling preferences and the possibility of offering a choice of training techniques. An analysis of training effectiveness in both large and small companies reveals five categories of issues that are useful in evaluating the effectiveness of alternative training methods relative to user needs. In each case, it is clear that some users benefit more with one type of training — whether computer based, classroom/workshop or one on one — than others.

- **Variations in user mindset: the attitude issue.** Users are rapidly moving past the computerphobia stage. But some are still in the "Are you sure it won't bite?" category and need more hand-holding and sensitive, continuously available support than do the closet "techies." Alternatively, in companies that do not have a top-down approach to personal computer training, managers often prefer to lock themselves privately in their offices with their micro tutorials and learn away from the watchful eyes of computer-proficient subordinates.
- **Level of user commitment: the motivation issue.** This has two meanings. One distinguishes between users

"LOTUS", "PC-DOS", "DISOSS" "XENIX"
...HOW DO YOU GET IT ALL
TO WORK TOGETHER?"

Karten, a former information center manager, is president of Karten Associates, a Randolph, Mass., consulting firm active in computer literacy training and the implementation of corporate personal computing.

preferences can provide the most effective training

who have legitimate work-related reasons for learning personal computing and those for whom training provides a convenient opportunity for on-the-job career enhancement. (This is a valid distinction. Users are no different from programmers in occasionally looking forward to training as just such an opportunity.) A large financial investment in classroom training may be easier to cost-justify for personnel with immediate and documentable training needs.

The second meaning of commitment takes into account the priority nature of business life. Are users willing and able to make a commitment to complete a three-day, in-house class without work-related interruptions? Should classes be held off site so that users prone to interruptions and distractions would have a better chance of concentrating on the material at hand? Will self-paced, behind-closed-doors training improve the probability of completing a training program or will it add to the "I'll get to it later" syndrome?

■ Opportunities to put new skills to immediate use: the scheduling issue. Micro managers need to take a hard look at this one. Many users are concerned about the pressures and "learn it now or forever hold your peace" feeling imposed by an intensive, multiday class. Unless a user has a specific responsibility to implement what he has learned, some of the training material will not be absorbed. Much of the rest will be forgotten. Follow-up interviews a month or more after training often show that more than half the class participants had not yet used the skills that they had learned.

When training backlogs are long and growing, perhaps certain classes should be reserved for those with designated personal computing responsibilities, and other classes should concentrate on computer-based training. Or classroom training conducted a few hours twice a week rather than all at once may be worth seeking out.

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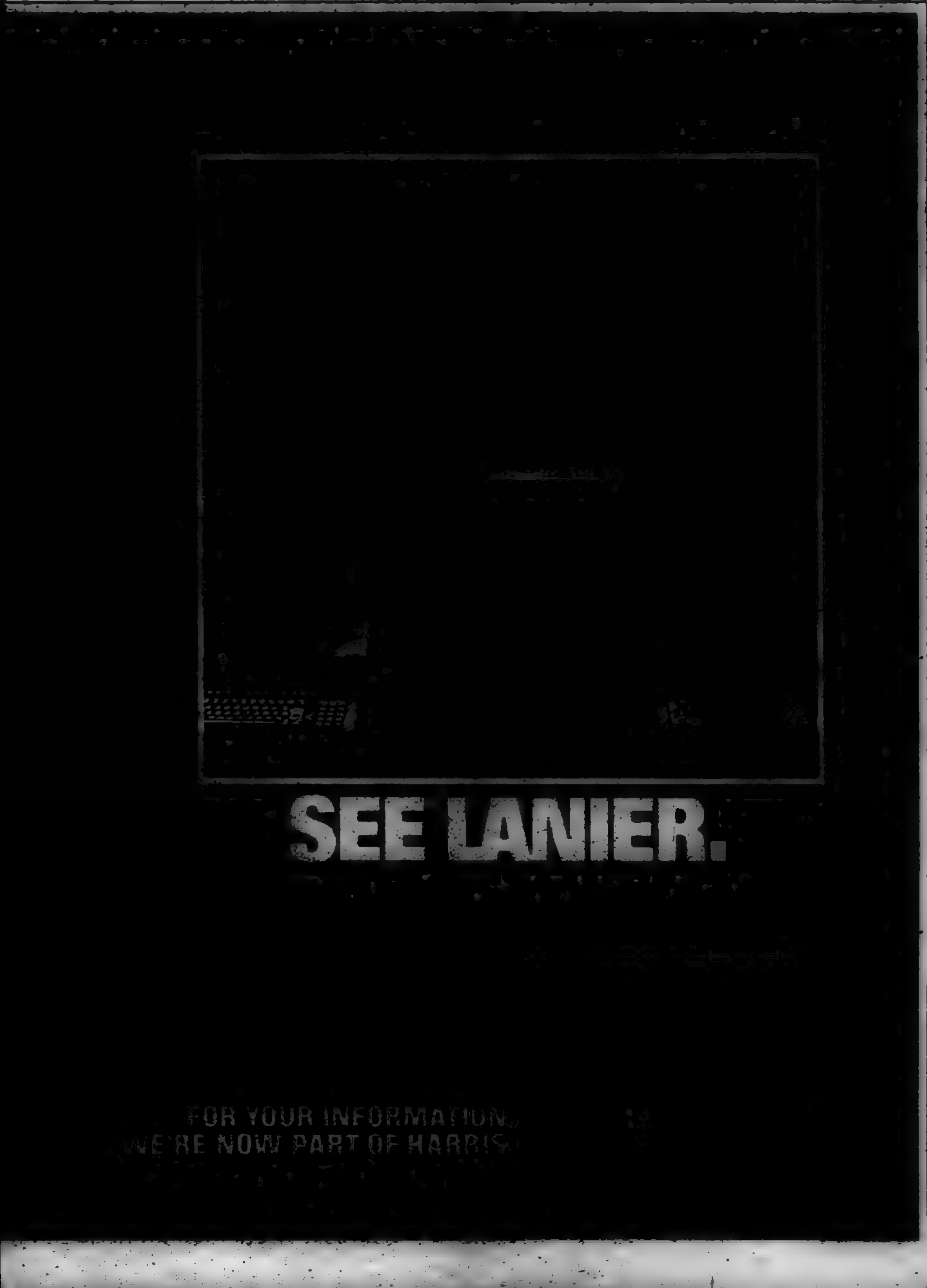
> *Users are rapidly moving past the computerphobia stage. But some are still in the 'Are you sure it won't bite?' category.*

■ Customized vs. general training: the relevance issue. How important is it to address company-specific business needs? The popularity of off-the-shelf micro-based tutorials may suggest that users are willing to forego relevance in the learning process. Or it may indicate that the customization offered by some vendors or designed by in-house staff is available only at what is perceived to be too great a cost. Many users resist the packaged (Lotus Development Corp.'s 1-2-3) approach of some training vendors. Given the cost of lost learning, the expense of customized training can be worth the investment.

■ Training effectiveness: the quality issue. Training effectiveness is a function of the quality of the training. Classroom training that is not a blend of business, technical and teaching expertise may do users a disservice. Similarly, if a micro-based tutorial's explanations are more confusing than the problems they are intended to solve, the user would be better off to read a book.

Information centers that invest the time to solicit and examine user preferences and to plan two or three different training paths to personal computer competence may be rewarded with a greater level of user satisfaction and skill and — who knows — maybe even a reduced rate of return!



File server, micro software merge to give investment

BOSTON — When end users at an investment firm here initiated a search for a micro-mainframe link, the MIS department joined in to ensure that the link was consistent with the firm's mainframe environment and that it provided for controlled access to data.

Users at Fidelity Investments Co. wanted a way to use mainframe data on their microcomputers in conjunction with software packages like Lotus Development Corp.'s 1-2-3.

"[They] were using powerful data, but in many cases they had to rekey it from a batch report back into a [personal computer], which can take several hours a day," said Frank Diasparra, vice-president of the firm's systems engineering group. "They'd say, 'You could get a lot more out of me if I could simply get the information I need from the main computer.' "

> *The firm wanted to use a central file server to give its various machines access to data from all other machines.*

The firm had about 360 microcomputers — IBM Personal Computers, Personal Computer XTs and compatible machines — and maintained its data on four IBM mainframes: two 32M-byte 3083 Model JXs, a 12M-byte 3033 and a 16M-byte 4381. The two 3083 JXs maintained production data bases under MVS/XA. Subsets of the production data resided on the 3033 under VM/SP, and the 4381 under VM, where they were available for user access. About 1,800 dumb terminals tapped into the data on the VM machines.

Diasparra said pulling together the various parts of a sprawling system was a goal his company shared with other firms. "Many, many organizations have the same problem. They need the ability to get data to and from the various parts of their computing environment," Diasparra said.

Fidelity, however, wanted more than a link between machines. When the firm began its search for a micro-mainframe link, it had a number of criteria for the product. The link would have to provide the following:

■ **Generic communications abilities.** Fidelity's users had recommended some links that tied particular mainframe software packages to particular micro products. "Every one had merit," Diasparra said, "but they were too specific. They were add-ons to somebody else's product line that tied the user to a particular data extraction capability on the host side, a certain set of tools on the [personal computer] side or a particular communications protocol."

Fidelity wanted generic capabilities so it could link new products as the firm acquired them.

■ **Peer-to-peer linkage.** Diasparra said Fidelity wanted to use a central file server to give its various machines access to data from all other machines, with each appearing to any other as the same kind of machine.

The firm also wanted to translate data from one format to another rather than merely to transfer it among machines, according to Alex Niehaus, a technical adviser in the systems group. "We wanted the ability to move from [VM to a personal computer environment] and translate the data to [personal computer] products such as Lotus' 1-2-3," he said.

■ **Data integrity and security.** Fidelity maintained a VM environment on its mainframes because VM offered strong control over users' access to information and allowed for automatic data backup. Diasparra said the firm wanted a link that was consistent with those features and that would not in-

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Last fall, the firm purchased Linkware Corp.'s Linkware Information Server, a product that combines a VM/CMS-resident file server application with corresponding personal computer software. It installed the mainframe software on both of its VM machines and gave about 25 personal computer users copies of the micro software.

The personal computers are linked with the mainframes via coaxial cable. Each micro has a terminal emulation board that allows it to appear to the mainframes as a 3270-type machine. Diasparra's group maintains control over access to mainframe data through the file server's user identification scheme, which allows MIS to allow or deny access to individuals or to classes of system users.

To obtain data from the mainframe, a user types a Linkware command on his personal computer; the software produces a menu displaying options. The user then looks through directories of mainframe libraries he has access to and instructs the software to translate data he wants into a format his micro software can use, such as Data Interchange Format and Lotus' Print format. He then downloads the data to his micro and manipulates it.

Diasparra said Linkware supports VM access methods and that this, in conjunction with the microcomputer file formats the product supports, gives Fidelity Investments the generic capabilities it needs. "With Linkware, we go to the data source, log on, see the data we are authorized for [and] download the data into the [personal computer] transformed into an executable format," Diasparra said. "The situation is completely reversible for uploading data."

When the user is finished, he can store updated files in one of two mainframe libraries — a personal library only he has access to or a central library, from which other authorized users can access the data. When a file is stored on the mainframe, it is automatically saved by VM's backup facilities.

User profile

Most of Fidelity Investment's 25 current users of the micro-mainframe link are financial analysts, secretaries and managers. They manipulate mainframe data on their personal computers with Lotus' 1-2-3 and Symphony, Ashton-Tate's Dbase III, Microrim, Inc.'s Rbase and other micro software packages.

The financial staff members analyze stock market trends, customer information and financial data; the secretaries do budgeting, list-tracking and shareholder tracking; managers use their personal computers for decision support. Staff members in the firm's controllers office also use the micro-mainframe link for a variety of tasks.

Diasparra said that in the future, about one-half of Fidelity Investment's microcomputers will be tied in to the VM mainframes, and all these machines will use Linkware. The other half will serve as stand-alone machines.

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COMPUTER ASSOCIATES

Special Report

Good user-MIS relations spur successful acquisitions

By Joseph J. Adamsky
and Mary V. Campbell
Special to CW

After years of computer use, large corporations have established procedures and planning cycles for developing and managing automation. Microcomputer acquisition, however, has circumvented these controls.

Users bypass the coordinated support that is available from their information systems departments. Their reasons for avoiding involvement with MIS vary. Some say past experience has convinced them that DP would seek total control over their procedures; others like the idea of determining their own expenditures and scheduling their own applications development.

Regardless of the reason, users who set out on their own encounter problems. They find, for example, that they have failed to arrange appropriate maintenance contracts or that they cannot train themselves to use their equipment properly.

Such problems diminish the benefits of the microcomputer, and many corporate users never realize the potential that this tool offers for their businesses.

MIS departments in many corporations have exacerbated the problems by avoiding involvement in microcomputer acquisition and support. Whatever the reasons for MIS' inaction — the feeling that micros are merely toys, the lack of time and other resources to back micro acquisition, the power struggles between DP and user departments — the result is that users have been forced to proceed completely without support.

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> *Corporations that stress partnership between users and MIS will both minimize problems and maximize the benefits of microcomputers.*

In some companies, MIS has established control of acquisitions without providing any further support for users. This partial solution almost ensures failure. A total solution, on the other hand, involves both acquisition control and user support.

A planned partnership approach between user departments and MIS can bring about such a solution. This approach requires that neither party be dominant. Rather, in order to develop a strategy that best serves the corporate interest, each side provides expertise in its areas of strength: MIS offers its technical knowledge and experience; users outline their business needs, requirements and experience.

Such an approach requires the support and involvement of upper management. Upper management involvement does not ensure success, but its absence may result in failure.

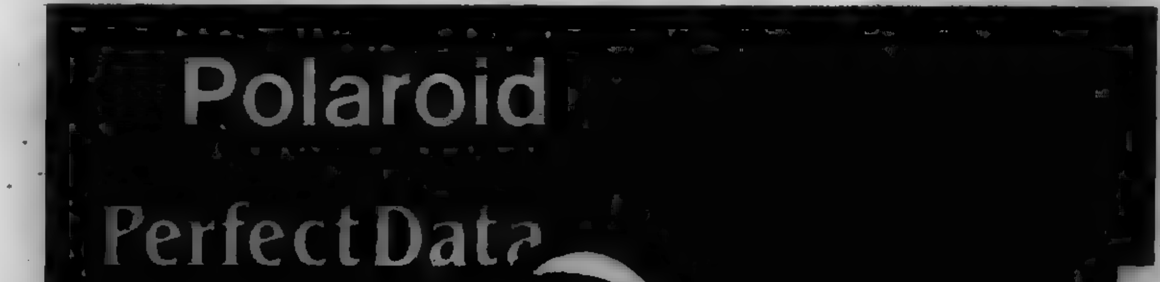
Any firm that decides to take a partnership approach to microcomputer acquisition and support should first develop a plan of action. The plan will delineate roles so that the acquisition team can utilize different participants' expertise to achieve optimal benefits in a cost-efficient manner that is consistent with corporate goals.

The plan should include the following steps:

- **Organize a committee.** The committee should include user and MIS representatives. To be truly effective, it should have clearly stated responsibilities for purchase review, standards, common package approval, security and the like. The committee should be vested with appropriate authority to support these responsibilities. The membership should include representatives of both user and MIS interests, but the committee should be kept to a small size.
- **Appoint a coordinator.** Ideally, the coordinator of the joint effort should be from a user department.
- **Consider a pilot effort.** Before a firm makes a major purchase of hardware and software, it can run a pilot program in one selected user department. This pilot will validate the exact configuration of hardware and software packages that will be required. It will also help the acquisition group develop security, procedural and processing specifications.
- **Identify high potentials.** The acquisition group should identify users who have the motivation and interest to enhance the chances of a successful first effort. It should also point out applications that do not have a great number of interrelationships with other systems.
- **Bring in outside experts.** "Outside," in this case, means experts who have no connections to vendors. A firm should hire such consultants to conduct seminars or short training programs.
- **Centralize purchasing.** Centralized purchasing provides both leverage and quantity discounts for hardware, software, maintenance and service.
- **Buy the software.** A firm should purchase software first, then buy the hardware that supports it.
- **Establish policy and controls.** In order to minimize potential problems and maximize benefits, a firm must establish security and purchase controls and develop microcomputing policies. Controls should not, however, constrain users and MIS staff members.
- **Determine training needs.** A wide variety of training methods will be needed initially and on an ongoing basis. Options include formal group sessions, tutorials, individual instruction and books and manuals. Some will require outside assistance; experienced MIS or user staff members can conduct others.

With a plan in place that addresses these points, a firm can move toward microcomputer acquisition and support. Corporations that stress partnership between users and MIS will both minimize the problems that develop when user departments proceed alone and maximize the benefits of microcomputers.

Adamsky is an associate professor of computer science at Grand Valley State College in Allendale, Mich., and a principal at Creative Computer Solutions, a consulting firm in Grand Rapids, Mich. Campbell is president of Micro Solutions, a consulting firm based in Baltimore.



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Special Report

Low-cost multiuser systems may usurp role of local nets

By Charles Grant
Special to CW

IBM's recent introduction of the Personal Computer AT has generated attention for both multiuser systems and stand-alone micros connected by local-area networks. No doubt, customers who had not considered multiuser systems will be asking about them. And while few vendors welcome head-to-head competition with IBM, there are examples of well-engineered, value-added products successfully competing with Big Blue.

Besides the attention that comes with IBM's "validation" of the multiuser approach, IBM's introduction of a local-area network with an operating system that supports record locking means major software vendors will be more willing to develop true multiuser applications.

Multiuser systems usually support fewer workstations than local-area networks; 12 is a typical upper limit. Systems of this size support smaller businesses and the departmental organization of larger businesses within which communication primarily occurs.

> *Multiuser systems will replace stand-alone personal computers as the OA unit.*

This suggests a scenario for future cooperation between the two approaches. Multiuser systems, with their resemblance to the departmental organization of businesses, will replace stand-alone personal computers as the office automation unit. Local-area networks and stand-alone personal computers will play an important role in providing companywide and interdepartmental communications.

There are two main types of multiuser systems — time-shared and multiprocessor. The multiprocessor approach more closely parallels the local-area network because each workstation has a dedicated processor.

Workstations in a multiuser system usually consist of a keyboard and a VDT cabled to a CPU. Each workstation has a dedicated processor plugged into the system bus located in the CPU. The microprocessors communicate with the system's dedicated file server and each other via the bus, rather than cabling, which is why multiuser systems are also referred to as closely coupled networks.

Both local-area networks and multiuser systems address the need for microcomputers that support the sharing of information and equipment. Cost and performance differences result from the fact that local-area nets attempt to extend multiuser capabilities to microcomputers intended for stand-alone use, while these capabilities are designed into multiuser systems.

The multiuser system's architecture delivers significant cost and performance advantages. Because multiuser workstations do not require individual power supplies and supporting hardware for each workstation, these systems are usually much less expensive than local-area networks. Networking circuit boards, the personal computer housing and, in some networks, a translator unit all add to the cost of the local-area network.

The use of dedicated processors for workstations enables multiuser systems to deliver processing power equivalent to that of a local-area net. But since the multiuser system is closely coupled, system communication is inherently faster than in a local-area network.

Single vendor may ease problems

A single vendor usually supplies and services the entire multiuser system. Because this vendor has designed the system, problems will probably be easier to diagnose and repair.

A local-area network, on the other hand, becomes a network of vendors as well as of personal computers. Local nets are usually installed after a business has purchased a few personal computers, and it is not unusual for the personal computers to come from different vendors. It is unusual for the networking hardware manufacturer to have also manufactured the personal computers. Installation and service means dealing with different vendors. And because no single vendor designed the entire system, network maintenance is more difficult.

Local-area nets will continue to appeal to businesses that have made a significant investment in personal computers and now recognize a need for multiuser capabilities. But as customers recognize the price, performance and service advantages designed into multiuser systems, these systems will become an attractive alternative to local-area networking.

Grant is president of North Star Computers, Inc., a San Leandro, Calif.-based manufacturer of multiuser microcomputers.

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Presentation graphics meets firm's need for flexibility

NEW YORK — Two and a half years ago, managers at a financial services firm here acquired access to analytical graphics output from micro spreadsheet packages. They liked it at first, but soon clamored for better quality.

"You get spoiled very quickly," said Brad Burnett, coordinator of an on-line portfolio analysis service at Shaw Data Services, Inc. "As we became more and more spoiled, we wanted to have increased flexibility with our graphics."

Specifically, the managers wanted presentation-quality graphics they could use as communication tools in-house and at client meetings. Shaw Data provides its clients, more than 300 money managers and banks, with access to and analysis of financial information.

The firm found spreadsheet graphics too limited for use in presentations because they provided few labeling options or chart formats, Burnett said. Shaw Data's managers wanted the ability to insert explanatory notes and comments anywhere on their charts and to choose appropriate formats for different types of information. They also wanted software that would allow them to output graphics to paper, transparencies or 35mm slides.

In the summer of 1983, the firm investigated six micro graphics software packages, bought copies of three of them for in-house testing and decided to purchase Graphwriter from Graphic Communications, Inc. Shaw Data installed its first copy of the software in the fall of 1983 and is currently running two copies, each on an IBM Personal Computer XT.

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> *The firm found spreadsheet graphics too limited for use in presentations.*

Top managers from various departments within the firm design charts and graphs using paper worksheets provided with the software. They pass the worksheets on to secretaries and low-level managers, who sit down at the Personal Computers with the graphics software.

The worksheets include all the questions the software will ask of the computer operator, such as which format, what kind of labeling and what type of output the final graph should have.

When a manager completes the sheet, his work is done. "I can hand that piece of paper to a secretary and have a graph back in 15 minutes," Burnett said. Using the worksheets to plan charts helps Shaw Data make effective use of its expensive microcomputers, he added.

The software itself is menu-driven and provides 23 different chart and graph formats. Burnett said the variety allows Shaw Data's employees to choose appropriate graphics for the topics they want to present.

The firm's client services staff, for example, produces pie charts that break down inquiries the staff receives from clients into categories such as performance, pricing and accounting. With the pie charts, the staff can see what type of information customers request most often and can prepare itself to answer their questions.

Burnett uses a combination bar/line chart to plot Shaw Data's hardware and software expenses over time. The bars on the chart show how expenses increase and decrease from month to month. The lines, which connect the tops of the bars, show general trends.

Shaw Data's accounting department makes bar charts, line graphs and combination graphics that track payables and receivables, and its personnel department uses various formats to show employee concentration and growth. "Almost everyone in our organization now has access to graphics," Burnett said.

Besides providing the in-house applications, the software helps the firm deal with suppliers and customers. Shaw Data gives many of its customers access to financial information over dedicated long-distance telephone lines.

As such, AT&T is one of its prime suppliers. With the graphics software, employees plot line downtime; they use the graphs they produce to negotiate service agreements with AT&T, according to Burnett.

A set of monthly graphs that Shaw Data's systems group creates shows how long customers must wait to receive information over phone lines. These graphs depict average response times for different geographical areas. With them, Burnett said, "we can plan equipment purchases and system enhancements to better meet the ever-increasing needs of our clients."

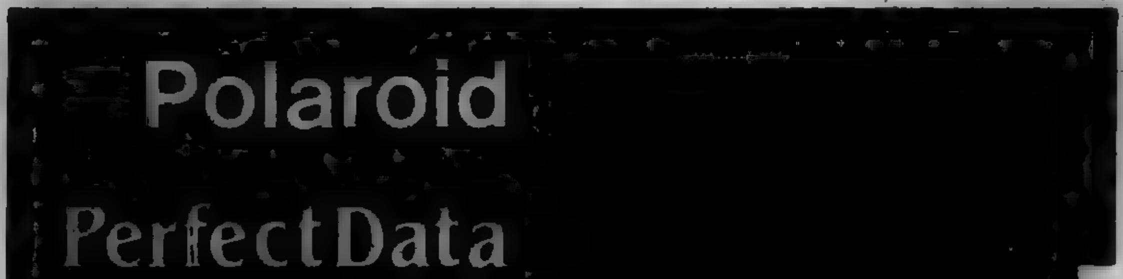
If a customer calls to report a delay, for example, Shaw Data's employees check the customer's reported response time against the average for his area. A response time that varies significantly from the average may signify a problem phone line and prompt a line upgrade.

For transparencies and slides

The firm also uses the graphics software to produce transparencies on two Hewlett-Packard Co. plotters, one 7470A two-pen and one 7475A six-pen plotter, and to make 35mm slides on a Polaroid Palette system. The slides and transparencies supplement presentations that Shaw Data makes to individual clients and to its annual client seminars — regional meetings that attract between 150 and 200 people.

With the software and the plotters, each transparency costs approximately $1 and each slide about 35 cents to produce. The firm previously relied on a graphics artist to make slides and paid him $20 for each one. "We are overwhelmed by the difference in price," Burnett said. He added that turnaround times for presentation graphics have also improved.

The software has some built-in warnings to steer users away from poor chart design. If a user attempts to use a format that is inappropriate for the data he wants to display (for example, if he tries to draw a line graph rather than a pie chart to show segment information), the software denies the user's request. "You don't even get an option to try it," Burnett said.



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OVERHAUL

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labor rate. Managers predict how many hours they will need for each task, and their predictions are fed into the system. After users approve completed tasks, the tasks' completion dates are entered, and the system calculates achieved labor rates.

Project managers are judged by how well they meet their predictions: If the managers plan to devote 40 hours to a task, they receive 40 hours worth of credit for the completed task, regardless of how many hours their staff members actually devoted to the job.

Strowbridge said that the setup requires managers both to execute tasks efficiently and to plan them well. If they plan for a 40-hour task and consume 60 hours (a 66% achieved labor rate), 20 hours worth of work goes without credit; if they complete a 40-hour task in 20 hours (a 200% achieved labor rate), they exhibit bad planning skills.

The software system generates monthly achieved labor reports, which go to top managers in the MIS department. Strowbridge said he uses these reports to show the firm's corporate executives how well his department has met its productivity goals.

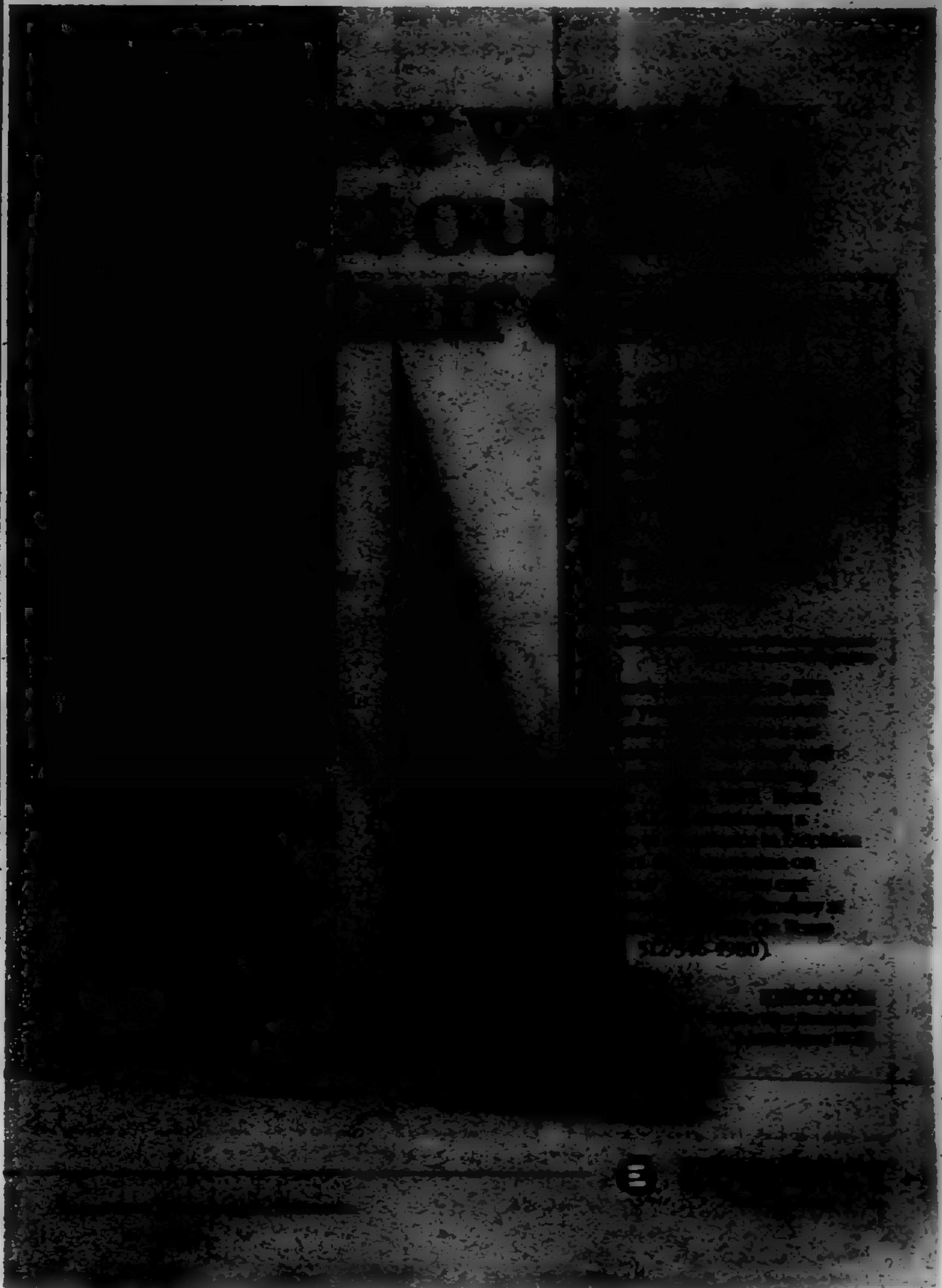
He said achieved labor reporting is new to MIS managers but familiar territory for other executives. "They live in that world," he said, and MIS benefits from working in the same environment.

Strowbridge uses other reports generated by Microman to apprise top management of backlogs, staffing needs, budgets and other MIS status indicators. He also justifies user charge-backs based on information the system produces.

"These reports enable me to really give our senior management a handle on what [MIS] is doing for the company," he said. "They're a great communication tool for us because they make our work immediately clear and comprehensible."

The reports are tailored by frequency and by level of detail to different groups of managers. Top managers in the MIS department receive monthly reports that are summaries of overall activity. Project managers, on the other hand, get weekly detail reports of their tasks.

According to Strowbridge, the weekly reporting procedure helps managers stay on top of their projects. "It tells you if you're in trouble, and you can take corrective action immediately," he said.



Special Report

DP professionals rank high as critical system resource

Micro equipment, training, integration mean nothing without effective control

By John A. Devolites
Special to CW

Not all corporations have had good fortune acquiring microcomputers. Some corporations seem to be following such ludicrous guidelines as the following:

- Local-area networks are in — they are stylish and only require a coaxial cable.
- Forget about compatibility — sooner or later everything will be integrated.
- Buy cheap software — after all, expensive software really does not work that much better.
- Take advantage of bankruptcy actions — although a microcomputer manufacturer may have fallen on hard times, it is a golden opportunity to pick up machines at unbelievable savings.
- Anyone can program — programmers use Cobol, but Basic is just as good.

Such questionable advice runs rampant these days because just about everyone — from the organization's vice-president for public affairs to the purchasing director — fancies himself an expert on microcomputers.

Unfortunately, many corporations have overlooked an important resource in their rush to automate — the DP professional. As a result, they have confused the capabilities of personal computers, mainframes, word processors and other equipment; underestimated the need for training; and overestimated current integration capabilities, among other mistakes.

> *Many corporations have confused the capabilities of personal computers, mainframes, word processors and other equipment; underestimated the need for training; and overestimated current integration capabilities.*

It is a sad state of affairs — one that could be prevented by establishing effective control over microcomputers.

Where the responsibility for this control resides within an organization is important, but it is not as important as the basic need for such control. To solve these problems will require a consistent, practical approach to information management within each corporation. That is how control is defined.

It can be achieved in large part by following a more intelligent set of guidelines than those mentioned above. The three most important are the following:

- **Standardization.** — Most large corporations decide on a specific vendor before their first major microcomputer acquisition is made. Others, however, acquire a potpourri of microcomputers. Standardization reduces the overhead costs of acquiring, maintaining and developing microcomputer systems.

The level of standardization should include the amount of memory, type of disk drives, software packages, communications, printers and displays. Keep in mind that many microcomputer distributors offer trial evaluation periods for computers, software and peripherals.

- **Vendors.** — The selection of a vender to provide microcomputer systems really boils down to the initial and ongoing investment the corporation plans to make in the technology.

Some companies have standardized on certain microcomputer configurations with third-party add-on boards and peripherals. The cost savings of this approach are substantial, but long-term integration and maintenance can be issues.

Overall system maintenance should also be considered. Some companies negotiate a fixed price per system; other companies have elected to use a time-and-materials approach when it comes to systems maintenance.

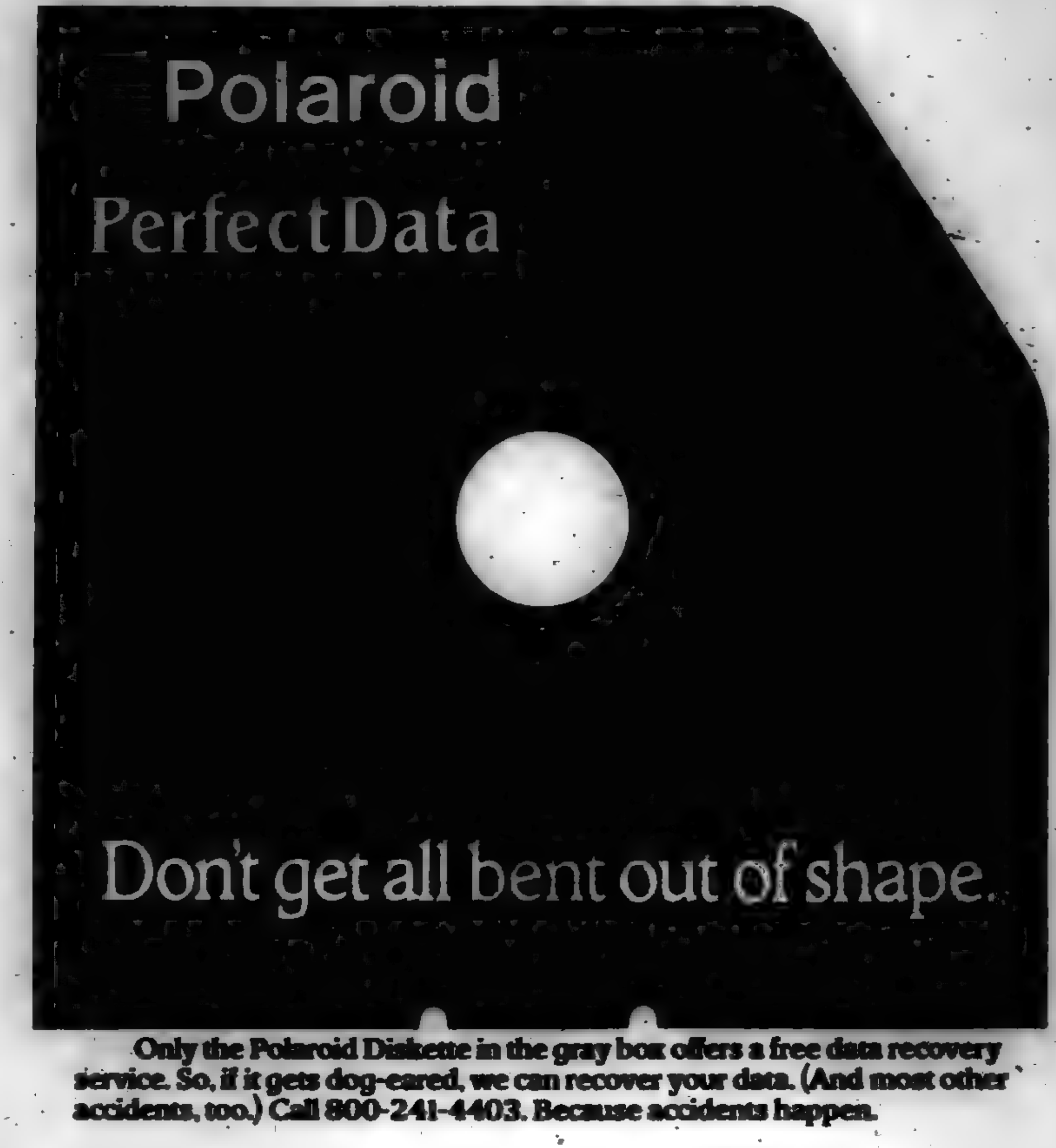
- **Planning.** The investments major corporations have made in micro technology dictate the need for formal planning. These questions should be answered before microcomputers are purchased:
- Are they needed?
- Who is going to use them?
- What are they going to be used for?
- Who will be responsible for them?
- What types of hardware and software should be bought?
- Will this hardware and software work with other systems?
- Who will be responsible for training and what will it entail?
- How will the microcomputers be used three years from now?

Providing answers to these questions may seem difficult, but it is a requirement in today's large corporations where there is a tremendous temptation to write a purchase order and buy without forethought. The low cost of micros in combination with decentralized buying authority can create havoc.

Integrated planning may initially delay the acquisition, but over the life span of the technology it will substantially reduce frustration and costs.

Some corporations assemble a team of in-house experts. Others may rely on external resources when planning for integrated microcomputer acquisition.

Devolites is DP director for the government divisions of Booz-Allen & Hamilton. He is responsible for directing the departments of Computer Operations and System Administration, Configuration Management, Software Development and Special Projects.



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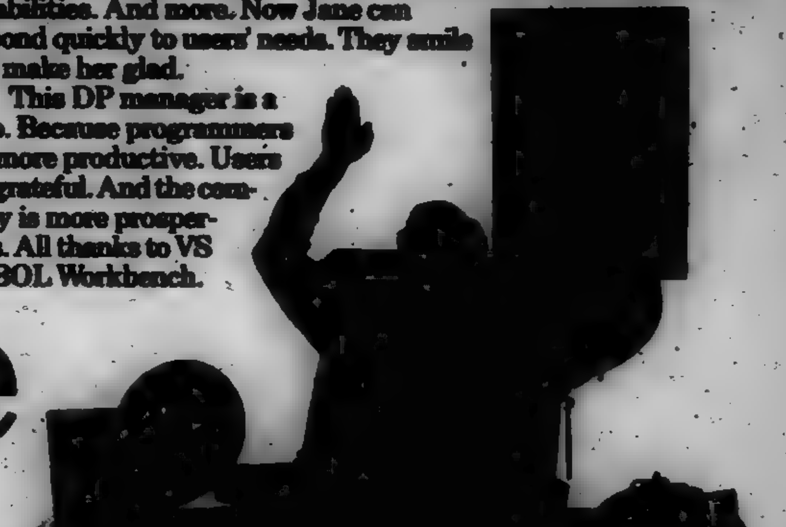

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Special Report

Programmers will hold out for practical workstation

By Jim Dickie
Special to CW

While administrative users have willingly embraced the microcomputer, programmers have typically shied away from it, choosing instead to continue using IBM 3270-type terminals attached to mainframes.

They have had no justification for purchasing micros; their work entails developing applications to run on large mainframes, and there has been a lack of micro software capable of helping them with this sophisticated task.

Programmers have no aversion to microcomputers. Their reaction to the idea of micro workstations is generally positive. They find the interactivity, detailed graphics capability, user interface and other features that microcomputers offer very attractive. They respond positively to the idea of moving development and testing activities to microcomputers.

When vendors offer practical micro workstation systems, those that justify the use of personal computers rather than mainframe terminals, programmers and other power users will be glad to use them. Micro workstations will increase programmers' productivity by removing the constraints of mainframe response time and will also offset mainframe processing burdens.

The microcomputer programmer workstation market presents software vendors with a major growth opportunity. It offers them the chance to venture outside the saturated markets for word processing, spreadsheet and graphics software and to move into an untapped area with more than one million potential users.

Hardware manufacturers have started to design machines — the IBM Personal Computer XT/370, for example — that support the concept of programmer workstations. Mainframe software vendors have started to transport workable subsystems of their programs to microcomputers.

The real goal, however, is not to make the microcomputer a subset of the mainframe but to take a totally new approach to applications development, an approach that takes advantage of the capabilities of the microcomputer. This approach must, however, take into consideration what happens to programs once they are sent to the mainframe.

In order to design software to support the workstation concept, vendors will have to consider three sets of requirements: one for the micro, one for communications and one for the mainframe.

More software requirements

The architecture of the system that runs on the micro workstation should be a true fourth-generation language. It need not help programmers code Cobol or assembler but should help them solve business problems. It should have all of the attributes of a mainframe fourth-generation tool — a nonprocedural language and intelligent use of defaults, for example — and should allow users to get results in one-tenth of the time they would need with lower level languages.

The language itself should also relieve users from worrying about the environment under which the applications will run. Whether the program being developed is meant to run as an on-line or batch program on the mainframe, or as a stand-alone application on the microcomputer, the use of the system should remain constant.

The system should do all of this while taking advantage of the benefits that micros offer. It should, for example, allow for applications flowcharting with microcomputer graphics. It should

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Dickie is director of product marketing and support for the MIS division at Informatics General Corp.'s Canoga Park, Calif., office. Informatics General markets mainframe programming tools.

Special Report

development before they jump on micro bandwagon

have field-level facilities and a menu-driven option to help first-time users. The system should be totally self-contained so that programmers can work independently of mainframe outages or line problems.

The most significant capabilities a micro workstation can offer are interactive prototyping and development and off-line testing. These features would allow programmers to involve users in an evolutionary approach to applications development, one in which the prototype expands in detail until it becomes a working system.

Communications requirements

The microcomputer workstation should also be rich in micro-mainframe link capabilities. However, vendors who offer systems that merely provide an easy means of uploading and downloading programs for development and maintenance will not provide enough value.

In addition to these capabilities, a link should allow for the selective extraction of data from mainframe data bases to facilitate the prototyping and testing process. It should also offer the ability to share information among a number of programmers. Links for microcomputer programmer workstations should be able to meet the same hardware requirements that traditional links do: They should support asynchronous, bisynchronous and Synchronous Data Link Control via a variety of add-on boards and protocol converters. The lack of communications standards makes this flexibility crucial.

Host software requirements

The mainframe host should address four functional areas: security, resource utilization, environmental intelligence and data base management system (DBMS) transparency.

■ Security. Because they will provide the ability to do development and testing off-line, microcomputer programmer workstation systems should include user profile arrangements at the host. The systems should be able to identify individual users by either passwords or serial number checks and to determine what types of operations specific users can perform. They should be able, for example, to track the applications that each programmer has developed and is allowed to maintain. The systems should also control file access and determine whether a specific user can report, update or browse in a given file.

■ Resource utilization. The code generated on the microcomputers should be able to run efficiently on the mainframe. There should be no reason to give up cycles in exchange for boosts in productivity. In the case of on-line programs, the mainframe system should be a compiler that generates source code modules. It should have the intelligence to analyze the task at hand and generate appropriate calls (in contrast to using a fixed-call strategy for all applications). In order to serve reporting applications, the host software should include a processing priority scheme and should provide for the automatic batching of tasks that access the same data.

■ Environmental intelligence. This feature should remove the need for programmers to understand the operating system under which different applications will run. The mainframe system should analyze the operating system and automatically generate its specific parameters. It should also generate appropriate teleprocessing code for applications that will run on-line.

■ DBMS transparency. The system should provide independence in regard to the files that programs must access. Based on what the program is designed to do, the mainframe software should generate all the calls that are necessary to access data from flat files, hierarchical files, relational data bases or a combination of any of these.

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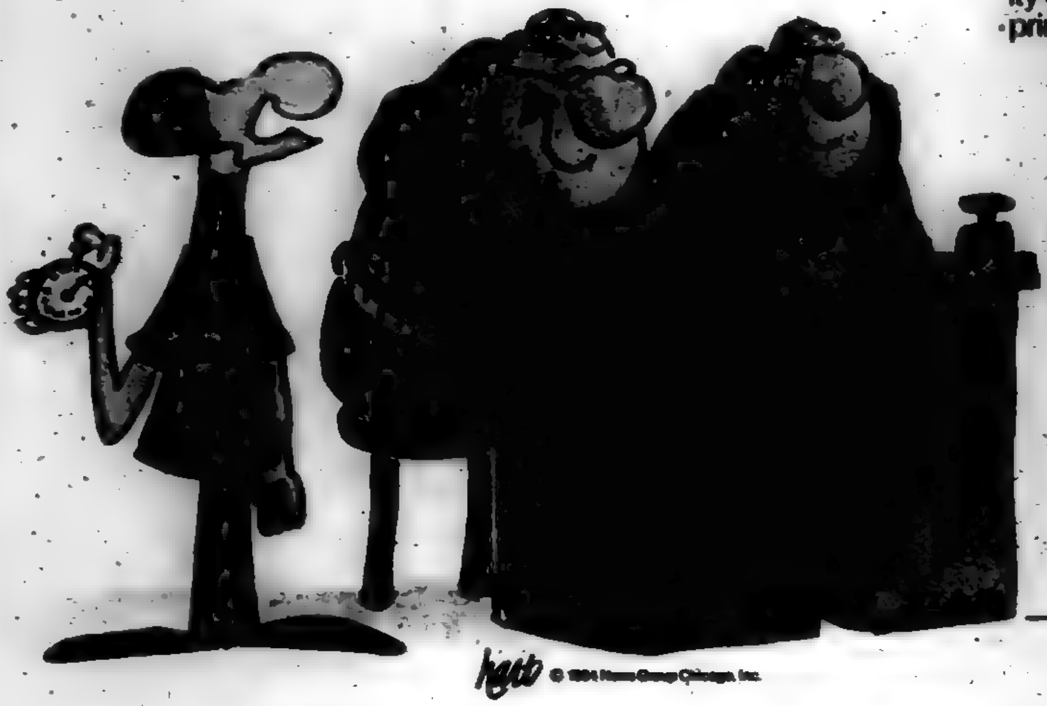

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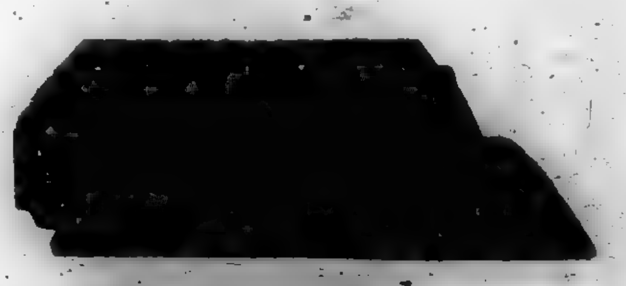

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Information age demands adjusted management skills

By William Godbout
Special to CW

The real value of microcomputers in the workplace is in the amplification of individual human effort and human skills — raising the individual's productivity by improving his creativity. Increased productivity is vital to bringing about the reindustrialization of the U.S. and its conversion from a smokestack society to an information society.

One of the ways to speed this conversion to an information society is to develop a matrix of management skills within which to employ microcomputers, workstations, mainframes, communications, networks and all other rapidly developing electronic tools available.

The result may be the redefinition of information management. And the time is right for bringing this new management matrix to bear on microcomputers in the office.

The first key point in applying management skills to microcomputers in the workplace is realizing that these capable machines are every man's tool, not just the wards of the DP department. If a manager starts developing another cult of high priests around micros from a user's standpoint — the true application standpoint — the effort will fail.

Those "everyman computers" now exist and they are getting better, faster and more capable every day. The improvement of work output through tools such as scientist/engineer workstations, dedicated administrative workstations, computer-aided design, graphics and manufacturing computers and many other desktop applications is now evident, even at this early stage of microcomputing in the workplace.

Managers must also realize what the single microcomputer or even groups of stand-alone or networked micros cannot do.

But first, managers must recognize what they must do. Microcomputers in the corporate environment should have the following capabilities:

- **Administrative reporting.** In the management of any project, administration and reporting are key requirements. General-purpose micros running word processing software meet those requirements very nicely.
- **Modeling.** Whether it is accomplished through physical or mathematical models or computer simulation, modeling is a microcomputer requirement. At certain levels of modeling requirements, general-purpose micros, using spreadsheet software and capable of making rapid "what-if" manipulations, are satisfactory.
- **Communications.** Another key requirement for microcomputers is that of communication, either with other micros or the mainframe.

The major problem in those three key areas — is that no manager today can pull a general-purpose microcomputer off the shelf, drop it on a desk and say, "This will do your word processing, modeling, number crunching and handle all your communications." That machine does not yet exist and may never exist, though it is a machine that all manufacturers are trying to build.

What is more likely to happen is a general case solution that will involve microcomputers and workstations and that will satisfy about 80% of all engineering, administrative, scientific and business applications at the individual's desk and under his total and local control.

But the other 20% will be met by the capabilities of highly specialized machines, with rigorously optimized hardware and software that makes them ideal for highly specialized control tasks, guidance tasks and data base management tasks. However, those machines are basically unsuitable for general computing.

Management skill enters in after that 80th percentile. The best manager must be able to answer the question, "Can the job be done with a single off-the-shelf microcomputer, or will we need additional special and dedicated hardware and software?"

Summing up those two key points in the managerial question, the person charged with deciding to install microcomputers must first be able to answer the question: "Can we use electronic equipment as an amplifier of individual human effort in this application?" If the answer is yes, he then can ask whether or not a single, off-the-shelf micro can fill his needs.

Managers charged with bringing micros into the workplace have a great opportunity in the next two years to do it right. There is enough experience with micros to avoid time-consuming mistakes, there is enough solid direction from industry leaders to make very good estimates of where the future lies and there is enough actual experience already in the workplace to provide a history of what works and what doesn't.

Managers must now superimpose their own styles of management expertise on that growing body of hardware knowledge.

Godbout, chairman and CEO for Viasyn Corp. (formerly Compupro Systems, Inc.) established Compupro as a manufacturer and supplier of microcomputer systems and components. Compupro changed its name to Viasyn this year.

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APPLETON, Wis. — A link between AT&T Unix-based micros and an OS/MVS mainframe has provided an insurance firm here with a low-cost solution to a high-priority problem.

Homeco Life Insurance Co., a small affiliate of the Home Mutual group of life insurance companies, began in 1983 to offer its clients interest-sensitive insurance policies. These policies, which feature fluctuating interest rates, changing values and variable premium schedules, required more sophisticated record-keeping systems than the firm had on hand, according to Ed Patschke, Homeco's vice-president.

The firm had installed an office automation system for word processing and other tasks, but it did not have software sophisticated enough to support the interest-sensitive policies. "We had to get a system up quickly," Patschke said.

Homeco investigated software packages that could run on its AT&T Unix-based system — four Fortune Systems Corp. 32:16 micros that each supported four CRT terminals — but found them too expensive. Software that could process the life insurance policies carried license fees of about $250,000 and maintenance and installation costs that would have brought Homeco's investment to $300,000, Patschke said. "We knew we couldn't afford that."

Instead, Homeco decided to use a time-sharing service bureau to process its interest-sensitive claims. Homeco's managers signed a contract with TPA Systems, Inc. of Kansas City, Mo., a service bureau that ran policy-processing software under MVS/OS on a 32M-byte Amdahl Corp. 580 Model 5860 mainframe. Patschke said that TPA offered Homeco some significant benefits, including low cost — processing fees of $25 a policy — a proven track record and the ability to bring the system up quickly.

The service bureau's mainframe could also capture information from the policy transactions on magnetic tapes that could later be run through a 4M-byte Honeywell, Inc. DPS 8/44 mainframe in Home Mutual's headquarters. Homeco maintained its billing and accounting records on the Honeywell machine.

Incompatibility between Homeco's micros and the service bureau's mainframe posed a problem, however: Patschke though he would have to invest $7,000 in an IBM Personal Computer that his employees would use only for tying into a time-sharing service.

Before he bought a Personal Computer, Patschke attended a computer show where he saw a demonstration of a hardware/software terminal emulator that allowed Fortune micros to appear to MVS mainframes as IBM 3270-type terminals. He purchased the emulator, SST, Inc.'s Handshake II, and brought it up on one of Homeco's micros. The emulation hardware and software and the installation of both cost Homeco about half the price of the IBM micro, he said. In addition, the emulator allowed the firm to make use of its existing equipment.

Policy data

When Homeco's agents sell interest-sensitive policies, they mail an application form to the firm's headquarters. Employees key in data about the policy on a Fortune CRT terminal. The microcomputer that runs the terminal connects with the service bureau over a dedicated line, and the CRT operates as a remote on-line terminal to the service bureau's mainframe. When employees at Homeco key in policy information, it immediately enters a mainframe data base.

The service bureau's mainframe processes the data and creates an extract tape that TPA mails to Home Mutual for entry to the DPS 8/44. Employees at Homeco's headquarters can also request status reports from the service bureau mainframe. These are transferred on-line to the Fortune micro in Homeco's office and passed on to a Genicom Corp. printer that outputs hard-copy reports.

Patschke said the firm has been feeding its existing policy records to the service bureau and using the bureau's mainframe to maintain them but has not yet begun to issue new policies using the system. Next month, Homeco will start to use the system to record and process policies as its agents sell them.

Time savings

With the service bureau's software replacing the manual methods Homeco had been using to handle its interest-sensitive claims, the firm expects significant time savings, Patschke said. "There is no question that the software ... is going to streamline the processing."

In the future, Homeco plans to use its Fortune equipment and electronic mail software to set up a system through which it can exchange information with vendors who support its business.

Patschke said the company hopes, for example, to use electronic mail to receive blood test results and other information from outside laboratories. Homeco uses such data to help determine rates for insurance policies.

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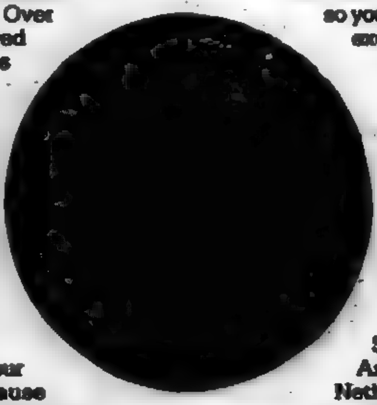

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Conferencing tool for IBM micros out

MENLO PARK, Calif. — An interactive teleconferencing package and a text/graphics electronic mail program have been introduced for the IBM Personal Computer line by Professional and Corporate Communication Systems, Inc.

CC:share, a real-time conferencing program, reportedly enables geographically separated users to run applications programs jointly over dial-up lines. Each user can see what the other is doing as it occurs on the screen, and they can pass control of the keyboard back and forth.

Potential applications include time-critical communications, presentations, remote software maintenance and software training, the vendor said.

CC:share reportedly supports two-way teleconferencing, alternate voice/data communications for one-way teleconferencing, file transfers and "snapshots."

At any time during the work session, the snapshot feature can capture a screen, compress it and store it as a PC-DOS file, the company said.

The CC:mail electronic mail package reportedly permits users to capture screens from an application and include them in a mail message or to attach application files to the message. The package also features a word processor, graphics drawing functions and a highlighter.

CC:share and CC:mail run on an IBM Personal Computer, Personal Computer XT and AT and compatibles with PC-DOS or MS-DOS 2.0 or higher. A Hayes Microcomputer Products, Inc. or compatible modem is required. CC:share requires an additional 26K bytes of memory space to run an individual application program. CC:mail needs 320K bytes of random-access memory.

In 10-unit purchases, CC:Share costs $195 per copy and CC:mail, $295 per copy.

Professional and Corporate Communication Systems is headquartered at Suite 160, 535 Middlefield Road, Menlo Park, Calif. 94025.

- Tecmar's storage unit for IBM Personal Computers combines a 20M-byte hard disk drive with a 60M-byte tape backup system/48
- IBM announced an entry-level version of its 5531 Industrial Computer/48

INSIDE

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SMALL TALK
Eric Bender
[illegible]

Computerphones: What do you get?

At Compaq Computer Corp.'s flashy launch of its Telecompaq last month, company executives kept insisting that the new desktop is not a computerphone — a statement that mystified everyone because the Telecompaq meets every common definition of a computerphone.

The message Compaq tried to convey was that smooth integration of telephone and personal computer functions would create a new and highly flexible type of machine. "It's hard to get that point across," Compaq President Rod Canion acknowledged.

Despite all its marketing smarts, Compaq faces a tough struggle with its triple-threat, triple-disk-drive machine. Among the hidden dangers is the requirement to sell, through telecommunications channels, a product that DP organizations

See [illegible] page 52

Quickmac for 1-2-3 debuts

ELMWOOD PARK, N.J. — Fox & Geller, Inc. has introduced Quickmac, a software package that adds programming capabilities to Lotus Development Corp.'s 1-2-3.

Many 1-2-3 users are developing substantial programs with 1-2-3's built-in macro facility despite the limited tools available within that facility, Fox & Geller President Jeffrey Fox noted. These 1-2-3 diehards "can use Quickmac to create applications using a high-level language," he said.

With the new package, users running 1-2-3 reportedly will be able to type in familiar programming statements such as DO WHILE or IF THEN/ELSE. Quickmac then will generate complete programs, using 1-2-3's macro tools.

The programming language employed is similar to that used in Ashton-Tate's Dbase III, the company said.

Quickmac is said to include a full-featured screen editor, a syntax checker and a

See FOX page 51

R Systems unveils OA packages

DALLAS — Three office automation software packages for multiuser systems under AT&T Unix, Microsoft Corp.'s Xenix and Ryan-McFarland, Inc.'s Cobol Operating System have been introduced by R Systems, Inc.

The packages are also available in versions for single or networked systems under Microsoft's MS-DOS. File compatibility is offered between versions, R Systems said.

The new packages include an integrated office automation package, a word processor and a desktop manager.

The OA package, R Office, reportedly features word processing and desktop management functions along with data base management, spreadsheet and report-generating capabilities. Data can be shifted between applications in the package.

R Office's word processing functions are said to include document editing, formatting, printing and report generation. Six editing modes are available, as are unlimited formatting options and several built-in print options, including a quick-print feature to print out whatever is on

See DEBUTS page 51

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IBM SQL/DS and DB2 relational DBMS now on PC

ORACLE, the relational DBMS compatible with IBM's SQL/DS and DB2, is now available on the IBM PC/XT and PC/AT. While SQL/DS and DB2 run only on IBM mainframes, ORACLE runs on IBM mainframes as well as on DEC, DG, HP and most other minis and micros. Any application written for SQL/DS or DB2 will run without modification on the complete range of systems supporting ORACLE, including PCs.

SQL/DS and DB2 are relational database management systems; ORACLE is a relational DBMS plus an integrated set of 4th generation software tools for application generation, report writing, color graphics and network communications.

Oracle Corporation introduced the first relational DBMS in 1979. Now, ORACLE provides the only complete implementation of the IBM-standard SQL language available for the PC.

Oracle Corporation cites three principal application areas for its product's capabilities:

- **The ORACLE Application Development Center** provides a PC-based development center for the creation of DB2 and SQL/DS applications. The flexibility of the personal computing environment is made available to programmers creating applications for use with IBM's relational database products.
- **The ORACLE Personal Information Center** extends the Information Center concept to the Personal Computer. ORACLE's application generator, graphics, spreadsheet and other end-user tools provide a SQL/DS and DB2 compatible Information Center on the desktop.

Users can become acquainted with the facilities and power of the Information Center in the personal computing environment, and transfer their knowledge and skills as the MIS Information Center facility evolves. The ORACLE Personal Information Center provides the facilities for MIS to develop the cooperative relationship with end users so vital to the success of the Information Center.

In addition, with ORACLE on departmental superminis, users can create identical Information Centers at the department level.

- **The ORACLE Distributed Information Center** provides an intelligent set of communication links among multiple systems, with ORACLE running on IBM mainframes and various minis and PCs.

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ORACLE is currently installed on over 1000 supermini and mainframe systems around the world, as well as on thousands of PCs and compatibles. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and many government agencies.

For further information, contact Oracle Corp., Dept. C, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 2043.

IBM unveils entry-level 5531 model

BOCA RATON, Fla. — IBM has released an entry-level model of its 5531 Industrial Computer and an industrial graphics display for factory floor operation. Both units are said to offer extended operation under conditions including high temperature, humidity, vibration and shock, power-line transients and particulate filtering. The IBM 5531 Model 011 OEM Industrial Computer — based on the Intel Corp. 8088 microprocessor — functions as an interface to plant equipment, worker-reporting terminals or supervisory workstations.

Standard features include a keyboard, 256K bytes of memory, one dual-sided diskette drive, a diskette adapter and a combination adapter. The combination adapter offers a programmable asynchronous communications port, a parallel interface port for printer attachment, a battery-backed clock and a thermal sensor interface.

The 5531 Model 011 costs approximately $3,725, depending on the dealer, and will be available in the second quarter of 1985.

The 7534 Industrial Graphics Display can be attached to the IBM Industrial Computer using either an IBM Enhanced Graphics Adapter, which costs $524, or the IBM Color/Graphics Monitor Adapter, which costs $244. When combined with the IBM Enhanced Graphics Adapter, it provides 640- by 350-pixel definition and can use four of 64 colors at a time.

The 7534 display — available in the third quarter of 1985 — will cost approximately $1,175, depending on the dealer, without either adapter board.

More information is available from IBM Manufacturing Systems Products, P. O. Box 1328, Boca Raton, Fla. 33432.

Tecmar offers drive/tape unit

SOLON, Ohio — Tecmar, Inc. has announced a combination hard disk drive and tape backup unit for the IBM Personal Computer, Personal Computer XT and AT. The QIC-60W20 is said to provide 60M bytes of tape backup and a 20M-byte Winchester hard disk drive.

The product reportedly contains a three-head tape deck and provides immediate read-after-write verification of data. A built-in power sensor is said to sense power reductions in the micro to protect the heads from writing on data during power interruption.

The system is said to provide menu-driven commands to lead the user through backup operations, including the restoration of lost information on a hard disk.

The QIC-60W20 costs $3,495.

Tecmar is headquartered at 6225 Cochran Road, Solon, Ohio 44139.

IBM System 9003 for manufacturing out

RYE BROOK, N.Y. — IBM has introduced a version of its System 9000 microcomputer for use in manufacturing and process control applications. The 9003 industrial computer reportedly can operate in a stand-alone environment or link with a host under IBM's Systems Network Architecture.

Based on the Motorola, Inc. 68000 processor, the 9003 reportedly can control up to 64 tasks concurrently and support up to 5M bytes of memory and up to 40M bytes of on-line storage.

It uses the CSOS operating system embedded in read-only memory. Microsoft Corp.'s Xenix multiuser operating system is offered as an option. Also optional are Basic, C, Fortran 77 and Pascal languages and software to support windowing.

The 9003's 66-in.-high cabinet includes a closed-loop air-conditioner, reportedly enabling the unit to operate at room temperatures of up to 125 degrees F. A battery-operated backup power source is optional.

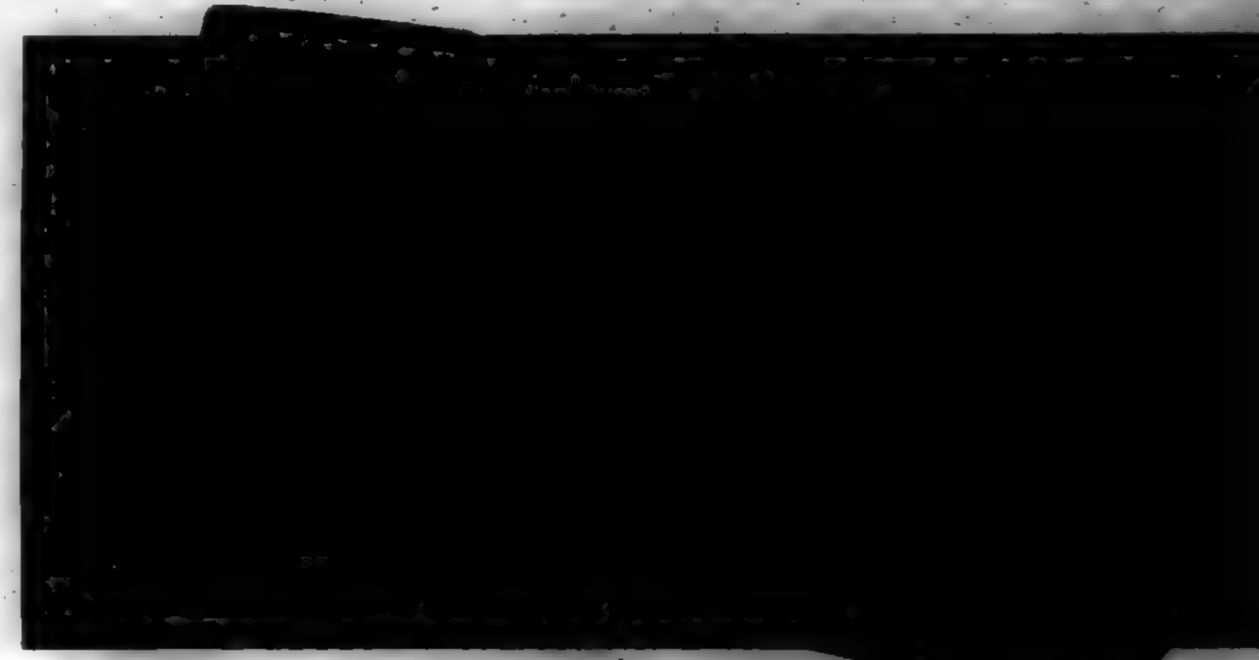
Both a pressure-sensitive keypad and a typewriter-style keyboard are included. According to a vendor spokesman, the keypad's 57 keys can be programmed to perform several operations, reducing the need for operator interventions.

Five expansion slots available

Five expansion slots are available on the 9000's chassis, and memory is said to be expandable to up to 1M byte for each feature board inserted. Optional disk storage includes the choice of 5¼- or 8-in. diskette drives or a 5¼-in. built-in hard disk.

The 9003 will be available this quarter and costs $21,130 in its basic configuration of 128K bytes of memory and one 5¼-in., 640K-byte diskette drive or one 8-in., 985K-byte diskette drive.

For more information on this system contact IBM's Information Systems Group which is located at 900 King St., Rye Brook, N.Y. 10573.



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MICROCOMPUTERS

SOFTWARE

■ Micro-Software Developers, Inc. has announced the C Debugger for creating C programs with the Lattice, Inc. C compiler on the IBM Personal Computer.

The C Debugger is said to support all four Lattice memory models and to recognize automatically the type being used. It produces a high-level view of C programs and a low-level view of machine addresses and instructions for testing assembler language functions.

The product allows the C source for the program being debugged to be executed one line at a time or in multiple lines, according to the vendor.

The C Debugger requires 256K bytes of main memory and IBM's PC-DOS Version 2.0 or higher.

The package is priced at $195 plus $3.50 for shipping and handling.

Micro-Software Developers, 2144 W. Main St., St. Charles, Ill. 60174.

■ Syscomp has announced DB III Export, program conversion software that translates worksheet files from Lotus Development Corp.'s 1-2-3 or Symphony to Ashton-Tate Dbase III data base files.

The product runs on the IBM Personal Computer, Personal Computer XT or AT running IBM's PC-DOS Version 2.0 or higher.

DB III Export reportedly can create a new data base file from specified spreadsheet data or append worksheet data to an existing data base file. Data base size is said to be limited only by disk size.

The product costs $75 and is available bundled with Syscomp's DB III Import for $125.

Syscomp, Suite 210, 8295 Aero Drive, San Diego, Calif. 92123.

■ Powerbase Systems, Inc. has released an enhanced version of its Power-Base data base management system for IBM microcomputers.

Release 2.1 of Power-Base is said to be compatible with IBM's Topview software and provide a data transfer link to and from Lotus Development Corp.'s Symphony.

Other features include foreign language support, password protection and improved performance response time.

Version 2.1 of Power-Base requires 320K bytes of memory and does not support DOS 1.0/1.1.

The product costs $595.

Powerbase Systems, 12 W. 37th St., New York, N.Y. 10018.

■ Thoughtware, Inc. has introduced Sell! Sell! Sell! software for sales training and analysis using the IBM Personal Computer and compatibles.

The software consists of two components. The training portion reportedly evaluates sales attitudes and skills and guides the sales representative through selling exercises. The applications portion permits the user to monitor, plan, execute and analyze the sales process.

The software's training component costs $495 and requires a color graphics card. The applications component costs $195 and requires dual diskette drives.

Thoughtware, Suite 1000A, 2699 S. Bayshore Drive, Coconut Grove, Fla. 33133.

■ Parameter Driven Software, Inc. has introduced PDS-Alert PC, a programming system for IBM Personal Computers.

PDS-Alert PC reportedly is a fourth-generation programming system that requires no programming experience for use. Under the software, the Personal Computer's screen displays questions and choices, leading the operator through programming step by step.

The process is said to be self-documenting. Effects of changes are shown on the screen immediately.

PDS-Alert PC requires a Personal Computer or compatible with a 5M-byte or larger hard-disk unit and at least 512K bytes of memory.

It costs $795.

Parameter Driven Software, Suite 2690, 30000 Telegraph Road, Birmingham, Mich. 48010.

■ International Electronic Machinery, Inc. (IEM) has announced Plot 77 software for the Hewlett-Packard Co. Series 200 desktop computer. Plot 77 is said to construct, scale and calibrate the axes of a graph for any array of coordinate data.

The product is installed under HP Pascal and stored in Motorola, Inc. 68000 native code. It is said to be compatible with most HP HPIB and RS-232 plotting devices and with most raster graphics printers. Plot 77 reportedly supports HP Series 200 color monitors and various color plotters and can be called from IEM Fortran 77.

Plot 77 contains a library of 14 plotting subroutines, according to the vendor. It is reportedly available on 3½-, 5¼- or 8-in. disks.

Plot 77 costs $395.

IEM, P.O. Box 1889, Fort Collins, Colo. 80522.

■ RTCS Corp. has released an enhanced version of PC/RTX, its operating system that implements the Intel Corp. IRMX86 Release 6 operating system configured for the IBM Personal Computer and Personal Computer XT.

PC/RTX Version 4.1 is said to offer faster floppy-disk operation and to support the IBM Enhanced Graphics Adapter and special-function keys on the IBM keyboard. The product reportedly includes PC-DOS and PC/RTX configuration utilities for

Continued on page 60

DENCE

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TELEX

TELEX COMPUTER PRODUCTS, INC.

MICROCOMPUTERS

Continued from page 49

the Personal Computer XT hard disk, utilities to transfer files between PC/RTX and PC-DOS disk formats and six Intel utilities.

PC/RTX Version 4.1 requires 512K bytes of memory and two 360K-byte disk drives or a 360K-byte drive and the Personal Computer XT hard disk. The product is available for $995.

RTCS, 1390 Flynn Road, Camarillo, Calif. 93010.

■ **Wallsoft Systems, Inc. has announced Dflow software that reportedly allows users of Ashton-Tate's Dbase II and Dbase III to debug programs by locating control statement errors.**

Dflow is said to illustrate program loops, IF/ELSE conditionals and case constructs. The package produces correctly indented program listings for individual files and applications systems.

Dflow runs on any Microsoft Corp. MS-DOS or IBM PC-DOS operating system running Dbase II or Dbase III, such as the IBM Personal Computer, Personal Computer XT or AT. The product costs $129.

Wallsoft Systems, Suite 863, 233 Broadway, New York, N.Y. 10279.

SYSTEMS

■ **Micro Five Corp. has unwrapped two new members of its 16-bit Series 1000 multiuser computer family.**

Both feature a 1M-byte diskette drive, 256K bytes to 768K bytes of main memory, from four to 20 I/O ports and a 60M-byte high-speed streaming tape system for backup.

The Turbo 1000 model T-1700 is said to feature 72M bytes of hard disk storage, and the Turbo 1000 model T-1800 is said to feature 140M bytes of hard disk storage.

Software systems for the models include Science Management Corp.'s Business Basic operating system or Micro Five's Stardos operating system.

The T-1700 costs $17,995 and the T-1800 costs $22,495.

Micro Five, P. O. Box 5011, 3560 Hyland Ave., Costa Mesa, Calif. 92626.

COMMUNICATIONS

■ **Comark, Inc. has introduced Twinax PC Board for terminal emulation on IBM Personal Computers running under IBM's PC-DOS 2.0 and up.**

The board reportedly provides emulation of local IBM 5291, 5292 and Model 11 terminals and allows any Personal Computer-compatible printer, with the capability to output graphics or compress printing, to emulate IBM's 5256, 5224 and 5225 dot matrix printers.

The package costs $895.

Comark, 135 N. Brandon Drive, Glendale Heights, Ill. 60139.

■ **Pathway Design, Inc. has announced the enhancement of its Pcpath communications software for IBM Personal Computers in the IBM Systems Network Architecture/Synchronous Data Link Control networking environment.**

Pcpath Release 2.2 now offers a command shell that accommodates high-level interfacing for local applications. Using Pcpath, a Personal Computer application written in a high-level language gains direct access to Pcpath's communications services.

Pcpath's command shell manages the interfacing of local applications to the lower programmatic interfaces built into the emulation software. Pcpath costs $295.

Pathway Design, 177 Worcester St., Wellesley, Mass. 02181.

■ **Dpex, Inc. has introduced MAC/3000, software that reportedly allows the Apple Computer, Inc. Macintosh to emulate a Hewlett-Packard Co. 2624A smart terminal.**

All major functions of the HP 2624A terminal are said to be supported. Also included are upward and downward file transfers, local editing using any Macintosh word processing or text editing package and printing with the Apple Imagewriter and Laserwriter printers.

The emulation software also reportedly supports both conversational and block modes.

MAC/3000 costs $169.

Dpex, Suite One, 240 Pamela Drive, Mountain View, Calif. 94040.

■ **Integrated Network Systems, Inc. has introduced its SDLC Loop PC Adapter for the IBM Personal Computer line.**

The adapter reportedly enables documents, data or programs to be distributed for processing throughout the IBM 8100 network. It offers single-key switching between a Personal Computer session and either of two IBM 3278/3279 emulation sessions.

According to the vendor, through the use of a menu-driven configuration program, the adapter also reportedly permits a Personal Computer to be more easily integrated in the 8100 network.

The adapter costs $1,275.

Integrated Network Systems, P.O. Box 91393, Mobile, Ala. 36691.

■ **Software Synergy, Inc. has announced Respond/TTY communications software that is said to link IBM's Personal Computer, Portable Personal Computer, Personal Computer AT or XT to minis and other micros by emulating a teletypewriter terminal.**

Data transfer features reportedly include the Xmodem protocol for error checking to ensure accurate data transmission and capture. The software is said to transfer both text and binary data, allow users to run other programs simultaneously and download or channel data into spreadsheets, word processing or data base files.

Respond/TTY requires 256K bytes of memory, IBM's PC-DOS version 2.0 or higher, one double-sided diskette drive, a monochrome or 80-col. color monitor, an AT&T-compatible internal or external modem and an asynchronous I/O board with appropriate cabling.

The product is priced at $125.

Software Synergy, 466 Main St., New Rochelle, N.Y. 10801.

■ Phoenix Computer Products Corp. has announced Ptel, binary file transfer software for microcomputers running the Microsoft Corp. MS-DOS operating system versions 2.0 and higher.

Ptel users reportedly can transfer binary and Ascii files to other users in a network, upload and download files from electronic bulletin boards and move files between different operating systems and machines. Ptel operates in VT102 terminal emulation mode and utilizes Phoenix's Telink binary protocol to change block size during data transmission, according to the vendor.

The product reportedly handles transmission speeds of up to 9.6K bit/sec. and can operate in originate and answer mode. It requires 90K bytes of memory and runs on the IBM Personal Computer, Personal Computer XT and AT, Digital Equipment Corp. Rainbow and other MS-DOS machines.

Ptel sells for $195.

Phoenix Computer Products, Suite 220, 1416 Providence Highway, Norwood, Mass. 02062.

■ Telexpress, Inc. has introduced a version of its Teleterm X communications package for the Tandy Corp. 16/6000 personal computer under Microsoft Corp.'s Xenix multiuser operating system.

Teleterm X reportedly supports a variety of modem types and allows users to define their own modem type. It is compatible with any system running Teleterm IM software and operates with most protocol converters for synchronous communications, the vendor said.

The software reportedly supports error-free, disk-to-disk file transfer and supports the X Modem protocol. It also permits file uploads and downloads with any asynchronous system, microcomputer or mainframe.

The product costs $395.

Telexpress, P.O. Box 217, Willingboro, N.J. 08046.

STORAGE DEVICES

■ Cipher Data Products, Inc. has announced that its 26M-byte Model 8210 tape backup system is available to support the Texas Instruments, Inc. Professional Computer.

The system is based on the vendor's Floppy Tape technology that enables tape drives to emulate the standard floppy disk interface and permits them to respond to floppy disk-like commands, according to Cipher Data.

The Model 8210-TI is priced at $1,095.

Cipher Data Products, P.O. Box 85170, 10101 Old Grove Road, San Diego, Calif. 92138.

■ Kamerman Labs has announced 10M-byte and 60M-byte streaming tape backup units for use with the IBM Personal Computer, Personal Computer XT and AT.

Continued on page [illegible]

FOX from page 47

macro "learn" facility that stores keystrokes.

The learn facility also is available separately as the Keymac package. Unlike other macro programs such as Borland International's Sidekey, Keymac is specifically designed for 1-2-3 applications, Fox said.

The products run on the IBM Personal Computer line and compatible systems. Quickmac requires 70K bytes of internal memory space.

Quickmac will be available in June for $99 or can be ordered now for $79. Keymac will ship in May for $49.

Fox & Geller is located at 604 Market St., Elmwood Park, N.J. 07407.

DEBUTS from page 47

the screen.

The word processing package, R Word, is said to include a 50,000-word spelling checker. R Word also includes a printer setup program for printer configuration. R Word reportedly can create anything from a memo to a report and offers users a menu of editing, formatting and printing functions.

Also introduced was a multiuser version of R Desk, desktop management software that was recently enhanced with an on-screen clock and cross-system file compatibility. R Desk serves as an on-screen notepad, to-do list, daily scheduler and desktop calculator.

The multiuser version of R Desk is priced at $295. Single-user R Desk is $39.95.

R Word is $895 in its multiuser version and $295 in its single-user version. R Office costs $1,295 for multiuser versions, and $495 for single-user versions.

R Systems is located at 11450 Pagemill Road, Dallas, Texas 75243.

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MICROCOMPUTERS

Continued from page 51

Each streaming tape cartridge is said to back up 10M bytes in less than four minutes. The tape units reportedly permit both image and file-by-file backup and restoration.

Communication between disk and tape is facilitated by a menu-driven program that allows the user to call up both tape and hard disk directories to back up, restore, erase, rename and print individual files, the vendor said.

The 10M-byte streamer tape backup is priced at $795; the 60M-byte model, $1,395.

Kenerman Labs, 8054 S.W. Nimbus Ave., Beaverton, Ore. 97005.

■ **Advanced Digital Information Corp. has introduced a file-addressable tape cartridge backup system for networked IBM Personal Computers.**

The Data Library tape system reportedly offers the capacity to store more than 30,000 IBM PC-DOS files and to emulate a hard disk, using all of the commands of Microsoft Corp.'s MS-DOS operating system.

The system also is said to permit users to store and retrieve data randomly without software modification.

Because it is file addressable, Data Library permits users to access data on a network, even after the network's hard disk has undergone a head crash, according to the vendor.

The Data Library interfaces with Novell, Inc. Netware software and costs $4,495.

Advanced Digital Information, P.O. Box 2996, Redmond, Wash. 98013.

■ **Prism Corp. has introduced Innerspace, a 5¼-in. add-in disk drive for the IBM Personal Computer XT.**

Designed as a replacement for the Personal Computer XT's standard 10M-byte disk, the Innerspace disk drive fits into the same space and reportedly offers either 43M bytes or 60M bytes of storage in its two versions. Both versions have an access time of approximately 30 msec.

The Innerspace unit consists of a complete add-in kit with installation software, manual and reference guide. It reportedly provides automatic defect management for data security and protects against accidental loss of data.

The 43M-byte Innerspace costs $2,195; the 60M-byte unit costs $2,595.

Prism, 30 W. Montague Expwy., San Jose, Calif. 95134.

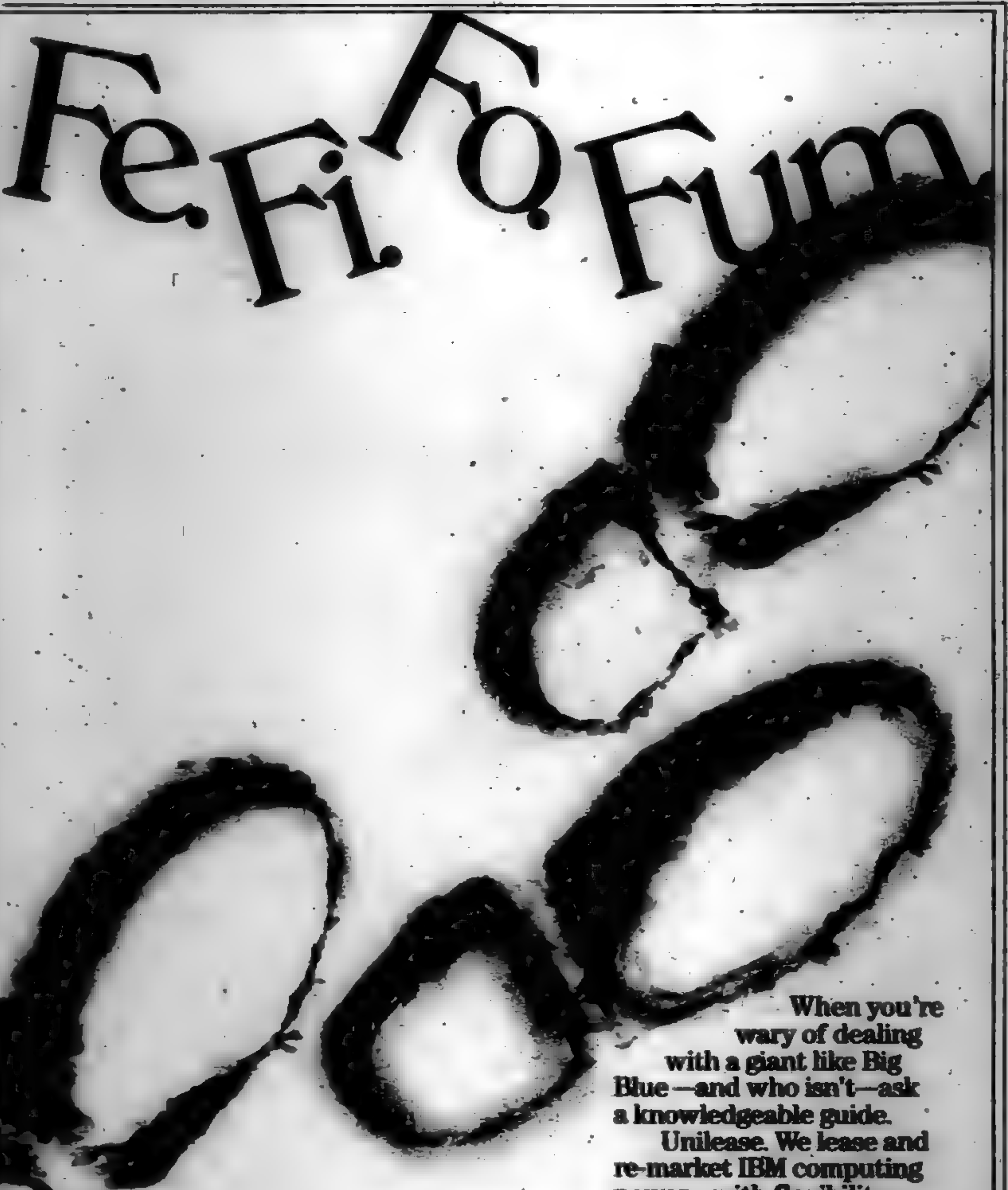
■ **Portable Computer Support Group, Inc. has announced the Chipmunk portable disk drive for use with the Tandy Corp. Models 100 and 200 laptop computers.**

The product is said to expand the computers' 32K-byte random-access memory with 358K bytes of storage per 3½-in. diskette. Users can reportedly save files on disk or call files from the disk with a single keystroke.

A diskette supplied with the disk drive includes functions that allow users to view segments of large files from a remote mainframe and directly upload or download files to and from the mainframe with a single keystroke, the vendor said.

The product costs $599.

Portable Computer Support Group, No. 207, 11035 Harry Hines Blvd., Dallas, Texas 75229.



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NAME from page 47

will end up supporting.

But Compaq has staked out its turf much more clearly than did AT&T with its Unix PC, an intriguing system flung out toward the misty ranks of those who buy "next-generation" machines.

AT&T's plans for the Unix PC aren't clear — for one thing, if a full range of voice/data features is so important, why doesn't the Unix PC offer them for multiple users? For another, does the new Communications Manager add-on for the AT&T 6300 PC make that machine a fairly direct competitor of the Unix PC?

Closer to earth, the suppliers already offering personal computer/phone combos underline the need to expand the range of communications options and link them tightly to specific applications.

In one case, Zaisan, Inc. found that users wanted the ability to dial automatically a phone number displayed in IBM 3278 terminal emulation mode, noted Don Cooper, marketing vice-president at the Houston firm. Zaisan, which introduced its ES3 IBM Personal Computer-compatible system last July, has added read-only memory software to carry out the task.

Tangible benefits

But there are huge numbers of potential options — when do all the potential benefits become tangible?

For Bruce Berman, whose Boston-based Catalyst organization does political communications and fundraising, adding voice store-and-forward to a range of other telecommunications functions did the trick.

Berman bought Watson, an add-on product for the Personal Computer from Natural Microsystems Corp. of Natick, Mass., and found that the device "began to shape the way that I work."

"With one button, I can get in touch with any client," he said. Clients also can call in to pick up messages. In addition, the setup gives "closer contact with my employees who are not on-site without making them feel overmanaged," he said. "They like calling in."

He pointed out that the system can make calls by itself, sending recorded or voice-synthesized messages. Recorded messages work perfectly well in some situations, he said. "If you're delivering information to people that they want or need, they don't care."

COMMUNICATIONS

AT&T service offers up to 20% savings

By John Dix
CW Staff

ANALYSIS

Corporate users with private-line networks may be able to shave 10% to 20% off their communications bills using a recently announced AT&T service in which user networks exist in the memory of AT&T switches and links are established when and as needed.

Introduced in March [CW, March 11], AT&T's Software Defined Network (SDN) is an analog service for voice transmissions and data communications up to 9.6K bit/sec. SDN "enables users to put together a private network using AT&T switched facilities," said Joel Gross, product manager of the service. SDN is slated to be available later this month.

"Communications managers today can only manage the large sites in a network, and the hundreds and sometimes thousands of small locations go virtually unmanaged," Gross said. These small sites typically use direct-distance dialing and Wats lines because they do not have the traffic required to cost-justify a private line to tie into a corporate network, according to Gross.

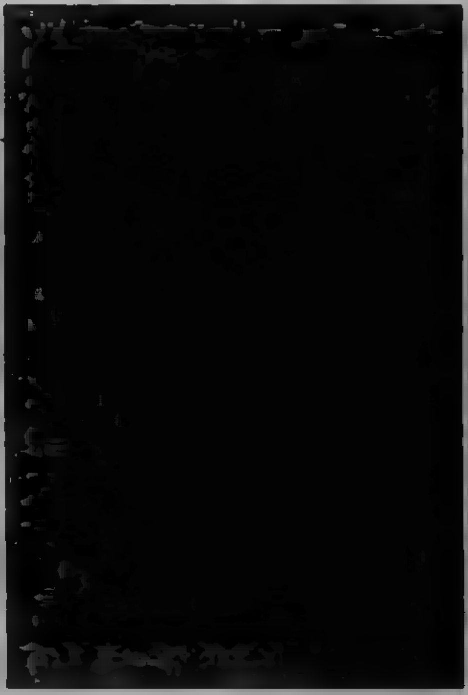
"With SDN you can put almost every location on the corporate network and provide features and cost management and network management to each site," Gross said.

Targeted at business customers with at least 20 geographically dispersed corporate sites, SDN is said to provide functions similar to electronic tandem networks — where private branch exchanges are networked together using leased lines — and AT&T's Enhanced Private Switched Communications Service (EPSCS) and Common Control Switching Arrangement (CCSA) service, which are switched private-line services for large organizations.

Like these network alternatives, SDN provides for the following:

- Seven- or 10-digit private numbering plans in which all users, regardless of location, can establish a connection through the corporate network using the company's numbering plan.
- Call authorization codes that can be

See SDN page 59



- Timeplex has announced an asynchronous port module for its Link/1 facilities management system for T1 transmission/55
- Verilink has announced a channel service unit for T1 lines/55
- Uninet will jointly produce, market and support private packet-switched networks with the telecommunications division of M/A-Com/59
- Triangle Software released an enhanced version of its Netcheck CICS network management software/59

INSIDE

Voice/Data Communications/55
Software/59

Groups oppose FCC proposal for allotment

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — Two large user groups last week expressed their opposition to proposals being considered by the Federal Communications Commission to allocate customers who do not choose long-distance communications carriers among available service providers.

The International Communications Association (ICA) and the Ad Hoc Telecommunications Users Committee, which represents 30 large Fortune 100 firms, are opposing the default allocation plan that is supported by the U.S. Department of Justice [CW, April 22].

Under the current plan, customers who do not choose a long-distance carrier under equal access are defaulted to AT&T Communications. The plan being considered by the FCC would apportion these so-called default customers among AT&T's various competitors, according to the percentage of customers initially captured by each carrier. This plan has worked with success in Northwestern Bell territory and prompted the Justice Department to throw its weight behind the change in the interest of "encouraging consumer choice."

ICA last week told the FCC that while "it understands the FCC's dilemma in desiring to find a means to resolve what is in effect an inertia favoring AT&T's existing dominance, [the ICA] cannot endorse a solution which would result in the unilateral transfer of a customer from AT&T to another long-distance carrier without that user's affirmative prior approval."

ICA said the proposal blatantly contradicts the FCC's stated policy of minimum interference in the marketplace and infringes on the consumer's freedom of

See ACCESS page 58

Net wiring still an issue

DATA STREAM
John Dix
CW Senior Editor

Although many of the lower level nuts and bolts issues of local networking have been superceded in users' minds with higher level software concerns, wiring and choice of media remain important technical and cost issues.

The options haven't changed much over the years. Twisted-pair wire, as used with telephone systems, is ubiquitous today, but it is rarely used for data communications. Coaxial cable, originally developed 50 years ago, is the most widely used data communications medium for corporatewide local networks and, more important, existing host-peripheral connections. Fiber optics is still in its infancy.

New on the scene is shielded twisted-pair wire. As flexible as telephone wire but a little more bulky, shielded twisted-pair wire can sustain higher data rates at greater distances than normal telephone wire. IBM uses two shielded twisted-pair wires in its Cabling System wiring scheme for data transport. That system also contains four regular twisted-pair wires for voice system support.

There are advantages and disadvantages with each type of wire and cable. The highest data rates, for example, can

See WIRE page 55

IBM management tools advanced but not perfect

By John Dix
CW Staff

BOSTON — "IBM is five or more years ahead of the rest of the world in software network managment," according to John King, executive director of James Martin Associates, a consulting firm in Carmel, Calif.

King taught a seminar on IBM Systems Network Architecture (SNA) network management at the Network Management and Technical Control conference held here recently. In the class, King outlined IBM's recommended structure for Network Control Centers, described some of IBM's network management tools and addressed areas where these IBM products need improvement.

IBM is putting together an edifice of network management software that will resemble other software edifices it already has in place, King said. Like SNA, "we will have to live with this for the next 20 years," he said. The International Standards Organization (ISO) once looked at network management but, accord-

See IBM page 54

Stand-alone Phonemail available from Rolm

SANTA CLARA, Calif. — In back-to-back announcements, Rolm Corp. unveiled a version of its Phonemail messaging system for non-Rolm switches, and parent company IBM reported it will market the product in the U.S. and Canada.

The Rolm Phonemail voice store-and-forward system can reportedly be used with private branch exchanges manufactured by other switch vendors or with Centrex services provided by local telephone companies.

Originally designed to be integrated with Rolm's family of switches, the Phonemail version lacks some features available when integrated with Rolm CBX II systems. In particular, the stand-alone version cannot support a call-waiting light, and users have to forward their phones manually to their mailboxes instead of having incoming calls automatically routed there after four unanswered rings.

As with the integrated version, Phonemail for non-Rolm switches comes in four-, eight- or 16-channel

See ROLM page 55

KING from page 93

ing to King, abandoned the effort after two years. ISO's network reference model will borrow network management technology from IBM's architecture, the speaker predicted.

Drawing from IBM documentation, King said the mainframe manufacturer recommends a three-tiered Network Control Center as the nerve center for network management. These levels include a help desk, network operations and technical support.

According to King, the first level, the user help desk, can resolve 85% of network problems that generally involve things like making sure the user device is turned on. Operations support resolves 10% of net failures, including link and modem problems. The remaining 5% of the problems are software-related and require technical support.

IBM's network management tools revolve around centralized, host-based applications software, King said. The Network Communications Control Facility (NCCF) is the baseline application that runs on Vtam on the host. Other applications, such as the Network Problem Determination Application and the Network Logical Data Manager, run on top of NCCF.

These and other packages provide end-to-end management capabilities, if IBM or compatible modems and peripherals are used. "Modems are a very strategic IBM network management product," King said. IBM uses mainstream or in-band signaling for network management — where status data of remote equipment is intermixed with the main data stream — while most other vendors pass that data over a separate side or out-of-band channel.

Although "overpriced and underpowered," IBM modem technology will eventually dominate because of IBM's lead in software-based network management, King said. NCR Comten, Inc. already makes IBM-compatible modems.

But as advanced as IBM's host-based software management tools are, problems exist. King said IBM needs to do the following:

- Reduce network complexity, particularly when developing systems generations that define the location and type of equipment in a network. Today users have to "gen" the host and the front-end processor separately using different equipment descriptions.
- Extend connectivity of SNA host network management applications to local networks — including personal computer nets — and separate the job of network operator into separate positions for CPU room operator and network operator.
- Increase application availability by improving network routing alternatives and recovery procedures.
- Provide for nondisruptive network growth where systems can be attached to the network and be recognized as new devices without having to stop everything to do a new systems generation.

Network management is being driven today by the ever-increasing need for continual network service with acceptable response times at reasonable costs, King said. Although these goals will remain constant in the future, networks and network management systems will have to change with the times, particularly to support personal computers.

Honeywell expands Ethernet server lines

PHOENIX — Honeywell, Inc. has announced a network control server, the NCS/150, and several diskless communications servers for its Ethernet local-area network products.

Honeywell's local net products are compatible with Ethernet Version 1.0 and IEEE 802.3 standards, according to the vendor. They support the Xerox Network System protocols and Honeywell's Distributed Systems Architecture for its DPS 90, DPS 88 and DPS 8 large-scale processors, as well as its DPS 6 small systems and Microsystems 6/10 and 6/20.

The NCS/150 is said to centralize administration of a local network and provide initial loading of operating system software. The NCS/150 supports up to 40 communications servers with or without disks. Multiple NCS/150s can be integrated into a single Honeywell Ethernet network to support a larger number of servers or to provide redundancy.

Honeywell's CS/1 series has been expanded with the diskless CS/1-X, which provides the same functions and supports the same number and types of devices as the CS/1.

Software for the CS/1-X is loaded from an NCS/150 over the network. Software for the CS/1 can be loaded from its own diskette or from an NCS/150 over the network.

Seven models have been added to the CS/100 series, four of which are diskless. Honeywell's communications servers support from four to 14 synchronous or asynchronous terminals. The disk CS/100 products can be loaded from the terminals or from the network control server over the network. The diskless CS/100 products support servers in environments where operator intervention is not practical or where a floppy disk drive is subject to contamination.

The NCS/150 communications server costs $6,195. The diskless CS/1-X, which can be configured with up to 32 ports, costs $8,095. Prices in the CS/100 series range from $3,780 to $5,670.

Honeywell can be reached at P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

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VOICE/DATA COMMUNICATIONS

■ Timeplex, Inc. has announced an asynchronous port module for its Link/1 Facilities Management System for T1 transmission.

According to a vendor spokesman, the Link/1 Quad Asynchronous Module (QAM) allows Link/1 units to handle an intermix of voice and synchronous and asynchronous data. It supports up to four asynchronous ports at rates up to 19.2K bit/sec.

QAM permits a single point of control over asynchronous devices connected to Link/1 units. In hierarchical systems, network control of the asynchronous ports requires separate supervisory port control of the multiplexing devices.

Interfaces available with QAM include RS-232/CCITT V.24, RS-422/CCITT V.11, RS-423/CCITT V.10 and MIL-STD-188-144 unbalanced.

QAM costs $1,750.

Timeplex, 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

■ Verilink Corp. has announced its 551V List 6 CSU, a channel service unit for T1 lines.

The product reportedly monitors T1 traffic and can perform loopback signals for problem isolation and troubleshooting. A vendor spokesman said the channel service unit features single-end fault location capability, full jack access to a line and data terminal equipment (DTE) and the removal of bipolar violations incoming from the DTE.

The loopback capabilities consist

Continued on page 89

WIRE

from page 53

be supported with fiber optics, but the glass strands are expensive and still hard to tap and split.

Coaxial cable — used in either broadband CATV-type applications or baseband Ethernet-type implementations — supports high data rates but is costly and inflexible.

Shielded twisted-pair wire — which is reportedly adequate for multiple megabit data support — is limited in application.

[illegible]

Regardless of capability, all of these media require that buildings be rewired. This costly and disruptive fact is cited by manufacturers of modern private branch exchanges which are peddling their products as office communications hubs. "Install our PBX," they say, "and capitalize on your existing telephone wiring to support terminals and personal computers."

Still other vendors push products that enable you to send a data signal through twisted-pair wire above the frequencies used for the voice signal.

Using existing twisted-pair wiring is appealing, but care should be taken that desired error rates can be attained. Traditionally, telephone wire has been installed haphazardly, changed randomly and poorly documented.

Lines, for example, may be spliced, branched or left with stubs running nowhere that cause problems like reflection, which can wreak havoc with data communications.

Existing telephone wiring is not the answer for mainstream data communications needs. So, faced with the need to provide communications support to a growing number of data devices, the user can, among other things, try to make do with existing systems by adding point-to-point, host-to-peripheral coaxial cable links (if risers and cable trays are not already filled); take up the overflow by supporting some terminals and personal computers with the PBX; install departmental local networks and gateways to connect them to the necessary host facilities; or rip out all the existing systems and install a flexible, standardized wiring system or local network.

If the wiring mess has become intolerable, the last choice might make sense, but then the question becomes: What do you use to rewire?

Three-tiered transition

Fiber optics is probably the best bet for the long term, but it is still too early to make that kind of choice. In fact, some consultants warn that the migration to the preferable office communications medium may not be a single transition but a three-tiered transition from the systems in place today to an interim fix and finally to something like fiber optics.

Because the cost of the transition is so high, some large companies constructing new buildings are trying to cover their bases.

One firm in New York is installing an IBM Cabling System that supports terminals and personal computers with shielded twisted-pair wiring; an AT&T System 85 PBX that can use the IBM Cabling System's unshielded twisted-pair wiring for terminal support; and a coaxial cable backbone that will initially be used to connect on-premise teleconferencing facilities, but which doubtlessly can be employed otherwise in the future.

ROLM

from page 53

models. Users can store personal greetings and retrieve messages from any Touch-Tone telephone.

IBM said it will adopt Phonemail as its voice messaging product and discontinue its Audio Distribution System (ADS) in the U.S. and Canada. IBM reported it will provide central service support for ADS through 1986.

Prices for the four-port Phonemail system start at $67,000.

Rolm is located at 4900 Old Ironside Drive, Santa Clara, Calif. 95054.

IBM's Information Systems Group can be reached at 900 King St., Rye Brook, N.Y. 10573.

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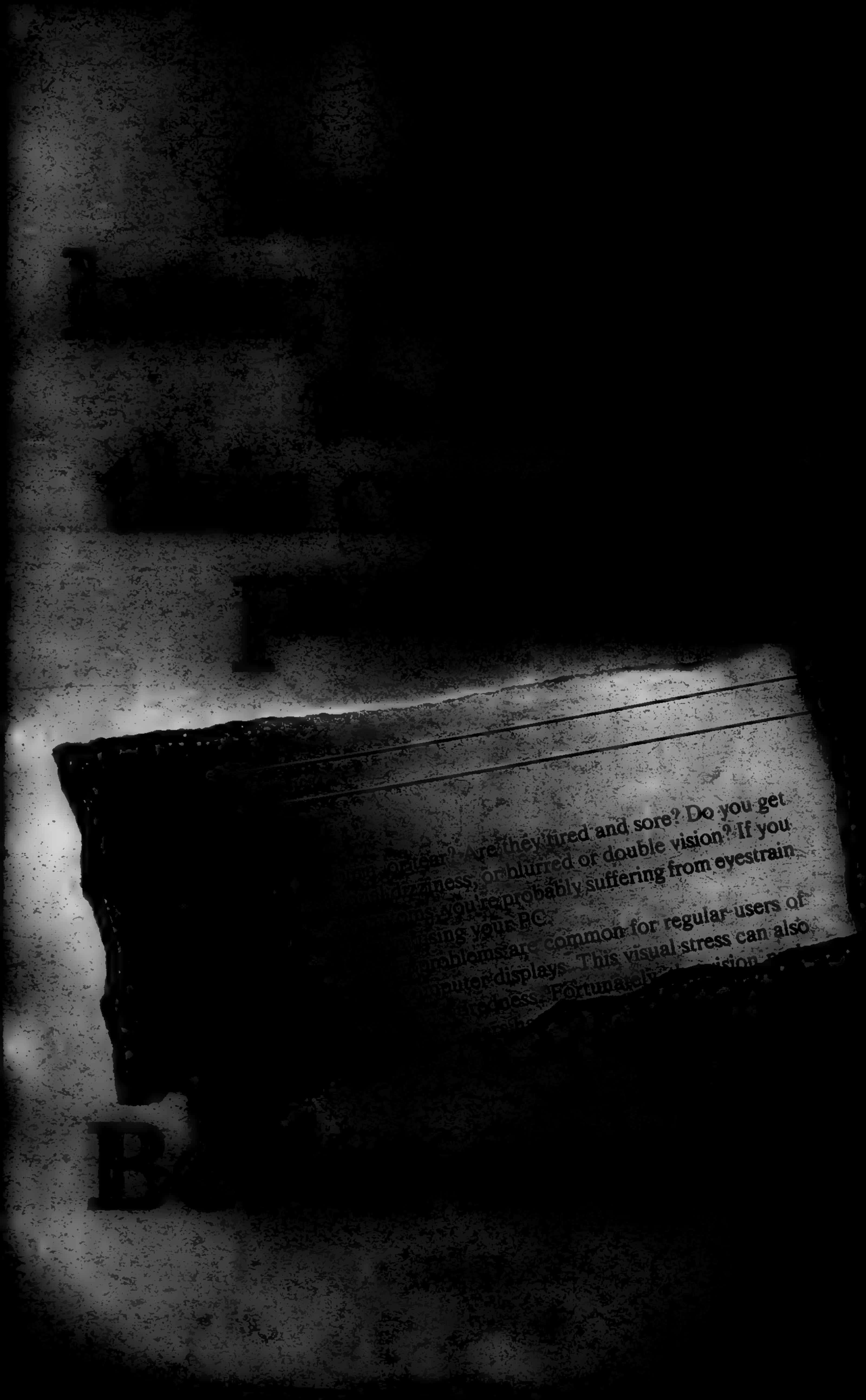

or tear? Are they tired and sore? Do you get
dizziness, or blurred or double vision? If you
you're probably suffering from eyestrain
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problems are common for regular users of
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Better Sooner.

Computers don't ever get headaches.

But the people who use computers do.

Quite clearly, as PC Magazine spells out, that's not the only trouble they're having.

In case you're tempted to dismiss this as trivial, there are two things you should be aware of:

First, more than twenty states are already preparing legislation to force some improvements.

Second, if computer users suffer, so does business.

Because computers are only as fast and accurate as the people who operate them.

You are not a machine.

Computers are designed by engineers.

They usually know a lot about technology but very little about people.

Which is why so many computers are technically impressive but strangely unnatural to use.

Eye strain	59%
Back pain	49%
Headaches	30%
Shoulder	29%
Hand/wrist	18%
Neck pain	15%

(Source: "Ergonomic Principles in Office Automation" Pub. 1983 by E.I.S. AB, Sweden.)

Ericsson, in its very Swedish way, has always believed that excellent ergonomic design isn't a privilege.

It's a right.

That it isn't a noble gesture but demonstrably good for business.

It's an attitude that has made Ericsson No. 1 in Europe twice over:

First, as the giant of European telecommunications.

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(You couldn't ask for a better marriage of technology for the future.)

Here is one example of how they got there.

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Even the shape of the actual characters was specially developed to allow easier recognition of difficult to distinguish letters like O and Q.

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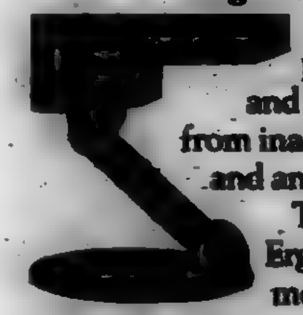
You can even have characters and graphics on the same screen.

Ergo-Arm.™



Thousands of people get neck and muscle pain from inadequate height and angle adjustment.

The Ericsson Ergo-Arm lets you move your screen exactly where you want it.

Better than back pain, wouldn't you agree?

Ergo-Touch.™

The keys are full-size and the layout is ergonomically planned for greater accuracy and speed.

Yet the keyboard is 20% more compact and less than half the weight of IBM's.

Even the cord is adjustable to suit left- or right-handers.

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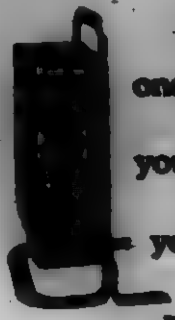

The system unit is one-third smaller than IBM's.

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ERICSSON

ACCESS

from page [illegible]

choice. However, it does not look optimistic that the FCC will deflect the Justice Department's latest efforts, which, not unexpectedly, have emerged from frequent misgivings voiced by MCI Communications Corp. and GTE Sprint Communications Corp. on the equity of the divestiture's allocation formula.

ICA said that while equal-access conversion plans by the former Bell operating companies may lead to added marketing costs for AT&T's competitors — which face a geographically dispersed pattern of end-office conversion to equal access — ordering carrier allocation will prompt added revenue requirements for the other common carriers far beyond their arguable short-term benefit. ICA said these added costs, if all end offices are converted at the same time as advocated by Satellite Business Systems of McLean, Va., would then be passed on in rate hikes.

Beef about allocation scheme

The ICA, which represents telecommunications users who individually spend more than $1 million annually, has a further beef about the allocation scheme. Acknowledging that large- and medium-size business users will probably already have centralized telecommunications management, the ICA maintained that "process of ordering and billing local-access lines is frequently distributed among decentralized operating units . . . and many major corporations may operate much like a collection of small businesses at the local telephone level, without benefit of a national presubscription strategy."

Ad Hoc similarly based its opposition to a mandatory allocation scheme on the fact that "[mandatory allocation] could unreasonably intrude on the decisions of business and residence customers."

The group said lesser steps can be taken to improve the participation of consumers in the presubscription process. It noted complaints levied by Allnet Communication Services, Inc. against the divested Bell operating companies that allege delays in the provisioning of service, billing and collection problems and failure to deliver service on a timely basis.

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At accelerated speeds, DataComm 2412 can access packet switching networks, graphics terminals, and remote databases. It can also link minis to a mainframe computer.

Features of the DataComm 2412 include: a 30-number auto dial, log on feature; an auto adaptive equalizer; and an optional plug-in ARQ module that automatically detects, corrects and assures error-free data.

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SDN

from page 53

used to charge departments for network use.

- The establishment of call screening groups, where calling privileges for certain user segments can be regulated — restricting, for example, some users from making off-net calls, placing calls after 5 p.m. or making international calls.
- Generation of reports that detail network use.

According to Gross, SDN provides these capabilities at savings of 10% to 20% when compared with electronic tandem networks and AT&T's EPSCS and CCSA services.

Users who network PBXs with leased lines might supplement these nets by using SDN to support small locations. Because customers have on-line access to their network, location support can be added, deleted or altered overnight and sometimes in as little as 15 minutes, Gross said. "You don't have to rewire anything."

SDN will initially be available from more than 600 AT&T serving offices around the country, Gross said. It is accessed through three types of communications facilities:

- Standard SDN access, a new type of access that AT&T is asking the local exchange carriers to provide to end users. It is said to be a switched-dedicated access trunk similar to Wats; the facilities are switched but dedicated to use with SDN. Recommended data speeds supported with this type of access should not exceed 4.8K bit/sec.
- Private-line access, procured by customers from a local carrier or through AT&T acting as the customer's agent, using voice-grade analog lines or digital facilities. Both accommodate speeds up to 9.6K bit/sec.
- Customer-provided access, in which customers arrange access links with the carrier of their choice.

Making the choice

While accessing a switched service with a leased line seems analogous to putting the cart before the horse, choosing the type of access needed is simply a matter of finding the most cost-effective facility for each location's traffic. Small locations with low volume traffic would probably opt for SDN standard access, the most expensive type of access option, Gross said. Medium-size users might be able to cost-justify leased analog lines, which have fixed monthly rates. Large users may get the best price/performance by using T1 1.54M bit/sec digital facilities.

Once within SDN, AT&T routes the circuit according to instructions stored in the memory of its network switches. "There are no dedicated intermachine trunks," Gross explained. "The customer is being carried within a special domain within the switched network."

Beside the cost of accessing the SDN network, users are charged for the transport portion of the network from one SDN serving office to another. This charge is dependent on minutes of use, time of day and the distance between serving offices (see chart page 60).

Other network fees include a one-time, nonrecurring set-up charge of $105,000, which is payable in three installments. Additionally, there is a $1,000 access line grouping charge for each site supported up to 50 sites. The site-charge tapers off to $600 per site for 200 sites or more.

Continued from page [illegible]

of data terminal equipment monitoring for the DTE side of a T1 line and data channel type and inband loopback capability for the network side. A 551V List 6 chassis fits either a 19- or 23-in. rack and can be adapted for mid- or front-chassis mounting.

The product costs $2,200.

Verilink, 1169 Borregas Ave., Sunnyvale, Calif. 94089.

- United Telecommunications, Inc.'s Uninet, Inc. subsidiary has announced that it will jointly produce, market and support private packet-switched networks with the telecommunications division of M/A-Com, Inc.

Both companies will promote the private network offering, which is based on M/A-Com's CP-9000 Series II packet-switching equipment and Uninet's Gen4 proprietary software and hardware network products.

According to Uninet, orders for more than $40 million of Gen4/CP-9000 Series II products have already been placed. The agreement, the vendors said, combines Uninet's network operating experience with M/A-Com's technological expertise.

Uninet, 10951 Lakeview Ave., Lenexa, Kan. 66219.

SOFTWARE

- Triangle Software Co. has released an enhanced version of its Netcheck CICS network management software. Version 2.0 is said to offer ad hoc and automatic message broadcasting, automatic attempts at reconnecting service and detailed reports of resources such as control units, lines and terminals for inventory purposes.

Netcheck 2.0 reportedly allows messages to be stored indefinitely for automatic broadcast to any group of terminals at a specified time. The product is said to allow users to specify a number of automatic attempts to reestablish service after disconnection and provide four hard-copy reports to track resource inventory.

The product runs on any DOS or OS/VS system with CICS 1.5 or higher, according to the vendor.

Netcheck 2.0 costs $8,500 for DOS systems and $12,500 for OS/VS systems.

Triangle Software, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

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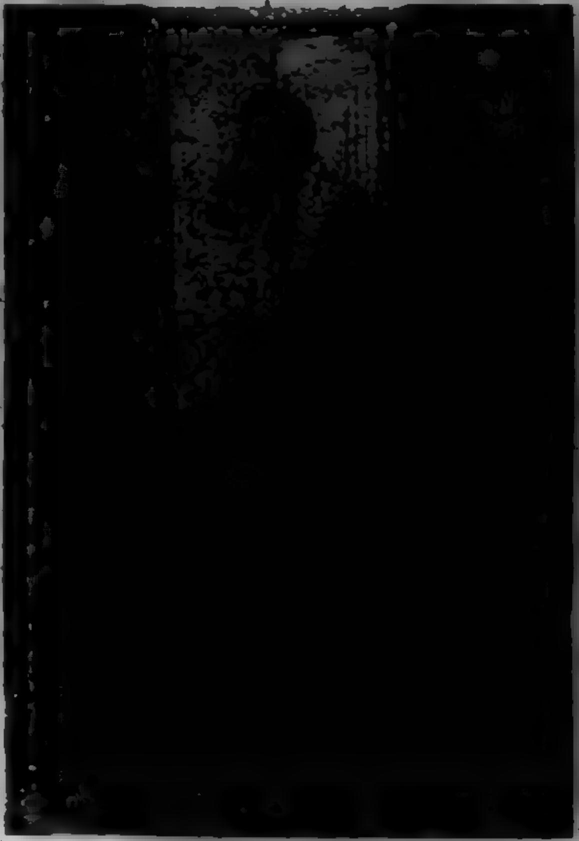

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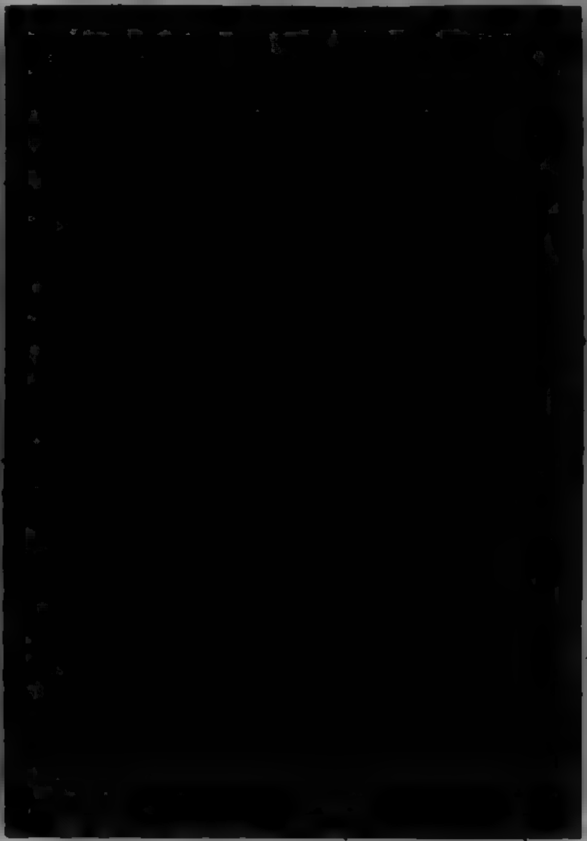

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400 Corporate Court, South Plainfield, NJ 07080

LIMIT

from page 53

facilities, making it less attractive for large corporate network use," he said.

'Supplement to voice systems'

Billed as a voice and low-speed data network service, SDN is basically viewed as a "supplement to voice systems that have unpredictable peaks and valleys," according to Charles G. Abbott, a communications consultant in New York.

"Data is more controllable than voice because it can be held back, as compared with the uncontrollable, spontaneous, individually initiated voice call," Abbott said. With SDN, traffic peaks can be accommodated on an as-needed basis.

AT&T points out that SDN can be combined with its recently announced digital Accunet Switched 56 network service. "You can marry these services so it looks like a hybrid service," said Joel Gross, SDN product manager at AT&T. When used together, customers can specify that they want end-to-end digital connectivity, given that they have digital local-access facilities. When used together, the administrative functions of SDN — such as the use of authorization codes and call screening — can be applied to Accunet Switched 56.

The primary benefit of SDN is cost, consultants said. "SDN is a cross between a Wats line and a private line," according to Harry Newton, president of Telecom Library, a publishing and consulting firm in New York. "AT&T is trying to give users a switched network that looks like a private line." It gives users most of the functionality of private lines, but the traffic fill required to cost-justify dedicated facilities is unnecessary.

Another major benefit of the service is availability. Unlike a private line — where if the line goes down you have to wait until it is repaired — with SDN, alternate circuit paths can be established, Dittberner said.

On the dark side, Newton said, the technology behind SDN may eventually enable AT&T to do away with private lines, a proposition of which "large users are desperately afraid.

'AT&T is having difficulty'

"AT&T is having difficulty in providing private or special facility lines," Newton said. "It can't do it on a timely basis, and it can't cover its costs. AT&T's strategy is to try to get away from the price war and provide value-added services, such as SDN."

When and if the Federal Communications Commission ever deregulates AT&T — something the company pushes for regularly — it will instantly drop all private-line services, Newton contended.

"AT&T ultimately wants to get out of the private-line business," he said.

Likely motivators behind this strategy include the costs of installing dedicated facilities — costs that Newton said take too long to recover — and the imperative of maintenance; private lines require quick repair whereas switched services like SDN can bypass failed facilities.

Proposed Software Defined Network rates
(Business Day, Schedule A*)

Time Increments	Mileage Bands						
First 30 sec./additional 6 sec. increments	$.29/$.026	$.32/$.028	$.35/$.031	$.37/$.033	$.42/$.036	$.43/$.038	$.45/$.040
2 minutes	$.68	$.74	$.82	$.87	$.96	$1.00	$1.05
4 minutes	$1.20	$1.30	$1.44	$1.53	$1.68	$1.76	$1.85

CW Chart

* Schedule A rates are the highest of the Software Defined Network (SDN) tariffs because they are end-to-end and include the cost of standard SDN local access.

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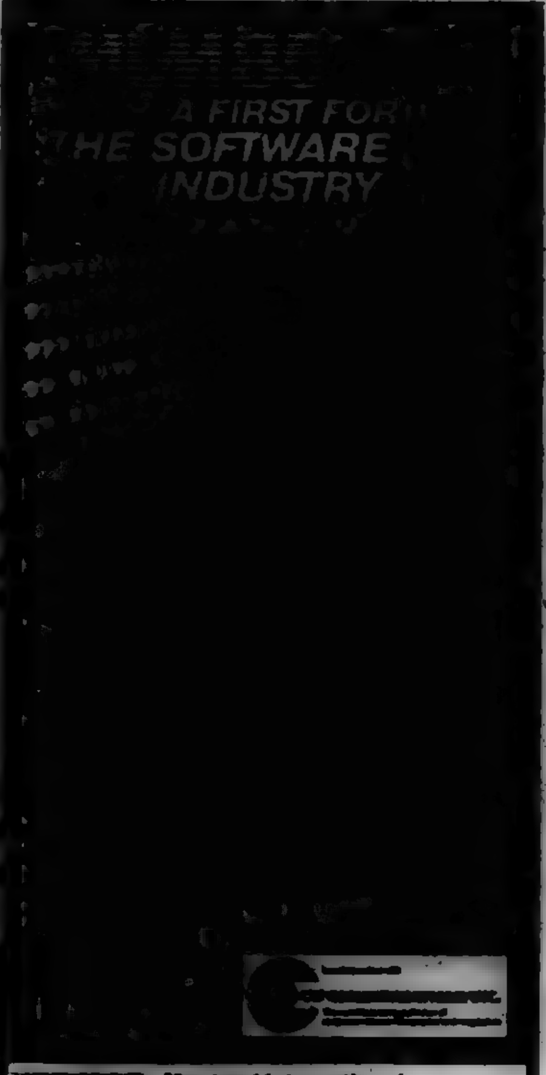
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SYSTEMS & PERIPHERALS

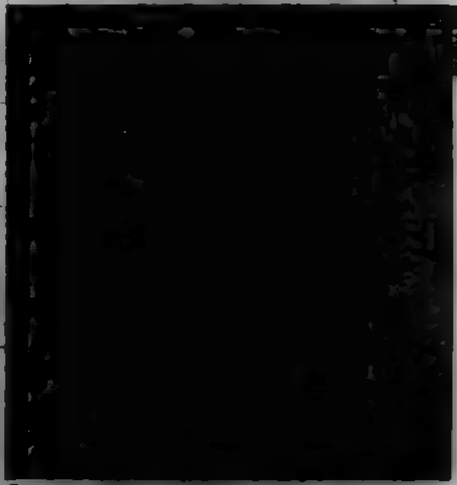
IBM 1800 followers flock for support

By [illegible]
CW Staff

The IBM 1800 Data Acquisition and Control System — vintage 1964 — inspires kudos from its user base even now. A group of these users has banded together to help each other find parts and service since IBM announced its support for the venerable machine will cease in September 1985.

Of the nearly 2,000 machines built, more than 900 are still up and running, estimated Fred Ludwick, lead engineer for energy management systems at Niagara Mohawk Power Corp. in New York state and systems division manager of Common, the IBM computer users group that is addressing 1800 maintenance issues. Ludwick has two 1800 systems that he uses for acquiring data from bulk power systems for the 24,000 square miles and 3.5 million customers in the Buffalo, Syracuse and Rochester, N.Y., areas, he said.

The 1800 uses core memory, and all its peripherals were hardwired to it originally so interrupts would be vectored to the right place, Ludwick said. Ludwick has switched to IBM 3274 controllers and disk drives built for an IBM Series/1 machine, he said. The original machine had "personality wiring" customized for each user, Ludwick said.


Some users remain loyal to the 1800, despite IBM's plan to discontinue support.

IBM tried to convince 1800 users to migrate to its System/7 and then to its Series/1 minicomputers, but customers were not pleased with those arrangements, Ludwick said. The 1800 had a selector channel so users could connect any channel-selectable peripheral to it, such as large disk drives or printers, which the other machines did not offer, he said.

In addition, users of the 1800 could run batch partitions for commercial functions and run real-time partitions simultaneously, another function the Series/1 and System/7 did not offer, he added. There is no real migration path for people who have millions of lines of code written for the 1800, because programs were written in 1800-specific assembler language, he said.

Ludwick's company plans on purchasing an IBM 4381 system eventually to replace the 1800 and to add new functions, he said, because his company needs a much larger energy management system than is possible with the vintage machines.

In the meantime, Ludwick acts as an informal adoption agency to match up 1800 parts with people who need them, he said. "I've placed about a dozen," in the last two years. Every now and then he hears about one that got thrown away, and he cringes. "There is a market for the machines," he said.

Timothy Gregory, electronic research

See 1800 page 65

■ Benson, Inc. unveiled a a color imaging system/62

■ Applied Computer Sciences unveiled a Wang-compatible dot matrix printer/62

■ Sun Microsystems added a graphics processor board and a buffer storage board to its Sun-2/160 color workstations/62

INSIDE

Turnkey Systems/62
Printers/Plotters/62
Board-Level Devices/62

Raster Technologies unveils Model One/75 graphics unit

NORTH BILLERICA, Mass. — Raster Technologies, Inc. has unveiled an entry-level version of its Model One graphics system called the Model One/75.

The Model One/75 is available in a deskside tower enclosure and was designed for electrical or mechanical computer-aided design, simulation, modeling and geophysical applications.

Features include a 19-in. monitor with a 1,280- by 1,024-pixel resolution, keyboard, data tablet and a mouse. Other features include a local debugger, command stream translator, local macro programming capabilities, local entry of graphics commands and a Help facility. The Model One/75 is software-compatible with the rest of the company's Model One product line, according to Raster Technologies.

A basic configuration costs $15,950. Display list memory costs $2,950 for 512K bytes, and a direct memory access interface costs $1,500. Shading and depth buffering firmware costs $600, the company said.

For more information, Raster Technologies is located at 9 Executive Park Drive, North Billerica, Mass. 01862.

HP introduces disk drive featuring removable media

PALO ALTO, Calif. — Hewlett-Packard Co. announced a 20.5M-byte removable media disk drive for its HP 1000 and HP 9000 computer systems.

Called the Model 7907A, the unit was designed for use in automatic testing, data logging, computer-aided engineering or security and intelligence applications and is said to be the first mid-range removable-media disk drive HP has offered. Previously, the removable media feature was only available on the company's larger, more expensive disk drives, the vendor said.

HP said the 7907A features a 45-msec average transaction time. An off-line store/restore operation can reportedly be accomplished in two to three minutes, and the unit is capable of performing 22 I/O operation/sec., the company said.

The 7907A uses an 8-in. removable media cartridge, which is reportedly suitable for rugged environments. The 7907A costs $12,500, and extra 20.5M-byte cartridges cost $215 each. The unit will be available in July.

More information is available from the HP Inquiries Manager at 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Novix chip boasts more speed than Motorola 68000

By [illegible]
CW West Coast Bureau

CUPERTINO, Calif. — Novix, a five-person company based here, has announced a microprocessor that it claims can operate 10 times as fast as Motorola, Inc.'s 68000. The company said the chip contains 80% fewer components than the 68000. Called the NC4000, the unit is primarily aimed at the scientific and engineering communities where speed is a critical factor, according to John Golden, Novix's general manager.

Golden said the chip is based on a reduced instruction set that enables it to achieve internal processing speeds of roughly 8 to 10 million instructions per second (Mips). Novix will begin shipping the chip in June, with commercial quantities available by September. The chip will cost approximately $100, he said.

The NC4000 chip was designed by Novix principal Chuck Moore, who invented the Forth Language in 1970. The chip's instruction set is based on 20 to 30 Forth words, which act as the chip's machine language, according to Moore.

Leo Brodie, a Novix consultant, said commercial applications for the NC4000 will include robotics, single-chip device controllers for hard and floppy disks and video displays and digital signal processing for military and computer graphics applications. Tom Cholipski, director of technical operations at Sysorex International, the venture capital firm based here that financed Novix, said the chip can also be used to generate real-time graphics. The NC4000 can generate animation at 60 times a second.

Cholipski claimed, however, that to realize its design potential, the NC4000 must focus on languages other than Forth, which has roughly 20,000 users.

Moore contends his chip can operate with other languages, using an assembler or a compiler, but he admits doing so will slow the chip's processing speed to approximately 2 Mips.

Ray Duncan, president of Laboratory Microsystems in Los Angeles, which develops and markets Forth language software, said the NC4000 design is hampered by a lack of memory space and inadequate addressing capability which make it a poor vehicle for transferring the new chip idea to other languages. Duncan said that, on paper, the chip performs well, but once it is buried under the operating system and peripheral controlling devices or acts as a coprocessor with systems like the IBM Personal Computer, its speed advantage is substantially reduced.

Ken McKenzie, a Dataquest, Inc. analyst, said the chip's potential is difficult to gauge because silicon development is only 5% to 10% of a chip's success. Commercial success depends on other factors, he said, such as whether the chip is producible economically and the availability of second-sourcing potential.

Novix is located at 10590 North Tantau Ave., Cupertino, Calif. 95014.

SYSTEMS & PERIPHERALS

TURNKEY SYSTEMS

■ Benson, Inc. has announced its Color Imaging System, which combines a Color Image Processor (CIP) unit with the company's Colorscan 800 ink-jet color plotter.

The user connects the CIP unit to the Benson Colorscan 800 and to an IBM 5080 workstation with analog cables to plot screen images using a video sampling technique. The video sampling technique is said to allow the CIP to grab the image off the screen and transfer the pixels directly to the plotter.

If optional memory is added, the screen images are sent to the CIP in seconds, the screen is frozen for two seconds while the data is dumped into memory and the user can go back to work on the workstation, according to the vendor.

The plot is said to be complete in less than five minutes.

The CIP also adds multiplexing capability to the Colorscan 800. Up to four different workstations can share the system.

Features include selectable black/white field reversal, limited-color mode and accentuated black. The CIP formats the data necessary to drive the Colorscan 800.

The basic one- or two-user system costs $19,500 for the Colorscan 800, the CIP and the necessary cables. Additional memory of 3M bytes to 4M bytes, depending upon the workstation configuration, costs $3,000 and allows up to four users to use the system.

Benson, P.O. Box 32059, 2690 Orchard Park Way, San Jose, Calif. 95152.

PRINTERS/PLOTTERS/PERIPHERALS

■ Applied Computer Sciences, Inc. (ACS) has released its Wang Laboratories, Inc.-compatible printer, the ACS Genicom 3404 dot matrix printer.

Applied Computer has taken a Genicom Corp. printer and added an ACS interface unit that provides the printer with Wang OIS and VS systems compatibility, the vendor said. The ACS interface has self-test diagnostics.

The printer works at 480 char./sec. in draft mode and 100 char./sec. in near letter-quality mode, the vendor said.

Options include a color option feature for color printing, a draft-speed-only mode and a quiet version of the printer, the vendor said.

The ACS Genicom 3404 costs $4,995.

ACS, 12910 Kingsgate Way N.E., Kirkland, Wash. 98034.

BOARD-LEVEL DEVICES

■ Innovative Computer Technology, Inc. has announced its Monitor Attachment card which plugs into the I/O slot of an IBM Series/1 processor to detect and correct problems such as machine failures and power interruptions.

The device reportedly can warn staff of problems by sending messages through a bisynchronous adapter that will dial a modem and flash messages on the staff member's terminal screen, the vendor said. It can issue reboot messages to the processor in case of a Series/1 failure and relay the time and date to the operating system via a real-time clock with battery backup.

The system costs approximately $1,200.

Innovative Computer Technology, 90 Broad St., Denville, N.J. 07834.

■ Raster Graphics, Inc. has announced a red-green-blue (RGB) color graphics generator board that was designed for Intel Corp. Multibus applications that require text and graphics.

The RG-12C board provides 512- by 240-pixel resolution with four pages of memory, eight colors and a 60Hz refresh rate, the vendor said. The board is used with RGB color or black-and-white television monitors.

The board costs $695.

Raster Graphics, P.O. Box 5157, Bend, Ore. 97708.

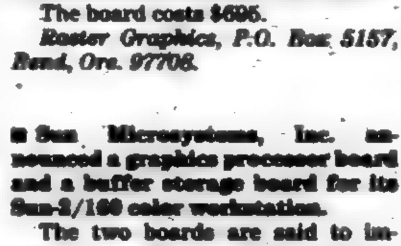
■ Sun Microsystems, Inc. announced a graphics processor board and a buffer storage board for its Sun-2/160 color workstation.

The two boards are said to improve the Sun-2/160's speed in graphics-intensive applications.

The graphics processor board reportedly improves processing speed in two- and three-dimensional transformation, clipping, scaling and rendering operations. The unit enables the Sun-2/160 to draw vectors with floating-point coordinates at 1.5M pixel/sec. This, the vendor said, allows users to draw 25,000 three-dimensional vector/sec. The shade rate of three-dimensional polygons, including hidden surface removal, is 1M pixel/sec. with fill rates of up to 35M pixel/sec. Polygons are generated and processed at 1,000 pixel/sec., the vendor said.

The graphics buffer board is said to improve hidden surface removal response time. Both boards cost $5,900 each.

Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043.



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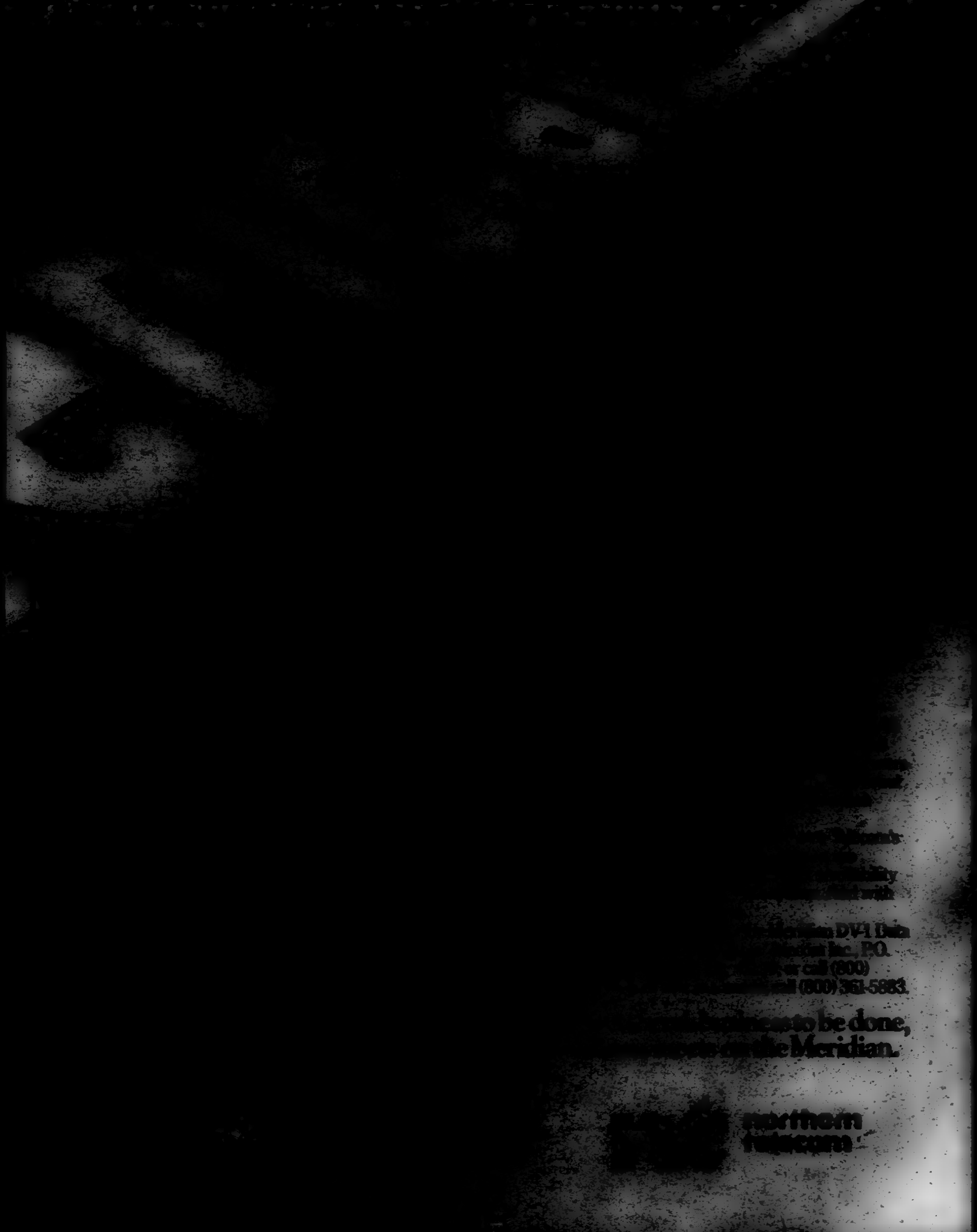

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from page 61

assistant at TRW Corp. in California, agrees that there is a market for them. Gregory has been trained to assume the maintenance of both the 1800 hardware and software for his company.

TRW has had three 1800s since 1969, two of which are used for spacecraft testing, Gregory said. The company is planning to keep the old IBMs for the duration of the test program — into the 1990s, he said. Gregory found a spare 1800 in another part of the company and bought a surplus model from the California Gas Co., he said, so he is not really worried about getting parts.

TRW will keep its machines because there is no migration path that makes sense economically, Gregory said. The 1800 uses IBM's MPX and TSX operating systems, which were peculiar to it, he said. All the software used in the testing program was written in house, and it would be too expensive to start from scratch with another system.

"The 1800 is the last of a breed," Gregory said. It was built strictly for process control, where each device is assigned an interrupt level that cannot be changed via software, he said. "The processor sits there and waits for [an] interrupt to happen, and then it goes out and does something," he said. The closest thing to it is the IBM Series/1, he said, but software can change the interrupt level of the Series/1.

TRW's 1800s were in storage for six years during a cessation of the spacecraft testing program, Gregory said. "It took me nine months to revamp everything," he said. The machines have to be booted with a card reader, he said, something which he is trying to get around now. A lot of the circuit cards in the machine are the same as those used in IBM's 360/370 series machines, he said, but the solid logic technology cards that are particular to the 1800 will be hard to find.

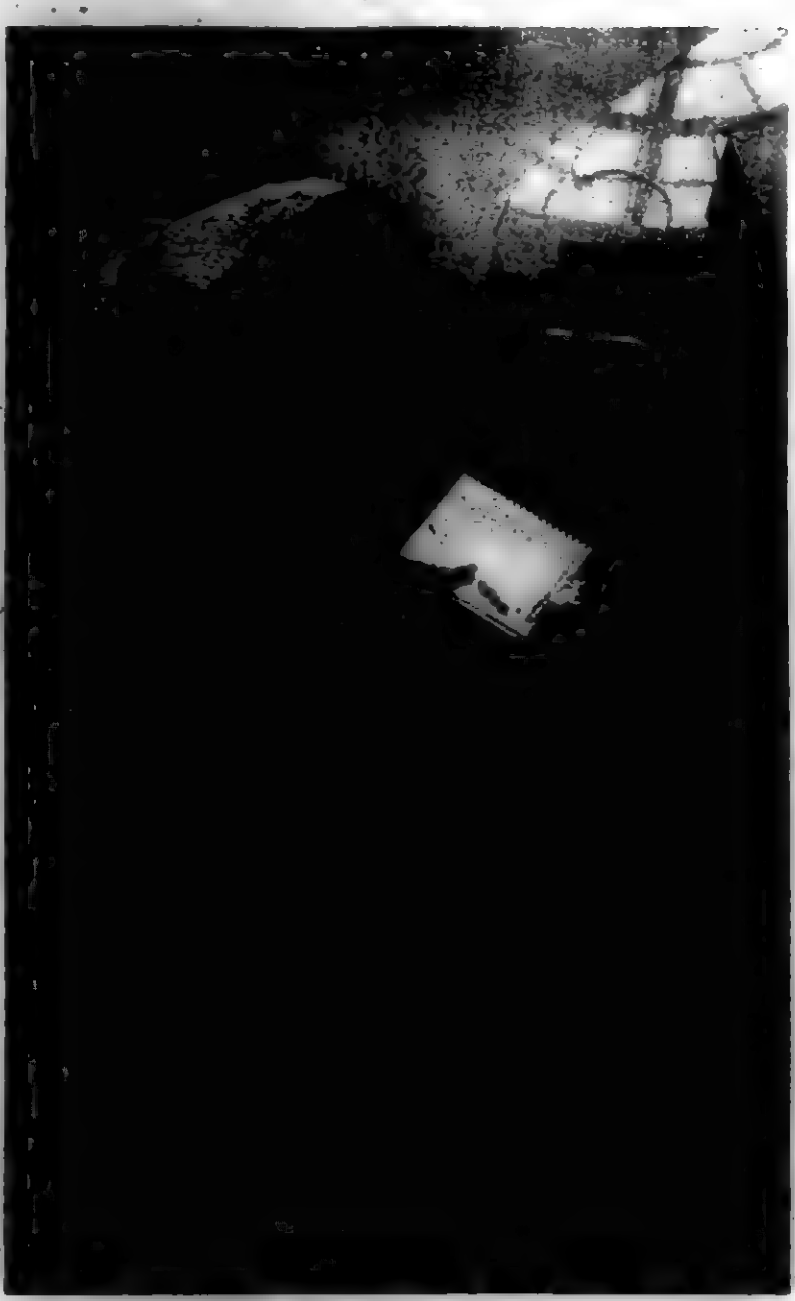
Terry Littlewood, a TRW employee who oversees U.S. Air Force (USAF) projects, is responsible for 11 1800s that are located in three different sites around the country. They are used for calibrating and certificating the guidance and control systems of the USAF Minuteman fleet, Littlewood said.

Littlewood's group is putting together information needed to contract later this year with a company to build an 1800 emulation system, he said. "We'll also try to get as many spare parts as possible from IBM," he said. The main thrust of the 1800 policy will be to maintain the 1½ million lines of code in the system, he said. "Rather than rewrite, we'll try to emulate the timing, instruction set, interface [and so on]," he said.

> ❞
>
> ***TRW will keep its [1800] machines because there is no migration path that makes sense economically.***

Littlewood sends his staff to be trained at a power plant in Ontario in the care and maintenance of the old system, he said. The processor is extremely reliable, Littlewood said, but he has problems with the peripherals, which, on some of his systems, are the ones that came with the systems years ago. He has teletype IBM 1053 printers, but through the Common users group, he has gotten directions for building an RS-232 interface that he has tried — unsuccessfully so far — to connect to a Texas Instruments, Inc. printer. He also still uses IBM 1810 and 2311 disk drives, he said.

"See? It starts every printout with 'I'll never lie to you.' "



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COMPUTER INDUSTRY

UCS merger hails major TRW impact

By Peter Bartolik
CW Staff

ROCKAWAY, N.J. — When a $10 million company is acquired by a $6 billion company, convention would suggest that the smaller entity is in for some big changes.

But the recent acquisition of Ultimate Computer Services, Inc. (UCS) by TRW Corp. seems to indicate more of a change for the larger company.

At UCS, a company engaged in refurbishing and reconditioning used IBM computer equipment, chief executive officer and cofounder Bob LaRocca is staying on as director of reconditioning services for TRW's Customer Service Division. In a recent interview, he said the merger into TRW essentially chops three years off of his five-year plan for national expansion and "saves us the aggravation of going public."

At TRW, according to Industry Services Director John Harnett, the merger will enable the service giant to establish a regional network of UCS refurbishing centers. It also provides TRW with UCS' cadre of experienced field engineers with large IBM mainframe experience who can seed TRW's existing field service organization and create a new business opportunity for the third-party service company.

UCS, soon to move its headquarters from Denville, N.J., to Parsippany, N.J., operates two refurbishing and storage facilities, one here and the other in Bensenville, Ill. According to LaRocca, the Chicago and New York-New Jersey hubs probably account for 50% of the movement in used IBM computers. Harnett said plans call for additional facilities to be opened this year and next year in markets that represent concentrations of dealers and lessors.

Literally founded in a basement garage

See ULTIMATE page 80

CEO predicts MSA's future

Acquisitions, sales, competition addressed

By John Desmond
CW Staff

NEW ORLEANS — Management Science of America, Inc.'s (MSA) Chairman and Chief Executive Officer John Imlay was interviewed here at the recent Interact meeting attended by 3,200 MSA users.

In sum, Imlay said MSA will be acquiring more software firms to move into new vertical markets; that the domestic division of its subsidiary, Peachtree Software, Inc., will be sold within weeks; that if he had a chance to do it over, he still would have bought the Peachtree micro software company; and that MSA is bracing itself for IBM's entry into the applications software arena.

Imlay commented on the following topics:

How MSA will become a billion-dollar company: "We've obtained a great deal of capital and now have $85 million, which is earmarked to move into different areas of software. You will see us in the future moving to other vertical markets. We want to wrap our financial cross-industry general ledger and payroll systems around specific industry systems."

Imlay

How MSA can keep pace with Cullinet Software, Inc.: Figures from the respective companies show that MSA is growing at a 20% annual rate, while Cullinet is growing at a 50% quarterly rate. "Cullinet is in the data base or systems software area in a dramatic way. They've done an excellent job. That particular point in the

See IMLAY page 76

- A Japanese researcher said he found it hard to believe that the fifth-generation project poses any threat to U.S. industry/68
- Storage Technology announced a four-day workweek for some production personnel, layoffs at its printer division and a Securities and Exchange Commission investigation/72
- Boston's version of a computer trade center may still open early next year, but it won't bear much resemblance to the original concept/74

TI admits profit plunge, layoffs

By Clinton Wilder
CW Staff

DALLAS — Texas Instruments, Inc. became one of the hardest hit companies in the current high-technology slump with its recent announcement of an additional 1,000 layoffs and an 88.6% plunge in first-quarter profits.

TI President J. Fred Bucy surprised most industry analysts when he told shareholders at the company's annual meeting that first-quarter earnings totaled just $9.1 million, or 37 cents per share. The company earned $79.8 million, or $3.32 per share, in the first quarter of 1984. Rev-

See TI page 75

Tax reform big business

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Robert Mattson, IBM's director of taxes, was not a popular fellow at a recent business conference on tax reform here. Amid a roomful of tax lobbyists who had united to win accelerated depreciation schedules in the first rush of the Reagan era, Mattson said those benefits should be weakened so that business income tax rates can be sharply reduced.

Afterward, Mattson faced a host of questions from the audience. It was a scene that illustrated the uncharacteristic

See TAXES page 80

Industry projections show familiar pattern of decline

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

About six months ago, semiconductor industry observers and participants were saying business would pick up again after the end of the year. A couple of months later, they were saying wait until the second half of this year. Now some are saying to wait until next year.

Two months ago, computer equipment vendors and industry watchers were saying business would be off in the first three months of the year, and the broad consensus was that a short-term downturn was materializing. But over the past two months, consensus has shifted to the opinion that the first half of the year will be bleak, followed by a rebound in the second half.

Over the past few weeks, bad news has been followed by bad news. The bad news initially centered on the minicomputer industry but has now spread far and wide. Although there have been isolated incidents of good news, the trend seems to be toward greater disappointments, as witnessed by the financial results of such firms as IBM, Control Data Corp., Computervision Corp., Wang Laboratories, Inc. and Apple Computer, Inc. More recently, Digital Equipment Corp. hinted at short-term revenue pressure, and Data General Corp. said profits for the year will be flat.

In general, the stock markets have reacted stoically to the flood of bad news. Stocks have dipped, but there has been no bloodbath on Wall St., apparently because stock prices have floated down gradually in anticipation of short-term setbacks. But the greater reason for the mellow reaction seems to be faith in the projections of IBM.

IBM admits problem

In coming as close as it ever will to admitting a mistake, IBM implied that its greatest problem, aside from the strength of the U.S. dollar, was a "wait-and-see" attitude on the part of large mainframe customers who wanted to find out what the Sierra CPUs mean to older products.

IBM said in no uncertain terms that it expects the second half of the year to make up for the first quarter and for the second quarter that seems to be going down the tubes.

That pretty much sums up the outlook that the leading semiconductor companies projected about six months ago. But a number of factors have aggravated and extended the chip industry's problems: excess capacity, reluctance by customers to resume ordering at the preslump pace and the realization that the ironclad law of supply and demand dictates price cuts in times of oversupply.

The chip vendors' prime customers are the computer equipment manufacturers. If chips are not being sold, that can only mean that equipment vendors are faced with excess capacity, customer reluctance to resume ordering at the preslump pace and the looming reality of the law of supply and demand. Even mighty IBM will have to ship at an incredible rate in the second half of the year to make up for the disappointments of the first half. And if IBM turns out to be not so mighty after all, the bloodbath in the industry will begin.

Japan's FGCS Project: Fire behind the smoke

OUTSIDE LINES
John McWilliams

Since the Japanese Fifth-Generation Computer Systems (FGCS) Project was initiated in April 1982, American opinion has seemed divided between those who view the project and its goals as "a lot of smoke" and those who see a scheme designed to make Japan the "dominant industrial power in the world" by the late 1990s.

The people at the Institute for New Generation Computer Technology (Icot), the organization charged with quarterbacking the FGCS Project, perceive the project in quite a different light. According to Yoshihisa Ogawa, chief of Icot's Research Planning Section, the FGCS Project is a "national project" aimed at developing "basic technologies" that will enable the realization of innovative "knowledge processing" systems for use in the advanced information society of the 1990s.

Since the FGCS Project, now entering its second stage, is proceeding as planned and producing the anticipated results, it can hardly be considered a lot of smoke. And as for the cries of Japanese world industrial hegemony being raised in certain quarters, Ogawa said he found it extremely hard to believe that the 50 researchers at Icot, and the 200 or so additional personnel at other participating corporate and national research laboratories, pose much of a threat to American industry.

Any advantages the Japanese might have hoped to gain by getting the jump on the rest of the world in creating a "knowledge industry" and the tools necessary to capitalize on it seem unlikely to materialize now that a number of fifth-generation computer-related projects have also been started in the U.S. and Europe. There are two such projects under way in the U.S. — the Department of Defense Advanced Research Projects Agency's Strategic Computing and Survivability Project, begun in 1984, and a private-sector project begun in 1983 by the Microelectronics and Computer Technology Corp. European fifth-generation projects include Great Britain's Advanced Information Technology Project and others being studied in France and West Germany.

Rather than feeling threatened by these other fifth-generation projects, Icot welcomes them. "We have been actively promoting international cooperation in the development of [FGCS] technology all along," Ogawa said.

As testimony to the "openness" of the FGCS Project, Icot has sent a number of researchers and specialists to the U.S. and Europe each year since the start of the project to give talks at conferences and symposia. Icot has also invited, on average, eight experts from various fields and countries to Icot every year for about a month each to take an active part in the research and development work being done there.

The FGCS Project is an ambitious, forward-looking 10-year national project sponsored and supported by Japan's Ministry of International Trade and Industry and implemented by Icot. Its stated goals are the development of a non-Von Neumann computer architecture with ultra-high-speed parallel processing functions as a basis for a knowledge-information processing system with symbolic inference capabilities, large-scale knowledge bases and advanced human interfaces.

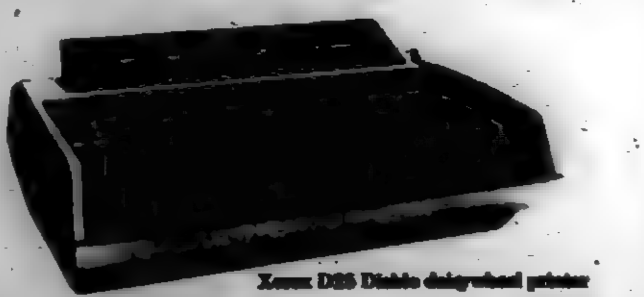
The project has been designed to be carried out in three stages: a three-year initial stage (1982-1984), a four-year intermediate stage (1985-1988) and a three-year final stage (1989-1991).

The initial stage saw the successful completion of research into various parallel inference schemes for an inference subsystem; the development of a parallel-type relational data base machine called Delta as part of the knowledge base subsystem; the establishment of specifications for basic software systems; and the development of a sequential inference machine, its programming and operating systems and ESP, a sequential logic programming language designed for use in future software development.

The project has now entered the intermediate stage. During the next four years, the fruits of the initial stage of the project will be used to determine the algorithms and basic architecture necessary to develop the inference and knowledge base subsystems that will form the core of the fifth-generation computer system.

The final three-year stage of the project will be devoted to integrating the various hardware and software components to achieve a working prototype of the envisioned fifth-generation computer system.

McWilliams is managing director of The Word Shop, Ltd., a Yokohama, Japan-based translation company specializing in texts in the fields of computers, data communications and robotics.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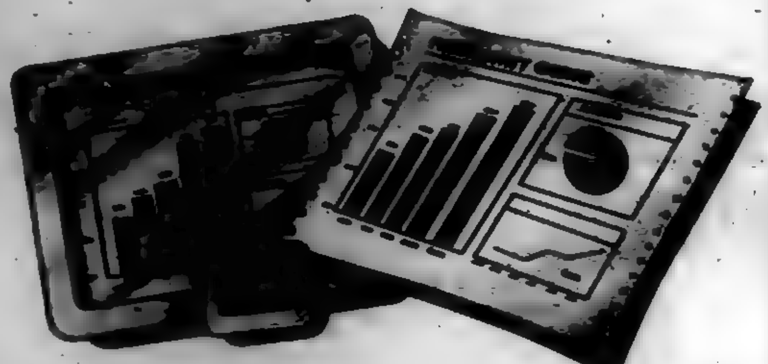

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COMPUTER INDUSTRY

Fortune Systems cuts staff, reorganizes management

REDWOOD CITY, Calif. — Citing the need for strong downsizing, Fortune Systems Corp. recently laid off 20% of its work force and reorganized its top-level management positions.

The manufacturer of AT&T Unix-based office automation equipment said it expects a first-quarter revenue decline of 20% to 30% from $15.1 million in the first quarter of 1984, according to a spokesman. Fortune Systems reported revenue of $70.2 million for the year.

The layoff of 100 of the firm's approximately 510 employees took place at all levels of the company except engineering, a spokesman said. "The goal of a profitable 1985 requires strong downsizing early in the year to lower the break-even point," said Fortune Systems President and Chief Executive Officer James S. Campbell.

Under the reorganization, Campbell has assumed responsibility for marketing and sales activities in his current position. Senior Vice-President Robert J. Ruebel moved from marketing to corporate development, and James Ferentz was promoted from vice-president of manufacturing to senior vice-president of operations.

Intel posts profits slump

SANTA CLARA, Calif. — Intel Corp. recently reported that first-quarter profits slumped to $10.8 million, or 9 cents per share, from year-earlier profits of $50.2 million, or 43 cents per share.

Earlier this year, the company said it was anticipating even lower sales and might not post any profit for the quarter.

Revenue for the quarter was $375.2 million, up slightly from $371.5 million a year earlier. Compared with the fourth quarter of 1984, revenue was down 10% and profits were down more than 50%; however, the first quarter was better than Intel had projected earlier this year, when the company said sales could be down 25% from the fourth quarter [CW, March 4].

With the semiconductor industry in a sales slump, Intel laid off 900 workers and closed two plants following the announcement of fourth-quarter results, which were down significantly from those of the third quarter. At the company's annual shareholders meeting recently, Intel Chairman Gordon Moore compared the industry downturn to the oil crisis of the mid-1970s.

Announcing the first-quarter results, Intel President Andrew S. Grove said, "While we don't see any real improvement yet, we feel that we have reached bottom. We expect orders to improve as customers' inventories decline to levels that will trigger reordering."

CAI chief resigns after 17 years; firm to relocate headquarters

BOULDER, Colo. — Computer Automation, Inc. (CAI) recently announced the resignation of its founder and the relocation of its corporate headquarters from here to Irvine, Calif.

David H. Methvin, CAI's founder, president and chief executive officer, resigned April 1 after 17 years with the organization, citing the company's eight straight losing quarters. George Pratt, a company board member for 14 years, assumed the positions of chairman and chief executive officer.

Pratt announced April 2 that CAI will consolidate its operations at the Irvine, Calif., site of its minicomputer division before the end of May. Pratt said the move represents an effort to stem the tide of CAI's operating losses over the past two years, including a $2.4 million loss for the quarter ended Dec. 31.

Pratt also announced that CAI will retain an investment banking firm to assist in recovery efforts, which may include the sale of one of its operations. CAI manufactures minis, micros, distributed DP systems and automatic test equipment for users and OEMs.

Ungermann-Bass' sales down 23%

SANTA CLARA, Calif. — Ungermann-Bass, Inc. reported a 23% decline in first-quarter sales, compared with the fourth quarter of 1984, and a net loss of $514,000, or 3 cents per share.

The supplier of local-area network systems said revenue for the three months ended March 31 was $11.9 million, compared with $15.5 million for the quarter ended Dec. 31. The figure represented a slight increase from $10.8 million in the first quarter of 1984.

Ungermann-Bass' first-quarter loss compared with a $964,000, or 6 cents per share, profit in the same quarter a year ago. Fourth-quarter 1984 profits were $2 million, or 12 cents per share.

COMPUTER INDUSTRY

STC shortens workweek, undergoes SEC examination

LOUISVILLE, Colo. — Storage Technology Corp. (STC) recently announced that, effective May 3, it will adopt a four-day workweek for portions of its manufacturing operations here.

The company also announced that the Securities and Exchange Commission (SEC) is investigating STC's securities offerings, financial reports and books and records dating back to 1981.

The company said the shortened workweek and planned layoff of 160 people at its printer operations in Palm Bay, Fla., were due to a slowdown in the computer industry and STC's reorganization status. Ryal R. Poppa, chairman and chief executive officer, said, "There is a general slowdown that is affecting many companies in the computer industry, and in Storage Technology's case this slowdown is compounded by the company's being reorganized under Chapter 11 of the [Federal Bankruptcy Act]."

Poppa said that under normal circumstances the company would have been able to avoid shortening the workweek, but due to the Chapter 11 situation it must keep manufacturing in line with the current level of business. The company filed for protection from its creditors Oct. 31 of last year.

The company said the shortened workweek does not apply to field service, sales, marketing, systems engineering and support groups.

The SEC investigation reportedly is to determine whether the company followed SEC rules and acceptable accounting procedures in keeping its books, issuing securities and filing financial reports.

Xicor cuts work force, hours

MILPITAS, Calif. — Citing continuing weak business conditions in the electronics industry, Xicor, Inc. announced the layoff of 130 employees and the institution of a four-day workweek for most of its remaining workers.

The semiconductor manufacturer said its 1985 growth rate will be less than it anticipated in 1984, when it significantly increased its work force, facilities, equipment and inventories.

The layoffs reduce the work force from 740 to 610 employees. Only Xicor sales and marketing employees will continue to work a five-day week.

Xicor President Raphael Klein said the cost-saving measures will not affect the company's product development, order delivery and factory upgrading schedules. Xicor expects to break even on an estimated $9 million in revenue for the first quarter of 1985.

Industry reports chip orders, shipments increased in March

SAN JOSE, Calif. — The battered semiconductor industry received some good news in March, as both order and shipment rates for semiconductors increased from February figures. But it was not enough to turn around the industry's weak first-quarter showing.

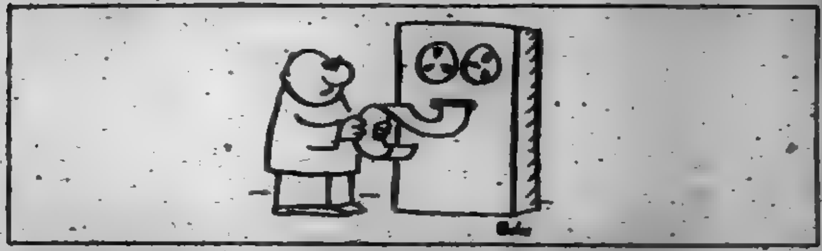
The Semiconductor Industry Association (SIA) reported that March billings from U.S.-, Japan- and Europe-based semiconductor manufacturers rose 21.4% from February figures to $903.9 million. The total $2.4 billion shipment figure for the quarter, however, was down 6% from the first quarter of 1984 and down 18% from the quarter ended Dec. 31.

March orders boosted the average monthly figure for the quarter to $691.1 million, up 4.4% from the average at the end of February.

Predicting continuing slowness in the computer market and excess semiconductor inventories, SIA President Thomas D. Hinkelman forecast a second-quarter semiconductor order rate of $2.5 billion to $2.6 billion, compared with $3.57 billion in the second quarter of 1984. He estimated that the yearly shipment figure for 1985 would total $10.4 billion, off approximately 10% from 1984.

"[The semiconductor industry] recovery continues to be hampered by weak orders for computers and office equipment, whose manufacturers consume about 40% of all semiconductors in the U.S. market," Hinkelman said.

The SIA figures are based on manufacturers who participate in the World Semiconductor Trade Statistics program.



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COMPUTER INDUSTRY

Original plans dashed for Boscom high-tech center

By Clinton Wilder
CW Staff

BOSTON — The much-ballyhooed computer trade mart called Boscom may still open here in January 1986, but it will bear little resemblance to the size or purpose envisioned by its founders some years ago. Even the name Boscom may go the way of most of the other ambitious plans for the waterfront high-tech center.

Boscom lives on as one tenant of the World Trade Center of Boston, a business center that plans to offer one-stop access to banking, commerce, shipping and other services to American and international firms doing business overseas. The center received the official blessing of the World Trade Center Association at the association's quarterly meeting in Tokyo April 2.

The new hope for the center is a bittersweet feeling for Boscom, which originally was to occupy the entire site (then 500,000 square feet) with computer vendor displays and demonstrations — an Infomart of the East Coast.

But when two years of marketing resulted in only a handful of leases to high-tech vendors, underwriters FMR Corp. of Boston decided on a different tack. FMR included the project in a joint venture with several other local real estate interests in September 1984 that became part of the World Trade Center. Boscom will use 25% of the center's floor space.

Boscom and its nine computer industry tenants have been on hold since then, with 50% of its 200,000 square feet within the trade center leased. Now with a clearly defined scope and purpose, Boscom representatives hope to woo companies that did not bite in the first round.

Although marketing representatives were able to sell the concept to IBM, Xerox Corp., Lotus Development Corp., McCormack and Dodge Corp., Nynex Corp. and several smaller companies, they barely dented the list of 250 top industry vendors contacted.

"Trying to educate the industry that a computer trade center made sense involved a lot of time and marketing dollars," said Margaret Ake, Boscom's project manager and only remaining employee from pre-World Trade Center days. "It was hard to convince large, successful companies to do something different, and smaller companies weren't planning as far in advance as Boscom because the industry is so volatile."

The perception of competition with Dallas' Infomart and, to a lesser extent, San Francisco's Datamart did not help, either. "Infomart was the first, and some companies only wanted to try one market center as a test," Ake said. "A lot of people thought if anyone was going to be successful, [Infomart developer] Trammell Crow would be. And many companies already had sales offices in Boston, whereas Dallas was more of an untapped market."

Boscom representatives will now try to downplay the Infomart competition and emphasize the advantages of an international business center. Ake led a delegation of four Boscom officials to California's Silicon Valley earlier this month, approaching several of the same firms that were cool the first time around.

"With the World Trade [Center] aspect, it's different, which will help," Ake said. "And we've realized we're not in competition with each other. I think there is plenty of room for one computer mart in San Francisco, Dallas and Boston."

But any success may inevitably be compared to the original vision of Boscom, which many viewed as a can't-miss proposition in the heart of one of the world's major computer technology centers.

"In the brochure, we still refer to it as Boscom," said World Trade Center of Boston spokeswoman Kim Whittaker. "But to be perfectly honest, I don't know whether the name will be kept."

Sorbus to offer STC service

FRAZER, Pa. — Third-party maintenance provider Sorbus, Inc. announced recently it will provide maintenance to users of Storage Technology Corp. (STC) tape and disk drives and printers.

Sorbus, the former service division of Management Assistance, Inc. that was sold to Bell Atlantic Corp., said it will initially offer on-site agreements to STC users in 12 metropolitan markets: Los Angeles, Denver, Dallas, Houston, Chicago, Detroit, St. Louis, Atlanta, Boston, New York, Philadelphia and Washington, D.C.

Ronald A. Wallace, president of Sorbus, said the company has received a number of inquiries about service for products manufactured by STC, which has been operating under Chapter 11 of the Federal Bankruptcy Act since last fall.

"It makes good marketing sense to offer STC customers the opportunity for single-source service for both the peripherals and the IBM mainframes to which most of the STC drives and printers are attached," Wallace said.

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NICKELS AND DIMES

3Com Corp. reported that revenue for the third quarter ended Feb. 28 increased 129% to $10.3 million from $4.5 million in the same quarter last year. Profits were $859,000, or 6 cents per share, compared with $500,000, or 4 cents per share, in the comparable period one year earlier.

■

Measurex Corp. announced profits for its first quarter ended March 3 of $4 million, or 44 cents per share, compared with $2.2 million, or 28 cents per share, in the like quarter last year. Revenue was $44 million, a 22% increase over $36.1 million earned in last year's first quarter.

■

Systematics, Inc. reported earnings for the third quarter ended Feb. 28 of $2.23 million, or 20 cents per share, compared with $1.4 million, or 13 cents per share, in the same quarter last year. Revenue was $24.4 million, compared with $20.5 million in the prior year's quarter.

■

Evans & Sutherland Computer Corp. announced revenue for the 1984 fiscal year was $70.1 million, a 16% increase over 1983 revenue of $60.6 million. Profits were $7.3 million, or 83 cents per share, down from $10.8 million, or $1.21 per share for fiscal 1983.

Revenue and profits for the fourth quarter of 1984 were, respectively, $20.2 million and $1.8 million, or 20 cents per share, compared with $17.8 million and $3.6 million, or 40 cents per share, for last year's quarter.

■

Software AG Systems, Inc. reported revenue for the third quarter ended Feb. 28 was $12 million, compared with $10.5 million in the like quarter last year. Profits were $1.2 million, or 22 cents per share, compared with $1.7 million, or 27 cents per share, for the same period of the previous year.

■

Tektronix, Inc. announced profits for the third quarter ended March 2 of $26.8 million, or $1.38 per share, compared with $25.7 million, or $1.34 per share, in the comparable period last year. Revenue was $418.3 million, compared with $402.4 million in the previous year's quarter.

■

On-Line Software International, Inc. announced profits of $360,000, or 10 cents per share, for the third quarter ended Feb. 28, compared with a net loss of $241,000, or 6 cents per share, for its third quarter one year ago.

■

Danaleer, Inc. reported profits for the fourth quarter ended Dec. 28 of $202,000, or 3 cents per share, compared with a loss of $5.7 million, or 74 cents per share, for the corresponding period in the prior year. Revenue was $5.9 million, compared with $162,000 in the like quarter one year earlier.

■

Science Management Corp. announced revisions to its 1984 results because of a reallocation of tax benefits between continuing and discontinued operations.

The net losses for the quarter ended Dec. 31 and for the year remain as previously reported, but the continuing and discontinued operations components are revised. Income from continuing operations for the fourth quarter was revised from $191,000, or 7 cents per share, to $634,000, or 24 cents per share.

The loss from discontinued operations for the fourth quarter was increased from $1.05 million to $1.55 million, while the loss from the discontinued operations for the year was revised upward from $2.13 million to $2.37 million. The estimated loss on the disposal of the software systems division, included in the loss from discontinued operation for both the fourth quarter and the year, is now $1.2 million instead of $912,000.

TI

from page 67

enue dropped 3.8% to $1.29 billion from $1.34 billion in the same period a year ago.

Although the company said both its computer- and noncomputer-related businesses were slumping, semiconductor industry analysts said TI's downturn reflected its major stake in the hard-hit memory chip market.

TI is a leader in production of memory chips such as the 64K- and 256K-byte products, which have experienced a greater decline in demand than the market for microprocessor chips.

TI officials painted a dim picture for the rest of this year. Bucy predicted a 15% drop in semiconductor demand this year, and other TI officials said domestic markets would drop 19%. Both figures are more pessimistic than recent prognostications by analysts and the Semiconductor Industry Association.

"More so than any other major semiconductor supplier, TI has a decided tilt to generic memory chips," said A. A. LaFountain III, president of LaFountain Research in Bay Head, N.J. "That factor more than anything else leads them to portray the market in such gloomy terms. It's a realistic prediction for their product mix."

TI's layoff announcement was the latest in a series of bad news for company employees. The company reduced its work force by 2,000 in December, then announced in February that the temporarily shortened workweek at its semiconductor manufacturing facilities will be continued through the first half of this year.

Company officials cited a continuation of the inventory backlog that has plagued the industry as the reason for additional layoffs.

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And you can see everything through on-screen "windows" and control it all with easy-to-use pop-up menus.

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*IBM Product Center price.

IBM Presents "Christopher Columbus," The Untold Story, May 19 and 20, 8PM ET on CBS.

IMLAY

from page 67

field is growing at a 50% rate, and they're capturing their share of the market. As they get into applications, I think they'll find it a bit different. The need to deal with the end user is a bit different."

On Cullinet's strategy of relying on a data base product: "They're a little bit closer to the fire than we are. If IBM [microcodes software] and comes out with an effective data base package that can compete well with Cullinet, it could bode trouble, just as [Storage Technology Corp.] was in trouble when IBM came out with a disk. Whether IBM closes its machines is still a debatable issue."

On MSA's future strategy in the micro software area: "We're emphasizing workstation software — packages that can be used in a workstation environment and are dedicated to the corporate workstation. We will layer all our systems under Information Expert [MSA's fourth-generation productivity tool] so they can dispense information up and down [from a host] to the microcomputer workstation."

On the domestic division of Peachtree, not yet sold: "We've sold Eduware and Designware to [Encyclopaedia Britannica, Inc.]. We sold our international operation and the micro distribution division. Those went very smoothly. On the Peachtree side, which is word processing and accounting systems, we have had many, many negotiations. Some people turned out not to have money. We hope to have it wrapped up within a couple of weeks." (Imlay would not comment on to whom the division may be sold.)

With the chance, what he would have done differently at MSA: "You're never really happy. If you were, you'd become complacent. But we probably would have gone after more acquisitions more quickly than we have in the past. We probably would have grown the company a little bit faster than we did. Basically, I'm very satisfied."

On Peachtree: "If I had to do it over again . . . I would have done it. At the proper time, it seemed like a good thing to do. I guess we were the first [company] to announce our intentions to get out [of the microcomputer software market]. Since then, we've seen a lot more leave the fold. The market went bad.

"It's very difficult to manage the price deterioration that took place, to manage the piracy. It turned into a merchandising business. We were competing for racks and shelf space. That's not our business. What's the gambler's song — 'You've got to know when to hold and know when to fold up.' "

Strengths and weaknesses of MSA vs. Cullinet; Cincom Systems, Inc.; Hogan Systems, Inc.; and Walker Interactive Products, Inc.: "Our strengths are in our people, our customer base, our technology. We feel we can compete with anyone.

"But the one you didn't ask about, and the one you should ask about, is IBM. We think we're four years away from [it], and we'll be ready for [it], with great strength in our customer base. The concern is not so much with the independents — not to say they are not worthy competitors — but in being ready for IBM when [it gets] in the business."

On the role of stand-alone applications vendors: "A full-service vendor has a great advantage. But there are specialty companies that still have a niche. They'll be very healthy, $20 million companies in the future."

On MSA's emphasis on Information Expert, first announced last fall: "We're conservative in our policies in that we like to have a product tested and working and deliverable [before its announcement]. The R&D has gone on for four or five years. It's here now, and we can sell it. When you talk about futures, sometimes vaporware appears. Last year, we [told] the users it was coming, and the first people began to use it."

What makes a revolutionary idea revolutionary?

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First, it has to be new. Really new. STEAMER is new. Brand new. It's an extremely powerful data compressor combined with a very efficient statistical multiplexer. And it's about to set the data communications industry on its ear.

Our data compression ratio is better than anyone else's. Nobody but nobody can produce better data compression efficiencies than we can with STEAMER. By using advanced statistical multiplexing techniques which yield statistical efficiencies of about 8 to 1, and passing the statistically multiplexed data through a proprietary algorithm, we get data compression efficiencies averaging 2.2:1 to 3.2:1.

Columbus may have changed the way people thought about the shape of the world. But we've changed the way the world thinks about data compression.

That's significantly higher than anyone else. And it means increased throughput and operating efficiency for you. Columbus may have changed the way people thought about the shape of the world. But we're changing the way the world thinks about data compression.

Proprietary compression algorithm: the heart of the matter.

Our proprietary compression algorithm continually analyzes the incoming data stream on a port-by-port basis and compresses the most frequent strings into shorter strings. If the '48 Beetle taught people to think small, we're teaching them to think short.

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In fact, the STEAMER compression routine is so efficient, it virtually guarantees no additional delay added to response time. Our compression algorithm can compress or decompress 3,000 characters per second. That's the equivalent of a 14,400 BPS circuit operating at an 83% saturation rate in both directions simultaneously!

[illegible]

We compress the uncompressible. They said it couldn't be done. But we did it. In some graphics applications we got better than a 2:1 data compression ratio. We can even compress object code files. Which means that in addition to being an outstanding choice to ensure exceptional throughput and operating efficiencies, the STEAMER is really the *only* machine that can do all of the following: remote file transfer, some graphics applications, computer to computer and computer to terminal communications on the same link, maintain system throughput even when modems must operate in fall back mode because of line degradation, increase terminal quantity without scrapping the current modem investment, and relatively secure communications without the necessity of buying expensive encryption equipment.

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Revolutionize your network today. Call 1-800-[illegible] now and we'll tell you even more about STEAMER. And don't wait. STEAMER'S going to do to all other stat muxes and data compression machines what the easy open pull top can did to can openers. Make 'em obsolete.

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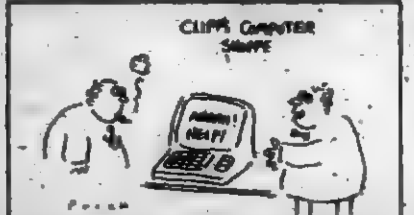

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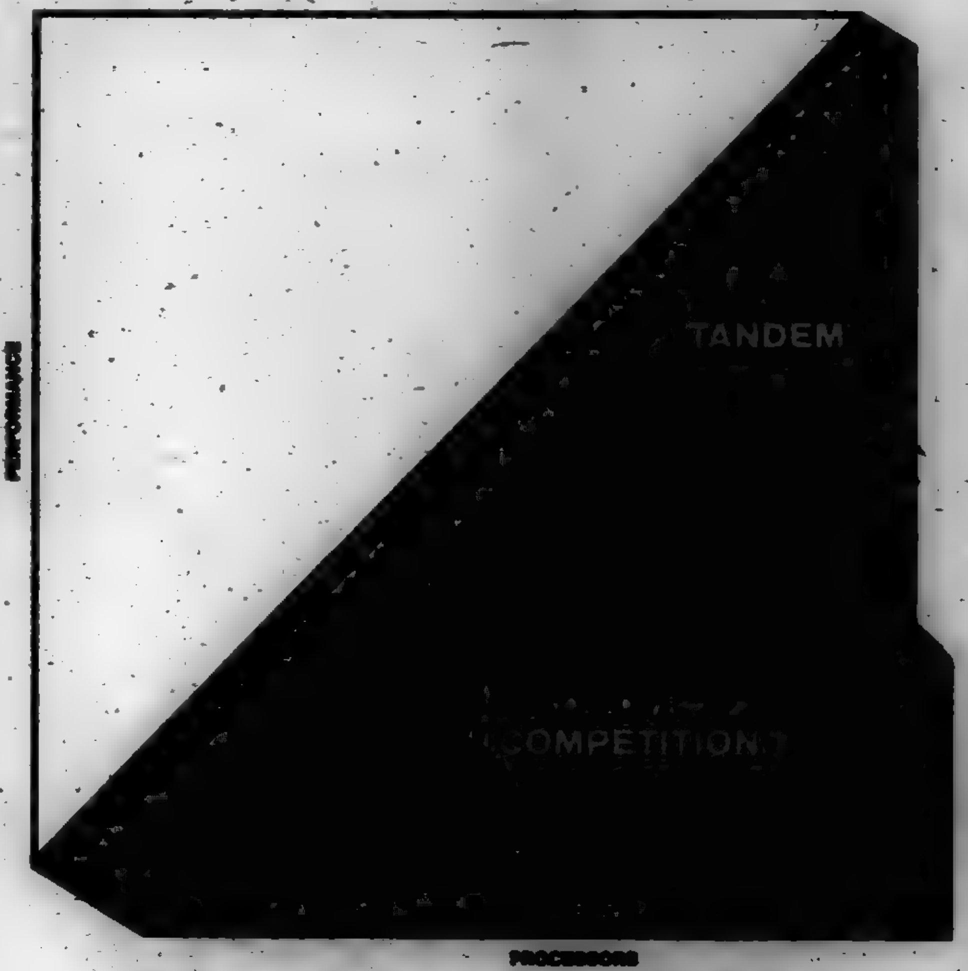
AND HOW THE LEADER IN ON-LINE TRANSACTION PROCESSING INCREASES PERFORMANCE.



As Tandem grows, so does performance. The competition can't keep up.

WHAT COMPUTER FAT IS.

Computer Fat is created when you buy more computer than you need. With conventional computer architecture, you have no other choice. You buy the closest fit available and grow into it.

This is wasteful and very expensive.

WHAT IT DOES TO PERFORMANCE.

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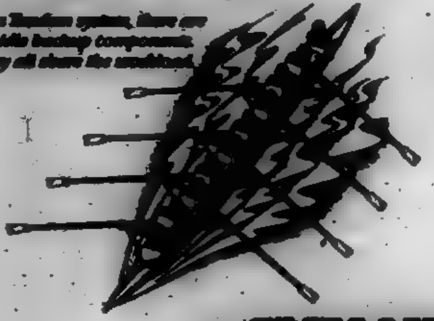

In a Tandem system, there are no idle backup components. They all share the workload.

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TAXES

from page 67

split that the U.S. Department of the Treasury's tax reform proposal has created in the usually close-knit community of business lobbyists.

The Treasury Department's tax reform proposal would eliminate most business tax breaks — including accelerated depreciation and the investment tax credit — in return for cutting the corporate tax rate from 46% to 33%. Many in the business community are lobbying the department to make changes in the plan before it emerges in final form from the White House in mid-May.

But at the conference, held by the Institute for Research on the Economics of Taxation (Iret), speakers said some firms are lobbying hardest for retention of accelerated depreciation and other capital formation incentives, while others are lobbying hardest for a cut in the tax rate.

The conflict occurs because the tax reform plan is intended to be revenue-neutral in the corporate sector, so retaining corporate tax breaks (such as accelerated depreciation) requires a higher tax rate to pay for them, according to Iret President Norman B. Ture.

It is this trade-off that has split the business lobbyists into two main coalitions. IBM, for example, is part of the Coalition to Reduce High Effective Tax Rates. Members of this group are willing to sacrifice accelerated depreciation in order to reduce their relatively high tax rates.

IBM's Mattson said a host of special tax breaks that distort business decision making must be abolished so that corporate tax rates can be reduced. "Rates are first. We've got to bring them down," he said.

Opposing coalition

In the other camp are capital-intensive firms that give top priority to retaining the capital formation provisions of present law. This coalition includes the U.S. Chamber of Commerce, the National Association of Manufacturers, AT&T, GTE Corp., Honeywell, Inc., Chrysler Corp., Ford Motor Co., Exxon Corp. and Continental Airlines Corp.

In a recent letter to Treasury Secretary James A. Baker, the latter group argued that repealing the tax breaks would hurt business investments by raising the cost of capital, thus hampering economic recovery and U.S. competitiveness in world markets.

"I think it's inevitable that the business community is going to be deeply divided [on major tax reform]," observed John M. Albertine, a prominent Washington lobbyist and president of the American Business Conference, Inc.

The Treasury Department reportedly is considering retention of some tax incentives, such as a modified depreciation schedule, to woo more business support for tax reform. "A few squeaky wheels need to be greased," commented Rep. James R. Jones (D-Okla.).

Sen. Phil Gramm (R-Texas) advised the audience to lobby for those changes now, because it will be difficult to make major changes once a bill emerges from the White House. Subsequent efforts to win tax breaks will be derided by the public as special interest lobbying, he said.

ULTIMATE

from page 67

12 years ago, UCS grew to $10 million in revenue last year and currently ships out about 1,000 IBM computers a month after reconditioning or refurbishing, LaRocca said. When dealers and lessors move a piece of equipment from one user to another, it generally requires refitting of various features and, in many cases, repair as well.

It recently began offering maintenance of Storage Technology Corp. equipment and plans at some point to become involved with Digital Equipment Corp. computers.

The company is also involved in equipment removal and reinstallations. LaRocca said he hopes to increase site-to-site involvement from the current 25% to 40% range to about 75%. UCS also warehouses equipment and optional features, enabling lessors and dealers to hold inventories of machines and options and to fill specific orders from stock.

UCS customers

Although its primary customer base is most of the 280 members of the Computer Dealers & Lessors Association, UCS also provides similar services in varying degrees to about 50 large end-user clients. UCS has accumulated a large stockpile of cables, and LaRocca said that with large data center moves, "the odds are that 90% of the cables in the floor [of the old site] will be the wrong size [for the new site]."

The firm sells its ability to turn over the equipment requirements of its customers rapidly. "By the time someone could get a quote from IBM [for refurbishing], we've done it and had the equipment installed for six months," LaRocca said.

A large part of business in recent months has been power-cycle conversions of European-manufactured IBM equipment being shipped to the U.S. to take advantage of the imbalance in currency exchange rates, according to LaRocca.

UCS had planned eventually to open refurbishing centers in four or five other metropolitan areas. "TRW is financing us to do that," LaRocca explained. Aside from the undisclosed financial terms of "an offer I couldn't refuse," LaRocca said the greatest change for him has been adapting to a large corporate environment.

"Things move a little bit slower than I'm used to, but that makes me think things out a little more than I might have done before," he said.

TRW deal attractive

LaRocca said four or five equipment manufacturers contacted him about establishing business relationships, but he said he was not convinced of their long-term commitments. He found the TRW offer attractive because he was convinced TRW would establish a presence in IBM equipment maintenance, and he saw an opportunity to set the tone for that presence and move UCS personnel into key TRW positions.

For TRW, Barnett explained, the deal provides expertise in large mainframe equipment that their Customer Service Division had not previously developed.

The UCS field service engineers that were absorbed into the TRW field organization will provide an opening into large data centers, he added.

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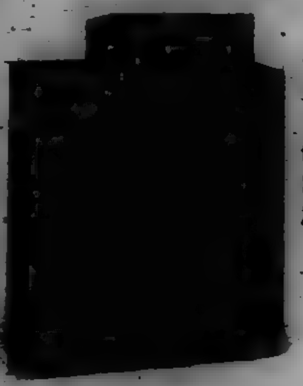

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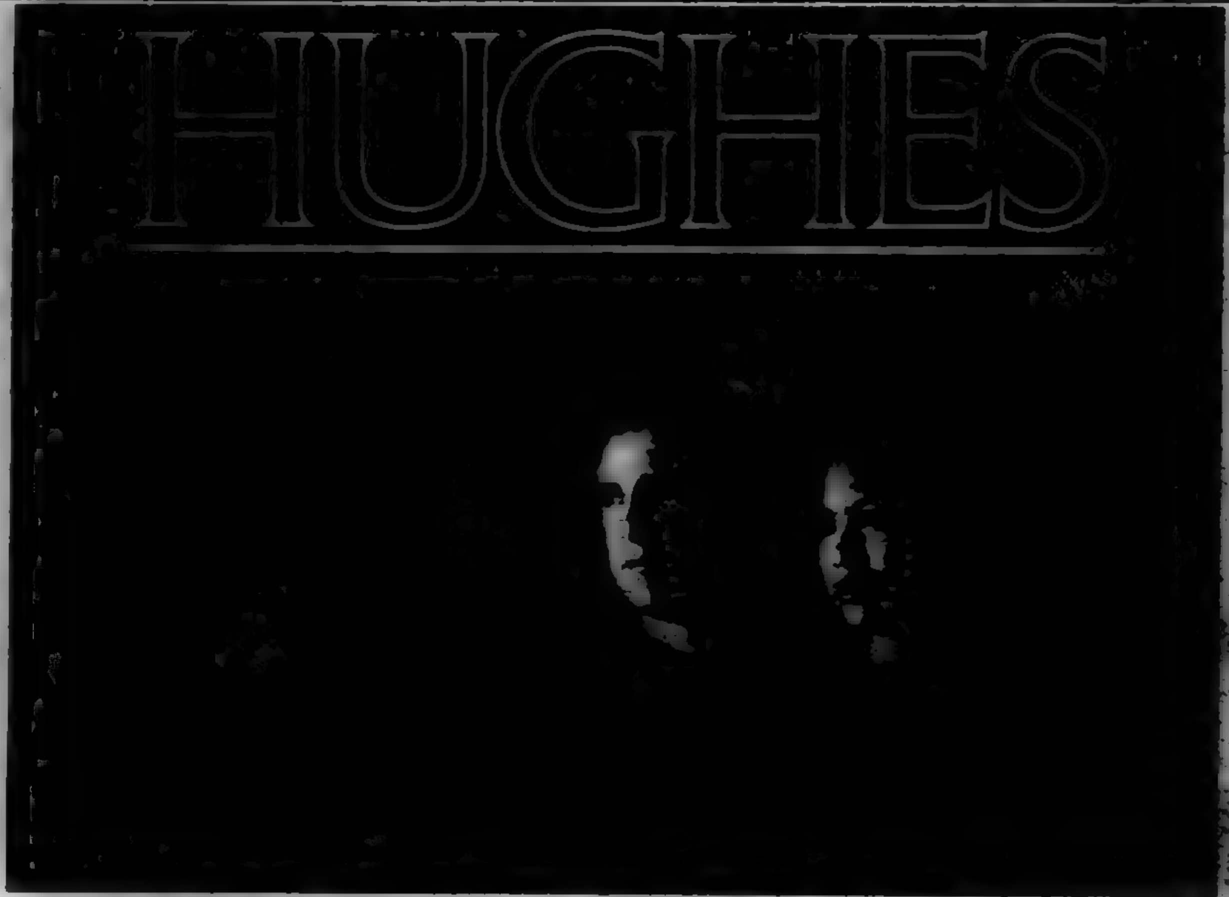

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3 POSITIONS AVAILABLE

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GRAPHICS PROGRAM DEVELOPER

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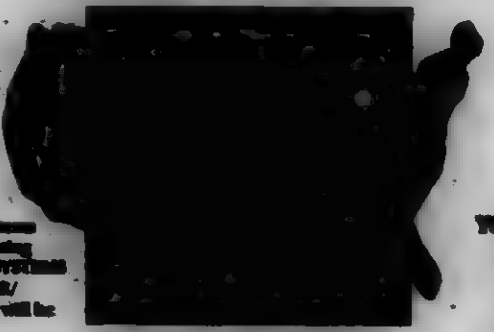

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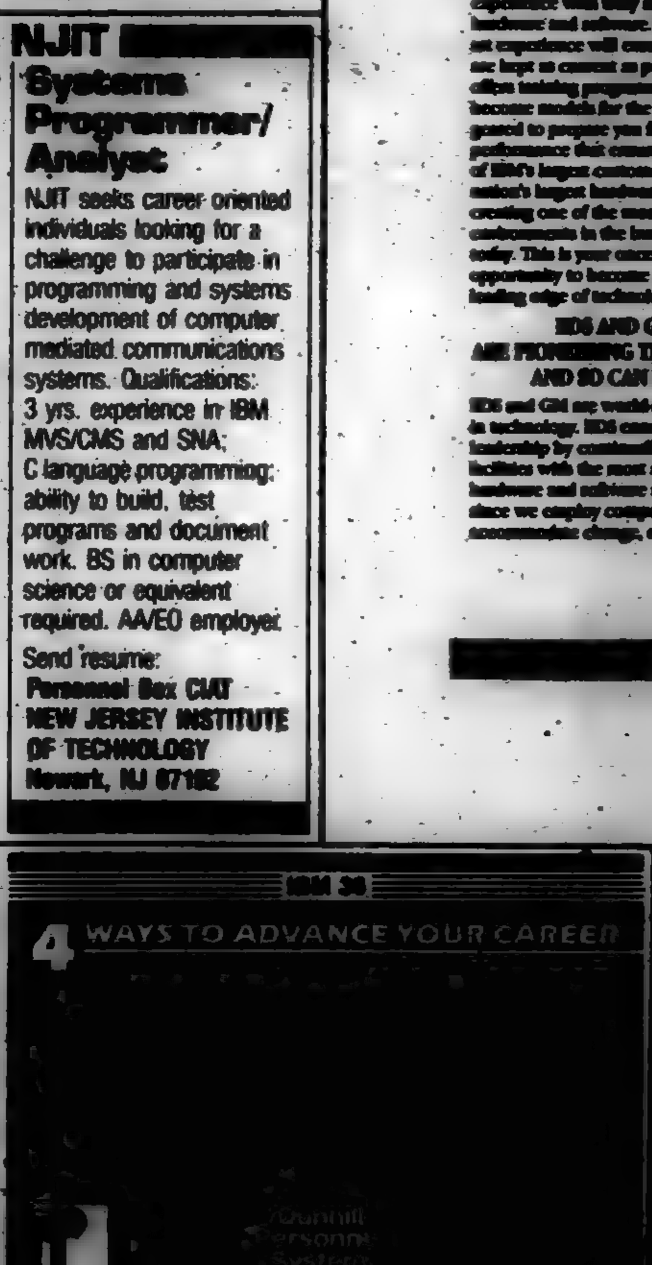

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Community College
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Rock Springs, WY
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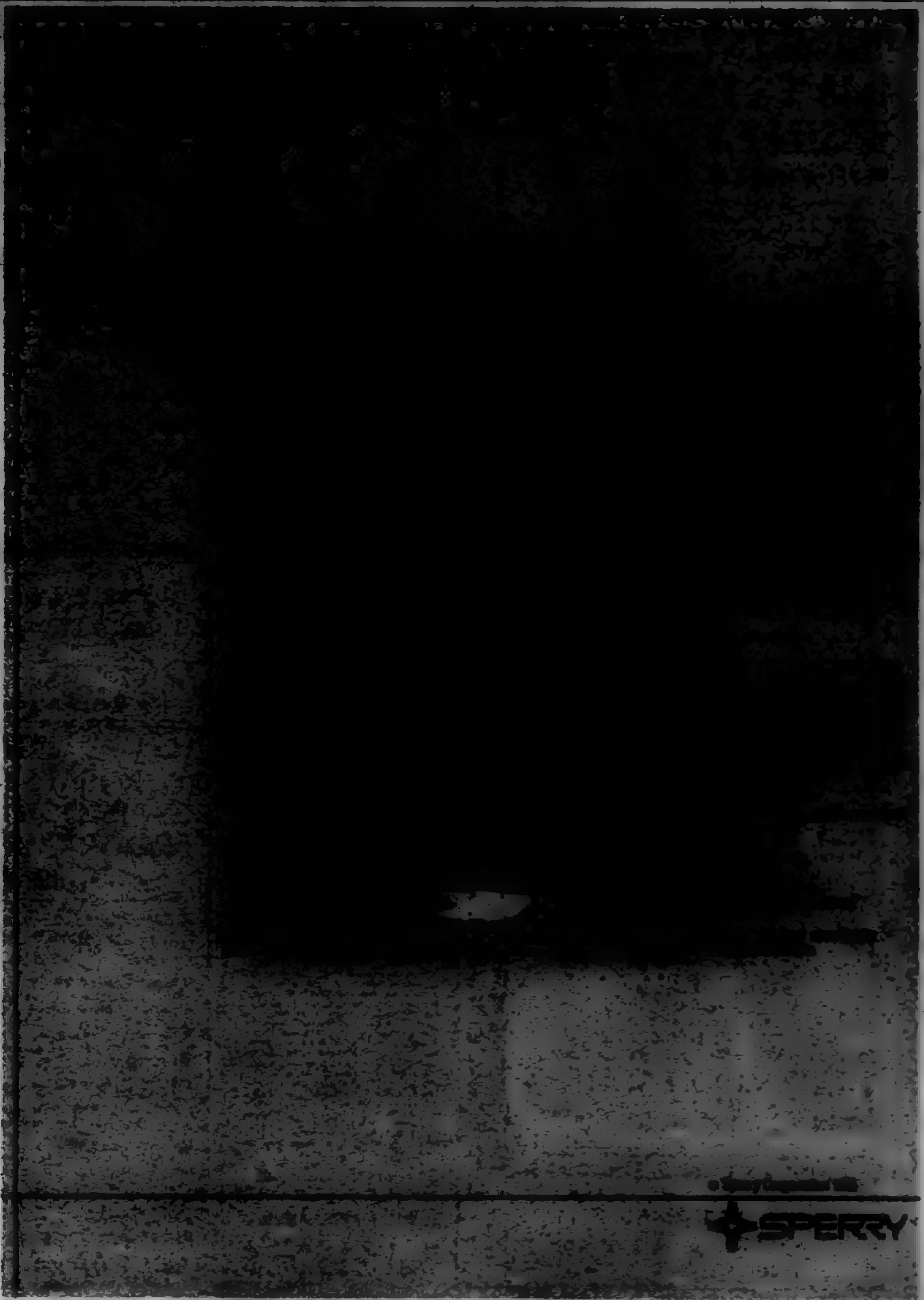

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The University of Kentucky, Institute for Mining and Minerals Research has an opening for a Systems Programmer. Examples of work are: test, check, and analyze program functions to identify faults and design corrections; work with field service engineers to help isolate computer hardware problems; and design and implement new system software including new device drivers and handlers for non-standard devices and specialized applications. Facilities include a VAX 11/780, PDP 11/23 and PDP 11/34. Knowledge of VMS, RSX, FORTRAN, Assembler, and BASIC is a definite plus. Minimum requirements are a BS degree in Computer Science, Electrical Engineering, or a related field and two years experience or the equivalent combination of education and experience. Deadline for receipt of letter of application, including minimum acceptable salary, and resume is May 10, 1985 but may be extended if additional applicants are necessary. Send to: Lee Procter, Lexington Campus Employment Office, East Maxwell Street, University of Kentucky, Lexington, Kentucky 40506-0014.

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- The selected individuals will work primarily in the support/development of end-user applications on the mainframe and must be able to respond to a broad spectrum of user needs. Previous development experience using COBOL or PL-1, JCL, and IBM utilities in an OS/MVS environment required. Knowledge of Structured System Development, SAS, IMS and IBM PC software a plus. Knowledge of IMS DB/DC required for some positions.

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- This position provides analytical and technical support for real-time systems problems, resolves service disruptions, assists in quantifying transaction response time, and develop solutions for computer resource utilization in communications. The selected applicant will have at least five years network operations experience in a large scale environment with thorough knowledge of BASIC, VTAM and NCP software. A Bachelor's degree with an Electrical Engineering major is a plus.

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- This individual investigates production failures, performs recovery/start-ups, and develops disaster recovery plans. Requirements are six years operations experience in a large mainframe environment with two years in Production Control a plus. Thorough knowledge of TSO, OS/JCL and UCC 7/11 is essential.

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(209) [illegible]
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COMPUTER SCIENCE

Lyndon State College is [illegible] Vermont [illegible] computer science faculty [illegible] ACM program [illegible] Department of Mathematical Sciences. [illegible] Ph.D. in Computer Science [illegible] VAX 11/780 and UNIX [illegible] VAX 11/750 [illegible] by May 24, to Perry Viles, Dean of Academic Affairs, Lyndon State College, Lyndonville, VT 05851. EOE.

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[illegible]
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Minneapolis, MN 55402

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James R. Tate
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DATABASE ANALYST

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SENIOR DATABASE ANALYST: 6 years experience in EDP and 3 years experience in Database Administration are required, with IDMS or IMS included in this experience; must be able to develop both logical and physical database designs; code and compile schemas, subschemas and DMCL's; provide technical support to the application group; system installation and internals knowledge is a plus.

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Dallas, Texas 75230 (214) 661-[illegible]
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Denver, Colorado 80210 (303) 758-[illegible]
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2000 Town Center, Suite 2500
Southfield, Michigan 48075 (313) 353-[illegible]
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STANFORD UNIVERSITY
Personnel-Ref. #47257
Attn. Kathy [illegible]
Stanford, CA 94305
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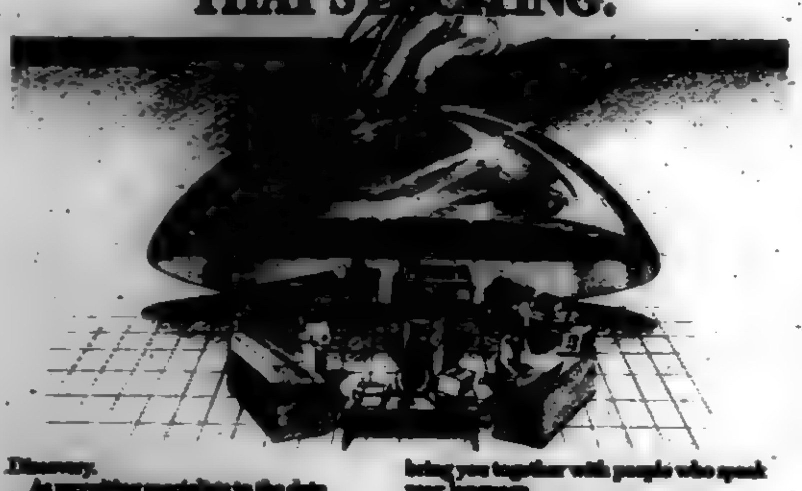

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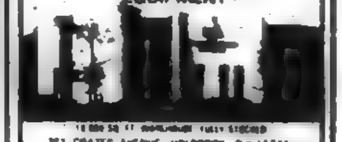

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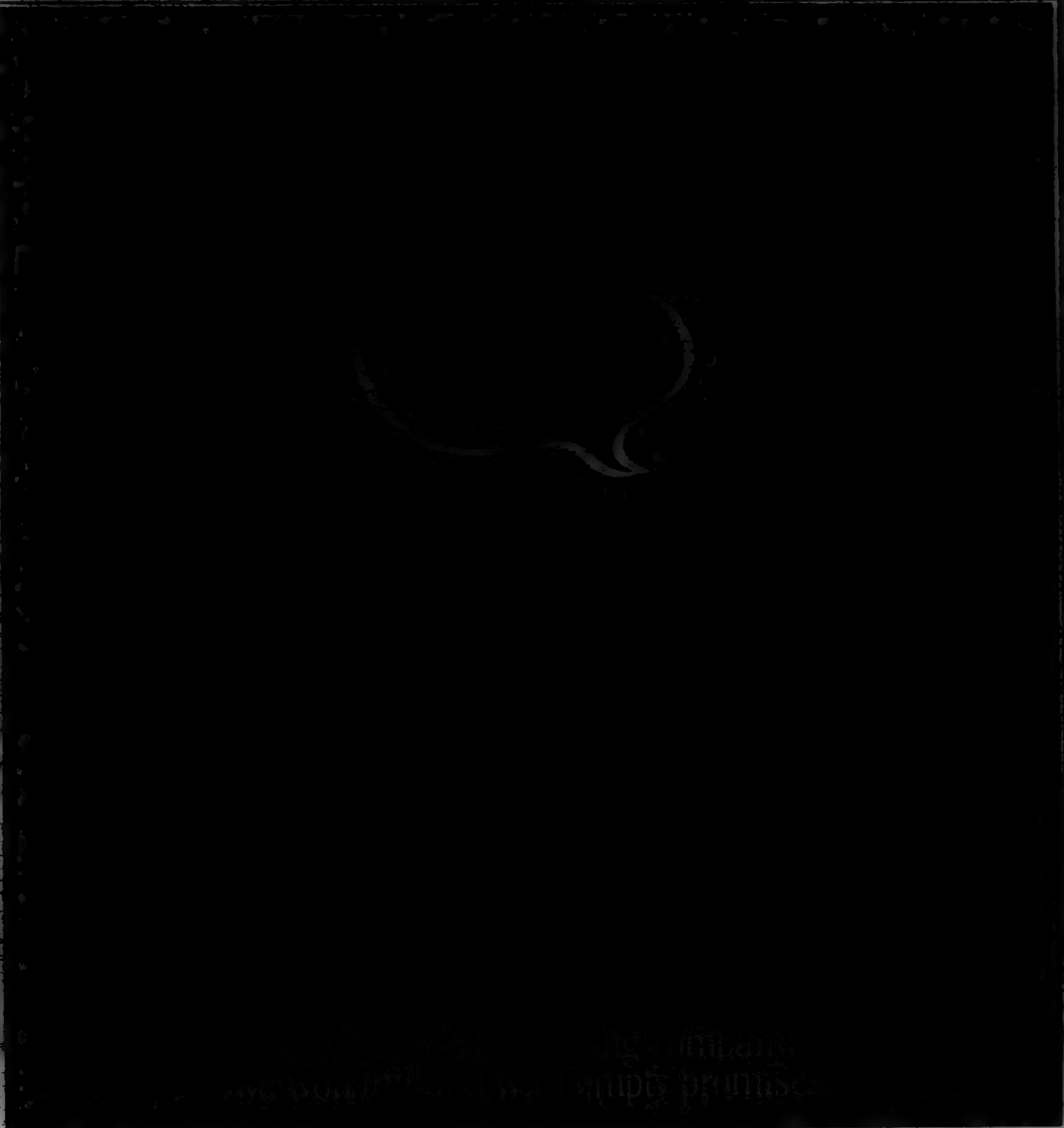

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4321	0.25	1	4381-3	4.0	[illegible]
4331-1	0.25	0.5 to 1	3083E	4.2	[illegible]
4331-11	0.38	1 to 2	3033N	4.3	[illegible]
4331-2	0.50	1 to 4	[illegible]	4.4	[illegible]
4341-9	0.52	1 to 4	3033UP	[illegible]	[illegible]
4361-3	0.70	2 to 4	[illegible]	[illegible]	[illegible]
4341-10	0.75	2 to 4	[illegible]	[illegible]	[illegible]
4341-1	0.88	2 to 4	[illegible]	[illegible]	[illegible]
4341-11	1.1	2 to 8	[illegible]	[illegible]	[illegible]
4361-4	1.15	2 to 12	[illegible]	[illegible]	[illegible] to 24
3031	1.2	2 to 6	3083JX	[illegible]	[illegible] to 32
4361-5	1.46	2 to 12	[illegible]	[illegible]	16 to 32
4341-2	1.5	2 to 16	[illegible]	[illegible]	16 to 48
4341-12	1.85	2 to 16	[illegible]	[illegible]	[illegible] to 64
3031AP	2.0	2 to 8	[illegible]	[illegible]	16 to 48
4381-1	2.1	4 to 16	[illegible]	15.5	16 to 64
3032	2.5	2 to 6	[illegible]	26.8	32 to 96
4381-2	2.7	4 to 32	[illegible]	28.7	32 to 128
3033S	2.9	4 to 16	[illegible]	29.4	64 to 192
*3083CX	3.3	8 to 32	[illegible]-400	32.9	128 to 384

*First [illegible] installation 1987

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SYSTEMS	MIPS	MEGABYTES
470[illegible]	[illegible]	[illegible]
47[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] 32
[illegible]	[illegible]	[illegible] 64
[illegible]	[illegible]	[illegible] 64
5[illegible]	[illegible]	16 to 64
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58[illegible]	[illegible]	32 to 128
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AS/8083	8.4	16 to 32
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AS/9050	9	8 to 48
AS/9060	11.2	16 to 64
AS/9070	16.2	16 to 64
AS/9080	20	16 to 64
†AS/XL-60	28	32 to 256
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The above information is intended as a guideline for computer users on relative computer system instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is not responsible for the accuracy of the MIPS data. Cycle times will vary based upon hardware/software configurations, and system manufacturers continually modify computer models as design improvements in hardware and software arise.

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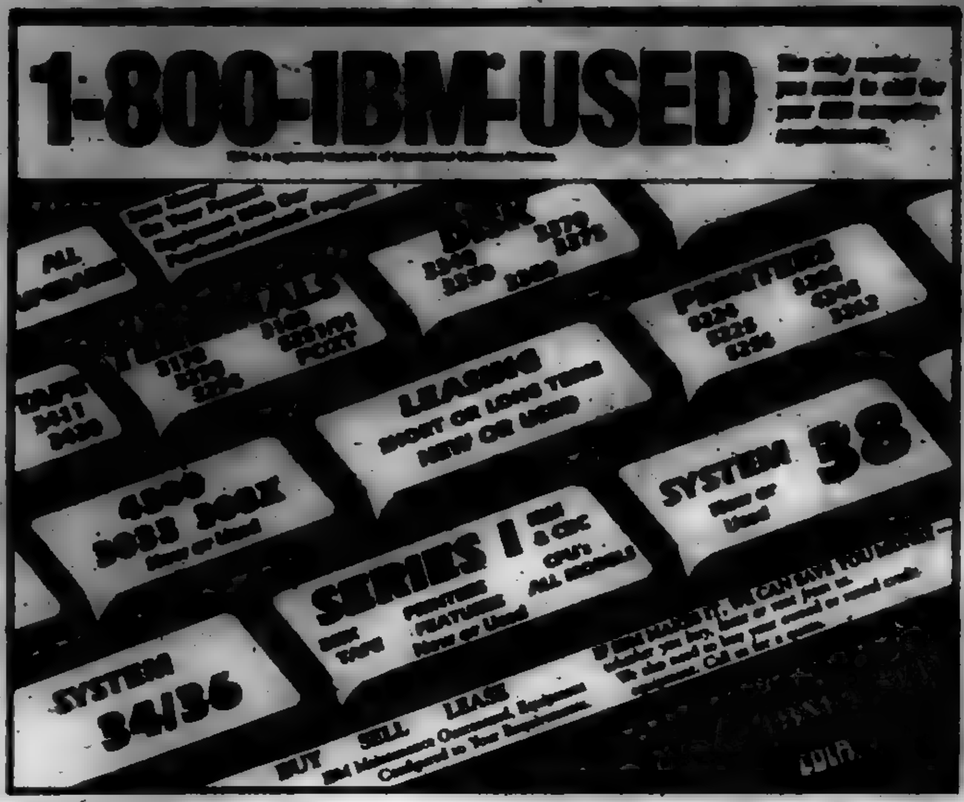

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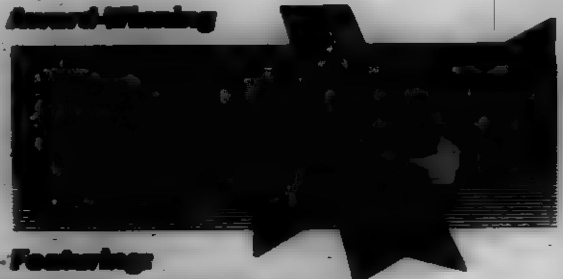

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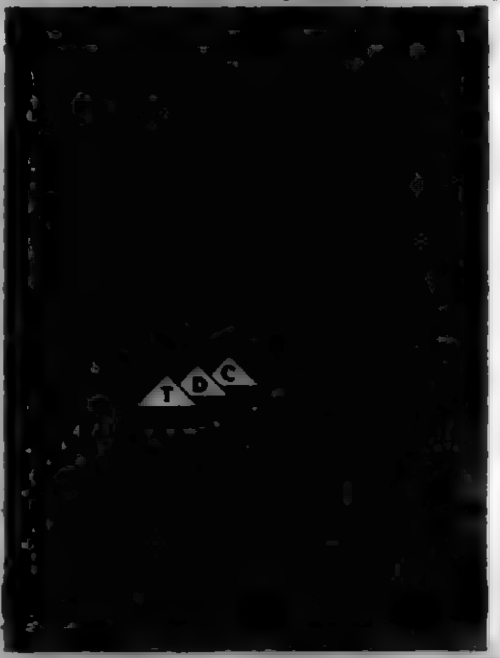

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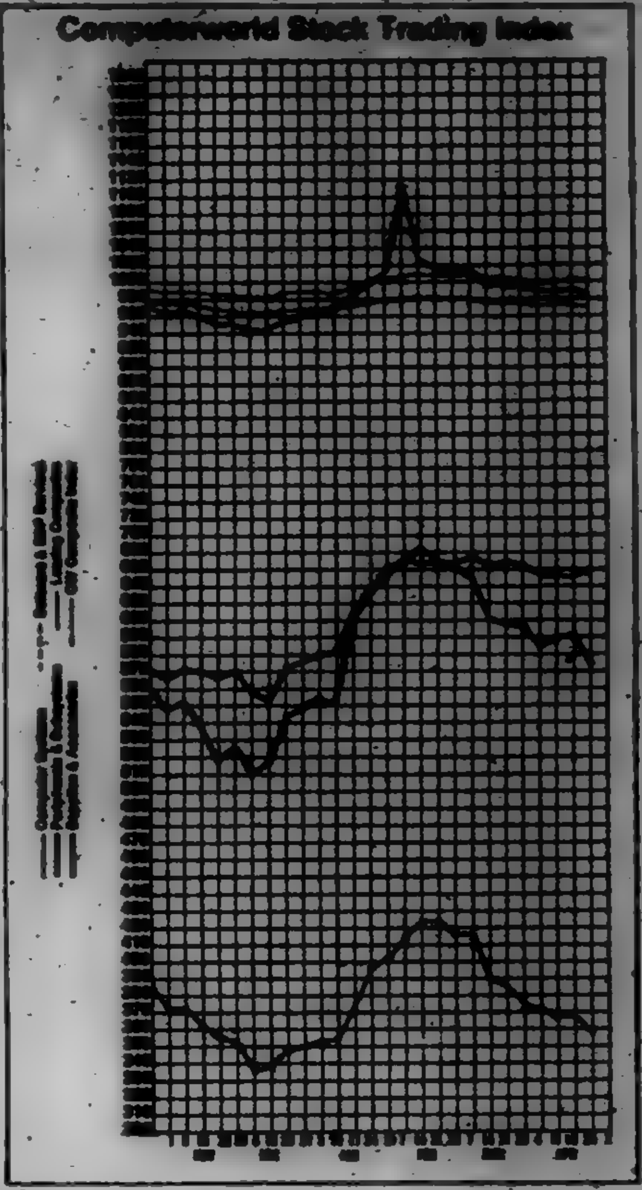

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Starts today
Comdex/Spring '85 previewed/16

In Depth
New partners in information ID/1

In Depth
Part 2:
Primer for friends and lovers/ID/7

Technology yields banks slim return on investment

By Charles Babcock
CW New York Bureau

NEW YORK — Banking institutions invested heavily in high technology at the end of the 1970s, but no bank or group of banks emerged with a competitive advantage as a result.

That is the conclusion reached by the Big Eight accounting firm of Touche Ross & Co. in a recent survey of executives at 200 banks worldwide.

Spokesmen for the New York management consulting firm declined to speculate on what would have happened if a bank had not invested in technology during that period. Instead, they said technology costs to banks were higher than anticipated without yielding any long-term competitive advantage.

Even Citibank N.A. here, recognized as having gained a consumer market share through its early use of automated teller machines, has found costs rising in step with new revenue.

"There is no bank that has grown significantly and kept costs down," said Jack Shaw, a Touche Ross senior consultant.

The survey reported disappointment on the part of many senior executives at major banks, including 50 in the U.S., that computerization had not yielded more bottom-line benefits.

The Touche Ross researchers said, however, that banks' spending on technology will not slacken. Rather it will "increase sharply between now and 1990" because of the competitive pressures of international banking, they reported.

At the same time, senior bank executives will try to improve the investment's contribution to bank profits by linking new technology more closely to marketing plans, Shaw said.

In the case of automated teller ma-

See BANKS page 8

TOP OF THE NEWS

Lisa, we hardly knew ye. Apple Computer will cease production of its once-vaunted microcomputer. Page 2.

■

From tape to cartridge in three months. An early user of IBM's 3480 tape drive converted about 70,000 3420 reel-to-reel files to the 3480 cassette format in three months. Page 3.

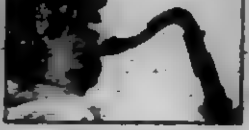
■

Xerox and Compaq rolled out the micros, the former unveiling a series of five IBM-compatible machines and the latter a line of portable IBM Personal Computer AT compatibles. Page 12-13.

Applied Data Research offered IBM IMS and DL/1 users another pathway to relational data base management system technology by introducing automated migration software. Page 14.

■

A flair for the offbeat. Phillipe Kahn, founder of Borland International, has gone from a garage office to the big time in two years. Page 51.



■

Bypass cost, payback have users wary

Last in a series on corporate bypass strategies.

By John Dix
CW Staff

Although some companies already benefit from communications bypass technologies, many users are not sold on the idea because of high up-front costs and fear of being locked in by the systems.

Users interviewed said they are continually surveying bypass technology with an eye toward fluctuating common-carrier rates and service options. Some said, however, that their geographically dispersed networks made bypassing standard telephone facilities impractical.

While cost is the factor most commonly used to justify bypass systems, it is not the only consideration users cited. The lead time associated with common-carrier circuit installation is a key motivation for bypass, according to Roland W. Sprouse, director of communications planning and engineering for American Airlines. "There are probably some savings to be gained by doing it, but the problem is getting service in a timely fashion and gaining control of escalating expenses."

American Airlines is stepping carefully, given the economics of the situation. "We're skeptical about going out and doing anything major right now because rates and tariff filings are being batted around, and things are so unstable," Sprouse said.

This flux, coupled with high up-front equipment costs, often makes it hard to cost-justify bypass systems within a permissible payback period.

"If a bypass system has a straight five-year payback, the investment would be questionable with all the dynamics in the industry right

See BYPASS page 8

FYI

Out of work at 46, manager sets DP skills on new course

By Charles Babcock
CW New York Bureau

After 25 years in MIS, David H. Dorbandt had come to see computer managers as agents of change. They continually needed foresight and adaptability to help others adjust to technology within their companies.

Now Dorbandt, 46, finds he needs all of his resourcefulness to cope with a change that has affected him more than many of his coworkers. It required him to cease representing his company and begin representing himself, a middle-aged man looking for a job.

On Feb. 4, Hoffmann-LaRoche, Inc., the Nutley, N.J., pharmaceutical company where Dorbandt worked for 18 years, announced it was cutting its staff by 1,000 employees because its patent on the drug Valium was due to expire and major revenue cuts were expected. Particularly hard hit was the systems development side of MIS, former employees of the department claimed. Dorbandt was a

See DORBANDT page 6

A look at tomorrow today

In this issue, *Computerworld* introduces Update, a monthly special section focusing on a series of management and technical issues of current and future interest to you, the reader.

Update aims to look at the near-term implications of future technologies as well as the critical management issues facing DP departments today.

The inaugural section of Update, titled "Toward the fifth generation," follows page 50 and provides a comprehensive look at the next-generation of technology. AI, expert systems, supercomputers, parallel processing and the race between the U.S. and Japan for the lead in these technologies are among the areas covered.

In June, Update will focus on recruiting and keeping a DP staff.

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NEWSPAPER

Random access

Industry sources said the strong U.S. dollar in international currency markets is resulting in a tremendous flow of European-manufactured IBM mainframes into the U.S. third-party market. Leasing firms are buying new and used mainframes in relatively inexpensive European currencies and shipping them to the U.S. One independent observer said IBM is winking at that practice but may come down hard on a European firm caught buying discounted new equipment from West German educational institutions and shipping it here for resale.

■

Tandem Computers, Inc. is already developing a successor to its recently introduced Nonstop EXT, according to sources close to the company. Like EXT, the follow-up machine will preserve Tandem's existing architecture and will be aimed at users in the branch or district offices of large corporations. But Checkmate, as the unannounced CPU is known internally, will be implemented in gate arrays — a technology not now present in Tandem processors.

■

Gate arrays will also form the technological base for a second processor model now under development within Tandem Computers, Inc., according to an analyst who follows the vendor closely. Continuing with its chess theme, Tandem has reportedly nicknamed the second processor Check and intends for the system to be a replacement for its current top-of-the-line mainframe, the Nonstop TXP. Check is said to be slated for introduction early next year.

■

Plea-bargaining talks have begun in the computer crime case of Philip Gonzales Fadriquela, a computer operator charged with illegally accessing U.S. Department of Agriculture computers in Colorado, according to a source. In February, a federal grand jury in Denver issued an indictment containing three felony charges and four misdemeanor charges [CW, Feb. 11]. A trial is scheduled to begin May 13 if the plea bargain falls through, the source said.

■

OEMs in the U.S. and Europe have gotten a good look at DEC's Microvax II, which could be unveiled next week. According to France's Matra Datavision, the product line will consist of five models, based on Cmos technology, with memory that can be upgraded from 512K bytes to 12M bytes. The upward limit of the Microvax I is 1.5M bytes. Low-end models in the line are expected to be available in June.

■

Management Science America, Inc. (MSA) is expected this month to announce a series of distributed personal computer applications, according to a company source. The micro applications will reportedly allow reference data bases to be downloaded via MSA's Expert Link to IBM Personal Computers for processing, including transaction validations and edits. The products will help relieve the host and lower communications costs because communication with the host is not required while the micro is processing. Prices will reportedly range from $1,000 to $4,000 per application, with site licensing available for companies with 100 micros or more.

■

Hewlett-Packard Co.'s much-ballyhooed Spectrum product family will make its long-awaited debut before year's end, according to Douglas Chance, vice-president and general manager of HP's Information Systems Group. Chance claimed that, contrary to recent reports, development work on the successor to the HP 3000 line is proceeding according to schedule. Chance said that about 40 Spectrum systems are up and running in various test sites.

Apple to drop faltering Lisa

By Kathleen Sullivan
CW West Coast Bureau

CUPERTINO, Calif. — Apple Computer, Inc. last week said it will halt production this summer of the Lisa personal computer, a system that gained recognition for its user interface design but floundered in the marketplace.

In the same announcement, Apple said it will introduce an external 20M-byte hard disk drive for its 512K-byte Macintosh computer this fall.

Subsequently, the company told securities analysts that it is considering further cost-cutting measures in light of slow demand for personal computer products. Commenting on Apple's recent performance, Chairman Steven Jobs last week said, "April has not been one of our better months."

Lisa users who were contacted were not dismayed about Apple's announcement. Joel Eide, microcomputer specialist with Winnebago Industries, Inc. said that for reasons he would not detail, the Forest City, Iowa, recreational vehicle maker was already planning to emphasize the use of IBM Personal Computers and compatibles, rather than the 21 Lisas it already has installed.

Asked if he would buy more Lisas at closeout sale prices, Eide said, "We have saturated our need for more Lisas."

In response to Apple's announcement, a user in the corporate data processing department of a major Los Angeles manufacturer said, "Apple took [its] time in terms of converting [the Lisa] to a [Macintosh], and frankly, I don't know what . . . we're going to do with it."

Introduced two years ago, the Lisa represented Apple's first venture into the corporate personal computer market.

Although the microcomputer was applauded for its use of icons, graphics and a mouse pointing device, analysts warned that its $10,000 price tag was too high.

Since its introduction, the Lisa's price has plummeted. The most recent price cut was announced at Apple's annual meeting in January, when the company launched its Macintosh Office. At that time, Apple renamed the Lisa, dubbing it the Macintosh XL, and cut its price to $3,995.

Only four months ago, Apple was describing the Macintosh XL — with its 1M byte of internal storage and 10M-byte internal hard disk drive — as the high-end system in its Macintosh Office. But its tenure in that office was short-lived.

Barbara Krause, a company spokeswoman, said Apple will continue to service and support the machine. This spring, Apple will begin shipping a number of products designed to enhance the system, including a kit to change the Lisa's screen resolution so that it corresponds to a Macintosh screen and software that will allow users to convert Lisa data files to Macintosh files, she said.

Tim Bajarin, an analyst with Creative Strategies International, a San Jose, Calif.-based market research firm, applauded the company's move. He said Apple's decision to suspend production of the Lisa would allow the firm to fine-tune its concept of the Macintosh Office.

Chris Steitz, an analyst with Infocorp, a Cupertino, Calif.-based market research firm, estimated that Apple had sold only 60,000 Lisa personal computers in two years. Although the machines began moving faster in recent months, it was probably a case of "too little, too late," Steitz said.

Analysts noted that the departure of the Lisa would leave a void at the high end of the Macintosh line, even with the introduction of the 20M-byte hard disk drive. They said Apple would fill that gap with future Macintosh announcements.

Krause said she did not know whether the decision would result in layoffs at Apple's Dallas plant, where workers assemble the Lisa, as well as the Apple IIc and Apple IIe. She said the company would try to absorb the workers affected by the announcement into its other operations.

CW senior writer Ed Warner contributed to this article.

NEWS SUMMARY

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Some placement professionals are pessimistic about finding jobs for out-of-work Honeywell users/6

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Compaq launched IBM Personal Computer AT-compatible products and cut prices on all existing models except the single floppy disk drive Portable Personal Computer and Deskpro Model 1/13

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IBM 3480 user converts 70,000 tape files to cartridge

By Tom Henkel
CW Staff

BARTLESVILLE, Okla. — One of the first users of IBM's 3480 tape drive, Phillips Petroleum Co. here, said it was so impressed with the unit that it decided to convert nearly all of its 10½-in., reel-to-reel 3420-type tape files to operate on the cartridge-based 3480.

It took Phillips roughly eight months from the time the first 3480 was delivered on IBM's early delivery program to convert approximately 90% of its 80,000 active tape reels to the 3480 format. Those eight months included testing and debugging the 3480. The actual conversion process took about three months, according to Russel Shelton, the company's manager of DP operations, in a recent interview.

The 10% of Phillips' active 3420-type reels that were not converted to the 3480 format contain data that is regularly sent to outside organizations, such as data for conversion to microfilm. That data will remain in the 10½-in., reel-to-reel format, as will approximately 40,000 additional reels of inactive data, Shelton said.

'Converted all that can be converted'

"We have converted all that can be converted to cartridge tape," Shelton said, noting that two data centers within the facility here expanded their storage capacity, switching from 57 3420 Model 6 tape drives connected by eight control units to a combination of 58 3480s (also connected via eight control units) and 15 3420 drives connected with four controllers. The drives work in conjunction with Phillips' configuration of IBM mainframes, which include two 3084 processors, two 3081 Model K processors and a 3081 Model D. The company uses IBM's MVS/XA operating system with JES3.

Phillips' sweeping conversion to the 3480 runs counter to the expectations of most industry analysts, who believe that users will probably phase in the 3480 over a period of years starting with one application and gradually expanding. In fact, Shelton noted that "when we came up with [the total conversion] approach, it was new to [IBM]."

Admitting that the Phillips conversion may be a unique case, Shelton said the company decided to convert to the 3480s because the drives proved to be more reliable than the older 3420s. For example, after installing the 3480s, Phillips has virtually eliminated the need to rerun tapes because of hardware errors. Furthermore, Shelton maintained, the 3480 operates with roughly 20% more throughput than the 3420, and head cleanings have been cut from six times a day on the 3420 to once a week on the 3480.

"We're a conservative shop and usually don't go into things so early. We had reservations; you don't change the bulk of the corporate data without thinking about it," Shelton said, adding that the 3480 conversion was further complicated by a simultaneous operating system migration from MVS/SP to MVS/XA.

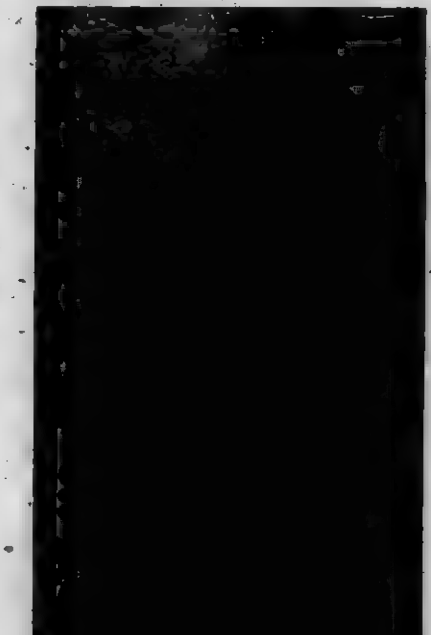
Double conversion not ideal

The double conversion was not an ideal situation, nor was it planned. The company originally scheduled the MVS/XA conversion prior to installing the 3480s, in hopes of avoiding confusion or inconvenience to users. But the MVS/XA conversion was delayed, Shelton said.

"Once you jump off a cliff, it's hard to climb back-up," Shelton said, adding that Phillips decided to convert to Extended Architecture and the IBM 3480s at the same time to avoid prolonging the conversion process.

The eight-month conversion to the 3480s was handled in two stages. Phillips first converted 10½-in. reel tapes that were being used by a 3084 processor in an applications development environment. By doing this, Shelton said, Phillips hoped to avoid losing active production data if there were problems with the 3480s.

"If it had been a bomb, we could have changed our minds" at the end of the first 3480 installation phase, Shelton said. "But the 3480s have just been excellent," he said.



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DEC PDP-11/84 upgrade boasts 40% performance hike

MAYNARD, Mass. — Digital Equipment Corp. recently announced an enhanced version of its PDP-11/84, said to perform from 20% to 40% better than the original OEM version announced Dec. 4.

Available to both end users and OEMs, the system is being offered as a boxed, rack-mountable CPU or as a system kernel configuration capable of supporting rack-mountable disk and tape units, the vendor said.

Said to be the highest performance model of the 16-bit PDP-11 line, the PDP-11/84 was designed for science and engineering as well as commercial, educational and medical applications. The unit is software compatible with other PDP-11 series processors and is supported by all PDP-11 operating systems. In addition, the PDP-11/84 is hardware compatible with DEC's line of PDP-11 Unibus-based systems.

The PDP-11/84 includes an 18-MHz implementation of DEC's J-11 CPU chip set. Also included is a floating-point accelerator chip and memory modules that incorporate 256K-bit memory chips.

Cache memory is composed of 8K bytes of direct-mapped storage and 32K bytes of read-only memory for bootstrap and diagnostic operations. The 256K-bit random-access memory features private-memory interconnect that reportedly accelerates memory (specifically direct-memory) access transfers. Main memory can be expanded in 1M- or 2M-byte increments up to 4M bytes. A battery backup option is also available, the vendor said.

The rack-mountable version of the PDP-11/84 is housed in a 10½- by 19- by 27-in. enclosure. A 1M-byte configuration costs $18,000.

The system kernel configuration is mounted in a 42-in.-high standing cabinet that includes the same functional elements of the rack-mountable version but also offers additional backplane mounting space and an additional power supply for expansion.

The cabinet also has mounting space for a 10½-in. rack-mountable option such as a disk subsystem. A 1M-byte system kernel configuration costs $22,500.

DEC also announced two kits to upgrade previous OEM versions of the PDP-11/84 to the higher performance model. The kits consist of a CPU board and 1M or 2M bytes of memory. The 1M-byte kit costs $4,500. Shipments of all the products are slated to begin this month.

Further information is available from DEC, which is located at 111 Powdermill Road, Maynard, Mass. 01754.

Informatics, RTI launch software for micro-to-host links

IBM-DEC, Infocom connections debut

By John Gallant
CW Staff

The microcomputer-to-host link arena has become more crowded as two large systems software vendors unveiled link products recently.

Relational Technology, Inc. (RTI) entered the link fray for the first time with the unveiling of an IBM Personal Computer link to its Ingres relational data base management system running on Digital Equipment Corp. VAX processors and other machines.

Informatics General Corp., in a joint announcement with Infocom, Inc., introduced its fourth micro-mainframe link — a product that ties Informatics' Answer/DB mainframe data extraction software to Infocom's micro-based Cornerstone relational DBMS.

According to an RTI spokesman, Ingres/PC Link combines the Ingres Visual Query Language, Ascii terminal emulation and file transfer capabilities. It automatically reformats data from Ingres for processing by micro software products, including Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase, Microsoft Corp.'s Multiplan and Micropro International Corp.'s Wordstar.

The IBM Personal Computer component of Ingres/PC Link runs under IBM's PC-DOS and requires 128K-byte memory and a single 5¼-in. drive. The micro and host components can be connected by dial-up/direct asynchronous communications or through an Ethernet local net.

The price for Ingres/PC Link for a single host system, including the right to make an unlimited number of micro components, ranges from $1,500 to $12,500, depending on host processor. The spokesman said general shipments of Ingres/PC Link are scheduled to begin within three months.

RTI is located at 1080 Marina Village Pkwy., Alameda, Calif. 94501.

Informatics and Infocom jointly announced Micro/Answer for Cornerstone, which a spokesman said provides a communications link between Cornerstone on the Personal Computer and most IBM mainframe files and DBMS. The product allows a user to extract selectively information through Answer/DB from IBM's IMS/DL/1, Vsam, Cullinet Software, Inc.'s IDMS, Cincom Systems, Inc.'s Total, Software AG Systems, Inc.'s Adabas and other DBMS and file access methods. The selected data is automatically reformatted by the link to the format required by Cornerstone.

The minimum hardware requirement for Micro/Answer for Cornerstone is a Personal Computer with 256K-byte random-access memory (RAM) and two 360K-byte disk drives. Micro/Answer for Cornerstone will be available in July at $550 per copy. Cornerstone is priced at $495, and Answer/DB is priced at $30,000 for IBM's DOS operating system and $45,000 for IBM's OS.

In addition to the link announcement, Informatics introduced a microcomputer-based package that allows microcomputer software developers to add micro-mainframe link capabilities to their products. The Micro/Answer Toolkit, the spokesman said, features software utilities, documentation and technical assistance to enable a developer to customize Informatics' Micro/Answer link technology for the microcomputer software. The Toolkit will be available only through special marketing and license agreements with Informatics.

Informatics is located at 21060 Vanowen St., Canoga Park, Calif. 91304.

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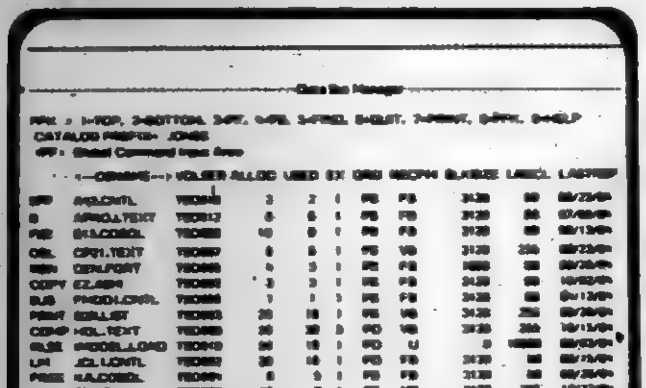

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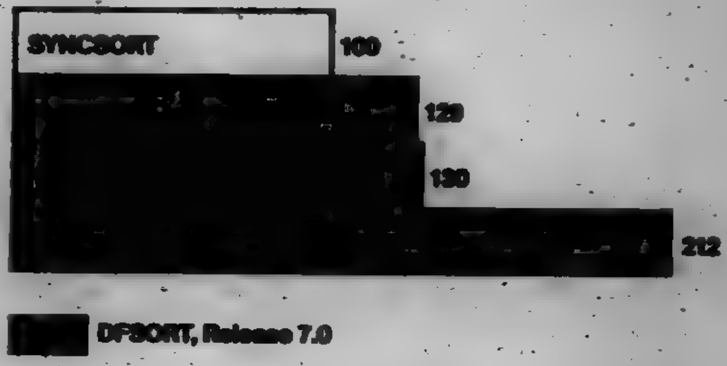
There is no joy in Armonk! DFSORT7 struck out every time it came to bat against the latest release of SyncSort (Release 2.SE) in a recent series of MVS benchmark tests. (In sorting, as in most other forms of human endeavor, it's a long way from *baby* to *Babe*.)

The bar charts below tell the story more eloquently than we can:



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Ex-Honeywell site staff aims at IBM world

By Charles Babcock
CW New York Bureau

EDISON, N.J. — After two hours of IBM CICS formatting instruction, the roomful of students — all experienced Honeywell, Inc. users — were still paying rapt attention.

CICS does not run on Honeywell computers, and most members of the class had yet to spend a day with an IBM mainframe, but they recognized the value of the training. It was a lifeline cast to them after they were dismissed from their jobs at Hoffmann-LaRoche, Inc., a N.J. pharmaceutical company. Hoffmann-LaRoche is a Honeywell shop, and its former employees have found themselves suddenly adrift in a predominantly IBM world, class members said.

On Feb. 4, Hoffmann-LaRoche cut its staff by 1,000 — after its patent expired on Valium and Librium, drugs that at one time were the No. 1 and No. 2 best-sellers in the U.S. With nothing to replace them, the firm decided it needed to cut costs by $50 million, company officials said.

The cuts were made across the board, a Hoffmann-LaRoche spokesmen said, although the former employees

See CUTS page 8

Basic skills transferable, headhunters say

PARAMUS, N.J. — Placement professionals said Honeywell, Inc. skills can be transferred to an IBM environment, provided the skilled person can find someone to hire him.

It would take "no more than two to three months" for someone trained on Honeywell systems to learn a new environment, said Norman J. McLaughlin, DP placement manager at Robert Half of Boston, Inc.

For that matter, there are many openings for Honeywell-experienced people in the Boston area, McLaughlin said.

But other placement experts were less optimistic that the MIS staff members caught in a cutback at Hoffmann-LaRoche, Inc. in New Jersey would be able to find a job.

It is not difficult to transfer skills from one system to another, said Robert W. Shields of Robert Shields & Associates of Houston, but there are few jobs to choose from among the non-IBM vendors.

"If you have 100 programmer jobs open, 85 to 90 will be IBM," he said. Finding jobs for people with experience on Control Data Corp., Honeywell or Sperry Corp. machines is easier than for those with experience from other vendors because their equipment often coexists with IBM's. When it comes to Burroughs Corp. or NCR Corp., however, "forget it," Shields said.

The best approach for the former Hoffmann-LaRoche employees is to seek jobs in combined Honeywell-IBM shops where their Honeywell experience will be valued and they will get a chance to learn IBM. There are very few such jobs in the Houston area, he said.

A third placement official said the real issue may not be Honeywell vs. IBM experience. It may be the age and salary level of the former Hoffman-LaRoche employees.

"I'm familiar with the Hoffmann-LaRoche situation. They are good, solid people but not great," said Herbert Z. Halbrecht of Halbrecht Associates, Inc. of Stamford, Conn.

The Hoffmann-LaRoche systems programmers and program analysts were well-paid individuals who are going to have a tough time convincing an employer to both hire and train them at their present salary level, Halbrecht said.

"When the market gets a little soft, companies look for the best people — the stars," but when they look at middle-aged people, they ask whether they haven't already peaked, he said. "It's not a good time to be 48 or 50 and not have made it pretty big," he added.

At a class for the former Hoffmann-LaRoche MIS workers, Edward G. Weite noted that one of the dismissed employees was 56. "What's he going to do?" he asked.

Weite, 52, one of the few terminated workers to find a job, said he did so by taking "a cut in status and pay" and by looking for a job before the cuts were announced.

— Charles Babcock

DORBANDT from page 1

senior group manager in systems development in charge of the information center; he was one of the highest level computer managers let go.

Being out of a job "was a shock," even though Dorbandt, unlike many of his coworkers, had told himself it might happen. Hoffmann-LaRoche had warned six months earlier that cuts were coming, without indicating who would be affected.

When he was let go, Dorbandt found he had prepared himself better than he had prepared his wife and two teenage daughters. One of his key strategies — for them as well as for himself — was to continue his daily routine. Each morning since Feb. 4 he has left for work, although now "my job is looking for a job.

"In retrospect, it's a new lease on life," he said.

"Hoffmann-LaRoche is no longer a growing company. There simply isn't the opportunity there anymore," said Dorbandt, who is looking for a director-level job in a strong company. "I've played all the instruments. It's time to lead the orchestra."

Dorbandt started out with Hoffmann-LaRoche as a systems programmer. As a group manager, he directed much of its third-generation software development in finance, marketing, research and engineering, he said.

At a time when Digital Equipment Corp. had produced only a handful of its VAX minicomputers, Dorbandt decided they would be "a fundamental research engine" and committed Hoffmann-LaRoche's research area to using them, he recounted.

Dorbandt said it was "a natural migration" from minicomputers to microcomputers and became the director of the information center, supervising six people and training 700 employees to use IBM Personal Computers.

Not all of this experience is instantly marketable, however, since Hoffmann-LaRoche uses Honeywell, Inc. mainframes, and there are few other Honeywell sites in the metropolitan New York area.

"It's an IBM-oriented marketplace, and I am directing my efforts with that in mind. One of my long-term objectives has been to get into the IBM mainstream," he said.

Still, he said he is "looking for opportunity rather than a particular piece of iron."

Skills transferable

Unlike many former Hoffmann-LaRoche programmers and systems analysts, Dorbandt said he believes his skills as a manager "transcend technical details and are transferable" to non-Honeywell sites.

Even those with skills that are primarily technical should not worry about eventually finding another job, he said.

As for his own search, Dorbandt has the services of a placement agency, secretaries and counseling, paid for by Hoffmann-LaRoche, and he combs the want ads of trade magazines and newspapers.

But he said the real search probably is going on through business associates with whom he has been in contact.

"For a lot of people, this is going to be a real mid-life kicker. It is going to give them the chance to renew their skills and their confidence in themselves," he said.

FDR/COMPAKTOR/ABR
Innovation Data Processing, Incorporated

MANAGEMENT SUMMARY

FDR (formerly known as Fast Dump Restore) is a dump and restore utility designed to reduce the time required to produce a dump and restore the data. FDR replaces all standard IBM dump/restore utilities, supports all VS1 and MVS (XA) environments, and can be used with most IBM and compatible disk devices.

FDR uses three method plans in attaining input/output efficiency: 1) the use of increased blocking factors, 2) the elimination of redundant and unnecessary data, and 3) the use of cylinder orientation to minimize delays due to physical rotation, arm movement, and so on. FDR also offers a performance option (BUFNO=MAX) that increases the number of buffers FDR uses during the dump operation, and is designed to decrease elapsed time and save system resources. FDR has a full-volume disk-to-disk feature.

FDR includes a *Stand-Alone Restore* (SAR) program. This program allows restoration of a full-disk volume when, due to the unavailability of a VS1 or MVS operating system, FDR cannot be run. SAR can also be used to restore partial volumes and to clip a volume. SAR also aids the operator by issuing prompting messages on the console and error messages on the console, printer or tape whenever a problem is encountered during the restore. SAR also permits the Restore of specific tracks.

Recent enhancements to SAR include support of stand-alone operations in MVS/XA mode, a standalone backup capability, and support of backup and restore functions under *VM*.

A no-charge option available to FDR users is the *Data Set Functions* (DSF) subsystem. DSF allows the user to dump and restore individual data sets on a pack and to dump and restore by absolute tracks. It can also be used to restore data sets from full-volume FDR backup tapes and allows the user to rename a data set when restoring it. Password protection is provided, and can be activated on either a volume or data set basis.

Compaktor (CPK), an extra-cost option, is a disk management utility used to reorganize direct-access volumes using the FDR methodology. It reduces space fragmentation, merges data set extents, aids in positioning data sets, and offers several other solutions to frequent disk pack organization problems.

Automatic Backup and Recovery (ABR) is another extra-cost option that manages disk space on direct-access volumes. Disk volume and data set backup can be automated based on the last reference date and update characteristics. Data sets that have not been used for a time period can be automatically archived, freeing the disk space for more productive use. Reports can be tailored to user specifications. A Data Set Not Found Exit permits the Automatic Restore of data sets that have been archived without user intervention. The vendor recently released extensive ABR panels for TSO users. The panels provide complete dataset and volume reporting, thus permitting end users more direct control over their datasets. ABR is designed to operate with both the DSF and Compaktor subsystems.

FDR provides enhanced support for VSAM files which are cataloged into an ICF catalog. These data sets are also relocatable with DSF and ABR.

COMPETITIVE POSITION

While the packages listed on page one of this report compete with the FDR/Compaktor/ABR products, the only competition for FDR itself is IBM's DF/DSS. FDR is more efficient than the IBM product. This, along with its reliability, account for FDR's very extensive user base.

The other products listed as competition are disk space management packages and thus compete with ABR. The main competition includes Cambridge's ASM2 and Sterling's DMS/OS. While both of these products were introduced several years before ABR, neither has as large a user base. In addition, they are both more expensive than ABR.

The FDR/Compaktor/ABR family of products holds a very strong market position that is likely to continue. The family provides outstanding performance and reliability, and the vendor has earned a reputation for quality control that is equalled by few in the industry.

ADVANTAGES AND RESTRICTIONS

FDR, as its name implies, is a fast method for dumping and restoring data. The package is faster and more efficient than similar IBM utilities, and achieves a high performance level, reducing elapsed time and saving system resources.

A major advantage is the Stand-Alone Restore program. The ability to backup and restore disk volumes without an available operating system is critical to disaster recovery. The automatic restore to unlike devices and the automatic restore of archived files are additional advantages.

Another major advantage is the outstanding reliability of both the product and the vendor, as attested to by the rating in Table 1 and the wealth of comments from users. Many consider FDR the most reliable software package they have ever used, with never a bug to be found. Another decided advantage of FDR is the free 90-day trial offering.

USER REACTION

Twenty-three users of FDR responded to an independent Datapro survey. The average age of installation was 4½ years. The utility was running on various IBM mainframes as well as on an Amdahl 5860 and three NAS models. All but one were running under MVS, MVS/SP, or MVS/XA. Not every respondent rated all categories. Six did not rate User education, explaining that none is available.

TABLE 1.	Excel.	Good	Fair	Poor	MAUR*	CA**
Reliability	23	0	0	0	4.00	1
Efficiency	19	4	0	0	3.83	1
Ease of installation	20	3	0	0	3.87	1
Ease of use	12	10	1	0	3.48	1
Troubleshooting	19	3	0	0	3.86	1
Documentation	10	9	3	1	3.22	1
User education	5	4	6	2	2.71	2
Vendor's maintenance	14	7	0	0	3.67	1
Overall satisfaction	17	5	0	0	3.77	1

*Mean Average User Rating, on a scale of 4.0 for Excellent.
**Cluster Analysis—the range of average user ratings confined to each cluster for each category, where Cluster 1 is the highest and Cluster 4 is the lowest. (See Report [illegible] for individual category Cluster allocations.)

These users overwhelmingly stressed the advantages of FDR. All 23 said the package performed as promised by the vendor. Many comments were made regarding the outstanding reliability of the package, with long-time users saying that they have never had any problem with FDR. They consider IDP the most reliable software firm they have ever dealt with, with one commenting: "I wish some of the big name software folks took some lessons in quality assurance from Innovation." This is also reflected in the table above, with reliability receiving a very rare 4.00 rating.

Twenty users said FDR saves system resources, 18 said it saves staff time, 12 considered it inexpensive, and 16 said that using FDR resulted in financial savings for their companies. Fourteen considered the package simple to operate and 10 said it is flexible in its capabilities, allowing different device migration, archiving, single dataset restore, and global functionality.

Several users praised the vendor for providing excellent technical support. IDP is very responsive to problems or questions and the support staff is very well trained with thorough knowledge of the internals of FDR and MVS. In addition, IDP is quick to upgrade their product as soon as IBM announces any new hardware or system modifications. Furthermore, the vendor is continually improving and enhancing their products' capabilities.

Few restrictions were mentioned. Two users considered FDR complex and one said it is inflexible, while another said that the migration facility for data set movement to unlike devices is slow. One user said the documentation is poorly organized, while the user who rated documentation poor commented that there is no overall description of how all the components of the package fit together. As a result of this, much time is spent flipping through the manual to determine what is needed to carry out a requested function. A vendor spokesman explained that reorganization of the documentation is difficult because some users have only one component of the product. While there are no major plans for changing the documentation, the vendor is currently adding more examples of how to use the product. ☐

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BYPASS

from page 1

now," noted Seth Lewis, manager of telecommunications with Home Insurance Co., a property and casualty insurance firm headquartered in New York. To justify such a system, it "would have to offer something else besides potential cost savings, such as improved speed, response time, performance or quality."

Throw-away money

Obviously, the shorter the payback and the longer the system can be used, the better. With bypass, however, the up-front costs might be throw-away money, according to William E. Kane, director of telecommunications for SEI Corp., a Wayne, Pa., company that provides computer services for investment firms.

"I can spend $50,000 [on a bypass system] now and find out in 18 months that the company I did business with has been purchased or has run out of funds or that the technology and my internal needs have changed far enough that I can't use it anymore," Kane said. "If I can use the system for five years — which is a long time in this industry — then it becomes reasonably easy to justify. But if you're on the borderline between two or three years, it's hard to make an economic justification for it."

Others agree. "If you can't justify the fact that [the bypass system] is going to be a good technolgoy two to three years from now, how are you going to [justify] it in five years?" said Dohn Kivett, vice-president of telecommunications with Wachovia Corp., a bank with 200 offices in North Carolina. "You're going to have to live with that system for a while once you install it."

Advantages questioned

Kivett does not know if there are any great advantages to be gained at this point by implementing a bypass system. Wachovia's network consists of roughly 400 leased lines within North Carolina, where "services are reasonably priced and service and response has been good," Kivett said. "If local mileage rates continue to increase, that might make bypass more attractive."

Bypass attractiveness varies by state, given variants in rates, applications (voice/data, local or long distance), acceptable level of service (availability, reliability and error rates), availability of alternatives and by the technologies for implementing such systems.

SEI and Home Insurance, for example, have each considered turning out their local loops in favor of direct links to AT&T Communications central offices.

Home Insurance operates a network of roughly 120 multidrop analog leased lines that tie its New York offices with remote branch offices and agents. "The most effective type of bypass for us would be to get some kind of T1 links . . . directly to AT&T to take out the local loops," Lewis said. "But we couldn't justify all the new hardware we would need" to terminate the high-speed digital facilities, he added.

Home Insurance ruled out the use of a microwave link to AT&T because "the network is critical for us and we couldn't take the chance of any increased downtime that we would potentially be exposed to with a microwave shot in downtown New York," Lewis said.

Local loop alternative

SEI is also considering bypassing the local loop by installing multiple T1 spans between its facilities and the AT&T switching offices that terminate its network of 500 to 600 leased lines. AT&T has done a preliminary study of SEI's facilities, and Kane is waiting for the results. "If it's anywhere close to economical, it would be beneficial for me to get rid of those local loops." This would eliminate finger pointing between the local and long-distance carriers when circuit problems arise, Kane said.

If SEI implements the T1 links, its local telephone company would not totally lose out. Unlike some corporations that install private facilities directly to long-haul carriers [CW, April 15], AT&T would probably contract with SEI's local telephone company to provide the circuit. Typically, however, the price of 15 leased lines is the same as that of a T1 link that provides 24 leased-line equivalents, meaning the local company would lose some revenue.

The options available for local bypass — links to long-distance carriers, private microwave, infrared or point-to-point cable between buildings — are not feasible for long-distance bypass. The only viable way to get around long-haul common carriers today is to install private satellite networks.

You have to worry about the inherent delays with satellites, Sprouse warned. "If you add just a second of holding time on each call, then you can start blocking other calls," he maintained.

Users who do not have the concentration of traffic needed to justify bypass may still be able to capitalize on the technology. "Our initial judgment is that bypass is not meant for users of our geographical structure," said Kerry Overlan, corporate telecommunications and OA director with United Fruit Co. in Boston.

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BANKS

from page 1

chines, the banks improved customer service and found customers making smaller and more frequent transactions with no net gain for the bank. If fewer tellers were employed, more high-cost computer specialists took their place, said Phillip Strause, a senior consultant.

In effect, the banking executives surveyed have allowed themselves to be driven by the new technology, incorporating it into their operations but not planning increased returns from its use.

"Computers have made banking more efficient, but banks haven't been able to get people to pay for it," Strause said.

CUTS

from page 6

claim any department not tied to operating revenue suffered heavily, including MIS systems development.

"None of these people were terminated for performance reasons. They were all absolutely proficient in Honeywell systems," said Frank Falconieri, an official at Passaic County College in New Jersey who helped set up the CICS course.

Nevertheless, the former Hoffmann-LaRoche employees said they are finding their experience of little value in looking for a job; sometimes it is even a hindrance.

"Honeywell has great, modern facilities, but they don't have too many users around here," said Theodora H. Ongkingco, 45, a Rutherford, N.J., programmer analyst. Because she arrived to work early Feb. 4, she was the first MIS person dismissed, she said.

"There are a lot of large organizations that need management support — and they're not Honeywell [sites]," said Thomas M. Downie, 44, of Park Ridge, N.J., who spent 10 years in management support services at Hoffmann-LaRoche.

"I want to get into the IBM environment. Seventy percent of the world is IBM, and it behooves us to recognize it," said Frederick M. Hendricks, a former staff manager in systems development with 25 years experience at Hoffmann-LaRoche.

The Edison class in CICS was set up to help the former Hoffmann-LaRoche employees transfer their Honeywell knowledge into a common IBM environment. It is being financed by the Private Industry Councils of several counties and Passaic College.

Some class members, however, wondered if training in CICS would be enough.

"I don't even mention Honeywell. It's considered practically obsolete at many companies," said Celia A. Hines, of Morris Plains, N.J., who rose from programmer to a manager in the information center during 11 years at Hoffmann-LaRoche. Still, she said, Honeywell is there on her resume and prospective employers lose interest during interviews when they spot it, she said.

Ongkingco said she answered an ad for someone to be trained as a programmer analyst in IBM systems, only to be told the company wanted to train someone who already had IBM programming experience.

"The software is changing so fast. Sometimes the old experience isn't too good for you," said Spencer S. Chang, 49, of Parsippany, N.J., a program analyst.

"All of the IBM manuals are written in IBM acronyms. They're so different" from Honeywell terminology, noted A. Lance Zaremba, a computer security specialist who said he was never busier than during the last few weeks of his job.

Despite the obstacles, many former Hoffmann-LaRoche employees said the Cobol skills they developed carry over to IBM environments after the the employee learns IBM terms.

Downie, who had experience on IBM systems before joining Hoffmann-LaRoche, said he felt he could be productive within a few weeks after joining a firm.

One of the former Hoffmann-LaRoche employees said he lost out on a job at another Honeywell shop and it is just as well. "If I had gotten it, I would just be back in the pickle," said Edward G. Weite, one of the few people who has found work since the cuts.

"About that data base conversion, sir. The department doesn't seem to share our enthusiasm."

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Xerox unveils micros, software, laser printers for office

By Edward Warner
CW Staff

NEW YORK — A fleet of products targeted at the office work group — including five personal computers, a software series and two laser printers — was unveiled here by Xerox Corp. last week.

The personal computers all are said to offer IBM Personal Computer compatibility and run the Microsoft Corp. MS-DOS operating system. Four of the five are manufactured by Ing. C. Olivetti & Co., the Italian firm that builds the AT&T 6300 personal computer. The fifth, priced at $4,995, reportedly offers 1.1M byte of memory and the windowing and mouse-driven features normally associated with much higher priced Xerox Star systems.

Like the AT&T 6300, the four Olivetti machines use an Intel Corp. 8086 family microprocessor. Two of the four, the 6064 and 6065, reportedly include a keyboard, monitor and 256K bytes of memory. The 6064 includes twin diskette drives and is priced at $2,898. The 6065 offers a single diskette drive and an internal 10M-byte hard disk and is priced at $4,485. Both will be available in the U.S. within the next three months.

The other 8086-based machines, the 6067 and the 6068, reportedly feature greater memory, bundled Xerox word processing software and specially designed word processing keyboards. The 6067 is offered with Xerox Writer I software and includes twin diskette drives, 384K bytes of memory, a 640- by 400-pixel display and a price of $2,985.

The Xerox 6068, meanwhile, offers the same display, 512K bytes of memory, a 10M-byte hard disk and Writer II, a more sophisticated word processing package. The 6068 is priced at $5,150. Both machines will be available in the third quarter.

The fifth machine in the rollout, the Xerox 6085, debuted along with a software series for it that includes a windowed environment and mouse-driven functions. With a built-in 10M-byte drive, 15-in. display and 1.1M bytes of internal memory, the 6085 carries a standard version price tag of $4,995. Included in the 6085, available in September, are a keyboard, mouse and two RS-232C ports.

Introduced with the 6085 was Viewpoint series software, including a $125 Viewpoint windowing environment. Viewpoint reportedly contains the Xerox Pilot operating system and serves as the cornerstone for use with the other packages in the Viewpoint series. The packages will be priced from $35 to $995. The entire Viewpoint series will be available in September, a Xerox spokesman said.

Two laser printers, a high-end and a low-end model, were also unveiled. The high-end Xerox 3700 reportedly prints at up to 24 page/min and includes a 10M-byte hard disk that can store up to 2,000 pages and receive print jobs from a host computer. The 3700 features RS-232C and Centronics Data Corp.-type parallel interfaces. It is priced at $29,995 and, with Xerox controllers, can support IBM communications protocols including Systems Network Architecture/Synchronous Data Link Control.

At the low end, the $4,995 Xerox 4045 Laser CP claims a 10 page/min printing rate and the ability to store up to 128 different type fonts. Included are both parallel and RS-232C interfaces, along with 128K bytes of memory, expandable to 384K bytes. The Laser CP can print documents created on a micro using software designed for printing on a Xerox 2700 II electronic printer or a Xerox Diablo 630 daisywheel printer. Xerox said the Laser CP will be available in the third quarter in some U.S. cities.

Xerox is located at Xerox Square 006, Rochester, N.Y. 14644.

Microsoft rolls out spreadsheet

BELLEVUE, Wash. — Microsoft Corp. last week introduced a spreadsheet for the Apple Computer, Inc. 512K-byte Macintosh micro that reportedly incorporates business graphics and a data base.

Called Microsoft Excel, the spreadsheet reportedly offers 16,384 rows by 256 columns — over four million cells — and two-way file compatibility with Lotus Development Corp.'s 1-2-3. Users may also create macro programs using a built-in recorder that creates the macro while the user carries out applications.

The Excel spreadsheet, which costs $395, reportedly will come bundled with Apple Switcher, a program developed by Apple that allows users to switch between Macintosh applications. Apple Switcher, not yet formally announced by Apple, will permit users to have both Excel and Microsoft's Word in memory and to switch and exchange data.

Excel will be available in September. Current owners of Microsoft's Multiplan for the Macintosh can upgrade to Excel for $200. Owners of both Multiplan and Microsoft's Chart for the Macintosh can upgrade for $100. Microsoft can be reached through Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

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Compaq launches IBM AT-compatible family

HOUSTON — Compaq Computer Corp., the largest supplier of IBM Personal Computer compatibles, launched its long-awaited line of Personal Computer AT-compatible systems and cut prices on existing models here last week at its annual meeting.

The systems run up to 30% faster than the IBM Personal Computer AT and offer a range of options, the firm said. Both portable and desktop versions carry a starting price of $4,499 and are available immediately.

Compaq claimed that the Compaq Portable 286 features IBM AT compatibility, an optional 20M-byte hard disk drive, an optional internal tape backup system and the ability to handle up to 2.6M bytes of random-access memory (RAM). Exactly the size of the original Compaq Portable Personal Computer, the machine weighs 30 pounds.

Like the Portable 286, the Compaq Deskpro 286 is based on an Intel Corp. 80286 chip running at either 6 MHz or 8 MHz. The system reportedly offers up to 8.2M bytes of RAM, 70M bytes of hard-disk storage and space for four internal storage devices.

Analysts react favorably

Industry analysts and dealers generally gave the introductions high marks. By offering a compatible system with unique enhancements, Compaq is "repeating its success with the [IBM Personal Computer] and the XT," said Chris Steitz, senior analyst at Infocorp, who predicted that 35,000 of the new systems will be sold this year.

"This lets them keep up with their game of follow the leader," said Michael Geran, vice-president for research at E. F. Hutton & Co. "They've got momentum."

Like others, however, Geran said the window of opportunity created by slow AT deliveries is closing, and IBM's potential economies of scale threaten to crush compatible suppliers.

The high-end systems are said to work with popular software programs, hardware peripherals and add-ons for the AT.

The Compaq Portable 286 Model 1 features 256K bytes of RAM, a 1.2M-byte diskette drive, a 9-in. high-resolution text/graphics monitor, keyboard, parallel and serial ports, security lock and three expansion slots. It also has interfaces for red-green-blue, composite video or TV monitors. The Model 2, similar except for offering 640K bytes of RAM, a 20M-byte hard disk drive and two expansion slots, will sell for $6,299.

Options include an $899 10M-byte tape backup system, a $1,095 512K-byte added memory board, a second 1.2M-byte diskette drive priced at $650, a 360K-byte diskette drive that costs $350, a $2,095 20M-byte hard disk drive and MS-DOS 3.0 and Basic software for $65.

The Compaq Deskpro 286 Model 1 includes 256K bytes of RAM, a 1.2M-byte diskette drive, five available expansion slots, space for four half-height internal storage devices, security lock, parallel and serial ports and monitor interfaces. The $4,499 standard price includes an optional $255 12-in. text/graphics monitor. The Model 2 provides 640K bytes of RAM, a 30M-byte hard disk drive and four available expansion slots. It costs $6,254 with monitor.

Last week Compaq also dropped prices on all existing models except the single floppy disk drive Portable Personal Computer and Deskpro Model 1, which analysts agreed was a logical repositioning move.

The price of the standard portable with dual floppy disk drives was reduced to $2,699 from $2,995, and the cost of the Compaq Plus Portable Computer dropped to $3,999 from $4,995. Prices for Deskpro models (with monitors) dropped as follows: Model 2 to $2,899 from $2,995; Model 3 to $4,499 from $4,995; Model 4 to $5,799 from $7,195.

Compaq is located at 20555 FM149, Houston, Texas 77070.

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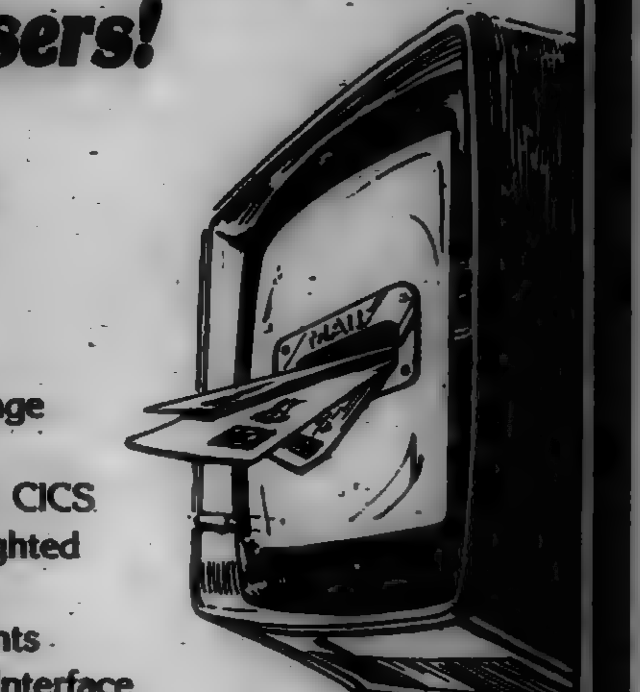

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ADR cuts path to Datacom/DB from IBM's IMS, DL/1

By John Gallant
CW Staff

NEW YORK — Applied Data Research, Inc. (ADR) gave IBM IMS and DL/1 users an automated pathway into the world of relational data base management system technology with the introduction last week of a system that migrates existing IMS/DL/1 applications to ADR's Datacom/DB without reprogramming.

ADR's DL1 Transparency reportedly allows IMS or DL/1 programs to operate against the Datacom/DB relational DBMS without changes to program logic. The system intercepts DL/1 or IMS requests and automatically translates them for processing by the relational DBMS.

An ADR spokesman said DL1 Transparency reduces the effort required to convert from the older IBM DBMS technology to a relational DBMS — an effort that involves rewriting program source code, recompiling programs and redesigning the data base. In addition, purchased applications software designed for IBM DBMS can be run against Datacom/DB through DL1 Transparency.

DL1 Transparency is said to provide a completely automated migration from an IMS or DL/1 environment to Datacom/DB through the following four subsystems:

- Relational Data Base Design, which creates definitions for Datacom/DB data bases from existing DL/1 definitions. It also automates the population of the ADR/Datadictionary, which allows users to utilize ADR's Ideal applications development system, Dataquery query language and PC Datacom micro-mainframe link.
- Data Restructure, which reads all designated logical and physical IMS or DL/1 data bases and converts them, reportedly in a single pass, to Datacom/DB data bases.
- Intercept, which, at program execution time, takes control of the IMS or DL/1 environment and determines which of the IBM DBMS calls are to be processed using Datacom/DB data bases. This subsystem also supports mixed-mode processing involving both IMS or DL/1 and Datacom/DB, allowing a phased transition of applications.
- Transparency, which reportedly traps IMS or DL/1 calls from the applications and automatically generates appropriate Datacom/DB calls. Also, Datacom/DB return codes are translated to corresponding IMS or DL/1 codes and returned to the applications. This subsystem of DL1 Transparency reportedly allows applications to run against Datacom/DB without modification. ADR President Martin Goetz said DL1 Transparency offers an alternative for users of IBM's older IMS or DL/1 technology who are not convinced of the capabilities of IBM's DB2.

Stephen Gerrard, vice-president and director of product marketing for ADR, said 65% of IBM mainframe sites with a DBMS use IMS/DB or DL/1 — a figure that translates to roughly 10,000 user sites. International Data Corp., a Framingham, Mass.-based market research firm, estimates the percentage slightly lower at just over 62%. Gerrard said DL1 Transparency is aimed at that audience.

DL1 Transparency was introduced to beta test in September and is now available to selected customers, according to ADR. General availability is slated for the third quarter.

DL1 Transparency runs under IBM's OS/VS1, MVS and MVS/XA in CICS/VS, batch and shared mode. It costs $40,000 for OS environments and $30,000 for DOS.

ADR is located at CN-8, Rt. 206 and Orchard Road, Princeton, N.J. 08540.

DL1 Transparency seen appealing to narrow audience

By John Gallant
CW Staff

Applied Data Research, Inc.'s (ADR) DL1 Transparency could prove to be an important new technology — provided users have tired of Big Blue's aging data base management systems, have decided to make the switch to a relational DBMS and are unhappy with IBM's DB2 strategy. But analysts and IBM DBMS users interviewed by *Computerworld* questioned whether those conditions exist today.

Introduced last week, DL1 Transparency allows IBM IMS and DL/1 users to run existing applications against ADR's Datacom/DB relational DBMS without reprogramming. Users and analysts agreed that a manual conversion from a hierarchical to a relational DBMS would require a huge investment of time, money and manpower. Thus, they said, the product could be of value to users considering Datacom/DB for both production and information center requirements. Beyond that specific audience, however, DL1 Transparency may meet with only limited success.

"Anything that eases a conversion effort gets our attention," said G. E. Bachman, manager of computer services for Wichita, Kan.-based Beech Aircraft Corp. The firm runs more than 20 applications under IMS on an IBM 3084 mainframe.

"But it would only be important if we were to switch to a relational system," he added. "We have not seen enough advantage in going to relational. We think IMS will hold up well for at least the next few years."

Bachman's sentiments were echoed by Bruce Johnson, manager of data base operations at Westinghouse Electric Corp.'s corporate data center in Pittsburgh. Westinghouse runs IMS under MVS/XA on an IBM 3081 processor.

"We are not interested in moving to a relational system, but we are following the progress of DB2," he said. "If we move to relational we will be more inclined to consider IBM's product first."

Even users who have decided to go with relational do not necessarily see conversion as a problem. Carl Baxley, MIS manager for Towson, Md.-based Bendix Corp., said his company is lessening its reliance on IMS and moving to Cullinet Software, Inc.'s IDMS, which offers relational capabilities. But instead of a massive reprogramming of applications, Baxley said, Bendix is replacing older, IMS-based systems with newly purchased, IDMS-compatible packages.

Westinghouse's Johnson said IBM's current dual-DBMS strategy, which emphasizes the use of IMS for production systems and DB2 for information center needs, has not caused any concern. At the introduction of DL1 Transparency, ADR officials intimated that users were unhappy with the prospect of maintaining and paying for two DBMS — a charge other observers have also leveled against IBM. But, Johnson said, "IBM's strategy makes sense to us."

Steven Pfrenzinger, president of Encino, Calif.-based IMS Consulting, Inc., agreed. "There are some frustrated DL/1 users who will see ADR's announcement as a real opportunity. But I think most customers see fewer reasons to leave the IBM fold in light of what is happening with DB2."

According to Pfrenzinger, early users of DB2 are enthused about its capabilities, and IBM is actively addressing problems that have cropped up in DB2 thus far. "Users are concerned about the two-DBMS strategy, but both they and IBM are also looking to DB2 to handle everything in the near future," he said. That ADR's timing may have been off was also the opinion of William Inmon, a director at Coopers & Lybrand in Denver. "Three years ago, the market for this type of product was ripe," he said. "But the people who would have gone to Datacom/DB are now being shepherded to DB2. IMS users have been told by IBM that DB2 is the way to go."

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FCC approves AT&T's private-line rate restructuring

WASHINGTON, D.C. — The Federal Communications Commission allowed AT&T's far-reaching restructuring of private-line rates to go into effect last week, subject to further investigation and monitoring for potential service delays and bypass developments.

The effect of the changes would be to raise average private-line customer rates immediately, especially for voice-grade calls within a 50-mile radius. However, some categories of private-line service, such as Dataphone Digital Service rates, would drop in cost [CW, Jan. 28 and March 18].

The private-line rate restructuring reflects the changes brought by the breakup of AT&T and the divested regional Bell operating companies, along with the implementation of an access charge system.

During the past 18 months, the FCC and AT&T have struggled over the form of the new rate structure and have produced a system that leaves many of the decisions regarding what kind of service will be used to customer discretion.

The FCC said that while the rates that were approved "did not constitute an ideal rate structure," the imperfections will be investigated while the rates are in effect.

The commission gave AT&T six months to align its proposed rate structure for local channels with the underlying local rates that customers could also obtain from the local telephone company to reach an AT&T central office where connection to a private-line circuit is made.

The FCC also said "questions remain about some aspects of the separate structure by which AT&T offers service on its own network" and voiced concern that "the implementation process proceeds smoothly so that alternatives provided formally in these tariff structures are actually available to customers."

AT&T's proposed discount plan for small businesses put on hold

The Federal Communications Commission suspended the May 1 start-up date for AT&T's proposed discount service for small businesses until Oct. 1, saying the carrier inadequately projected demand for the service and had not accurately estimated its competitors' pricing responses.

Called Pro-America, the discount calling plan would require customers to pay a $25 monthly fee for which they would receive a 15% discount on message telephone service — all domestic U.S. standard long-distance calls. The plan targets customers who make more than six hours of message telephone service calls monthly or spend more than $167 in long-distance calls per month.

Fierce opposition to the plan was registered by AT&T's competitors, which asserted that the dominant carrier had not filed the legally required cost support documents. The argument raised was that the service was priced below cost.

The five FCC commissioners voiced regret at the necessity for deferring the service but said that AT&T, as the dominant carrier, was legally required to show how the service would pay for itself. AT&T conceded that it would not cover its costs in 1985 but would do so in 1986.

IBM CEO predicts rebound

By Mitch Betts
CW Washington Bureau

ATLANTA — John F. Akers, in his first stockholder meeting as president and chief executive officer of IBM, predicted that shipments of IBM products will increase substantially in the second half of 1985, as Big Blue rebounds from an 18% drop in earnings in the first quarter.

The first-quarter decline, Akers said, resulted from the continuing strength of the U.S. dollar in foreign exchanges and from a slowdown in installations of high-end products as customers paused to evaluate the forthcoming IBM 3090 processors and enhanced 3380 storage devices.

Asked about the shortage of IBM Personal Computer AT units, IBM officials said they are working diligently to increase production capacity, and they predicted that shipments will double in the second quarter (over the first quarter) to meet extraordinary demand for the AT.

As a large and complex business, Akers said, IBM will continue to face several competitive challenges, such as manufacturing and marketing in high volumes, integrating its product line, operating in 125 countries and handling intense public scrutiny.

The computer giant also faces economic challenges from the U.S. budget and trade deficits, protectionist legislation and "a tax system in need of basic reform," Akers said.

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Comdex/Spring '85 opens amid stiff micro competition

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Comdex/Spring '85 may attract up to 50,000 attendees.

Wave of IBM AT clones bow

By Eric Bender
CW Staff

ATLANTA — As the dog-eat-dog competition in microcomputer sales intensifies, computer dealers and other resellers will make their annual pilgrimage to Atlanta for Comdex/Spring '85.

Getting under way today, the show is expected to draw about 50,000 attendees, all looking for potential hits among the hundreds of microcomputer products making their debuts.

Comdex/Spring kicks off with a keynote address on the personal computer industry by Rod Canion, president of Compaq Computer Corp., and continues through Thursday. In addition to displays by more than 700 exhibitors, 42 technical and marketing sessions are scheduled.

On the show floor, the long-awaited wave of machines compatible with the IBM Personal Computer AT should be out in full flood, with Compaq's own entries sharing the limelight with systems from Corona Data Systems, Inc., Kaypro Corp., ITT Information Systems, NCR Corp., Televideo Systems, Inc., Texas Instruments, Inc., Zenith Data Systems Corp. and other vendors.

Another round of IBM-compatible laptop micros also will be on display, with recently introduced models from Grid Systems Corp., Morrow, Inc., Zenith Data and others.

Second Symphony to debut

On the software side, Lotus Development Corp. will display the second release of its Symphony multifunction package, which demonstrates the expanded-memory scheme jointly developed with Intel Corp. Lotus also will show Symphony Link micro-to-mainframe communications software, the 1-2-3 Report Writer package and the still-not-quite-ready-for-prime-time Jazz software for the Apple Computer, Inc. Macintosh.

Additionally, Microsoft Corp. will show Macintosh applications software introduced last week; Digital Research, Inc.'s Graphics Environment Manager software will be displayed at various booths; and Quarterdeck Office Systems, Inc. will unveil multitasking versions of its Desq operating environment program.

Samna Corp. will introduce word processing software supporting personal computer local-area networks and the IBM Document Content Architecture, and Innovative Software, Inc. will show a second release of its Smart Software System.

Canion

Among communications introductions at Comdex/Spring will be various packages running on the IBM PC Network. 3Com Corp. will announce Ethermac, a network server that permits Apple's Macintosh to hook up with 3Com's Etherseries products.

Digital Equipment Corp. will launch a link between IBM Personal Computers and compatibles and its Micro PDP-11 microcomputers running the A-to-Z software family. Hayes Microcomputer Products, Inc. will show Transet 1000, a multifunction device offering print and communications buffering, I/O switching and port expansion.

Digital Communications Associates, Inc. will introduce Irmalink/Windows, an addition to its micro-to-mainframe family. Several micro-to-mini products will also debut, including Quadram Corp.'s Quad 5251, an adapter card for the IBM Personal Computer that emulates IBM 5251 Model 11 and 5291 Model 2 terminals, permitting links to IBM System/34, 36 and 38 minis.

Quadram and other third-party suppliers will be showing memory boards supporting the Lotus/Intel expanded-memory specification. Enhanced graphics cards will also be in evidence. One of these, from Orchid Technology, Inc. is said to be compatible with the IBM Professional Graphics Controller and to offer 256,000 color capability.

Dozens of storage products will jostle for the spotlight, including a half-height Bernoulli Box cartridge system from Iomega Corp. and many 20M-byte hard disk drives for the IBM Personal Computer XT or Personal Computer AT.

Output devices will include a 4-lb ink-jet printer and a high-speed 136-col. ink-jet printer from Epson America, Inc.

Comdex/Spring is organized by the Interface Group, Inc., which is located at 300 First Ave., Needham, Mass. 02194.

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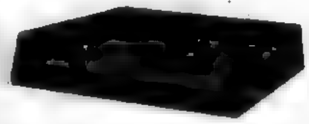

Martin foresees coming revolution in methodology

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — A "massive revolution" will soon overtake DP methodology and promises dramatic improvements in software productivity, according to information systems guru James Martin.

After a lengthy spell of relative stability, applications development today stands on the cliff edge of a period of unprecedented technological change, Martin said during a recent conference sponsored by the Institute for Information Management.

To a degree, the predicted changes in existing methodology have already begun to materialise in the form of phenomena such as nonprocedural languages and end-user computing. Other such changes lie just over the horizon.

Of the advances that have yet to emerge, none apparently holds a greater potential for boosting software productivity than the expected advent of automated development tools for program design and specification.

For more than 25 years, the procedure for specifying and designing proposed applications has remained fundamentally unchanged. Despite enormous advances in technology, systems analysts continue to do their jobs almost entirely by hand, their chief tools being paper, pencils and plastic templates, Martin said.

Even within IBM, "software people seem to think they're in a cottage industry in which they can get away with doing things manually," he said.

In the near future, however, the face of systems analysis will be forever transformed by the emergence of high-technology aids that will allow applications design and specification to be largely automated, Martin predicted.

The tools will enable user organizations, for the first time, to apply the principles of computer-aided design to the task of creating software, he explained. In the past, the use of CAD techniques has been limited primarily to hardware, where their value has already been conclusively demonstrated, he said.

Automation of the program-design process is sorely needed. Also needed is a fundamental change in the way the system development life cycle is managed, Martin said.

Unless systems analysis and the management of development projects are significantly modernized, huge improvements in software productivity will remain elusive, he said.

With the relatively recent advent of fourth-generation languages, programming output has reportedly risen in some cases by as much as 20-fold. But the drawback with fourth-generation languages is that their benefits extend only to the coding phase of the development process, not to system design or the definition of specifications, Martin said.

Mumps users plan meeting

CHICAGO — The 14th Annual Conference of the Massachusetts General Hospital Utility Multiprogramming System (Mumps) Users Group for professionals in medical, business, academic and scientific fields will take place June 10-14 at the McCormick Center Hotel here.

The conference will address software development, management and standards. Presentation of papers, tutorials, exhibits, roundtables and a job exchange are scheduled.

The basic registration fee is $150, plus $120 for full-day tutorials and $60 for half-day tutorials.

More information can be obtained from Mumps Users Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

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Speaker dispels MIS spending/productivity corollary

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — A Xerox Corp. executive and best-selling author last week challenged the widely held belief that information technology and high levels of management productivity go hand in hand.

Under certain circumstances, a large dose of computing resources can do a company's productivity and competitive position far more harm than good, according to Paul Strassman, a vice-president with Xerox's Systems Group.

Speaking here at the Institute for Information Management's seventh annual conference, Strassman cited recent research that uncovered "no apparent correlation between management productivity and technology spending."

Strassman conceded, however, that such pronouncements border on heresy because they conflict with the prevailing industry view that virtually any business, no matter what its condition, can profit from a massive infusion of high technology.

MIS investment hinges on health

Whether a heavy investment in MIS can truly benefit a company depends, in part, on the organization's basic state of health. If a firm enjoys a superior strategic position, spending for computing resources can yield a "handsome return on investment," Strassman said.

But if a corporation's competitive position is relatively unfavorable, a sudden profusion of systems can cut management productivity significantly. "When your business is in trouble and the big boys are kicking sand in your face, the last thing you should do is go out and buy a lot of microcomputers," Strassman said.

An ailing company wishing to return to financial good health should forget about technological quick fixes and focus instead on sharpening its strategic analysis and planning.

In other words, a troubled firm needs to identify its competitive strengths and weaknesses and then figure out how to maximize the former while minimizing the latter, Strassman said.

Rigorous physical exam

The procedure is analogous to a rigorous physical exam by a doctor and usually requires the participation of an MIS director. To succeed in today's business world, MIS executives "have to understand where the leverage factors and the added value lie in their companies," he said. "They have to understand these matters as thoroughly as they understand the details of their own departmental budgets."

Without such an understanding, Strassman added, MIS directors will be unable to decide how to invest information technology to exploit their corporations' competitive advantages.

In an interview following his prepared remarks, Strassman described MIS management as a discipline whose role is fundamentally changing. Once confined primarily to tactical and operational issues, MIS managers' professional concerns today are being broadened to include questions of how high technology should best be invested, the Xerox executive said.

Nothing in their past training or experience has adequately prepared MIS directors to assume their new-found, greatly expanded roles. The result is that most MIS executives are woefully ill-equipped to deal with questions of strategic investment, Strassman said.

Meeting the challenge

But sooner or later, they will have to meet the increased challenge. They can hardly do otherwise. "Companies can no longer afford to misapply their information technology," Strassman said. "The stakes are too high."

Strassman, who will soon leave Xerox to start his own consulting firm, could offer MIS directors no surefire formula for success in their efforts to shift from one job role to another.

"There's no magic to adding another skill to an MIS director's portfolio," he said. "MIS directors just have to spend more time with and listen to people who are already experts at investing [strategic] resources."

The change in job roles will also probably force MIS executives to delegate some of their operational duties to subordinates so that they can devote increased attention to high-level concerns, Strassman said.

Robotics industry meet set

DETROIT — The Robots 9 Exposition and Conference will be held at Cobo Hall here June 2-6. The industrial robotics conference is sponsored by Robotics International, a member of the Society of Manufacturing Engineers (SME), and the exposition is sponsored by the Robotics Industries Association.

The conference will cover the latest advances in robot technology and will feature 20 technical sessions, four forums, two tutorials and a daily course on robot basics.

Conference fees are $475 for SME members and affiliated companies and $545 for nonmembers. Individual prices for parts of the program are offered as well. Exposition fees are $10 in advance or $15 on site.

More information can be obtained from Robots 9 Public Relations, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

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End users gaining clout in question of micro use

By Charles Babcock
CW New York Bureau

NEW YORK — Although MIS departments have reasserted control over the acquisition of microcomputers, end users — not MIS guidelines — will dominate how the micros are used, according to a panel on "Opportunities in Personal Computing."

The panel was part of a recent two-day seminar here on the opportunities in management information, sponsored by the Conference Board, a business research group.

Speakers included Joseph T. Brophy, senior vice-president of data processing for Travelers Corp., whose workers use 9,000 micros; Michael J. McLaughlin, senior vice-president of information systems and services for New York Life Insurance Co., which has placed approximately 3,000 IBM Personal Computers on the desks of its agents; and Michael J. Intille, vice-president of information services at Central & South West Corp. (CSW), a utility conglomerate in Texas that uses 530 micros.

Intille said that his MIS department is expected to help acquire microcomputers, but the end users get control over their use. End users may select whatever brand they wish.

"That's no easy task in terms of managing my people. They say, 'Look at the dumb thing this user did.' They're upset because they can't be in charge," he said.

When CSW users want to do projects on their micros, the MIS department works with them, but the users direct the projects. An executive in the user's department must sponsor it, and it is financed out of the department's budget, Intille said.

"It's important [for] me to see a commitment from the [users]. If [they have] that commitment, [they] will stay up 16 hours a day to make it work," he said.

CSW tries to distribute a new program to its micro users each month, either one written in-house or one in the public domain. The free software encourages users to experiment, Intille continued, and it broadens their idea of what microcomputers can do.

According to Intille, his company estimated that the computers pay back their $3,000 to $6,000 cost if employees save one hour a week or 2.5% of their time a year. "They're very simple tools to cost-justify," he said.

Microcomputers are supported by a regularly published personal computer users list, a walk-in information center, a micro hot line and on-site consultation. In addition, his department supports many software packages, including Lotus Development Corp.'s 1-2-3, Cullinet Software, Inc.'s Goldengate, Ashton-Tate's Dbase III and IBM's Displaywrite 2. The microcomputer is the latest tool in advancing "the free-enterprise spirit" of his company, Intille said.

Both Brophy and McLaughlin said their MIS departments took a stricter view of cost-justifying micros, and the IBM Personal Computer XT was a de facto standard in their organizations. At Travelers, each purchase must be authorized by a central review group, Brophy added.

He said that Travelers is concerned about providing a secure environment in which micro users can operate, because many of its micros are connected to the company's 16 IBM 3084 mainframes under TSO. That tie also gives micro users access to Travelers' national network and data base management system, he said.

Travelers sells integrated financial services in a competitive environment, and microcomputers help it provide quick responses to customers, he noted. By 1990, many transactions will arrive at and leave company offices "untouched by human hands," he said.

In addition, micros are instrumental to staff changes in the company. In 1970, Travelers used two clerks for every professional, such as an account representative or an agent; by 1990, it will use two professionals for every clerk, he said.

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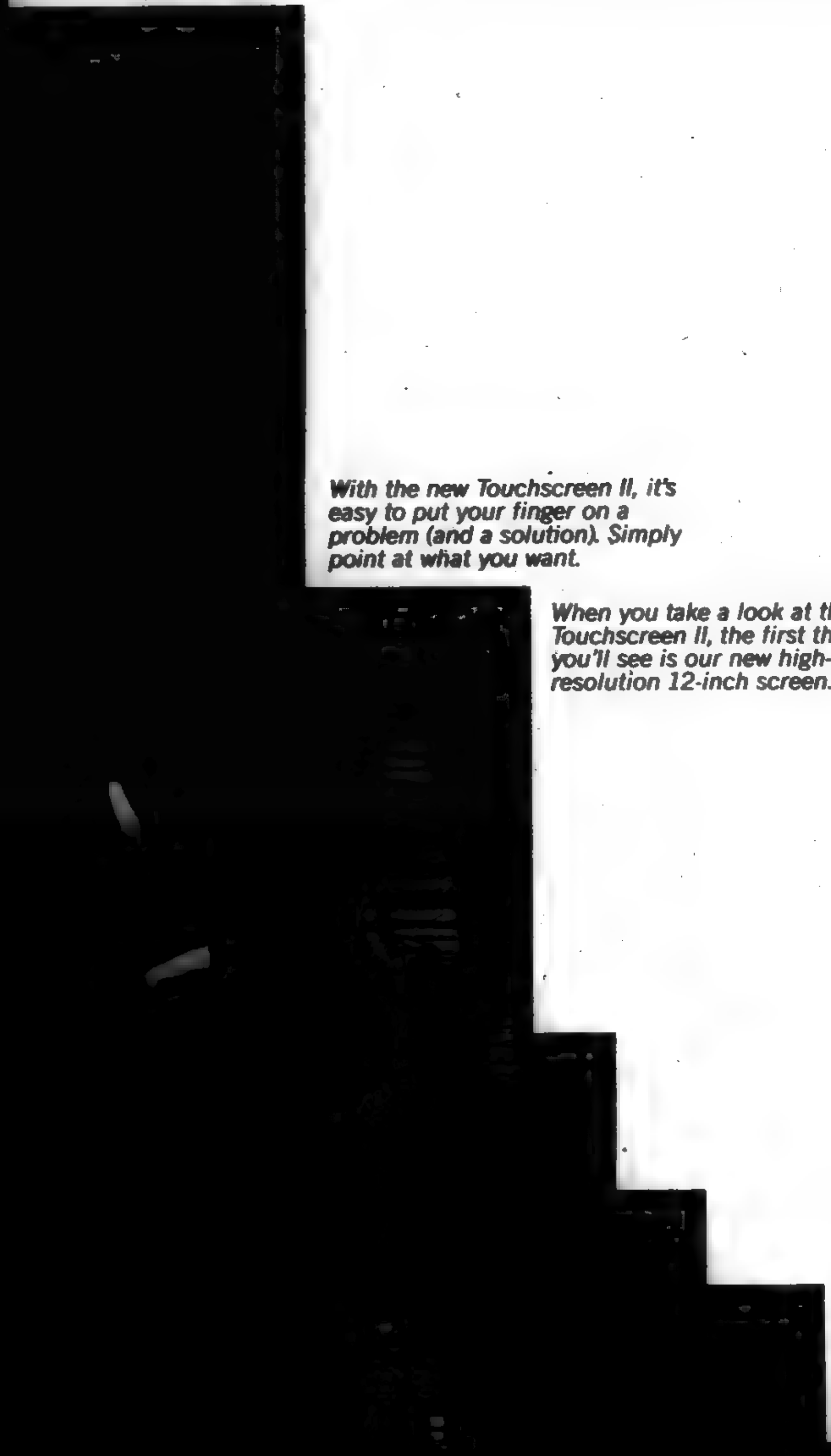

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HEWLETT PACKARD

Micro-mainframe link use varies with cluster size

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — The use of micro-mainframe link technology as a solution to end users' problems and as a tool allowing corporations to make realistic plans for the future is not a straightforward proposition.

So said members of a panel on micro-mainframe links at the Association of Data Processing Service Organizations, Inc. meeting here recently.

Micro-mainframe link usage depends significantly on the size of the personal computer cluster involved, according to John Worthen, president of Focus Research Systems, Inc. in West Hartford, Conn., who said his company recently completed a survey of micro-mainframe link requirements of MIS managers at 112 IBM mainframe installations throughout the U.S.

The statistics revealed that 74% of the sites surveyed had less than 25 IBM Personal Computers, and 26% had more than 100 personal computers. Of these, 80% of the users with more than 100 micros used the links to access corporate mainframe data, while only 40% of the sites with less than 100 personal computers did.

According to Worthen, 65% of all the personal computers were used in plain vanilla applications and were connected to mainframes either for terminal emulation or data transfer.

The statistics also showed that installations with less than 100 microcomputers had hard-wired local connectivity at 60% of the sites, and remote telecommunications connections at 40% of the sites, while larger sites reversed these figures, Worthen said.

This had a ripple-effect on connection speeds, with small sites, which had a predominance of local loops, transferring 10% of the data at 2,400 bit/sec. or less and large sites, which had a predominance of remote telecommunications setups, transferring 28% of the data at less than 2,400 bit/sec. These figures were directly related to the local vs. remote connectivity situation, Worthen said.

Worthen also said that future micro-mainframe link usage would increase 90% during the next five years at these sites, but that users felt there were many obstacles that stood in the way of progress — data security issues, degradation of network performance and the dispersal of MIS control throughout separate corporate divisions.

Difficult to plan

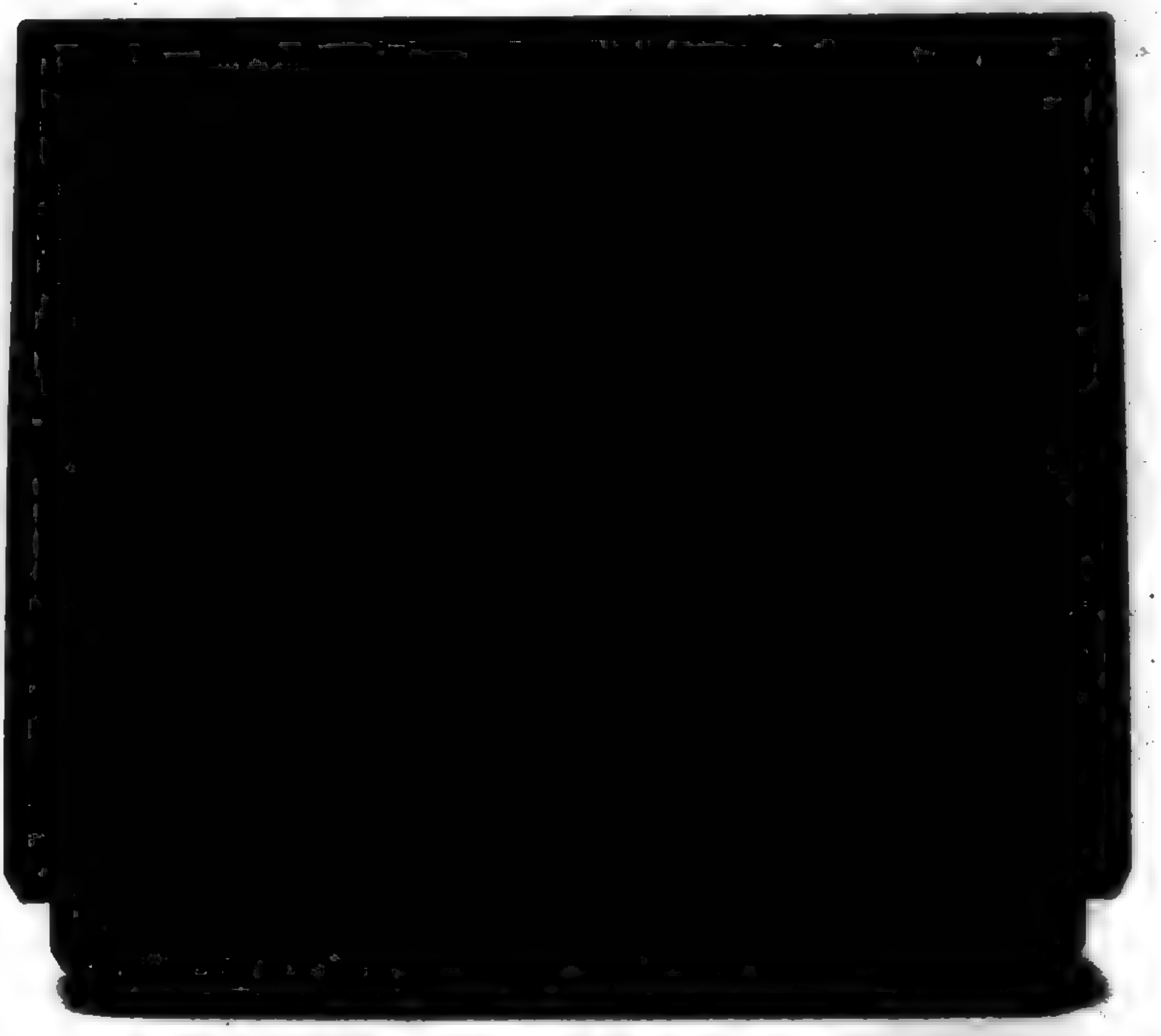
Today's micro-to-mainframe links make it difficult for corporate users to plan effectively for future requirements, said David Ferris, chairman of Ferrin Corp., based here, which provides hardware and software services to micro users in Fortune 1,000 companies.

He added it will take three to five years for the technology to provide shared specialized peripherals, to let micro batch data updates into mainframes or to allow communications tools to be built into individual systems.

The major complaints from corporate users about micro-mainframe links center on the links' inability to extract only the required data, to link data relationally and to upload data easily to the mainframe data base, Joel Isaacson said.

Isaacson is president of the Personal Computer Professionals Association in Los Angeles, a service group that selects and evaluates products for corporate users. He is also chief of the Information Services Division at Carter-Hawley-Hale, a $4 billion retail organization based in Irvine, Calif.

Isaacson said that users were clamoring for microcomputer products to organize host data into standard formats for extraction, to provide standard workstation formats for transferring data and to provide user-friendly extraction programs.



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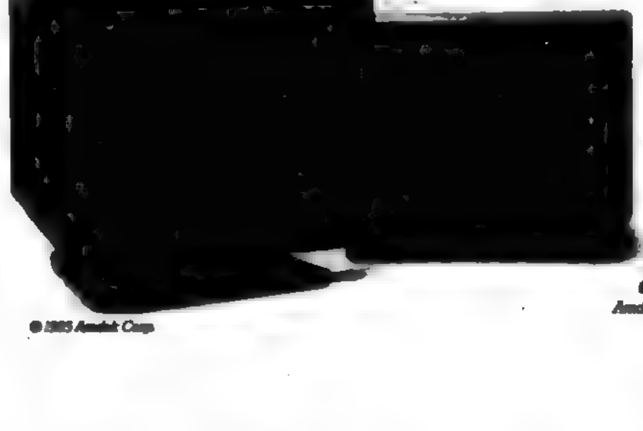

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NEWS

NCR unveils IBM AT clone

By Charles Babcock
CW New York Bureau

NEW YORK — NCR Corp. announced a desktop computer, said to be IBM Personal Computer AT-compatible, that will be available in August and priced 5% less than the AT's list price.

Dubbed the PC8, it will run under the NCR-DOS 3.1 operating system, capable of using software designed for the IBM Personal Computer family. It will also run Microsoft Corp.'s Xenix for a multiuser environment, company officials said.

Both the Personal Computer AT and the NCR model use the 6 MHz, 16-bit Intel Corp. 80286 microprocessor.

The PC8 will come in two models, one with 256K bytes of random-access memory (RAM) and one with 512K bytes of RAM, expandable to 4M bytes.

The basic model has a single, half-height 5¼-in. floppy disk drive with 1.2M bytes of storage.

The enhanced model has the same 1.2M bytes of floppy disk storage, along with a 20M-byte, full-height, hard disk drive, expandable to 40M bytes, company spokesmen said.

Added features

NCR claimed the micros offer additional features that add value to the IBM Personal Computer AT clone: a 640- by 400-pixel monochrome or color monitor gives higher resolution than the IBM Personal Computer monitors, but can display Personal Computer graphics; an optional 10M-byte streaming tape drive serves as a data backup device; and a keyboard with 30 programmable function keys eliminates the need to use the shift key with the function keys.

Up to 16 users may connect to the PC8 at one time, said Vernon W. Yates, general manager of NCR's personal computer division. Yates acknowledged that machine performance would slow, depending on the application being run, as more and more users hook up to the machine.

The IBM AT is limited to three users. IBM observers say the limit avoids a decrease in machine performance with disk-intensive uses such as word processing. The PC8 has the same average disk access time as the Personal Computer AT, Yates said.

The basic PC8 will sell for $3,795; the enhanced version will cost $5,505, spokesmen said. Volume shipments will begin in the third quarter.

NCR officials also announced the following:

- The PC6, an IBM Personal Computer XT-compatible based on the 16-bit, Intel 8088-2 that is said to be up to 38% faster than the XT. It will be available in July for $2,583 for a basic model that comes with a 256K bytes of RAM, expandable to 640K bytes; one 320K-byte floppy disk drive; one 20M-byte, half-height hard disk drive; and a 10M-byte tape streamer drive for backup.
- A Retail Personal Computer, combining NCR's already released PC4 with software and peripherals, including a cash drawer that allows it to function as a point-of-sale terminal. Its price ranges from $4,331 to $8,891. It is available immediately.

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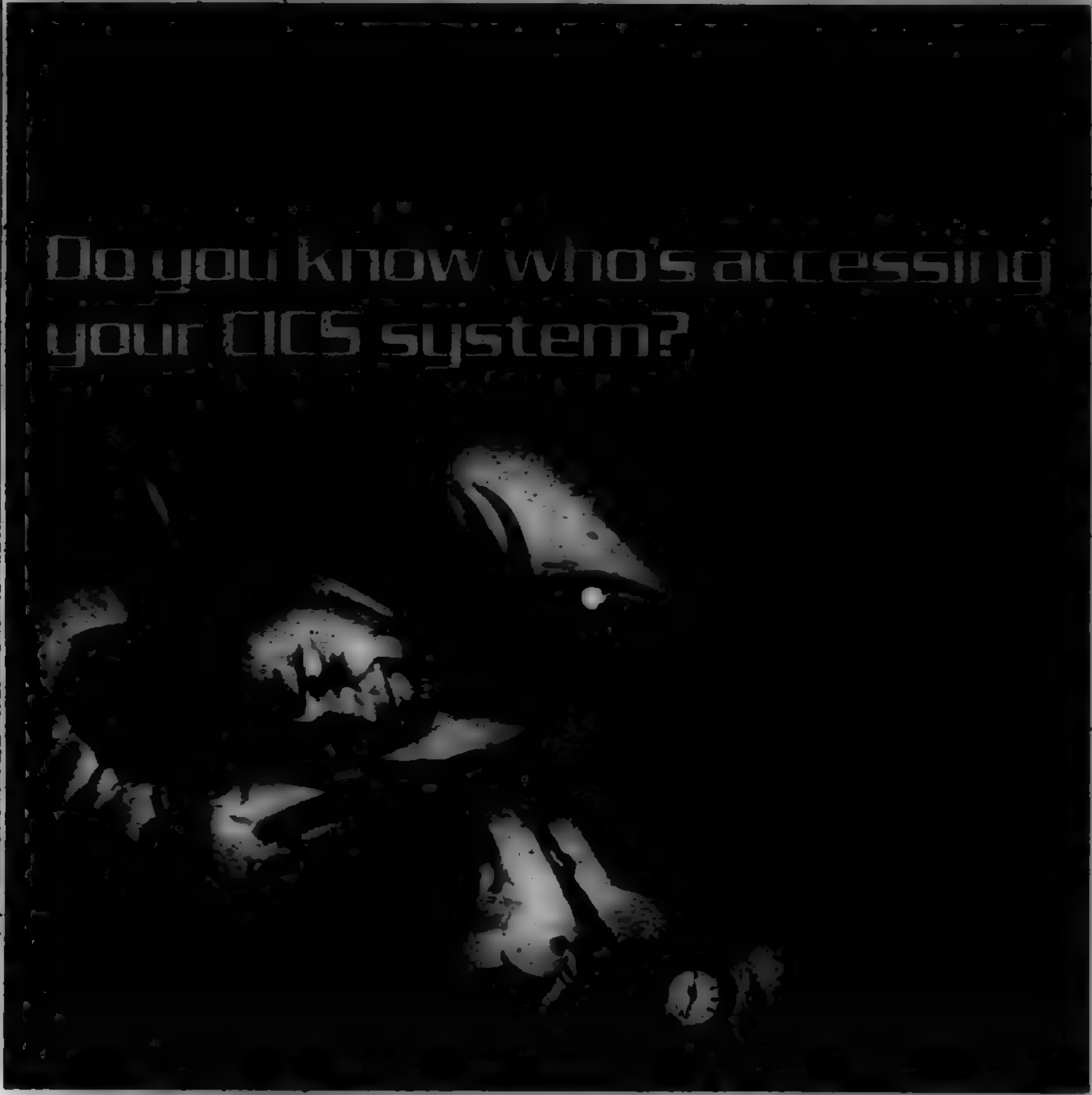

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Put DP in sync with corporate strategy, execs told

By Charles Babcock
CW New York Bureau

NEW YORK — Corporate MIS directors have to start tying information processing to the strategic goals of their companies, or someone else will assume the job, said William R. Synnott, senior vice-president of the Bank of Boston Corp.

If MIS directors succeed in doing this, they will be functioning as the chief information officers within their companies, Synnott told 75 MIS and business managers here recently. His one-day seminar, "Managing Information Resources for Competitive Advantage," was sponsored by Research & Planning, Inc., a Cambridge, Mass., consulting firm.

Synnott said the need to develop information resources that function step by step with the corporation's plan and strategy is pressing because of the danger that those people with the most knowledge of the corporation's operations may take over a high-level MIS function.

"To paraphrase Pogo, MIS managers may one day look at each other and say, 'We have met the chief information officer, and he is not us,' " Synnott said.

The first step toward assuming this role is for MIS managers and top management to share a new vision of their companies' computer resources. Top management has to see information management as instrumental to achieving the long-range competitive goals of the company. MIS managers have to acquire a grasp of the fundamental business problems facing the company, he said.

The best-known example of a business using this combined power is American Airlines, Inc.'s passenger reservation system, Synnott said. Not only did the airline's system initially favor its own flights, a practice the U.S. Department of Justice has since ruled against [CW, April 8], it also captured valuable data on the pricing and traffic patterns of competitors. By getting its terminals into travel agents' offices first, it locked out the competition, he said.

To manage change in a competitive climate, the chief information officer must become "an engine of change," encouraging the use of microcomputers throughout the company, controlling use of micros so that they can be interconnected and building networks between computer users at all levels.

Market penetration

Chief information officers should also understand that by extending their companies' services through technology, they might achieve greater market penetration and a competitive advantage, he continued.

Some banks are gaining mortgage business by putting terminals in real estate agents' offices. Realtors can prequalify a buyer at a certain price level and begin the application process if potential buyers find homes that they want. The process speeds loan approval and locks in mortgage customers almost as soon as they decide to buy, Synnott said.

When banks install automatic teller machines, they are reaching out into the consumer's space rather than building more branches. And the consumer assumes much of the information processing task formerly handled by tellers, he said.

Another way chief information officers can help their companies achieve a competitive advantage is to look for some way to use technology to generate revenue "to own the railroad," he added. Synnott cited the example of J. C. Penney Co., which, after building a national retailing network for itself, is selling time on the network to gasoline retailers for credit transactions.

Chief information officers must maintain a corporatewide point of view, Synnott said. "The question is not whether we need a chief information officer," he concluded. "The question is, 'Who is it going to be?' "

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NEWS

End-user computing varies with corporate culture

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Corporate perspectives toward end-user computing vary with corporate cultures, according to industry executives who direct such activities at major U.S. corporations.

Speaking at an Association of Data Processing Service Organizations, Inc. (Adapso) panel on end-user computing, held here recently, C. L. Hodges, supervisor of the Personal Computer Services Center for Chevron Corp., said his department tests and evaluates hardware and software for end users, communicates with vendors, coordinates user training and staffs a user-support hot line.

One problem at Chevron, Hodges said, is that it takes 36 days for a Chevron end user to obtain a personal computer once it is authorized, due to Chevron's lengthy approval cycle for end users. Hodges said the cycle includes reviews by Chevron's applications manager and its data communications group.

"A five-week review is an inordinately long time, especially given the short product life cycle of personal computers today," Hodges said. Chevron is in the process of cutting its review procedure down to 13 days, he said, by processing end-user orders electronically using IBM's Professional Office System and by warehousing commonly used hardware and software.

Lee Milligan, manager of financial information services at Apple Computer, Inc. in Cupertino, Calif., said that at Apple, the choice of computer hardware, software and service is left up to the end user, without the intervention of a centralized MIS department.

Rather than using an MIS department, each Apple product group decides autonomously how a computing task should be handled, Milligan said. At Apple, 50% of the computing tasks are handled by desktop personal computers, and employees are encouraged "to stay off mainframes and minis," he said.

There are problems with this autonomous approach, however, Milligan said. Information is not easily transferred between personal computers, and it is much harder to manage data.

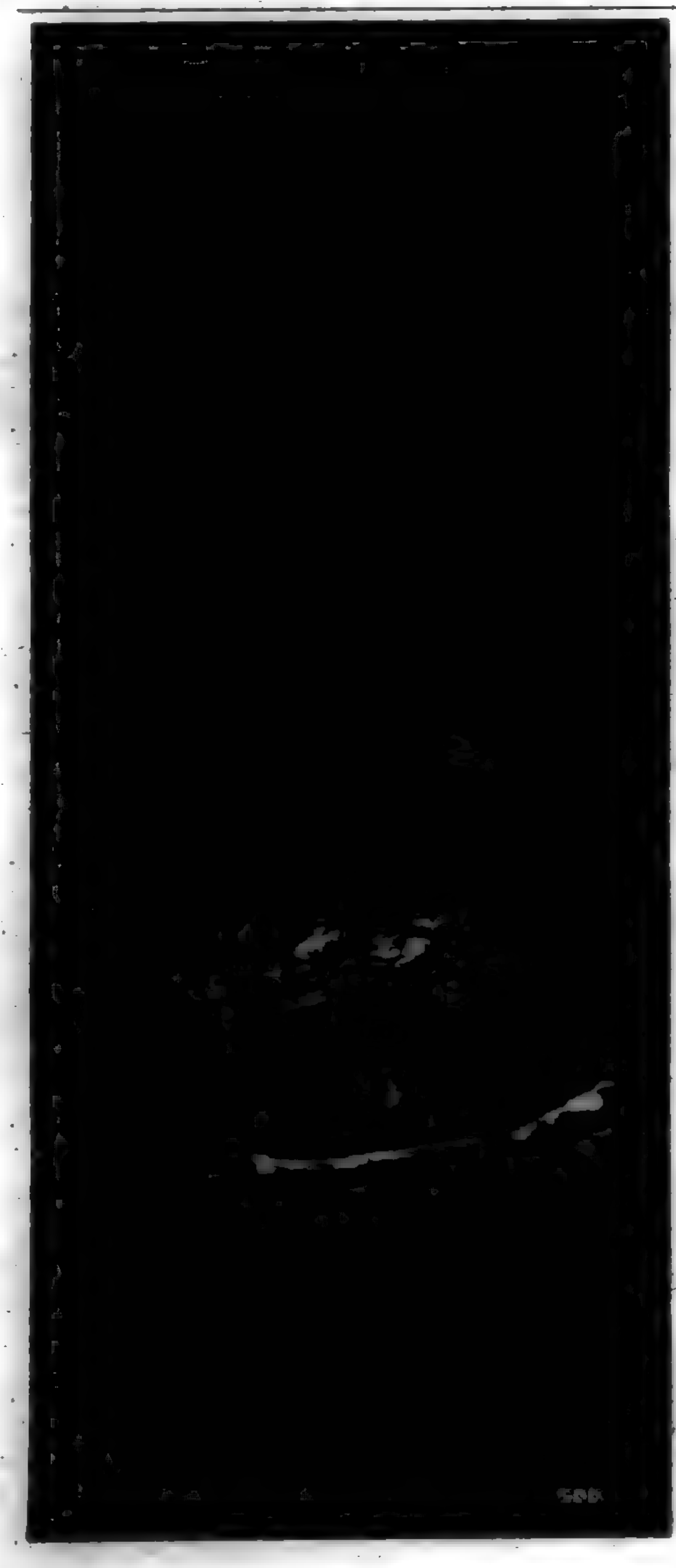
Milligan said the benefits of allowing end users to choose their own computers far outweighs the disadvantages. Among the advantages are that there are lower computing costs and that Apple's mini and mainframe computers are freed for other tasks such as distribution, manufacturing and payroll.

Robert F. Berland, IBM's director of strategic planning for MIS in Armonk, N.Y., said today's information overload makes it difficult for end users to decide what software or networking services to use.

The most crucial requirement for end-user software at IBM is ease of use, typified by transparent data extraction and archiving, he said. The ideal end-user computing setup at IBM would leverage existing technology to link intelligent workstations, departmental micros and mainframes, Berland said.

Coby Dunn, vice-president for end-user computing at the Bank of America in San Francisco said that typical Bank of America end users have minimal computer expertise and no formal applications development training. Their requirements are largely the sharing of corporate data, integrating inquiry and analysis and generating applications development without programming, he said.

According to Dunn, Bank of America is working on a three-tiered delivery strategy for its end users, using workstations, distributed systems and mainframe computers.



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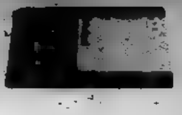

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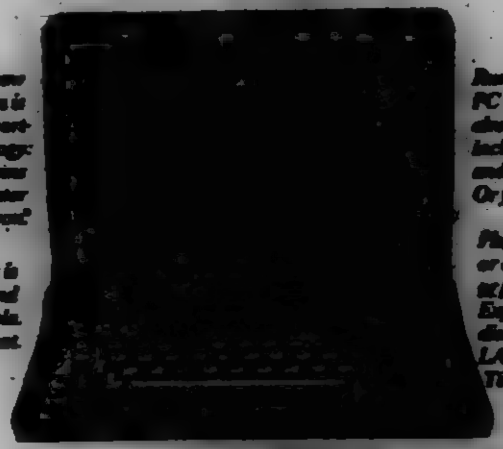

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INTERNATIONAL REPORT
CW International News Network

FRANCE

PARIS — ICL Co. has introduced the System 39 Level 30 and System 39 Level 80 mainframes, which will replace the company's 2900 line. The machines are intended to compete with Digital Equipment Corp.'s superminicomputer line and with IBM's 4361 and 3083 systems. The machines, available in single and dual versions, are based on Cmos technology and run under the VM operating system.

■

PARIS — Negotiations reportedly are under way between France's Alcatel and Altos Computer Systems, Inc. The French company is said to be interested in Altos' recently unveiled 3086 microcomputer, which reportedly is the first supermicro based on the 32-bit 68020 microprocessor from Motorola, Inc.

JAPAN

TOKYO — Japan's Agency for Cultural Affairs has announced a revised copyright law that includes software program protection. Effective Jan. 1, 1986, software will be registered and illegal to copy. To date, there has been little effort to monitor or discourage illegal use of software in Japan, and it is unclear how the new legislation will be enforced at this point.

■

TOKYO — Fujitsu Ltd. began a field trial of an integrated services digital network (ISDN) last month with an unnamed communications company in Singapore. The ISDN was designed to integrate facsimile, voice, graphics and data transmissions over a digital communications network, according to a spokesman. The field trial is intended to test multiple types of media in a single network based on CCITT standards. This reportedly requires the integration of hardware and software upgrades at three switching stations, use of digital telephone, facsimile machines, personal computers and other terminals.

■

TOKYO — NEC Corp. and NEC Toshiba Information Systems Ltd. jointly introduced the Acos System 610 mid-range mainframe and the Acos System 630 high-end mainframe. The systems feature large-scale integration and run under the Acos-4/MVP operating system. The Acos 610 is available in single- and dual-processor versions, offering 16 and 24 ports, respectively, and has memory ranging from 4M to 40M bytes. The 630 is a single-processer system with 8M to 32M bytes of main memory, 64K-byte cache memory and 24 channels, the vendor said.

■

TOKYO — Fujitsu Ltd. has added a high-end and low-end to its supercomputer line. Facom VP-400 is said to perform at 1.14G floating point operation/sec. (Flops). The entry-level Facom VP-50 reportedly operates at 140 Mflops and is field upgradable to the firm's existing VP-100 and VP-200 supercomputers.

WEST GERMANY

FRANKFURT — The West German business personal computer market grew 44% in 1984 — to 140,000 units sold — according to a study completed by Diebold Deutschland AG. The most popular personal computer in West Germany last year was IBM, with 30% market share, followed by Apple Computer, Inc., with 15%, and Olivetti Corp., with 9%. Experiencing decreases in shipments last year were Commodore Business Machines, Inc., Victor Technologies, Inc. and Hewlett-Packard Co. Personal computer sales have stagnated in West Germany without reaching the saturation point, the study concluded.

■

MUNICH — Although Systems '85: Industry Show for Computer and Communications is still six months away, Munich's biennial computer show has already booked more computer exhibitors than the World Center for Office, Data and Communications Technology segment of the Hannover Faire.

The popularity of Systems '85 appears to be growing: The show had only 952 vendors in 1983, compared with 1,400 vendors signed up for this year's Oct. 28 through Nov. 1 event (150 of which are American firms). No longer considered a regional show, Systems '85 could strip the Hannover Faire of its standing as "Queen of German computer shows," according to industry sources, because of the show's sophisticated schedule.

German micro mart slows

STUTTGART, West Germany — IBM Deutschland GmbH presented a "first" at a press conference here last week: its consolidated balance sheet for 1984. Along with downplaying the company's sluggish Personal Computer sales, IBM announced a modest gain in revenue for 1984, which was up just 6.2%, compared with its healthy 15.2% jump in 1983. The company's 1983 profit margin of 6.4% remained unchanged in 1984.

Last year IBM emphasized a considerable expansion of its Personal Computer business, and this year that was a favorite topic. The Personal Computer business accounted for just 1% of 1983 revenue here. One year later that figure is three times as much, said Lothar Sparberg, IBM Deutschland general manager. That means 3% of revenue, approximately $100 million, can be attributed to the Personal Computer. IBM did not mention any sales figures, but inside sources estimate that no more than 30,000 Personal Computers were sold in West Germany in 1984. These figures show a stagnation in the West German marketplace.

Diebold Deutschland AG recently released annual figures on market share in West Germany that offer another angle to IBM's position here. Based on the dollar value of installed base, the figures illustrate a decrease in IBM's market share from 28.4% to 27.5% — including micros, minis, small business systems and mainframes — to primarily benefit German competitors Nixdorf Computer AG and Siemens AG. Meanwhile, both of the latter firms enjoyed growth rates above the industry average of 15%.

According to industry sources, other West German subsidiaries of American computer vendors have lost relative market share in West Germany during 1984. These include Amdahl Corp.; Burroughs Corp.; Control Data Corp.; Datapoint Corp.; Management Assistance, Inc.; Mohawk Data Sciences Corp.; National Advanced Systems Corp.; Sperry Corp.; Storage Technology Corp.; Texas Instruments, Inc.; Wang Laboratories, Inc.; and Xerox Corp.

Among the successful American subsidiaries whose businesses all grew in West Germany last year were Commodore Business Machines, Inc.; Data General Corp.; Digital Equipment Corp.; and Hewlett-Packard Co.

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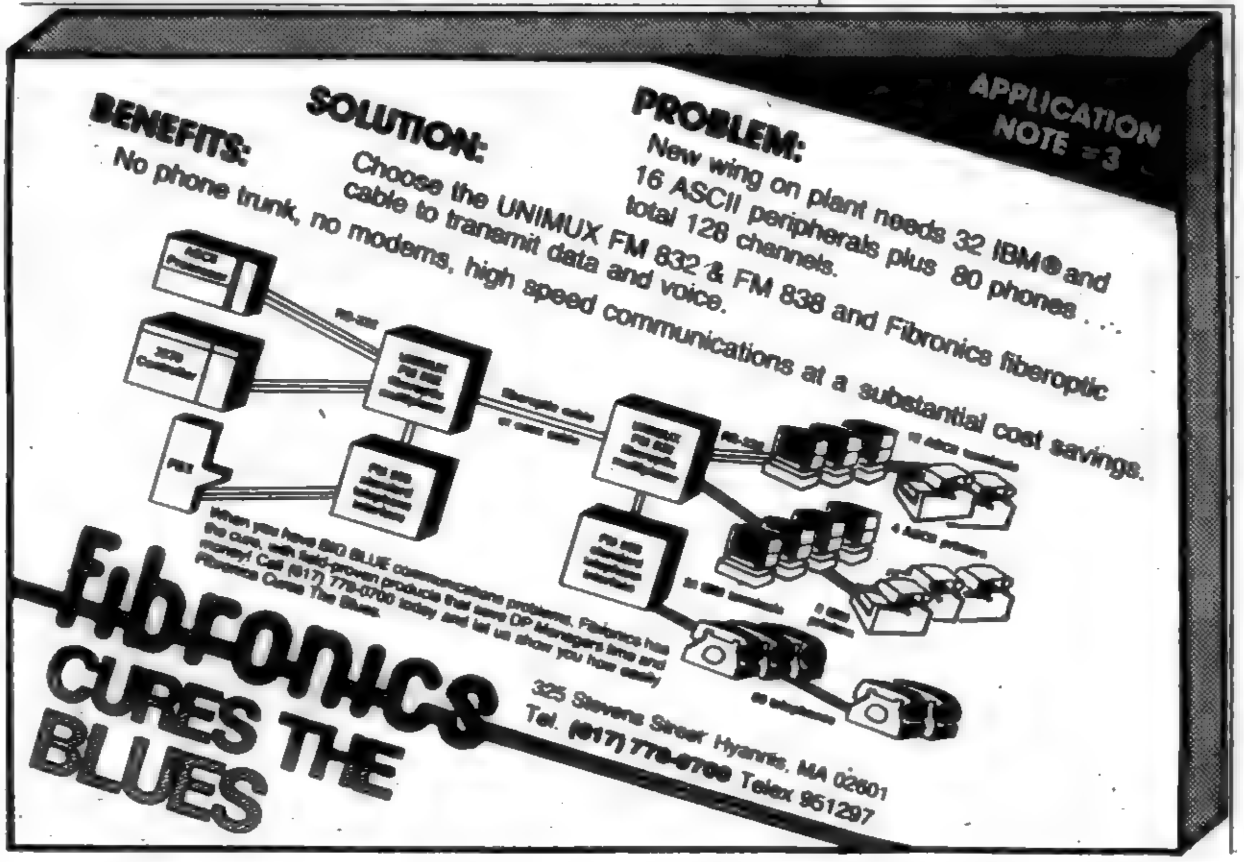
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System manages savings for manufacturing firm

OKLAHOMA CITY — A manufacturing company here saved $1.5 million after it installed a system to help manage its manufacturing operations.

CMI Corp. builds controlled asphalt plants, oil field products and road construction equipment and most often builds small quantities of many products, said Larry J. Farley, manager of manufacturing systems implementation.

In mid-1982, CMI installed a Sperry Corp. 1100/61 computer with eight 8470 disk drives and 100 user terminals, Farley said. CMI bought Sperry's Unis material requirements planning system and Mapper, Sperry's report and applications development system, he added.

Sperry's Unis manufacturing software started in a pilot mode for the company's pump-unit manufacturing line in December 1983, with eight Unis modules — including inventory management, inventory accounting, bill-of-materials and order entry — and CMI's complete customer file, Farley said.

CMI's system enables Larry Jack, pumping unit manufacturing, to produce an efficiency report on a unit just completed.

Savings in purchases

The company saved about $1.5 million in raw materials purchases, labor and the carrying costs of inventory, partly because the Unis system pointed out an overstock in pumping unit subassembly component inventory, Farley said. The company was able to use up the excess components, rather than fabricate new items, he said.

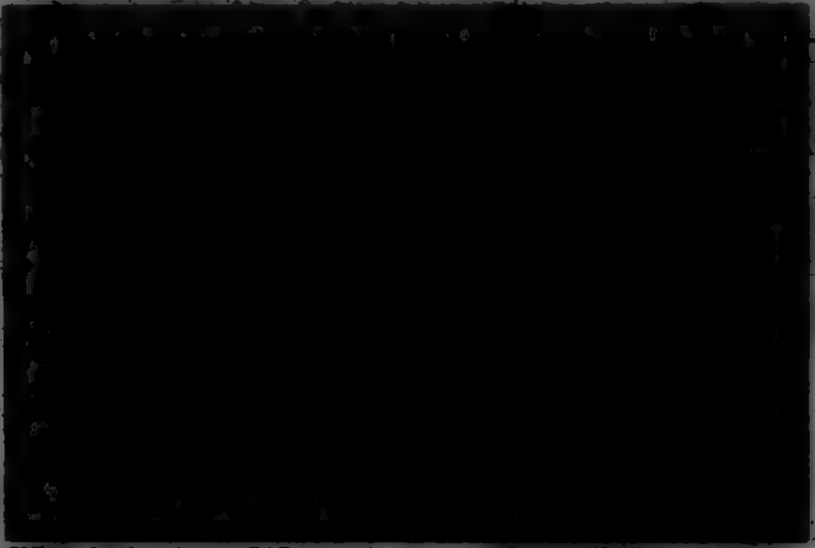
Farley found that Sperry's Mapper system, an interactive report and applications generator, lets his personnel build their own data bases and reports so they can make changes to reports quickly, he said.

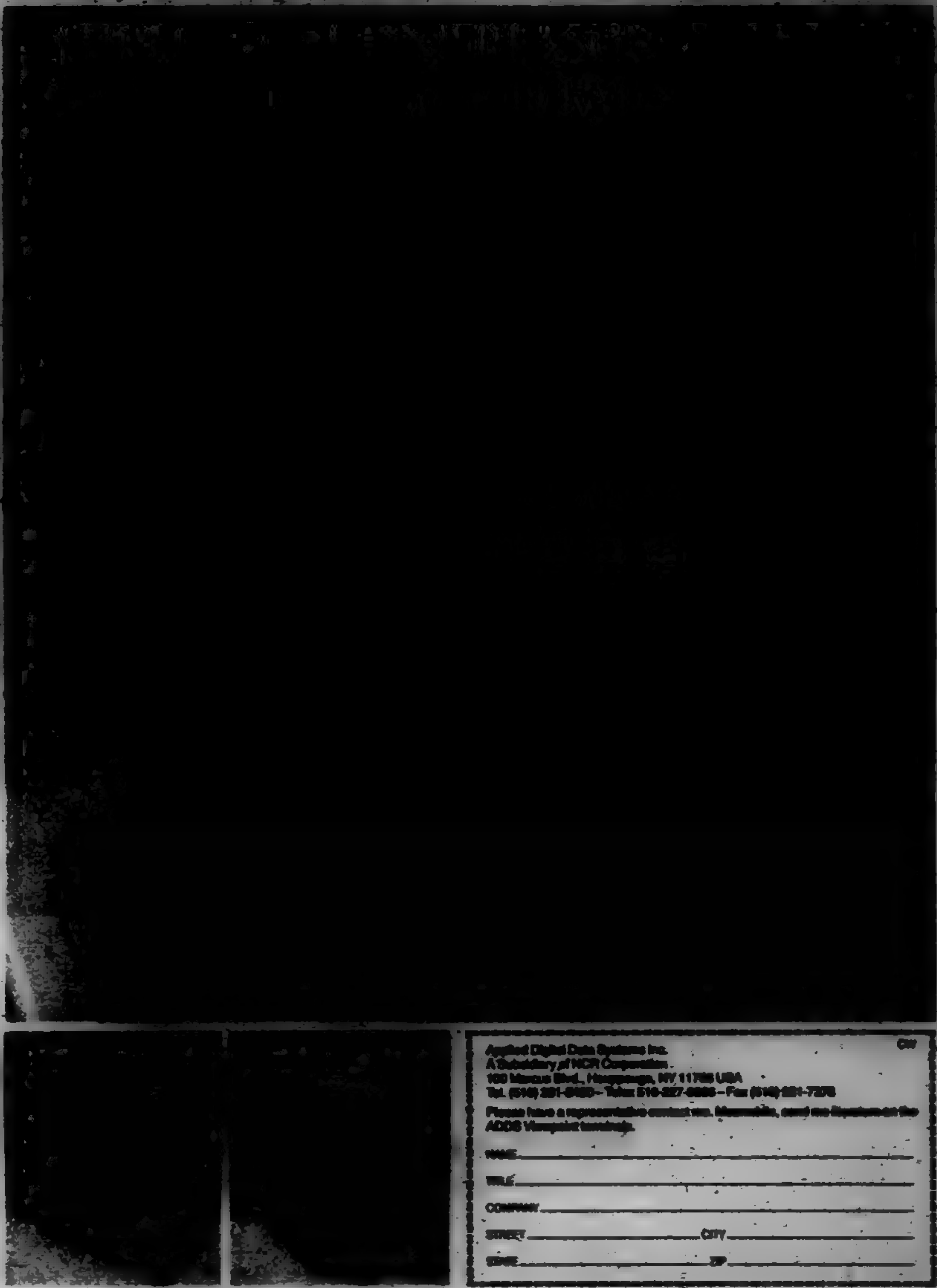
The Mapper system speeds user acceptance of the Unis manufacturing and resource management system, Farley said. Mapper is unable to access the data base, but can pass a request to a Cobol program to pull the data from Unis out into Mapper so the user can manipulate it, he said.

There are now more than 200 Mapper system users with more than 400 applications at CMI, Farley said. Typically, a user will put together two or three different reports, each taking about five minutes, then enter the necessary data and start manipulating or doing calculations with it, he said. If the user needs help, Farley or others can assist him, he added.

The company saves 12 to 16 man-days per month by using Mapper to prepare spreadsheet reports that formerly were calculated and typed, explained Mapper coordinator Richard

See CMI page 30


CMI production planner Ed Bergen checks a shipping manifest.



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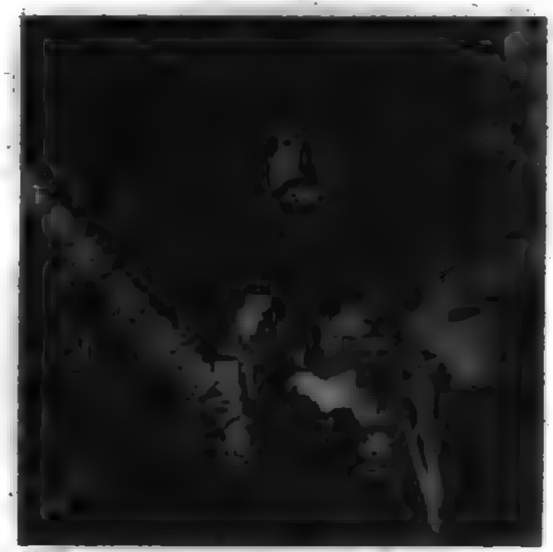

CMI's management system streamlines data.

CMI

from page 29

Wooton. In the past, two monthly comparisons of product costs for upper management and sales each took three to four days to prepare, Wooton said. Now, producing four of the reports takes a total of two hours.

About 2½ hours per week are required to enter and analyze time-card data — a task that previously took 20 man-hours per week, he said.

A production control supervisor who is a beginning Mapper system user recently spent 30 minutes putting together a six-month forecast on after-market sales of approximately 1,100 manufactured parts, Farley said. His manager wanted information about the quantity on order and the quantity on hand added to the report, and Farley added the extra information in about five minutes, he said. Then, top management saw the report and asked that unit costs and extended cost data be added too. It went back to Farley for another five minutes of work, and the result is a document now valuable at several levels, he said.

Some of the marketing staff at CMI changed their minds about getting their own microcomputers because they discovered the information they wanted was available through the system, Farley said. He added that extensive quality-control reporting and auditing is now on the system, too. It serves to keep track of parts audited, reject information and the responsible department, he said.

CMI is extracting parts description and cost data from almost every Mapper system application, Farley said. This eliminates an operator having to key in the information, and it also automates the costing of almost any parts report when management wants cost data, he said.

The Mapper application that most CMI people come in contact with is a combined production/service parts shortage report that includes expediting information, due dates and promised dates and other information by department and manager so the manager knows just what machine has been held up, Farley said. This comes out each morning, or more often if necessary, in about 20 copies, which are not identical, according to Farley.

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DPMA to offer May seminars

PHILADELPHIA — The Data Processing Management Association (DPMA) here will host three morning seminars at the Sheraton University City hotel here during May.

The topic on May 15 is "Decision Support Systems and the Office of the Future"; on May 22, the theme is "Micro-to-Mainframe Linking Within the Information Center"; and on May 29, the seminar theme will be "Application Development Tools."

The sessions cost $40 each for members and $50 each for nonmembers.

More information is available from the DPMA of Philadelphia, P.O. Box 2357, Philadelphia, Pa. 19103.

IBM announces grant recipients

ARMONK, N.Y. — IBM has donated $27 million worth of cash and equipment that will be shared among 13 universities for programs to enhance graduate-level MIS education.

The grants are designed to help graduate schools prepare students to manage data bases, DP equipment and software, IBM said. With the grants, universities can improve curricula and develop courses leading to advanced MIS-related degrees. Each school will receive up to $1 million in cash and up to $1 million worth of IBM hardware and software.

The 13 universities were selected from 77 schools that submitted proposals in response to IBM's announcement of the grant program in April 1984.

The universities include the Claremont (Calif.) Graduate School, Georgia State University, Indiana University, MIT, the University of Arizona, the University of California at Los Angeles, the University of Georgia, the University of Illinois at Urbana-Champaign, the University of Minnesota, the University of Pennsylvania, the University of Pittsburgh (Pa.), the University of Rochester (N.Y.) and the University of Texas at Austin.

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TURNAROUND TIME

Larry Long

Q While I have some sympathy for the difficulties encountered by personal computer software vendors protecting their proprietary interests, their stipulations on copying are impractical in a corporate environment. The current public relations campaign to get the public to conform to licensing protocols leads me to wonder whether our current practices are ethical.

We would never knowingly cheat or defraud anyone. However, our own procedures for distributing personal computer software within our own organization do not conform to the many and varied forms of words that software vendors wrap around their licenses.

We buy licenses for every personal computer that runs licensed software, but we try to avoid buying licenses when we just want to evaluate a package. Borrowed software is returned following evaluation and back-up copies are destroyed.

We issue copies, not the original software, to our production users — and we won't license anything we can't copy.

We don't reregister licensed software if it is moved to a different host personal computer or when we swap the original personal computer for repair or upgrade.

These practices clearly do not conform to the requirements of many of the software licenses. Even though our practices are not intrinsically illegal, they could be regarded as being in breach of contract. However, we don't consider that we have damaged the interests of the vendors, so any breach would be merely technical and have no financial value.

Our procedures are based on commercial pragmatism. Because of this, we do sign licenses that we don't intend to adhere to fully. Is this practice ethical?

A breach of contract, no matter how seemingly insignificant the infraction, is unlawful and, therefore, it is unethical.

It's common knowledge that people in business, government and education have abused personal computer software license agreements — some blatantly. People have openly recounted their abuses to me with a sense of pride of accomplishment. In reprisal for these abuses, some software vendors may have overreacted, in my opinion, in the stipulations and restrictions they set forth in their license agreements. I would be surprised if one out of 100 users even reads the agreement. Most simply use common sense in their treatment of a vendor's copyright.

The vendor-sponsored campaign to curb abuses is needed, but I agree with you that we need a more pragmatic approach to the licensing of proprietary software. I would encourage the personal computer software industry to cooperate in developing a universal license agreement that is guided by common sense and fairness, and that can be understood by all and enforced by the industry. As is, a great many users are feeling pretty unethical about now.

Q How do you gracefully say that I will do any work that is remotely related to computers? I have 20 years experience in operations, programming and systems. And I've been unemployed for eight months.

On my resume, I stated that I am seeking "a challenging position as a programmer/analyst leading to project management." How can I say that I would be happy with any type of computer work without sounding like I'm desperate?

How about this: "a challenging opportunity that will permit me to employ my computer expertise in areas where computing and information resources are not realizing their full potentials."

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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JUNE 2-5, DALLAS — **American Bankers Association's 1985 National Operations and Automation Conference.** Contact: American Bankers Association, Communications Group, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

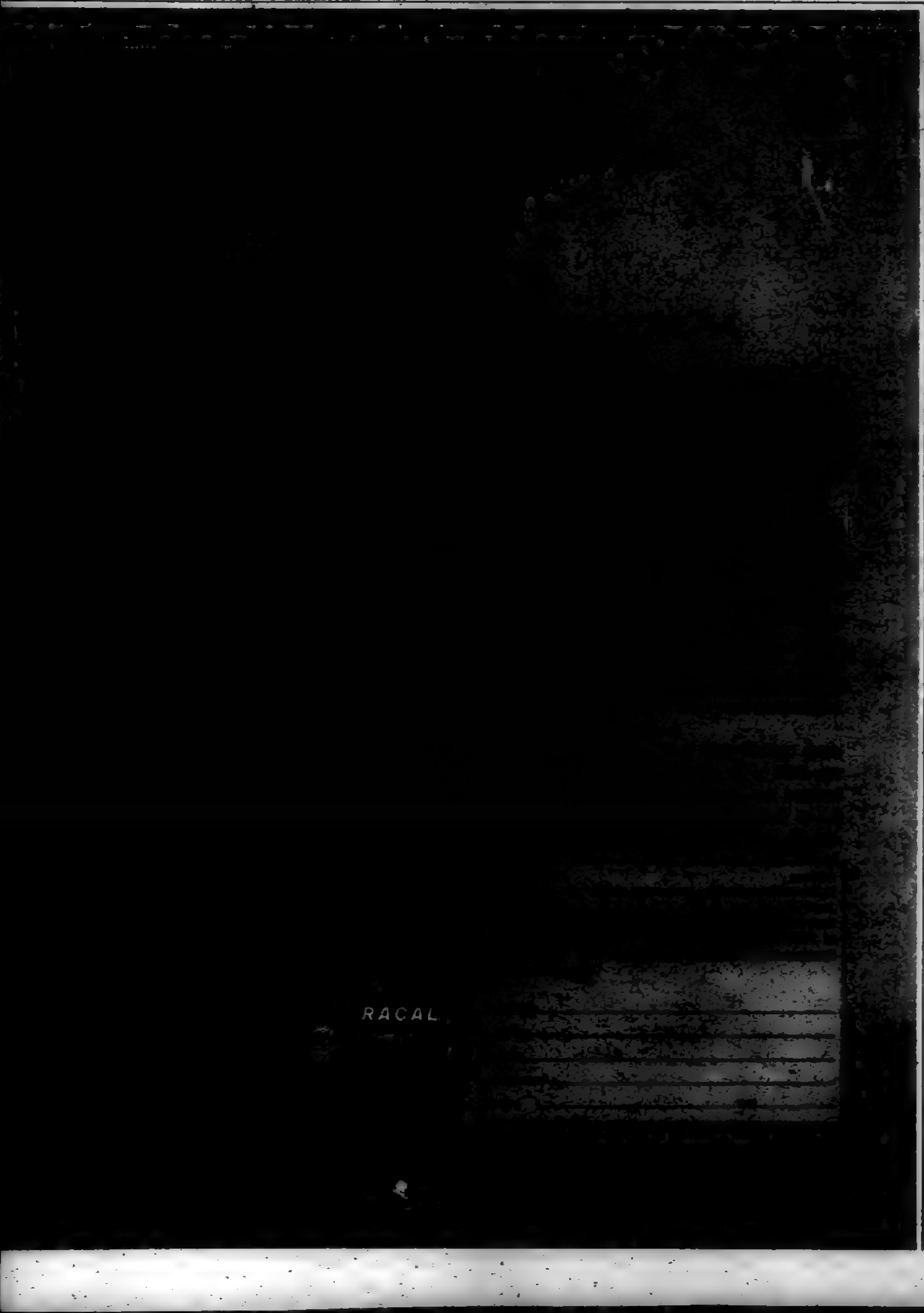
JUNE 3-4, BOSTON — **Fundamentals of Data Processing for Administrative Assistants and Secretaries.** Contact: New York University School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022. Also being held June 20-21 in San Francisco and June 27-28 in Los Angeles.

JUNE 3-5, MONTREAL — **Canadian Information Processing Society Congress '85.** Contact: Canadian Information Processing Society, Fifth Floor, 243 College St., Toronto, Ont. M5T 2Y1 Canada.

JUNE 3-5, SAN FRANCISCO — **Long-Range Information Systems Planning.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020. Also being held June 17-19 in Boston.

JUNE 3-6, CHICAGO — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 24-27 in Washington, D.C.

JUNE 3-6, CHICAGO — **Vtam: From Start to Finish.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 17-20 in Boston and Atlanta and June 24-27 in Los Angeles.



JUNE 3-6, FORT LEE, N.J. — **CICS/VS MRO/ISC.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 3-6 in Los Angeles, June 17-20 in San Antonio and June 24-27 in Fort Lee.

JUNE 3-6, DENVER — **Vtam: Its Structure and How to Use It.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 10-13 in Fort Lee and June 24-27 in San Antonio.

JUNE 3-6, LOS ANGELES — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held on June 17-20 in Fort Lee and June 24-27 in Atlanta.

JUNE 3-6, NEW YORK — **IMS/DC Programming.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 17-20 in Chicago.

JUNE 3-6, WASHINGTON, D.C. — **CICS/VS Applications Design.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 11, 13, 18 and 20 in New York; June 17-20 in Fort Lee and Los Angeles; and June 24-27 in San Antonio.

JUNE 3-6, MONTREAL — **Montreal International Software Market '85.** Contact: Montreal International Software Market, P.O. Box 1119, Suite 1919, 300 Leo-Pariseau, Place du Parc, Montreal, Que. H2W 2P4 Canada.

JUNE 3-7, FORT LEE, N.J. — **CICS/VS Internals.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 10-14 in Atlanta, June 17-21 in San Antonio and June 24-28 in New York, Chicago and Los Angeles.

JUNE 3-7, ATLANTA — **CICS/VS Application Programming — Command-Level.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 10-14 in Boston, Chicago and Los Angeles and June 24-28 in Fort Lee and San Antonio.

JUNE 3-7, MONTREAL — **Fourth-Generation Languages: Paths to Productivity.** Contact: National Seminar, Canadian Information Processing Society, Fifth Floor, 243 College St., Toronto, Ont. M5T 2Y1 Canada.

JUNE 3-7, BOSTON — **Systems Workshop II.** Contact: Ware Associates, P.O. Box 948, Groton, Conn. 06340.

EDITORIAL

Can we talk?

Is it just saber rattling, or is there a pitched battle brewing between users and vendors over the software protection issue?

On one side are the micro software vendors. Their rightful claim to losing millions of dollars a year to illegal copying of their packages has prompted them to promote a protection methodology based on locks and "key rings."

On the other side is the most outspoken of perhaps a dozen corporate microcomputer user organizations: the New York-based Microcomputer Managers Association. The group's nononsense, blanket rejection of the Association of Data Processing Service Organizations, Inc.'s proposed lock-and-key scheme [CW, March 11] caught the micro software vendors off guard and appears to have set the stage for a classic user-vendor confrontation.

Vendor reaction to the users, gauged at the recent Adapso spring meeting, indicates little softening in the industry's position. No matter whose estimates of revenue loss to piracy one believes, it is clear that copying the leading micro software packages is a growing threat as end-user computing proliferates.

Users are determined to protect their investments and their future revenue stream by promoting site licensing, the only antipiracy methodology they can accept at present. However, site licensing — whereby users pay a flat fee for limited or unlimited copies of a package — is not a palatable choice for many vendors, as it, too, would cut into the revenue derived from unit-priced sales.

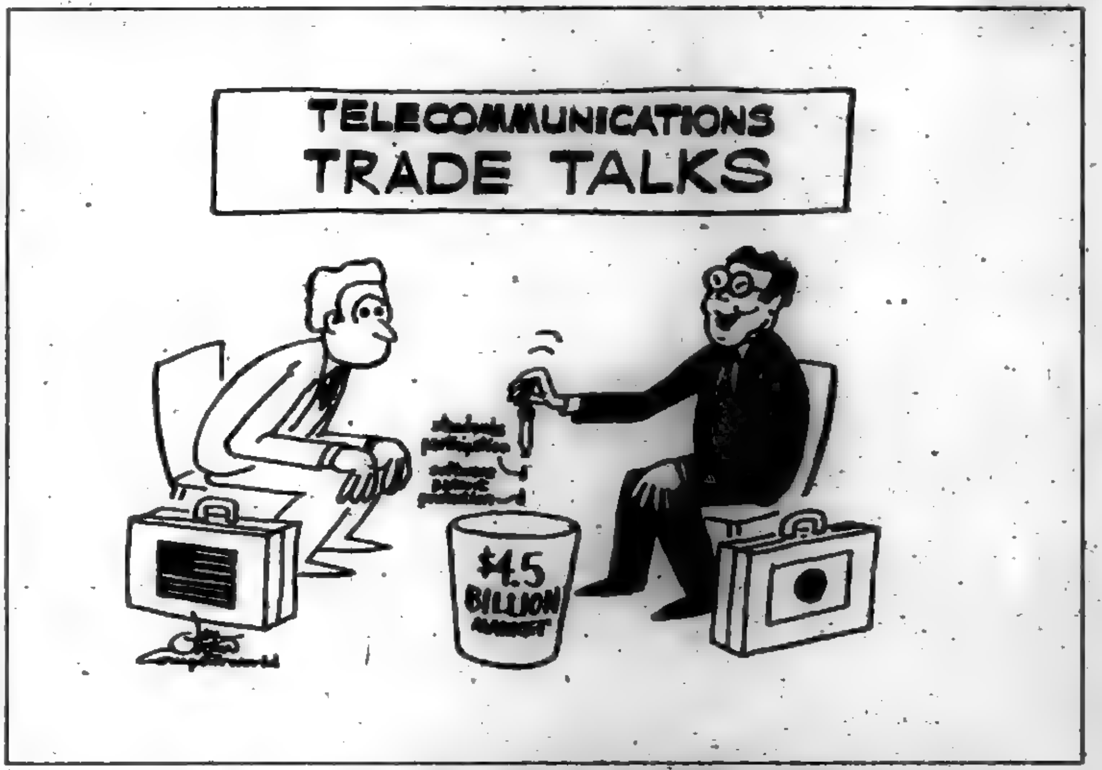
But certainly no protection methodology can be effective without widespread corporate acceptance, and that is precisely what the MMA claims is missing here. Its concerns are as valid (and different) as those of the vendors: the key scheme does not address the growing number of multiuser systems; some workers could find themselves carrying several different keys or buying duplicate keys for each micro they use; lock installation would be a costly headache.

It is unclear just how seriously each side is taking the other in the software protection matter. Some Adapso members seem to regard the MMA and its protest as little more than a nuisance, although the official line from the organization is one of concern.

The MMA, on the other hand, has made little effort to date to talk the matter out with Adapso. The MMA was not formally represented at the Adapso meeting, which dozens of micro software vendors attended and where the protection issue was discussed in open session. The MMA claimed it wanted to be in on protection discussions from the outset but was not invited to do so.

Initiating open and continuous dialogue between users and vendors before a full-scale war breaks out would be in the best interest of both sides. The MMA has threatened to use its multimillion-dollar buying clout as leverage to counter unwanted protection schemes. Adapso knows that its membership holds the keys to business solutions and that the MMA has nowhere else to go for pivotal micro packages and peripherals.

Clearly, one side must draw a line over which the other can jump and begin thinking about compromises.



'Don't complain. Two drops in the bucket are certainly better than one.'

LETTER

Make Cobol code understandable

And the absurdity goes on. Articles such as "Maintenance push is on" [CW, April 8] are prime examples. This article supposedly deals with Cobol productivity in general and program maintenance in particular. Yet not once in the entire article was the major reason for the lack of program productivity mentioned.

How long and what will it take for us to recognize that the ability to understand Cobol coding has a direct correlation to programming productivity?

The author described 30 bugs/1,000 source code statements for new programs, but he said that adding new code is a much more hazardous undertaking. Doesn't the author recognize the danger is simple — that the code to be modified is not clearly understandable? Doesn't he realize that much fewer bugs will be created modifying 5,000 lines of clearly understandable code than 500 lines of poorly programmed code? The fact that the author is still using "lines of code produced" as a measure of productivity is very discouraging. How can the author and others discuss poor Cobol program productivity without identifying the major reason for it?

Structured code can isolate each function of a program in a top-down format. That is all it does. Although that is very desirable, it does not make Cobol coding more understandable.

This type of coding is just as difficult to understand — whether it's within structured or spaghetti code. The author obviously is not aware that many installations have found little or no im-

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VIEWPOINT

Collaboration benefits management, vendors

THE DATA CENTER
John P. Murray

There is a great deal of difference in the way the managements of installations work with their vendors. The styles range from total reliance upon the vendor to complete independence. These cases represent the extremes, and neither is correct.

In the first case, the installation's management has abrogated its responsibility. You can find examples of organizations under the de facto control of their vendors. In these situations, no solution, other than the particular vendor's solution, is even considered. This is unfortunate, of course, because it precludes all opportunities to find more appropriate, and perhaps less expensive, solutions. Sometimes, as a result of this one-vendor policy, an unnecessarily complex or cumbersome approach is taken to solve technical problems because those are the only answers available from the vendor.

The second instance is also representative of an incorrect position with regard to the vendor-customer relationship. There are information processing managers who absolutely will not rely upon their vendors for anything other than support for whatever specific products they may have installed. The "don't call us, we'll call you" syndrome is in effect here. Sometimes you will see examples of outright hostility toward particular vendors. That is an unfortunate circumstance; it does no one any good.

There is a middle ground. Development of an environment where the management of the installation and its vendors work together should be encouraged — a collaboration seeking to improve the information processing function. The goal should be the development of a first-class installation, where both the customer and the vendors secure benefits.

The vendor is often in a position to provide significant help beyond the installation and continuing maintenance of its products. The knowledge the vendor acquires as a result of its experience in a variety of situations can be most beneficial where an appropriate rapport has been developed between the vendor and the installation's management. Astute managers should recognize this potential assistance as a positive factor, and they should work to cultivate the proper relationship.

> ”
>
> *The goal should be the development of a first-class installation, where both the customer and the vendors secure benefits.*

First set the ground rules

The primary step in the development of such a relationship must be in the establishment of the ground rules. The management of the information processing department must not relinquish its authority. The proper role of the vendor is to support actively the needs of the installation within the guidelines set forth by the function's management. The atmosphere should not only allow but encourage the vendors to suggest new approaches, new products, and these suggestions should receive serious consideration from the customer. It must not be forgotten, however, that the ultimate goal of the vendor is to increase sales.

Conversely, once an installation's management has rejected a particular item or suggestion, the vendor must acknowledge that the issue is closed and move on to other things. Some vendors do themselves considerable harm because they are unwilling to accept that an issue is closed. Going to a higher level in the organization to plead a case may generate some additional sales, but such a tactic may work against the vendor and create considerable ill will in the long run.

The usual result of such a vendor strategy is the development of an adversary relationship with the installation's management. This contributes to an attitude that works to exclude the vendor from increased participation — and eventual increased sales — within the organization.

Both customer and vendor should be aware of the value of ancillary services the vendor can provide. This can often be provided with little or no cost to the customer. This aspect of dealing with the vendors should be considered a value-added feature. Vendors should work harder to push this concept because it is of value to all concerned. Making the management of the particular installation more effective without increased cost will often generate increased sales for the vendor in the future.

Applying value-added features

What are some of the specific areas where help can be provided? Several concerns within the data center can be used as examples. Many data centers face difficulty in dealing with change control, with their scheduling processes and with client relationships. As a result of their numerous contacts, vendors are often aware of data centers where these concerns are being effectively managed.

The vendors may be able to supply the names of people in other organizations who can provide help. They may also be able to provide members of

See DATA, page 39

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

A 'we'll see' approach can placate cries for new 'toys'

MANAGEMENT MATRIX
Walter F. Cuisle

Let's suppose that you are handling DP for one of several divisions within a big corporation. You get a call one day from the vice-president, asking you to "come over for some coffee and a chat." The next day, there you are with your boss and maybe one or two people from other areas for a little coffee and a chat about, as it turns out, shiny new toys.

The vice-president just returned from a tour of another division and is bursting with new ideas — some of which involve you. "They have this great new XYZ system they just finished, and the vice-president over there tells me it shouldn't be too much trouble to implement here. It ought to be a big help to you in finishing up that ABC system of ours. What do you think?"

Forget the report you did last week describing ABC as 65% complete. Stay calm. Remember what you were told as a kid when you absolutely *had to have* a shiny new toy just like the other kids. Don't say no; say, "We'll see."

There must be a reason why the powers that be want this thing. There must be a reason, whether or not it's a good one. This means you really do have to take a good look at this new toy. If you decide not to adopt the system, you'll need solid reasons for the front office. If you do decide to adopt it, the reasons must be even more solid for the folks in the programming pit. (They do get a little possessive about their creations.)

Time is a problem

Your problem is one of time. Ordinarily, you would want to work up a point-by-point comparison of the existing and proposed systems: strengths, weaknesses, costs and savings. This lets everyone involved make an objective choice. But the kids in the front office are no doubt eager to get your answer; you don't have the time to do that full study, and the odds are you don't have the budget to support it either. The trick is to do just enough of an analysis to let the folks in the front office decide whether or not they want to fund your department for a full study. Don't consider this just another batch of busywork — look at it as an opportunity to close a sale.

You're selling that full study, and the nice thing is you win no matter what. If they buy the study, you have the time and money to do a proper analysis of the new XYZ vs. your existing ABC. On the other hand, your presentation may show that abandoning ABC for XYZ is just too expensive. You won't have wasted time on an unfunded study, and you wind up no worse off than you were before.

Recognize that the attraction of this new toy is likely to be more in how it looks and what it does than in how well it performs what it promises. Your presentation should reflect that attitude, comparing features and the costs. To do that, you can successfully use some of the techniques used to close a sale.

Add up the features

One technique that fits the situation and takes a little time is called the "T Close." Draw a large "T" on a piece of paper, dividing it into two columns. Label one side "XYZ," and put down its notable features, starting with the ones that seem to be attracting the most attention. Label the other column "ABC," and opposite each of those desired features put down the nearest equivalent feature of ABC. If your ABC system doesn't have it, put down the name of your in-house package that does. You should be able to sketch this out fairly rapidly in a brief talk with the people who want the new system. You can fine-tune it with a telephone call to the DP manager who uses the other system. Finish by extending the ABC column, if necessary, with those features it has that XYZ doesn't.

You'll see two things from the columns: a list of current in-house systems that have the desired features and a set of those features that you do have that the XYZ system doesn't provide. It's almost certain that the desired features can't be carried over directly, but because you have identified the nearest equivalent, you can find a reasonable estimate of the cost to produce that feature just by looking in your files. If you completely adopt the new system, you will have to rework it to add those features or you'll lose them. That's an expense, too.

You'll end up with three numbers: the cost to abandon ABC and adopt XYZ, the cost to modify ABC to pick up the most attractive features of XYZ and the cost to adapt XYZ and

See MATRIX, page 39

Cuisle is a senior associate with Nicholas [illegible] Associates in Bryn Mawr, Pa.

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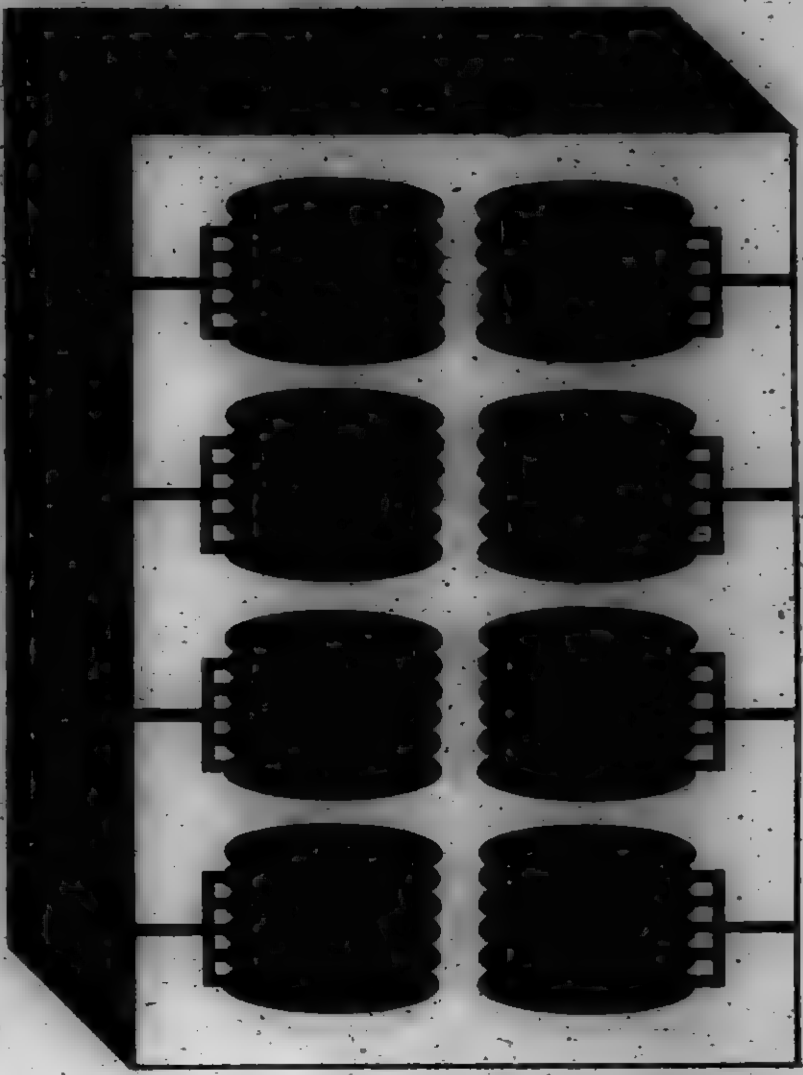

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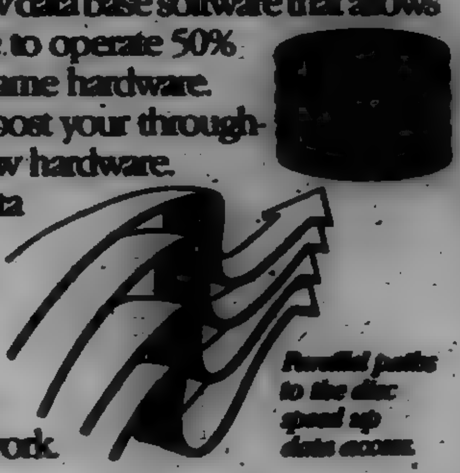

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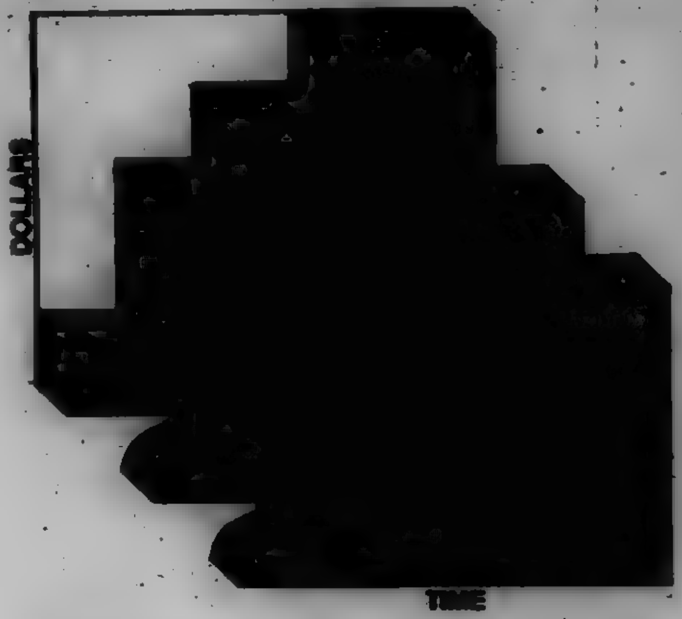

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TANDEMCOMPUTERS

VIEWPOINT

IBM 3270 no substitute for 5250 on System/36, 38

READER'S PLATFORM
Charles S. Baisly

The proliferation of IBM products based on the 3270 technology has been the subject of much attention, particularly in the article, "Evolution of the IBM 3270" [CW, Jan. 21], where author Scott Brear presented a number of comments and reflections on the subject. I am in agreement with most of those comments, but there is one area in which my opinions differ — namely, the possibility that IBM will standardize the 3270 as a replacement for the 5250 series supported on the IBM System/36 and 38.

This projection was based on the release of remote 3270 support on the System/38, as well as on the fact that a version of the 3180 terminal is supported locally on both the System/36 and 38. On the surface, these two facts would tend to support the anticipation of 3270 standardization. However, detailed examination of these facts may lead one to an entirely different set of conclusions.

Although the 3270 and 5250 terminal series appear to be functionally similar, the 5250 series has a number of features designed to relieve the host or remote cluster controller of many of the processing functions required in the 3270 series. The 5250 series — 5251, 5291, 5292 and 3180 Model 2 — have 32 different combinations of display attributes supported on a standard basis. The local editing features include independent processing of zero fill, right/left adjust, auto field exit and alphanumeric field-only check.

Resident logic

A key point is that the logic to support these features is resident in the terminal itself, rather than in the controller or the host applications program as in the 3270 series.

It is true that IBM has released support of remote 3270 clusters on the System/38, but I suspect that this feature was announced to assist migration of small networks — for small 4300 series customers who have chosen to move to the System/38 environment — rather than as an indication of the 3270 becoming the primary terminal for this system.

The support of 3270 devices on the System/38 requires large memory commitments (60K-byte base plus 20K byte/device) and significant system overhead to allow the 3270 to emulate the functions of the 5250 keystrokes. If IBM had intended to position the 3270 as its replacement for the 5250 on the System/38, one would have suspected IBM to have taken a more integrated approach to 3270 support.

IBM further supports evidence of my position by its introduction of the 5294 remote cluster as a replacement for the 5251 Model 12 remote cluster. The 5294 has enhanced processing capabilities that can be modified by microcode changes. The new unit can support speeds up to 56K bit/sec. The unit has vastly increased local storage, which reduces the amount of data traffic between the host and the cluster significantly by providing local screen save and restore capabilities.

Several clues to IBM's future directions in these areas were provided recently by IBM's comprehensive announcement of its Office Automation Strategy. The 5294 has been enhanced by the addition of a text editing assist feature to work with the new Displaywrite series announced on the System/36 and indicated as a future product for the System/38 in an IBM statement of direction.

The second point raised by

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Baisly is president of Perle GSD, Ltd., a Chicago-based supplier of protocol conversion equipment for the IBM System/34, 36 and 38.

LETTER

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provement in program productivity while using structured coding. This is because no attention was given to improving the ability to understand Cobol coding. Installations that have shown some increase in productivity included walk-throughs. These walk-throughs encourage programmers to make their coding more understandable in anticipation of the walk-through sessions. It is this coding clarity, combined with the structured coding, that is making the difference.

We in data processing seem to forget that programming productivity — through clearly understandable, easily modifiable coding — was the major objective of the creators of Cobol. All we need to do is use Cobol as they intended.

A key tool to achieving understandable coding is the automated Cobol quality assurance monitor. It examines Cobol coding and alerts programmers and management to deviations from company standards. It also includes a metrics portion that identifies the quality of software and applications programs.

Data processing can dramatically increase program productivity once it recognizes that understandable coding is the correct path and then follows that route.

Jerry Silver
New York

DEAL

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their own staffs who can suggest methods that have worked well for other installations. Rather than continue to struggle with such issues, the help of the vendors should be solicited.

The vendors can, as another example, organize tours of other installations for senior management who desire increased information about a new process or system before they agree to provide support for its installation. To some degree, of course, this is a sales ploy, but it can also provide an opportunity to demonstrate how the process or system might work in the organization. It also gives senior management the opportunity to look objectively at the value of the proposal.

A balance must be struck between turning over control of the information processing function to the vendors and ignoring the potential inherent in their increased participation. If the value of that participation is understood and appreciated, if management works to develop the appropriate environment and if the proper balance is maintained, everyone in the installation wins.

MATRIX

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modify it to pick up the most attractive features of ABC. Obviously, you can't guarantee that the work can be done for those costs — the numbers are too rough as yet. On the other hand, you can justify each of the numbers as reasonable, even if rough, because they come from previous projects rather than off the top of your head.

No one can say you haven't been objective. Best of all, you've offered options to the front office and put the ball back in their court. Now they, not you, have to decide whether to give you the additional time and money to do your full proposal or to abandon the idea altogether.

It's quick and dirty, but it works. When you were a kid, "we'll see" didn't always mean "no." When it didn't, the next question was, "What's it worth to you?"

3270

from page 38

Brear was that the 3180 was supported on the System/36 and 38, as well as 3270 subsystems. While the 3180 Model 2 (a member of the 5250 series) shares keyboard, display and logic units with the 3270-compatible 3180 Model 1, the 5250-compatible 3180 Model 2 uses more complex microcode and a twin-axial interface, rather than the coaxial type A interface on the 3270 series. As IBM is sharing many component subsystems, logic units and enclosures in its various implementations of the Personal Computer to achieve manufacturing efficiencies, it would follow that a similar strategy in the terminal area would be followed without losing the ability to offer products that differ vastly.

A user who has committed corporate resources to the acquisition of 5250 series terminal equipment should be reassured that this investment will not soon be obsolete.

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Impact of standard work unit

First in a two-part series dealing with the concept of the standard work unit measurement and its impact on on-line systems performance.

The foundation of efficient on-line system performance is a concept known as the standard work unit. The standard work unit was initially born of experiences with on-line systems at McDonnell Douglas Automation Co. (McAuto) in St. Louis in the late 1960s and early 1970s. From its origin at McAuto, the standard work unit has spread to other on-line environments where there is a desire to have consistent, satisfactory on-line performance.

Once management goes beyond simply adding hardware to improve performance, it will discover that the long-term solution to better on-line performance is to control on-line systems from the moment of their design, ensuring that all on-line transactions conform to the standard work unit.

The standard work unit applies wherever there is an on-line system that has transaction and data integrity.

See UNIT page 45

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

Codd: Relational approach to DBMS embraced by users

By Maura McEnerney
CW Staff

CINCINNATI — Although somewhat hesitant about self-praise, E. F. Codd, founder of the relational data base model, said he expects his relational approach to data base management to be a lasting one.

"The relational approach is going to be around for a long time," Codd told attendees at Cincom Systems, Inc.'s annual user group meeting held here recently.

In explaining the concepts of his relational data base model, Codd said he believes relational systems have been widely embraced by users because they allow data to be easily distributed, give end users a wider variety of data views and provide a flexible authorization system for data base administrators.

Codd said he was driven to develop the relational model after examining the data base management systems of the 1960s. "I

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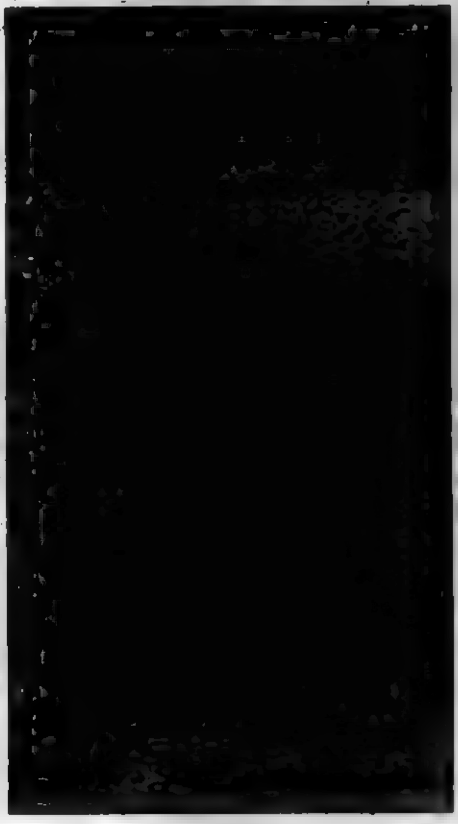

SOFTALK
Maura McEnerney
CW Staff Writer

Cincom sports new look to aim for top

For Cincom Systems, Inc., the recent Interact '85 event was more like a coming-out party than a users group meeting.

Once a modest company that enjoyed the success of its Total data base management system (DBMS), Cincom is hoping to take on the giants of the software industry by first taking on a new look. Cincom is sporting a new president, a new package of products and a new emphasis on marketing that it hopes will catapult it from a $100 million a year company to a $500 million a year company by 1990.

Cincom Systems

Last year Cincom restructured its management team, putting Dennis Yablonsky, formerly Cincom's director of marketing and sales, into the president's office and moving Thomas Nies, the firm's founder and former president, into the chief executive officer post. Management directions at Cincom will not differ greatly from their present course, said Yablonsky, who told *Computerworld* that he shares the business philosophy of his predecessor.

However, the current emphasis on marketing comes through loud and clear. Yablonsky is a dynamic, outspoken executive with an extensive sales background. Four of his six current vice-presidents have some responsibilities within the marketing or sales areas and, in a year and a half, the sales team has more than doubled to nearly 200 sales representatives, he said.

Cincom's management team is giving increased attention to its integrated products, including its TIS DBMS-related products, widely installed Mantis fourth-generation language, tools for data base administration, applications software, a micro-mainframe connection and a net-

See CINCOM page 50

- ■ Gannett New Media Services unwrapped an on-line news summary service — based on the *USA Today* newspaper — accessible via micro or terminal/42
- ■ Data Kinetics released an automatic table handling system for IBM mainframes/42
- ■ Data Design Associates introduced an interactive query facility for its IBM-based financial applications/42
- ■ Esca announced a micro-based decision support system and a link that allows for the transfer of mainframe data to the DSS/43

INSIDE

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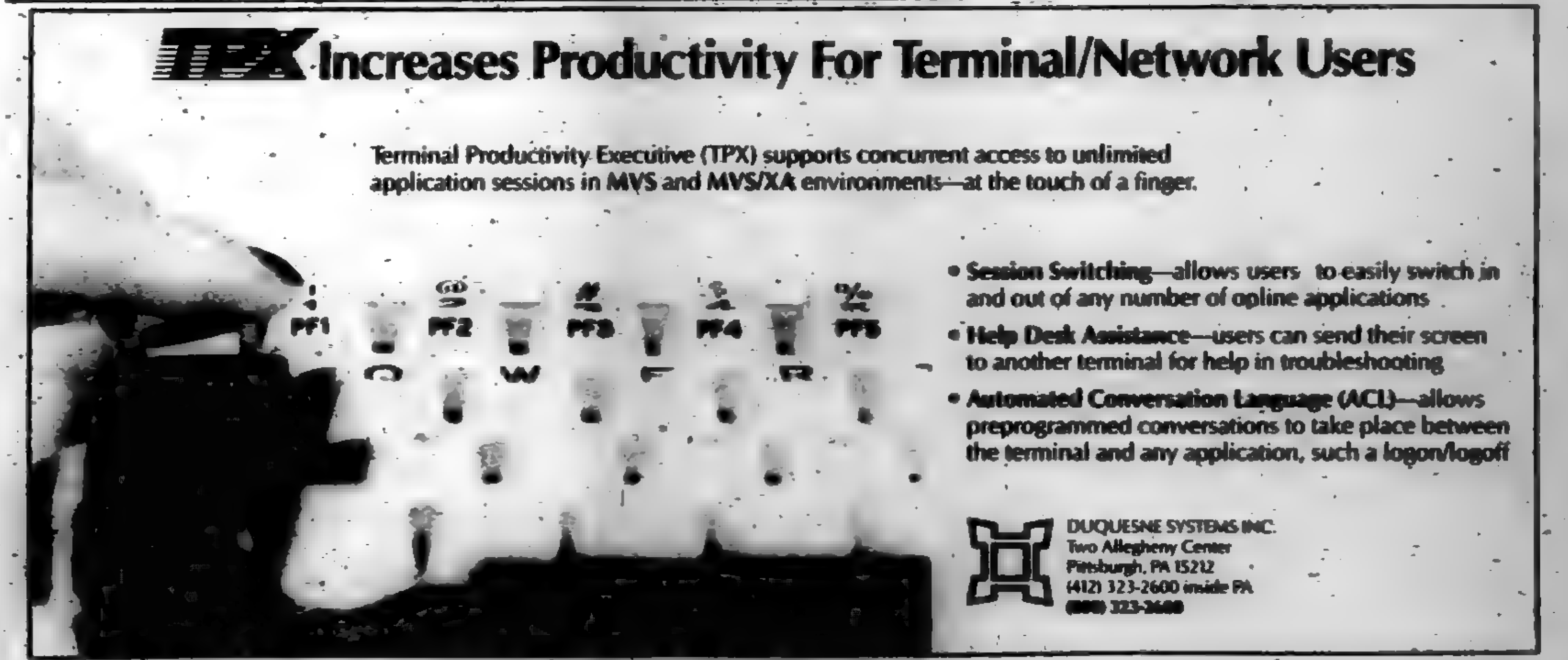

TPX Increases Productivity For Terminal/Network Users

Terminal Productivity Executive (TPX) supports concurrent access to unlimited application sessions in MVS and MVS/XA environments—at the touch of a finger.

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Tablebase released in U.S. for use with IBM mainframes

OTTAWA — Data Kinetics Ltd. has announced the U.S. release of Tablebase, an automatic table handling system for IBM mainframes.

A spokesman said the product is designed for use with either IBM's MVS or DOS operating system and automates the management of data in virtual memory.

Tablebase provides table searching and data reorganization capabilities and increases users' control of applications systems, according to the vendor.

Tablebase reportedly reduces processing time, system maintenance and coding requirements.

It allows users to take better advantage of current IBM hardware architecture and core memory facilities, including Extended Architecture, and allows flexible restructuring of data in core memory, the spokesman said.

Tablebase supports several teleprocessing interfaces, including IBM's ISPF, IMS/DC, CICS and others.

Tablebase is priced at $25,000 for MVS and $15,000 for DOS.

More information about Tablebase is available from Data Kinetics, located at 97 Norman St., Ottawa, Ont., Canada K1S 3K5.

Data Design introduces interactive query facility

SUNNYVALE, Calif. — Data Design Associates has introduced an interactive query facility for its applications software packages for IBM mainframes under OS and DOS. The company also announced an interface to IBM Personal Computers.

According to a spokesman, DD-View is said to eliminate the need for a report writer by allowing users to create on-line queries. Query definitions created by users can be saved. As definitions are created, selected formats are displayed at the bottom of the screen. When users select an erroneous definition, the system displays an error message and the cursor is displayed in the field needing correction.

The company's DD-Link allows Personal Computers and compatibles to emulate mainframe terminals. With DD-Link, mainframe data is reformatted for compatibility with spreadsheet programs for Personal Computers. Both DD-Link and DD-View are integrated with Data Design's mainframe applications.

DD-Link costs $10,000. DD-View is available with Data Design's applications packages, which cost between $21,000 and $66,000 depending on the modules selected.

Data Design is located at 1279 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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Gannett offers on-line news

WASHINGTON, D.C. — Gannett New Media Services, a division of Gannett Co. and publisher of the *USA Today* newspaper, has announced USA Today Update, an on-line news summary available through three information networks.

A spokesman said USA Today Update summarizes news from some 200 national and trade news sources including wire services, major metropolitan newspapers and broadcast outlets.

The summaries are targeted to specific businesses and industries. The news summaries, dubbed Decisionlines, are typically 20-paragraph capsules of developments in industries such as banking, insurance, law, energy, travel, telecommunications, technology and real estate. Updated Decisionlines are available at 9 a.m. EST each business day.

Offer more in-depth look

In addition, USA Today Update's Hotlines summaries offer compilations of general, financial, weather and international news from 8 a.m. to 11 p.m. EST. The service's Special Report summaries, which are provided in question-and-answer format, offer a more in-depth look at topics of interest.

USA Today Update is prepared by a staff of journalists based in Arlington, Va. The service can be accessed via terminal or microcomputer over dial-up lines through information networks including General Electric Information Services Co. (Geisco), H & R Block Co.'s Compuserve and Newsnet, Inc.'s Newsnet.

As an example of pricing for USA Today Update, rates from Geisco, which are discounted based on usage, begin at $40/hour for corporate users. With a 10-hour monthly minimum, the rates are $36/hour; 20-hour monthly minimum, $32/hour; 50-hour monthly minimum, $30/hour; and 100-hour monthly minimum, $28/hour, a Gannett spokesman said.

Gannett New Media Services is located at P.O. Box 450, Washington, D.C. 20044.

Esca offers IBM-based DSS, link

CHICAGO — Esca, Inc. has introduced an IBM Personal Computer-based decision support system (DSS) and a micro-mainframe link that allows users to transfer data from an IBM mainframe to the DSS.

A vendor spokesman said Esca Mainframe Link (MFL) permits users of its Esca-DSS to retrieve data from a mainframe data base without using data programming terms. Esca MFL runs as an IBM CICS application that transmits selected data from IBM's MVS operating system data files to the micro.

Users must be authorized to log on to CICS and enter the correct password in order to begin a session, the spokesman said. A user data view capability allows data elements available to the user to be sent back to the micro. Esca MFL incorporates a data dictionary that keeps a list of DSS users and the data bases they can access.

Esca MFL costs $60,000. It is currently being beta tested and will be available in the fourth quarter.

Esca-DSS is a menu-driven program said to provide business analyses functions without the use of a command language. The spokesman said users can retrieve data, draw graphs, perform statistical functions or view results by using a mouse or cursor keys. Users can simultaneously gather information and analyze it in different ways. A modeling function handles multiple dimensions without the need to rebuild the product's spreadsheet when data is added.

Esca-DSS costs $2,000 per copy and will be available in the fourth quarter.

Esca is located at Suite 650, 312 W. Randolph St., Chicago, Ill. 60606.

SYSTEMS SOFTWARE

■ **Main Frame Software Products Corp. has announced Screens, a utility that allows users to create and maintain screens in an IBM IMS/DC environment.**

A vendor spokesman said Screens can bypass IBM's MFS facility. Memory is saved because the MFS buffer pool is no longer required. Screens does not access IMS libraries to format information to be displayed or read, thus allowing the number of inputs and outputs for each transaction to be lowered. A "hard-linking" facility can be used to eliminate inputs and outputs to the data base.

The product includes an applications windowing facility that lets end users design screens. Default capabilities allow the user to create or change Screens from an IBM terminal while IMS is active. Screens can be developed under IBM's TSO and migrated to IMS.

A permanent site license for Screens is $10,000.

Main Frame Software Products, 135 Glen Road, Wellesley, Mass. 02181.

See SOFTWARE page 44

Honeywell unveils tools for DPS line

Adds info retrieval, graphics packages

PHOENIX — Honeywell, Inc. has announced Texto, an interactive document management and information retrieval system, and the Business Graphics Option module for the Honeywell Financial and Corporate Planning System (HFCS). Both products run on the company's DPS 8, DPS 88 and DPS 90 mainframes under the Gcos 8 operating system.

Texto, developed by Chemidata, S.A., is a productivity tool for the organization, storage and retrieval of textual data, a spokesman said. The product allows users to create a document data base, then cross-reference the stored documents through user-defined keywords. The user builds a library of documents, catalogs or index files by entering information on blank forms supplied by Texto. The system then creates form letters, mailing labels, sorted and formatted lists or user-defined reports.

Chemdata's Logotel option was announced as a command language for Texto to provide a simplified user interface to the Texto data bases. Logotel is said to enable the end user unfamiliar with Texto commands or applications to enter requests for information. The Logotel option also permits the user to list and save a set of commands for routine procedures.

The Texto document management system is available now for $35,000. The license fee for Logotel is $13,300.

The HFCS analyzes data and provides a base an organization can use to build interactive analysis models, according to the vendor. The Business Graphics Option translates HFCS models into full-color histograms, pie charts, bubble plots and line and star charts.

HFCS is available for a license fee of $3,760. The HFCS Business Graphics Option is available for a license fee of $13,440.

Honeywell can be reached at P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

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SOFTWARE

from page 43

■ **Applications Software, Inc. (ASI) has introduced a version of its ASI/Inquiry, software that supports downloading of data to the IBM Personal Computer from mainframes running IBM's IMS/DB/DC or CICS.**

ASI/Inquiry reportedly incorporates an architecture based on real-time query of IBM's DL/1 data base management system and supports downloading to such personal computer software as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase III.

The software also offers an ability to do ad hoc code generation and an internal clock that prioritizes system resource allocation.

ASI/Inquiry costs $72,000.

ASI, 5455 Garden Grove Blvd., Westminster, Calif. 92683.

■ **Software Research Associates has announced that its Test Coverage Analysis Tool (Tcat) software now supports the C language.**

According to a spokesman, versions of the Tcat/C system are available for Digital Equipment Corp. VAX series minicomputers under the VMS or AT&T Unix operating systems and for IBM Personal Computers under PC-DOS.

The product consists of a C "instrumenter," a runtime program that collects test coverage data and writes trace files, and a coverage analyzer that produces coverage numbers. Also included are an interactive runtime package, utilities for manipulation of trace files, a trace file archiving facility and on-line Help screens.

Tcat/C costs $2,500 for a single CPU perpetual license, $9,000 for a multiple CPU site license and $975 for a single-user micro license.

Software Research Associates, 580 Market St., San Francisco, Calif. 94104.

■ **Adaroc, Inc. has announced the Resource Account Management and Statistical Exception System (Ramses) job accounting and resource management system for IBM's System/36 minicomputer.**

Written in RPG-III, the program is said to track and provide exception and summary reports on devices in the system, including CRTs and printers. The system's financial management charge-back capabilities provide job accounting and resource usage monitoring.

Ramses costs $2,995.

Adaroc, P.O. Box 263, Shrewsbury, Mass. 01545.

■ **Uccel Corp. has announced Release 1.3 of its Automated Job Management System for automating batch job restarts and reruns. UCC-11 runs on IBM or compatible equipment under OS operating systems.**

Release 1.3 reportedly uses dynamic allocation for performing maintenance on the system's two data bases. In addition, the enhanced UCC-11 is said to expand several on-line functions, simplifies installation and revises documentation.

Release 1.3 includes tools to evaluate the impact a restart/rerun may have on subsequent jobs. The features are said to help identify potential problems and to increase the efficiency of recovery.

The one-time license fee for UCC-11 is $21,000.

Uccel, Uccel Tower, Exchange Park, Dallas, Texas 75235.

■ **Exsys, Inc. has announced that its expert system for software development is available for the Data General Corp. Eclipse MV series of mini- and superminicomputers under the AOS/VS operating system.**

Exsys is written in C language and was developed in New Zealand by Adata Software Ltd. The expert system is said to cut program development time by allowing systems analysts to design applications by defining them, with no programming or testing required. Documentation is provided automatically by Exsys.

All Exsys programs are integrated with the same file structures, data relationships and cross-referencing of data and procedures, a spokesman said.

Exsys is a member of DG's Independent Software Vendor program. The product was developed with research money provided by DG.

Prices for Exsys range from $20,000 on the MV/4000 to $125,000 on the MV/10000.

Exsys, Tower 56, 126 56th St., New York, N.Y. 10022.

■ **Productivity Products, Inc. has announced Focusout and Focusin for enabling users of Information Builders, Inc.'s Focus fourth-generation reporting and retrieval tool to generate file descriptions from the IBM DB/DC Data Dictionary.**

Focusout supports Focus users in the IBM MVS and VM/CMS environments.

According to a spokesman, Focusout creates Focus file descriptions for operating systems' flat files, IMS data bases, CMS files and Information Builders' PC/Focus files.

The Focusin programs enables users to fill the data dictionary with information on their current systems.

The price for Focusout and Focusin is $15,000; Focusout alone is $10,000.

Productivity Products, P.O. Box 36, Vernon Hills, Ill. 60061.

■ **P-Stat, Inc. has announced that its P-Stat 8 data management and analysis software is now available for the Control Data Corp. Cyber 180 mainframe.**

P-Stat 8 combines interactive data and file management, data display, statistical analysis and report writing capabilities in a single package, a spokesman said. The package features on-line help, interactive data

Continued on page 46

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UNIT

from page 41

For on-line systems where there is no transaction and/or data integrity — and there are such systems — the standard work unit is not useful. Typical environments where the standard work unit is the key to improved on-line performance include IBM's IMS/DM/DC, IMS/CICS, CICS/Vsam, SQL/DB2, Cullinet Software, Inc.'s IDMS/DC and IDMS/CICS.

The standard work unit has many forms. Variations of the standard work unit measure from one data center to another depend on such things as the following:

- The maximum transaction arrival rate.
- The overhead associated with the execution of any on-line transaction.
- The work being done by each on-line transaction.
- Machine size, speed and competition among programs operating on the machine.
- The speed with which I/O is done.
- The base software driving the on-line environment.

The standard work unit is best understood in terms of an analogy. Consider the dynamics of an hourglass. Inside the hourglass are grains of sand. The grains of sand are small and uniform in size. They queue on top of each other, all trying to get to a critical resource — the bottleneck in the hourglass. Once in the bottleneck, the grains of sand quickly flow through.

The grains of sand can be compared to on-line transactions. The bottleneck of the hourglass can be compared to an on-line controller such as IMS, CICS and IDMS. The rapid flow of the grains of sand through the bottleneck can be compared to fast and efficient on-line performance.

Now consider what happens when pebbles are put in the hourglass along with sand. The pebbles take a long time to pass through the bottleneck. Even worse, the pebbles passing through the bottleneck prevent the grains of sand behind them from getting to that resource in the first place. The result is an uneven flow through the bottleneck.

Runs at speed of slowest transaction

The same effect occurs when long-running transactions are mixed with short-running transactions in an on-line environment. Performance becomes spotty and uneven. The system runs at the speed of the slowest transaction being executed.

What are the factors that affect the speed of a transaction? The primary factor affecting transaction runtime is the amount of I/O the transaction executes. I/O operates in terms of milliseconds, while internal program execution operates in terms of nanoseconds — a difference of about two orders of magnitude. Also, program logic is such that it must wait until I/O is executed.

If on-line transactions are to yield good performance, they must all execute only a small amount of I/O. There must be no single transaction that executes a large amount of I/O mixed in with other transactions that execute only a small amount.

Unfortunately, determining the amount of I/O executed by an on-line transaction is no simple task, especially for programmers who think in terms of logical flow and not of actual physical program execution. At least indirectly — and often directly — the amount of I/O a transaction requires depends on the number of data base calls requested by the programmer. While most programmers do not think in terms of access method execution, which is necessary to determine how much I/O is done, programmers do think in terms of data base calls because these calls are a part of their logical flow. So phrasing the standard work unit in terms of data base calls reduces the necessary transaction control to a level intelligible to programmers.

The most basic form of the standard work unit requires that every transaction will do no more than n calls. McAuto planners originally suggested a maximum of 35 calls, but that figure varies from shop to shop.

However, there is other overhead associated with transaction execution that impacts performance as well as the amount of I/O done. For example, a very large program may issue only a few calls. But moving the large transactions in and out of memory, or worse yet, leaving the large transactions resident in main memory requires its own overhead. Thus, a refined version of the standard work unit might mandate that every transaction will do no more than n calls, be no larger than mK bytes of object code and use no more than p seconds of CPU time, where m, n and p vary from shop to shop.

Further refinements possible

But there are further possible refinements to the standard work unit. In most DBMS, some calls require a large amount of I/O, while other calls do not use I/O at all, depending upon the storage of data in the buffer and the usage of buffers to satisfy secondary calls to the data base. So an arbitrary number of "points" — points having no technical connotation — can be allotted for any transaction, where different data base calls have a different point weighting.

For example, an on-line transaction may be allowed up to 150 points, where a direct retrieval counts for 10 points, a sequential retrieval counts for one, a deletion counts as 15, an insertion counts as 10, index maintenance counts as two points for each index and so forth.

The net result of the application of the standard work unit across all on-line transactions is the creation of a structured environment. It is that structuring of the environment that yields good on-line performance.

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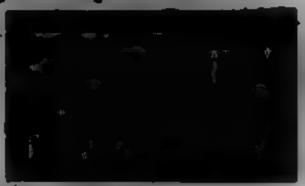

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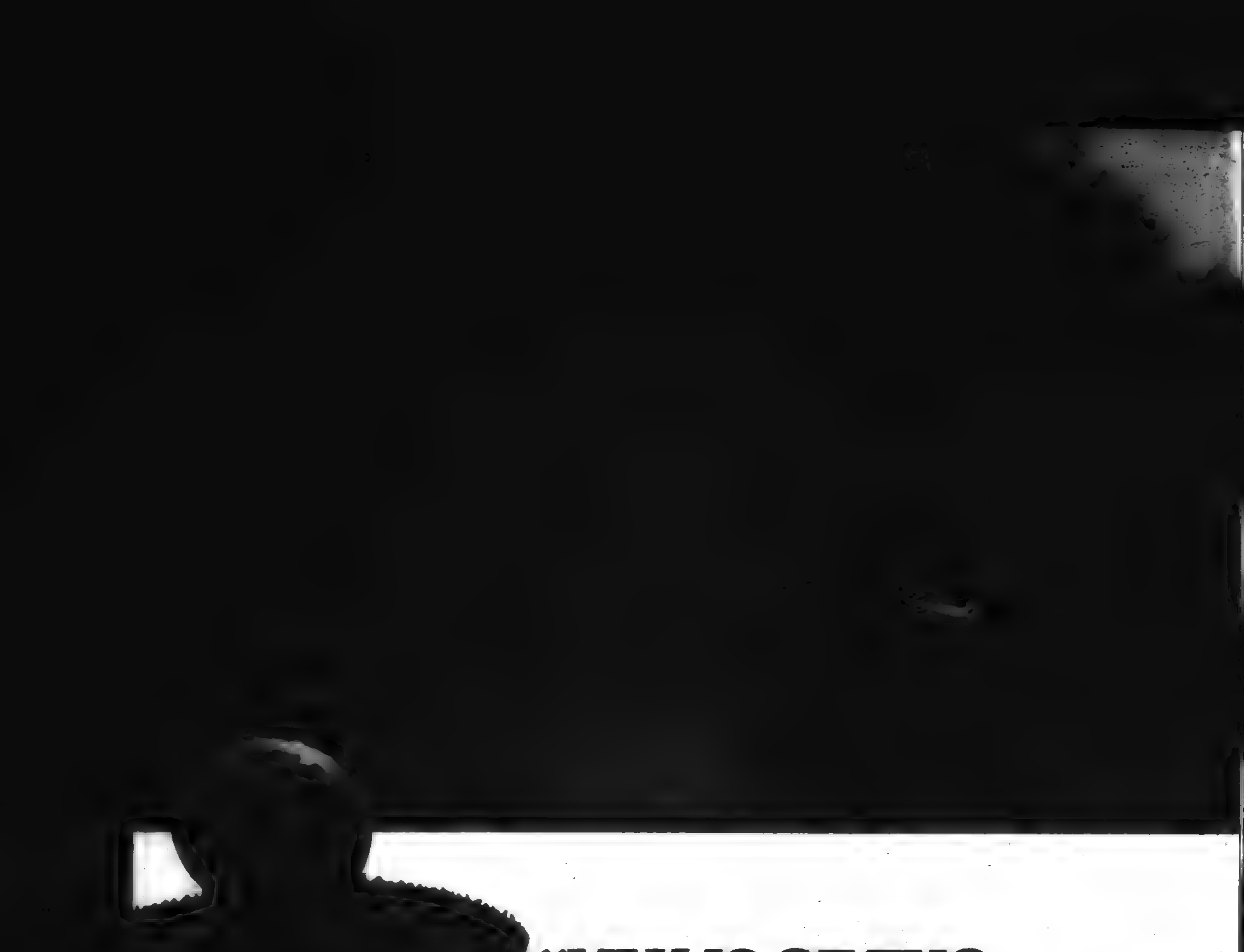

"VAX IS GIVING AMF MORE TIME FOR THE THINGS THAT REALLY MATTER."

Michael Lilly
Director, Corporate MIS/Operations
AMF, Incorporated

To many people AMF means recreational sports. But today it also means electronic components, filtration equipment, automated process equipment and more.

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As Michael Lilly says, the company's decision to stake its future in MIS on Digital's VAX computers – and the office automation tools like All-In-1,™ DECnet™ and DECmail™ software that run on them – was hardly a snap judgment.

Every major computer company was considered. Lilly says that, "dollar for dollar," only Digital's VAX system offered the power, ease of use and communications capability with other computer systems – including IBM – that AMF needed.

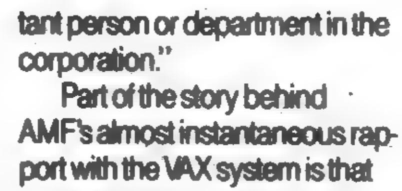
So AMF chose the VAX computer – the best-selling 32-bit computer in the world – and waited to see what the machine could do.

> **"SUDDENLY WE HAVE TOOLS AND CAPABILITIES WE NEVER HAD BEFORE."**

Lilly and his group didn't have to wait long. The system was up and running within days.

Reaction within the department was rapid and gratifying. "We really got excited about it," says Lilly. "Immediately, we were communicating better." And there was more – spreadsheets and word processing and a mail system. "Suddenly," Lilly said, "we had a vehicle for total open communications to every important person or department in the corporation."

Part of the story behind AMF's almost instantaneous rapport with the VAX system is that it's so easy to use. Menus and operating commands are the same for each fully integrated application. Whole functions are completed in as few as two keystrokes. And because everything is in plain English, it's literally as simple as A-B-C to incorporate



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any VMS™ application into the daily work routine.

"INSTEAD OF SIX WEEKS TO DEVELOP AN APPLICATION, IT TAKES TWO."

VMS software development tools have so improved the way things are done in his department, Lilly says, that he projects the savings in applications development time and costs alone at some 70 percent.

"Many of our new applications here at AMF will be written on that machine. I can't quantify it exactly. All I know is that I'm getting a heck of a lot more bang for my buck."

The first tests of VAX equipment proved so successful, that AMF quickly enlarged the system, adding terminals and DECmate™ and Rainbow™ personal computers. New departments went on line; for example finance.

"And that," says Lilly, "really created an explosion." Now AMF is implementing programs like general ledger systems, stock options and inventory systems, and keeping more efficient and flexible records, from accounts payable to personnel.

Adds Lilly, "People here are screaming to be on the VAX system, and there's got to be a reason for that. And I tend to think that it's return on investment, mailing lists, discounted cash flows, spreadsheets they couldn't even begin to do before, versatility, tremendous graphics potential. It's just a whole world of opportunity that is elevating AMF to the forefront."

"ANYONE WHO USES VAX IS GOING TO GET THE COMPETITIVE EDGE."

Lilly feels the VAX system has already elevated his own department to the forefront.

"It's put corporate MIS on the map," he says. "It has effectively increased productivity and efficiency. People are beginning to believe we can do the things we say we are going to do."

And what VAX technology is doing for his group, Lilly believes, it can do for all of AMF, or indeed for any company. "Any corporation that employs this technology," he says, "is going to get the competitive edge.

"This technology will explode. Because there are a thousand reasons to have it. But what it really all boils down to is this: everybody will want a VAX system because they can do the job better, faster and more efficiently.

"And that's what really matters."

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SOFTWARE & SERVICES

Continued from page 44

entry, relational data base capabilities and an English-like command language.

According to the vendor, P-Stat 8 is available on all models within the Cyber 180 line including the CDC Cyber superminis, Models 810 and 830.

The prices for P-Stat 8 range from $13,000 for Model 810 to $15,000 for Model 830.

P-Stat, P.O. Box AH, Princeton, N.J. 08542.

PRODUCTIVITY AIDS

■ OBS Software Co. has introduced a CICS application development system for IBM mainframes running MVS.

Qwik/CICS enables end users to create and modify program selection menus, Help text, transaction error message text and network broadcast messages, a spokesman said. It automatically generates CICS command-level Cobol source statements.

Qwik/CICS contains a field-level security feature and reportedly is available with an interface to higher level security software, including Cambridge Systems Group, Inc.'s ACF2 and IBM's RACF.

A license for Qwik/CICS costs $29,000.

OBS Software, 115 Sansome St., San Francisco, Calif. 94104.

■ Duquesne Systems, Inc. has announced Release 6.0 of its Shared Dataset Integrity Plus (SDSI Plus) productivity aid for data management. The product runs under IBM VS1, MVS and MVS/XA environments.

Release 6.0 reportedly eliminates data integrity and protection problems caused by simultaneous access of the same data, according to a spokesman.

The product reportedly offers enhanced job requeue processing when no Dasd is available and is said to exploit the faster I/O available on IBM 3084 and the recently announced 3090 series processors.

Other enhancements to Release 6.0 include a conflict display feature that provides information about local and cross-systems problems and a hardware reserve display that aids in diagnosing reserver interlocks.

For a two-CPU shop, the permanent license fee for SDSI Plus is $14,000; a permanent license for shops with an unlimited number of CPUs is $19,000.

Duquesne Systems, Two Allegheny Center, Pittsburgh, Pa. 15212.

■ Westmoreland Systems, Inc. has announced Version 3.0 of its Application Design & Development (ADD) system for the IBM System/34 and 36.

Enhancements to Version 3.0 make the system easier for nonprogrammers to use, a spokesman said. Also included is a simplified 20-page manual providing an introduction to the system.

The ADD system can create job streams consisting of combinations of sorts, reports, prompt screens, OCL procedures, batch programs and on-line inquiry and maintenance programs. In Version 3.0, the process of setting up a job has also been streamlined, the spokesman said.

The price for Version 3.0 of the ADD system is $3,500.

Westmoreland Systems, P.O. Box 2726, Suite 1, 288 Park Ave. N., Winter Park, Fla. 32790.

■ CS Laboratories, Inc. has introduced C/Script II Plus Isam, an applications development tool for Data General Corp. computers under DG's AOS and AOS/VS operating sytems.

C/Script II Plus Isam allows users to generate Isam reports, file maintenance, inquiry and audit report programs through DG's Infos II Data Base Access module. The product automatically generates Cobol I/O source code, the vendor said. Changes in the file maintenance records can be tracked through the product's transaction logging facility.

Users can generate file maintenance programs with defaults displayed within or outside of fields. Up to 99 screens or windows per file maintenance program can be accessed for data input. Screens can then be viewed sequentially or selected from a screens menu.

C/Script II Plus Isam sells for $12,000 for AOS, and $16,000 for AOS/VS.

CS Laboratories, 459 N. Dean Road, Auburn, Ala. 36830.

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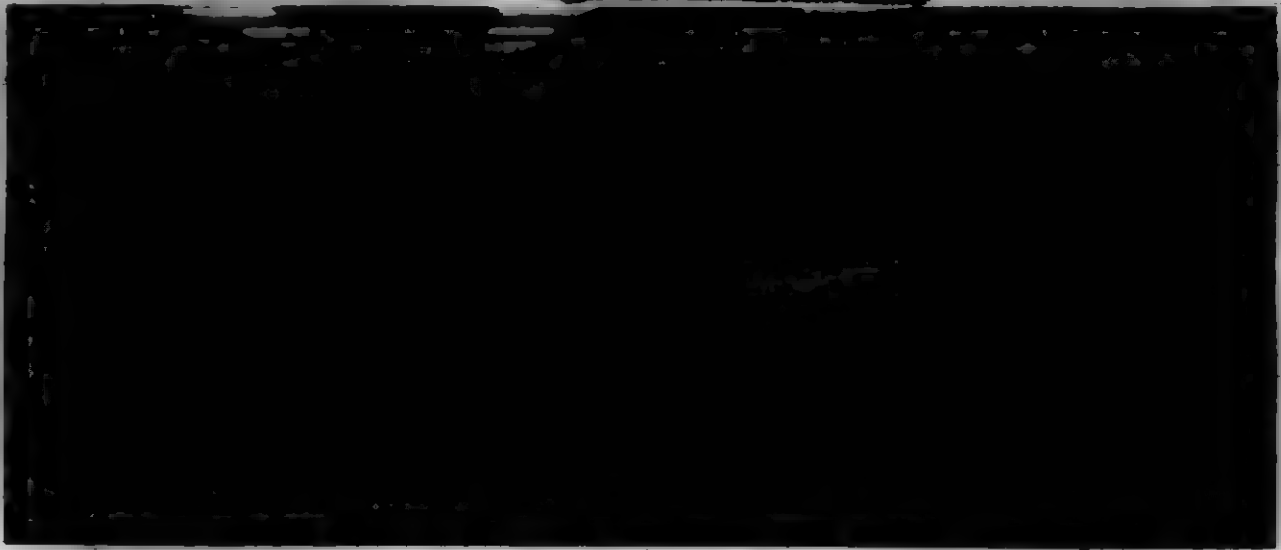

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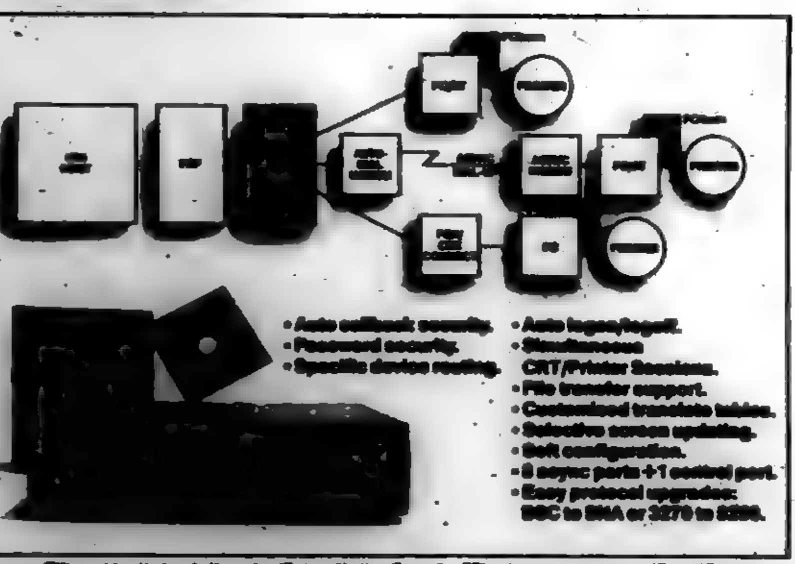

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CW

CODD

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was horrified by how complicated those systems were," he said. The relational model was the result of efforts to eliminate what Codd called "the frigidity" of these systems' data base structures.

"If you wanted to make changes to the data base, you had to take the system down and modify it using utility programs," he said.

Cincom Systems

Nonrelational DBMS technology forced computer departments to bear the "tremendous burden of maintaining those systems," Codd said. That technology also exhibited little concern for the needs of end users, he said.

Concise, simple

"The aim of relational was to [give end users and applications programmers] a concise and simple way to get at data," Codd explained.

The relational model that Codd subsequently developed eliminated the importance of a record's positional address and instead relied on characteristics like column headings and domain-constrained operations. "In the relational model, rows and columns can be shuffled without a loss of information," according to Codd. In addition, he said, a data description in the data dictionary can be changed without bringing the system to a halt.

According to Codd, a greater number of data management systems will incorporate the relational model in the future. Other important developments will center around distributed data bases, Codd said.

"We will see the development of distributed systems that are much more powerful than [those that exist] today," he said.

Codd said the relational approach lends itself better to environments where the data base is located in a remote site.

This approach is economical, he said, because requests can be made for multiple records. "If I were an executive in a company that had data distributed in two cities, I would rather put my trust in a [relational] system than in applications programmers," Codd said.

AUBURN

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Currently, records on Auburn buildings are in a bit of a disarray. Four departments — the university architect, analysis and planning, risk management and property control — all maintain records about university structures. The school's risk manager, for example, handles insurance coverage for all the buildings and needs the information to complete insurance applications.

And, according to Hooper, each department has its own way of tracking building information. For example, some departments identify buildings by name in alphabetical order, others use numerical classifications, she said.

"You could go into any of the offices and ask how many buildings there are on campus, and you would get four different answers." Records on the buildings are currently kept on a sequential file tape on the mainframe, and there is no interface between the different departments, she explained.

Auburn's ultimate goal is to have one record for each building, with all offices sharing the data. The school is hoping Cincom products will help. "The TIS concept allows us to have one record and lets the data base administrator control who is updating what is in that record," she said. With the planned system, she added, "if there is a $20,000 piece of equipment assigned to the chemistry department, [the university] can be sure that the room it's in is also assigned to the chemistry department."

The facilities management system is the first big application the university is tackling using TIS' Logical User View component, the relational aspect of its DBMS. Although Auburn's MIS department had some trouble interfacing Cincom's Mantis fourth-generation language with the data base, Cincom's support center helped iron out those problems, she said.

And if all goes according to schedule, the facilities management application will be fully operational by the end of the year.

"We have a commitment that any in-house project we develop will be developed using TIS," she said. One other possible application is development of a student record system, she said.

AVOID
EQUIPMENT DAMAGE & LOSS

CINCOM

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work management system.

"We are not just the Total people any more," Yablonsky said. "We've spent a lot of money over the past five years building products, and [Nies] believes we now need to spend an equal amount of money promoting what we have."

Cincom's philosophy may be likened to that of industry powerhouse Cullinet Software, Inc., which builds sales around its IDMS DBMS. "That approach works," Yablonsky said.

Cincom is hanging some of its future success on the prospect of sales of TIS to IBM DOS users. Cincom used Interact '85 to launch Release 2.0 of TIS which, for the first time, provides support for DOS users. Yablonsky believes the announcement will open doors for Cincom, which is hoping to leverage its existing client base. Of the approximately 2,500 IBM mainframe sites using Total, Yablonsky said, 50% to 60% are DOS shops, and the potential of swinging those users over to TIS offers some significant possibilities for Cincom. "Up until now, we've only been playing in a portion of the market," he said.

Although it has enjoyed success in the DBMS and fourth-generation language markets, Cincom is preparing for the day when IBM unveils a cohesive DBMS strategy. "In the short term, we think [IBM's] software strategies have been our biggest friend," he said. "From here on out you can expect to see IBM raising its software prices about 30% a year. And the more IBM charges for its software, the more value we can put on ours."

If IBM bundles the functions of its operating system, teleprocessing monitor and data base manager or microcodes some of the capabilities of its DBMS, Yablonsky feels that "that is not going to hurt us.

"We'll still be selling Mantis, we'll still be selling query languages, we'll still be selling the directory for the Logical View processor, but we'll be selling it as a cap over the top of an IBM data base machine," Yablonsky added.

"IBM will eventually take 80% to 90% of the data base market. But we don't care. We're giving our customers good data base software today. If customers decide in the future that there is better data base management software, fine. But they will still want our Logical View, Data Directory and Mantis products," he said.

Even with the increased emphasis on marketing, research and development remains a high priority at Cincom. The company will spend $250 million over the next five years on R&D, five times what it spent during the last five-year period, Yablonsky told users.

"We're trying to put our company into a position where no matter what IBM does, [it] can't hurt us. You can't just market your way out of that problem," he said.

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Update

May 6, 1985

TOWARD THE FIFTH GENERATION

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Update

Toward the fifth generation

The mind of man is capable of anything — because everything is in it, all the past as well as all the future.
— Joseph Conrad

The future seems to me no unified dream but a mince pie, long in the baking, never quite done.
— E. B. White

By Glenn Rifkin
Update Editor

It is 1995 and the popular images of science fiction have been transformed into fact: intelligent humanoid machines in the form of robots; computers that see, hear, speak and reason; knowledgeable systems that are nourished by the input of a genius' storehouse of wisdom, able to hold and use that knowledge forever. A decade of intense research and creation has led to breakthroughs that have set the computer world at the threshold of fundamental change.

This script for tomorrow, however, is not from a Hollywood dream factory or the pages of an Isaac Asimov novel. These images are the very practical perceptions of researchers in both academia and industry, and the boundary between fact and fiction has grown increasingly hazy. The future is no longer measured in space odyssey fantasies but in the price/performance specifications of an industry waiting to explode. This is the fifth generation, the next significant step in the evolution of computing; the leap forward that, if successful, will bring the future in.

The fifth generation got its official start in October 1981 when Japan's Ministry of International Trade and Industry coined the term to describe its goal of creating powerful, intelligent computers by the mid-1990s. Since then, fifth generation has become an umbrella description encompassing work being done in the fields of parallel processing, artificial intelligence, expert systems, robotics, natural language, vision systems and more.

Though much of the fifth-generation dream remains in an embryonic state, large sums of time, money and talent are being poured into its pursuit. Commercial applications for AI hardware and software — in the form of expert and knowledge-based systems — have begun emerging and are spawning what many consider to be the foremost future growth sector of the computer industry. DM Data, Inc., a Scottsboro, Ariz., consulting firm, has predicted that the market for AI products will reach $4 billion by 1990 (see chart Update/4).

Collaborative work between manufacturers and universities, much of which is funded by the U.S. Department of Defense, is focusing on long-range goals and, in many cases, producing unexpected short-term payoffs. While the blue-sky possibilities of academic research often attract the most media attention, the near-term realities have already shown enormous potential in a myriad of applications.

The fifth generation is not without controversy, however. Debate has raged around AI, for example, since serious work in that field began in the 1950s. Not only technological but moral and philosophical questions about the concept of intelligent, "thinking" machines abound. Though pioneering work has been done in many of the subgroups that fall under the AI mantle, critics claim that devising many of the algorithms needed to impart true human-like capabilities is simply not possible.

In addition, development of fifth-generation machines has, in some quarters, become a race between the U.S. and Japan for supremacy in these new technologies. Protagonists in the drive to organize America's push toward the fifth generation have argued that Japan, with its focused approach, is positioning itself to take a dominant role in what will be the worldwide market for intelligent knowledge processing machines (see Update/8).

This inaugural section of *Computerworld* Update will examine the march toward the fifth generation and where it might lead. As these technologies come down from the dizzying heights of speculation to the shelves of DP shops in corporate America, what is in store? What form will the new hardware architectures and software applications take? How is the military spurring on major

See FIFTH UPDATE/4

DIGITAL COMPUTERS

"All our '56 models have the 'memory' feature but if you can hold until '57 they will have a preconscious and an id."

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COVER ILLUSTRATION BY KAREN WATSON

Update

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work in the field? Which companies and individuals are showing the way, and how is the rest of the computing world responding? And how will the DP or MIS manager be affected by the influx of new ideas and the products that follow?

Birth of a technology

The desire to create a machine capable of imitating intelligent human behavior has long held fascination for those dabbling in both science and science fiction. As computing technology began to mature in the 1950s, the idea of an intelligent computer, able to think, speak and move about on its own, took hold of a small group of university-based computer scientists, and the field of artificial intelligence was born.

For the next quarter of a century, however, the core of AI research remained an academic exercise in speculation. The computers delivered by industry were simply not powerful enough or versatile enough to take on the herculean task of reasoning.

The major centers of AI research, including MIT in Cambridge, Mass., Carnegie-Mellon University in Pittsburgh and Stanford University in Palo Alto, Calif., combined the available industry technology with their own wizardry and created prototype machines capable of running simple AI applications. These machines were used to initiate early research in expert and knowledge-based systems.

It has only been in the last five years, as the price and power of computers have headed in opposite directions, that AI has taken off as a viable commercial industry. Though the seeds and first fruits of AI have grown from traditional computing architectures, the consensus among leaders in the AI community is that a radical departure in computing will be necessary to reach the lofty goals to which the technology's boosters aspire.

The evolution of computational technology to date has generally been divided into four generations: vacuum tubes, transistorized circuits, integrated circuits and, finally, very large-scale integrated circuits (VLSI). While the computer industry is currently moving from the third generation of integrated circuits to the fourth generation of VLSI, work is already being done on the fifth generation of parallel processing.

Computer scientists now suspect that the sequential von Neumann approach (named for the pioneering mathematician John von Neumann) may be inadequate for building computers able to process information fast enough to usher in the age of AI.

According to W. Daniel Hillis, founder of Thinking Machines Corp., a fifth-generation computer start-up in Cambridge, Mass., "Programs become slow as they become smart. Today, we write [AI] programs that use a few hundred facts. We would like to increase this to a few million, but the programs already take minutes to make decisions that must be made in seconds. Scaled up, they could take years. So-called von Neumann machines, even if they are built of exotic, ultrafast components, are unlikely candidates for solving these problems, since they are limited by the speed of light."

Despite continuing work with exotic but flawed materials such as gallium arsenide

See FIFTH UPDATE/5

CW CHART

Market Area	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Expert Systems	4	9	17	[illegible]	74	145	245	[illegible]	670	[illegible]
Natural Language	5	5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Visual Recognition	10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	370	[illegible]	[illegible]	[illegible]
Voice Recognition	5	7	11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AI Languages	3	5	6	12	21	[illegible]	45	[illegible]	[illegible]	[illegible]
AI Computers	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Government Contracts*	[illegible]	30	40	50	[illegible]	[illegible]	[illegible]	[illegible]	175	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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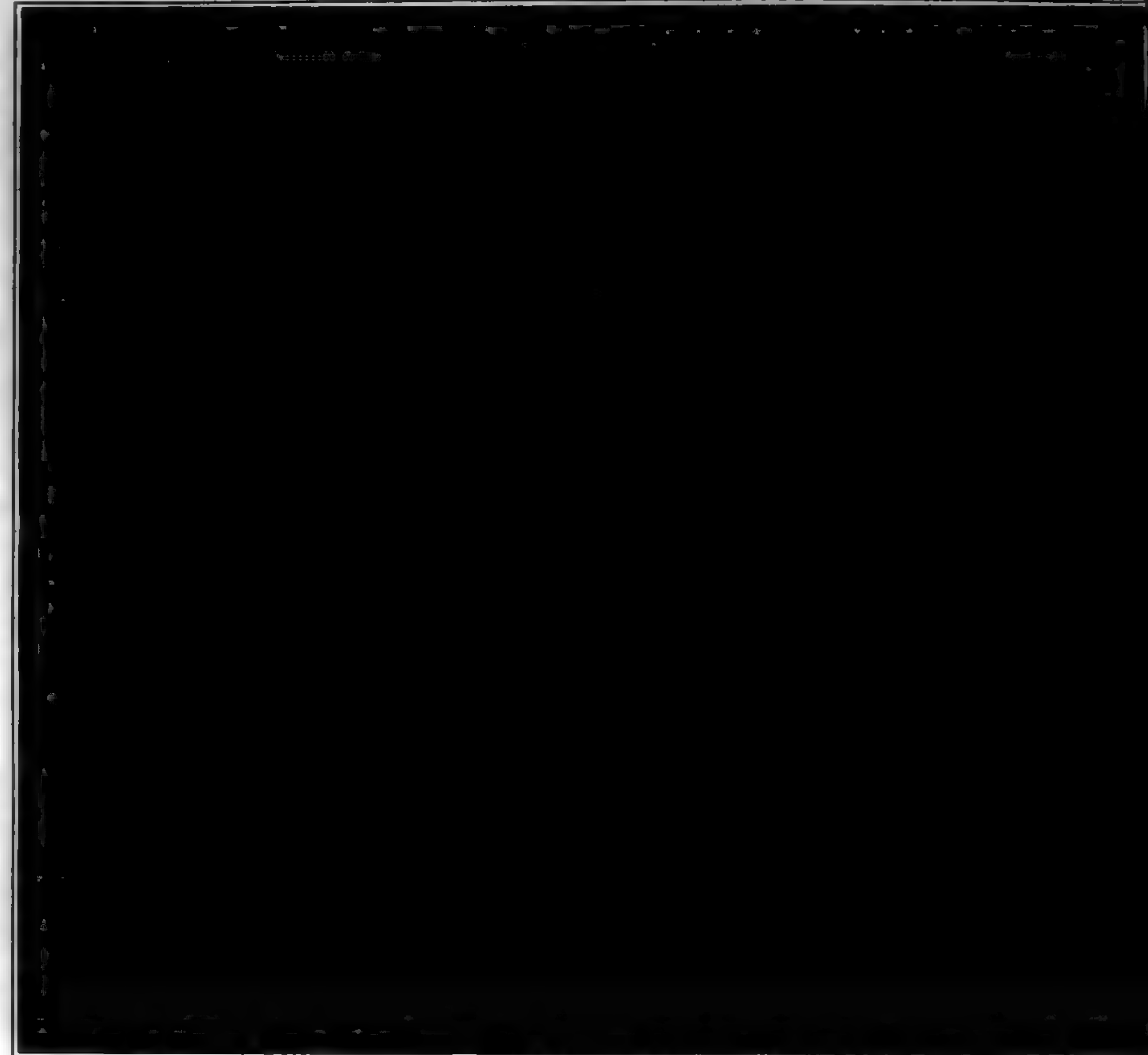

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FIFTH

from UPDATE/4

or Josephson junctions, which have the capability to dramatically speed up traditional sequential machines. "Computers as we have known them for the past 20 to 30 years are about as fast as we can make them," wrote B. L. Buzbee and D. H. Sharp of the Los Alamos (N.M.) National Laboratory in *Science* magazine.

"The demand for greatly increased speed can be met only by a radical change in computer architecture — from a single serial processor to a computer which is an aggregation of many parallel processors that can perform independent operations concurrently," the authors wrote.

Fifth-generation or non-von Neumann machines, which will either depart from or drastically alter current architectures, are under development in the U.S., Europe and Japan. These new supercomputers, employing parallel rather than serial processing, promise to bring about massive change in the computer industry during the next quarter century.

The concept of parallel processing is simple: Rather than having a single serial processor performing operations sequentially, the machine will employ thousands or millions of processors, each with its own small memory bank, working simultaneously on a single task or a multitude of tasks. The concept is not new. But the dramatic decrease in the cost of microprocessors has suddenly made the idea viable.

As many as 50 parallel processing projects are reportedly under way at U.S. universities, including MIT; Cornell University in Ithaca, N.Y.; New York University; Stanford; Carnegie-Mellon; and the University of Illinois. These projects are being heavily funded by the the U.S. Department of Defense Advanced Research Projects Agency's (Darpa) strategic computing project. Darpa is seeking machines that will increase by several orders of magnitude the speed with which expert systems and AI can be processed.

To illustrate the power difference, the Gartner Group, Inc., a Stamford, Conn., consulting firm, pointed out that IBM's most powerful mainframes, the 3090 series, will operate at around 50 million instructions per second. The military is seeking to acquire machines capable of running complex expert systems at approximately 10 billion instructions per second.

Industry heavyweights such as IBM, Digital Equipment Corp., Control Data Corp. and others are already involved with parallel processing projects, and small start-up companies are finding their way into the fray. Thinking Machines, using research done at MIT, is at work on a prototype of its Connection Machine, a computer that uses 100,000 processors.

Though the company will not discuss the status of the machine, it is rumored that the prototype will be ready by 1986.

Parallel computation

Meanwhile, researchers such as Edward Feigenbaum of Stanford, are working on models for expert systems that will incorporate parallel computation. The problem of programming for parallel systems has not yet been solved and is considered a major obstacle to success. Feigenbaum is attempting to adapt for parallel processing a programming tool called the Blackboard Framework, which was originally developed at Carnegie-Mellon in the early 1970s, and actually make parallel the tool's Lisp programming language. The project aims to show that this way of organizing the tools and the language can boost processing speed by several orders of magnitude.

The idea of massive parallel processing machines has, not surprisingly, crossed over to the traditional area of vector processors or supercomputers (such as the Cray Research, Inc. X-MP and Control Data Corp.'s Cyber series) and has caused some confusion. These giant, multimillion dollar number crunchers have not been targeted for AI or expert sys-

See FIFTH UPDATE/6

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Update

FIFTH

from UPDATE/5

tems work per se, but attempts to make them even faster have embraced the idea of parallel processing or non-von Neumann processing as well.

According to Sid Fernbach, a San Jose, Calif.-based consultant, a parallel processing machine might be referred to as a "social" vector-type machine, "because you can issue one instruction and have them all execute the same instruction at the same time.

"On the other hand, most of the parallel processors allow for a mix of instructions to be executed simultaneously as well," Fernbach said. "The potential, therefore, is greater, and as a matter of fact, you can build vector instructions into a parallel processing system so you can have the best of both worlds."

The Cray-2, scheduled for delivery this year, and the Denelcor, Inc. HEP-1, for example, employ two to four processors already, and industry analysts predict that systems with eight to 16 processors may be available by the end of the decade. This is a far cry, however, from the dream of a million processors, and the supercomputer industry continues to seek von Neumann solutions. The Cray-3, for example, scheduled for delivery in 1987, would be the first computer ever manufactured using gallium arsenide chips, which reportedly would make it five to 10 times faster than the Cray-2.

As supercomputers, which have traditionally been pigeonholed for scientific number crunching in government and scientific labs, begin to move into new market areas, the potential for these machines to play a major role in the fifth generation becomes apparent. "The supercomputer of the future will be a parallel processing system, which consists of clusters of processors, each dedicated to a certain type of activity, such as AI, numbers, graphics or a combination of a lot of things," Fernbach predicted. "This is the direction we're going in, and it's going to take a good 10 years to get there."

Developing markets

"Free enterprises and profits are not waiting for the superparallel-processing computers," stated "AI Trends," a report from DM Data consulting firm. Indeed, artificial intelligence programs are currently available for everything from personal computers to mainframes. The value of many of these programs has yet to be demonstrated on a wide scale, but the trend is clear. Vendors see a new market, and they are going after it.

> **'The supercomputer of the future will be a parallel processing system'**
>
> *— Sid Fernbach*

Although AI-type programs can conceivably be written in a number of programming languages, the language of choice among AI professionals in the U.S. is Lisp (meaning List Processing), a 26-year-old symbolic programming language.

The newer Prolog language originated in Europe but is the choice of the Japanese in their push to develop fifth-generation machines. With its vast base of support and a long list of perceived advantages, however, Lisp remains the favorite in the U.S.

Among the traditional hardware architectures, the DEC VAX minicomputer is the most widely used for Lisp-based AI programs.

Personal computers have just recently entered the artificial intelligence fray and, because of the memory and power requirements of most Lisp software, have proven to be a target for the toy-like expert systems that have recently proliferated.

That, of course, will be changing radically over the next several years.

According to the Gartner Group, "the ubiquity of [personal computers], in general, is making for a market that is too large to ignore. If nothing

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Update

else, many users will demand that AI programs be deliverable over a [personal computer]."

In addition, micro-based expert systems using natural languages serve as demonstrators of the viability of AI technologies and "work to the aid of individual end users eager to spread the gospel within their organizations."

As microcomputers with increased capabilities, such as IBM's Personal Computer AT, appear, the number of available, useful micro-based AI applications written in Lisp will increase. Lisp requires a large amount of memory and horsepower to be effective, however, and the current choice of serious AI users remains the dedicated Lisp machine.

The major difference between dedicated Lisp machines and computers that run Lisp is that the dedicated machines have been imbedded with more than 12,000 Lisp functions in the programming environment to optimize the language.

With an appropriate interpreter, Lisp will run on other hardware but will show a corresponding loss of performance. According to Henry Firdman, a Lexington, Mass.-based AI consultant, Lisp offers highly efficient memory management, interactive programming environments, multiwindow capabilities and advanced graphics.

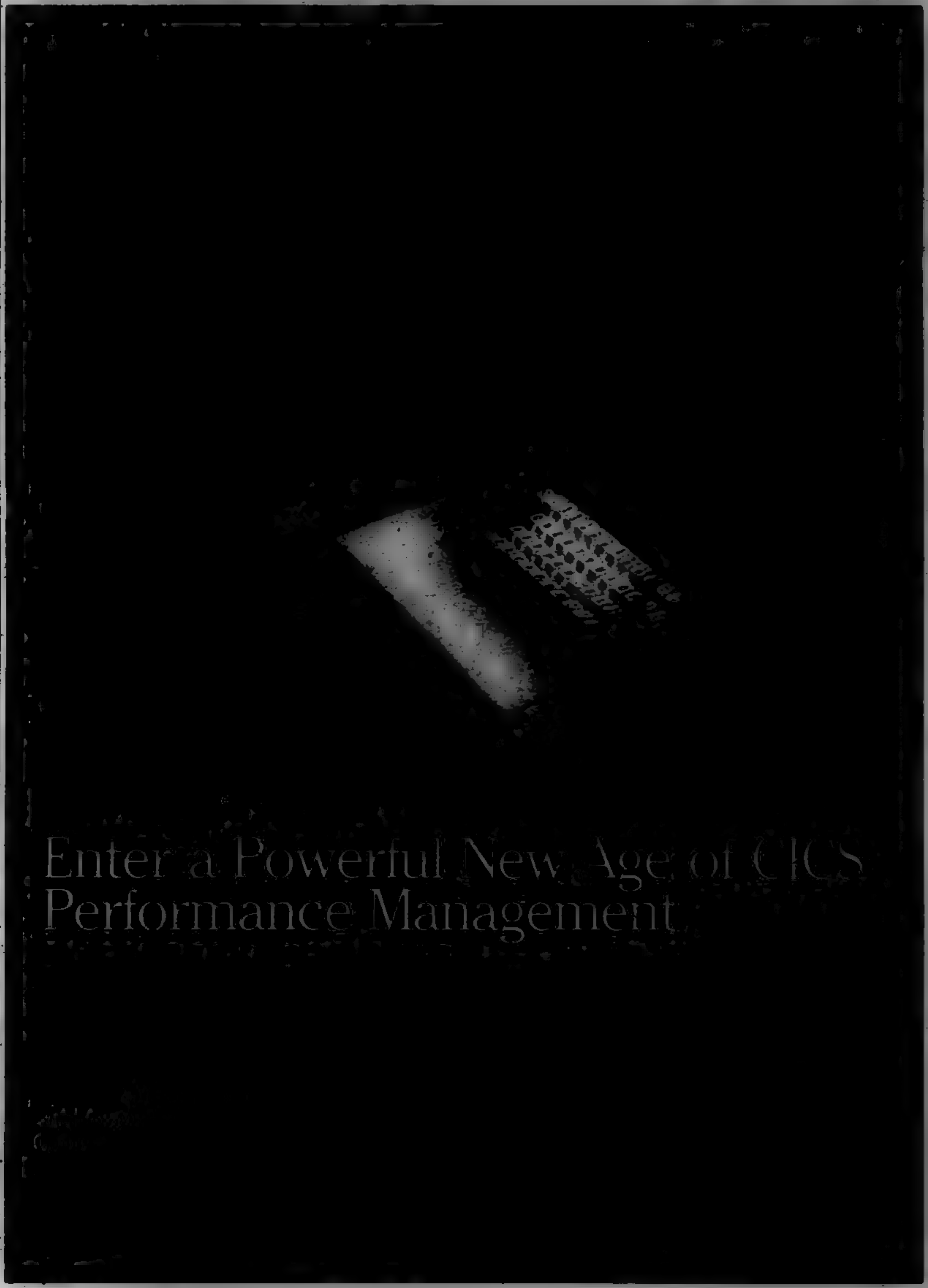
Burgeoning market

The market for Lisp machines is a burgeoning one, though it remains miniscule in comparison with the greater computer industry. Since the first machine — the Xerox Corp. 1100 — appeared in 1981, the market has grown to an estimated $183 million this year, according to the Gartner Group.

Estimates of the market's growth by 1990 vary widely. Find/SVP, a New York-based consulting firm, predicts a $2 billion market, while Arthur D. Little, Inc., a Cambridge, Mass.-based consulting firm foresees a $10 billion market. Firdman cautioned that a breakthrough in technology during that time period could make the projections inaccurate. "AI is currently an industry of tools, not products," he stated.

While those numbers have not spawned a flood of start-ups as in the micro software business, it has generated interest within a growing segment of the industry. Currently, the market leaders are Symbolics, Inc.; Lisp Machines, Inc.; and Xerox. Texas Instruments, Inc. has just entered

See FIFTH UPDATE/10



Update

The race to the fifth generation

Does Japan have the inside track?

In October 1981, Japan's Ministry of International Trade and Industry unveiled a set of ambitious plans for its fifth-generation project. Funded to the tune of $850 million over the next decade, the fifth-generation project would trigger a quantum leap forward in computing, a leap that would land on the doorstep of the future with powerful, intelligent machines interacting with humans via natural language, graphic images and speech.

The fifth-generation announcement rocked the computing world. Japan, which had yet to assert itself dramatically in the worldwide computer marketplace and was not perceived as a particular threat to U.S. domination of the industry, suddenly loomed as a potential giant.

Six months later, the Japanese announced the formation of the Institute for New Generation Computer Technology (Icot), which would guide this massive assault on the computer age. American and European industries began to react, and several national consortia sprang up quickly to decide how to counteract the Japanese plans.

Many leaders in the computer industry and academia in America, however, were vocally skeptical about the fifth-generation project. "It's just a smoke screen" and "a major public relations effort" were comments commonly heard. The U.S. just had too much firepower, too many top minds, too much money and a company called IBM, to allow the Japanese to horn in on this valuable territory.

In March 1983, Prof. Edward A. Feigenbaum of Stanford University and Pamela McCorduck published *The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge to the World*. In it, they wrote: "The Japanese have seen gold on distant hills and have begun to move out. Japanese planners view the computer industry as vital to their nation's economic future and have audaciously made it a national goal to become number one in this industry by the latter half of the 1990s.

"The consequences of complacency, of our spirited attention to the present at the expense of the long view, will be devastating to the economic health of our most important industry. The Japanese could thereby become the dominant industrial power in the world."

Among those who responded to the book was William F. Zachmann, vice-president of International Data Corp., a market research firm in Framingham, Mass. Zachmann penned his own report in which he firmly disagreed with the authors.

Computerworld Update met first with Feigenbaum and then with Zachmann and asked them each to consider once again the issue of Japan's fifth-generation project and its potential impact on the U.S. computer industry.

INTERVIEW

Edward Feigenbaum

Two years have passed since your book was published. Has anything changed in your outlook? What is the status in Japan?

In the first three years of the Icot project, my feeling is that Japanese computer science and technology closed the artificial intelligence gap. [The U.S. has] more activity, but we don't have better activity going on here. They have now understood and practiced AI enough to be state of the art throughout Icot and the industrial firms.

Basically, both countries are starting out even in the era of parallel computing for AI. We both have the same number of ideas, which is very little. They have extraordinary focus and momentum. We have extraordinary diversity and almost intentionally unfocused activity.

We'll see which one pays off in the next few years. Phase II [will last] four years for the Japanese. Four years is enough time to give us a good running start on parallel computing.

To see how a wide-ranging, innovative, defocused program like ours can compete with an intense, narrowly focused effort like Japan's is really one of the most interesting technology experiments that has ever been done.

What is the current timetable for Icot?

The Japanese held the second international conference on the fifth generation last November to signal the end of Phase I of the project and herald the beginning of Phase II [on April 1, 1985].

The Japanese said they were going to use the first three

'Japan has extraordinary focus. We have extraordinary diversity.'

— Feigenbaum

William F. Zachmann

Do you perceive a serious threat from the Japanese fifth-generation project to our place in the computing industry?

I do not think the probability is very high that the Japanese fifth-generation project will result in some major competitive advantage for the Japanese. On the other hand, I believe [artificial intelligence], expert systems and software systems that aim in one way or another to extend human mental capabilities the way a bulldozer extends human physical capabilities will unquestionably be a very important part of the future.

The Japanese project suffers from some serious problems in that it is based on some premises that are likely to prove incorrect.

Please explain.

The role of nonnumeric processing, for example. I rely for authority on a paper titled *Overview to the Fifth-Generation Computer System Project* by Prof. Tohru Moto-Oka of the University of Tokyo, published in 1983.

One of the statements he makes is that "current computers have extremely poor performance in basic functions for processing speech, text, graphs, images and other nonnumerical data as well as for AI-type processing such as inference association and learning."

That is the key to a very important assumption here. The assumption is that AI applications, which fifth-generation computers are supposed to support, essentially require capabilities that current computers don't have. I would take issue with that statement.

'The Japanese project suffers from some serious problems.'

— Zachmann

Feigenbaum

years for learning, tool building and fundamental conceptualizing — in other words, as a catch-up period. That's exactly what they did.

During Phase I, they built a pair of sequential Prolog machines, one of which was state of the art in comparison with the Lisp machines available in this country. The second was far in advance of American state of the art with regards to speed. They constructed large Prolog programs and gained a tremendous amount of experience in logic programming.

They also created several interesting and complex expert systems applications using Prolog, and they began the process of disseminating the knowledge about AI languages, representation and expert systems widely throughout industry. They now have an extended family of industrial people working on Icot projects that numbers in the neighborhood of 200 to 300 trained individuals.

The core group of people, which was originally 40, is now 48 and will climb to 100 in Phase II. So there are three rings of people for Phase II: 100 for the inner group, 1,000 in the Icot extended family and about 10,000 people in the whole industrial picture, including Icot. That's a massive training effort. The Japanese, no matter what they achieve in Phases II and III, will have built themselves an enormous infrastructure of educated, well-trained people in symbolic computation and AI.

How has the U.S. responded to this?

Since the book came out, some very positive things have happened in this country and Europe. There's a broad recognition of the importance of the symbolic manipulation technologies including AI and its associated machines. Darpa [Defense Advanced Research Projects Agency] launched its huge strategic computing project, which is primarily focused on high-speed symbolic computation. The industrial firms in the U.S. have picked up interest in the field to an astonishing degree. And that's one place where we differ from the Japanese.

The Japanese have a deep industrial interest, but it runs narrow and deep in a few companies. We have a very broad industrial interest.

To the extent that I am able to see into the industrial picture, I am astonished at the range of AI going on here. It's really breathtaking how many companies are establishing groups and training themselves.

Yet you continue to be concerned about AI growth?

The primary danger to these activities in the U.S. and Europe is defocusing. The Japanese project is focused on AI and its applications. The programs in the West are broad-ranging programs, except for Darpa.

The Japanese normally handle things by multiple national projects. The fifth-generation is just one project along a wide frontier, whereas the Western projects tend to cover everything with one project.

Because the Darpa project is funded by the U.S. Defense Department and must be mission-oriented, [a lot] of the strategic computing money will be spent for military-oriented test beds. The Japanese do not have to shoulder that defense burden.

Critics of your work tend to feel that we are so strong, even in unfocused ways, that we will not lose to the Japanese in the long run.

Ten years is a long time, and small gains per year can compound into significant shifts of position. In 1972, the Japanese had not produced a single commercial chip when they launched their national semiconductor activity. In 1982, they had 60% of the world's market for 64K-byte RAMs [random-access memories]. They are capable of moving very rapidly, and in my view, they are moving into an area which [has] the maximum growth potential for the information processing industry.

> **'Some very positive things have happened in this country and Europe. There's a broad recognition of the importance of the symbolic manipulation technologies.'**
>
> *— Feigenbaum*

There is still a vast unoccupied territory in that universe, and that is the territory occupied by symbolic processing applications, particularly those which we know of as AI. That's a very important area in which to occupy territory, and that's what the Japanese are intending to do.

Is this the greatest obstacle to our own fifth-generation push — the unwillingness to team up for focused national effort?

Obstacle is the wrong terminology. You have to call these things "national characteristics." We have national characteristics of independence — the desire to push along our own track rather than to be focused into someone else's track.

Are you encouraged in any way about changes in our efforts or are we as individualistic as ever?

We are as individualistic as ever. There's no change in the spirit of cooperation, none whatsoever. The encouragement has been in the breadth of response — but not in the cooperative nature of that response.

Zachmann

There is no question that current computers do just fine processing speech, text, graphics, images and other nonnumerical data. I see no real reason to conclude that current computers are inadequate for AI applications or nonnumeric processing.

What about the search for these super, high-powered computers?

It is not sustainable by the facts to claim that somehow there are these AI, Prolog-type, brute-force inference engine applications just waiting for bigger, more powerful computers. If there were such applications, they could run on existing computers.

In fact, the obstacle to those AI applications is not hardware at all. It's partly that the imagination that has been used in building those kinds of systems is as yet insufficient. It's partly that the model is incorrect.

What will make the important things happen?

If you approach it from the purely formal point of view, which is what logicians and academicians tend to do, then it seems that if you only had this super-fast engine, it would solve all the problems of the world.

In fact, that's not the case. There is lots of hardware available to run Prolog or anything else you want to run. The real obstacle is that the AI software has not been intelligently enough written yet.

What are the obstacles to software being written?

One of the things we're going to find when we get more seriously into the concept of expert systems is that the expertise just isn't there. One of the phenomena of human life generally is that you and I can decide we're experts on something or other. I say you're an expert, and you say I'm an expert. We talk a lot of mumbo jumbo, and nobody knows the difference.

Most of the social sciences have that characteristic. Psychology, sociology, economics are, in fact, an enormous mass of mumbo jumbo. The idea that there's all this knowledge just laying around waiting to be put into computer systems is not so.

What about the assumption that AI and knowledge-based systems will typically be large and complex?

That assumption is also incorrect. While there certainly is a class of AI applications that may require complex inference engines, the most important AI applications will run on personal computers.

A lot of people in the industry still view this as a race between the U.S. and Japan. The Japanese are pouring a lot of money and effort into this focused effort. Is their effort not to be taken seriously?

There is no question that the fifth-generation project has been a very effective public relations effort for the Japanese. It has given the sense that they are very leading edge and looking to the future. They've certainly had the support of a number of American and European academics in sustaining that particular illusion. The idea that this is going to give the Japanese an objective leg up on the rest of the world is not sustainable by the facts.

There very well may be some useful things that result. However, I don't think they will have the breadth of reality-level impact that is implied. The amount of money is not that huge. If you compare it with IBM's [research and development] budget, it's a drop in the bucket.

There are a lot of people in Japan who obviously know better. In fact, my understanding [is] that the second round of [funding] for the project was by no means enthusiastically supported by all of the people involved.

> **'You and I can decide we're experts. I say you're an expert, and you say I'm an expert. We talk a lot of mumbo jumbo, and nobody knows the difference.'**
>
> *— Zachmann*

One of Prof. Feigenbaum's major points is that it is characteristic of the way the Japanese attack these problems to come at them with a very focused, cohesive approach. Americans, on the other hand, characteristically take a much more individualistic approach — everyone essentially doing their own thing.

Prof. Feigenbaum is incorrect if he maintains there is a radical difference between the U.S. and Japan in that regard. Dedicated, focused effort toward achieving objectives is certainly as much a characteristic of U.S. companies as it is of Japanese companies.

Do you feel that fifth-generation-type work is so far ahead or blue-sky that it is missing the point?

It's not even that they are so far ahead; it's that they are [going] in the wrong direction. [It's like] the old Islamic saying, "I fear you will never get to Mecca, my friend, for you are on the road to Kandahar." Calling that approach "too far ahead" gives it more credit than it deserves. It's not too far ahead; it's just silly. It's not relevant to the much wider range of real-world problems.

Update

FIFTH

from UPDATE/7

Expert systems are the closest we can get to cloning. We capture the expertise of a good production manager. We distribute copies of the rules to spread the expertise around.

the market with its Explorer machine after several years of extensive AI research, and Sperry Corp. has signed an agreement with TI to build a Lisp processor that will be integrated into Sperry's product line.

The current state of the art is, indeed, limited by power and memory requirements of computers as well as the need for breakthrough-type algorithms to transfer more subtle aspects of human reasoning and intelligence to computers.

Industry analysts predict that over the next few years, Lisp machines will move from their current installed base in universities and U.S. Department of Defense facilities to private industry. This movement is being led by Xerox, which wants to use its other businesses to help bring AI into such new areas as the office marketplace.

Xerox approach differs

Unlike Symbolics, which sells its high-powered, single-user systems, considered the Cadillacs of the industry, at a premium price, starting at $60,000 and going up to a fully configured $150,000, Xerox is trying a different approach with the technology it has been developing since 1970 at its Palo Alto (Calif.) Research Center. Its 1108 Lisp machine sells for $21,950 in base configuration.

"Our desire is to get the AI applications revolution under way and get AI into the day-to-day operations of the Fortune 100," explained Beau Sheil, manager of product development for Xerox's AI Systems Business Unit.

According to Sheil, all the major vendors will soon offer some kind of support for AI. "It's a niche market, but as visibility grows, I expect everybody to be in there," he stated.

Software expert systems

In the drive toward the fifth generation, the first shining star has been the expert system. Although it has been the subject of much criticism — called "empty mimicry" by *Fortune* magazine — the expert system has its origins in AI research, and if it remains a giant step away from true human intellect, it is already serving as a bridge into the revolution.

Expert and knowledge-based systems are rule-based (IF-THEN) computer software programs that can be used to model complex problems and solutions. The expert system derives its knowledge from a living expert in a particular field, and the knowledge-based system draws from books, reports and other nonhuman resources.

The components of an expert system are simple: The human expert is debriefed by a knowledge engineer — a new profession born out of this research. It is the knowledge engineer who creates a data base of facts and inference rules — incorporating into this as much human subtlety as possible.

These rules are then processed through a decision-making computer program, called an inference engine, using either backward chaining (working backward from the conclusion to the facts needed to support that conclusion) or forward chaining (gathering facts to reach a conclusion).

The results are generally distilled through a natural-language front end or interface. Users of the system can then interact in English-language commands with what is now a sophisticated expert assistant.

Closest to cloning

"Expert systems are the closest we can get to cloning," said Richard E. Morley and William A. Taylor of Gould, Inc. in a report on expert systems.

"We capture the expertise of a good production manager. We distribute copies of the rules to spread the expertise around. We no longer fly our expert all over the place."

Expert systems have been used with success in the fields of medicine and geology and in the military. The key to success with these systems is closely tied to the degree of difficulty of the problem to be solved. If the problem is too broad and the scope too vast, the expert system of today will likely fail.

John McDermott, principal scientist in the computer science program at Carnegie-Mellon University in Pittsburgh, has developed a number of highly successful expert systems, most notably the Xcon system for Digital Equipment Corp., which configures its VAX minicomputers to fit individual customer needs. Xcon reportedly saves millions of dollars annually for DEC.

"I've been fairly fortunate in picking problems that are the right size, given the state of the technology," McDermott said. "The problem is that if you pick things that are too easy, people laugh. If you pick things that are too hard, then you fail. Get-

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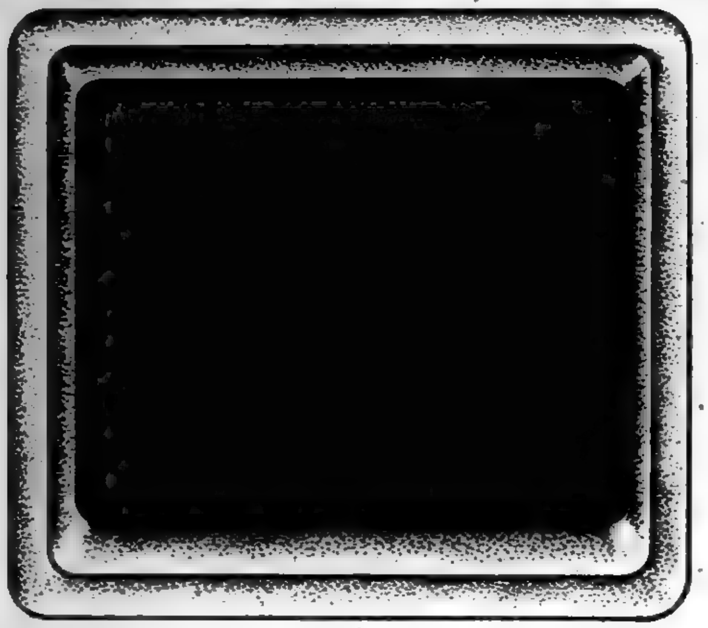

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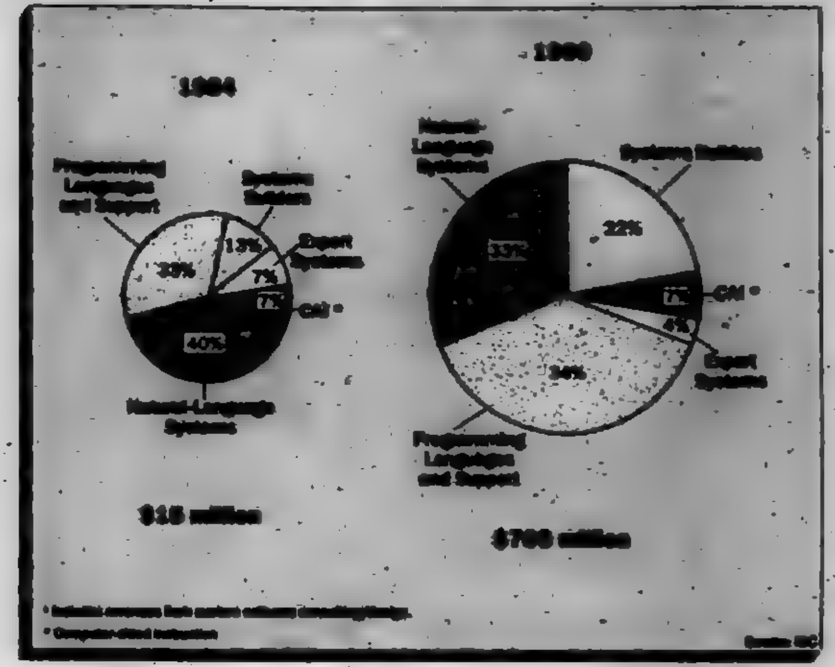

ting the right size problem that can be successfully solved with the current state-of-the-art technology is key."

The current state-of-the art is, indeed, limited by power and memory requirements of computers as well as the need for breakthrough-type algorithms to transfer more subtle aspects of human reasoning and intelligence to computers.

The "intelligence" of expert systems has been called into question. Critics claim that existing expert systems have no more connection to intelligence than many conventional computer programs, and that the mechanical meanderings of a computer can hardly compare to the "rich associations, metaphors and generalizations that language evokes in people and that constitute the essence of meaning and thought," according to *Fortune* magazine.

Karl Wiig, director of AI at Arthur D. Little, Inc. (ADL) in Cambridge, Mass., admitted that a number of expert systems are overrated. He cautioned that people may have misconceptions or false expectations of the difficulty of creating a good expert system.

"Some people feel cheated because they expect systems to live up to a lot of overinflated expectations," Wiig explained. "What they have to understand is the cost of building these systems is much higher than, say, building a decision support system for the same purpose.

"You are not dealing with a human who learns relatively easily. You are dealing with a machine that must be spoon-fed. As a result, the cost of being sufficiently explicit on a subject is going to be very high."

Consultant Henry Firdman said there are additional obstacles to creating broadly useful expert systems. Knowledge engineering, for example, is labor-intensive, expensive and requires skills that are in short supply. In addition, current hardware and software tools are expensive and difficult to learn to operate. And finally, there is resistance among experts whose turf is threatened. "People don't like to be replaced," Firdman said.

Thus, two camps have been set up under the expert systems umbrella. There are those, primarily in academic research environments, who are mainly interested in the potential of transferring human intelligence to machines. Others, particularly in industry, take a more practical view.

"I see the development of systems that are very narrow and specialized and can provide expertise in a very limited area," Sheil of Xerox said. "They must leverage a fairly consequential professional, like the petroleum geologist [for whom] Schlumberger Ltd. built its expert system [called Dipmeter Advisor]. There you have a small number of people in a very specialized field who make decisions that have millions of dollars [hanging] on them. You can justify systems that help them make small adjustments in the quality or speed of those decisions. AI is particularly well suited to those types [of] things because it is a depth rather than a breadth of knowledge," Sheil said.

"The academics are trying to understand intelligence," added Arnold Kraft of DEC's AI group. "We're more pragmatic. We say, 'Here's another set of nifty tools to help you solve problems.' "

At DEC, the widespread use of Xcon has had an extremely positive effect beyond the money saved on VAX configuration. According to Kraft, the company is moving at full speed into further AI research with more than 200 people devoted to research and development work in that area. "Our goal is to take the abilities of our best people and make them available to other people; generally upgrade everyone's capabilities," Kraft said. "The result of that is the people who are very good get to go on to yet harder problems, and the [drudgery] is gone for them. The others actually learn through the program, which is like the eyes and ears of the expert."

Industry is getting heavily involved in expert systems research. It is estimated that more than 200 of the Fortune 500 companies have set up internal AI research groups, although some efforts are considerably more substantial than others. Such giants as General Motors Corp., General Electric Co., Martin Marietta Data Systems, Inc., Lockheed Aircraft Corp., Hughes Aircraft Co., TRW Corp. and United Technologies Communications Co. all have major AI projects under way, and ADL predicts that corporate and government spending for AI will reach $1.25 billion annually by 1990.

For the market to explode as predicted, however, the applications emphasis for expert systems must make a dramatic shift away from the one-of-a-kind geological, medical and military applications of the past and move toward more commercially oriented areas of business/financial decision making, equipment diagnostics and maintenance and manufacturing planning. For large vendors first entering the AI business, it is a matter of shaping internal thinking.

At Hewlett-Packard Co., Ira P. Goldstein of the Computer Research Center is leading a major effort to bring AI and expert systems to HP's desktop line of computers. Although he would not reveal specific product offerings, Goldstein said that the first such products would be available in 1985. For HP, there is a natural expert systems connection between its computing and scientific diagnostic equipment, according to Goldstein, and in fact, the company already has an early expert system available for its electrocardiographs.

HP, however, wants to expand its use of expert systems deeply into the software development, manufacturing and office technology areas. For Goldstein, the technology questions are eclipsed by a larger issue. "One of the largest problems you face is how to transmit the culture in order to shift the paradigms. How do train the several thousand software engineers at HP to be conversant [with] this technology?"

While the large companies grapple with this, the concept of bringing expert systems to a mass audience has created what many believe is the leading business opportunity in the field: expert systems development tools. These development tools are generally shells, or the framework of an existing expert system with its specific knowledge base removed.

The first such shell was Emycin, developed at Stanford University, which was the inference engine and knowledge-base management system for Mycin, an early expert system also developed at Stanford and used in medical diagnosis. Since then, a spate of start-up firms, many with university ties, has emerged to sell these development tools.

Among the early competitors are Teknowledge, Inc., General Research Corp., Smart Systems, Inc., Inference Corp., Software A&E and Intellicorp. Such major firms as Xerox, McDonnell Douglas Automation Co. and Tymshare Corp. also offer such tools while others such as DEC, Data General Corp., Texas Instruments, Inc. and IBM are said to be working on versions for their customers.

The field of expert systems tool development will grow at a rate of 60% per year soon, according to Frederick Hayes-Roth, chief scientist for Teknowledge, a market-leading, four-year-old Palo Alto, Calif.-based firm. GM spent $3 million to acquire an 11% equity in Teknowledge in 1984, signaling the beginning of a strategic business relationship between the two companies.

"In five to 10 years, expert systems will be everywhere," Hayes-Roth said. "Whether you know you are dealing with one or not, I'm uncertain. Some people use expert systems and AI to configure products for their customers, but they don't tell them they are using AI. Some customers are simply not ready for it, and in some cases, the company doesn't want its competitors to know it is using AI."

The costs of doing an application using an off-the-shelf tool, such as Teknowledge's S.1 or M.1 packages, are going down so dramatically that the number of applications is increasing tremendously, Hayes-Roth said.

The problem for suppliers like Teknowledge is that the technology is brittle and is only good for re-creating highly specialized talent. Without the resources to produce custom systems for countless clients, Teknowledge said it felt the best step would be to help people do it themselves.

According to DM Data, Inc., as the industry becomes more experienced with this option and the

See FIFTH UPDATE/14

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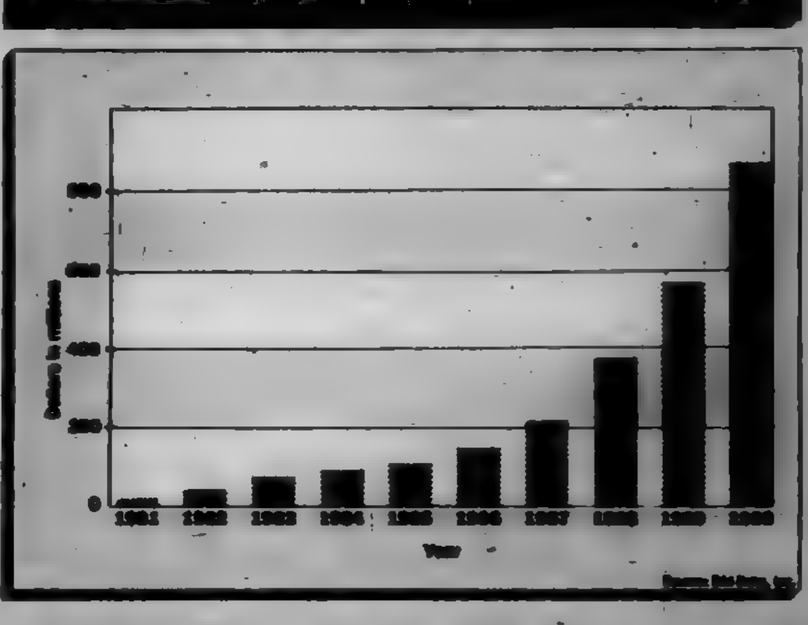

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Update

FIFTH from UPDATE/11

documentation improves, this do-it-yourself approach to creating expert systems will increase dramatically because of cost-effectiveness and increased security on systems. The consulting firm predicted that these framework systems will account for more than half the market by 1988.

"Within the next few years, some knowledge acquisition tools will be developed that will make it possible for people with only modest amounts of AI experience to develop first-rate systems in a handful of domains," Carnegie-Mellon's McDermott predicted. "With that, we'll see a jump in the number of expert systems out there."

Despite the growing excitement about this budding industry, those within the field are keeping the technology in perspective.

Hayes-Roth

"Will it change our lives in five to 10 years?" Hayes-Roth asked. "I doubt it. The computer didn't change our lives in five to 10 years, and this won't either. It will make a lot of companies a lot of money in that time, however."

"There's nothing special about expert systems now," McDermott added. "As increasingly powerful techniques are discovered, however, they will be exploited in applications programs so that through an evolutionary process, in 20 or 30 years, we'll have some truly impressive machines."

For the DP professional, the impact of expert systems will be long in coming, according to ADL's Wiig. "Cobol will stay around for a long, long time," he said. In addition, the majority of uses for AI tend to be focused on the management of knowledge within the organization — dealing with professional content and the organization of professional activities — rather than with actual implementation or writing code.

In the future, however, expert systems will have such an effect on how an organization does business "that it will require a totally different alignment of what you think of the DP professional," Wiig pointed out. "I know of many DP managers who had difficulties adapting to the general concept of management information systems when that concept came about. They wanted to continue to operate the computer center and were not very interested in changing the concept to supporting management within the organization. With this, we are dealing with a much more drastic revolution."

Need for natural language

Undoubtedly, computer scientists of the future will look back at current expert systems as crude and simple forerunners to offerings today's users can only imagine. Among the key obstacles to reaching the next generation is the task of implementing cognitive understanding on a machine. With all the advances to date, a computer is still only capable of understanding what is programmed into it.

Creating a natural-language interface for the computer is the first step in that complicated process. From overexposure to science fiction movies and literature, computer neophytes have come to expect that systems understand everyday English commands.

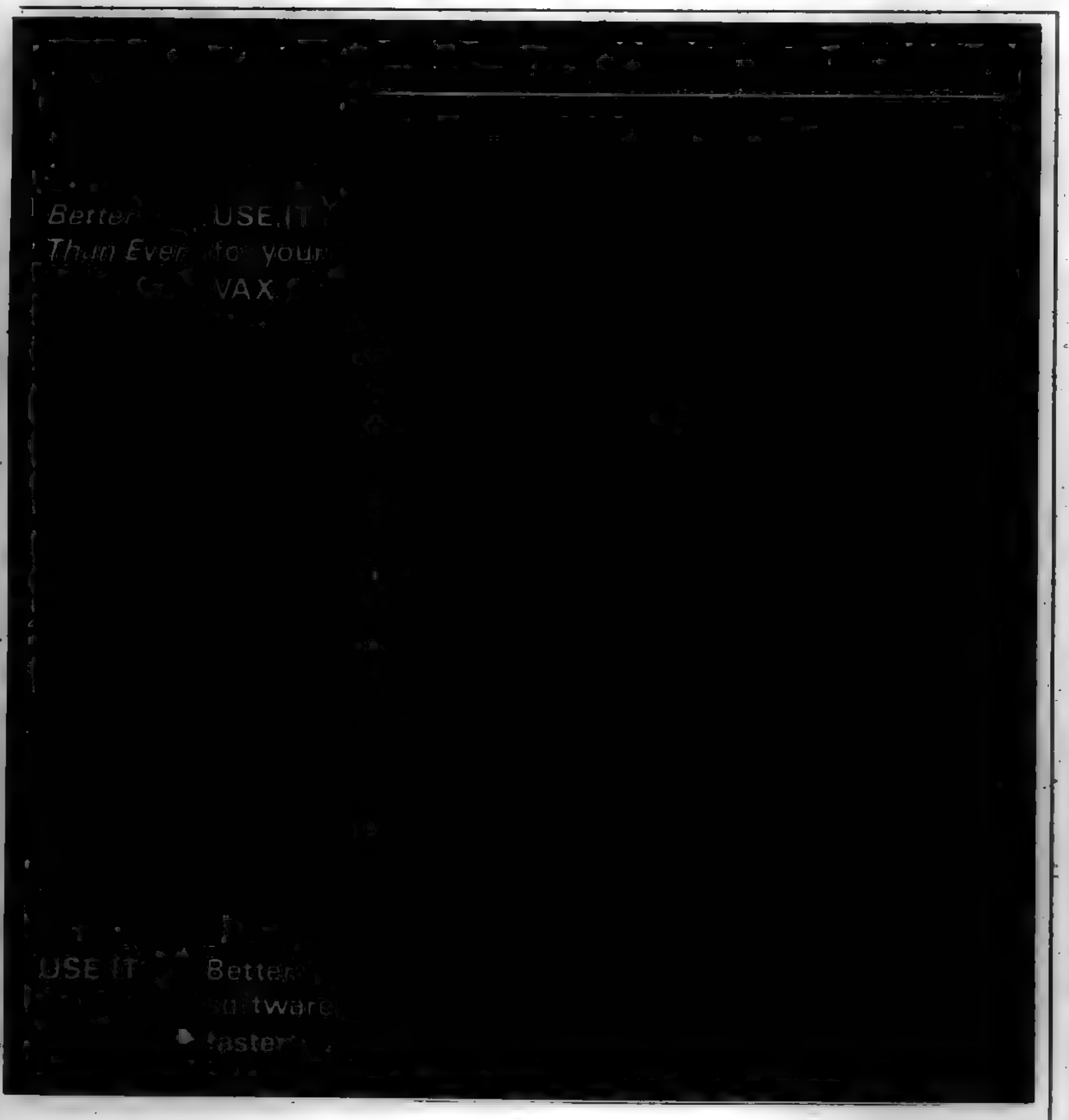
In fact, natural-language understanding is in an embryonic state, and getting a computer to comprehend the broad and complicated nuances of syntax and semantics has not yet come very far. How, for example, does the computer differentiate between "Time flies like an arrow," and "Fruit flies like an apple?" According to Firdman, "Out of sight, out of mind" was translated into "an invisible maniac" by a computer.

Cognitive science, a field that combines computer science and cognitive psychology, has attempted to quantify natural-language understanding, but it is like peeling an artichoke: The more layers you peel away, the more it seems there is to get through. For the use of computers to reach a maximum audience, particularly in business settings, natural-language interfaces must allow access to data bases, decision support systems, spreadsheets and the like without the intimidation of computerese.

Roger Schank, professor of computer science and psychology at Yale University, has been a pioneer in natural-language understanding. After more than a decade of research in the field, Schank has become less convinced of the immediate payoffs of AI. Speaking at a recent workshop of the Information Industry Association at Hyannis, Mass., Schank pointed out that AI is no more available today than it was 10 years ago. "AI has as its goal something so complicated and so difficult that it will never be here," he stated. "By that I don't mean that AI is impossible. I just mean there will always be more to do."

Natural-language understanding, according to Schank, presents some fundamental problems. "The problem

See FIFTH UPDATE/16



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Update

AI technology: Implications for DP

By Howard Dicken
Special to CW

Businesses soon will be able to obtain the decision-making skills of a Fortune 500 manager or a $1,000/day consultant by creating an artificial intelligence expert-system software program. How will this and the other subtle aspects of AI affect the data processing manager? With the AI industry just now emerging from the university laboratories and AI products becoming commercially available, the capabilities and potential of AI products are now very real.

AI can be considered as the application of computers to the process of learning and understanding from experience, acquiring and retaining knowledge and responding quickly and successfully to a new situation.

Unfortunately, this definition does not resolve the fundamental problem of obtaining a consistent and complete definition of the word "intelligence." The basic answer, however, is that the capability of AI allows a computer to make human-like decisions.

Dicken

With a few exceptions, the initial AI products will be in the form of software or software packaged with customized computer hardware, such as the following:

- Expert systems — software programs that attempt to duplicate the decision-making process of human experts in a given field, such as geology, medicine, engineering and science.
- Natural language software — programs that allow the user to query the computer and access data in a conversational style as opposed to specific computer commands.
- Visual recognition — software programs and hardware being developed primarily for applications associated with inspection and robotics, allowing a system to discern particular objects, shapes or components.
- Voice recognition — hardware and software programs designed to analyze the sound and identify each spoken word.
- AI computers — hardware that is specifically designed for AI software and applications; usually symbolic processing.

All of these areas will have some impact on present DP activities. For example, advances in voice and visual recognition and AI computers will start to affect hardware acquisition decisions in the next few years. We now have the possibility of seeing limited-range, voice-activated typewriters by 1986. The major technical impacts, however, will be in the areas of expert systems and natural languages.

A primary growth factor for AI in the next one or two years will be the availability of framework expert systems and the realization within the user community of the need for this technology. In some companies this capability has already bypassed the DP department. In one case, the capability of expert system development originated in the research and development department and was transferred directly to engineering — completely circumventing the DP department. With natural language, anyone will be capable of accessing a data base — if allowed.

What are the factors that will affect the data processing manager? The changes will range from none to complete reorganization. The potential changes for a company will range from the technical to the management level and even to social aspects. In the extreme case there will be no need for a DP department and the support specialist. This is most likely to occur in new companies without an established DP department.

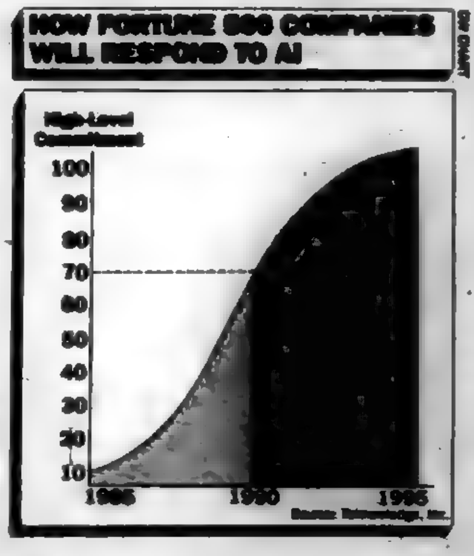
With the present trends to powerful desktop computers, natural language interfaces and the resultant "distributed processing" data base management, data analysis (spreadsheets) and even word processing can be and are currently performed by individuals in smaller companies.

A natural language interface to a data base allows entry and use without requiring any programming knowledge. For some current products, very little computer operation experience is necessary beyond finding the "on" switch and the ability to read commands on the screen.

Even the word processing department will not be required. Today, with a combination of new word processing programs, spelling checkers and form checkers (an IBM program), even an engineer can turn out an acceptable letter. This will be even easier in about two years when commercially viable voice-activated word processing computers become available.

More likely than the demise of the DP department is the trend toward self-programming. AI software, including both expert systems and natural language, will allow the user to customize the programs to obtain the proper data and desired report forms. Expert systems, once they are developed, can provide information to any inexperienced operator. The results will be, if not the elimination of a staff of specialized programmers and computer experts, then a major shift in the type of skill required.

In a few years, the DP department in a progressive company will not be advertising for Cobol or Fortran programmers. If a programmer is required at all, the language requirements will most likely be Prolog, Lisp and object-oriented languages such as Smalltalk. The most needed (and marketable) individual will be a "knowledge engineer," a specialist who has the ability to translate an expert's knowledge into an expert system. These people are already commanding salaries of $60,000 to $90,000 — if a good engineer can be found. As with computer programmers of 20 years ago, there will be a major but temporary shortage in most of the AI skill areas.


HOW FORTUNE 500 COMPANIES WILL RESPOND TO AI

Source: Teknowledge, Inc.

Assuming some or most of the potential trends discussed above come to pass, the major management problem with the advent of AI will be one of control. With the combination of distributed processing, natural-language data bases (which anyone can technically access) and self-created expert systems, information control will be a key management factor. Control of security, accuracy and amount of system use all will be equally important.

Problem of system overload

The ability of AI software to allow any individual to access and manipulate data bases or other files introduces the potential problem of system overload. In fact, this has already happened in some initial installations of natural-language data bases. The users who are amazed at the ability to obtain "instant information" instead of waiting in queues for weeks at the DP department start to exercise the system by requesting more information and performing "what-if" types of analysis. The result is search requests that have taken hours of CPU time, completely tying up the system. The potential of unrestricted use by any employee is almost sure to create a "traffic jam." The amount and cost of equipment required to accommodate the uncontrolled load would increase dramatically.

Even without uncontrolled use, the amount of computer equipment will increase. AI programs typically require two to 10 times more dynamic memory to provide the operating intelligence. Most computers dedicated to AI software are 32-bit machines with extended memory capabilities. Lucky for the department's budget, however, is the decreasing cost trend of computers and memory of over 30% per year. This does mean, however, that present equipment becomes technically obsolete in less than five years.

AI programs, including the natural-language data bases and expert systems, can be less accurate than those currently running. For the DP department and the user management personnel who are accustomed to reporting data to "x" decimal-place accuracy, AI programs will require some rethinking. For example, a good expert system is designed to give "fuzzy" answers. The answers are actually weighted in terms of probability based on the confidence of the input information.

Natural-language data bases introduce the same possibility of error as requesting the information from a human. There is the same problem of the correct interpretation of the request or question. For example, take the following conversation with a data base:

Human: Give me the value of PX Computer Sales in New York.

Computer: Do you mean annual sales?

Human: Yes.

Computer: $10 million.

Human: OK, that's all.

This information could be completely inaccurate if the user was thinking of New York City when the question was asked and if the natural-language data base had been trained to respond to recognize states. Normally, a good AI program is designed to identify possible misinterpretations, but as the programs become more human-like and are expected to respond as such, the same type of errors can occur.

One industry observer suggested the possibility of stagnation within the DP department. With all of the "artificial" intelligence, the departments will not have to do anything. We assume that this will not be true.

The bottom line is that the DP manager will have to do more managing. With the capabilities of AI onboard, the DP manager will have fewer programming and technical problems but will have more problems of resource allocation, data control, security, equipment selection, program selection, budgets and personnel acquisition.

Dicken is the president of DM Data, Inc., a Scottsdale, Ariz., consulting firm that specializes in artificial intelligence.

Update

FIFTH from UPDATE/14

of language is not language. It's what is behind it," he explained. "It is the inference problem. The inference problem is caused by the fact that what we say is only the tip of what we are really thinking and thus trying to express. The problem is [deciding] how are you going to teach all this stuff to a computer."

Despite the enormity, and perhaps impossibility, of this task, the market for natural-language software is growing. According to DM Data, when combined as front ends for expert systems, this software is projected to be the fastest growth area of the AI market, increasing at a compound rate of more than 75% per year. By 1990, the company predicts nearly a $1 billion marketplace.

Natural-language front ends currently exist for personal computers, minis and mainframes and generally focus on two uses: data base query and software integration. Products range in price from $400 for IBM Personal Computers and up to $50,000 for minicomputers. The best-known success story in the natural-language business to date is Waltham, Mass.-based Artificial Intelligence Corp.'s (AIC) Intellect product, a software interface-to-mainframe data base management system.

The company was founded in 1975 by Larry Harris, but the product did not appear until 1981. Written not in Lisp but in PL/I, Intellect runs under DOS/VSE, MVS and VM environments and sells for between $50,000 and $70,000. Intellect has been picked up by such software manufacturers as Cullinet Software, Inc. and Information Science, Inc., and in 1983 was given the stamp of approval from IBM.

Goldstein

Other major players include Cognitive Systems, Inc. (of which Schank is chairman), Frey Associates, Inc., Microrim, Inc., Mathematica Products Group, Inc. and TI. According to the Gartner Group, however, none of these products approaches a human understanding of English. All have limitations and will not accept just any free-form query. This generation of products is also not portable, as the lexicons that are built in are intimately tied to the underlying data bases.

Today's offerings use such techniques as "fuzzy set" theories, which allow the computer to make a satisfactory decision as opposed to no decision at all, forgiving misspelled words and responding with the nearest equivalent.

Heuristics are incorporated into the technology to offset what AI researchers call "combinatorial explosion," a state in which the number of possible alternatives is so enormous that a computer simply cannot handle it — as in chess, for example, where there are approximately 10 to the 120th power legal moves. So programmers build in rules of thumb based on experience to cut down the number of alternatives.

At Yale and at such companies as Cognitive Systems, work is being done on translation methods to well-known software packages.

Although the first uncertain steps are being taken in cognitive understanding, it is clear that at least a decade separates today's user from the breakthrough technology required for high levels of natural-language understanding. Work in the research laboratories of universities tends to precede commercial product cycles by 10 years and the next generation of understanding is only now getting under way in academia.

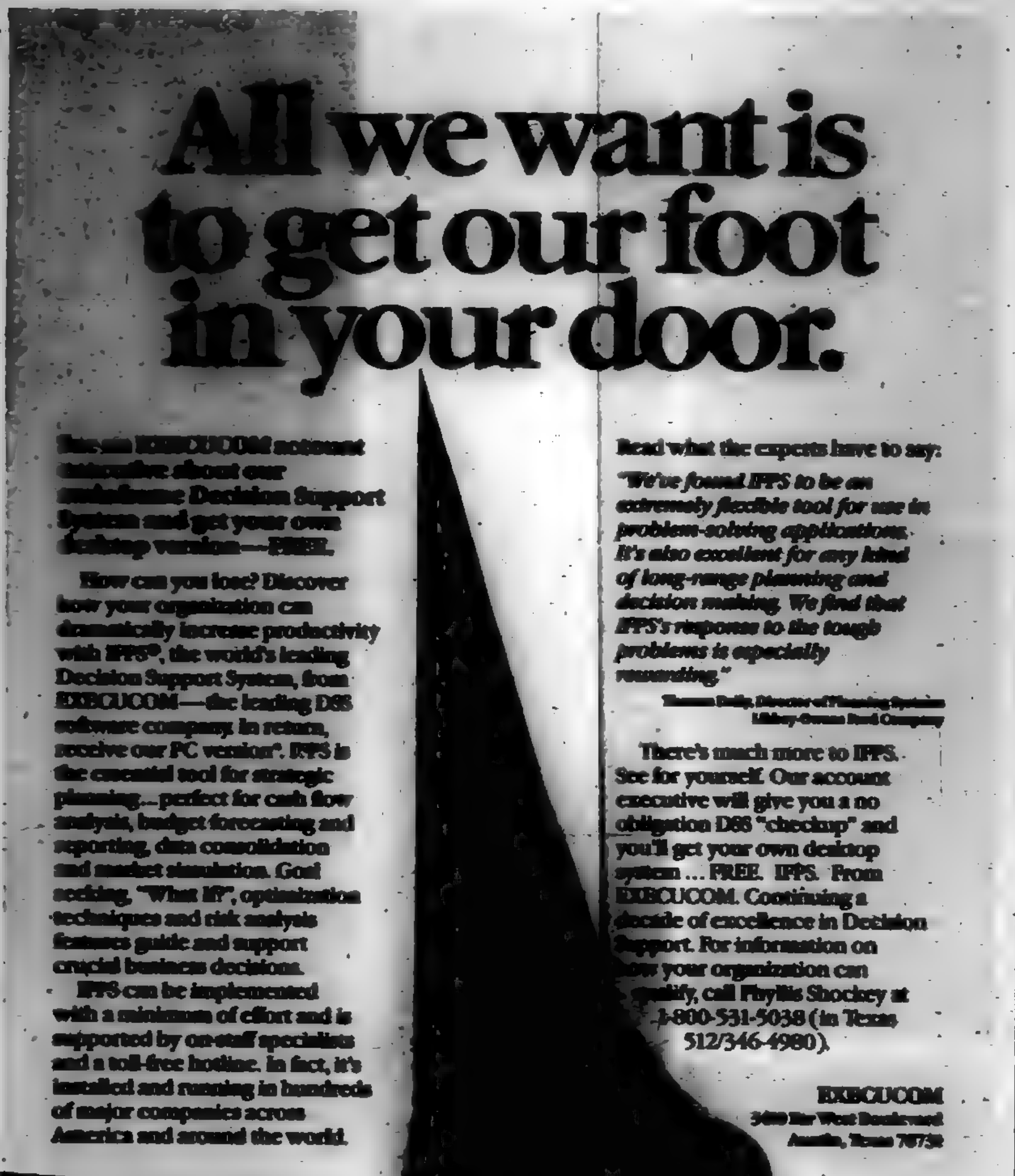
As Schank explained, "We in the field of AI will continue to have, as we work on the problem, spin-offs that relate to people in the information industry to make their lives easier. A great many interesting things will happen. But don't lose sight of the fact that, in general, AI is about understanding intelligence. And we aren't quite there yet."

IBM: Leader or follower?

Unlike in virtually any other segment of the computer industry, the name IBM is not frequently heard in discussions of artificial intelligence. For a long time, IBM was considered in many circles to be anti-AI, a reputation gained by its seeming indifference to the study of this new technology.

But as the world's largest computer company, with an annual research and development budget of $4 billion — more than most other computer makers' annual revenues — this giant powerhouse must be viewed as vital to the interests of any emerging field. Indeed, many in the industry said they believe that to hold off a major challenge from the Japanese in the next decade, IBM must spearhead U.S. efforts in the fifth generation.

Ironically, IBM is viewed as anything but innovative. According to Feigenbaum, IBM has historically taken a backseat in major development work. "One might look to DEC for innovation, but I don't remember looking to IBM for innovations in time-sharing or innovative architectures or anything across the board," Feigenbaum stated. "I look for IBM to



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Update

Illustration courtesy of Darpa

Darpa's autonomous land vehicle will be ready for initial testing in Denver in the beginning of May.

do something significant later, once it [is] proven that it is a viable technology." Added a report from the Gartner Group, "IBM often leaves the spadework, such as market education and development, to others and then muscles its way up to the bar."

In fact, IBM has been involved, however quietly, with AI research since the 1950s when it developed the classic checkers program and did work on machine translation and automatic theorem proving. Since then, work has been done on an ongoing basis at the company's Thomas Watson Research Center in Yorktown Heights, N.Y., as well as at its Paris and Palo Alto, Calif., scientific centers.

Although IBM does not have a specific group devoted to AI research, it has more than 100 people working on AI-type projects such as expert systems, speech recognition, natural language and text processing, Lisp and Prolog, symbolic programming and parallel processing. In fact, IBM announced in February that it would donate $30 million in equipment and personnel to support the effort at Cornell University headed by Nobel laureate Kenneth Wilson (see story Update/22) to construct a supercomputer using parallel architectures.

In addition, IBM has reportedly developed an experimental 512-microprocessor system called the Yorktown Simulation Engine, similar to the Ultra machine being developed at New York University.

Despite all of its research work, IBM currently offers only two AI-related products — its Lisp/VM, a version of the Lisp programming language that reportedly incorporates current programming techniques into a 370 time-sharing environment; and A Manufacturing Language (AML), a powerful robotic language used to program IBM robotic systems. A version of AML is available for the Personal Computer.

Although IBM remains tight-lipped about its research projects, it has admitted to development work on a number of AI-related systems. Getting the most attention is the interactive, continuous, real-time monitoring program for the MVS operating system called Yorktown Expert System for MVS operators (YES/MVS) [CW, April 8].

Monitoring and management of large systems like IBM's 370 require that problem-solving be done in real-time, a task becoming increasingly complex as DP installations and computer applications grow. YES/MVS is an expert system that can essentially perform automatically tasks performed by computer operators. Currently, YES/MVS can perform about two-thirds of all operators' nonmanual functions. It can respond automatically to conditions in the system and summarize them.

Although IBM has been deluged with requests for the system, YES/MVS is still in the prototype stage and is not ready to be announced as a product.

In addition to YES/MVS, IBM is working on several other prototype systems including the following:

- **Transformational Question-Answering System (TQA).** An outgrowth of early work in natural-language translation, TQA was designed for querying relational data bases in English.
- **Epistle.** An natural-language expert system that can check spelling, grammar and style with applications such as summarizing electronic mail.
- **Scratch pad II.** This system, under development for eight years at Yorktown Heights, contains extensive facilities for symbolic mathematical computation.
- **Prism.** A project from the Palo Alto scientific center, Prism (Prototype Inference System), is an experimental shell — a general-purpose development tool for expert systems.
- **PSC Prolog.** Developed by the Paris scientific center, this programming language operates on IBM 370s under the VM/CMS operating system.
- **Handy.** A user interface containing many of the elements required to allow work between end users and AI systems.

Darpa's computing project

"The battlefield is no place for humans," someone once noted. Ironically, the military tends to agree, and toward that end, the Defense Advanced Research Projects Agency (Darpa) launched its $600 million strategic computing project in 1983. The military has long been the leading financer of innovative academic research in computing, and this latest plan is considered the biggest boost toward the fifth generation.

Although Darpa's initial thrust calls for the creation of three specific defense projects — the autonomous land vehicle (ALV), the pilot's associate and a battle management system — the research and development that surrounds these massive ventures will encompass virtually every aspect of fifth-generation computing. The plan calls for transcending today's computer capabilities by a quantum jump. Powerful computers will be developed, driven by expert systems, and the machines will be equipped with sensory and communications modules enabling them to hear, talk, see and act on information and data they develop or receive. "This new technology promises to increase our national security greatly," the Darpa press announcement reported.

Although academic and industrial researchers tend to downplay the romanticized science fiction images of intelligent machines, the Strategic Computing project inevitably conjures visions of *Star Wars* technology.

Battles of robots, driverless vehicles, sophisticated and intelligent fighter planes and weapons with the predatory instincts of animals are all represented in Darpa's ambitious plans.

The military, however, has taken a pragmatic view as well. By parceling out the wealth to academia and industry through grants and contracts, Darpa is hopeful that the strategic computing project will effect a widespread technology transfer, allowing any and all advances to move into much-needed development in the private sector.

Backed by massive defense spending, the plan's original $600 million figure will more than likely exceed $1 billion before the initial project is finished.

According to Clinton W. Kelly III, director of Darpa's engineering applications office, the program seeks to develop a technological base that can be incorporated into new weapons systems.

"Our mission is to do the high-risk research that most of the individual services will not undertake because of the cost," Kelly explained. "We're chartered to always be at the leading edge, to push the frontiers out," he said.

The payoff, Kelly pointed out, must be correspondingly high — a 10 times improvement over current technologies. And the leading-edge components of computing attract most of Darpa's interest. "Computing, up until a few years ago, was incorporated into military equipment as an afterthought. Now, it has reached a level of sophistication and capability where it can't be an afterthought anymore," Kelly said. "It has to be part of the integral design of a system.

"There are a lot of computer-based systems out there that do certain things quite well in anticipated environments," Kelly added. "But if the environment changes, the systems are not intelligent enough to adapt."

Kelly was quick to point out that Darpa's function was not to develop weapons but a technology base that the individual services can exploit for weapons development. To this end, three major projects have been initiated.

Autonomous land vehicle

This first project, initiated prior to the formulation of the strategic computing plan, is part of an overall design for autonomous systems, such as unmanned aircraft, submarines and land vehicles. According to initial requirements, the ALV will be able to navigate cross-country, plan its route from digital terrain data and update its plan as its vision- and image-understanding systems sense and resolve ambiguities between observed and stored terrain data. Its expert local-navigation system will devise schemes to ensure concealment and avoid obstacles as the vehicle pursues its mission.

According to Kelly, the vehicle already exists and is set for initial testing at the end of May in Denver. In its first test, the vehicle is expected to move at 5 kilometers per hour, increasing to 10 kilometers per hour by November. "That doesn't sound very fast," Kelly said, "but you have to keep in mind that that is [1,000 times] better than anybody has done before."

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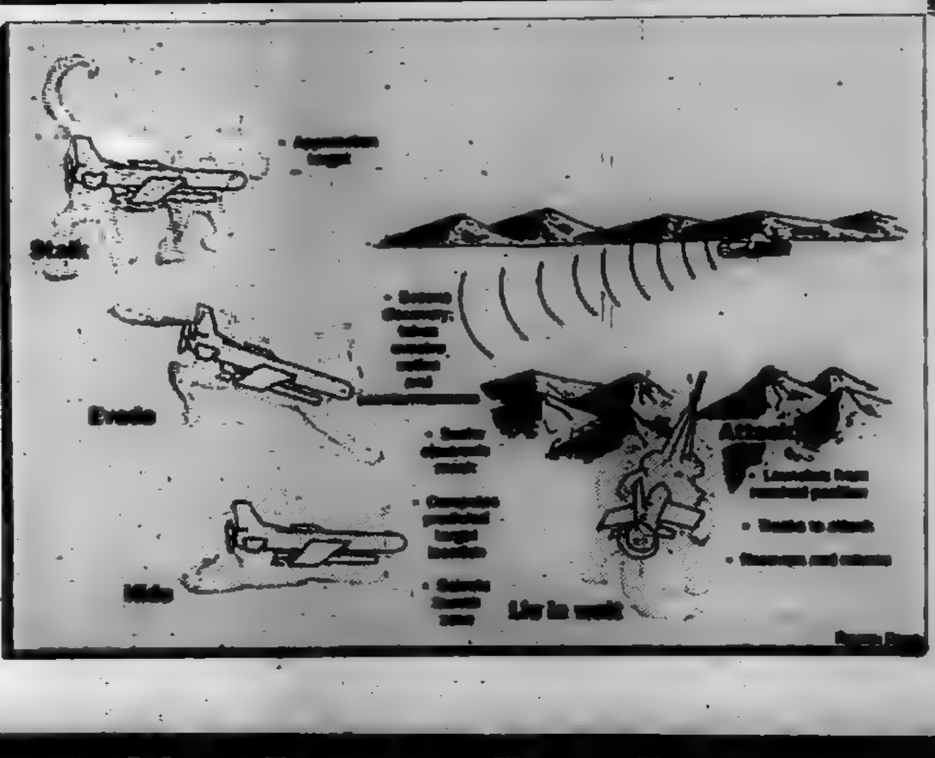

See FIFTH UPDATE/19

Update

Esprit crucial to European technology

By [illegible]
Special to CW

With 441 proposals to choose from, the European Economic Community's (EEC) five-year European Strategic Program for Research in Information Technologies (Esprit) earlier this year awarded funding to 104 projects. The success of Esprit — akin in many ways to Japan's fifth-generation project — is vital to the long-term survival of an independent European computer industry. Nonetheless, other industry shortcomings — most beyond the bounds of Esprit or even the EEC — will have to be resolved if Europe's computer companies are to remain competitors in the 1990s.

Projects approved this year will receive about $130 million, with a matching sum contributed by the participating organizations. Funded areas and the number of projects include the following:

- Software technology — 14.
- Advanced information processing (artificial intelligence) — 26.
- Office systems — 23.

See ESPRIT UPDATE/24

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Soviets' AI research takes shape

As the U.S., Japan and Europe gear up for the fifth generation, what is happening in the Soviet Union?

Though it is difficult to gauge how far the Soviets have come in computing technology, it is generally agreed that they lag far behind the U.S. and Japan in many emerging technologies.

According to retired Adm. Bobby Ray Inman, head of Austin, Texas-based Microelectronics and Computer Corp. (MCC), the Soviets have developed, within heavy industries that support defense, "a pretty good capability to take Western technology and adapt it to their own needs. They have been far less successful in creating new technology of their own."

Henry Firdman, a consultant, and Gabriel Jakobson, an AI researcher with GTE Corp. Laboratories in Waltham, Mass., are Soviet Jews who emigrated to the U.S. in the early 1980s. Both Firdman and Jakobson were deeply involved in AI research in the Soviet Union. Firdman, in fact, started the first laboratory devoted solely to AI research there in 1974.

Though both men were forced to discontinue work in the field when they applied for emigration, Jakob-

See USSR UPDATE/22

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FIFTH

from UPDATE/17

By 1988, after initial road-following techniques are perfected, the ALV will begin cross-country navigation. Concurrent with work on the ALV is the development of a walking machine capable of maneuvering over virtually any terrain.

Among the more ambitious goals for the ALV and the walking machine is to eventually incorporate the behavioral patterns of lower mammalian animals as they sense and react to threats as well as predation. Kelly said he is hopeful that the vehicle will be an analogue to interesting behavioral patterns in the animal world, such as the panther stalking its prey (see chart Update/17).

Battle management system

A second Darpa project — the battle management system — is aimed initially at naval aircraft carrier groups and is based on a multiperson, multiproblem paradigm. This system will be designed to help teams responsible for managing large-scale, fast-paced combat situations fuse information, generate options, make decisions and monitor events.

The contract for the system was awarded to Texas Instruments, last December and will face a twofold approach, according to Kelly. On the one hand, expert systems will have to be developed to handle extraordinarily complex problems created by many contingency assignments that involve large numbers of men and ships in tense, war-time situations.

In addition, there is the problem of communicating at the front and back ends of the system, Kelly explained. Senior officers and staff will not want to use complicated command sets and exotic languages to communicate with the system, so a natural-language and speech-understanding front end and similar back end will be required so that results will be offered in English.

Pilot's associate

The third project is the pilot's associate, whose objective is to create a phantom crew in the cockpit of an aircraft that will help the pilot fly and exploit various weapons systems and defensive systems on board. The prime motivation for this project (which has yet to award a prime contractor) is the increasing complication of aircraft. "Not only can the pilots not cope with the tremendous flow of information that's coming in as it is currently displayed to them, but they lack both the mental and physical abilities to extract from the airframe all it is capable of providing," Kelly explained.

The system will enable a pilot to off-load lower level instrument monitoring, control and diagnostic functions, freeing the pilot to focus on high-priority decisions and actions.

Kelly said he believes this capability is deliverable by the 1990s.

Although R&D work has been passed on to a long list of universities, research labs and corporations, Kelly said he is concerned that technology transfer goes beyond specific work on the military applications. He pointed out the implications of the battle management system for use in air traffic control, the pilot's associate for the commercial airline industry and the ALV for work in robotics.

Surprisingly, Darpa is anything but secretive about its work for this reason. Kelly said individuals and research groups are constantly being invited in to learn firsthand about the ongoing work. "We've run into occasional national security problems, but to the extent possible, we want to pump this technology out into the industrial base."

As the Strategic Computing program evolves, anticipation of its payoffs is high. Kelly tempers the enthusiasm with real-world pragmatism. "To my way of thinking, the ultimate impact of these kinds of technologies will be determined by how inexpensively you can deliver them," he insisted. "It's fine to talk about a missile system with all these capabilities, but if you can't deliver it for a very low cost, you don't have very much."

Fifth-generation projects are under way at more than 70 universities and many research laboratories and corporations. A broad expanse of technology is being developed covering a wide range of applications. Projects once considered impossible are in prototype stages, including advanced vision systems, speech and voice recognition systems, computer-aided instruction systems and computer-aided design and manufacturing systems incorporating both AI and advanced robotics.

The work is made more exciting and tantalizing to both "techies" and humanists because it encompasses and irrevocably intertwines many diverse disciplines such as philosophy, mathematics, humanities and the arts, computer science, psychology and linguistics.

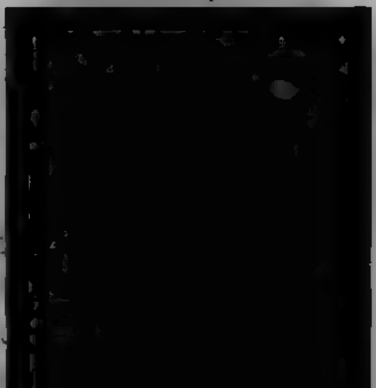
- **MIT.** MIT has been at the forefront of AI research since the discipline was formulated in the mid-1950s. AI pioneers such as Joseph Wiezenbaum, Marvin Minsky, Patrick Winston and Randall Davis have led MIT's efforts to move AI from a set of intellectual academic theorems to real systems with practical payoffs. A spate of MIT alumni have spawned commercial ventures using technologies that were developed and refined at MIT's Artificial Intelligence Laboratory.

See FIFTH UPDATE/23

Compuware Case #4

(You and)
CICS
Abend-AID
vs.
The Dump

Exhibit A.
The Irate Boss.



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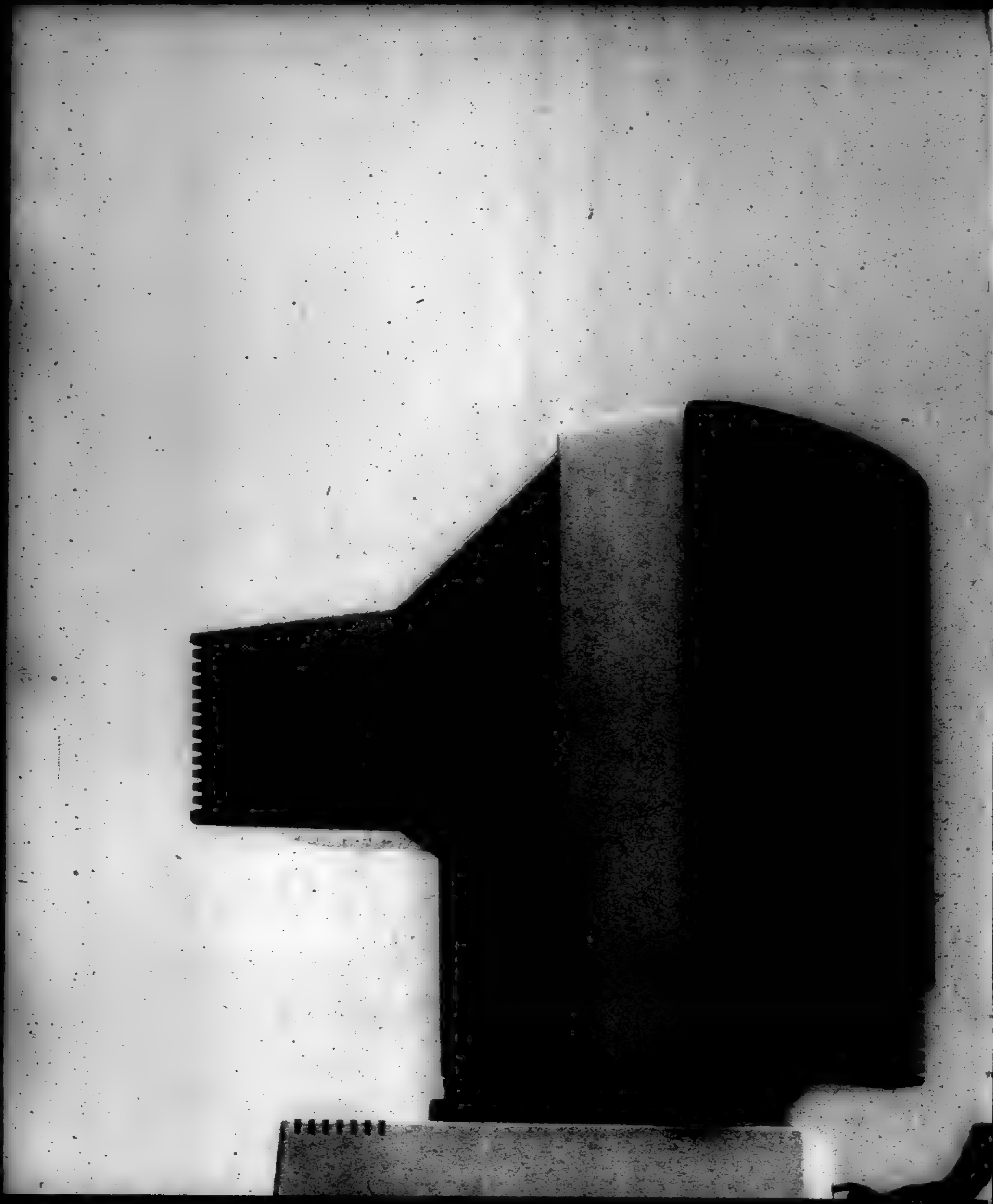

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Update

WILSON from UPDATE/7

puters and will be upgrading them quickly. The bulk of the market will lie in the low end (machines priced at several hundred thousand dollars), but installations at all price levels, including over $100 million, will exist.

■ Supercomputers will be closely integrated with three-dimensional color graphics. The desire for real-time graphics displays (60 frames per second) of the progress of three-dimensional simulations will create an extraordinary demand for supercomputer upgrades and other technological advances. Real-time graphics of this sort requires roughly 100,000 times the peformance of current supercomputers. This performance level will not yet have been reached in 1990 but will be close enough so that pressure to reach it will be immense.

■ A flowering of scientific, technological and artistic endeavors will accompany the increasing power of supercomputers. Virtually all graduate disciplines in such fields as science, engineering, biology and medicine will be making essential use of supercomputers.

■ Supercomputers will be playing major roles in industry. They will be used throughout the U.S. industrial base — in chemicals, oil, aerospace, glass, photography and image processing and high technology — to shorten product development cycles and help engineers achieve new levels of product optimization with respect to low cost, high quality and environmental compatibility.

Industry-university joint efforts will increase rapidly as cooperation between basic university research and industrial applied research becomes more and more fruitful.

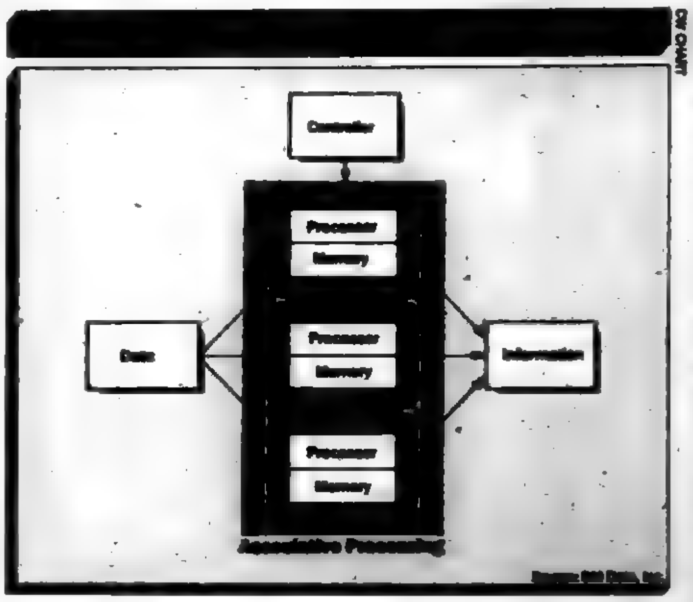
All of the predictions I have made for 1990 are based on trends visible today. For example, all of today's supercomputer manufacturers are moving to incorporate parallelism into their designs.

Today's supercomputer market is small because of the multimillion-dollar price tags on supercomputers. There is a huge market vacuum for a line of supercomputers that can be assembled and then upgraded step-by-step in $100,000 increments, fitting in well with the present multibillion-dollar supermini market.

Today, in forefront computer graphics efforts such as those at Don Greenburg's Center for Computer Graphics at Cornell University, it often takes eight hours of supermini-level processing to produce a single graphics picture. Further processing power is required to generate a single graphics picture from a three-dimensional simulation.

Few such simulations are attempted on current equipment. No one familiar with the processing power needed to support graphics will be surprised by the estimate that a machine 100,000 times as powerful as a Cray supercomputer would be required to support real-time graphics.

Throughout the graduate programs at Cornell and around the country, students work on a thesis project, attacking the most complex problems in their disciplines. Supercomputers are designed to handle precisely this complexity.



CW CHART

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Complexity arises when a planetary scientist wants to understand Saturn's rings, which contain thousands of rocks, instead of the simpler problem of one planet circulating the sun. Complexity arises when an automobile engineer tries to understand the turbulent flow of air underneath an automobile, including every swirl and eddy past the tires and oil pan, instead of just smooth airflow past a perfect sphere. Complexity arises when an economist studies a regional economy of many different sizes of towns and factories instead of just overall gross national product figures.

Beyond this, there are two areas of scientific and engineering inquiries of overwhelming importance and equally overwhelming difficulty: the turbulent flow of gases and liquids and the precise nature of the chemical bonds that bind atoms in molecules. Both of these problems recur in many scientific disciplines and technological applications; both are of multibillion-dollar importance to industry; and both are major unsolved problems of scientific research of over 50 years' standing.

In 1990, a major effort pushing supercomputer technology to its limits will likely occur in order to make progress on these problems.

By then, supercomputers in universities should be widely distributed among departments and individual faculty members, just as superminis are today. However, in the meantime, the strong supercomputing programs already in existence at Cornell and the University of Illinois should play a major role in moving from the current era of expensive vector machines to inexpensive parallel machines.

An intense but friendly competition should develop between these two universities to be the first to achieve major breakthroughs in parallelism. Each university will be working with industrial partners — Illinois with Cray Research and other companies and Cornell with IBM, Floating Point Systems, Inc. and others.

Finally, in 1990 the U.S. will likely face more intense international competition in supercomputers than it does today. Over the last 10 years, the major Japanese manufacturers, such as Fujitsu Ltd. and Hitachi Ltd., have risen from scratch to develop supercomputing products competitive with the best the U.S. has to offer.

The Japanese manufacturers have formidable resources at their disposal to continue supercomputer development. I believe that the U.S. can gain a temporary edge if it moves rapidly into parallelism, but foreign vendors will press hard to catch up. Competition will intensify as it becomes clear that a multibillion-dollar market is at stake.

Dr. Kenneth G. Wilson, a 1982 Nobel laureate in physics, teaches at the Floyd R. Newman Laboratory of Nuclear Studies at Cornell University in Ithaca, N.Y. He was recently named director of the new National Advanced Scientific Computing Center at Cornell. Among the center's first major ventures is a joint development project with IBM on a new architecture for supercomputers.

USSR from UPDATE/18

son continues to track AI activities in the Soviet Union through his former ties.

According to Jakobson, fundamental AI research in the Soviet Union compares to work being done here, but applied research is not state of the art. On the other hand, he pointed out that the strong Soviet tradition in mathematics research has encompassed work in linguistics and natural language development.

Despite its deficiencies in AI hardware, the Soviets have begun to respond to the fifth-generation call, and work is spreading rapidly.

According to Jakobson, the Soviet Academy of Sciences has an academic computing center in Moscow studying AI and natural language processing. "The Soviet Union is a huge country, and hundreds of people are working on AI research," he said. "They can concentrate their efforts very quickly and get results."

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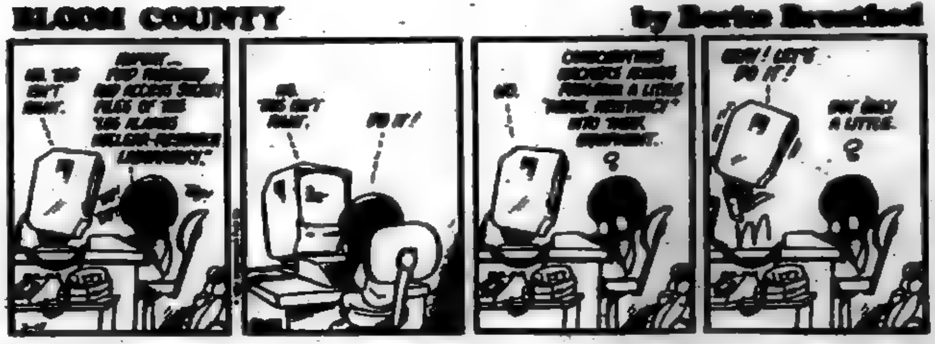

FIFTH

from UPDATE/19

Winston, currently director of MIT's AI lab, has written several noted books on AI and is deeply involved in research on computer learning. With the recent flood of interest in the commercial possibilities of AI, Winston has seen the conflict firsthand.

"Whenever a field catches the public eye as AI has, there's bound to be a certain amount of tension between people of varying dispositions," Winston said.

Winston admitted that the search for top-notch AI researchers is getting tougher as the large salaries from industry have begun to lure them away. "Sure, we've lost a few people who we would have preferred to keep, and I'm speaking more in terms of the field than just MIT," he said. "But a few people have left research to go into the field and work on proprietary commercial products. From one point of view that's unfortunate. But from the other side, it's a sign of the maturing of the field."

With large grants from Darpa as well as significant corporate contributions of money and equipment, MIT remains able to focus on its many research projects. The AI lab has major commitments to work in robotics, which encompasses computer vision, manipulation and the connection of perception to action. It is also at work on "deep" expert systems, which Winston described as those delving beyond existing expert systems technology into models that reason and employ problem-solving paradigms that are not rule based.

In addition, a wide range of smaller activities are under way: computer learning, natural language, common-sense reasoning, parallelism (the lab is at work on a prototype of a machine with one million processors) and the development of basic theories on intelligence.

Although only a few feeble attempts at commercializing computer learning have been made, Winston said he is pleased to see interest in the area begin. The idea of creating a computer that will teach itself is not new, but it remains among the most difficult problems to solve. Winston's work at MIT is currently integrating computer vision work in hopes of creating a prototype that will learn about the world by looking at it and thinking about the functions it will perform.

"In the next 10 years, we will see learning emerge as an extremely important characteristic of commercial systems because the world is too complex to spoon-feed computers everything they need to know," he said. The fundamental problem blocking AI work at MIT and elsewhere, according to Winston, is the shortage of people who can do truly outstanding work in this difficult medium, "Our primary limitation is that there are only a few 'universe-class' people who are likely to shift our paradigms," he said.

■ **Digital Equipment Corp.** DEC, the Maynard, Mass.-based minicomputer giant, has had a long and rewarding relationship with the AI community. Its minis continue to be a popular choice for AI development work. The company spends heavily in support of AI research at universities, and in 1979, DEC began using an expert system internally with the advent of the Xcon system.

Xcon is perhaps the most well-known industrial AI success story to date. The system, refined by John McDermott at Carnegie-Mellon University, is now an integral part of DEC's manufacturing facilities, configuring every VAX and PDP-11 order. The success of Xcon has spurred development of layered add-ons called Xsel and Xsite. Xsel is a sales representative's assistant, interactive and friendly, which incorporates all of Xcon's knowledge but helps the sales representative configure and sell the system to the customer. Once a system configuration is completed, Xsite can be used to do site preparation work.

According to Arnold Kraft of DEC's AI marketing group, those three systems are the largest expert systems in use in industry today. DEC has not stopped there, however, more than 20 additional applications are under development for internal use. Despite its success thus far, DEC does not offer its expert systems for sale. "We share the names and details with our customers, but it is only to let them know what we are doing and give them the courage to proceed on their own," Kraft said.

Kraft pinpoints DEC's success in the emerging AI world as the ability to combine commitment to innovation with a pragmatic understanding of the real world. "There are a lot of problems out there that still haven't been touched, and AI will help a great deal," Kraft said. "But the people out there with the problems are in real-life situations, and they don't want to replace everything they've done in the past — their software libraries or their manual procedures. They would like to complement what they have. I believe those are the people who are going to succeed first in using AI."

Winston

■ **Microelectronics and Computer Technology Corp (MCC).** As the rush toward advanced computer technologies increases, the quest for R&D in a variety of areas has launched a spate of consortiums around the country. MCC in Austin, Texas has made among the most widely publicized and ambitious efforts. MCC, independent and for-profit, was founded by a group of industrial corporations such as DEC, CDC, NCR Corp., Sperry, Gould and others as a direct response to Japan's announcement of its ambitious fifth-generation project.

It has become increasingly clear to American industry that it is extremely difficult for any one corporation to handle the scope of R&D necessary to keep this country in the forefront of technological advancement, especially with Japan's unrelenting charge toward the same world markets.

Thus, MCC offered a way for companies to hedge their bets while bringing together top-flight talent and resources for high-risk research. Rather than turning to government, MCC's founders decided that a private consortium offered a more effective way to pool resources.

When it began operation in January 1983 under newly selected Chief Executive Officer Bobby Ray Inman, a retired admiral, MCC initiated four major development areas: advanced computer architecture, packaging and interconnect technology, software technology and very large-scale integration CAD. Under the advanced computer architecture group were four subgroups: human interface, AI, parallel processing and data base. Member corporations or shareholders purchase a share of MCC and must join one or more of the four programs for which they contribute funds and personnel.

According to Inman, the genius of the plan was that it allowed companies to focus on long-term problems without bringing in current proprietary technologies. By working in areas where none of the shareholders had significant prior efforts, a company could invest $10 million and, in 10 years, have received $100 million in research.

MCC has nearly 300 employees — 60% of whom are direct hires — and 20 member companies. Because of the long-term nature of its work, MCC will not discuss any of its specific projects or additional planned ventures. "The U.S. as a whole will remain competitive with the Japanese, and MCC is going to contribute to that," Inman said. "There may be some surprises, some early deliverables in areas like software, production of software, data base management and human interface. The gains in AI and parallel processing are likely to be farther out."

Despite its lofty goals, MCC has run into obstacles. The problem of having some companies participating in one discipline but not another has raised questions about the viability of technology transfer. Also, its proprietary nature makes it difficult to view MCC as a national resource aimed at countering the Japanese.

In addition, Gordon Bell, vice-chairman of Encore Computer Corp. and a leading proponent of the formation of MCC, said that such projects and corporate America in general are missing the most significant point. "There is sort of an intellectual pecking order here which has science first, engineering second and manufacturing third," Bell said. "And by the time you get to manufacturing, there aren't any smart people left. What it amounts to is that we really can't make things anymore."

The outlook

Ten years may be a lifetime in the traditional computing industry, but artificial intelligence represents a step beyond tradition. Though the continued miniaturization of technology in both size and cost promises to extend the horizon line of the fifth generation by impressive jumps, the quantum leap forward for AI clearly remains 20 to 30 years out.

According to Morley and Taylor of Gould, a flying bumblebee and a Cray supercomputer are comparable in computational energy. The bumblebee and the Cray computer process the same number of bits per second, but hardware, they pointed out, is not nearly fast enough for human emulation.

Despite this, researchers continue to pursue machine intelligence on many levels, undaunted by the overwhelming odds or the seeming impossibility of imagined goals. The march toward the fifth generation may see breakthroughs in paradigms, or it may continue to be a trudging, evolutionary process. A 10-year period, experts agreed, is simply not enough to expect to see a revolutionary type of change.

MIT's Winston views the future as a staircase. Knowledge accumulates on one step for many years without any commercial use, until all of a sudden it gets used voraciously, and the technology moves up a step. "This will happen in AI," he predicted. "Systems will not change much for 10 years, then suddenly there will be a revolution. New paradigms will be rapidly incorporated into commercial products."

According to Stanford's Feigenbaum, in 30 years the effect will be dramatic. Knowledge, he pointed out, will be viewed in a different way then today. It will no longer simply reside in books but will be on-line and will be accessed by need in the concept of the living library, a library responsive to a user's needs.

"These tools," Feigenbaum stated, "will become active agents, intellectual aides to a great deal of our routine business, industrial, engineering, scientific and financial way of thinking."

ESPRIT

from UPDATE/18

- Computer-integrated manufacturing (CIM) — 19.
- Advanced microelectronics — 28.

A prerequisite for Esprit funding is that at least two industrial organizations from separate EEC-member states be involved in a research effort.

The result is that 270 companies, universities and research institutes are represented in the first year of the program's main phase. The majority, naturally enough, are based in the UK, France and West Germany. Among private-sector participants, 50% of all projects involve small firms.

It is clearly too early to gauge the quality of the work that will emerge from the Esprit projects. The research covers a wide array of advanced technologies and the participating organizations seem to have many of their good people involved.

From a European's vantage point, fifth-generation computers may offer Europe its last chance to build a domestic computer industry. U.S.-based companies today supply about 45% of Western Europe's information processing equipment. Japanese vendors, though now providing a considerably smaller percentage, are making significant inroads into the European market.

European computer makers, though fortified with ample resources and a home market potentially larger than that of the U.S., have fared unimpressively, with some requiring state subsidies and protective measures to carry them through hard times. What's more, as the march of technology shortens product life cycles and demands larger amounts of capital to remain competitive, European companies are joining forces with Japanese vendors, or in the case of Olivetti Corp., with AT&T, to battle the giant of European computing — IBM.

This is an opportunistic and usually successful short-term policy. However, just as the Japanese vendors will eventually shed their American partners (or absorb them) to attack the U.S. market directly, a similar pattern will follow in Europe. Esprit, it should be noted, is by no means the only research and development effort aimed at developing a European fifth generation. The Alvey program, the UK's $500 million fifth-generation project, has been under way for two years. Smaller government-funded efforts are moving ahead in France and West Germany. In addition, most of the large computer firms and many large end users are funding AI research projects.

On the positive side, there seems little doubt that the Europeans are capable of making important and potentially marketable contributions to next-generation systems.

In addition, European banks and insurance companies, which will be among the first users of expert business systems, appear at least as open at this point to bringing the new technologies into their businesses as are their American counterparts. This should provide European AI vendors with good testing grounds and, eventually, more eager customers.

Unfortunately, the problems facing Esprit are numerous. Simply coordinating work across long distances and coping with differences in language, corporate cultures and corporate strategies will be difficult, despite the relatively limited goals of the program. Esprit projects, it must be noted, are limited to precompetitive research.

On the positive side, there seems little doubt that the Europeans are capable of making important and potentially marketable contributions to next-generation systems.

It will be at the development stage and beyond, however, that more long-standing problems will surface. After all, Esprit will be meaningless if the results of its research cannot be translated into products and jobs. Among other inhibitors to growth are the following:

- Little venture capital is available to European start-ups that might produce and market Esprit-derived technology.
- European MIS managers are far less open than their American counterparts to purchasing from small, unproven vendors — and the same goes for European governments.
- Relations between private companies and leading research universities, an increasingly important factor in the U.S., remain very poor in Europe despite the step forward that Esprit represents.

Given the long list of challenges facing the European computer industry over the short- and long-term, it would not be surprising if, as with today's technology, Europe ends up importing much more of the fifth-generation technology than it exports.

Sonenclar is director of artificial intelligence research at the Gartner Group, Inc. in Stamford, Conn.

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New partners in information

By Harvey Poppel

Within the past two years, once-iconoclastic IBM has affiliated with such diverse partners as Sankyo-Seiki, Sears Roebuck & Co., Merrill Lynch & Co., CBS, Rolm Corp., Intel Corp. and Stratus Computer, Inc. AT&T has struck deals with United Technologies Corp., N.V. Philips, Electronic Data Systems Corp., Convergent Technologies, Olivetti Corp., Ricoh Co. and Japan ENS. General Motors Corp. has acquired EDS.

In just one year, from 1982 to 1983, information industry acquisitions zoomed 31% vs. an average in all other industries of 4%.

The underlying rationale is compelling. Information industry corporate planners are seeking sustainably higher returns on their shareholders' equity (ROE). They have come to realize that the underlying tradeoffs to growing ROE have tilted away from internal development and toward external development. True, internal development still has its advantages. Most important of these is control. Research and development teams can be focused on specific targets, and funding spigots can be opened up or closed down.

In many instances, internal developers can continue the pace of commercialization and the degree of conformity with industry standards. The resultant product and service can be highly proprietary or open for others to share and leverage. Moreover, internal developers are bred from the same corporate culture and pool the benefits of cumulative experience for their corporations.

But many companies that have relied solely on internal development have been frustrated by their inability to keep up with, much less exploit, the accelerating pace of information technology and marketplace dynamics.

Infotrends

There are five fundamental, yet interrelated, forces — "infotrends" — that drive external development.

As emphasis swings from the mass marketing of generic facilities to the specialized, often vertical marketing of content-differentiated products, the available R&D dollars and talent are spread too thin to satisfy all (or any) development imperatives. As a result, hardware and telecommunications firms, previously vertically and horizontally integrated, are seeking content-laden partners.

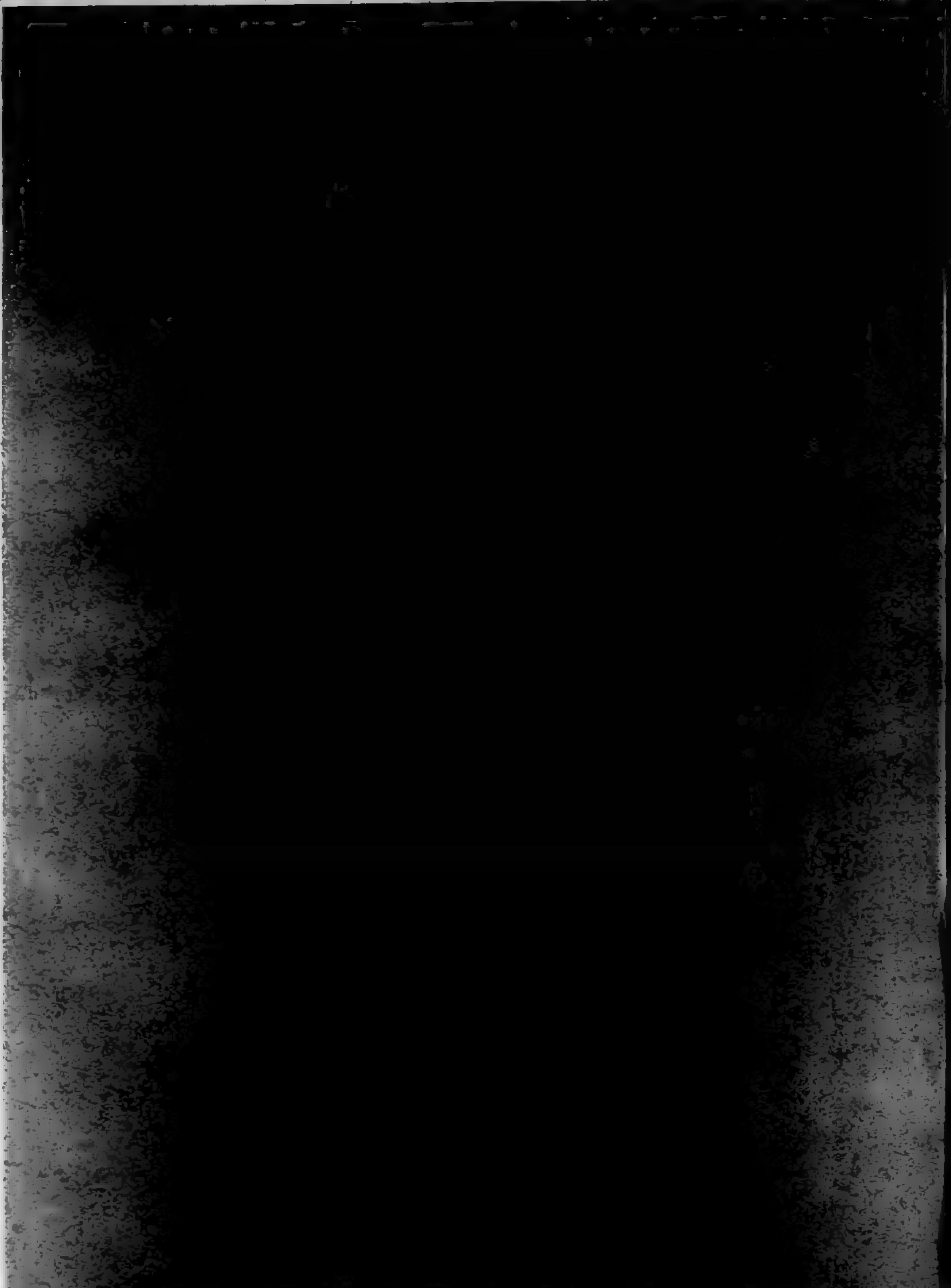
For example, Wang Laboratories, Inc. has begun to take positions in data bases related to document preparation (including the exclusive electronic publishing rights to the *Random House Dictionary* and *Roget's International Thesaurus*). Apple Computer, Inc. and most other computer manufacturers are increasingly cultivating value-added resellers with differentiative applications software through co-marketing arrangements and even, in some cases, financial and technical support. Local telephone companies and value-added network carriers are encouraging interconnections and joint marketing of audiotex and other electronic bases.

End users become more sophisticated; they are seeking "interoperability" — which I define as the perfect exchange of content — even where that content has to travel across disparate I/O devices, operating and data base management systems, network architecture and CPUs, provided or operated by multiple suppliers. The quest for interoperability has led some content companies to enter the networking business to facilitate the electronic distribution of their data bases, software and applications processing. Dun & Bradstreet Corp., for example, now has Dunsnet, and General Electric Information Services Co. has Marknet.

Also, numerous computer, office and telecommunications equipment companies have co-ventured with other suppliers in the following areas:

- The physical interconnection of their products; for instance, Northern Telecom, Inc.'s computer-to-private branch exchange interface.
- Electronic mail; for example, X.400, the Consultative Committee on International Telephone and Telegraph's Message Handling System.
- The compatibility of their operating systems; for example, the recent European supplier agreements involving AT&T's Unix.
- The interface between systems and applications software; for example, the Japanese Microsoft Extended Basic (MSX) project to standardize low-end home computer operating systems.
- The compatibility of storage media and drives (for example, compact disk/read-only memory [CD-ROM]).
- A broader set of industry-specific interoperability standards, such as GM's proposed Manufacturing Automation Protocol.

More than simple agreements and co-ventures, however, some players involved in communications hardware have begun to acquire others who have interconnecting components. Among the products that fit together in an interoperable system are terminals, coders, modems, local-area networks, multiplexers, switches, concentrators, private wide-area networks and network management devices. And external developments among suppliers of these and other related products are spreading



rapidly. As interoperability becomes more universal, so will direct content exchanges between buyers and sellers. This can be business-to-business, such as with industrial products, or business-to-consumer.

Some information service companies, such as Control Data Corp. with Redinet, General Electric Co. with Dealertalk and McDonnell Douglas Automation Co. with Edi-Net, are attempting to lock up certain business-to-business segments.

Others, like Trintex and Keycom, are focusing mainly on the broadly based business-to-consumer segment. This is leading to massive restructuring of other industries and the potential bypassing of intermediaries between buyers and sellers. I call this process "disintermediation."

Some of the endangered species include travel agents, banks, wholesale distributors, outside sales forces and certain classes of retailers.

The specter of disintermediation is spurring businesses with deep roots in other industries to enter the information industry. Several banks and aerospace firms have been among the leading computer servicers since the 1960s. But now they are being joined by other financial institutions, such as Cigna Corp. and Merrill Lynch, and other types of manufacturers, such as GM and Toyota.

Moreover, leading players in other industries are joining the fray, including retailing (Sears, J.C. Penney), distribution (McKesson) and transportation (American Airlines, Norfolk Southern Railway Co.). Some, like Gulf & Western, which is acquiring Prentice-Hall, may simply be diversifying into what they perceive to be a more robust industry. But most of the others are impelled primarily by the need to control the restructuring of their core businesses and only secondarily by the diversification opportunity.

Interoperability and disintermediation are both causes and effects of global markets: Globalization is a very powerful rationale for external development. One goal is to gain economies of scale by spreading fixed and semifixed costs over a broader geographical base.

But even the largest firms are finding it increasingly difficult to deepen penetration in foreign markets unilaterally. As a result, they have established collaborative relationships with strong indigenous players: Xerox Corp. (Rank Xerox, Fuji Xerox), Honeywell, Inc. (Bull) and Fujitsu (Siemens AG, TRW, Amdahl) were among the first to go this route during the 1960s and '70s.

Some of these partnerships no longer exist, and there were relatively few followers until recently. Now such diverse U.S. entities as AT&T Technologies, Dun & Bradstreet, RCA Corp., MCI Communications Corp., General Electric, Ameritech and Honeywell are leveraging their products and services, in part through joint ventures and other collaborative agreements with foreign firms.

A second goal related to globalization is to gain access to leading-edge markets and technologies. And this is the principal rationale for the intensifying invasion of North America by European and Asian firms, most often through external development. U.S. print and electronic publishing has become a hotbed of external development activity for British, Dutch and Australian publishers.

Japanese firms, for the most part, have opted for collaborative arrangements in the U.S., rather than outright acquisitions. In many cases, these are OEM arrangements; for example, Ricoh, Canon and Toshiba manufacture image equipment for U.S. partners such as AT&T, Eastman Kodak Co. and 3M Corp. to market domestically. Some are joint development efforts, such as Sharp and RCA in Cmos.

Other collaborations leverage Japanese manufacturing and technology experience. Examples include Toshiba and Westinghouse, which are jointly manufacturing CRTs in the U.S., and NEC Corp., which is developing integrated circuits for Corvus Systems, Inc.

Europeans are especially interested in the U.S. A late-1984 survey of European chief executive officers published in *The Wall Street Journal* showed that 45% picked the U.S. as the first choice for foreign investment. Only 28% picked other European countries. Olivetti, AT&T's partner in certain

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European segments, also has cultivated several dozen equity positions in U.S. companies. Siemens AG, Plessey Co. and Racal Electronics are among the more acquisitive European hardware firms, while Nixdorf Computer AG, Ericsson, CIT Alcatel and Nokia seem to favor joint ventures and other such vehicles.

Ultimately, it is the convergence of information industry interests among the leading players that is driving them to high levels of external development activity. IBM proudly asserts its intentions to be a $100 billion company by 1990, $185 billion by 1994. Few question its R&D competence, but the goal of achieving and then surpassing a 5% share of the world's swelling information industry market undoubtedly will lead the company to expand external development in the years ahead. Other publicly held firms, smaller than IBM and lacking R&D critical mass, will rely even more on external development in the years ahead. Many are severely limited by current profit and cash-flow pressures in expanding their R&D budgets but can leverage their stock value or debt/equity position in acquiring other firms.

Some smaller, privately held firms are in an even tighter bind. Venture capitalists, until recently their primary funding source, are strung out, and the initial public offerings market has tightened up markedly. During the halcyon days of 1983, some 75% of $3 billion to $4 billion in venture capital went into the information industry, while some 120 companies in the industry went public for the first time, raising another $3 billion.

By 1984, these funding sources had dropped by 40%, and they are unlikely to recover fully for some time. Worse yet, if all companies financed by venture capital in 1983 alone had been initially successful, they would have required an additional $9 billion over the ensuing two to four years to keep going, shutting out subsequent start-ups.

And even where available, R&D monies don't go as far as in the past. Good R&D talent is hard to find, motivate, control and retain. R&D facilities are growing more asset-intensive. Information technologies are becoming more specialized, and the failure rate of new product development is high.

R&D isn't the only area where scale and scope are critical. Many manufacturing, software and service companies find they lack distribution leverage. The leverage they seek may be geographic or horizontal scale, or it may relate to boosting sales productivity or tightening account control. As a result, larger information industry firms with substantial marketing, maintenance and physical distribution capabilities can often readily acquire or collaborate with the manufacturers and developers of their choosing, especially those who bring vertical product market expertise to the table.

The computer service and software sector of the industry was the first to come to grips with these external development drives, and other companies, confronted with them for the first time, would do well to heed the microcosmic lessons learned by this sector.

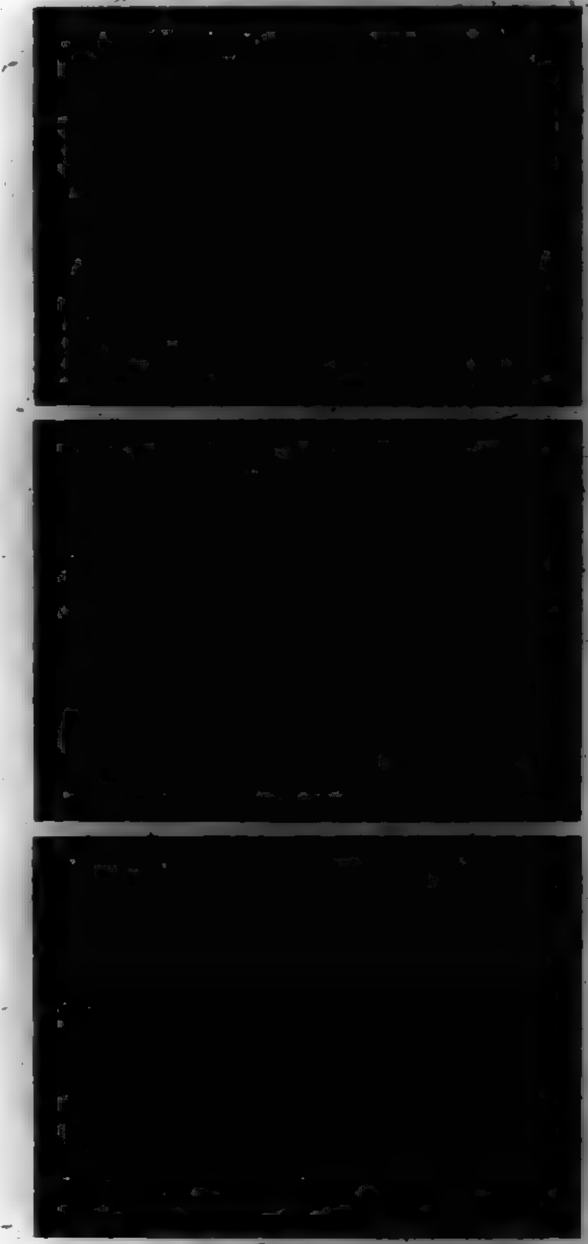
First, consider the trend in computer services and software. Since 1969, the number of annual U.S. acquisitions has swelled from 20 to nearly 150. Initially limited to raw facilities firms — mainly batch data processing centers, contract programming and time-sharing — the majority of deals now are in content-related areas: software, value-added reselling and remote transaction processing.

Many of the early deals were stock swaps and other easily valued transactions. Nearly 75% of today's acquisitions involve cash, and more than 60% involve contingency valuations, such as earnouts (the amount of money that is paid is contingent on how well the company does after it is acquired).

Automatic Data Processing, Inc. (ADP) was one of the pioneers in growth primarily by external development. By 1973, ADP had already made more than 40 acquisitions, and by year-end 1984 it had completed more than 100. ADP stands alone among all publicly held firms in the information industry in recording more than 25 unbroken years of growth in revenue and profits. Many other information service firms have been relatively successful in external development. Dun & Bradstreet's 1983 acquisition of McCormack & Dodge Corp. stands out in retrospect as a particularly shrewd deal for both parties.

Indeed, there is a growing affinity among content-based information service firms, hardware and telecommunications firms. Younger software suppliers, transaction processors and data base developers find that they cannot afford to develop national, much less international, distribution power by themselves. Microcomputer retailers are highly selective in stocking software and hardware from smaller, unproven firms. Specialized data base providers and transaction processors lack end-user visibility unless promoted by a strong marketer.

Besides distribution, emerging players lack the wherewithal to develop next-generation products because they are stretched out fully trying to make the current generation successful. Meanwhile, larger companies in hardware, telecommunications, publishing and outside the industry know that they cannot marshal enough talent, vertical market knowledge and, hence, produce internally to satisfy their growth objectives and market strategies. They need those smaller content-based firms. And that is why the computer services and software sector has been an early hotbed of convergence.



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Outright acquisitions of publicly held firms are expensive. Since 1980, the price/earnings ratios of publicly held information industry players have ranged from double to triple the Value Line 960 all-industry average. On top of that, the acquisition premium (the amount paid over the trading price two months before the acquisition announcement) has averaged 20% more than in other industries. This means that the more successful of the acquired publicly held companies typically are being capitalized at 25 to 40 times earnings. Strategic rationale notwithstanding, this places a tremendous onus on the acquirer of a publicly held firm to pay back its external development investment.

To reduce the risk of not recovering their investment, information industry firms are increasingly pursuing other options. These include acquiring privately held firms with more modest capitalization ratios, often ranging between eight and 15, rather than 25 to 40.

In computer services and software, where deal-making is a way of life, the median transaction has been between $4 million and $5 million. And 75% of acquired companies have been lower profile, privately held businesses. In fact, only 3% of acquired information services companies have been stand-alone, publicly held, the balance being divestitures of parts of publicly held firms.

Clearly, the bigger deals, like GM/EDS, McDonnell Douglas/Tymshare, IBM/Rolm, Dysan/Midec and D&B/A.C. Nielsen, may grab the headlines, but they are just the "tip of the chip" when it comes to information industry external development.

Stopping short of outright acquisitions, some firms favor joint ventures with no equity exchanges and no readily determinable valuation. Nevertheless, such arrangements, especially joint ventures, have often proven unstable because the strategic interest of the parties, even when congruent at the outset, typically diverges over time. Witness Honeywell/Bull — a marriage that was eventually annulled; Satellite Business Systems, Inc. — where two of the three original owners have tuned out; Fujitsu/TRW — a mismatch of intentions and contributions; and Anaconda-Ericsson, Inc. — unquestionably a naive choice by Ericsson for U.S. entry. Governance clashes often paralyze or confuse the management of these ventures. Moreover, the venture typically lacks a coherent culture unless the partners are very similar, which is rare.

One less risky vehicle for information industry firms is to invest in venture capital pools directed at areas of potential strategic leverage. Some firms have made the mistake of commingling their monies with others, leading to conflicts and fuzzy objectives, as with joint ventures.

I believe it is better for a firm in this industry to establish its own dedicated pool, typically $10 million or more, with clear-cut strategic objectives relating to specific areas of technology, market or product development. This strategic capital fund can then be invested in multiple situations, thereby spreading the financial and developmental risks, while maintaining a clear strategic rationale. These investments, which can be managed internally or by an outside agent, can take many forms — minority equity purchases, loans, OEM discounts or R&D resources — with the ultimate objective of jointly leveraging the portfolio companies' capabilities, once mature.

But regardless of the external development vehicle, from outright acquisition to strategic capital funds, successful external development depends on four critical factors:

- Staying close to and leveraging experience and expertise — what we call the "strategic core." A survey of the Fortune 100, often quoted by one of the major management consulting firms, shows that only 27% of unrelated acquisitions have been successful, while 64% of those related to an existing internal product, market or technology have been successful.
- Relatedness isn't enough; companies should go for strong, longer term marketplace-driven opportunities. They are the cake; synergies are the icing.
- Companies should select affiliations strategically; they're not deal-making. Not all acquisitions and joint ventures can be directed or preplanned. But when unexpected candidates surface, as they frequently do, successful acquirers will have the benefit of an explicit external development strategy — or at least guidelines against which to evaluate the candidate situation.
- Once a strategic partner is in sight, a company should anticipate how the partnership will best function before the transaction is structured. Potential conflicts abound. Most acquireds wish to retain some or all of their autonomy and culture, yet are seeking some sort of strategic assistance. Acquirers have learned that they need to invigorate, not smother or homogenize, firms.

Yet, corporate leadership will want more than an addition to the balance sheet or a new bubble on the corporate portfolio grid. To overcome the potential for conflict, issues of governance, compensation, reporting, mutual assistance and cultural independence should be agreed upon before the deal is struck.

About the author

Harvey Poppel is a partner in Broadview Associates of Fort Lee, N.J., a merger and acquisitions consultant to companies that are in the information services/software industry or seek participation in it. Poppel came to Broadview from Booz, Allen & Hamilton, Inc., a management consulting and technology firm, where he was a senior vice-president and a managing officer of the information industry practice.

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Understanding the DP professional

A primer for the wives, Part 2 husbands, friends and lovers of people who speak computerese

Last week, Part 1 of this two-part series interpreted the language of computer professionals for laymen. Part 2 describes the various jobs that make up data processing. Why not tear this article out and share it with someone who doesn't speak computerese.

By Bruce Kula

Phyllis is one of four systems analysts who work for the First National Bank of Erehwyna. This morning, Phyllis is meeting with Harriet, the supervisor in filing.

Harriet has a problem. Every day she receives a list of the files required by bank employees (employee files for the personnel department, financial information on clients for the loan department and so on), which Harriet's clerks try to locate.

If a desired file isn't on their shelves, Harriet finds out its location, then fills out a card with that information and the date the file should be returned (it's a bank policy that no one may keep a file for more than a week). Every day, Harriet shuffles through her cards to ascertain who must be notified that day that they have held a file too long that someone else requires. Harriet explains all this to Phyllis, who happens to have no prior knowledge of the way things work down in the filing department.

As Phyllis listens, she detects a bit of jealousy on Harriet's part — most other departments have computer terminals to help them do their work, but filing is still doing everything by hand. Harriet's knowledge of computers is as vague as Phyllis' knowledge of filing, but she realizes a computer would help her keep track of her files better, which would allow her more time to address more important tasks.

Phyllis hears jealousy, perhaps, because she has a good ear for what people really mean, even when the people have some trouble expressing themselves. Phyllis thinks of herself as a people-oriented person, as opposed to some of her colleagues, whom she considers (rightfully so) more computer-oriented.

So as Phyllis heads back to her desk, her head filled with new information about the filing department, she is thinking about two problems: first, increasing the efficiency of filing by

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> *The most biting insult one can give a systems analyst is probably, "We were doing it faster before you put it on the computer."*

automating their procedures (giving them access to a computer system for tracking files); and second, giving filing a system that will make the department more satisfied. It isn't hard to automate procedures in such a way that things are worse than they were before. In fact, the most biting insult one can give a systems analyst is probably, "We were doing it faster before you put it on the computer."

Phyllis sits down at her desk and thinks. She might just sit and think for the rest of her working day, without so much as committing a word to paper. But this filing problem doesn't happen to be very difficult, and she starts sketching a flowchart after a few minutes. Her first flowchart has boxes and arrows, representing what kind of information filing has to keep track of, where they get it and what they do with it. Then she scribbles a second flowchart. This one has special symbols for devices in the computer system, such as a terminal, disk storage and so on. Finally, she works on a very complicated flowchart that represents the way programs in her imagined filing system will work.

Not all systems analysts use flowcharts, but Phyllis was trained that way, and she finds they help her think about how a system should be put together. She also finds it is a good way to express to a programmer how the system will be written.

By the end of the day, Phyllis has the specifications for a system that she thinks will work well for Harriet. She starts a memorandum to her boss, describing in a general way how her system will work and how much time it will take to design, write and test it. Her boss will look over her proposal and make a decision: Will the cost of assembling an automated system for filing be justified by its advantages? Phyllis' understanding of people will serve her in good stead, since it helps her to write a very convincing proposal.

Phyllis has an excellent general understanding of how a computer system works, but she couldn't explain it in a technical way. She's more interested, really, in the way people work.

Phyllis makes $37,000 per year.

Applications programmer

Jack is one of a dozen applications programmers at First National of Erehwynn. He works very closely with Phyllis some days: She describes for him what he has to do, and he does it. But Phyllis is not Jack's boss, even though she makes a little more money and has a few more years' experience. She might be thought of as an architect and Jack as a builder — equal partners, in a way.

This morning Phyllis has handed over a sheaf of documentation to Jack, all of which has to do with a new automated system for the tracking of files. Phyllis has gotten approval for the project and has put together a formal design and all the other information Jack will need to write the programs for the system. After an hour or so, Jack feels he understands the project well enough to get to work on it.

He leaves the conference room, sits down at his desk, types in his password on his terminal — and his phone rings. It's the computer operator.

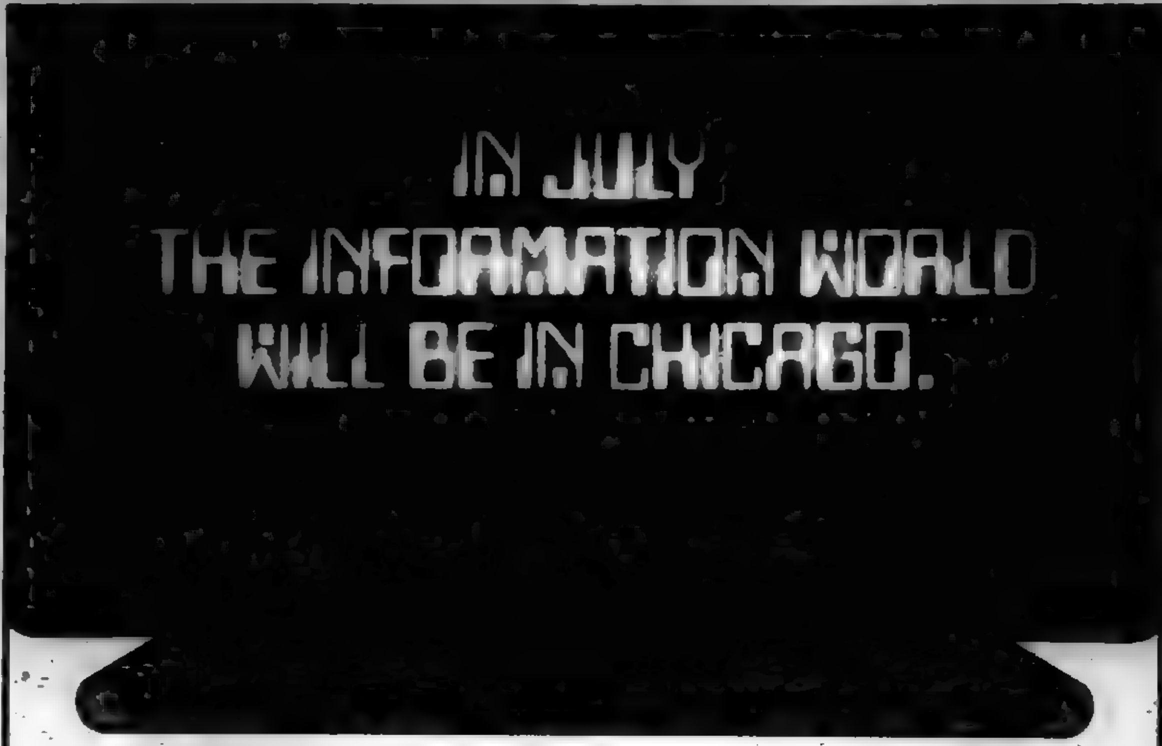
The computer operater informs Jack that the monthly statement system has "blown up on an S0C1 in MSPRT021," which means to Jack that one of the programs he is responsible for requires his attention. It just so happens he didn't write the program that failed, but Jack's boss has assigned responsibility of the monthly statement system to Jack, so when there is a problem with it, it's Jack's problem.

Naturally, the new filing system documentation gets set aside while Jack deals with this new problem. He assembles his tools: a listing of program MSPRT021 in the language the original programmer used when he wrote it (the source code), a listing of computer storage as it looked when the program failed (the dump) and his computer terminal.

From the source code listing, Jack ascertains that no one has changed the program lately — the most recent change occurred two years ago. He looks at the dump and calculates where the program began in computer storage and where it failed. Subtracting the second hexadecimal address from the first, he figures out exactly what instruction was being executed when the program died. Going back to the source code (which he understands better than the machine code of the dump) he discovers the program was working on calculating the day of the week — Sunday through Saturday — from the Gregorian date (which happened to be February 29).

Tricked by leap year

Now Jack is suspicious because, as all programmers know, routines that process a date must take into account the possibility of leap year. A little more checking through the program confirms his suspicion: Program MSPRT021 was written without regard for the fact that February sometimes has 29, not 28, days. The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routine for figuring the day of the week was confused by the fact that the day after February 28 was not March 1, and faced with what it considered an impossibility, abended — came to an abnormal end.

Turning to his terminal, Jack types in the commands that allow him to fix the source code so that a leap year is recognized as a possibility by MSPRT021. Then he runs the job to translate the program into machine code. Lastly, he tries out the program to make sure he has really fixed it. It turns out he has: The program goes to normal EOJ — End Of Job.

Now there are forms to be filled out: first, a problem report, explaining what went wrong and why and what Jack did to fix the problem. That will go to the computer room supervisor. Next, a form describing the changes Jack has made to program MSPRT021, a line or two averring that Jack has thoroughly tested his fix and a request that his new version be given production status. That will go to the data processing department librarian, who will move the program to the proper computer library for tested programs.

And the filing system Phyllis turned over to Jack? That must wait until tomorrow.

Jack makes $33,000 per year.

Computer operator

Usually, there are two computer operators on the day shift at First National, but Jim has called in sick, so Elaine will be handling the computer room by herself today. That's the first thing she learns when she comes to work. The second thing she learns is that she is going to have some extra jobs to run today. It seems a mechanical failure of a printer caused some jobs usually run on the night shift to be deferred. The printer has been repaired.

Elaine finds all this out by looking at the turnover sheet, a document used at First National to allow communication between operators from one shift to the next. Of course they can also talk to each other, but the turnover sheet provides permanent documentation and helps ensure that an operator just starting work has all the information required to do his job.

Next, Elaine checks her job schedule. This schedule lists jobs that must be run during her shift, in order by time and priority, along with any special procedures involved. She notices, for example, that someone has requested that last month's Interest Experience Reports should be printed again; that means she must use last month's information (stored on tape) instead of the current month's.

The First National's computer room has two display terminals: one is the computer console, which Elaine uses to communicate with the computer about which jobs are running, which jobs should be initiated, which tapes should be mounted on tape drives, which forms should be mounted on printers and so on; the other allows Elaine to monitor the status of the operating system and the system that controls user terminals.

At this second terminal, Elaine can, for example, ascertain how many people are using their terminals at any given moment and whether their response time — the amount of time it takes for the computer to respond to their requests — is at an acceptable level.

At First National, users expect to see a screenful of data within three seconds after they type in a request. Elaine checks her system and discovers average response time is currently 0.2 seconds, which is very good, but to be expected at 8:00 a.m. when few users are on the system. At 10:00 a.m., she knows, average response time will be more like 2.9 seconds, because about 40 people will be using terminals at the same time.

Getting things moving

Elaine submits her first jobs of the day to the system. For some of these she uses a card reader, some she initiates by typing commands on her console. The programs start running, under the control of the operating system, which will send messages to the console screen if the programs require any human intervention, such as the mounting of tapes or forms, from the operator.

Elaine happens to know the jobs she has submitted will chug away in the computer for an hour or so before anything more is required of her, so she sets to work on some of the maintenance tasks for which she is responsible. The tape drives have to be cleaned occasionally to work properly, and the printers, which collect paper dust from the forms fed through them, must be thoroughly vacuumed. New tapes must be labeled, and new computer room documentation must be filed.

At 9:30, Elaine makes a quick check of the system, alerts the computer room supervisor and takes a welcomed coffee break. She is not allowed to smoke, drink or eat in the computer room. Smoke molecules from a cigarette could keep a disk drive from reading data properly, and a spilled cup of coffee could disable a computer worth millions of dollars.

When she returns to the computer room, Elaine notices a message on the console: A program in the monthly statement system has failed, and the operating system has diagnosed and reported the problem. Elaine goes to a list tacked to the bulletin board and discovers that Jack is the programmer responsible for the monthly statement system. She telephones him; he requests a dump. Back at the console, she finds that the operating system has saved about 300 pages of output from the failing job. She types in a command to start printing the output, which

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she eventually will tear off the printer and give to a data control clerk, who will put the listing in a box marked "Programming Staff," from where it will be collected by a secretary, who will drop it on Jack's desk.

Then, of course, there is a form to fill out: Elaine must write up a problem report to document what happened.

There are some operators, like Elaine's assistant, Jim, who enjoy being computer operators and wouldn't change jobs for the world. Elaine, however, has different plans. She is taking night classes to earn a degree in computer science, in the hope that she will be selected for the next opening for a programmer trainee on First National's programming staff.

She won't make much more money as a novice programmer, but Elaine has an interest in, and an aptitude for, the technical side of computers. Her goal is to become a systems programmer.

Elaine makes $22,000 per year.

Systems programmer

Richard is the most experienced of the four systems programmers at First National of Erehwyna, with six years worth of systems programming experience behind him. Before he became a systems programmer, he was an applications programmer.

As applications programmers gain seniority and skill, they often have to come to a decision about which way to go in their careers. Phyllis, who was an applications programmer at the same time as Richard, decided that she had little interest in the computer itself and worked to become a systems analyst.

Richard, on the other hand, devoured every tidbit of information he could find about computers and operating systems, built his own home computer, subscribed to two computer publications and became a systems programmer. Unlike Phyllis, Richard could describe in great detail how the system worked. When Phyllis speaks of the operating system, she says "the system"; when Richard speaks of it, he says "my system."

Toughest time

Of all the technical people at First National, Richard believes he has the toughest time explaining to an outsider what he does for a living. The last program he wrote was a fairly complicated assembly language program that collected statistics about how the system was working, which allowed Richard, the other systems programmers and the operator, to view the status of the system on a terminal and to keep an eye on such indicators of the system's health as average response time. He explained the program to a friend, who understood it fairly well after 45 minutes, at which point she fell asleep.

Even though Richard's programs are a little difficult to describe, what is worse than that is the fact that even though his title is systems programmer, he really very seldom writes a program. This month, for example, Richard is installing a new version of a tape management system, which will not require writing any programs. This system keeps track of what information is on the thousands of tapes First National has.

Richard has finished reading the documentation that came with the new system, which included three thick manuals, a 20-page document describing installation procedures and a 40-page document describing problems with the new system. Today, Richard will go through the list of problems again very carefully and fix any problems that might affect the tape management system when it runs at First National.

Any new software that Richard installs is likely to have something wrong with it, no matter how much the bank paid for it or how reputable the software vendor is. This is because computer installations vary widely from each other in their mixes of hardware and software. Depending on the environment, a perfectly good program may go awry. Therefore, software vendors often will ship software with a list of warnings, alerting the systems programmer that such and such an environment requires this or that change in the installation procedure or in the software itself.

Sometimes the new software is put on tape and made ready for shipment before a problem crops up, and the vendor will provide only a description of the problem, some way to fix it once the software is installed and the promise that future versions of the software will be sold with the problem fixed.

The first problem Richard reads about says "Multiple volume output files cause excessive label processing time at 1,600 BPI." Richard knows nearly as much about the hardware environment at First National as the software environment and realizes this problem will not affect his system. He makes a note to himself at the top of this page: "Fix not applied."

The next problem reads "24/31-bit dual-mode processing may cause register corruption resulting in abend when multifile volume used for input." This gibberish makes perfect sense to Richard, who writes "Fix applied 29 Feb." at the top of the page and starts typing at his terminal. The software vendor has provided a way to get around the problem of register corruption by changing the code of one of the programs in the tape management system.

In this case, Richard cannot make a change to the program in the same way Jack makes a change. Jack changes source code, the language of programmers; Richard changes object code, the language of computers. Richard will make his changes using a program that accepts hexadecimal

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numbers, not English-like statements, as input. The reason for this is that the purchased tape management system is sold only in the form of object code. The vendor refuses to sell source code, which could be plagiarized more easily by other software companies than the object code could.

Richard, unlike Jack, will not test the change he makes. Usually, he takes the software company at its word that a particular fix will solve a particular problem. Anyway, the systems Richard works with are normally so complex that Richard could not possibly find time to test all their functions. Even the software vendor probably has not done that. Richard will install a system, try out a few of the major facilities the system provides and, if they work, he'll consider his job done.

Unfortunately, when one of Richard's systems doesn't work, nearly everyone at First National finds out about it — because failing systems software makes it impossible to use the computer. For that reason, he gets more phone calls in the middle of the night than any other programmer at First National.

Richard is paid $37,000 per year.

Software engineer

Susan is employed by Tape Management Systems, Inc. (usually known as TMSI). Her company sold a group of computer programs called Supertape to the First National of Erehwyna, as well as 100 other businesses. Supertape can be used to maintain a sort of index of a computer installation's tapes. Instead of a computer operater figuring out which tape to use for a particular job, Supertape will figure it out and write a message to the console screen that says "Mount tape number 4301," or words to that effect. This makes the computer operator's job easier and reduces the number of mistakes that can cause data to be lost. So First National was happy to lease the Supertape system for $2,000 per year.

Susan wrote most of the programs in the Supertape system. When a problem is discovered in the field ("in the field," at TMSI, means "at a customer site"), it is her job to fix it. There are other software engineers responsible for other software that TMSI sells and leases.

TMSI has a system on one of its own computers — the Problem Report System — for keeping track of any trouble that customers have with their software. Susan can go to her terminal every morning and get a pretty good idea of how she will spend her day.

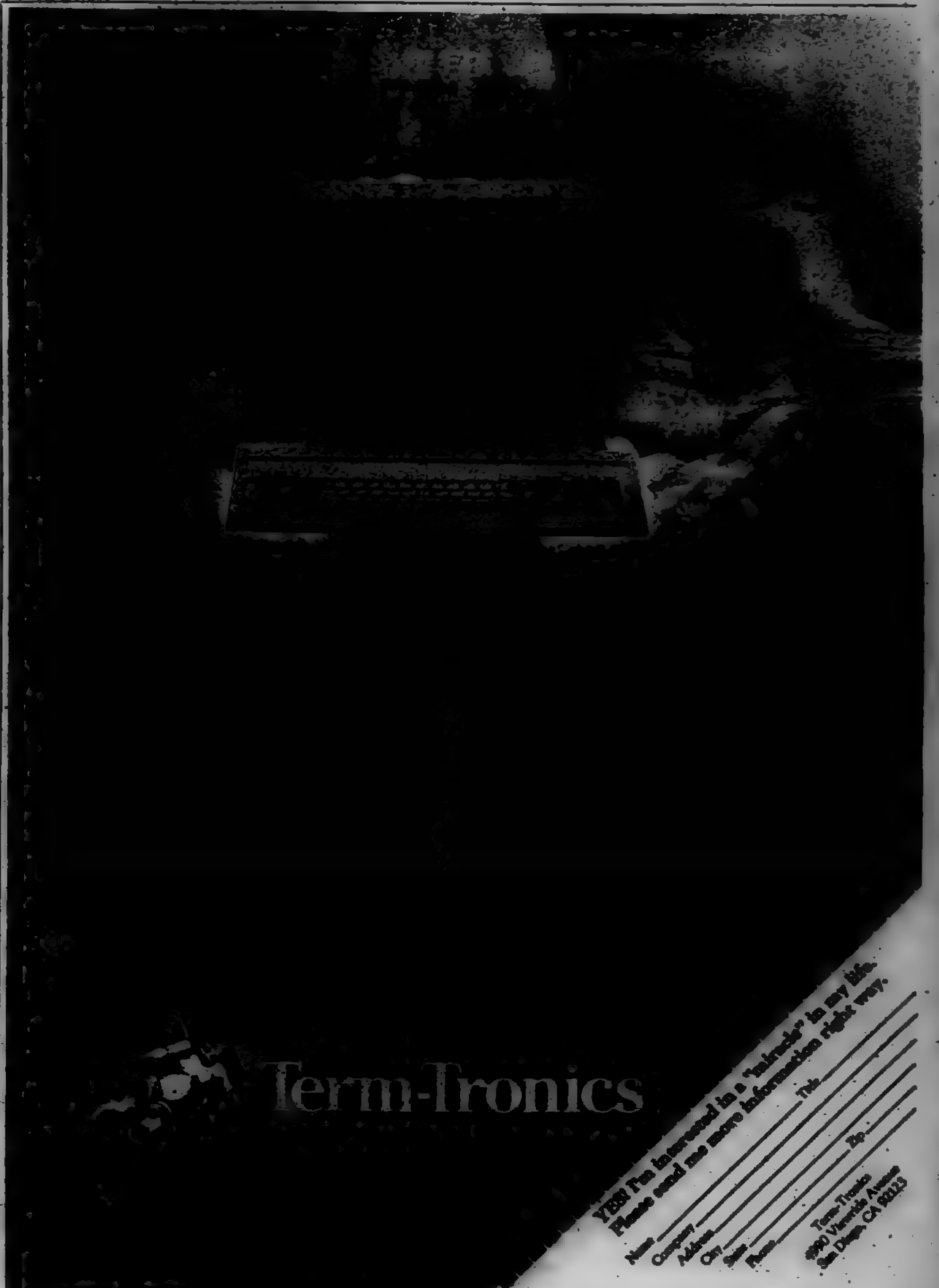
This morning she discovers a problem report submitted by a bank in Erehwyna. The bank uses some tape drives that can only handle one kind of tape: a tape whose data has been recorded at a density of 1,600 bytes of data per inch of tape. When the computer operator inadvertently mounts a tape recorded at a higher density on one of these drives, Supertape should send a message to the operator's console that says, in effect, "Wrong tape drive for this tape." According to the problem report, what actually happens when this situation occurs at the Erehwyna installation is that the whole operating system stops dead. After this minor operator error, in other words, the bank's daily processing is interrupted.

Susan's first step in solving this problem is trying it out herself, to see if the problem occurs as it was reported.

She goes into a laboratory down the hall where a computer and peripheral equipment are available for her (and the other software engineers') use. She starts up a program that will request a tape mount. When the console shows the request, Susan mounts a 6,250 byte/in. tape on a 1,600 byte/in. tape drive. This should cause the system crash described by the customer.

But it doesn't happen that way. On the system console is a message that says, "Wrong tape drive for this tape." As far as Susan is concerned, Supertape seems to be working exactly as it is supposed to work.

At this point, Susan could close the problem as "not reproducible" — a nice way of saying the customer is wrong. But she has gotten problem reports from this bank in Erehwyna before, and it seemed like a professional outfit that would research a problem pretty thoroughly before calling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> ”
>
> ***Almost immediately, Susan is on to something. It seems the bank does not use the same brand of tape drive as TMSI.***

TMSI about it. She assumes the problem is real and that she simply has not been able to imitate the steps leading up to it.

She calls TMSI's customer service department and asks the representative who handles the First National account some questions, trying to ascertain what is different about her test in the laboratory from what is happening at the bank. Almost immediately, she's on to something. It seems the bank does not use the same brand of tape drive as TMSI. A different kind of tape drive could be an eventuality for which Supertape is not prepared.

Hardware (like a tape drive) communicates with software (like Supertape), and the software has to be able to ascertain just what kind of device it is conversing with. Susan surmises that Supertape has not properly identified the tape drive it is communicating with at First National.

She pulls out a program listing and scans through it until she finds the code that checks for tape density mismatches. After a few moments, she sees the problem: Supertape checks the brand of tape drive being used after it checks the density; it should do that before. The language spoken by this different brand of tape drive makes Supertape go on as if everything is all right, leading, a few nanoseconds later, to disaster.

Trial run

At her terminal, Susan makes the changes to the erroneous program. She tests artificially, without a tape drive at all, by sending the program data that looks like the sort of thing a tape drive would send it. Now the program reacts properly.

She fills out a form with the name of the program, the problem she has fixed and a brief description of what she did. This goes to the test group at TMSI, which will recheck her work. Eventually, it will become part of a new version of Supertape, which will be sent to all customers who lease it.

Susan makes $34,000 per year.

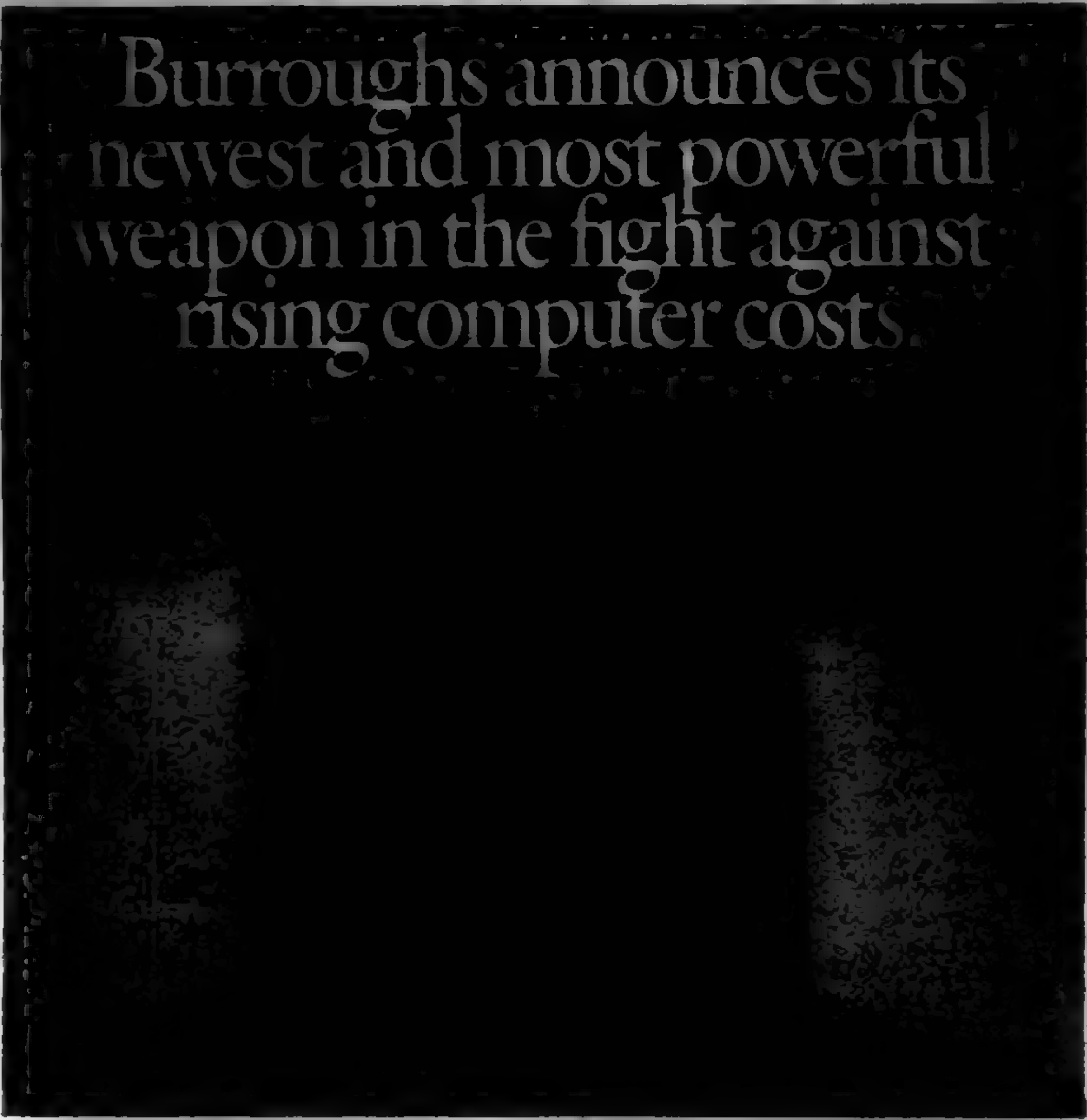
■

Just the surface of talking to and understanding computer professionals has been scratched in these two articles. Many data processing jobs, systems, devices and concepts have been ignored — on purpose.

My intent was to describe things in a general enough way that most of the concepts and terms will apply to any computer installation. Ideally, your friends in DP will expand upon these articles by relating what I've written to their own experiences.

About the author

Bruce Kula is currently a software engineer for Paradyne Corp. in Largo, Fla. He has been a truck driver and a high-speed planer operator in Wyoming and a systems programmer near Detroit. He now lives and writes on the shore of the Gulf of Mexico.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IN DEPTH

Microprocessors

What you need to know

By Stephanie Di Donato

From a user's perspective, the microprocessor is the most distant element of the computer, and a part he might not often consider in a purchasing decision.

The primary rule of microprocessor selection is: Unless you are writing a program in the instruction language of the microprocessor itself, you are interested in the choice of microprocessor made by a computer vendor only insofar as it affects the layers of the system closest to you.

Understanding the selection of microprocessors requires understanding the process as a whole. First, applications programs should be located to serve the particular requirements of the current and projected uses of the computer.

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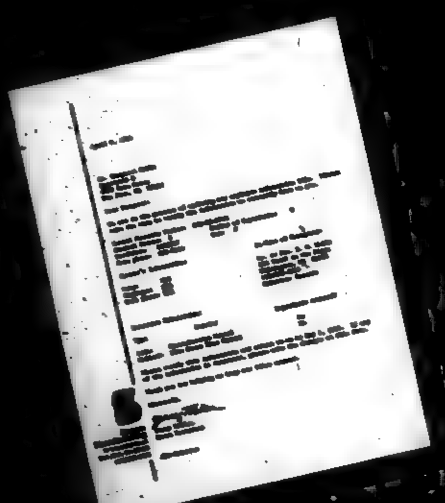

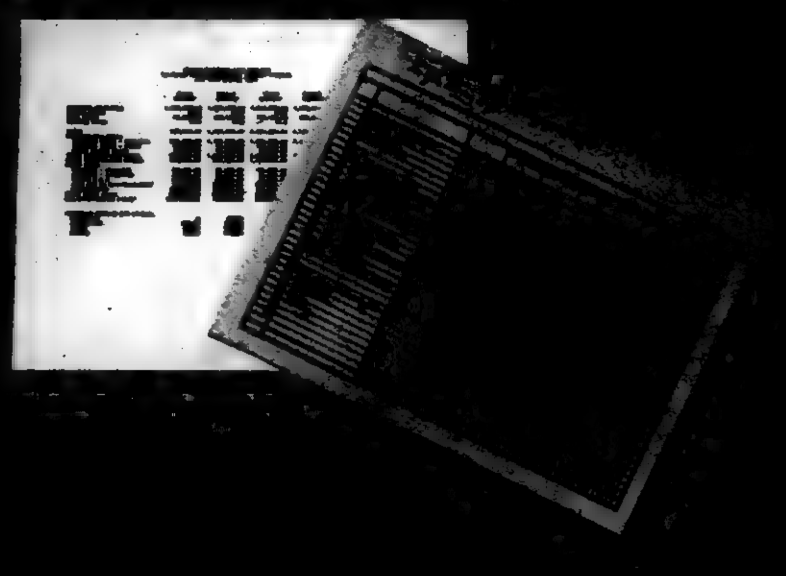

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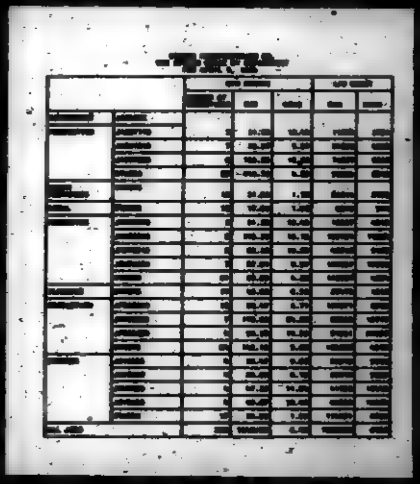

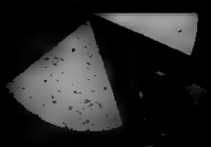

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Second, any programming languages that are required to support those applications should be located. If the application is already translated into computer instructions, this step is not required.

Third, the operating system that is required to run the applications and programming languages must be identified. And finally, the microprocessor type and computer system needed to run that operating system can be considered.

This classical approach is often difficult for a corporate buyer to apply, because the purchase may be contemplated to support a more general decision support or computer literacy goal. Perhaps the organization is preparing for a corporate standard of purchase that must support all applications. In this case, since the applications mix will be unpredictable, it is usually best to consider systems suitable for the widest possible mix of applications.

> **"**
>
> ***While corporate purchasers should not rush off with the crowd, they should be cautious when they are on a lonely trail.***

Here it is possible to apply some indirect microprocessor selection rules. To do so, the buyer should know what microprocessor is used in the products being considered and what is used in the major product offerings in the marketplace as well.

The first question to ask about the microprocessor is how often it is used — not a very technical issue, to be sure, but a very important one. A microprocessor chip used in various products will have many skillful programmers supporting it. More programs will be written for it. Its popularity is an indication of market suitability and of some history of satisfactory performance.

Finally, other people with the same selection to make have obviously chosen it. While corporate purchasers should not rush off with the crowd, they should be cautious when they are on a lonely trail.

The second question about a microprocessor is upward compatibility. This is a little more technical and relates to whether the microprocessor is a member of a family of products that provides for performance growth but retains the same basic instruction set and operating concepts. Buying the last or largest of anything leaves nowhere to go but down.

The final question to ask, and the question to be asked only if the process to this point results in more than one candidate, concerns the technology of the product. The evaluation of microprocessor technology is something best left to computer scientists; if at all possible, a team should participate in any decision that gets this far.

The team should include managers and business professionals. Specialists tend to select technologies that are interesting, topical and modern, not necessarily practical. Managers and business professionals should probably control the selection process.

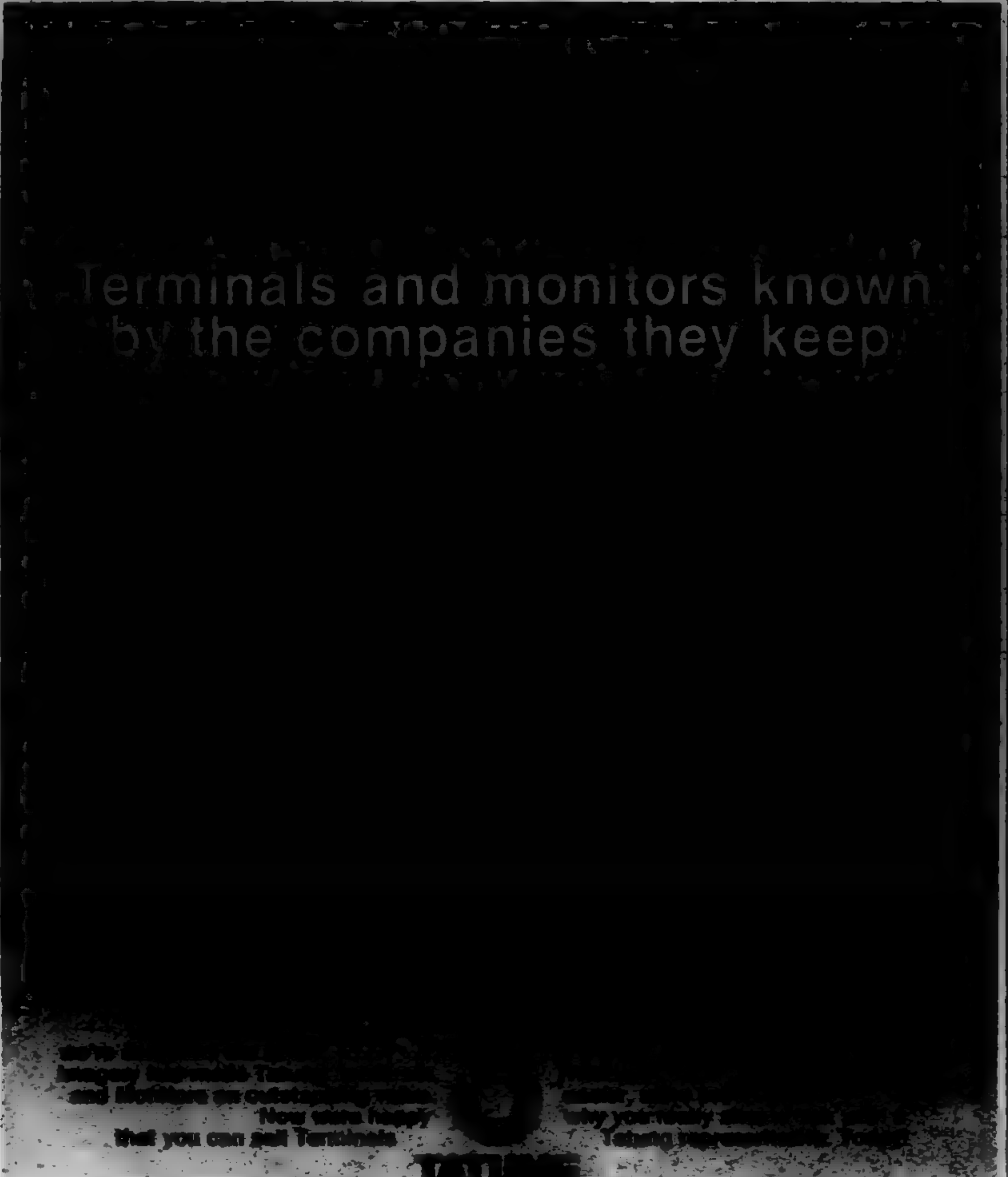
Instruction sets

One area in which users often are misled is the power of instruction sets. Some microprocessor products have flexible and sophisticated instructions, and using those instructions may improve the performance of a given business application significantly. Users may even select a microprocessor based on the ability to support floating-point calculations directly through custom instructions.

Unless you intend to program directly in machine (or assembly) language, be sure that the language you select will use any special instructions before you buy a microprocessor that supports them. You might think that any language written for a computer would support all the instructions available on its microprocessor, but they do not.

The primary grouping of microprocessors is by the width of the data bus — the only meaningful measure of bit size.

Thus, the Intel Corp. 8086, the



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National Semiconductor Corp. 32016 and the Motorola, Inc. 68010 are all 16-bit systems.

Some of the chips shown in the table at right, such as the AT&T WE 32000, are not normally available for commercial development but are proprietary to the manufacturer. Evaluations of products containing these special processors should not be made directly by users without specialist or engineering support, and they are included for information purposes only.

The 8-bit computers based on the MOS Technology 6502 (primarily the Apple Computer, Inc. Apple II) and the Zilog, Inc. Z80 (the various computer systems based on Digital Research, Inc.'s CP/M) dominated the market as recently as three years ago. But the marketplace has moved to 16-bit products, and most research and software writing efforts are going in that direction. The 8-bit products purchased today still have plenty of applications and software, however.

The most popular 8-bit microprocessors available today are the following:

6502. The oldest of the current popular chips, the 6502 is known primarily for its use in the popular Apple II. The 6502 is reasonably fast and inexpensive, but it has a limited instruction set and an address space of 64K bytes. There have been several efforts to extend this address space to 128K bytes through memory management, most notably with the Apple III (which has been discontinued). With the large base of Apple II computers and a lot of software for them, this chip family, including the 65C02, is therefore likely to have the best future of the 8-bit products.

Z80. A chip developed (and a name trademarked) by Zilog, the Z80 was designed to extend the instruction set of the older Intel 8080 processor. It has a compatible superset of the 8080 instruction set and, because of that, inherited the operating system developed for the 8080, CP/M. The combination was the hottest in the business marketplace, never approaching the total volume of the Apple II but capturing many of the complex applications and enjoying an excellent reputation among businesses and professionals who wanted the closest thing to a "real computer." The IBM Personal Computer, however, has damaged this market. There is no single dominant market leader among the Z80's vendors and no hope that it will be much of a factor in the future.

The 32-bit microprocessors, the newest products, are at the other end of the range. Are they the wave of the future? Certainly, but the question is, how far off is the future? There has not been time for a market consensus to develop on 32-bit chips — only a few are even getting built into products. The best prospects in the 32-bit market are those that are generally compatible with their 16-bit ancestors, because programs for them can be made more readily available when (and if) they come into commercial production.

Other good prospects are the chips that provide a compatible architecture to an existing minicomputer, such as Digital Equipment Corp.'s Microvax.

68020. This chip is the Motorola champion of 32-bit systems, and in fact is probably the premier 32-bit processor based on the fact that many people think that the whole 68000 line is 32-bit (it isn't, unless you care to accept a fairly arbitrary standard of measurement, the internal bus size). Like the rest of the family, the 68020 is an upward-compatible enhancement of earlier products.

Packed decimal instructions have been added to the product to improve its business math performance, and a math co-processor is available to improve floating-point operation. Since the 16-bit Unix implementations will migrate to this chip with no trouble, and because of its strong virtual memory structure, the 68020 is probably the best bet in 32 bits for commercial success.

80386. Intel's 80386 is still a bit of a ghost, but the product is expected to be another upgrade of the segmented memory architecture of the 80286. While this development provides a processor that is compatible with the earlier products, it probably pushes the segment memory management scheme a little further than most software developers will care to take it. The 386 is supposed to come with a new co-processor for match operations, an improved version of the 8087, but there is some question as to exactly what kind of operations it will support. If IBM continues to go with the Intel family, the 80386 may find good commercial acceptance.

32032. National Semi's 32032 is probably the technical champion of the 32-bit processors likely to see commercial exploitation. The product is fully compatible with the rest of the 32000 line, so mobility of code is assured. The product has a companion memory management chip with virtual memory support, as well as a floating-point chip. Its instructions are compact in comparison with other 32-bit chips, reducing program size (not much of a factor) and speeding execution by reducing the number of instruction bytes that must be pulled from memory (sometimes a significant break on execution speed). The 32032 is already offered in commercial fault-tolerant computer products; it is the only one of the nonproprietary chips to make an appearance in the marketplace.

The 16-bit family is best, at least in today's market. While all of the products shown in the table are sound and useful from a technical perspective, the market has passed by most of them in favor of two: the Intel 8086 family and the Motorola 68000 family.

8086. The parent chip in the popular Intel family, the 8086 is now pretty much in eclipse. A version of the 8086 with an internal structure identical to its parent but with an 8-bit data bus, called 8088, was selected for the IBM Personal Computer. This shot the family to the top of the market charts and prompted Intel to do some new engineering work to keep it there. The effort resulted in the 80186, a form of the 8086 with a few new instructions and with a lot of circuits that were external to the old 8086 built into the new processor chip.

The result is a lower chip count and a lower computer cost, so the 80186 has largely replaced the 8086 in designs that use the 16-bit data path. A newer family member, the 80286, is even faster and has a very

Microvax	DEC	–	–	●	–	–	–	–	–	–	●	–	–	–	–	–	–	●	●	–
NSC 800	National Semiconductor	●	–	–	●	–	–	–	–	●	–	–	–	–	●	–	–	–	–	●
WE 32100	AT&T Technologies	–	–	●	–	–	–	–	●	●	●	–	–	–	–	–	–	●	–	–
Z800	Zilog	●	–	–	–	–	–	–	●	●	●	–	–	–	●	–	–	–	–	●
Z80000	Zilog	–	–	●	–	–	–	–	●	●	●	–	–	–	–	–	–	●	–	–
65C02	MOS Technology	●	–	–	●	–	–	–	–	●	–	–	–	–	–	–	–	–	●	–
8085	Intel	●	–	–	●	–	–	–	–	●	–	–	–	–	●	–	–	–	–	●
80C86	Harris/Intel	–	●	–	–	–	●	–	–	●	–	–	–	–	–	●	●	●	–	●
8088	Intel	●	–	–	–	●	–	–	–	●	–	–	–	–	–	●	●	●	–	●
32008	National Semiconductor	●	–	–	–	–	–	–	●	●	–	●	●	–	–	–	–	●	–	–
32032	National Semiconductor	–	–	●	–	–	–	–	●	●	●	●	●	–	–	–	–	●	–	–
68000FN	Motorola	–	●	–	–	–	–	–	●	●	–	–	–	–	–	●	–	●	–	●
68010	Motorola	–	●	–	–	–	–	–	●	●	●	–	–	–	–	●	–	●	–	●
68020	Motorola	–	–	●	–	–	–	–	●	●	●	–	–	–	–	●	–	●	–	●
68881	Motorola	–	–	●	–	–	–	–	–	–	–	●	–	●	–	●	–	●	–	●
80188	Intel	●	–	–	–	●	–	–	–	●	–	–	–	–	–	●	●	●	–	●
80287	Intel	–	●	–	–	–	–	–	–	●	–	●	●	●	–	–	–	–	–	–

> ***Because the newer Intel chips, such as the 80186 and the 80286, use the same interrupt for a different purpose, there could be software compatibility problems.***

flexible memory management scheme.

The biggest handicap Intel has with its series is also its biggest boost: the IBM Personal Computer family. It seems that when Microsoft Corp. developed the PC-DOS operating system for IBM, it used an interrupt on the 8088 that was reserved for use by the hardware in future developments. The use of the interrupt is written into most of the thousands of programs produced later for the Personal Computer. Now, because the newer Intel chips, such as the 80186 and the 80286, use the same interrupt for a different purpose, there could be software compatibility problems.

68000. A Motorola product, the 68000 actually enjoyed a brief lead over the Intel family until IBM made its decision. Unlike the 8086 computer series, which uses segmented memory only, the 68000 has the ability to address up to 16M bytes of memory directly.

The 68000 family is a virtual memory, page-oriented microprocessor. It also has an instruction set that is very similar to that of the popular DEC PDP-11. This combination has made the 68000 the prime target for AT&T's Unix operating system among microprocessors. Unix offers personal computer users an excellent migration path, because it is supported on computers up to the mainframe class. Its primary drawback is the relative lack of good commercial software for Unix.

Most Unix programs are written in the C programming language, an uncommon vehicle for commercial software but a solid language nevertheless. The 68000 comes in several models, the current champion being the 68010. There is even a 68000 with an 8-bit data bus, the 68008, which offers a kind of Motorola 8088 flexibility but has not really caught on. This processor has expanded page-handling capabilities and an improved scheme for pre-fetching instructions so the arithmetic logic unit always has something to work on. Apple Computer's Macintosh family uses 68000 microprocessor chips, but at present both the user and the developer are somewhat insulated from the chip by the language and operating system structure of the machines. If you think you need a 68000 chip for some technical reason, it is highly unlikely that Macintosh will let you get close enough to it.

32000. National Semiconductor's family of microprocessors offers many excellent features but has had little commercial use in microcomputers. The family has members with 8-, 16- and 32-bit data paths, generally upward-compatible throughout the range. The 16-bit chip, the 32032, has the same 16M-byte address space as the 68000, and an accompanying memory management unit offers virtual memory support. The instruction set is considered by many to be the best on a microprocessor, and several computer manufacturers of fault-tolerant systems have based their designs on the National Semiconductor product.

There is a Unix operating system implementation on the 32032, and most of the popular language processors are implemented for it. Given a chance, the 32000 series could be the basis for a very powerful computer system.

Most users should never become involved in technical evaluations of microprocessor chips because there are too many other factors, such as

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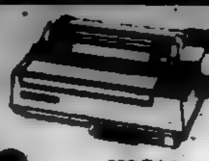
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languages, applications and operating systems, that are more important and will eclipse the chip technology in an evaluation. Getting into the details of microprocessor features would normally be a consideration only when a long-range view of vendor products is being taken or when the user will be doing machine-level programming.

Chip technology will affect long-range suitability of products, because lack of a clear and easily supported migration strategy on the current chips will ultimately leave users stranded when better products become available.

None of the current 8-bit chips has a solid migration path; they rely on high-level language compatibility rather than machine-level compatibility. Anyone who uses Basic on several systems knows how compatible high-level languages are. The 16-bit chips, on the other hand, all offer a good path for growth into 32-bit technology.

IBM's use of the Intel 8088 family in the Personal Computer is probably the most significant reason that the series continues to grow. If IBM should, at some point, decide to go with a different chip family, Intel's position in the market will probably weaken. It doesn't look as if that is about to happen, though, because IBM has moved to the 80286 with the IBM Personal Computer AT, running under both MS-DOS and Xenix.

Programming at the machine level is a good reason to consider the specific hardware. Most businesses will not find sufficient reasons to justify assembly language programming, but some special communications or device control applications may require it. There is no question that the Intel 8086 family is more difficult to program than the other 16-bit products; the segmentation architecture seems to cause minicomputer and mainframe programmers more transition difficulties than the structures of the 68000 or 32000.

Other factors may affect a programming task on microcomputers, however. Not all computers provide an assembly language (Macintosh does not), and some systems use an internal hardware architecture that restricts some of the features of the microprocessor. Don't select a computer because of the Motorola 68000 virtual memory addressing system to find that the computer vendor did not elect to supply memory management.

The microprocessor field is changing rapidly and growing more complex. Micro buyers may find themselves lured into excessive technical detail when evaluating systems. If your application really demands attention to the microprocessor itself, that level of consideration becomes justified. In most cases, it is not. Developing a basic understanding of microprocessors is desirable for anyone who intends to use or purchase microcomputers, but that understanding should not be allowed to draw business professionals so close to the technology that they forget the application. ‡

About the author

Stephanie Di Donato is a senior editor/analyst for Data Decisions, a market research firm.

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SCIENCE/SCOPE

In the 25 years since the birth of the world's first laser at Hughes Research Laboratories, the "light fantastic" has grown from a laboratory curiosity into an indispensible tool in medicine, industry, electronics, data processing, communications, and scientific research. That first laser, built by Dr. Theodore H. Maiman, was operated on May 15, 1960. It used a flash lamp coiled around a solid ruby crystal to produce an intense pulse of red light with a wavelength of precisely 6943 angstroms. Lasers today employ various gases or crystals and operate throughout the electromagnetic spectrum. They are used as tools for cutting, welding, drilling, and marking metals; as alignment and measuring devices; as the sources of signals in fiber-optic communications systems; and as rangefinders and target illuminators in military systems. Promising new medical uses include advanced eye surgery techniques, internal cauterization, and treatment of cancer. Already used in some computer printers, lasers one day will be widely used in high-speed optical computers to process and store data.

Building blocks for what will become an electronics factory of the future are being set in place at Hughes to cut costs in manufacturing airborne radars and other avionics programs. Lasers, fiber optics, remote fiber fluorometry, and advanced optics play a part in an Industrial Modernization Incentive Program (IMIP) contract awarded by the U.S. Navy with Air Force participation. IMIP is a share-the-savings concept to reduce costs of the F-14, F-15, and F/A-18 radar programs by more than $10 million, while improving the quality and reliability of the systems. Three projects employing new manufacturing technology focus on solder joint inspection, metal fabrication inspection, and continuous chemical analysis of solutions used in electroplating printed wiring boards.

An advanced factory management system model, developed by Computer Aided Manufacturing-International and Hughes, will help optimize use of manufacturing resources. The model will address interactions of all work areas within every level of the organization. It will precisely identify department production capacities, queue bottlenecks, and resource flow. Managers now must make decisions without knowing all interactions among workstations, cells, and departments.

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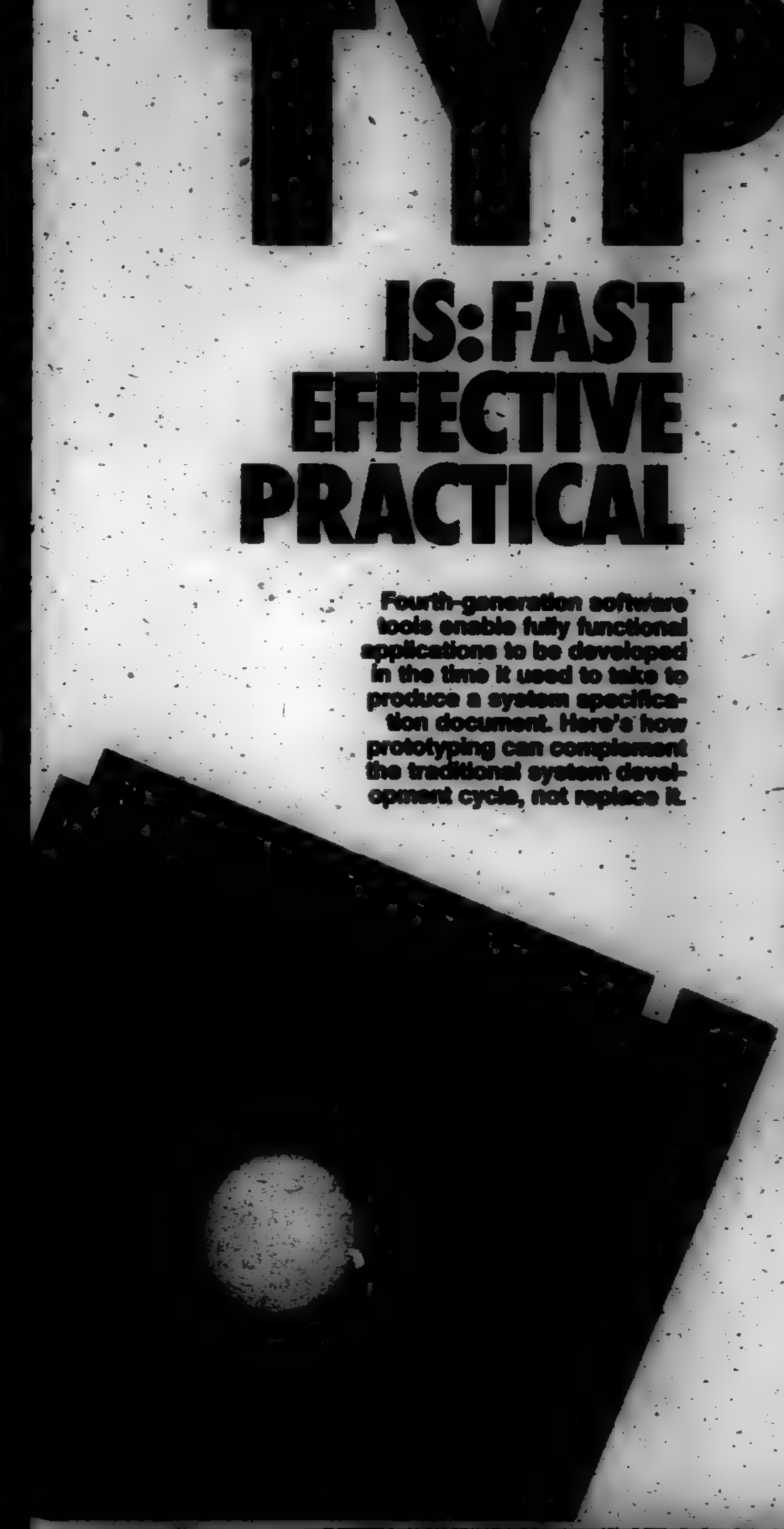
PROTOTYPING

IS: FAST EFFECTIVE PRACTICAL

IS NOT: NEW MAGICAL A SUBSTITUTE

Fourth-generation software tools enable fully functional applications to be developed in the time it used to take to produce a system specification document. Here's how prototyping can complement the traditional system development cycle, not replace it.



By Lee Adamski

Anyone involved in the development of computer applications has, at least once in his career, seen a tremendous effort go into the design of a system, complete with the latest structured design methodologies, extensive definition of requirements, reams of documentation and end-user sign-offs — only to have the final system turn out to be completely inappropriate for the needs of the users.

This is an extreme example of a system that did not meet its requirements. But really, how many systems are accepted and used as first designed? No matter how much planning and specification are done, what is the first thing that happens when a system finally becomes operational? Request for modification — *Change*. There always seems to be something designers forget.

Prototyping has been defined as the process of building and refining a working model of the final operational system during the development process. In fact, prototyping can mean anything from designing a hard-copy example of a computer report to creating a full-blown computer system.

with I/O, reports, screens and fully populated data bases.

The use of prototyping in the development of computer applications probably means something different to everyone. Terms such as evolutionary development, iterative enhancement, heuristic development, self-actualizing prototyping, planned evolution, applications simulation, pilot software systems, software breadboarding, evolutionary design, throwaway code, incremental development and the evolutionary life cycle are finding their way into the vernacular of applications designers.

Prototyping has come to mean all of these.

The main purpose of prototyping, however, is to refine the functions and I/O of a system during the design phase, without having to wait for development to be completed.

Is prototyping something new? Not really. Years ago, designers were creating mock-ups of reports, card layouts and, more recently, screen designs.

The idea of throwaway code is certainly not new. Many data processing professionals have all seen their share of programs, design specs and even full systems end up in the trash basket.

What it is not

Prototyping is not a substitute for good analysis and design, nor is it an excuse to abandon proven structured design methodologies, adequate documentation or good programming techniques. And above all, it is not a magical solution to developing systems.

However, if used properly, prototyping can be a very effective tool and a helpful aid in developing systems that meet the needs of users.

The process of developing a prototype is really the same as developing a system except that it's known up front that it may simply be thrown away, and it gets into the users' hands more quickly.

Basic assumptions

If some basic assumptions about the way things really happen are accepted (things that have come to be accepted as "facts-of life"), prototyping is seen as a viable method for developing good systems.

It is impossible to do something right, much less perfectly the first time.

How many people have said to themselves, "If I could do it over now, I'd have the perfect system"? That is because experience not only teaches us how to do things, but more importantly, how not to do things.

It is much easier to modify or improve something than to create something from nothing.

Once something is seen, it's easy to uncover its deficiencies or shortcomings. If an analyst is asked to develop a system or a programmer is assigned a program to solve a problem, it will take them some time to come up with a proposed solution. They will research the problem, develop alternative solutions, analyze, design and eventually come up with a solution.

If that same analyst is shown the same problem with a proposed solution, he will immediately respond, "Why didn't you do it this way? You could have. . . ." This is because people are by nature critical. They love to give advice, and they can always come up with suggestions on how to do things better. If someone is asked how to solve a problem, he may not know. But chances are that if he's shown a solution, he will immediately explain why that solution won't work. Many users say "I don't know what I want until I see it," or "Give me an example."

Learning is gradual, iterative and accomplished by example.

People do not learn everything at once. They learn gradually, iteratively and by experience.

For example, a certain company uses an electronic mail system. Few employees know all, or probably even half, of the facilities of this product. Most of the workers learn a few basic functions needed to accomplish a basic task, for example, sending and receiving mail. It is not until a task creates a need for a more advanced function that the function is learned. This appears to be true even for users who took a class where the entire set of functions and facilities was explained. People just seem more comfortable with a gradual assimilation of the system's capabilities.

How do most technicians learn JCL? By reading the IBM manual? By taking a detailed course in JCL? Probably not. More likely by asking a more experienced colleague if he had an existing JCL stream to accomplish a job. Gradually, by doing this, new programmers developed a rather thorough knowledge and understanding of JCL.

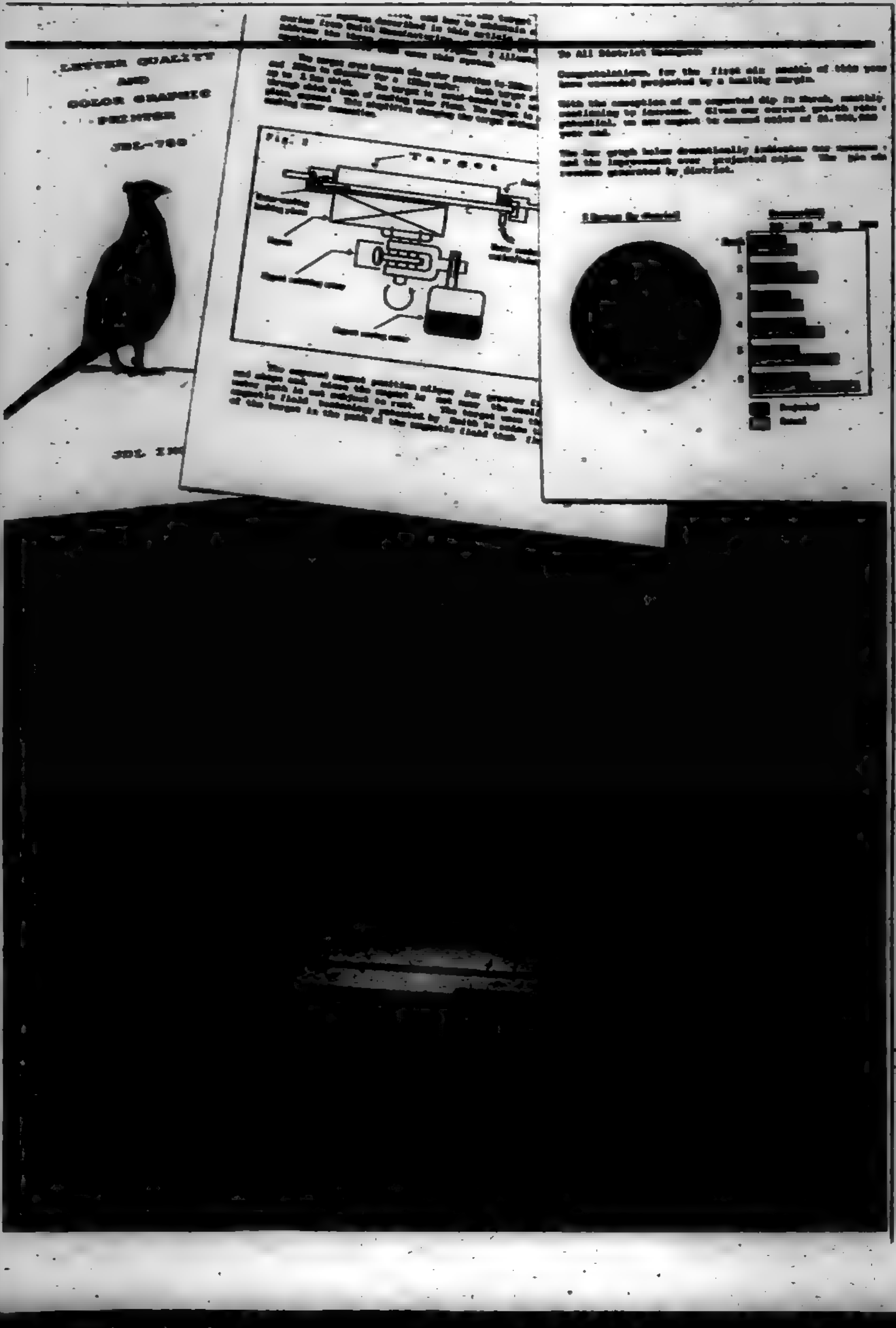
How does all of this relate to prototyping? It points out that one cannot give a user a volume of documentation describing the proposed system or spend an hour or two explaining how it will work and expect him to make a reasonable appraisal of its ability to meet his needs.

A more effective way of eliciting a valid response from a user would be to give him a working model, allow him ample time to play with it, experience it and then ask him to respond.

The trouble starts when the system gets placed in the hands of the user.

The assumption above caused one analyst to observe, "This would be a great job if it weren't for the users!"

The point is that developers can ask users what they want, then sit in their offices and design these great, fail-safe systems they believe are perfect and will meet users' needs. However, it's not until users work with the system that developers find out what users really want.



Users cannot accurately specify systems until they have used them.

Therefore, users should use the system before it's too late.

Anyone who has ever been in the software vendor business knows what a traumatic experience it is to release a product. The greatest minds in software development can produce a product that they think does everything that anyone would ever want it to do — then it's released.

Users, however, being the ingenious, devious people that they are, will find all kinds of ways to use it and abuse it, while uncovering all kinds of functions that it should be doing that its developers never dreamed of. This is because:

The primary catalyst to innovation is people, not methodology.

Below are a few observations by well-respected experts in the systems development field. These statements suggest that there has been trouble specifying systems requirements and communicating effectively with users:

"The document setting out the details of a new system (system specification, general design, functional specification) effectively forms a contract between the user department and the systems development group, yet it is frequently impossible for the user to understand because of its sheer bulk and the technical concepts built into it."

"We have no way of showing a vivid, tangible model of a system to users. It's hard for users to imagine what the new system is going to do for them until it's actually in operation, by which time it's too late."

"By definition, and in any disguise, problem solving is a heuristic process — a process of trial and error. Anyone who fails to recognize this is doomed from the outset, either to outright failure or, at the very least, extreme frustration."

"Many of the most significant problems with systems work are related to simple, fundamental and early misunderstandings about what should happen and who is responsible for making those things happen. I suspect that most important bad decisions are made early. Surely improving the early communication will likely increase the chances for success of the entire project."

"In fact, the user is rarely capable of expressing his desires clearly, and the analyst must be capable of helping the user express his needs . . . The analyst must concentrate on the output of the systems process."

The first two quotes were taken from *Structured Systems Analysis: Tools and Techniques* (1977), written by Chris Gane and Trish Sarson, and the remaining three were taken from *Structured System Development* (1977) by Kenneth T. Orr. What is apparent from these statements is that the problem of communicating with users and specifying systems requirements accurately has been realized for some time, and most methodologies have been attempting to solve it. But, in fact, these problems remain the major stumbling blocks in the systems development process.

> ”
>
> *Anyone who has ever been in the software vendor business knows what a traumatic experience it is to release a product.*

The traditional systems development cycle generally consists of several steps. These include:

- A feasibility study, where the technical, operational and cost feasibility of a proposed system is determined.
- A requirements definition phase, where the requirements that the system must meet are determined, documented and approved (the sign-off).
- A design phase, where a physical solution to the requirements is determined. This phase usually proceeds from a general design to an exact specification for the construction of each system component.
- An implementation phase, where the system is constructed, tested and verified.
- A conversion phase, where a smooth transition from the current mode of operation to the new system is made.
- A production phase, where the new system becomes the day-to-day operational system of the user group.
- A maintenance phase, where the system is continually enhanced and revised to meet the ever-changing needs of the users.

Some limitations

Many systems that adequately satisfy user requirements have been designed and implemented using this traditional approach. However, more often than not, problems arise. As mentioned earlier, it's often very difficult for users to pre-specify their total requirements completely.

Analysts document every detail as they understand it, using the latest systems development methodology (which they've learned by either studying a 400-page text on the subject or perhaps even attending a three-day workshop), produce a voluminous requirements specification document and then expect the user to read it, digest it and approve it.

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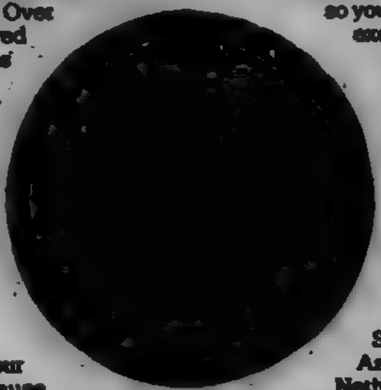

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Because of its sheer size and complexity, the document may simply be avoided by the user or, if he does make an attempt to study it, chances are he will not fully understand it. At some point, out of frustration or desperation, he signs off, and analyst and user move into the next phase of the systems development cycle.

Other problems are the time lags between the initial contact with the user and the production of the requirements document — and between the approval of the specification document and the delivery of the system. During these time lags the following often happens:

- Users forget details of preliminary discussions or lose interest and enthusiasm for the project.
- Business conditions may have changed, which can have the effect of making original needs obsolete.
- Original users who requested the system may have left the company or been assigned to other responsibilities.

The final result is that the delivered system fails to satisfy the requirements of the user.

Several benefits

If, at this stage of the project, some of the effort normally put into producing the requirements definition is expended in building a model or prototype, several benefits can be realized:

- The user gets immediate feedback from the analyst while his interest and enthusiasm in the project is still high. He sees tangible proof of progress.
- A conversation piece is created that will stimulate a meaningful dialog between analyst and user.
- The user can see, touch and work with the system rather than just read about it. He becomes actively involved in the development process and his enthusiasm increases.
- Project communication is enhanced, and ambiguities are resolved early in the project — before it is too late.

Types of prototypes

The amount of effort expended in the prototyping phase can vary, based on the kind of prototype that is built.

In its simplest form, a prototype can be nothing more than a mock-up of system outputs. Sample reports and panel layouts are developed, and hard-copy representations are reviewed with the user. These will eventually become part of the detailed system specification. For this, almost any interactive programming tool that allows an analyst to design mock-ups interactively and then produce hard copies can be used.

A somewhat more elaborate form of prototype is a throwaway functional model of the proposed system. This type simulates the functionality of the proposed system. Users can actually sit at a terminal and use the system as it would be used in its final form. Data entry, inquiry requests and traversal through program and panel hierarchies can be experienced. In addition, user-friendliness and man-machine dialogs can be evaluated.

A limitation of this prototyping method is that, as much as it looks like the ultimate system, it is still purely a model not capable of evolving into the final, operational system. However, it is excellent for demonstrating the system and selling it to management. And the prototype can serve as a useful requirements tool to communicate the system specifications to the applications developers, but it eventually must be discarded. The final, operational system would have to be redeveloped in the software chosen to implement the system.

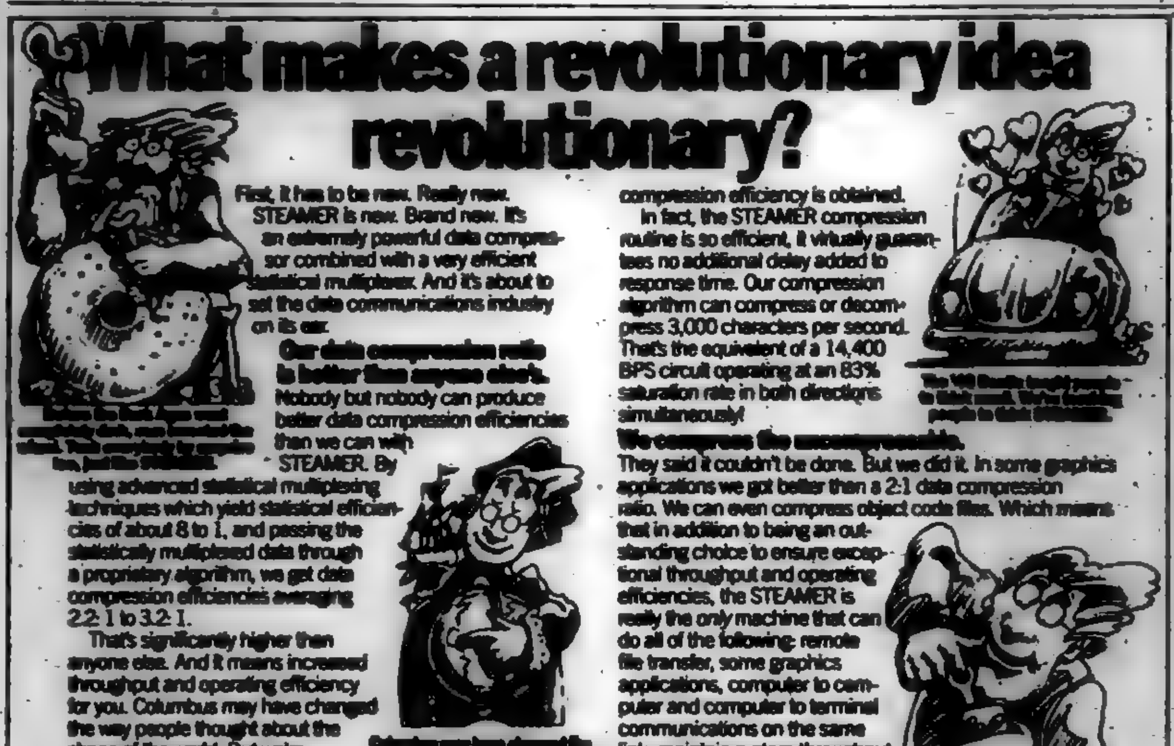
For a throwaway functional model, any interactive software tool capable of simulating a real system is adequate, as long as it can produce a model fairly quickly. Personal computer products are often used to produce these prototypes.

The third prototyping method, called an evolutionary system, has all the attributes of the throwaway type with the additional capability of evolving into the final system. This type has been made possible by current fourth-generation software tools.

Fourth-generation tools

Several software tools are needed to produce effectively a prototype capable of evolving into a finished product application. If the proper tools are not selected, the prototyping phase will be seriously hampered. The following is a list of basic tools required for efficient fourth-generation prototyping:

- An active, integrated data dictionary capable of housing information about all system entities, for example, programs, panels, reports, data elements and so forth. This dictionary becomes a single repository to document and control all system components.
- An on-line screen-painting facility that is easy to use and capable of producing screens quickly that not only look like the desired panel but that can simulate the functions expected of the system.
- A nonprocedural report generator that allows prototypers to specify report layouts quickly and produce hard-copy mock-ups of proposed reports.
- A high-level, fourth-generation language that supports structured programming techniques, reduces or eliminates the complexities of coding and permits programs to be written and maintained quickly and interactively.
- A query language capable of generating quick, ad hoc inquiries, also integrated with the data dictionary.
- An automated documentation mechanism that automatically stores and maintains documentation as it is



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to meet on the Meridian.

developed during the prototyping process, with the capability to generate hard copy easily and as needed.

● A data base management system capable of modeling all required file and data structures. The DBMS should support data modeling, facilitate data access to applications and provide physical data structure independence.

In general, good prototyping software should be integrated, available from one workstation, easy to use, menu-driven and command-driven, accessible to and usable by end users, self-documenting, portable and usable in the final, operational system. It should also permit quick modification and reassembly and support multiple versions of system entities.

Guidelines for use

Not all systems are good candidates for prototyping. Batch systems, systems that are highly algorithmic and have few data elements and nonpredictive systems are generally poor candidates for prototyping.

Systems that are highly interactive with significant man-machine dialog, that employ a high degree of data manipulation and record management and that are predictive in nature are generally good candidates. The typical management information system usually works fine.

User participation is another key ingredient and cannot be underestimated. Active contribution on the user's part is mandatory for the success of the project. A prototype that is constructed behind closed doors, regardless of how clever the prototypers are, is no better than a requirements document that fails to communicate the user's needs. The user is the primary catalyst to the success of the prototype.

The prototyping process can be broken down into six basic steps:

1. **Initial user confrontation.** The process begins with the initial user contact, where a general understanding of system requirements is determined. Basic outputs, existing problems and so on are reviewed.

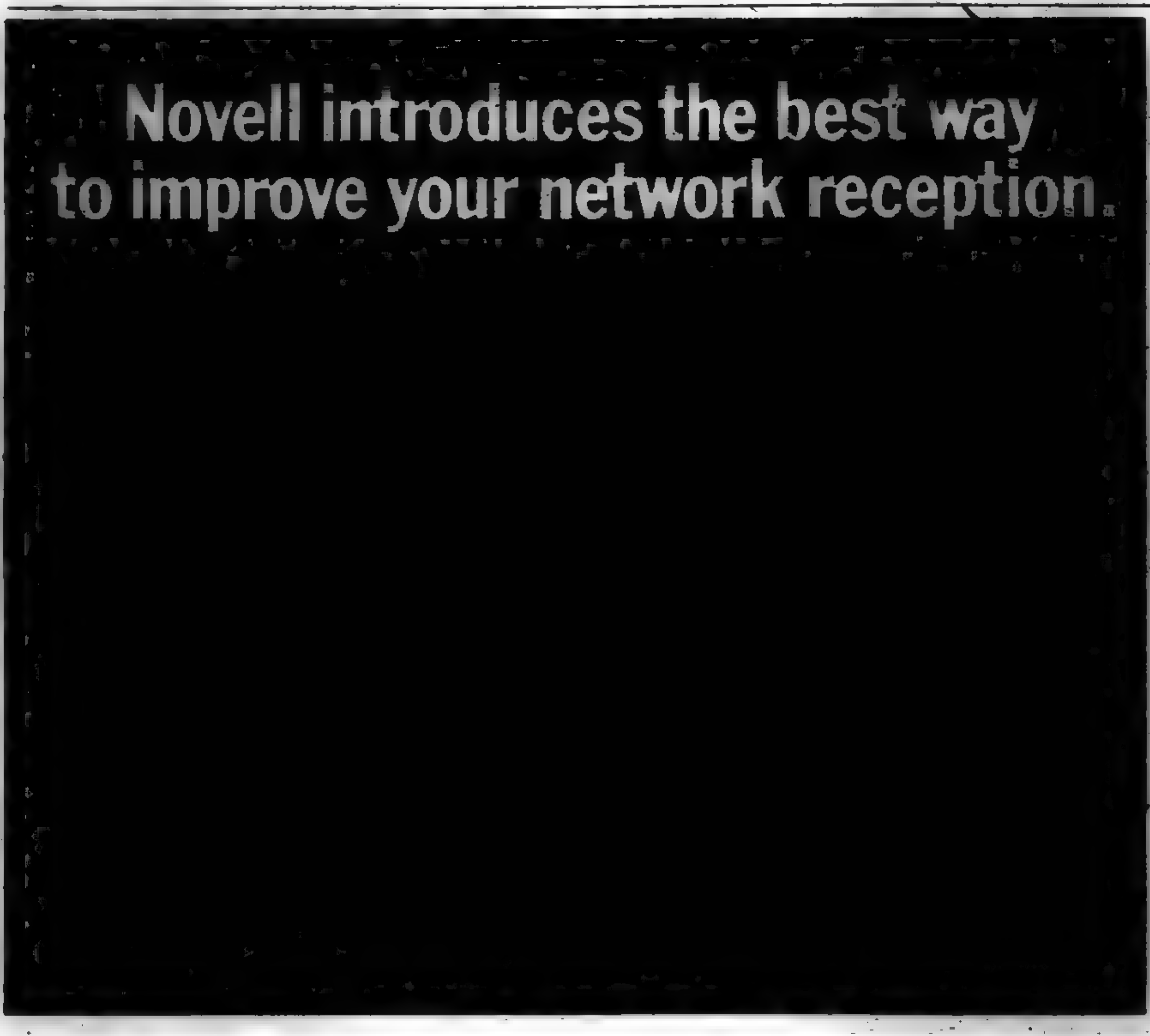
2. **First-cut outputs.** The analyst immediately documents his understanding of the requirements of the system by building models primarily of the outputs of the system. Sample report and screen layouts are built using the appropriate prototyping tools. Remember, this is all based on the initial user-analyst meeting.

3. **User review.** The sample outputs are reviewed with the user. A refining process begins. Omissions are pointed out. Misunderstandings are cleared up. Outputs may be consolidated, or the need for additional system outputs may become obvious.

4. **Prototype modification.** Changes suggested by the user in Step 3 are implemented by the analyst. The analyst himself makes modifications and reviews them with the user. Often, Steps 3 and 4 are combined and executed by the user and analyst. These two steps may be repeated several times, until a mutually acceptable agreement between analyst and user is reached. At this stage of the project, thrashing can occur. The analyst must prevent this from happening by establishing a defined scope with reasonable time constraints. Without this necessary restriction, the refinement process could go on forever. At some point, the process must stop, and the decision must be made to go ahead.

5. **Data structure evolution.** During the process of defining outputs, the data needed to support the operation becomes evident. This is the signal to start building data structures. Initially, one large flat file will suffice. The objective at this point is to have the data necessary to provide the outputs desired. The source of the data and normalization will occur later. Physical, test data bases can be built at this time, but they are not necessary. Data can simply be defined internally in programs to simulate real data bases.

6. **Code program shells.** Programming can begin, but in a very high-level fashion. A simple driver program to simulate screen traversal is a good starting point. High-level programs shells that contain narrative documentation or pseudocode and stubs, rather than actual code, could be developed. Many fourth-generation languages closely resemble pseudocode and can be converted quite easily to actual code when used in the implementation of the final



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operational system.

Once the prototype is complete and the analyst and user have come to a reasonable agreement regarding system requirements, the more traditional activities of the systems development cycle, that is, those not resolved by the prototype, are undertaken.

What to do now

The prototyping phase was only concerned with system functionality and with the I/O of the system. The less visible aspects of the system must now be dealt with and documented. Hardware and software used to implement the system must be decided upon. Detailed capacity planning and system sizing must be performed. Transaction rates must be determined. Frequencies and volumes must be specified and performance considerations, such as a reasonable response time, must be agreed upon.

Other concerns not addressed by the prototype include security procedures, backup/recovery, conversion, system testing and implementation plans, user sites, system reliability, audit trails and controls and documentation and training.

In the data base area, the DBMS must be chosen. Data must be normalized, logical views completed and data items finalized. Source of input to the data base and procedures for populating the data bases must be determined. In the area of programming, standards must be established regarding module sizes, procedure labeling, Help facility, messages, PF key usage, panel and report layout consistency and so on.

Programs developed in the prototyping process that will be used in the final system must be cleaned up and have rigid, structured programming techniques and guidelines applied to them.

What happens to the prototype is another question that comes up at this time. If it is the type that is not capable of evolving into the final system, it can simply serve as the model or requirements tool for the actual development of the real system. If programs were already written, they can simply be rewritten in the language chosen for implementation. Again, it is much easier to take an existing program and reprogram it than to start from scratch.

The prototyping process is often very enlightening. After the process is complete, it may be decided to discard the prototype and abandon the project or to cease system development and purchase a vendor-supplied solution. The prototyping process may simply have uncovered the fact that the proposed system is really not feasible or at least not cost-justifiable at this time. In these instances, it is better to realize this now rather than after the system is implemented.

Finally, if the prototype was developed with a tool capable of evolving into the final system, its future must be decided upon at this time. If it still meets the requirements of the system after the operational and performance constraints have been applied, it should become the final operational system. If not, it should be examined to determine what can be salvaged or refined to be used in the final operational system.

Often, only a small portion of the prototype system must be redone using an alternate implementation tool to make the prototype a usable system. The screens and many programs may be used as they are.

A little more should be said about choosing the proper tools to implement the system. There is no such thing as the perfect tool. Each has advantages and disadvantages. However, some are more appropriate than others. The best systems are those that are implemented using the appropriate tools.

Today there are more varieties of software than candy in a candy shop. It is not unusual to see an application written in several languages. The main driver programs may be in a fourth-generation language, while subroutines are written in PL/I, Cobol or assembler.

During the era of second and third-generation software, shops were categorized as assembler shops, RPG shops, Cobol shops and so on. This is not the case anymore.

The problem today is that people are attempting to carry this second and third-generation mentality into the fourth generation. Often, the decision to use a specific tool for an entire application is made when some portions would be more appropriate for an alternative software language or tool. People are using tools for the wrong purpose. A fourth-generation language — chosen to realize productivity gains in the applications development phase — is then expected to outperform traditional languages. This is impossible.

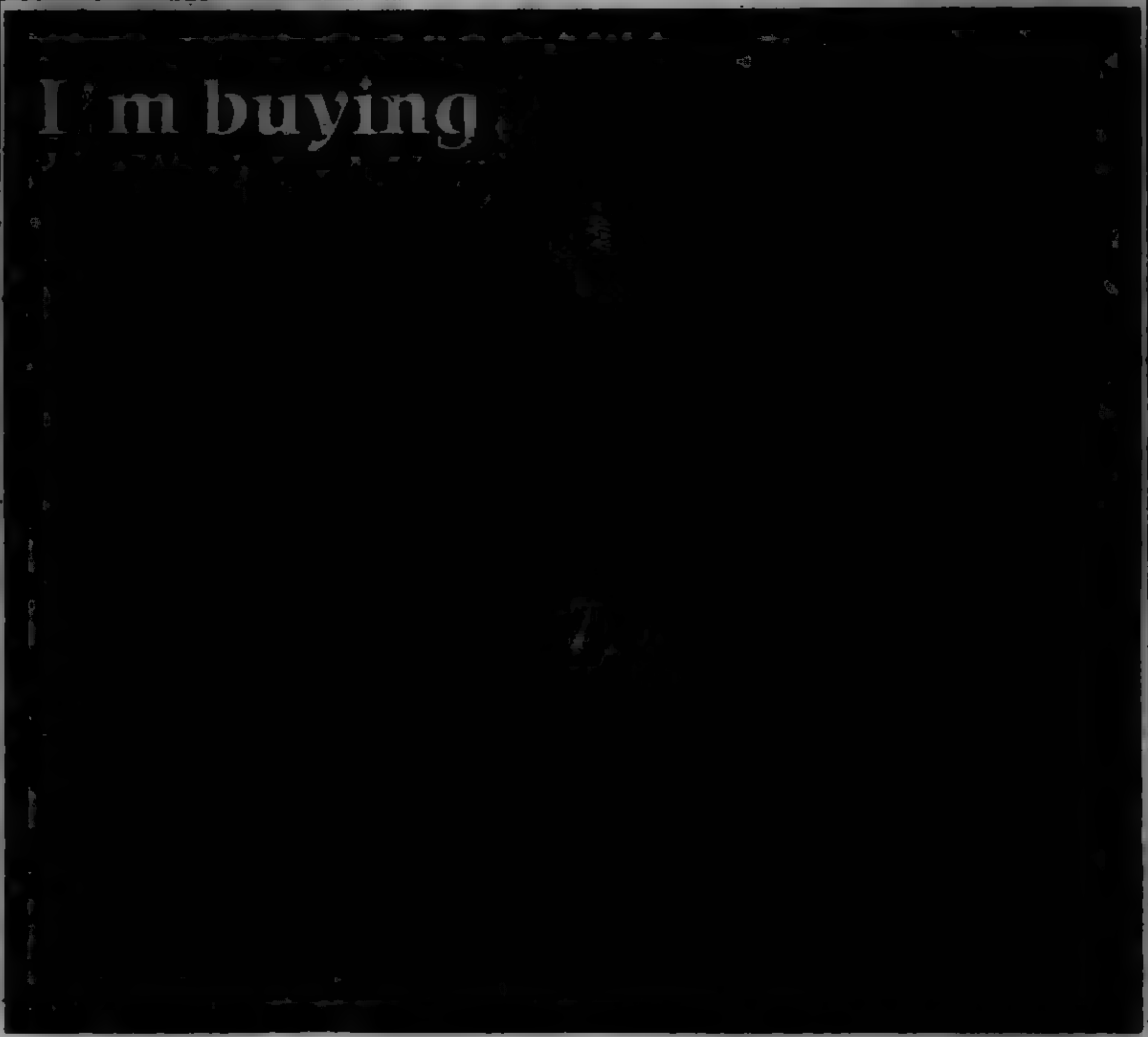
The days of RPG, Cobol and assembler shops are over. The computer professional of today must be knowledgeable in several software tools and languages — and, more importantly, must choose the appropriate tool to solve today's problems.

Prototyping, like any other software development aid or tool, has advantages and disadvantages. It can be used or abused. It is simply another tool to be used in the systems development cycle.

Prototyping is not an excuse to abandon traditional techniques and methodologies that work. It is not appropriate in all situations. If used properly, however, it can be a most effective aid in developing systems that truly meet the needs of users.

About the author

Lee Adamski is manager, Ideal Consulting and Education, at Applied Data Research, Inc. (ADR) of Princeton, N.J. Prior to joining ADR, Adamski worked for Sperry Corp. as a systems education consultant.



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MICROCOMPUTERS

Phillipe Kahn

Borland boss takes unconventional route on the road to micro software success

By Kathleen Sullivan
CW West Coast Bureau

SCOTTS VALLEY, Calif. — Two years ago, in a small office over a garage, Borland International was planning a media campaign to launch its first product, a Pascal compiler called Turbo Pascal. But the fledgling firm was operating under severe financial constraints. It was broke.

The company's founder, a former math instructor from France named Phillipe Kahn, wanted to run an advertisement in a particular magazine. But he knew that the magazine, a small systems publication based in New Hampshire, would expect $9,000 up front. The situation, Kahn decided, called for a ruse.

See KAHN page 52

- Tandy unwraps a local-area network for IBM Personal Computers, Tandy micros and other MS-DOS machines/54
- Lotus unveils a report writer for its 1-2-3 package/57
- Datacopy announces packages that enhance its Word Image Processing System/59
- Morrow introduces a battery-powered IBM-compatible portable with a 25-line screen/60

Users applaud Reflex tools

By Paul Korzeniowski
CW Staff

Early users of Analytica Corp.'s Reflex, a data base management package that runs on the IBM Personal Computer, said the package provides financial analysis functions that competing software cannot.

"There was no data base management package that met my requirements," noted David Malmberg, director of new technology at McKesson, Inc. of San Francisco. "Most data bases merely store data and do not allow one to analyze it. With those packages, I was unable to build a data base that worked as a financial model. Reflex allows one to group data in various ways and then produce a series of charts or graphs that can be used for analysis."

Announced last November, the data base includes spreadsheet and graphics capabilities that allow users to perform

See REFLEX page 55

Zenith boosts microcomputer line

GLENVIEW, Ill. — In a move that other vendors often spread over several years, Zenith Data Systems Corp. this week will announce five personal computers, each running Microsoft Corp.'s MS-DOS operating system and targeting a different segment of the personal computer market.

Two machines, the 14.5-lb Z-171 and the 24-lb Z-138, will be targeted at the transportable market. For entry-level buyers, Zenith will unveil the Z-148, a 128K-byte machine priced at $2,199 with dual-diskette drives. For those who want a more powerful system, an enhanced version of its Z-150, sporting an 8-MHz clock speed (nearly twice that of its older brother), will debut. And for the uppermost strata of the personal computer market, Zenith will introduce its Z-200, said to be compatible with the IBM Personal Computer AT [CW, April 29].

With its LCD screen, flip-down keyboard and twin, vertical diskette drives,

See ZENITH page 54

SMALL TALK
Eric Bender
CW Senior Editor

Memory scheme set as showstopper

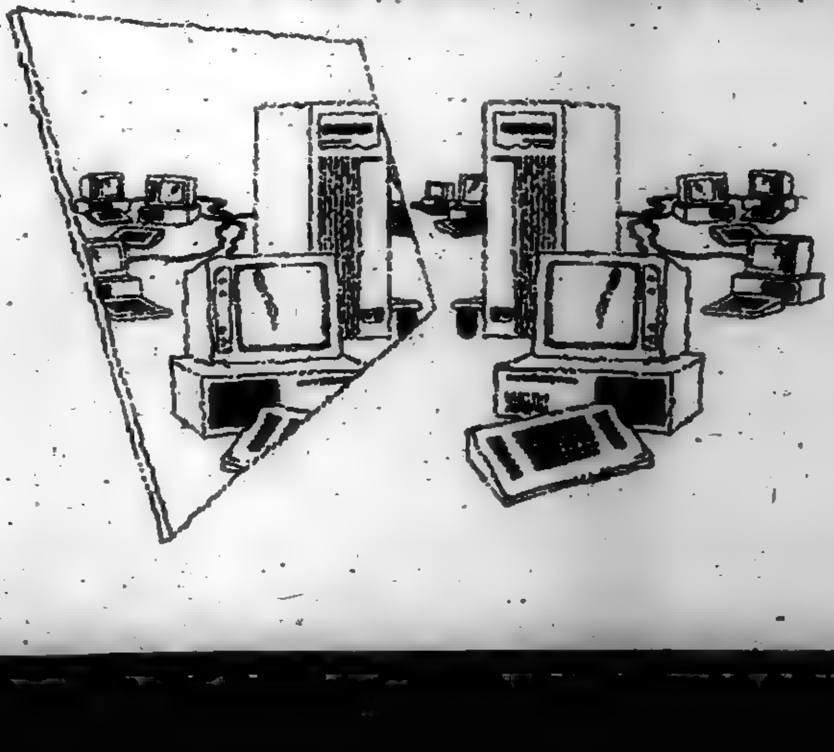
The first public demonstration of the expanded memory scheme cooked up by Lotus Development Corp. and Intel Corp. begins today on the show floor at Comdex/Spring in Atlanta.

The architecture gives suitably outfitted IBM Personal Computers running under PC-DOS more than 640K bytes of directly addressable random-access memory (RAM) — up to 4M bytes of additional RAM for standard Personal Computers, up to 8M bytes for the Personal Computer AT — with only about 2% performance degradation, claimed Mitchell Kapor, Lotus chairman.

Published as the Lotus/Intel Expanded Memory Specification, the approach is

See MEMORY page 55

Mirrored Hardware



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Borland continues to expand wares

Since it first appeared on the market, Borland International's Turbo Pascal — a high-speed compiler and language development environment for Zilog, Inc.'s Z80- and Intel Corp.'s 8086- and 8088-based microcomputers — has been joined by four other Turbo programs.

The Turbo family now includes Turbo 87, a Turbo Pascal program with Intel's 8087 support for 16-bit computers; Turbo Tutor, a tutorial for novice Pascal users; Turbo Toolbox, a Pascal program development tool that complements Turbo Pascal; and Turbo Graphix Toolbox, which provides graphics procedures to be used with Turbo Pascal.

Last summer, Borland introduced Sidekick, its first application program, priced at $49.95. Designed for the IBM Personal Computer and compatibles, Sidekick is a desk-accessory program that includes a notepad, a calculator, an appointment calendar, an automatic telephone dialer and Ascii conversion tables.

In February, the firm began shipping Superkey, a keyboard enhancement program priced at $69.95. With Superkey, users can program a single key to replace often-used commands.

What's next for Borland? The firm is now working on Sidekick Plus, a successor to Sidekick, according to Philippe Kahn, Borland's founder. In addition, the company is developing language tools for C, Modula-2 and Basic, he said.

Seeking to dispel rumors, Kahn added the firm is not designing a Lotus Development Corp. 1-2-3 look-alike or an Ashton-Tate Dbase II clone.

KAHN

from page 51

So Kahn designed a phony flip chart that listed the top business and computing magazines of the day, with notes on how large an ad the firm planned to take out in each. "*Business Week* — double spread," read one page. While the target magazine was included on the chart, it had been crossed out.

Kahn enlisted a friend to play his secretary, and instructed her to interrupt his meeting with the target magazine's salesman with the message that a large Japanese firm wanted to order one million copies of Turbo Pascal.

When the salesman arrived, he noticed the chart and asked Kahn why his magazine had been crossed off it. Kahn feigned embarrassment and apologized, saying his staff should not have left the chart out. When his "secretary" told him that a Japanese firm was on the line, he left to take the call in an adjoining room. There, watching through a peephole drilled for the occasion, Kahn saw the salesman staring with bewilderment at the chart.

When Kahn returned, the salesman had been snared. He volunteered to give the Turbo Pascal advertisement special placement at a reduced rate and, most importantly, gave the firm two months to pay. Kahn, pretending to be reluctant, agreed.

Turbo Pascal, sold through mail order, went on to achieve remarkable success, analysts said. Jan Lewis, a senior analyst with Infocorp, a Cupertino, Calif.-based market research firm, said the release of Turbo Pascal resulted in a ground swell of grass-roots support for the young firm.

According to Kahn, more than 300,000 copies of the $49.95 program have been sold since late 1983. Turbo Pascal gave Borland a solid financial footing for marketing other products (see story left).

Kim Evans, an industry analyst at Dataquest, Inc., a San Jose, Calif.-based market research firm, estimated that privately owned Borland took in $10 million in revenue in 1984.

The original Turbo Pascal ad, now framed, hangs in the firm's conference room. Borland's ads, which are long on information and short on style, have become a trademark of sorts for the firm. "Their ads might not be elegant, but they are effective," Lewis said.

Although his days of hoodwinking unsuspecting salesmen have passed, Kahn continues to champion an unconventional approach to business, which extends to his style of dress. At a recent interview, Kahn sported bright red corduroy slacks and a flowered Hawiian shirt.

When asked to describe the firm's philosophy, Kahn, who worked his way through college playing the saxophone in French jazz clubs, paraphrased American jazz musician John Coltrane. "Coltrane once said, 'Damn the rules. Any way you play it, it's the same 12 notes,' " Kahn said.

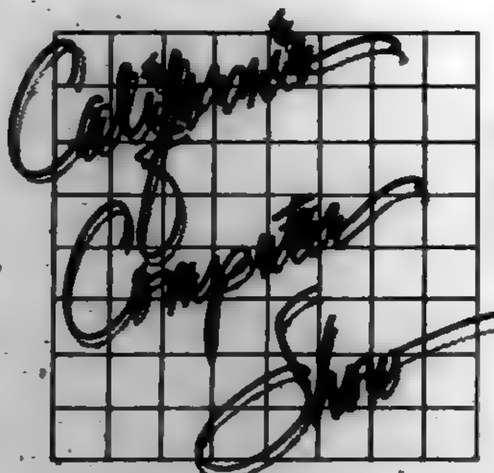
Champion of functionality

Unlike other firms that emphasize the importance of marketing, Borland champions functionality. "We sell useful software at rock-bottom prices," Kahn said. "We are customer-oriented first. We are product-oriented and technology-driven. Marketing comes after that."

At a time when experts said there was no market for programming tools, Kahn built a prosperous firm on the shoulders of a Pascal compiler, said Scott Tiernan, who sits on the board of the Software Entrepreneurs' Forum, a Palo Alto, Calif., group. "He has shaken up an industry that really was closed to the little developer," Tiernan said.

Tiernan added that independent software developers regard Kahn as a hero. "Everyone likes to see someone who becomes successful, especially when they're going aginst the grain," he said.

Dataquest's Evans attributed Borland's accomplishments to the company's ability to provide "excellent technically oriented products" to a specially targeted audience — the technical, scientific and student markets. "It's a significant part of the market whose needs have not been addressed to the fullest extent," she said.



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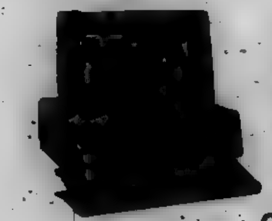

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INFOTRON SYSTEMS

HP launches hardware, software for micro OA

By Jeffry Beeler
CW West Coast Bureau

PALO ALTO, Calif. — Hewlett-Packard Co. late last month moved on both hardware and software fronts to make its personal computer line more useful in office automation.

On the hardware side, the firm extended its Touchscreen microcomputer family with the introduction of two desktop processors that provide larger display screens and more I/O capacity than their HP predecessors.

On the software side, six additional modules were added that reportedly reflect HP's desire to encourage use of the Touchscreen machines as stand-alone micros rather than as terminals. The six packages follow:

- HP Access, a Touchscreen-resident application that reportedly simplifies the task of extracting data from host CPUs or micros and allows users to download the material for local processing.
- HP Application Link, an Access-like product that extends the company's existing financial applications by permitting accounting data to be retrieved remotely from HP 3000s and downloaded to Touchscreen sys-

See HP page 60

Tandy introduces micro net

FORT WORTH, Texas — Tandy Corp. has announced a personal computer local-area network that requires no dedicated file server.

The Vianet network reportedly will link IBM and Tandy personal computers and other machines' computers running Microsoft Corp.'s MS-DOS operating system. Each micro will gain equal access to the network's resources. Vianet will be based on the Datapoint Corp. Arcnet token-passing data-link hardware.

Vianet reportedly needs no central, dedicated computer to function as a server and has a fully distributed architecture and simple command structure. If one personal computer in the network fails, the network will remain up, Tandy said.

Vianet users reportedly will be able to share applications software and any data or printers normally accessed by that software. The Tandy network also emulates Microsoft MS-DOS 3.1 record-locking calls, allowing multiuser applications to run without modifications.

Vianet interface boards — with network software — for Tandy Models 1000, 1200, 2000 and other IBM Personal Computer compatibles cost $499.95. An active hub for the network costs $695.95. A passive hub costs $69.95.

Tandy is located at 1800 One Tandy Center, Fort Worth, Texas 76102.

ZENITH from page 51

the Z-171 may be the most eye-catching machine of the group. The resemblance of the $2,699 Z-171 to Morrow, Inc.'s Pivot is no accident, according to Zenith Marketing Vice-President John Frank.

The Z-171, Frank said, is the result of a joint venture with Morrow in which Zenith enhanced the Pivot's basic design to include a back-lit, 25-line display, a pressure-sensitive function key template and optional support for a VDT. The machine will ship in June and is based on the Harris Corp. 80C88, a Cmos chip with reduced power requirements.

The other transportable in the rollout, the Z-138, is "25% lighter than most CRT-based [transportables] on the market," Frank said. Based on the Intel 8088 chip, the standard Z-138 includes a 7-in. Zenith Chromagold amber display; detached keyboard; 128K bytes of memory (expandable to 640K bytes); one 360-byte, 5¼-in. diskette drive; and MS-DOS 2.11 and 1.25. It costs $2,299. A dual-drive, 256K-byte unit costs $2,599. Both will ship in July.

For the low end of the desktop market, the Z-148 reportedly offers in its standard version one 360K-byte diskette drive, 128K bytes of memory, serial and parallel ports, detached keyboard and MS-DOS. It costs $1,899. A dual-drive unit costs $2,199. Both will ship in July.

The enhanced Z-150, called the Z-158 series, reportedly is based on the Intel 8088 processor but operates at a clock speed of 8 MHz instead of the 8088's standard 4.77 MHz. As a result, applications execute 60% faster, Zenith said. For timing-sensitive Personal Computer software, a switch reduces the clock speed to 4.77 MHz. Machines in the Z-158 series will include a single-drive model, priced at $2,499; a dual-drive model, priced at $2,899; and a dual-drive model with an internal 10M-byte disk, priced at $4,099. Delivery of Z-158 series machines will begin in July.

Zenith also is introducing a line of monochrome monitors that use what Zenith called nonglare technology to reduce reflections. A 12-in. model, with either an amber or green screen, will cost $199. An amber screen, 12-in. monitor with what Zenith called an improved contrast element will round out the line. It costs $229.

Zenith Data Systems, a subsidiary of Zenith Electronics Corp., is located at 1000 Milwaukee Ave., Glenview, Ill. 60025.

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REFLEX

from page 51

"what-if" functions with their data. "We have to analyze data in different ways so we know where and when to sell different products," noted Robert Dafala, assistant vice-president at Crocker National Bank in San Francisco. "Reflex stores historical performance and sales data and provides the tools needed to analyze it."

Reflex had to supply a number of mathematical functions to analyze the data. "A number of data base packages allow a user to include simple equations in a report or a data base," said James Washagan, sales administration manager at Clorox Co., an Oakland, Calif., manufacturer of household products. "Reflex provides sophisticated statistical features such as the ability to add or multiply columns."

Malmberg, a beta test user of the package, has worked with Reflex since November, monitoring the performance of various McKesson subsidiaries, such as its liquor distributor with 40 facilities.

"We have a number of suppliers for various brands of liquor," he explained. "Reflex allows us to monitor the financial performance of each supplier. With the package one can examine a physical record, translate the data into a graph and produce a number of charts."

At Clorox, Reflex supplements Information Builders, Inc.'s Focus. Washagan downloads Ascii files from Focus and loads them into Reflex to produce graphs and reports that help monitor sales performance.

Before finding Reflex, Washagan had searched through a number of other data base packages for one that met his needs. These packages included Information Builders's PC/Focus, Microrim, Inc.'s R:Base 4000 and Micro Data Base Systems, Inc.'s Knowledgeman.

For Malmberg, Lotus Development Corp.'s 1-2-3 was inadequately fulfilling functions that are now completed with Reflex. "After one builds a Lotus model, he can just examine how various input would affect output," he said. "Reflex allows one to build different types of models and look at data in different ways."

The beta users claimed that Reflex was easy to operate. "The package's pull-down menus and Help screens alleviate training woes," Washagan said. "The package is much easier to work with than something like [Lotus'] Symphony, which has five or six layers." Users said they were operating the product a few hours after receiving it and were constructing complex data base models in a few days.

Complaints about the product were few. Reflex did not supply relational capabilities, Washburn noted, so that users are unable to link files.

A second complaint focused on Reflex's report-writing module. "I am unable to load it and the program disk at the same time," Malmberg said. "They should be stored on the same diskette."

Despite the beta users' praise of the product, six to eight months after first receiving it the users are like Lone Rangers in their corporations. "Although I am the only person at the company working with the product now, I think it may soon be introduced to other departments," Malmberg predicted.

First commercial deliveries of Reflex began in April.

MEMORY

from page 51

a variation of memory paging, in which one region of the processor's address space is equipped with an I/O port and performs as a window to the larger paged memory.

In the case of the Lotus/Intel spec, a 64K-byte region called the page frame is mapped out somewhere between 784K bytes and 960K bytes. Within the page frame are four 16K-byte windows — each of which is independently addressable, speeding things up.

Expanded memory paging

The PC-DOS/MS-DOS software driver, called the Expanded Memory Manager, pulls pages of expanded memory into the page frame when they are necessary, according to Intel. The driver also handles programs that run concurrently, as well as print spooling and virtual disk functions.

This, in short, is described by Lotus and Intel as the "expanded memory" approach.

As the spec notes, this approach has nothing to do with what IBM calls "extended memory" for the Personal Computer AT. The AT's 80286 processor potentially can access extended memory in the 1M- to 16M-byte range — but programs running under PC-DOS can't, except as a virtual disk.

Within the MS-DOS world, of course, there are other ways to get that added RAM. Among these is the software segmentation architecture in the Microsoft Corp. Windows environment, which shuffles data around more flexibly, according to Chris Larsen, MS-DOS product manager at Microsoft.

Virtual memory support

Alternatively, the next release of MS-DOS may support virtual memory, a more sophisticated technique than memory paging and one that will bring "personal computer software technology into the 1970s," speculated Richard Strauss, vice-president for products at Corporate Software, Inc.

As usual, IBM's plans remain obscure. Tom Billadeau of TRB & Associates is among those suggesting that Big Blue may go with a virtual machine facility, "which could be cheaper."

While acknowledging that uncertainty, however, Kapor pointed out that "there's nothing else out there now."

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Lotus unveils report writer for 1-2-3

CAMBRIDGE, Mass. — Lotus Development Corp. last week introduced 1-2-3 Report Writer, a $150 program well described by its title.

The package will enable users of Lotus' 1-2-3 program to create custom reports and forms using data from 1-2-3 data base files.

The Report Writer is said to change or delete fields, to add multiple-line headers or footers, to sort up to four levels and to perform calculations.

Additionally, the product will save report formats and libraries for future use, according to a spokesman. It will store up to 30 different formats per file.

The package will handle up to 160 fields and as many records as a 1-2-3 data base can contain, he said.

Originally developed by Concentric Data Systems, Inc. of Westboro, Mass., and named 3-2-1 Report!, 1-2-3 Report Writer represents the first Lotus product to reach the market that was not developed in-house, the spokesman noted.

The program reportedly will work with existing versions of 1-2-3 and with the release scheduled for fall shipment.

Available this fall, 1-2-3 Report Writer will run on the IBM Personal Computer, Personal Computer XT, Personal Computer AT and the Compaq Computer Corp. line of IBM-compatible systems.

Running with 1-2-3, it requires 256K bytes of internal memory, IBM's PC-DOS or Microsoft Corp.'s MS-DOS 2.0 or higher operating system and a minimum of two floppy disk drives.

The software will be demonstrated for the first time at Comdex/Spring '85 this week in Atlanta, the spokesman said.

Lotus is headquartered at 55 Cambridge Pkwy., Cambridge, Mass. 02142.

AST, Borland to market tool

IRVINE, Calif. — AST Research, Inc. and Borland International have announced a joint marketing agreement under which Borland's Sidekick desktop utility software package will be bundled with AST's Sixpackplus multifunction board for the IBM Personal Computer.

Under the agreement, AST will begin including Sidekick in Sixpackplus this month. A nonprotected copy of Sidekick will be mailed to existing Sixpackplus users, AST said.

Sixpackplus reportedly offers up to 384K bytes of memory and several I/O capabilities.

Sixpackplus with 64K bytes of memory and Sidekick costs $395. Sold separately, Sidekick costs $84.95 in its unprotected version.

AST Research is located at 2121 Alton Ave., Irvine, Calif. 92714.

Commodore high-performance micros out

Unix-compatible C900 based on Zilog CPU

HANNOVER, West Germany — Amid much fanfare here at last month's Hannover Faire, Marshal Smith, Commodore Business Machines, Inc. president, launched that company's latest entry into the high-performance range of microcomputing — the Commodore 900. The product is a 16-bit AT&T Unix-compatible personal computer.

The C900 machine, based on Zilog, Inc.'s Z8000 CPU, will be available in two versions, Models I and II. Model I operates as a single-user personal workstation with an emphasis on computer-aided design applications. The Model I features a graphics resolution of 1,024 by 800 pixels, a mouse control device and windowing capabilities. It comes with a 15-in. monochrome monitor, a video controller card with a 128K-byte memory and a 20M-byte hard disk.

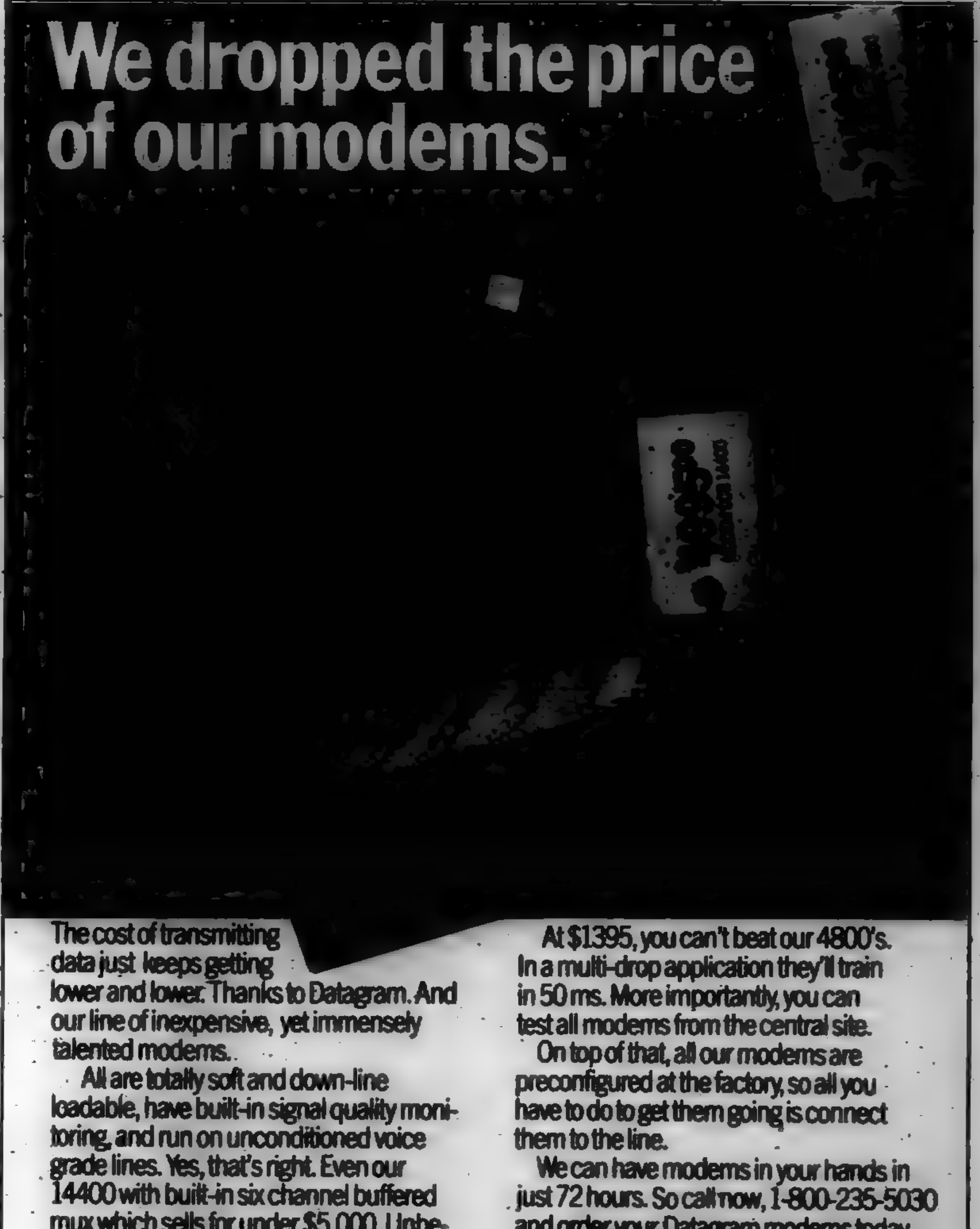
The Model II, the multiuser system, is equippd with C compiler software, more than 50 applications and a Business Basic Compiler. Model II features a monochrome monitor and a 67M-byte hard-disk capacity, and supports up to seven RS-232C ports.

The main storage capacity of both models is 512K bytes of random-access memory, expandable to 2M bytes. The built-in hard disk has between 20M and 67M bytes, and the floppy disk drive has 1.2M bytes.

The C900 runs under the Coherent operating system offered by Mark Williams Co. of Chicago. Coherent is said to be completely compatible with AT&T's Unix System V Version 5.2 and to put its utilities and operating system into 2M bytes of disk storage.

The Commodore 900 machines will be built in Germany and will be available in the U.S. in the third quarter. Prices for the machines will begin at approximately $2,700, Smith said.

Commodore is headquartered at 1200 Wilson Drive, Westchester, Pa. 19380.



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Quadram announces voice/data integration boards for IBM micros

NORCROSS, Ga. — Quadram Corp. has introduced for the IBM Personal Computer and Personal Computer XT its Silver Quadboard enhancement card and its Asher C1200 and C2400 voice/data integration boards.

The Silver Quadboard is said to offer up to 640K bytes of memory based on 256K-bit dynamic random-access memory (RAM) chips. It comes bundled with Quadmaster III software and includes one parallel and one serial port.

The Quadmaster III software reportedly offers users the ability to set up virtual memory disks in RAM, with the virtual disk size fixed in 1K-byte increments. The package also includes a controlled print buffer.

The C1200 and C2400 Asher boards reportedly are full-length cards linked through dual cables to the user's telephone system. Communications commands are controlled by the Personal Computer's keyboard, and voice and data transmission takes place simultaneously.

The C1200 reportedly offers communication at 1.2K bit/sec. and can be upgraded to 2.4K bit/sec. without replacing the entire card. Both cards are equipped with a concurrent windowing program that permits users to run five different programs in main memory.

The C1200 costs $695; the C2400 is $995.

Without memory, the Silver Quadboard is offered with serial, parallel and game ports, clock calendar and software for $325. Memory configurations are priced as follows; 64K bytes, $395; 384K bytes, $595; and 640K bytes, $795. An optional second serial port costs $50. The Silver Quadboard reportedly will be available in the second quarter.

Quadram is located at 4355 International Blvd., Norcross, Ga. 30093.

Datacopy adds enhancements to Wips system

MOUNTAIN VIEW, Calif. — Datacopy Corp. has introduced two software packages that enhance its Word Image Processing System (Wips) and one package that provides Wips capabilities without the use of an image scanning device.

The Wips system operates on the IBM Personal Computer XT and AT and consists of a scanning device, which captures an image, and Wips software, which reportedly permits image storage and manipulation.

One of the packages, Wips Editor, permits the editing of a Wips image file at the picture element level, according to the vendor. It allows scrolling in its zoom mode and features such editing tools as paintbrush, airbrush, erase, drawing and text insertion. Cut-and-paste capability is also provided.

Another of the packages, Wips Planner, reportedly permits page planning, including the layout of pages and integration of text and graphics. The layouts are created by defining boxes for text and images or by modifying standard layouts.

The third product, Wips Jr., is said to contain all of the image-handling capabilities of the standard Wips software except image capture capability. Systems under Wips Jr. gain images for manipulation via diskettes or a communications network.

Wips Jr. is priced at $495. Wips Planner costs either $995 or $1,350 depending on features. Wips Editor is priced at $245.

Datacopy is located at 1215 Terra Bella Ave., Mountain View, Calif. 94043.

Service program offered

CULVER CITY, Calif. — Ashton-Tate has announced a Corporate Emphasis program, designed to supply large corporations with technical support and programming tips. Companies purchasing 25 copies of Ashton-Tate products are eligible for the program.

Services include a technical support phone line open only to large corporations, a list of third-party training companies certified by Ashton-Tate and the help of Ashton-Tate engineers in developing various applications.

The program provides self-study training textbooks, workbooks and demonstration diskettes.

Ashton-Tate also announced it will begin publishing three periodicals. "Tech Notes," designed for corporate microcomputer support specialists, will offer tips on applications development, the vendor said. "Corporate Update Newsletter" will supply executives with product information. "Ashton-Tate Quarterly Review" will consist of case studies and other materials from books published by Ashton-Tate's Publishing Group.

In addition, Ashton-Tate plans to form an advisory board of corporate microcomputer managers to inform the company of other support needs.

Ashton-Tate is located at 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

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Morrow unveils IBM-compatible portable

By Kathleen Sullivan
CW West Coast Bureau

SAN LEANDRO, Calif. — Morrow, Inc. this week will introduce the Pivot II, a battery-powered portable the firm said is fully IBM-compatible. The Pivot II features a specially designed LCD with a 25-line screen.

Based on the 16-bit 80C88 Cmos microprocessor, the 13-lb Pivot II portable comes with Microsoft Corp.'s MS-DOS 2.11 operating system. The computer reportedly includes Newword, a word processing program from Newstar Software, Inc.

Included in the system's 32K-byte read-only memory are a personal appointment scheduler, a four-function windowing calculator, a clock calendar, phone directory and automatic dialing program, Morrow said. Unlike other portable computer firms, which have adopted the 3½-in. disk drive for their new systems, Morrow has retained the standard 5¼-in. disk drives for the Pivot II line.

An internal rechargeable battery will power the system for approximately three hours, the company said.

Like its predecessor, the Pivot, the system includes Morrow's Lumicon display technology, which the company said enhances viewing under difficult lighting conditions. The screens reportedly feature a proprietary nonglare material. Three models will be available. One model will feature a single disk drive and 256K bytes of random-access memory (RAM). It will cost $1,995, the firm said.

The other models will come with dual disk drives, an internal 300/1,200 bit/sec. modem and red-green-blue and composite video capabilities as standard features, the company said. One model, with 256K bytes of RAM, will sell for $2,995; and the 640K-byte version, for $3,795.

The firm has promised to deliver an adapter kit by the third quarter of this year that will allow users to hook up the Pivot II to an IBM expansion chassis.

Morrow is located at 600 McCormick, San Leandro, Calif. 94577.

HP from page 54

tems, according to HP.

- HP Word/150, which for the first time allows a secretarial word processing capability to be offloaded from HP 3000s to the company's micros.
- HP Print Central, which reportedly provides users with a command-free means of borrowing a shared printer by going through a host HP 3000.
- Two programs that reportedly make the company's Thinkjet and Laserjet printers compatible with Apple Computer, Inc.'s Macintosh.

Joining HP's personal computer line are the Touchscreen II and Max II, which satisfy widespread user demand for an enlarged screen, according to John Metcalfe, the firm's OA marketing manager. Both the latest Touchscreen models boast 12-in. screens, compared with 9-in. displays for the product family's original members.

Unlike existing HP micros, which offer only two accessory slots, the Touchscreen II and Max II each come with four slots. Metcalfe said the availability of two extra slots gives users increased flexibility to expand their memories or attach additional peripherals as their needs dictate.

In contrast with earlier HP micros, the two latest machines are said to provide a choice of user interfaces — Touchscreen or conventional.

With HP Access, users of both the Touchscreen II and Max II can remotely retrieve information from an HP 3000 series data base without knowing anything about the host's commands, Metcalfe said. The same software product reportedly can allow the two desktop models to gain access to personal computer data bases.

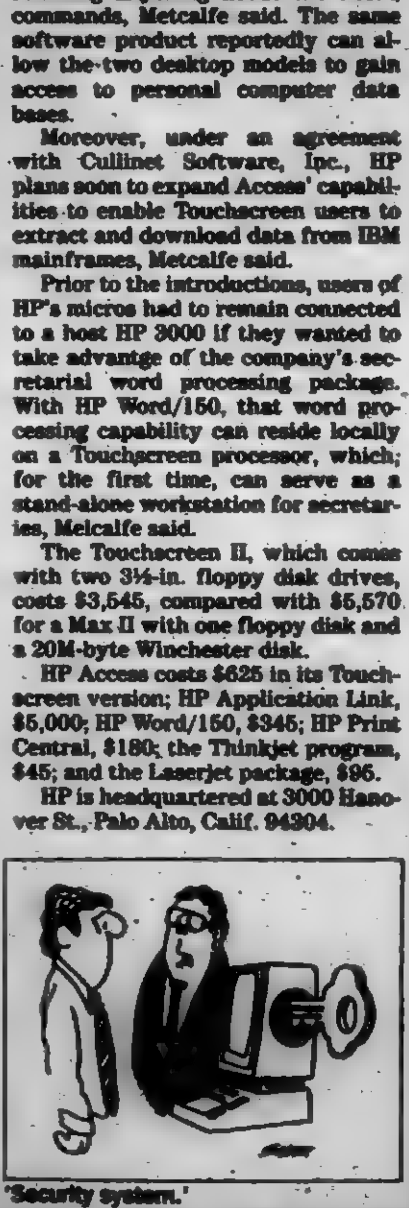
Moreover, under an agreement with Cullinet Software, Inc., HP plans soon to expand Access' capabilities to enable Touchscreen users to extract and download data from IBM mainframes, Metcalfe said.

Prior to the introductions, users of HP's micros had to remain connected to a host HP 3000 if they wanted to take advantge of the company's secretarial word processing package. With HP Word/150, that word processing capability can reside locally on a Touchscreen processor, which, for the first time, can serve as a stand-alone workstation for secretaries, Metcalfe said.

The Touchscreen II, which comes with two 3½-in. floppy disk drives, costs $3,545, compared with $5,570 for a Max II with one floppy disk and a 20M-byte Winchester disk.

HP Access costs $625 in its Touchscreen version; HP Application Link, $5,000; HP Word/150, $345; HP Print Central, $180; the Thinkjet program, $45; and the Laserjet package, $95.

HP is headquartered at 3000 Hanover St., Palo Alto, Calif. 94304.



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Application Compiler[1]:	Yes	No
Report Writing Features: (A) Access to System Date and Time:	Yes	No
(B) Choice of Column or Row Format:	Yes	No
(C) Accessible Tables:	40	10
Password Security:	Yes	No
User-Definable Data Entry Rules:	Yes	No
Automatic Key Index Maintenance:	Yes	No
Data Dictionary:	Yes	No
Number of Relational Operators:	6	2

[1] From original manufacturer.

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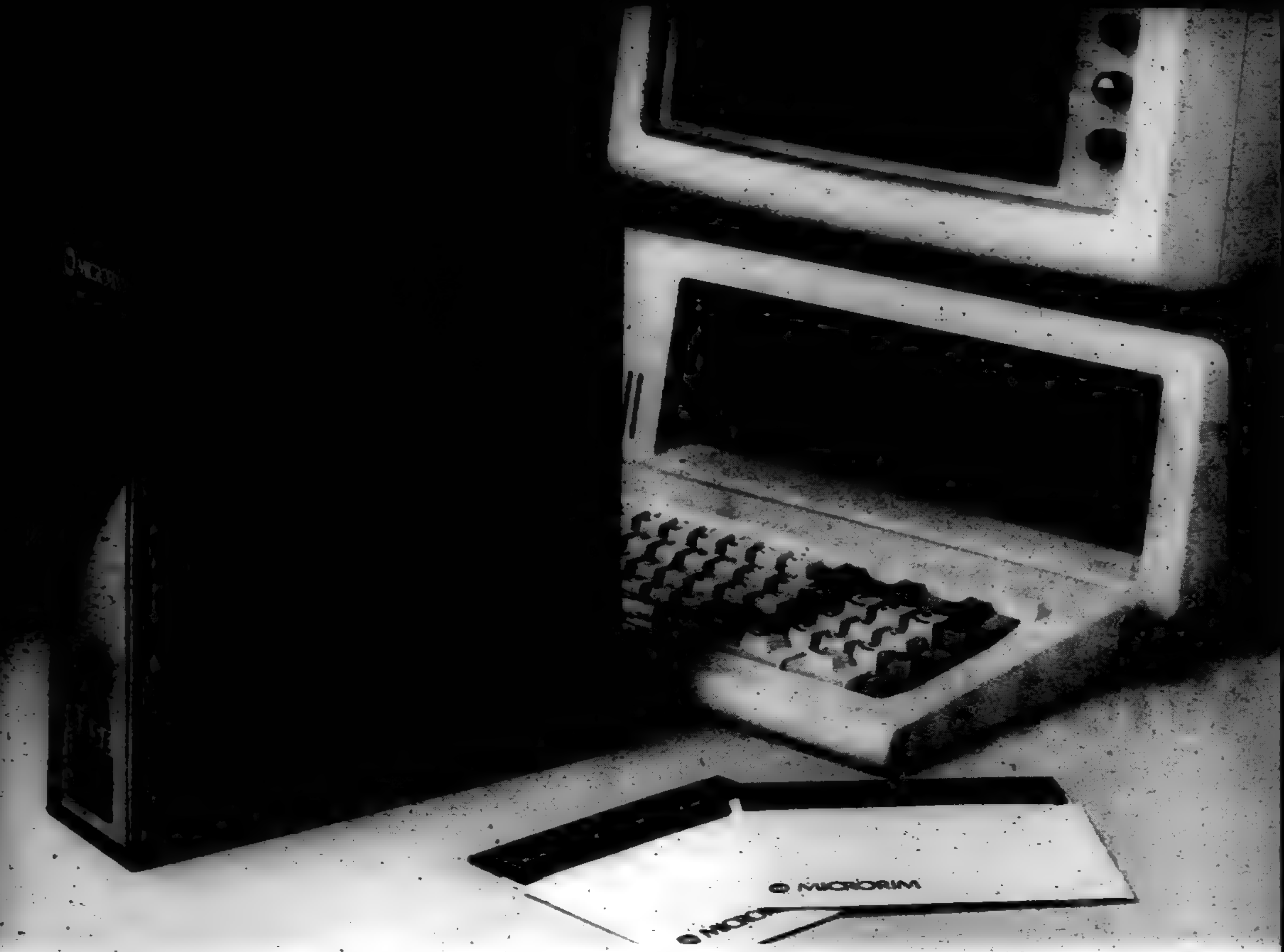

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COMMUNICATIONS

WIRE TAP/DANIEL MINOLI

Net optimization takes practical insight

Some network design issues from five years ago still confront the practitioner trying to optimize a network in the postdivestiture era to take advantage of tariff gradients for traffic flowing within and between Local Access Transport Areas.

These issues relate to the processes used to calculate the resources needed to connect corporate facilities, which determines such things as the number of lines, ports or pooled modems needed. The desire of network optimization is to minimize the facilities used while achieving a desired grade of service based on response times and the number of busy signals the user is willing to endure.

The pragmatist who routinely consults modeling tables to determine the number of lines needed to support given traffic patterns — such as Erlang B tables — may be overlooking some assumptions made with the model that could obscure actual needs.

The following are some assumptions intrinsic to many modeling aids that diverge from the conditions typical of network environments:

- Many optimization models assume — for mathematical reasons — that the number of users that need to be supported at a remote site is infinite. Presuming that all other assumptions made with network models such as Erlang B are valid, this assumption leads to drastically different results compared to the answers reached when the real population at that site is considered.

A more sophisticated model, the Engset model, uses most of the same assumptions as Erlang B but takes into account real user populations, leading to a more realistic determination of the resources needed. Formulas that use infinite populations can suggest the use of twice as many lines or ports, for example, as models that take into account actual user

See MODEL, page 73

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

IBM 3274 upgrade coming?

DATA STREAM
John Dix
CW Senior Editor

Although the timing is still uncertain, there are many indications that IBM is readying a replacement for its workhorse communications controller, the 3274, that will offer a slew of improvements over the older box.

While some of the capabilities discussed here are drawn from user wish lists instead of from concrete insight into what the controller will actually look like, most assumptions revolve around the idea of increasing connectivity on both the workstation and host sides of the controller.

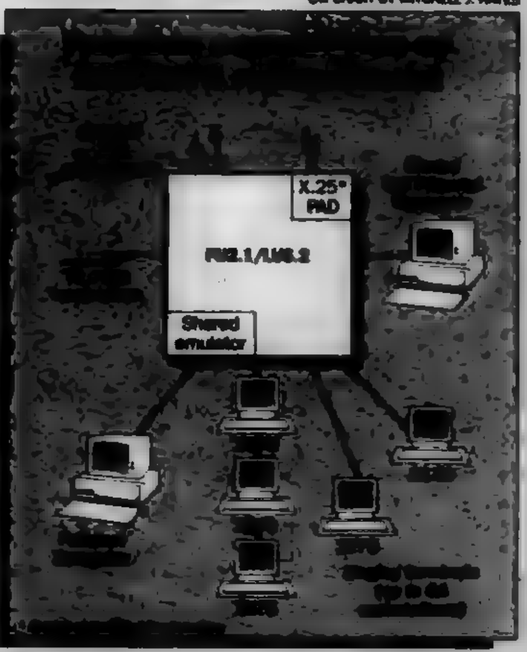
Many of the capabilities analysts expect to be incorporated into IBM's 3274 replacement are already available from plug-compatible controller manufacturers. The replacement box will, for example, probably support 64 devices, twice the number supported by the 3274; this is a feature available from a couple of competitors.

Today, the 3274 within IBM's System Network Architecture (SNA) is a Type 2 Physical Unit (PU). All nodes in SNA networks are associated with one or more of the following: an actual physical unit type, a Logical Unit (LU) or a Systems Services Control Point (SSCP).

Within SNA the 3274 replacement will likely be an upgraded type of Physical Unit known as a PU 2.1. If

See 3274 page 72

CW CHART BY MITCHELL J. HAYES



- Cohesive Networks has released T1 products for backbone networks/66
- Memotec Data has introduced a network management system that runs on an IBM Personal Computer XT and can be used to monitor an X.25 network/66
- Hewlett-Packard has announced a statistical multiplexer that connects up to 16 workstations/69
- Bridge Communications has announced an Ethernet gateway that can be used to tie network segments together into a net up to 40 kilometers long/70

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HP announces local network connecting superminis, micros

PALO ALTO, Calif. — Hewlett-Packard Co. has announced HP 9000 LAN, a local-area network that connects HP's 9000 Series 500 supermicrocomputers and HP 3000 superminicomputers.

HP 9000 LAN is based on HP's Advancenet local network. HP 9000 LAN reportedly supplies an Ethernet-type interface, supports transmission speeds up to 10M bit/sec., runs on baseband media and includes multiple access collision detection facilities. The local network is said to connect up to 100 devices over a maximum distance of 500 meters.

HP 9000 LAN features file transfer capability, remote program management, interprocessor communications and remote file access.

The product consists of interface cards for each node and network software. The card costs $2,200.

For single-user HP 9000 devices, the software costs $1,700 for the first node, $850 for additional nodes. For multiuser devices, software is $4,000 for the first node, $2000 for each extra node.

HP is located at 3000 Hanover St., Palo Alto, Calif. 94304.

Seminar views communications issues

By Paul Korzeniowski
CW Staff

BOSTON — Corporations are being forced to monitor a meteoric rise in the use of communications with inadequate network management tools.

That message was delivered at "Strategic Planning for Network Management," a seminar that took place during Network Management Technical Control, a conference held here recently sponsored by the CW/Conference Management Group based in Framingham, Mass.

Wayne Hall, manager of corporate network programs at Digital Equipment Corp., monitors DEC's in-house network, which connects more than 40,000 terminals, 5,000 personal computers and 2,700 nodes throughout the world. "Our network is probably 100 times larger than any of our customers' networks," he said. "Since the network is so large, it presents us with some challenges. There are no network management packages designed for such a large system, and we can't turn to other companies to help solve a problem."

Hall's problem will become worse during the next few years as the network expands and the number of personal computer users grows to 25,000 or 30,000.

As this process evolves, network growth may be limited by network management system inadequacies. James G. Herman, director of network architecture at BBN Communications Corp. in Cambrige, Mass., noted, "As networks grow and become more complex, one may not possess the tools needed to monitor and fix them. It is similiar to the use of vacuum tubes. As vacuum tubes became the limiting factor to what a computer could do, new technologies had to be developed."

Hall concurred. "Just tracking and managing equipment used on our network has become a difficult task," he noted.

Another missing item in network management systems is a telephone cost tracking system. "Telephone costs differ throughout the world," he said. "Just determining what our telephone costs are can be a tedious process. Once these costs are determined, one must determine where costs can be cut. If we cut costs, we must substantiate those cuts. Whenever we want to spend money for enhancements, we have to show where the money is going."

Another problem is monitoring network performance. "It is difficult to separate network functions from the software that runs on the network," he said. "Do response time improvements stem

See LIMITS page 72

System enables users to create nets with T1 facilities

CAMPBELL, Calif. — Cohesive Networks, Inc. has released the Cohesive System, products said to enable a company to create backbone networks using T1 1.54M bit/sec. digital communications facilities.

The product consists of two parts: CN-1 nodes and the operation management system (OMS).

A CN-1 node is compatible with the wideband digital services offered by AT&T, the former Bell operating companies and interchange carriers, as well as private T1 transmission equipment such as microwave, fiber-optic, satellite or coaxial media, the vendor said. T1 lines and digital transmission equipment can be connected to CN-1s through standard DS-1 interfaces.

The product supports asynchronous transmission rates from 50 to 19.2K bit/sec. Synchronous transmission through RS-232 interfaces ranges from 1,200 to 19.2K bit/sec.

Synchronous transmission rates for V.35 connections range from 1,200 to 56K bit/sec. Up to 56 RS-232 ports operating at speeds up to 9.6K bit/sec., or up to 28 V.35 connections operating at 56K bit/sec., can be attached to the network.

A CN-1 node controls different transmission facilities and devices through a timing and control scheme called automative adaptive network synchronization. Each node can reroute transmissions if a link fails.

A single OMS, consisting of a computer with 80M bytes of hard-disk storage, terminal and printer, is needed for each network. OMS enables a user to configure a network and dedicate types of lines between different nodes. It also supplies diagnostic features and provides summary reports of network usage, according to the vendor.

Cohesive System costs range from $30,000 to $70,000 per node.

More information is available from Cohesive Networks, located at 1680 Dell Ave., Campbell, Calif. 95008.

Net manager debuts, runs on IBM micro

NORCROSS, Ga. — Memotec Data, Inc. has introduced Network Control Centre (NCC), a network management system that runs on an IBM Personal Computer XT and can be used to monitor an X.25 network.

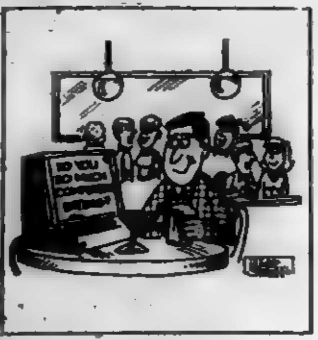
The product monitors X.25 packet assembler/disassemblers and X.25 switch concentrators and stores calling information on the microcomputer's hard disk, the vendor said. Reports on network status, use and call billing can then be generated. For example, the package will provide reports listing who used the network, how long the user was connected to it and how many packets of data the user sent on the network. The software also supplies billing information on network users.

A vendor spokesman said the package monitors the condition of each device on the network and informs a central operator whenever there is a problem.

NCC runs on a Personal Computer XT with IBM's PC-DOS 2.1 and 256K bytes of random-access memory.

NCC costs $5,000.

Memotec Data is located at Suite 105, 3320 Holcomb Bridge Road, Norcross, Ga. 30092.



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COMMUNICATIONS

Xpert gets Uninet OK

ALEXANDRIA, Va. — Atlantic Research Corp. has announced that its Xpert terminal has been certified for use on Uninet, Inc.'s public packet-switching network.

Xpert reportedly can hold four host sessions simultaneously and emulates IBM 3270 series, Digital Equipment Corp. VT100 and Ascii terminals. Users can move from one host session to another by pressing a few keys.

Because the product was designed for packet-switching networks, the terminal does not require a packet assembler/disassembler or protocol converter, the vendor said.

Atlantic Research is located at 5390 Cherokee Ave., Alexandria, Va. 22312.

MULTIPLEXERS/ MODEMS

■ **Nokia-Kinex Corp. has announced 14400/M, a 14.4K bit/sec. modem that is said to operate over AT&T leased lines.**

The modem features synchronous operation, a variety of tail circuit applications, automatic adaptive equalization, fault isolation, performance capability, remote control diagnostics, noninterfering port diagnostics, independent monitoring of RS-232 signals on each port, dynamic real-time digital line quality monitor and bit-error rate tester.

A vendor spokesman said the product is available in single-port or multiport configurations. A single-port model has 12K and 9.6K bit/sec. fallback transmission rates. A multiport configuration allows up to four channels to send data over the same path, the vendor said.

A single-port version of the product costs $3,295.

Nokia-Kinex, 6950 Bryan Dairy Road, Largo, Fla. 33543.

■ **Astrocom Corp. has introduced a modem emulator that operates either separately or combined with RS-232 and V.35 interfaces.**

The modem emulator replaces two back-to-back modems and can provide RS-232-to-V.35 interface conversion. The V.35 interface allows synchronous devices to communicate at distances of up to 2,000 ft. The emulator runs asynchronously at speeds up to 57.6K bit/sec. or synchronously at switch-selectable speeds of 2.4K, 4.8K, 9.6K, 19.2K, 38.4K, 56K or 57.7K bit/sec.

Single-quantity prices are $367 for the RS-232 stand-alone version and $235 for the circuit card version. The optional V.35 interface unit is $419 for the stand-alone version, $285 for the circuit card version.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

■ **Nokia-Kinex Corp. has announced the 9600/FP, a 9.6K bit/sec. diagnostic modem that can monitor up to 16 remote devices on a multidrop line.**

The 9600/FP reportedly enables users to perform remote polling tests and a universal test that simulates polling performance of a multipoint network. It is said to feature a built-in network diagnostic system, automatic retrain on remote modems, automatic antistreaming, fault isolation and performance monitoring. The modem supports synchronous half-duplex or full-duplex communications.

The modem's retraining cycle during each poll of a multipoint line takes 30 msec, the company reported.

The 9600/FP costs $2,575.

Nokia-Kinex, 6950 Bryan Dairy Road, Largo, Fla. 33543.

■ **Hewlett-Packard Co. has announced HP 2334A, a statistical multiplexer that connects up to 16 workstations.**

The product is said to work with analog or digital leased lines, dial-up lines or

Continued on page 70

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Continued from page 69

X.25 packet-switching networks. The HP 2334A transmits data at speeds up to 19.2K bit/sec. and supports port speeds to 9.6K bit/sec.

The full-duplex, asynchronous product may be integrated into an X.25 network, the company reported. For example, HP 2334A can be connected to an HP 3000 series or HP 1000 series minicomputer and act as a remote X.25 workstation cluster controller, according to the vendor.

HP 2334A prices range from $2,500 for a four-port version to $6,000 for a a 16-port model.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

■ **Xel Communications, Inc. has introduced a combination data service unit and channel service unit for use with AT&T's Dataphone Digital Service network.**

The product, Daphne, includes three loopbacks and a self-test feature. An eight-position modular jack makes it possible to interface with other networks, the vendor said.

The 8500-000 version transmits data at 2,400, 4.8K and 9.6K bit/sec. It is priced at $795. The 8500-001 model transmits data at 2,400, 4.8K, 9.6K and 56K bit/sec. and lists for $895.

Xel Communications, 17600 E. Exposition Drive, Aurora, Colo. 80017.

■ **CTS Fabri-Tek, Inc. has introduced three modems, CTS 4827, CTS 9629 and CTS 14.4MX, to its product line.**

The modems feature adaptive equalization, front-panel programmability and LCD status, the vendor said. The products are designed for four-wire leased lines and operate in either half-duplex or full-duplex mode.

CTS 4827 transmits data at 2,400 bit/sec. or 4.8K bit/sec. and features phase shift frequency modulation. CTS 9629 works at speeds of 4.8K bit/sec., 7.2K bit/sec. or 9.6K bit/sec., and the CTS 14.4MX transmits data at 4.8K bit/sec., 7.6K bit/sec., 9.6K bit/sec. or 14.4 bit/sec. Both CTS 9629 and CTS 14.4 work with quadrature frequency modulation.

CTS 4827 costs $1,395, CTS 9629 sells for $1,745, and the CTS 14.4MX is priced at $4,995, which includes a six-channel multiplexer.

CTS Fabri-Tek, 6900 Shady Oak Road, Eden Prairie, Minn. 55344.

LOCAL-AREA NETWORKS

■ **Data General Corp. has introduced a software I/O driver that allows most DG Eclipse/MV superminicomputers to access Network Systems Corp.'s Hyperchannel local-area network.**

The software driver runs under DG's AOS/VS operating system and enables the DG processors to be interconnected in a multivendor environment using the coaxial cable-based Hyperchannel network. Systems that can be supported include equipment from IBM, Digital Equipment Corp., Control Data Corp., Honeywell, Inc. and others, the spokesman said.

The AOS/VS Hyperchannel Driver is priced at $8,640.

DG, 4400 Computer Drive, Westboro, Mass. 01580.

■ **Digital Microsystems, Inc. (DMS) has announced Univac Hinet Gateway, which is said to provide synchronous communications between DMS Hinet local-area networks and Sperry Corp. 1100 mainframes.**

DMS' Hinet is a baseband network that supports up to 63 users and has a transmission speed of 500K bit/sec. With the product, terminals or personal computers supported on a Hinet network emulate Sperry Uniscope 20 terminals. The device is also said to support file transfers between the network and the mainframe.

Univac Hinet Gateway costs $4,995.

DMS, 1755 Embarcadero, Oakland, Calif. 94606.

■ **Massachusetts Computer Corp. (Masscomp) has announced an enhanced version of its Multibus interface for the Ethernet network. It is designed for Masscomp 500 series 32-bit computer systems.**

The interface is said to offer throughput performance in excess of 90K byte/sec. Transmission control protocol is reportedly implemented on the board, off-loading the CPU of all packing, unpacking and retransmission of user data, Masscomp said. The interface reduces CPU cycle requirements for typical Ethernet applications to 0.5%, according to the vendor.

The interface is based on an Excelan, Inc. Exos-201 module and the most recent versions of Ethernet software and the Masscomp RTU operating system.

The product is priced at $3,900, the vendor said.

Customers using the previous Ethernet interface may upgrade for $2,500.

Masscomp, 1 Technology Park, Westford, Mass. 01886.

■ **Bridge Communications, Inc. has announced Gateway Server/4 (GS/4), an Ethernet-to-Ethernet gateway that can be used to tie local network segments together into a net up to 40 km long.**

Placed between Ethernet local-area networks, the product can connect networks using coaxial or fiber-optic media and overcome the 2.5-km limitation of most Ethernet networks, the vendor said.

The product overcomes the limitation with a packet/repeat function that automatically restarts the carrier-sense multiple access with collision detection algorithm on each net-

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work. GS/4 filters network traffic between local-area networks and automatically balances traffic loads and reduces delays, Bridge Communications said.

The product's network management facilities provide information on collisions, cycle redundancy checks, alignment errors and byte and packet throughput.

GS/4 uses three Motorola, Inc. 68000 microprocessors, two for the controller and one for network protocol. The product provides internetwork throughput of 350 packets or 1.75M bit/sec., according to the vendor.

The product costs $9,900 plus a $150 annual software license fee, the vendor said.

Bridge Communications, 1345 Shorebird Way, Mountain View, Calif. 94043.

NETWORK SERVICES

■ **Memotec Data, Inc. has announced SP-830, a packet assembler/disassembler (PAD) designed for X.25 networks.**

The product reportedly provides statistical multiplexing features that enable up to four asynchronous ports to be supported over a single link. Each port can transmit data at speeds from 75 bit/sec. to 9.6K bit/sec. with the X.25 data link supporting transmission speeds from 1,200 bit/sec. to 9.6K bit/sec.

The product conforms to CCITT X.25, X.3, X.28 and X.29 standards, the vendor said. SP-830 features autospeed, autoparity, autoconnect, port hunt groups and support for Digital Equipment Corp. VT100 terminals.

The PAD weighs 5 lb and includes an external power supply.

SP-830 costs $1,715.

Memotec Data, 600 McCaffrey St., Montreal, Quebec H4T 1N1.

TEST EQUIPMENT

■ **Tektronix, Inc. has added two devices, the 836 and 835, to its line of portable data communications analyzers.**

Both devices are said to provide line monitoring, interactive exercising and simulation and data link testing for bisynchronous, asynchronous, X.25, Synchronous Data Link Control and high-level data link control networks, the vendor reported.

The 836 operates full duplex at data transfer rates of up to 72K bit/sec. and half duplex at 144K bit/sec. The 836 features a data transfer capability that allows buffer contents and read-only memory data to be exchanged between an 836 and a host system, the vendor said. A user can store setup features, captured data and programs in the product's nonvolatile memory.

The 835 operates at speeds of up to 19.2K bit/sec. and is upgradable to the 836.

The 836 costs $4,650, and the 835 sells for $3,350; both products are available in rack-mounted versions.

Tektronix, P.O. Box 500, Beaverton, Ore. 97077.

■ **Dynatech Data Systems has announced Prism, a real-time network performance and management system.**

Prism is said to measure performance on from 16 to 2,048 lines, each operating at speeds up to 64K bit/sec. The lines can support a number of protocols including bisynchronous and Synchronous Data Link Control.

Status reports can be read at a terminal or sent to a printer or plotter. Reports using real-time or historical data can be used to monitor or change a user's configuration. Other reports, including weekly performance summaries, can be generated automatically by the system or by the user.

Prism consists of a Convergent Technologies, Inc. N-Gen or Megaframe workstation, a Hewlett-Packard Co. plotter and Dynatech software.

Dynatech said that the system costs between $2,000 and $5,000 per port. The product will be available in the fourth quarter of this year.

Dynatech, 7644 Dynatech Court, Springfield, Va. 22153.

AUXILIARY EQUIPMENT

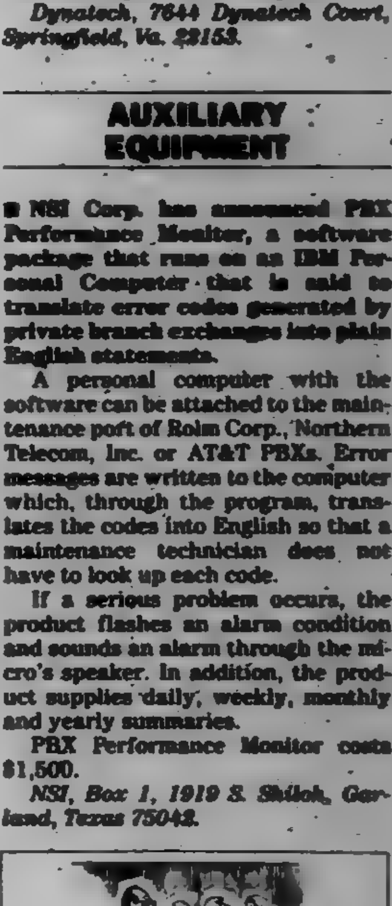
■ **NSI Corp. has announced PBX Performance Monitor, a software package that runs on an IBM Personal Computer that is said to translate error codes generated by private branch exchanges into plain English statements.**

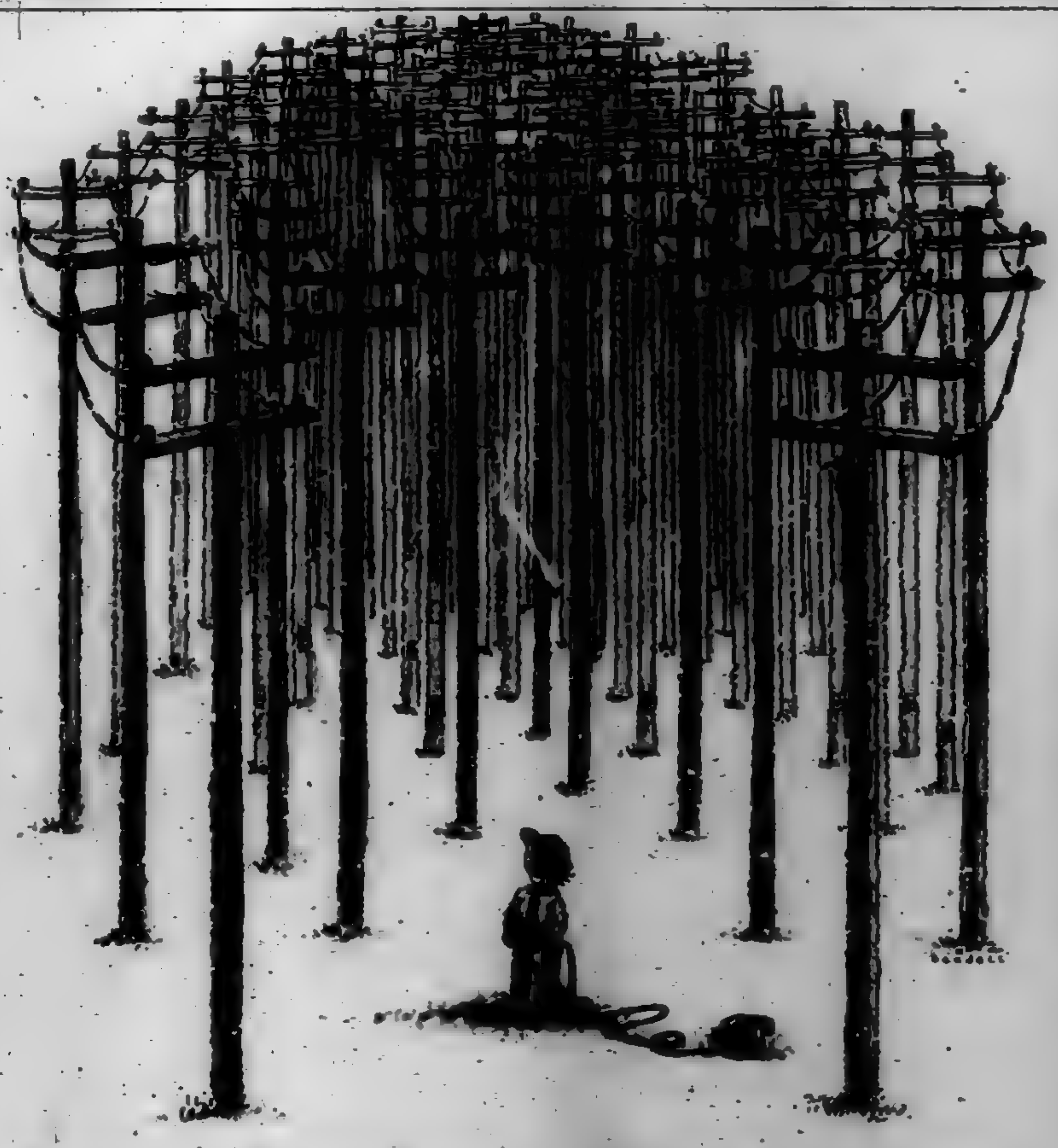
A personal computer with the software can be attached to the maintenance port of Rolm Corp., Northern Telecom, Inc. or AT&T PBXs. Error messages are written to the computer which, through the program, translates the codes into English so that a maintenance technician does not have to look up each code.

If a serious problem occurs, the product flashes an alarm condition and sounds an alarm through the micro's speaker. In addition, the product supplies daily, weekly, monthly and yearly summaries.

PBX Performance Monitor costs $1,500.

NSI, Box 1, 1919 S. Shiloh, Garland, Texas 75042.





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3274 from page 67

coupled with an upgraded logical unit type, LU 6.2, the controller would have intersystem communications capabilities. This would enable the controller to establish sessions between attached workstations, including IBM Personal Computers, and make it possible to support sessions between local devices and workstations supported by remote PU 2.1 controllers without having to route the traffic to a higher level host.

Personal Computers will, in fact, probably have a great deal to do with the capabilities of the 3274 replacement. The asynchronous Ascii devices do not coexist neatly in the realm of 3270-type synchronous Ebcdic devices. That fact gave birth to a whole submarket for boards that enable Personal Computers to emulate 3270 workstations.

Instead of emulating 3270 workstations at each Personal Computer, IBM may put a shared 3270 emulator in the upgraded controller. Besides the cost advantage of a shared device, such a capability may enable the Personal Computers to be supported with twisted-pair wire instead of coaxial cable.

To minimize the number of micros needed, a 3270 replacement may also support a shared Personal Computer. This would enable, for example, 3278 workstation users occasional access to a micro.

Other capabilities that IBM may incorporate into a 3274 replacement include alternate types of host and workstation connections.

The upgraded box will likely be built using the IBM Cabling System — a building wiring scheme — and future IBM local network products in mind. Today's 3274 can be used with the balanced twisted-pair wire used in the Cabling System, but small adapters are needed to interface the controller's coaxial cable connectors to the telephone-like wire. Certain models of the controller may be available that can directly accept the balanced twisted pair.

IBM may also make it possible to string together multiple workstations with a single cable, possibly with a loop facility or a cable-through capability similar to that used on its System/34, 36 and 38 processors.

On the link side of the controller, analysts expect IBM to provide multiple-host connections, enabling supported devices to access applications simultaneously on different processors without going through a remote front-end processor.

Finally, for its controllers used locally, IBM may offer a fiber-optic interface to replace IBM channel bus and tag cables.

LIMITS from page 67

from changes in applications software or network enhancements?"

Network management could be an important management tool, but today's packages do not provide reports needed to evaluate a business. "We would like to monitor end-to-end transmission of messages," Hall stated. "That capability would give us a good look at how the corporation is operating. Today, only node-to-node reports are available."

Herman added, "If one can monitor who is working with what information, one gains an insight into how the corporation is operating."

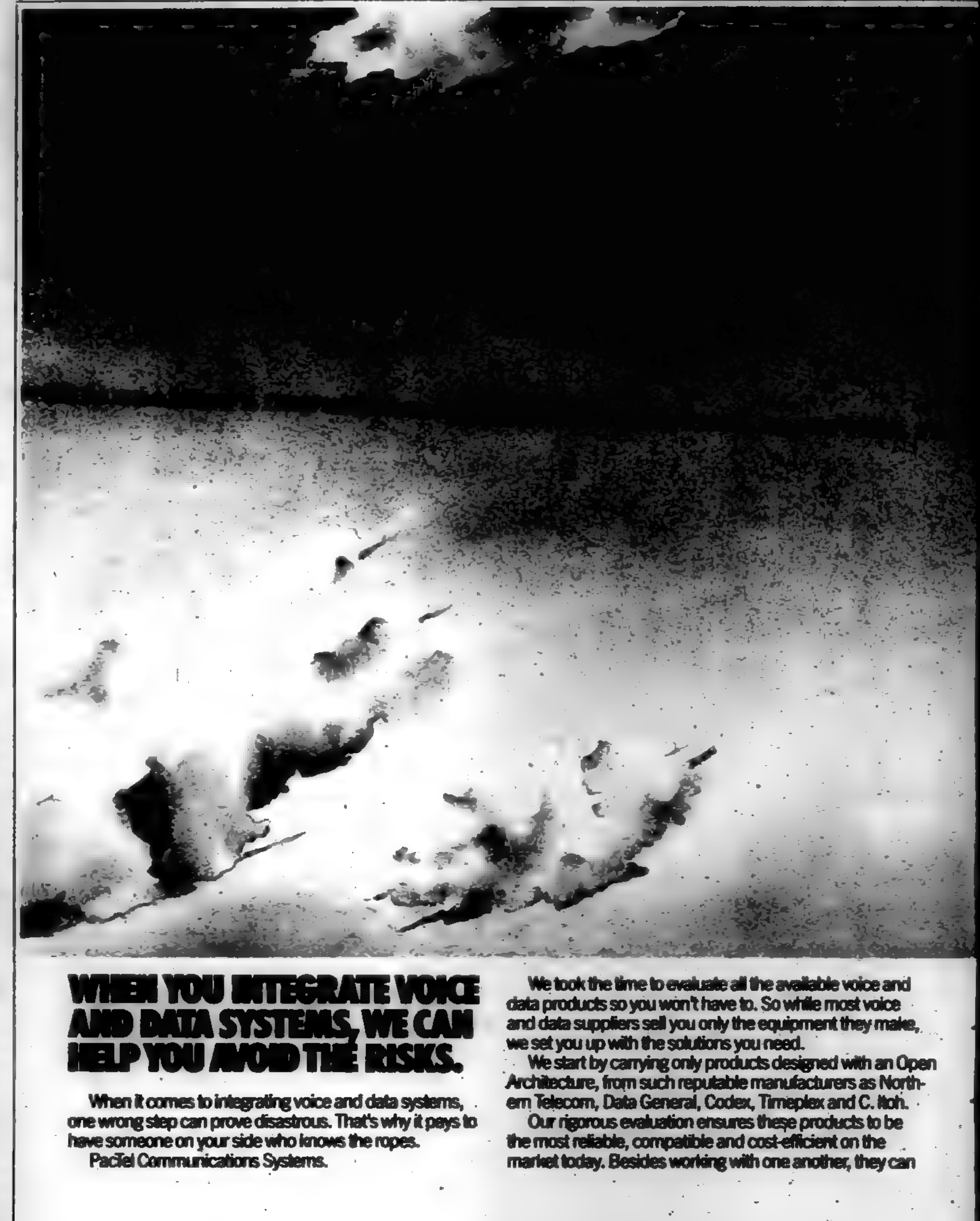
Steps to alleviate limitations

Although today's network management tools are inadequate, Hall listed steps to help alleviate the limitations.

First, he claimed that companies should build flexibility into a network. "New applications will be developed, departments will move to other areas and departments will be reorganized," Hall said. To solve these problems, he recommended that all buildings be wired with a common network topology. "A user should be able to plug into the network no matter where he is working." Yet, this approach is expensive, Hall said.

Another aid is assigning someone with network manager responsibilities at each node. Each manager is supplied with a tool kit that includes software tools, documentation, training materials and network policy guidelines. "The tool kit prevents different departments from having to reinvent the wheel," Hall noted.

Hall concluded that these steps can only be moderately successful because real-time maintenance and security tools are not yet available.



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MODEL

from page 67

populations.

■ Network models also assume that blocked calls are not retried, when in fact these calls are rarely lost and may indeed be retried within seconds, particularly with autodialers, CPU-originated traffic and camp-on routines of smart message terminals or switches.

For example, a typical problem recently analyzed by this author consisted of a CPU in a metropolitan area calling a sparse population of terminals in a smaller city to deliver electronic mail. After receiving messages from the sender, the CPU was programmed to attempt to route the message within one minute for up to 50 tries — with the interval made slightly longer as the number of attempts increased — before rescheduling the call.

In other words, the model suggested use of fewer communications facilities for this application than were actually needed because of the number and frequency of the retries.

■ Another assumption made with optimization models is that traffic patterns are consistent, when in fact they vary by the time of day and week and by the source of the traffic.

Even discounting the first and second points above, there is no guarantee that a given population will behave with any certainty in an intrinsically smooth fashion. Monday and Friday morning traffic may resemble shock waves. And CPU-generated traffic may be almost deterministic at high load — as when a buffer fed by bulk storage empties out to a line every 10 msec — and bursty at lighter loads.

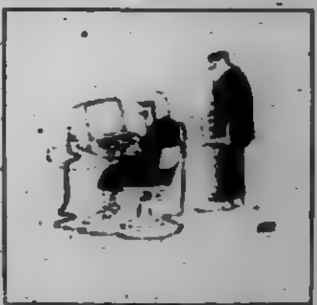
Generally the traffic may be mixed from several radically different sources, including data and voice input to a private-branch exchange and incoming local telephone traffic vs. incoming national toll traffic vs. incoming international traffic. Holding times may be a function of the time of day, message content and other factors. Traffic patterns at business centers differ from those characteristic of rural and semirural areas.

■ A last assumption made in many optimization models is that all users are independent of each other, when in fact the opposite might be true. Consider the problem of determining the number of foreign exchange lines needed between a centralized customer service center and a node in a star-configured data communications network. All data customers go through a concentrator in the remote city. A failure in the concentrator or communications line would prompt all customers in the given city to call the centralized customer service center. These calls would not be independent of each other.

> ”
>
> *Practitioners who design networks must make dozens, if not hundreds, of assumptions and engineering judgments often ignored by optimization models.*

Practitioners who design networks must make dozens, if not hundreds, of assumptions and engineering judgments often ignored by optimization models. In the end, they may very well wonder if the cumulative sum of all errors — a few of which were described above — suggests use of the incorrect number of facilities. Indeed, the issues described above may be in part responsible for the degraded service sometimes experienced by a number of public and private networks.

Yet, one rarely finds these issues treated in the thousands of queuing models available. In particular, very little is done in modeling that addresses customer behavior, not only in the traffic area but in market dynamics, vendor loyalty, tariff and pricing sensitivities and reaction to quality/degradation of service.



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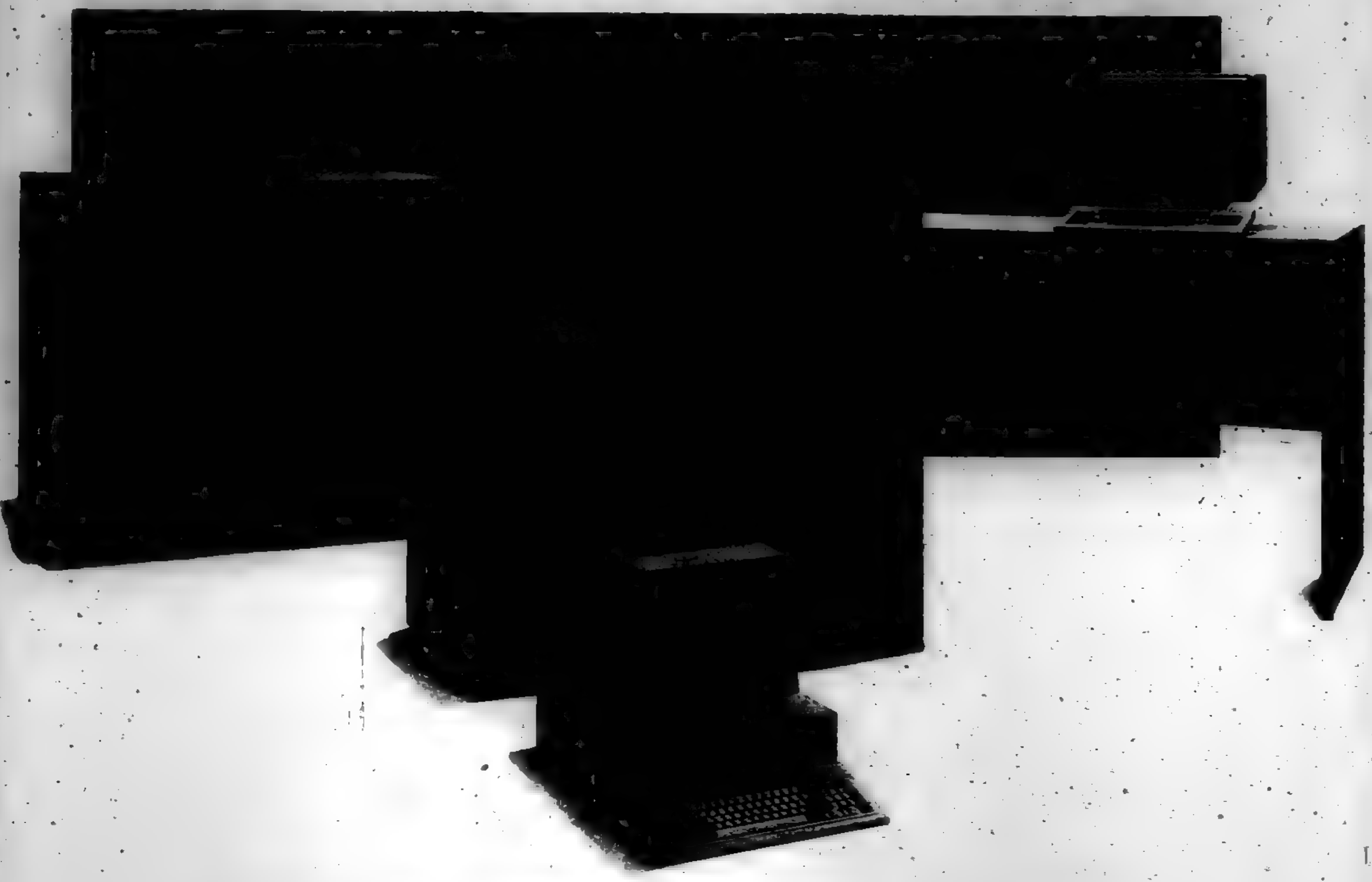

The UNIX* operating system from PC to mainframe.

SYSTEMS & PERIPHERALS

Wait dulls STC 8380E luster

By Charles Babcock
CW New York Bureau

ANALYSIS

NEW YORK — Claiming the bad times are over and the good times are about to roll, Storage Technology Corp. (STC) made official its plans to counter IBM's dual-capacity 3380 disk drive with the 8380E, a field-upgradable version of its 8380 disk drive that industry watchers said has one significant flaw: It will not be available until a year after IBM begins volume shipments of its double-capacity 3380s.

The 8380E, with 5.04G bytes of storage, a 17-msec access time and a data transfer rate of 3M byte/sec., matches IBM's 3380 double-capacity drive announced in February. In fact, STC's and IBM's approaches to the double-capacity drives are similar. Both retained the thin-film read/write heads that caused problems in early versions of the 3380 and 8380 drives. And both companies created the double-capacity models by increasing the ratio of tracks per inch on the unit's disk platters (STC threw in a slightly larger disk platter in its 8380E).

But there are also glaring differences between the two products. STC's drives are field upgradable. Current 8380 users can convert their drives to the 8380E models by replacing 12 circuit boards, the head disk actuator and the drive motor. Since the components fit into the same cabinet, no additional space is required for the double-capacity unit, STC said.

IBM's dual-capacity 3380s are only upgradable from single-capacity 3380s announced in February. Users of older 3380s cannot upgrade to the double-capacity

See STC page 80

HARD TALK
Tom Henkel
CW Senior Editor

STC, Memorex: Grim futures?

Storage Technology Corp. (STC) and Memorex Corp., generally viewed by industry watchers as being among the more tenuous companies in the IBM-compatible products business, both unveiled answers to IBM's double-capacity 3380 disk drive recently, ironically choosing the same New York restaurant in consecutive weeks to make their announcements.

See [illegible] page 82

- Here's looking at you! Study says vision robots are on their way/76
- General Automation unveiled two supermicrocomputers based on the Pick operating system/76
- Computer Consoles released a floating-point accelerator for its Power6 family of minicomputers/78
- National Advanced Systems unveiled a circuit board said to link IBM Personal Computers to SNA/79

INSIDE

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NCR introduces low-end, multiuser Minitower

DAYTON, Ohio — NCR Corp. has added a low-end addition to its Tower line of supermicrocomputers called the Minitower, a system that can support from two to eight users.

Based on Motorola, Inc.'s 68010 microprocessor, the Minitower supports NCR's derivative of AT&T's Unix System V operating system, Tower Operating System V. The unit is software compatible with two larger members of the Tower family, the Tower and Tower XP, but comes in a cabinet that is 33% smaller than the earlier models, the company said.

The Minitower reportedly can function as a stand-alone, entry-level system or as part of a distributed network supporting IBM Synchronous Data Link Control or X.25 protocols. The Minitower's Towernet communications package can interface with an Ethernet local-area network via the Xerox Network Service link-level protocol.

In an IBM Systems Network Architecture (SNA) environment, the Minitower can function as a Physical Unit Type 2 cluster controller node. Also, when operating under SNA, users can add various emulation packages that allow the Minitower to function as an SNA RJE device, emulate an IBM 3270 terminal or emulate an IBM 3278 printer, the vendor said.

With a base price of $6,995, the Minitower features 512K bytes of main memory, 25M bytes of Winchester disk storage,

See NCR page 82

Wang enhances small business CPUs, operating system

LOWELL, Mass. — Wang Laboratories, Inc. unveiled two very large-scale integration-type (VLSI) versions of the company's 2200MVP small business system and an enhanced release of its multiuser operating system that can be used on the entire 2200 product line. The company will no longer sell the non-VLSI 2200MVP CPU, a spokeswoman said.

The price of the VLSI-type 2200MVP — CPU only — is $4,950 for 128K bytes, which is said to be a $850 reduction from previous 128K-byte MVP CPUs. The 512K-byte model costs $7,300, a $3,000 reduction from previous 512K-byte MVP CPUs. A system configured with 128K bytes of memory, a terminal, a triple controller that can attach to a terminal, a disk drive and a parallel printer, one 5¼-in., 10M-byte disk and a 320K-byte floppy drive costs approximately $8,000, the vendor said.

The company claimed up to a 70% reduction in monthly maintenance for the VLSI-type CPUs, from a range of $87/mo to $205/mo for the previous MVP CPUs to a range of $42/mo to $67/mo for the VLSI-type MVP CPUs.

The 2200MVP and the Micro VP CPUs employ processors from VLSI Technology, Inc. of San Jose, Calif., which are said to allow the replacement of from seven to nine 8- by 11-in. printed-circuit boards with a single board that includes 32K bytes of control memory.

The VLSI-type 2200MVP (available now) combines the newly announced board in the traditional 2200MVP packaging, and the Micro VP, available in July, features smaller packaging. Each system accepts nine optional peripheral controller

See WANG page 82

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*[illegible]
Services Division, which does business as Ryder Truck Rental.
source 1983 Ryder Systems, Inc. Annual Report and Third Quarter Report, 1984.

Report foresees dilating vision-capable robot mart

Systems more flexible, safer but expensive

By [illegible]
CW Staff

NORWALK, Conn. — To see or not to see? That is the big question for robot users in the next few years.

About 60,000 of the 250,000 industrial robots purchased in the next 10 years will be equipped with vision capabilities, according to a report, "Robot Vision Systems," issued by International Resource Development, Inc. here.

Vision-capable robots will be able to operate with much more flexibility and safety than "blind" robots, the report said. But they're expensive, each costing roughly $160,000 now. The report also stated that the cost of robots that can see will fall rapidly as they become more common.

Buyers are skeptical

Early robot vision systems have been plagued by reliability problems and design bugs, the report said, and buyers are "rightly skeptical" of vendors' performance claims.

Robot vision systems use television cameras or charged coupled-device scanners, with the output from either passing through image processing and data processing subsystems. The camera or scanner can be mounted in the body of the robot (eye in shoulder) or in the robot's grippers (eye in hand), the report said. The robot's performance is strongly determined by the power of the signal processing electronics, the report added.

Older versions of seeing robots needed careful floodlighting or backlighting of the work area, the report noted. Later model seeing robot versions include signal processing semiconductor sets with special image processing capabilities that reduce the need for specialized work area lighting.

Far too many vendors are aiming at the robot vision system market, the report said, identifying more than 15 serious participants. As the market grows, "the heavyweights are moving in," it added. "General Electric Co., General Motors Corp. and IBM may soon have pushed out or acquired most of the smaller firms."

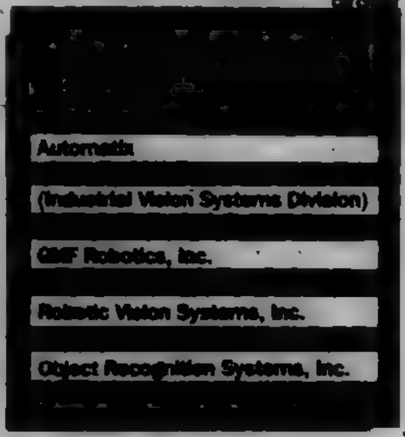
Continue to cost more

Vision-capable robots will continue to cost substantially more than blind robots, but the total installed price to users is sometimes less, the report observed.

Blind robots require special conveyors and other systems to present work pieces at precisely the right time and in the right place. Vision-equipped robots need fewer special fixtures around them, it said. They can pick parts out of bins, orient them correctly and more easily recognize problem conditions and emergencies, such as the presence of a human in the work area.

The report, which costs $1,850, can be obtained from International Resource Development at 6 Prowitt St., Norwalk, Conn. 06855.

CW CHART



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21

Supermicro firm unleashes Zebras

ANAHEIM, Calif. — General Automation, Inc. has introduced the Zebra 1750 and Zebra 6700 supermicrocomputers. Both machines are based on the Pick Systems Pick multiuser operating system, according to General Automation.

The Zebra 1750 is said to support from six to 12 terminals and to offer 128K bytes to 1M byte of memory with zero wait states and 20M bytes to 120M bytes of hard-disk storage. Also available is a 5M-byte removable cartridge disk drive and/or a ¼-in. streaming cartridge tape drive for backup.

The 6700 reportedly features the Motorola, Inc. MC68000 microprocessor, 1.2M bytes of memory (expandable to 3.25M bytes), 260M bytes of hard-disk storage and support for up to 64 users.

Also included is a backup battery power supply and a security key switch among other features, according to the vendor.

The Zebra 1750 is priced at $9,950. The Zebra 6700 is priced at $66,500, the vendor said.

More information is available from General Automation, located at 1045 South East St., Anaheim, Calif. 92803.

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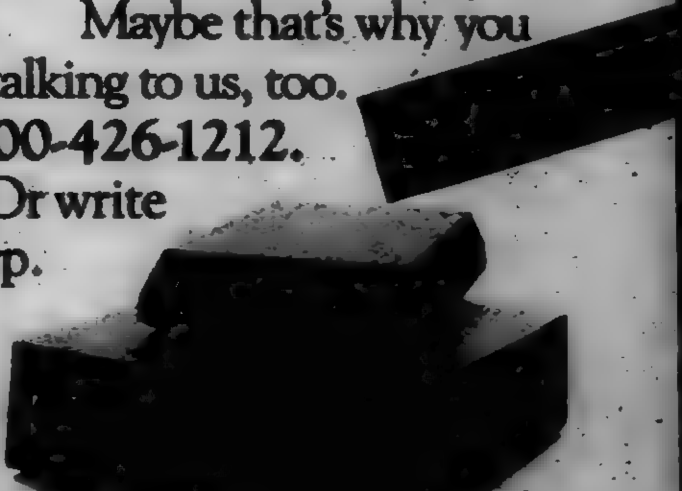

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*McGraw Hill's "Data Communications" magazine rated us as having the best technology and price/performance.

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SYSTEMS & PERIPHERALS

PROCESSORS

■ Computer Consoles, Inc. has released its Floating Point/Math Accelerator, an addition to its Power6 family of minicomputers that runs under either the University of California at Berkeley 4.2 BSC or AT&T System V versions of the AT&T Unix operating system.

The Floating Point/Math Accelerator is a coprocessor that can be installed in a Power6 system to give floating-point capabilities. The accelerator is said to speed execution of math functions, such as sine, cosine, arctangent, log, exponent and square root.

The accelerator option costs $16,500, and it will be available in the second quarter of 1985.

Computer Consoles, 97 Humboldt St., Rochester, N.Y. 14609.

■ Orcatech, Inc. has announced its Advanced Graphics Processor (AGP), which is a replacement for the existing graphics processor in the Orca 3000 and 3030 AT&T Unix-based graphics workstations.

Combined with the Unix system and the Programmer's Hierarchical Interactive Graphics Standard implementation, the AGP is said to provide users with a two- and three-dimensional graphics engine.

The processor is a three-board set that consists of a display list processor, a transformation and floating-point processor and a drawing processor.

The unit costs approximately $10,000, and it will be available in the fourth quarter of 1985.

Orcatech, 1000 Morrison Drive, Ottawa, Ont. Canada K2H 8K7.

■ AMF Logic Sciences, Inc. — a subsidiary of AMF, Inc. — has announced its Turbograph 300 vector-to-raster graphics processor that was designed for OEMs and systems integrators.

The Turbograph 300 can produce lines in formats such as solid and dashed, polygons with user-definable shading and color patterns, circles and ellipses and color and gray-level control. The display can be scaled and rotated, the vendor said.

Standard input memory is 128K bytes and can be upgraded to 512K bytes to store up to 80,000 vectors. Connections are available for the RS-232C serial interface, Centronics Data Computer Corp.'s 8-bit parallel interface or other interfaces as specified by the OEM. Options include an integral board for the IBM Personal Computer, an integral printer/plotter board and a stand-alone desktop cabinet for storage.

The retail price is $1,995 with discounts for OEMs.

AMF Logic Sciences, 10808 Fallstone Road, Houston, Texas 77099.

"Well, at least it wasn't a foreign computer that replaced me."

TERMINALS

■ Intecolor Corp. has announced its Model 6129 color graphics terminal that is compatible with Digital Equipment Corp.'s VT100 and Tektronix, Inc. 4010 terminals.

The terminal has 1,024- by 768-pixel resolution and can display 64 colors simultaneously. Graphics commands such as pan, zoom and polygon fill are built in, according to the vendor.

The terminals cost $5,275 each.

Intecolor, 225 Technology Park, Norcross, Ga. 30092.

■ Versatec has released an engineering workstation for its computer-aided engineering/computer-aided design system line that runs all Versatec Expert engineering applications software modules and Xerox Corp. Star office automation software.

The 8011 workstation has 768K bytes of main memory, a 1.2M-byte double-sided, double-density floppy disk drive and a 10M-byte Winchester disk drive. Upgrades include a 42M-byte Winchester disk and a 1.5M-byte main memory.

Features include 800- by 1024-pixel resolution, multiple windows, menus, optical mouse and internal Ethernet interface, the vendor said. Using the Expert VAX Ethernet interface, the workstation can access Digital Equipment Corp. VAX series programs and data, move Expert files to VAX for processing and display VAX applications and results in the workstation's VAX window.

The workstation costs $8,995 for the basic system, and the workstation with expanded memory is $10,995.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051

Where program
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If you want to take a look at programming from a different point of view, take a look at a Smart Desk equipped with an IBM 3270 Personal Computer.

The screen of the 3270 PC can be divided into several windows—including multiple PC sessions and up to four host sessions from the same or different computers.

In the blue window you can keep a menu of your function keys. It's easy to log on and connect to a host system for browsing a program listing in the yellow window.

To edit a second program, a single function key can download the source code to a PC session in the red window.

And, when you're finished editing, another function key can send the revised program back to the host.

These multiple windows are available in eight colors. They are ideal for reviewing more than one program at once. Or for the concurrent viewing and testing of source code.

The end result is faster and more accurate programming with less demand on the host.

Any window can be viewed full screen for detailed analysis. Or it can be sized and moved to any area of the screen, so you can create the screen format that works best for you. You also get two handy notepad windows.

And, of course, the 3270 PC is backed by IBM's commitment to service and support.

One more point to keep in mind: The 3270 PC is available in quantity discounts. Your IBM marketing representative has all the details.

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SYSTEMS & PERIPHERALS

POWER SUPPLIES

■ Ault, Inc. has released a 50W switcher power supply that is suitable for powering computer peripheral equipment, disk drives, CRT displays, microprocessors, multiplexers, modems and other data communications equipment.

The plug-in supply delivers 5A at 5V dc, 2A at +12V dc and 0.5A at -12V dc, according to the vendor.

It costs $80 in OEM quantities.

Ault, 1600 Freeway Blvd., Minneapolis, Minn. 55430.

BOARD-LEVEL DEVICES

■ National Advanced Systems, Inc. (NAS) has unveiled the Single Board Solution, a circuit board that is said to provide a communications link between IBM Personal Computers or compatible microcomputers and IBM Systems Network Architecture host processors.

The board uses one slot in a Personal Computer or compatible microcomputer and does not require user programming. It emulates an IBM 3274 Model 51C or 61C cluster controller and supports up to 16 concurrent sessions. It also provides synchronous host communications at up to 9.6K bit/sec., the vendor said.

The board consists of a National Semiconductor Corp. NS32016 CPU chip and 512K bytes of memory. It costs $1,495 and is available immediately.

NAS, 800 E. Middlefield Road, Mountain View, Calif. 94040.

AUXILIARY EQUIPMENT

■ LP COM has introduced a portable Telecommunications Test Computer that runs under Microsoft Corp.'s MS-DOS operating system.

The Model TC-2000 contains built-in self-diagnostics and an administration software package that includes a calculator, calendar and notepad. Systems are configured according to the user's needs for digital, analog or both testing functions.

A basic TC-2000 with Transmission Impairment Measurements (Tims) test instrument software and a Signaling/Supervision package for full signaling and testing capability — for analog testing — costs approximately $18,000.

A basic TC-2000 with the Protocol package for monitoring, trapping, emulation and analysis capabilities in a digital environment costs approximately $14,000. A fully loaded system with all capabilities costs approximately $27,000, the vendor said.

LP COM, 21050 Homestead Road, Cupertino, Calif. 95014.

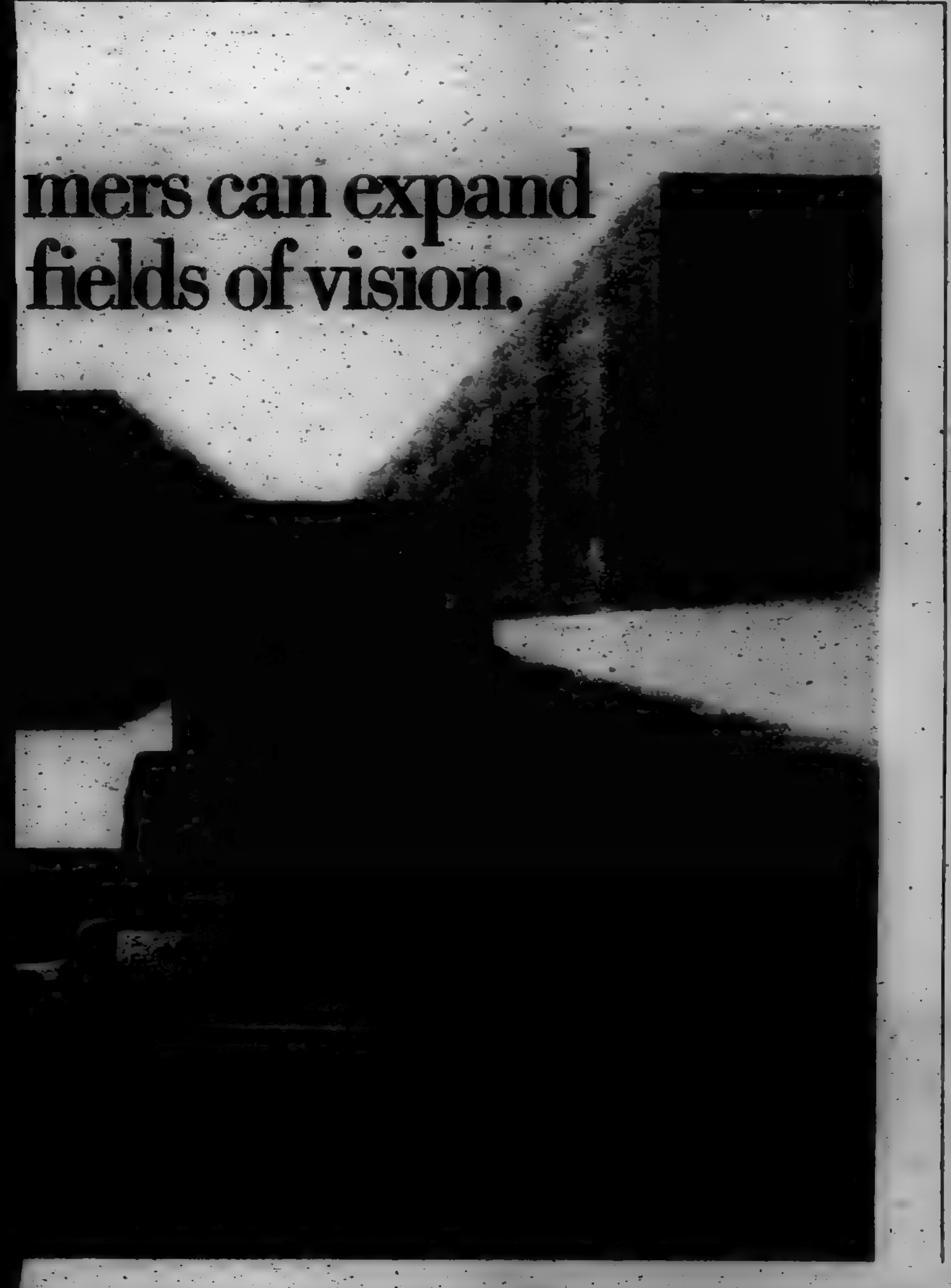
■ Dynapert, a division of Emhart Corp., has announced its UCCS 9000 Data Supervisory Management (DSM) system that controls and manages Dynapert printed-circuit board insertion equipment.

The Dynapert UCCS 9000 DSM system features a central data base that develops, edits, transfers and stores printed-circuit board programs for up to 20 axial, dual in-line package and odd-form insertion equipment (machines that automatically assemble printed-circuit boards), the vendor said. It polls each insertion machine hourly for information such as how many components were inserted or misinserted, time of operations and so on, which can later be extracted for management reports, the vendor said.

The system has 256K bytes of random-access memory, dual floppy disk drives and a monochrome terminal for $21,000. Options include a color terminal and printer interface.

Dynapert, Suite 105, 148 Linden St., Wellesley, Mass. 02181.

"Nobody remembered its birthday."



STC

from page 75

models. The field-upgrade feature gives STC a marketing edge over IBM, but the long delivery schedule for the 8380E and STC's already shaken reputation — as a result of its filing for Chapter 11 under the Federal Bankruptcy Act last October — seem to mar its attempts to make a strong comeback against IBM.

Why it is taking STC so long to bring the 8380E to the market is a puzzling and perhaps critical issue for STC. Ryal R. Poppa, chairman and chief executive officer of STC, said the company wants to make sure the 8380E is reliable. Even though STC is claiming it has already installed 2,000 of the 8380E units, Poppa claimed that to ensure reliability, the company wants to complete quality testing.

> *'Mostly, [the 8380E announcement] helps convince customers that Storage Technology is not going away.'*
>
> — Michael Geran
> E. F. Hutton & Co.

Since the 8380E is the first product STC has announced since its Chapter 11 filing, embarrassing technical problems with the unit would indeed be devastating. In that sense, Poppa's concern for quality is absolutely justified. But the noble quest for quality seems to pale when viewed in the context that IBM will be making volume shipments of its double-capacity 3380 for a year before STC can gear up volume shipments of its 8380E.

"Mostly, [the 8380E announcement] helps convince customers that Storage Technology is not going away," said Michael Geran, an analyst with E. F. Hutton & Co. in New York. It also gives customers a reason to go ahead and buy a single-capacity 8380 drive, he added.

"It looks like [it has] the technology to do it," Geran said of STC's attempted comeback. "But will the window be open long enough? The fourth quarter of 1985 is a long ways away."

The field upgradability of the 8380E could keep the 8380s moving out the door, said Robert H. Katzive, vice-president of Disk/Trend, Inc. a Los Altos, Calif., market research firm.

"IBM has a little problem there," since until recently the 3380 drives it was shipping were not upgradable to double-capacity machines, Katzive said.

But IBM has already shipped an impressive number, about 3,000 units, of the single-capacity 3380s that can be upgraded to double-capacity models. At that rate, one analyst estimated, IBM could ship 45,000 spindles, or 20,000 units, of the upgradable single-capacity models by the year's end, when the double-capacity upgrades become available.

In 1983, STC had 20% of the market for large-scale, 500M-byte drives, according to Disk/Trend's last published figures. That share has dropped in the face of the Chapter 11 filing, Katzive said.

Orders 'below expectations'

Poppa admitted orders for the 8380 were below expectations in the first quarter. If the pace does not pick up during the rest of the year, the Louisville, Colo., firm would realize about 60% of its anticipated $700 million in annual revenues, he said.

Poppa noted, however, that STC has cut its work force from 16,000 to 10,000, and its service revenues have continued to grow through the Chapter 11 proceedings. It only needs 8% to 9% of the large disk drive market for the company to be profitable, he said.

STC also announced an upgraded 8890 cache disk controller, which can be field-upgraded to contain up to 72M bytes of cache memory. The previous version contained 18M bytes. The upgrade is made possible by substituting 256K dynamic random-access memory chips for 64K-byte chips, according to STC.

Poppa also vowed that STC's optical disk project, although severely cut back earlier this year, is not dead. A team of 40 employees continues to work on the optical disk drive that is supposed to be compatible with IBM 3380 systems. An announcement on the product will come in 1986, Poppa said.

STC claimed to be working on its own version of the IBM 3480 tape drive, with an announcement to come later this year, he said.

The double-capacity 8380E costs $108,200, an STC spokesman said. The field upgrade of the single-capacity to double-capacity drive will cost $45,000, bringing a $63,150 single-capacity 8380 into line with the cost of the double-capacity unit, spokesman said.

STC is located at 2270 S. 88th St., Louisville, Colo. 80028.

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DRIVES from page 75

However, each company's dual-capacity 3380 alternative is disappointing, which raises the question of whether either firm has a long-term future in the IBM-compatible peripheral business.

STC's approach, a field-upgradable, double-capacity version of its 8380 disk drive, called the 8380E (see story page 75), mirrors IBM's approach to the dual-capacity 3380. But delivering the 8380E a year after IBM begins making volume shipments of its dual-capacity models is like hauling water to a fire in a leaky bucket. STC is already way behind IBM in single-capacity 3380 shipments. If it holds firm on the fourth-quarter 8380E shipments, it will probably fall further behind.

Memorex managed to match IBM's proposed fourth-quarter 1985 delivery date for the dual-capacity 3380 but with a far different disk drive. Memorex's 3680 HDP is a repackaged version of its 3680, which has eight head disk assemblies packed into one box.

Unable to announce product in time

The approach is clearly a novel idea that has some merit, but whether it will lure users away from buying the double-capacity 3380 is another question. Memorex is still promising a double-capacity 3380-type product soon, but it is clear the company is simply not able to announce such a product in time to compete seriously with IBM's slated fourth-quarter deliveries.

However, it's the promises from STC and Memorex that are most intriguing — and most disappointing. Both companies built their businesses on being able to deliver IBM-compatible peripherals sooner — and at more attractive prices — than IBM. Now the opposite appears to be the case. STC and Memorex still offer a price advantage, but IBM now has the strong upper hand on delivery.

STC cannot deliver its a dual-capacity 8380E until late 1986, and Memorex hasn't even announced a dual-capacity 3680 yet. Meanwhile, IBM appears to be gearing up for massive shipments of its dual-capacity 3380 in the fourth quarter of 1985 and early 1986, a move that could leave Memorex and STC in the dust.

STC's and Memorex's promises don't end with the dual-capacity 3380 either. It has been better than a year since IBM took the wraps off its 3480 tape drive, and so far neither Memorex nor STC has been able to match the IBM announcement. Both companies made it clear at recent press conferences that 3480-compatible products would be forthcoming, but neither company could be very specific about when such products would arrive.

Memorex beefed up its support for the IBM 3420 marketplace with a tape caching subsystem and some additional tape control units, claiming there are many users who do not want to switch immediately from the 10½-in. reel-to-reel 3420 format for the cartridge tape format used in the 3480. The company is wise to offer additional products to the 3420 marketplace, but the 3420 market is dying and will eventually become extinct. Granted, the end of the 3420 market will not come tomorrow, but if Memorex is betting on long-term profits from 3420s, it is in for a surprise.

Vows to build new products are certainly noble. But when users need solutions to tangible business needs, promises are of little help. Nor do promises do much for corporate bank accounts. Significant layoffs at both Memorex and STC are clear indications of that.

Already suffering from sagging sales as a result of stiffer IBM competition, neither Memorex nor STC is going to improve its current lot with promises while IBM ships truckloads of real products. Many people sincerely hope both Memorex and STC can turn current adversity into renewed success. But it just won't happen without real products. And unless IBM makes an enormous mistake that opens up a big window of opportunity for Memorex and STC, the future of both companies looks grim.

NCR from page 75

a floppy disk drive capable of storing up to 1M byte of memory, eight RS-232C I/O ports and basic Unix software. For an additional $755, users can purchase a Unix Extension Module, a collection of programs said to offer users more flexibility in configuring small disk-based systems. Modules include extra utilities, graphics software, documentation, software development, system accounting and communications software, NCR said. The Minitower will be available this month.

NCR is located at 1700 S. Patterson Blvd., Dayton, Ohio 45479.

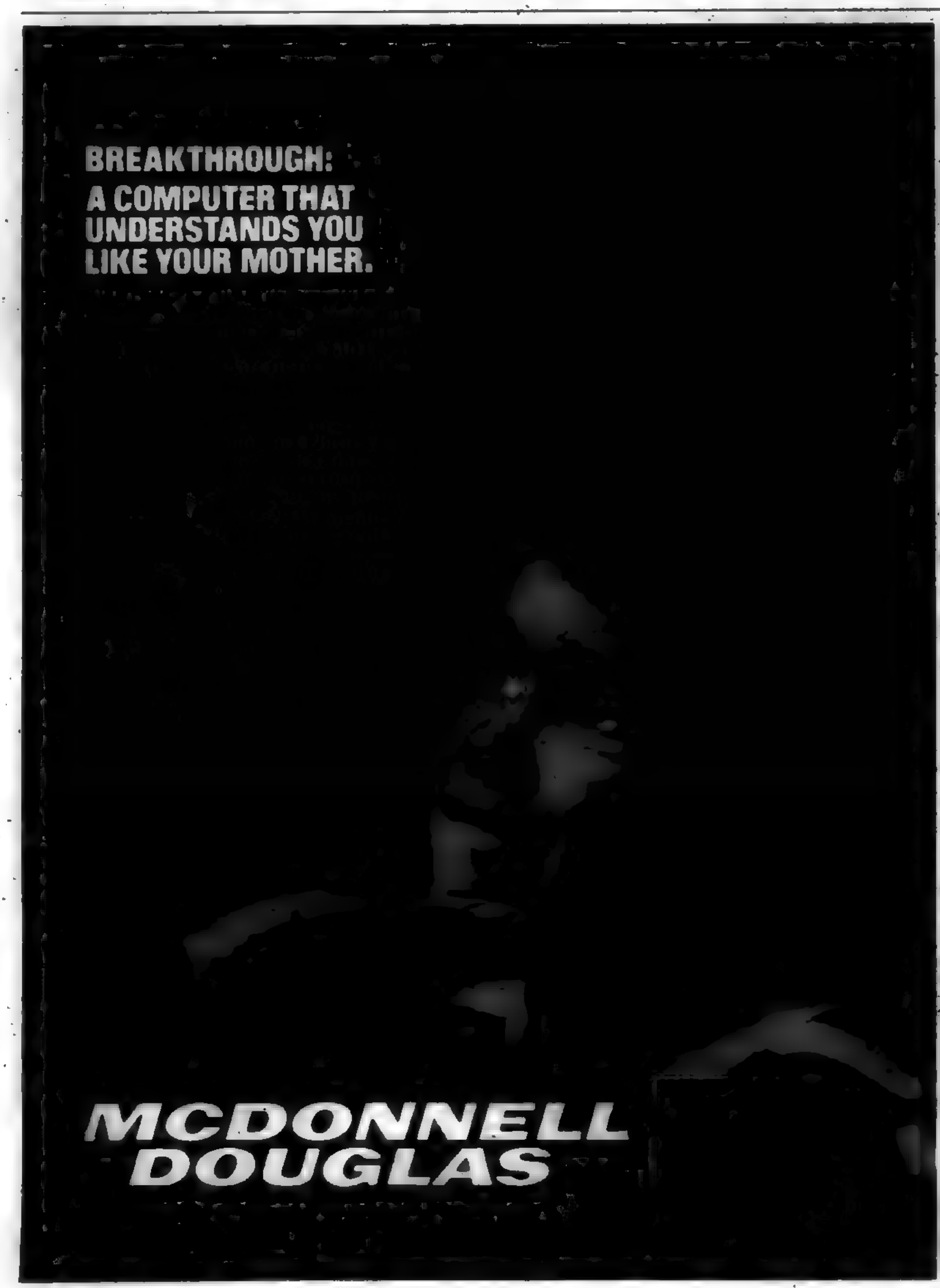
WANG from page 75

boards and can communicate with existing 2200 option boards and peripherals, the vendor said. Both machines support up to 13 users.

Both systems come with 32K bytes of control memory and can be ordered with either 128K bytes or 512K bytes of user memory. Four packaged configurations are available for either system.

Release 2.6 of the Basic-2 multiuser operating system that is required for the systems just announced is also available for all currently installed 2200 systems. This release features a generalized printer driver that allows 2200 CPUs to use the Wang Professional Computer Model PC-PM010 and PC-PM016 printers, the vendor said.

More information can be obtained from Wang, One Industrial Ave., Lowell, Mass. 01851.



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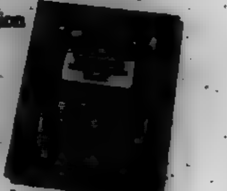

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COMPUTER INDUSTRY

Sterling launches proxy fight

By Kathleen Burton
CW West Coast Bureau

DALLAS — Spurned by the board of directors of Informatics General Corp., Sterling Software, Inc.'s cash buy-out offer will be placed before Informatics shareholders at that company's annual meeting May 9, Sterling declared.

Sterling, which first offered $25 per share and later upped the offer to $26 per share, said it will seek election of two protakeover directors and defeat of an antitakeover provision scheduled for vote at the Informatics meeting.

After its second offer was rejected by the Informatics board, Sterling declared in a statement, "It now appears that we have no choice but to proceed with a proxy solicitation to defeat the antitakeover proposal and elect two Sterling nominees to the Informatics board who will be committed to produce a merger with Sterling, which we believe is in the best interest of all stockholders."

Sterling, based here, placed advertisements in newspapers asking Informatics shareholders to sign new proxies in opposition of the antitakeover vote and in favor of the election of Samuel Wyly and Sterling L. Williams to the Informatics board. Wyly is chairman and Williams is president and chief executive officer of Sterling.

Informatics declined to comment on the latest round in the takeover attempt. Sterling had acquired 9.3% of Informatics stock on the open market prior to making its first cash offer. The bulk of Informatics shares are held by institutional investors.

In an earlier statement, Walter Bauer, chairman and president of Informatics, said the company's board rejected the original offer because it was "not in the best

See TAKEOVER page 99

Exec says U.S. will act to curb imports of Japanese products

By Clinton Wilder
CW Staff

WELLESLEY, Mass. — Japanese markets will remain cool to American high-technology products, and the U.S. government will institute its own protectionist trade measures, according to National Semiconductor Corp. Chairman Peter J. Sprague.

Sprague called the current semiconductor industry slump "dreadful" but predicted recovery later this year based on rejuvenated demand from computer and electronics manufacturers.

Sprague was interviewed here recently at his induction into Babson College's Academy of Distinguished Entrepreneurs. He was honored along with Australian publishing magnate Rupert Murdoch and People Express Airlines, Inc. founder Donald Calvin Burr.

Regarding current trade tensions, Sprague said Japanese promises to open trade doors are mere lip service. "It's all nonsense. Even if they removed the official barriers, it wouldn't make much difference anyway. I tried to open a consumer electronics store in downtown Tokyo, and it took a year and a half just to rent the space and set up.

Sprague, left, and Murdoch

"It's just a very restrictive country. Remember, we're talking about a place that in 1975, under full world pressure, decided to allow all of 114 Vietnamese refugees into the country."

Sprague predicted the U.S. will eventually respond with trade restrictions of its own. Such restrictions could include surcharges that would apply to National Semiconductor's National Advanced Systems Corp. (NAS) mainframes made by Hitachi Ltd. in Japan, he said.

"Protectionism will happen here," Sprague said. "And if it's an across-the-

See CURB page 96

Adapso calls tax bills costly

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Federal tax reform proposals coming up before the U.S. Congress this year could cost computer companies millions in tax dollars if enacted, according to I. Sigmund Mosley, vice-president of Management Science America, Inc.

During a meeting on federal tax issues at the Association of Data Processing Service Organizations, Inc. (Adapso) conference held here recently, Mosley said three tax reform proposals now before Congress could seriously affect the computer industry: the U.S. Department of the Treasury proposal, a second draft of which is scheduled for release May 15; a plan proposed by Rep. Jack Kemp (R-N.Y.) and Sen. Robert Kasten Jr. (R-Wis.); and a proposal by Sen. Bill Bradley (D-N.J.) and Rep. Richard Gephardt (D-Mo.).

Although some proponents claim the tax reform proposals would benefit high-tech companies more than traditional manufacturing companies — they would lower historically high tax rates incurred by

See TAX page 96

- Vendor representatives remain cool to a key ring antipiracy device at an Adapso conference/97
- Although most of the industry has not yet realized it, IBM has embarked on another radical shift in direction/96
- Victor Technologies has sued Tandy for a Radio Shack ad that calls a Victor product an "orphaned" computer/96

Chief says DG will focus on OA mart

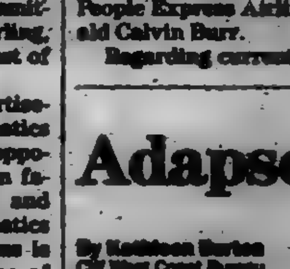
By Clinton Wilder
CW Staff

BOSTON — Despite its recent profit slump, Data General Corp. is confident it can shift focus from its traditional industrial and scientific computer applications markets to office automation, DG Chairman Edson D. de Castro told a recent meeting of security analysts here.

De Castro said the company's second-quarter slump was most acute in sales to industrial, scientific and OEM customers [CW, April 29]. He also noted that sales of the Data General/One laptop micros were still "below expectations" but that DG Desktop Generation micros and other OA products continue to sell well.

The Westboro, Mass.-based minicomputer maker reported earnings of $9.1 million in the quarter ended March 30, down from $14.2 million reported in the previous year. Per-share earnings slipped from 55 cents to 34 cents.

Explaining the quarterly results, de Castro cited weak orders from domestic customers, a marked drop in demand for DG's 16-bit Eclipse minis from OEMs and sluggish industrial markets due to the falloff in capital spending.


De Castro

"We are down in our traditional strength of sales of 16-bit products to OEMs for medical, technical and [computer-aided design and engineering] applications," de Castro said. "Those markets are moving to 32-bit systems, but the transition has been slow to occur, especially among electronics and semiconductor manufacturers."

De Castro predicted that the company's next significant growth area will be large-volume sales of high-end 32-bit OA products and integrated personal computers to both the private and public sectors.

"The office integration market is only beginning, and we have found our business mix shifting more rapidly to business automation," he said.

"In sales to the federal government, the OEM is becoming less dominant as the need for integration

See DG page 99

Computervision loss exceeds projections

BEDFORD, Mass. — Computervision Corp. last week announced a first-quarter loss of $18.8 million, or 65 cents per share, somewhat more than earlier projected.

The company announced last month [CW, April 15] the dismissal of 15% of its work force, some 950 employees, after projecting a first-quarter loss as high as $15.7 million. The actual loss was higher due primarily to one-time costs of reducing operating expenses, the company said.

The loss compares with year-earlier profits of $16.2 million, or 37 cents per share. Revenue for the quarter was $106.8 million, down 12% from year-earlier revenue of $121.7 million.

Despite the financial setback, which followed fiscal year 1984 profits of $47.7 million on revenue of $556.3 million, James R. Berrett, the company's president and chief executive officer, said, "the company continues to maintain a strong balance sheet."

Computervision said the adverse results were due to a sluggish economy, operating expenses based on higher than achieved revenue and a stretch-out in the sales cycle due to the transition of the company's product line.

Nixdorf exec blasts German PTT for impeding progress

By [illegible]
CW Staff

HANNOVER, West Germany — In a fiery opening day address at the recent Hannover Faire here, Nixdorf Computer AG's founder and president, Heinz Nixdorf, charged the West German Postal Telephone and Telegraph (PTT) authority with obstructing technological progress in the country.

According to this patriarch of the Paderborn, West Germany-based computer firm, the German PTT is grossly inefficient, expensive and anachronistic. Nixdorf claimed the state-run monopoly "would certainly change their structure if they thought it would make them rich."

Nixdorf's attack on the domestic PTT included the charge that the groundwork for an integrated services digital network system here will not be ready by the year 2000.

Nixdorf also hurled criticism at the government in general. "Germany is the strongest European country economically but at the same time the weakest nation. Germany just does not spend enough money educating its youth," he said. Furthermore, Germany's national birth rate is on the decline, heralding more bad news for the future national work force, Nixdorf predicted.

Nixdorf dealt harshly with his competition as well, arguing the superiority of his company's product line. "We've invested in order to produce quality. You cannot count on the same from the world's largest computer company," he said, alluding to IBM.

He noted that the U.S. Department of Defense invests huge sums of money in the electronics industry, which ultimately benefits private industry. German firms, on the other hand, are largely left on their own to finance their efforts, he said.

Nixdorf listed Japan, in addition to the Pentagon, among the enemies of the German high-tech economy. "The Japanese have been able to bring exceptional and inexpensive products to the market because of their low wage scale . . . a scale that would be considered unacceptable in Germany."

As for product strategy, "the future of Nixdorf AG lies in communications technology," Nixdorf said. He noted that the business of integrating data processing and data transmission accounted for 5% of the company's worldwide revenue of $1.09 billion in 1984 and predicted it will increase to 10% this year.

But the most important contribution of the computer company is the jobs it provides. Approximately 250 workers per month were added to the Nixdorf work force in 1984, and the company has shown continued growth so far. Nixdorf projected that corporate revenue will double that of 1984 in less than four years.

Lotus to buy Dataspeed for $6.5 million

CAMBRIDGE, Mass. — Lotus Development Corp. recently announced it had agreed to acquire San Mateo, Calif.-based Dataspeed, Inc. in a transaction valued at $6.5 million.

Lotus also recently announced first-quarter profits of $9.6 million, or 58 cents per share, up from $7.5 million, or 47 cents per share, a year earlier. Revenue for the quarter was $44.7 million, up from $28.2 million a year earlier, but below the levels of the previous two quarters.

Dataspeed manufactures two products that receive data transmissions from FM sideband radio waves and provide users with real-time stock quotations. The Quotrek product is a hand-held device that resembles a pocket calculator and displays information on a small screen. The Modio is a modem-like device that attaches to a micro and will reportedly be bridged to Lotus' 1-2-3 and Symphony software products.

The letter of intent, signed by the two companies, provides for a cash acquisition reflecting $2.05 for each Dataspeed share before accommodating a pro rata reduction of certain shareholder expenses associated with the acquisition.

Additionally, the agreement provides for conversion of about $3.7 million of Dataspeed's long-term debt to be converted into common stock at a conversion price of $5 per share. Also, Lotus will acquire about $300,000 of the long-term debt for approximately $122,000, and all interest on Dataspeed's debt will be forgiven, according to Lotus.

Dataspeed's current cash needs will be met by loans from Lotus to provide working capital until the acquisition is formally completed, which is expected to occur within three months, the companies said.

Following approval of the boards of directors of both companies and the shareholders of Dataspeed, the acquired company will operate under the Dataspeed name as a wholly owned subsidiary of Lotus. Dataspeed's chairman, David B. Lockton, and president and chief operating officer, James West, will continue to manage the company.

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Adapso group reviews key ring standard proposals

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Hardware and software vendor representatives who met here recently to review proposed standards for devices to prevent software piracy said several key issues remain unresolved.

Sponsored by the Association of Data Processing Service Organizations, Inc.'s (Adapso) Software Protection Committee, the meeting was held to discuss the committee's controversial standards proposal regarding development of a key ring hardware component intended to prevent microcomputer software piracy.

Marvin Goldschmidt, chairman of the Adapso committee and vice-chairman of Lotus Development Corp., said he was disappointed that no user groups — including the New York-based Microcomputer Managers Association, which opposes Adapso's copy-protection proposals — attended the meeting.

Problems cited

Several technical problems still stand in the way of the standard, which Adapso members said would be finalized within two months.

The prototype key ring products presented at the meeting by Quadram Corp. of Norcross, Ga., were too large, said Barton O'Brien, sales vice-president at RSA Security, Inc. in Sunnyvale, Calif.

"At this rate, the device will be bigger than the computer it's supposed to protect," O'Brien said. But RSA plans to manufacture such a key device that will act as an "electronic passport," verifying identification and credit and banking data, he said.

Ramesh Bijor, engineering manager for Racal-Vadic, Inc. in Milpitas, Calif., a manufacturer of modems and add-on cards, said he was skeptical of the prototypes he had seen at the presentation. Bijor said that speed and transparency to the end user were still unresolved issues.

"Quadram says its device will operate at 38.4K bit/sec.," he said, "but I'd believe it more if it ran at 2.4K bit/sec." Bijor said Racal-Vadic was planning to differentiate a key ring product by making it part of a modem.

Simcha Lerner, principal Lotus software engineer, said some computer systems, such as Apple Computer, Inc.'s Apple II, have noncommunicative status lines that prevent host-to-key-ring communications.

William A. Miller, vice-president for product development at Practical Innovations, Inc., a Sunnyvale, Calif.-based integrated circuit designer, said, "To meet the standard, we need to know more about it. What we really want to know is, can we do it cheaply, and will someone buy it."

Providing 100% security

Several participants questioned the viability of a hardware-based device, saying that nothing can provide 100% security. Skeptics said the device would require software to read the key, and software is always open to pilferage by motivated hackers or engineers.

But Paul Maybaum, a Hewlett-Packard Co. engineer, said, "There's a lot of paranoia about this, but just because a device can be defeated doesn't mean it's no good."

The key ring would make it technically and financially unfeasible for most users to defeat it, Maybaum said, because "very few people have a $10,000 logic analyzer on their desks."

Comdisco posts second-quarter profit increase

ROSEMONT, Ill. — Comdisco, Inc., a computer dealer and leasing company based here, recently announced second-quarter operating profits of $8.1 million, or 30 cents per share, up from $4 million, or 14 cents per share, in the same period a year earlier.

Revenue for the quarter was $138 million, down from $146.7 million a year earlier, according to the computer firm.

The company said computer sales revenue declined by about $25 million from that of a year earlier, owing primarily to a purchase slowdown resulting from anticipation of IBM's recently announced 3090 series mainframes.

Extraordinary gain

Comdisco also posted an extraordinary gain of $30.1 million, or 30 cents per share, realized through an exchange of new debentures for existing debentures.

Comdisco Chairman and President Kenneth N. Pontikes said, "IBM's recent product announcements have reduced uncertainty in the marketplace and will provide substantial future opportunities for Comdisco as deliveries begin and as existing systems are displaced."

The company said that, other than the computer sales decline, revenue from all of its other activities was higher than that of the year-earlier period.

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IBM must make changes to retain its 'colossus' status

OUTSIDE LINES
Brian Jeffery

First of a two-part series.

The trouble with IBM is that as soon as everyone has figured out how it works, it starts working differently.

In the 1970s, IBM was considered something of a monolith, preoccupied with its mainframes and none too agile in addressing other markets. Then in 1981 it reorganized, new strategies were introduced, diversification programs launched and a new "entrepreneurial" spirit manifested.

The success of IBM in the microcomputer marketplace was lauded as an indication of a new, flexible, fast-moving IBM. In 1983, *Time* ran a cover story about the company — "IBM: The Colossus That Works" — and IBM basked in an almost universally favorable response from the press, industry analysts and the financial community.

IBM announced that it was shooting for 15% annual revenue growth for the next decade and seemed to be making it. In 1983 it logged 16.9% revenue growth. That same year, IBM appointed a relatively young company veteran, John Akers, as president.

It is 1985, and a lot has changed. Although most of the industry has not yet realized it, IBM has embarked on another of its radical shifts in direction. By the time it is over, it will likely have an impact on the information processing industry equal to that of the 1981 reorganization.

The most visible change has been in IBM's microcomputer operations, once the showpiece of the "new IBM." IBM's Entry Systems Division has been cut back to the status of just another IBM product division, with its marketing operations turned over to a mainstream IBM division and its charismatic head, Phillip D. Estridge, removed from the scene. The PCjr is dead, and the breakneck 1984 growth in sales of Personal Computers has given way to what, by IBM's own admission, is going to be a much weaker 1985 market.

> ”
>
> *Although most of the industry has not yet realized it, IBM has embarked on another of its radical shifts in direction.*

While opinions differ on the significance of IBM's treatment of its Personal Computer operations, there is general agreement that there will be more central control of Personal Computers and closer integration with other IBM products and strategies.

The tone of IBM corporate management has also changed. In 1983, then IBM Chairman and Chief Executive Officer John Opel was emphasizing "new entrepreneurial opportunities with high, long-term growth potential." Opening 1985, IBM CEO and President John Akers gave an interview to *Business Week* in which he talked about IBM's Systems Network Architecture (SNA) and increasing IBM software revenue.

While all this was going on, yet another major change was occurring, one that was clearly not in the company's plans. IBM's financial performance took a nosedive. After its 1983 peak, IBM's revenue growth hovered a little above 15% for the first three quarters of 1985, then dropped to 12.4% in the fourth quarter. In the first quarter of 1985, things went from bad to worse. Revenue growth was down to a startling 1.9%, and earnings dropped no less than 17.9%. IBM blamed the slump primarily on the exchange rate.

The exchange rate didn't help, but the fact is that John Akers had taken over management of a company that had some serious problems, and the decisions being taken under his regime were attempts to deal with a fast-deteriorating situation.

What went wrong? Among other things were the following:

- IBM had given itself a major short-term growth stimulus by converting from a rental to a sales company, substituting larger up-front billings for the slower, more stable revenue streams from rental equipment. Rental income declined from 44% of IBM revenue in 1979 to 37.3% in 1981 and 14.3% in 1984 and seems to be disappearing in 1985.

The problem is that IBM has now pretty well exhausted the growth potential from this conversion process. In retrospect, IBM had converted too fast, giving it several years of fast growth but creating a serious growth drag over 1984-85 as the stimulus slowed.

- Despite the widespread perception of IBM as the "Colossus That Works," IBM over 1981-84 had been a company of highly variable performance.

A couple of "star" performers, principally mainframes and Personal Computers, had disguised weaker showings elsewhere. The mid-range sector has remained weak; virtually all of IBM's Independent Business Units turned in woeful performances; maintenance services, which have accounted for more than 11% of IBM revenue for several years now, remained a high overhead operation that had to strain to match corporate growth; IBM's move into the telecommunications area ran into technical bugs, problems with collaborators and losses; the company's massive investments in R&D and manufacturing plant and equipment did not pay off as expected.

As a result, IBM became highly dependent on its "star" performers. They were carrying much of the rest of the company. In 1984, IBM recorded record sales of its 3080 line of mainframes and related products, and its Personal Computers. Slumping 3080 and Personal Computer sales this year have had a "multiplier effect" in bringing down overall corporate performance, and the slowdown in IBM's revenue growth from these areas looks like a long-term phenomenon.

- John Opel's decentralized management style has resulted in IBM's failing to address many structural problems. For example, the profusion of Personal Computers in the corporate market has undercut IBM's efforts to develop a more comprehensive office automation scenario built around SNA.

The decentralized management style also meant that IBM failed to address the inefficiencies and losses of its Independent Business Units, the National Marketing Division small business direct sales organization and the disastrous Product Center program and other areas. Similarly, although IBM has been drawing plaudits for its heavy R&D and manufacturing investments, there is reason to doubt their effectiveness. IBM's in-house R&D activities have contributed only a few really new products and technologies, and throwing robots at its work force has disguised the fact that IBM remains overstaffed on the manufacturing side. In both cases, IBM's response has been to throw money at problems rather than to perform the kind of surgery that could have made these areas more cost-effective.

Next week: What the changes are likely to involve.

Jeffery is director of research at International Technology Group, a Palo Alto, Calif.-based computer industry market research firm that focuses on IBM.

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Former IBM exec joins Amdahl

SUNNYVALE, Calif. — Amdahl Corp. has named former IBM Corporate Marketing Director E. Joseph Zemke chief operating officer, effective May 1.

Zemke most recently was president and chief executive officer of Auto-Trol Technology Corp. in Denver. Before joining Auto-Trol, he was employed by IBM for 18 years as a systems engineer, regional manager and corporate director of marketing.

Zemke will be part of Amdahl's newly formed office of the president. He will report to Amdahl Chief Executive Officer John C. Lewis.

Zemke will be responsible for direct management of the day-to-day functions of the mainframe and storage product manufacturer.

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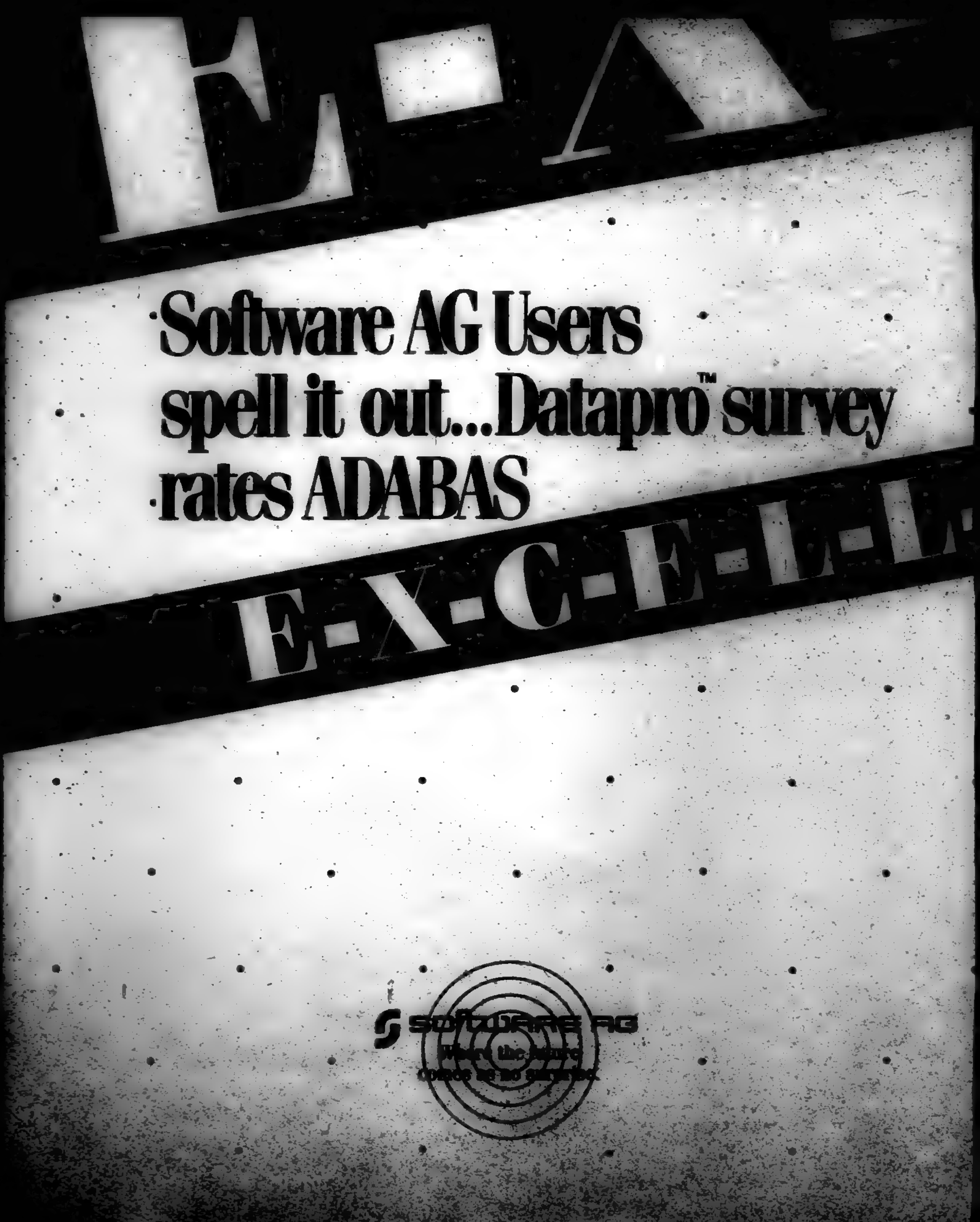

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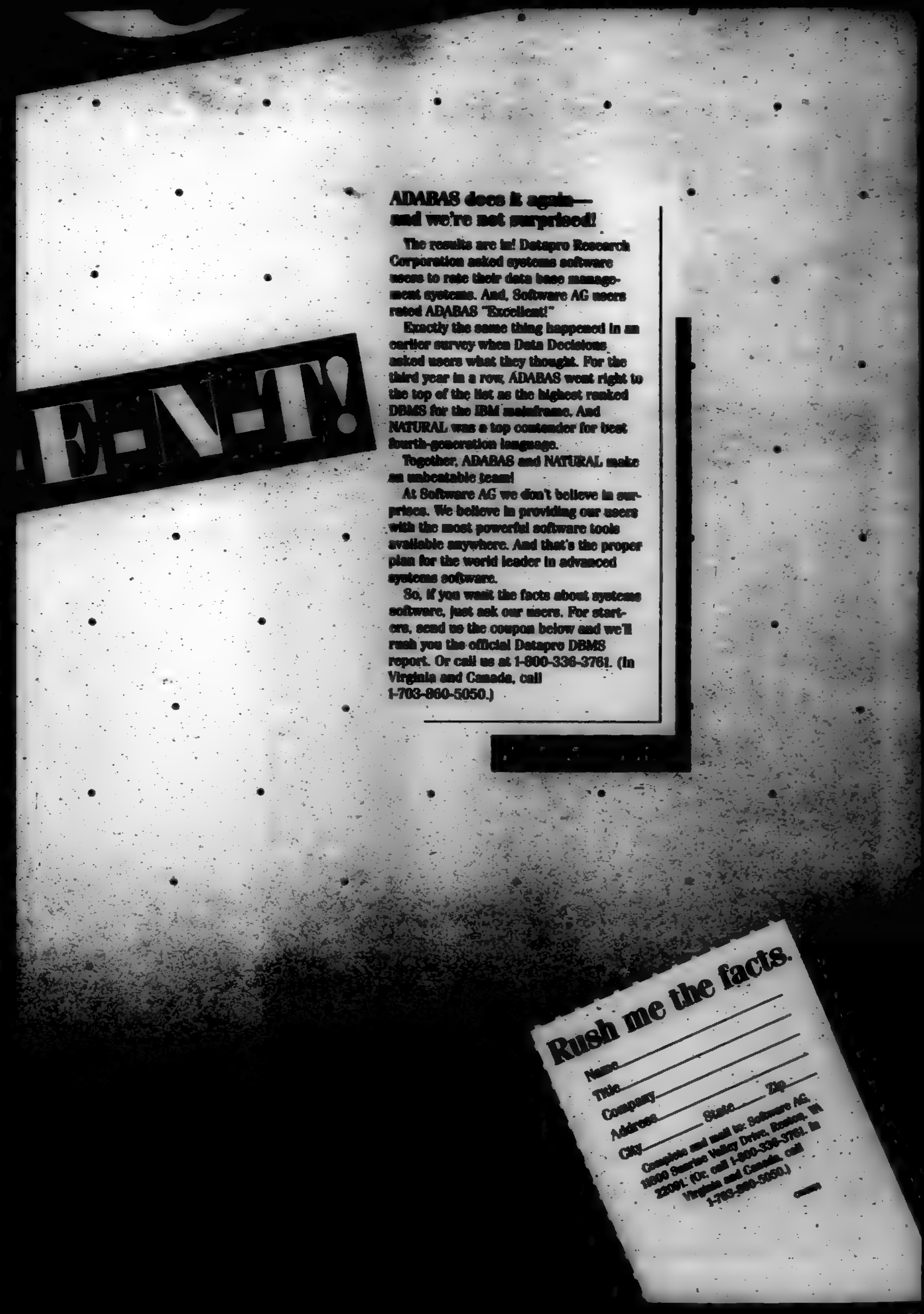

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Tandy advertisement prompts Victor suit

SAN FRANCISCO — Victor Technologies, Inc. has filed suit against the Radio Shack division of Tandy Corp. because of a Tandy newspaper advertisement that encouraged users of Victor and other personal computers to "throw your orphaned computer on the junk pile."

A spokesman for Victor, which is currently protected from its creditors under Chapter 11 of the Federal Bankruptcy Act, called the ad "really pretty sickening. It was particularly unfair since we've never abandoned any of our products, and we have continued to manufacture and support the 9000 [mentioned in the ad]," spokesman Michael Penna said.

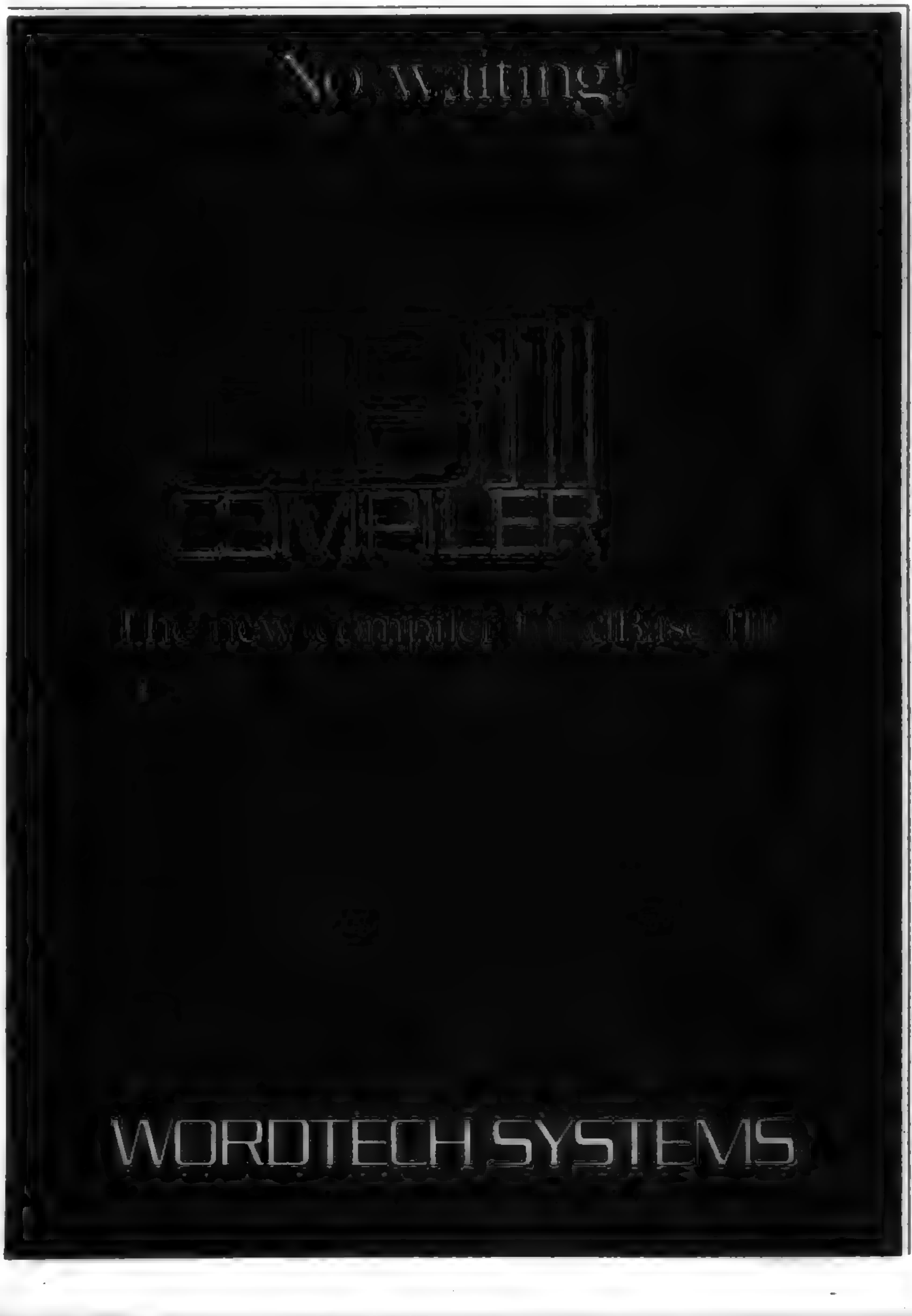
The suit, filed April 23 in U.S. District Court here, seeks $1 million in punitive damages and unspecified amounts in special damages and in general damages for loss of reputation. The suit demands compensation for any sales Victor can prove to have lost because of the ad and an account of any profits Tandy may have made promoting its products at the alleged expense of Victor.

The ad, which ran Feb. 22 in *The Wall Street Journal* and other publications, offered owners of Victor and other micros a $75 to $150 credit toward either a Tandy or a Radio Shack personal computer. "Radio Shack wants to give your orphaned computer a new home — the junk pile," the ad read.

Victor attorney Constance Jones said that Victor did receive a requested letter of apology from Tandy but that Tandy refused to publish a retraction of the ad as demanded by Victor. Jones said Tandy's letter "apologized for any offense that Victor had taken," but did not disclaim the description of the Victor computer as "orphaned."

Tandy legal department spokesman Herschel Wynn could not be reached for comment.

No other vendors mentioned in the ad have filed suit against Tandy, but Penna said Victor's action may encourage them to do so if they feel that their reputations have been damaged.



TAX

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noncapital-intensive companies such as software developers — Mosley said computer service and software companies have simply qualified for fewer tax credits and incentives in the past, and, therefore, fewer tax dollars would be taken away from them under the new proposals.

Mosley said Adapso plans to study each of the tax proposals to determine whether they create adequate incentives for research and development and capital formation. Adapso's board will support tax reform only if sufficient incentives are identified, he said.

Tax credit up for review

Also slated for congressional review is the Research and Development Tax Credit, which provides a 25% credit for increasing a company's qualified research expenditures over a specified time period, said Mary Jane Desrosiers, Adapso's assistant general counsel, who co-chaired the meeting with Mosley.

In 1983, the IRS attempted to redefine what constitutes qualified research, making computer software ineligible for the credit, Desrosiers said.

The IRS' proposed regulations were never finalized, Desrosiers said, but because the credit will expire Dec. 31, Adapso members will lobby for the passage of two bills now before Congress.

The bills (S. 58 and H.R. 1188), introduced by Sen. John Danforth (R-Mo.) and Rep. J. J. Pickle (D-Texas), respectively, would make the R&D tax credit permanent.

These bills would also redefine qualified research to include R&D specifically aimed at the development of software for business use, Desrosiers said.

No hearings have been scheduled for the bills yet, she said. However, Adapso is collecting financial data from computer and other high-technology firms that will be used to support Adapso's claim that the credit is effective in stimulating increased R&D, she said.

'Private Letter' ruling

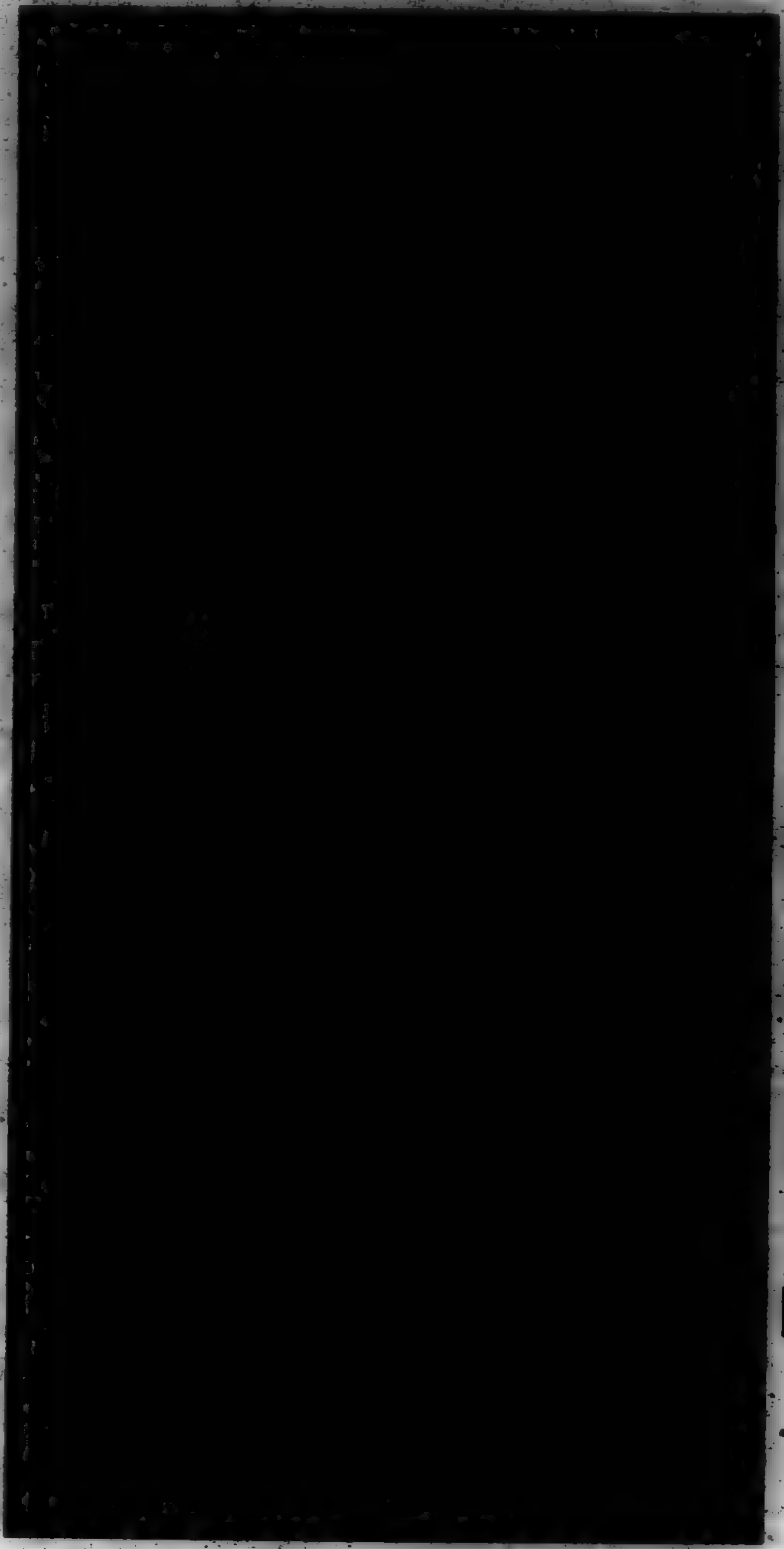
Another ruling slated for congressional review is the "Private Letter" ruling, issued by the IRS last fall. The ruling exposed most software companies to a personal holding company tax that could cost them a 50% tax on all retained earnings.

"The IRS ruling, in effect, lumps software companies under the personal holding company tax umbrella," Desrosiers said.

Under rules governing taxation of personal holding companies, software license and maintenance fees constitute "passive" income, and if 50% of a software company's income is derived from passive investments, they may be faced with a 50% penalty tax on retained earnings, Desrosiers said.

In response to the IRS ruling, Adapso has asked Rep. Ed Zschau (R-Calif.) to introduce legislation retroactive to 1963 that would exclude computer software licensing and maintenance fees from the personal holding company income category, Desrosiers said.

Adapso also hopes to convince the IRS that a mechanical application of the personal holding company tax would impede the development of the nation's software industry.



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Cray revenue triples for quarter

MINNEAPOLIS — The sale of nine supercomputer systems in the first quarter allowed Cray Research, Inc. to report $118.6 million in revenue, nearly triple the $44.1 million posted in the first quarter of 1984.

Profits for the quarter ended March 31 were $30.8 million, or $2.05 per share, up from $5.7 million, or 39 cents per share, one year ago. In the first quarter of 1984, Cray sold two systems and leased three others.

Because of the multimillion-dollar price tags of its key products, Cray's quarterly results are influenced significantly by the number of computer systems accepted during the period and by whether systems are purchased or leased.

Cray Research Chairman John A. Rollwagen said the company expects to install 30 new systems in 1985. "Though all of the systems accepted in the first quarter were purchased, we still anticipate significant leasing activity during the balance of the year, involving approximately half of the remaining systems," Rollwagen said.

CURB

from page 85

board thing, like a 10% or 20% surcharge on all Japanese products, we'll get caught in it."

Like most of its competitors, National Semiconductor has been hard hit by stockpiled customer semiconductor inventories, plummeting chip prices and the overall high-tech slowdown. "This is the worst downturn any of us in the industry can remember and the first one not tied to a general economic slump," Sprague said.

But he predicted National Semiconductor will rebound within three to four months with a boost from its 32-bit microprocessor-based products. "The Series 32000 is our brightest ray of hope in a while," Sprague said. "We think we have leadership in the technology, that [Intel Corp.] is way late and [Motorola, Inc.] is later than the market thinks. That's the best way out of a slump — to build proprietary products and hang others on them."

Pickup in [illegible]

Sprague believes the overall semiconductor industry recovery will coincide with a pickup in the computer and electronics market later this year. "Obviously we won't pick up in a vacuum, but eventually, our customers are going to chew through their inventories," he said. "The business hasn't gone away; it's simply an inventory problem. I know one company that bought $30 million worth of 64K chips at $5 each. Recently, I've heard of the same things selling for 65 cents."

Sprague also based his optimism on automobiles and other products currently in the design stage that will require more microprocessor-based technology than previous models.

NAS' recently unveiled AS/XL mainframe series is targeted directly at the IBM 3090 series Sierra, and Sprague had harsh criticism for Big Blue's market promises on another product, the discontinued PCjr microcomputer.

PCjr only 1% of IBM sales

"You guys in the press were lied to, everyone was lied to," Sprague said. "If any other company was touting a product like that right before pulling the plug on it, the [Securities and Exchange Commission] would be all over them. But IBM got away with it because the PCjr amounted to less than 1% of [its] business.

"IBM depends on what I call the 'FUD factor' — fear, uncertainty and doubt," he continued. "It's a big enough elephant to keep the marketplace in chaos when it wants to."

Sprague downplayed AT&T's recent entry into the 32-bit microprocessor sweepstakes and its intent to purchase four Honeywell, Inc. Synertek chip factories. "Being a monopoly for so long doesn't train you for competition," he said. "And I challenge anyone to name a more competitive business than semiconductors. If they don't succeed, it's no big deal to their overall business, but if we don't figure out the semiconductor market, we're dead. And the threat of death helps keep people focused."

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Compaq posts 42% profit rise

HOUSTON — Compaq Computer Corp. recently announced that its first-quarter profits rose 42% to $4.6 million, or 17 cents per share, compared with $3.3 million or 12 cents per share, one year ago.

The most successful maker of IBM-compatible desktop microcomputers reported revenue of $97 million for the quarter ended March 31, up 54% from $62.9 million in the year-earlier quarter.

"Our first-quarter results are especially gratifying when compared with the mixed results of other personal computer companies during this period," Compaq President and Chief Executive Officer Rod Canion said.

Canion said sales of the company's four Deskpro personal computer models increased steadily each month during the quarter. The company claimed that the Deskpro is now the second-best-selling line of desktop business micros, trailing the IBM Personal Computer line.

Personal computers debut

The company also recently introduced the Telecompaq series of personal computers. The series is said to combine telecommunications capabilities in a desktop micro.

The Telecompaq is a product of the company's Dallas-based Compaq Telecommunications Corp. subsidiary.

Compaq recently completed construction on the first of its three-building Compaq Center, its new corporate headquarters in northwest Houston.

DG

from page 85

and service from a single vendor is greater than ever before."

De Castro called the reported decline in the personal computer market a myth and expressed confidence that sales of the coolly received Data General/One would pick up. "The complaints about the [Data General/One's] LCD screen are behind us," he said. "Overall, our personal computer business has held up well, and desktop model sales are up 50% this year."

Last week, DG announced across-the-board price cuts on the Data General/One. The price for the most commonly sold configuration was slashed by $600, or 15%, to $3,495.

De Castro predicted DG would require 30% to 35% growth in 1986 to post a 12% or 13% profit margin next year. He said achieving such growth depends largely on the overall economy, even though the company has high hopes for the products it plans to announce in the next six months. "If people aren't buying anything, products won't make a difference," he said.

De Castro included on the Data General/One user list Colorado Gov. Richard Lamm, Lotus Development Corp. Chairman Mitchell Kapor and Apple Computer, Inc. co-founder Steven Wozniak.

TAKEOVER

from page 85

interests of the shareholders."

Ray Hanson, executive assistant to the president at Sterling, said confidential discussions have been ongoing for several weeks between officers of the two companies and that Sterling is hopeful the talks will continue.

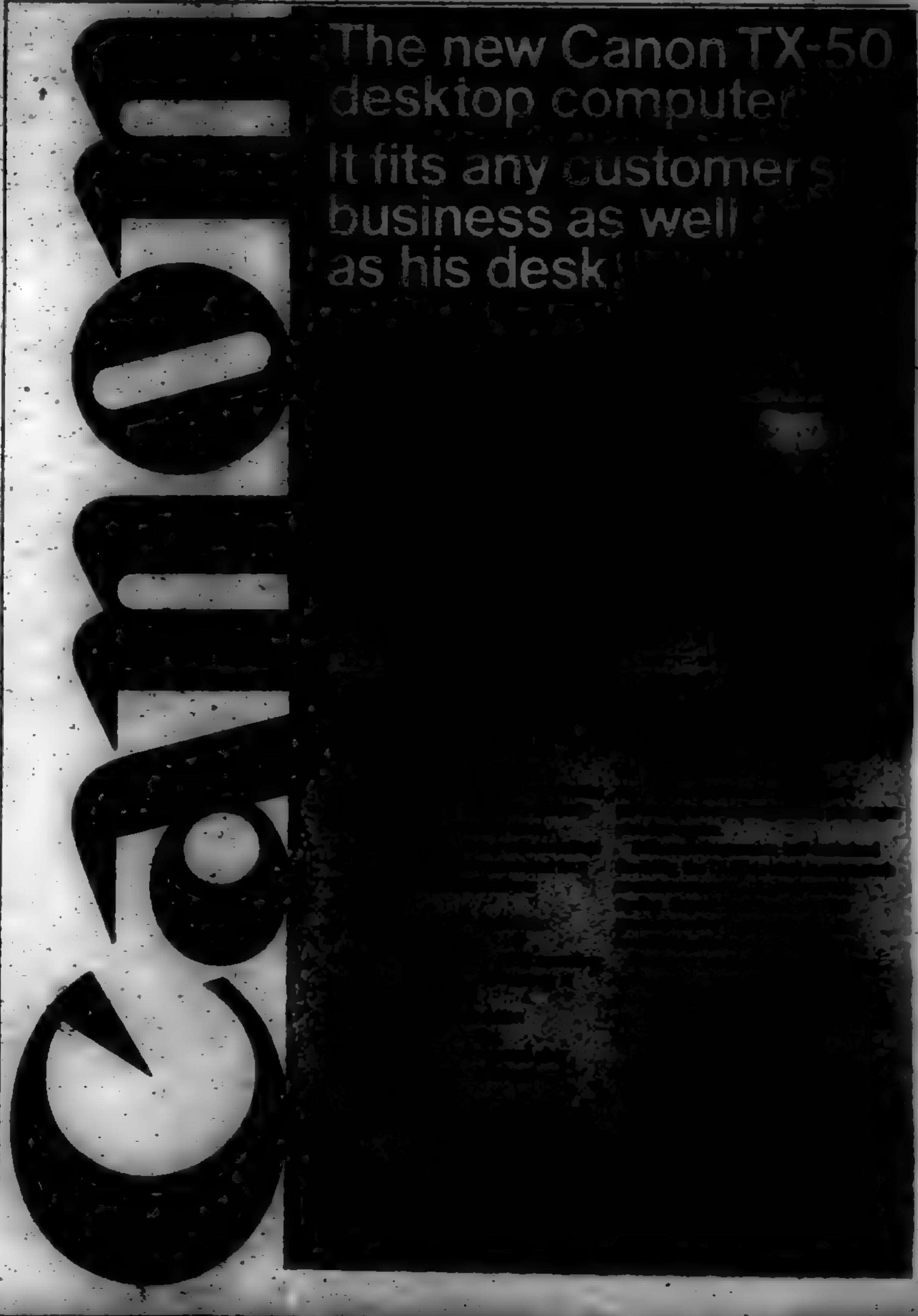
According to Hanson, Sterling does not foresee any problems with a loss of managerial goodwill at Informatics if the takeover is successful because, he said, "even a fallout of Informatics' executives would not diminish the long-term benefits we'd gain from Informatics' products and markets. The business will remain viable."

Informatics posted a 1984 revenue of $191 million and profits of $6.2 million. Last week, Informatics reported that first-quarter profits were $88,000, or 1 cent per share, down from year-earlier profits of $689,000, or 12 cents per share; revenue increased to $49.9 million from $41 million a year earlier. Sterling in 1984 posted a revenue of $18.7 million with profits of $1.1 million.

Curt A. Monash, a vice-president at Paine Webber, Inc. who observes software companies, said Informatics is ripe for a takeover because of its decentralized operations, unpopular management team and cash-rich position. According to Monash, Informatics is a $200 million company with approximately $50 million in cash assets and a $75 million debt. Sterling's offer of more than $120 million actually reflects a real-cash bid of $80 million for the company, which Monash called attractive.

During a recent meeting of software and services companies, John Cullinane, chairman and CEO of Cullinet Software, Inc., said of the Informatics battle, "I can't believe this is happening in the software industry; it's a first." Cullinane said he did not think the takeover attempt, if successful, would add any technical or business value to Informatics.

Informatics last Monday responded to the takeover threat with a lawsuit seeking to block Sterling from proceeding with the proxy battle, acquiring additional Informatics stock or from voting the shares it already holds. Informatics alleged that Wyly offered Bauer personal inducements, including guaranteed employment for 10 years, in exchange for Bauer endorsing the takeover attempt. Informatics also claimed Sterling's proxy battle was based on confidential information provided by Informatics during negotiations.


Canon
The new Canon TX-50 desktop computer.
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The carrier on the right is the Telecopier 295, a new high-speed facsimile just introduced by Xerox.

While it's not quite as flashy as the Concorde on the left, the technology is just as amazing.

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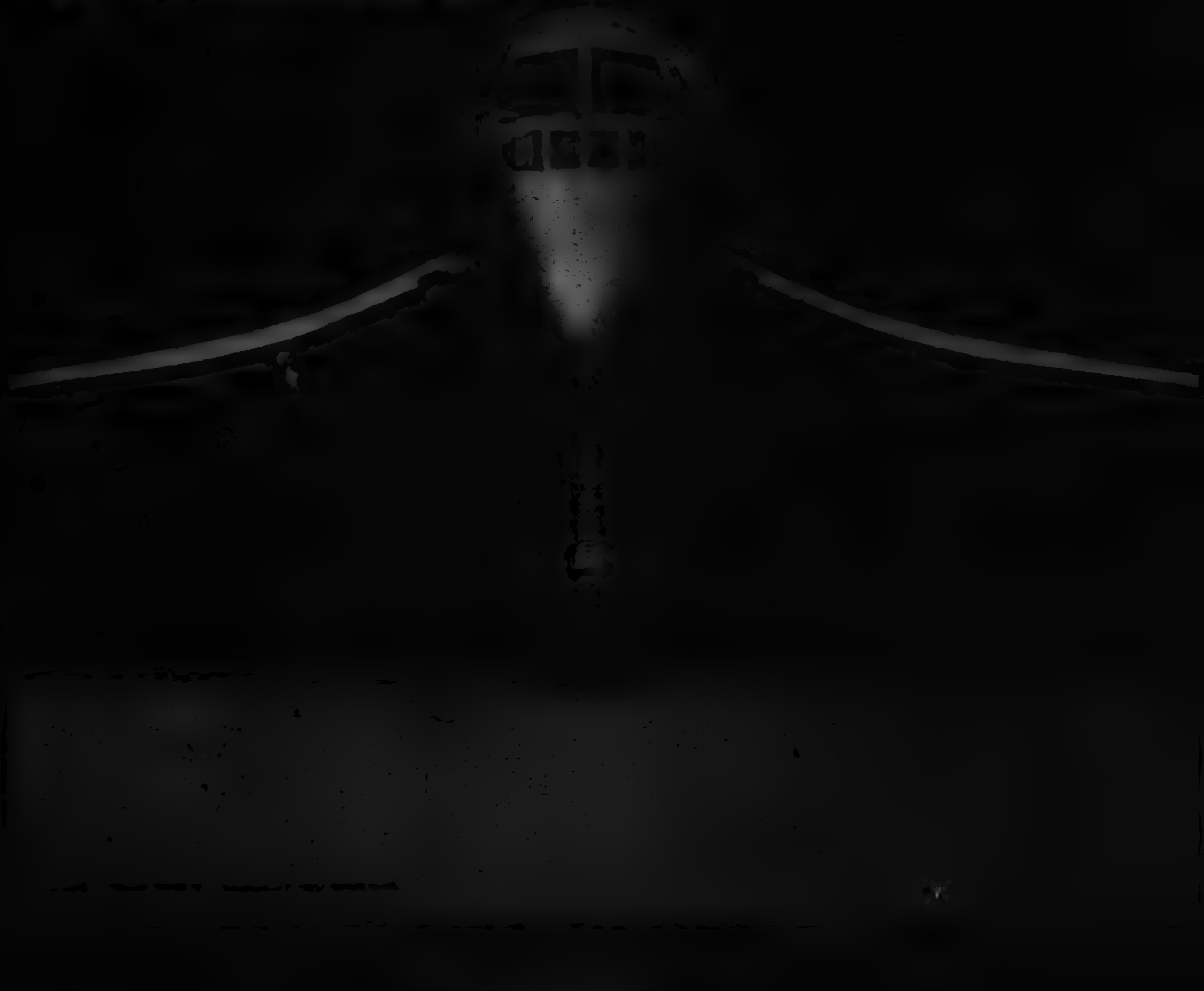

the computers and workstations that are part of Team Xerox.

With the G1/G2 analog compatibility option, it can communicate with other slower speed facsimile terminals. With the RS-232-C option, it can also convert and print ASCII encoded information from a vast array of computers.

But the most amazing thing about the Telecopier 295 is its price: about the cost of one round trip to Paris on the Concorde.

Now that's progress.

To learn more about the Telecopier 295, call 1-800-833-2323, ext. 44, or send your business card to Xerox Corporation, Dept. 44013, P.O. Box 24, Rochester, N.Y. 14692.

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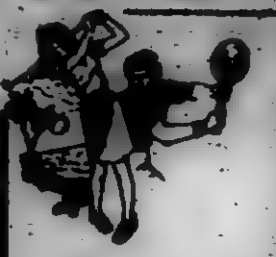

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A construction industry trade association [illegible]

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Yemen Arab Republic Technical Assistance Project General Notice

The International Development Association (IDA) has approved a development credit equivalent about US $4.7 million for a technical assistance Project to the Central Planning Organization.

The project includes two year of services each for a Senior Adviser/Computer specialist, Technical Advisers/Computer Systems Analysts (2), Cost specialist, Contract specialist and Technical Assistance specialist.

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Interested agencies and individual applicants for the specialists posts, may obtain further information by writing to the Project Director, Technical Assistance Project, Central Planning Organization, P.,O. Box 175, Sana'a Yemen Arab Republic; notifications of interest must be received not later than May 31, 1985. Applicants should indicate their specific areas of interest.

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Please send Standard Form 171 (Personal Qualifications Statement) or resume to:

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Bureau of the Census
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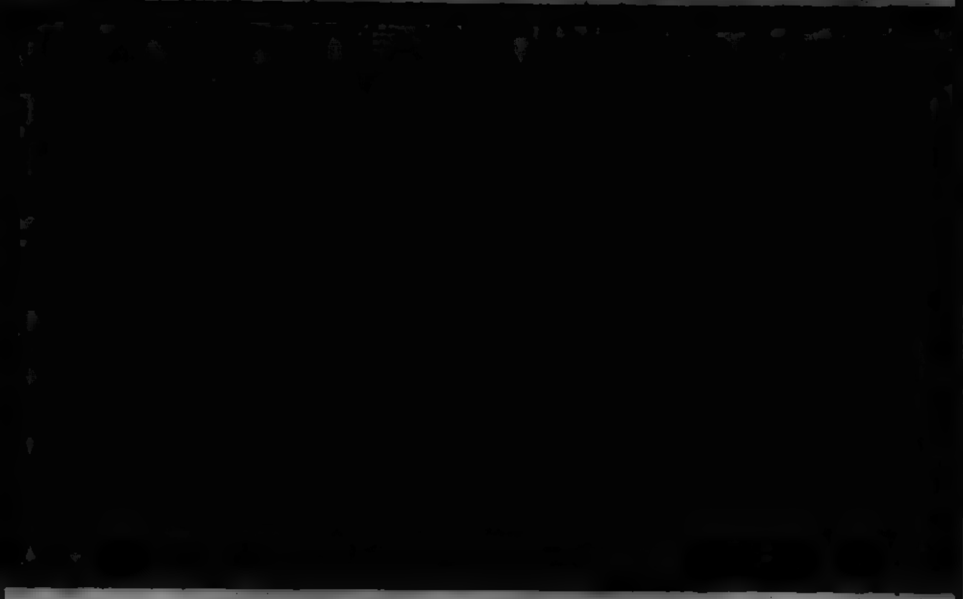

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AA/EOE

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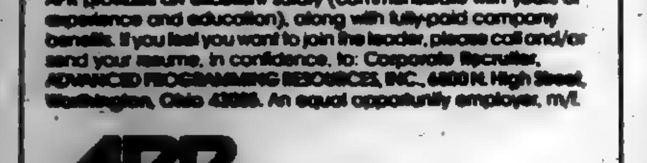

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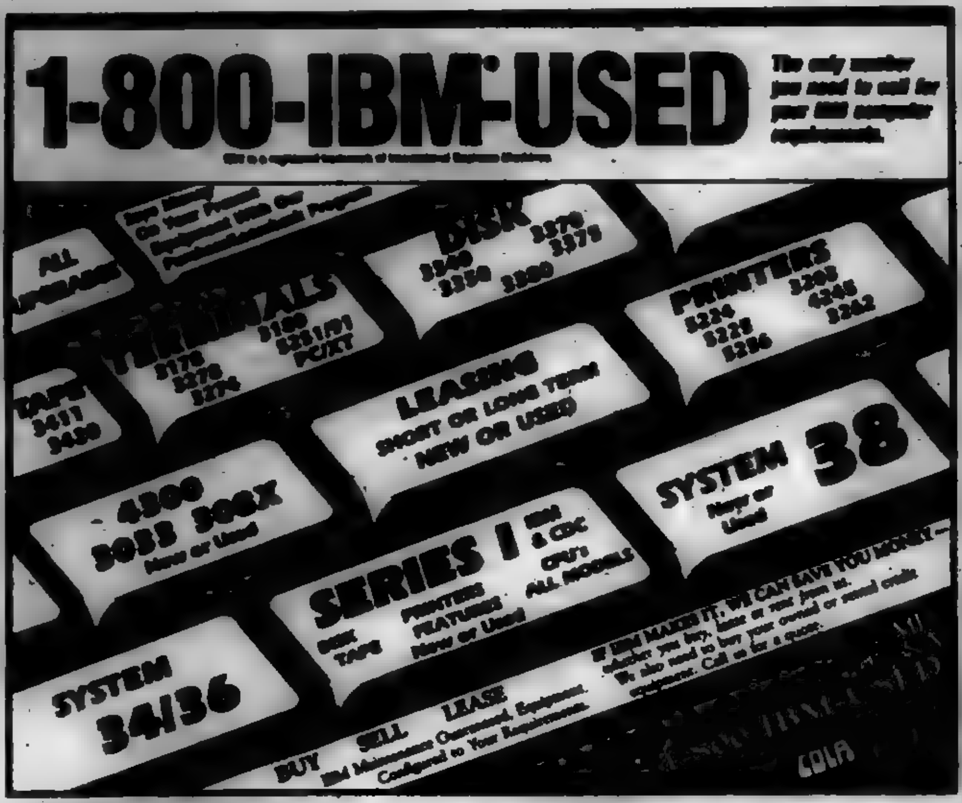

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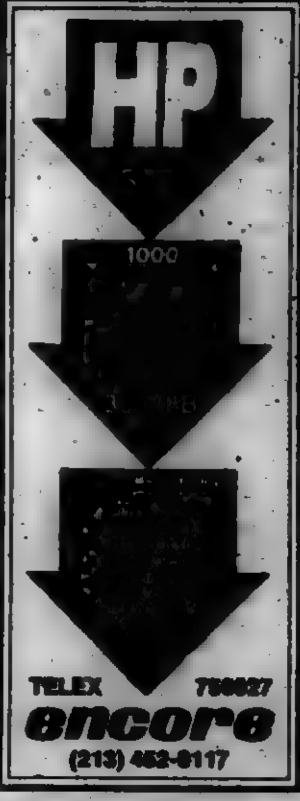

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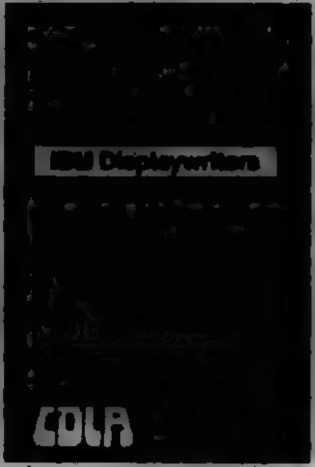

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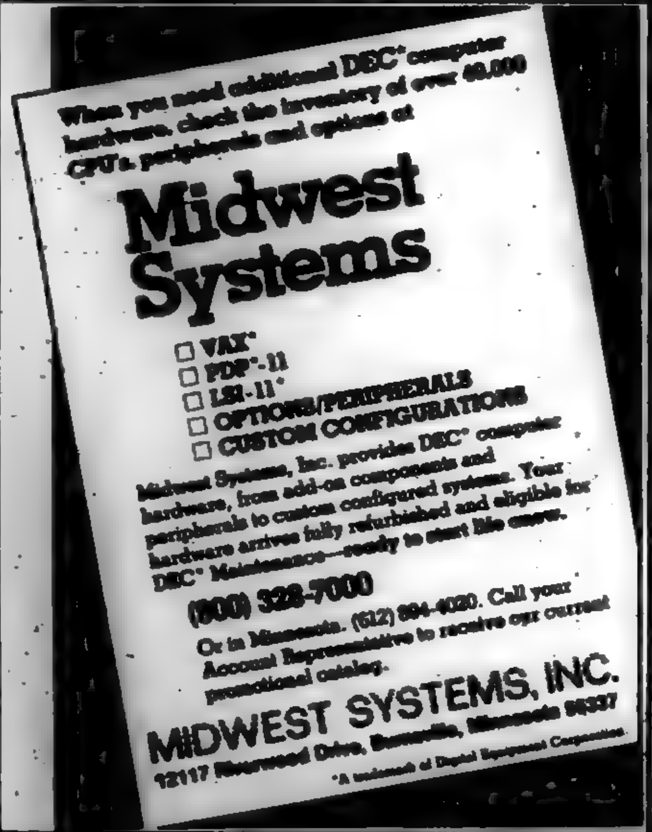

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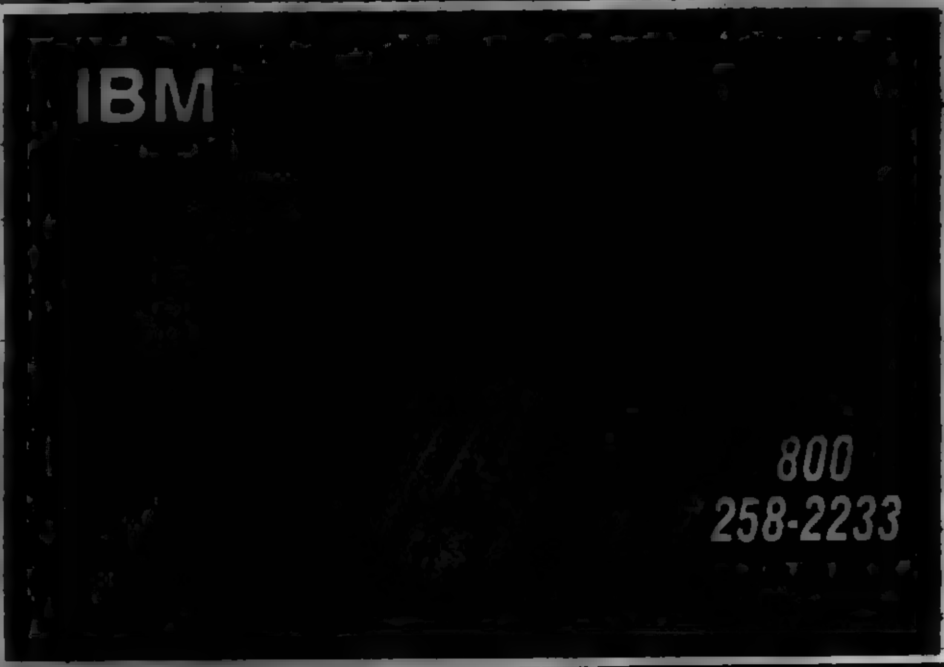

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Request for Proposal No. 1913, due 3:30 p.m., Thursday, May 23, 1985, for the acquisition, design, installation and implementation of a microcomputer Local Area Network for the College of Business and Industry at MISSISSIPPI STATE UNIVERSITY.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

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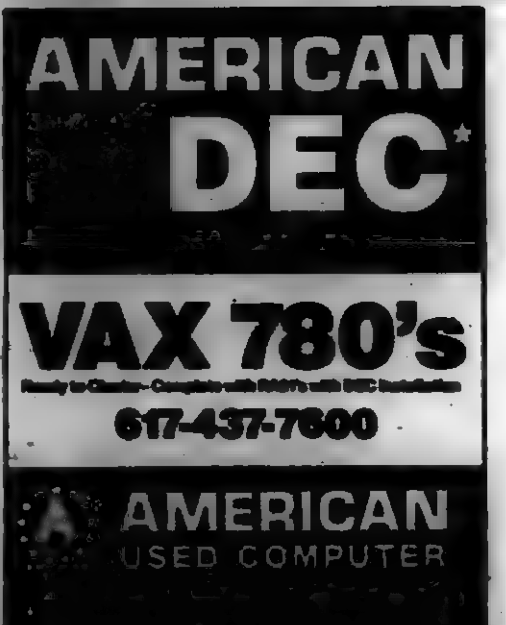

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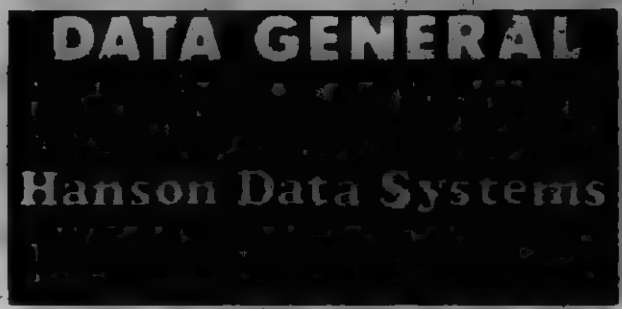

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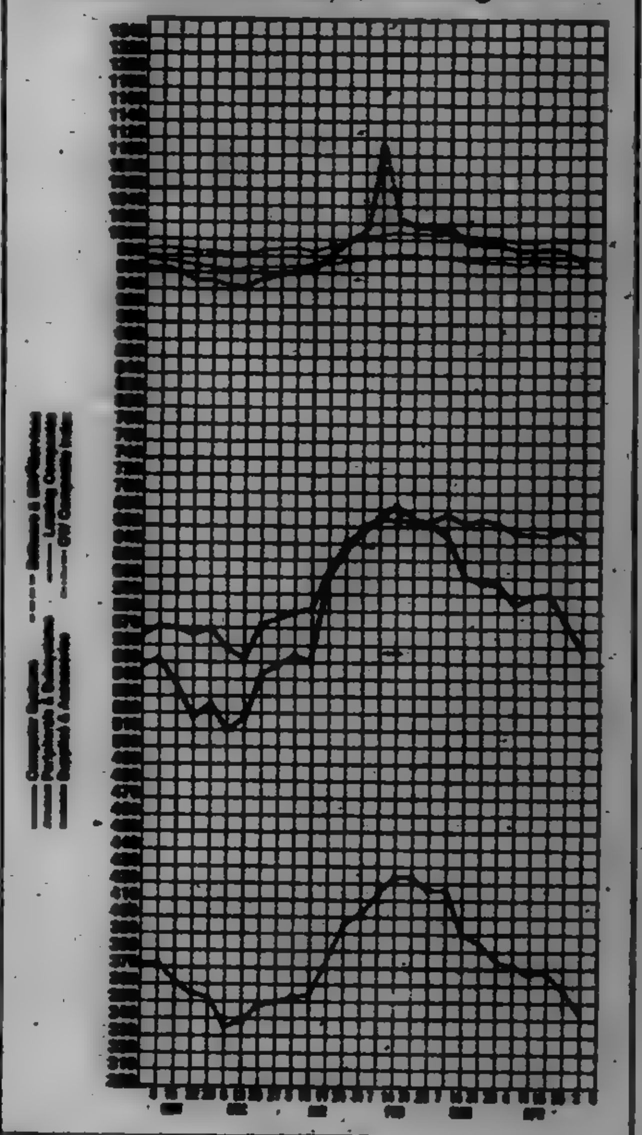

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Editorial

What Is Moving Overseas?

Are the doomsayers right in crying that the U.S. high-tech sector is in danger of losing its leadership position? Even as American name brands dominate and control the worldwide computer market, their product components are being manufactured by overseas suppliers. Korea has cornered the market on computer terminals and Japan now controls most of the computer printer and disk drive markets. Critics contend U.S. companies are in danger of becoming distribution businesses for foreign manufacturers, while many American manufacturers claim overseas manufacturing is the only way to keep costs down and remain competitive.

Who is right? Recent statistics aren't encouraging. Last year the deficit in the exchange of high-tech products between the U.S. and Japan grew to $15 billion and exceeded the deficit for autos. This year, the high-tech figure is expected to reach $20 billion. The softening of the market and the inflated U.S. dollar can both be blamed in part, but the problems go far beyond those factors.

A recent report submitted to the White House on behalf of the President's Commission on Industrial Competitiveness proposed some alternatives. Headed by John A. Young, Hewlett-Packard Co.'s president, the committee stated that the U.S. is spending too little high-tech money on civilian research and development — less than our trading partners, when the figure is considered as a percentage of gross national product. The committee also reported a failure on our part to incorporate more technologically efficient manufacturing methods so that we can be more competitive. Adversarial relationships between management and workers need to be addressed, and more needs to be done to help the work force adapt to the changing technology, the committee charged.

The commission addressed the need for a cabinet-level science and technology department to coordinate research efforts and a trade and industry department to focus federal resources on international competitiveness. The commission also stated the importance of retaining the R&D tax credit and trimming the federal deficit to ease interest rates.

It seems apparent that without some of these changes, more high-tech companies will be moving manufacturing operations overseas. Some don't see this as a problem. Other sectors maintain it will lead to increased vulnerability, and they cite the consumer electronics market as an example.

Solutions won't be easy — even after 18 months of study, Young's committee was unable to come up with a definite plan of action. One thing is clear, however. We as an industry need to take action against any potential threat to our leadership position.

Insider

Exploring New Territory

By Tom Willmott

The most significant management information systems planning challenges today do not come from the data center or the desktop computer. Data center planning activity has largely been mastered. The role of the personal computer in most organizations is relatively well understood. As a result, both users and vendors are focusing increased attention on the apparent vacuum between the data center and the microcomputer.

Widespread use of microcomputers has led to an investigation of the need for personal computer-area networks and micro-to-host communications. The success of the personal computer as a multifunction workstation has caused business executives to consider the acquisition of new departmental systems. Attention is now drawn to the potential for emerging technologies and new applications, and the incremental value to be gained by the acquisition of more robust, mid-range systems should be reviewed.

Advancing technology, price and performance advantages and increasingly sophisticated user demands are placing enormous pressure upon traditional time-sharing and word processing systems. It is possible that these unstable layers of the information architecture will evolve into a new generation of mid-range systems. Filling the gap between the data center and the microcomputer is the real challenge of the day.

The evolution of automation describes the framework within which potential demand for mid-range systems is taking shape. Market analysis shows that the emphasis in the phrase "potential demand" remains on "potential." The industry is still groping for an answer to one important question: "What are the real benefits to be gained, not only from the acquisition of mid-range hardware, but also from the applications software that might run on this mystery machine?" To date, there have only been a few products upon which to base any judgment.

Analysis of initial market and demand characteristics indicate that mid-range applications software benefits may fall into three functional areas:

- **Communications intermediary:** The capability of serving as a communication controller, server or gateway between host systems and workstations or low-end processors.
- **Peripheral server:** The capability of acting as a central site at which access to disk storage, printers, modems and other peripheral devices may be shared by multiple workstation users.
- **Applications processor:** The ability to process applications for access at multiple workstations within a department or work group.

Surveys of large organizations indicate that the application requirements of departments and work groups within these organizations are largely unexplored. Thousands of groups within large organizations around the country have yet to take advantage of automated systems. A perception exists among users that the software applications traditionally associated with office automation are cute, but not cost-justifiable. The suspicion lingers that tickler files and electronic mail are not worth the price of admission. Users are concerned with applications that solve real business problems, and these are often applications for which the DP department simply does not have time.

The array of WP, voice annotation, calendaring, electronic mail and tickler files pales when what you really need is a straightforward data base management system (DBMS) that allows nontechnical users to gain access to the information they need. Multiuser DBMS applications, for example, permit several users to simultaneously access and update records in a common file.

What's the matter with existing microcomputers? There is nothing inherently wrong with single-user DBMS, but they simply do not offer the power, flexibility and security of a multiuser architecture. In addition, the potential exists for the creation of multiuser vertical applications that automate departmental routines. Although the convenience and power of these potential software products gives promise to further improvements in office productivity, it is clear that users and vendors have only begun to dedicate the resources required to understand the application needs of the department or work group.

Admittedly, mid-range applications represent just a fraction of the total software market. And yet, research indicates that it is an area of maximum concern to information systems planners.

■

Willmott is vice-president of user research for International Data Corp. in Framingham, Mass., and a regular columnist for Computerworld Focus.

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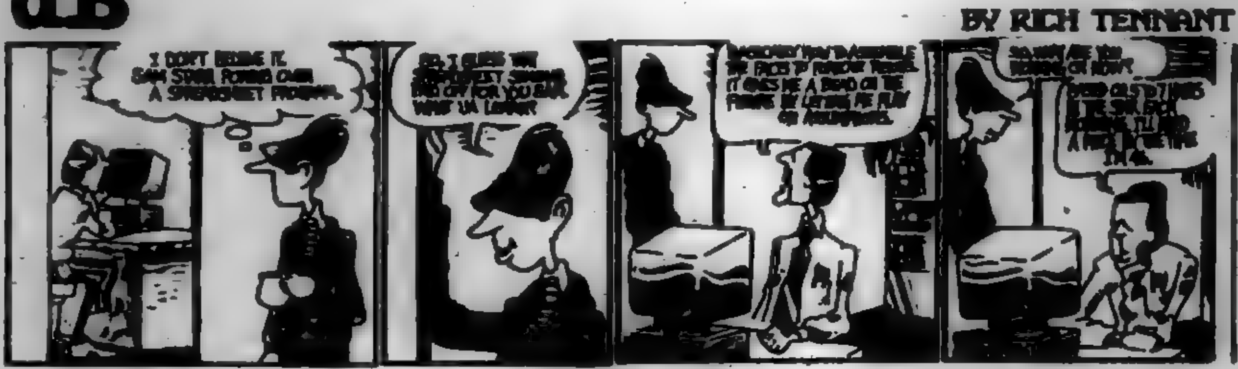
BY RICH TENNANT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Q&A

The value-added reseller (VAR) market is becoming a growth industry, providing microcomputer vendors with tighter channels of distribution to meet increasing user demand for specialized applications. VARs help position many micro hardware and software vendors into lucrative vertical market niches. Users are also discovering the value-added part of VARs can include more personalized service and expertise than either retailers or manufacturers can provide. Computerworld Focus *spoke with Evan Moltz, director of International Data Corp.'s Microfocus '85 research program, about the coming of age of microcomputer VARs.*

How has the VAR market evolved?

The VAR market has been evolving since the '50s when IBM realized it could not successfully solicit the federal government, among others. To penetrate the government market, IBM developed its own "reseller channels," a term eventually replaced by the acronym OEM. Digital Equipment Corp. also gained prominence by developing its own reseller or OEM channel to go after the scientific marketplace with its minicomputers. The evolution we are now seeing focuses on vendors that have traditionally sold minis and related products and that are now extending their product lines to include micro products such as workstations and stand-alone productivity tools.

Companies are doing this because they don't want to lose their customer bases to another vendor that may be able to migrate customers up to larger systems, so they're all trying to round out their product lines. The real growth in the VAR market is in the area of system integrators. These resellers buy hardware and software products, then customize the system somehow for the end user — perhaps by putting a front end or a forms generator on it. The most rapid growth among microcomputer resellers is in system integration, mainly because micros represent an entry level and preclude high entry and development costs. There is also a need in the marketplace right now to address niche or vertical markets with micros. Systems integrators are doing just that.

Another VAR growth area deals with captive audiences. Vertical businesses such as Merrill Lynch, for example, are now becoming active VARs of their own specialized financial software products. Associations such as FTD and the American Dental Association have produced specialized software products and are becoming legitimate VARs because they can sell directly to their own members.

An additional area in which VAR expansion is occurring is through time-sharing and mainframe software companies extending their software to run on micros. These are all part of the fast-growth curve of the VAR market.

Are there companies that have started as microcomputer VARs and are now extending upward to provide larger, more complete systems offerings?

It depends really on the companies these microcomputer VARs associate with. If they are doing business with suppliers offering complete product lines, then it's a lot easier for microcomputer VARs to migrate upward to larger systems. For the most part, however, when a VAR starts in the microcomputer arena with a specific vertical market, the tendency is to keep focusing on that particular field of expertise.

Is there any sort of penetration of microcomputer VARs into larger corporations and MIS departments?

No. I just don't see any real penetration there. The whole premise of a VAR involves adding some sort of expertise, especially if the VAR is predominantly selling microcomputer expertise in a given vertical market. MIS directors in major corporations are looking for generic applications, and 30% to 40% of corporate purchases are made directly from the vendor. Purchases may be delivered through a reseller, but they are sold by the vendor. We don't see the VAR channel really addressing the corporate marketplace per se, but rather the niche markets, the vertical markets.

There must be some niche applications microcomputer VARs can offer, for example, to the Fortune 500.

They're limited. If you're talking about such special software applications as micro-to-mainframe or micro-to-mini link packages that perhaps have been developed by systems houses, then you can see the use of a VAR. But when the type of installation you're talking about is the purchase of mass quantities for generic applications and the only value-added is training on Lotus 1-2-3, I don't think the VAR will be the reseller channel accessed. Stores such as Micro Age, Businessland and Entre are best suited for those situations.

Are super-VARs emerging that can offer total solutions for automating the office right through from the microcomputer to the mainframe level?

Some systems houses offer that now. Actually, the range of specialization

(Continued on Page 44)

When it comes to the demand for human resource management software, data processing has a problem...

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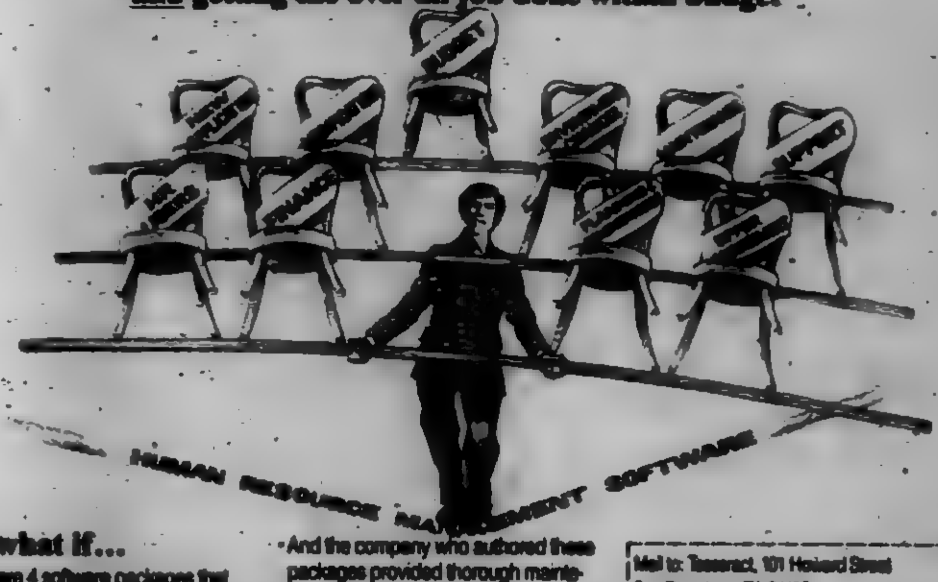

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In the News

Ready To Move?

Both voice synthesis and voice recognition, parts of the technology known as digital signal processing, have gone their separate development ways in recent years, and both have enjoyed separate levels of success.

A study from International Resource Development, Inc. (IRD), a Norwalk, Conn., research firm, pointed out that voice synthesis has enjoyed "substantial if not overwhelming success," expecting to account for about $100 million in 1985 revenues. Voice recognition, however, is currently garnering a fairly dismal $10 million.

A major problem with voice recognition has been the technology itself. Artificial restraints on users and marketing tactics have created an unfavorable image. Aside from these problems, IRD said, during the past five years voice input has been extensively tested and/or implemented in a number of areas — for example, manufacturing and industrial applications and military and aviation use of voice activated telephones and micros.

IBM might just help things along. An announcement from IBM is expected soon of a voice-activated typewriter (VAT). The VAT will reportedly be an isolated word speaker-dependent system capable of recognising a 5,000-word vocabulary with better than a 95% accuracy rate, IRD said. According to IBM, the system will even be able to distinguish between homonyms like "two" and "to."

With IBM's active entrance and the rectifying of many of the problems that have plagued voice recognition technology to date, IRD predicted that by 1995 the market for voice recogniton could reach a healthy $900 million, a figure not significantly behind the projected $1.5 billion in revenues voice synthesis products are expected to produce in the same year.

Hirings Up

Employment openings in the data processing field contioue to rise, according to a recent Data Processing Management Association (DPMA) international membership survey.

Of the respondents, 42% said they plan to increase their staff during the second quarter of 1985, and an additional 54% will maintain current management information systems and DP staff size. DPMA members indicated they will each hire an average of 6.5 individuals during the second quarter of 1985; of these, approximately 3.5 MIS and DP professionals will fill new positions and three individuals will be recruited for existing positions. Although the market continues to be most promising for programmers and systems analysts, DP professionals are also needed in more specialized growth areas such as telecommunications and data base administration.

The survey also pointed out that programming positions will represent 40% of all MIS and DP job openings; systems analysts will account for 33%; telecommunications specialists, 7%; data entry operators, 7%; data base specialists, 5%; miscellaneous specialists (including systems managers, training coordinators and project leaders), 5%; and microcomputer specialists, 3%.

In a related survey, 67% of DPMA members indicated their 1985 DP budgets will increase over 1984, with 40% of the new budgets going to personnel expenditures. The average budget was $2.1 million, representing 6.5% of total corporate revenues. Large systems (mainframes and minicomputers) accounted for 24% of the average DP budget, followed by 14% for software, 7% for telecommunications, 5% for microcomputers, 5% for training and education, 3% for office automation and 2% for data security.

Also of note, the DPMA study found 69% of the DP executives see the continuing influx of microcomputers and personal computing applications as the greatest trend affecting their departments in 1985.

DP Salaries Up 5%

Salaries in 1984 for U.S. DP employees increased 5% over 1983 salaries, according to a recent salary survey by the Administrative Management Society (AMS).

Salaries were reported as of September 17, 1984, covering 57,479 employees with 2,360 companies in 114 U.S. cities.

The salaries were broken down as follows: software systems programming manager, $40,000, a 5.8% increase over the $38,000 1983 figure; applications programming manager, $40,000, up 3.4% from $38,700; data base administrator, $36,400, up 4% from $35,000; lead programmer and analyst, $35,600, up 5.3% from $33,800; computer operations manager, $35,400, up 1% from $35,000; senior software systems programmer, $34,700, up 8.8% from $31,900; and systems analyst, $30,900, up 4.4% from $29,600.

The 5% overall salary increase registered in 1984 compared with an average 7.7% salary increase for non-DP middle management, the latter figure taken from another AMS survey conducted during the same period.

With regard to the DP salary survey,

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AMS found the merit raise was most often used by companies to grant increases to exempt (salaried) and nonexempt (hourly) employees. Either alone or in combination with other methods, merit raises were used by 78.8% of the companies for exempt employees and 81.8% for nonexempt DP employees. General increases, alone or in combination, were used by 24.6% for exempt and 20.9% for nonexempt employees. Other methods accounted for 16% and included cost-of-living, longevity and equity.

Capital Cause

The Capital PC User Group (CPCUG), a 3,000-member organization based in Gaithersburg, Md., has decided that personal computer software users have been ignored too long in the rush by software vendors to stamp out software piracy.

In a proposal entitled "Bill of Rights for Software Users," CPCUG has listed what Dave Browning, CPCUG director of vendor relations, termed "five essential rights inherent in the consumer use of commercial software.

"Copy protection for software vendors is obviously important," Browning said, "but the industry in general has ignored other, more fundamental rights of software users."

Browning made it clear the group's Bill of Rights is intended only for the software industry at large and not for any government agencies, the intent being to work with the industry and not against it through some possible legislative action.

"What we have to remember is that the computer software industry is unlike any other," he said. "Users are taking for granted that the same kinds of built-in rights and quality controls you find in other industries apply here. A lot of software users, for example, aren't even aware that they did not purchase outright the program they paid for in the retail store. Limited use licensing is something both foreign and confusing to users. Consumers should also expect to have the software product they buy first subjected to minimum quality control standards such as are found in the automobile, appliance and toy industries.

"One simple way of discouraging copyright violation and software piracy is for vendors to offer some sort of rebate or discount on separate, multiple purchases of software copies. A department that has purchased 19 separate copies of a certain software program and is ready to purchase number 20, is probably going to finally become leery about paying another $500 for another copy when the software vendor does not at least offer some sort of discount or rebate incentive. Who wouldn't be tempted to start making illegal copies?"

Briefly, the following is a list of consumer rights that Browning and CPCUG intend to present to the software industry:

Right to Product Quality — The right to expect a software product to perform with a level of quality consistent with industry-specified or -implied standards.

Right of Functionality — The right to expect a software product to perform basic functions common to the generic program type, with any exceptions or caveats fully disclosed prior to purchase.

Right of Continuous Service — The right to have on hand sufficient backup of program packages and authorization devices to continue operations uninterrupted by loss of or damage to the primary package or authorization service.

Right of Program Support — The right of access to information from the software manufacturer concerning known errors, fixes or temporary workarounds. The user also has the right to reasonable updates to the released versions for the correction of errors.

Right of System Integration — The right to integrate software products into the system environment without undue constraint or interference from copy-protection, software authorization or other extraneous program functions.

Big Blue Elephants?

In a move that surprised few industry watchers, IBM last month announced price cuts of up to 12%, effective immediately, on its Personal Computer and Personal Computer XT, and introduced two lower priced versions of its PC XT. The action is expected to be the bellwether of its next big announcement, the PC2.

In addition, according to industry watchers, IBM is expected to announce its version of the lap-size computer in the near future.

The price cuts on the PC apply only to the two-disk-drive machines. The PC with 256K bytes of memory was cut 5% to $2,295; 64K bytes was cut 6% to $2,115; and the Portable Computer was cut 4% to $2,895.

The 11% and 12% cuts were made on the hard-disk XT versions, to $3,895 for 256K bytes memory and $3,775 for 128K bytes. The single disk-drive model will sell for $2,270, and the double disk-drive model for $2,570. IBM also reduced the cost by 15% to add a hard disk at a later time. The new price for a hard disk is $1,690.

The big question is whether all those PC owners will be the proud possessors of a "blue elephant" or if they will be able to upgrade — replace the Intel 8088 processor with the 80286, which the PC2 is expected to have. Evan Moltz, director of Microservices for International Data

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Corp. in Framingham, Mass., said he doubts IBM will facilitate an upgrade because it has shown no interest in being in the board business. "But," Molts added, "I'm sure peripheral manufacturers will come out with boards to turn the PC into a PC2." He cautioned, however, that the PC2's 3.5 in. disk drives will further complicate conversion attempts.

Meetings of the Mind

Teleconferencing will grow at an annual rate of 54% between now and the end of the decade, from its present $279 million to $3.7 billion by 1990, according to Lorne Parker of the University of Wisconsin. Parker made this forecast during the first transatlantic press teleconference, linking New York with London.

The study involved 1,200 interviews and took two years to complete. More than 200 organizations presently using teleconferencing were surveyed. Of these, 69% have audio rooms, 31% have audiographic or telewriting equipment, 29% have two-way video and 23% have freeze-frame equipment. The benefit cited most often was savings in time and dollars. Other benefits mentioned were shorter and more efficient meetings, faster response time, improved communication between sites and wider expertise in making business decisions.

One of the fastest growing segments — 35% to 45% annually — was ad hoc videoconferences, the live programs distributed to hotels, convention centers and offices and commonly used for sales meetings, new product introductions, press conferences and training.

More information on the study can be obtained from the Center for Interactive Programs, University of Wisconsin, Madison, Wis.

Bad News for Computerland

March may have been the cruelest month for William Millard, founder and principal stockholder of privately held, family-run Computerland, the giant retailer with over 750 outlets and an estimated 1984 revenue of $1.4 billion.

In two back-to-back decisions by the same jury in Alameda County, Calif., Millard lost 20% of the voting stock in Computerland and 11 other companies and was assessed $115 million in punitive damages to Micro/Vest Corp., an investment group headed by John Martin-Musumeci, who was once employed by Millard. Micro/Vest's lawsuit stemmed from nonpayment of a $250,000 note taken out nine years ago by Millard with Marriner & Co., a Massachusetts venture capital company. Years later the Marriner group offered Millard the note for $300,000. Millard refused, and Micro/Vest bought the note for $400,000.

To pay the awards, court costs and legal fees, Millard may have to sell up to 50% of Computerland stock. Barbara Millard, president of Computerland and Millard's daughter, insisted the company will appeal both verdicts and added, "We are not interested in helping Micro/Vest obtain something to which we contend they have no right." Asked whether Computerland might possibly go public, Glenn Udine, public relations officer at Computerland, stated it was certainly not something they wanted to do.

In Brief

BOSTON — Cullinet Software, Inc. and Lotus Development Corp. recently announced plans to integrate Cullinet's Information Center Management System with Lotus's 1-2-3 and Symphony. Lotus' new product, called Cullinet Symphony Link, will allow users of Symphony to access mainframe data; Cullinet's new product, called Cullinet Universal Link, will enable Lotus 1-2-3 users to communicate with a mainframe from a micro with either floppy or hard disks.

The new products will provide mainframe integration via ICMS, which then allows for communications with mainframe data bases such as Cullinet's IDMS/R and IBM's IMS and DL/1, and also subscription data bases. Each link product costs $300; ICMS, which runs on IBM's System 360, 370, 4300 and 30 series, costs $150,000. At present, no plans exist for site licensing.

BILLERICA, Mass. — Honeywell, Inc.'s Small Computer and Office Systems Group (SCOS) will close its operations during four separate weeks in 1985 and reduce its 4,100 work force by 120 employees. The company cited softening in the U.S. small computer systems market as the major reason for cutbacks.

CAMBRIDGE, Mass. — Lotus Development Corp. signed a letter of intent to purchase financially troubled Software Arts, Inc., the Wellesley, Mass., developer of Visicalc. Under the terms of the agreement, Lotus would acquire Software Arts' assets, including the Visicalc, TK!Solver and Spotlight packages. The two Software Arts founders, Daniel S. Bricklin, chairman, and Robert Frankston, president, will also join Lotus.

Until a few years ago, Software Arts was a profitable firm. Its fortunes changed dramatically after a protracted 1983 legal battle with Visicorp, the San Jose, Calif., distributor of Visicalc. As a result, Software Arts' revenues plunged to $3 million in 1984 from $12 million the year before.

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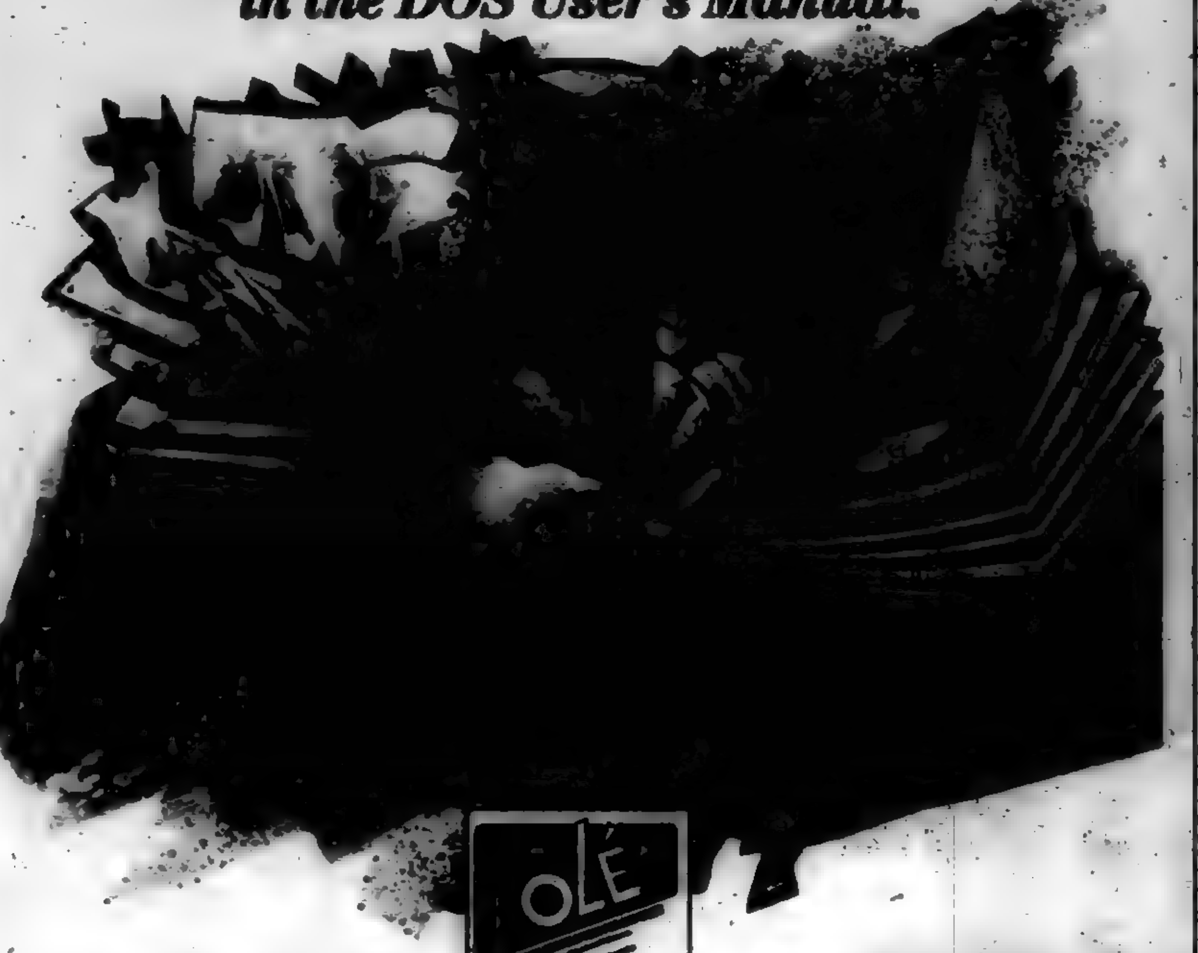

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Wise Managers Fit Software To End-User Needs

By Robert H. Holland

The chief executive officer (CEO) of a large insurance company is having difficulty managing the company's operations. Although he relies heavily on information regarding the company's products, markets and finances, the information he receives is often late, inaccurate and inconsistent — too much data, not enough information. He requests that an executive-level decision support system be implemented.

To his surprise, the CEO is informed that it is impossible to fulfill his request; the necessary data is generated by 30 different application software systems, a third of which are more than 10 years old; 943 software programs (more than 400,000 lines of code) written in three different languages, half of which are more than 10 years old; and more than 400 data bases and files containing data that has been proliferated by application software.

The result of this software potpourri is that 584 reports containing 50,000 pages of data are generated each month. The information the CEO wants is contained in these reports, but it would be a very long time before it could be integrated into a decision support system.

Although the CEO is planning to change the company's direction, he can see the inflexibilities the company faces. New products that are planned will impact the policy writing and distribution systems. The financial information system will have to support constant alteration of the product mix and the market. This is impossible with the existing application software. There must be a way. What should they do?

In another setting, a division director of a large international conglomerate wants to implement a customer direct-order system to help increase productivity and boost profit margins. The director is startled when the management information systems (MIS) manager tells him that, in his own division, they have evolved to 26 incompatible customer application

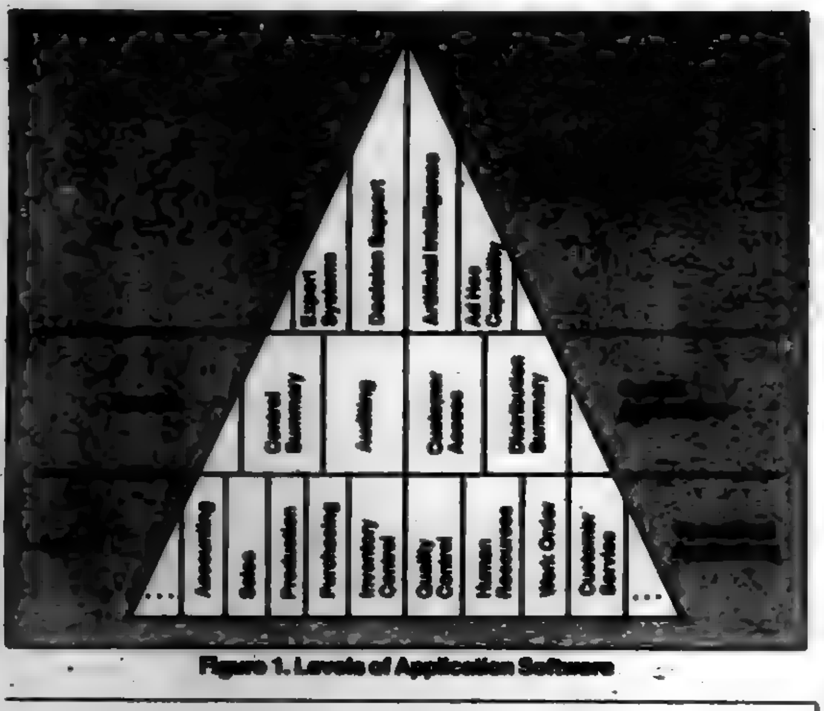

Figure 1. Levels of Application Software

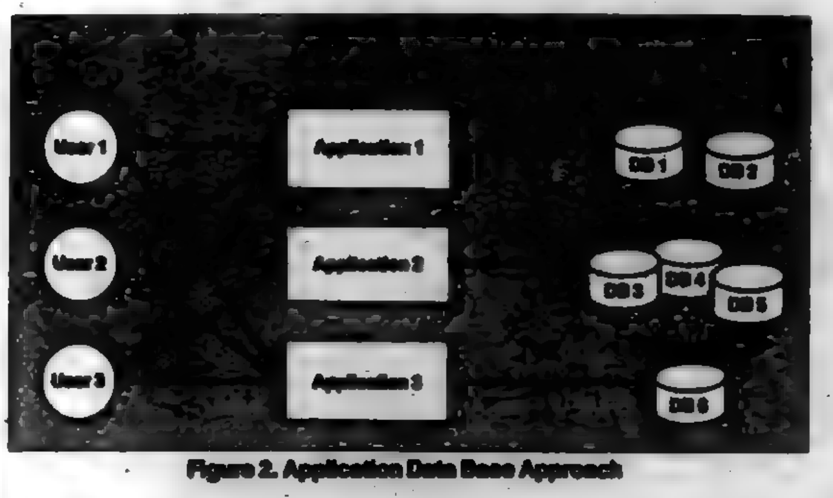

Figure 2. Application Data Base Approach

systems complete with associated data bases and files; four general ledger systems, all running concurrently; 50 employee data bases and files; and computer hardware from five different vendors (none of which is compatible).

It won't take long for the director to determine the new system cannot be implemented. Although the technology exists, it will be impossible to tap the application software and its data because of the way they are operating. Something will have to be done, but what?

Every type of organization has new business opportunities and plans that are being hampered in some way because application systems and associated information technology have evolved rather than being integrated into business direction. Today's business, whether it recognises it or not, has entered the information age. It is more dependent than ever before upon raw data collection and proper transformation into useful information. New business directions are formed in response to government regulation and deregulation, acquisitions and mergers, foreign and domestic competition, an enlightened customer-base and other factors too numerous to mention. These new directions can have a severe impact on the scope of application software and its development.

Today, the primary difficulties in application software are improper integration and the inability to match applications to current and planned business actions. Figure 1 shows the three levels of application software now being utilized. This figure is not intended to be exhaustive, nor does it contain terminology that necessarily applies to any one organization. However, it does apply in a generic sense to all organizations.

Level 1 applications are the most crucial and the most difficult to align with business direction. Such difficulty arises for two fundamental reasons. First, Level 1 applications are the most numerous. They are the foundation for the baseline operations of the company. Second, they collect or create most of the data used in Levels 2 and 3. The success of all other applications depends upon proper definition and integration at Level 1.

Level 2 applications have limited capability and are either control-oriented or revenue-generating in nature. One example is specialized software for customer ordering of goods such as rental cars, catalog merchandise, periodicals and insurance policies. Level 2 applications depend upon the integrated data supplied by Level 1 in order to provide normal, day-to-day decision-making capabilities. Examples include authorizing customer orders, making pricing changes, adjusting inventory levels and so on. Level 2 applications will not work unless Level 1 application software is integrated with business plans. Thus, when management wants to get to the market in a different way or to have better control of plans-to-actuals, they are often stymied by lack of application or information availability.

Application software used for decision support or specialized experimentation is Level 3 software. Examples include information centers, specialised design centers and ad hoc query capabilities. These applications use substantial amounts of data from Levels 2 and 3 and from sources outside the organization. Level 3 software doesn't work well (frequently, not at all) unless Levels 1 and 2 are properly integrated.

The three levels illustrate the importance of stabilizing data and applications in order to maintain day-to-day operations and to support business direction. Although application software is only one component in implementing business plans, it is a very important one.

Within the application software component, we have tended to couple the data to the application too tightly. This is illustrated in Figure 2. Applications have been structured in such a way that the same data is being proliferated through each application. Users are not getting

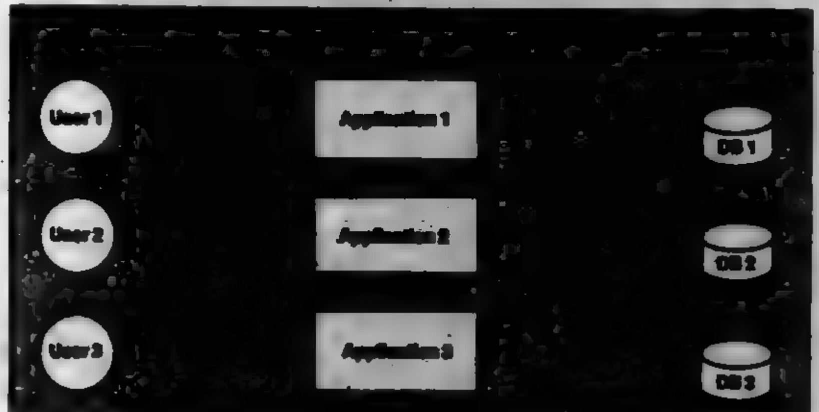

Figure 3. Subject Data Base Approach to Applications

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exactly what they need, and maintaining data integrity and flexibility is impossible. The configuration of lines between users and applications is rather complex and confused in Figure 2. Business people don't like this situation; they expect the applications to supply all the data they need. MIS people, on the other hand, don't like reinventing the wheel and building bridges to other applications every time a new business requirement comes along. This application approach has been utilized since the 1950s and is still widely used today.

A solution does exist, and the companies that have adopted it are getting very good results. The solution requires the development of application and data plans based on business actions. Figure 3 shows how this solution would affect the three applications from Figure 2. The data bases in Figure 3 are referred to as subject data bases. Each is defined by the data that refers to a single subject area as well as the necessary relationships to other subject data bases. This approach does not force various subjects into the same data base purely to meet a single application's requirements as shown in Figure 2. With subject data bases, we decouple the application from the data. Thus, the data becomes more flexible, more integrated and has far more integrity. The subject data bases are treated as an integrated information resource that is available to all applications rather than belonging to a single application. If this resource is to be established, applications must reflect integrated business actions.

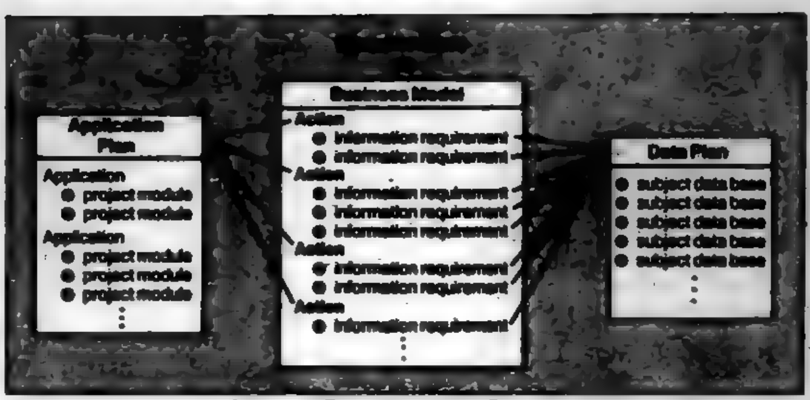

Figure 4. The Integration Process

Most companies today do not have an integrated picture of their business actions to aid them in the implementation process. This picture or business model identifies both current business actions and planned actions as well as the data required to perform the actions. A formal process for matching applications and data to business actions using the business model is shown in Figure 4.

The resulting data plan identifies the subject data bases necessary to support business actions. The data plan also includes relationships between subject data bases because it often takes more than one subject area to answer a question, make a decision or handle a business transaction.

The application plan shown in Figure 4 identifies all the application systems necessary to support business actions. They are implemented as project modules because they are too large to purchase or develop at once. Each project module has a defined scope and scheduled deliverables and supports specific business actions contained in the model. The common bond between them is the data resource because it must be shared across all applications. This is the framework necessary for efficient project development or evalation of application packages.

All organizations have a system environment in place. Most have been working at it for more than 25 years and have placed hundreds of man-years of effort into their current applications. Two such companies were described at the beginning of this article. This environment will not change overnight, but now is the time to begin. We cannot afford to throw away everything developed so far. Instead, we must come out of the application system rut in which we find ourselves. We must establish a common denominator between business and systems. The common denominator is the business model.

From a business standpoint, the benefits include greater profit margins, higher professional productivity, business integration where necessary and a competitive edge. For MIS, the benefits are reduced maintenance time and cost, the stabilization of the implementation plan and the ability to respond more quickly to changes in business requirements. Users at all levels will find they are getting what they want and need. When everyone is involved and committed, then the company truly begins to understand the meaning of the information age.

Holland is president of Holland Systems Corp., a firm specializing in information resource management products and services, in Ann Arbor, Mich.

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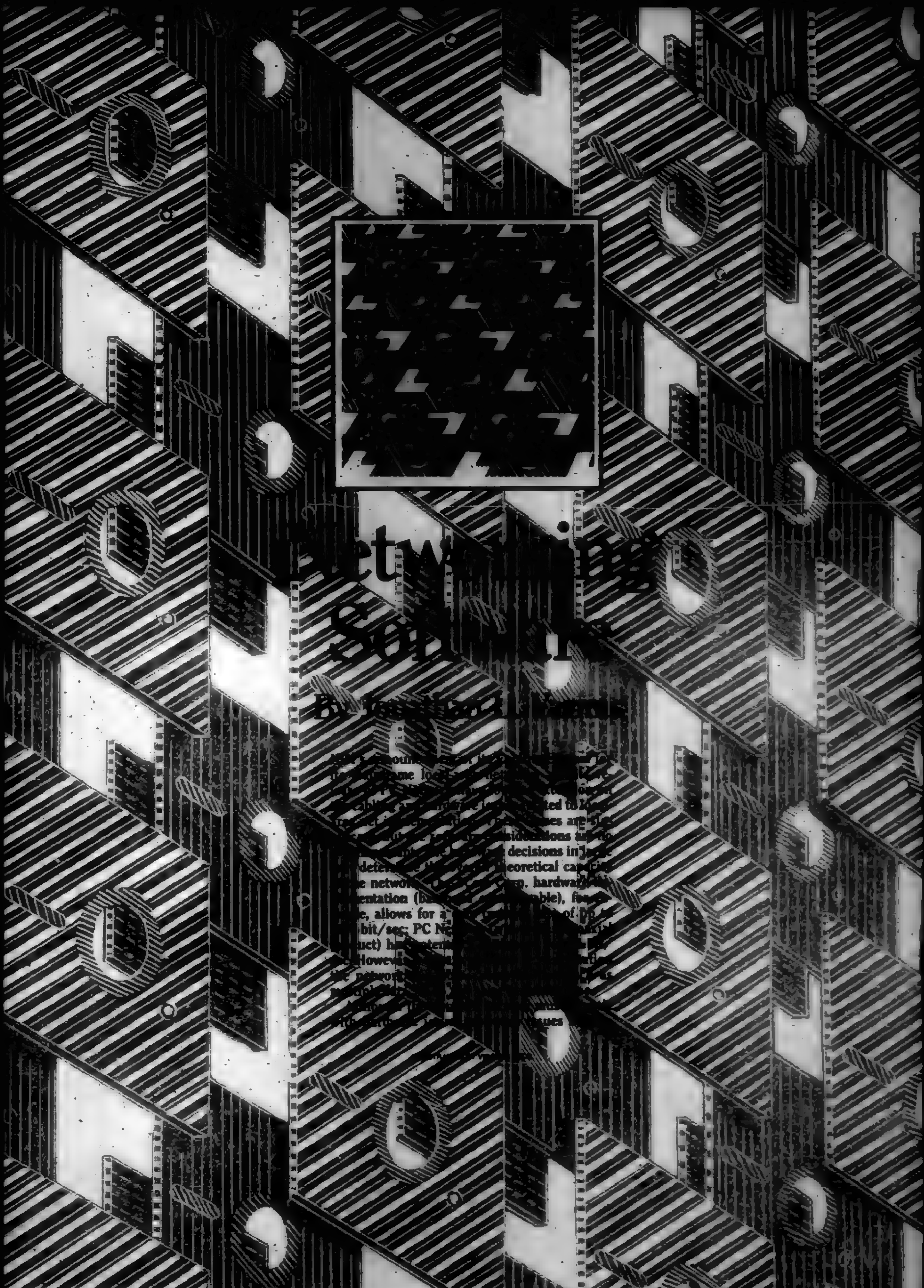

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Software factors involve two distinct areas: operating system considerations and application packages. The operating system software relates to how the user and the application package interact with the network. The widespread acceptance of the MS-DOS/PC-DOS operating system in the business environment is a mixed blessing. On the positive side, with a widely used operating system a successful microcomputer local-area network solution can, at a minimum, be designed for a single compatible series of hardware using an accepted user interface. On the negative side, PC-DOS was designed from the beginning as a single-user operating system. This heritage has inhibited its development into a networked environment because many of the design decisions in a multiuser environment differ from those in a single-user one. Further, PC-DOS has been criticized for its lack of friendliness, and these user interface inadequacies are exacerbated in a multiuser, shared-resource environment.

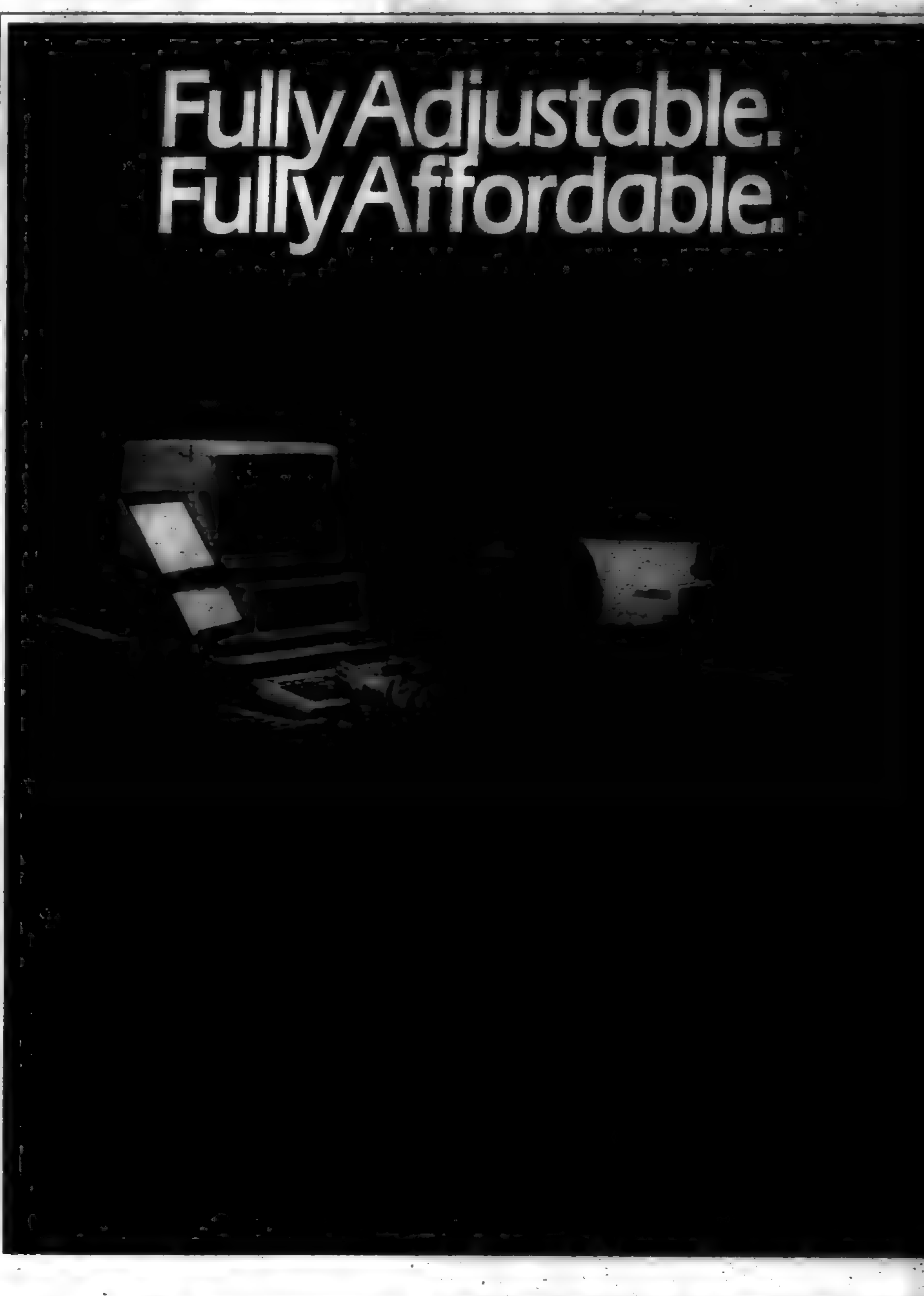
Network software is perhaps the most important factor in determining actual network performance.

Ideally, an operating system would be able to control all multiuser aspects of a network, including resource sharing (printer, disk, modem and so on) and file access and contention. Even with the release of PC-DOS 3.1, this ideal state has not been reached.

Most personal computer local-area network implementations have been forced to take a three-tiered software approach. The operating system continues to direct single-user-type functions such as copying and formatting. Some file-level protections may also be incorporated. For example, PC-DOS 3.0 introduced the ATTRIB command, whereby files can be designated read/write, read-only and so on. These capabilities had been built into the operating system from its inception, but prior to the release of DOS 3.0, manipulating this information was restricted to assembly language programmers and users of utilities such as the Norton Utilities.

To direct the newly imposed functions, a network program and, intelligent interface card were introduced. The interface card contains all of the intelligence necessary to physically communicate over the network, to solve contention problems (through token passing, collision detection and retransmission or other access scheme) and otherwise to interface with the network. The network program resides above the operating system and, in effect, intercepts the local operating system commands for remote resources or data, routes them over the network to the appropriate destination where the reverse translation occurs and the appropriate action is performed. Finally, differing levels of responsibility were assigned to the actual application package. In data base applications, where simultaneous access to a single file may be necessary, it is often left to the applications programmer to implement record- or even file-level protections to avoid file destruction.

PC-DOS also poses many problems (most notably its file handling through the file allocation table) for the would-be applications developer. The file application table is read into a computer's random-access memory (RAM) when a disk is accessed to hasten subsequent file access. However, if multiple users on a network are accessing the same disk, the actual disk allocation will probably differ from the copy of the file application table each individual



user holds in memory. Thus, steps must be taken to ensure that this does not cause potentially destructive conflicts.

One route taken by some developers was to preallocate file space on a disk. At best an imperfect solution (it is potentially wasteful of precious disk space), this approach presupposes the user has an idea of the eventual size of a file. In a networked environment, an optimal solution would be for the operating system, the network program or, as a last resort, the application package to force an update of the file allocation table in RAM before any disk access is performed.

Not only are these issues crucial in determining a network's attractiveness to both software developers and end users, they also significantly affect a network's actual performance. Recent tests have shown that the same network hardware may show as much as a 50% throughput improvement running different network software. Network software is a crucial determinant in end users' perceptions of network performance.

But more important for end users is their applications software, an area where issues are not primarily technical but rather those of implementation and business practice (licensing and copyrights).

As always, there's the good news and the bad news. First, the bad news. At best, network software offerings are limited and, to some extent, represent a chicken and egg dilemma. Software authors are not interested in writing programs for a limited market, and end users perceive minimal advantage in networking their personal computers with such limited software offerings. As peripheral pricing falls, fewer users can justify a network on merely a cost basis, so these software offerings become essential.

Ashton-Tate sent a chill through the network software marketplace when it withdrew the multiuser version of Dbase II from U.S. distribution (although the version does continue to be distributed overseas where it is apparently receiving a better reception). Ashton-Tate is pinning its multiuser hopes on a version of the more powerful Dbase III, although this product's release date has not been announced. Further dampening the enthusiasm of network advocates is the impression left by Ashton-Tate that their new product will be developed to run only on PC Network and not on the network of 3Com — the current market leader.

Users are fortunate that Ashton-Tate is not the only supplier of multiuser data base software. Software Connections Co. is the publisher of LAN:Datastore, a popular and widely supported package; and Stoneware, Inc. makes a multiuser version of DB Master for both Apple Computer, Inc.'s IIe and the IBM personal computers running on the Corvus Systems, Inc. Omninet network. Further, the announcement of PC Network has spurred a number of current data base package creators into at least the development stage for multiuser systems, although announced release dates have not been made public in most instances.

Although data base applications are thought to be the primary application for local-area networks in large organizations, many small- and medium-size businesses have been extremely satisfied with the multiuser accounting systems on the market. Local-area network software developers have also addressed many other vertical niches, including medical and

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Despite multiuser data base systems, accounting systems and so on, however, some people believe a new breed of software application, specific to local-area network environments, must be identified and developed before local-area networks will have their full impact in the office environment.

If personal computer local-area networks are to be viewed largely as a departmental solution to resource and data sharing, then an ideal network application solution would be messaging and calendaring. In a large number of office environments, most professionals' communication is with others in the same department or office. Telephone tag and other forms of missed communications are no less common in the large office environment than in dealings with outside parties. As a result, the electronic mail system is one of the most popular software features of any local-area network. Electronic mail has the potential to enhance office communications — the idea behind a local-area network — when users get over the behavioral hurdle to electronic messaging.

Appointment scheduling would be an ideal software solution to run on a local-area network. If you have ever tried to schedule a meeting of more than two people, you have some idea of the potential benefit of such a package. Of course, the program's success depends almost entirely on how diligently individuals maintain accurate, up-to-date schedules on the system.

Unfortunately, this may be a solution slightly ahead of its time. Its success rests on individuals utilizing a computerized system for an activity that has traditionally been a nonprofessional, manual task. Such ingrained user attitudes are slow to disappear. Unlike the spreadsheet, which was a dramatic improvement over previous methods of performing the same task, this scheduling function actually shifts some degree of burden to the professional who did not previously do this task. While ultimately this will prove to be a strength and selling point for local-area networks, such applications will not in and of themselves s
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Perhaps the thorniest issue relatin
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Software authors are understandably concerned that an organization might purchase one copy of a package and then shoo it around a network of hundreds of PCs.

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Network planners are often myst
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local-area networks. Only through
software can the true power of any
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Vertical markets vary greatly in sales potential, size, competitiveness and level of automation already installed. The top vertical markets all offer some potential for future sales depending on need for automation, relative receptiveness to using computers and availability of truly functional application software.

In 1984, the top markets for small systems were financial institutions and personal and business services. That year, the financial community (made up of banks, savings and loans, insurance agents, accountants and realtors) spent about $7 billion on small systems.

In the U.S., there are about 15,000 commercial banks and 5,000 savings and loans. At present, 22% of all mainframes are in financial institutions. From 1980 to 1984, penetration of personal computers and on-line teller machines increased rapidly and the installed base of automated teller machines tripled. Communication links between these remote job entry-type and distributed processing workstations will continue to be an attractive and lucrative application to be provided by vendors. In addition, the potential throughout the '80s for sales into this segment is attractive because of bank demands for accurate and timely record processing, billing and receiving; for data base management; for automatic cash dispensing; and for countless other bank functions.

Investment houses are a relatively new market for personal computers. About 24% of the some 50,000 stock brokers and investment analysts in that market use microcomputers. On-line data base access, financial portfolio packages and spreadsheets are the popular applications. Financial-data bases are, by far, the largest revenue makers for on-line services such as Dow Jones, I.P. Sharp, Telerate and Quotron Systems. Increase numbers of brokers are accessing data bases and downloading data right into productivity or analysis packages for manipulation off-line.

Of the more than 420,000 accountants in the U.S., about 40% of them use microcomputers. This market requires comprehensive general ledger programs to balance books and generate reports. Other popular applications include on-line data base searching to evaluate existing and new tax laws or regulations, automated payroll recordkeeping and check writing. Spreadsheets are very popular for analysis of receivables, payables, payroll, inventory and asset management. By 1988, 71% of all accountants will own micros.

At the end of 1984, nearly 36% of the 400,000 insurance agents in the U.S. used a microcomputer in some capacity. These agents are employed by 1,600 major stock insurance companies, 1,000 major property and casualty companies and 2,000 small mutual life companies. Because most insurance agents are independent and represent several companies, they are economically motivated to keep track of much paperwork and to do financial calculations for a wide variety of client options. Most of the larger insurance firms have developed proprietary systems that will assess risk policies, approve them and then figure rates. Many vendors have developed relationships with insurance firms that act as resellers to their agents.

In 1984, the financial community — banks, savings and loans, insurance agents, accountants and realtors — spent about $7 billion on small systems.

There are over 700,000 realtors in some 200,000 offices across the country. Penetration of microcomputers into this market has jumped dramatically in the last three years. The percentage of realtors using microcomputers is estimated to jump from about 25% today to about 75% in 1988.

Business and personal services are a large yet diverse and difficult market to reach. Personal services range from barber shops to wedding consultants. Business services (for example, public relations firms and advertising firms) work with businesses as customers.

In 1984, penetration of microcomputers into the personal services market was about 5%; penetration is expected to grow to 15% within five years. Funeral homes and cemeteries have bought micros more than any other personal services group and, as a group, 35% of them are expected to use micros by 1988. Few good customized software programs have been designed for the personal services market. The causes of relatively low sales growth rates have been the high cost of selling to these markets; low computer literacy rates; and the tendency of most users in this market to use general purpose word processing, data base and accounting packages.

Business services are a much more attractive market as a whole. While the needs of subsegments vary widely, most professionals in these companies are white-collar and have a high computer literacy rate. Advertising firms, public relations firms and hotels and motels still demand solid applications programs at a

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competitive price. These niches, especially, will enjoy healthy growth over the next five years.

Currently, about a quarter of all law firms use computers to handle a variety of applications (the principle ones being time and billing, information research and retrieval and records management). Mainframes, minicomputers and the accompanying distributed data processing links are not found as often in law firms as in other vertical niches because most laws firms are either one-man offices or have very small professional staffs.

Fifty percent of the software used by law firms consists of canned programs minimally altered. Programs specially designed for legal applications account for 30% of the purchases; the remaining 20% consists of canned programs with major alterations.

The applications of software differ between large and small firms. For large firms, the area of market opportunity is legal research, either from external on-line data bases (such as Lexis and Westlaw) or from internal files. The design and installation of data base retrieval systems, the principle element of computerized litigation support, has become very competitive for those firms targeting the large law firms. These law firms favor having a legal systems house customize software for in-house use. Medium-size firms are more interested in service bureaus for litigation support, which affords maximum flexibility should caseload, from time to time, vary considerably. Smaller firms rely on off-the-shelf data base and client accounting packages and appreciate faster, cheaper, access to commercial on-line data bases.

About a quarter of all law firms use computers to handle a variety of applications; 50% of the software used consists of canned programs minimally altered.

Considering the value of a lawyer's time, the complexity of the paperwork, the efficiencies derived from a computer and decreasing computer costs, this market still offers potential to small business computer vendors. However, over the next five years, sales growth will level off as saturation is approached.

The health care market remains a high growth area. Presently, about 10% of all physicians, 8% of all dentists and 30% of all hospitals own computers. Penetration of micros among physicians has increased rapidly over the past three years. This trend will continue as more doctors witness the decrease in office expenses through automation and as more young medical students bring to their practice computer literacy acquired in school.

Physicians use micros mainly for billing and claims processing. Other applications include patient recordkeeping and doctor-developed software designed for specific medical practices such as drug dosage and pulmonary test evaluations.

There are four major applications within a hospital: laboratory, finance, diagnostic-related group (DRG) data and physicians' offices. The lab area covers technicians who use sophisticated equipment and automation for recording and inventory, sampling and statistical reporting. Pharmacists are also major users of inventory systems. However, many small hospitals continue to use manual procedures. Over the next few years, nearly every hospital will require a system to correlate DRG data for reimbursement from insurance groups.

Of the 120,000 U.S. dentists, today, only about 8% use micros. By 1988, it is estimated, more than 50% of all dentists' offices will be automated. Dentists, burdened by high overhead and substantial capital equipment, typically welcome any means of reducing overhead.

In the building market, only 7% of all general contractors have purchased computers. Acceptance has been hampered by the large number of individual contractors and a lack of computer literacy. Penetration of micros will increase as computer costs decline and literacy rises. By 1988, roughly 22% of all general contractors will own or lease a computer. Architectural firms have been very receptive to computerization: About 50% of all firms have at least one computer, and an estimated 85% will have one by 1988.

Several types of software are critical to the contractor or architect: general ledger, project management and scheduling packages. The general ledger programs separate jobs by job cost and allow accounting for subcontractors. Project management packages, essential for computing estimates of proposed jobs, allow easier and more accurate bidding, accounting for ongoing projects and estimating completion costs for jobs in progress. Scheduling programs aid in job costing analysis, bidding, staffing and keeping control of resources.

The agriculture market, while small relative to several other vertical markets, has high potential. The percentage of farms with microcomputers will increase from 5% in 1984 to 25% in 1988. There lies ample opportunity for computer vendors and resellers who know specific problem-solving applications and can reach the frequently remote farmer with cost-effective means.

Farmers have embraced computer technology as they have many other

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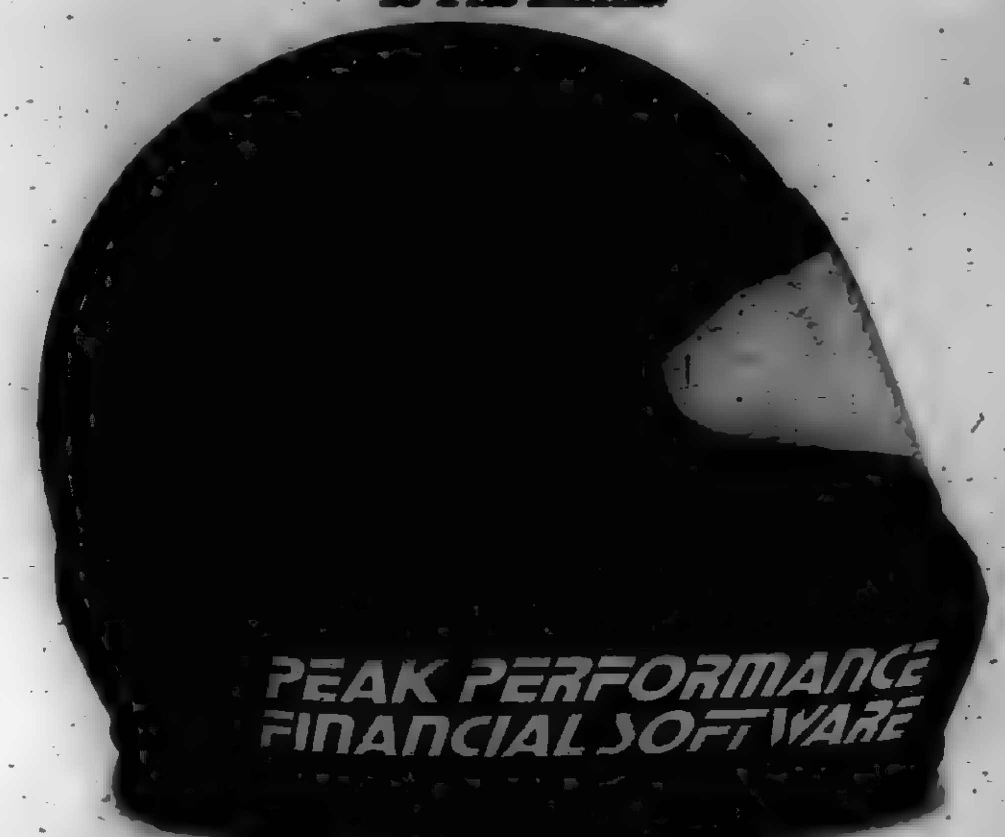

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mechanized farm functions. State fairs now regularly feature computer exhibits placed next to new tractors and prize livestock. About 2.4 million farms exist in the U.S., with more than 3.7 million employees. These farmers, faced with very slim margins and high volumes, have increasingly turned to computers for better inventory and financial controls, specialised accounting and precise up-to-date market conditions.

By the end of 1984, 8% of all farms possessed a microcomputer. Up to 1983, Apples and Radio Shack Model 80s dominated the farm market. IBM is now gaining in share, with more and more application software being written for it. Farmers spent an estimated $210 million on microcomputer systems in 1984 and will spend an estimated $525 million in 1988, when roughly a quarter of all farms will have microcomputers.

Finances and bookkeeping are probably the single most important farm application. Single and double entry, cash-based bookkeeping systems are very popular, such as those offered by Agridata Management Co. and Harvest Computer Systems, two leading vendors. Livestock management requires separate application packages because swine, poultry, cattle and dairy cows each have their own peculiarities. Crop management packages allow farmers to keep track of what was planted, the yield, rainfall, insect counts, soil-test results and fertiliser and pesticides; they also help farmers experiment with various combinations to yield the best results.

Another vital application is linking up with the commodities markets via on-line data bases, accessed via personal computer and modem. In a business where prices fluctuate frequently, current information is a key factor in providing a profit or loss. For example, Agridata Resources, producer of Agristar, one of the leading agricultural on-line data bases, offers private and public commodity news, weather service, agricultural-related news and reports, farming strategies and farmer charts on market data. The Harris Electronic News, a Videotex data base, and some 20 other data bases are also geared to farmers.

Other less conspicuous, yet important markets include transportation, wholesale and retail, schools, government offices and manufacturing plants.

A large concentration of mainframes are located in the transportation market, but it is increasingly being penetrated by small business machines. The vast majority of firms in the transportation business are small businesses or sole proprietorships. Presently, about 85% of them are using manual systems to do billing, inventory, route schedules and other accounting functions. By 1988, 35% of this market is projected to be computerised.

Wholesale and retail trade are almost horizontal markets. Thousands of varieties of goods are sold through these businesses. Many of the computer needs are similar: billing, inventory, point of sale and other accounting functions. Presently, about 5% of wholesalers and 2% of retailers are computerised; within five years these numbers should reach 30% and 15%, respectively.

In higher education, especially among colleges, computers per student promise to be higher than in elementary or secondary schools.

Elementary, secondary, vocational and university institutions all have been penetrated by microcomputers. In higher education, especially among colleges, computers per student promise to be higher than in elementary or secondary schools. Many lower-school computer purchases are still limited by lack of enough good software, lack of coherent networking strategies by application software publishers and lack of adequate budgets. Computer expenditures by schools are expected to go from $2.8 billion in 1984 to more than $3.8 billion in 1988.

Among manufacturing operations, average computer expenditure per manufacturing site is high because of the high cost of robotics, mainframes required to operate a plant and other factory automation equipment. In 1988, more than $8.8 billion will be spent by this market for all types of computers, large and small. The value of microcomputer-based systems sold to this market will total about $1 billion.

Government institutions and offices (federal, state and local) spent nearly $400 million in 1984 on small business computers. This market is also expected to enjoy continued healthy growth.

Whatever the market, computer vendors will have a good chance of succeeding if they keep focused, listen closely to the individual needs of the market they are serving, distribute products through a cost-effective distribution scheme and link up with other players offering complementary products or distribution channels to reach that particular market.

■

Yalonis is president of The Jupiter Group, a Sausalito, Calif., market research and management consulting firm specialising in the microcomputer industry.

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PC Software Support: Low Profile, High Stakes

By Tom O'Flaherty

Software maintenance has always been an activity people performed in secret. The goal of in-house maintenance is to do as little as possible, and it is not surprising that (unless things go wrong) maintenance has both a low profile and a low status in most organizations. Mainframe-software vendors value maintenance a bit higher than others do because for them maintenance is a continuing revenue stream. Nevertheless, even they believe glory and growth lie in developing and marketing new products.

Against this background, the low-key operation that characterizes support activities for personal computer software is not surprising. We can all be happy that the days are drawing to a close when personal computer software support was strictly caveat emptor — no address and no telephone number would be found in the package. Many personal computer firms still bear traces of this past attitude, but now its status has become more socially acceptable: "If we test our product well and have good enough documentation and on-line aids, we'll never have to actually talk to a customer."

This vendor attitude was often acceptable (perhaps even half-desired) by early users who had a hands-on, macho attitude toward micros. Alas, the days of the giants are passing; most users now need all the help they can get. The question seems to be where that help is going to be found.

The problem with talking about help for personal computer users is that several almost completely separate types of use and users exist. Defining corporate needs is no easier than defining the needs of any other group. Those needs are highly variable; a wide selection of software is often used; there are many casual users; "personal" personal computer use is declining; and departmental, or even corporate, needs are increasingly dominant.

Another problematic area is that of micro-mainframe links and their effects on software support at both the personal computer and the mainframe levels. Although this very specialized and demanding area of support will dwarf stand-alone and locally linked personal computer software support in several years, it is a current concern in only a few organizations.

It is just as well that most organizations do not yet have to concern themselves with micro-mainframe software support. Most organizations still have a great deal of unfinished business in the area of personal computer software support. These organizations are confronted by a wide range of support services: fixes to packages (often referred to as maintenance), enhancements to packages, training, providing custom personal computer software and consulting.

Fixes: Fixes — which are the way mainframe software has been maintained for years — are becoming much more common with personal computer packages.

However, many personal computer software vendors still seem to think they are publishing hardbound books rather than a loose-leaf service; they don't normally consider supplying fixes.

Many others that do provide fixes view the activity as a service that will possibly help future sales rather than as a business. This attitude tends to reduce the value of the function to the corporate user who is generally more than willing to pay a reasonable amount for the service.

Enhancements: Vendors now typically add functions to a package by coming out with a new package. The new improved package may be compatible (up to a point) with the previous package, and prior purchasers may or may not receive a discount on the new package. Introducing a new package also occurs in the mainframe world, but far less frequently. Mainframe software vendors are more sophisticated and understand an ongoing enhancement program is a win-win situation for themselves and their customers.

Training: The need to train people how to use particular packages as well as how to use personal computer software in general is obvious. Somewhat surprisingly, however, training has not yet been offered on a large scale or in an organized way. Except for traveling seminars and isolated computer stores, training has been a cottage industry. It will be interesting to see what impact the recent Computerland decision — to supply its name to franchised training centers — will do for this market.

Custom Personal Computer Software: Discussing customized software may broaden the category of software support beyond its usually defined limits. Although this is no doubt true from a vendor's standpoint (software vendors usually avoid customized software), the same sense of a deep divide does represent the customer's standpoint. In general, customers would like an overlap between personal computer systems design, standard packages, customized packages and customized personal computer software development. Because of the extreme youth of most personal computer packages aimed at specific applications, the plain vanilla version of those packages is even less likely than mainframe packages to meet legitimate business needs. The need for modification rises to an almost certainty when there is also a need to interface with a mainframe system that, likely as not, may be a custom system itself.

Consulting: A multitude of activities — helping to establish a personal computer strategy for a department or corporation, identifying functions that should or should not be carried out on a personal computer, matching specific packages to user needs, setting up a personal computer monitoring process, assessing costs and benefits of personal computer software applications and so on — can be covered in the consulting area.

Suppliers: Currently, it is much easier to describe the kind of support that should be supplied than it is to specify what sort of support is available or where to find it. The unfortunate fact is that for many organizations the principal source of support is "none of the above;" other suppliers are the package developer, a dealer or other reseller, a professional services firm or the customer organization itself.

Developers: Many software developers have moved from the stage of giving no support to one of at least supplying package fixes. As noted earlier, often these fixes are not provided on a businesslike basis. Few alternatives exist when this kind of support is not adequate for a specific package. Customers will have to be patient or seek out large firms with a mainframe orientation toward support. However, the recent saga of Peachtree Software, Inc. shows even this approach has its defects. There will be an even longer wait until many developers get into the enhancement business, which requires a longer view and more business maturity than most have, as well as a significant business base and cash flow.

Dealers: At first glance, dealers would appear to be the logical focal point for providing

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many types of after-sales service. So far, most dealers have not gotten involved. The Computerland training offering will even be limited to standard training. At this point dealers do not see themselves as having the skills to offer these kinds of services. Vertical market specialists are an obvious exception to this statement. One school of thought says that many dealers will be able to survive only by becoming specialists. It is doubtful whether many will be able to make the transition.

Services Firms: Professional services organizations are taking up much of the slack for after-sales service (training, customizing and consulting). Although some large mainframe-oriented firms have become involved, after-sales service has been provided mainly by very small organizations, many of them run by early personal computer enthusiasts who have made a business of their hobby.

There is a perceived need for these kinds of services in many organizations. However, these organizations are often frustrated in their search for a supplier. In addition, very-large organizations often find it uncomfortable to work with very small organizations. In this sense, demand exceeds supply.

Self-Support: More through circumstance than desire, many customers now provide much of their own support, especially in customizing and consulting. This tendency should decline somewhat as professional services firms' offerings become better known and their skills become more differentiated.

As corporations become better acquainted with specific packages, they can develop organization-specific training in such things as templates and applications interfaces. In some cases it would make sense for the corporation to modify a personal computer package to meet a specialized need.

Strategies: The most important strategy is to have a strategy. If an organization is able to learn from its mistakes, even a bad strategy is better than none.

At the least, the composition of each support function must be identified and one or more suppliers selected. This set of decisions could, for example, influence which personal computer software products are used.

Although a high discount is often the primary goal when an organization negotiates with personal computer software vendors, it should now be obvious that support or enhanced support may be even more desirable than getting the last 10% discount. Support arrangements include agreement on the vendor's correction cycle and enhancement policies, access to the vendor's data base of problems and solutions, a special hot line and a national users group.

Large customers can make the provision of high-quality support more attractive to responsible software vendors by relieving the vendor of routine but expensive tasks. A corporation can set up an internal support group that fields repetitive questions from personal computer users, passing on to the vendor only the rare or difficult questions. The internal support group would also have access to (perhaps a subset of) the vendor's internal data base of problems and solutions.

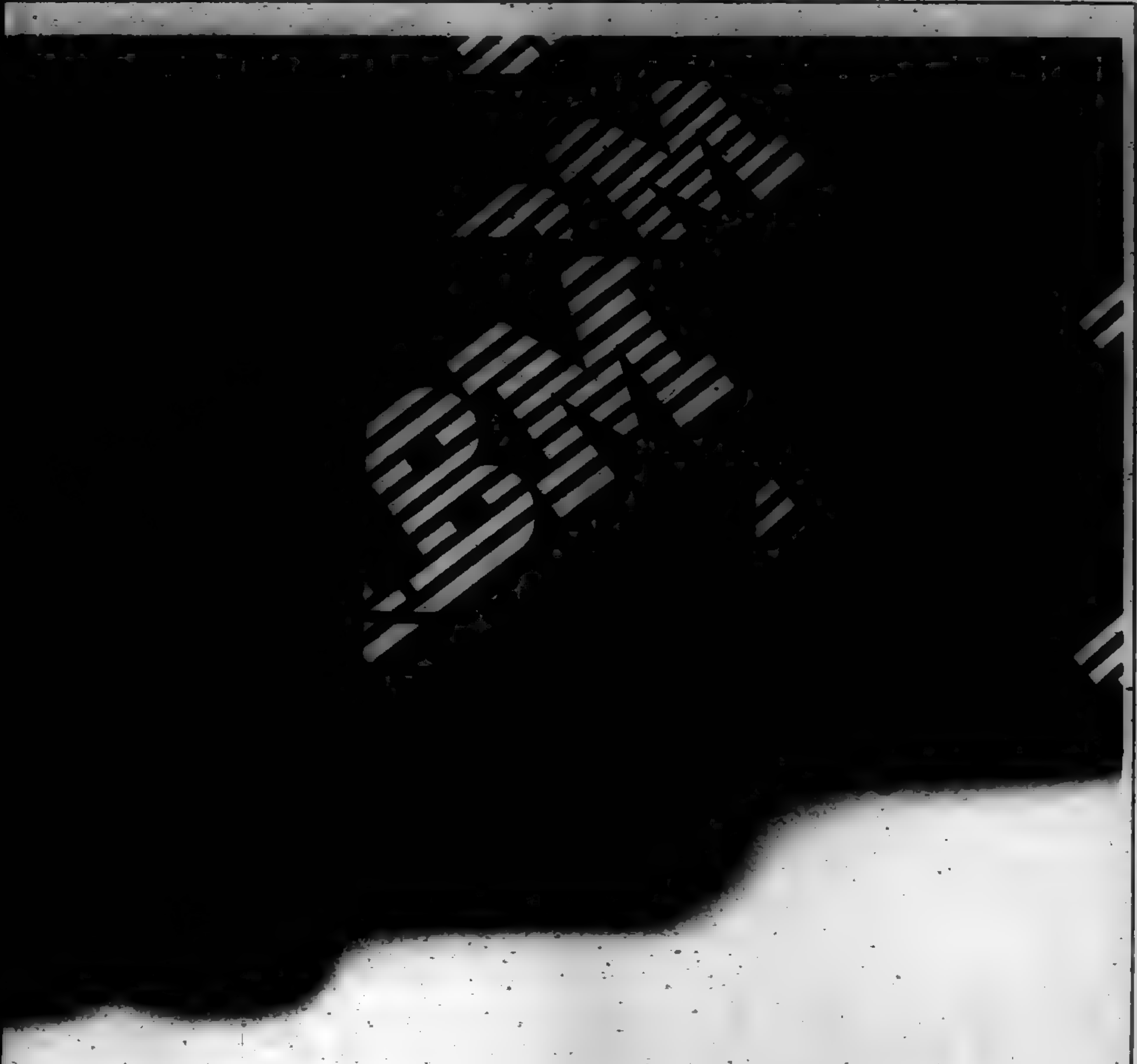
Conclusions: Personal computer software support will be a very difficult but potentially highly rewarding activity. Much of the difficulty arises from the following multidimensionality of the personal computer software support function:

- Internal vs. external support.
- Vendors vs. MIS professionals.
- End users vs. MIS professionals.
- Product multiplicity.
- Full-time department employees who are part-time users.
- Centralized vs. decentralized personal computer environments.
- Technical users vs. nontechnical users.

A personal computer software approach that satisfies most of these constituencies will take time to develop. It is almost certain that each organization will evolve its own solutions.

■

O'Flaherty is a principal of Information Service Strategies, Wood-Ridge, N.J., and a consultant on MIS planning.



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The Blitz Approach To Requirements Analysis

By John F. Palmer

After frequent slipped deadlines and reestimates of remaining work, many project teams find out too late that the requirements analysis work they still have to do can't be done in the time they have left. Faced with this time squeeze, they either skip directly into system design and implementation — ultimately producing an unusable system — or the project is cancelled by an impatient upper management. In each case, precious systems development resources are squandered.

To avoid this problem, project teams can use a technique called blitzing, which will identify the time and person-power necessary for requirements analysis before a project starts. Blitzing is the rapid development of representative portions of a requirements specification by a special group of systems development professionals. Project teams should put special emphasis on blitzing logical requirement specifications because the analysis and specification of logical or essential requirements — inputs, outputs, stored data and processes the new system must carry out, regardless of the technology used to implement the new system — consumes most of the time spent in systems analysis.

From a technical standpoint, blitzing is a three-part process that produces the following:

- A high-level essential model of the existing system being renovated by the project.
- Detailed models for selected essential activities identified by the high-level model.
- Time and person-power projections for completing the essential model.

Models produced by blitzing are built with the tools of structured analysis. The process uses the essential requirements framework and partitioning strategies of essential systems analysis.

The mechanics of holding a blitz are important. Blitzing is a team effort led by a facilitator who understands the techniques. A typical blitzing team will contain the project manager and representatives from the project team, user management, management information systems management and data administration. The blitzing meeting is held in an isolated location where interruptions that would slow productivity are minimal, and the meeting can be as short as a few hours or as long as a week. Sufficient conference support, including audio-visual support and food and beverage service, should be available.

First-time blitzers do better when the blitz is preceded by a short training session on techniques and objectives. Training should include several blitzing simulations to let the novice acquire some skill in the techniques before the meeting.

Blitzing a high-level current essential model — the first step in the three-part process — starts with the construction of a context diagram based on the blitzing team's informal understanding of the project's scope. This diagram identifies data flows (inputs and reports) that will separate the new system from the rest of the organization.

These inputs and outputs, along with other information about the new system, are used to identify business events to which the new system should respond. As the team constructs and reviews a list of these events, scores of events the system must respond to may be identified. In the process, the team must identify and record various project constraints, for example, the extent to which the project could change other systems.

Blitzing gives management a basic understanding of a process that typically will take up a significant share of project time.

At this point, the team informally defines system inputs and outputs. The definition usually consists of finding a form, report or screen layout that identifies most or all of the data element content of the input or output. An informal data dictionary of these definitions is set up to serve as a reference for the rest of the process. The inputs and outputs also serve to identify entities the system must keep data about over time. These entities are identified as the data element content of the system inputs and outputs is reviewed. Data elements that describe each entity are listed in the definition of an object data store named for the entity. These definitions are kept as a reference in a separate informal data dictionary.

Next, inputs, outputs, business events and entities identified so far in the blitzing process are used to define the individual business functions — the essential activities — of the existing system. An essential activity model — comprised of a simple data flow diagram that shows the single essential activity connected to the appropriate system inputs and outputs and object data stores and a high-level process description for an activity — is created for each essential activity.

When the blitz is done, the high-level current essential model will consist of five component pieces: context diagram; data dictionary of system inputs, outputs and data stores; list of events the system responds to; set of essential activity models; and list of constraints identified during the process. These products will ultimately provide a base for a complete current essential requirements model. However, before trying to complete the model, the blitzing process requires a projection of the effort required.

The high-level model, alone, is not sufficient for projecting resource requirements. Detailed analysis — the second step of the blitzing process — must be done on three or four representative essential activities to probe the difficulty of detailed analysis. A projection of resources to finish the current essential requirements analysis can be made from this.

Unlike the blitzing, the detailed analysis probes are carried out in working conditions similar to those that will be encountered by the project. The work is not done by the blitzing team but by the technicians and users who will complete the detailed analysis after blitzing has been completed. The same quality assurance measures normally carried out during detailed analysis are carried out to verify the work done on the probes.

The main resource measured by a probe is the person-time required. Anyone participating in a probe keeps a detailed record of how time was spent. At the end of each probe, these records are collected and analyzed. When all probes are complete, the results are used to project total resource requirements for finishing the current logical model — the third step in the three-part process.

The probing process proceeds in the same way for each essential activity selected for analysis. It starts with a confirmation of the interfaces an activity has with systems outside the context of the project. When the confirmation is complete, detailed process descriptions and stored data requirements must be defined.

To obtain the system knowledge to produce these model components, the probers trace the activity's context interfaces backward and forward through the existing system. A record is kept of logical features found; aspects of the system considered technologically dependent are ignored. This record is kept using the tools of structured analysis.

When the traces are complete, the logical features found are reformulated to remove subtle false requirements such as unnecessary stored data accesses mandated by file storage constraints. During this process, data flow diagrams, process specifications and data dictionary definitions produced by the trace are consolidated and restructured. The result is a structured analysis model of the essential activity that was the subject of the probe along with a time sheet for the probe. When all probes are completed, the blitzing team is re-formed to analyze the results. Rough projections can be made from straight-line extrapolation of resource consumption during the probes over the whole context of the project.

More precise projections result from a two-part process. In the first step of this process, the original blitzing team reviews all aspects of the models produced, the process used and the people involved, to identify factors that would lead to biased projections. The team looks for those aspects of essential activity modeling that took the most time and discusses the likelihood of finding similar difficulties in essential activities not yet analyzed. In the second step, based on the projection bias analysis, a custom-designed resource projection formula is established. Weighing factors are used to modify the straight-line projection formula, to adjust for biases found.

Changes are made in resources available or in the scope of the project to bring them into line with the projections obtained with the blitzing process.

Blitzing has three direct benefits:

- It informs project management of the extent of logical requirements definition work to be done during the project. If resources are adequate, the project should proceed as originally defined. If the resources needed for logical requirements work exceeds the capacity of resources available, then the project must be rescoped. The typical result of rescoping is the creation of a series of projects, each producing a usable system. If a series of projects is considered, it is wise to plan to produce a usable system every two years. The likelihood of a project cancelled increases enormously for projects that go on for significantly longer than two years.
- The blitzed logical model can have an effect on requirements definition when it is under way. Many analysts and users have never seen a logical requirements model. For them, the blitzed model is a valuable, if incomplete, example of what the logical model will look like.
- The probing procedure in blitzing is the same procedure used to complete the rest of the current logical model. The probing process is very different from the traditional structured analysis approach to building a logical requirements model. The biggest single difference is in the amount and type of current physical modeling — documentation of how logical requirements are currently implemented in the existing system. Many projects using traditional structured analysis waste a lot of time modeling these features. The probing portion of the blitzing strategy minimizes the current physical modeling work necessary to build the current logical model.

Blitzing also has some indirect benefits. It encourages direct participation of technical and user management in the project planning process. It also gives management a basic understanding of a process that typically will take up a significant share of project time. In addition, blitzing helps encourage a spirit of teamwork. Finally, it helps make upper management aware of some of the difficulties associated with identifying and defining the business policy that must be implemented in the new system.

Blitzing helps control the process of applications development by projecting the resources necessary for requirements analysis. When projects have sufficient resources to do requirements analysis, a major reason for project failure has been removed. Because failed projects not only reduce the applications backlog but also rob resources that could be used for other purposes, a small investment in blitzing can have a large effect on the applications backlog.

■

Palmer is one of the founders of The Atlantic Systems Guild, Inc. in New York and is coauthor of Essential Systems Analysis (New York: Yourdon Press, 1984).

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How MIS Managers Handle Applications Software

By Lee White

One manages a data processing department of 30. Another shares management responsibility with a second senior vice-president, and the size of their total department is over 500. A third, whose organization touches the pocketbook of every U.S. citizen, uses no mainframe at all; that case is balanced by a fourth whose installation has "a bunch of 3080s and 4300s." Five of them, together, are either using or testing or have already discarded almost every microcomputer and mainframe application software package known to modern man; one is using no query package at all.

As different as these DP managers, directors and vice-presidents are, they have more in common than is immediately apparent. What they share is amazement at how far the field has come and concern mixed with excitement over what may happen tomorrow. *Computerworld Focus* spoke with these six DP executives to find out how mainframe and microcomputer application software has changed the way their companies do business.

What we found was more than we were looking for. Much has been written lately about how DP managers and their staffs should leave behind their ivory-tower existence and speak to the masses. The people who were interviewed have done just that, and not one is unhappy the old days are gone forever. They reported optimism and success in the spread of end-user computing and reported little change in applications backlog. However, one manager noted that more projects were submitted as users gained confidence in his user-friendly DP department. None of the managers reported that the percentage of their software budgets had increased significantly, even with the new areas they were branching into.

Jerry Murchie is chief of the information section, U.S. Internal Revenue Service (IRS) Consulting Services Branch in Baily's Corner, Va. Consulting Services is charged with supporting end-user personal computing and has nothing to do with assessing or collecting taxes, processing refunds or performing audits. His division employs about 63 people during peak times; the rest of the year the staff numbers about 48. These people support all 63 district offices and seven regional offices in addition to national office functions, Murchie said. The end-user community is using micros that tie in to minis, primarily Zylog, Inc.'s Model 31. Because the IRS deals primarily in numbers, Murchie's group has settled on a few software packages — Ashton-Tate's Dbase II, Sorcim Corp.'s Supercalc and Lotus Development Corp.'s 1-2-3 — that fill the needs of their agents. Murchie is particularly interested in expert systems and his group is testing a number of packages, including Intelligent Terminals Ltd.'s Expertease. Murchie said these systems are both natural progressions and enhancements to what his group is now doing. He does, however, anticipate problems with memory limitations of the microcomputers, and even greater problems in finding the experts to program the packages. "In the old days of the pen and pencil, we used to make five errors an hour," Murchie joked. "Now we can make 5,000. I say, 'What have we done?' We've created a monster."

Another person trying to avoid creating an out-of-control monster is Bill Tibbitts, staff vice-president of the Information, Office and Data Systems Department at the 20,000-employee Whirlpool Corp. in Benton Harbor, Mich. Tibbitts has elected to take a more cautious posture before flinging too much technology at Whirlpool's knowledge workers. Whirlpool is using Cullinet Software, Inc.'s applications generator ADS/Online principally for program development in the manufacturing applications area, but no significant query-type software is running on the mainframe at present. Micros are being used extensively, and other packages in widespread use are Lotus' 1-2-3, Condor Computer Corp.'s Condor as a data base package, Samna Corp.'s Samna for word processing and Harvard Associates' Harvard Project Manager.

Mainframe data access is only in the test mode at Whirlpool, a situation Tibbitts doesn't see changing in the near term. "We are forcing [our users] to enter the mainframe manually at this time. We have a nationwide network, and we just have to make sure we have that under control before we let it go."

Tibbitts' cautious posture was echoed by most of the DP managers, with the notable exception of Roger J. Canuel, director of management information systems (MIS) at Ekco Housewares Co. in Franklin Park, Ill. Ekco employees with appropriate security clearance are able to update some files and they have assumed responsibility for the files, he said. "I have people on my staff who still feel they are the bankers or custodians and that no one should change the files except us," Canuel, who disagrees with these sentiments, explained. He contends that this new access situation is really no different from former times, when users submitted a request to change a file. Although no one is verifying that data input is correct when the user keys in the information, no one really did before either. The only difference between the old method and today's method is that "we don't see that piece of paper," Canuel said.

However, such easy acceptance of user involvement is not universal, according to our participants. Chuck Corley is manager of corporate manufacturing systems in the Information Systems Department at Memorex Corp. in Santa Clara, Calif. Memorex is a billion dollar company; its systems budget, as a percentage of sales, is about 2.5%. Among other pieces of hardware, the company has "more than a couple Amdahl V8s and some 3083s and 4341s," according to Corley. Although some of the hardware supports manufacturing, the corporate systems budget alone approaches 1%. Approximately 150 DP people function as support staff for the corporate effort.

Some of Memorex' user community — especially those with access to micros and minis — no longer use the systems group to get jobs done, Corley said. With the user-friendly attitude created by the DP department, users have bypassed traditional paths and now "we've lost the opportunity to get a real accurate closed loop," he added.

Doom and gloom, however, were rarely voiced by survey participants. This attitude was a contrast with that of a year ago when DP professionals were adopting a wait-and-see stance. Although products were available, they were often cumbersome to use. This hampered white-collar workers' efforts to bridge the micro-to-mainframe gap. Today, according to respondents, good products are there in multiples; only one of the group said product quality has a long way to go.

Robert M. Menar, senior vice-president of computing and communications at Carter Hawley Hale Stores, Inc. in Anaheim, Calif., has more than 200 people in his department and more than 230 staff members on the development side. These two divisions support approximately 65,000 employees and 9,500 terminals throughout the U.S. and Canada. To support what Menar terms the "exploding marketplace" of available products, Carter Hawley Hale has a separate group to keep up with technology on a research and development basis.

Not only were the surveyed managers optimistic about the increased sophistication and user-friendliness of the new software, they also expressed confidence in staffing for user support. At Whirlpool, for example, although internal transfers into the systems department account for much of the hiring, some of the best DP knowledge exists within user departments, according to Tibbitts.

William Paul, vice-president of information systems at Atchison, Topeka & Santa Fe Railway in Topeka, Kan., said a number of the railway's staff comes right out of user departments. "They are the people who understand what they're trying to put on the computer and what they'd like off the computer. They learn that system and then do the work themselves," Paul explained. Atchison, Topeka & Santa Fe also trains most of its staff in house. Although the company does hire some people right out of college, union agreements preclude much of the outside hiring. Instead, Paul said, a number of employees go to college and take computer science courses, some actually graduating with computer science degrees. These people have already met the requirements of belonging to the union and of technical training for information systems.

But colleges represent a fertile ground for the DP managers. Tibbitts said, "The college kids come in with a variety of backgrounds. Conceptually, they have no problems. Our challenge is to train them into our methodologies in the particular software packages we're using."

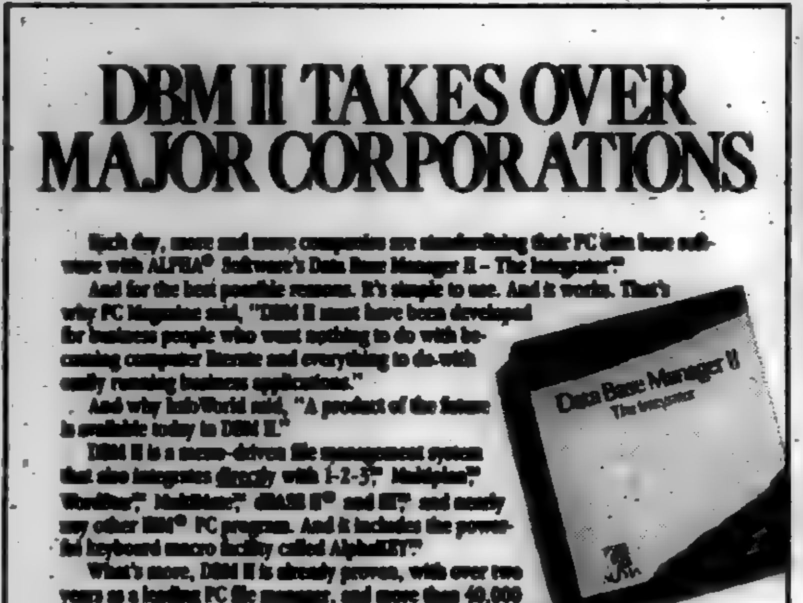
The executives also strongly agreed that the microcomputer is gaining strength in the business world now that effective micro-to-mainframe links are available. Carter Hawley Hale presently has about 500 microcomputers, and Menar expects that number to double by the end of 1985 and to continue to double for some time to come.

Menar's group, which includes end-user computing, has an impressive array of software available for the mainframes and micros and is using Information Builders, Inc.'s Focus and PC Focus as the linking software for personal computers. Cost is the only thing stopping further proliferation of microcomputers. In the meantime, Menar said, each of the 1,500 buyers has access to an IBM 3270-type terminal in order to access mainframe-based application packages. When microcomputers become a more financially feasible solution, he continued, all the dumb asynchronous terminals will be replaced with micros.

Another Carter Hawley Hale plan is to dedicate one of its 3083 mainframe computers to IBM's Professional Office System (Profs); Profs will then serve as a delivery mechanism for all data on the system. The company settled on Profs because it is user-friendly, Menar explained.

The methods employed to support end-user computing in the various companies in the survey varied, as did the hardware and software choices. Perhaps the most exciting and surprising comments, however, came in the area of perceptions: How users perceive the systems group, how systems professionals have adapted to wholesale end-user computing, how systems executives perceive their jobs today and how those jobs may change tomorrow.

Canuel said he has noticed a considerable change in the way users now perceive the systems department. "We were very much maligned long ago, and that was because we were not able to respond to the users' needs." He added that the perception of MIS has improved because users have assumed responsibility for the accuracy of their own data.



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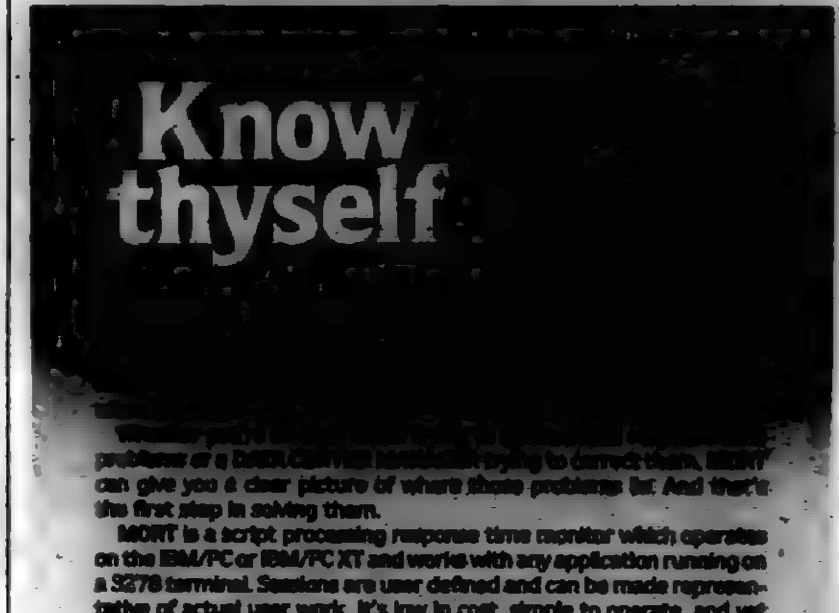

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Tibbitts said he has also seen a change, but thought the change could be attributed to an active effort on the part of systems personnel to effect the change. Tibbitts explained that a "philosophic" stance has been taken at Whirlpool. "We have tried to establish the point that we cannot run other people's departments better than they can. There is a tremendous amount of input needed from the user community. We work with them in developing the systems that will give them the support they need."

Perhaps part of the reason user-friendliness and user-responsiveness are bywords these days comes from the very top of the systems organization. Paul, from Atchison, Topeka & Santa Fe, not only came into the systems department from the user side four years ago, but came from the executive level, where he was in charge of merger studies and the corporate plan. Prior to that he was involved in real estate and industrial development, and before that he was general manager and vice-president in one of the regional offices. "I think I'm user-oriented, and I've had as my major objective making this department more user-oriented," he said.

User orientation has been a struggle for many of the surveyed DP executives. Most head departments with many long-time DP employees who have found the transition difficult. But each of these executives said the the transition was made, and the DP employees are pleased with the overall result. Murchie, who has been with the IRS for more than 25 years, was himself the longest term employee. He showed obvious enthusiasm for the user community he services. "I've tried to keep my eyes and ears open and to stay attuned to what's happening. If things have been difficult in the past, don't carry that preconception into today's setup," Murchie advised. He insisted that had his group allowed these preconceptions to overshadow the big picture, they would never have gotten as far as they have with end-user computing.

Menar also admitted to some attitude problems on the part of long-time systems department people, but only in the beginning. "We've adopted an attitude that first and foremost we are business people. The only reason we exist is for the purpose of buying and selling merchandise at a profit," Menar said. Carter Hawley Hale has sent many people to graduate programs at Harvard University and the Sloan School at MIT. The message these employees impart upon their return is that the traditional data processor is not going to survive without reeducation. "We need to pay attention to the user community," Menar explained, "and we're really trying to do that in a big way through an overall education program. We like to think we're doing an OK job."

In general, there appears to be little doubt that the executives surveyed and the people these executives supervise are doing a better-than-OK job. Five years ago, most people employed at the companies contacted for a similar survey hadn't touched a computer. Now, according to survey participants, computer activity has increased dramatically. And the excitement evident in the words of these people is testimony to a successful transition.

Even more evident is the anticipation directed toward the next five years. Paul sees microcomputers playing a bigger role in the future of business computing. "I think [the advent of] micros is one of the greatest things that has happened not only because [the users] can control a lot of the things they do, but I think it's forcing the information systems departments to be more user-oriented." Paul voiced high hopes for expert systems and artificial intelligence and predicted that such approaches will radically change the field.

Whirlpool's Tibbitts observed that he sees his job changing as he works more closely with top management, and he is finding that management is able to establish and verbalize its needs. "This gives [a project] more clout and we, in turn, are putting in systems that better meet the users' needs as a result of that clout," Tibbitts said.

Most of the participants gave little credence to the concept of fifth-generation languages, preferring to stress that fourth-generation languages still have a way to go. Canuel from Ecko Housewares was one of the doubters. "Despite what the vendors are saying, fourth-generation languages are not being used by the users. I think some more user-friendly languages will be coming out." Menar didn't see it quite the same way. Carter Hawley Hale's corporate strategy, according to Menar, is to make as much available to as many people as possible. Menar's group is presently testing Artificial Intelligence Corp.'s Intellect and hopes to have the product up and available to a large number of people through Profs by the middle of 1985.

To a person, though, the surveyed executives stressed the need to regard data as a corporate asset. Some, like Corley, worried that this very important asset is being abused. Others, like Menar, recognised a potential for abuse, but said it was a management issue rather than a systems issue. Menar stressed there must be a control mechanism, and management must take the responsibility to put that control mechanism into place. "If you were dealing with abacuses and calculators, you'd have a similar problem. Simply because it comes out of a printer off a computer doesn't mean it's the gospel truth," Menar summed up.

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White is a senior writer at Computerworld Focus.

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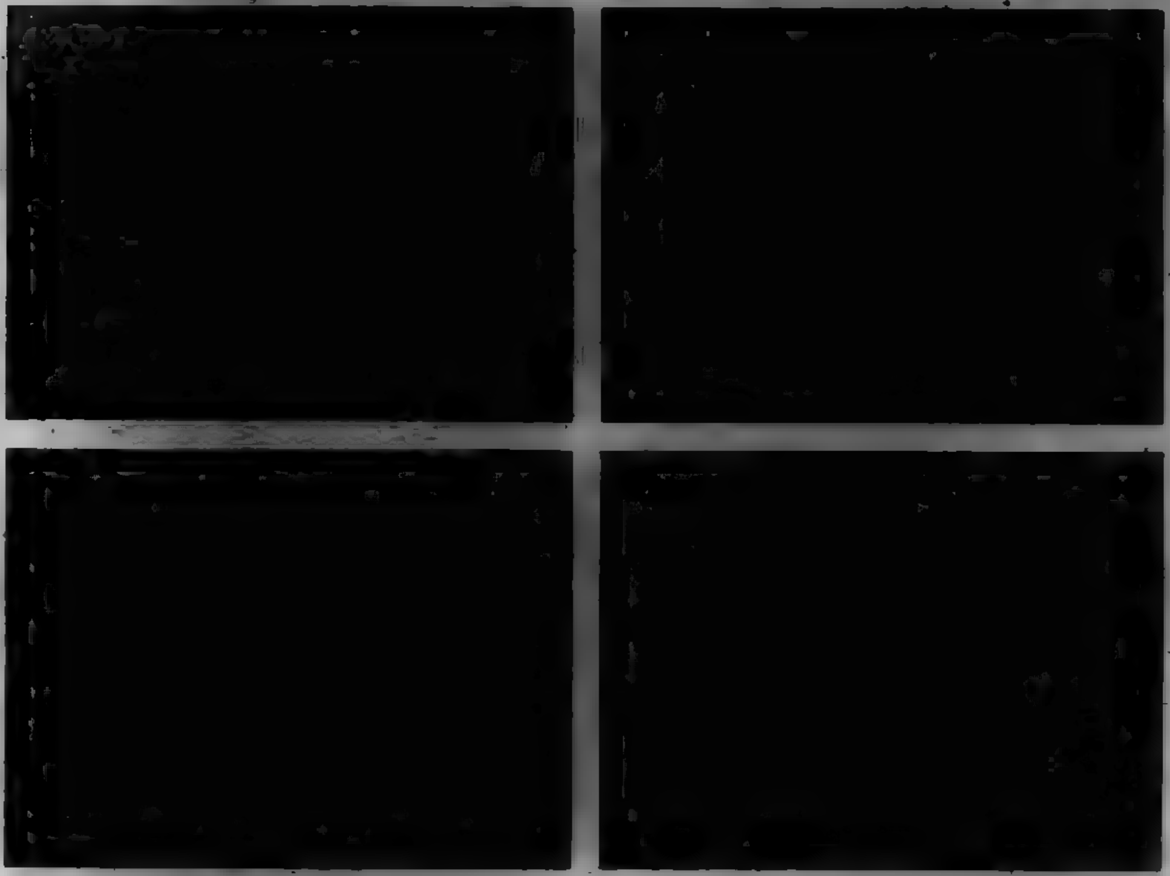

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By Norman L. Agin

icrocomputers are increasingly being used for serious data processing — for applications that go beyond the decision support functions satisfied to date by programs such as Visicorp's Visicalc and Lotus Development Corp.'s 1-2-3. This trend has major implications for designing the next generation of data base management systems. Until recently, personal computers were used primarily for decision support or ad hoc light-duty managerial applications generally undertaken in support of an analysis. A common example is the use of a personal computer by senior management or staff to make budget projections or calculate financial returns. The principal program originally used for decision support was Visicalc. Context Management Systems, Inc.'s Context MBA and Lotus' 1-2-3 introduced a second generation of higher performance spreadsheet programs offering more advanced features. Now decision support users can choose from Lotus Development Corp.'s Symphony, Ashton-Tate's Framework, Ovation Technologies Co.'s Ovation and a host of other new-generation software packages.

In contrast, DP applications involve routine files processing; are often clerical or operational, rather than managerial; and are undertaken in support of information maintenance and reporting, not decision support. DP applications — order entry, personnel recordkeeping and other production applications that neither require nor can be economically justified on a mainframe — are more traditional uses of computing. Developments in computing have led to the increased use of personal computers for DP; among those developments were faster personal computer processors (for example, the 8086 chip), lower-priced fixed disks and improved software.

Information workers' needs will be met only if computing consumers are able to develop their own applications without relying on computer specialists or MIS. The number of specialists cannot meet applications development demand.

DBMS are available to support the needs of DP users, but most are not satisfactory. If the needs of this fast-growing sector of the market are to be met, hardware and software changes are needed, specifically:

- Easier design of applications.
- Better user interfaces.
- Integration of software.
- Data management as the centerpiece of the integration.
- An open architecture.
- Multiuser access.
- Back-end processing for high performance.
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Over the next decades, many of the 50 million information workers in the U.S. will become computer users. Phones, typewriters and calculators will be replaced by desktop computers in one form or another. Applications not economical for mainframe implementation will be implemented on personal computers. Furthermore, many of these applications will be customized to individual requirements.

Information workers' needs will be met only if computing consumers are able to develop their own applications without relying on a computer specialist or a corporate management information systems (MIS) group member, except perhaps in a central staff support role. The reason for this is simple: the number of computer specialists cannot meet the demand for application development.

The two basic types of DBMS reflects the two different types of users. Some DBMS were designed principally for computer specialists to use in developing applications for other users; other DBMS were designed for end users to utilize for their own needs. For the most part, the former are syntax-based, nonprocedural languages and the latter are menu-driven. This distinction should disappear and, in fact, has already begun to do so. The future success of specific DBMS products will depend heavily on their ability to satisfy both markets. They must be powerful enough to satisfy the needs of computer specialists while at the same time easy enough to use to let computing consumers design or modify applications.

One way to produce this dual-purpose product is represented by menu-driven DBMS that also provide for table-driven menu design, cataloged procedures and command file operations. Cataloged procedures are batch operations that can be given a name and executed whenever desired by entering the appropriate name. Command files contain sequences of keystrokes and cataloged procedures and are executable by name. Command files are automatically created the first time by saving the keystrokes that respond to menu prompts or call cataloged procedures. The computer specialist can use these features to customize an application for novice users. At the same time, menu prompting gives end users an easy way to design their own applications.

The area of DBMS interfaces definitely needs improvement. Not only are innovative and simple user interfaces needed, but also new criteria must be established for measuring and judging the value of those interfaces. The end-user interface — the way users communicate with the computer — can be thought of as the front-end

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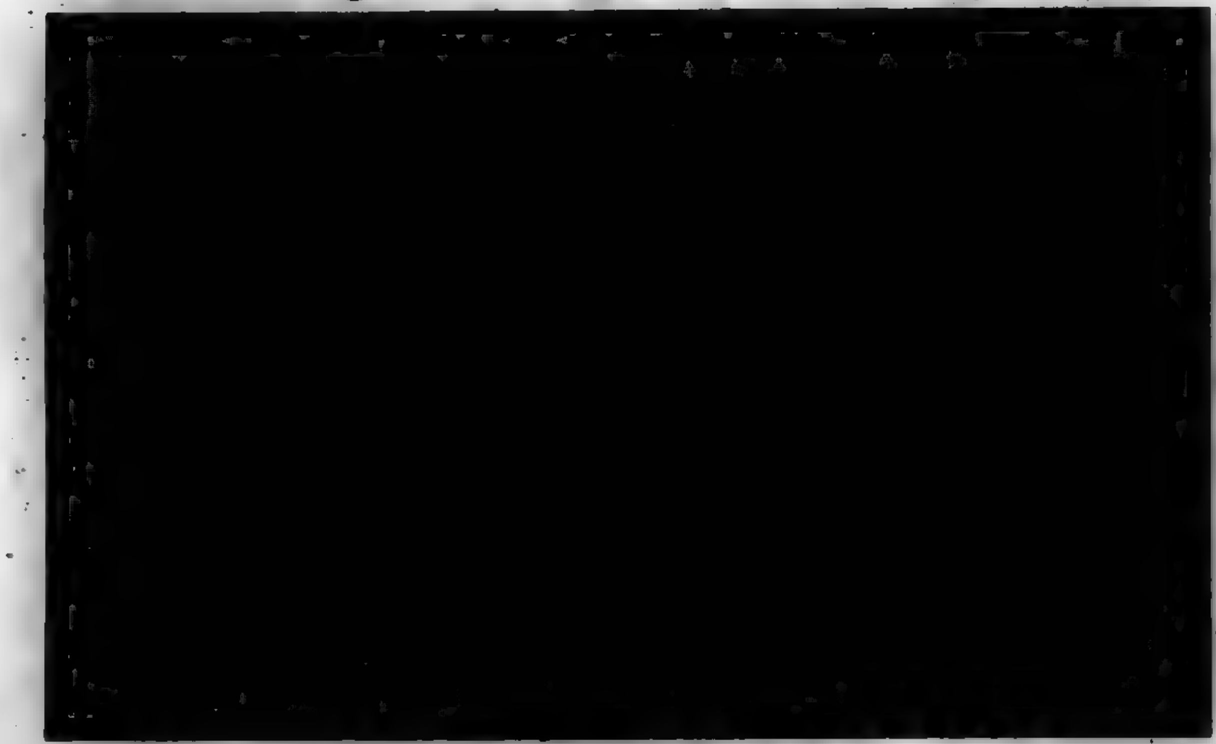

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to a DBMS. Major options include keystrokes, telling or touching.

Improved keystroke interfaces will continue the evolution that started with programming languages and has evolved through nonprocedural and natural languages. Programming languages such as Basic or Cobol tell the computer what to do and how to do it. Nonprocedural languages, also known as fourth-generation query languages, simply tell the computer what to do, and the language decides how to do it. An enormous improvement in programmer productivity and user ease has been associated with nonprocedural languages. However, these programs still require knowledge of a syntax-based language. Newer natural languages partially remove the requirements imposed by the language syntax. Nevertheless, they still require learning and extensive keystrokes and they allow for many mistakes.

Natural languages will probably not be a major new form of interfacing to a personal computer-based data base. Rather, the growth of "no" languages will fill this slot. With "no" languages, rather than entering keystrokes (except for specifying selection conditions and titles), a user indicates choices by simply moving the cursor key and pressing an enter key or responding with a mouse to pop-up menus that offer a number of options defined and limited by prior selections.

In future, as computing consumers increase their use of DBMS on personal computers, reviewers of software will concentrate less on comparisons of DBMS using criteria important to the computer specialist; they will instead concentrate more on measures (such as the front-end interface) that are appropriate to the end user. Criteria will include measures that relate to success in minimizing the time spent performing a specific operation: learning time, required number of keystrokes, entry errors, eye and hand coordination and physical effort.

To date, well-established measures have not existed and, as a result, user interface design has in large part been misdirected. For example, it could be argued that some of the windowing programs currently on the market have become ends in themselves. They require substantial added computer resources (especially memory), impose additional learning and slow down operation. What have the benefits been for the novice user doing routine DP?

"No" language interfaces will gain popularity even faster than natural languages because they better meet user needs. Simply stated, they require fewer keystrokes, reduce errors and dramatically shorten learning time.

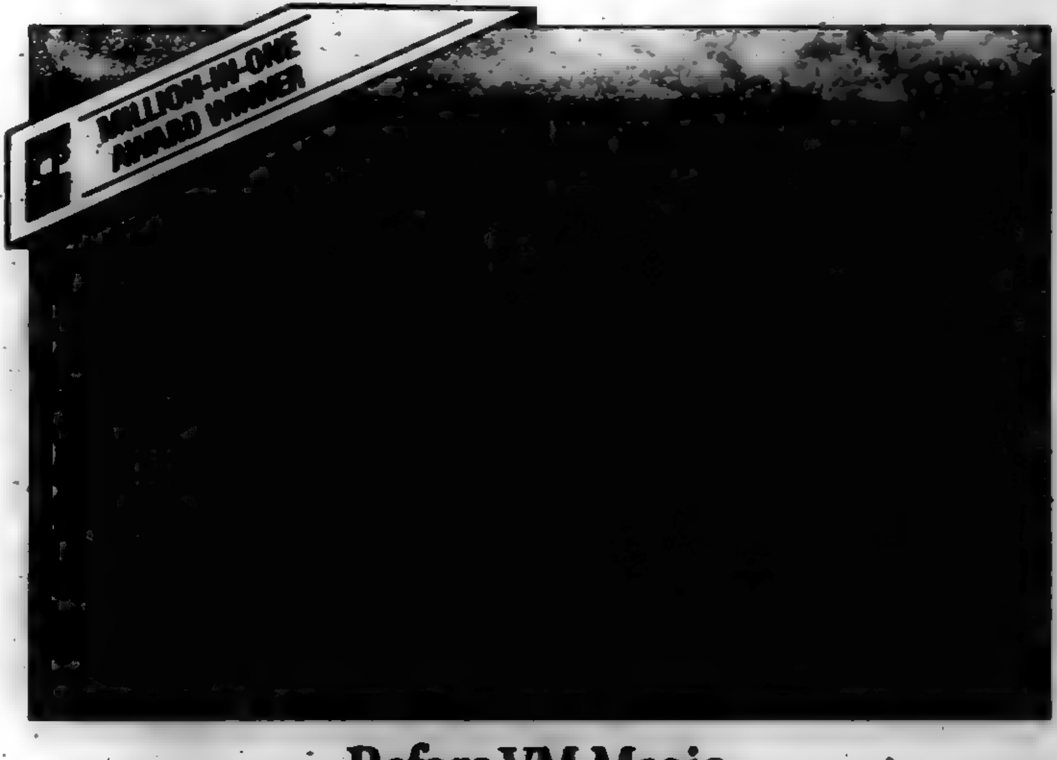
The major functions of personal computer software are data management, word processing, graphics, spreadsheet analysis and statistics. These are equally important to both decision support and DP. The ability to perform all major functions with a common set of data is usually considered integration of software functions. The integration provided by spreadsheet-based programs, however, is generally not appropriate for the more demanding requirements of DP.

> **"No" language interfaces will gain popularity even faster than natural languages because they better meet user needs — they require fewer keystrokes, reduce errors and dramatically shorten learning time.**

Integration within decision support software tends to be concerned with moving a few numbers from the spreadsheet to a graphics display. This type of integration is important for decision support, but fails to satisfy typical DP needs. DP requires the following:

- An ability to specify not the actual data to be moved, but the characteristics of the data. This means that the same functions can be performed automatically on a routine basis.
- Transfer of multiple sets of information in one pass of the data base. For example, to display a pie chart of sales by office for each product, the calculations of sales by office should be done for each product in one pass of the data file. This feature becomes particularly important when data files become very large.
- Intermediate storage between software functions of the information being moved, particularly where large files are involved.

The needs of software integration involve yet another dimension that will be



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satisfied by DBMS. The levels of data to be moved must be expanded beyond the items of information that appear in a window for one function and are needed by another. Three additional levels of data integration must be satisfied:

- The movement of records in the data base to other functions. One common task is to create an address list from the data base to merge with a form letter produced with a word processor. Another task is to move subsets of records and fields to become rows and columns of a spreadsheet to be used in an analysis.
- The movement of the results and calculations performed on the data base. A user might summarize information contained in the data base for display in a pie chart or to update specific rows and columns of a spreadsheet.
- The movement of reports from the data base. A report might itself become a spreadsheet, or a report from the data base might be embedded directly in a word processor file for inclusion in a memorandum or other type of report.

For DP, a data base manager must be the centerpiece of the integration. The data base manager provides far better opportunities for fill-in-the-form data entry, multiple file management and multiuser access than can a spreadsheet or any other metaphor. Spreadsheets, WP, graphics and statistics must be viewed as devices for analyzing and presenting information contained in or calculated from a shared data base.

To date, most popular integrated software programs have had spreadsheets as the core module. The basic device for input and viewing has been a tabular row and column. In some cases, the data base has even been restricted to be memory resident. As the use of personal computers becomes more serious and more applications of a professional DP nature appear, the spreadsheet as the centerpiece must yield to the data base manager.

Few serious applications will be possible without allowing for multiple file access — the ability to work with several relations simultaneously, as is the case in all data base managers as opposed to file managers.

The heavier duty requirements of DP also suggest the need for modules better fitted to the requirements of a specific application. Spreadsheet-based integrated products allow you to use only the modules provided.

Components are important for DP so that the routines used for data management, WP, spreadsheet analysis, statistics and graphics provide the full array of features required for production needs. Because of the routine and repetitive nature of DP applications, trade-offs in functionality are more costly than when made in the context of decision support.

The conclusion is that integrated DP software should have an open architecture. Components provided by one vendor should be tightly interwoven. However, the DBMS as the centerpiece should also allow for substituting and integrating software that a user may prefer or already own. In short, the developers of integrated, data management-based software systems need to provide both their own component modules as well as interfaces with other popular personal computer programs.

Visualizing the need for multiuser access to a data base in the context of the personnel department operations described earlier is relatively easy. Often it will be the case that one person may be entering data, another displaying specific records, a third preparing a mail list and so on. All need simultaneous access to the data base, which means the DBMS must provide record lock. File-locking software, often still advertised as multiuser, is inadequate and inappropriate.

Multiuser features of personal computer DBMS must begin to meet corporate MIS standards. Two examples illustrate where these requirements are not being adequately met. One is for data entry to transaction files instead of direct to a data base. This capability provides audit trails and allows for more efficient batch updates to the master files. This is especially important in a multiuser environment. For example, it is inappropriate for one workstation to be doing updates to the data file while another is printing a

As the use of PCs becomes more serious and more applications of a professional DP nature appear, the spreadsheet as the centerpiece must yield to the data base manager.

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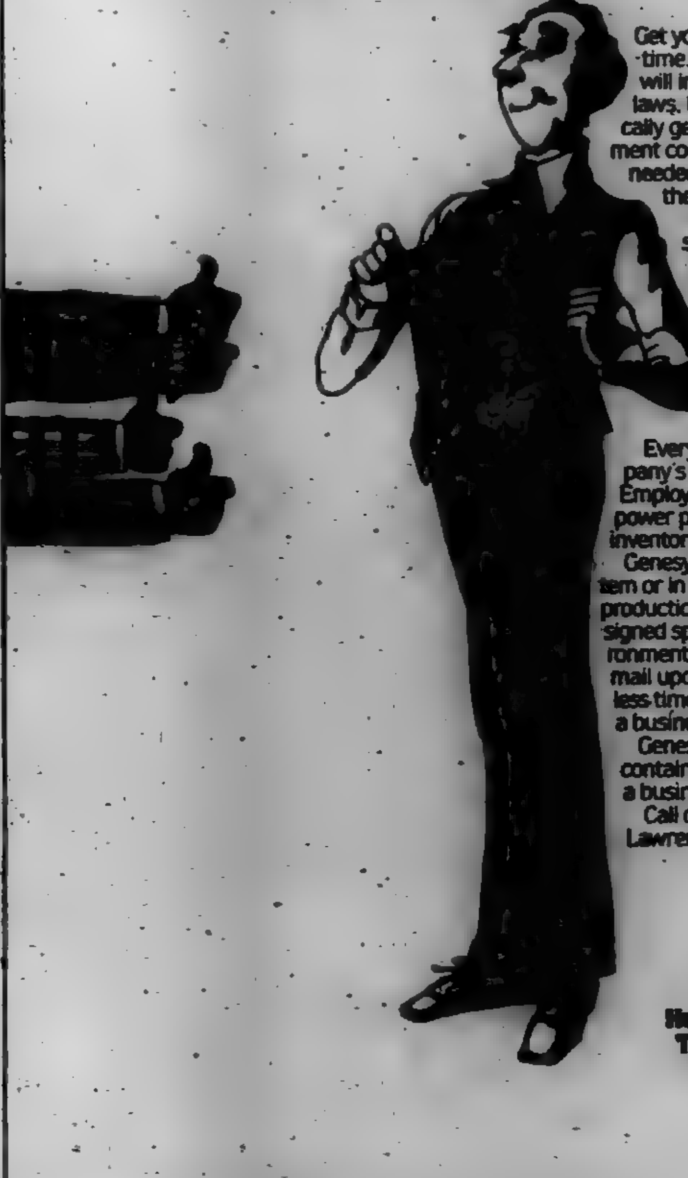

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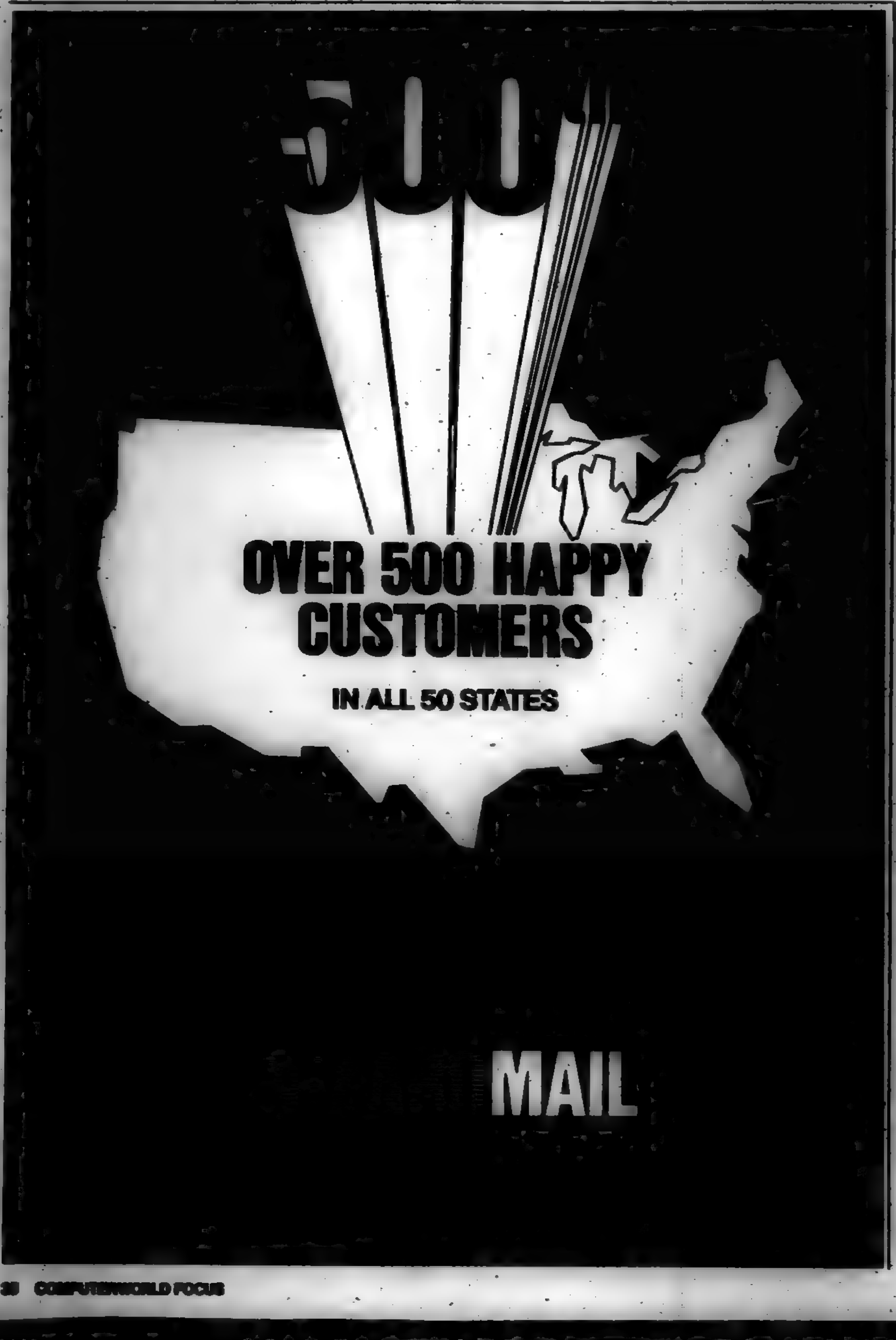
report; if both are done together, it is impossible to know whether the report reflected the updated record. Hence, the DBMS must support posting routines that allow for traditional methods and batch procedures for processing updates to multiple files.

Another example of a requirement for multiuser DBMS is improved data security. Password security is certainly required at the file level, but should also be available at the field or record level.

Users interface with an application program. Earlier, we called this the front-end of the software and hardware tasks required to achieve a computing capability. The back-end also involves hardware and software. The size and seriousness of the jobs performed on personal computers are growing faster than the capabilities of the hardware. Nowhere is this more evident than in the demand for multiuser access to data bases in work-area networks. Local-area net growth has not yet been explosive, but not because of lack of demand. Rather, the hardware and software combination provided by the popular network vendors has been inadequate or too expensive for personal computer-based computing. The need for dedicating or degrading a workstation that serves as a file server, slow processing of shared data file requests and naive design of record-locking schemes have been the reasons.

As in mainframe design, back-end processors have emerged to satisfy heavier duty DP requirements on personal computers. Additional processors will be used in the back-end. Processor chips are decreasing in price and being used more and more for specialized functions. We already see special-purpose math coprocessors, keyboard processors and video display chips. A natural extension is specialized hardware for higher performance data base access.



Another feature required by more serious personal computer-based data base management is closer integration with mainframe data bases. Communications between mainframe and micro must be more tightly interwoven if personal computers are to be used successfully for DP in a business environment. The micro-to-mainframe links in some of the new integrated spreadsheets and other software programs still fall far short of what is required. Flat files containing information needed by the personal computer user are not directly available on the mainframe. Nor are Ascii files the way information is used on the personal computer. Nor does movement of data in TTY emulation with 300/1,200 baud modems fully satisfy needs. Serious personal computer computing requires 3270 emulation, coaxed connection to the mainframe, fourth-generation query language access to mainframe data bases and file structures and automated conversion to file formats used on the personal computer. A simple way to identify this requirement is to say we need query on the mainframe, automated file transfer and conversion for the personal computer. Products that provide these capabilities are becoming available.

The early growth of microcomputers was mainly in the decision support area and was spurred by the Visicalc and Apple software/hardware combination. A second leap in growth occurred with the advent of the IBM PC and Lotus' 1-2-3. Decision support applications will continue to grow but at a reduced rate. As hardware processors increase in speed, large fixed disks decrease in price and personal computers become an interwoven part of a corporate computing environment. The next quantum jump in personal-computer growth will be for serious DP. The personal computer software industry needs to recognize this trend and understand its implications for software. The greatest impact will be in the design of the next generation DBMS.

■

Agin is vice-president of Martin Marietta Data Systems and president of ITSoftware in Princeton, N.J.

PETER BEACH

Keeping Track Of Human Resources

By Lee White

Human resources management is an application area desperately in need of order and efficient recordkeeping. Personnel departments must contend with the nightmare that results from the amount of paper generated, the number of records required and the length of time these records must be held. This situation is particularly complicated in relation to government requirements for affirmative action and equal employment opportunity (EEO) reporting, which require complex cross-filing and cross-indexing to make information available quickly.

A number of mainframe software packages on the market today have come a long way toward solving the problems inherent in this paper- and record-intensive field. The more sophisticated of these packages are comprised of modules. The modules can often be purchased and operated independently, but can also be integrated with one another and with comprehensive payroll software to create a system that can track almost anything a company or government might require.

This article will focus on a representative sample of mainframe-based application software packages that include both human resources management and payroll modules. The packages all purport to do the same things, and interviews with users tend to support vendors' claims. However, as is the case with most software, the vast majority of users of these packages were also involved in selecting the package for their companies. These users made their selections on the basis of literature, vendor demonstrations and discussions with other users (most of whom had also been involved in selecting the packages for their companies).

The caveats that pertain to the purchase of these packages are the same that apply to any other large, costly and complex system: Is the vendor likely to be around tomorrow? Is the company financially stable? Are there hidden costs such as documentation, training, upgrades, hot-line support? Is there a large installed base?

The two most critical issues, however, are defining — as narrowly as possible — the needs of the organization and deciding whether the cost of purchase and implementation is justified. In the area of human resources management and payroll, these issues are particularly difficult because the system cannot always give short-term, easily quantifiable, bottom-line cost savings.

The three systems that will be reviewed are the ISI Advanced Human Resource System from Integral Systems, Inc. of Walnut Creek, Calif.; HR:Millennium, from McCormack & Dodge Corp. in Natick, Mass.; and the MSA Human Resource System from Management Science America, Inc. (MSA) in Atlanta, Ga.

The ISI Advanced Human Resource System accommodates and supports the administrative requirements in the management of human resources. The system consists of four modules — Advanced Payroll, Advanced Personnel Management, Advanced Applicant Tracking and Advanced Position Control — and permits either independent implementation of the components or integration of all the modules. In addition, the system includes complete on-line capabilities. Personnel and applicant information can be entered and accessed in a real-time environment. Time reports and payroll adjustments can be entered in an on-line mode with editing and batch controls. Inquiry is available to the employee and applicant data bases and to the payroll and employment history files. ISI provides on-line security features that restrict access and protect data from unauthorized updating, according to the vendor.

Hardware requirements for the ISI system are IBM's 360 or 370; 4300 series; 3080 series and plug-compatibles; IBM's System/38 or Hewlett-Packard Co.'s HP 3000. The price range for the ISI system (for all hardware configurations except the System/38) is from $125,000 to $250,000, depending on the number of modules selected. The System/38 hardware is priced at $35,000 per module.

The Advanced Position Control module provides a framework for staff planning, human resource development programs, budgetary controls and monitoring and recruitment initiation functions. The position data base within this module includes information that defines each current or planned position.

The Advanced Applicant Tracking module aids the selection process by recognizing which applicants are best qualified for open positions. EEO summaries are provided on each applicant report to allow close monitoring of affirmative action goals. Also provided in this module is the capability to meet the reporting requirements of the Equal Employment Opportunity Commission (EEOC) and the means to respond to discrimination suits. A list of events such as reference checks, job offers, interview dates, examination scores and other information is included to allow monitoring of the applicant's status during the selection process.

The Advanced Personnel Management module includes data such as job status, benefits participation, skills inventory, basic personal and demographic information and payroll-related information. A useful part of this module, the Personnel Action Form, can be company-defined to meet specific organizational requirements. This form can record personnel actions such as initial employment, promotions, leaves of absence and transfers.

The final module is Advanced Payroll, which computes federal, state and local taxes and supports payroll disbursement, payroll auditing, payroll history and benefits and deduction administration, according to the vendor.

Advanced Micro Devices, Inc., of Sunnyvale, Calif., is a manufacturer of integrated circuits and employs 6,200 people in its domestic operations in Sunnyvale and Austin and San Antonio, Texas. The Sunnyvale location has been on line with the personnel piece of ISI's system since April 1983. Advanced Micro Devices is not using all the modules; the company is presently using the personnel and position requisition portions and is about to install the applicant system. Don Drucker, human resources systems manager, served as project manager for the ISI implementation; he said that, in his view, the governmental report writing capabilities were not the strongest parts of the system. "The real problem is getting the data clean, validating it and making sure everybody has good codes. Anybody can write the reports to dump it out in the format of the government. We've designed our own in-house system [for applicant flow]. Everyone who applies fills out a self-identification form, and we throw that into a [Mathematica Products Group, Inc.] Ramis system and run reports off that."

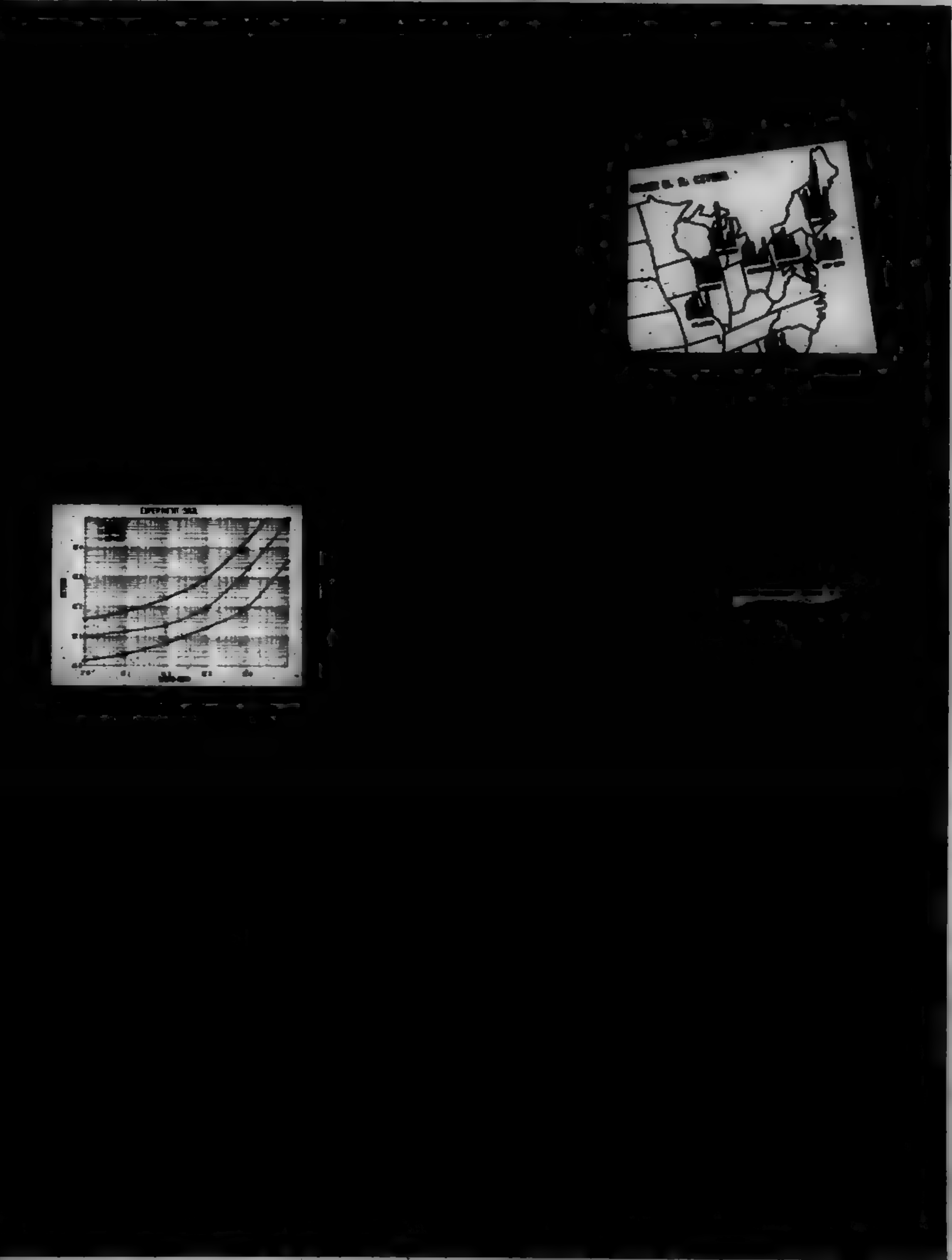
Advanced Micro Devices is not using ISI's payroll module, but Drucker has designed an interface from the ISI personnel module to the Bank of America payroll system. One of the great strengths of the ISI system, he said, is its potential as a foundation for implementing some of the more sophisticated human resources applications such as career development and succession planning. All the data elements necessary to accomplish the applications, including skills, training, education and previous experience, are built into the ISI data base. Drucker said he doesn't anticipate any problems with the implementation because the company hadn't encountered any problems in the past; he added that Advanced Micro Systems is generally pleased with ISI, although most of the support is provided in-house. Only one programmer has gone through the training; the system was put in prior to initiation of ISI's formal training classes.

Another user of ISI is Stephen Hawald of Vitro Corp., a subsidiary of Penn Central Corp. Vitro provides engineering services under contracts with the U.S. Department of Defense and supports 6,000 employees in its Silver Spring, Md., headquarters and its 30 field offices throughout the U.S. Hawald, manager of payroll at Vitro, spent a year examining more than 80 packages before Vitro signed a contract with ISI in September 1982.

To smooth the installation procedure, representatives from payroll, personnel and data systems joined the implementation team. During the final four months of installation, the older batch payroll system was run side by side with ISI. A hot line was set up to answer employees' questions, but by the fourth pay period, calls had trickled to almost zero and the hot line was discontinued.

Vitro has documented, quantifiable results from the payroll arm of the ISI system. Under the previous system, it took 25 employees five days to complete a typical payroll run; with the ISI system, 16 employees complete the process in fewer than three days. In addition, most personnel information can be accessed in less than one minute, Hawald said.

Like Vitro, the city of Cincinnati also employs about 6,000 people; with the exception of the Applicant Tracking unit, the city has all of the modules operational and on-line. The personnel part of the system has been up since October 1982, and the payroll and position control portion has been operating since July 1983. Cincinnati recently purchased the Applicant Tracking module and expects to have it operational by the end of 1985.



Bernie Menke, a computer project manager for Cincinnati, headed the development team that put up the ISI system. He said the system eliminated a great deal of the manual recordkeeping. For example, complete sets of records in the central personnel office were thrown away and the number of duplicate sets kept at departmental levels has been reduced. In addition, payroll processing is speedier and more accurate and the error rate for returned checks or requests for redeposit has dropped dramatically. "With the first payroll we issued, we did not have a single incorrect check, not one error. It just boggled my mind," Menke said.

It used to take 25 employees five days to complete a payroll run; with ISI 16 employees complete the process in fewer than three days.

The personnel recordkeeping capabilities of the system are impressive, Menke said, and management decisions are now much easier because of the management-level information readily available on the system. In addition, the city was able to file the EEO report as a direct output from the system and it was accepted by the federal government. The city has not implemented a skills inventory data base, by virtue of management decision, but the system would provide this capability if the decision were reversed at a later time.

ISI's support gets high marks from Menke, who has worked with other packages during his career. His prior experiences with those packages made him wary, but he added, "I just can't say enough good things about [ISI's] support. ISI was just dramatically different from the others." Although no formal training classes existed when Cincinnati bought the system, ISI sent its people to Cincinnati to train the project team, and the project team then trained all the users. Although quantifiable results may not be apparent, "without [ISI], I don't know where we'd be today," Menke concluded.

HR:Millennium, the integrated personnel and payroll package from McCormack & Dodge in Natick, Mass., coordinates and controls payroll and personnel information. The software boasts extensive system capabilities including multicompany processing, comprehensive taxing and reporting modules, detailed work force analysis and real-time updating.

The system runs on IBM's 4300 and 3080 mainframe computers, and its price — less than $200,000 — includes payroll and personnel modules, report writers, training, automatic upgrades, on-line capabilities and hot-line support.

Millennium's payroll module pays employees by check or direct deposit; calculates retroactive increases; handles federal, state and local withholding taxes; accumulates payroll hours and dollars by project, cost center and job; stores earning history; and allows automatic transfer of payroll expenses with a general ledger interface.

The personnel package handles information on job and personal data and history of illnesses and injuries; generates detailed reports to monitor company compensation plans; maintains education and skills information for career planning and internal recruiting; produces EEO reports; analyses work force utilization by comparing current staff to labor market statistics and Affirmative Action Plan goals; and reports adverse impact of transfers, promotions and new hires.

Part of Millennium's extended system capabilities is tracking applicant flow when information to support hiring decisions is necessary — a critical function in EEO or Office of Federal Contract Compliance Program litigation, for example.

Pete Poole is a group manager in the Information Systems Department at the 5,000-employee Baptist Medical Center in Birmingham, Ala. The hospital purchased the entire package from McCormack & Dodge, but has fully implemented only the payroll module, which has been in operation for over a year. They have begun to use the personnel and position control portions and are in the process of inputting data. The hospital expects to begin using the parts for affirmative action, Occupational Safety and Health Administration reporting, benefits reporting and automatic deposit sometime in 1985. Poole characterised the conversion procedure as "real clean," and attributed the success primarily to McCormack & Dodge's support. "We've called them on a Saturday night, and they were here on Sunday morning," Poole said.

John Baas, director of employee relations at Bronson Hospital in Kalamazoo, Mich., also gave high marks to McCormack & Dodge's support. "They preach service, and they do back that up," Baas said. Bronson has been on line with the entire Millennium package, running in a parallel mode with the hospital's older, homegrown system, since December 1984 and Baas said he anticipates that Millennium will fill the hospital's needs. At present, there are 2,580 employees at Bronson, which includes the parent company, Bronson Health Care Group. The decision to choose McCormack & Dodge was influenced by the fact that Millennium supports a multicompany group.

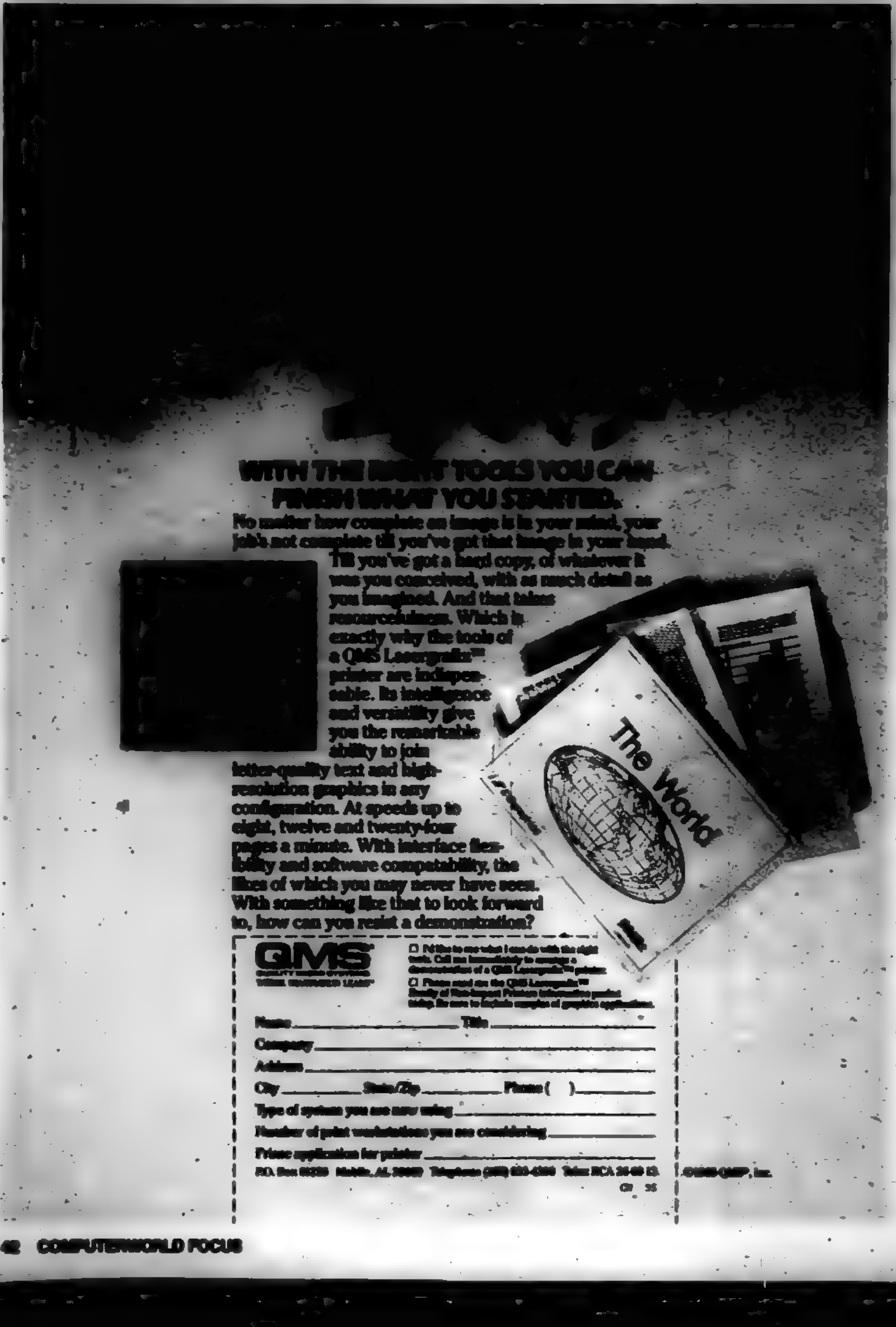
Members of Bronson's implementation team attended formal classes offered by McCormack & Dodge during 1984 and found them very helpful. In addition to the implementation team, there was also a management team headed by Baas. "The implementation team had responsibility to go to classes, learn the system and do the day-to-day work of implementing the system. [The management team] was there for referrals and to answer basic policy questions," Baas explained.

Part of Millennium's extended capabilities is tracking applicant flow — a critical function in EEO or OFCCP litigation.

Bronson Hospital is running Millennium on an IBM 4341 and has recently purchased an IBM 4381. Some degradation in response time had occurred, which was one of the reasons for purchasing the new computer, Baas said. "It takes a lot of space and a lot of memory. It generates a tremendous amount of information."

Management Science America, Inc. (MSA), in Atlanta, Ga., boasts the largest installed base with well over 2,000 organizations nationwide using its system. The supported technical environments for the MSA Human Resource System are IBM's 4300, 3030 and 3080 computers, under MVS/XA, MVS, OS, DOS, DOS/VSE, SSX/VSE; IBM plug-compatibles; Honeywell, Inc.'s DPS8; medium and large Burroughs Corp. computers; the Sperry Univac 1100 and NCR Corp.'s VRX. The price range is from $120,000 to $175,000, depending on the modules selected. Available modules are the MSA Payroll System and the MSA Personnel Management and Reporting System.

The MSA Payroll System provides automated recordkeeping; computation of federal, state and local taxes; and includes a special report generator to create reports without DP assistance. Other enhancements available within the system include deductions and employer-paid benefits, automatic payroll deposit, Individual Retirement Account and 401(k) deductions.



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The personnel module of the MSA system includes applicant tracking; employee information such as personal data, salary and performance reviews; skills inventory; benefits participation; and EEOC and Affirmative Action reporting. Also available are extended personnel capabilities such as position control, benefits/Employee Retirement Income Security Act compliance, employee and labor relations and career development.

Solar Energy Research Institute in Golden, Colo., a beta test site for many MSA products, has been on line for more than two years. At present, 550 employees are part of the payroll and personnel system, which is running on an IBM 3031. According to senior programmer analyst Paul Dragseth, who was project leader for MSA implementation, Solar Energy Research Institute is using most of the packages, except for applicant flow (which is installed but not implemented) and position control. The company is using the system to file its EEO report, but cannot use MSA for its other reports. "We have some special reporting that has to be done that MSA doesn't provide because we're a DOE [Department of Energy] contractor," Dragseth explained. Dragseth and others from Solar Energy have found MSA's formal classes and Interact — MSA user group meetings — valuable. He also applauded MSA's support, but said Solar Energy's own technical support solves most problems.

> **MSA boasts the largest installed base with well over 2,000 organizations nationwide using its system.**

Joe Petruzzellis, senior systems analyst in the Corporate Information Systems Department of American Hoechst Corp. in Somerville, N.J., also said he benefited from Interact, especially in the startup days of the MSA system. American Hoechst is a veteran user, having installed the system in July 1979. About 9,000 employees are on the system which is running on an IBM 3084. The system is on line, but not in a real-time mode. Although the company is using the system extensively, it has chosen to create its own reports using Pansophic Systems, Inc.'s Easytrieve in place of those provided by MSA. American Hoechst does pull information from MSA for these reports. The company has also discontinued using the position control portion of the package, finding it "cumbersome," Petruzzellis said.

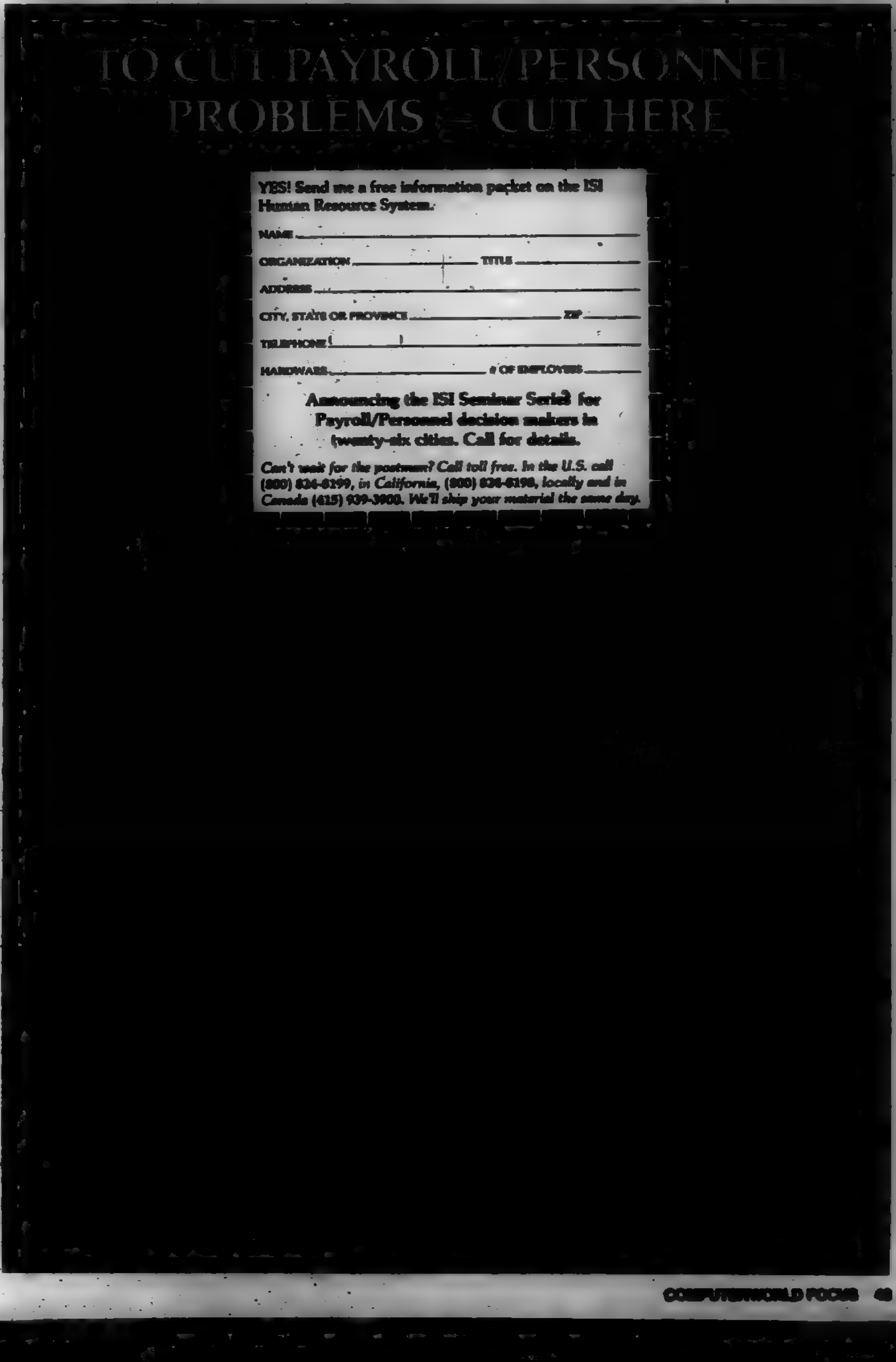
Another MSA user is Paradyne Corp. in Largo, Fla. Since April 1984, Paradyne has been on line with most of the MSA modules, including position control, life-to-date history, benefits and payroll. Joyce Daley, employee information manager in the Human Resources Department, was project leader of the MSA implementation team. Daley said the best part of the system is "ownership of the information. When we had a service bureau doing our payroll, the only thing we owned at the end of it was checks."

Paradyne makes good use of the system's report-writing capabilities, particularly the special report generator, for labor reports, payroll and personnel. Daley praised the benefits statement generator, which can read the entire system including the payroll portion.

Daley has attended many of the MSA classes and will soon attend MSA's expert classes. She and members of the DP and payroll have gone to Interact. Last year's Interact was particularly valuable because Paradyne had just gone on line. "Here we were with this new system, wondering who was in control. Interact allowed us to talk to other users, and it gave us a good feel for how other people were using the system. You get so wrapped up in getting it to produce checks that you don't look at the big picture."

■

White is a senior writer at Computerworld Focus.



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Manager's Corner

By Michael E. Lawson

The demands placed on many DP departments force them into a fire-fighting routine that leaves little room for essential long-range planning. However, planning is playing an increasingly important role and information systems managers cannot ignore one important component of all long-range plans: ensuring that information systems professionals possess the education necessary to maximize their impact on the organization. Two kinds of education are appropriate: technical training, to ensure currency in a very fluid market, and management education, to improve the effectiveness of information systems personnel.

Effective courses for technically oriented people fall into four categories. These courses can improve the way organizations will be managed, the way information is presented and the quality of analyses conducted on behalf of the organization. The courses cover the following ground:

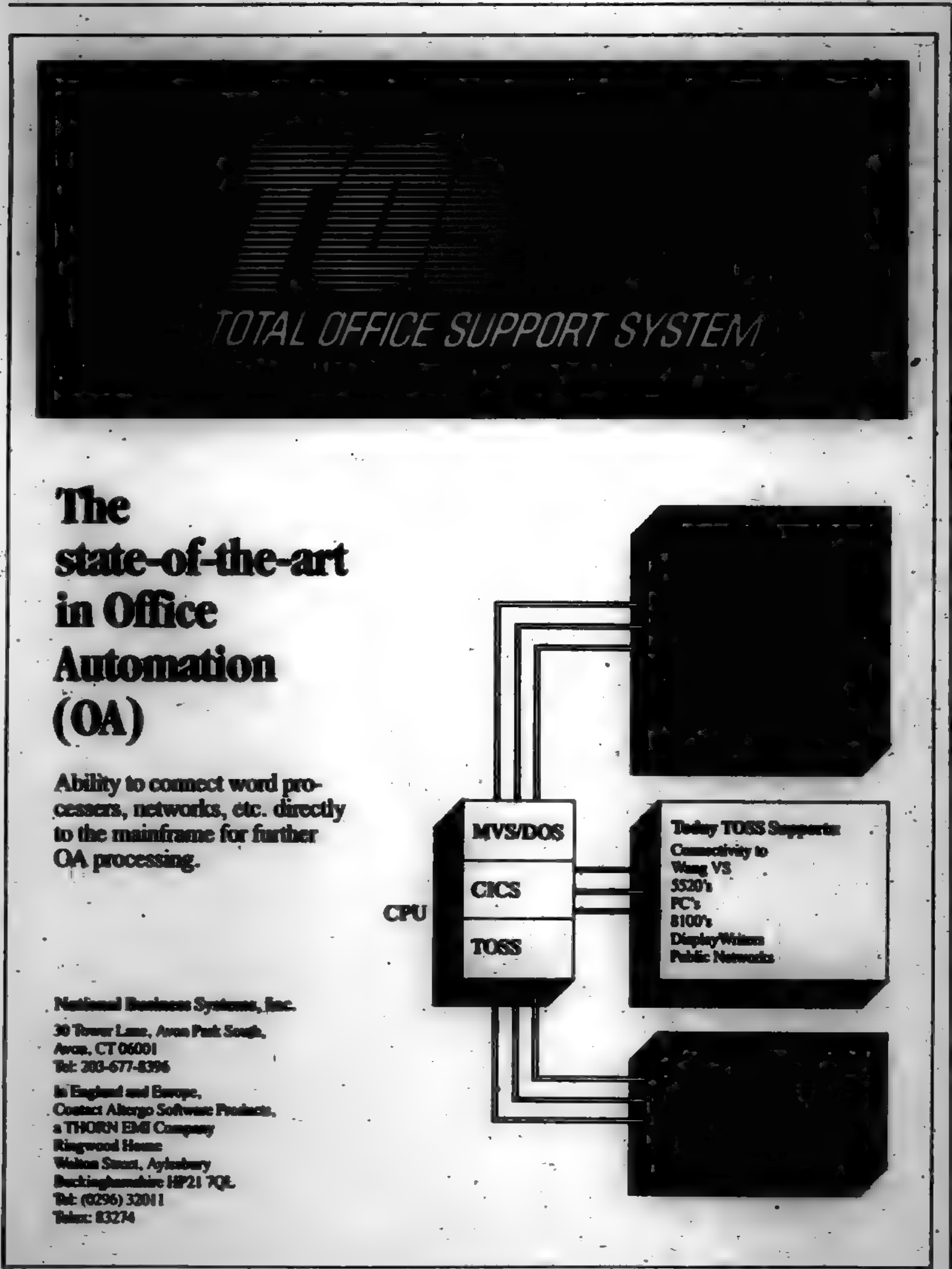
- Improving the way information systems professionals communicate ideas and plans. A good course would stress the organization of information and its presentation as well as techniques that would help the presenter analyse and handle interactions with the intended audience. An effective program would videotape presentations and offer detailed critique sessions.
- Evaluating the costs and benefits associated with management information systems projects. A good course would develop techniques for analyzing the financial aspects of a systems project and would utilise these techniques to produce a structured analysis of the costs and benefits of a project. After taking this course, the analyst should be able to deal with issues such as investment timing, flow of funds and risk. Finally, this type of course would describe how such complex analyses are most usefully presented to management.
- Realising the importance of finance and accounting in the life of any organization. This course would familiarise information systems professionals with the fundamental concepts of accounting and finance. An important goal would be imparting an understanding of financial statements and the effect of various financial transactions on the organization. Strong programs would develop an understanding of the impact of inflation on financial decisions. How to prepare a capital budget would be of real value, as would information describing the general budgeting process of the organization.
- A comprehensive management development program for information systems professionals. This course would cover the major components of a business or management education. Modules on accounting, finance, operations, marketing and business strategy would be included. A marketing module, for example, would cover competitive evaluation, market segmentation, product mix, promotion and perhaps sales management.

Duration of these courses can range from two or three days to several weeks or more. Courses could be developed in house or might be delivered by outside organizations — either companies that specialize in delivering continuing education courses for business or the continuing or executive education departments of major universities.

Be clear about the educational goals you are setting and how these courses will help you meet specific objectives to improve staff productivity. With that task behind you, develop a relationship with an organization interested in helping you meet those goals. Two pointers: Do not buy off-the-shelf courses before you investigate the organization's willingness to tailor educational programs to your needs. Second, check out the programs by talking to someone who has been enrolled before.

◆

Lawson is director of the Masters Program in Management Information Systems at Boston University's School of Management.



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Q&A

(Continued from Page 3)

would be more from the supermini down to the microcomputer level. Mainframes are still a direct-from-vendor market. In any case, the VAR market is going to become fragmented, with the basic divisions drawn between micro-specific VARs and the larger systems VARs.

In the last few years, IBM gained publicity with the active promotion of its own VAR programs. What role does IBM play in all of this?

IBM's interest in the VAR value-added dealer channel is to penetrate markets it can't tap through its retail channels or direct sales forces. IBM wants to make sure it's actively in distribution channels that might take off in the future. It doesn't want to be left in the dust.

How large is the U.S. microcomputer VAR market?

The 1984 U.S. micro VAR market of $4.3 billion will reach almost $14 billion by 1989. Those figures include all micro and stand-alone systems.

Products

NEW ROCHELLE, N.Y. — **Respond**, a series of communications software modules from **Software Synergy, Inc.**, provides terminal emulation for IBM Personal Computers to allow access to subscriber information services, mainframes, minis and other micros, according to the vendor. Several popular programs such as Lotus Development Corp.'s 1-2-3, Multimate Corp.'s Multimate and Ashton-Tate's Dbase III can also be accessed through Respond, Software Synergy said.

Respond reportedly lets users transfer any kind of text or binary data as well as data base files, screen by screen or line by line, to either a disk or printer. Data can be sent and received automatically and unattended, the vendor said. Respond/All, one of the eight software versions available in the series, offers asynchronous and synchronous communication through a single product, according to Software Synergy.

Prices range from $175 for the Respond Async module to $953 for the Respond/All module. Further information is available from Software Synergy, Inc., 466 Main St., New Rochelle, N.Y. 10801.

TRUMBULL, Conn. — **Canaan Computer Corp.** has introduced Multigate-PC and Multigate-VM, two communications products providing IBM Personal Computer users with interactive access to PC-DOS and VM/CMS applications residing on personal computers, IBM System/370 mainframes and Canaan Corp.'s own DCS 5400 departmental computers.

Multigate-PC consists of PC Server, a program that places an IBM PC in a Canaan terminal emulation mode, and Canaan Server, a program allowing personal computer users access to DCS 5400 storage and security features, according to the vendor. Multigate-VM reportedly provides a gateway between IBM PCs and an IBM VM mainframe, as well as allowing the exchange of PC-DOS and VM/CMS files between two DCS 5400 computers or from a DCS 5400 to an IBM VM mainframe.

Multigate-PC, including software and cabling, costs $1,195 with a yearly maintenance fee of $125; Multigate-VM is licensed for $99 per month. More information is available from Canaan Computer Corp., 39 Lindeman Drive, Trumbull, Conn. 06611.

VIENNA, Va. — **Boeing Computer Services** has announced Boeing Calc, a financial spreadsheet package targeting companies with finance, planning and consolidation needs that have outgrown the limits of memory-bound single-page spreadsheets.

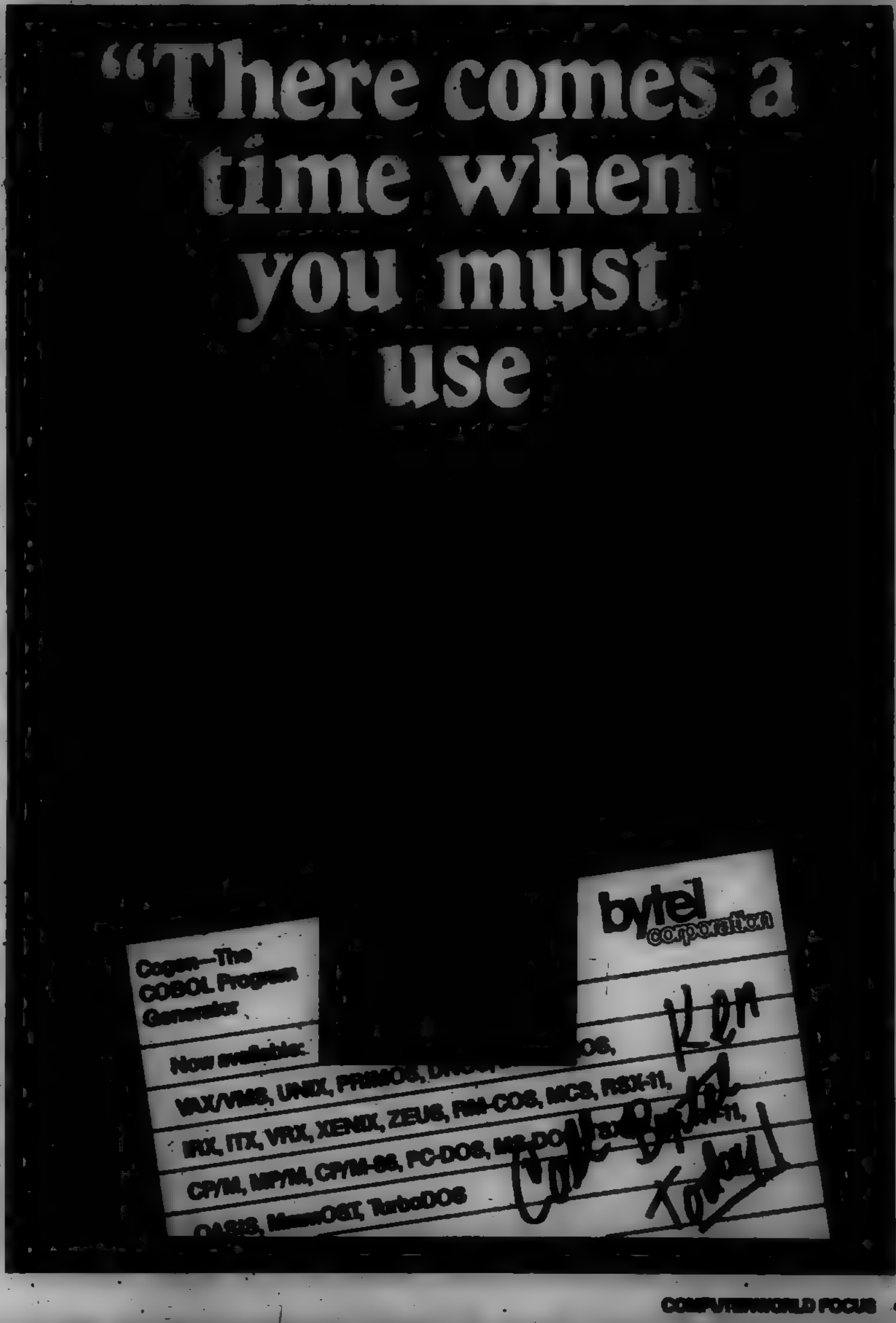
Boeing Calc permits the formation of up to 1,000 pages of rows and columns, enabling financial data to be broken into manageable segments, according to the vendor, and separate pages can be formed for departments, divisions, subsidiaries and so on. Information is then uploaded to the mainframe module of Boeing Calc for merging into a centralized corporate spreadsheet for consolidation and comparative analysis, Boeing said. Boeing Calc can also read standard DIF files as well as Lotus 1-2-3 files.

The microversion of Boeing Calc runs under PC-DOS or MS-DOS on the IBM Personal Computer XT and Personal Computer AT and compatible micros; the Boeing Calc mainframe module runs under MVS/TSO for 4300 series and 30 series mainframes. The microcomputer module is priced at $399 per copy, and the microcomputer to mainframe package is $8,899, the latter consisting of one copy each of the microcomputer and mainframe modules. For more information contact Boeing Computer Services, 7980 Gallows Court, Vienna, Va. 22180.

NEW YORK, N.Y. — **Coefficient System Corp.** has offered Vterm 4010, software that reportedly combines Tektronix, Inc.'s 4010 and 4014 terminal emulation, Digital Equipment Corp.'s VT 100 terminal emulation, four error-correcting file transfer protocols and general communications capabilities. Running on the IBM Personal Computer, Personal Computer XT, Personal Computer AT, IBM Portable and on several compatibles including Data General Corp. One, AT&T 6300 and Compaq Computer Corp. Deskpro, Vterm 4010 claims to run all host software written for a Tektronix 4010, including Integrated Software Systems Corp.'s Tell-A-Graf, SAS Institute, Inc.'s Sas/Graph and Plot-10. The software also reportedly provides printer and plotter support, throughput to 9,600 bit/sec communications, disk capture of graphics and text, support of Microsoft Corp.'s mouse, programmable soft-key macros, on-line Help, automatic dialing, horizontal and vertical scrolling and a 132-col display.

To run Vterm 4010, users need an asynchronous communications board, a graphics adapter that will drive either an IBM monochrome or color monitor, 192K bytes of random-access memory, PC-DOS 2.0 through PC-DOS 3.0 and at least one floppy disk drive. Vterm 4010 can also be copied to and run from a hard disk, the vendor said. Vterm 4010 is priced at $249 from Coefficient System Corp., 611 Broadway, New York, N.Y. 10012.

WESTBORO, Mass. — **Data General Corp.** has announced its Desktop Generation Model 45, a dual processor, multiuser system that runs Desktop/UX, a native Unix operating system based on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Products

AT&T's System V operating system. The Model 45 carries both the Motorola, Inc.'s 68000 microprocessor and DG's Microeclipse processor; the dual architecture is said to allow the Microeclipse processor to offload I/O operations from the 68000, which is dedicated to running Unix applications. The microeclipse processor also supports a range of Desktop Generation peripherals such as printers, storage devices and terminals.

Desktop/UX offers the standard Unix Bourne and C shells for development, includes a C language compiler and is upwardly compatible with DG/UX, DG's native Unix for its 32-bit superminis. For communicating in multivendor networks, Desktop/UX supports the TCP/IP networking protocol and UUCP, a Unix-to-Unix networking protocol.

A basic Model 45 configuration includes 512K-byte random-access memory, 15M-byte hard disk, one floppy disk drive and is priced at $11,845, the vendor said. The system supports up to eight users and can be configured with memory up to 4M bytes and hard-disk storage up to 142M bytes. A Desktop/UX license is $1,800, and a TCP/IP license for the Model 45 is $750. For further information, contact Data General, 4400 Computer Drive, Westboro, Mass. 01580.

KING OF PRUSSIA, Pa. — **Soft-Switch, Inc.** has announced a software bridge to link IBM's Disoss distributed office system to the Soft-Switch electronic document system. According to the vendor, the Disoss bridge provides transparent distribution of text documents between Soft-Switch users and Disoss users and Disoss users can exchange revisable text documents with users of non-IBM systems such as Wang Laboratories, Inc.'s WPS, OIS and VS systems; Xerox Corp.'s 860 system; and NBI, Inc.'s 3000. IBM systems supported include the Displaywriter, the 5520, 6640, 6670, OS 6, DCF, Profs and Disoss. Personal computer software supported includes IBM's Displaywrite 2 and Multimate from Multimate International. Soft-Switch is a document control system that runs on an IBM host computer under MVS or VM operating systems. The Disoss bridge is $20,000 ($10,000 if the required Soft-Switch DCA translator is in place) from Soft-Switch, Inc., 200 N. Warner Road, King of Prussia, Pa. 19406.

MAYNARD, Mass. — **Digital Equipment Corp.** has introduced four networking products, including two packages linking the DEC Rainbow and the Ultrix operating system to Decnet networks and two terminal server products linking terminal users to systems on Decnet.

Decnet-Rainbow software provides file transfer capabilities for sharing data across a network, remote resource access for sharing peripheral devices, task-to-task communications for developing distributed applications and network management for tracking the status of a network, the vendor said. Decnet-Rainbow is scheduled for this fall for $295. Decnet-Ultrix software, for DEC VAX and Microvax systems, reportedly enables users to transfer data and files between Ultrix and VMS, DEC's VAX operating system. Users are also said to be able to communicate with a Unix-based system because the TCP/IP protocol, a standard protocol used by the Department of Defense, is common to both Unix and Ultrix. Decnet is scheduled for August for $1,000 in the Ultrix 32M-byte Microvax configuration and $2,000 in the Ultrix 32-VAX configuration.

The Decserver 100 is a network terminal switch for connecting up to eight asynchronous terminals to one or more hosts on Xerox Corp.'s Ethernet network. Terminal Server Version 2.0 software, which runs on DEC's Decsa Ethernet Communications Server hardware, reportedly allows users to connect any non-DEC computers to DEC's local-area network. Users also have the ability to connect any local or remote terminal via terminal server to any system in the network. Both the Decserver 100 and Terminal Server Version 2.0 software are scheduled for release in June and are priced at $2,800 and $1,000, respectively. For more information contact Digital Equipment Corp., Maynard, Mass. 01754-2198.

NEW YORK, N.Y. — **Systems Strategies, Inc.** has announced SNA/3270, a software package that reportedly allows Ascii terminals and printers to access an IBM Systems Network Architecture (SNA) network as though they were true 3270 devices. According to the company, SNA/3270 is transparent to all IBM subsystems including TSO/SPF, VM/CMS, CICS, IMS and Vtam; with no host modification required. The system can be defined to have a number of different 3270 configurations, while synchronous data link control line parameters, terminal and printer options and assignments can be respecified for different IBM networks.

SNA/3270 requires no operating system — all scheduling, tasks and queue management are performed by the internal IPC software, the vendor said, and this enables the package to run under any interactive or real-time executive. If no operating system is available, the system will execute in stand-alone mode.

SNA/3270 emulation software is comprised of four on-line modules: SDLC protocol; SNA protocol; the 3278 terminal emulator, which performs presentation services, data stream processing and the 3278-to-Ascii terminal translation;

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application development report: MARK V

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"MARK V is helping us to be responsive to user requirements in a timely fashion, while minimizing the need for a heavy IMS resource," says Mike Berkley, Systems Consultant and MARK IV®/MARK V coordinator at Arizona Public Service Company, a Phoenix-based utility.

A software product of Informatics General Corporation, MARK V is an online application generator that can increase programmer productivity by 50 to 80 percent. The development tool allows the programmer to specify what functions the program is to perform, with minimal knowledge of IMS data base processing or online interfacing requirements.

Arizona Public Service has been using MARK IV, a batch oriented application generator for some time, so the company had built up a considerable MARK IV programming expertise by the time MARK V was brought in. This MARK IV talent has been a great asset in training MARK V programmers for the new online applications the company is developing, Berkley notes.

"In the MARK V applications we've developed so far, we've found that the bulk of the system can be done by someone with little or no experience with IMS, a data-base management system from IBM — especially if the programmer is familiar with MARK IV and its hierarchical structure, for example," he explains. "I believe the programmer needs to have some feel for the IMS environment, but at a much more simplified level than what you need to write IMS COBOL."

However, Berkley cautions, it is still necessary to have an IMS-trained coordinator or data base administrator involved in the application development to assure that IMS efficiencies are maintained.

The first test for MARK V was a tie-in with the existing customer information system to allow charitable contributions with utility payments. It had to be done in one week and was! Next, an accounts receivable package was enhanced. Applications were developed in Data Administration to improve access to the table control system and the IBM Data Dictionary. The payroll/personnel function was the source for several timely, yet very user friendly systems, including medical monitoring and keyword control. One user was so pleased that they changed direction away from a mini and are now committed to the mainframe, an IBM 3081. Payroll/Personnel Systems Supervisor, Bernie Baker, claims "I now have a tool which allows in-house development to compete with software packages." Baker goes on to add, "I'm extremely pleased and encouraged by the success in using MARK V and plan its use in many future applications."

This set the stage for the most important use of MARK V so far — an enhancement to an existing COBOL Gas Service Request System to provide dispatchers and management with more extensive real time information in "trouble" orders. The system was needed as soon as possible, but heavy IMS experience was not available, while MARK IV experience was. Hank Oen, Supervisor, Gas Systems says, "I was convinced that we could not meet the schedule deadlines with a procedural language."

The first step was a one week MARK V class that Berkley taught to Oen's group. Rather than doing the standard class problem, the students programmed two screens from the actual gas system. One team had a working subsystem by the end of the second day. Because of the specific need, the class featured an extremely high intensity level and many questions. Once the class ended, the heavy development began and the system was installed on time. However, it became clear that the response time was unacceptable, primarily due to browsing through the secondary index and excessive processing. A redesign effort was undertaken, using MARK IV for a data base conversion and making more efficient use of MARK V. In the meantime, the vital part of the system was left in production by removing certain MARK V requests. It was in this two week redesign effort that MARK V excelled, says Oen, "Module interchangeability allowed reconfiguration of functions for performance improvement in weeks vs months." The final result left smiles on the faces of Corporate and Computer services management, the user and technical staff.

"So far, we've had success using MARK V for smaller applications, especially those with severe time constraints, but I think many of the enhancements have made it a viable product for large-scale systems," Berkley adds. "I particularly like features such as the dynamic action codes, multiple data base updates, data base browsing, subroutine capabilities and, of course, the Program Function keys."

"I believe the programmer needs to have some feel for the IMS environment, but a much more simplified level than what you need to write IMS COBOL."

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Products

and the 3278 printer emulator. SNA/3270 is licensed by Systems Strategies for $90,000. For further information contact Systems Strategies, Inc., 225 West 34th St., New York, N.Y. 10001.

LAKE OSWEGO, Ore. — **Unify Corp.** has announced Unify 3.2, an enhanced version of Unify, the company's Unix-based relational data base management system. Unify 3.2 features include a one-step data base creation procedure, improved menus, improved transaction logging and new documentation, the vendor said.

Unify 3.2 consolidates four separate functions — define data base, create data base, define screens and define menus — that reportedly allow users to develop data base applications by simply defining how the data base should look. Unify 3.2 will then automatically create the data base upon that definition, the vendor said. The new system menus permit users to move quickly from one function to another without having to exit to the Unix shell, while an optional transaction logging keeps track of logical transactions for greater security, Unify said. Three levels of documentation include tutorial and reference manuals for beginning and experienced users and a programmers' manual that defines Unify's open system approach and enables sophisticated users to access the host interface language.

Unify 3.2 will be distributed to OEM and other customers at single-copy prices ranging from $1,495 to $14,500. For more information, contact Unify Corp., Building Two, 4000 Kruse Way Place, Lake Oswego, Ore. 97034.

PALO ALTO, Calif. — **Micro Focus** has introduced its VS Cobol Workbench development tool, which the company said allows fast, uninterrupted mainframe program development, testing and maintenance of programs downloaded to an IBM Personal Computer. The programs are then uploaded to the mainframe for integration testing and running.

The VS Cobol Workbench reportedly allows OS/VS Cobol and VS Cobol II syntax to be used separately or to coexist in a single program, enabling conversion of OS/VS Cobol programs to VS Cobol II via flags that report errors in code from one syntax to the other. VS Cobol Workbench also allows programmers to test calls or embedded host command languages (Exec statements) to host data base and data communications services such as IMS, CICS, DL/1, SQL/DS and DB2, according to Micro Focus. This capability permits the programmer to simulate the mainframe's response to the calls by storing test data values inside the VS Cobol Workbench software, the vendor said, enabling the programmer to continue developing through to module and program testing off line on the IBM PC.

The company claimed VS Cobol Workbench also makes application testing easier through its optional Session Recorder, which allows automatic recording to disk of all programmer keystrokes during a test session. The keystrokes can then be played back for regression testing or other purposes and edited to keep in step with program changes. VS Cobol Workbench supports the IBM Personal Computer, Personal Computer XT, Personal Computer AT, Portable PC and 3270 Personal Computer. Single-copy price is $4,000 from Micro Focus, 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

WALTHAM, Mass. — **Honeywell Information Systems, Inc.** has introduced its Infonow Videotex System, which reportedly enables local and remote users to dial into a central computer for instant retrieval of textual and graphic information. Infonow is based on the French Antiope videotex protocol, but is otherwise protocol independent, Honeywell said. Information is stored on pages similar in concept to the pages of a book, in the central system's data base. Users access the data base from portable Minitel terminals manufactured by the French firm Telic-Alcatel. The terminals contain a fold-down keyboard, 9-in., 40-line-by-24-char. monochrome display screen and built-in modem for communications with the central system.

A VT-Link adapter board and emulation software are available to allow a Honeywell Microsystem Personal Computer, IBM Personal Computer or IBM Personal Computer XT to function as a user terminal. Guided by a series of menus that work like a book's table of contents, users reportedly can locate a desired category of information without having to know anything about computer terminals or how the videotex data base is structured. Users can bypass the menus for more direct information retrieval by entering mnemonic codes or designated key words, the vendor said.

Any of three preconfigured Honeywell DPS 6 minicomputers can be used as the Infonow central system. These three DPS 6 central systems, including Infonow videotex software, electronic messaging and a console terminal, sell for $93,000, $116,000 and $173,000, respectively. Minitel terminals are priced at $650 each with volume discounts available. A Honeywell microsystem PC for use as an IP terminal sells for $4,635, while the SA terminal is priced at $795 for a VIP7201 and $1,900 for a VIP7301. For further information contact Honeywell Information Systems, Inc., 200 Smith St., Waltham, Mass. 02154.

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May 13-15, Washington, D.C. — **CADD/CAM: Management, Evaluation and Implementation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

May 13-15, New York — **The IBM PC.** Also, May 15-17, Denver; May 20-22, Honolulu; May 20-22, Chicago; May 29-31, Detroit; May 29-31, Philadelphia; June 3-5, Boston; and June 5-7, Houston. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

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HRMS meet personnel data needs

'People are the common denominator of progress . . . no improvement is possible with unimproved people.'
— *John Kenneth Galbraith*
Economic Development

By John Gallant
CW Staff

A few years ago, an in-house study team at Buffalo, N.Y.-based Marine Midland Banks, Inc. asked company executives to forecast their information requirements into the next decade. One common denominator was the desire for more and better information with which to manage the bank's personnel — its human resource.

"Human resource management information was seen as one of the most important concerns," said William Flannery, administrative vice-president and director of human resource operations and planning for Marine Midland. "We needed much more management-level information to make better use of our people."

Marine Midland already had a personnel system running on an IBM mainframe, Flannery said. But as with many of the personnel or human resource management systems developed in the past, Marine Midland's system consisted of little more than some employee-related records tagged on to an existing payroll processing system. The 300-branch bank maintains information on approximately 19,000 former and current workers.

Because payroll processing is basically a rote function that requires little more than number-crunching power, it was one of the first applications to be conquered by computers. Today, payroll remains a basic component of most sophisticated HRMS. It is offered by vendors either as a module of the full HRMS or as an optional package to be integrated with the HRMS.

But the current generation of large systems human resource software has far outgrown its payroll roots. If you are a newcomer to HRMS technology — also known as human resource information systems — welcome to a new set of buzzwords such as cafeteria-style benefits administration, applicant tracking and processing, skills inventories, position control and compliance reporting.

Founded on integrated personnel data bases, HRMS have become powerful decision support tools designed to help management optimize what many top executives are coming to view as a firm's most valuable asset — its workers.

Proponents claim that, armed with an HRMS, personnel administrators can cut labor and recruiting costs, ensure compliance with new and existing government directives and reduce employee turnover by helping workers achieve their career goals.

See RESOURCE page 23

Site licensing stirs debate at Comdex

By Edward Warner
CW Staff

ATLANTA — When software dealers and vendors met here at the Comdex/Spring '85 trade show last week, the talk was of site licensing — the means by which many corporate software buyers would like to acquire their personal computer software.

Multimate International Corp. detailed a site licensing plan for one of its word processing packages. Borland International's founder, Philippe Kahn, said his firm is already providing site licenses and is currently negotiating others for its Turbo Pascal compiler. Kahn said he favored site licensing partly because of his distaste for most current software licenses, agreements he called "a tax on honesty."

Site licenses, under which several program copies can be made for a set price, free users from worrying about program duplication and often yield more generous discounts than do bulk purchases.

See LICENSE page 11

Enhanced ISN, PBX from AT&T

By John Dix
CW Staff

DALLAS — AT&T Information Systems chose the International Communications Association's Telecom '85 show here to unveil enhancements to its Information Systems Network and low-end private branch exchange.

Enhancements to AT&T's ISN enable the local network to support IBM 3270-type synchronous terminals, interconnect Ethernet networks and interface with AT&T Starlan networks. The added capabilities provide for the following:

■ IBM 3278, 3279, 3178 and 3179 displays can be directly connected to ISN through twisted-pair wire at IBM standard Type A coaxial rates of 2.36M bit/sec., AT&T reported. Terminal users can dial cluster controllers through ISN and maintain up to two controller sessions. This is said to alleviate the need to dedicate controllers to certain applications.

■ Compatible synchronous devices can

See AT&T page 6

TOP OF THE NEWS

Software vendors were mighty blue with IBM's plan to include two bundled software packages with Personal Computer XT shipments to dealers. Page 2.

■

It may have looked like a carnival, but there was little clowning around at ICA's heavily attended Telecom '85 show. Conference coverage begins on page 6.

Networking products headlined Comdex/Spring '85, along with introductions of net applications software. Page 11.

■

Software maintenance consumes more than half of DP personnel resources, yet most companies do not manage software as a vital asset. Page 18.

■

SOS for the jobless. The pain of possible DP layoffs resulting from a corporate merger will be eased by a nationwide computerized placement service offered by the merging firms. Page 17.

FYI

Retailer profits from net sales

By Charles Babcock
CW New York Bureau

NEW YORK — The J. C. Penney Co. is finding that the best way to offer computer network services to others is to provide them internally first.

For two years, the retailer has been selling services on its national network through a subsidiary, J. C. Penney Systems Services, Inc. Its first customers have been gasoline retailers that authorize credit purchases and record transactions, much like the chain of J. C. Penney stores has been doing since 1970, company officials said.

Systems Services added 3,000 Shell Oil Co. service stations to the network last year for a total of 3,250 stations. It also brought 450 Gulf Oil Corp. stations online and more recently began a pilot project with Amoco Oil Co. Systems Services added its first banking customer, the 64-branch Zions First National Bank of Salt Lake City, at the end of March, according to Robert A. Mooney, president of the subsidiary.

J. C. Penney is currently optimizing its network by placing IBM Series/1 minicomputers in many J. C. Penney stores. The Series/1 machines will collect point-of-sale data from terminals in the stores and satisfy payroll and other store housekeeping demands. They will also

See NETWORK page 4

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NEWSPAPER

IBM ships software with XT

By Eric Bender
and Edward Warner
CW Staff

ATLANTA — The romance between IBM and personal computer software vendors cooled last week when the industry giant acknowledged plans to ship software with sales of the Personal Computer XT.

IBM will send dealers two software programs free with each Personal Computer XT until the end of July. Each Personal Computer XT with a hard disk drive will be provided with IBM's Displaywrite 3 and a choice of IBM's Topview operating environment or Data Edition file manager. Floppy disk models will be delivered with IBM Writing Assistant and Planning Assistant packages. Dealers may price the software as they wish, IBM said.

Personal Computer XTs sold through direct channels will be shipped with a similar choice of software, according to IBM. An IBM spokesman termed the move "very routine in this industry." He would not say if IBM planned similar promotions for other machines.

Most software vendors said they opposed the IBM plan, although Fred Gibbons, president of Software Publishing Corp., said the IBM effort was nothing new and that it mirrored similar efforts to bundle software by Tandy Corp. and Hewlett-Packard Co. (The Writing Assistant and Planning Assistant are published by Software Publishing for resale by IBM.)

Microsoft Corp. Chairman Bill Gates said the bundling devalues the packages involved in the bundling. Microsoft makes the Personal Computer's operating system, but could lose sales of its word processor to the bundled Displaywrite 3. Gates acknowledged Microsoft's long-term relationship with IBM but added, "the thing about friendship is that it's there [with you] to weather the ups and downs."

> 'When IBM covers up a mistake, they don't care whom they smother.'
>
> — W. E. Peterson
> SSI Software, Inc.

Camilo Wilson, president of Lifetree Software, Inc. in Monterey, Calif., called the move "predatory" and "inherently unfair."

Like several other vendors, Wilson suggested that IBM had simply moved to clear inventory sitting on the shelves and said he did not expect sales of his firm's packages to be damaged by Displaywrite 3. Wilson said IBM tried selling the software but that did not work. "They put it on consignment, and that didn't work out. Now they're giving it away," he said.

"When IBM covers up a mistake, they don't care whom they smother," said W. E. Peterson, executive vice-president at SSI Software, Inc. in Orem, Utah. "We hope it's a one-time deal."

"Dealers have to be concerned," said Richard Lefebvre, executive vice-president at Multimate International Corp. in East Hartford, Conn.

"Their margins have been in software. IBM might be testing this for industry reaction," he added.

Wang adds IBM-compatible micros

LOWELL, Mass. — Wang Laboratories, Inc. last week added four machines offering software compatibility with the IBM Personal Computer to the low end of its microcomputer line.

The desktops add IBM monochrome display emulation capability, an existing option, to standard Wang Professional Computer configurations. Wang will promote the systems on the basis of both IBM compatibility and price/performance features, according to Ken Sullivan, Wang director of product marketing.

All models reportedly are available immediately and feature an Intel Corp. 8086 processor, 256K bytes of random-access memory, a monochrome monitor, Wang Advanced Word Processing software, Microsoft Corp. MS-DOS 2.1 and Basic. Expansion slots are compatible with the Professional Computer, not the IBM Personal Computer, Sullivan noted.

The Wang Model PC-PK5, with five expansion slots and two 360K-byte diskette drives, is priced at $3,300. The Model PC-PK6, with five expansion slots and a 10M-byte drive, costs $4,700. The Model PC-PK7, priced at $3,650, features eight expansion slots and dual diskette drives. The Model PC-PK8, with eight slots and 10M-byte hard disk drive, costs $5,050.

IBM micro emulation option

Wang also unveiled an IBM Personal Computer color and graphics emulation option, priced at $575, and an Intel Corp. 8087-2 numeric coprocessor, which costs $300. Both are currently shipping, the vendor said.

Additionally, the price of the Professional's optional 30M-byte hard disk drive was cut to $2,595 from $3,995.

The company also added 19 software packages that run on the Wang Professional in native mode.

More information is available from Wang Laboratories, located at One Industrial Road, Lowell, Mass. 01851.

Give u [illegible]

IBM discount

IBM has sweetened the deal to entice users of its discontinued 4321 and 4331 processors to upgrade to the larger, newer 4361 line of processors with a series of discounted software packages.

IBM is offering users a 33% discount on a group of 53 applications and development programs that include such popular packages as its Professional Office System and PC Bond.

Since early September 1984, when it announced the low-end 4361 Model Group 3, IBM has been offering a discount to 4321 and 4331 users willing to buy upgrade kits to migrate to the 4361 before the end of September 1985.

An IBM spokesman said a similar set of discounted software is currently available to customers who purchase System/36 and 38 processors before the end of this September.

NEWS SUMMARY

J. C. Penney found it could reduce the risk of downtime by subdividing its national retailing network and taking down one piece at a time/4

CW at Telecom '85: Packet-switching networks were highlighted with Harris, BBN Communications and Racal-Milgo announcements . . . Telecommunications managers are still wrestling with the whys and hows of integrating personal computers into corporate networks, showgoers said . . . Rate hikes and increasing tariffs are encouraging telecommunications customers to study their options, according to managers here/6-8

Burroughs lost its first bid to overturn fraud and breach of contract judgments against it that stem from a lease of its B800/8

CW at Comdex/Spring '85: Some sophisticated applications are on the horizon, but don't expect site licenses for them, according to one computer dealer . . . Compaq Computer's chief executive officer predicted that communications will propel the next drive in personal computing, ushering in an information-access revolution . . . Product debuts and demonstrations here provided a boost for microcomputer networking/10-11

A university's plan to dump a donated Honeywell computer and replace it with IBM-compatible and DEC equipment is causing a flap in Kansas/12

CW at SSP Software Maintenance: A recently revised software applications development cycle at Zale includes maintenance aspects as a key component . . . MIS shops should imitate the software vendors' method of grouping enhancements into applications releases instead of making enhancements one at a time, a consultant advised . . . Software maintenance may consume 55% to 60% of a corporation's DP resources, but software is seldom managed as a vital corporate asset/13-16

The merger between Chevron and Gulf may result in thousands of layoffs, but the companies are helping out the soon-to-be unemployed with a nationwide electronic job-hunting service/17

The American Handicapped Employee of the Year is a systems analyst at IBM's Entry Systems Division in Austin, Texas/18

Former data processing employees of Blue Cross/Blue Shield of Iowa are still hoping to gain redress from their former employer through an $18 million lawsuit/22

A California electric company is using a computer system for everything from managing a nuclear power plant to meter-reading processing/26

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Retailer's tool giveaway prompts suppliers to automate

NEW YORK — The J. C. Penney Co. is giving away a software package in an attempt to get its smaller suppliers to process J. C. Penney orders electronically.

Automatic order processing was formerly reserved for the 500 J. C. Penney suppliers that were large enough to have their own mainframes.

Now, suppliers with resources no larger than a microcomputer and modem can do the same thing, according to the company.

Large suppliers for several years have called the J. C. Penney data processing center in Dallas to retrieve their latest orders from a mainframe file.

Several days savings

Electronic retrieval saves the suppliers the several days that an order formerly spent going through the mail, said Robert Capone, vice-president and director of systems and data processing at the retailer's New York headquarters.

"We've cut 11 to 14 days out of the order cycle," Capone said.

By getting smaller suppliers to follow suit, J. C. Penney can reduce the amount of goods in the order-processing pipeline and get what it wants into its stores more quickly, company officials said.

Runs on micros

The software will run on microcomputers manufactured by Apple Computer, Inc., NCR Corp., IBM or any micro running PC-DOS.

"The fact that we provide the software program gives us some control over the security aspects. We know it's not going to crash our systems," Capone said, adding that the supplier can gain access only to his own orders.

The software giveaway effort began in February, with an initial 309 suppliers given the chance to sample the package. By the end of March, 50 suppliers had the system in use, according to Capone.

J. C. Penney has about 5,000 suppliers, although the 500 largest account for about 75% of the volume of its goods.

— Charles Babcock

J. C. Penney's subnetworks reduce downtime danger

By Charles Babcock
CW New York Bureau

NEW YORK — When J. C. Penney Co. used to take its national retailing network down for maintenance, the retailer's existence hinged upon its ability to bring the net back up.

The hazard was increased by the need to make alterations in a short time on a network that links 55 IBM 3080 series mainframes in eight data centers. The network does all transaction processing for 1,700 J. C. Penney stores nationally, company officials said.

"If you take a large network down, make a lot of changes, and it doesn't work when it comes back up Monday morning, the whole business is at risk," said John M. Dratch, director of data processing and technical support.

However, J. C. Penney has reduced the risk of downtime since last October when it divided the network into four subnetworks and began taking only a fraction of the net out of operation at a time, company officials said.

The national retailer was able to take this step after serving as a beta test site last summer for IBM's SNA Network Interconnection (SNI). SNI allows IBM's Systems Network Architecture (SNA) to be divided into subnetworks that, together, can still be operated as a logical whole.

Two more SNI-divided subnetworks will become operational in June, according to Dratch.

Answering a second need

When J. C. Penney opted for SNI, the IBM product answered a second need of the company. "Our network was so large we were running out of addressing for the devices. That was a primary driving force to move to SNI," Dratch said.

Last year, J. C. Penney was approaching the 65,536 addressing maximum available to it through SNA Vtam, with no slackening in demand for more devices. It now has 86,000 devices online, and by June it will have boosted the previously available addressing by 600%. The increase will come from subdividing the national network into six subnetworks with a total of 393,000 addresses, Dratch said.

The number of addresses is increased because "SNI can distinguish terminal 1 in one network from terminal 1 in another," he said.

Shortly after beta testing SNI at J. C. Penney last year, IBM announced it would offer SNA extended addressing, up to eight million addresses per network, without SNI. Dratch said IBM made no mention of SNA extended addressing when J. C. Penney was considering SNI. Even if it had, extended addressing would not have solved the firm's need to subdivide the network, he said.

When the J. C. Penney network is divided into six parts, a user in one part can communicate with any other part. The boundaries of the subnetworks are invisible to the users, Dratch said.

SNI allows a terminal user in one SNA network to gain access to applications on a host in another network; a terminal user accessing an application in one network can tap into data from another network, said IBM spokesmen in Rye Brook, N.Y.

SNI also allows executive users at J. C. Penney to get information from outside networks, such as the Dow Jones News & Retrieval Service, which supplies news about companies with which J. C. Penney deals, Dratch said.

SNI is a combination of Vtam communications software in the host computer running under the operating system and IBM 3705 and 3725 communications processors running IBM's Network Control Program, Dratch noted.

Because it was a new product, installation of SNI was somewhat drawn out, Dratch added.

"We had to make sure the code worked, the definitions were properly described and coded and the correct routing installed," Dratch recounted. The process began in February 1984 and was completed eight months later, after a few problems were worked out by IBM, he said.

NETWORK from page 1

function as local gateways to the network for Systems Services customers, Mooney said.

Five hundred Series/1 machines will be installed by the end of the year. Another 250 will be in place in 1986, company officials said.

"The Series/1s are justified as in-store processors because they become a node — an entry point — into the network. A customer can ride from there all the way up to the host," Mooney said.

The Series/1s are tied into one of three J. C. Penney data centers, each with its own Systems Services IBM 3080 host computer. The centers are located in Reno, Nev.; Lenexa, Kan.; and Columbus, Ohio. These centers in turn are connected to the J. C. Penney national network through five additional J. C. Penney data centers.

Through special coding, Systems Services traffic is kept separate from J. C. Penney's own retail processing, and if one data center went down, traffic could be rerouted to another, company spokesmen said.

Each host is front-ended by an IBM 3705 or 3725 communications processor running the IBM Network Control Program, said John M. Dratch, J. C. Penney's director of data processing.

The network operates under standard IBM mainframe operating systems, including MVS with Vtam and Systems Network Architecture, company officials said.

"We look at our network as a single logical computer. We established the goal in the early 1970s that any terminal could connect with any computer through this network," Dratch said.

J. C. Penney technicians in the data centers operate the Series/1 machines remotely to avoid the cost of additional staff people in the stores.

A potential customer does not have to be an IBM user to connect to the network, despite its predominately IBM complexion. Any manufacturer that follows the X.25 standard communications protocol can be hooked up, Dratch said.

Systems Services charges 12 cents per transaction — credit authorization and data collection — for a customer supported with leased lines, a fee that drops below 10 cents for some high-volume customers, Mooney said. The fee includes all line expenses beyond the user's modem.

For dial-up customers who do not need a leased line to the network entry point, fees are 6 cents for a credit authorization and 4 cents for data collection, Mooney said.

The following average response times have been recorded this year: 19.6% of transactions were handled in one second; 35.8% in two seconds; 19.9% in three seconds; 8.3% in four seconds; and the remainder in five seconds or more.

Mooney said that credit authorization and transaction processing, the two needs that led J. C. Penney to create a national network, will remain the business core of Systems Services.

But he said that retailers, once they start using a specific service, may find multiple uses in the same way that J. C. Penney is continually finding additional uses for its net.

Once sales data is collected, they can be analyzed to reveal what goods are selling best in what locations. Or the network can be used for messaging between far-flung sites, Mooney said.

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SSi

Packet-switching nets grab center stage at conference

CW AT TELECOM '85

By Paul Korzeniowski
CW Staff

DALLAS — Packet-switching networks were highlighted at Telecom '85, a conference here last week sponsored by the International Communications Association.

Harris Corp. has entered the packet-switching market with Sopho-Net, based on Philips Export B.V.'s European packet-switching product. The wide-area network reportedly connects a variety of X.21 and X.25 networks and is based on the International Standards Organization's Open Systems Interconnect model.

Sopho-Net supplies three types of nodes: an 8- to 24-port node, a 64-port node and a 164-port node. Each port can operate at 72K bit/sec.

The system will transmit up to 1,500 packet/sec., and transmission time is less than 20 msec, a spokesman said.

The network is said to support various media, including satellite, fiber optics, microwave, leased lines and private lines. The system reportedly features full-duplex operation, data encryption capability and two-level password protection.

An eight-port system costs $20,000.

Harris is located at 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

BBN Communications Corp. has added C/300 Packet Switching Node (PSN) to its line of packet switches. The product features throughput of up to 900 packet/sec. and up to 64 access ports.

CS/300 PSN uses custom-designed gate array chips, high-density memory and a single-board design, the vendor said. The product reportedly is software compatible with the C/30 PSN, BBN's other switch, and accepts C/30 host and packet assembler/disassembler interfaces. A typical configuration costs $90,000.

BBN also has announced the T/1000 Digital Resource Exchange (DRX), a T1 line multiplexer. The product supports up to 96 synchronous, 192 asynchronous or 96 voice ports and transmission speeds up to 1.9M bit/sec.

The product is said to reroute failed circuits automatically. T/1000 DRX includes alarm reporting, line monitoring and diagnostic capabilities. System, point-to-point or network loopback testing is provided, the vendor said.

The product can be integrated into a BBN packet-switching network. T/1000 DRX provides digital bypass with drop and insertion and dynamic bandwidth allocation.

T/1000 DRX prices range from $50,000 to $60,000.

BBN is located at 70 Fawcett St., Cambridge, Mass. 02140.

Statistical multiplexers

Racal-Milgo, Inc. has announced three statistical multiplexers: Omnimux 82, Omnimux 162 and Omnimux 322.

The products support single- and dual-link and widebase applications. The multiplexers work with asynchronous and synchronous communications at transmission speeds ranging from 50 to 19.2K bit/sec.

Protocols supported include bisynchronous, Synchronous Data Link Control and Hasp.

Omnimux 82 costs $2,002, Omnimux 162 costs $4,008, and Omnimux 322 costs $5,956. The optional front panel costs $300.

Racal-Milgo is located at 1601 N. Harrison Pkwy., Sunrise, Fla. 33323.

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CW AT TELECOM '85

Ramblings from the floor of last week's International Communications Association annual Telecom '85 conference:

- Intracompany communications needs will be met in the future with a troika of technologies, according to Ken Oshman, president of Rolm Corp. Private branch exchanges such as those manufactured by Rolm offer universal availability for occasional data users; local networks will be employed within departmental work areas where high-speed data bursts must be accommodated; and direct peripheral-to-host cabling will be retained for heads-down data users, Oshman said.

- Oshman also claimed that in two years Rolm has sold 500,000 digital telephones. This number indicates the growing acceptance of voice and data integration.

Heide Toffler, wife of author Alvin Toffler, asked Oshman if life at Rolm had changed since IBM purchased the communications company. Oshman reportedly said, "My aunt once told me if you can't say anything good about a situation, just say that it's different."

- Wang will announce a Computer-to-PBX Interface (CPI) within the next six months, according to a Wang spokesman. While Wang will initially back the CPI interface championed by Northern Telecom, Inc. and Digital Equipment Corp., the spokesman said that through software coding changes, the interface may also support AT&T Information Systems' Digital Multiplexed Interface (DMI). This coding technology — which may be patented by Wang — would enable Wang to use the same hardware interface with either the CPI or DMI T1 signal formatting techniques.

- IBM's Cabling System is virtually identical to AT&T's wiring system but costs five times as much, according to Bob Fleming of the Gartner Group, Inc., a market research firm in Stamford, Conn. In an ICA session on local networks, Fleming called the IBM Cabling System expensive and bulky and predicted that IBM would eventually use standard twisted-pair wire instead of the shielded twisted-pair used in the system today.

In a concurrent session, H. Michael Braude, also of the Gartner Group, predicted that the first products IBM will support with its promised token-ring network — which will be laid over the Cabling System — will be Personal Computers, System/36 minicomputers and 3274 controllers.

Written by CW staff members John Dix and Paul Korzeniowski.

AT&T from page 1

be interconnected using IBM's Binary Synchronous Communications (BSC) or Synchronous Data Link Control (SDLC) protocols through an ISN transport interface that uses data compression. Half-duplex speeds up to 9.6K bit/sec. for BSC are supported, and half- or full-duplex communications at speeds up to 19.2K bit/sec. are possible with SDLC.

- Ethernet-type IEEE 802.3-compatible local networks can be interconnected using ISN. ISN is said to terminate layers one and two of the International Standards Organization's network model at 10M bit/sec. It is also said to enable communications between devices that use the same higher level protocols, such as Xerox Corp.'s XNS, the U.S. Department of Defense's TCP/IP or the protocols used with AT&T's 3BNet.

- AT&T's Starlan personal computer network can be interfaced to ISN at its 1M bit/sec. operating speed. The Starlan interface is said to provide a bridge service between Starlan clusters as well as provide Starlan access to ISN resources.

AT&T also announced its Inter-Premises Trunk ISN capability. This feature is said to enable ISN packet controllers to be interconnected using digital transmission facilities — like AT&T's Dataphone Digital Service and Accunet — at 9.6K bit/sec., 56K bit/sec., 64K bit/sec., 1.54M bit/sec. or 2.06M bit/sec.

The ISN features will be available for delivery in the second and third quarters of 1986. Prices will vary according to applications. A system used only for asynchronous applications will range in price from $350 to $550 per port, AT&T said. Price per port for an ISN that is primarily supporting Starlan applications and Ethernet bridging services will range in price from $500 to $800. An ISN primarily supporting synchronous terminals and BSC and SDLC will cost from $1,000 to $1,300 per port.

Enhancements made to AT&T's System 75 PBX include increasing the maximum number of lines the device can support from 400 to 800.

AT&T also announced Automatic Alternate Routing, a feature said to provide the least expensive available routes for private network calls.

The System 75 is said to be able to support T1 links through AT&T's Digital Multiplexed Interface and also be able to interface with ISN.

Using a concurrently announced device called the 3270 Data Module — which can also be used on AT&T's System 85 — the System 75 can support IBM 3270-type terminals.

The data modules come in three models: the 3270T, which costs $785, connects terminals to a System 75 or 85 over standard four-pair telephone wire; the 3270A, at $995, operates either synchronously for standard 3270 support or asynchronously to enable a 3270 terminal to emulate an AT&T 4410 or Digital Equipment Corp. VT100 terminal; and the 3270C, at $1,600, is used to connect 3270 cluster controllers to the PBXs.

In a related annoncement, AT&T said its Premises Distribution System (PDS) is generally available. Wang Laboratories, Inc., Hewlett-Packard Co. and Xerox have all reportedly announced support of PDS.

AT&T Information Systems is located at 100 Southgate Pkwy., Morristown, N.J. 07960.

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Random access

Cincom Systems, Inc. this month will announce Release 5.0 of its Control Manufacturing System, an enhanced version of what was formerly known as MRPS Version 4.1. Renamed, repackaged and with new features, the product will consist of eight modules, the foundation of which are Cincom's Bill of Material and Routings and Material Control modules. Enhancements to the system will include integration of Cincom's Mantis fourth-generation language, as well as improved security and text management facilities. Prices for the Control Manufacturing System modules will range from $25,000 to $90,000, depending on the operating environment.

The announcement is said to be the first of several applications-related products Cincom will unveil this summer. Also slated for announcement will be a Cost Management Module, an Accounts Payable Module and Release 2.0 of Cincom's Accounts Receivable package. Other product announcements expected from Cincom include Version 1.3 of its Ultra relational data base management system for Digital Equipment Corp.'s VAX computers. The enhancement will allow the product's relational processor to support DEC's RMS.

■

Did Big Blue retrofit a report on VDT safety? IBM is miffed over a news story on an IBM-commissioned study of potential VDT health hazards. The article in the New York-based newsletter "VDT News" quoted scientist Arthur W. Guy's report as saying it is desirable to shield older VDT screens. When IBM released the report it included a preface from Guy dated April 18, after the VDT news story was printed. In that preface Guy said that unshielded VDTs are not a health hazard. Released last year, a summary of the VDT report said that although there is no evidence linking VDTs to health problems, scientists found the intensity of the magnetic field emitted from terminals is similar to those fields in previous experiments that altered the development of chicken embryos [CW, Oct. 29].

■

Computervision Corp. next week is expected to unveil Caddsconnect, an Ethernet interface, according to an informed source. The interface will allow users of its computer-aided design and manufacturing system to access Computervision data bases from multivendor systems. Sales and performance of Computervision's first networking product, Computer-Aided Design and Drafting-Access System, were disappointing, the source noted. Volume shipments of Caddsconnect are expected to begin soon.

■

A group of 216 former Hoffmann-LaRoche, Inc. employees, including former MIS staff members, have charged age discrimination against their former employer in a class action suit filed in U.S. District Court in Newark, N.J., last week. The employees were among those let go Feb. 4 in a staff cutback at the New Jersey pharmaceutical firm [CW, May 6].

■

The expected arrival at this summer's National Computer Conference of Encore Computer Corp.'s 32-bit superminicomputer family will feature Cmos technology rather than the transistor-to-transistor or emitter-coupled logic of existing mid-range processors. The Wellesley Hills, Mass.-based hardware vendor plans initially to build its AT&T Unix-based multiprocessor system series around National Semiconductor Corp.'s 32032 chip. Dubbed Multimax, the supermini will debut alongside a software development system and a series of workstations, the company said.

Micro's niche undefined in communications nets

CW AT TELECOM '85

By John Dix
CW Staff

DALLAS — Where and how the personal computer fits into the corporate communications network remains an unsettled issue for many large companies.

Incorporating micros into the mainstream data network is so involved that one company contacted here on the floor of the International Communications Association Telecom '85 show said it was trying to limit microcomputer use.

Companies providing micro access to corporate data resources are doing so through terminal emulation, attendees concurred. "We have several hundred [personal computer] users, and they want to hook in and be able to talk to the host and [to] each other," said Cort Hessler, network engineering manager at Martin Marietta Data Systems, Inc. in Orlando, Fla.

'The shocking part'

"The shocking part is how fast the end user became aware of the capabilities" and started requesting host support, Hessler said. Demand outstripped Martin Marietta's ability to keep up with user requests for support. The company now uses protocol converters that look like IBM 3270 control units, each unit providing terminal emulation for eight to 14 attached micros, Hessler said.

The company is now studying the feasibility of using value-added network services that provide protocol conversion to support remote personal computers as 3270-type terminals. By using intelligent network services, the company reduces the burden on its own network, Hessler said.

Use of network services may also help performance. Although the shared protocol converter/controller provides better economy than putting emulation capabilities in each micro, file transfers can bring the converter to its knees, Hessler said. Some users identified a growing need to recognize personal computers as processors instead of just terminals. Such is the sentiment at Brown & Root, Inc., an engineering and contracting firm in Houston, which has more than 100 personal computers in its corporate network, according to Lee Lemaire, manager of data communications.

The personal computers now supported by Brown & Root emulate 3270-type terminals. They are connected through a 3274 controller to IBM dial-up Synchronous Data Link Control host ports. The company is testing an IBM product enabling Personal Computers to be recognized as processors within IBM's Systems Network Architecture.

Although this capability would increase the functionality of micros in a network, other dangers do exist, other users warned. "The problem with using personal computers as distributed processors is that you will need more communications power, additional storage and some way to manage [the micros]," noted Stephen Robinson, director of telecommunications and data processing for the state of Nebraska.

The manageability question is of great concern, Robinson said. Once the additional storage required is put at the micro level, there is a risk of isolating information, he noted. Such data concurrency issues necessitate that the user implement control of who can update what files when.

Users content for the most part

Luckily for Robinson, the personal computer users within his purview are mostly content with their spreadsheets and word processing software. "A small percentage of our personal computers turn into communicating devices," he said. Those users who do need host access must demonstrate that need. Typically these users will need current host data — information that has to be manipulated by other users, Robinson indicated.

Martin Konrad, vice-president of communications systems at E. F. Hutton & Co. in New York, echoed some of those sentiments. "We try to keep the population of personal computers down," Konrad said. "We find personal computers difficult to control and difficult to provide with data base access."

Instead of micros, E. F. Hutton is trying to mimic typical personal computer capabilities through shared-logic systems. Using Data General Corp. MV4000 minicomputers and DG's Comprehensive Electronic Office System software, E. F. Hutton is able to provide the standard fare of word processing and spreadsheets while retaining access control to the company's distributed data bases, Konrad said.

Burroughs loses bid in B800 case

SAN FRANCISCO — Burroughs Corp. has lost its bid to overturn the verdict and obtain a new trial in a case in which an insurer was awarded $800,000 in a fraud and breach of contract suit against the vendor [CW, March 4]. The company said it will appeal the findings in the case, brought by Beaver Insurance Co.

District Judge Thelton Henderson of the U.S. District Court of Northern California here denied Burroughs' motions contesting the $786,300 fraud portion of the award, said Richard Perez, trial counsel for Beaver. Burroughs did not challenge the $14,000 breach of contract portion of the award, Perez said.

The case stemmed from charges by Beaver that Burroughs committed fraud and breach of contract when it leased a malfunctioning B800 minicomputer to the insurance company, a spokesman said.

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AT&T rate hikes driving users to examine options

CW AT TELECOM '85

By John [illegible]
CW Staff

DALLAS — Customers still prefer AT&T Communications' end-to-end private-line services. But short-haul AT&T rate hikes, coupled with increasing local telephone company tariffs, are encouraging users to study their options.

That was the collective opinion of telecommunications managers polled at Telecom '85, sponsored by the International Communications Association here last week.

Most managers agreed that procuring end-to-end leased circuits from AT&T is more manageable than trying to coordinate the installation of local circuits separately from the AT&T long-distance portion.

AT&T's new private-line rate structure breaks out local and long-distance cost components, but seeing where the money is going does not, by itself, sway users away from AT&T end-to-end service.

"We'll still use AT&T end to end because it's easier to manage and simplifies circuit provisioning," noted Bill Perkins, director of airline communications with Trans World Airlines, Inc. (TWA) in Kansas.

'You have to jump in the middle'

TWA still maintains logs of circuit numbers for both the local and long-distance segments of its leased lines, even though the entire line is AT&T's responsibility. Once in a while "you have to jump in the middle" between AT&T and the local companies, Perkins said. "With the circuit numbers, you can go to the local companies [even though it is AT&T's responsibility] and expedite circuit repairs."

Irving Trust Co., a financial services company in New York, will also continue to rely on AT&T's end-to-end service. That decision, however, hinges on which company gives the best service, explained John Compitello, vice-president of telecommunications, voice planning and control.

Admitting that cost affects the decision, Michael Taussig, communications manager of a New York-based consumer products company he would prefer remained anonymous, said AT&T end-to-end service is currently worth the money. Users that try to do away with end-to-end AT&T service must incur the cost of engineering the circuit and must coordinate its installation and maintenance with AT&T and the local telephone companies involved.

The manpower this requires makes users less likely to take matters into their own hands, even when faced with AT&T's rate hikes for short-haul private lines. Irving Trust's Compitello said he expects AT&T's short-haul rates to go up 10% to 15% and New York Telephone Co.'s local rates to go up 8% to 12%, but he is, for the meantime, resigned to that fact. "You have to conduct business as usual.

"Once the rates are firm and you have time to analyze them," Compitello said, "you can evaluate your options." This process typically takes six months. Options available include installing T1 links and bypass facilities, he said.

Another option is to use Wats lines. John Hildebrandt, corporate manager of telecommunications for Warner-Lambert Co., a health care and consumer products company in Morris Plains, N.J., said that because of short-haul circuit rate hikes he will probably use a Wats line to replace a current private line.

Hildebrandt said his company will closely study short-haul circuits but noted that bypass is "still a little too expensive for us."

As rates increase, however, the available options become more viable. Taussig said local rates for a typical voice-grade leased line may go from $276/mo to more than $400/mo. Because of this, he is installing a local T1 link that will carry voice, data and video traffic between two of his local facilities.

Reaction depends on requirements

How users will react given escalating rates depends on their particular requirements, their geographic locations and their relationships with the telephone companies involved, noted John Costello, corporate telecommunications manager for Ex-Cell-O Corp., a company that makes automotive and aerospace products.

There is no easy way to pinpoint when, where and how options can be exploited, Costello said. "Bypass, for example, depends solely on the circumstances of a given requirement at a given time." For his own part, Costello "doesn't see using bypass in the near future."

Some users have a fatalistic but optimistic opinion of rate hikes such as those being planned by AT&T and the local telephone companies.

TWA's Perkins said local rates are bound to go up as the industry moves to cost-based pricing. The silver lining to the cloud, he noted, is that as local rates come into line with carrier costs and the system gains equilibrium — after being skewed for so long by AT&T's cross-subsidization of the local companies — overall communications costs will go down.

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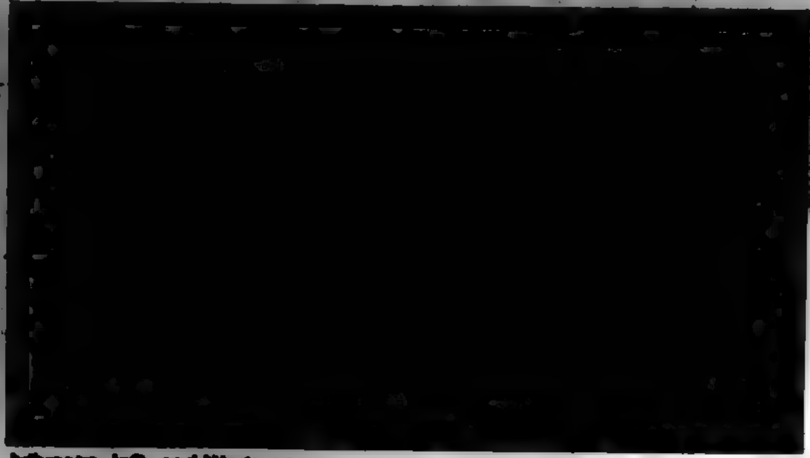
Vendors cool to site licensing, look for alternatives



Juliussen, left, and Wagman

CW AT COMDEX/SPRING '85

By Edward Warner
CW Staff

ATLANTA — The future looks bright for such applications as expert systems, natural-language data base interfaces and micro-to-mainframe communications packages, according to a major personal computer software distributor who spoke here last week at Comdex/Spring '85.

Corporate software buyers, however, should not expect to be able to purchase site licenses for those or any other best-selling package, according to David A. Wagman, chairman of the board of Softsel Computer Products, Inc. Under site licensing agreements, first popularized in the mainframe software industry, buyers pay a set price for the right to make copies of a program.

Site licensing no problem

Wagman said site licensing was no problem when vendors' representatives were at the user's site each day to maintain the software and ensure that the license was not violated. "There isn't an equivalent today. How can you site-license 4,000 machines and be sure [the software] isn't [really being used on] 4,500 [machines]?" he said.

Wagman, who made his comments as part of a panel presentation, said major software publishers will resist site licensing and will instead offer volume discounts to corporate users. Softsel, he added, supports the hardware-locking scheme for software protection proposed by the Association of Data Processing Service Organizations, Inc.

In the area of expert systems software, Wagman said, users can expect to see the arrival of sophisticated how-to programs that take user input and provide suggestions on how to solve a specific problem. For the DP manager this could mean the development of a program such as "How to Fine-Tune MVS on Your IBM 3783." Wagman also suggested that software incorporating the principles of artificial intelligence might one day produce applications tailored to the way individual users work.

Wagman, whose Inglewood, Calif.-based firm publishes the "Softsel Hot List" of top-selling personal computer software, also advised his listeners that several types of software are headed for flat or declining sales.

He predicted growth, however, for corporate software resellers, who, he said, use their low overhead to compete largely on price but who "are generally well respected for their technical knowledge."

Another panelist, Egil Juliussen, predicted the rise of another means of software distribution: downloading software directly to a user's micro. Juliussen is chairman of the board of Future Computing, Inc., a Dallas-based research firm.

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Compaq exec sees push to communications coming

CW AT COMDEX/SPRING '85

By Eric Bender
CW Staff

ATLANTA — Although communications today is a relatively weak force in personal computing, it will be the industry's next major push, predicted Rod Canion, president of Compaq Computer Corp. "We're about to see an information-access revolution."

In a keynote address here at Comdex/Spring '85 last week, Canion noted that "communications is in its infancy and fogged with skepticism because of all the babble about [electronic mail, local-area networks] and new technology.

"But it must be realized that communications is a means to an end, a tool just like the personal computer is a tool, and we have yet to see its real importance emerge.

"The reason a personal computer user can live without communications today is because in the general business market one's competition isn't using communications either," Canion said.

Single standard not seen

Unlike the case in microcomputer hardware, where there is a dominant industry standard, "it doesn't seem that there will be a single standard in the family of communications hardware," Canion noted. "The primary standard in this area is most likely to be in software — a standard interface to the industry-standard personal computer architecture that supports the wide range of communications hardware alternatives needed."

Meanwhile, Canion maintained, the hardware standard built around the IBM Personal Computer will continue to grow in strength. "It is now clear that the game is over for those refusing to adopt the industry standard," he said.

Canion also downplayed reports that IBM will shut down its open architecture. "If IBM were to come out with architecture that wasn't compatible with the existing standard, it would itself be starting from scratch and thus starting even with [Apple Computer, Inc.], AT&T and anyone else in trying to set a new standard," he said.

"The standard created by IBM is in fact now independent of IBM," Canion claimed. "The industry today involves millions of users and thousands of companies that are dependent on maintaining that standard.

"And, in the end, what's good for the standard is good for IBM," he added.

Micro network products command Comdex spotlight

OUT AT COMDEX/SPRING '85

By [illegible]
CW Staff

ATLANTA — Personal computer networking took a high profile at Comdex/Spring '85 here last week, with a flurry of demonstrations and product debuts — including many additions to the fast-growing crop of network applications software.

In one of the first moves by a major supplier of microcomputer applications software, Multimate International Corp. announced local-area network versions of its Multimate word processing package for IBM, 3Com Corp. and Novell, Inc. networks. Richard Lefebvre, executive vice-president of Multimate, commented that "the installation of local-area networks among our corporate customers has increased dramatically in the past year."

> "The installation of local-area networks among our corporate customers has increased dramatically in the past year."
> — Richard Lefebvre
> Multimate International Corp.

The cost of a three-user license for Multimate 3.3 is $995, with licenses for additional users priced at $195 each. Multimate is headquartered at 52 Oakland Ave. N., East Hartford, Conn. 06108.

Lotus Development Corp. officials, meanwhile, pointed out that the upcoming release of its Symphony multifunction package will be able to address shared print resources and shared files on a local-area network. Lotus said it also has updated its licensing policy to permit a single copy of the package to run on a network, as long as a key disk and documentation are present at each workstation.

Other major players that are not yet offering network software underlined their plans to move in that direction. "We're making the transition from single-user to multiuser," said Edward Esber, president of Ashton-Tate. "Networks are very important for use in the corporate market."

The tricky issues raised in pricing network software make price the largest obstacle for a host of software firms poised to enter the networking arena during the next few months, industry executives pointed out.

Among other network developments at Comdex/Spring '85, 3Com introduced an IBM 3270 gateway for its Etherseries networks. The Ether 3270 software package, running on a dedicated IBM Personal Computer or Personal Computer AT, reportedly supports up to 32 host sessions. Users can transfer files to and from the host, and print jobs can be spooled to network printers or network storage, the company said. The package will be offered next month for $1,595.

3Com also introduced Ethermac software, which will link Apple Computer, Inc. Macintoshes on the Appletalk network to 3Com's 3Server network server. Available in June, the software is said to give Macintoshes access to network hard-disk storage, to connect separate Appletalk networks, to permit data sharing between Macintoshes and IBM Personal Computers and to provide spooled printing to Apple's Laserwriter printer.

The Ethermac software includes the Ethershare and Etherprint packages. Ethershare for the Personal Computer and Macintosh costs $695 per server, and Etherprint for the two machines is priced at $395 per server. Ethermac user software costs $50 per user, and the 3Server expansion board (with Appletalk port) costs $625. 3Com is located at 1365 Shorebird Way, Mountain View, Calif. 94039.

Also at the show, Banyan Systems, Inc. introduced enhancements to its Virtual Networking Systems line, including a $995 software package that allows an IBM Personal Computer AT to act as a network server. Banyan is located at 135 Flanders Road, Westboro, Mass. 01581.

Comdex/Spring abounded with networking demonstrations, the largest of which was a joint effort between Novell and Proteon, Inc. that linked 24 exhibitor booths. Wang Laboratories, Inc. also showed its Fastlan, an existing easy-to-install version of Wangnet, which the company has now opened up for sale through reseller channels.

Several micro-to-mainframe products also debuted, including Irmalink/Windows and Irmax Graphics from Digital Communications Associates, Inc.

Running on the firm's Irma terminal emulation board, Irmalink/Windows reportedly provides IBM Personal Computer users with simultaneous microcomputer, mainframe and notepad windows. The package will be available in June for $149.

Irmax Graphics is a hardware/software combination said to enable an Irma-equipped Personal Computer to function as a 3270 Personal Computer. Irmax Graphics is compatible with IBM's host-based Graphical Data Display Management system and operates in a Systems Network Architecture teleprocessing environment, the vendor said. The product also permits the micro to act as an IBM 3278 S3G or S2G monochrome terminal or as an IBM 3279 S2G or S3G color terminal.

Irmax Graphics will be available in July for $1,595 from Digital Communications Associates, which is located at 303 Technology Park, Norcross, Ga. 30092.

LICENSE

from page 1

Multimate site licenses could offer discounts of $100 or more off the current selling price of the Multimate word processing package, according to Richard Lefebvre, Multimate's executive vice-president and chief executive officer.

A site license for 1,000 copies of Multimate would be priced at $170,000, he said.

Multimate said that the minimum quantity for a site license would be 500 copies.

Reactions varied

Reactions at the show to the site licensing concept were varied. Analyst Esther Dyson, president of Edventure Holdings, Inc., said she supported site licenses because "eventually the large buyers are not going to buy [software] copy by copy."

Software vendor Fred Gibbons, president of Software Publishing Corp., said that he felt most corporate users were looking for simple bulk discounts, rather than true site licenses.

Gibbons said that software packages are usually bought in small, low-cost quantities. He said that he found it difficult to believe that any corporate personal computer user has the authority to spend $10,000 to purchase a companywide software license.

Personal computer software publisher Joseph Seidler, president of Analytics Corp., went even further, saying that if site licensing were to become popular, "I don't see how we could stay in business."

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University of Kansas looking gift horse in mouth?

System donor miffed by replacement plan

By Donna Raimondi
CW Staff

LAWRENCE, Kan. — The University of Kansas' bid to upgrade its computer center is taking some heavy fire from Honeywell, Inc., donor two years ago of a DPS 8/20C system that will be unplugged to make room for the school's new computers.

The university will disconnect a donated 1.2 million instructions per second (Mips) Honeywell DPS 8/20C machine that runs under Honeywell's CP6 operating system to make way for a Digital Equipment Corp. VAX series or compatible system for academic and research uses and an IBM or compatible 4381 Group 3 machine for administrative purposes, said Richard Mann, director of information systems at the school.

> *'It is impossible to understand the rationale behind unplugging a donated computer and replacing it with purchased equipment.'*
>
> — Honeywell, Inc.

The plans have led to editorial salvos fired in the local press, which claimed that there has been "a longtime effort by IBM officials to tie up most state computer business and eliminate any other systems."

'Disappointed with decision'

"Honeywell is very disappointed with the university's decision to disconnect the donated Honeywell equipment," a Honeywell spokeswoman read from a prepared statement. "It is impossible to understand the rationale behind unplugging a donated computer system and replacing it with purchased equipment at greater cost. Evidently, the university's decision is to limit computers to those of one dominant supplier without competitive bids. Honeywell does not believe the university or the state of Kansas is best served by this decision."

According to Mann, the "dominant supplier" comment is not valid, and Honeywell is making a bigger flap than need be. "We originally proposed bringing in a big IBM-compatible mainframe and sharing it between the administrative side [which is IBM] and the academic side [Honeywell]" so users would have both Honeywell and IBM access, he said. The faculty vetoed that idea, however, saying that they wanted access to VAX machines, he said.

The university plans to keep a 2.2 Mips Honeywell DPS 3 system that runs under Honeywell's Gcos operating system, which it purchased from the vendor six years ago, Mann said. The school plans to keep the system at least until it is paid for in 1987.

The proposal was changed to include a VAX 8600-type machine for academic computing and an IBM 4381 Group 3 equivalent for administrative tasks, Mann said. An old, paid-for IBM left from the administrative center will be brought into the academic center for statistical applications, and the Honeywell DPS 3 will remain.

'We had to make a choice'

"The problem was I didn't have enough money to do that and also continue to run the smaller Honeywell," Mann said. "We had to make a choice," and faculty users decided against the DPS 8/20C machine, he said.

The university wants something in the 4 or 4.5 Mips range that can run DEC's VMS operating system and is compatible with DEC's software, he said.

Everything the faculty needs does not run on Honeywell's operating systems, Mann said, and even software packages that do run on them have to be converted. SAS Institute, Inc.'s SAS package — a popular statistical package among academic researchers — will not run on the big Honeywell system under Gcos, for example, he said. The university has other statistical packages under Gcos but cannot offer enough diversity to its users with the Honeywell systems, he said.

"If I had $100,000 a year, I'd put it [the Honeywell DPS 8/20C] up. I have no problems with that — I like the machine," Mann said. He said he plans to put it up as soon as possible, probably in a year.

In the meantime, bids have gone out to IBM, National Advanced Systems Corp., Amdahl Corp. and other IBM-compatible companies as well as to DEC, Mann said.

One of the third-party vendors has an excellent chance of receiving the IBM or compatible portion of the contract, he said, because it tends to charge less than IBM and because Kansas is bound to choose the lowest bid for the systems and services required by the university.

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Retailer's development cycle emphasizes maintenance

CW AT EDP SOFTWARE MAINTENANCE

By John Desmond
CW Staff

DALLAS — Maintenance of applications should become easier at Zale Corp., where a recently revised applications development cycle makes maintenance a key focus.

"The manager of maintenance is also the manager of development" at Zale, according to Kathleen A. Davis, manager of quality assurance for the jewelry retailer headquartered here.

"It's very hard to get developers to focus on what makes an application maintainable. They'd rather talk about nested ifs," she said, referring to a common procedural peeve.

Speaking at the Data Processing Management Association's EDP Software Maintenance conference held here last week, Davis said planning for maintenance in development results in fewer programming bugs. "We want to do it right the first time and not do it over and over again," she said of programming.

Davis

A number of maintenance-related problems spurred Zale's management to embark on an eight-month effort to revise its applications development cycle, Davis said. Users were not satisfied, applications support was not adequate, and MIS groups with mutual interests were not communicating, she said. "No one talked to anyone else until things reached the crisis point," Davis said.

Zale's former development cycle was a rigid system limited to technical aspects that excluded operations personnel and users, Davis said. A major credit system application produced under the old system could not be brought up on time because no one on the development team noticed the absence of a batch processing window, she said.

In the new development process, "The focus of the project is on the business problem, not the technical solution. User participation is not only encouraged, it is required," Davis said. "We decided that to be successful, we had to include everyone."

Broadened definition

The definition of software maintenance at Zale was broadened to include factors such as structural changes required by users, impact on business operations, systems performance constraints and documentation. "Maintenance takes on a much broader scope" in the new process, Davis said. The project manager decides whether the maintenance goal has been satisfied, she said. If the goal has not been met, a management decision is made on whether to implement the application. "As long as they can make an informed decision, it's not a problem," Davis said.

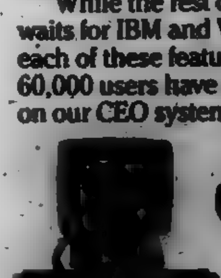
Zale has 12 development projects under way currently and has 56 applications in place. The company has 200 employees in its MIS department, and half of them work in development. One major application being developed is a credit system. "Very few people buy diamonds with cash," Evans noted. Another application under development is a revised payroll system, scheduled to be brought up by Jan. 1.

Zales' calculation of the maintenance implications and complexity of new applications includes the following eight factors:

- Manual recurring dollar impact.
- Target date constraints.
- User impact.
- Divisions affected.
- Changes to existing functions
- New functions.
- Applications system interfaces.
- Support system impact.

Documentation in Zale's development process is negotiable between operations and maintenance personnel, because the company has found that rigid requirements may lead to unnecessary documentation, Davis said. "We want to eliminate binders and things on paper as much as possible," in favor of prompts on the display screens, she said.

The company's development cycle has yielded benefits already, according to Davis. A postimplementation review of an application developed using the old system showed that users were dissatisfied, project leaders were frustrated and operations people were struggling with the application, which was just six months old. "The program code was not exactly spaghetti code, but it was not easy to maintain," Davis said. The programmers used assembler and a hodgepodge of other languages to write the application, which was a sales audit program, she said.



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MIS managers advised to group software changes

CW AT EDP SOFTWARE MAINTENANCE

By John Desmond
CW Staff

DALLAS — To ease the burden of software maintenance, MIS departments should imitate software vendors' practice of issuing new releases of enhanced applications.

So said Faina Kontorovich, a senior consultant with Alexander Grant & Co., a New York-based accounting and consulting company. Kontorovich spoke at last week's Data Processing Management Association's (DPMA) EDP Software Maintenance conference here.

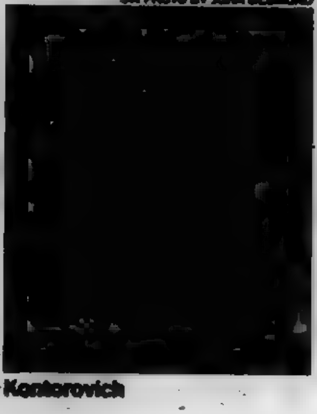
"All the software companies do it; that's the way they make money," she said. "But in the corporate world, we stop thinking in that frame of reference," she said.

The release method of software maintenance is defined as grouping software changes for implementation, instead of making changes one by one, Kontorovich said.

Defining maintenance as changes made to a program after delivery to a user, Kontorovich said her company's figures show that 67% of users' total expenditures for software is spent on maintenance, compared with 33% on development. Error correction accounts for only 15% to 20% of maintenance programming time. The balance of maintenance programming hours are spent changing or enhancing programs, she said.

The consultant and former applications development manager cited improved planning and management, better design of changes, greater control and enhanced testing and documentation as benefits of the release method. Decisions must be made regarding exactly what goes in the release, when changes are made, the priority of changes and the impact of not making an improvement, she said.

CW PHOTO BY JOHN DESMOND



Kontorovich

Carrying out a user-requested software enhancement may involve changing only two lines of code but may still require a rewrite of the program's documentation. "People don't do it," said Kontorovich, noting that documentation suffers as a result.

Sell idea to decision makers

The release idea must be sold to the decision makers in the organization, whether they are users or management types, she said. She advised DP managers to argue that the release method will save on maintenance costs. But one user in the audience was skeptical, commenting that his end users would have to wait longer for enhancements. However, another user pointed out that to implement many changes at once in new release would take less time than to make a series of individual changes.

Ground rules for establishing the release method include the designation of an individual to decide what enhancements are to be included, the timing of releases, emergency maintenance provisions, a testing scheme and change control procedures, Kontorovich advised. In response to a question on how frequently releases should be issued, the consultant advised flexibility.

Begin using the release method on small, simple systems first, Kontorovich said, because the method may not work.

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DATA SWITCH CORPORATION

Xmodems: The right blend?

In today's typical data processing environment, it is hard to find an ideal mixture of hardware and software. With the growing use of AT&T Unix systems for commercial applications, there is a rising interest in personal computer-to-Unix communications for terminal emulation, electronic mail and file/data transfer.

This software benchmark examines two Xmodem communications products designed specifically for personal computer-to-Unix communications: Tango from Computerized Office Services, Inc. and PC Works from Touchstone Software Corp.

Included in the testing was Blast from Communications Research Group (CRG), one of the few non-Xmodem products available on the market today.

The tests were conducted within the Yates Ventures, Inc. laboratory using directly connected computers over a 24-ft cable (20 ft is often used as the safe maximum length for reliable Xmodem data transfer).

PC Works and Tango were tested using a two-drive IBM Personal Computer with 256K bytes of memory and a Zilog, Inc. Z8000/31 microcomputer running Zeus 3.21. The Blast tests involved the same IBM Personal Computer but used an AT&T IS 3B2/300 microcomputer running Unix System V.

> *The difference lies in Blast's transmission protocol.*

The actual time tests involved three executions of a file transfer, and times expressed are averages of those three executions. Additionally, the tests were conducted at 1,200, 4.8K and 9.6K bit/sec. rates using files of 1K, 20K and 100K bytes.

The test results show a lack of variance in transmission speeds, even with a fairly large file (100K bytes). This indicates the need to look beyond mere speed as a criterion for selection.

Reliability more important than speed

Reliability of data transfer is, of course, more important than the speed of transmission. Variances in the number of transmission errors do not, unfortunately, really appear in direct-connect transmissions. Long-distance phone transmissions were tested for Blast and Tango. Because the parameters of this test could not be controlled or measured accurately, the results should only be taken as broad indicators.

With line noise at approximately 20%, Blast had no trouble with transmission of large files. In fact, transmission time was roughly the same as over directly connected lines (22 min for 100K bytes at 1,200 bit/sec.), indicating that Blast's error-correction methods are very efficient.

On three separate tries under the same conditions, Tango's error threshold was exceeded for every attempt to transmit a file larger than 40K bytes.

The difference lies in Blast's transmission protocol. CRG refers to their technique as a "blocked, sliding window" protocol. This means that data is sent in a pipeline of encoded blocks.

The program continues to send blocks of data without waiting for a receiving acknowledgment. When the acknowledgment is received by the transmitting program, blocks that were corrupted can be re-sent out of order. This process allows transmission to be much more efficient under adverse conditions.

As the number of errors rises, Xmodem products must resend corrupted data before new data is sent, greatly slowing down the process.

Propogation delays can also cause great problems for Xmodem products, which must wait for an acknowledgment before continuing transmissions. Blast's sliding window allows propogation delays of up to 2 sec. at 1,200 bit/sec., enabling the product to be used with satellite links, microwave transmission, private branch exchange systems and other links that traditionally create problems for data communications. This qualifies Blast as an "industrial strength" product that can provide reliable, quick transmissions even under conditions that are far from ideal.

Additionally, Blast provides the ability to transmit files simultaneously in both directions, potentially doubling the time savings.

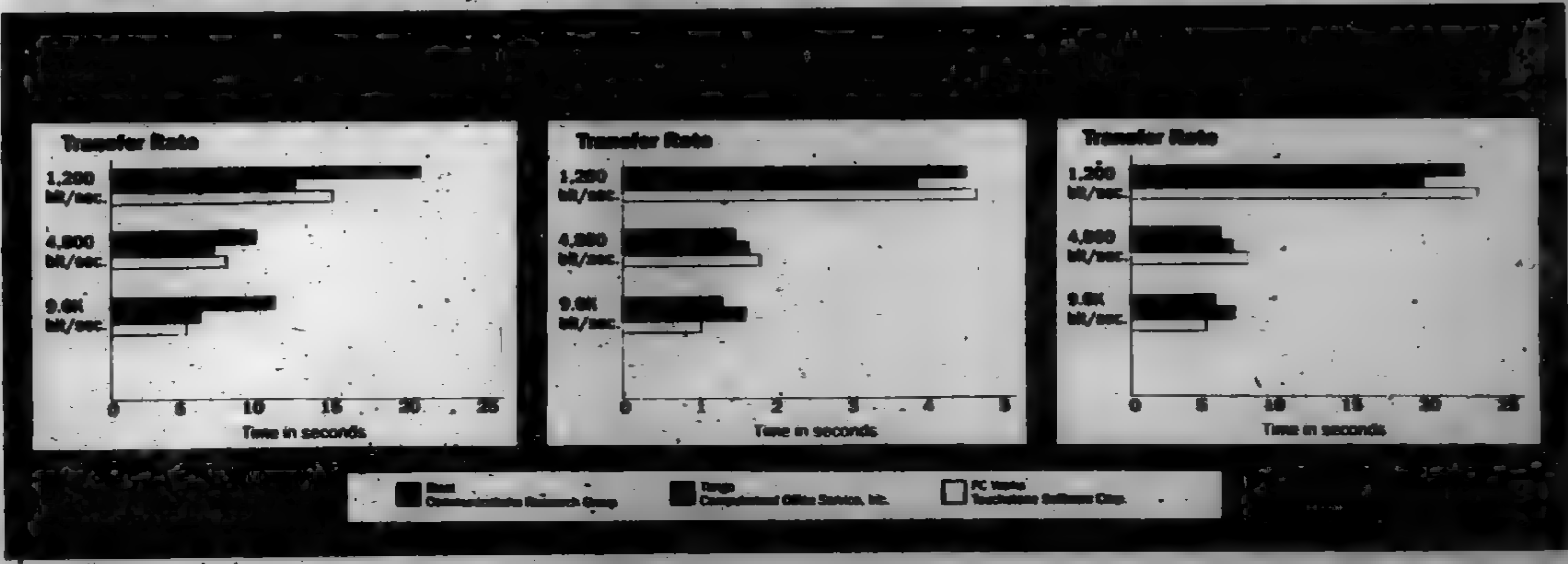
Ease of use and terminal emulation capabilities may be more important for users working strictly with directly connected computers, whereas Xmodem products can provide acceptable performance. These two factors traditionally have been Blast's weak points.

Along this line, Blast now has new documentation and a Digital Equipment Corp. VT100 terminal emulation mode. Terminal emulations supported by Tango and PC Works are listed in Table 2. The Tektronix, Inc. 4041 mode, which Tango supports on an IBM Personal Computer with graphics, was tested and found to work well but slowly.

Although there was little variance overall in transmission times for the three products, Tango's times did not improve from 4.8K to 9.6K bit/sec. This indicates that Tango's error-detection and correction algorithms do not allow the product to take advantage of the higher bit/sec. rate.

ABOUT THE BENCHMARK

Product evaluations, specifications and technical information are provided by Yates Ventures, Inc. Software Evaluation Laboratory Service (Sels), which is solely responsible for their accuracy. More information about Sels is available from Yates Ventures, Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.



Software upkeep seldom seen as vital corporate asset

CW AT DP SOFTWARE MAINTENANCE

By John Desmond
CW Staff

DALLAS — Despite findings that up to 60% of DP personnel resources are consumed in performing software maintenance — maintenance being any change made to a program after it is delivered — most corporations do not manage software as a vital corporate asset.

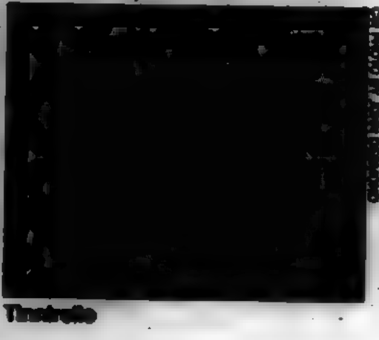
That central theme emerged from interviews with users and speakers at the Data Processing Management Association's EDP Software Maintenance conference held here last week.

"The message isn't being communicated to management about the importance of maintenance," said Ned Chapin, consultant with Infosci, Inc. of Menlo Park, Calif. and president of the Software Maintenance Association. "DP hasn't made its case well for maintenance. Software is an asset. We should recognize that and treat it with esteem."

To many DP managers, the way to improve software maintenance is to hire more people to work on it, Chapin observed. The 30-year industry veteran said DP managers often ignore other ways to improve, such as managing maintenance better, investing in more maintenance tools and improving maintenance procedures and methods.

For many companies, finding programmers who enjoy working on maintenance is difficult, users and speakers indicated. According to William Vann, manager of applications development for Avon Direct Response, a clothing firm in Newport News, Va., "Young programmers don't like to clean up somebody else's mess."

The conference's personnel track leader, Paul C. Tinnirello, manager of data services programming for the Oldwick, N.J.-based A. M. Best Co., responded to the comment saying, "That opinion reflects an ever-present attitude in business — 'maintenance, problems, cleaning up a mess — yuk! That's not for me.' "



Tinnirello

A tremendous imbalance often exists between a DP manager's perception of a software system's viability and its actual importance to the company, said Rick Ball, support coordinator of service station automation for Esso Petroleum Canada in Toronto.

Citing an example at his own company, Ball said he was called to Esso's Alberta, Canada, DP site to assess a maintenance problem several years ago. He discovered that only two people were assigned to maintain the terminal automation system; one was a recent college graduate, the other a former operations technician. The automation system controlled the sale of all petroleum products from several Esso terminals, sales representing several billion dollars of company revenue.

"The company would have gone out of business in a week if it ever went down," Ball said. Since then, he said, Esso has responded and now has a highly developed maintenance program.

Many corporations display a bias toward software development and against maintenance, especially in promotion policies, several speakers indicated. "Development is associated with glamour," Ball said. "It's easier for a manager to talk about some new project than it is to talk about maintaining the viability of a system."

The bias toward development also extends to vendors, according to Jack Parker, manager of business systems support for Burroughs Wellcome Co., a Greenville, N.C.-based pharmaceuticals firm. "The speakers at this conference all said, 'These are the problems,' but I haven't heard many solutions. Vendors are guilty of treating the maintenance process as a no-no. They haven't realized its potential. There is a disparity between the tools marketed for development purposes and the tools marketed for maintenance purposes," Parker said.

One vendor said the market for maintenance tools is a slow one. "We're chafing at the bit because it's moving so slow, not because it's not moving," according to Burton Strauss, a senior consultant with Peat, Marwick, Mitchell & Co.

The view that the tool market is slow is shared by Nicholas Zvegintzov, editor of the "Software Maintenance News" newsletter. "The current state of technology is that a fair number of special-purpose [maintenance] products do solve some problems," Zvegintzov said. "But everybody and his mother-in-law said the big breakthrough will be an integrated system that [solves many problems] in a single interface. There are no such products now."

Ball

More troubling to Zvegintzov than the state of technology is that managers are finding their employees reluctant to use tools, and vendors are finding it difficult to sell tools. The reason, he suspects, is "the cost of using tools is much higher than we care to admit. We're asking the human to do something very difficult to complement the tool. And there is no magic answer."

Perhaps the typical corporate view of software maintenance is that of Richard Gallery, applications project manager at Boston Edison Co. According to Gallery, "When you want to punish someone, put them on maintenance. I don't think management thinks maintenance is anything but a low programmer's job. Maintenance is important. But trying to relate that to someone is another story."

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Oil firms provide job data base for displaced workers

By Jeffry Beeler
CW West Coast Bureau

HOUSTON — Two oil industry giants are jointly supporting a nationwide private data base used to find jobs for thousands of employees who may face layoffs as a result of the firms' recent merger.

To create the data base, Gulf Oil Corp. is continually approaching large corporations throughout the U.S. and asking them to furnish details about current job openings. Selected submissions are then electronically stored in a Chevron Corp. data center built mainly around IBM 3081s.

If Gulf or Chevron employees are subsequently displaced and want to find a new job, they can log on to the centralized data base through on-line terminals installed in more than 20 cities.

Can call up a list of jobs

Using a Gulf-written screen format, the employees can extract a list of all the reported openings that lie within a designated job category, according to Jay Stright, Gulf's director of professional recruiting and placement. Other report formats, meanwhile, allow users to sort the listings by salary level or geographic region, he said.

Although Chevron has promised jobs to all Gulf employees who are willing to relocate to California, many of the workers are expected to reject the offer [CW, March 4]. Those who refuse to move may therefore find themselves out of work.

The prospect of mass layoffs concerns Gulf, which has long prided itself as being a "leader in state-of-the-art outplacement services," according to John Ramsden, the firm's general manager of human resources. Several months ago, with funding from Chevron, the company began to create a solution.

The result of Gulf's and Chevron's cooperative effort is a package of employee outplacement services that includes secretarial support, training in basic job-hunting skills and a system for distributing resumes to prospective employers. All the elements of the placement program are available through a string of resource centers that Gulf has opened in 21 U.S. cities.

Confidential-search data base

Also accessible through the resource centers is a confidential-search data base, which keeps records of all the employees who agree to participate in the job-hunting program and are eligible to do so, Gulf's Stright said.

The centerpiece of the oil companies' placement plan is the nationwide private data base, which lists some 6,000 search firms and 18,000 hiring specialists as well as job openings, he said.

Raw material for the data base comes primarily from direct mail and telemarketing campaigns, which seek information about potentially suitable job openings in Fortune 1,000 firms. To a lesser extent, the data base also relies on toll-free hot lines and newspaper advertisements for its contents, Stright said.

Although it is unable to support ad hoc queries, the menu-driven data base does give users a choice of five report formats, Stright said. One of the reports provides summary listings of openings within 15 broad job categories and many subcategories. Another format allows users to focus on individual listings within a summary report and request additional details about each. A third indicates what jobs are available within a specified geographic area, while a fourth sorts the listings according to the user's salary requirements. The remaining report lists only the openings that have entered the data base since an employee's most recent logon.

Because merger-related layoffs within Gulf and Chevron have yet to begin in earnest, the effectiveness of the job-search data base is still difficult to gauge with certainty, according to Ramsden. But before the job placement effort is finally dismantled, the data base is expected to generate several thousand new jobs for displaced Gulf and Chevron employees, he said.

Education focus of DPMA meet

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) will hold an Information Systems Education Conference Oct. 26 to 27 at the Sheraton Houston Hotel.

The program will consist of more than 60 presentations and panel discussions for computer systems educators, undergraduate instructors and students. Topics to be discussed include educational software, delivery systems and productivity, the impact of technology on professionals and computer-aided instruction.

Registration before Sept. 2 is $110 for DPMA members and $130 for nonmembers.

The DPMA Education Foundation is located at 505 Busse Highway, Park Ridge, Ill. 60068.

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Disabled IBM analyst wins award

By [illegible]
CW Staff

AUSTIN, Texas — The American Handicapped Employee of the Year for 1985 is a systems analyst at IBM's Entry Systems Division here.

James Caldwell has degrees in mechanical engineering and a doctorate in business from the University of Texas at Austin. Since 1970, he has been employed as a jack-of-all-trades in the development lab,' Caldwell said. Currently, most of his time is spent acting as a liaison for technical and business concerns between vendors and IBM researchers who are designing and building unannounced products for the IBM Personal Computer.

Caldwell

In 1962, Caldwell's career as an underwater engineer ended in a fire. "I lost 70% of my skin, and complications [resulting from] the fire caused central nervous system damage," he said. The results were total blindness and paralysis below the waist. He returned to school for his doctorate, because at that time few companies would hire handicapped people and he wanted to be more employable, he said.

Caldwell works on an IBM Personal Computer, which he said is an ideal tool for handicapped people by virtue of its software operating system. The I/O is software controlled, so extra equipment like braille printers and voice synthesizers is easy to add, he said.

The award was presented on May 8 at a meeting of the President's Committee on Employment of the Handicapped in Washington, D.C. It honors Caldwell for his employment record and his dedication to helping others.

Caldwell is on the board of the mayor's committee of employment for the handicapped and helps handicapped people put together devices they need to work more productively.

WASHINGTON UPDATE
CW Washington Bureau

NTIA chief pushes concern for telecom users' needs

WASHINGTON, D.C. — David J. Markey, chief of the National Telecommunications and Information Administration (NTIA), recently told a U.S. Senate subcommittee that the agency should "pay more attention to some of the actual needs and interests of communications users."

Markey said NTIA's recent efforts have been directed at international trade issues, but a study is underway to review domestic regulations governing telecommunications [CW, Feb. 18].

"We sometimes seem to have concentrated so much on trying to balance among competing corporations that we have lost sight of users' interests," Markey testified. "More needs to be done in this regard, and this will be a major emphasis of our study," he added.

GAO auditors take portable laptop micros for test drive

WASHINGTON, D.C. — Auditors in the regional offices of the General Accounting Office (GAO) are field testing 16 models of portable laptop microcomputers to see which ones are suitable for use by GAO field auditors, a GAO official said recently.

The "test drive" of the laptops will continue until an internal evaluation report is issued June 14, according to Steve Jue, the project leader in the GAO's Seattle office. That report will prepare the way for bid requests, he added.

The GAO has decided to buy portables because the agency's field auditors frequently visit federal offices and need lightweight tools for data analysis, Jue said. The portable units used in the test were provided by vendors at no cost or obligation, he said.

Commerce Department plans computer price index change

WASHINGTON, D.C. — U.S. Department of Commerce statisticians plan to change the computer price index used in calculating the inflation-adjusted gross national product (GNP), so that figure will better reflect the decline in prices of computer products over the last several years, an official said last week.

Jerry Donahoe, chief of the National Income and Wealth Division at the Bureau of Economic Affairs, said the agency developed an experimental index to account for the decline of computer prices. The department has always kept its computer price index "flat," or unchanged, on the general economic assumption that price cuts mean lower quality.

The new index for computer prices will be introduced later this year as part of a comprehensive revision of the GNP calculation, Donahoe said. However, its effect on the statistic will be offset as the base year for calculating inflation-adjusted GNP is changed from 1972 to 1982, he said.

IFPS users set June meet

AUSTIN, Texas — The national meeting of the IFPS Users' Association will be held June 16-20 at the Hyatt Regency Hotel here.

The conference will focus on the themes of managing end-user computing and effective implementation of Execucom Systems Corp.'s Interactive Financial Planning System (IFPS) in a changing organizational and technical environment. Highlights include case analysis and discussion and management panels.

The keynote speaker will be Michael E. Treacy of the Center for Information Systems Research at the MIT Sloan School of Management in Cambridge, Mass.

The cost of the conference is $350 before June 9 and $450 after that date. The fee for two days is $250 before June 9 and $350 afterward.

More information is available from John Jenkins, IFPS Users' Association, c/o Southern Bell Telephone Co., 10A 56 Southern Bell Center, 675 W. Peachtree St., N.E., Atlanta, Ga. 30375.

Communications conference set

SAN DIEGO — The third annual Strategies in Telecommunications Conference will be held June 10-12 at the Hyatt Islandia Hotel here. The conference, titled "Telecommunications Planning in an Era of Uncertainty," will focus on communications issues.

Topics include predivestiture promises and postdivestiture realities, emerging network opportunities and options for users, transmission facilities, international communications, legislation and regulation.

The conference is free for clients of Gartner Group, Inc.'s Strategies in Telecommunications Service and costs $875 for nonclients. More information is available from Gartner Group, 72 Cummings Point Road, Stamford, Conn. 06902.

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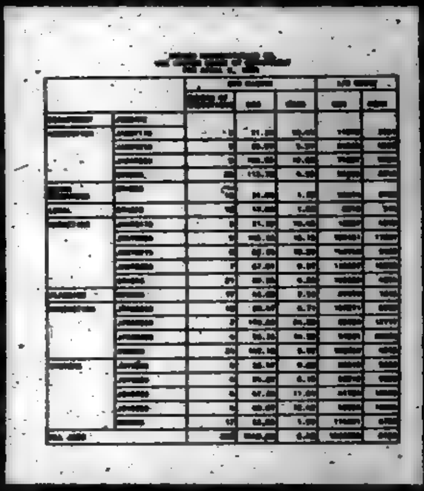

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Decision still out in Iowa DP workers' class action suit

DES MOINES, Iowa — More than two years ago, approximately 140 former DP employees of the Des Moines Blue Cross/Blue Shield of Iowa office hoped to gain redress from their former employer by filing an $18 million class action lawsuit [CW, Oct. 4, 1982]. They are still hoping.

The employees' lawsuit charges that Blue Cross/Blue Shield of Iowa wrongfully denied its employees severance pay when it hired Electronic Data Systems Federal Corp. ([EDSF] — now Electronic Data Systems Corp. [EDS]) for its DP needs in 1980. Blue Cross/Blue Shield of Iowa's DP employees were given the choice of working for EDSF, but the plaintiffs claim that they would not have received comparable benefits.

"[EDSF] didn't have the same complete Blue Cross medical coverage, and maybe the pay was comparable, but they work 10 hours a day and on weekends," said one former DP employee who requested anonymity because the matter is pending. "But the biggest thing was the lack of severance pay. We considered that an earned wage."

David Shinkle, a Des Moines attorney representing the plaintiffs, has accused Blue Cross/Blue Shield of Iowa of dragging its feet on the litigation. He cited Blue Cross/Blue Shield of Iowa's challenge to the right of five named plaintiffs to represent the former DP employees as a class. Blue Cross/Blue Shield of Iowa appealed to the Iowa Supreme Court when that challenge was denied at the district court level. The Iowa Supreme Court upheld the lower court's decision last January.

"It's been a snail's pace," Shinkle said. "Once [Blue Cross/Blue Shield of Iowa] had the chance to take the depositions of the five people who filed suit, [Blue Cross/Blue Shield of Iowa] delayed [taking the depositions] as much as possible."

Blue Cross/Blue Shield of Iowa attorney Jacki Samuelson refused to comment on the case, saying it is corporate policy not to comment on matters in litigation.

EDSF is also a named defendant in the suit. The plaintiffs claim EDSF engaged in "wholesale firings" and layoffs of former Blue Cross/Blue Shield of Iowa DP employees in the months following the conversion. "[Some employees] were told in no uncertain terms that EDSF was not the place for them," the suit said.

Blue Cross/Blue Shield of Iowa signed a 10-year contract with EDSF in September 1980, then reportedly gave its DP employees 24 hours to make a decision between working for EDSF or leaving without severance pay.

Those who remained at EDS

An EDS spokeswoman at the company's Dallas headquarters confirmed that of approximately 140 DP workers at Blue Cross/Blue Shield of Iowa at the time of the conversion, only 22 are now employed by EDS. Of those, four have relocated to EDS operations in Dallas or elsewhere, and only seven — five managers, one programmer and one systems analyst — hold senior positions in DP. The others remaining from Blue Cross/Blue Shield of Iowa's DP operation are in clerical or systems operator positions.

After the Iowa Supreme Court ruled in favor of the plaintiffs in January, Shinkle drafted a notice to inform class action members that the five named plaintiffs can legally represent them. The defendant has the right to object to the content of the notice, and the latest legal round began last month with a hearing on Blue Cross/Blue Shield of Iowa's objections. A judge's ruling on the issue is expected later this month.

For some of the employees who claim they were unfairly displaced by EDSF, it has been a tough five years. "I like my new job, but at this point I'm probably $6,000 to $8,000 below what I would have been if things had stayed the same," said one former worker who managed to find another DP job in the Des Moines area. "I'll probably never catch up, and it takes a while to learn to live on less income."

Prime exec moves to AT&T

MORRISTOWN, N.J. — AT&T last week said it has named former Prime Computer, Inc. Vice-President Roland Pampel to a new vice-presidential position in its Computer Systems unit.

While expressing regret about the departure of Pampel, Prime President and Chief Executive Officer Joe M. Henson declared that the AT&T appointment was "a great credit to Roland and to Prime."

AT&T said Pampel will direct software development, marketing and sales for the Computer Systems unit. Prior to joining Prime, Pampel was employed at IBM, where he was involved in the development of minicomputers and Systems Network Architecture (SNA). James D. Edwards, president of AT&T's Computer Systems organization, said Pampel's "knowledge of SNA and distributed data processing are valuable assets."

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RESOURCE from page 1

More important, they say, an HRMS can transform the personnel department from a service center to a vital force within a company. In addition to supplying complex work-force-related information to be used by upper management in strategic planning, the HRMS can monitor and modulate personnel performance to assure maximum return on that investment.

"Our personnel application was mainly a payroll system expanded to hold personnel information," Marine Midland's Flannery said. "It was vintage 1960s technology and just too restrictive. We realized that we needed a system flexible enough to allow us to get management information quickly, in an on-line fashion."

Absolute necessity for today and future

Like Marine Midland, many companies are finding that the information and insights a modern HRMS can provide are vital assets in an increasingly competitive economy. "Human resource management information is an absolute necessity for today and the future," Flannery said.

> **"**
>
> *An HRMS can transform the personnel department from a service center to a vital force within a company.*

"The driving force behind human resource systems today is not simply the desire to automate the personnel function but to ensure that personnel plans fit the strategic plan of the company," said Ronald Pilenzo, president and chief operating officer of the American Society for Personnel Administration (ASPA).

As head of ASPA, Pilenzo oversees the world's largest association of personnel professionals. ASPA's 34,000 worldwide members represent some 40 million workers, he said.

"Companies are gaining an awareness that utilizing people data is an essential management tool," he said.

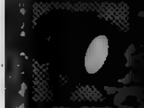
Pilenzo's comments were echoed by International Data Corp. (IDC), a Framingham, Mass.-based market research firm, in a recent study of the applications software marketplace.

"Access to computing power is a reality for more and more users in the large business environment and is fueling new applications growth. . . . Small businesses, too, are more and more able to afford to invest in the productivity gains yielded by computerization. These are among the major reasons for the growth forecast of . . . horizontal markets such as accounting and human resources," the study stated.

"Human resources, particularly, has undergone a dramatic change in the past 10 years," IDC concluded.

"Managing human resources has become more and more critical in the intense, competitive environment of a society in transition from an industrial to an information economy."

Nature of data in HRMS [illegible] security needs



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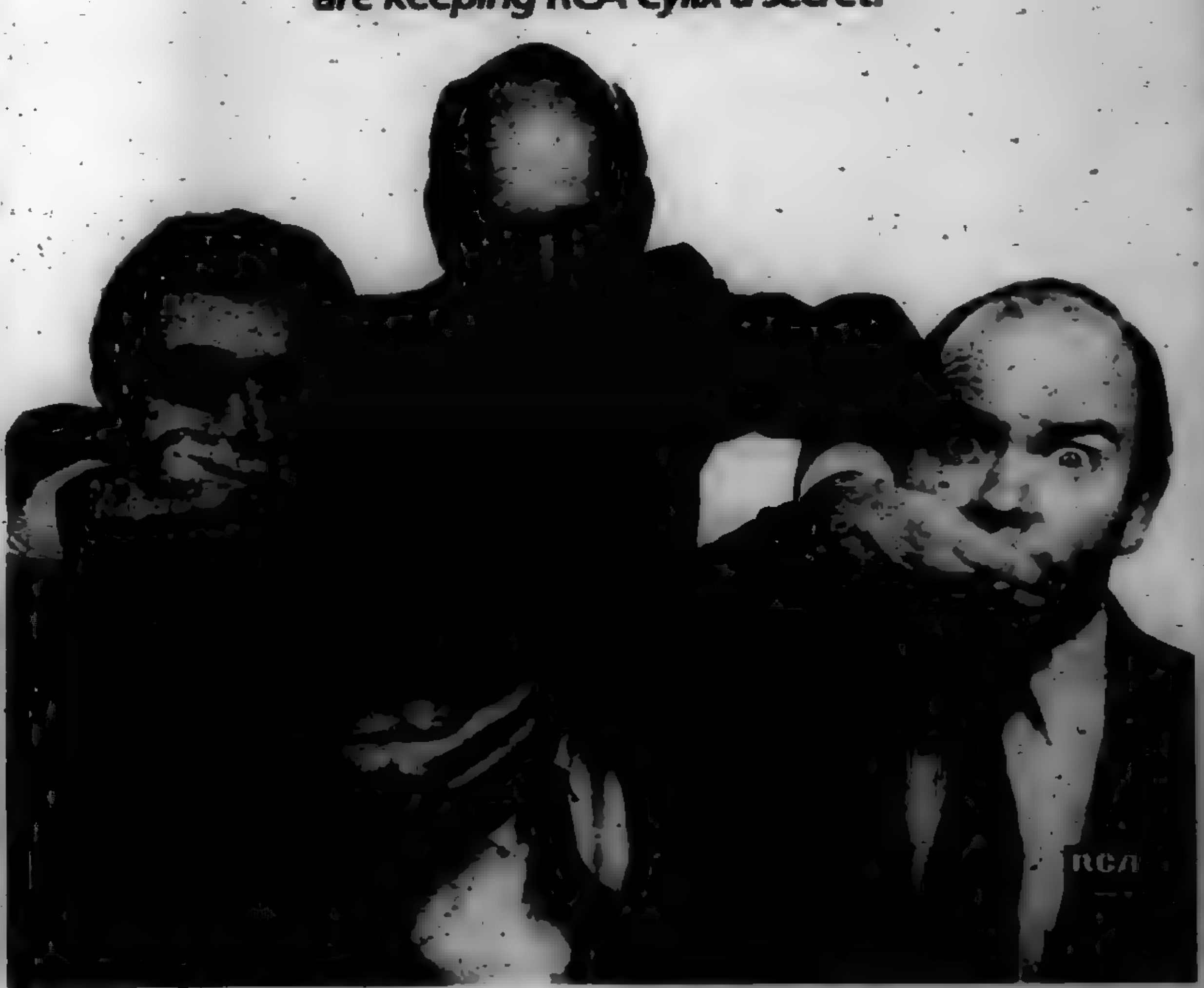
Why key DP/MIS managers are keeping RCA Cylix a secret.



NEWS

CW CHART

SELECTED LARGE-SCALE ON-LINE* HUMAN RESOURCE MANAGEMENT SYSTEMS

Argonaut Information Systems, Inc.	AIS Human Resources System	IBM mainframes (OS, DOS); Digital Equipment Corp. VAX (VMS); Hewlett-Packard Co. HP 3000 (MPE)	Employee biographical data, position control, performance and salary review; applicant processing; personnel requisitions; salary administration, benefits management; government compliance and Occupational Safety and Health Administration (Osha) reporting	AIS Payroll IV	HP Image 3000	No	No	Yes
[illegible]	[illegible]	DEC VAX (VMS); HP 3000 (MPE)	[illegible]	[illegible]	HP Image 3000	[illegible]	[illegible]	[illegible]
Comshare, Inc.	Profiles Applications Library	Available through Comshare's time-sharing network	Human resource planning; salary administration; Equal Employment Opportunity/Affirmative Action (EEO/AA) planning; general personnel administration (service offers statistical/analytical reports)	Optional (Comshare's Questor DBMS)	May be used with Questor via time-sharing	Yes	Optional (provided through Questor)	Yes
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cortex Corp.	Cortex Human Resource Management System	DEC VAX (VMS)	Personnel administration; applicant/job placement; government compliance reporting; benefits/pension administration; statistical analysis subsystem	Not integrated	Product includes data management system	Yes	Yes	No
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cyborg Systems, Inc.	On-Line Payroll/ Human Resource	Any processor that supports Ansi Cobol	Payroll processing; benefits management; position control; applicant tracking; time and attendance monitoring; manpower planning; employee/labor relations; health and safety monitoring; EEO/AA planning	Not integrated	IBM IMS; Cullinet IDMS/R	Yes	Yes	Yes
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

AIS Human Resources System	Yes	Yes	No	No	Access restricted by menu, option, function, terminal, user, organization; optional violation logging	All tables and certain fields may be user-defined; modular design allows each organization to tailor system	$10,500 to $35,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Profiles Applications Library	No	Yes	Profiles/PC runs on IBM Personal Computer XT; allows for data sharing with Profiles Applications Library	Yes	Security at password, account, location, user, group levels	Provides advanced analytical reports and modeling capabilities; time-sharing network supports multilocation organizations	Based on use; e.g., an average report costs $15 to $220, based on number of employees
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cortex Human-Resource Management System	Yes	Yes	Version runs on DEC Microvax	Yes	User-defined security extends to fields within modules; provides two levels of password protection	User may tailor system tables via prompts; reporting tools allow data to be viewed in a variety of formats	$40,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
On-Line Payroll/ Human Resource	Yes	Yes	Version runs on Personal Computer XT	Statistical only	On-line security system controls access by application, function, screen, employee, group, field	Provides complete federal 401(K) regulation compliance; facilitates on-line pay calculation for manual checks	$45,000 to $140,000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

The products included in these charts were selected on the basis of available market research and interviews with industry consultants and researchers. The list is intended to represent a sampling of the human resource management systems available for large processors. It is not intended to be an exhaustive summary of available products.

* All products were described as fully on-line systems by their vendors.

SELECTED LARGE-SCALE, ON-LINE* HUMAN RESOURCE MANAGEMENT SYSTEMS

Information Science, Inc.	Human Resource Software	IBM mainframes (all standard operating systems); Wang Laboratories, Inc. VS (VS)	Personnel management; EEO reporting; applicant tracking; benefit statement production; payroll processing; health claims processing; pension administration; flexible compensation and defined contribution administration; position control	Not integrated	IBM IMS, DL/1; Software AG Systems, Inc. Adabas	Yes	Yes	Yes
Management Science America, Inc.	MSA Payroll/Personnel System	IBM mainframes (OS, DOS/VSE, MVS); Honeywell, Inc. DPS 8 (Gcos); Sperry Corp. 1100; NCR Corp. VRX; Burroughs Corp. large- and medium-scale systems	Payroll processing; personnel management; compensation and salary administration; career planning (skills inventory, progression planning); benefits administration; employee/labor relations; Occupational Safety and Health Administration compliance; position control; time and attendance reporting; employee history; applicant flow	General Ledger, Forecasting and Modeling System	IBM IMS, DL/1; Cullinet IDMS; Software AG Adabas; ADR Datacom/DB	Yes	No	Yes
Software International Corp.	Human Resource Management System	IBM mainframes (OS, DOS)	Payroll processing; personnel management; applicant tracking; position control; report writer; Canadian version	General Ledger Cullinet IDMS	IBM Vsam, DL/1, ISAM	Yes	No	Yes
Tesseract Corp.	Personnel Management System; Benefits Plan Administration; Payroll Processing; Claims Processing	IBM mainframes (OS, DOS, MVS)	Employee record keeping, training and development; government compliance reporting; employee relations (communications); placement; position control; labor relations; benefits/fund/risk management; time and attendance reporting; labor distribution	Not integrated	IBM IMS, Vsam; Software AG Adabas; Cullinet IDMS	No	No	Yes

ISI Human Resource System	Yes	Yes	Data can be transferred to Criterion micro applications through user link	Yes	On-line security system controls access by password, module, terminal, organization, screen or any combination	Checkwrite feature produces on-line payroll checks; tip processing feature allows for tip (gratuity) income accounting	Mainframe, $125,000 to $250,000 System/38, $35,000/module
HR:M Payroll HR:M Personnel	Yes	Yes	Interactive PC Link provides for data transfer to micro applications	No	Security limits range from organizational/company level down to data element level	Federal 401(K) discrimination testing capabilities; Borderless Query provides information access across M&D products	$65,000 to $200,000
Human Resource Information System	Yes	Yes	No	No	Application-security by such items as department, user, transaction, function, password	Data-sensitive modification feature automatically changes data base records at specified date; tables architecture allows users to table system without coding	$80,000 to $125,000

The products included in these charts were selected on the basis of available market research and interviews with industry consultants and researchers. The list is intended to represent a sampling of the human resource management systems available for large processors. It is not intended to be an exhaustive summary of available products.

* All products were described as fully on-line systems by their vendors.

HRMS buyers urged to fit system to company needs

PRODUCT SPOTLIGHT

What should a potential buyer or developer look for in a large systems human resource management system (HRMS)?

Beyond core features — including a comprehensive personnel data base, ad hoc data access tools, a flexible architecture and integration with payroll (see story page 1) — HRMS analysts said buyers should pick and choose according to their needs from among the wide variety of available functions. The system selected should be flexible enough to accommodate their changing needs.

"The bottom line, from both a cost and efficiency standpoint, is what the data tells you," said Ronald Pilenzo, president and chief operating officer for the American Society for Personnel Administration. "If you cannot answer that question, do not buy the function. You run the risk of getting a system that gives you a lot of nice-to-know rather than need-to-know information.

"You also have to look 10 years out and plan for the data you will need then," he added. "Does the data the HRMS gathers and maintains fit in with the organization's strategic plan?"

Because so much employee data is shared between personnel and payroll — functions that are often handled by different departments within a company — the integration of the two systems is generally considered a necessity.

"What you want is a system that integrates payroll data but is not driven by it," Pilenzo said. "That linkage between payroll and personnel is critical. Some companies have two separate systems, and that can create monumental problems in exchanging data, including long lag times and lost information."

The importance of the payroll/personnel link is not lost on Betty Jo Baker, personnel manager for *The Baton Rouge State Times & Morning Advocate* in Louisiana. Before the newspaper, which employs some 780 workers, purchased a personnel system that could be integrated with the existing payroll system, Baker's staff had to submit all types of employee information manually to the payroll department for inclusion in the payroll system.

According to Baker, that meant a lot of paperwork and a lot of missing or delayed information. She characterized the integrated payroll/personnel system running on the newspaper's Digital Equipment Corp. VAX processor as a godsend that has saved her department a great deal of time.

Personnel-specific data base

Another important characteristic of a sophisticated HRMS is a comprehensive personnel-specific data base that is handled either by the system's data base management system — something relatively few HRMS vendors offer — or through interfaces to one or more widely installed DBMS.

"The system clearly should have a comprehensive data base that is segmented so various users can get control of their respective piece," said Vincent Ceriello, president of Los Altos, Calif.-based VBC Consulting Group, Inc. "With the need to access information quickly and easily, a relational DBMS-based system is especially useful here."

In addition, if the HRMS is to be anything more than simply a storage mechanism or a static reporting tool, it should offer some means for accessing data quickly on an ad hoc basis, either through a flexible report writer or through a query language.

Ceriello also highlighted the importance of data access tools. "Reports used to be just lists," he said, "but now users are looking for [decision support system-type] reports — fourth-generation language-generated or ad hoc reports to aid in planning. The HRMS should offer a complete set of reports, both standard and query driven."

But above all, analysts and users emphasized, the system must be flexible enough to handle both those changes forced on the company by the outside world and the growth and change specific to the company. That flexibility should be embodied in the basic HRMS software architecture that, in the case of many vendors' products, is based on a system of user-definable data tables.

Both users and analysts agreed that the decision to buy a particular HRMS should rest with the end users — the personnel department — based on the guidance, not the dominance, of DP.

"Personnel needs advice and consent from DP," Ceriello said. "Is the HRMS practical? Will it work in our environment? What is our policy on micros? What related software can we support? Those are the kinds of questions DP can answer.

"But the decision of which package to buy should rest primarily with personnel," he continued. "A system imposed on personnel will not fly, even if it is a technical masterpiece. Personnel should say to DP, 'don't tell me what to do, and I won't tell you how to do it.' "

— John Gallant

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Director, Corporate MIS/Operations
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As Michael Lilly says, the company's decision to stake its future in MIS on Digital's VAX computers – and the office automation tools like All-In-1,™ DECnet™ and DECmail™ software that run on them – was hardly a snap judgment.

Every major computer company was considered. Lilly says that, "dollar for dollar," only Digital's VAX system offered the power, ease of use and communications capability with other computer systems – including IBM – that AMF needed.

So AMF chose the VAX computer – the best-selling 32-bit computer in the world – and waited to see what the machine could do.

"SUDDENLY WE HAVE TOOLS AND CAPABILITIES WE NEVER HAD BEFORE."

Lilly and his group didn't have to wait long. The system was up and running within days.

Reaction within the department was rapid and gratifying. "We really got excited about it," says Lilly. "Immediately, we were communicating better." And there was more – spreadsheets and word processing and a mail system. "Suddenly," Lilly said, "we had a vehicle for total open communications to every important person or department in the corporation."

Part of the story behind AMF's almost instantaneous rapport with the VAX system is that it's so easy to use. Menus and operating commands are the same for each fully integrated application. Whole functions are completed in as few as two keystrokes. And because everything is in plain English, it's literally as simple as A-B-C to incorporate

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any VMS™ application into the daily work routine.

"INSTEAD OF SIX WEEKS TO DEVELOP AN APPLICATION, IT TAKES TWO."

VMS software development tools have so improved the way things are done in his department, Lilly says, that he projects the savings in applications development time and costs alone at some 70 percent.

"Many of our new applications here at AMF will be written on that machine. I can't quantify it exactly. All I know is that I'm getting a heck of a lot more bang for my buck."

The first tests of VAX equipment proved so successful, that AMF quickly enlarged the system, adding terminals and DECmate™ and Rainbow™ personal computers. New departments went on line, for example finance.

"And that," says Lilly, "really created an explosion." Now AMF is implementing programs like general ledger systems, stock options and inventory systems, and keeping more efficient and flexible records, from accounts payable to personnel.

Adds Lilly, "People here are screaming to be on the VAX system, and there's got to be a reason for that. And I tend to think that it's return on investment, mailing lists, discounted cash flows, spreadsheets they couldn't even begin to do before, versatility, tremendous graphics potential. It's just a whole world of opportunity that is elevating AMF to the forefront."

"ANYONE WHO USES VAX IS GOING TO GET THE COMPETITIVE EDGE."

Lilly feels the VAX system has already elevated his own department to the forefront.

"It's put corporate MIS on the map," he says. "It has effectively increased productivity and efficiency. People are beginning to believe we can do the things we say we are going to do."

And what VAX technology is doing for his group, Lilly believes, it can do for all of AMF, or indeed for any company. "Any corporation that employs this technology," he says, "is going to get the competitive edge.

"This technology will explode. Because there are a thousand reasons to have it. But what it really all boils down to is this: everybody will want a VAX system because they can do the job better, faster and more efficiently.

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HRMS holds money-saving potential for growing firms

PRODUCT SPOTLIGHT

Although automating formerly manual personnel tasks may not be the primary catalyst sparking increased human resource management system (HRMS) usage today, the move to reduce paperwork and speed employee information processing has been an important factor in that growth.

Damian Rinaldi, director of International Data Corp.'s (IDC) Software and Services Information Program, explained, "The costs associated with managing people have risen dramatically. In large organizations, users can achieve significant savings if the management of human resources is more efficient."

Naomi Lee Bloom, senior principal with the Arlington, Va.-based management consulting firm American Management Systems, Inc., outlined a few of the ways an HRMS can help a company pare costs.

"Companies spend a bloody fortune on recruiting," she said. "It is both difficult and expensive. If you have good position-control and career planning capabilities and can identify appropriate in-house candidates, you can save a lot of money by promoting from within. "Also, in the area of union relations, the most important thing is prompt response to grievances. If you have a tracking system so that nothing about a grievance slips through the cracks, you can contain the costs related to them. That is also true with safety-related incidents."

Record requirements changed

The increasing burden of federal and state directives — such as the Equal Employment Opportunity Commission and Affirmative Action legislation and Occupational Safety and Health Administration guidelines — requiring companies to maintain detailed records and to report regularly on compliance has also been a factor in the spread of HRMS. But that, most observers agreed, has changed somewhat under the administration of President Ronald Reagan.

"Government compliance reporting is not as important a force as it once was," said Vincent Ceriello, president of Los Altos, Calif.-based VRC Consulting Group, Inc. Before founding VRC Consulting, Ceriello worked in personnel systems development at Ford Motor Co., where he helped develop a companywide skills inventory system. He also specialized in custom HRMS development at Information Science, Inc., a vendor of human resource software, and was head of manpower planning for San Francisco-based Bank of America.

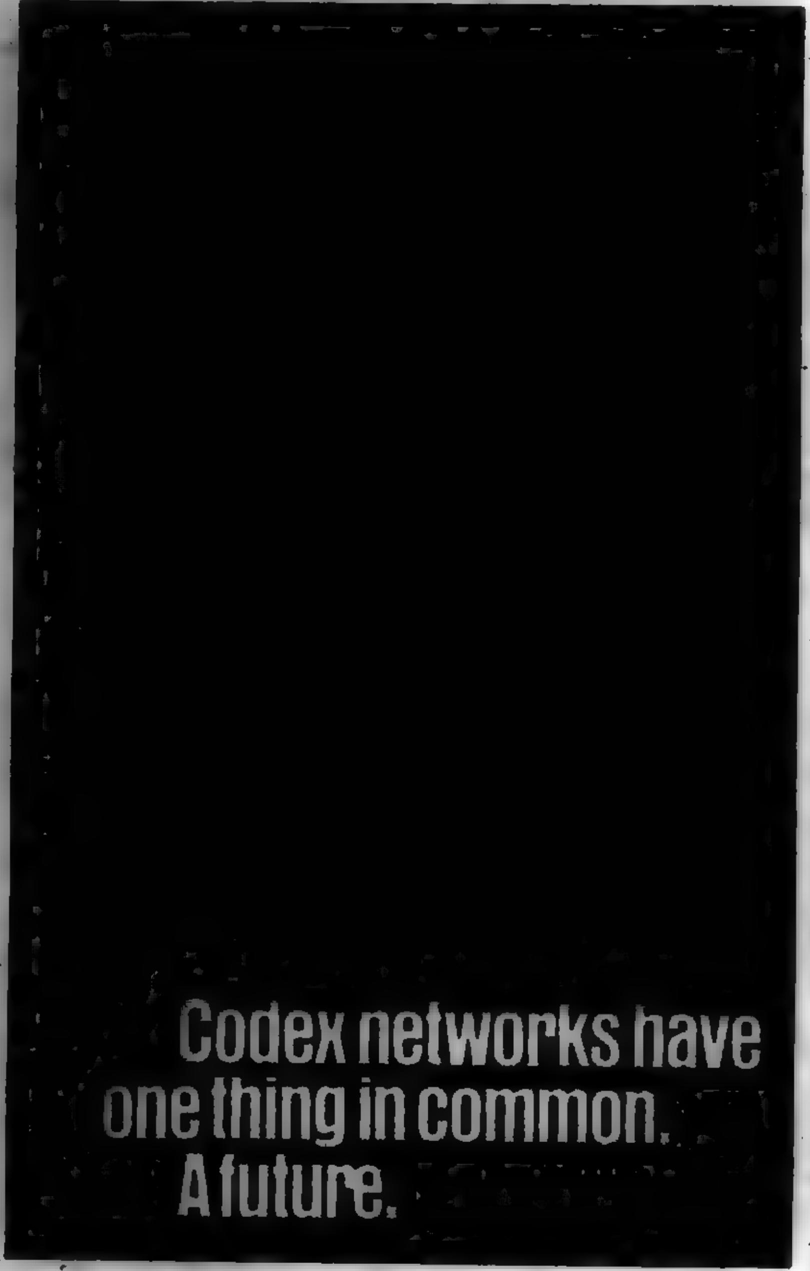
"That is a function of the current administration and of the backlog of cases awaiting action at the various watchdog agencies," Ceriello continued. "It is just not as big a concern to companies and not as big a factor in the push to HRMS. Today, cost containment, benefits and salary management and comprehensive personnel planning are much more important forces."

Nonetheless, only the smallest companies can still handle that type of detailed record keeping and compliance reporting manually. In addition, some recent developments in the field of personnel management have also spurred wider interest in HRMS.

"Compliance reporting initially caused people to look for systems that could automate that function," said Douglas Phillips, manager of professional services for Andover, Mass.-based Software International Corp.'s HRMS product. "More recently, people have turned to these systems for help in managing programs like 401(K) and cafeteria-style benefits."

Also, according to Bloom, interest in multifunction human resource systems has

See HRMS page 34



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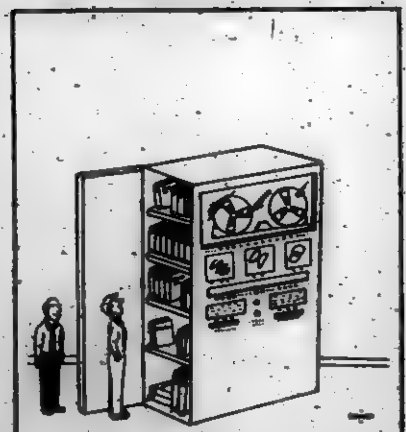
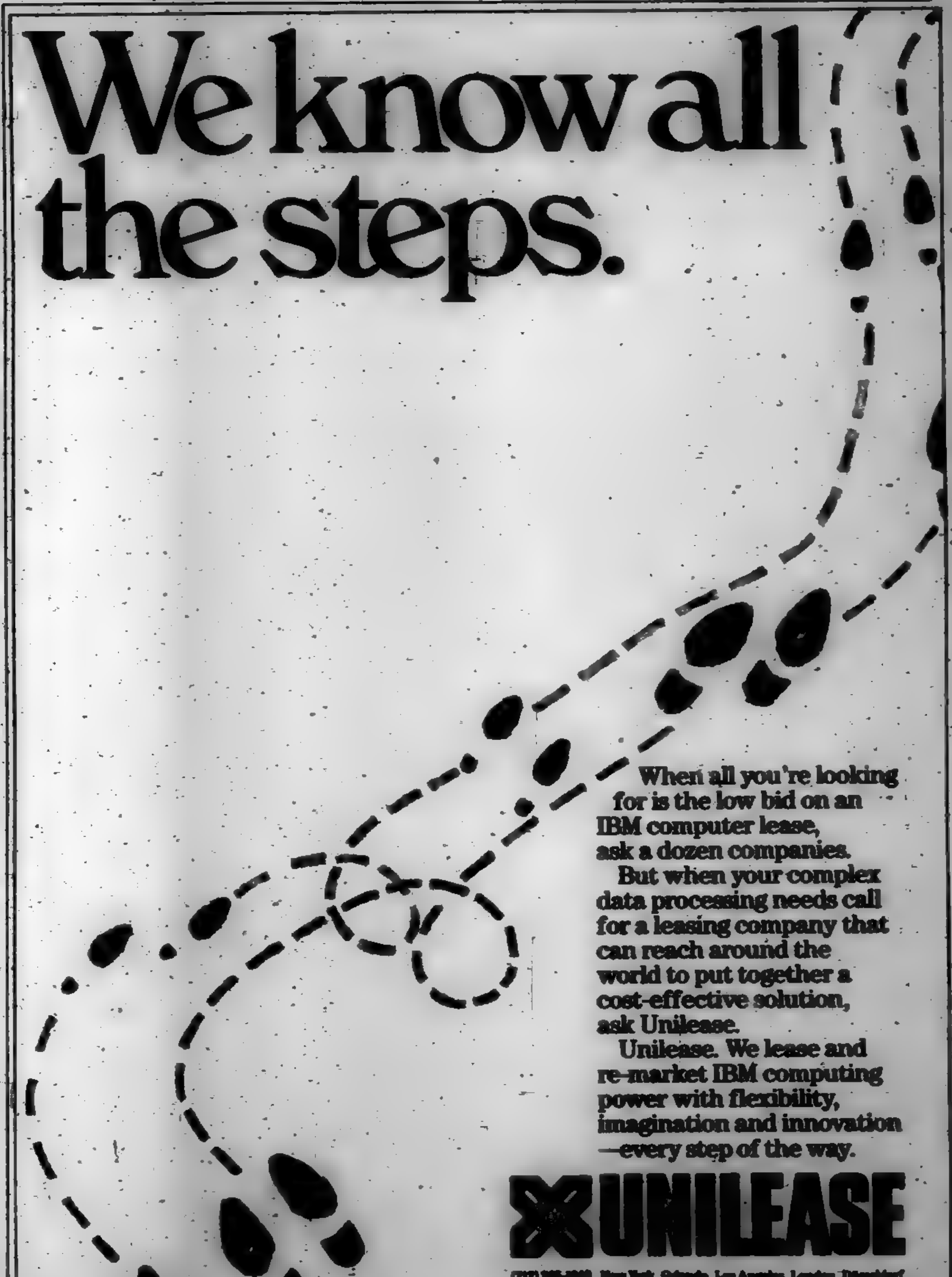


"You're right — it does hold a lot of information."



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Allowing time to fine-tune system pays off for bank

PRODUCT SPOTLIGHT

The exhaustive product evaluation process was complete. Marine Midland Banks, Inc. had finally selected a human resource management system (HRMS).

The Integral Systems, Inc. ISI Human Resource System purchased to run under Cullinet Software, Inc.'s IDMS data base management system on the bank's IBM mainframe was intended to replace an aging, inflexible system that had been developed in-house. A year and a half before the ISI HRMS package was to go on-line, Marine Midland brought the system in-house and began a lengthy modification project.

Was this an incongruous approach to an HRMS implementation?

Not at all, according to William Flannery, administrative vice-president and director of human resources operations and planning for the Buffalo, N.Y.-based bank.

"We had questioned our top executives about their information needs into the coming decade," Flannery said. "Their responses highlighted certain things we felt the [package's] data base had to accommodate, certain vital fields that had to be included. So we enlarged the data base to extend the usefulness of the package beyond its normal life span."

In modifying an already large system, Flannery admitted that Marine Midland was "going down some untraveled roads." For example, modifying the personnel data base forced Flannery's staff to alter the product's report writer. Flannery also said the modifications were expensive.

Thus, he advised potential HRMS users to forego alterations to avoid unexpected difficulties and problems with new releases.

Some would argue that in the amount of time Marine Midland allocated to modifications, the bank could have developed its own HRMS. But Flannery disagreed. "In-house development is not a viable option today," he said. "It is simply too costly and too time consuming."

What is Flannery's advice to prospective HRMS users? "Be certain you clearly specify what you need in a system and understand specifically what the vendor has to offer."

Betty Jo Baker, personnel manager for *The Baton Rouge State Times & Morning Advocate* in Louisiana, also has some advice for people contemplating the purchase of an HRMS. "Make sure it is interfaced to payroll. That has been a godsend for us," Baker said. The newspaper uses Collier-Jackson, Inc.'s CJ/Personnel system running on its Digital Equipment Corp. VAX-11/780 processor.

Because the HRMS is linked to the CJ/Payroll package on the VAX, Baker said, information flow between the paper's personnel and payroll departments has improved. Lost and delayed paperwork is no longer a problem. The HRMS has also eased the staff's regulation compliance reporting work load and has allowed Baker to set up an applicant tracking system to manage information on the approximately 2,500 people who apply for employment each year.

"We even set up a hot list of more qualified applicants that the system generates based on, say, the levels of education or experience we request," Baker said. "We can just call up the list instead of wading through [the list of] all those other applicants."

— John Gallant

Lotus on a VAX?

dBASE II on a VAX?
Friday! on a Micro VAX?
Condor on a PDP-11?
PFS:File on a PRO?
Personal Pearl on a VAX?
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Spellbinder on a VAX?
WordStar on an MV10000?
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Multiplan on a PDP-11?
PL/M on a VAX?
SuperCalc 3 on a PRO?
T/Maker Integrated on a VAX?
MS BASIC on a Micro VAX?
Milestone on a PDP-11?
Palantir on a PDP-11?
SpellStar on a PRO?
MailMerge on a PDP-11?
PMS II on a VAX?
dBASE II on a PDP-11?
Lotus 1-2-3 on a PDP-11?
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Spellbinder on an Eclipse?
Friday! on a VAX?
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RM/COBOL on a PDP-11?
RTCS/UDI on a VAX?
Mass-11 on a PDP-11?
Milestone on an Eclipse?
Lotus 1-2-3 on a Micro VAX?
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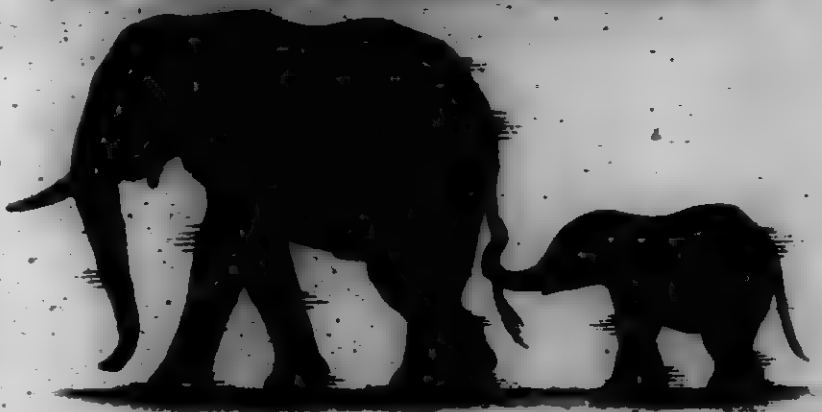

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Speaker says bias colors criticism of federal DP shops

By [illegible]
CW Washington Bureau

WASHINGTON, D.C. — Computer managers in the U.S. government have been unfairly criticized for years by outsiders who failed to understand the unique characteristics of federal DP systems.

That was the opinion of Robert V. Head, a 13-year veteran of government DP management and keynote speaker at the 11th Annual Federal DP Expo & Conference held here recently.

Head said recent studies critical of federal DP management were conducted by outside experts and thus contained a built-in bias that the government should operate its information systems as private industry does.

The speaker noted four reasons why government data systems are unique:

- The federal government's $15 billion DP operations are much larger than those of private firms.
- With size comes complexity — more subsystems to design, more lines of code to write and more interfaces to specify.
- Federal information processing is conducted in a goldfish-bowl atmosphere in which expenditures and blunders get publicity.
- Laws and regulations make managing federal systems more difficult than managing systems in the private sector.

Head gave the keynote speech shortly before his scheduled retirement from government service. He is currently an assistant to the commander of the Federal Computer Performance Evaluation and Simulation Center, a technical services organization that supports computer planning for military and civil agencies.

To garner more respect for the government computing community, Head urged federal DP professionals to take a more active role in improving their public image.

He also recommended that agencies respond to increases in end-user computing by setting standards for hardware and software compatibility and by abandoning the 20-year-old policy of centralized supervision of DP.

HRMS

from page 30

only sprung up relatively recently because the technology driving the functionality of such systems has only been perfected in the past 10 years.

More sophistication

"Payroll was straightforward and easy to automate," Bloom said. "But personnel is . . . tough to automate. It does not boil down to algorithms. That is why the early human resource systems were only simple record keepers, just data fields added to payroll. Today, HRMS is much more sophisticated and includes decision support, modeling and analytical capabilities. These technologies themselves are relatively new."

Whatever the forces behind its growth, observers such as Phillips and Rinaldi agreed that the market for human resource software is expanding rapidly. IDC estimated that in 1984 independent software vendors earned some $305 million from the sale of such systems. That figure represented an almost 45% increase over sales in 1983.

This year, according to IDC, the independents will garner approximately $440 million from the sale of HRMS, a 43% jump over 1984 figures. IDC's estimate for 1989 puts that sales figure at roughly $1.75 billion.

— John Gallant

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Data Communications Systems Analyst
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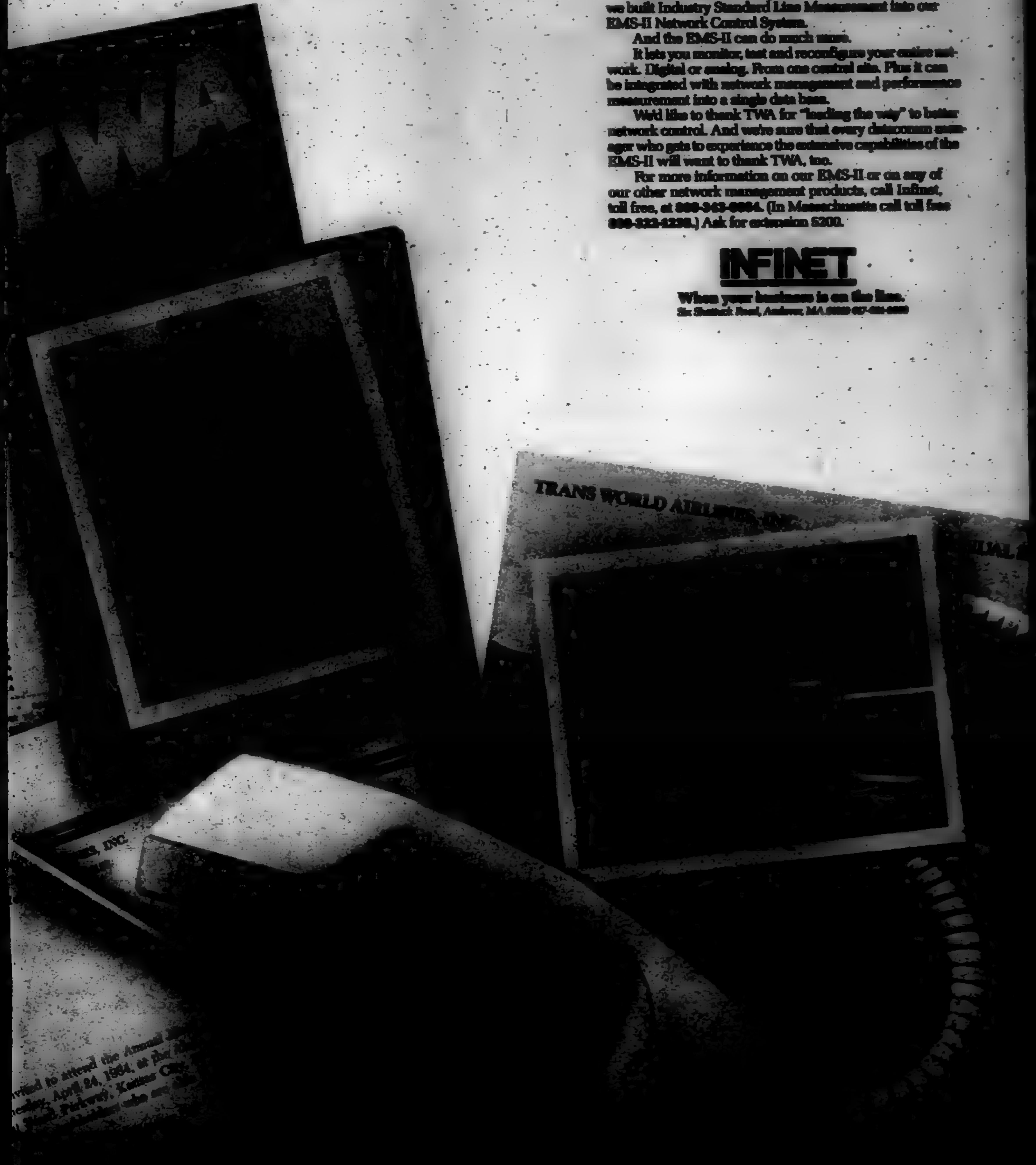
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NEWS

INTERNATIONAL REPORT
CW International News Network

DENMARK

COPENHAGEN — Datateam, a two-year-old Danish wholesaler, has acquired its Swedish competitor, Owell Plus, for an undisclosed amount of money, according to a company source.

The union of the dealers' assets strengthens Datateam's position in the personal computer and add-on markets, a spokesman said. Datateam now has subsidiaries in Norway, Sweden and Finland.

■

COPENHAGEN — Nixdorf Computer AG will terminate its cooperative agreement with Logatron, its Danish agent, at the end of 1987. Since 1976, Logatron has represented Nixdorf throughout Scandinavia, but within the past few years, the firm lost its contract to sell the Nixdorf product line in Norway and Sweden. Sales of Nixdorf's products in Denmark will now be handled by a Nixdorf subsidiary.

ENGLAND

LONDON — Lloyd's Bank International has begun implementing a worldwide network linking operations in 47 countries with Sopho-Net from Philips Telecommunications B.V., the Dutch communications giant.

The Sopho-Net system will handle data, text, foreign exchange conversion, letters of credit, interbank information and electronic mail traffic over five nodes located in London, Tokyo, Hong Kong, Paris and Madrid. Another 32 nodes are in the process of being installed, according to a spokesman.

Some 20 different bank applications running on equipment from IBM, Digital Equipment Corp., Wang Laboratories, Inc., Perkin Elmer Corp. and General Automation, Inc. will reportedly be linked by Sopho-Net.

■

LONDON — British computer maker Systime has given new meaning to the phrase "catch-22." Facing a $500,000 fine imposed by U.S. authorities for shipping Digital Equipment Corp. PDP-11 minicomputers to Pakistan and Iraq in 1981 without appropriate U.S. re-export licenses, the company has now been told it will be fined by the European Parliament for breach of European Economic Commission trade regulations if it pays the U.S. fine.

SWEDEN

STOCKHOLM — Unsatisfied with the fruits of its recent research, the Swedish government is continuing to probe the possible connection between birth defects and VDT-related work, according to Anna Greta Leijon, a government minister.

"To date, we have no sufficient proof showing a direct correlation between birth defects and [VDT-related work], but at the same time it is not absolutely clear that there is no risk either," Leijon said.

She will consult with representatives of labor and management to see if it is possible to allow pregnant VDT workers to be fill other positions during their pregnancies. "If we can't arrange it through negotiations, we will have to consider legislation," Leijon stated. She added that manufacturers should increase efforts to find alternatives to VDTs.

■

STOCKHOLM — Management Science America, Inc. (MSA) has opened a subsidiary here, which will be responsible for MSA product sales and support throughout Scandinavia. "We are counting on quickly gaining a large market share," said Mats Sofors, president of MSA in Sweden. Last year, before establishing the Swedish office, the company sold $900,000 worth of software in Sweden through its British office. "We expect [sales of] $2.5 million for 1986," he added.

WEST GERMANY

MUNICH — German plug-compatible manufacturer BASF plans to bring its upgraded top-end mainframe to the market at least six months ahead of IBM's 3090 series, sources reported. BASF's 7/90-2 and 7/90-4 models, built by Hitachi Ltd., will be available during the second quarter of 1986, while IBM's fastest machine, the 3090 Model 400, is not expected to appear until mid-1987.

In performance, the BASF 7/90-2 corresponds with IBM's Model 200, and the 7/90-4 is comparable to the IBM Model 400.

Dexpo West '85 set for Dec. 11

PRINCETON JUNCTION, N.J. — The eighth national exhibition of equipment for Digital Equipment Corp. systems will be held Dec. 11-13 at the Anaheim Convention Center in Anaheim, Calif.

Dexpo West '85 will feature exhibitors of software, hardware, systems and services that are compatible with the DEC line of computers.

Cost of admission to the show is $5.

More information is available from Expoconsul International, Inc., Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

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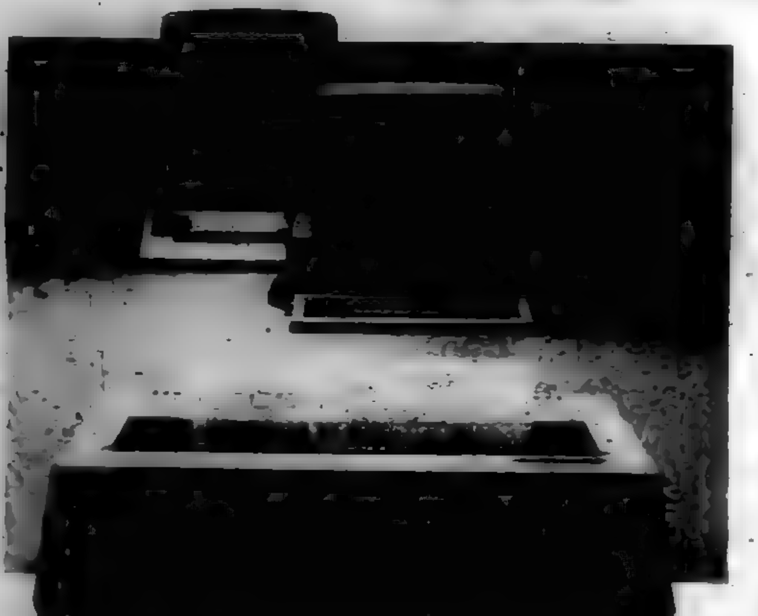

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The CX 3180 even features dual legends on its sophisticated front panel controls. One set emulates the IBM 3287 and the other works for your PC—or for any other ASCII computer. And the parameters are switch-selectable.

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The words above are taken from a 35-page white paper written by Software International, the company whose first general ledger package actually started the applications software industry 15 years ago.

Entitled, "Setting Standards In Mainframe Applications Software," the report may be the first of its kind—the first ever to set down on paper the standards appropriate for application software products.

In it are ten guidelines suggested as standards in the design of applications software as well as standards which cover product installation, customer service and support. In short, standards for how a professional software vendor should build its products and how it should treat its customers.

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ROSEMEAD, Calif. — An electric utility company here is using business applications ranging from managing a nuclear power facility to improving customer service and meter-reading processing.

Southern California Edison (SCE) is one of the nation's largest public utilities, providing electricity to approximately 3.5 million residential, commercial and industrial customers in 800 Central and Southern California cities and towns.

An IBM customer since 1973, SCE runs most of its business applications on two IBM 3084s and an IBM 3081 processor, known as the computer complex because information can be transferred among them, according to John R. Fielder, manager of the computing services division. It supports 128 IBM direct-access storage devices, 4,000 IBM 3270 on-line terminals, four IBM 3800 printing subsystems and numerous other peripheral devices.

SCE was one of the first companies to install IBM's MVS/XA operating system. This software architecture is said to enhance the 3084s, allowing SCE to obtain more storage capacity with a minimum of system changes.

Three major DP needs

"Our IBM configuration [3084 Model Qs running MVS/XA] helps us respond to three major data processing needs within SCE," Fielder said. "First, it accommodates a large portfolio of batch and on-line business applications. Second, it handles our growing office/information center operations. And third, it enables the development of new and critical applications."

A 3081 Model K was upgraded to a 3084 Model Q in one day in April 1983. About a year later, a second 3084 Model Q was installed also in one day, according to Fielder.

One 3084 Model Q processes approximately 690,000 transactions and makes daily inquiries through the company's Customer Information System, an application developed by SCE. About half are customer inquiries that go to field and service representatives, who receive the information through on-line terminals, Fielder said.

"Our customer service department handles all kinds of transactions and interactions," Fielder explained. "When a customer establishes credit, or someone requests that service be turned on or off, a transaction occurs, and a record is generated in the IBM system."

The system produces an average of 186,000 bills each working day. These are printed by four 3800 laser-based printing subsystems.

Another SCE-developed application is a Material Management System that coordinates supplies necessary for the construction and maintenance of electrical facilities and equipment. Subfunctions include acquisition analysis, assembly maintenance and physical inventory.

Management information about SCE's San Onofre Nuclear Generating Station near San Clemente, Calif., is also maintained by the system. Information about plant maintenance, administration, safety and staff training is available, Fielder said.

The other 3084 Model Q supports an information center — a facility that provides help for professional and clerical staff. "With terminals and IBM Personal Computers, the staff can generate graphics, handle simple data base applications, develop models and perform spreadsheet functions," Fielder said.

"Our office systems group is directing text processing applications to an IBM configuration to take advantage of extended functions available through the mainframe connection," Fielder noted.

Twenty IBM 5520 administrative systems support between 200 and 300 users. Approximately 50 3270 Personal Computers and several IBM Displaywriters tie into the central network, or will soon, using IBM's Distributed Office Support System as the host software, Fielder said.

Roughly 360 applications programmers who develop programs and maintain existing ones use the 3081.

The 3084s are also at the heart of a system to improve the processing of meter readings, Fielder said.

Currently, the utility's 545 meter readers read an average of 380 meters daily and log the data on special forms scanned by optical character readers. Soon, they will enter meter readings on special devices that resemble hand-held calculators. The data will be recorded on microcassettes inside the devices.

At day's end, information on the microcassettes will be sent by telephone lines to five IBM Series/1 computers, which will pass it on to a 3084 for billing purposes.

The program is expected to be fully operational by early next year.

"This will increase the accuracy of the readings and improve our service to customers, as well as reduce the paperwork for the meter readers," Fielder said.

SCE recently installed an IBM performance improvement option on the 3084 Model Qs to increase internal execution speed by about 6%.

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OFF THE PRESS
George Harrar
CW Senior Editor

CHARGED BODIES
By Thomas Mahon

Here's another book for mainframe types who make their living far from the "People, power and paradox in [the] Silicon Valley," mentioned in this book's subtitle.

This work is more biography than it is history — the microcomputer takes a back seat to the people who invented it and marketed various parts of it.

The author labors to sell the glamour and importance of the valley. Here is, he said, "perhaps the most far-reaching inquiry ever into the nature of intelligence. Combined with research in bioengineering and artificially intelligent software, this inquiry may extend dramatically our sense of who we are and what we can do, and affect our very evolution . . . A thought breakthrough waits ahead of us, in comprehending who we are and how to proceed from here. It may come from a supercomputer, from a radio signal sent by an advanced civilization or from another tormented, inspired loner." Wherever this idea is germinated, it will owe a debt to the community of Silicon Valley, Thomas Mahon said.

He likes to create myths, for instance, about the swift, all-powerful venture capitalists: "Their communications network is reputed to be instantaneous. And lethal if need be. The entrepreneur who is discovered trying to put something over on his backer or prospective backer — withholding some element of risk, or overstating the product's capabilities, for example — will not only find these negotiations terminated, but discover that the resulting bad rep will likely extinguish the chance of future deals anywhere else as well."

Another example: "The relationship of the founder to his or her business/social entity is as complex and as deeply felt as the love-hate relationship Michelangelo had for the Sistine Chapel ceiling."

A reader with a high tolerance for such hyperbole can find interesting stories here: Robert Noyce, commenting on the simultaneous discovery of the integrated circuit in two places, says that it was an idea whose time had come. If he or Jack Kilby had not made the discovery, somebody else would have within a year or two.

Alan Shugart, who moved on to cofound Seagate Technology, Inc., reflects on competing against the company that still bears his name: "It used to bother me in the early days when I would hear people complaining about [Shugart Corp.]. Now I see it in the paper all the time, and it doesn't bother me. [People] don't even recognize it as my name, I guess."

The author describes the evolution of George Morrow's company from Morrow's Micro Stuff to Thinker Toys, Inc. to Morrow Designs, Inc. There is also an interesting section on Stanford University's evolution into "The Harvard of the West." And Mahon relates reactions of friends who come up from Los Angeles to the valley. They often ask, "How can you stand it? It feels as if it's going to implode!"

When he finds a dissenting voice to life in the fast track here, the author nimbly renames the place Paradox Valley, suddenly so complicated that no "Baedeker, no Virgil" (did he really write this?) could presume to be the single guide.

Hardcover, 330 pages, $15.95, ISBN 0-453-00457-3. New American Library, 1633 Broadway, New York, N.Y. 10019.

THE REGIS TOUCH
By Regis McKenna

The image makers typically stand behind the images they create. Not so for Regis McKenna, whose face and thoughts regularly appear in national magazines.

He is often, literally, the story who steps out from behind the story.

Now, this consummate public relations man — or marketing consultant, as the book jacket describes him — has taken up the pen to tell others how he helps companies pitch themselves. His suggestions include the following:

- Building strategic relationships with suppliers, distributors and customers is more important than "low prices, flashy promotions or even advanced technology."
- Advertising to the masses is less important than reaching the 10% — the retailers, analysts, journalists and "luminaries" — of any industry that influence the other 90%. (IBM failed here with the PCjr.)
- "When a company is able to develop the infrastructure fully, it is almost impossible for its product to fail." (Lotus Development Corp. succeeded here with 1-2-3.)
- "Whichever company modifies its product most quickly and most effectively will win the product-positioning battle."

McKenna grew up professionally with Silicon Valley. He recognized that high-tech companies required more than the traditional public relations and advertising [illegible]. He involved himself in the business strategy of the companies he took on as clients, [illegible] marketing money should be spent creating a

See [illegible] page 42

THAT DOES IT ALL:
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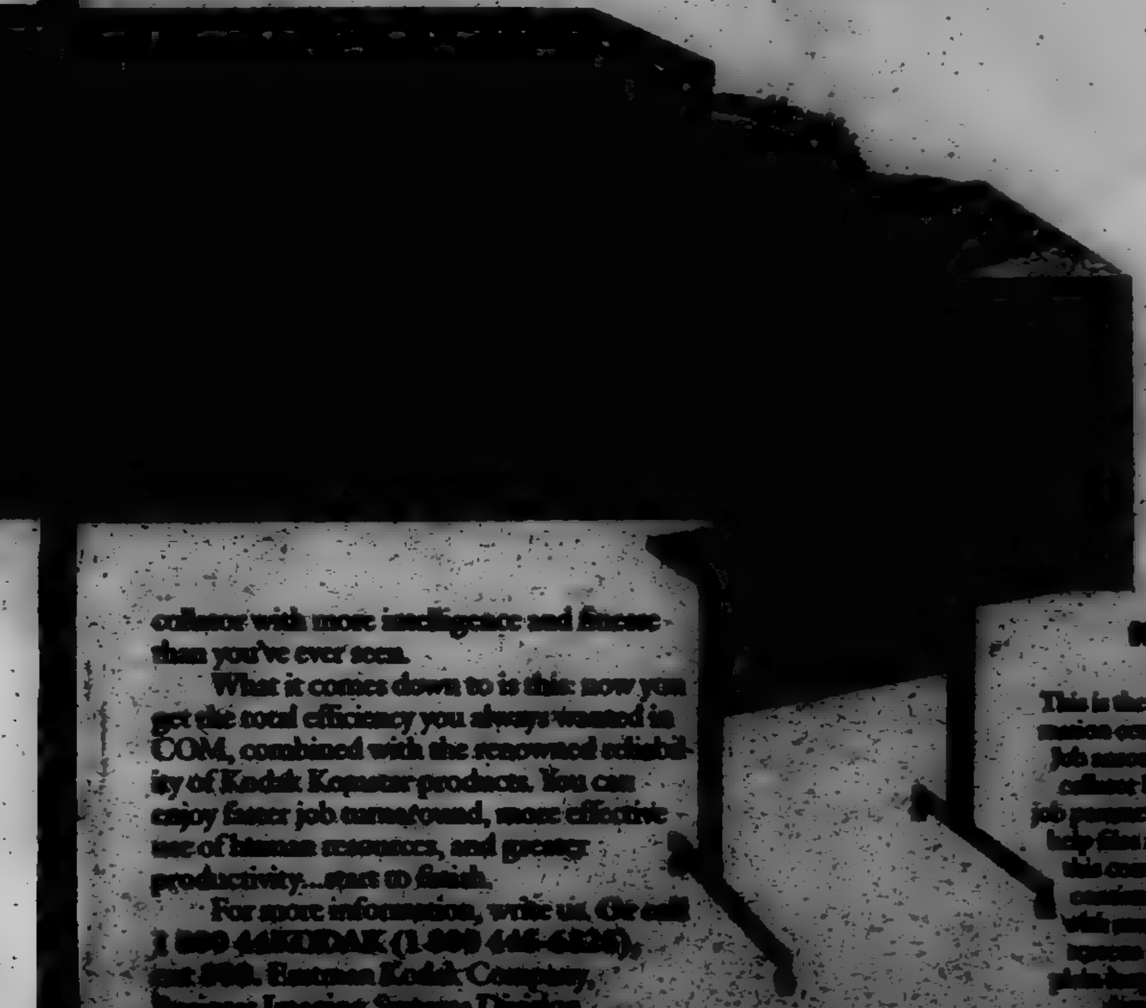

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Qume

BOOKS

from page 38

lasting image, not a fleeting message. The marketing-driven approach, he said, relies on advertising and promotion; the market-driven approach emphasizes strong products, understanding the customer and building relationships.

McKenna is a quotable marketing man. He wrote: "Customers are always enthusiastic about future products, but they don't necessarily buy the products once they are introduced. In many cases, there seems to be an infinite demand for the unavailable." About market projections, he said: "You can choose any numbers you want and reach any conclusions you want."

Much of the book is general advice and as such is fine to read but difficult for a company to apply.

Readers get an interesting view here of what companies in an increasingly competitive and unforgiving market are doing to sell themselves. The book presents an unintended message to users: Sort out what products and companies actually offer from what they seem to offer. Take back the control the vendors and the image makers exercise over the variables in making purchase decisions.

Hardcover, 179 pages, $15.95, ISBN 0-201-13981-2. Addison-Wesley Publishing Co., Reading, Mass. 01867.

OUT OF THE INNER CIRCLE

By Bill Landreth
with Howard Rheingold

To a hacker, perfection is breaking into a system and using it undetected.

So said Bill Landreth, alias "The Cracker," a 19-year-old hacker wizard arrested in 1983 for tapping into the GTE Corp. Telemail network. Landreth was a member of the "Inner Circle," a band of hackers, approximately 10 of whom had their personal computers, modems and even telephones confiscated by the FBI.

Landreth pleaded guilty and was sentenced to three years probation and ordered to pay GTE $87 for unpaid telephone charges. Now The Cracker is in print with a hacker's guide to computer security.

Out of the Inner Circle tells who hacks and why, as well as how they do it. The book points out the weak links in security and the devices used to correct the problems.

"User friendly," Landreth said, is often synonymous with "hacker-vulnerable." Machines running AT&T's Unix and Digital Equipment Corp.'s Tops, RSTS and VMS operating systems are favorite targets.

Early versions of Prime Computer, Inc.'s Primos did not require passwords for logon, although Primos is now among the most secure of operating systems, Landreth writes.

"The hackers' world as a whole does not contact IBM systems nearly as much as it contacts other systems," Landreth said.

The Cracker's chief advice for combating hackers is to educate users, whom he calls the weakest link in the security chain. When a hacker is discovered, Landreth recommended that the system operator enlist the hacker's aid before neutralizing him.

Paperback, 230 pages, $9.95, ISBN 0-14-087-139-X. Microsoft Press, 10700 Northup Way, Box 97200, Bellevue, Wash. 98009.

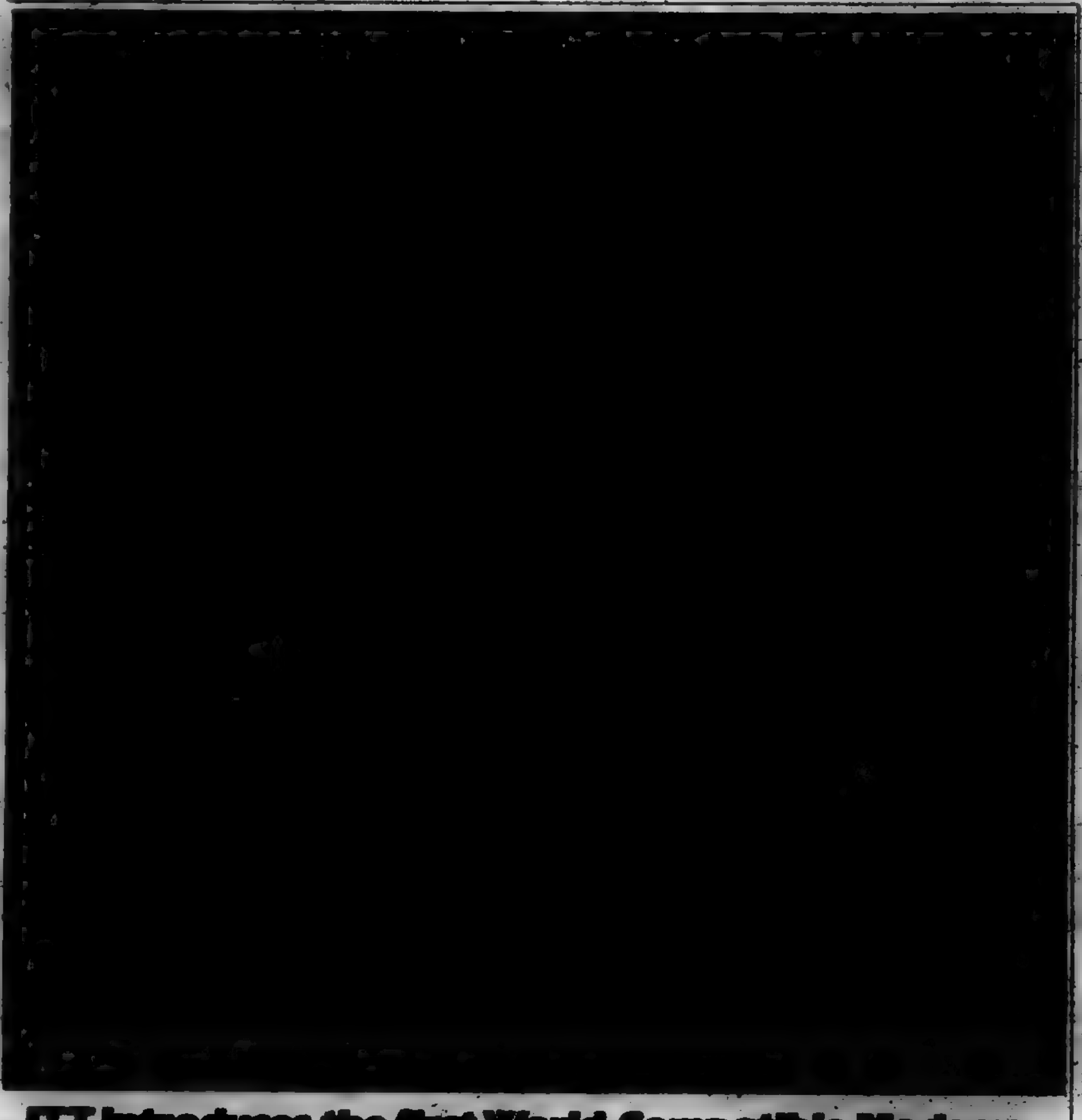
—John Desmond

BOOKS OF NOTE

THE COMPLETE IBM PERSONAL COMPUTER, a guide to hardware for expanding the Personal Computer, Personal Computer XT, AT and compatibles, by Seth Novogrodsky, Frederic Davis and the editors of *PC World* magazine. Paperback, 281 pages, $16.95, ISBN 0-671-49278-0. Simon & Schuster, Inc., Rockefeller Center, 1230 Ave. of the Americas, New York, N.Y. 10020.

ARTIFICIAL INTELLIGENCE & ROBOTICS: FIVE OVERVIEWS, examines AI technology and reviews the state of the art. Hardcover, 618 pages, $99.50, ISBN 0-89934-227-2. Business/Technology Books, 14 Evergreen Drive, Orinda, Calif. 94563.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.



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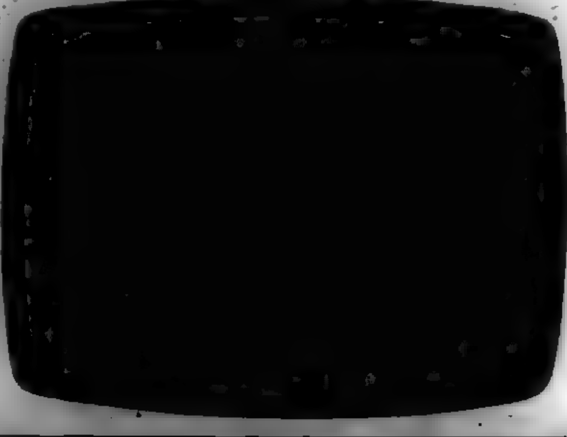

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[illegible] ON THE MOVE

GEORGE SCHERER was promoted to director of data processing and systems operations of New York Racing Association, Inc.

Prior to his promotion, Scherer was systems manager at Honeywell, Inc. from 1965 to 1980 and served as an IBM sales representative from 1963 to 1965.

Scherer, who has served as director of systems, assistant director of Mutuels Tote System and DP, also assisted the director of mutuels in day-to-day operations.

The promotion was part of a reorganization implemented which realigned the responsibilities of more than a dozen of the association's top management members.

The New York Racing Association operates New York's Aqueduct, Belmont and Saratoga racetracks.

Scherer graduated from King's College in Wilkes-Barre, Pa., in 1962.

■

RCA Government Communications Systems Division has appointed **BILL MOORE** as director of information processing systems in Camden, N.J.

In his position, Moore has overall responsibility for the design, development, production and fielding of a wide range of equipment and systems used by classified customers to collect, distribute and analyze information.

Previously, he was manager of programs management, a position he held since joining RCA in 1983.

Prior to joining RCA, Moore served for 31 years with the National Security Agency (NSA) in Fort Meade, Md., where his last assignment was special assistant to the deputy director of research and engineering. While with NSA, he held management positions in research and engineering, long-range and strategic planning, program management, contact administration and procurement.

From 1977 to 1983, Moore was responsible for the design, development and acquisition of line-of-sight systems for the cryptologic community, conducting a technology development effort that resulted in the successful translation of real-time spectrum analyzers, digital signal processors, acoustical-optical receivers and tunable millimeter-wave receivers into systems.

For four years, from 1973 to 1977, he was responsible for life-cycle support of the U.S. Signal Intelligence systems.

He holds a bachelor of science degree in engineering from the University of Arkansas.

■

JOSEPH MOTTO has been named management information systems director of the city of Phoenix.

Motto has 24 years of experience in the information processing field.

Prior to this, he was management information director for the city of Charlotte, N.C., for 12 years.

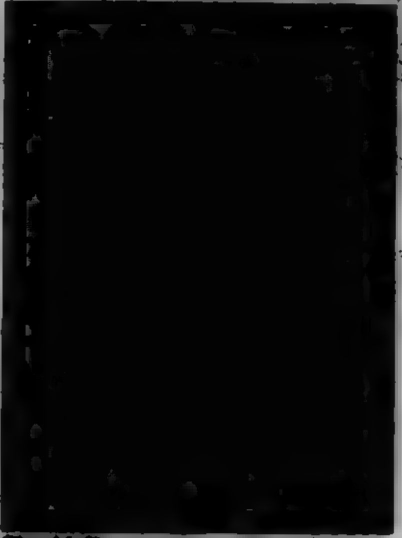
Before working with the city of Charlotte, Motto spent more than 12 years with Systems Development Corp., working either on weapon control systems or as an assistant technical director for the integrated municipal information systems project for Charlotte.

As MIS director, Motto was instrumental in two computer conversion efforts. The first was in 1974 from RCA Corp. to Burroughs Corp., and the second was in 1983 from Burroughs to IBM. He also established a microcomputer support capacity for city departments as well as introducing office automation techniques, including electronic mail and word processing.

Motto has a bachelor of science degree in geology from Pennsylvania State University and a master's degree in urban administration from the University of North Carolina at Charlotte.

■

GORDON SHACKLETT has joined



Shacklett

Summagraphics Corp. as director of information systems. His responsibilities include directing computer operations, programming and systems development.

Shacklett comes to Summagraphics from National Micronetics, where he was data processing manager.

He holds a bachelor of arts degree from California State University at Fresno.

Founded in 1972, Summagraphics is a leading manufacturer of digitizers and a supplier of low-cost computer-aided design systems.

■

JEFF LAUFHUTTE has joined Prodigy Systems, Inc. as manager of information systems, a new position.

Prodigy recently formed a management information systems department and is installing a computer system to integrate its purchasing, inventory, billing and delivery functions.

Laufhutte was a former management consultant with Arthur Young & Co.

Laufhutte, as a consultant to Top Rank, Inc. in New York, a promoter of prize fights, developed a data base system to track the records of boxers throughout the world.

He holds a B.A. in Computer Information Science and an MBA in Management Information from Iona College in New Rochelle, N.Y.

■

MICHAEL F. JOHNSON, MICHAEL R. FROST, H. LEE WEST, R. KEITH CAMPBELL and **W. TOM HENRY** have joined or been promoted by Coca-Cola Bottling Co. in Charlotte, N.C.

Johnson is director of management information services. He will assume responsibility for all corporate data processing functions.

NEWS

Prior to joining Coca-Cola, Johnson was a senior manager with Price Waterhouse & Co. in its management consulting services division.

He graduated from Virginia Commonwealth University with a bachelor of science degree in business administration and management.

Frost joined Coca-Cola as manager of systems and programming. He will have overall responsibility for the evaluation, development, implementation and maintenance of central corporate management information systems.

Previously, he was a senior systems analyst with Ingersoll-Rand Co. in Charlotte, N.C.

Frost holds both undergraduate and graduate degrees from the Georgia Institute of Technology in applied mathematics and information systems.

West has joined the company as manager of technical services. He will be responsible for all technical software support functions.

Previously, he served as the data base administrator for Ingersoll-Rand in Charlotte.

He graduated from Lynchburg College in 1978 with a bachelor of science degree in business administration.

Campbell has been promoted to manager of operations and will be responsible for all facets of the company's data processing operations.

Campbell joined the company in 1974 as a computer operator and has held various positions within the department. These positions have been in both the operations and systems areas.

Henry has been promoted to manager of branch support systems. In this position, he will have overall responsibility for the development, implementation and maintenance of information systems used by outlying branch operations.

Henry joined the company in 1983 and was project manager in the systems area. Previously, he was employed by Computer Systems, Inc. as manager of the computer services division.

Henry graduated from Limestone College with a bachelor's degree in business administration.

■

JOHN J. FLAHERTY has been named manager of computer services at Boston Gas Co. He is responsible for the company's computer technology and computer operations.

Flaherty

Flaherty joined Boston Gas in 1970 as a management trainee and served in several capacities in the company's information services department, including assistant manager of computer services and director of computer operations.

He is a 1966 graduate of Boston College High School and received his bachelor's degree in business administration from Boston College in 1970.

■

ALAN GUIBORD has joined Timeplex, Inc. as vice-president of management information systems. His responsibilities include information processing, data center operations, office automation and telecommunications.

Most recently, Guibord has been senior director of MIS at Gould, Inc.'s computer systems division in Fort Lauderdale, Fla.

Previously, he was director of management information systems for Inforex, Inc., both prior to and following its acquisition by Datapoint Corp.

■

RICHARD D. KERR has been appointed director of corporate information resource management for Johnson Wax in Racine, Wis.

Kerr joined Johnson Wax in Canada in 1961. He has held a number of management positions in corporate information resource management, both in the U.S. and in Europe, including director of information resource management support — Americas, Pacific and Far East — and director of information resource management support — corporate and U.S. operations.

Since January of 1983, he has been assigned as assistant to the executive vice-president of U.S. consumer products.

He graduated from Marquette University with a B.S. in finance and mathematics.

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More information about the First Annual International Computer Graphics Image Contest is available from Richard Pichora, Raster Technologies, 9 Executive Park Drive, North Billerica, Mass. 01862.

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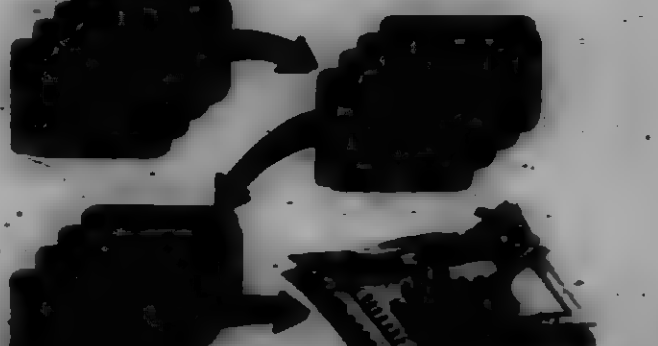

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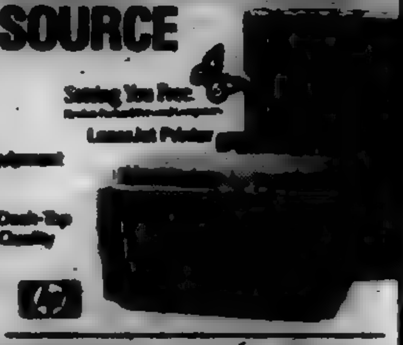

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CALENDAR

WEEK OF JUNE 9

JUNE 10-11, NEW YORK — **Strategic Planning and Information Systems.** Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

JUNE 10-11, FORT LEE, N.J. — **CICS/VS Performance and Tuning.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 10-12, NEW YORK — **Data Communications Network Design, Integration and Applications.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 10-12, FORT LEE, N.J. — **Vsam: Its Structure and How to Use It.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 10-14, ATLANTA — **CICS/VS Internals.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 10-14, BOSTON — **CICS/VS Application Programming — Command-Level.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 10-14 in Chicago and Los Angeles.

JUNE 10-14, CHICAGO — **Fourteenth Annual Meeting of the Mumps Users Group.** Contact: Conference Department, Mumps Users Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 10-14, NEW YORK — **CICS Command-Level Programming.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 10-14, ATLANTA — **CICS/VS Application Programming — Macro Level.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 10-14 in San Antonio.

JUNE 12-13, FORT LEE, N.J. — **Recovery/Restart.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 12-13, BOSTON — **Tools and Approaches for Managing the Applications Base.** Contact: Registrar, Nolan, Norton & Co., One Forbes Road, Lexington, Mass. 02173.

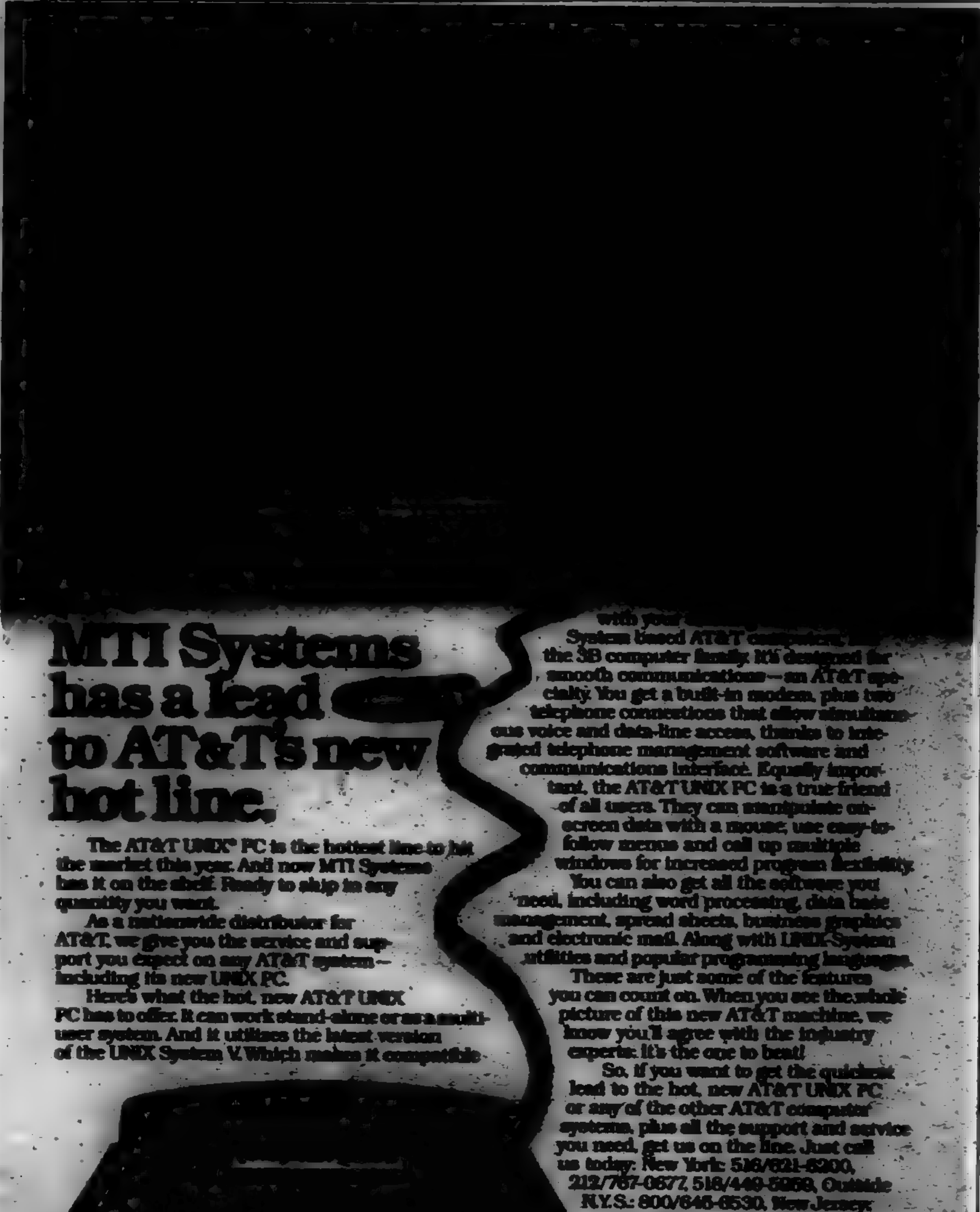
JUNE 12-14, ANAHEIM, CALIF. — **Info/West: The Western Information Management Exposition & Conference.** Contact: Show Manager, Info/West, 999 Summer St., Stamford, Conn. 06905.

JUNE 13-14, SAN FRANCISCO — **Pacific Telecom and Telecommunications.** Contact: Telestrategies, Inc., P.O. Box 811, McLean, Va. 22101.

JUNE 13-14, LOS ANGELES — **Data Communications and Networking for the IBM Personal Computer and Other Personal Computers.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810. Also being held July 8-9 in Atlanta and July 22-23 in New York.

WEEK OF JUNE 16

JUNE 17-18, NEW YORK — **Managing the Data Center.** Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.



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JUNE 17-18, TORONTO — **Planning Corporate Communications Networks.** Contact: Sheridan College of Applied Arts & Technology, Conference Centre, Trafalgar Road, Oakville, Ont. L6H 2L1, Canada.

JUNE 17-19, PHILADELPHIA — **Administrative Management Society (AMS)/Penn Expo.** Contact: AMS, c/o 119 Avant Garde, Kenner, La. 70065.

JUNE 17-19, NEW YORK — **Third Annual PC Expo Conference Program.** Contact: PC Expo, 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

JUNE 17-19, HOUSTON — **CICS Internals for Systems Programmers.** Contact: Betty Bruce, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

JUNE 17-19, TORONTO — **CICS Command-Level.** Contact: Betty Bruce, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

JUNE 17-20, NEW YORK — **The National Data Base and Fourth-Generation Language Symposium.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 17-21, LOS ANGELES — **Structured Analysis & Design Techniques Workshop.** Contact: Elise Rabelais, Learmoth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

JUNE 17, CAMBRIDGE, MASS. — **Center for Information Systems Research's 10th Annual Summer Session.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-19, BOSTON — **Backup Network Planning.** Contact: EDP Security, Inc., 181 West St., Waltham, Mass. 02154.

JUNE 17-18, NEW YORK — **Fundamentals of Information Processing for Nontechnical Executives.** Contact: New York University School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022. Also being held June 24-25 in San Francisco and June 27-28 in Washington, D.C.

JUNE 17-19, BOSTON — **Long-Range Information Systems Planning.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

JUNE 17-20, FORT LEE, N.J. — **CICS/VS Logic and Debugging.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 17-20, CHICAGO — **IMS/DC Programming.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 17-20, FORT LEE, N.J. — **CICS/VS Applications Design.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 17-20 in Los Angeles.

JUNE 17-20, BOSTON — **Vsam: From Start to Finish.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held June 17-20 in Atlanta.

JUNE 17-20, SAN ANTONIO — **CICS/VS MRO/ISC.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 17-20, WASHINGTON, D.C. — **Association of Information Systems Professionals' Syntopicon XIII Annual Office Automation/Information Systems Conference and Exposition.** Contact: James J. Donio, 1015 N. York Road, Willow Grove, Pa. 19090.

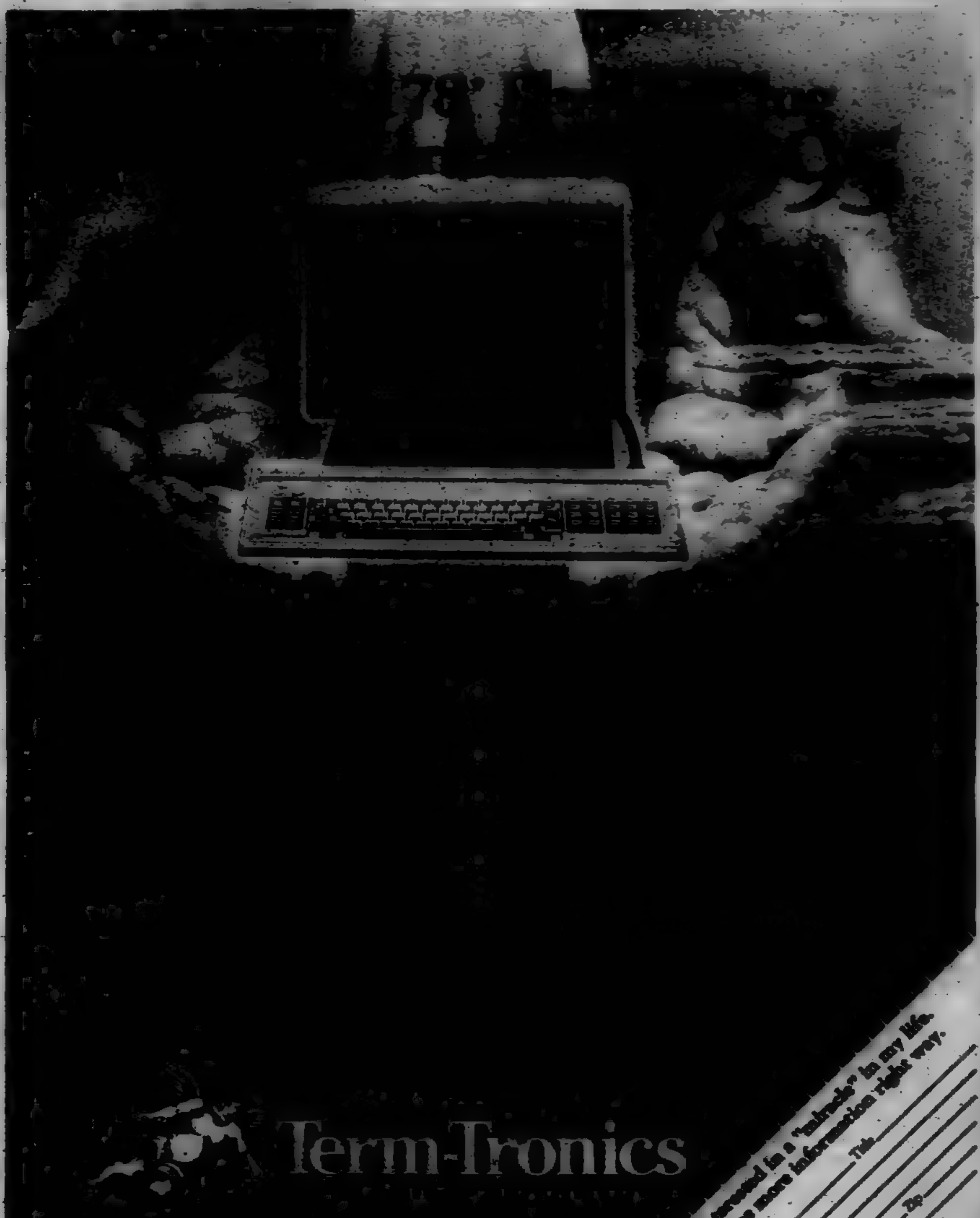
JUNE 17-21, NEW YORK — **MVS JCL.** Contact: Synod, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 17-21, NEW YORK — **CICS Macro-Level Programming.** Contact: Synod, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 18-20, ROSEMONT, ILL. — **1985 Advanced Manufacturing Systems Exposition & Conference.** Contact: Online Conferences, Inc., 989 Ave. of the Americas, New York, N.Y. 10018.

JUNE 19-21, ATLANTA — **VM/SP Structure, Flow and Tuning.** Contact: Betty Bruce, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

JUNE 20-21, SAN FRANCISCO — **Fundamentals of Data Processing for Administrative Assistants and Secretaries.** Contact: New York University School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.



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EDITORIAL

Go with the flow or don't go at all

Who is the chief information officer and what does this person do?

In an industry known for its fondness for new labels and acronyms, the CIO title is beginning to appear with some frequency. Logically, the CIO is at the top of the information management structure within a corporation.

That's a spot that traditionally has belonged to the MIS executive. But a chief directive for the CIO is to use computer power to achieve overall corporate directives. Too many MIS executives have not realized that if they don't learn to control and guide their firms' investment in technology, someone else within their company will move into the CIO spot to do just that.

American Airlines, Inc.'s passenger reservation system is a classic example of using information processing to reach corporate goals. The system initially favored American Airlines' flights over those of competing airlines. By the time the U.S. Department of Justice ruled against that practice, the terminals were already in travel agents' offices and competition was effectively locked out.

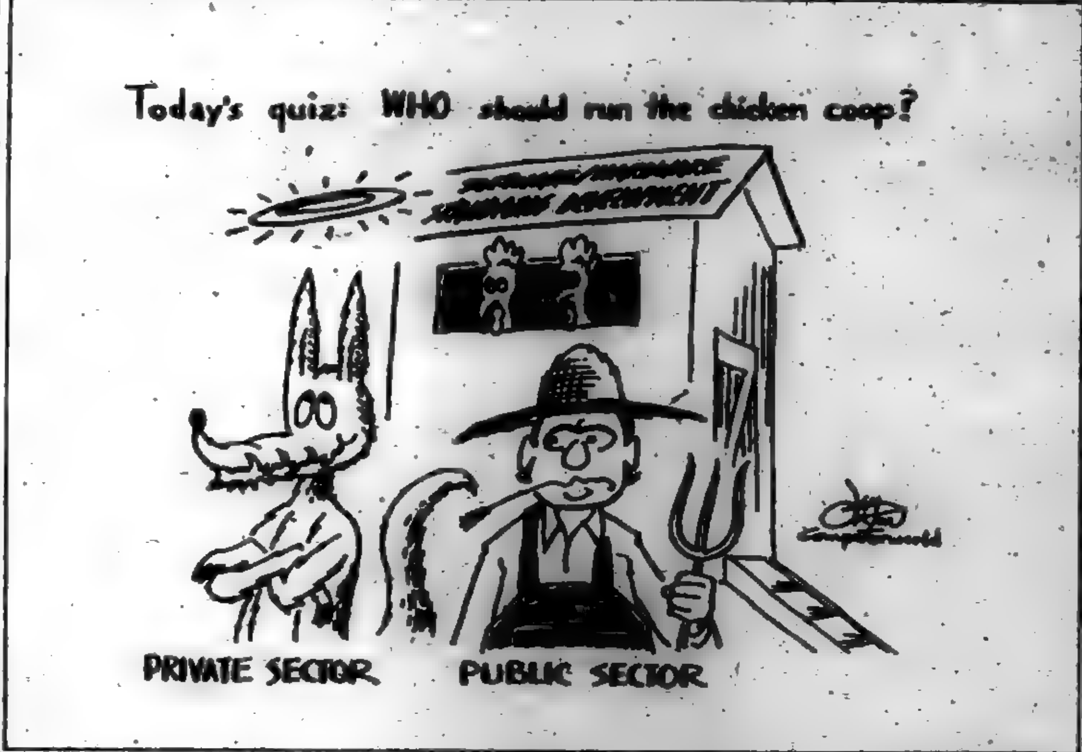
Information processing managers would do well to emulate the kind of thinking that went into developing the American Airlines system. But too many MIS executives are not aware that tying information processing to the strategic goals of their companies has become a necessity rather than an option.

Xerox Corp. executive and author Paul Strassman maintained that the reasons for this failure to understand the need to maximize their companies' competitive strengths is a simple one [CW, May 6]. Most MIS executives haven't been trained to direct the investment of the information technology that they control.

That may be true. But the reasons why MIS executives fail to align themselves with corporate strategies are really unimportant. It is essential that they move immediately to add another skill to their repertoire if they want to stay in control of the information processing function.

MIS directors who do not or cannot fill their expanded roles by learning to think in terms of strategic high-technology investment may well find people from other areas of their companies taking over high-level MIS functions.

Those who don't want to find themselves reporting to a CIO who comes from another area of corporate operations have just one choice. The information processing executive must learn to think in terms of corporate goals and put information technology resources squarely behind achieving those goals.


Today's quiz: WHO should run the chicken coop?
STRATEGIC/HIGH-TECHNOLOGY INVESTMENT
PRIVATE SECTOR
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Computerworld

LETTER

Specifics of VDT fixes helpful

After reading numerous articles defining problems with VDTs, it was nice to read "Optometrists write prescription for VDT eyestrain" [CW, April 1], which described some solutions to the problem.

It is very rare to read about specific measures, such as "tinted polarizing glasses" and "luminance of about 35-ft candles," in trade journals or vendor publications. The general lack of supporting documentation leaves many of us experimenting with various fixes that are not often endorsed by our organizations or budget people.

I discovered that it helps to put a cardboard hood around the VDT, which has been criticized by coworkers as unsightly; turning off half the room lights, which others turn right back on; and getting a circular polarizing VDT filter.

Another fix is getting prescription reading glasses to relax my 20-20 vision eyes, which have a hard time focusing on the VDT light source — as opposed to print on a flat surface. I hope more articles that document other fixes for the VDT eyestrain problem are forthcoming.

Randall L. Bishop
Littleton, Colo.

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VIEWPOINT

The cable quest: abracadabra in Akihabara

LECHT ON SCIENCE
Charles P. Lecht

Part one of a two-part series.

This is a tale of intrigue and mystery in electronics. Although it ends in New York, the episode took me to many places here and abroad and ultimately to Akihabara, Tokyo's amazing electronics megamarketplace. In the many sidewalk concessions, shops and large department stores there, it is said that anything can be found.

My travel episode began in February, on board a plane from Tokyo to New York. I had just purchased a portable laptop with disk and printer and was waiting for it to be unpacked until takeoff, anticipating the fun it would provide during the long hours ahead. I wasn't disappointed: Indeed, I marveled at its spirited response once energized by the precharged, long-lasting batteries that were provided with it. It did everything I expected and even more. I even admired the manner in which the hardware and programs were presented. After a brief period of practice, I took to giving spontaneous demonstrations to passers-by. I even wrote the pilot a letter, perhaps the first of its kind entered and printed on board an airplane.

I was having so much fun with the system that I didn't give it a second thought when I observed that an RS-232 cable was missing — a cable essential to transfer my files between my new laptop and two older, more powerful desktops in New York and Tokyo.

I have been getting a bit more organized than usual in my work — for example, more than six months ago I began to archive my work in the two land-based systems. I recently made preparations to link these two systems in what may be the world's smallest personal network spanning the longest distance. I planned to dump the laptop's memory into the computer in the U.S. or Japan, depending on which end I was located in, and have access to them from either location with minimum communications costs.

> *I was having so much fun with the system that I didn't give it a second thought when I observed that an RS-232 cable was missing — a cable essential to transfer my files between my new laptop and two desktops.*

However, carrying this off depended upon the cable, whose absence I had overlooked. I looked at it this way: Without the cable, anything I entered in my airborne laptop would have to be re-entered on the ground if it was to be archived in my files.

It is not uncommon for rational business people to enter a "twilight zone" when a new gadget is delivered. I confess to this. Some of us are motivated to put up with defects in original equipment because of the fear that worse damage may result to our new wonders from a visit to a repair shop even before the first battery charge had run out.

Now, obtaining even a two-foot connector cable may not be all that easy, even if thousands are out there somewhere. You have to know where to go and whom to ask if you don't have an address. And what's worse, experience has taught me that if you don't have the time to research the matter, you may well have to learn to live without the equipment you desire — which is also likely if you don't maintain friendships in the technical community.

On arrival in Manhattan, I realized how important the cable was to my plans. I had two options. I could re-enter the work I'd done on my laptop on the plane into my New York desktop system, or I could maintain two archives, at least until the cable could be found. One archive — distributed to and maintained in two systems 12,000 miles apart — was hard enough to accomplish. If I chose the latter alternative, I would have had two archives distributed to three systems. So, I decided to begin re-entering the data and embarked on a quest for the missing cable.

I called the laptop manufacturer to ask where I might purchase the cable, and I learned the cable was not yet being distributed. I quickly discarded the possibility that the cable would not be available for a long time, assuming that at least one of my friends in the U.S., Japan or Europe would know how to find or make the cable.

Well, you know how these things go — time passed and I didn't find the cable or someone to produce it.

Further aggravating the situation was the fact that I didn't have time to research the matter. In fact, I hardly thought about the quest until the next time I needed the cable. By then I strengthened my resolve to get it one way or another, and that "another" category included going to a trade fair where the laptop's manufacturer could possibly be demonstrating the system with one of the now-present cables and "lifting" it. The moral jus-

See CABLE page 53

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

System conversion tips to bet on for IRS-style results

HUMAN CONNECTION
Jack Stone

From all the news accounts of the transitional travesties at our beloved Internal Revenue Service data processing installations, the discerning data processor would think that the year was 1965, when installations of the then radically new IBM 360s were in full swing and the trade press was bulging with stories of conversion disasters.

Did you note the news clips, and did they seem familiar? "More than three million lines of code had to be checked out . . . underestimated degree of difficulty of the task . . . new equipment plagued with more than a normal share of bugs . . . complex communications system . . . system didn't perform parallel testing . . . insufficient conversion aids . . . programmers lacked the necessary experience."

Of course, these days, one doesn't have to be a dyed-in-the-wool programmer to express annoyance — if not disgust — at the IRS' inability to get its act together. Most of the public knows when a consumer-oriented system is malfunctioning, and the untold millions of end users of the IRS' taxpaying system who will not receive timely tax refunds and are not "computer aware" will consider their introduction to systems problems a particularly poignant experience.

> *How in the world could the IRS have fouled up so badly? The IRS' DP management, most likely, ignored the lessons of history and proceeded to take certain enormous and unnecessary gambles on completing the conversion on time — and then it lost that gamble.*

Perhaps in a few months the checks will finally arrive, the down payments on new cars and TV purchases will be completed, and the incident will be forgotten. But the nagging question will remain: After all that is known and has been written and taught on the subject, how in the world could the IRS have fouled up so badly?

I am forced to conclude that the IRS' DP management either didn't know what it was doing, which is not too bad an excuse in view of the enormous complexity of the system; didn't care about what it was doing, which is highly unlikely in view of the prospect of being grilled by the legislature on Capitol Hill for malfeasance; or, most likely, ignored the lessons of history and proceeded to take certain enormous and unnecessary gambles on completing the conversion on time — and then lost that gamble.

What follows is a brief set of guidelines for those seeking hero status as leaders of conversion efforts which, either independently or in concert, are guaranteed to result in cutover delays, screaming users, programmer resignations and excessive costs.

- Present the conversion project to the analysts and programmers as the "DP challenge of a lifetime, which only the most elite can accomplish," then work them day and night for months on end — or at least until a few team leaders quit without having trained their replacements.
- Take full opportunity of the conversion effort to simultaneously install new hardware, introduce a new operating system, develop new applications programs, extend communications facilities, move to a new location and replace the old system without running it in parallel.
- Make certain that the initial release of the application system is "full-featured" so that it satisfies the wish list of every politically important user manager, ignoring the extra-heavy programming effort required to do this.
- Be sure to delay the usual system documentation chores until the cutover is completed so as not to divert the systems folks from their primary mission. Defer a user training program for the same reason.
- Commit in a meeting of top management — or, to be more dramatic, before a mass meeting of the user population — that the conversion will be completed on time, to specification, within budget. This strategy may result in a particularly poignant experience for you because you may find yourself pounding the pavement, looking for a new job.

Stone is a Washington, D.C.-based independent management consultant, educator and writer, specializing in DP human communications and personnel development.

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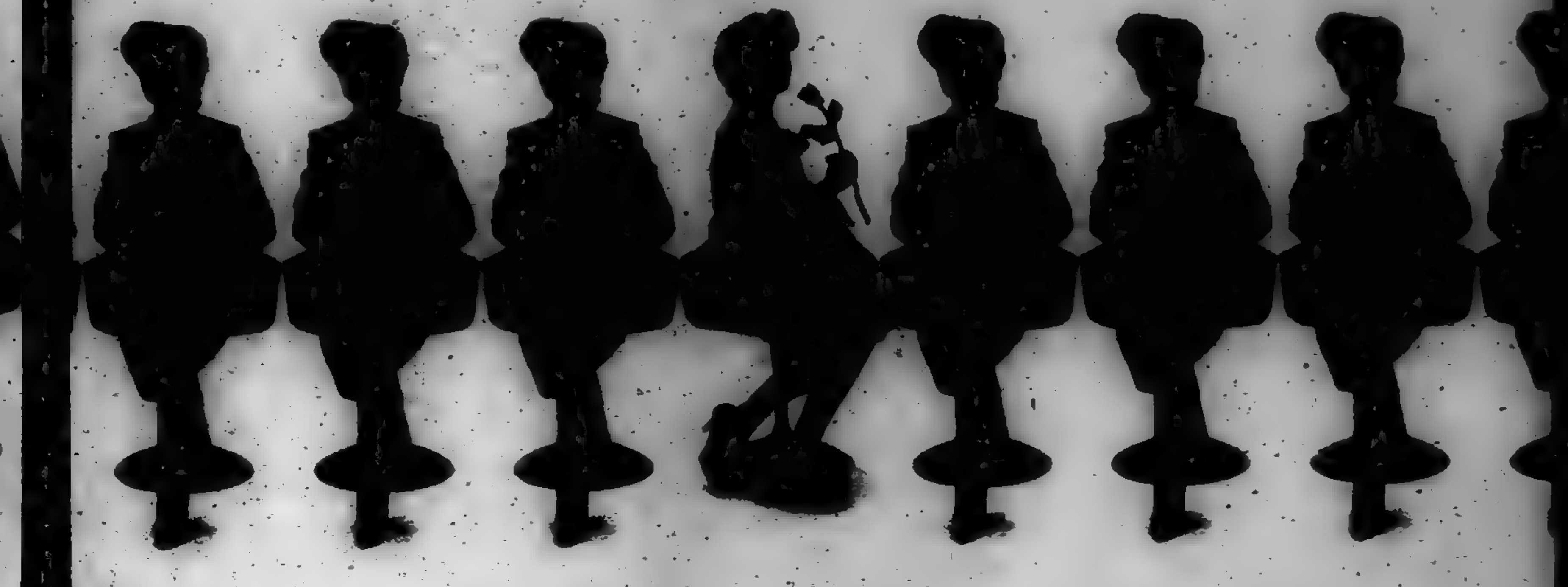

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VIEWPOINT

Software warranties ease glitches for users, vendor

READER'S PLATFORM
Leon F. Stewart

I would like to comment on the column "User bugged by distribution of defective packages" [CW, April 8] that discussed the problems encountered when software is not properly supported or warranted by the software developer.

I have never experienced the frustrations described by the author, probably because I have never been active in the microcomputer software area. However, I have been active in the IBM System/34, 36 and 38 area as a purchaser and software vendor, and I have seen some of the problems mentioned.

I encourage all software vendors to offer better warranties on their products. My company, Britz Publishing, Inc., has sold thousands of software packages on a money-back-guarantee basis since it began selling software in 1982. Britz would not consider doing business any other way. Users and vendors alike would be better off with better software warranties.

The absence of a good software warranty contributes to the software piracy mentality. Because the software purchaser generally has no recourse when confronted with a defective software package, he is being told, "you bought it, you own it." Because he owns the package, he is likely to feel no remorse in letting others copy it. The idea may develop from a defective package, but it is easily transferred to a good package.

What has a software developer got to lose if he offers a money-back guarantee? It would seem that few people would take advantage of the situation just to try a package they really don't intend to keep. Unfortunately, however, software vendors are often guilty of this tactic. When an order comes in to Britz from another software vendor, I know from experience that there is a great likelihood that the vendor will ultimately return the package. Perhaps a software vendor has higher standards than other users. I suspect that in many cases, it is just one vendor wanting to look at another's product.

On the other hand, many people will make a purchase because they feel safe thinking that if the package is defective, they have a remedy for the problem. The purchaser will develop a better attitude toward the vendor and is more likely to reward the vendor's good faith with good faith in regard to protecting the vendor's rights.

With a no-warranty software package, the vendor is saying in effect that he doesn't have faith in his own product. The software vendor should be able to say, "This is a good product, and it will do what we say it will do. If it doesn't do what we say, bring it back to us."

Perhaps the chief reason software vendors do not want to offer a substantial warranty is that they hate to make refunds. It used to pain me to write a refund check. I have come to realize that giving refunds is just another cost of doing business. It is part of the price my firm pays for selling to the 95% of its users who are satisfied and don't ask for a refund.

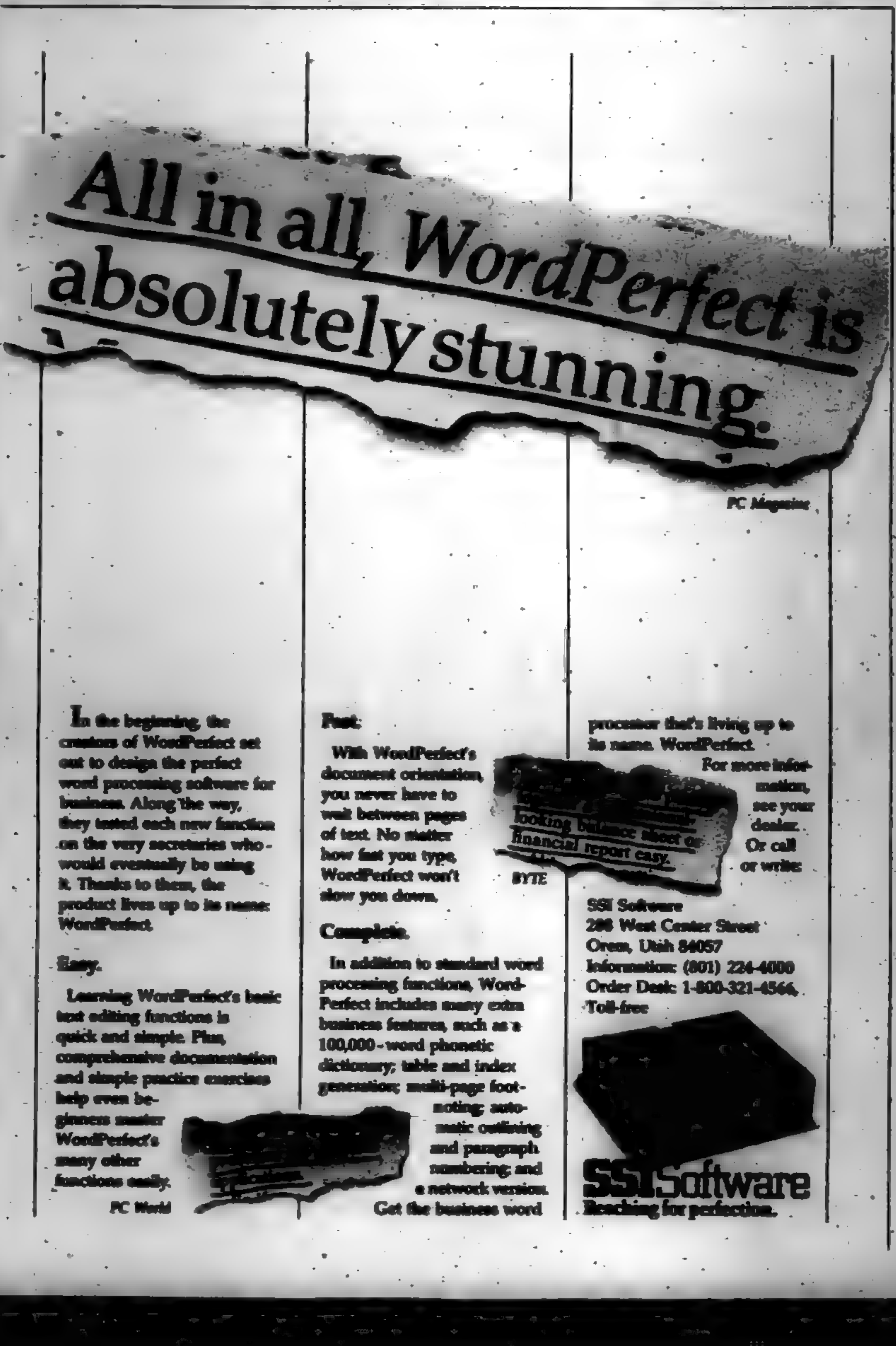
The heart of the software warranty problem is the software itself. It is fairly obvious that a lot of software is being sold that contains bugs of one sort or another. I am not so naive as to suggest that it is possible to market software that is 100% bug-free. The real solution is testing the software before it is put on the market and correcting the discovered bugs before and after the sale. After a software vendor has packaged 100,000 shrink-wrapped boxes of diskettes and manuals and has shipped them to retail stores, it is very difficult to correct a program bug no matter how small or large.

It is extremely difficult, if not impossible, to anticipate all potential user situations. There must be numerous test sites and a lengthy time period before a software product can even begin to approach the circumstances it will encounter on the general user market. This time factor is one of the biggest problems.

When bugs are found in a product after it is on the market, the vendor must provide the purchaser with a corrected version. The only real question is the cost of the correction. If the package cost is more than $1,000, undoubtedly the correction should be free. For lower price packages, there should be a moderate fee in the $20 to $50 range. Chances are that enhancements will accompany the bug-free version. The vendor actually may be correcting functional situations not addressed by the software's original design.

The software vendor will at least break even on the sale of corrections and update. A hot seller might need several thousand upgrades at $50, which computes to a substantial sum by anyone's standards. Who wouldn't like the chance to sell a new set of diskettes at $30 each to half of the users of any one of the top 10 micro packages? ‡

Stewart is president of Britz Publishing, Inc., a Jackson, Miss., software vendor.



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LETTERS

Pundits' analyses refuted

Here are a few observations on the column "Osborne foresees price plunge" [CW, March 18] and on the pundits who the writer contacted following my presentation at the Association for Systems Management meeting.

Dealers are putting up a brave front regarding prices holding at the high end of the software market, but you only have to scratch the surface to discover that prices are, in fact, collapsing. If Robert Lefkowitz really believes that customers are now looking for more power and capabilities in high-priced software packages, then he must have been out of the country for the past two years. Does Lefkowitz really believe that the average word processor user has now fully explored all the capabilities of high-end word processors and that they are chomping on the bit for yet more word processing features?

Most word processor users have not begun to tap truly the capabilities of their software and wouldn't know what to do with the new features they're being offered, because they never really use the features they have. I speak before many audiences, and more power at the same price is not what the buying public is looking for. What they are getting is an attempt to maintain high prices, and that's certainly not what the customer is looking for. Customers are looking for lower prices: That is why prices will fall as sure as night follows day. With regard to word processors, you might be interested to know that many of the high-end, expensive word processors are now so feature laden that typists cannot type more than 50 words a minute without going ahead of the software.

There is no way anyone can sell an inexpensive product and let every user call in at the company's expense. We used to keep score at Osborne Computer Corp. of the number of people who called in complaining that their computers wouldn't work when they had not even turned on the power switch yet. The small charge we make has, in fact, reminded our customers that they were taught to read in grade school. We have no complaints from anyone regarding the charge for support. The quality of the documentation is so good that we have had just two calls for a total net revenue of $10 to date.

Osborne most certainly has no intention of taking a shotgun approach, we choose our product very carefully, because we write all of the documentation supporting the software, and we insist on the software being modified to meet our keyboard and user interface standards.

Where did Mary Ellen Dick get her information that Osborne pays its authors peanuts? She never called us for any facts. The truth of the matter is that we pay some of the highest royalty rates in the business.

You might suggest that these three pundits check with me before attempting to tell the world inaccurately what I am doing.

Adam Osborne
Hayward, Calif.

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CABLE

from page 40

tification for this tactic could doubtlessly be argued using classic civil disobedience logic, which justifies committing minor crimes against a giant entity by attempting to increase vastly its honesty.

I actually went to a gigantic computer exhibition in March, knowing the manufacturer would be there, hoping that the cable would be there too. Although I did not intend to "lift" the cable if it was there, I did intend to appeal for it so convincingly to the company's booth attendants that the sense of justice in one of them might compel him to secretly hand the cable over to me.

No such luck. The manufacturer was there all right and so were the attendants, but the cable was nowhere to be found.

I've been around long enough to know that a missing part or two commonly accompanies the introduction — if not the early deliveries — of a computer system. Even though I was dismayed at having to continue to reenter all the data that I produced in flight to my system in New York as I waited for the missing cable to materialize, I wasn't too surprised.

And the search continues

When the opportunity presented itself, I resumed my search for the cable, but whether I was in the Silicon Valley, Dallas, Tokyo or New York, the answer was the same: The cable wasn't to be found. And although everyone I talked to knew the cable was easy to make, no one seemed anxious to make it; it seems that a special set of tiny instruments are required to carry off the manufacture.

And to add insult to injury, I had been carrying around the software needed to decode the laptop's transmitted data for some time — software that would map the data into code acceptable to my land-based systems.

All I needed was the cable to make the connection to my laptop. The conclusion of the this tale will reveal my new approach to the problem, how I carried it off and how it brought the cable to my very doorstep in the Big Apple.

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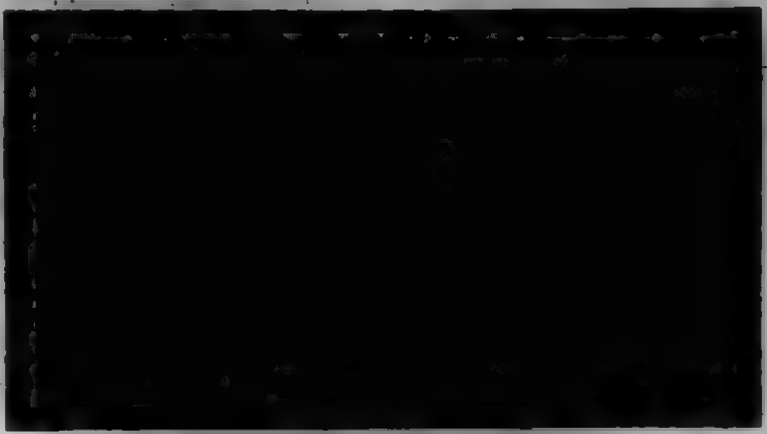

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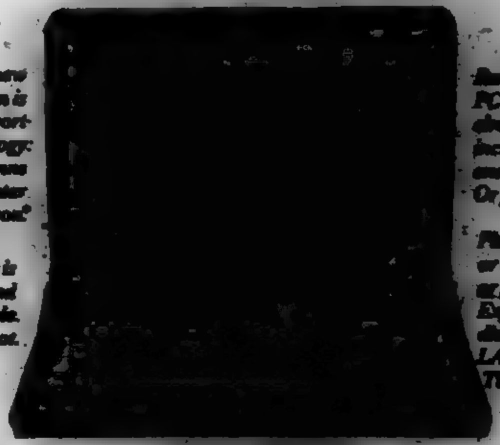

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SOFTWARE & SERVICES

SOFTALK
John Gallant
CW Senior Editor

Is IBM's DBMS glass half empty?

'The lack of functionality of IBM's data base management systems and the increasing user confidence in independent [vendors'] DBMS are really giving IBM problems in the DBMS market.'

Scott Smith, vice-president
The Gartner Group, Inc.

Is the glass half empty or half full? When it comes to the data base management system market, IBM might

See IBM page 76

SOFTLINE/WILLIAM INMON

Work unit key to on-line results

Second of a two-part series

Ted Codd, one of the pioneers of data base theory, is credited with saying that performance comparisons between relational and hierarchical, or on-line, data base management systems are biased because a limited amount of work done in the on-line environment is being compared to a massive amount of work done in the relational environment. Codd had hit upon the very essence of the difference between the two types of systems, and in doing so, has stated why relational systems cannot equal the performance of hierarchical systems.

Unquestionably, relational systems are flexible, certainly much more flexi-

See DBMS page 77

Boris Beizer

'Dedicated to several unfortunate, very bad software projects for which I was privileged to act as a consultant (albeit briefly). They provided lessons on the difficulties this book is intended to circumvent. . . . Their failure could have been averted — requiescat in pace.'

With that dedication, Boris Beizer opened his book Software Testing Techniques *(Van Nostrand Reinhold Co., New York), a practical guide for programmers implementing software testing methodologies. According to Beizer, most software development shops place far too little emphasis on correct testing methods. Proper software testing, he believes, can ensure cost-effective development projects and fewer software quality problems.*

Beizer is a consultant and director of testing and quality assurance for Pennsauken, N.J.-based Data Systems Analysts, Inc., which specializes in the design of telecommunications software systems. He calls himself a "testing nut." His sixth book, which deals with personal computer software quality, will be published this fall. Beizer recently discussed software testing issues with Computerworld *staff writer Maura McEnaney.*

Q *What is your definition of a software test? Specifically, what are you testing?*

There is no formal proof that a piece of software is correct, so we accept the fact that all software will go out with a certain number of unpredictable bugs. The objective of all testing is to reduce the number of bugs to a pragmatically acceptable level. That is determined by the application, the market and a whole bunch of other things.

Q *Do you think companies today adequately test software?*

[Testing] ranges from superb in a very small minority of companies to unbelievably abominable. If you ask where the mean is, I'd say [it's] significantly lower than [it] is in their best interest [to be].

Q *What are companies routinely doing wrong?*

See BEIZER page 75

■ Mapco has offered a data center planning service that tracks performance and expenses and models future requirements/68

■ An enhanced release — dubbed Focus V — of the Focus fourth-generation language is out from Information Builders/68

■ D&B Computing Services has announced a remote information center service based on its Nomad2 fourth-generation language/68

■ A knowledge-based systems development tool has been unwrapped by Carnegie Group/68

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ Why not Cullinet, ADR or Focus? There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as the standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes*? Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ Why not just go with DB2 or SQL/DS? A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

■ What about Goldengate, dBase III, Symphony or Framework? PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 1060.

SPSS' tool translates DEC's stats

By Edward Warner
CW Staff

BEDFORD, Mass. — When the statisticians speak in chi-squares and the managers speak in profit and loss, a translator is needed. For the quality assurance group in the educational services division at Digital Equipment Corp. here, the translator that makes statistics comprehensible to corporate managers is the SPSS Graphics package from SPSS, Inc.

The SPSS Graphics version for DEC VAX-11 minis, which was introduced at the recent National Computer Graphics Association conference, was beta tested by DEC's quality assurance group. That group, which monitors the performance of DEC training programs around the world, uses the graphics package to produce between 30 and 40 charts per month covering such topics as student interests and attendance patterns. The charts are presented in reports to managers, most of whom do not work directly with statistics.

According to director Hossein Hosseini, the group was already using SPSS statistical analysis software — the SPSS-X Information Analysis System — when SPSS approached them to beta test the new graphics package. This was not the first statistical graphics package the group had used, but it was the first it had found that could operate with either extract data summaries from SPSS-X or with data input to it directly, he said.

Rekeying data unnecessary

Most graphics packages can work with raw data, Hosseini explained, but SPSS Graphics' ability to import files from SPSS-X meant that data and data definitions would not have to be rekeyed when users wanted to create a graph. Another plus, he said, was that SPSS Graphics could determine and display the variables in each SPSS-X system statistical file that it imports.

As a result, he continued, the user needs only to look at the file's variables to decide which to put on the horizontal and vertical axes or which, in the case of a bar chart, is the break variable. A statistician who wanted to create a chart on sales trends in each of several regions, for example, would put sales on the vertical axis, the financial quarter on the horizontal axis and designate each region — the break variable — with a differently colored bar.

Such a chart might not be interesting for a statistician, but it would be useful to an executive with little knowledge of statistics, he said.

Hosseini said the quality assurance group will keep SPSS Graphics, even though the software, which runs on a DEC VAX-11/780, had a few minor bugs in its beta version. These bugs, he said, were corrected quickly by the vendor. The beta version of the package, he added, did not contain its promised library of state and national maps, upon which bar charts can be overlaid. A vendor spokesman said this feature has since been included.

Planning tool aids data center forecasting

By Jeffry Beeler
CW West Coast Bureau

DEL MAR, Calif. — A software company here has developed an automated planning system that is said to enhance data center forecasting by allowing MIS cost and performance models to be linked.

According to a spokesman for Mispco, Inc., MIS Planner (Misp) automates the process by which companies predict the impact of proposed business changes on systems expenses, requirements and performance. Misp combines two existing software products — a cost-modeling package from San Diego-based Performance Management Associates, Inc. and a performance-modeling system from Austin, Texas-based Information Research Associates, Inc.

In a typical application, the spokesman said, the cost-modeling package estimates a firm's hardware and personnel needs, projects its transaction volumes for the next year and computes, by month, the demand for each MIS activity. The module also figures the company's MIS budget for a given level of resources.

Next, the performance-modeling package calculates the utilization limits that will have to be set to maintain an acceptable service level. The results of the package's computations are then relayed to the cost-modeling system, where they are compared with Misp's estimates of future hardware use.

In addition to the cost- and performance-modeling systems, Misp reportedly contains an IBM Personal Computer XT front end and a methodology for gathering and formatting data from an MIS organization.

Mispco makes the automated planning system available in two options. The company will supply Misp plus a week of training, or it will adopt a turnkey service approach and assume full responsibility for a customer's forecasting project.

The Misp software and a week-long training course cost approximately $75,000.

Mispco can be reached at Box 2747, Del Mar, Calif. 92014.

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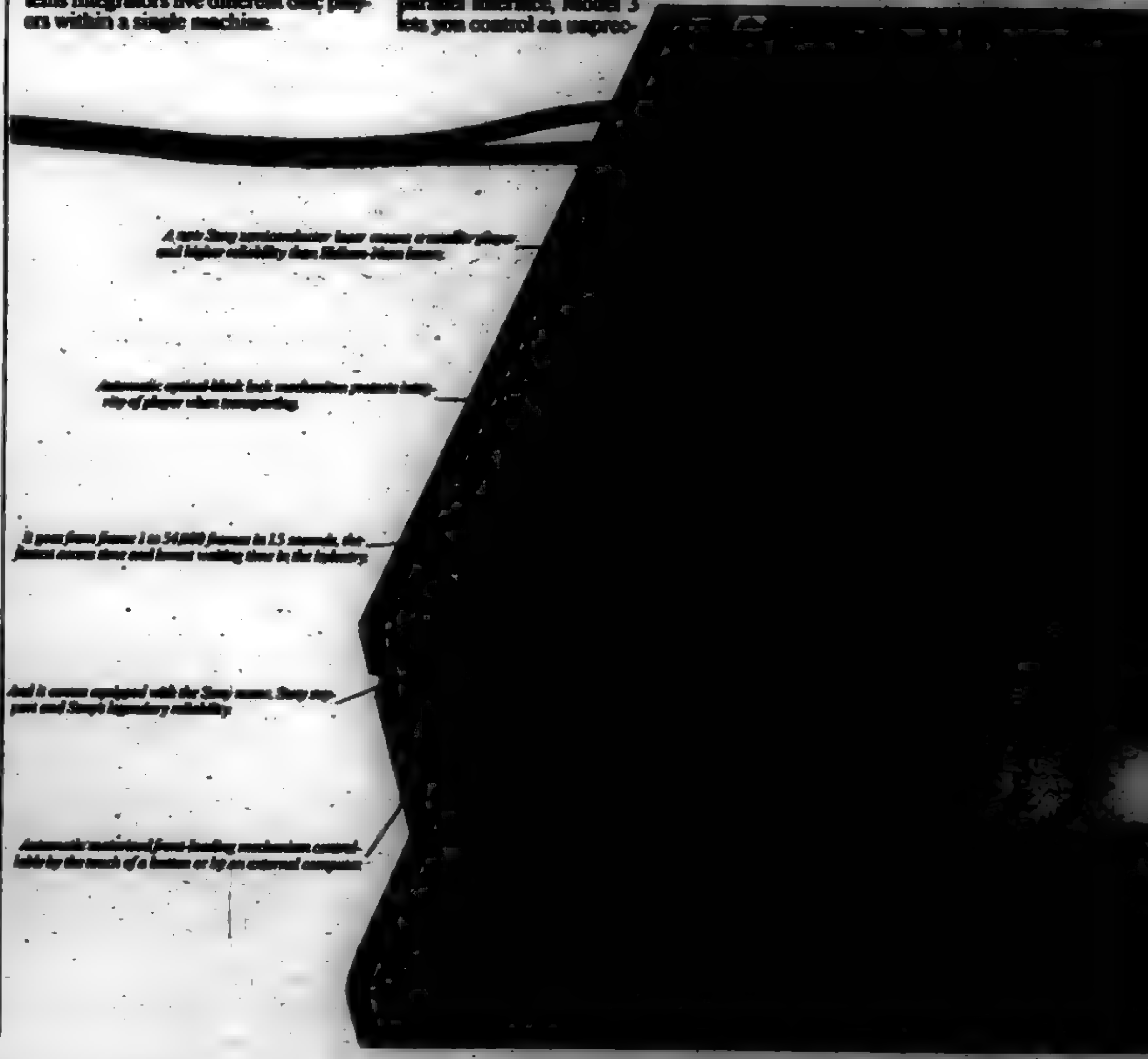
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Enhanced Focus release out from Information Builders

Interactive application tool also introduced

NEW YORK — Information Builders, Inc. has announced an enhanced release — called Focus V — of its Focus fourth-generation language, featuring full screen orientation for report creation and output presentation and an integrated editor and screen painter.

The company also announced a version of Focus for IBM's DOS/VSE operating system and a Focus-based interactive application called the Application Tracking System (ATS). According to a spokesman, ATS allows personnel administrators to manage the flow of job applicants and requisitions within an organization.

In addition to DOS/VSE, Focus is available for IBM VM/370 and MVS operating systems and a variety of data base management systems including IBM's DL/1, IMS, SQL/DS and DB2; Cincom Systems, Inc.'s Total; Software AG Systems, Inc.'s Adabas; and Intel Corp.'s System 2000.

The Focus editor and screen painter, dubbed Ted, provides a full screen applications development environment portable across all Focus versions. The editor is designed to handle I/O screen development and transaction processing logic. The screen painter allows users to develop data base applications in a single terminal session. Screen design is accomplished by layout of the screen in the Paint mode, assigning field names and screen attributes in the Assign mode and placing the screens into the Focus procedure with the Fidel mode.

Other features of the editor include simultaneous editing of up to four files in four screen windows; transfer of code or text between windows; automatic save and execution of Focus procedures from within the editor; and integration between Ted and the Focus Session Monitor, which logs all terminal activity.

The Ted editor and screen painter, an optional feature of Focus under CMS and MVS/TSO, cost $4,500 for a one-time license or $150 per month on a rental basis.

Other enhancements to Focus V include TSO file integrity, which ensures that either the physical data base or its shadow image maintains full file integrity in the event of system failure; generalized date handling, which ensures that date-oriented data is always sorted correctly; and schema enhancements that include data validation tests for specifying values used in transaction processing procedures.

The one-time charge for the VM/370 and MVS/TSO, CICS, IMS/DC versions of Focus V is $42,000 for a basic system and an additional $22,000 for the Focus data base management, transaction processor and interactive data base editor.

Focus for DOS/VSE is scheduled to be available in the third quarter. Also included in the DOS/VSE version are the company's Talk Technology facilities for creating data bases, modifying data and designing reports for novice mainframe users. Use of the facilities requires no knowledge of Focus or mainframe computing.

The one-time charge for the DOS/VSE version of Focus is $25,800.

ATS features

The ATS is said to handle all Equal Employment Opportunity and Affirmative Action Program reporting requirements, as well as produce standard management reports. ATS also includes Table Talk, Information Builders' menu-driven report generator.

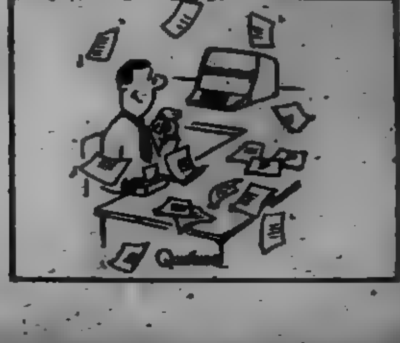
The ATS applications package organizes data within file folders called screens. When an applicant's name is entered, a history record appears showing related job applications, their disposition and all corresponding job requisitions that apply to the candidate.

ATS reports include applicant, new hire, transfer and applicant detail reports. Management reports include job requisition by department, job requisition by recruiter, cost per job requisition, source-summary and physical required report.

ATS operates on IBM mainframes under VM/CMS or MVS/TSO and requires the basic Focus system with the Fidel Screen Manager option. The mainframe version is avilable for a one-time license fee of $9,000 or a monthly license fee of $240/mo.

A personal computer version of ATS is available for the IBM Personal Computer family, the Wang Laboratories, Inc. and Texas Instruments, Inc. Professional Computers and the AT&T 6300. The one-time license fee is $3,700 if Information Builders' PC/Focus is on the machine or $4,400 for a self-contained version including a copy of PC/Focus.

Information Builders is located at 1250 Broadway, New York, N.Y. 10001.



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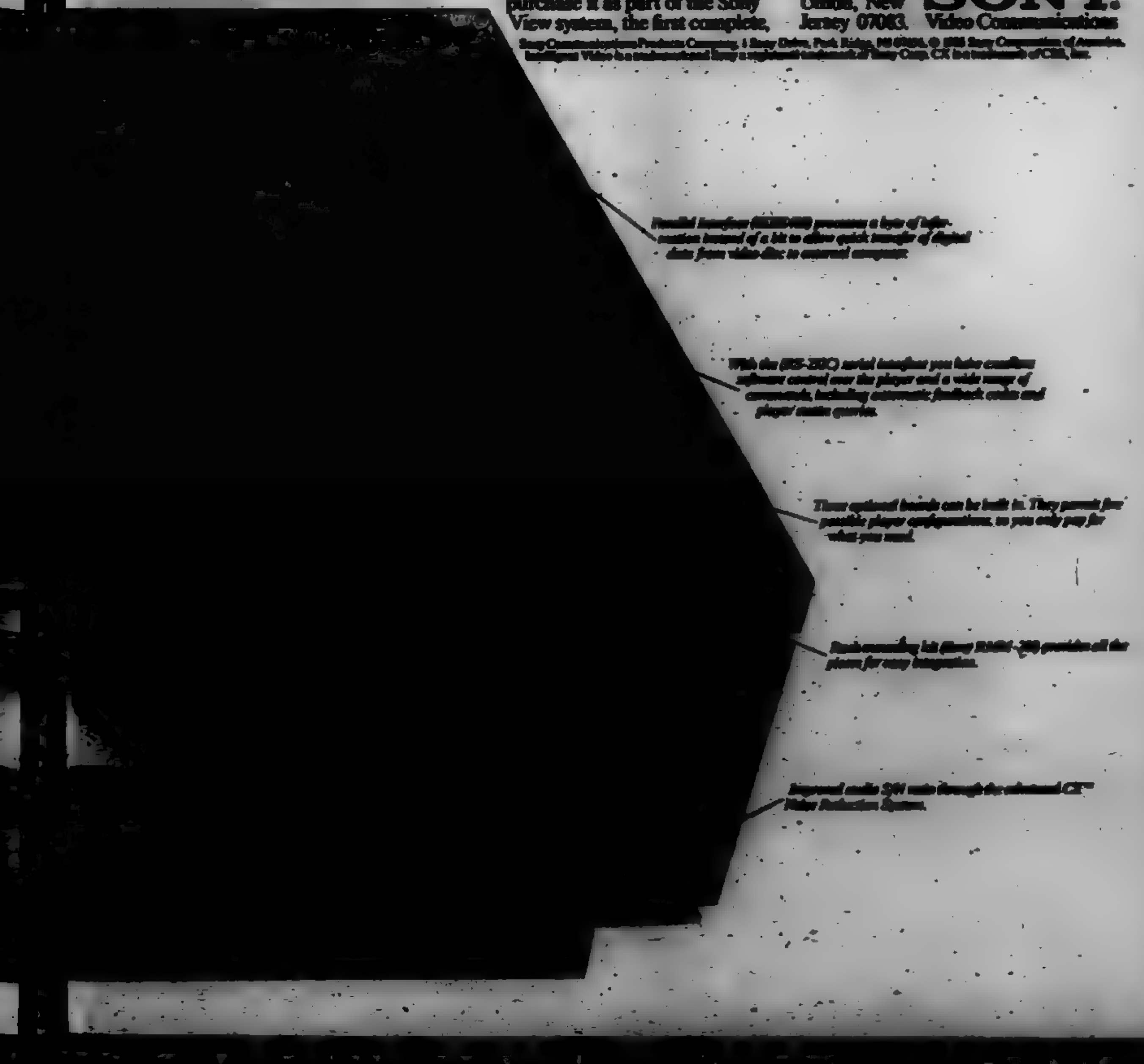
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Carnegie Group unveils knowledge-based AI tool

PITTSBURGH — Carnegie Group, Inc. has introduced an integrated environment for developing knowledge-based systems on Symbolics, Inc. 3600 series, Texas Instruments, Inc. Explorer and Digital Equipment Corp. VAX computers.

According to a spokesman, Knowledge Craft is a productivity tool designed for knowledge engineers and artificial intelligence systems developers to aid in the development of knowledge bases for AI applications. Written in common Lisp, the product features Carnegie Group's Carnegie Representation Language for developing knowledge bases.

Knowledge Craft features a multiwindow interface and two-dimensional graphics capabilities to allow users to add graphics to multiple windows of text. In addition to its knowledge representation capabilities, the product offers inference strategy features for building AI knowledge-based systems.

Knowledge Craft costs $50,000, including first-year support, updates and training.

Carnegie Group is located at 650 Commerce Court at Station Square, Pittsburgh, Pa. 15219.

Remote access capability added to Nomad2 DBMS

WILTON, Conn. — D&B Computing Services, Inc. has announced that its Nomad2 fourth-generation language data base management system can now be accessed remotely.

According to a spokesman, the Remote IC service is available for any manufacturers' hardware. D&B uses a proprietary data transmission network to transmit Remote IC services from its data processing center in Stamford, Conn.

Users of Remote IC lease a fixed percentage of D&B's hardware capacity at a predetermined monthly rate.

For example, a buyer can purchase a Nomad2 license with processing power equivalent to 25% of an IBM 4361 mainframe, according to D&B Computing.

Buyers purchase the Nomad2 license and pay a preset monthly charge for the processing power and storage space leased.

One-year cost for the Remote IC is approximately $22,250, according to the vendor.

Additional information is available from D&B Computing Services, which is located at 187 Danbury Road, Wilton, Conn. 06897.

SYSTEMS SOFTWARE

■ **Applied Software, Inc. has announced Data Set Manager (DSM), a full screen file management facility for IBM TSO users running MVS or MVS/XA.**

A spokesman said TSO DSM provides a full screen window to the user file catalog. Commands and file management features of the product are said to reduce TSO training time and improve TSO performance.

Support for IBM's ISPF includes an interface to PDF and a query facility for locating files by space allocated and used and last referenced date and volume. DSM's Dead usage displays encourage users to delete unused files and release excess space of overallocated files.

DMS supports sequential files, partitioned data sets and members of a partitioned data set. All TSO commands are supported with DSM's customer-defined command table. A customer-defined exit facility is provided.

The monthly lease charge for DSM is $100, and the yearly charge is $1,106. For a second CPU, the prices are $80/mo or $880/year.

Applied Software, Suite 250, P.O. Box 13027, 840 U.S. Highway 1, N. Palm Beach, Fla. 33408.

■ **Productivity Products, Inc. has introduced software that operates in conjunction with IBM's DB/DC Data Dictionary to provide support for Information Builders, Inc. Focus users in IBM's MVS and VM/CMS environments.**

A spokesman said Focusout creates Focus file descriptions from the dictionary for flat files, physical and logical IMS data bases, CMS files and Information Builders' PC/Focus files. It also reportedly allows Focus files to be documented in the Data Dictionary along with conventional files.

Productivity Products' Focusin program enables users to populate the dictionary with information about their current systems.

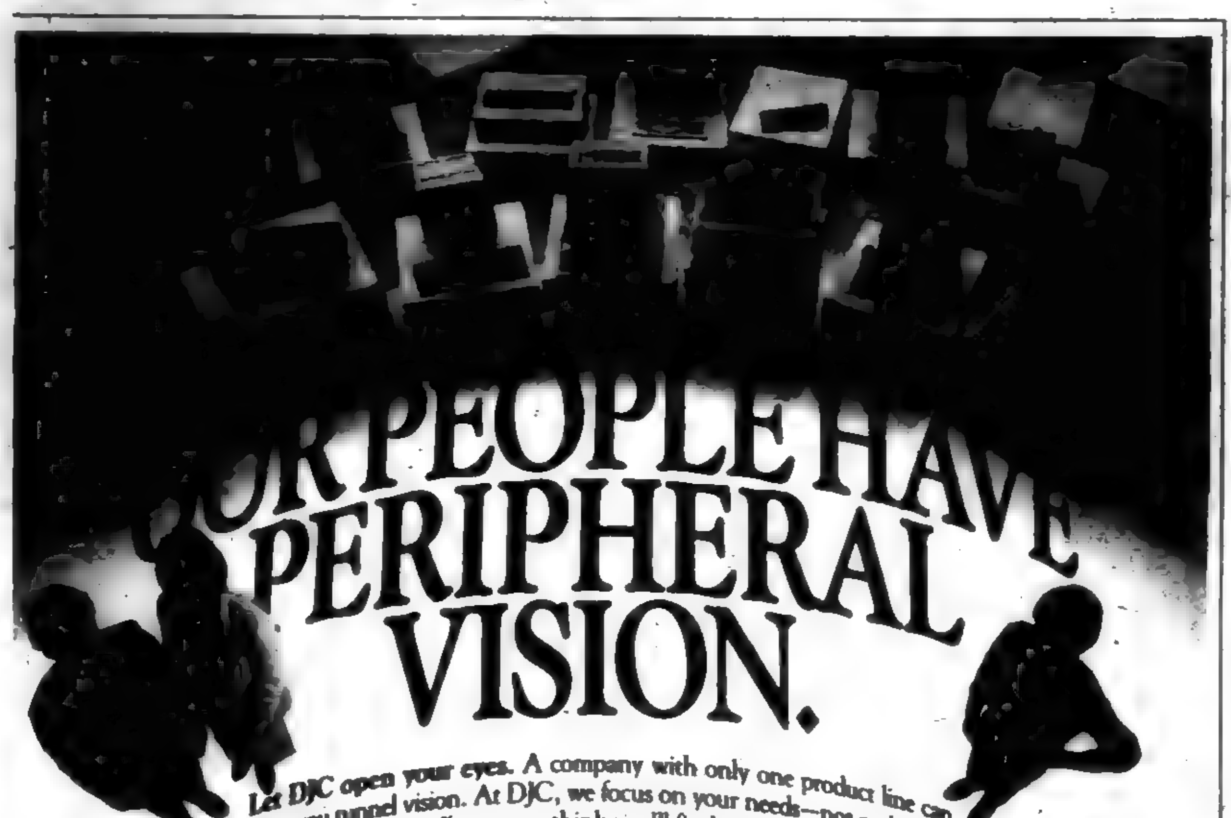
Focusout/Focusin costs $15,000.

Productivity Products, P.O. Box 26, Vernon Hills, Ill. 60061.

■ **Software Systems, Inc. has announced Data Dialogue for linking IBM's System/34 and 36 with the IBM Personal Computer.**

According to a spokesman, Data

Continued on page 64



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VMCENTER. It's a survival tool—and a whole lot more. For more information on VMCENTER, call or write VM Software, Inc., 2070 Chain Bridge Road, Suite 355, Vienna, Virginia 22180, telephone (703) [illegible].

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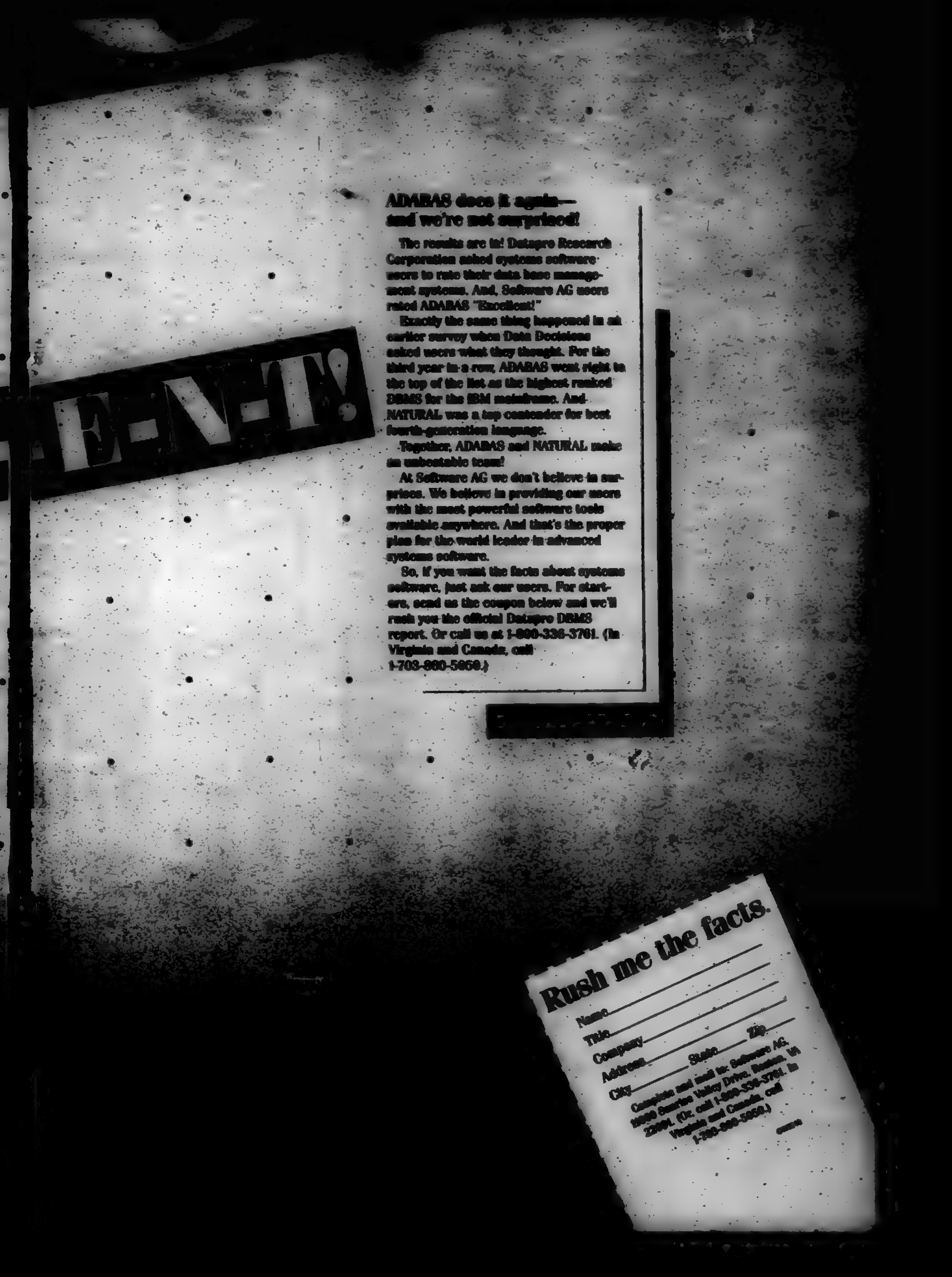

ADABAS does it again— and we're not surprised!

The results are in! Datapro Research Corporation asked systems software users to rate their data base management systems. And, Software AG users rated ADABAS "Excellent!"

Exactly the same thing happened in an earlier survey when Data Decisions asked users what they thought. For the third year in a row, ADABAS went right to the top of the list as the highest ranked DBMS for the IBM mainframe. And NATURAL was a top contender for best fourth-generation language.

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SOFTWARE & SERVICES

Continued from page 80

Dialogue is a data dictionary that enables System/34 and 36 users to select, retrieve, sort and reformat the data from their host systems for use in Personal Computer applications such as spreadsheets.

Data Dialogue enables users to select and retrieve individual files from up to 10 disk files at a time and reformat the selected data into multiple Personal Computer format types for integrating with Personal Computer applications.

Data Dialogue costs $1,250 for System/36 and $995 for System/34.

Software Systems, 208 Metro Drive, Jefferson City, Mo. 65101.

■ Executive Support Products, Inc. has announced Extended Printer Queuing — Image Queuing (XPQ-IQ) a print spooling package that runs on Honeywell, Inc. DPS 8, DPS 88 and Level 66 mainframes with Honeywell's Gcos III or Gcos 8 operating systems.

Reportedly, the product will support Honeywell's Data Management IV package when used for a transaction processing application. XPQ-IQ enables a time-sharing or batch user to queue a file and print it at a remote printer while continuing work at a terminal. Also, a user is able to send several reports to one printer or one report to several printers.

The software supports DM-IV subroutines that are functionally equivalent to Cobol Open, Write and Close statements, the vendor said.

XPQ-IQ costs $11,900.

Executive Support Products, Suite 211, 3901 MacArthur Blvd., Newport, Calif. 92660.

■ On-Line Software International, Inc. has announced Release 2.4 of Intertest, the company's IBM CICS testing and debugging programmer productivity tool. The product is available for IBM's MVS and DOS/VSE operating systems.

The Intertest menus have been enhanced to make them easier to learn and use, a spokesman said. In Release 2.4, logical separation of functions has been improved and the menus are more self-explanatory.

According to the vendor, breakpoint displays are provided for Cobol and PL/I programmers. Messages have been improved, the source code and main storage display areas have been extended and PF key support is incorporated.

The price for Intertest Release 2.4 is $25,200 for IBM's MVS, and $21,000 for DOS.

On-Line Software, Two Executive Drive, Fort Lee, N.J. 07024.

PRODUCTIVITY AIDS

■ Touch Technologies has added an integrated screen management facility to its VAX Intouch applications development system for Digital Equipment Corp. VAX computers.

VAX Intouch Version 1.0 now allows users to create input screens without having to purchase a separate forms management system, a vendor spokesman said. Intouch options include block-mode terminal emulation, keystroke-level character validations and character translation capabilities.

Intouch costs from $5,000 to $40,000.

Touch Technologies, Suite 101, 609 S. Escondido Blvd., Escondido, Calif. 92025.

■ MCRB Software, a division of MCRB Service Bureau, Inc., has announced two packages — Lifesaver and Analyze/R — for Cullinet Software, Inc. IDMS and IDMS/R data base management system users.

For users migrating from Release 5.7 to 10.0 of IDMS, Lifesaver is said to help create routines to aid in migrating applications between IDMS/R dictionaries.

Analyze/R will provide management and billing information about all facets of IDMS/R relational data bases. The product, processed in a batch environment, consists of an input parameters editor, a tool that selects required information from the IDMS/R area and a reporting tool.

Analyze/R also reports on unused and wasted space, provides departmental or applications cost breakdown, increases information regarding data security and usage and provides flexible cost factoring.

Lifesaver costs $4,700 and is available now. Analyze/R costs $16,500 through June 30 and is scheduled for June 1 shipment.

MCRB Software, 11633 Victory Blvd., N. Hollywood, Calif. 91509.

APPLICATION PACKAGES

■ Honeywell, Inc. has introduced the Account Reconciliation System for its DPS 6 computer system.

The Account Reconciliation System reportedly was designed to assist banks in providing checkbook balancing services to large corporate accounts. The package is said to allow users to customize processing for their clients by selecting the type of reconciliation desired, the charge method, input media and formats, report content and retention period for data base information. A menu-driven set of modules is included.

Annual primary license for the product is $2,314, with an initial license of $5,000.

Honeywell, 200 Smith St., Waltham, Mass. 02154.

■ Hewlett-Packard Co. has announced an inventory management package for its HP 3000 minicomputers.

A spokesman said HP Invision includes capabilities for monitoring inventory using five forecasting as well as five different purchasing methods.

Users are then able to analyze usage trends for each inventory item, forecast the usage rate for the next period and determine if sufficient inventory will be available to meet demands.

According to the vendor, depending on the purchasing method, the system automatically considers the current inventory-holding costs, the amount of item usage throughout the year, the item quantity currently on order, recent item trends and the vendor's lead-time history.

HP Invision is priced at $25,000 and can be integrated with HP's SFD/3000 distribution management software.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

■ Unicalc Corp. has announced Micro Prompting for its mainframe spreadsheet package Unicalc/DB, for use with IBM's MVS and DOS under TSO or CICS and Cullinet Software, Inc.'s IDMS-DC under MVS and DOS.

The Micro Prompting feature allows users to go through a Unicalc/DB session without using the complex spreadsheet command syntax,

Continued on page 88

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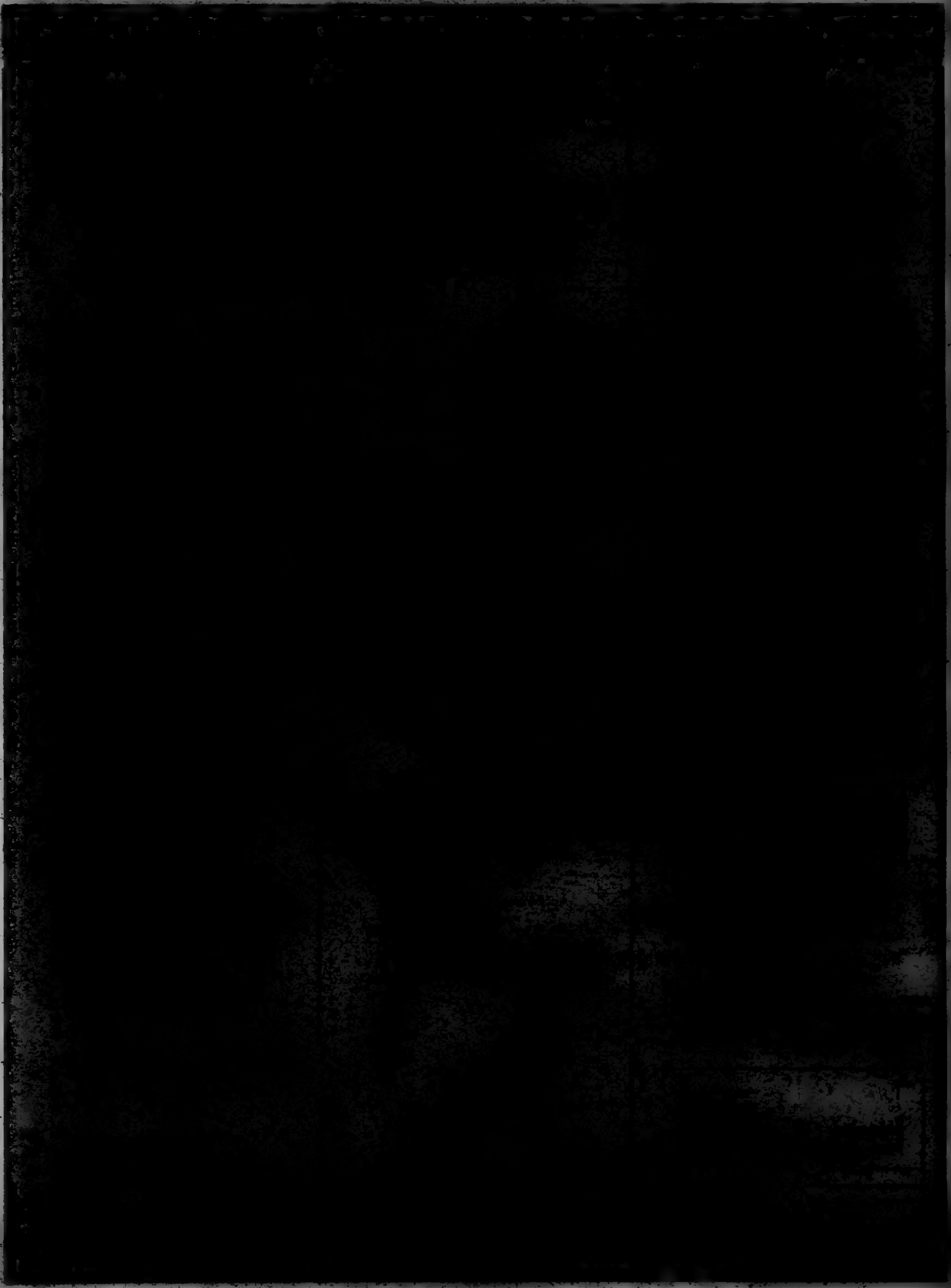

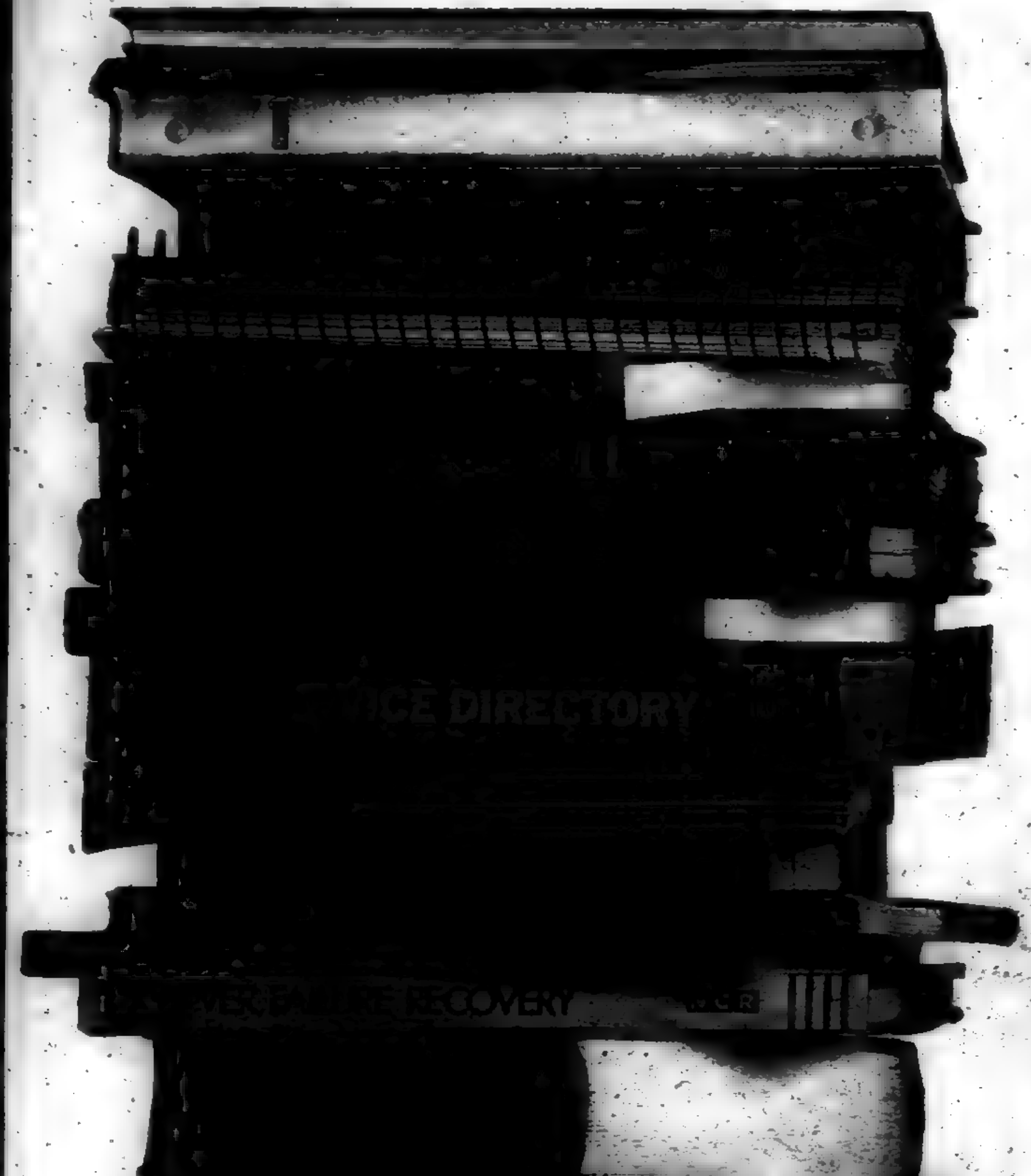
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SOFTWARE & SERVICES

Continued from page 64

according to a spokesman. With Micro Prompting, Unicalc/DB reportedly parallels the operation of micro spreadsheets such as Lotus Development Corp.'s 1-2-3. Users are led through a Unicalc/DB session with English-language prompts and displays of choices in a menu format.

Micro Prompting costs $1,000 as an add-on to Unicalc/DB. Unicalc/DB costs $11,000 for MVS, $6,500 for DOS on the IBM 4331 and 4361 and $8,500 for DOS on the IBM 4341 or 4381.

Unicalc, Two Academy Lane, Wayne, Pa. 19087.

■ Cycare Systems, Inc. has announced the C900 health care applications package for IBM mainframes running the MVS operating system.

The C900 reportedly allows large health care facilities — including health maintenance organizations, outpatient hospital clinics, medical school practice plans and large physicians groups — to automate patient accounting, scheduling, insurance billing, claims processing and premium billing.

C900 includes more than 30 applications packages said to be designed for patient care, patient accounting and administration of health maintenance organizations. It runs on IBM 4381 and 3080 series mainframes.

Price varies according to configuration. Software-only configurations range in price from $800,000 to $2 million.

Cycare, Suite 530, Dubuque Building, Dubuque, Iowa 52001.

■ Outlook Software, Inc. has announced Outlook/AR Accounts Receivable System for the IBM System/38.

According to a spokesman, Outlook/AR links billing, collection and accounts receivable reporting activities in financial and distribution systems. On-line cash posting, credit monitoring and history analysis capabilities are provided. Options are available for the automatic generation of general ledger transactions, a spokesman said.

Functions that assist users during cash posting operations include display of existing debit, credit or closed items. Transaction types available include invoices, payments, adjustments, miscellaneous cash receipts, finance charges and discounts. In addition, an unlimited number of adjustment transactions can be defined, the spokesman said.

Outlook/AR can run separately or in conjunction with Outlook/GL as well as with the Outlook/38 Financial Modeling System. It is priced at $8,500.

Outlook Software, Suite 117, 1 Woodfield Lake, Schaumburg, Ill. 60195.

■ Visual Engineering, Inc. has announced that its line of AT&T Unix-based software products now runs on processors from a variety of vendors, including Amdahl Corp., Digital Equipment Corp. and NCR Corp.

By coupling Unix with the Graphical Kernel System (GKS) and the C programming language, Visual Engineering can support the range of systems from a single source file, a spokesman said.

Visual Engineering products include Visual:GKS, a set of graphics functions for applications integration; Visual:C-Chart, a representation graphics tool set; and Visual:Prochart, a charting system for end users.

Systems running the software include the DEC VAX series, all Amdahl processors, the AT&T 3B2 supermini, NCR Tower running Unix System V, Pyramid Technology Corp. processors running Unix System III, Convergent Technologies, Inc.'s processors running Ctix and Sun Microsystems, Inc.'s Sun Workstations running OSX.

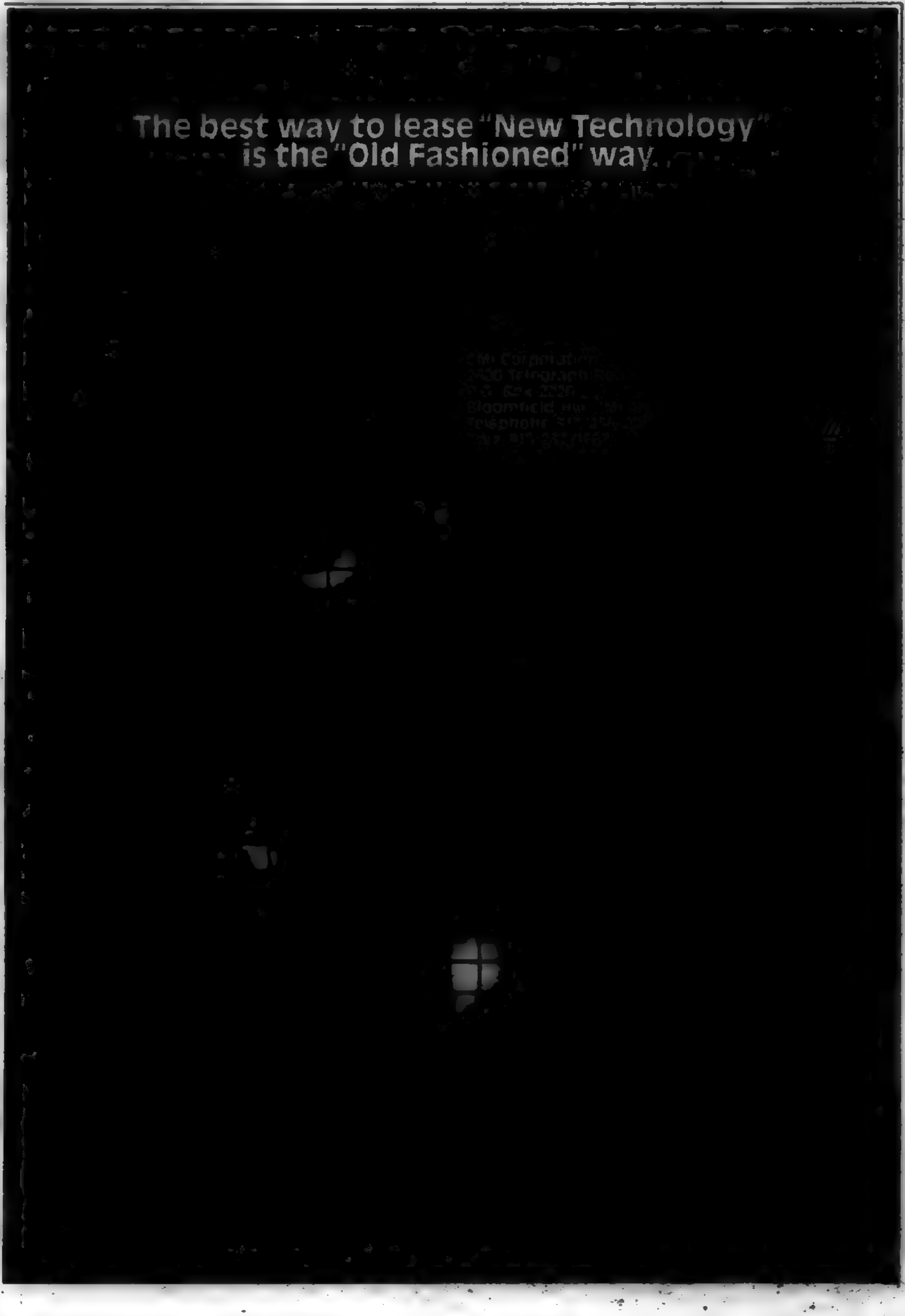
Visual Engineering software for Unix-based systems costs $690 to $36,000, depending on configuration.

Visual Engineering, Suite 200, 2680 N. First St., San Jose, Calif. 95134.

■ Management Science America, Inc.'s (MSA) Health Care System software for health care costing and accounting for hospitals is now available to users of Applied Data Research, Inc.'s Datacom/DB data base management system.

According to a vendor spokesman, the Health Care

Continued on page 70



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SOFTWARE & SERVICES

Continued from page 68

System provides cost accounting that enables hospitals to comply with state and federal reimbursement requirements. It also helps forecast service demand, manage multiple product lines and provide hospital management with information needed for third-party payments.

The Health Care System works with MSA's Expert Link micro-mainframe software and with Information Expert, the company's fourth-generation reporting and retrieval tool. MSA Health Care System for Datacom/DB costs between $130,000 and $220,000, depending on modules and options.

MSA, 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

■ Tres Systems, Inc. has added remote on-line printing capabilities to its Materials Management System (MMS) for IBM mainframes running under OS/MVS.

Tres MMS/II Version 1.4.3 now allows multiple shipping notices and information to be accepted for back-ordered items. Other enhancements reportedly allow stock-code items to be cross-referenced to purchase orders, and an account validation facility helps eliminate erroneous entries.

MMS/II Version 1.4.3 costs approximately $200,000 to $225,000, depending on configuration.

Tres Systems, 16775 Addison Road, Dallas, Texas 75248.

■ Intro-Logic, Inc. has announced its Manufacturing III system for order entry, production and inventory control, shop-floor management and shipping and receiving applications. Manufacturing III runs on the IBM System/34, System/36 and 4300 series CPUs under DOS or OS.

A spokesman said Manufacturing III is based on a closed-loop design. The product features an integrated general financial system that ties manufacturing activity to general ledger, accounts payable and receivable and payroll systems. The software is menu-driven and uses English language commands.

Manufacturing III costs $40,000, the vendor said.

Intro-Logic, 24700 Northwestern Highway, Southfield, Mich. 48075.

■ McDonnell Douglas Information Systems Group has added a mechanisms linkage module to its Unigraphics II computer-aided design, engineering and manufacturing software.

The Mechanisms module allows engineers to perform detailed analyses of components such as rods, springs or joints, a spokesman said. The product provides capabilities for multielement linkage design, analysis and animation and interfaces to third-party analysis packages. The Mechanisms module also allows the designer to perform static, kinematic and dynamic analysis.

The Mechanisms module costs $8,000 to $18,000.

McDonnell Douglas Information Systems Group, P.O. Box 516, St. Louis, Mo. 63166.

■ National Information Systems, Inc. has announced that its Vue project management system is now available on Convergent Technologies, Inc.'s Miniframe and Gould, Inc. computers under AT&T's Unix.

A spokesman said Vue uses the critical path method of scheduling and includes capabilities for sorting, specifying a time window and choosing selected materials for reporting and summarizing.

Vue also runs on Convergent Technologies' Megaframe, Digital Equipment Corp.'s VAX series and PDP-11s, IBM mainframes under VM/CMS, Hewlett-Packard Co.'s HP 3000 and Honeywell, Inc.'s DPS-6 and DPS-8 computers.

Vue is priced from $2,995 to $20,000 depending on hardware configuration.

National Information Systems, Suite 130, 20370 Town Center Lane, Cupertino, Calif. 95014.

■ WR Associates Information Systems, Inc. has announced Release 2.1 of its Order Entry Invoicing & Sales Analysis System for IBM System/34 and 36 minicomputers.

A spokesman said enhancements to Release 2.1 include the following features: expanded pricing capabilities allowing pricing by customer and item in addition to user-defined trade discounting; on-line credit checking based on dollars and days past due; open order and invoicing; and gross margin analysis reporting.

Release 2.1 of Order Entry Invoicing & Sales Analysis System is priced at $4,500.

WR Associates Information Systems, Suite 203, 3105 Marshall St., Richmond, Va. 23230.

■ Control Data Corp. has announced that Schofield & Associates, Inc.'s Ingot fourth-generation language and decision support system software now runs on Cyber 180 computers under CDC's NOS/VE operating system.

Ingot also runs on IBM mainframes under MVS/TSO and VM/CMS, Data General Corp. machines under DG's AOS/VS, Prime Computer Corp. processors under Primos and Digital Equipment Corp.'s VAX computers under VMS.

Ingot is said to include a standard universal interface to personal computers and word processing systems and a standard operating interface to permit its models to operate with other programs in the computer.

Ingot for CDC systems is priced from $8,000 to $40,000.

CDC, P.O. Box 0, 8100 34th Ave. S., Minneapolis, Minn. 55417.

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■ Advanced Data Systems, Inc. has announced a customer order information system and a scheduling and inventory control package for Hewlett-Packard Co. HP 3000 computers.

Customer Order Information System (Coins) provides order entry and invoicing, financial management and payroll and personnel functions, a spokesman said. Coins operates as a stand-alone system or can be integrated with the company's inventory control package. Coins is priced at $15,000.

The Scheduling, Purchasing, Inventory Control, Reporting and Engineering (Spire) package is designed to support the job shop, the spokesman said. Spire is a modular package and is priced from $5,000 to $50,000, depending on customization.

Advanced Data Systems, Suite 165, 3604 Galley Road, Colorado Springs, Colo. 80909.

■ Global Software, Inc. has introduced an accounts receivable package for IBM mainframes under IBM's OS, DOS/VSE and MVS operating systems.

A spokesman said the accounts receivable system provides users with alternate access paths for inquiry and multilevel security features. Other features reportedly include an on-line notepad that prompts users with a message and appropriate account history when an account review is accessed, a report writer and secondary key indexing.

The Global Software accounts receivable system is priced between $80,000 and $100,000.

Global Software, 1009 Spring Forest Road, Raleigh, N.C. 27609.

■ Real Estate Solutions, Inc. has announced that its revised "Guide to Real Estate and Mortage Banking Software" is now available.

The updated guide, a 1,220-page, two-volume manual, highlights more than 525 available software packages and computer services.

The guide's software analysis features a product description, data on specific business applications, intended users, property types, program structure, operating systems and hardware requirements, documentation and prices, according to Real Estate Solutions.

The guide is available for $135.

Real Estate Solutions, Department R, 2609 Klingle Road N.W., Washington, D.C. 20008.

■ Command Data Systems, Inc. has introduced the Computer-Aided Dispatch and Police Records Management integrated software packages and a Crime Analysis module for its Leader records system for use by police and emergency agencies with Digital Equipment Corp. VAX series computers.

The Computer-Aided Dispatch system consists of modules that manage police and emergency vehicles and personnel within a locality. It is said to maintain status reports, prioritize incoming calls for help and assign vehicles to emergency situations. The system automatically logs all status changes.

The Police Records Management System consists of modules that are said to help track known criminals, recognize similar modus operandi, retain field interview data, inventory lost or stolen property and interface with local, state and national crime information systems.

The Crime Analysis System module reportedly allows officers to search for information based on criteria such as physical descriptions, types of crimes, vehicle descriptions and criminal histories. It is said to be useful for detecting crime patterns, forecasting, allocating resources, correlating suspects and organizing special operations.

Prices for the systems vary according to requirements. The Computer-Aided Dispatch system ranges from $50,000 to $95,000 and the Police Records Management System, from $40,000 to $90,000. The Crime Analysis Module costs $16,000.

Command Data Systems, 6230 Village Pkwy., Dublin, Calif. 94568.

■ McDonnell Douglas Computer Systems Co. has announced an agreement to market Computer Programming, Inc.'s Serialized Inventory Tracking and Control Systems (Sitacs) for McDonnell Douglas' Microdata Corp. 4000, 6000, 9100 and 9000 processors.

A spokesman said the Sitacs inventory management tool allows the tracking, control and movement of inventory by location and status and tracking of raw material and sub-assemblies. Modules in Sitacs include requisition and field issues and returns, inventory and purchase order control and repair order processing.

An optional subsystem, Military Standard for Requisitions and Purchases (Milstrip), is also available. Milstrip creates issues and returns from a Department of Defense 80-col. record format.

Sitacs applications software is priced from $25,000 to $35,000 for a permanent license. The Milstrip option is priced at $5,000.

McDonnell Douglas Computer Systems, 17481 Red Hill Ave., Irvine, Calif. 92714.

■ Greene Software has announced EMS/36, an Extended Mapics Security system for IBM System/36 Mapics users.

A spokesman said EMS/36 allows each Mapics menu option to be secured individually for control of program access. New Mapics menus, menu options or applications may be added and secured at any time. EMS/36, transparent to users, can be used in addition to Mapics-level security or as a stand-alone security system.

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SOFTWARE & SERVICES

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The menu-driven EMS/36 has Help screens and password reports and is written in RPG-II.

EMS/36 costs $395 for a one-time license fee.

Greene Software, P.O. Box 23, Victor, N.Y. 14564.

■ **Data Systems for Industry has unveiled a purchasing module for its QED manufacturing management system on the Hewlett-Packard Co. HP 3000 and Stratus Computer, Inc. Stratus/32 systems.**

The Procurement Requirements Processing (PRP) module maintains the on-order status of items purchased for materials requirements planning (MRP) and receiving. It produces printed purchase orders automatically from the MRP file and permits manual entry of purchase orders, a spokesman said.

The product offers automatic vendor sourcing and provides vendor performance and purchase price variance controls.

The PRP module costs $15,000.

Data Systems for Industry, 3942 Cerritos Ave., Los Alamitos, Calif. 90720.

■ **Dimension 4 Design Group has announced an accounts collection package for users of IBM's System/34 and 36 minicomputers.**

The Money Collection System automatically prints customized collection letters and tracks collection activity until an account is paid, a vendor spokesman said. The product organizes collection efforts and alerts users when accounts are entering past-due status. It also interfaces with IBM's Mapics and other IBM accounting packages.

The Money Collection System costs $1,250.

Dimension 4 Design Group, Worthington, Ohio 43085.

■ **Vector Automation, Inc. has announced an International Graphics Exchange Standard (Iges) format converter for its Cadmax family of computer-aided design and manufacturing products.**

The Iges Format Converter converts existing drawing files into a standard Iges format for transfer from compatible CAD/CAM systems into the Cadmax products, the vendor said.

Drawing files can be output to a 9-track 800 or 1,600 bit/in. tape. The product costs $5,000.

Vector Automation, Village of Cross Keys, Baltimore, Md. 21210.

■ **Versatec, Inc. has introduced Versaplot 9, a plot generator for Versatec's monochrome or color electrostatic plotters running under Digital Equipment Corp.'s VMS operating system.**

According to a spokesman, Versaplot 9 supports Direct Memory Access data transfers to Versatec's DMA controller for immediate on-line plotting. Output can be targeted to disk, magnetic tape, or directly to the Versatec plotter.

The product is available in Fortran IV and DEC's VAX-11 macro assembly language source code. A set of command files is included.

Versaplot 9 is available on diskette or 9-track magnetic tape for $4,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

■ **Computronics has introduced a system usage accounting package for users of Prime Computer, Inc.'s Primos Revision 19 operating system.**

A vendor spokesman said Log-Time keeps information about the system user for calculation of computer charges. Log-Time will compute charges for connect time, CPU time and disk I/O time. Charges are logged to the disk and can be used in the production of invoices and charge-back reports, the spokesman said.

An audit trail registers unsuccessful attempts to log on to the system, the spokesman said. In addition, Log-Time includes an interuser electronic mail subsystem. Price for a single system is $600.

Computronics, 4N165 Wood Dale Road, Addison, Ill. 60101.

■ **Calma Co. has announced Geodraw, a two-dimensional computer-aided engineering drawing tool that allows a design engineer to create drawings from a solid model design. Geodraw runs on Calma's Digital Equipment Corp. VAX-based system or**

Continued on page 74

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Continued from page 72

Calma's Apollo Computer, Inc. workstation-based system.

Goodraw was developed by Structural Dynamics Research Corp. (SDRC). A vendor spokesman said Goodraw interfaces with SDRC's Geomod solids modeling package to provide a method for producing 2-D documentation of conceptual models for project analysis, prototyping and contract bid requisitions.

Using Goodraw, users can create text, dimensions, labels and balloons and interact with the system to arrange arrows and position text. Other features include limit dimensions, curve fonts and the ability to create symbol libraries.

Goodraw on a DEC VAX costs $25,000; on an Apollo workstation, $12,500.

Calma, 501 Sycamore Drive, Milpitas, Calif. 95035.

■ Lilly Consulting and System Services has announced a three-part access security system for users of the Digital Equipment Corp. RSTS/E time-sharing system Version 7.2 and greater.

According to a vendor spokesman, the SAC System controls day and time of day access by user account, keyboard number and keyboard type. SAC System reportedly can limit the system commands a user can issue and programs a user can run.

SAC Menu provides menu access control for hard-copy and CRT terminals with a choice of 16 access privilege levels. SAC Password reportedly offers password protection and generation.

The bundled system costs $2,990. Unbundled prices are $1,490 for SAC System, $1,290 for SAC Menu and $450 for SAC Password.

Lilly Consulting and System Services, 7350 W. Marine Drive, Milwaukee, Wis. 53223.

■ Viking Software Services, Inc. has announced software for Digital Equipment Corp. VAX computers that allows users to select and execute tasks without using the operating system command language.

The Viking Control System (VCS) was designed for users of limited computer functions, a vendor spokesman said. The program assigns each user an access and privilege profile to maintain system control and security. A Control Program requests the user's identity and password, validates the user and presents a menu of tasks from which the user may select.

The VCS also includes a reporting program and an access control mechanism. Viking's Form Manager and Data Manager are required for use. The VCS costs $1,000.

Viking Software Services, Suite 816, 2815 E. Skelly Drive, Tulsa, Okla. 74105.

■ Software Express, Inc. has announced that its Appgen applications generator now runs on Digital Equipment Corp. AT&T Unix-based VAX computers.

Appgen reportedly allows the developer to create and customize an application through a series of English-language prompts. The prompts drive the general applications processors that provide the business applications functions. A developer's responses build parameters to drive the runtime module and create a specific application, a vendor spokesman said.

The price of Appgen on Unix-based VAX systems ranges from $6,000 to $24,000.

Software Express, 2925 Briarpark Drive, Houston, Texas 77042.

■ Precision Visuals, Inc. has announced that its line of graphics software now runs on all Perkin-Elmer Corp. computer systems.

Software available for PE computers includes Precision Visuals' DI-3000 graphics tools package, Grafmaker for defining charts and graphs, the Metafile System and the Contouring System for generating contour plots, according to a vendor spokesman.

The Precision Visuals packages, available from PE, cost from $500 to $14,000, depending on configuration.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

PE, 2 Crescent Place, Oceanport, N.J. 07757.

■ Precision Visuals, Inc. has announced that its DI-3000 graphics tools package now runs on Apollo Computer, Inc.'s DN600 and monochrome DN300 workstations.

According to the vendor, DI-3000 allows graphics programmers to access capabilities of pen plotters, film records and other output devices without modifying the applications.

DI-3000 reportedly supports Apollo's windowing system by putting each application program in a different window and treats each window as a different graphics output device.

DI-3000 licenses for the Apollo DN300 or DN600 workstations begin at $5,500.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

■ Britz Publishing, Inc. has announced the Graphics/Presentation System for IBM System/34 and 36 minicomputers.

According to a vendor spokesman, Graphics/Presentation is a menu-driven system for analyzing, sorting and presenting graphs or displays.

The product reportedly enables users to create, edit, save and print graphics, including vertical and horizontal bar and scatter graphs.

Graphics/Presentation costs $90.

Britz Publishing, 1814 Capitol Towers, Jackson, Miss. 39201.

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BEIZER

from page 57

They are not testing adequately or not testing smart. In many cases, people spend an enormous amount of money on testing. But because they don't understand testing needs and they don't understand the technology of testing, they are basically wasting their money.

Q *What do you mean by not testing smart?*

If you throw a million random numbers at a routine, that could be an enormous number of tests. But that doesn't mean that those tests prove anything. Testing smart is using a variety of techniques, using structural and functional techniques. There's a whole [testing] technology out there, and people don't know about it. So testing smart is using effective tests — tests that have a high probability of revealing bugs.

Q *How have attitudes toward testing changed? Are companies coming to recognize the importance of testing?*

I would say that those [companies] that have been burned very badly or those that are very advanced in their thinking are coming around to that point of view. But the prevailing attitude today is still that it is all right to test only 85% of the code. These companies are thinking only of short-term goals and not accounting for the [long-term] cost of bugs.

Q *What constitutes a realistic attitude toward testing?*

Understanding the issues of testing and quality assurance, having basic knowledge of the techniques and establishing the management and technical resources required.

Q *Is there such a thing as a foolproof test of software quality?*

Not for any real program. The ultimate test is pragmatic. I can argue that a program has no bugs because I don't care how it behaves. The idea of what is and isn't a bug is essentially a human judgment. All bugs stem from human misconception or disagreement. Consequently, there can be no theoretical proof or no formal method that guarantees the elimination of bugs.

Q *Do a variety of programming languages affect testing procedures?*

Certain types of programming languages can reduce certain types of bugs. Assembly language tends to be the most bug prone. More modern languages like Pascal eliminate certain types of bugs or make them unlikely to occur. However, because programs in the higher order languages tend to take on more complex tasks, the bug rate has remained almost constant. We're finding a raw bug rate before testing on the order of 3%, or three bugs per 100 statements. It doesn't seem to matter whether those are 100 assembler-level statements or 100 statements of Job Control Language or 100 statements of Pascal or Cobol.

Q *What portions of the program are the most important to test?*

All of it. Bugs are random. Bugs are wild cards. The bug doesn't know which part of the program you are emphasizing.

Q *What percentage of a product life cycle should be spent on testing?*

You can't test forever; otherwise, the product never leaves the house. So you've got to say, "I can afford to do this amount of testing, and I'm going to allocate my resources in the optimum way."

If you look at the limited view of testing from conception to the point at which it goes out the door, nobody in this business today could argue for anything less than 50%. Everybody agrees-it's at least 50% testing, 50% development until the product is released.

> ❞
>
> *Quality is where it's at. And we are going to learn how to build testable designs. Structured coding was the big subject of the '70s. In the '80s it's testable designs.*

Q *What can be done to convince upper management that testing is critical?*

Two things. In some cases, they've had a very serious catastrophe that has almost ruined them. If they've had a catastrophe and it's recoverable, then sometimes management's head is turned around. Fundamentally, though, it has to be a grass roots movement. Programmers have to start testing with or without management support and show tangible evidence [of improvement] in terms of producing products at lower costs with longer life spans and that are easier to maintain.

Q *Do you see that happening?*

I see it happening in some places. I think there's nothing less than a revolution going on. I think the computer world is going to polarize into those who understand quality and those who don't.

Q *What can DP management do to foster the proper attitude toward testing?*

First, [managers] better get realistic attitudes about what software development is all about. Secondly,

See BEIZER page 76

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BEIZER

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they've got to stop laying guilt on [programmers] for the existence of bugs, which they do. Human beings are being asked to produce perfection for which they are not equipped. Consequently, we have to stress prevention methods and test methods that catch bugs.

Also, who is management rewarding? Management rewards the programmer who fixes the bug. Well, that's the [person] who put it in. Every [quality assurance] person I have talked to said we're punishing the people who discover the bugs, and rewarding the people who put them in. That's a very mixed message.

Q ***To whom should the responsibility of testing fall? Should there be specific people assigned to do just testing or should this testing be rotated?***

It should be a responsibility divided among programmers. But it depends a lot on the product and its complexity.

I advocate a balance between the designer's own test and independent testing depending on where in the phase of things you are and where in the life cycle you are.

Q ***What about the future of software testing — where do you see things going?***

I see the future of software as an activity dominated by testing with occasional forays into design. As far as I'm concerned, quality is where it's at.

And we are going to learn how to build testable designs. Structured coding was the big subject of the '70s. In the '80s it's testable designs.

IBM

from page 57

well be inclined to view the glass as half empty. Despite the fact that recent market research indicates IBM's two premier DBMS — IMS and DL/1 — account for close to two-thirds of the installed DBMS base, the blue giant is losing its once viselike grip on the DBMS market.

Glass more than half full

Considering the revenue IBM derives from its DBMS products, others might see the glass as something more than half full. According to the Gartner Group's Smith, IBM's DBMS-related products garnered the Armonk, N.Y., goliath well over $600 million — out of total software revenue of about $3.2 billion — in 1984.

Six hundred million dollars is an amazing figure when you contemplate the total revenue of the independent software companies considered to be leaders of the pack. When one of the independents breaks the $200 million total revenue mark some time in the future, it will be earning only one-third of what IBM earned from DBMS software alone last year.

By the time the $200 million milestone is reached, however, it will represent less than a third of IBM's DBMS revenue for the same period. Gartner Group predicted approximately 30% compound growth in IBM DBMS revenue, a growth rate that should bring DBMS revenue to much more than $2 billion by the end of this decade.

Glass half empty

Still, as far as revenue-conscious IBM is concerned, trends in the DBMS market make the glass seem half empty. Like applications software, DBMS software is becoming a chink in IBM's revenue armor. Gartner's research shows that an increasingly smaller number of prospective buyers are looking to IBM for their DBMS. That trend was borne out by International Data Corp. (IDC), which, in a recent ly, study, predicted that by 1988 just under half of DBMS sales will go to the independents. In addition, Gartner's research indicates that users view IBM's DBMS products as weak in most functional areas.

> *Even though IBM's two premier DBMS account for close to two-thirds of the installed DBMS base, the blue giant is losing its once viselike grip on the DBMS market.*

What's the problem? As most large users are probably painfully aware, IBM's IMS and DL/1 are aging technology — albeit technology that has lived a long and extremely useful life. Yet, the weight of a large percentage of the world's applications rests on those systems.

So, while a productivity-hungry marketplace has turned to the vendors of such tools as relational DBMS, fourth-generation languages and powerful applications development systems, IBM has had to face the dilemma of providing the new wrinkles its customers need while maintaining the older systems on which their clients' operations are based. A massive installed product base that assures a steady stream of rental income is a wonderful thing. But, as Atlas knew, the weight of the world can be ponderous.

IBM's DBMS strategy to date has not won rave reviews from users or critics, although time may soften some of the criticisms that have risen. IBM's approach is essentially a dual-DBMS one, which focuses on IMS for production systems and the fledgling DB2 relational DBMS for information center or end-user needs. Two DBMS with two leases without a great simultaneous increase in productivity, users and ob-

See IBM page 78

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SOFTWARE & SERVICES

IBM

from page 76

servers said, is a little hard to swallow.

"IBM is shooting itself in the foot with the dual-DBMS strategy," Smith explained, "and will continue to slip here."

Existing base hard to penetrate

Thus, the independents have been able to move swiftly in the DBMS market — at least as far as new customers are concerned.

But a harder market to penetrate has been the existing IBM DBMS user base. Applied Data Research, Inc. is betting, though, that its recently unveiled DL1 Transparency will help it get both feet into that base in short order.

The DL1 Transparency is said to allow IMS and DL/1 users to migrate to ADR's Datacom/DB relational DBMS without a massive conversion, a stumbling block any user would pale before in moving to another DBMS.

At the introduction of DL1 Transparency, ADR President Martin Goetz said, "DB2 is only a partial solution. IBM is locked into IMS, and DB2 is not satisfying users."

Timing may be off

But ADR's timing may have been off, at least in the eyes of some users and analysts. While IBM's dual-DBMS strategy has been less than satisfying, there has been grudging acknowledgement that IBM is moving to improve the capabilities of DB2 and may even eventually position it as its primary DBMS offering. Users may not be as unhappy with the migration path IBM has carved out as some would believe.

One large prejudice that will have to be overcome, and one that ADR firmly believes it can overcome, is the notion that relational systems are not appropriate for production applications.

But it may take some convincing to sell IBM shops on the idea that they should stray from the path of Big Blue and place all their eggs in a relational basket — especially if there is a chance IBM will get its DBMS house in order.

But if IBM does that, then things will be different all over for the independent DBMS vendors. For now, though, ADR sees the market as a glass half full.

DBMS

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ble than traditional hierarchical or network systems. But exercising relational flexibility requires unstructured processing. If a relational system imposed the discipline required of structuring processing to achieve good performance, then its flexibility would be lost. Systems are either flexible or they perform well; they do not do both.

Performance problems

Ironically, at the physical data structuring level, relational and hierarchical systems can be configured almost identically. It is not at the physical data structure level that relational systems are unable to perform. It is in the unstructured use of the relational systems that performance problems arise.

At first glance, there seems to be a conflict between business function and the standard work unit. But that conflict disappears upon detailed examination.

Consider the amount of business function that an airline clerk has. The clerk can book trips, assign seats, take payment, reserve accommodations, assign ticket class, determine discount, order special meals, reserve automobiles and so on. In short, airline clerks have a tremendous amount of function at their fingertips.

And what sort of response time does the clerk experience? Consistently good response time. The secret is in the on-line packaging of the airline function. Consider how the clerk accomplishes function. The clerk transacts one piece of the function at a time — not all at once. It may take 10 different transactions to book a trip, but each enjoys a response time of one to two seconds.

What the clerk does not do is load all the information at once, push the Enter key and hope everything works out well — and quickly.

Consider the on-line packaging of business function in another environment — the insurance industry. One approach to building life insurance policies is to cram a large amount of information into several screens and then push the Enter key to

See DBMS page 78

DBMS

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transact the policy. Such an approach is the result of transferring a batch mentality to the on-line environment.

Using the standard work unit, the same function could be accomplished. First, the policy number is created in the data base by an on-line transaction. The next transaction attaches name, address and so on to the policy. The next transactions address beneficiary and employment information and so forth.

Instead of one giant transaction, many smaller transactions are run. Each transaction uses less I/O and achieves a response time of two to three seconds. There is no difference in the function, but rather in how the function is packaged. And packaging the function in accordance with the standard work unit is the secret to satisfactory on-line performance.

Application throughout design process

The standard work unit, to be effective, must be applied throughout the design process. If the standard work unit is first mentioned at the program debugging phase, then it is often too late to reconstruct a transaction that grossly violates the standard work unit. So, effectively applying the standard work unit requires that the designer be aware of proper packaging of on-line functions early in the design process.

In the early stages of design, the developer hardly knows a great deal about specific I/O activities. However, the developer does know about data-driven and multifunction processes.

A data-driven process is one in which resource consumption depends on the amount and/or the configuration of the data on which the process operates. A multifunction process is one that attempts to do a great deal of processing in a single execution, much like the large batch programs that did everything on a master file once the batch program had control of the master file.

The developer can look for both data-driven and multifunction processes early in the design life cycle and design accordingly. If the designer does a good job early on, the result is a minimum of fuss once the system gets to the point of being programmed.

Work unit solidifies relationship

One very beneficial by-product of the standard work unit is strictly nontechnical. When installed and adhered to, the standard work unit greatly solidifies the relationship between applications developers and the data base administration group — normally a stormy relationship. Applications designers know very specifically the parameters under which their on-line transactions must be built.

Provided the applications group adheres to these standards, it has the final say on how the system is to be built. And the data base administration group knows that if all applications are built under the standard work unit, performance will be satisfactory.

The standard work unit must be addressed technically and organizationally. The latter is because to be effective, it must be applied across the entire organization. Further complicating matters is the issue of complacency. When first applied, the standard work unit requires change. Those changes are reflected in the work patterns of the designer and the programmer — two groups that traditionally resist change.

> ”
>
> *If a relational system imposed the discipline required of structuring processing to achieve good performance, then its flexibility would be lost.*

Stick and carrot approach

Management must embrace the standard work unit with both the stick and the carrot. It must understand that not embracing it leads to poor on-line performance, which in turn leads to the unnecessary acquisition of more hardware. There is a strong, direct relationship between the standard work unit and budget control.

The standard work unit positively affects the DP budget in another important way. On-line systems written under the standard work unit only have to be maintained when there is a change in the users' requirements. But on-line systems not written under the standard work unit require constant modification just to achieve adequate response time. Thus, the standard work unit directly affects the maintenance as well as the hardware budget.

The standard work unit is the key to on-line performance. It dictates that each on-line transaction do a discrete amount of processing — usually controlling the amount of I/O performed by each transaction. The standard work unit can be formulated in terms understood by the programmer — in terms of data base calls or points based on data base calls. Management must be aware of the positive budgetary impact that can result from establishing and enforcing the standard work unit.

Inmon, a director at Coopers & Lybrand in Denver, is a noted author on the subject of data base design and a regular contributor to Softlines.

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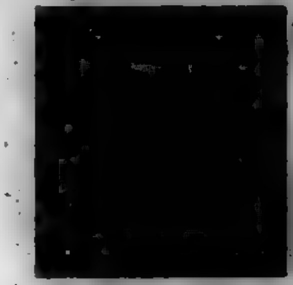
Virtual Memory Operating System	Yes	No
Removable Storage Options	Yes	No
Local Area Networks	Yes	No
Architected for OA/DP	Yes	No
Relational Data Base	Yes	No
Industry de facto Standard Word Processing	Yes	No



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IN DEPTH

CHIEF INFORMATION OFFICER

Does your company need one?

By Michael Weiner
and John Girvin

The information revolution is going to sort out MIS executives into winners and losers. At risk is your position on the organization totem pole. There is opportunity to be up with the thunderbird or down in the dust.

The importance of the information asset is taking concrete form in a growing number of companies with the emergence of an enterprise-level resource manager called the chief information officer, or CIO.

First, a definition: "Chief information officer" is a generic title for an enterprise-level executive (usually a senior vice-president) who participates on a peer basis with other corporate officers in the formulation of company policies needed for the direction, management and control of the business. The CIO's participation is not limited to information, but rather, encompasses all aspects of the business where information plays a key role. He is the information

IN DEPTH

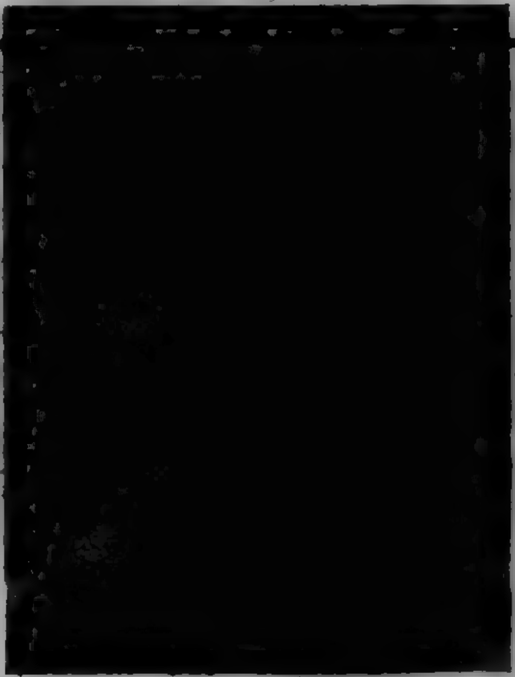
Interviews

By George Harrar
Senior Editor, Features

For years the CIO position has been more idea than reality, a dotted box sketched onto a corporation's management hierarchy with no name to fill it. The true CIO is still difficult to find.

Here are three — from a bank, an insurance company and a maker of machinery and chemicals.

William SYNNOTT



Page 8

"Someone who comes to the job with a knowledge of business and picks up technology along the way has an edge in becoming the CIO."

David HASKIN

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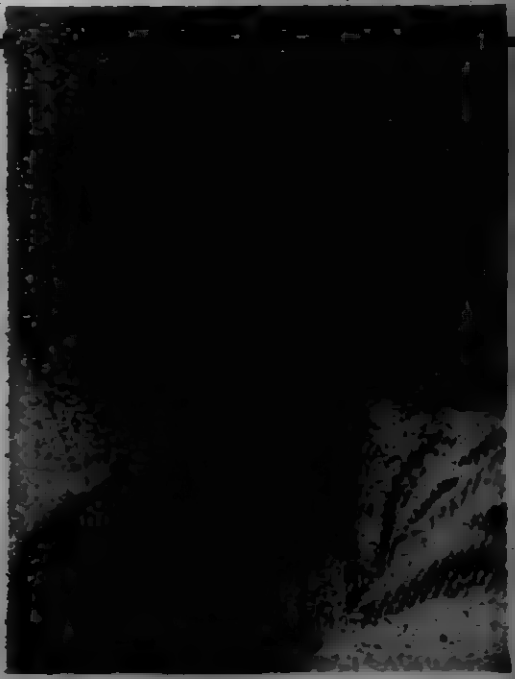
"[The CIO] takes the MIS function and uses it to its full capability in providing information and knowledge to operating policy members."

Dan IRWIN



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"We recognized a wave of technology coming. If we continued our old pattern organizationally, we were likely to miss opportunities."

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resource representative and technology adviser to the chief executive officer and other members of the executive committee.

For the DP executive seeing the creation of this new position, several important questions present themselves:

- What are the most appropriate functions of a CIO and what is his value to the organization?
- What could a CIO accomplish that an MIS executive could not?
- Will the CIO concept work in your organization?
- If a CIO becomes a reality for your company, how will it happen and what is your role?
- Can you (should you) be that person?
- What is critical for the success of a CIO?
- What makes this concept attractive to business management?
- Is this position a natural career path for the DP executive?

To John Diebold & Associates, the concept of the CIO seems well matched to the needs of organizations that seek to use information as a managed resource and its technology as a means of extending the reach of what they know and do.

Our recent research, including interviews at major corporations, gives us a picture of the CIO — who he is, what he does, how he got where he is and the factors crucial to his success.

Reporting relationship

The first thing to note about the CIO is his position in the organization. Tradition has long placed the information systems function under the chief financial officer, a placement that made sense because most early systems supported accounting and financial functions.

The CIO has now moved away from this reporting relationship and usually reports directly to the chief executive officer or similar corporate general manager. This change is important. The elevation itself is central to the concept, and the new reporting relationship underscores that the CIO now has a companywide responsibility and orientation.

Most CIOs have been created by direct action of the office of the president or the chairman of the company. The chairman of a large Western bank holding company, for example, directly recruited the senior DP executive of another bank to be his personal technology adviser and information policymaker.

The chairman has almost completed an extensive decentralization of the corporation into line-of-business units, making the heads of those units responsible for the management and use of technology. The CIO supplies the coordinating element in this organizational approach.

There are several messages here: The demonstrated interest of executive management has much to do with providing visibility and authority to the CIO. It seems the CIO requires top-down, rather than bottom-up, initiation. The idea can originate in the systems department, but it must be made attractive to the executive office or it probably won't fly.

The MIS director of a major energy company felt that the distributed nature of the firm called for a CIO position as a technology facilitator and coordinator. He initiated a study that recommended the concept to the president.

The MIS director saw himself in this new role. The company saw things differently. The job went to a "spare" executive who was between assignments. The MIS director continues to support the concept and the incumbent but questions his own sense of strategy.

Is the senior MIS executive the natural candidate for the CIO job?

Not necessarily. Of the CIOs interviewed, less than half have spent their careers in data processing. Most do have a good technical background, but they are most interested in what works rather than how it works.

Many CEOs seek a CIO who can make them feel confident that the technology is being managed properly without bombarding them with DP

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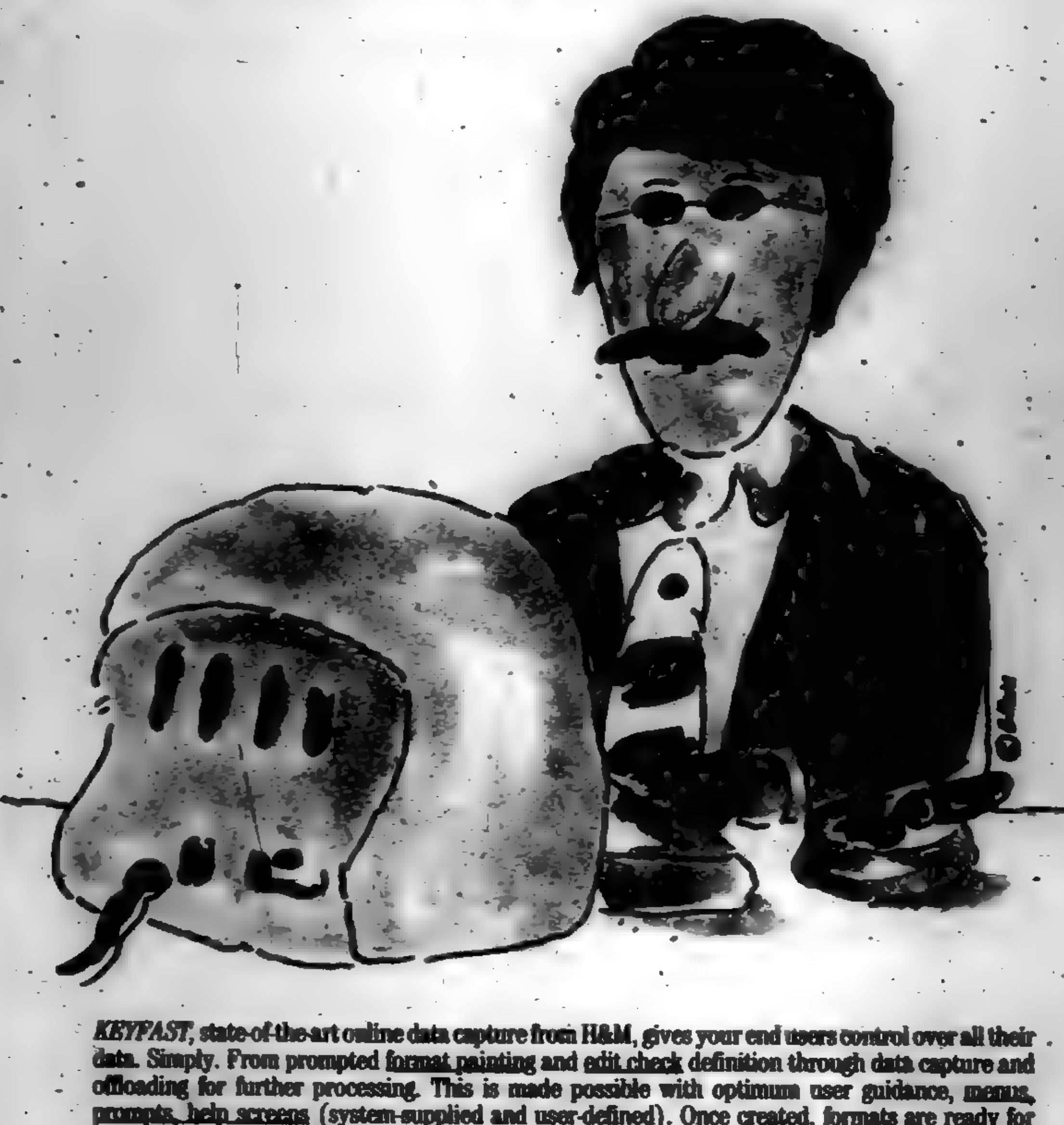

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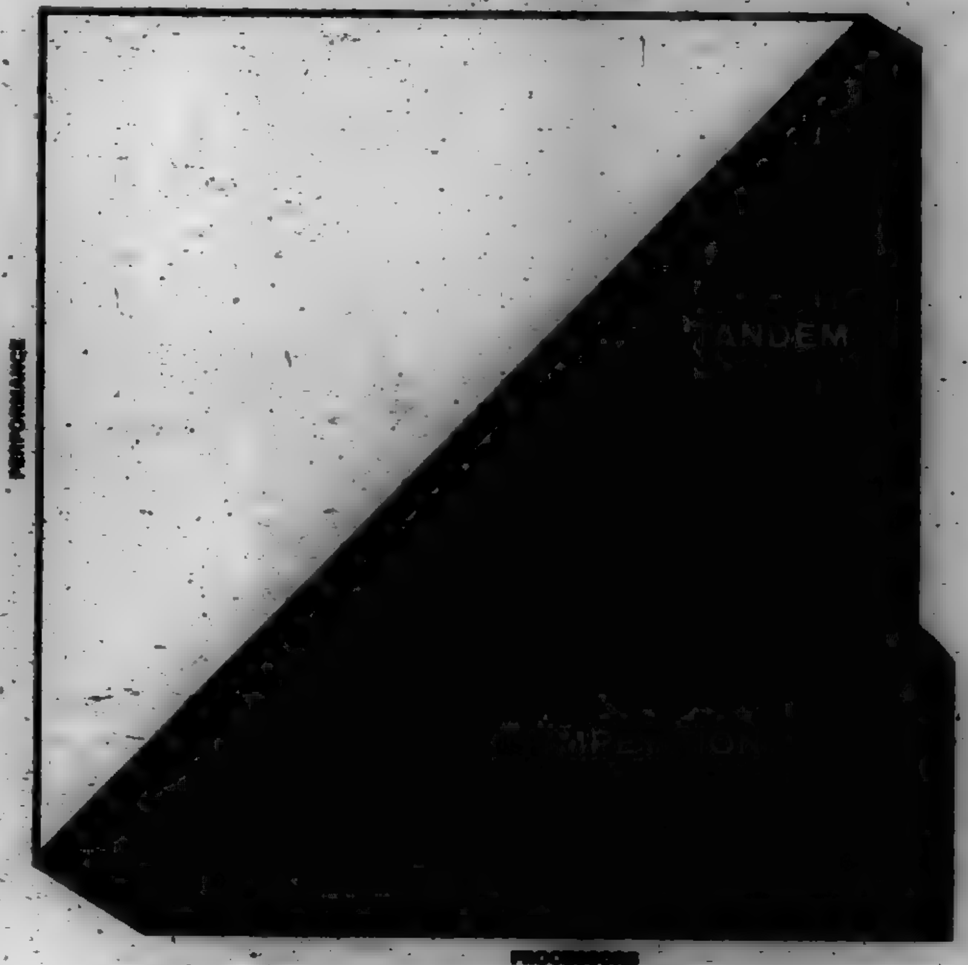

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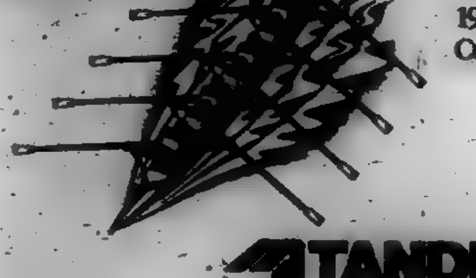

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> **”**
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> ***The CIO is a staff function with no direct responsibility for line activity. CIOs are rewarded handsomely — salaries in the range of $150,000 to $250,000.***

buzzwords. It is most important that the CIO have a good knowledge of business in general and his company's industry in particular. Detailed technical workups should be the function of his staff.

Should the CIO and the senior MIS executive be one and the same person?

In most cases, no. The CIO seems to function best when separated from the day-to-day responsibilities for systems and operations activities. Where this setup may not be organizationally feasible, the existence of strong lieutenants can insulate the CIO from the tactical aspects of information processing. One CIO interviewed (in the insurance business) preserves the distance between himself and DP development and operations. "I don't want to waste time in executive-level meetings explaining why the system went down during the closing or why a project is lagging — although I want to know about it," he said.

In what sort of organization will the CIO concept find the most fertile ground?

Our recent surveys point to the decentralized model as the type of organization where a CIO can play a particularly full role. The need to coordinate activities, especially at a planning level, recurs in corporations with distributed resources.

Most CIOs actively participate in the information systems planning function. While not necessarily the final arbiter of the plans, the CIO has a controlling influence over the shape and coordination of the plans through his policy functions. In addition, organizations with CIOs have made impressive steps toward the coordination of information and business planning.

True believer

The CIO is unique. Perhaps you can see yourself in this description: The typical CIO is a person who commands respect within the general corporation. He holds a track record of managerial accomplishment and has acknowledged command of the workings of his business. He is a true believer in the importance of information and information technology and is considered a dependable adviser on its uses. The CIO of our acquaintance is an effective manager who has the proven ability to get work done through people.

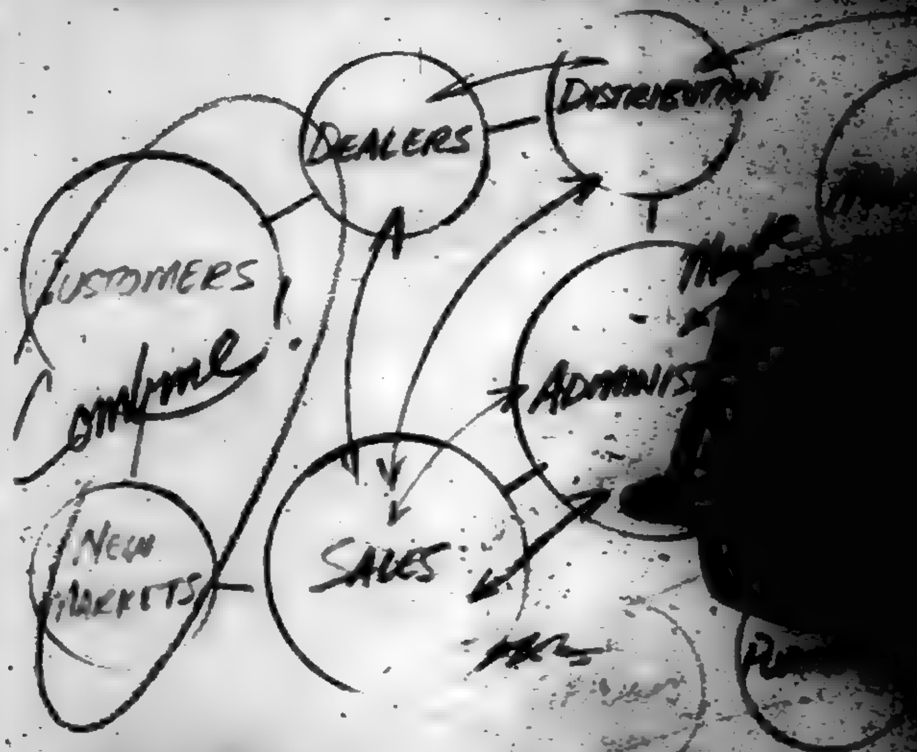
Above all, this CIO is a communicator who can express and sell ideas — to the CEO, to his peer group, to his subordinates. This ability to communicate is indispensable in his role as adviser and coordinator. The CIO, in contrast to the MIS executive, gets things done by negotiation rather than command.

The CIOs interviewed described their jobs as important, interesting, different and difficult.

"I spent my entire career telling people what to do," said the CIO of a Midwestern insurance company. "Now I have to ask for cooperation — sometimes even plead!" Another remarked, "The dotted-line relationship is easy to draw on an organization chart but has an intentionally vague definition — people can find a way to ignore you."

The CIO is a staff function with no direct responsibility for line activity. For their work, CIOs are rewarded handsomely — salaries in the range of $150,000 to $250,000.

Some chief information officers owe their existence to executive fiat. Others



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CIO PROFILE MATRIX

Company	Industry	CIO Title	Reports to:	Time in job (years)	Key functions managed
B	Oil/energy	Vice-president of information technology and corporate services	Executive vice-president and vice-chairman	2	DP, communications, strategic planning
D	Consumer product	Corporate vice-president of MIS	Group vice-president	2	DP, office automation, communications
F	Computer manufacturing	Corporate manager of information systems	Executive vice-president of operations	1	Planning, data management, communications, architectures
H	Insurance	Executive vice-president	President	3	DP, office automation, communications
J	Manufacturing	Corporate vice-president of MIS	President	6	Corporate DP utility, communications, corporate MIS planning
L	Insurance	Division vice-president, technical and operational services	President and CEO	5	DP, office automation, communications, general operations
N	Financial services	Chief information systems officer	Chief administrative officer	1	DP planning and coordination, capital expenditure (DP), policy

Company	Control of information resource (direct or through subordinate)	Technology deployment	CIO background	Degree of success
B	Direct for planning, through DP manager for other	Distributed	General management	Moderate to high
D	Direct	Centralized	Data processing	Moderate
F	Direct	Decentralized	General management	High
H	Through vice-president of MIS	Distributed	General management	Moderate to high
J	Direct	Distributed	Data processing	High
L	Through vice-presidents	Centralized	Data processing	Moderate to high
N	Direct	Distributed	Data processing	Too early to tell

found that their current slot in an organization took on the functions of the CIO naturally (particularly in banking operations).

Whichever the case, the concept itself seems to need to evolve within an organization. This evolution develops over stages:

- The corporate realization that information is a resource and needs to be managed.
- The understanding that the resource needs an executive-level representative.
- Finding the right individual for the job.
- Establishing, by policy, the initial scope and intent of the CIO.
- Gaining the tolerance (and later, respect) of management peers.
- Gaining the first visible success (getting someone to believe).
- Reviewing progress and building on success.
- Reengineering the job to capitalize on what has worked and then fine-tuning the concept to complement the organization and corporate culture.

The chief information officer is not only an appropriate executive position for the future, the job is here now — and it is working. The CIO represents the repositioning of the information function to its true place in the organization.

The CIO offers information systems executives a management position to which they can aspire. But it requires a new viewpoint — one that will not be familiar to many. This job is not for the DP manager who is still the classic computer jock, the machine room honcho, the software closet-type. The CIO will know technology, but he must know business. The CIO can talk to technicians, but he must talk to executives. The CIO can give orders, but he must know how to give advice.

The figure above illustrates the range of CIO implementations in some 15 large corporations, each with more than $5 million in revenues. Most of the companies are effectively decentralized and lie in the financial services sector. Almost all CIOs report to the CEO or equivalent.

The CIO's control usually embraces all information services — data processing, office automation and telecommunications. Most of these executives come from a technical DP background, although always with a strong industry knowledge and management history.

For most organizations, the designation of a chief information officer represents a dramatic change from the status quo. Information must be perceived as a company resource in the same light as capital, people and equipment. This understanding of the value of information in marketing and business management makes it a major concern of executive management.

The handwriting on the wall now says that business will use information technology as a competitive weapon. The chief information officer is an obvious manifestation of the desire to control the resource.

About the authors

Michael Weiner is vice-president of John Diebold & Associates, the division of The Diebold Group, Inc. that helps clients adapt computer and communications technology to improve business effectiveness.

John Girvin, who specializes in organizational studies and strategic planning for information systems, is a senior associate at John Diebold & Associates.

Interview: Synnott

(William Synnott is senior vice-president of The First National Bank of Boston.)

When did you become a chief information officer?

Synnott: I don't know that anybody ever becomes one. It's just an evolution into a new role and responsibility in the firm.

There was no one point of change?

Synnott: No, it's just an acceptance and understanding of the fact that DP is changing from the old back-shop, centralized data center operation to distributed minicomputers and now micros all over the corporation. As that occurs, and you have to rise to a new type of leadership to get integration of those resources, the role begins to evolve.

So the chief information officer concept really goes along with information resource management. That is, if you're going to have resources spread all over the corporation, somebody is going to have responsibility for coordinating and integrating those resources through some form of technology architecture and planning. Then you're evolving into a CIO-type role. There are a lot of people around actually beginning to perform that role, whether or not they use CIO as a title.

I don't know of anyone using that title.

Synnott: Nobody uses it as a formal title. It's just like the CFO — nobody uses that as a formal title either. You're usually a controller or financial vice-president or something like that. But they're generally known as the chief financial officer by virtue of the fact that they have control over the financial activities of the corporation. So in the same way, a CIO should have some kind of control and involvement in information resources around the corporation. That doesn't mean he has to own them. It only means he has to have some functional involvement in planning their architecture, their integration.

In your book in 1981 with William Gruber, *Information Resource Management*, you talked about information managers creating this position and the evolvement of the necessity of this position. How did you create the position here?

Synnott: Well, let's put it this way: The position becomes clearer when you have a decentralized operation. When you are highly centralized, it's less clear because you have control of the resources. As the [operation] begins to decentralize, you lose physical control of the resources, and therefore, you have to take functional control. That's when a CIO becomes much more apparent.

In Diebold's recent survey, in fact, it found that there are more CIOs, if you will, in companies that are decentralized than there are in centralized companies for that reason. However, even if you centralize, the very fact that micros and minis are spreading all over the corporation means that the information resources, at least, are decentralized. So one way or another, it's that realization that creates the need for information resource management and the CIO.

Now also, it depends on the kind of company you're in. Companies that use data processing and systems more as a support tool, such as some manufacturing companies, do not view information resources as critical to the corporation. Therefore, there is less likelihood that there would ever be a CIO, let alone information resource management, in such a company. It is more likely that in those companies, the CIO is going to be reporting to someone two or three levels down in the organization. He's not strategic to the enterprise.

On the other hand, in a company where systems are strategic, such as in banks and insurance companies or financial services, it is much more likely that the information resources will be viewed by top management as critical to the enterprise, as a potential for competitive advantage, not just back-office productivity.

So where you have companies that are strategic, where information is vital and where decentralization is occurring, that's where the CIO is most prominent.

To whom do you report now?

Synnott: I report to the president.

For how long have you reported to him?

Synnott: I've reported to the Office of the Chairman for the last five or six years. The Office of the Chairman used to be composed of the chairman, the president and two vice-chairmen. I reported at the time to a vice-chairman. I later began to report to the other vice-chairman, who subsequently became president. So I've sort of been in that Office of the Chairman for the last five or six years.

Also, over the last three years, we have had a major strategic planning exercise in the bank, which resulted in the restructuring of the entire bank by product lines, by customer segmentation and so on.

In that process, it was determined that we would try to decentralize the staff functions to the five groups that comprise the bank. And so, not just systems but also human resources, finance and all of the other staff functions began to be decentralized.

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which I head up, which is working for the Office of the Chairman and represents the Office of the Chairman in coordinating the activities of the five groups.

That's where you see the opportunity for the CIO?

Synnott: That's where the CIO becomes much more prominent because the need is much more prominent. When you have a completely centralized operation, where you have control of all the technology resources, there's less need for a CIO as such, because you already have all of the resources. The architecture is in place, and you are making decisions on it every day. But when the resources get decentralized, and you don't have control over all of them, that's when you need a technology architecture that controls the infrastructure. That's when you need policies and standards, and that's when you need strategic planning. The whole role of the CIO, which represents that kind of thing, becomes much more obvious.

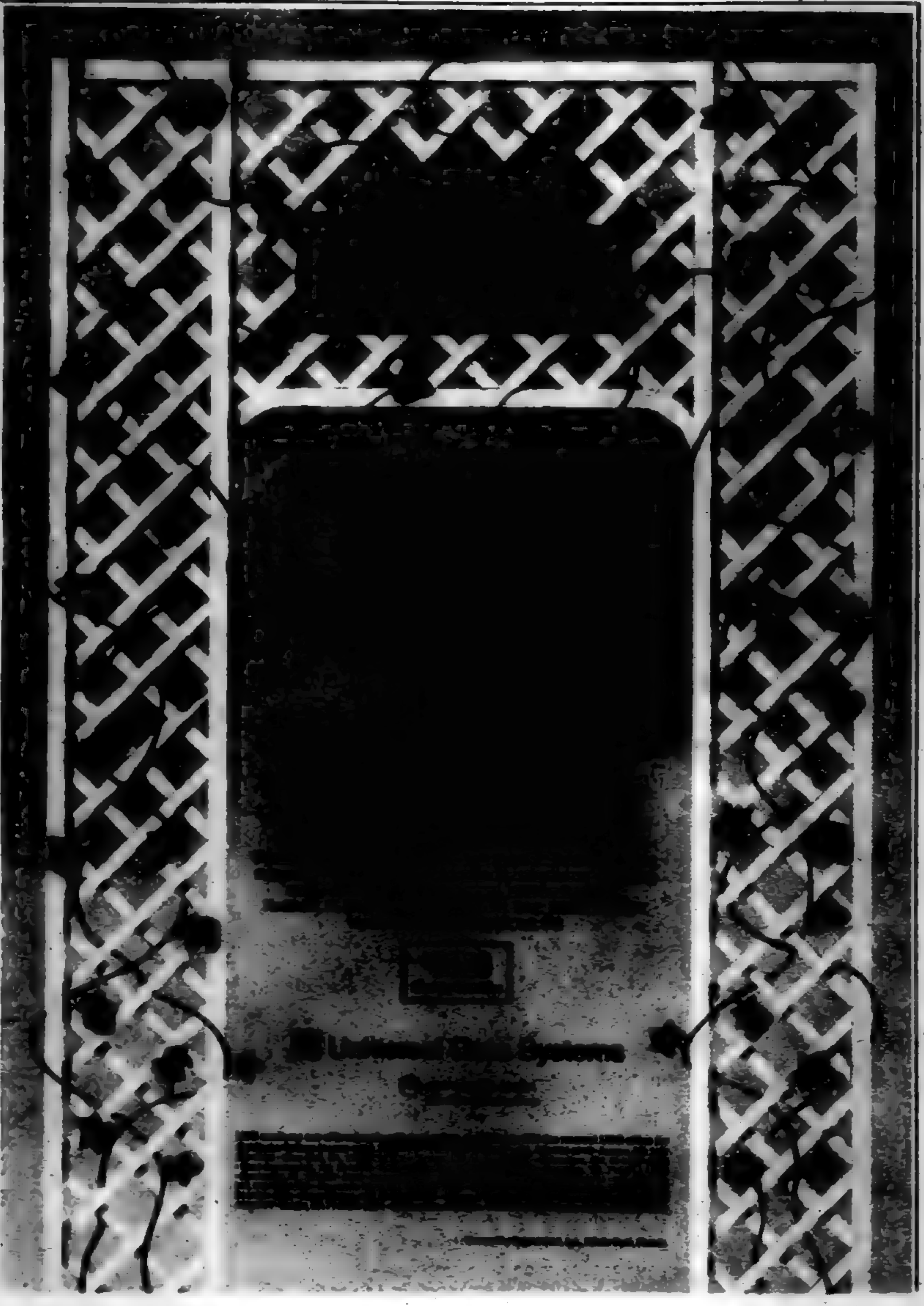
That's not to say that people who are centralized don't have CIOs or the need for them. But it's simply that the need is different, according to the type of company and how centralized or decentralized you are.

You're talking very broadly in terms of policy, setting guidelines and architectures. Give me an example of what kind of decision would be made by you and what kind might be made by someone who reports to you, in terms of the technology.

Synnott: First of all, we have to separate what the central staff unit is responsible for vs. the groups. The line groups have their own systems and programming people. Therefore, they make decisions on how to allocate their own resources, what projects to put them on and what their own business priorities are. On the other hand, my role is to establish the systems and programming standards by which systems will be developed so that they're all done in a consistent fashion.

My role is also to oversee in the early planning process whether they're going to buy or build a system. If they're going to build it, to oversee the systems design for [adherence] to the standards. If they're going to buy it, to help them find a package that fits into our architecture.

Data processing, on the other hand, is still centralized in our bank, but it is attached to the largest line unit that uses data processing, so it operates as a corporate utility. It is run by the line unit, but it has a board of directors consisting of the five group heads and myself to oversee equipment planning and capacity planning and things like that.



On the other hand, the things that are still centralized — because they fit the entire corporation — are things like telecommunications, data management and corporate systems, things that are done for the corporation, things that support the staff functions, such as finance, human resources, strategic planning.

> ***What I brought to this job was primarily a knowledge of banking and systems, rather than a technical, in-depth background.***

So you have more of an influence on those than on data processing.

Synnott: That's right. I have a dotted-line responsibility over systems development and data processing. I have central responsibility over telecommunications, data and voice worldwide and data management. So communications and data management are becoming more of the things we concentrate on, and systems and data processing are more of a line function now.

Describe briefly your background prior to coming to Bank of Boston and your career here.

Synnott: Well, I've been with Bank of Boston for almost 18 years. What came before then is kind of irrelevant. But I did come from a bank in Connecticut, where I'd been 16 years prior to coming here. I guess the point is, my background began as a banker, and I played all the various roles in banking in Connecticut in a small bank before I came here. So when I came to Bank of Boston, I came specifically to head up the computer systems department, which is one department out of a number of them. I had had some exposure to computers in the sense that I was head of the operations committee of a 10-bank consortium that put together the first bank joint-venture computer center in the U.S.

But my background was banking, and I backed into data processing. So what I brought to this job was primarily a knowledge of banking and systems, rather than a technical, in-depth background.

Do you think that's a good background for a person to rise to a CIO?

Synnott: Well, it is because in order to be a CIO, you have to have three major skills and abilities. One of them is an understanding of the business. I came with that because I understood banking when I came here.

Is that primary? You're naming that number one?

Synnott: Yes, I think that is

> ***What we're seeing, in many cases, is that the data processing manager very often does not become the CIO. In fact, somebody from the business side of the house becomes the CIO, because he understands the business. He hires somebody to be his technical guru.***

primary. The second is to be, overall, a manager — a generalist manager who can manage any number of activities, including a data processing operation. And the third is to be a technician, or to at least use technology as your trade tool. It is, I believe, in that order — business, management and technology.

The problem is that most people who come up the technical ranks come up as programmers, systems analysts, data processors . . . and they're missing the business and managerial side of things. They try to fill it in as they go along, but it's a tough row to hoe. It's a completely different world when you're dealing in data processing and the scientific kind of perfection and logic that it represents vs. the guy who's working in business and management, which is amorphous, hazy, unstructured and people-oriented. I'm afraid that an awful lot of people in this business who've come up the technical ranks are struggling just to overcome the lack of business and management in their backgrounds. So someone who comes to the job with a knowledge of business and picks up technology along the way has an edge in becoming a CIO.

Are some of these people afraid to move into the higher ranks, the more general management ranks, because it's a different style of people you're dealing with?

Synnott: Yes, and they're uncomfortable with it. A lot of them are uncomfortable with it. I've known a lot of people who really would like to stay out of the front office and do not want to deal with the top managers. They'd rather deal with what they're comfortable with.

It's difficult enough to cross over to managerial and business. But for people who have no tradition in it and have come up the technology route, it's even more difficult. That's why what we're seeing, in many cases, is that the data processing manager very often does not become the CIO. In fact, somebody from the business side of the house becomes the CIO, because he understands the business, he understands management, he understands their needs. He hires somebody to be his technical guru. I'm not saying that all people do that. But there's a pretty good mixture of people coming from the business side of the house vs. the technical side to become the CIO. So the question in my mind is not whether there will be CIOs, but who will they be?

How would you suggest MIS executives prepare themselves? How can they learn the business? Do they have to do a stint outside MIS in a more general area?

Synnott: That would be helpful. There are a variety of ways that someone can learn the business and get to be a manager. One of them, of course, is to work outside of the area for a while in the company. Unfortunately, what I find is that very few companies take people from the systems side of the house and put them into their management-training programs. In fact, systems is usually excluded from the general management training program. So you have to somehow fight to get that done.

Then you need to work very closely with the users. Let's put it another way: You need to change your alliance. Instead of an alliance with finance and operations and back-office kind of people, you need to become allied with strategic planning, marketing, product managers. And where that doesn't exist, the guy's not going to go very far. You're not going to use systems competitively if you're working for the operations guy or the finance guy. You're going to end up counting the beans instead of making them.

If you work, on the other hand, for product managers and marketers, you're going to have an opportunity to not only learn their business and their products, but to be competitive with systems. That's a whole area that I think data processing people could do a whole lot more work on — trying to change their alliances.

Of course, there are schools. You can go and get an MBA or take graduate courses — all kinds of business and management courses. That will teach you business and management in general. It will not teach you your own business. The only way to learn your own business is to be in the business.

Is traditional data processing losing out here? On the lower end, end users are doing more programming and, on the upper end now, CIOs are coming in, probably from outside data processing ranks. Is data processing losing some of its power, some of its influence?

Synnott: Let's put it this way: It's changing. As you move from centralized, big mainframe computers to decentralized minis and micros, the role of data processing is changing. First of all, it serves more as a corporate data base repository, whereby people go and get the data to put on their minis and micros or offload through high-level languages information they need for management support. So in one sense, you're serving as a sort of corporate data base repository. In another sense, you're running corporate systems, those things that will never be decentralized, because they're the bread and butter of your operation, and they spread across the corporation — like deposits and loans in a bank.

You'll always be doing big data base, high-transaction-type systems, because they're too big to run any other way. But a lot of the small stuff will be going off to the user, and particularly management information systems.

I break down systems into three types: internal systems or operating support systems; management systems or management support systems; and then customer systems or competitive support systems. What we find is that the internal operating systems are where data processing has been: in the back shop, productivity-oriented in the past. Well, they've automated most of that today. It's time to move on to something else. You don't give that up, you keep it as a floor, but you move on.

The next thing they move to is management systems. And when you begin to move to management systems, first of all, it's difficult for the data processing people to know what management wants. So they start taking a second-generation approach, where you used to print out everything in the computer, because you didn't know what was wanted. Now what they're generally trying to do is put them on-line to the data bases and let them access anything they want — 'cause they still don't know what they want. That's sort of a second-generation approach to a fourth-generation problem.

So what's happening? The information center, which started out as a data center information center, is beginning to move to departmental information centers and now to personal computer information centers. What you're finding is that certainly the management support side of systems is moving to the end user through micros, through minis, through information centers, through high-level languages, all that kind of stuff.

Now that leaves you with the customer support systems. And I say, this is the new frontier. The sharp systems guy is going to get out there working with those marketing people and those product managers and build new systems that are technologically innovative systems that will create revenue and hit the profit side of the bank, not the expense side.

Can you give us an example here at Bank of Boston?

Synnott: Cash management is a case in point. People are putting terminals in treasurers' offices and trying to give them all sorts of help in how to manage their money. As a matter of fact, you can take that as a general strategy: terminals in customer spaces. What we did 10 years ago is we moved terminals into employee spaces, and we put everybody on-line. That took care of all the internal operating systems. Well, now, when you do competitive systems, you do the exact same thing, only you put them in customer offices. In many cases, you move your back shop to his back shop. You let him do his own order entry, for example. You let him do his own cash management.

So this whole technique of putting terminals in customer offices, either on micros or in machines that access

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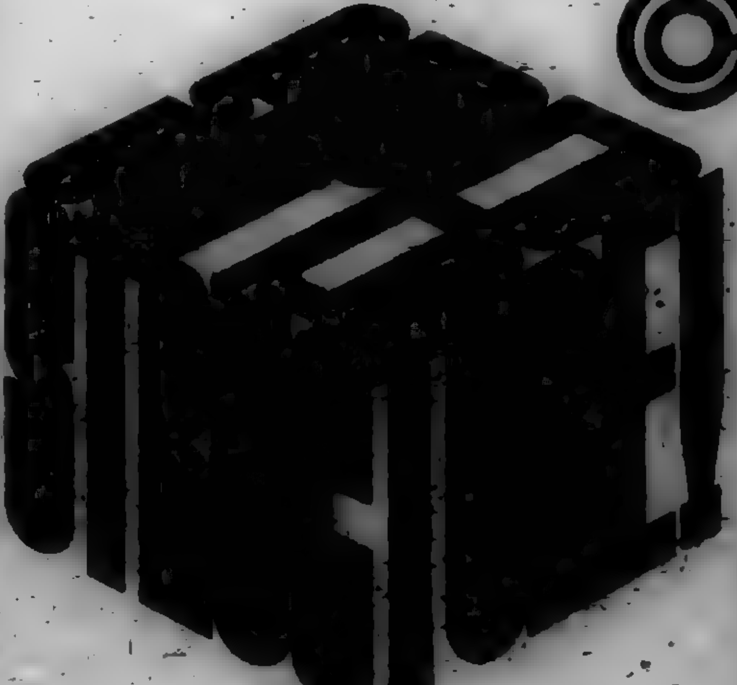


your information bases, is the new way to fly.

That creates a different relationship between customers and the bank.

Synnott: Sure. Because if the treasurer has a terminal in his office, he only wants one terminal. So you're probably going to lock out your competition if you can be the first and the best there. So that same technique is being used by many banks in many ways. And not only banks. The classic case is of American Hospital Supply putting order entry terminals in the hospitals and American Airlines with its airline reservation system. Everybody's doing that.

In a bank, it becomes cash management, it becomes ATMs, it becomes home banking, it becomes putting terminals in a real estate office so that you can tie in the mortgage application with the home buyer. There's all sorts of ways to do that. All I'm saying is, this is one strategy for getting competitive with systems. And I think that's where it's at. That's where a CIO can really play an important role today in helping to support management as end user computing goes along. He can provide some leadership and some logical control, at the same time working to build competitive systems.

Underneath it all, your operating systems will still go on. They'll still be supported by the data center. The data center will always live. But there are going to be lots and lots of minis and micros, and the key is how are you going to connect it all so that the information flow makes sense in the organization. That's where architecture comes in.

What networks do you have installed here?

Synnott: We have a variety of networks.

Is that a problem?

Synnott: Yes, it is. We have networks that we've acquired; we have networks we've built. We have three networks, for example, serving correspondent banks alone, because we built one and we bought two.

What is a correspondent bank?

Synnott: Correspondent bank data processing — doing data processing services for banks all over New England.

We have three networks there, and we had to optimize those. However, that problem has been solved because we've decided to go out of the business. We sold the business, in fact, so we're getting out of the correspondent bank data processing business. We just don't feel we can make any money in it.

But there are lots of other networks. We have one network that takes care of all of our Boston branches. We have another network that supports the affiliate banks in Massachusetts that we have bought. We have other networks that go out across the country to serve . . . banks and financial leasing companies. And then, of course, we have an international network.

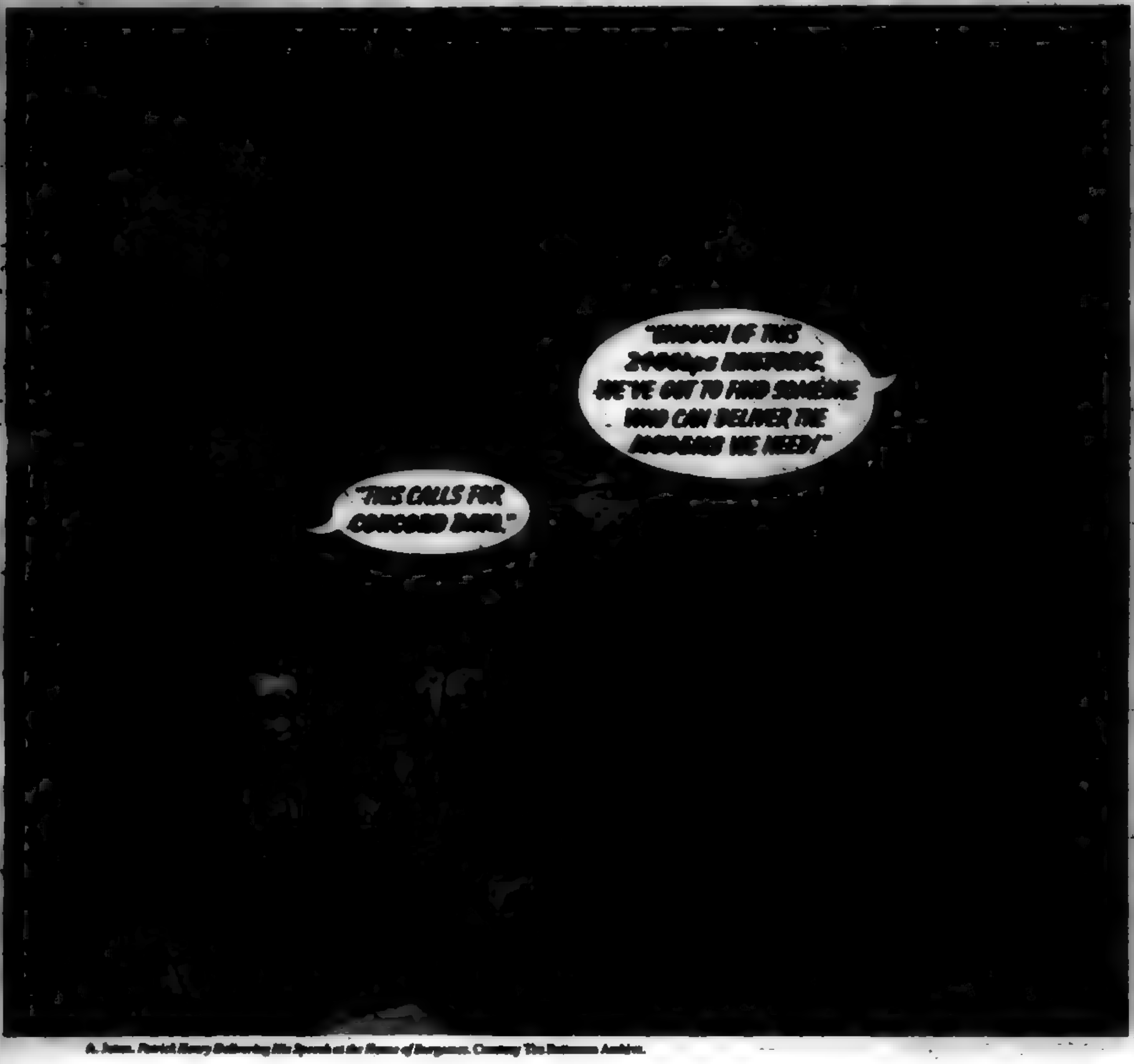
Are we talking SNA or what kind of network?

Synnott: All kinds. We use a little bit of everything. It hasn't all been pulled together yet. That's what our telecommunications planning is all about. We have just finished putting in an international network, and it consists of IBM Series/1s as nodes in Hong Kong, London, Boston and South America. Access to those nodes is by any which way you can. Some are leased lines, some are dial-up, some are packet-switched networks — all kinds of things. Everybody accesses any way they want, but the fact of the matter is, if you want to print a document in Tokyo that you've written in Paris, what they do is they get on their Wang in Paris, they type the document and they send it to the London node (however they can get there). London, in turn, sends it to Hong Kong; Hong Kong directs it to Tokyo, where it's printed.

That international network is in place. Our data base structure internationally is in place because we have a common data base that goes into every office in the world. That enables us to pull off customer data, financial data and management data whenever we want to and transmit it.

Where is that data stored?

Synnott: It's on a System/34 or 36. It's a system we built ourselves. The data base is maintained out of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London, and it's the same data base for every office. The requirements of each office that are different are built around it, so there are submodules in each office; there are different report generators and things like that. But the data base itself is sacrosanct. No one touches it. It's like a sealed Rolls Royce engine. It's maintained out of London. If they change it, they change it for everybody and download to everybody. So we have a common data base worldwide. That's because we were able to start from scratch and build it.

What kind of information is in the data base?

Synnott: Everything that runs the bank. Everything from current accounts to loans to money market instruments — everything that runs the bank.

We began the system in 1972, it was installed in 1976, and it was rewritten in 1980. It's ongoing all the time, but we try not to change it much, because it's pretty old now and it's been in for a while. We don't need to change it a lot. Most of the requirements that individual offices have are specific to them, and they can write their own little routines to do that. But this allows us to transmit financial data literally overnight and consolidate it and put it on the CFO's desk.

So internationally we're in pretty good shape with a communications network, a data management network. Domestically, we're not in such good shape, because domestically, it's been built up over 25 years, and you've got a hodgepodge of things. So it's a long process of amalgamating your networks and optimizing them and getting your data base management structure in place so that it gradually evolves as systems are rewritten.

Around what network are you going to optimize?

Synnott: Well, we have to simply consolidate the various networks we have into one optimized network.

So you're going to have to patch them all together: You're not looking to one network . . .

Synnott: No, but for example, we might have 10 lines going to Cape Cod, because they're all different services. Well, we'll want to put one line to the Cape. It might be a broad line. In some cases, we might be able to tie into fiber-optic services offered by Netco [New England Telephone Co.]. But it will be one path, not 12. That's the kind of thing we need to do. How we're going to hook it all together is a combination of what we can buy from Netco or Nynex vs. what we can do ourselves. We do have places. We have microwave, for example, from here to our data center. We've been running all data between those two sites off microwave for years.

Is there any other spot within Bank of Boston where you could move now?

Synnott: If I wanted to get out of data processing, there are probably other places that I could go, becoming more of a banker. If I want to stay in this field, there isn't any place to go.

Do you want to stay in this field?

Synnott: Yes, because I've been in this field long enough. I enjoy the field, it's a rapidly changing one. I wouldn't want to get out of the field altogether, because frankly, when I retire, I want to go into this business as a seminar leader and consultant. I wouldn't want to get out and run personnel or buildings or something else. I'm too close to ending my career to want to change it.

But it is true that if you reach the top of the ladder in the systems world, there isn't any place to go unless, as a CIO, you broaden your role and responsibility, you become more a part of the executive team.

The only logical extension I can see is to move into strategic planning. As strategic planning gets more product-oriented and as technology becomes more competitive, that's a nice logical extension.

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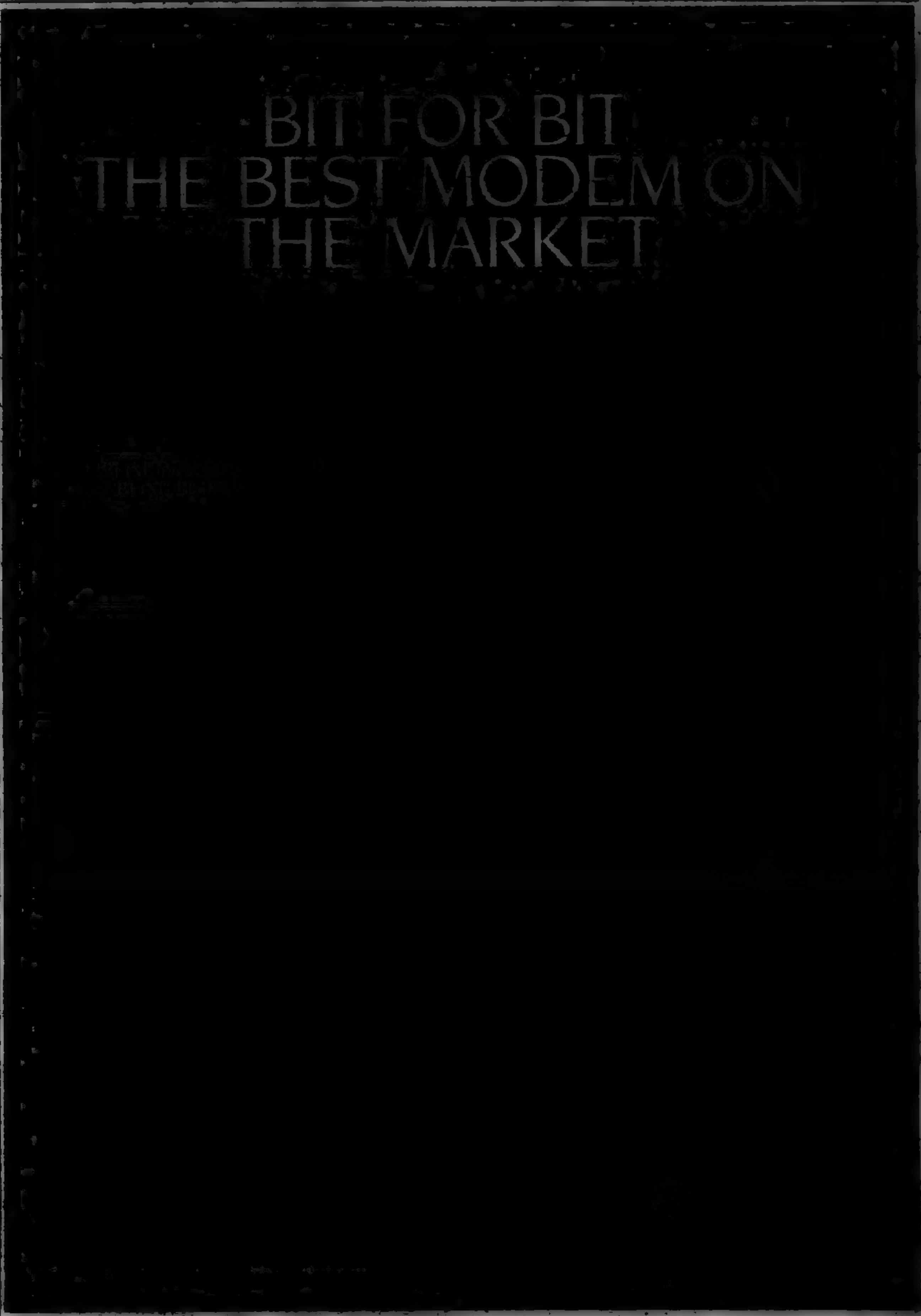

Interview: Haskin

(David Haskin is senior vice-president, Corporate Resources, at Northwestern National Life Insurance Co. in Minneapolis, Minn.)

Did the CIO position at Northwestern exist before you came to fill it?

Haskin: No, the position resided in two separate areas: MIS was under the chief financial officer, and Human Resources reported elsewhere.

Who decided to create this position, the president?

Haskin: The chairman and chief executive officer. My particular background and talents had something to do with that. The chairman, when I decided to come back into the insurance business after having left it for four years, created this spot.

What is your background?

Haskin: I've been here about a year, and I'm head of MIS and Human Resource Services. I was at Minnesota Mutual Life for 17 years in a similar capacity, handling MIS, human resources, administration.

Was the CIO job created in response to a particular need within the company?

Haskin: At the time, about a year ago, the MIS function was in need of some overhaul. The systems we had in place hadn't been redone for a number of years — that needed doing. The concept of chief information officer was fairly new to the company. I don't know if you would give that title directly to me now, or if the company would even recognize that's what we're moving toward. But that's the way I'm shaping the function.

You are certainly reporting at a high level.

Haskin: Yes, to the chairman and chief executive office. The company split up — the chairman and chief executive has most of the staff units reporting to him; the president has three line units and some subsidiaries reporting to him.

What are you able to accomplish as a CIO that your predecessor — who had the responsibility for MIS but not the high reporting status — could not do?

Haskin: It's an evolving function. What's happening is the recognition that in the financial services industry, information is a resource to be managed just as much as any other resource. In the past, most companies looked at information as an accounting kind of function or as a financial reporting function or what have you. There's a growing awareness that because you have this data base of information, you can use it for competitive and strategic advantage.

How have you used information strategically?

Haskin: We're just beginning the function. As an old-line insurance company that's coming into the financial services industry, we've started to recognize that our competition isn't the traditional groups of people in the insurance industry who we've come up against. It's Sears, Dean Witter, American Express — you don't know where it's going to come from next. As a consequence, we have to look strategically at what those companies are doing and how they're marketing their services and what kinds of distribution systems they're putting up and so on. That's the kind of data that in the past it would have been nice to know; in the future, it's survival.

When did the company shift toward financial services?

Haskin: It's been gradual. About two years ago, we organized into profit centers and changed our distribution system from the traditional captive agent kind of company to more of a "brokerage" operation.

How many employees does the company have?

Haskin: In the home office, there are a couple of thousand. There are nine claim offices, 25 group offices and a field force of 6,000 agents. That's just Northwestern National Life. We have a subsidiary on the West Coast, Northern Life, and a subsidiary on Long Island, North Atlantic Life.

Does your responsibility include all three?

Haskin: Northwestern National, right now. We provide certain MIS services to the others.

You said that prior to your coming, the systems hadn't been changed in many years.

Haskin: I think a lot of firms developed systems that fit the traditional batch processing, serial processing kind of mode. The products and distribution systems fit that well. Today you have to be more responsive to the changing marketplace, more responsive with product changes, more responsive to the needs of your distribution system. It kind of equates with a data base design. When you get into relational data bases, you start to gather a lot of information and look at it in a different way than you did in the past.

In your MIS position prior to Northwestern, were you involved in daily MIS operations or more of a management role?

Haskin: More from a management perspective.

You came up then from the managerial side?

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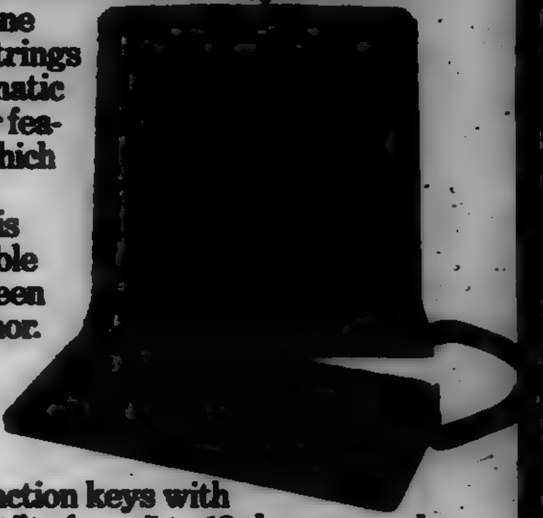

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IN DEPTH/INTERVIEW: HASKIN

I came up from the human resources side. I have a master's degree in industrial relations. I started in the life insurance business in the personnel area and gradually added functions to my scope of responsibility.

Haskin: As a matter of fact, I came up from the human resources side. I have a master's degree in industrial relations. I started in the life insurance business in the personnel area and gradually added functions to my scope of responsibility. MIS came under that at one point in time. I took some interest in it. I built a time-sharing company, a subsidiary for Minnesota Mutual. That was 10 to 12 years ago.

It seems to be a pattern that the chief information officer is not coming from the MIS ranks.

Haskin: I think that's probably true, because traditional DP ranks look at the technology side of the house more often than the information side.

It's not a technological problem — in part, sure — but by and large it's a problem of what are you going to do with your information and data and body of knowledge, rather than how you process it or [whether you] have the latest operating system and so on.

But just as you have learned enough about the technology, couldn't someone come through the technology ranks and learn the management side?

Haskin: It can happen. It's a matter of managerial style and how you view your role and function.

Who reports to you?

Haskin: The head of Human Resources and then five direct reports from the MIS side — technical services, operations, data administration services, telecommunications and corporate applications systems.

Do you sit on a policy committee for Northwestern?

Haskin: Yes, Northwestern National Life has an operating policy committee of eight people.

Are you looked to as the technology advocate?

Haskin: In a general way. On any heavy technology questions I'd go to one of my direct reports.

What mainframes are installed at Northwestern National?

Haskin: We have three mainframes right now at headquarters, a 3084Q, 3081K and a 4381, all MVS/XA.

Do you need more power from your systems, such as from the IBM 3090 series?

Haskin: We have a 3090 on order due to be shipped in December, and then we have a position order for the 400, when that comes out. In our capacity planning projections, we believe that somewhere in 1990 we will have the equivalent of three Qs in place. That's how we project our power requirements, which will probably be the 3090 400, or whatever it is at that time.

We're in the process now of distributed processing, looking at the departmental machines, and, of course, personal computers are all over the place.

IBM Personal Computers?

Haskin: Harris Corp.

Was that choice made before you got here?

Haskin: Yes, that choice was made before I got here.

Is there any thought of changing? Are there others on the recommended list?

Haskin: Yes, Harris just happens to be predominate right now.

What networks are in place?

Haskin: SNA, and we're putting in Disoss this year.

The load on information systems is tremendous in an insurance company.

Haskin: Quite heavy. We look at a growth rate of about 40% per year right now.

How many transactions enter the system in any given period?

Haskin: That's difficult to say. In group claims, we're processing probably 12,000 to 15,000 claims a day.

Do you need a fault-tolerant system?

Haskin: I haven't seen the need for that. I expect that when we get to where we're headed in on-line agent-to-customer kind of processing, we might want to consider that. But our downtime or failure rate has been so small. We probably run 98% to 99% availability fairly consistently.

How do the agents communicate right now to the home office? They're not linked on-line?

Haskin: No, they're not on-line. Most of them have personal computers, and we send them out diskettes on various kinds of products.

Do you have a time period in mind for bringing them on-line?

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Haskin: We want to establish throughout the home office our data base technology, which we hope to have done by the end of 1986. During that period, we're also looking at how we'll link our field force.

Any of your five within MIS who report to you would study the issues and make recommendations to you?

Haskin: The company is decentralized into profit centers, and the applications programming is done there and reports to the profits center head. Each of the directors and vice-presidents in that area sit on a strategy policy committee of which I am the permanent chair. That committee sets the policy for standards and processing and protocols. How they do their applications programming in the group area — that's up to them, but they have to *follow* the established standards and link to corporate.

How do you keep up with the technology. Do you really need to?

Haskin: I think it's impossible to keep up with the in-depth technology. There is such a variety of magazines; I pick two or three. Mostly I read publications that deal with strategic issues rather than in-depth technological issues. I know what systems software is capable of. How it's put together — that's something else.

How about your competitors within the insurance and financial services industry — do they have positions like yours? Is that where the industry is heading?

Haskin: I was at a meeting of the conference board, and they asked how many people were headed that way. There was a scattering of hands, not very many had the true chief information officer. I'd also guess that if you asked some people at Northwestern National Life what a chief information officer is, you wouldn't get a very clear definition. I don't know if I can give you an absolute definition.

What is your definition?

Haskin: It's an individual who takes the MIS function and uses it to its full capability in providing information and knowledge to operating policy members who can use it in a strategic way. It goes beyond just financial data. It goes to what the competition is doing, what the marketplace looks like and so on.

You have Human Resources under you. Is that just because of your background, or are Human Resources and MIS a particularly good mix?

Haskin: It's probably because of my background, but I also happen to think it's a good mix.

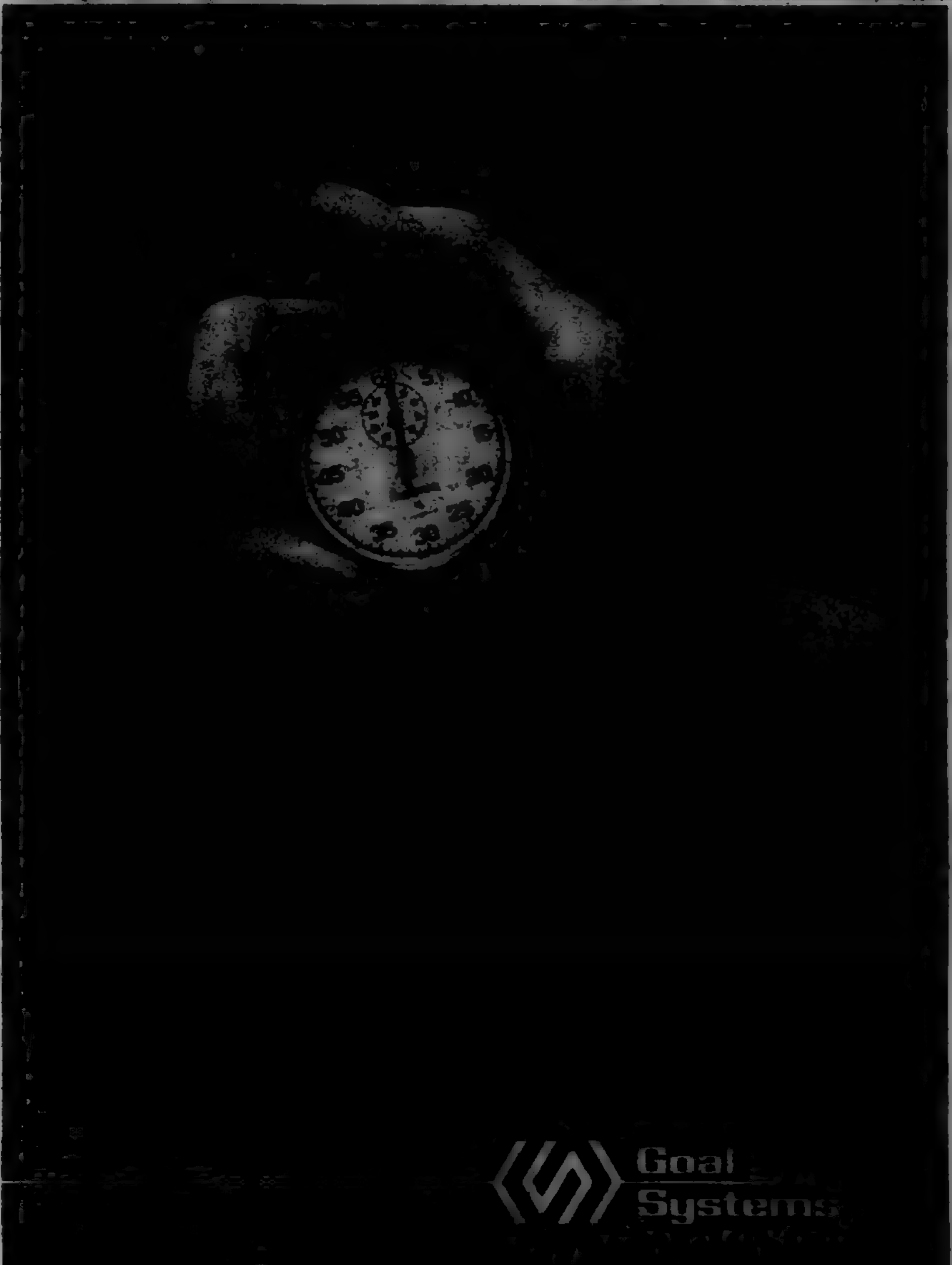
What kind of synergy is there between the two?

Haskin: I think it provides some synergy in the MIS area because traditionally, these folks have had a heavy technological orientation and somewhat less of an orientation toward the interaction with operating management. I think by bringing some of the human resources methodologies and techniques to that group, it gives them a growing awareness of how they really *can* be mainstream to the company's operations.

Are you the connection between the two, or are there other connections between Human Resources and MIS people?

Haskin: There are links further down the line and throughout all the divisions. Human Resources is for all

> ***You look at the MIS resources at Northwestern National Life, and they account for probably a quarter of the company's operating budget — an operating budget of $100 million.***



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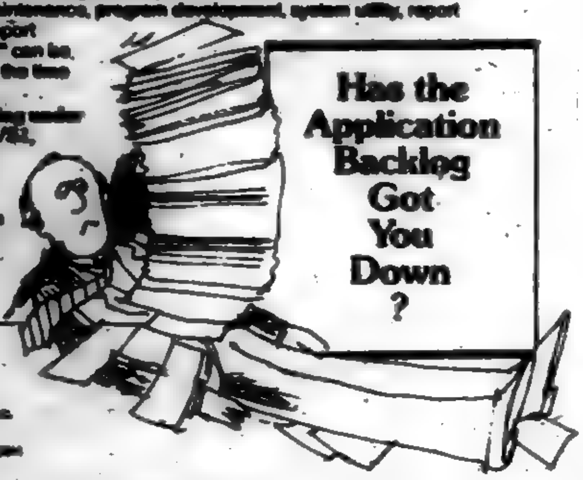

IN DEPTH/INTERVIEW: HASKIN

> ***A real problem for us as we continue to expand and develop our systems is qualified, capable people. How you identify them, track them and train them is as important to me and to the company as the technology.***

Northwestern National Life, not just MIS.

How well do Human Resource people and technical DP people talk to each other?

Haskin: Better. I have a very strong belief that MIS people have to have a much firmer grasp and understanding of the business. I also believe that business people have to have a much firmer grasp and understanding of what MIS can do for them. For years those people didn't speak a common language.

Does one learn the other's language, or do they meet somewhere in the middle?

Haskin: It's essential that they meet in the middle.

Do you have training courses and educational seminars to get the two communicating?

Haskin: We're working on that. I demand of the MIS people that they learn the insurance/financial services business and that they can speak that jargon. And I'm providing the business people with some high-level kinds of functional courses of what you can do with this MIS resource. You look at the MIS resources at Northwestern National Life, and they account for probably a quarter of the company's operating budget — an operating budget of $100 million — and we're spending $25 million on MIS. To me, if you're spending that kind of money, it's absolutely essential to understand what you're going to do with it.

How many MIS people work at Northwestern?

Haskin: About 325. Some of those are applications programmers who report to the profit centers.

Do you use a micro?

Haskin: No. I just brought in a Rolm Cypress. The reason for that is we put in a Rolm switch a month ago to handle our voice and data traffic, and I'm experimenting with this Cypress, which is an intelligent terminal with a telephone tied in.

Was the decision to bring in the Rolm switch made prior to Rolm's connection to IBM?

Haskin: Yes. Well, it was made when IBM owned about 25% of the company.

Did that affect your decision?

Haskin: I was pretty convinced that IBM was moving in that direction, and I thought it was a safe bet. And the Rolm technology in either case is solid.

What do you use a micro for?

Haskin: Right now, one of my first applications would be in tracking some of our Human Resources situations, which may sound kind of strange. But I think a real problem for us as we continue to expand and develop our systems is qualified, capable people. How you identify them, track them and train them is as important to me and to the company as the technology.

Is it roughly a balance, 50:50, of your time spent on Human Resources and MIS?

Haskin: In the past year, it was probably 75:25, and now it's coming around to 50:50. Initially, MIS took

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more of my time because I wanted to reposition what we were doing.

Did you establish this reporting structure with the five within MIS reporting to you?

Haskin: Yes. The traditional way it was organized was with a single head running all of MIS. I wanted to open it up, get into it a little more, and I think that by the way we are set up, the individual functions are moving up to more of a major status. Take telecommunications, which used to be sort of a sideline function. It's mainstream and vital to us right now, because if you can't move the data and the information around in a proper and efficient manner, you haven't got anything. The person who manages and controls the network is the backbone of our business.

> ***The person who manages and controls the network is the backbone of our business.***

In creating five MIS positions where there was one, you diffuse the power of any one person within MIS. In this restructuring, did you lose any key DP people?

Haskin: Not a one — well, the old head of MIS left.

Would you agree with my description of what happened — that if you are the CIO, a good way to centralize the power and responsibility for yourself is to diffuse it lower down and then have these people report to you?

Haskin: That wasn't my intention to do it that way. My intention was that each of those particular functions in themselves is of growing importance and so you want to upgrade the stature of them.

Is there a micro on the desk of your president or chairman?

Haskin: Not at this point.

What are their attitudes toward technology? How central are computers and information to the success of Northwestern?

Haskin: Both the president and the chairman have said publicly that our most important strategies for the future are our people and our systems. Without our people and the systems, we're not going to go far.

That's elevating systems very high.

Haskin: I'm talking about systems in a broad sense now, how you deliver your product, how you report to your customer and so on.

So what information systems can do is get the information in and out faster?

Haskin: It's the arteries of the company.

As a CIO now, are you able to move to any position within the company?

Haskin: I think it's a marvelous training ground or spot to take a view of the entire company operation. There's no question about that.

There are four other senior vice-presidents?

Haskin: On the operating policy committee, there is the chairman, the president, two executive vice-presidents and four senior vice-presidents — the head of our investment operation, the chief financial officer, the general counsel and myself.

Is there anything else about the CIO position you would like to say?

Haskin: I'll say one thing. It's very much an evolving position. What does chief information officer mean to Northwestern? There has to be input from various people and groups, customers and clients that will solidify what this is all going to mean when you take a look at it three or four years out.

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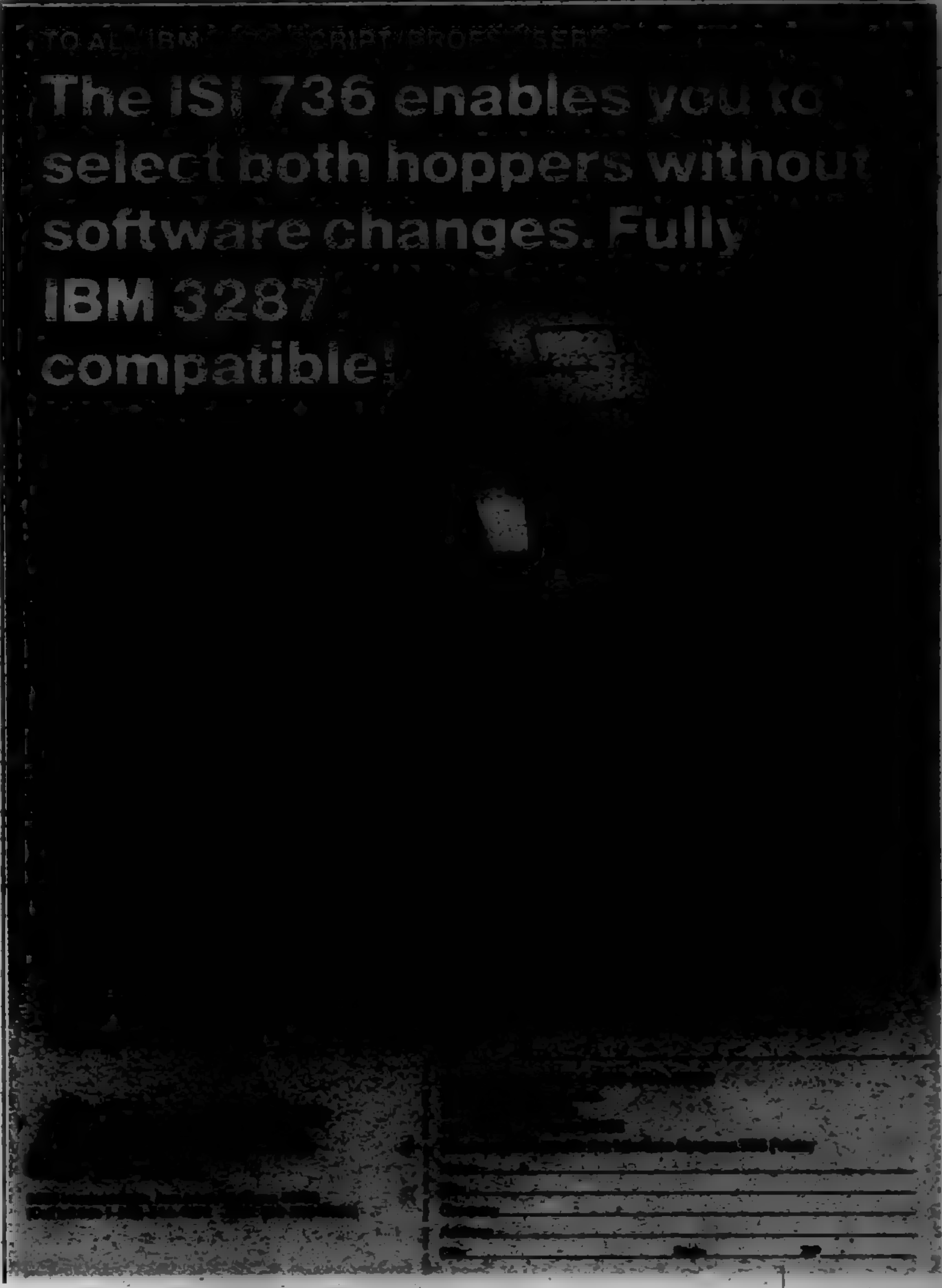
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Interview: Irwin

(Dan Irwin is director, Information Resources, at FMC Corp., the Chicago-based manufacturer of machinery and chemicals.)

Who created your position?

Irwin: There's probably not a simple answer to that question. The position was recommended by a task force appointed by the president of the company to determine, among other things, how we should organize to incorporate office automation technologies most effectively.

So he wasn't necessarily thinking of a CIO position?

Irwin: Right. And the task force recommended that a position be created that would bring together from a variety of different places in the company traditional MIS business systems and computer operations, telecommunications, technical computing (computer-aided design and manufacturing is the most visible reflection of that) and office automation.

What problems or possibilities did the president have in mind when he began this task force? It must have been a response to some situation at FMC.

Irwin: Well, it was in response to a lot of emerging technologies, particularly in the office area. There was a lot of demand beginning to come from within the company, without a good understanding at the senior management level of how we should manage this technology in conjunction with all the other information technologies. That concern spawned the creation of the task force, which had a broad representation from around the company — from operating groups and corporate staff. It probably had more line than staff representation. It had a management orientation as opposed to a technical orientation.

Whom do you report to now, the president?

Irwin: Yes.

Was there a vice-president of MIS before?

Irwin: There was a director of MIS who reported to the chief financial officer.

So your position required a major realignment of the reporting structure.

Irwin: A realignment, yes. It moved all of MIS from finance into its own area — information resources. It took technical computing from corporate manufacturing, and it took all of our office information support functions here in Chicago from the administrative department and put them in our section.

Is telecommunications a subgroup?

Irwin: Telecommunications was in MIS before, and now it has been made peer level with systems and computer operations.

So we have systems, computer operations, telecommunications . . .

Irwin: . . . technical computing, office automation — five functional areas report to me.

What is your mandate?

Irwin: To take the technologies that are available and will become available and use those to the strategic advantage of the businesses in the company.

Your background is not in data processing or MIS.

Irwin: That's correct.

It was determined by the task force that it would be better . . .

Irwin: That was a recommendation that the [person] in this position have a broad business background, an operating business background, as opposed to a technical background. The task force recommended that whoever was appointed to this position be from a background of general operating business management.

Was there also the hope that this person have some interest in and some familiarity with computer technology?

Irwin: Oh sure.

What interest in your past would . . .

Irwin: Well, there's not a business that I've managed with FMC that hasn't had systems as an integral part of it.

Could you briefly sum up what you've done at FMC?

Irwin: I started out in the petroleum equipment business, spent 15 years in both of our divisions there and at different times managed both of those divisions.

I came to Chicago after 15 years with FMC as director of business planning and, in that capacity, had responsibility for working and supporting our businesses in the development of their strategic business plans.

Is this a position that you sought?

Irwin: No, not really.

Did you have any hesitancy about taking it when you were approached?

Irwin: Absolutely none.

How do you keep up with changing computer and office technology?

Irwin: In the traditional ways. Vendors are a very good source. My counterparts in other organizations. My own people and what they bring

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forth. I encourage them to continue to test and try new things and bring them to the fore because I think research and development — not in the product sense but in an acquisition of what's available sense and what might make sense to us — is a very vital part of the role we have to play. I would characterize that as research and development very similar to the kind of R&D that you do in product development in an operating business. Trade literature. Your publication, among others. Conferences.

Will you attend, particularly since it's in Chicago this year, the National Computer Conference?

Irwin: Yes, I intend to do that. I've done a lot of learning in the last eight months.

What's the hardest to learn? Software is often thought of as one of the toughest areas to really understand.

Irwin: You know, I guess part of it is what you want to learn and what you think you need to learn to carry out the mission that you have. I don't think to carry out my mission I have to have a nuts-and-bolts knowledge of Cobol, for example, or a nuts-and-bolts knowledge of how a particular piece of software is put together.

What do you need to know?

Irwin: What I need to know is what a piece of software can do, functionally, what it's going to cost to perform, the people development and hardware costs, and what it's going to provide the business on the benefits side. That's much more the role that I have to play.

And it's up to me to be sure that I have the right technical people in place, making the right technical judgments that go into the cost side of applying those various technologies.

Do you need to understand something like Unix or MVS?

Irwin: You need to understand what it does, sure, and how it communicates or does not communicate with its counterparts in the industry. One of the things we have to be sure over time is that we end up with a network of workstations that, for all intents and purposes, can communicate with any other workstation. We're a long way from being there, but every step that we make today either enhances or inhibits us in moving in that direction.

Do you use a microcomputer?

Irwin: On a limited basis, yes.

What kind?

Irwin: That's a Wang personal computer, and it's hooked up to our VS system here in Chicago.

What does it take for a professional, at whatever level at FMC, to get a micro on his desk? What need does he have to show, or what authorization?

Irwin: The task force recommended that each location of the company should establish a task force that would be multifunctional — in other words, have a representative from each of the departments — to go through a planning process that would determine the communications pattern as well as the needs for workstation capabilities. [This task force would] define what the requirements were for the whole unit on an integrated basis. And out of that rolls the equipment needs and the justification for each individual.

We are in the process of doing that here in Chicago. Last summer, we put in a number of workstations on a pilot basis. That was to allow some of us to get some live experience with the technology and to be able to make some judgments about the reasonableness of justifications that were going to be coming forth in, or out of, these task force recommendations. Hence, that's how I got one of them.

But we're building, I think, a good solid base on which to make judgments as to whether applications make sense and will provide benefits or [whether] they're nice to have, but not necessarily justifiable.

Did you use a micro before?

Irwin: Not to any great extent. I've had an Apple at home for a couple of years, and I do some personal things on that, but nothing related to FMC.

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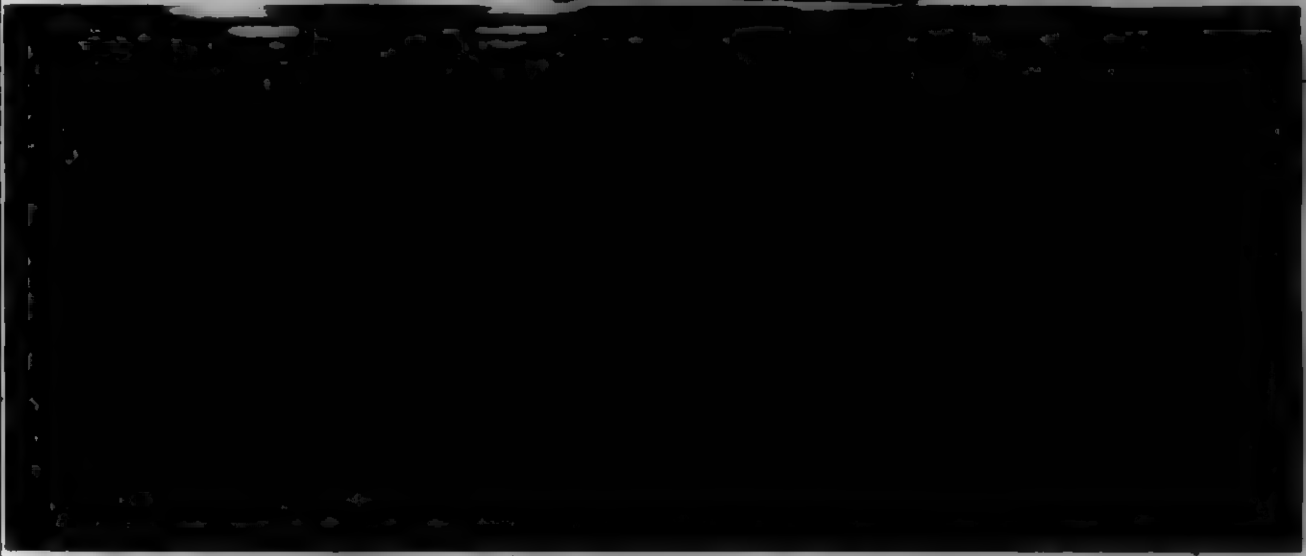

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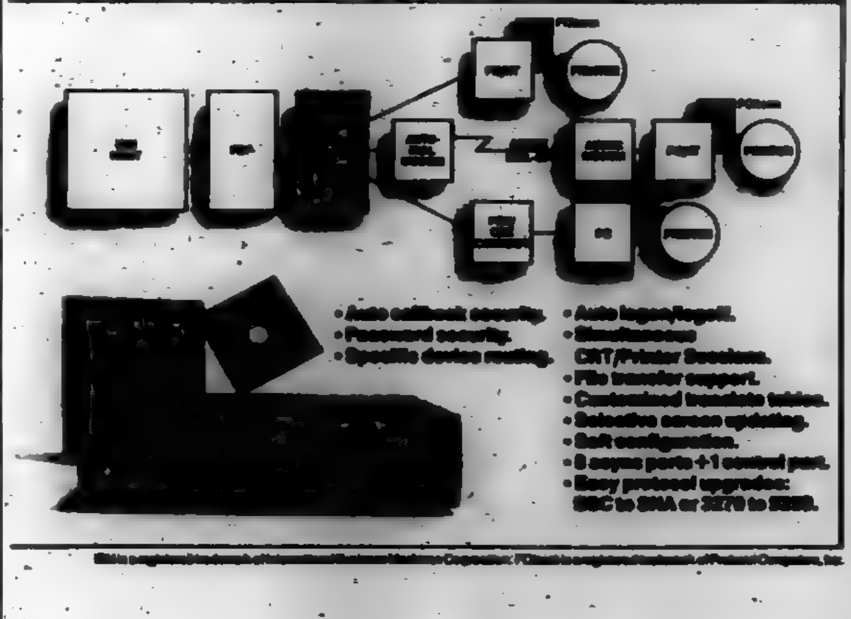

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> ”
> *We now have other businesses that are exploring putting some of their customers on our voice messaging system to improve communications — order expediting, order change and so on. We found that to be a very effective technology.*

How many divisions are there, or separate locations, of FMC?

Irwin: I just read that in our annual report last night. There are more than 100.

Did you consider FMC technologically behind before the creation of this position?

Irwin: No. I think a better way to characterize it is that we recognized a wave of technology coming. If we continued our old pattern organizationally, we were likely to miss opportunities that were going to be there for us as a company.

The benefits of information technology are often, or sometimes, hard to measure on the bottom line of an annual report. How will your success be measured?

Irwin: I'm very hopeful we'll measure some of it on the bottom line. I hold out for that and expect that we'll be able to.

In what year? When would it start showing up?

Irwin: Oh, I would think we'll start to see some benefits by sometime this year or '86, but the real big bangs may be '88 or '89, down the road. By the real big bangs, I mean where we could take the technology and apply it in a unique, an unusual kind of way in a business to get a competitive advantage.

Can you give an example of how that's taking shape right now?

Irwin: Well, during the time we were running a pilot in one of our businesses, we put all of the field sales people on the voice messaging network. As a result, we were able to eliminate a layer of management. And they implemented that before we ever got out of the pilot on voice messaging.

We now have other businesses that are exploring putting some of their customers on our voice messaging system to improve communications — order expediting, order change and so on. We found that to be a very effective technology. That is an example of where we clearly cut the field sales administration cost in that one business by eliminating one whole layer of management, just because one regional manager is now able to communicate effectively with 50% more people than he was when they were playing telephone tag all the time.

It also creates a stronger link to your customers.

Irwin: It sure does.

Who lost power in order for you to get power? Is the MIS department or traditional data processing losing power in this realignment?

Irwin: I don't think of it that way. I see us as bringing together all of the information technologies in a way that they perhaps even gain power, because they're stronger with the balance that's there than they would have been before. And we don't think a lot in terms of power in this company.

Is your office here on the 67th floor a statement by the company of a greater emphasis on the use of information technology?

Irwin: Yes, that's true.

Who are your major competitors in petroleum and chemicals?

Irwin: As you probably know, we're a pretty widely diversified company, so we run into a lot of different companies. In the petroleum equipment business, Cameron Iron Works would be one competitor. Combustion Engineering would be another.

How do you measure yourself to your competitors in terms of using information technology. Do you worry that they are getting the strategic edge on you in terms of using new technology?

Irwin: Yes, we sure do. And one of the functions that I think we need to perform, and we've a long way to go at it down in my department, is an effective surveillance of the competitive environment, of the companies that we compete with. And I see that as a role that we should play.

How does one go about that?

Irwin: Oh, I think in the same way that you do in the business itself. Competitive intelligence. Just through the networks that are there.

When you first took your position here, I assume you called in the managers of the five areas that now report to you. What did you tell them would change in terms of using information technology as a corporate weapon?

Irwin: Well, I said, first of all, that's going to be our emphasis — using it as a strategic weapon as opposed to a cost-reduction mechanism. I told each of the people who report to me, "I'm looking to you to provide leadership in your area. Seek those opportunities, get them to the surface so that we can get them in front of the people who are running our business, and they can take advantage of them where it makes sense." That was one of the first things I said.

Using information technologies in new ways involves risks. It's not the relatively safe backroom service that data processing has provided for a long time. Risks can mean coming up short on the bottom line, spending thousands or a million dollars on a technology that doesn't work or that turns out

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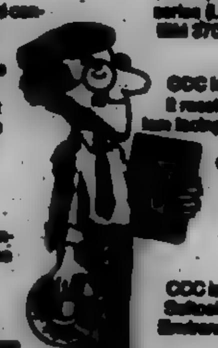

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wrong. I assume the company understands that's a real possibility.

Irwin: I think you're right, Sure.

Did you lose any managers in this realignment?

Irwin: Yes.

> ***We ended up approving two vendors as full OA suppliers and a third as a personal computer workstation only.***

People who were more comfortable with the old ways of operating?

Irwin: I don't know that I could characterize any generalizations, and I'd just as soon not do that.

Did you know before taking this position what mainframes the company had in place — by models?

Irwin: Absolutely not.

Do you know now?

Irwin: Yes.

Were you surprised?

Irwin: No. Because what I knew was that our predecessor MIS department had consistently followed a strategy of adopting the latest technology as it came forward in mainframe hardware and operating systems and implemented and done it very cost effectively. And they'd done a hell of a good job. So I knew in that sense where we were. But to talk about an IBM 3084 — that meant nothing to me.

What mainframe systems do you have now?

Irwin: A 3084, 3081, and we're in line for a Sierra when they roll off.

So the IBM announcement would be something you would be very up on. What would you be looking at — the 200 model, or would you be waiting for the more powerful 400 model?

Irwin: Honestly, it will depend on where it fits into our capacity expansion requirements in terms of timing.

You're an IBM shop.

Irwin: We are today.

And tomorrow?

Irwin: We are today.

Would there really be the possibility of going to one of the plug-compatible manufacturers or one of the Bunch companies?

Irwin: I think anything's always a possibility.

How about in terms of micros? Do you have a "recommended" list?

Irwin: That came out of our OA task force last year. Micros were viewed as a subset of office automation. In other words, they are a type of workstation that should fit in an OA environment. And we ended up approving two vendors as full OA suppliers and a third as a personal computer workstation only: Wang Laboratories, Inc. and Digital Equipment Corp. for the complete systems and IBM for the Personal Computer only. We've reached a decision now with IBM's new System/36 announcement to give that the blessing. So those are the standards that people in the company are following today.

Right now your Wang does not talk to your DEC, does it?

Irwin: Not very effectively.

And do either of them talk to . . .

Irwin: They all talk to the mainframe.

The Wang doesn't talk to the IBM Personal Computer. That has to be one of your problems.

Irwin: It is a problem. That's why we draw the line where we have, and we're working on these interface problems.

So what you want is a network that ties them all together.

Irwin: That's right.

You don't particularly care who it comes from.

Irwin: That's right. Whoever it comes from ought to provide the best functionality for the business function that we deal with. In a number of our businesses, which are engineering-based, a vendor that has good engineering hardware and software is likely to have an advantage over one that is more business-oriented. And all of that has got to be rolled together.

Apple Computer is absent from the list.

Irwin: It just hasn't been there with a product that can communicate with anything we have.

The Macintosh Office?

Irwin: I don't know.

That was just announced.

Irwin: I know. And I have not seen an evaluation of it.

But you're satisfied with the three you have.

Irwin: I think they cover our needs pretty well.

Do you know how many personal computers exist in FMC?

Irwin: Throughout the company? The answer to that is no, but it's somewhere between 600 and 800.

Do you see a lessening in the influence of traditional data processing, given the trend toward end-user computing and end-user programming? It seems we have a

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movement away from programming in a centralized data processing department and now here, at the top end, we have an executive — you — coming from a non-MIS background. It seems data processing is squeezed a little bit or is just losing some — you don't want me to use the word "power" — some influence.

Irwin: I think you're fishing for that. And I don't think that's necessarily appropriate. I think the jury is still out on where we'll be five years from now in terms of distributed computing vs. centralized computing. And what I have seen and heard up to this point would tell me more experience is going to be necessary for us to see.

But you obviously are going to see smaller and smaller boxes with more and more power, it's going to allow you to push capability to the end user. And you're going to see an increasing array of software that is easily used by the end user, that is probably going to enlarge the whole of the computing field, in a sense. But golly, I don't see at the same time a replacement of your traditional data processing, because those large systems applications have to [get done]. At least that's how it seems to me. But where that balance is going to end up is hard to call at this point.

> ”
>
> ***I don't see at the same time a replacement of traditional data processing, because those large systems applications have to [get done].***

Fourth-generation languages — are they commonly used through the corporation?

Irwin: Reasonably commonly, yes, as part of that research and development effort that I'm talking about. We have brought some in: We are actively using some fourth-generation languages in program development today. We are researching others, testing others.

Which ones are you using now?

Irwin: Well, [Management Decision Systems, Inc.'s] Express is one that we've done more with than, I think, anything. I've never been quite sure whether you classify Ramis [Mathematica Products Group, Inc.] as a fourth-generation language or an end-user language, but Ramis is heavily used throughout our company.

What do you generally use your micro for?

Irwin: I basically use it for personal kinds of things: calendars, we share calendars now amongst our group. Several of the people that work for me like to send electronic messages on it. I typically will answer their messages with a VMX, because that's more comfortable for me to use than the electronic messaging.

I saw a speech recognition system at IBM. It's obviously not a product yet. But would that be something that you could see a real use for here? An executive speaks into the system, the words come up on the screen and then it can be sent off?

Irwin: I think that's where it's headed. I think that is one large step toward making the technology user-friendly to a much larger segment of the work population.

Do you consider your micro user-friendly at the moment? Do you feel comfortable with it?

Irwin: Oh yes.

And you still have an Apple at home, but the Wang here. Which do you prefer? Would you say one's more fun, one's more productive?

Irwin: With the Apple, I don't have the same kind of power because it's not tied to a mini. You know, it does the things I want to do at home. Probably the biggest inconvenience is that the word processing on it is different in some characters from the word processing on the Wang. So you kind of have to sit down and get your act together before you run off a letter or something. And especially if you don't write that many letters, which I don't.

Let's get back to management. How many people report to you?

Irwin: About 260.

Was there any loss of staff within data processing?

Irwin: No.

Have you encountered any particular resistance? We talked about several people leaving, but could you characterize what . . .

Irwin: The answer to your question is no. It's been the opposite: a lot of enthusiasm, both on the business side of the house as well as our more technical side of the shop.

Is the task force still in existence?

Irwin: No. The task force officially disbanded with the creation of this department.

Could information technology have been used in the kinds of ways that you're using it now without the creation of your position?

Irwin: Sure it could have. Well, the forces to pull it together would not have been as highly focused as I think we've got it now. I think that's a key part of any organizational decision that you make.

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What's on your mind?

Part 2

In the end-of-the-year Forecast issue, we printed seven controversial statements and invited reader response. The best of these responses appeared in the March 11 issue. The new survey below deals solely with microcomputers. Respond to as many statements as you like, but we prefer longer comments (50 to 150 words) on one or two of them. Feel free to write in the space below or on a separate sheet of paper.

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1

We have a formal policy controlling the purchase of micros, yet no one knows exactly how many there are or what they're used for.

2

Software copying is a vendor problem, not mine.

3

End users get a lot out of their micros — including games, calls to their favorite on-line data base and personal word processing.

4

Micro equipment is so cheap that price doesn't prohibit purchase. But the hidden costs are huge.

5

End users want to share data, so this year we're setting up a microcomputer local-area network.

6

We give end users all the tools they need on micros, but the load on DP hasn't lessened.

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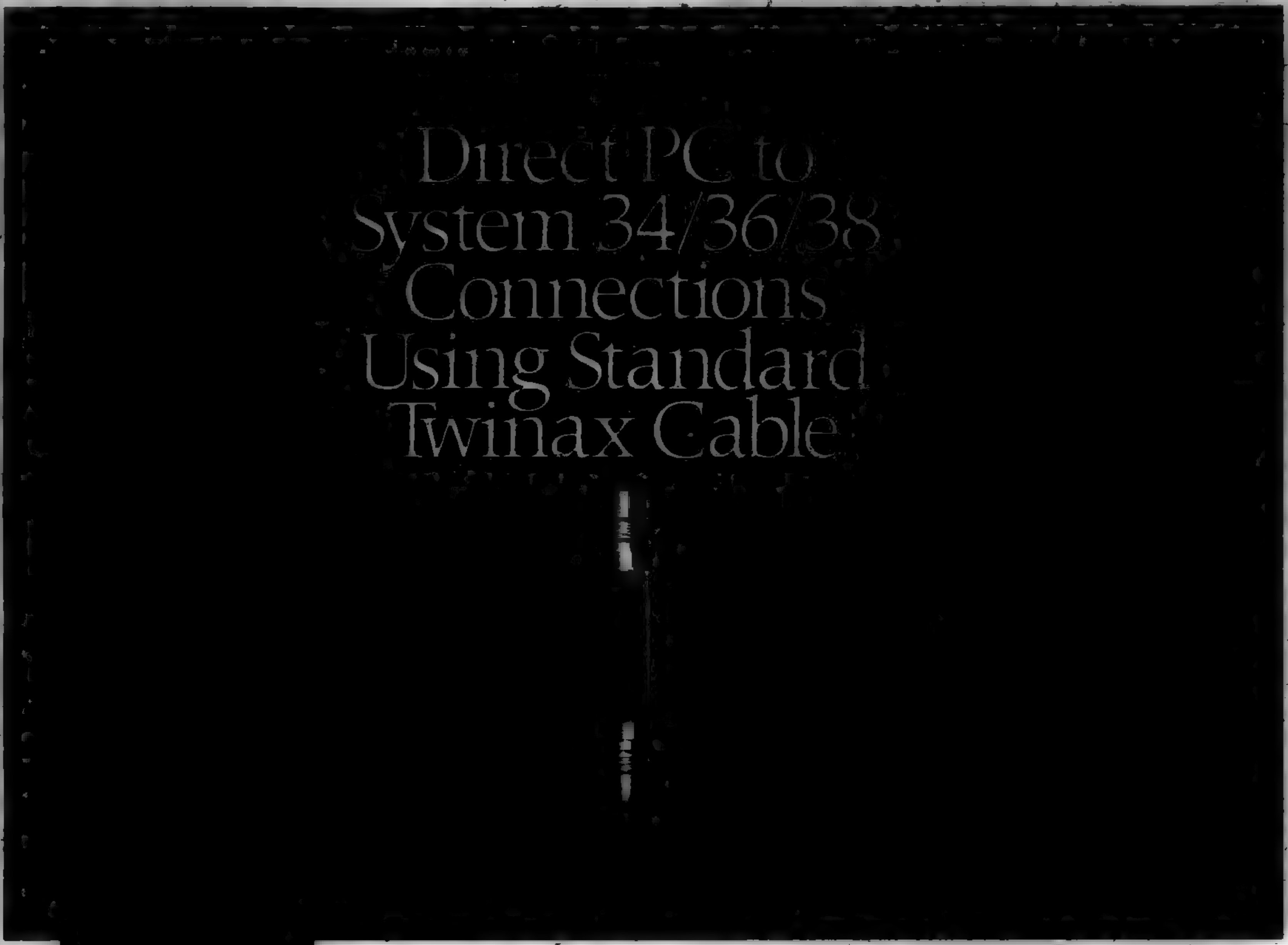

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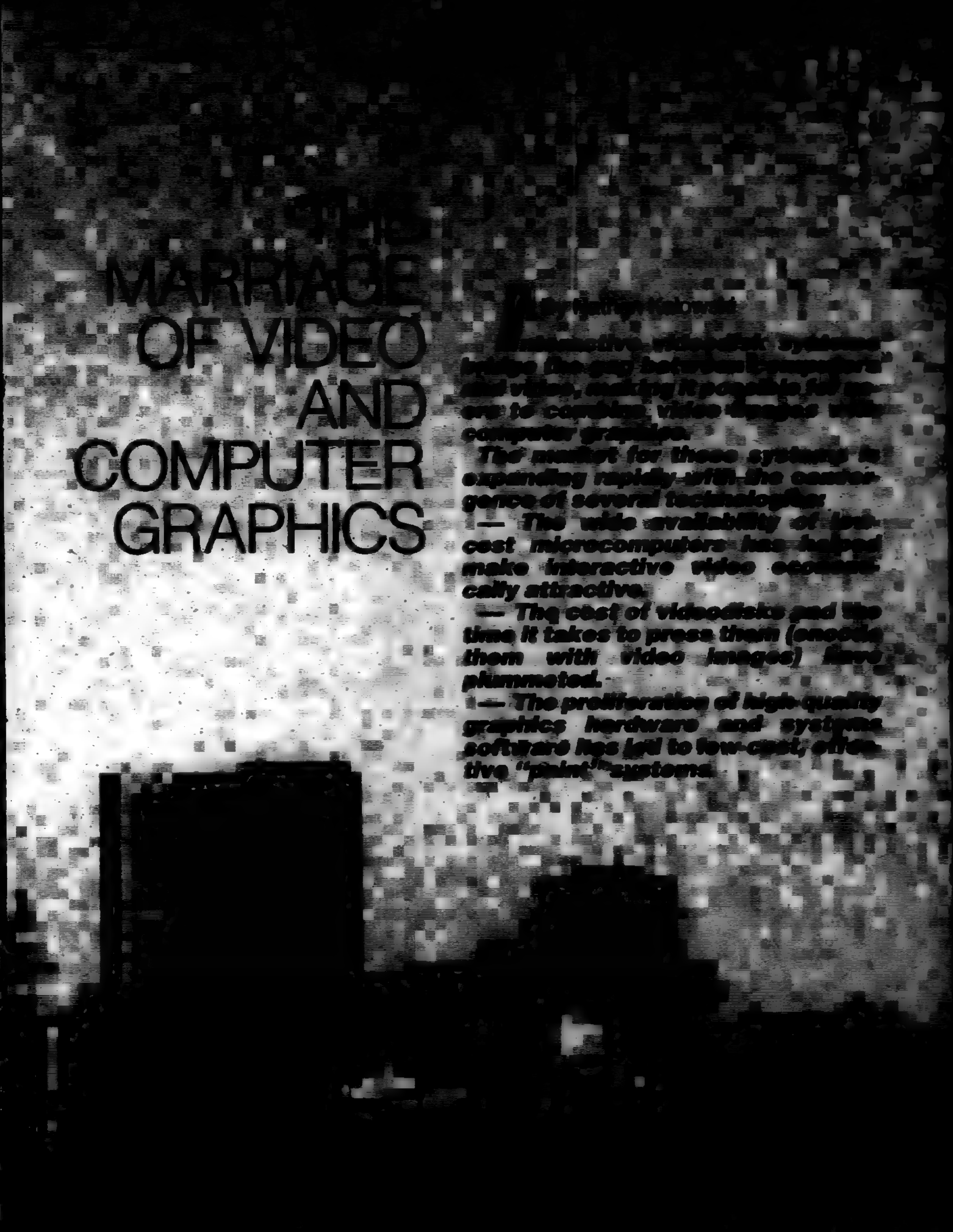

THE MARRIAGE OF VIDEO AND COMPUTER GRAPHICS

By [illegible]

Interactive videodisk systems bridge the gap between computers and video, making it possible for users to combine video images with computer graphics.

The market for these systems is expanding rapidly with the convergence of several technologies:

— The wide availability of low-cost microcomputers has helped make interactive video economically attractive.

— The cost of videodisks and the time it takes to press them (encode them with video images) have plummeted.

— The proliferation of high-quality graphics hardware and systems software has led to low-cost, effective "paint" systems.

Users who have a personal computer with a videodisk controller and graphics tools can develop text, menus, graphics highlights, charts and other descriptors and can display them in conjunction with photographed video images.

To produce the displays, a developer places the graphics images that he has created on a microcomputer over photographed images he has stored on a videodisk. The videodisk allows the developer to present photographed images in any sequence: forward, reverse, slow motion and the like. The microcomputer lets him annotate and highlight the video progression with still or animated graphics.

Richer interface

This marriage of videodisks and graphics provides a richer human-machine interface than either video or graphics offers alone. In fact, it begins to approach human communications because it allows different data types — video, graphics, sound and data — to be presented simultaneously.

Each element reinforces the others; together they form a powerful presentation. In addition, viewers can interact with the program, learning and responding to the presentation and receiving instant feedback through the capabilities of the computer and the random-access attributes of the videodisk player used as a computer peripheral. As a result of such interaction, people retain much more information than they do from other types of presentations.

Winning against the HP3000 isn't everything.

When we recently benchmarked the BTI8000 against HP's top-of-the-line Model 3000/68, we had cause to celebrate. Because the independently-audited test results proved we could outperform HP by more than three to one.

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But don't take our word for the BTI8000's performance. Write for your own copy of *Benchmark '85*, which includes a comprehensive report by KMG Main Hurdman, the international consulting and accounting firm. Just send your request to: BTI Computer Systems, 870 West Maude Avenue, Sunnyvale, CA 94086; (408) 733-1122. In Europe: BTI Computer Systems (UK), Ltd., Birmingham B13 8NG, England; (021) 449-8000.

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The communications standard.

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Interactive video systems treat the images stored on a videodisk as a data type, which can be accessed and retrieved like any other data type. Such systems allow developers to call up video images in any order and to use any given image over and over in the same program. With interactive systems, developers can "grab" images, digitize them and manipulate them by computer for enhancement, sizing or positioning.

Overlay capability

Computer graphics images are created and stored separately from video images. The graphics can either be displayed independently or overlaid on the video image. The overlay capability is a powerful tool for annotating objects that the videodisk displays in full motion or still frame.

For example, a video image of a personal computer can be overlaid with a circle that highlights a function key and with text explaining what the key does. Developers can create a number of graphics for the same personal computer image. With the graphics, they can take a user step by step through a lesson on how the machine works.

Interactive systems are based on videodisks that store images in an analog format and allow these images to be called up by frame number on a random-access basis. (Videotapes, on the other hand, are accessed linearly and must be viewed from beginning to end.)

As a storage medium, videodisks are compact. One 12-in. disk can store up to one-half hour of video, 54,000 still frames (the equivalent of 700 slide carousels) or 1G byte of data. Yet for all their power, the disks are economical, costing only $10 to $20 per copy, compared with $40 or more for videotape. Videodisks also are durable, with a typical lifetime of 10 years.

Encoding text

Currently, videodisks are used to store video and audio information. However, disks that can encode text as well (those with the ability to store from 1K to 16K bytes per frame) are beginning to emerge; they should be widely available by the end of this year.

A disk encoded with text can serve both as an interactive training medium and as an interactive reference source that provides additional information about the subject being taught.

Videodisks with high storage densities will also provide sound-over-still capabilities. Telephone-quality sound (4K bit/sec.) will be digitally encoded using compressed audio techniques. Given that a disk can hold up to 1G byte of data, it will be able to store many hours of sound and have room left over for text and video. Digital sound-over-still technology should become available this year.

Further in the future is digitized video, which will let interactive video approach the capabilities of digital image processing. Systems that accommodate digitized video will allow users to zoom in for close-ups, enhance images and change colors.

About the author

Nathan Kalowski is vice-president of marketing for Visage, Inc., a Natick, Mass., firm that manufactures interactive video systems.

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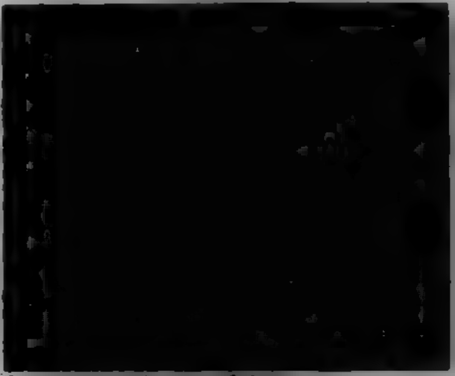
MICROCOMPUTERS

Sysgen update automates tape backup



Sysgen Disc-File and QIC-File

FREMONT, Calif. — Sysgen, Inc. has introduced a software enhancement for two of its ¼-in. tape backup units that reportedly offers automatic backup of stand-alone personal computers.

The software reportedly enables users of personal computers with built-in clocks to schedule automatic backup when the machine is not in use. The software requires users of systems without built-in clocks to set the time when they boot the operating system.

Automatic backup is available on some local-area network servers, including the 3Server from 3Com Corp., but Sysgen said its automatic archival system for stand-alone units is a first. The automatic backup software was officially announced at the Comdex/Spring '85 trade show last week in Atlanta.

The automatic backup software will come bundled at no additional charge with Sysgen's 10M-byte Smart QIC-File, which costs $995, and 40M-byte Smart Image backup systems, which cost $1,395 and $1,495, respectively, in their internal and external versions. It will also be sold to existing users of those backup systems for a fee of about $25, Sysgen said. The software is scheduled to ship in June.

The package includes a menu-driven utility that lets users preselect files to be backed up, including subdirectories or only those files changed since the last backup. Two backups a day may be done, and, if the computer is in use at the time of a scheduled backup, users are reminded with a beep. Backup takes place automatically once they are finished. Sysgen

See SYSGEN page 92

Desq packages give IBM users multitasking

ATLANTA — Quarterdeck Office Systems, Inc. has introduced software said to permit multitasking of applications on the IBM Personal Computer. The firm also announced Desq 2.0, an enhanced version of Quarterdeck's Desq windowing software, which also supports multitasking.

The Desq-GT multitasking software package is targeted at spreadsheet users who want to have several applications files open at once, Quarterdeck said. Users reportedly can run such activities as printing or communications in a background mode while working on an application in the foreground. Consistent menu interfaces are provided for applications running under Desq GT, and more than 150 applications programs run without modification, Quarterdeck said.

The software reportedly supports bit-mapped graphics. Also supported are several mouse systems and both monochrome,

See DESQ page 92

■ Hayes Microcomputer Products announced a multifunction board for print and communications buffering/88

■ Quadram unveiled a card to permit IBM Personal Computer-to-IBM minicomputer communications/82

■ Innovative Software enhanced its Smart software series/82

INSIDE

Software/82
Systems/87
Communications/87
Storage/88

MICRO BITS
Thomas Madron

Is Topview worth the investment?

Topview, IBM's entry into the integrated software market, may be aimed at a market that is not there.

Like other integrating products, Topview allows users to access more than one applications program concurrently. However, the vendor claimed that Top-

See TOPVIEW page 89

IBM offers desktop printers

RYE BROOK, N.Y. — IBM recently introduced two desktop printers for its Personal Computers and some compatibles.

IBM's Color Jetprinter costs $745 and prints in seven colors, with ink stored in cartridges. It can produce output on 8½ by 11-in. transparencies, coated paper and bond paper, according to IBM.

The Color Jetprinter reportedly is all-points addressable and can generate graphics with a density of up to 9.6K dot/sq in. in a single pass and up to 19.2K dot/sq in. in double printing.

Text can be printed in any of four pitches, each with two speeds, IBM said. With a normal pitch of 10 char./in., near-letter-quality documents can be printed at up to 20 char./sec. and drafts at up to 33 char./sec.

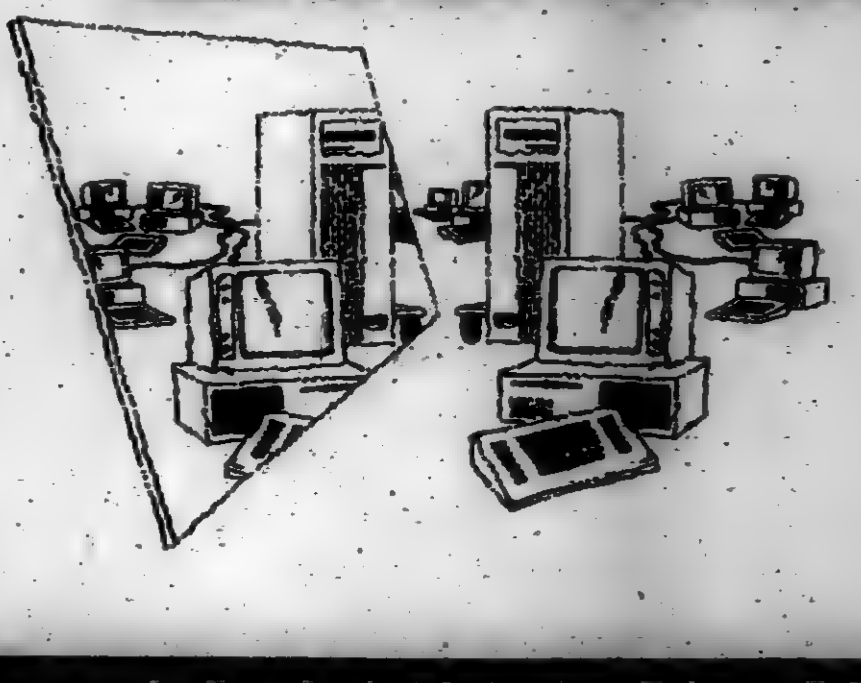
With a condensed pitch of 16.7 char./in., near-letter-quality documents are generated at up to 30 char./sec. and drafts at up to 50 char./sec.

The IBM Proprinter, a dot matrix device, reportedly handles single-sheet paper, multipart forms or envelopes through a slot in front, while continuous-form paper can be fed from the top. The Proprinter costs $549.

The Proprinter can print drafts or data at up to 200 char./sec., reports at up to 100 char./sec. and near-letter-quality documents at up to 40 char./sec., according to IBM. The all-points-addressable device can produce as many as 17.3K dot/sq in.

IBM said both devices are available immediately.

More information is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.



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Hayes offers multifunction device

NORCROSS, Ga. — Hayes Microcomputer Products, Inc. has introduced Transet 1000, a multifunction device that offers print and communications buffering, I/O switching and port expansion.

The device, which costs $399, reportedly performs multiple tasks simultaneously, including sending or receiving data via a modem while sending output to a printer, and can act as a standalone 24-hour electronic mailbox.

Compatible with any device with an RS-232 port, Transet can handle data from a computer or high-speed modem at up to 19.2K bit/sec., Hayes said. Any communications software package providing terminal emulation can work with the equipment.

Xmodem protocol offered

Communications features reportedly include time-date stamping, overflow control and dynamic memory allocation. Mailbox functions also include a logon message and options for sending, scanning and printing mail. Transet also offers the Xmodem protocol, to insure data integrity and password features.

Print capabilities are said to include compression, pagination, automatic page numbering, format control, collated printing of multiple copies and time-dating.

Transet features 128K bytes of internal memory, divided into mailbox, buffer and replay segments.

The device also includes a Motorola, Inc. 68008 processor, software-controlled peripheral switching, two serial ports and a printer port, which supports both parallel and serial printers. The device permits a personal computer to send output to two printers or two personal computers to access a printer, Hayes noted. Specific configurations can be stored in electrically erasable programmable read-only memory, according to the company.

Transet is scheduled to ship late this month. Systems accessory kits, with utility disk and cable, for the IBM Personal Computer, Apple Computer, Inc. Macintosh and Apple IIc also will be sold, with pricing set by individual dealers, according to the vendor.

Hayes is headquartered at 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

Compaq unveils Intel-based IBM chips

HOUSTON — Compaq Computer Corp. has introduced read-only memory Bios chips that make its Intel Corp. 8088- and 8086-based systems compatible with the IBM PC Network and the IBM Enhanced Graphics Adapter, the firm announced earlier this month.

The replacement firmware, scheduled for a mid-May delivery, can be installed by dealers. The costs are $30 for floppy disk drive systems and $40 for hard disk drive models, company officials said.

Compaq's Intel 80286-based systems, as shipped, are fully compatible with the two IBM standards, the company said.

More information is available from Compaq at 20555 FM 149, Houston, Texas 77070.

Corporate micro users hold meet

NEW YORK — An organization for corporate users of personal computer local-area networks, formed here recently by network reseller LAN Services, Inc., held its first meeting on May 2.

Kicking off the meeting of the PC Network Users Group, chairwoman Laurie Antonell of Merrill Lynch Capital Markets pointed to the need for networking standards.

She called for greater support from applications software vendors like Lotus Development Corp., saying that suppliers "must give in, at least on site licensing," to network user demands.

Antonell also emphasized the requirement for multiuser network versions of single-user personal computer packages.

"The [personal computer] environment is fantastic; the products are great," but users need to be able to move the software to a network environment, she said.

About 50 users showed up at the meeting, which featured an overview of Novell, Inc. network products and plans from Harry Armstrong, Novell marketing vice-president.

The gathering was the first personal computer network users group meeting he had seen, Armstrong remarked. "I've been waiting for this meeting for about four years."

Monthly meetings are planned. The next meeting, scheduled for June 20, is expected to focus on communications servers. The group also intends to set up an electronic bulletin board for members, Antonell said.

More information on the PC Network Users Group is available from Susan Freedman at LAN Services, Suite 701, 37 W. 57th St., New York, N.Y. 10919.

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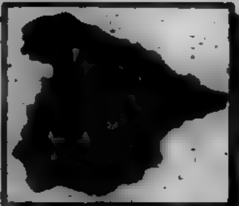

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Computerworld Espana is the only MIS/DP newspaper in Spain. Each week 8,500 MIS/DP executives turn to Computerworld Espana for information on new products and services, current applications and industry trends.

Commodore World, is a monthly publication with a circulation of 22,000. Editorial targets the Commodore user with reports on all aspects of Commodore operations.

PC World addresses the overall Spanish micro market. 12,000 owners and users of Commodore, Hewlett-Packard, Olivetti, Apple, Sinclair, DEC and IBM microcomputers read PC World for the latest developments and applications in the micro field.

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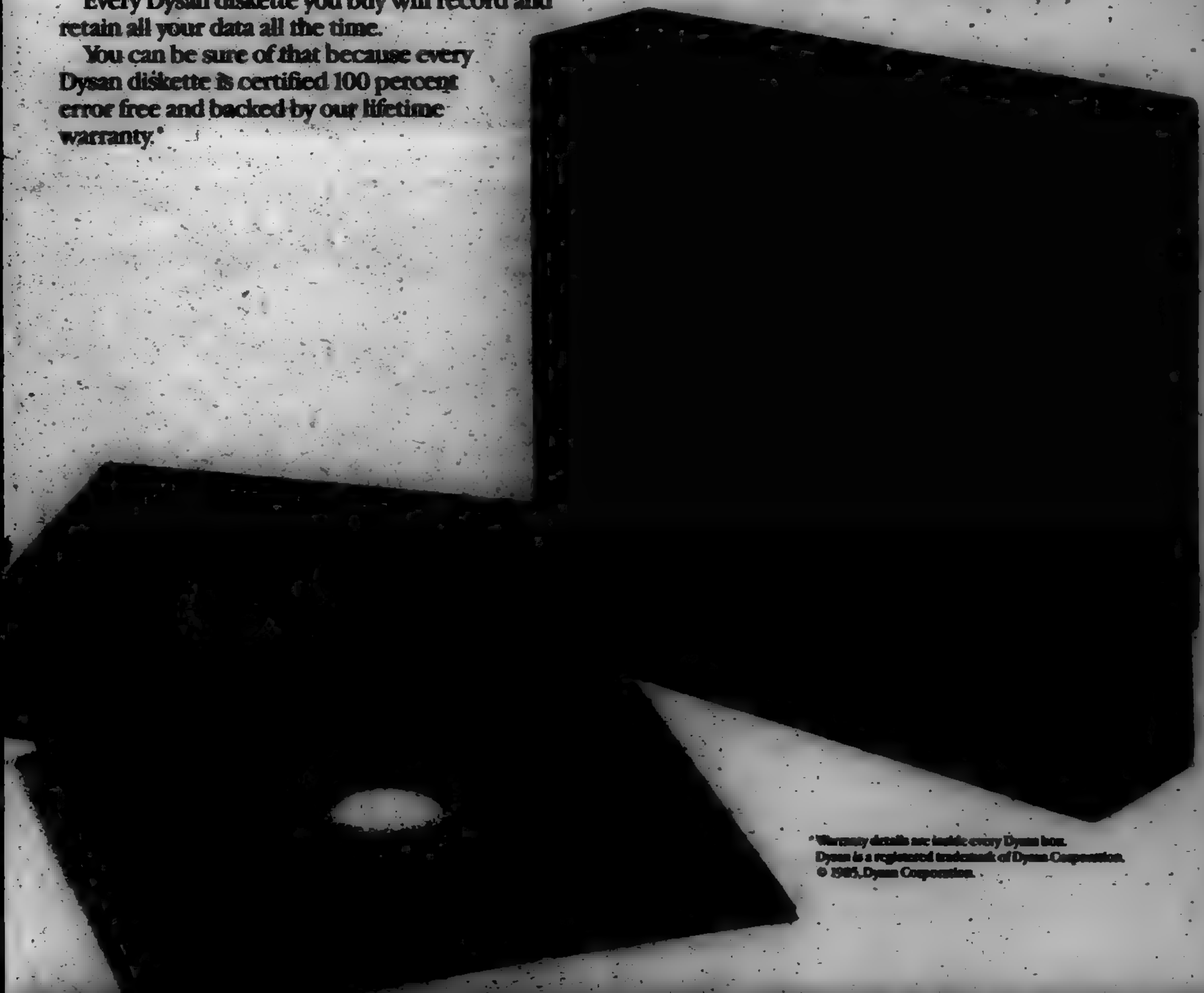

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Enhanced Smart series out

OVERLAND PARK, Kan. — Innovative Software, Inc. has enhanced the three programs in its Smart software series for the IBM Personal Computer. The enhancement reportedly includes asynchronous communications capability in each program.

Version 2.0 of Smart is said to incorporate a time manager and communications module into Smart word processing, spreadsheet with graphics and data base management programs. Each program is available separately or can be bundled into an integrated package.

Version 2.0 of the Smart Spreadsheet reportedly has been made faster by adding support for the Intel Corp. 8087 and Motorola, Inc. 80284 math coprocessors. The Smart Spreadsheet is said to support up to 999 rows and 9,999 columns.

Version 2.0 of each Smart program is said to include the Smart Programming Language to set up customized projects. The programming language is composed of English-language commands such as IF, ELSE, ENDIF and CONTINUE and several debugging commands, the vendor said.

The communications module in each Smart program reportedly allows users to upload, download and transfer data unattended. Other features include automatic dial, answer and logon to remote data bases, electronic mail and capture to memory, file or printer. The communications module supports the standard Xon/Xoff protocol, Xmodem standard and emulation of Ansi terminals, according to the vendor.

Smart 2.0 word processing software costs $295; Smart Spreadsheet costs $395; and data base management software costs $495. The bundled system sells for $895. Each program runs on the IBM Personal Computer, Personal Computer XT and AT with a minimum of 256K bytes of memory and two floppy disk drives or a hard disk.

Innovative Software is located at Suite 380, 9300 W. 110th St., Overland Park, Kan. 66210.

Quadram unveils adapter for IBM Personal Computers

NORCROSS, Ga. — Quadram Corp. has announced an adapter card that is said to allow IBM Personal Computers, including the Personal Computer AT, XT and Portable Personal Computer, to emulate IBM workstations in IBM System/34, 36 and 38 minicomputer environments.

The Quad 5251 card reportedly allows the micros to emulate IBM 5251 Model 11, IBM 5291 and IBM 5292 workstations. The card attaches the micro directly to the mini's twin-axial cable, which eliminates the need for modems in the host.

The emulation board reportedly permits concurrent switching between micro and mini sessions with a single keystroke and features a user-configurable display station. The product is said to support IBM Virtual Diskette file transfer software and transfer to disk storage, screen print and color or monochrome displays.

The Quad 5251 is said to be compatible with IBM 5250 emulation software and hardware. It requires IBM's PC-DOS 1.1 or 2.0 operating system and 128K bytes of memory.

The product costs $895.

Quadram is located at 4355 International Blvd., Norcross, Ga. 30093.

SOFTWARE

■ Datasystems Software Corp. has announced the enhancement of its Entrymanager, software for remote job entry using personal computers under AT&T's Unix, IBM's PC-DOS or Microsoft Corp.'s MS-DOS operating systems.

Formerly known as Datamanager, the software now reportedly supports the Unix System V operating system and features an expanded data base. That data base has the capacity for 256 record types and allows 256 fields per record.

The software operates on a network to provide for intelligent data entry and distributed data processing, the vendor said. It offers input validation at the character, field and form levels.

Entrymanager costs $695.

Datasystems Software, 7301 Topanga Canyon Blvd., Canoga Park, Calif. 91303.

■ McGraw-Hill Training Systems has introduced its Faststart Tutorial Series, software for the IBM Personal Computer that reportedly teach users how to use either Lotus Development Corp.'s 1-2-3 or IBM's PC-DOS 2.0.

Topics covered in the tutorials are said to range from beginning concepts to advanced functions. The tutorials include menus and run simultaneously with the application, a system which lets learning exercises become templates for future use.

The PC-DOS version requires 128K bytes of memory, and the 1-2-3 version requires 256K bytes of memory.

The 1-2-3 version costs $79.95. The PC-DOS version costs $59.95.

McGraw-Hill Training Systems, P.O. Box 641, Del Mar, Calif. 92014.

See MIS page 53

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*Wyse 50 is a trademark of Wyse Technology. TeleVideo 914, 924, 925 and 950 are trademarks of TeleVideo Systems, Inc.

AIDS from page 62

■ **Alloy Computer Products, Inc.** has announced enhancement of its Formula/One software with the inclusion of a utility that reportedly lets the software exchange data with Lotus Development Corp.'s 1-2-3.

The utility is said to allow data to be transferred from 1-2-3 into Formula/One, an equation-solving package for forecasting and time-series trend analysis. Formula/One runs on the IBM Personal Computer line, including the Personal Computer AT.

The utility reportedly includes a windowing feature that allows users to view both 1-2-3 and Formula/One on-screen simultaneously while exchanging data.

The utility will be supplied free to current users of Formula/One. With the utility included, Formula/One remains priced at $395.

Alloy Computer Products, 100 Pennsylvania Ave., Framingham, Mass. 01701.

■ **Rochkind Software Corp.** has introduced Ride, a programming language for business applications. It runs on the IBM Personal Computer under Microsoft Corp.'s Xenix and MS-DOS operating systems.

Ride supports all C statements except GOTO. It includes such built-in functions as data conversion, string manipulation, I/O, form input, data base access, screen handling, report generation and mathematical operations.

Ride costs $295.

Rochkind Software, 3060 Valmont Road, Boulder, Colo. 80301.

■ **Rio Grande Software, Inc.** has introduced RGS Softmaker II, data base management software for the Apple Computer, Inc. Macintosh personal computer.

The software is said to be menu driven and to provide such utilities as deletion, mass deletion, merging, sorting and renaming of files. It also features on-line help and password protection on data and structural files and for screens, according to the vendor.

It also reportedly includes formula definition for customized reports. RGS Softmaker II will automatically total all numeric columns with 14-digit accuracy, RGS said.

The package is priced at $199, according to the vendor.

Rio Grande Software, P.O. Box 5906, 221 Nolana, McAllen, Texas 78504.

■ **National Data Processing Corp.** has introduced Dataflow, software for batch data entry on the IBM Personal Computer.

Written in the C language, the software reportedly includes record insertion, backward and forward scrolling, format linking and automatic format selection. The system requires relabeling of about 45 keys with key labels supplied in the package.

The software is sold without a file transfer utility. It costs $600 for the first machine and $300 for each additional machine.

National Data Processing, P.O. Box 2383, Wilmington, N.C. 28406.

■ **General Electric's Automation Controls Department** has introduced factory simulation software for IBM Personal Computers and compatible machines, including IBM's Workmaster industrial portable computer built for General Electric.

Modelmaster is said to give the user representations of actual factory floor layouts and includes icons of factory equipment such as robots.

The product reportedly allows users to design a plant or assembly line, and select production machines to be used in the simulation. Users can design the factory floor and select the amount of production time the simulation represents. Users then can observe bottlenecks in material flow and make appropriate corrections.

Modelmaster is priced at $6,000 and will be available in the third quarter.

General Electric Automation Controls Department, P.O. Box 8106, Charlottesville, Va. 22906.

■ **Honeywell, Inc.** has announced Microsystem VIP Emulation asynchronous terminal emulation software.

The product reportedly allows the Honeywell Microsystem Personal Computer, IBM Personal Computer and Personal Computer XT to communicate directly with Honeywell DPS 6 minis and DPS 8 and Multics mainframes by emulating Honeywell terminals.

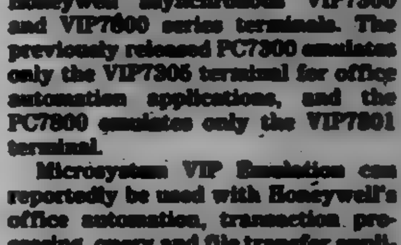
The software is said to emulate all Honeywell asynchronous VIP7300 and VIP7800 series terminals. The previously released PC7300 emulates only the VIP7305 terminal for office automation applications, and the PC7800 emulates only the VIP7801 terminal.

Microsystem VIP Emulation can reportedly be used with Honeywell's office automation, transaction processing, query and file transfer applications on DPS 6 systems and with Honeywell Solution Center programs on DPS 8 mainframes.

The software costs $400.

Honeywell, 200 Smith St., Waltham, Mass. 02154.

See AIDS page [illegible]



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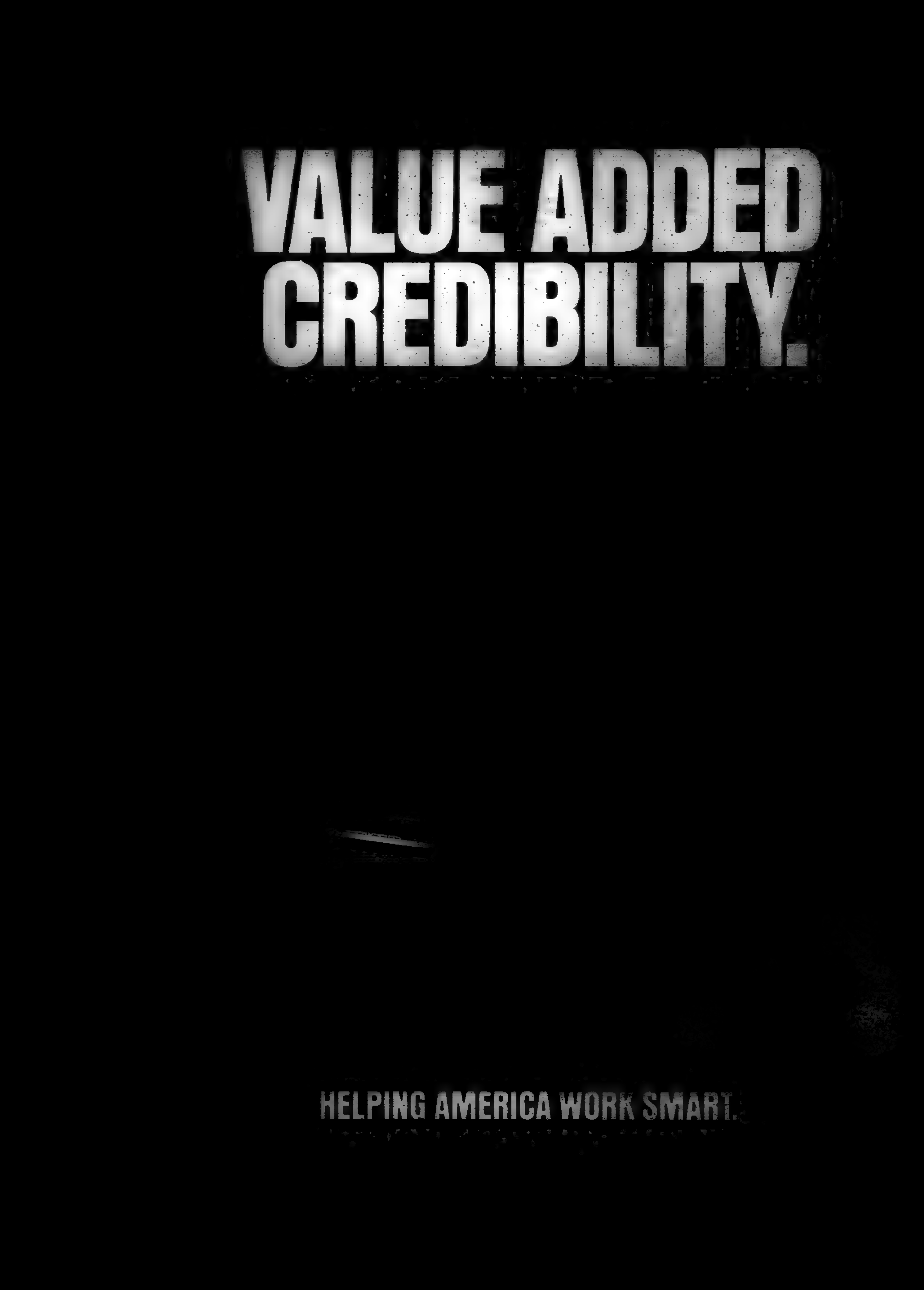

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AIDS

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■ Scientific Computing Associates has introduced a version of its SCA Statistical System for the IBM Personal Computer line.

The software is said to be an integrated system offering interactive and compatible batch processing modes. Its capabilities include data manipulation and general statistical analysis

The Personal Computer version of the tool reportedly lacks the vector capability of the mainframe version.

A hard disk and a minimum of 512K bytes of memory is required.

The software costs $595.

Scientific Computing Associates, P.O. Box 625, De Kalb, Ill. 60115.

■ Macmillan Software Co. has introduced its Asyst software, said to permit machines in the IBM Personal Computer line to function as scientific workstations.

Asyst software reportedly uses the Personal Computer's optional Intel Corp. 8087 coprocessor to offer 80-bit internal precision for computational accuracy. An integrated package, it also is said to enable users to perform data analysis, data acquisition and graphics.

The entire Asyst package is priced at $1,695. Modules within the package are priced from $495 to $795.

Macmillan Software, 866 Third Ave., New York, N.Y. 10022.

■ QCX Corp. has announced a Cobol applications generator for the IBM Personal Computer, Personal Computer XT and AT.

Fastec software is said to combine elements of Cobol with screen generation, report generation and relational data base management. The product reportedly generates self-documenting and modifiable Micro Focus, Inc.-compiled Level II Cobol programs for menu screens, file update screens, inquiry screens, reports and file extracts.

Fastec requires the QCX or Micro Focus Level II Cobol compiler and a 256K-byte hard-disk system. Generated applications can be run separately on a 128K-byte floppy disk-based system.

QCX, 261 Circle Court, Palatine, Ill. 60067.

■ Micro Data Base Systems, Inc. has introduced its Menu Maker software for the creation of menus on the IBM Personal Computer.

Menu Maker reportedly can be used to execute commands used by IBM's PC-DOS operating sytem or to invoke off-the-shelf programs among other tasks.

Menu Maker reportedly traverses directories.

Menu Maker can support an unlimited number of menu levels and is priced at $195. It is available for PC-DOS 2.0 or later versions.

Micro Data Base Systems, P.O. Box 248, Lafayette, Ind. 47902.

■ Exsa, Inc. unveiled Exsa-DSS, a menu-driven decision support system for the IBM Personal Computer.

Exsa-DSS reportedly does not require a command language for use. Instead, users can choose among on-screen options and make selections using either a mouse or key. They may also simultaneously choose data from a large number of independent sources, treating them as a single data base.

The software requires 256K bytes of memory and IBM's PC-DOS 2.0 or later. It is priced at $2,000 per Personal Computer. A mainframe link, Exsa-MVL, costs $60,000 per mainframe site.

Exsa, Suite 650, 312 W. Randolph St., Chicago, Ill. 60606.

■ Sysgen, Inc. has announced enhancements to the software in its streaming tape backup subsystems. The software reportedly supports IBM's PC-DOS Version 3.0 on the IBM Personal Computer line.

Sysgen Image Release 3.01 is said to allow users to perform image as well as file-by-file backup of hard disks exceeding 10M bytes of storage capacity. The release remains compatible with the earlier 2.0 and 2.1 versions of PC-DOS and MS-DOS.

Release 3.01 reportedly offers improved error detection.

The product costs $35.

Sysgen, 47853 Warm Springs Blvd., Fremont, Calif. 94539.

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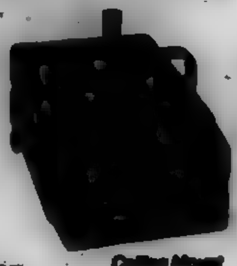

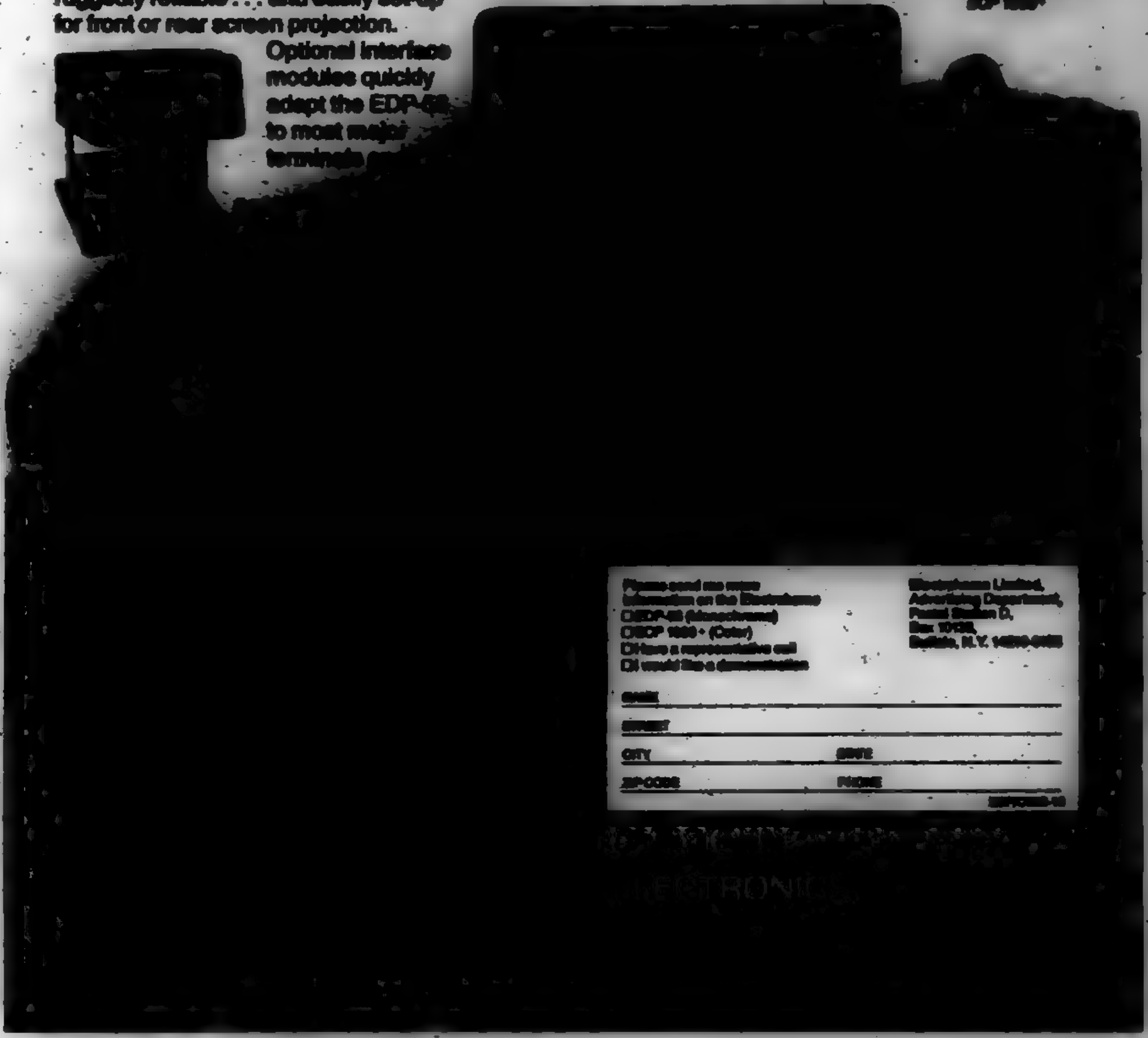

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ELECTRONICS

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TeleVideo 922

DEC VT220

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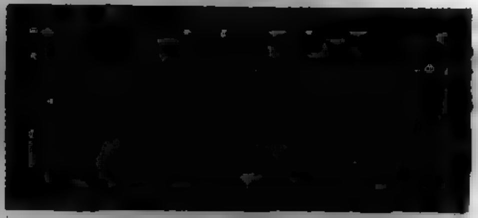
Where's the VT220 ESCAPE key?

2. Our ESCAPE key is located above the TAB key, right where you'd expect to find it.

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In fact, you have to go hunt for the VT220 ESCAPE key halfway across the row of function keys.

3. Take a look below at the 922 keyboard. That's a true accounting keypad, complete with a Clear Entry, Double Zero and a TAB key. Not merely the numeric keys you get with the VT220.

4. Our SHIFT key is exactly where it should be, so it does exactly what it should do—shift. Their SHIFT key is shoved over by the ⟨ and ⟩ key to create lots of ⟨ and ⟩ on the CRT. Of course with a little practice, you could relearn their keyboard. But why, now that you've seen our 922?

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VT220 Display Screen.

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6. Here are 5 more advantages to the 922.

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Programmable Function Keys	15 (30 with shift)	15 (shifted only)
True Accountant Keypad	YES	NO
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Enhanced ANSI Mode	YES	NO

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The TeleVideo® 922

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AIDS

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■ National Semiconductor Datachecker/DTS Corp. has announced Posicom, communications software linking the company's controller-based and terminal-based point-of-sale scanning systems with its Datachecker/DTS 600 Store Computer, an IBM Personal Computer XT compatible.

With this connection, store managers can apply point-of-sale data to a variety of spreadsheet and data management packages, according to a spokesman. Supermarket managers can plug a 600 Store Computer into a Datachecker 1600 or 1700 controller to access point-of-sale information and host data.

The software converts data to the standard personal computer format, Comma Separated Values. When used in conjunction with Datachecker/DTS terminals, Posicom requires the company's Terminal Network System (TNS) communications board and software developed by Datachecker/DTS for the 600.

Posicom is available at no charge with the purchase of a model 611 or 621 Storage Computer or TNS. Prices for the 611 and 621, including TNS, are $4,000 and $4,500, respectively. TNS separately costs $1,895.

National Semiconductor Datachecker/DTS, 2909 Semiconductor Drive, Santa Clara, Calif. 95051.

SYSTEMS

■ Project Software & Development, Inc. has announced Maximo Maintenance Manager, a turnkey factory maintenance system based on an IBM Personal Computer AT.

A vendor spokesman said that the package assists in work-order tracking, equipment history and inventory control. Maximo allows a user to associate each work order with craft, crew and spare part requirements. According to the vendor, requisitions are automatically generated from a job plan and closed against an inventory control system.

The product features an IBM Personal Computer AT with IBM's PC-DOS, a 20M-byte hard disk drive, 512K bytes of random-access memory and a color monitor as well as a mouse.

Maximo costs $25,000.

Project Software & Development, 20 University Road, Cambridge, Mass. 02138.

■ Action Instruments, Inc. has announced BC-10, an IBM Personal Computer-compatible microcomputer that works with bubble memory cards rather than disk drives. The product is designed for factory automation, process control and field-test applications.

BC-10 features an Intel Corp. 8088 microprocessor, an optional 8087 microprocessor and 256K bytes of random-access memory. In place of disk drives, the machine supplies plug-in bubble memory cards. Each card holds between 128K and 512K bytes of memory, and four cards can be loaded into the machine.

BC-10, available in 19-in. rack or wall-mounted configurations, costs $2,295, excluding monitor and keyboard.

Action Instruments, 8601 Aero Drive, San Diego, Calif. 92123.

COMMUNICATIONS

■ Prentice Corp. has begun bundling Software Publishing Corp.'s PFS:Access communication software with Prentice's Popcom C100 and Popcom X100 modems.

The modems, which run on an IBM Personal Computer with IBM's PC-DOS operating system, operate at speeds of either 300 or 1,200 bit/sec. They are full-duplex, offer compatibility with Hayes Microcomputer Products, Inc. and AT&T Bell Laboratories 212A modems and include automatic dialing and answering functions, the vendor said.

The Popcom modems give access to a number of on-line data base services, including Source Telecomputing Corp.'s Source and Dow Jones & Co.'s Dow Jones News Retrieval Service, the vendor said.

Popcom X100, an external modem, costs $499.

Popcom C100, an internal modem, sells for $469.

Prentice, P.O. Box 3544, 266 Caspian Drive, Sunnyvale, Calif. 94088.

■ Network Software Associates, Inc. has announced an enhanced version of its Adapt SNA RJE emulator software that allows IBM micros emulating an IBM 3770 or 8100 RJE workstation to operate in unattended mode at a remote location.

Adapt SNA RJE/UOF is said to be a programmable interface with a control flow-exit facility for the IBM Personal Computer, Personal Computer XT or AT. The product enables a user-customized micro program to examine every message sent by the host and to send an appropriate command to the emulator or host before returning control to the emulator.

The UOF version can reportedly be used in Cobol, C, Basic or assembly language. It requires IBM's standard Synchronous Data Link Control adapter card, PC-DOS version 2.0 or higher, and 192K bytes of memory.

The Adapt SNA RJE emulator enhanced by UOF costs $570. The UOF upgrade for current RJE emulator users sells for $295.

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

■ Communications software featuring script language for performing unattended communications has been announced by VM Person-

Continued on page 69

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UNIX Overview	Apr 9 June 11 Aug 6 Oct 8 Dec 3	Jan 15 May 20 Oct 1	Mar 19 July 30 Dec 17	Jan 15 Mar 19 May 28 July 30 Oct 1 Dec 17	Feb 19 June 18 Oct 15	Mar 12 Aug 20	Feb 19 June 18 Oct 15	Mar 12 Aug 20	$325	[illegible]
UNIX Fundamentals for Non-Programmers*	Apr 10-12 June 12-14 Aug 7-9 Oct 9-11 Dec 4-6	Jan 16-18 May 29-31 Oct 2-4	Mar 20-22 July 31- Aug 2 Dec 18-20	Jan 16-18 Mar 20-22 May 29-31 July 31- Aug 2 Oct 2-4 Dec 18-20	Feb 20-22 June 19-21 Oct 16-18	Mar 13-15 Aug 21-23	Feb 20-22 June 19-21 Oct 16-18	Mar 13-15 Aug 21-23	$730	
UNIX Fundamentals for Programmers*	Apr 15-17 June 17-19 Aug 12-14 Oct 14-16 Dec 9-11	Jan 21-23 June 3-5 Oct 7-9	Mar 25-27 Aug 5-7	Jan 21-23 Mar 25-27 June 3-5 Aug 5-7 Oct 7-9	Feb 25-27 June 24-26 Oct 28-30	Mar 18-20 Aug 26-28	Jan 14-16 Feb 25-27 June 24-26 Oct 28-30	Mar 18-20 Aug 26-28	$735	$1125
Shell as a Command Language*	Apr 18-19 June 20-21 Aug 15-16 Oct 17-18 Dec 12-13	Jan 24-25 June 6-7 Oct 10-11	Mar 28-29 Aug 8-9	Jan 24-25 Mar 28-29 June 6-7 Aug 8-9 Oct 10-11	Feb 28- Mar 1 June 27-28 Oct 31- Nov 1	Mar 21-22 Aug 29-30	Jan 17-18 Feb 28- Mar 1 June 27-28 Oct 31- Nov 1	Mar 21-22 Aug 29-30	$480	
'C' Language Programming*	Apr 22-26 June 24-28 Aug 19-23 Oct 21-25 Dec 16-20	Jan 28- Feb 1 June 10-14 Oct 21-25	Apr 15-19 Aug 12-16	Jan 28- Feb 1 Apr 15-19 June 10-14 Aug 12-16 Oct 21-25	Mar 4-8 July 8-12 Nov 11-15	Apr 29- May 3 Sep 9-13	Jan 21-25 Mar 4-8 July 8-12 Nov 11-15	Apr 29- May 3 Sep 9-13	$1225	
Shell Programming*	Apr 29-30 July 1-2 Sept 2-3 Oct 28-29	Feb 4-5 June 17-18 Oct 28-29	Apr 22-23 Aug 19-20	Feb 4-5 Apr 22-23 June 17-18 Aug 19-20 Oct 28-29	Mar 11-12 July 15-16 Nov 18-19	May 6-7 Sep 16-17	Jan 28-29 Mar 11-12 July 15-16 Nov 18-19	May 6-7 Sep 16-17	$480	$1125
Using Advanced UNIX Commands*	May 1-3 July 3-5 Sept 4-6 Oct 30-Nov 1	Feb 6-8 June 19-21 Oct 30- Nov 1	Apr 24-26 Aug 21-23	Feb 6-8 Apr 24-26 June 19-21 Aug 21-23 Oct 30-Nov 1	Mar 13-15 July 17-19 Nov 20-22	May 8-10 Sep 18-20	Jan 30- Feb 1 Mar 13-15 July 17-19 Nov 20-22	May 8-10 Sep 18-20	$735	
UNIX Internals	May 7-10 July 8-12 Sept 4-6 Oct 30-Nov 1	Feb 11-15 June 24-28 Nov 11-15	Apr 29- May 3 Aug 26-30	Feb 11-15 Apr 29-May 3 June 24-28 Aug 26-30 Nov 11-15	Mar 18-22 July 22-26 Dec 2-6	May 13-17 Sep 23-27	Feb 4-8 Mar 18-22 July 22-26 Dec 2-6	May 13-17 Sep 23-27	$1375	
UNIX Administration*	May 15-17 July 15-17 Sept 18-20 Nov 11-13	Feb 19-21 July 9-11 Nov 19-21	May 7-9 Sep 10-12	Feb 19-21 May 7-9 July 9-11 Sep 10-12 Nov 19-21	Mar 26-28 July 30- Aug 1 Dec 10-12	May 21-23 Oct 1-3	Feb 12-14 Mar 26-28 July 30- Aug 1 Dec 10-12	May 21-23 Oct 1-3	$735	
Advanced 'C' Programming Workshop*	May 20-21 July 22-23 Sept 23-24 Nov 18-19	Feb 25-26 July 15-16 Dec 2-3	May 13-14 Sep 16-17	Feb 25-26 May 13-14 July 15-16 Sep 16-17 Dec 2-3	Apr 15-16 Aug 5-6 Dec 16-17	Jan 14-15 June 3-4 Oct 7-8	Apr 15-16 Aug 5-6 Dec 16-17	Jan 14-15 June 3-4 Oct 7-8	$480	$1125
Advanced 'C' Programming Under UNIX*	May 22-24 July 24-26 Sept 25-27 Nov 20-22	Feb 27- Mar 1 July 17-19 Dec 4-6	May 15-17 Sep 18-20	Feb 27-Mar 1 May 15-17 July 17-19 Sep 18-20 Dec 4-6	Apr 17-19 Aug 7-9 Dec 18-20	Jan 16-18 June 5-7 Oct 9-11	Apr 17-19 Aug 7-9 Dec 18-20	Jan 16-18 June 5-7 Oct 9-11	$735	
Berkeley Fundamentals and 'csh' Shell*	June 3-7 July 29-Aug 2 Sept 30-Oct 4 Nov 25-29	Mar 4-8 July 22-26 Dec 9-13	May 20-24 Sep 23-27	Mar 4-8 May 20-24 July 22-26 Sep 23-27 Dec 9-13	Apr 22-26 Aug 12-16	Jan 28- Feb 1 June 10-14 Oct 21-25	Apr 22-26 Aug 12-16	Jan 28- Feb 1 June 10-14 Oct 21-25	$1225	

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MICROCOMPUTERS

Continued from page 97

al Computing, Inc. (VMPC).

The Relay Gold software, which also runs on the Data General Corp. DG/One and Wang Professional Computer, can provide micro-to-mainframe communications, including cooperative processing, according to the vendor. Working with VMPC's Relay/3270 on the mainframe, Relay Gold provides IBM 3270 terminal emulation and error-free file transfers.

The software is said to be useful for the development of expert applications, under which executives can access Dow Jones News Retrieval, a product of Dow Jones & Co, or electronic mail services. The software also supports the AT&T 2224B and Hayes Computer Products, Inc. 2400 modems and others.

Relay Gold costs $295 and will begin shipment July 1.

VMPC is located at 6 Germantown Road, Danbury, Conn. 06810.

■ Telexpress, Inc. has released Teleterm X, a communications software package designed for Tandy Corp. Model TRS-80/16 microcomputers running Microsoft Corp.'s Xenix operating system.

The product supports the Xmodem protocol and is supplied with file transfer capabilities, according to the vendor. The software is equipped with automatic dialing and logon procedures and a print feature that supplies the ability to spool output to a printer or a disk file.

Teleterm X works with modems from Hayes Microcomputer Products, Inc. and Tandy, a spokesman said.

The software includes a modem table that allows a user to set modem parameters. In addition, the package works with protocol converters from a number of manufacturers, including Avatar Technologies, Inc.

Teleterm X costs $395.

Telexpress, P.O. Box 217, Willingboro, N.J. 08046.

STORAGE

■ Miniscribe Corp. has announced two 3½-in. microcomputer Winchester disk drives.

The two-disk Model 8425 reportedly provides 25.6M bytes of storage, and the single-disk Model 8212 provides 12.8M bytes of capacity. Both products are said to use thin film media and incorporate the industry standard ST412 interface. Mounting requirements for both are reportedly identical to those for 3½-in. floppy disk drives.

Both models are said to feature average power consumption of 9.7W, an average access time of 68 msec and a data transfer rate of 5M bit/sec.

The Model 8425 is priced at $600, and the Model 8212 is priced at $450.

Miniscribe, 1861 Lefthand Circle, Longmont, Colo. 80501.

■ Corvus Systems, Inc. has introduced a combination fixed disk drive and tape backup unit for the IBM Personal Computer.

The Corvus Trimline Combo reportedly offers 20M bytes of formatted disk storage and either 45M bytes or 60M bytes of tape backup. It fits under the Personal Computer's monitor.

All of the unit's backup options, including the setting of defaults, reportedly are presented in menu form. Using the unit, a disk can be backed up completely or on a file-by-file basis. A directory of backup files is provided at the beginning of every tape.

The Trimline Combo costs $3,295.

Corvus Systems, 2100 Corvus Drive, San Jose, Calif. 95124.

■ Tecmar, Inc. has announced the AT HD disk drive and QIC-60 AT tape backup unit for the IBM Personal Computer AT.

The AT HD is a 20M-byte Winchester hard disk drive with an average access time reported to be 45 msec. It is designed for internal installation.

The QIC-60 AT is an internal streaming tape backup unit that is capable of copying 20M bytes of data in four minutes. The product can copy an entire hard disk or selectively copy individual files, according to the vendor.

The AT HD is priced at $1,595, and the QIC-60 AT sells for $1,695.

Tecmar, 6225 Cochran Road, Solon, Ohio 44139.

■ PC's Ltd. has announced four external hard disks for the IBM Personal Computer, all including a controller linking them to the micro.

The disks are available in 10M-, 20M-, 33M- and 42M-byte versions.

The 10M-byte hard disk costs $749 or $1,344 with tape backup. The 20M-byte version sells for $895 or $1,490 with backup. The 33M-byte disk costs $1,495, and the 42M-byte disk costs $1,695. The tape backup purchased separately costs $795.

PC's, 7801 N. Lamar, E-200, Austin, Texas 78752.

■ Telebyte Technology, Inc. has introduced its Packetape 67M-byte archival storage system for the IBM Personal Computer AT and XT.

The storage system uses a ¼-in. data cartridge subsystem incorporating a half-slot interface. It reportedly provides on-the-fly error detection and correction.

The Packetape unit reportedly appears to the IBM unit as four 16.75M-byte diskette drives. All files are randomly accessible on-line using standard PC-DOS commands, according to the vendor.

The Packetape unit is priced at $2,990.

Telebyte Technology, 270 E. Pulaski Road, Greenlawn, N.Y. 11740.

See [illegible] page 99

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TOPVIEW

from page [illegible]

view provides a truly concurrent operating environment in that multiple applications can all run at the same time, while some other products simply stop and restart several applications as a user moves from one to another.

Thus, at its best, Topview can be viewed as an extension to the operating system. Once installed, it allows users to move with some ease from one application to another.

This article was written on Micropro International Corp.'s Wordstar running under Topview, with Microstuf, Inc.'s Crosstalk XVI running concurrently, connected to a mainframe system. All of these packages were running on a Tandy Corp. 1200 HD, an IBM Personal Computer XT clone, which substantiates the claim that [illegible] patibles.

From a user's perspective, Topview works mostly as advertised. A pointing device, either a mouse or the cursor keys, is used in making selections from menus that appear in a window. Various applications can be seen concurrently from different windows provided they do not require a full screen window themselves. Windowing is essentially not available for Wordstar or Crosstalk XVI, at least not with my versions.

The program seems a bit sluggish in moving from one application to another but not irritatingly so.

The program seems a bit sluggish in moving from one application to another but not irritatingly so.

In addition to the pointing device, only three keys are normally used to control Topview: the 7-Home, 9-Pgup and Alt keys. When inside an application, Topview is signaled by pressing the Alt key. At that point, a menu pops up that allows users to change from one program to another or to start another application. When a procedure is to be run or confirmed, the 7-Home key is pressed. The 9-Pgup key allows escape from the menus without confirming a procedure.

During the installation procedure, however, it became clear that some programs would not work at all, while others were far more difficult to use from Topview than directly from MS-DOS. Moreover, Topview does not support some facilities, such as batch files or a B drive on a Personal Computer XT.

But I have a larger problem with products like Topview: While they may assist productivity once the learning curve has been overcome, I'm not convinced that the productivity improvement will adequately compensate an organization for the cost of installing such products.

Let's estimate two hours of training and two hours of total installation time for Topview. We'll also assume an installation with 100 personal computers and an average personnel cost of $12 an hour, although that is on the low side for many organizations.

We have the following costs: $14,900 for original purchase of 100 copies at $149 per copy; $2,400 for training time and $2,400 for installation costs. That's a total cost of $19,700 for 100 workstations.

Depending on how we amortize all this, we will need an average productivity improvement of $197 per employee to break even. This probably must be amortized within a year, since the configurations, number of personal computers in the organization and related issues will all be changing and growing during the year. I suspect that an organization that invests in a product like Topview will not recover its costs.

Moreover, employees who have already learned how to use MS-DOS and appropriate applications will likely not use the product, and new users remain new users only for a short period of time. These are some of the reasons why similar products have had only mediocre sales.

In a large organization with a substantial network, a significant amount of network performance data can be gathered only at the end user's terminal. A multitasking system that would allow such data to be recorded, saved and later transmitted to a central collection site would be invaluable.

True multitasking operating systems, like Digital Research, Inc.'s Concurrent PC-DOS or the upcoming MS-DOS 4.0, may be a better choice for such tasks than overlays like Topview.

Madron is manager of computer services at North Texas State University, Denton, Texas.

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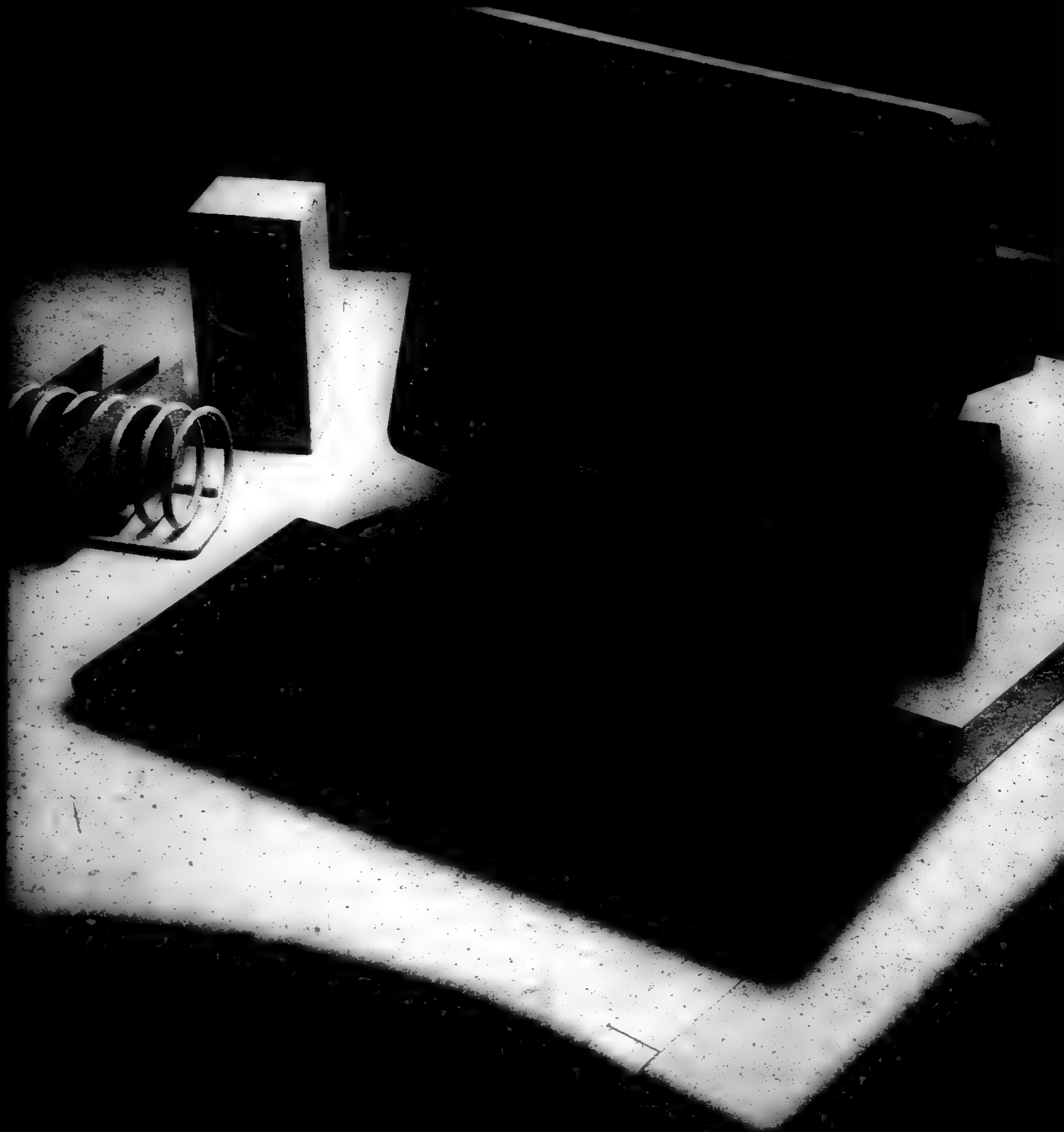
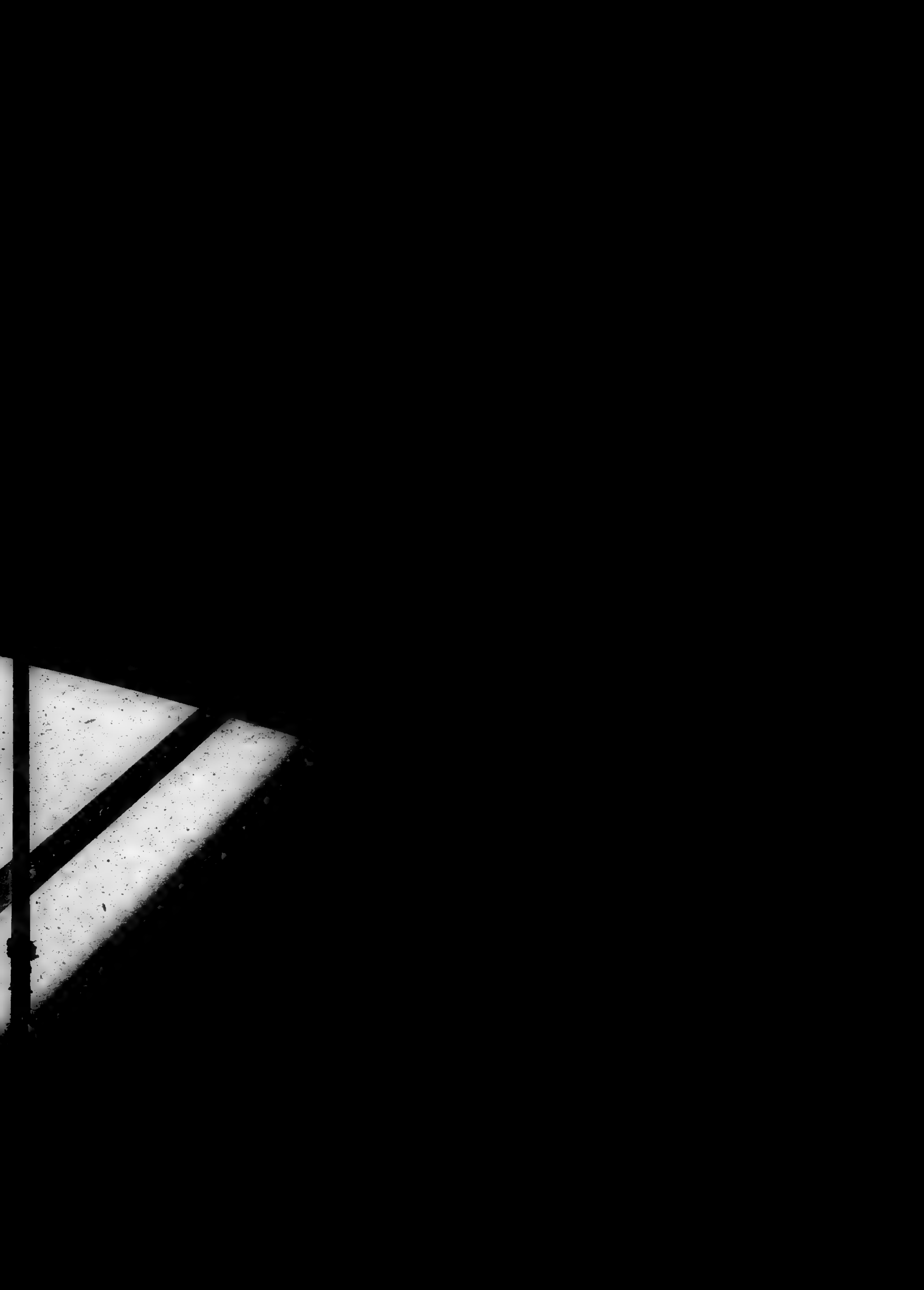
Let's talk. Remember, you're not out of the woods, yet.

an IBM company

[illegible] (In Alaska, California and Hawaii, call [illegible].)





STORE

from page 85

■ California Computer Group, Inc. has announced Filestar, a 60M-byte direct-drive cartridge streamer storage system for the IBM Personal Computer AT and XT.

The product is said to be capable of a 150-msec start/stop time and a streaming transfer rate of 3.75M byte/min. Filestar reportedly offers a stationary head and motor design that is said to reduce alignment problems and wear on the drive.

Filestar allows users to back up individual files or the entire hard disk, according to the vendor. The drive fits into a half-height floppy space in the micro and requires one expansion slot for its tape controller.

Filestar costs $1,395.

California Computer Group, Suite G-10, 3303 Harbor Blvd., Costa Mesa, Calif. 92626.

■ Scientific Micro Systems, Inc. (SMS) has released two storage subsystems that boost storage capacities for microcomputer systems with Intel Corp. Multibus backplanes and with Small Computer Systems Interface (SCSI) ports.

The SMS 8000 Model 60 is said to provide added storage for the SMS 8000 Model 40 microcomputer system as well as Multibus-backplane systems from other vendors. It employs SMS' FWD 8006 controller, which supports 5¼-in. Winchester disks and both 8-in. and 5¼-in. floppy disks.

The SMS 5000 Model 60 is said to serve as added storage for systems equipped with an SCSI port. This version includes SMS' Omti 5000 series controller that supports 5¼-in. Winchesters, both 8-in. and 5¼-in. floppy disks and streaming tape.

The SMS 8000 Model 60 with an 8-in. floppy drive and a 10M-byte Winchester disk drive costs $6,000. The same system with a 5¼-in. floppy and 10M-byte Winchester is $4,900; with a 5¼-in. floppy and 280M-byte Winchester, it costs $14,000.

The SMS 5000 Model 60 costs $4,100 with a 5¼-in. drive and 10M-byte Winchester disk drive. That model, with a 5¼-in. floppy and 280M-byte Winchester, costs $13,000.

Scientific Micro Systems, 339 N. Bernardo Ave., Mountain View, Calif. 94043.

COMDESIGN STATISTICAL MULTIPLEXERS: TC-500A SERIES

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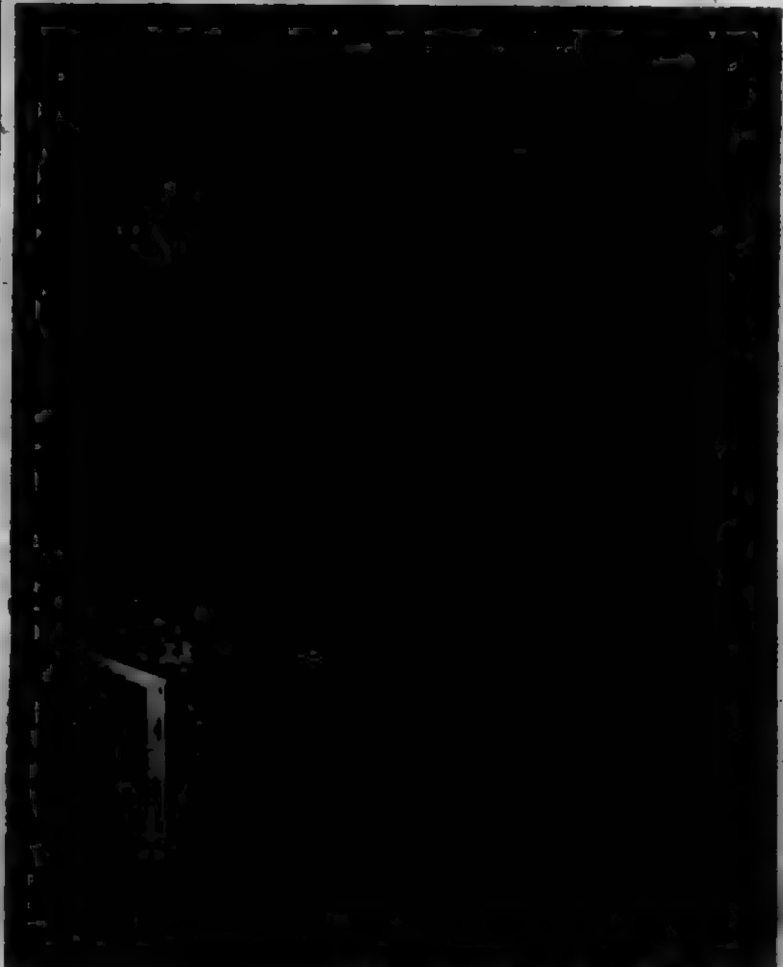

With 32 busy terminals, I ask a lot of my stat mux. ComDesign's TC-500A delivers.

TC-500A: The performance you need.

The days when statistical multiplexers could almost, but not quite meet your needs . . . are past. The TC-500A from ComDesign is the difference between Almost and All the Way.

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The TC-500A can handle an aggregate input of up to 307,200 bps with 32 channels operating at 9600 bps. It provides error correction, network monitoring and diagnostics, and achieves exceptionally fast response times even under heavy loads.

The TC-500A is available with 4800 or 9600 bps integral modems and synchronous capability. Additional channel capacity can be installed in the field to allow convenient network expansion. ComDesign's unique modular firmware scheme provides easy access to available options and the latest operating software.

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DESQ

from page 75

and color monitors, Quarterdeck said.

Desq-GT is said to be compatible with program interface files, which are being provided by IBM and independent developers to make programs work easily under IBM's Topview operating environment. Unlike Topview, however, Desq-GT supports both keyboard and mouse commands interchangeably, allows the use of batch files and supports virtual memory, Quarterdeck said.

Desq 2.0 is said to incorporate bit-mapped graphics support along with multitasking. Like Desq-GT it is compatible with IBM's program interface files.

Both products will be available in July. Desq 2.0 costs $199.95, and Desq-GT is $99.95.

Quarterdeck Office Systems is located at 1918 Main St., Santa Monica, Calif.

SYSGEN

from page 79

President Richard Tam said that another of the software's features is the ability to sense that a new tape cartridge is in use, a feature that he said prevents users from swapping cartridges and getting data mixed up. The software, he said, also can verify that the proper files were backed up and create directories of tapes and already-archived files.

Sysgen also announced enhanced software for the Sysgen Image tape subsystem and a combined hard disk/streaming tape subsystem for the IBM Personal Computer XT.

The software, Release 3.01, reportedly will support IBM's PC-DOS 3.0 and allow users to perform image and file-by-file backups of hard disks larger than 10M bytes. The Sysgen XT-Extra subsystem combines a 10M-byte hard disk with a 20M-byte tape backup unit in a system that uses the XT's disk controller and power supply.

Existing Sysgen Image users may upgrade to the release for $25; the XT-Extra is priced at $1,395 and will be available in June.

Sysgen is located at 47853 Warm Springs Blvd., Fremont, Calif. 94539.

COMMUNICATIONS

DATA STREAM
Paul Korzeniowski
CW Senior Writer

AT&T having trouble in computer market

The transformation from a large monopoly to a diversified conglomerate is proving to be difficult for AT&T. Sixteen months after divestiture, the telephone company remains a relatively insignificant player in the computer game.

Last year, the company released two hardware lines. Its line of 3B minicomputers, released in spring of 1984, had been developed and used by AT&T and its operating companies for a number of years. So far, sales of the 3B have been slow and have been targeted mostly at regional operating companies.

AT&T's 6300 Personal Computer, introduced in June 1984, marked AT&T's entry into the microcomputer market. After roughly a year, the product's 1% market share rivals that of Columbia Data Products, Inc. and that of Televideo Systems, Inc., and is well below that of companies like Compaq Computer Corp. and Kaypro Corp., according to Infocorp, a Cupertino, Calif., market research firm.

One can argue that initial market expectations were unrealistic. Yet, even AT&T has admitted that its performance last year was not as good as expected. There are a number of reasons why the communications giant has experienced trouble selling processor hardware.

For one, the company did not have sufficient time to develop complete product lines. The 3B line was pushed out the door onto the market primarily because it was the only box AT&T had to sell. (The 6300 Personal Computer was designed by Olivetti Corp., and AT&T merely placed its label on the product.)

Another problem was that the company had to build distribution channels and a computer sales force. Retailers were slow to add

See AT&T page 100

WIRE TAP/DANIEL MINOLI

Network models inadequate?

Standard network optimization methods, with their inherent assumptions, can greatly misrepresent actual needs, as outlined in a previous column [CW, May 6]. The use of a cookbook formula approach to network design can, in some cases, indicate the need for twice as many tie line trunks than are actually needed, requiring added expense.

Additional pathologies of standard networking models that designers should be aware of while trying to optimize networks include the following:

- Standard optimization models assume that networks exist in a steady state. This means the model used to determine the network facilities needed assumes that users generate traffic that is stable in reference to time. In reality, traffic rates and parameters change almost continuously throughout the day.

Because communications traffic never reaches a steady state, the optimization model used may inaccurately indicate the facilities required. To compensate for this, users can adopt a more sophisticated model or at least factor this element into their network design.

- Communications traffic is autocorrelated — related to itself — whereas network models presume all

See MINOLI page 101

Minoli is an associate vice-president, systems planning and engineering, of Prudential-Bache Securities, Inc. in New York.

- DG and Equatorial Communications have formed a joint marketing pact that will integrate Equatorial's satellite net products with DG hardware and software/96
- United Technologies has introduced a digital voice/data PBX that supports 40 to 200 voice/data lines/96
- ETI has announced a package that enables users to determine communications costs using the new AT&T private-line tariffs/96

Net managers automating

Survey says 28% growth expected over five years

BOSTON — Network managers are turning to automated tools to help monitor increased network usage.

That finding came from a joint survey conducted by Seattle-based Comm+ Systems, Inc., a nonregulated subsidiary of Pacific Northwest Bell Telephone Co., and CW Conference Management Group of Framingham, Mass., at the Network Management Technical Control conference held here last month. The survey included 110 managers representing approximately 15% of the conference attendees.

The managers projected that their networks would grow by 28% per year for the next five years.

More than half of the managers (52%) stated that their network management tools were at least partially automated, using a control terminal to monitor equipment. One quarter of the systems are manual and 23% are completely automated.

Approximately 80% of the managers were considering automating functions. The desired functions mentioned included performance reports, which were cited by conference attendees 61% of the time; management reports (58%); problem isolation (54%); color graphics displays (54%); and on-line network controls (49%).

Downtime was named by 40% of the respondents as their major problem area. Other problems attendees cited, in

See SURVEY page 100

Canadian firms seek legal communications bypass

By Brian Banks
Special to CW

In Canada, communications bypass is illegal, but many large Canadian firms are developing bypass strategies so that, in the event it is legalized, they can implement the systems quickly.

The motive for bypass — the use of any one of several technologies to step around telephone company facilities for voice/data communications — is generally economic. But bypass also offers users an added element of control over telecommunications destinies, a cherished commodity in such a dynamic environment.

Large-volume business telecommunications users who see bypass as a medium for potential savings are beginning to press for its legalization. And the growing presence of CNCP Telecommunications as an alternative to the telephone companies is reinforcing their position. According to Hudson Janisch, a University of Toronto law professor who specializes in telecommunications, "The bypass issue is alive and well in Canada."

The latest indication that bypass is on a lot of minds here was the recent announcement by Jean de Grandpre, Bell Canada Enterprises, Inc.'s chairman, that Bell Canada was contemplating a billing-by-the-bit rate structure for data transmissions.

On the surface, the connection between this possible move by Bell Can-

See CANADA page 101

Banks is the assistant editor of Computer World Canada, a subsidiary of Computerworld with headquarters in Mississauga, Ont.

Nynex ushers in Pathways family for Centrex service

NEW YORK — Nynex Corp. said it will offer a family of advanced network services called Pathways through the New York and New England Telephone companies.

The five services underline Nynex's commitment to maintaining the viability of its Centrex offering by adding software enhancements.

The five services available in 1986 are the following:

- The Infopath packet-switching service, which allows users to access other computers, remote interactive data bases and interexchange carriers without performing conversions.
- The Flexpath digital private branch exchange service, which will provide direct inward/outward dialing, perform analog-to-digital conversion at a rate of 1.54M bit/sec and allow customer control over circuits.
- The Switchway switched 56K bit/sec. service, which will be charged on a usage basis as opposed to a private-line rate and will use a standard two-wire local loop connection to the network.
- Intellipath digital Centrex service, which will offer direct inward dialing, automatic route selection, trunk queuing, tandem networking, call distribution, customer station rearrangement and traffic information.
- Quickway digital service, a digital point-to-point, point-to-multipoint full-duplex data transmission at 2,400, 4.8K, 9.6K and 56K bit/sec. speeds.

Nynex said it intends to add a Virtual Network Service as an alternative to private-line and special service circuits that will enable all traffic to be routed on the public switched net-

See NYNEX page 100

One size

Symphony. It's the one software

To meet the varied needs of your end users, you don't need more software. You simply need the one software that does more. Symphony™ from Lotus®

With Symphony users get a comprehensive software program with five basic functions—spreadsheet, database management, graphics, word processing and communications. These five functions can be used alone, together or in any combination. And with Symphony, users can start with one function and grow into others as their needs change.

Users can even create customized applications.

With Symphony's powerful command language, end users can save time by creating their own applications either for themselves or for entire departments. And users don't have to be programmers to build an unlimited variety of turnkey applications.

With Add-Ins, Symphony grows as you grow.

Symphony's unique open-ended architecture allows you to expand the functionality of the basic program with Add-In products. These Add-Ins work like Symphony—and with Symphony—so users don't have to learn a new language. Spelling Checker and Text Outliner are already available. And a variety of future Add-Ins and industry specific applications are now being designed by Lotus and qualified third-party developers to further enhance Symphony's capabilities.

fits all.

solution for more PC users.

Our micro-to-mainframe link will tie Symphony to your existing environment.

Later this year, Lotus will introduce a new micro-to-mainframe Add-In product. Developed jointly by Lotus and DCA®, this new link will allow designated PC users to transfer data to and from your mainframe computer. Mainframe data will be available on their PC spreadsheets in useable form, eliminating the need for retyping.

If your corporate environment already includes 1-2-3™, Symphony makes an even easier fit. It has a familiar user interface and reads 1-2-3 data.

And like all Lotus products, Symphony is supported by the industry standard in service and support, with training programs, Courseware, and Lotus Books.

Symphony Software. The more your people do, the more it will do for your people. After all, you wouldn't expect less from the software that was named "Product of the Year"* and easily became 1984's best selling new software product.

For more information on Symphony Software, contact your Lotus Marketing Representative or local authorized Lotus dealer.

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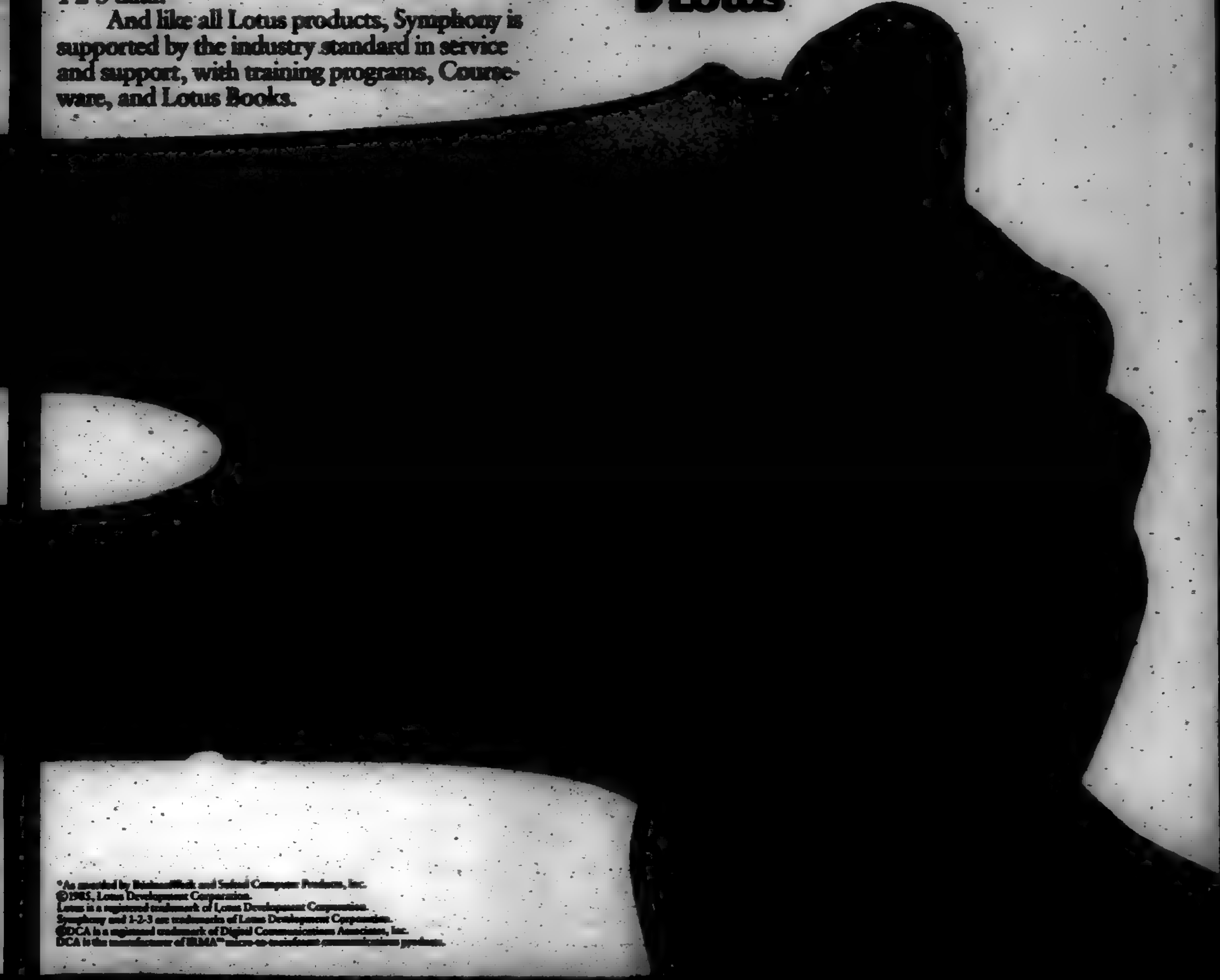

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DCA is the manufacturer of IRMA™ micro-to-mainframe communications products.

DG, Equatorial join forces on integrated satellite net

WESTBORO, Mass. — Data General Corp. and Equatorial Communications Co. have announced a joint marketing agreement that will integrate Equatorial's satellite network products with DG hardware and software products.

The companies plan to develop joint proposals for point-to-multipoint data distribution and interactive satellite networks. With earth stations placed at user sites, the networks will enable DG users to bypass local and long-distance telephone company facilities, according to a spokesman.

Each station will be able to transmit and receive asynchronous or sychronous data at speeds up to 19.2K bit/sec. There are two types of stations available — an interactive station that has a 48-in. diameter and a point-to-multipoint station that has a 24-in. diameter.

Prices for a system will depend on a user's hardware configuration and options required.

DG is located at 4400 Computer Drive, Westboro, Mass. 01580. Equatorial Communications is headquartered at 300 Ferguson Drive., Montain View, Calif. 94043.

United Technologies unveils PBX supporting 256 ports

ST. LOUIS — United Technologies Communications Co. has announced UTX-1001VS, a digital voice/data private branch exchange (PBX) that supports 40 to 200 voice/data lines and a total of 256 ports.

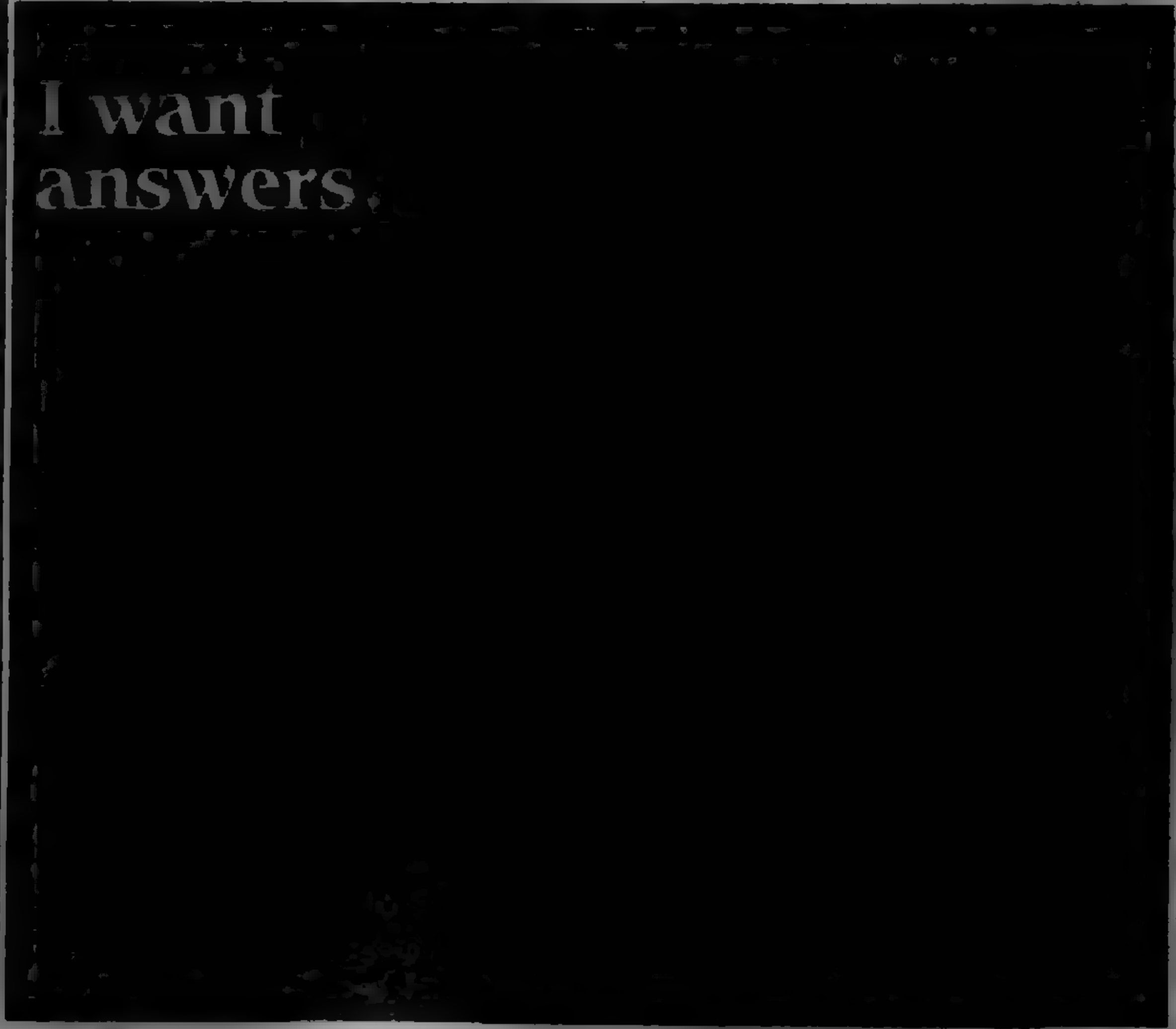
The product is said to have a digital, universal port structure. UTX-1001VS reportedly supports multiple-line and trunk configurations, and each port can be assigned to voice and/or data combinations. A spokesman said that in a simultaneous voice/data transmission, data can be supported at 4.8K bit/sec. When only data is transmitted, it can be sent at speeds up to 19.2K bit/sec.

Dual nonblocking switch matrices, one for voice and one for data, reportedly are standard for all ports. The PBX uses two-pair wiring and adaptive delta modulation.

The product's voice capabilities include integrated voice messaging, single-button access to station features and support for 2-, 6- and 15-line instruments, the vendor said.

UTX-1001VS prices range from $1,225 to $1,525 per line.

United Technologies Communications is located at 1224 Fern Ridge Pkwy., St. Louis, Mo. 63141.



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IBM minis get option package

MANASSAS, Va. — Control Concepts has introduced ICP, a packaged communications option for IBM System/34, 36 and 38 minicomputers.

According to the vendor, the product contains the following four options: communications controller, modem rack, security module and synchronous modem. The communications controller emulates an IBM 5251 Model 12 or 3274 Model 51C controller. The controller emulation is said to enable remote terminals — Digital Equipment Corp.'s VT100s, personal computers or IBM 3270-type terminals — to access applications or data bases on the minicomputers.

A modem rack supports up to eight asynchronous modems that can transmit data at speeds of 1,200 and 2,400 bit/sec.

The synchronous, full-duplex modem provides 2,400 or 4.8K bit/sec. transmission.

ICP costs from $7,950 to $16,095.

Control Concepts can be reached through Box 2367, 12004 Bulls Ford Road, Manassas, Va. 22110.

ETI release uses new AT&T rates

BOSTON — Economics and Technology, Inc. (ETI) has released ETI Private-Line Pricer Version 2.0., which includes recent changes to AT&T private-line tariffs.

A vendor spokesman said the product runs on an IBM Personal Computer under IBM's PC-DOS operating system, providing tariff information that enables users to determine communications costs using the new private-line tariffs.

The package supports complex rate restructuring, carrier special-access tariffs and carrier default or user-specified routing, the company reported.

The product is available in two configurations: one with AT&T default routing and the other with user-defined routing. The first costs $2,990, and the second costs $3,660.

ETI is located at 101 Tremont St., Boston, Mass. 02108.

Test Your Microcomputer IQ*

1. Name a totally integrated software package that was rated #1 by *Software Digest*.
2. Where can you buy an IBM PC XT or AT, AND have it installed, AND get on-site warranty for it?
3. Who will educate IC personnel or end-users at their site or yours?
4. What provides virtually any type of PC communications capability — from simple TTY to 3278/79 emulation?
5. What provides a micro software facility that allows you to customize a system to your specific requirements?
6. Who are the premier micro consultants to the *Fortune* 1350 companies?
7. Who has made the word hot-line obsolete, by staffing a full-service support center with computer professionals?
8. What is the easiest way for an IC manager to satisfy the many end-user needs in the organization?
9. What company's evolutionary approach to software and service (also demonstrated by NOMAD, now NOMAD2, the premier 4GL/DBMS) ensures that they'll be a major force in the micro marketplace for years to come?
10. Name the companies that can provide all of the above?

*(Turn Page Upside Down for Answers)

1.DunsPlus Software 2.From DunsPlus 3.The DunsPlus Education Staff 4.DunsPlus's Communications Utilities 5.The DunsPlus Tool Kit 6.DunsPlus's Professional Consulting Staff 7.The DunsPlus Support Center 8.Call DunsPlus at 800-DNB-PLUS 9.Dun & Bradstreet, the parent company of DunsPlus 10.DunsPlus

If you answered all of the above correctly, you've already solved most of the problems facing you. If not, give us a call at 800-DNB-PLUS, or write us at 187 Danbury Road, Wilton, Connecticut 06897.

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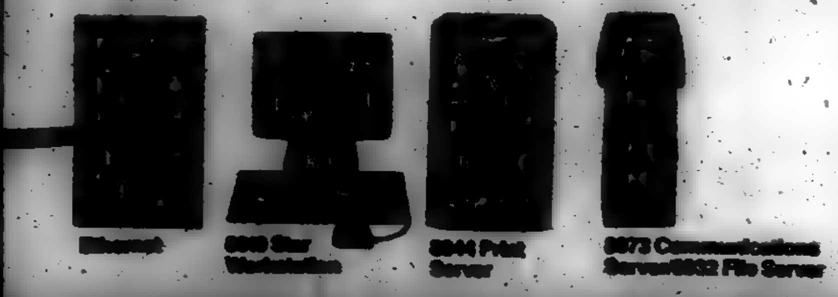
Ethernet
8010 Star Workstation
8044 Print Server
8073 Communications Server/8032 File Server

Matt's office has been winning a lot of new business lately. And it's really not much of a secret.

Because he and his co-workers have been able to make more efficient use of their resources. How? Well, Matt brought in Team Xerox.

Which includes Xerox 8010 Star

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What's
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Workstations, high speed laser printers, file servers for organizing and storing data and communications servers for accessing mainframe data bases, all linked together with a Xerox Communications Network. For complex analytical tasks, Xerox also included a Xerox Artificial Intelligence System.

So Matt (and the people in his domestic and international offices) could create, access, share and react to information more quickly and more easily than ever before.

And since Matt's office has become so much more productive, he was able to cut costs—and enter a bid that was $500,000 less than anyone else's.

To make Matt's secret yours, call Team Xerox at 1-800-833-2323, ext. 42 or send your business card to Xerox Corp., Dept. 42013, P.O. Box 24, Rochester, NY 14292.

AT&T

from page 93

the 6300 to their line since it was merely a fast IBM Personal Computer clone, and the clones lost their luster as IBM ramped up production.

AT&T has been using its private branch exchange sales representatives to sell its computer equipment. The sales representatives have learned a new technology and in many cases have developed a new set of leads.

In order to become a major league hardware player, AT&T has to establish a presence in larger corporations. Yet, AT&T has been slow to develop links to IBM mainframes. Almost a year after its introduction, the 3B line is still unable to communicate with IBM mainframes.

AT&T may be ready to solve this problem as analysts are predicting that the company will soon release a number of products that will tie its systems to IBM mainframes.

Banking on Unix acceptance

Rather than providing links with IBM, AT&T tried initially to bank on corporate acceptance of its Unix. Unix represents both AT&T's greatest strength and its primary weakness.

Unix has carved a niche in scientific and academic markets. But it has yet to gain a foothold in other markets and AT&T appears to be trying to force Unix acceptance into unwilling markets.

AT&T is hoping to bolster its presence in the personal computer market while simultaneously enhancing acceptance of Unix with the Unix PC.

The first piece of hardware that the telephone company developed for commercial use is an impressive machine with an icon-driven, user-friendly interface, a large screen and fast processor. Its version of Unix adds file and record locking, the lack of which were significant drawbacks to other variations of Unix.

AT&T expects that half of its Unix PC sales will come from direct sales to large corporations.

Two-pronged attack

This represents a two-pronged Unix attack. If the Unix PC is sold to large corporations, the corporations could develop an interest in large Unix systems. If the Unix PC becomes a big seller in large corporations, it will establish AT&T as a viable competitor with IBM and Apple Computer, Inc. in the microcomputer market.

However, there are few reasons for a large corporation to be interested in Unix PC. It, like the 3B line, lacks links to IBM mainframes.

Also, there are few popular microcomputer packages that run on the machine. Developers seem to be more interested in supplying products for such products as Apple's Macintosh.

And now that the barrier of 640K bytes of random-access memory on the IBM Personal Computer has been broken — with a bank-switching techniques from Lotus Development Corp. and Intel Corp. — developers may be more interested in writing new applications for IBM than for AT&T machines. It will be interesting to watch what, if any, software is developed for the Unix PC in the next six months.

Handicapped by regulations

A fundamental problem for AT&T is that it is handicapped by regulations that prohibit the company from bundling its telephone and computer capabilities.

If the company could put together packages of computers and communications services at a special price its products may become more alluring to large corporations. Industry analysts expect that these regulations will be lifted in the long term.

For the short term, AT&T faces a number of challenges. None of these problems are insolvable, especially since AT&T has tremendous technical resources in Bell Laboratories — and deep pockets.

SURVEY

from page 93

declining order of times mentioned, included problem isolation (35%), inventory tracking (21%), vendor coordination (19%) and vendor response time (18%).

Network monitoring was cited 43% of the time by conference attendees as the most important network management feature. Trouble tracking (39%), performance reporting (33%), on-line trouble tickets (21%) and network inventory (17%) were also listed as important features.

The most important considerations cited by the managers in evaluating network management systems were, in order, service, field testing of a product, installation and support, reputation, financial stability and training.

Good service headed the list of the expectations that network managers have of vendors peddling network management systems.

NYNEX

from page 93

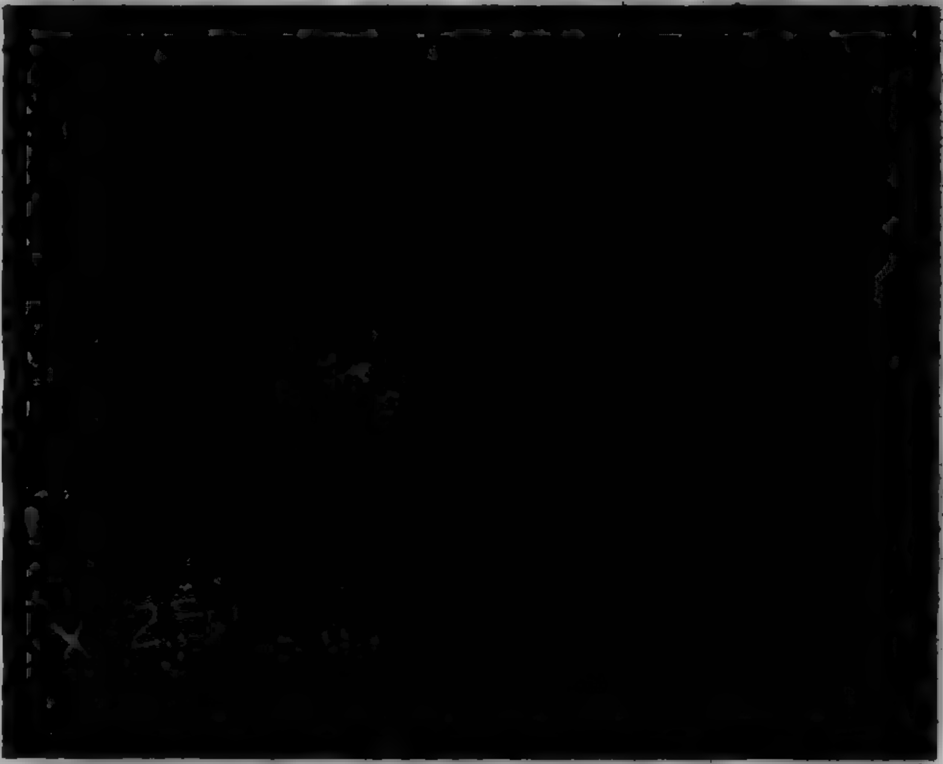
work to provide capabilities similar to private lines. Features such as a local-exchange-wide Centrex and customer control networking will be part of this.

A second service being planned is Integrated Digital Services for answer supervision and incoming call identification.

Nynex said the aim of the Pathways family of services is to give all users a voice/data capability on a single circuit without regard to terminal interfaces, standards and bandwidth limitations.

The communications company said the offerings are part of its evolution to an integrated services digital network.

The LAN's IBM Mainframe Connection



Auscom High-Speed Interfaces to The IBM Channel

Auscom, the recognized leader in IBM mainframe channel interfacing, provides the capability of attaching the LAN of your choice directly to any IBM or Plug-Compatible mainframe. This allows you to access the host at your LAN technology speed instead of settling for slow-speed serial connections. Auscom offers a variety of field-tested solutions to meet your network-to-host requirements, including end-user interface units and board-level products for integration into OEM networking systems.

With the Auscom solution, no changes to the host operating system are required. Our channel interfaces appear as standard control units to your mainframe. Standard access methods are used for transfer of data to and from your mainframe at rates of up to 2 megabytes per second. Networking protocols can be run in the host, the Auscom interface or the LAN controller. We maintain an extensive software library to support our unit which provides support for such protocols as XNS, TCP/IP and optimized high-speed packages.

Our interface unit can simultaneously emulate multiple controllers and support different protocols, providing maximum flexibility in meeting your local and remote networking requirements.

For example, by installing both a LAN controller and a packet-switching interface in a single unit, you can link the host to both local and telecommunications networks. If support for your network is not currently available, the full programmability of our interfaces allow integration by either Auscom or your own programming staff.

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MINOLI

from page [illegible]

traffic occurs independent of itself. For example, an MIS manager might get a telephone call about a failed application and immediately turn around and place a call to a systems person. There is a correlation between the calls that network modeling methods generally do not recognize.

Although the exact effect of autocorrelation cannot be forecast, it can be taken into account by making presumptions, such as 10% of all traffic will have some kind of self-dependence.

- Rarely does one have virgin traffic input because both voice and data are buffered at many stages within communications systems. This changes their original character in a way that could have a bearing on the number of facilities needed.

Take needs into account

For example, a voice message coming into a person's desk through a switching system represents a different type of traffic than when the same message, after going unanswered, is routed to a voice storage unit. Because network models do not factor in filtering, as it is called, network designers should take into account their particular needs and adjust the model recommendations accordingly.

The points presented here and in the previous column are not meant to argue that analytical models are useless but rather to convey some of their limitations. Models do play an important role in a sound network design, but comparison of the refinements of one model with another must be made with the specific assumptions of each model in mind.

When evaluating network models, it is important to maintain a focus on the improvement being sought. The percentage of improvement when using one model rather than another should always be explicitly determined. That determination will show if the adoption of the more accurate model will be worth the time and expense.

It would be wasteful, for example, to try to optimize a network using a more accurate model when an input traffic component may have an inherent error range of 20%.

Sophisticated model not always necessary

If your traffic input is within a 20% plus or minus error range — meaning, for instance, that you presume your network is going to handle 20,000 messages a day when it may actually handle 24,000 or 16,000 messages — it would not pay to try optimizing your network with a more sophisticated model. Some users have been known to try to fine-tune one part of their network design within 5% of accuracy while other parts are left at 20% accuracy.

The partitioner should always attempt to keep a proper perspective of network models so that the confidence and reliability of the various assumptions are in the same approximate range, without expending resources to refine a part of the equation only to find no valid marginal utility.

This approach toward network models will actually save design and implementation money for a typical Fortune 500 firm.

CANADA

from page [illegible]

ade and bypass may not be apparent. Should billing by the bit be implemented, Janisch said, it will represent one more step toward rate rebalancing, wherein telephone usage and service charges accurately reflect the costs to the telephone company of providing services. And, Janisch said, "The specter of bypass is the driving force behind rate rebalancing."

Current telephone rates in Canada are affected by cross-subsidization — the subsidization of local rates by long-distance revenue. Prior to divestiture, the same situation prevailed in the U.S. Some telephone company services in Canada continue to be charged at rates well above their actual cost. This sets up the incentive for bypass because the alternate services can come in at lower prices. By seeking rate rebalancing, the telephone companies can reduce the incentive for bypass and thus preserve their customer base.

A number of large Canadian companies are already looking toward developing their own private telecommunications networks to insulate themselves from the telephone companies as much as possible. Should bypass become legal, these firms would be the first to commit to it.

George Dej, president of the Canadian Business Telecommunications Alliance, concedes that, if bypass becomes a legal reality in Canada, there would probably be a lot of support for it among Canadian businesses.

Some organizations, Dej pointed out, would like the opportunity to deal directly with Telesat Canada, rather than having to go through the telephone company. And others, he said, depending on their ability to obtain rights of way, would probably lay their own fiber-optic cable networks or install microwave systems.

The Canadian Radio-Television Commission (CRTC) is expected to deliver a statement on the issue when it announces the results of last fall's interexchange hearings. While CNCP's proposal to offer competitive long-distance services dominated those hearings and will be foremost in people's minds when the CRTC's decisions are announced, statements of direction with regard to bypass and the sharing of telecommunications services are expected. The telephone companies have already told the CRTC that they believe bypass cannot be prevented if the economic incentives for it remain in place.

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SYSTEMS & PERIPHERALS

DEC slashes $300 off price of VT220 units

MAYNARD, Mass. — Digital Equipment Corp. lowered the price of its VT220 CRT terminal by $300, a move industry analysts said was a reaction to increased competition in the marketplace.

The company said the VT220 now costs $1,095, down from $1,395. The price cut is the second significant pricing action DEC has made on the VT220 since its introduction in November 1983. When announced, the VT220's list price was $1,295. Last summer, DEC increased the purchase price by $100.

DEC cited volume shipments of the VT220 as the reason it was able to shave $300 off the purchase price. Industry analysts, however, contended that DEC officials have been disappointed in VT220 sales in light of competition from vendors making VT220-compatible terminals, some of which are priced between $700 and $900.

Further information is available from DEC, which is located at 146 Main St., Maynard, Mass. 01754.

IBM updates printers

Boosts band printer, cuts prices, drops products

By Tom Henkel
CW Staff

RYE BROOK, N.Y. — IBM has announced four models of its 4245 band printer and an automatic sheet feed feature for its 4214 printer. In addition, IBM cut the purchase prices on its 4245 and 4248 printers and said it was withdrawing six other products from its marketing lineup.

The band printers are the Models 12, D12, 20 and D20. Models 12 and D12 print at up to 1,200 line/min, and Models 20 and D20 can print at up to 2,000 line/min. Model 12 and Model 20 attach directly to the byte multiplexer, selector or block multiplexer channels of IBM 3090, 3080, 3030 and 4300 series mainframes as well as 370/148, 158 and 168 CPUs. Models D12 and D20 attach, via coaxial cable, to IBM's 3274 control unit and 4701 finance communications controller. The Models D12 and D20 can also attach to an IBM 4361 series mainframe through a workstation adapter, IBM said. The Model 12 is field upgradable to the Model 20, and the Model D12 is field upgradable to the Model D20. Standard features of all four printers include optical character recognition (OCR) printing support and a 20% floor space reduction over the older 4245 Model 1. The units support both OCR A and B fonts and the European Computer Manufacturing Association Subset 11/National Retail Merchants Association extended alphabets, IBM said. Other features include 132 print positions, the ability to print 10 char./in. and skip speeds of 24 and 55 char./sec.

IBM's band printer works at speeds up to 1,200 line/min.

The 4245 Model 12 and Model D12 cost $28,000 with a monthly maintenance charge of

See PRINTERS page 110

- A parallel processor has reached a computational speed of more than 100 times that of its component processors/104
- Datamedia unwrapped two processors for its AT&T Unix-based 932 supermicrocomputers/104
- Eastman Kodak released four computer output microfilm products/106
- Northern Illinois University replaced its Amdahl 470/V8 computer with an Amdahl 5850 machine in less than eight hours/110
- Point 4 Data unwrapped its multiuser Mark 4 Tower, which is compatible with other Point 4 systems/110

Cluster controller out for IBM environments

ATLANTA — C. Itoh Electronics Co.'s CIE Systems Division has unwrapped an IBM 3274-type data processing cluster controller that supports IBM and compatible 3178, 3179, 3278 and 3180 terminals, printers and other peripherals in IBM mainframe environments.

The CIE 4000 cluster controller — said to be a replacement for the IBM 3274-61C remote controller — costs $4,700. It establishes a logical and physical connection between the host computer and peripheral units to perform housekeeping tasks such as regulating data transfers and minimizing processing interruptions due to peripheral activity.

Users can load software via diskettes, and the controller supports input devices such as light pens and multiple Ascii and IBM 3270-type printer devices, the vendor said. Translation between personal computers with Ascii code and IBM mainframes with the Ebcdic system are handled by the controller.

Remote support

The unit is said to support as many as 16 3270-type devices, located as far as one mile from the controller. The controller connects to the host system by telephone line or limited-distance circuits operating at data transmission speeds of up to 9.6K bit/sec.

It can connect to networks via IBM's Binary Synchronous Communications or Systems Network Architecture/Synchronous Data Link Control protocols, the vendor said.

More information can be obtained from CIE Systems, which can be reached through P.O. Box 16579, 2515 McCabe Way, Irvine, Calif. 92173.

IBM 3270s have peaked in popularity, study says

By Tom Henkel
CW Staff

FRAMINGHAM, Mass. — IBM's 3270 and the many compatible versions of the popular CRT terminal have reached their popularity peak and will begin a decline over the next five years.

That is the conclusion of a recent study by International Data Corp. (IDC), a market research firm here, which contends that microcomputers with 3270 communications capabilities are quickly eroding the mighty 3270 terminal marketplace and by 1989 will outstrip sales of 3270-type terminals.

But while the demand for 3270-type terminals may be declining, IDC reports that the need for 3270 communications capabilities is steadily increasing. IDC said that between 1983 and 1984, for example, there was a 41% growth rate in shipments of devices supporting 3270 communications. Products included in this growth rate include not only the 3270-type terminal but also microcomputers and protocol converters.

By 1986, IDC projects that 3270-type terminal shipments will start to decline. By 1989, IDC sees the growth rate for the market dropping off by roughly 10% per year.

Increasingly competitive pricing on 3270-type products from IBM will cause continued heartaches for makers of 3270-compatible products, IDC predicted. In 1984, for example, IDC said the bulk of the 3270 business, 79.3%, went to three companies: IBM, ITT Courier and Telex Corp. "There is still much unsettled business in store for the 3270 plug-compatible manufacturers. In IDC's judgement, the 3270 display market is not going to disappear; however, it is not going to be a lucrative market for many players."

By the end of the decade, IDC said, up to 40% of the 3270 terminal market will have been lost to microcomputers. Those most likely to use a micro instead of a 3270 terminal include managers, secretaries, programmers, scientists, engineers and other business professionals.

But in spite of predictions of eminent doom at the hands of microcomputer makers, IDC said at least some makers of 3270 terminals have been able to hold their own. In 1984, IDC said, the 3270 terminal market grew 19.2% with total shipments of 638,386 units.

CW CHART BY MITCHELL J. HAYES

See 3270 page 104

SYSTEMS & PERIPHERALS

Unit called 100 times faster than component chips

By [illegible]
CW Staff

CAMBRIDGE, Mass. — Bolt, Beranek and Newman Laboratories, Inc., has produced a version of its parallel processor computer that is said to be more than 100 times faster than any of the machine's component processors. This achievement of linearity with a 128-processor machine sets the stage for development of much larger models, Bolt, Beranek and Newman's John Goodhue said.

The largest version of the firm's parallel processor — the Butterfly — uses 128 Motorola, Inc. 68000 chips and has a processing speed of 60 million instructions per second, according to David Walden, president of the firm. It will be used for computation-intensive applications such as experimental simulations and design systems, he said.

The tightly coupled parallel processing machine uses special coprocessors designed by Bolt, Beranek and Newman to aid the 68000s in parallel computations, Goodhue said. It runs under the firm's Chrysalis operating system.

The Butterfly system's architecture increases bandwidth, memory and I/O capacity in an additive fashion, the vendor said. Key elements of the system include a custom very large-scale integration switching chip, custom microcode to support the system's parallel architecture and a multiprocessor operating system.

C-language programs can be converted to take advantage of parallel processing, Goodhue said. "All applications software that we wrote were in standard C. It is no different than any other C application," he said.

Bolt, Beranek and Newman used a tight coupling or shared-memory architecture — a switching system that adds data capacity as processors are added, Walden said. All processor elements have full access to all memory locations in the system, he said. This approach is said to add memory and I/O capacity as processors are added to avoid potential bottlenecks as the overall system size increases. The number of additional switching points grows arithmetically rather than exponentially, he said.

The Butterfly research project began in 1978, a spokesman said, and more than a dozen experimental systems are in use, primarily as research tools at U.S. Department of Defense-sponsored research and development facilities that participate in the department's Defense Advanced Research Projects Agency's (Darpa) Strategic Computing Program, a spokesman said.

As part of a recent contract with Darpa, the company will build 10 16-processor Butterfly systems for Strategic Computing Program participants during 1985 and 1986, the vendor said. The processor is available commercially to "anyone who meets export control requirements and is willing to buy a computer engine with limited support," a spokesman said, but Bolt, Beranek and Newman has not officially made the processor a product yet.

More information is available from Bolt, Beranek and Newman, which is located at 10 Moulton St., Cambridge, Mass. 02238.

XCP introduced by Datamedia

NASHUA, N.H. — Datamedia Corp. has introduced two processors for its AT&T Unix-based 932 supermicrocomputers.

The Unix Communications Processor (XCP) handles communications tasks for the system and off-loads communications responsibilities from the CPU. It is configured with Motorola, Inc.'s 68000 microprocessor and 512K bytes of shared system memory, the vendor said. Two RS-422 serial lines, each supported with local direct memory access (DMA), provide asynchronous or synchronous communications. The XCP processor can support communications with transfer rates of up to 256K bit/sec. XCP also supports four RS-232C asynchronous ports and one serial and parallel printer interface.

Each processor is priced at $3,260, according to the vendor.

For more information, Datamedia is located at 491 Amherst St., Nashua, N.H. 03063.

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During this same time period, the installed base of 3270 terminals grew 17.9% totaling 2.9 million. Although these figures look impressive, IDC cautioned that they can be misleading if viewed only on a short-term basis.

Over the next five years, IDC estimates a 14.4% compound annual growth rate for 3270 shipments and a 15.8% compound annual growth rate for the installed base. IDC contends that the 3270 communications protocol has become a universal standard.

The report is titled "3270 Market" and costs $1,200.

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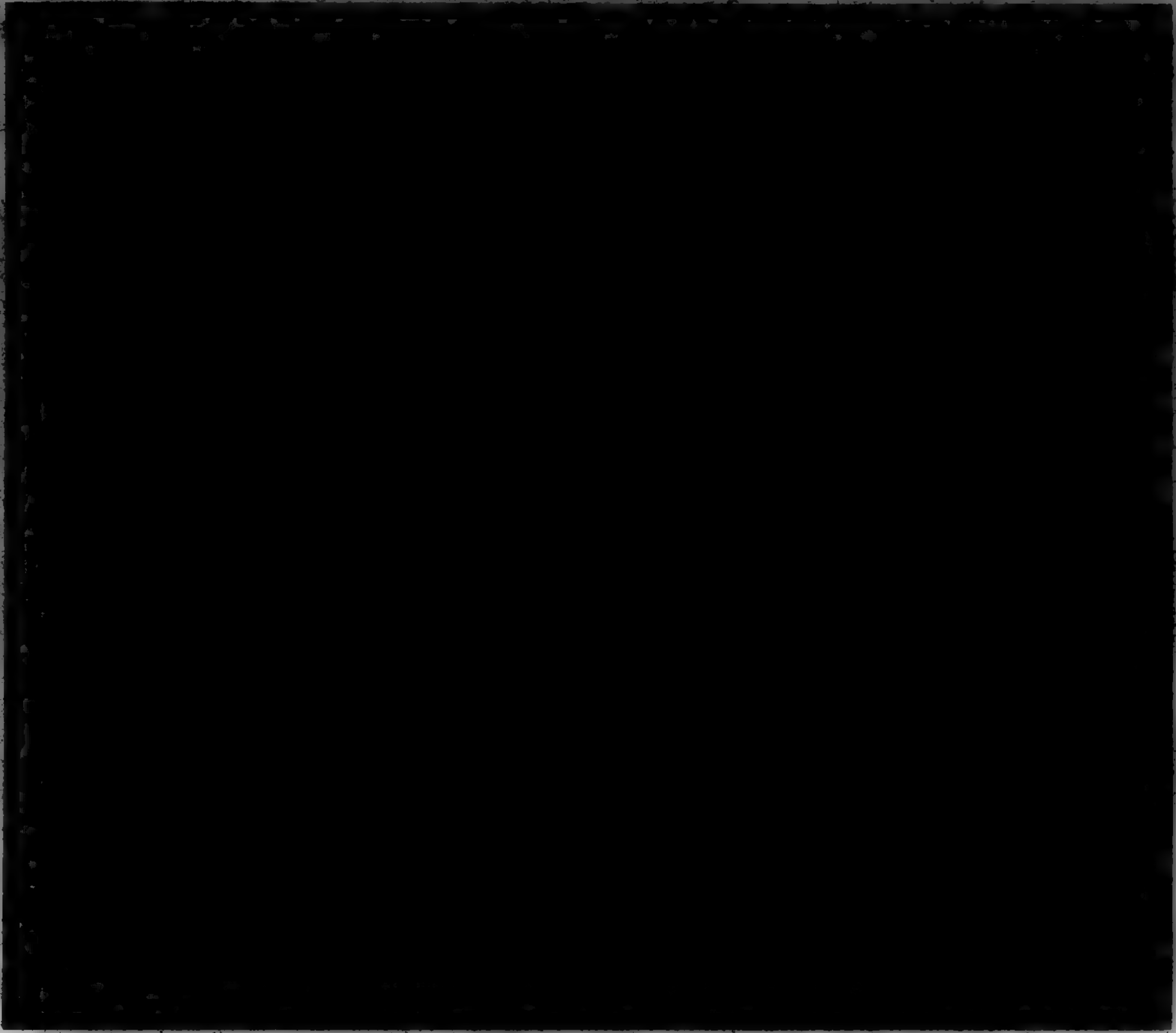

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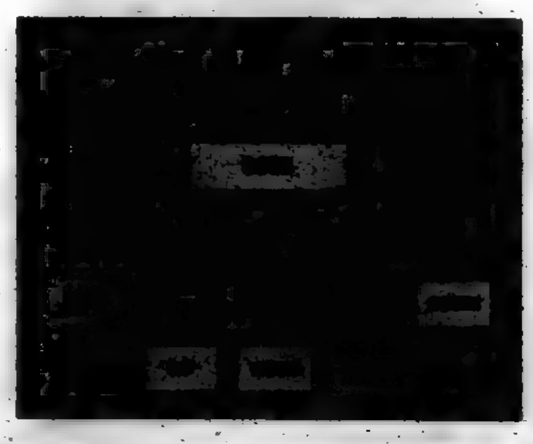

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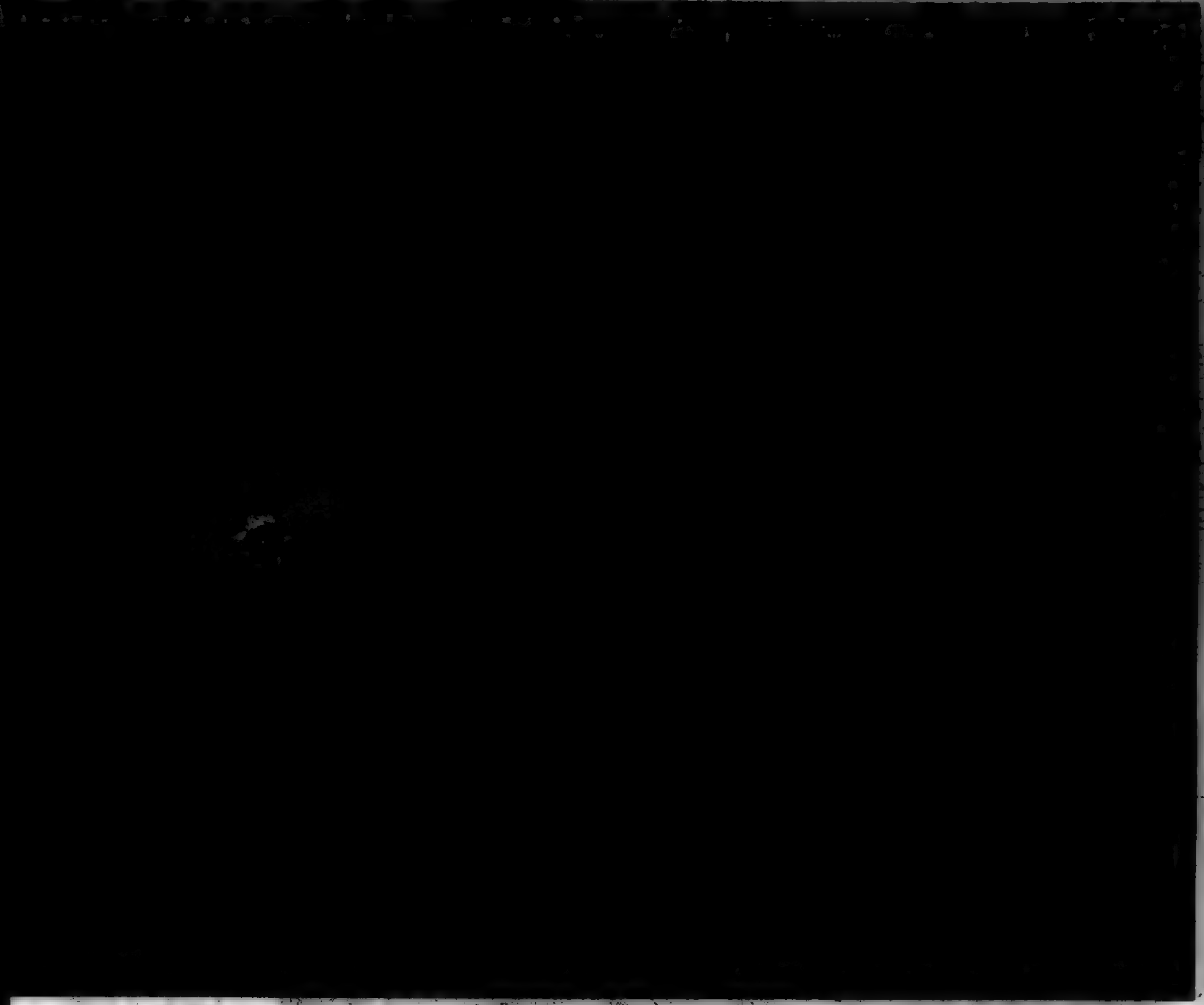

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Kodak rolls out computer output microfilm products

ROCHESTER, N.Y. — Eastman Kodak Co. has released a turnkey document image management computer system, an imaging system for computer output microfilm and two microfilm retrieval terminals that integrate plain-paper copying technology.

The turnkey KAR-8800 computer-assisted retrieval system is Kodak's top-of-the-line system for document image management, the company said. The basic configuration includes a Prime Computer, Inc. 2550 superminicomputer running under Prime's Primos operating system and equipped with Prime's Information data base management system. The system's storage capacity begins at 300M bytes and can be expanded to 1,200M bytes, the vendor said.

The KAR-8800 is a multiuser system that can support from 16 to 32 CRT terminals and microimage terminals. It can be used as a stand-alone computer or can be connected to any mainframe that can use IBM formatted tapes for information sharing and exchange. A tape drive opens this upload/download gateway to data bases maintained on mainframe computers, the vendor said.

The KAR-8800 with 2M bytes of main memory, a 300M-byte disk, a streaming tape drive, 16 ports, the Prime Information software and the Primos operating system costs approximately $165,000.

The Komstar imaging system is said to create, duplicate and collate microfiche and output data on 16mm microfilm with image marks to permit automated retrieval. The system provides in-line, integrated control of all computer output microfilm (COM) operations, the vendor said. The 16mm output is retrieved at the front end of the process for off-line duplication.

Kodak said it expects that the majority of installations will encompass on-line COM processing and in-line finishing, but the modular Komstar system can operate off-line and may be configured without a finisher.

The system is said to be compatible with all current IBM mainframes and operating systems, and it will support most other computers through the use of 1,600 or 6.25K bit/in. magnetic tape. Komstar costs $141,000, the vendor said. With a finisher and duplicator portion on-line, the cost increases by $62,000. With a finisher and duplicator portion off-line, the price increases by $63,800.

Inexpensive microimage copies

The IMT-350 microimage terminal and the Starvue II reader/printer both provide the ability to copy microimages onto plain paper at a cost of less than 2 cents each, the vendor said.

The IMT-350 microimage terminal — compatible with the Kodak KAR-8800, KAR-4400 and KAR-2200 information systems — is an automated micrographics workstation with integrated copier functions. It can monitor its own operations, accept search, print and text instructions (up to 100 commands) directly from an interfaced computer and communicate with operators in English-language phrases, the vendor said. The self-threading Starvue II reader/printer is for organizations with fewer time-critical or small-volume applications. The units both have 250-sheet supply cassettes which are used to load paper into the terminals. Each will accept 8½- by 11-in. bond or European DIN standard A4-size or B5-size uncoated stock. The paper cassettes can be loaded horizontally to make prints of microimages that are wider than they are long, such as computer printouts.

The IMT-350 costs $16,995, and the Starvue II costs $10,699.

More information is available from Eastman Kodak at 343 State St., Rochester, N.Y. 14650.

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School graduates to larger mainframe

Illinois university replaces Amdahl V/8 with firm's 5850

By Donna Raimondi
CW Staff

DE KALB, Ill. — Pleased with the performance and service it received from its Amdahl Corp. 470 V/8 series mainframe, Northern Illinois University (NIU) here decided to call upon Amdahl once again, this time for a larger 5850 mainframe, which the school's DP manager said was installed in less than eight hours.

"We had adequate floor space to position, install and run tests before we brought down the old system and uncabled the peripherals," said John Tuecke, executive director of computing facilities at NIU. The university bought an Amdahl 5850 to replace a five-year-old Amdahl 470 V/8, he said.

The V/8 system had become inadequate for growing administrative applications, Tuecke said. "Our [on-line] transaction load for update and inquiry transactions increased from 12,000 a day to 30,000 a day," he said, after the installation of a student financial aid system and a bursar accounting system. The 5850, which is about the same physical size as the V/8, cut the university's response time from 1.7 sec. in production to about 1 sec. or below, Tuecke said. But the real benefit was in the bursar accounting system applications software that was being tested at that point under IBM's CICS test environment, he said. "The response time in test was so poor it was measured in minutes rather than fractions of seconds," he said. "If we stole from production, production would suffer, but by going to a new system we were able to get subsecond response time as we wanted," he added.

Tuecke considered proposals from IBM for a 3081 Model D and from National Advanced Systems, Inc. for an AS/9060. Although he had an Amdahl in house already, it was not a foregone conclusion that the new machine would be from the same vendor, he said. The price of the Amdahl 5850 (the university will pay $2.28 million over a five-year period in purchase price and interest) was "very competitive, particularly against IBM," Tuecke said. Amdahl was willing to give the university a more than current market value trade-in price on the V/8, he added.

The 5850 gives the university twice as much main memory — 24M bytes as opposed to 12M bytes on the V/8 — and increases the number of channels from 12 to 16, he said. The 5850 is said to perform at 11.5 Mips, based on published results of other people's benchmark tests, Tuecke said. That compares with a 6.5 Mips rating for the V/8, he said.

Another reason for going with the 5850 was that Tuecke was already happy with the service he obtained from Amdahl, he said. "NIU has a very difficult problem in attracting skilled systems programmers," he said, partly because of the university's low pay scale and its proximity to Chicago, which has plenty of such jobs in industry. Tuecke must look to the vendor for high levels of support, particularly for software, he said. "We looked very carefully at the service philosophy of other companies and felt that Amdahl was the best bet," he said.

The 5850 uses the same peripherals and software as the V/8, Tuecke said, and for the most part, the users (administrators, students, researchers) did not even realize their machine had been replaced. The 5850 has capabilities that will not be realized until the university can afford to implement them, such as faster channel rates, he said.

Tuecke's plan called for a test of the new system two weeks before Thanksgiving weekend in 1984. He was going to test it in a four-hour period after unhooking the V/8, note any changes that had to be made, reconnect the V/8 while changes were made, and complete the installation during Thanksgiving weekend, he said. But the tests went so well, he completed the installations during the initial test phase, he said.

Point 4 Data supermicro unwrapped

IRVINE, Calif.— Point 4 Data Corp. has released its Mark 4 Tower multiuser supermicrocomputer that is compatible with other Point 4 systems and runs with Point 4's Iris operating system.

The Mark 4 Tower — available to value-added resellers — features a 280-nsec, 16-bit CPU that is said to be capable of executing over 3 million instructions per second. The supermicrocomputer has 512K bytes of mapped memory, a peripheral interface board with built-in Winchester disk, diskette and cartridge tape streamer controllers as well as an eight-port asynchronous direct memory access multiplexer, expandable to 16 ports. The modular system can support up to three Winchester disk drives for an expanded capacity range of 86M bytes to 258M bytes.

The unit reportedly occupies less than two sq ft and with 512K-byte mapped memory, 86M-byte Winchester drive, 45M-byte ¼-in. cartridge tape streamer, power supply, Tower cabinet and the Iris operating system with Business Basic, costs $21,995.

More information can be obtained from Point 4 Data, 2569 McCabe Way, Irvine, Calif. 92714.

PRINTERS from page 103

$300. Models 20 and D20 cost $35,000 with a monthly maintenance fee of $400. IBM also cut the price of its 4245 Model 1 printer from $54,500 to $35,000.. In addition, IBM cut the purchase price of its 4248 impact line printer from $90,000 to $75,000. Also announced was the 4214 automatic sheet feed feature for the company's 4214 printer. The unit costs $1,650 with a $24 monthly maintenance charge.

IBM added it was withdrawing six products from its current lineup as of Aug. 1: the 1403 Model N1 printer; the 2821 control units Models 1, 2, 3, 5 and 6; the 3211 Model 1 printer; the 3811 Model 1 printer control unit; the 4245 Model 1 printer; and the 5152 graphics printer.

More information is available from IBM, Rye Brook, N.Y.

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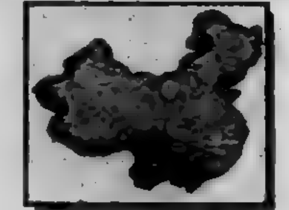

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COMPUTER INDUSTRY

Fasb software accounting plan given sparse support

By Charles Babcock
CW New York Bureau

NEW YORK — A proposed method of accounting for the costs of software to be marketed won little support during public hearings here recently.

Two groups that addressed the Financial Accounting Standards Board (Fasb) took opposite stands on the issue. The Association of Data Processing Service Organizations, Inc. (Adapso) urged the board to adopt a method of capitalizing software costs, while the American Electronics Association (AEA) advocated straight-expense reporting as the costs are incurred.

Robert Wayman, spokesman for the AEA, said he was also speaking as chief financial officer for Hewlett-Packard Co., which expenses software development costs. HP's approach contrasts with IBM's practice of capitalizing much of its software costs, according to IBM spokesman Earl F. Wheeler.

Few of the speakers embraced the proposed accounting method, which combines expensing some of the software costs as they are incurred while capitalizing others. When software is in the design and feasibility stage, costs would be expensed. Once it goes to coding, testing and making master copies, those costs would be capitalized, according to the proposed standard.

The Fasb is attempting to establish a common standard for the mixed practices that now prevail. The Securities and Exchange Commission (SEC) issued a morato-

See FASB page 131

- Xerox will lay off 500 workers and relocate 600 others in a reorganization around its new computer products/116
- New IBM boss John Akers can look forward to a decade of one-man rule/122
- The current industry slump has been caused by the transition to an emphasis on smaller systems, an IDC analyst said/128

Foreign telecom market tough

By Clinton Wilder
CW Staff

NEW YORK — U.S. telecommunications firms seeking to crack international markets face governmental, financial, technological and cultural barriers, according to a forum of telecommunications executives held here recently.

Most participants in the third EIC/Intelligence, Inc. telecommunications forum also agreed that finding ways around those barriers is critical for corporate success in the data and voice communications industry. "The [U.S.] balance of payments in electronics is far worse than in automobiles," said Walter F. Light, recently retired chairman of Canada-based Northern Telecom, Ltd. "Time is of the essence."

Overseas marketing is a major hurdle, particularly for smaller companies, according to Peter Erb, former chairman of Millicom, Inc., an international communications marketing firm. "In Europe, you can't sell a product that is not supported well locally," Erb said. "Japan and several European countries have large, integrated trading companies that take small [native] firms under their wing and help them market. For the small American companies, marketing muscle is what's missing. The reason IBM has been successful is that it is primarily a marketing company, not an engineering company."

Several executives suggested that the true international growth area for tele-

See FORUM page 130

CW CHART BY MITCHELL J. HAYES

Commerce stats: mixed signals?

WASHINGTON, D.C. — New orders for office and computing machinery dropped 35% from $7.9 billion in February to $5.16 billion in March, according to figures released by the U.S. Department of Commerce last week. At the same time, however, mixed signals in the computer industry were evident in an increase of 16.7% in the value of shipments from January through March as well as a steady increase of 19.2% in the value of unfilled or backlogs of orders for equipment for the three-month period.

Cynthia Latta, senior economist for Lexington, Mass.-based Data Resources, Inc., a unit of McGraw-Hill, Inc., said it is dangerous to make generalizations on the basis of one month's statistics, pointing to the 160% increase in office and computing machine orders placed between January and February, according to Commerce Department figures.

Latta said she is inclined to believe there is softness in the economy as far as the computer industry is concerned. "If their orders are off and their profits are down, you can't argue with that," she said. The economist pointed out that the increase in backlog shown in the Commerce Department figures indicates that the computer industry is aggressively keeping its inventories under control.

INDUSTRY INSIGHT
Clinton Wilder
CW Staff Writer

High tech on its own

Imagine a scenario with computer companies and industry analysts in one room, and those who follow the overall U.S. economy in another. Now the folks in Room No. 1 are a little depressed at the moment, since just about everyone from IBM on down has said things are slow and won't get much better until, depending on who you ask, the second half, the fourth quarter or early next year. But most observers are confident that the current industry downturn will become an upturn at some point in the near future.

In Room No. 2, the mood is currently upbeat, but with the underlying apprehension of F. Scott Fitzgerald's Jazz Age revelers just before the Great Crash. The boom economy of 1984 has begun to stumble, and most indications are that it's going to get worse. Two large deficits — trade and the federal budget — are not getting any smaller, and that doesn't bode well for recession fears.

So why are those high-tech folks in the first room so optimistic for the end of 1985? Is the projected upswing line on the computer industry growth chart going to pass

See INSIGHT page 131.

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EXPANSION
BOARD SLOTS

Harris to merge Lanier, Information Systems sectors

NEW YORK — Harris Corp. recently announced it will combine its Lanier Business Products, Inc. and Information Systems groups into one entity, encompassing 12 business units, effective July 1.

The reorganized group will retain the name of Information Systems and, according to Harris, will represent an $800 million entity dedicated to serving the converging data processing, office automation and communications markets worldwide.

Joseph A. Boyd, chairman and chief executive of Harris, said, "This new structure achieves the synergism envisioned at the time of the Harris-Lanier merger 18 months ago."

The Information Systems group will be headed by Jack C. Davis, senior vice-president and sector executive, who will report to John T. Hartley, Harris president and chief operating officer.

A component of the new organization will be the Business Information Systems sector, headed by Wesley E. Cantrell, who will be named senior vice-president of Harris and president of Lanier. It will consist of the National Accounts Division, serving large customer organizations, and the Lanier Business Systems Division for small and medium accounts and large accounts not served by the National Accounts Division.

Boyd said the reorganization "will make available Harris' extensive line of information management products from a single source, together with the technology required to interconnect these products."

Also, Harris recently released its third-quarter financial report showing a 13% decline in profits compared with those of a year earlier.

The company posted profits of $17.2 million, or 42 cents per share, compared with $19.8 million, or 50 cents per share, for the year-earlier period. Revenue was $574.1 million, compared with $582 million a year earlier.

Boyd said earnings for the former Information Systems segment were down sharply, reflecting weak demand and competitive pressures. Semiconductor sales produced a loss for the quarter, according to the company.

Sperry posts 32% profit hike in '84

NEW YORK — Sperry Corp. recently reported a 32% increase in profits for fiscal year 1984, with a 43% increase in profits from continuing operations.

Those figures included a charge of $24.1 million from the write-down of the company's investment in Trilogy Ltd., a charge of $12.7 million for an arbitration proceeding and credits of $64 million from the reversal of deferred income taxes.

For the year, the company posted profits of $286.7 million, or $5.15 per share, on revenue of $5.68 billion. In 1983, the company posted profits of $216.2 million, or $3.86 per share, on revenue of $4.19 billion.

Fourth-quarter results

In the fourth quarter, the company posted profits of $105.9 million, or $1.89 per share, on revenue of $1.79 billion. A year earlier, the company posted profits of $86.8 million, or $1.53 per share, on revenue of $1.48 billion.

Gerald G. Probst, chairman and chief executive officer, said the company's commercial computer business experienced a very strong fourth quarter, with revenue up 35% over the year-earlier period and operating profits up 76%.

For the year, commercial computer revenue was up 22%, and operating profits were up 43%.

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Xerox announces reorganization; work force affected

NEW YORK — Following the introduction of its personal computers and laser printers [CW, May 6], Xerox Corp. announced a reorganization around its workstation group that will result in the elimination of 500 jobs and relocation of some 600 additional positions.

The company has also realigned its three-member corporate office, effective May 16. Former Chairman C. Peter McColough relinquished that position and was named chairman of the executive committee of the board of directors. David T. Kearns, who was president and chief executive officer, retained the title of CEO and was named chairman; the position of president was not filled. William F. Glavin, formerly executive vice-president, was named vice-chairman.

Xerox restructured its Systems Group to form a new Information Systems division and named as president of the division Eliott D. James, formerly vice-president and group executive with Harris Corp. The division combines the planning, development and manufacture of office systems, microcomputers and word processors, electronic publishing equipment, applications software and artificial intelligence systems, according to Xerox.

The restructured Information Products division will continue under the direction of its current president, Renn Zaphiropoulos, and will consist of the electronic typewriter and printer division, including the Diablo printer business, Xerox said.

Goal is interconnection

Xerox, developer of the Ethernet network, said its goal with the products is to offer interconnection of its products and networks with those of other vendors within a public and private network range.

Xerox Systems Group President Robert V. Adams said a variety of Xerox networks based on technologies such as fiber optics and twisted-pair wiring will also be introduced.

To illustrate its commitment to interconnection, Xerox cited the software and hardware options that already connect Xerox 6000 series workstations to the Xerox network.

In addition, the firm said it will offer a network product for the Xerox 6060 series workstations that will support third-party software applications being developed for the IBM PC Network.

Xerox said it will target its computers and laser printers at the office work group. The computers will be offered with existing Xerox products in configurations for in-house publishing, document preparation and engineering design. Xerox also announced that it will establish the Xerox Software Center at its Rochester, N.Y., headquarters to sell and support personal computer software.

Chip makers set staff cuts

By Kathleen Burton
CW West Coast Bureau

MENLO PARK, Calif. — In a move that reflects continued hard times in the semiconductor field, two Silicon Valley chip makers recently announced work force reductions.

The layoffs will affect 650 workers at Signetics Corp. and 600 at Fairchild Camera & Instrument Corp.

Both firms blamed the personnel cuts on severe pricing competition and a decline in linear and digital logic semiconductor orders, which resulted in lowered revenues.

The Semiconductor Industry Association (SIA) said earlier this month that U.S. semiconductor shipments were $2.4 billion during the first three months of 1985, representing a drop of 15% from the last three months of 1984. The SIA said it expects chip sales in the U.S. to drop 10% this year.

The Signetics layoffs will affect 400 workers at the company's wafer fabrication plant in Sunnyvale, Calif., 150 employees at its bipolar chip fabrication plant in Orem, Utah, and 100 workers at its Albuquerque, N.M., operation. The layoffs will begin now and continue through the end of June, a company representative said.

Signetics, a subsidiary of the U.S. Philips Corp., made similar employment reductions in February, cutting 400 positions from its Sunnyvale operations and laying off 100 employees in its Albuquerque plant.

At Fairchild, 200 employees will be laid off when the company closes a silicon wafer manufacturing plant in Healdsburg, Calif., later this month. The Healdsburg plant is being closed because it is cheaper to purchase silicon wafers from outside suppliers, a Fairchild representative said.

Fairchild will also close a production plant in Wappingers Falls, N.Y., laying off 230 employees there, and will terminate 170 employees at its linear division in Mountain View, Calif. Approximately 50 workers from the Wappingers Falls facility will be transferred within the company when manufacturing operations move to a plant in South Portland, Maine, the representative said.

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Peachtree sale severs MSA ties to micro software market

ATLANTA — Management Science America, Inc. (MSA) announced last week the sale of Peachtree Software, Inc. to Intelligent Systems Corp. for an undisclosed amount of cash and notes.

The Peachtree operation was the remaining vestige of MSA's costly venture into the development and sale of microcomputer software products aimed at the retail and OEM market.

Intelligent Systems, based in Norcross, Ga., manufactures and markets enhancement products for microcomputers and color graphics display terminals through three operating divisions: Quadram Corp., Princeton Graphics Systems, Inc. and Intecolor Corp.

Although declining to reveal the sale price, MSA did say that reserves established during its fourth quarter were adequate to account for the disposition of its various micro software operations. The company had set aside almost $6 million in anticipation of the cost of bailing out of the micro software market; additionally, losses from those operations were set at almost $7 million for the year.

Products announced

At the Comdex/Spring '85 trade show held here last week, Peachtree announced two modules, Accounts Payable and Accounts Receivable, for its Back to Basics software series for use on Apple Computer, Inc.'s Macintosh.

Leland J. Strange, president and chief executive officer of Intelligent Systems, said Peachtree was "a good fit" in his company's growth plan. "Essentially, our strategic thrust has been, and is, toward the achievement of strong positions in several computer-related markets with good growth potential," he noted.

'Strong brand awareness'

"Peachtree Software is a highly familiar presence in multiple distribution channels, and its strong brand awareness as a major microcomputer accounting software firm strengthens our position in the enhancement market," Strange said.

MSA said that under terms of the agreement, it retained certain equipment as well as rights to distribute certain software as part of its micro-mainframe package, Expert Link.

Last October, MSA shocked the industry with its announcement that it would divest itself of all microcomputer software subsidiaries and focus on its traditional direct sales mainframe software market.

In January, MSA sold its Micro Distribution Division to Corporate Software, Inc.; in February, Edware and Designware were sold to Encyclopedia Brittanica, Ltd. and Peachtree Software International was sold to foreign distributors.

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Datapoint, MDS set pact

SAN ANTONIO — Datapoint Corp. recently announced its board of directors have approved a previously announced nonbinding letter of intent to spin off the company's service organization and combine it with the service organization of Mohawk Data Systems Corp. (MDS).

Datapoint intends to spin off the service organization to Datapoint shareholders on a tax-free basis. The terms of the transaction call for the publicly traded service company to purchase the assets of MDS' service division for $85 million and to loan MDS an additional $20 million for working capital.

Although Datapoint has said previously that the resulting third-party service organization would be the largest such entity in the U.S., others in the third-party service industry have claimed that the new organization will be dealing primarily with servicing Datapoint and MDS equipment.

Both Datapoint and MDS are essentially controlled by investor Asher B. Edelman, who acquired substantial shares in both companies and forced them to adopt the liquidation strategy he successfully applied to Management Assistance, Inc., which has been split up and sold off. The linking of Datapoint and MDS has spurred criticism of Edelman, with some charging that he is using Datapoint to bail out MDS after failing to find a buyer for the MDS service organization. Recently, Edelman altered his strategy and declared an intent to retain Datapoint's systems operations.

In related developments, Datapoint said it has achieved substantial expense reductions and expects total annual cost savings to amount to $57 million. The reductions included the elimination of 310 jobs.

Datapoint also recently announced a cooperative marketing agreement with Fujitsu Business Communications, formerly American Telecom, Inc. The two companies announced completion of evaluation and connectivity testing of Fujitsu's Focus private branch exchange products and telecommunications applications with Datapoint's networking and office automation products.

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FCC declines to outlaw AT&T's lease termination fees

WASHINGTON, D.C. — The Federal Communications Commission declined to outlaw termination charges that could be faced by customers of AT&T Information Systems who want to break leasing contracts for equipment. The FCC said that the termination penalties were a "commonly accepted business practice."

The Independent Data Communications Manufacturers Association (IDCMA) asked the FCC to declare the termination charges illegal, citing the alleged anticompetitive effect they have on the competitive equipment markets.

Other equipment manufacturers groups, such as North American Telecommunications Association (Nata), and users groups such as the International Communications Association and the Ad Hoc Telecommunications Users Association also requested that the provision be declared illegal.

These groups alleged that AT&T Information Systems was able to recover more than 100% of the equipment's initial costs as carried on the books.

The FCC said it found that the contracts were agreements entered into under state law and therefore parties would have to resolve differences at that level.

Nata counsel Albert Kramer said after the FCC decision, "While Nata is gratified that the FCC did nothing today that will prevent state courts from declaring AT&T's termination charges invalid, as we're sure they will do, at the same time we're extremely disappointed that the FCC did not find that the fees also violated federal law.

"The FCC ignored the discriminatory effects of the charges on the hundreds of independent CPE [customer premises equipment] suppliers and thousands of CPE users. Instead, it embraced the special-interest pleadings of the single dominant supplier: AT&T [Information Systems]," the Nata counsel said.

FCC Commissioner Mimi Weyforth Dawson noted at the meeting where the FCC unanimously declined to act that the termination fees currently affect approximately 61% of leased equipment contracts and are scheduled to expire in January 1988. Other FCC staff officials also made the point that AT&T has steadily lost market share for telephone equipment since the divestiture and deregulation of telephone equipment.

The FCC also noted in a release that state public utility commissions have consistently upheld termination liabilities as part of contracts and added that the waiving of the charges when the customer buys in-place equipment "is reasonable and consistent with prior FCC action." The FCC added that charges of overrecovery of equipment costs were "unsubstantiated."

Convergent sees profit downturn in first quarter

SAN JOSE, Calif. — Convergent Technologies, Inc. recently reported that first-quarter profits declined to $206,000, or 1 cent per share, compared with the first quarter of 1984 when profits were $1.8 million, or 5 cents per share.

Revenue for the quarter was $92.6 million, up from $56.6 million a year earlier but down 19.8% from record revenue in the fourth quarter of 1984.

Paul C. Ely Jr., president and chief operating officer of Convergent, said the results showed the company was making progress despite the small profit.

The company said it repaid all debt under its unsecured $100 million credit facility and does not anticipate any near-term borrowing.

The company said revenue from the Convergent-built Unix PC being marketed by AT&T Information Systems offset revenue declines in other product lines. It attributed the revenue decline to the general weakness in the electronics industry.

Quarter profits shoot up at MCI

WASHINGTON, D.C. — MCI Communications Corp.'s first-quarter profits soared to $40.4 million, up from $5.9 million in the first quarter of 1984. Per-share earnings jumped to 17 cents from 3 cents, and revenue rose from $474.7 million to $570.6 million.

The results for the three months ended March 31 included $63 million in nonoperating income from a partial settlement with U.S. West, Inc. [CW, April 15].

Also included was a nonoperating expense of $59.5 million to reflect the decline in value of customer premise units that perform preprogrammed dialing for some MCI customers. The units will become obsolete as customers convert to MCI Dial-1 service. The same expense item in the year-earlier quarter was $40.2 million.

Local Data Protocol Converters

DataLynx/3274 connects 1 to 9 async CRTs and printers to a 3270 multipoint network, SNA or BSC.

VersaLynx/3278 allows an IBM 3178/3278 terminal to access ASCII systems using asynchronous protocols.

InterLynx/3287 attaches low cost serial ASCII printers to IBM Type "A" coax ports on 3274/3276 controllers and 4331 CPUs.

DataLynx/5251 connects 1 to 9 async CRTs and printers to a System/3X host.

InterLynx/3278 attaches low cost ASCII CRT terminals or PCs to Type "A" ports.

DataLynx/3780 connects asynchronous devices or minicomputers to 2780/3780 BSC networks, and has CRT and printer port and file transfer utility.

InterLynx/3287 NP is the InterLynx/3287 packaged in a smaller unit with the security of tamper-proof, no panel construction. Options are set by the portable plug-in panel.

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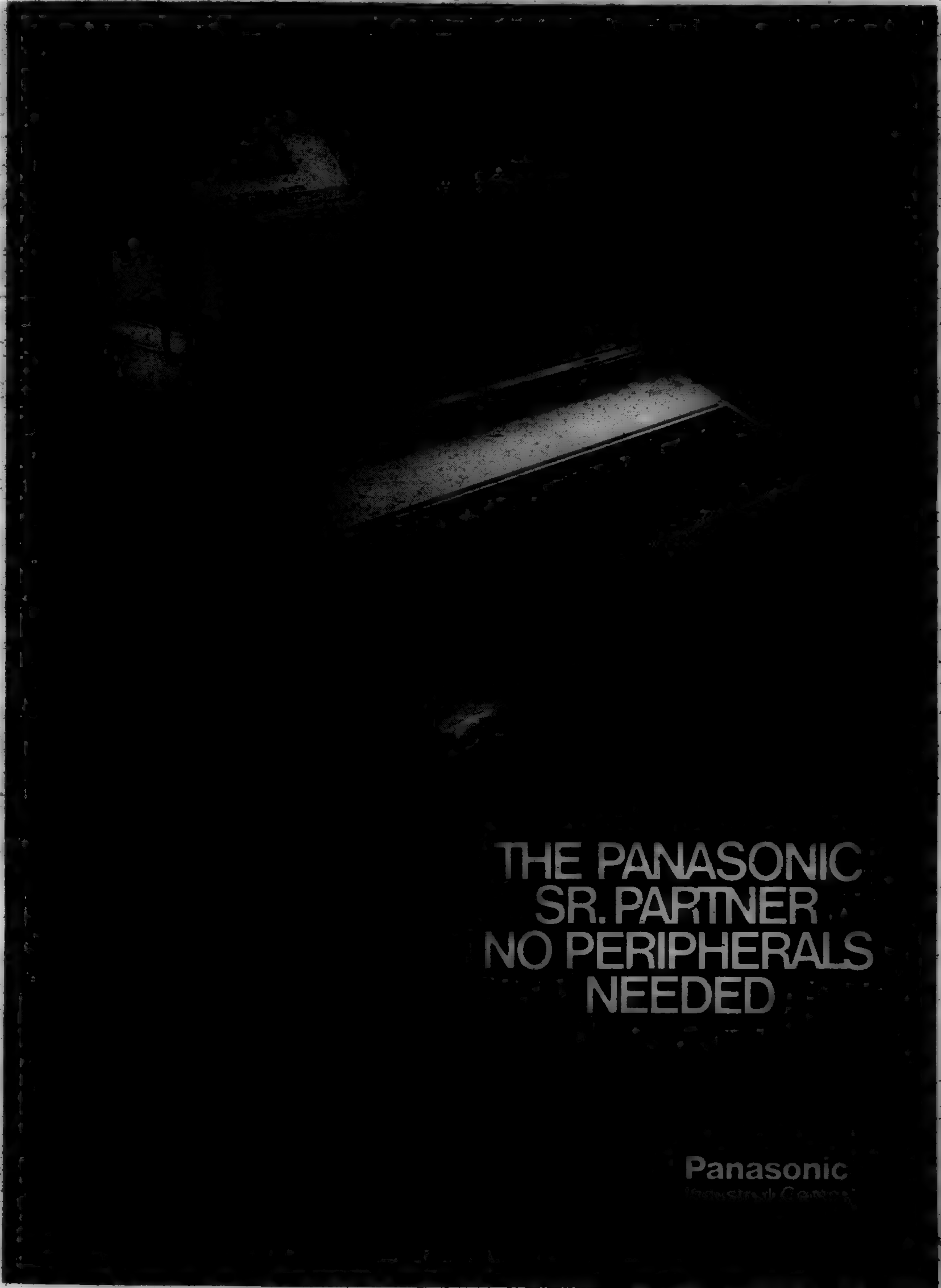
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Akers regime to swap collegiate style for one-man rule

OUTSIDE LINES
Brian Jeffery

Second of a two-part series.

IBM has a new boss: John Akers. Akers took over as IBM's chief executive officer Feb. 1, and now holds the position concurrently with that of president. In addition, Akers, at 50, is young. He can look forward to perhaps a decade at the helm of IBM. IBM is clearly moving away from the "collegiate" style of leadership that has characterized it since 1981 to something closer to a one-man rule.

Akers has already begun to make his presence felt in the reorganization of IBM's Entry Systems Division, which has been cut back from a largely autonomous, $5 billion marketing and manufacturing operation to a more limited systems development and manufacturing unit.

Akers also appears to be associated with the renewed IBM emphasis on Systems Network Architecture (SNA), reflected in the higher priority now being accorded the company's SNA-based token-ring local-area network and the advanced SNA office automation capabilities under development since the '70s, with which IBM has done little to date.

Recent IBM moves to clean up many of its marketing and telecommunications operations also seem to be attributable, if not to Akers himself, at least to the tone that he is setting in the organization.

Rebound from decentralization

IBM appears to be rebounding from the decentralization binge began in 1981 under then-President and now-Chairman John Opel. As discussed last week, IBM's policies from 1981 to 1984 resulted in much growth but too little coordination and a tendency for IBM units to pursue short-term goals that advanced their own interests rather than those of the company as a whole.

> *The emphasis of the Akers regime seems to be that IBM should act more as a unified company and less as a conglomerate.*

The following are among the areas now receiving attention:

■ The corporate information systems market. Although individual product lines such as host systems and Personal Computers have done well here, IBM is still a long way from pulling them together under a single, coherent scenario. The company's concern appears to be to establish a more in-depth penetration of this sector that will ensure that the growth of information processing usage here will be reflected in IBM's bottom line. In 1984, IBM's 2,000 largest U.S. accounts and their overseas counterparts still accounted for more than three-fourths of IBM revenue, and the general slow growth in the mid-range systems bracket and a slowdown in the personal computer market have led to a renewed focus on this area.

Like everyone else, IBM has done its homework about the growth of information processing among large organizations, and the company's game plan is to provide a wide range of products, systems and services integrated under SNA that will result in a more in-depth penetration than selling individual products for individual applications. Thus, last October IBM finally announced a scenario that provides realistic links between its Personal Computers and its host-based office systems. By the end of 1985, IBM is also likely to have its token-ring local-area network out and to have made its first introductions for handling voice and advanced image processing under SNA. If IBM can succeed in establishing SNA as the main environment for large systems users to implement OA, it will be assuring itself a stable and lucrative revenue stream well into the next century.

■ Telecommunications. For several years, IBM has been accumulating relatively small and not very viable telecommunications operations, such as its Information Network service bureau, which is a loss maker, as is its Satellite Business Systems, the $300 million satellite communications firm of which IBM now owns 60%. Rolm Corp. was bought after two years of deteriorating financial performance, and its record is still insignificant when compared with the private branch exchange market leader AT&T. IBM also has a $300 million cellular radio network for internal use, which it has only recently begun to look at in commercial terms.

By the most optimistic estimate, telecommunications will bring in no more than $1.5 billion in revenue in 1985 — not much more than 3% of IBM's total revenue. As diversifications go, the area has not been too successful, and IBM is now trying to make something of it.

Last December, IBM created the nucleus of a new structure with its Telecommunications Products Organization. The company's game plan now seems to be to start leveraging the synergies among its various telecommunications operations and between these and its corporate systems business. During 1985, IBM is likely to start delivering "cradle-to-grave" communications offerings to large systems users, integrating its various on-site products and remote services under (what else?) SNA. Akers seems less interested in third-party tie-ups in this area than was his predecessor.

■ Marketing and distribution. After several years of allowing third-party distributors to undercut its direct sales forces, IBM now appears to be moving in the opposite direction. Clampdowns have begun on its various third-party Personal Computer distribution programs, and IBM also appears to be looking at restrictions on mid-range systems marketing through its value-added reseller program that would enable the company's direct sales forces to regain some of the ground they have lost to third-party distributors over the last few years.

A stronger direct sales effort for Personal Computers targeted at large systems users is clearly in the works, and IBM is even starting to give IBM product centers an edge in product pricing and availability over third parties.

Overall, the emphasis of the Akers regime seems to be that IBM should act more as a unified company and less as a conglomerate, exploiting market and product synergies more closely and favoring its direct sales forces more against the mass of third-party distributors it has signed on since 1981.

This new IBM backpedalling is already proving difficult for many in the industry to accept. When it comes to Personal Computers, for example, a whole new group of IBMers is now talking about such things as 3270 integration, the Distributed Office Support System and comprehensive electronic documents, and they are much less fond of third parties than Philip D. Estridge's Entry Systems Division team used to be.

Nightmares materialize

It looks as if IBM is finally going to start delivering on the nightmares that IBM peripheral, add-on and software vendors, as well as Personal Computer retailers, have been having for years about the company moving in on them, whereas large systems users who have used the Personal Computer anyhow for several years are going to start finding IBM laying down the law the way it has for other products and systems since the '60s.

It is also worth listening to what IBMers have been saying about increasing software revenue. IBM has started to field a much stronger host applications product line over the last few years, to compete with the independent software houses in the market, but it also looks as if IBM's policies with its Extended Architecture software will be extended.

Do you think this is an alarmist outlook? What would you do in Akers' place? You've committed to some ambitious growth targets and have told everyone about them. Yet, you are faced with deteriorating financial performance, slowdowns in critical markets, and your company is carrying a lot of relatively slow-growth, inefficient and, in some cases, loss-making deadwood.

An ambitious IBM has proved a dangerous competitor. A desperate IBM is going to be a lot worse. And Akers is going to be running IBM for 10 years.

Jeffery is director of research at International Technology Group, Inc., a Palo Alto, Calif.-based market research firm that focuses on IBM.

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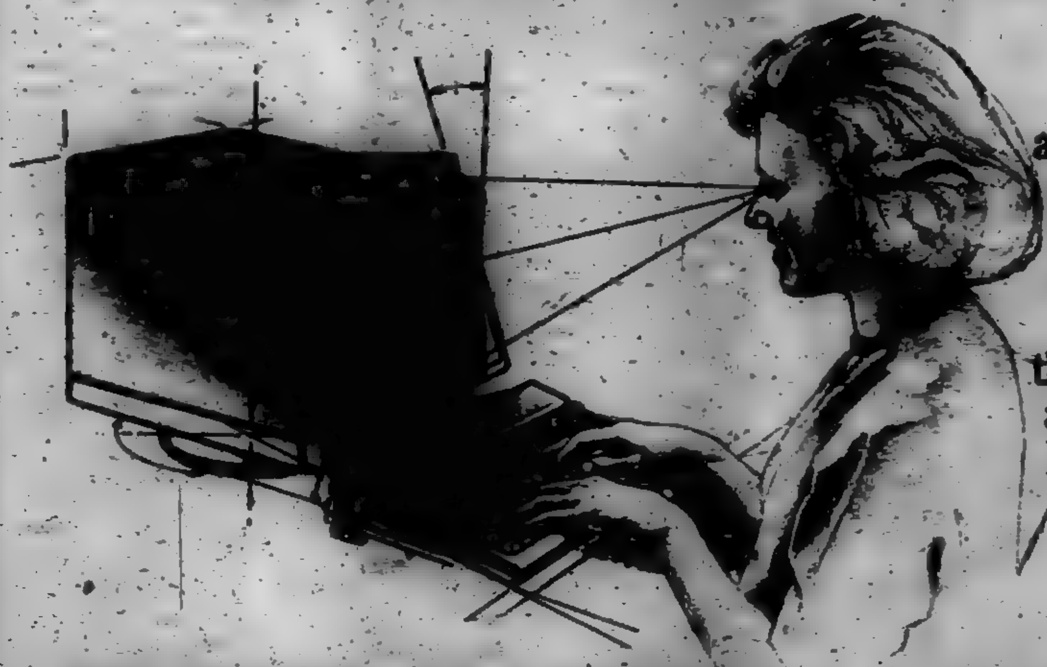

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Miniscribe inks $20 million venture capital agreement

LONGMONT, Colo. — Disk drive manufacturer Miniscribe Corp., based here, recently announced a $20 million equity financing agreement with a venture capital group led by Hambrecht & Quist, Inc. The San Francisco-based investment banking firm was apportioned three of seven seats on Miniscribe's board of directors, including the new position of chairman.

Q. T. Wiles, chairman of Hambrecht & Quist, will become chairman of the board of Miniscribe in a move that increases the number of directors from six to seven. Two other Hambrecht & Quist executives added to the Miniscribe board were William R. Hambrecht and Ta Lin Hsu. As a result, Miniscribe said, current directors J. Wade Kennedy and Robert K. Anderson were expected to resign.

Continuing to serve as president, chief executive officer and a member of the board is Roger Gower, who was named to those positions in December after resigning as president of ITT Corp.'s Qume Corp. subsidiary. Miniscribe founder and former President Terry Johnson resigned at the time of Gower's appointment.

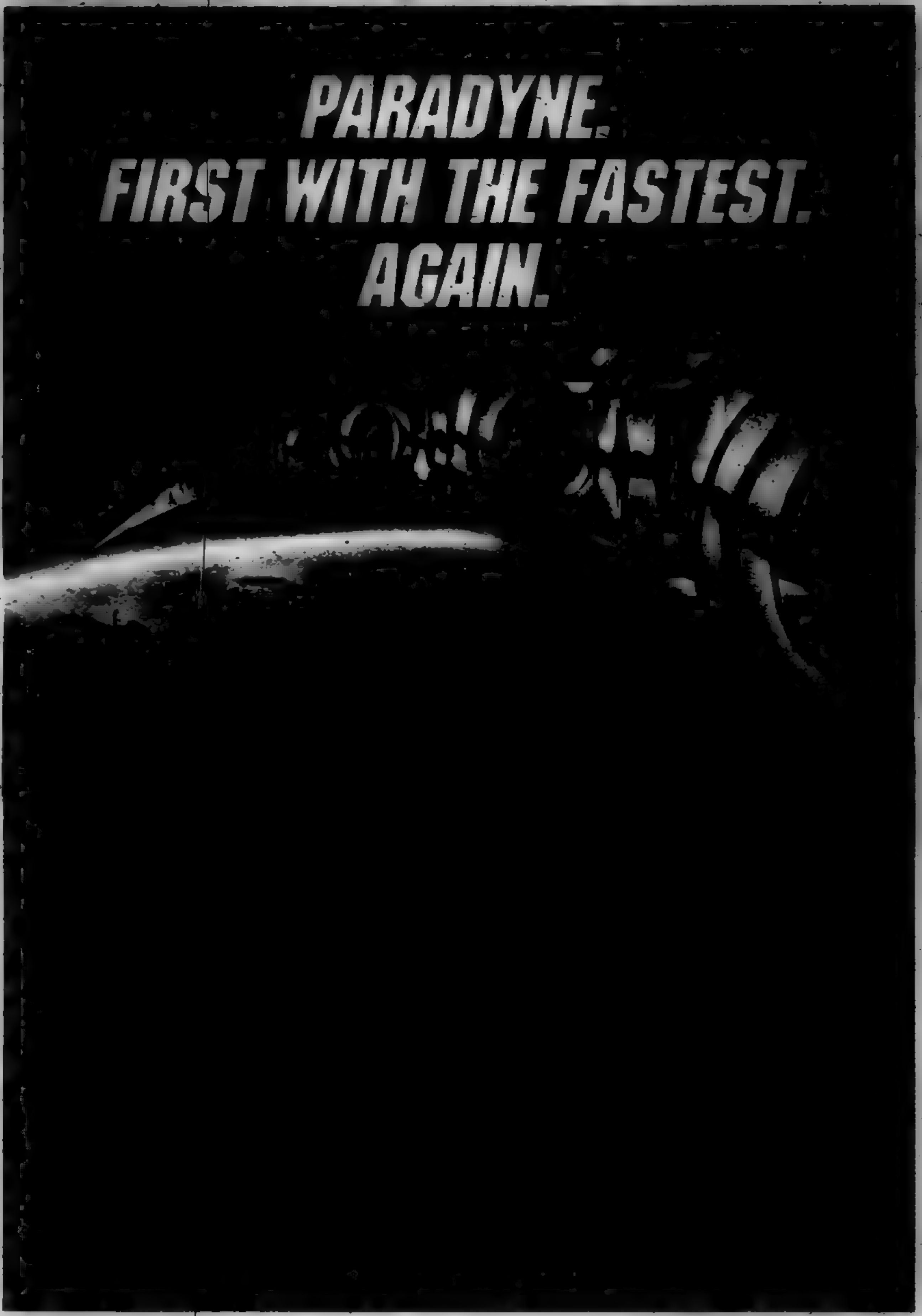
The company had previously announced that it would seek outside financing to shore up its cash shortage problems.

In early 1984, the company suffered a setback when IBM cut back on orders for disk drives for its Personal Computer XT.

In a recent interview, Miniscribe Vice-President Lawrence J. Klassen said that the firm is determined not to become too dependent on any one customer in the future.

Miniscribe has moved most of its manufacturing offshore to the Far East, cutting its domestic full-time work force to 400.

Under the financing arrangement, Hambrecht & Quist will invest $8.5 million in Miniscribe. Miniscribe will privately place with the group of investors a series of preferred stock convertible into common stock at a price of $1.45 per share. Additionally, Miniscribe will issue five-year warrants to purchase 1.45 million shares of common stock at $1.60 per share and allocate those warrants to affiliates of Hambrecht & Quist, to Wiles and to members of the management team, the company said.



Honeywell to service Apple sites

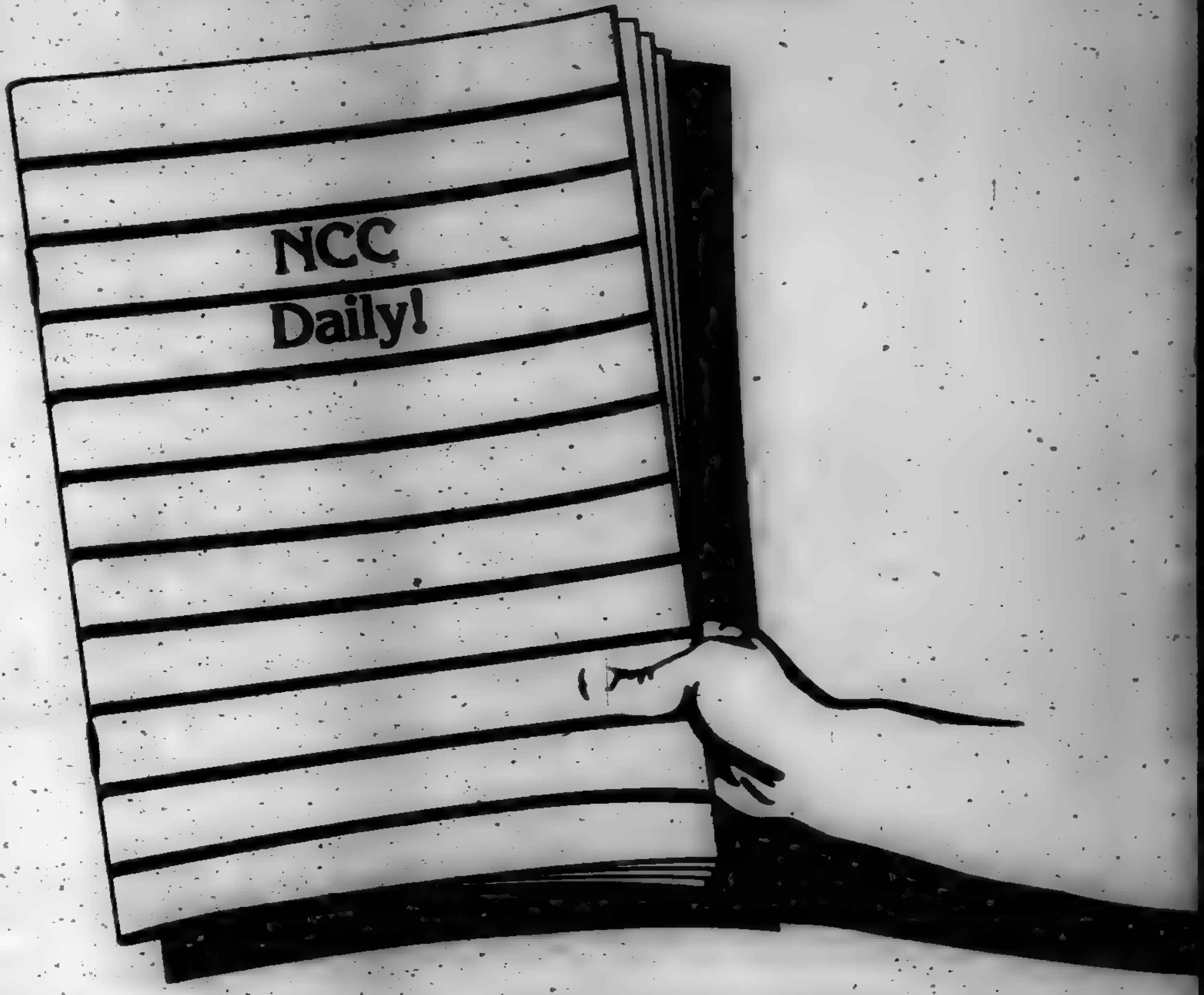
CUPERTINO, Calif. — Apple Computer, Inc. and Honeywell, Inc. recently announced that Honeywell will provide third-party service for Apple's direct sales accounts.

As Apple's preferred service supplier, the companies said, Honeywell will offer service primarily to Apple's large corporate customers who use the Macintosh Office series. Honeywell's Customer Services division provides service and maintenance for Apple's entire product line as well as computer and communications products of other vendors.

Roy Weaver, vice-president of Apple's field operations, noted that Macintosh Office products are designed to connect and coexist in a multivendor environment. "It is important that the service organization working with Apple has the capability to support a wide variety of products and [the] expertise to meet the changing needs of businesses as office automation evolves," Weaver said.

Sy Kraut, vice-president of Honeywell's Customer Services division, said Apple customers will be able to obtain services from his division's network of 250 authorized service locations and a national service force of more than 3,700 people.

Announcing the NCC tour guide



The National Computer Conference (in Chicago this July 15-18) is so big, attendees need a guide to the show. Something like a tour guide. To make sure they see everything they came to see.

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NCC Daily!	July 15, 16, 17, 18	June 10 (all 4 issues)
NCC Preview	July 8	June 21
NCC Show	July 15	June 28
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AST reports quarter profits, revenue hike

IRVINE, Calif. — AST Research, Inc. reported fiscal third-quarter revenue of $37.8 million, up from $20.1 million in the first quarter of 1984.

Profits for the quarter ended March 31 were $5.8 million, or 56 cents per share, compared with $1.6 million, or 19 cents per share, in the year-earlier quarter.

The vendor of peripherals for IBM and other vendors' microcomputers said its results were aided by decreasing component costs and its own cost-reduction programs.

"These results reflect a strong demand for the company's recently introduced products, as well as higher volumes of the company's major products," AST President Safi Qureshey said.

AST primarily supplies peripherals for the IBM Personal Computer line as well as for micros made by AT&T and Apple Computer, Inc.

Stratus posts doubled revenue

MARLBORO, Mass. — Stratus Computer, Inc. reported that revenue doubled and profits more than doubled in the first quarter compared with the same three-month period in 1984.

Sales for the first quarter ended March 31 were $15.2 million, compared with $7.6 million in the prior year. Earnings were $1.5 million, or 8 cents per share, up from $676,000, or 4 cents per share, in the first quarter of 1984.

Stratus President William E. Foster said the results reflected market acceptance of the company's Stratus/32 fault-tolerant computer system.

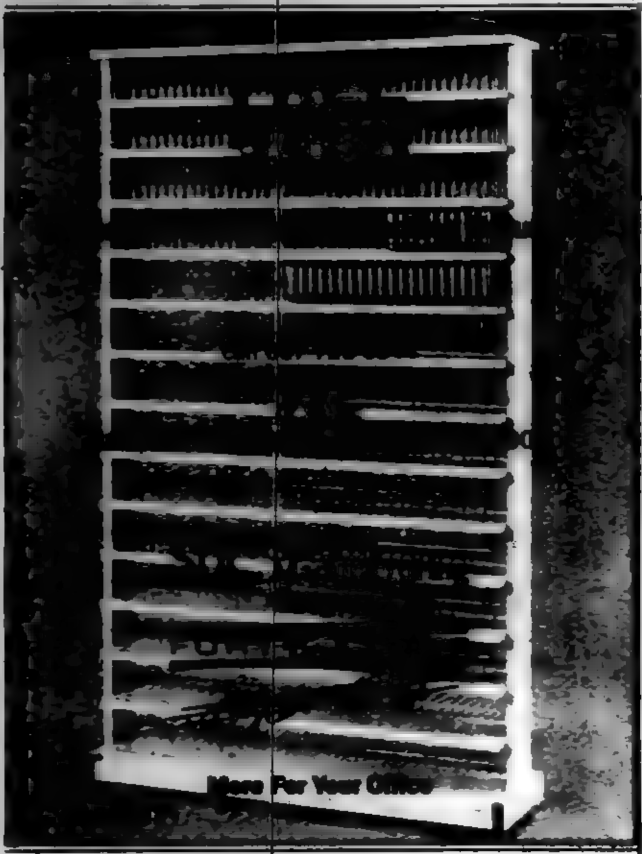
The company also announced two personnel changes at the executive level. Vice-President of Finance and Administration John H. Curtis has moved to vice-president of international operations and Corporate Controller Gary E. Haroian has been named treasurer and acting chief financial officer.

Tandem first-quarter sales rise 32%

CUPERTINO, Calif. — Tandem Computers, Inc. reported that first-quarter sales rose 32%, and profits more than tripled compared with the same quarter a year ago.

Tandem reported revenue of $146.5 million for the quarter ended March 31, compared with $111.2 million in the first quarter of 1984. Profits were $6.8 million, or 16 cents per share, compared with $1.9 million, or 5 cents per share, a year ago.

Tandem President James G. Treybig attributed the strong showing to wide market acceptance of the company's V-8 disk drive, introduced early in the quarter. Treybig said early customer response has also been favorable to Tandem's Nonstop EXT system.



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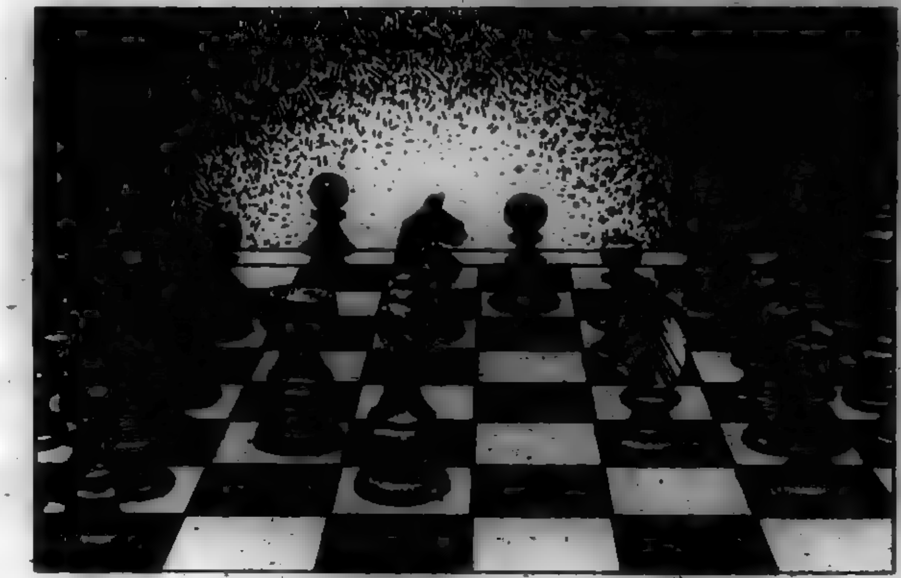

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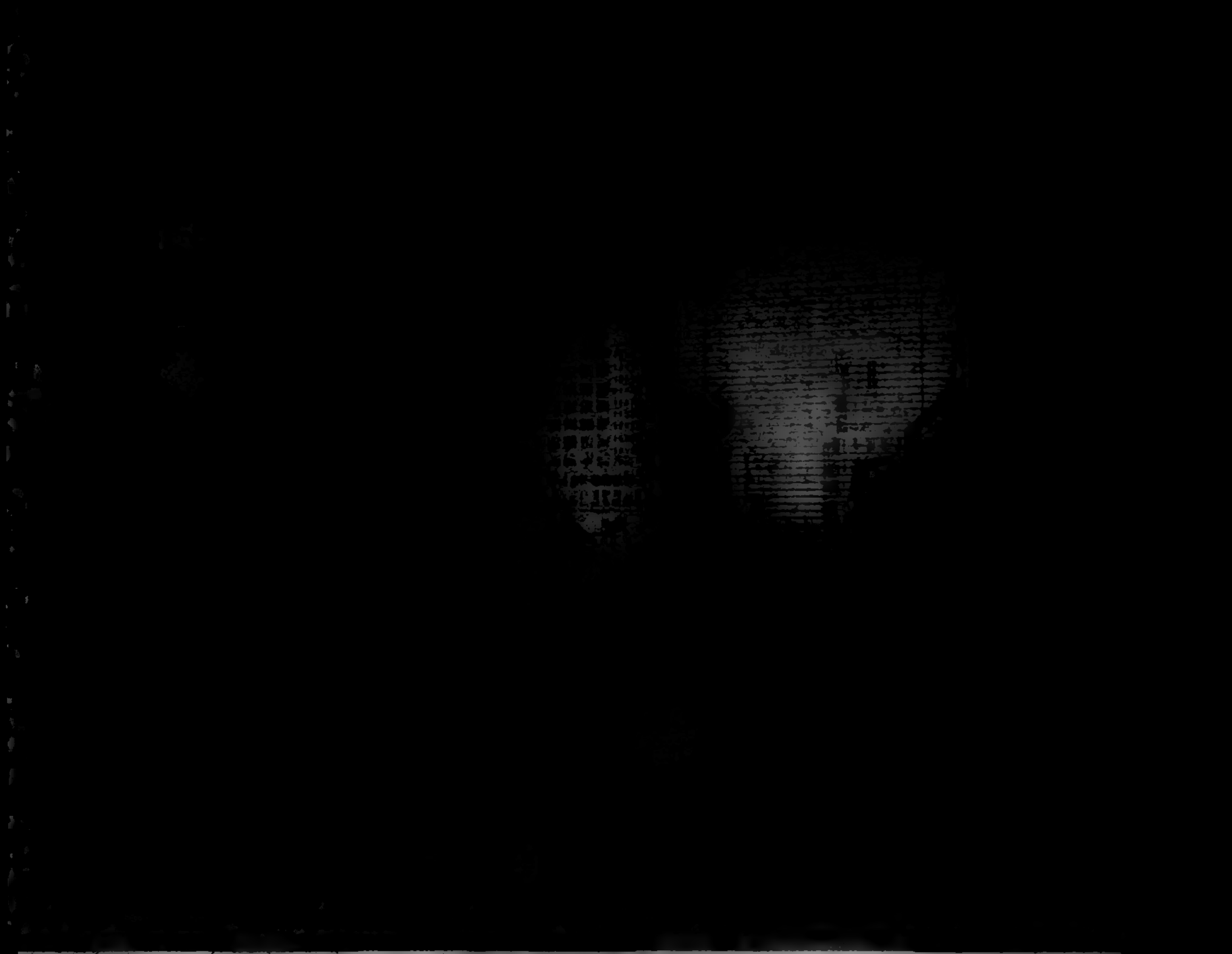

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RELATIVE PERFORMANCE*	125	100	64	109
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Relative Price Performance Index
**Computerworld, August 20, 1984*

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Technology transition blamed for industry slump

By James Connolly
CW Staff

NAPA, Calif. — The slump that has slashed computer vendors' earnings is partly due to the industry passing through a transitional period toward a time when cost/performance ratios will favor smaller systems, according to a consultant who spoke here recently.

"What we are looking at is the beginning of the end of the first generation of information systems," said William F. Zachmann, vice-president of corporate research for Framingham, Mass.-based International Data Corp. (IDC), speaking at IDC's executive conference on office systems. Zachmann told 320 DP executives that departmental systems and micros finally have begun to replace mainframe-based systems.

Zachmann claimed that, while many people believe computers are in their fourth generation, those first four generations actually were blended into one. He said the levers for change in the next generation will include microcomputer emphasis, local-area networks, industry-accepted standards, user involvement and control and higher level interfaces.

The theory that a company should build the largest system it can to get the "most bang for the buck" no longer applies, Zachmann said. He adopted the "economy of small" philosophy of Austrian Phillip Ein-Dor, who said there is no longer an economy of scale as one moves into larger systems. Zachmann likened the changes now affecting the computer industry to the climactic changes that killed the dinosaurs and left room for smaller animals.

The "period of dislocation" could last two or three years and may impact mainframe-dependent IBM more than less-established companies, Zachmann predicted. The transition does not mean the end of mainframes or of IBM, but it does mean that sophisticated micros can be direct substitutes for in-house time-sharing systems based on mainframes that hold outdated, inaccurate and unusable data, Zachmann said.

Not necessarily inadequate

But IDC's director of microcomputer services, Aaron C. Goldberg, disagreed, saying that the central data base is not necessarily inadequate, that it usually is well maintained and well documented, even if it is based in a departmental system rather than in a mainframe. "The key job of the MIS department is to make sure [it] maintains an accurate, up-to-date data file," Goldberg noted.

He said there are micro-to-mainframe solutions available today, and that systems such as the Digital Equipment Corp. VAX-11 superminicomputer offer a tremendous amount of resources for the office. Those systems can operate as buffers, downloading more easily to 10 such mid-range systems than to hundreds of microcomputers, he said.

But Goldberg warned the attendees that computer vendors are circumventing them, trying to sell equipment and software directly to microcomputer users.

Meanwhile, Thomas H. Willmott, IDC's vice-president for user services, observed that the soft earnings of the computer industry are attributable to smart shopping and "user paralysis." He said the computer market has been slowed by the realization that many of the personal computer products that people read about are "much tougher to implement . . . than was the data center."

Willmott noted that single-function word processing systems of the later 1970s have been "blown from the water." Today's office system is based on a mid-range system, which can be a minicomputer-based system, a distributed processing system based on a micro-to-mainframe link, a local-area network utilizing a gateway to the host, a department-based minicomputer or a private branch exchange switched connection to a host computer.

Firm appeals Nasdaq action

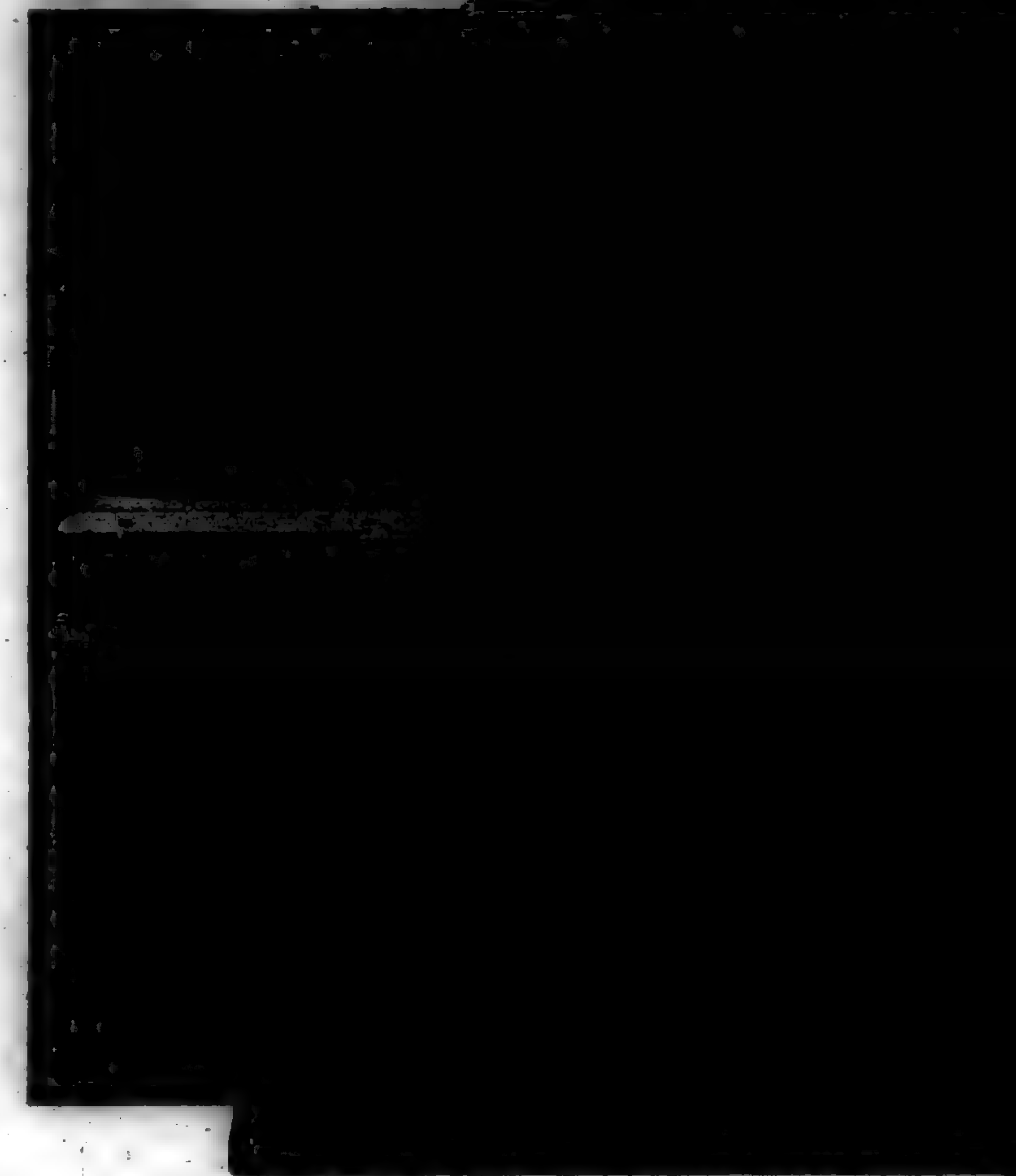
ANAHEIM, Calif. — General Automation, Inc. announced that it has appealed the recent deletion of its stock from the National Association of Securities Dealers Automatic Quotation (Nasdaq) exchange system.

Nasdaq dropped General Automation's stock from its national over-the-counter trading system April 29 because the company's shareholders' equity fell below $375,000, the minimum required for Nasdaq listing. In the quarter ended Jan. 26, the company reported shareholders' equity of $275,000.

The vendor of industrial automation components and systems said it has reduced debt by $30 million during the past several years, restructured its management and operations, successfully introduced new products and redeployed nonmainstream assets. "The company's stability and progress should be gauged by a broader measure than simple shareholder equity," the firm said.

A decision on the appeal is expected in July.

INTELL



CAI vice-president resigns

BOULDER, Colo. — Bad news continued for Computer Automation, Inc. (CAI) with the resignation of its second top officer in two months and a first-quarter loss of nearly $1 million.

The company recently announced that Lee E. Hargrave Jr., executive vice-president and chief operating officer, will resign on May 17. Hargrave's resignation coincides with the move of the company's corporate headquarters here to Irvine, Calif. [CW, April 29]. The move followed the April 1 resignation of CAI founder, President and Chief Executive Officer David H. Methvin.

CAI posted a loss of $945,000, or 46 cents per share, in the quarter ended March 31 on revenue of $12.7 million. The figure compares with a net loss of $1.3 million, or 64 cents per share, in the year-earlier quarter. The 1984 figure was helped by a nonrecurring revenue gain of $1.2 million from the disposition of a lease on a CAI building in Irvine. That sale contributed to 1984 first-quarter revenue of $13.5 million.

In his resignation announcement, Hargrave said recent moves to streamline and consolidate the maker of minicomputers and micros made his position expendable. "A company of this size clearly does not need both a chief executive officer and a chief operating officer, so I have decided to move on to other challenges."

Computer Associates buys assets of Value Software

JERICHO, N.Y. — Computer Associates International, Inc. recently announced that it has acquired all the assets of Value Software, Inc. of Cherry Hill, N.J., an IBM systems software company specializing in operations management software packages for mainframe computer data centers.

Terms of the agreement will not be disclosed, the company said.

Value Software was bought because it has a good product line and an existing user base, a spokesman said. The firm is the third major IBM OS/MVS systems software company acquired by Computer Associates within the last three years. In August 1982, the company bought Capex Corp., maker of a Cobol optimizer program and other OS products, and acquired Johnson Systems, Inc., maker of job accounting products, in June 1984. It has also acquired smaller firms, such as Arkay, the developer of a product that converts code from IBM's DOS to OS, a spokesman said.

Computer Associates is retaining sales, support and development personnel and trying to phase other staff members into its operations wherever possible, the company said.

The purchased company has been having financial difficulties for a while, the spokesman said. Value Computing, Inc. — as the company was known a year ago — was sold to Harvey Kimmel, a private investor, in October 1984 when the name was changed to Value Software.

Hogan ditches software plan

DALLAS — Hogan Systems, Inc. announced it has abandoned plans to develop software for international banking management and is seeking a buyer for the project. The decision means Hogan will close its International Systems Division office in New York and write off $5.7 million in unrecoverable development costs.

The write-off contributed to Hogan's dismal quarterly and annual fiscal results. Hogan posted a fourth-quarter loss of $10.7 million and revenue amounting to approximately one-third of the company's sales a year ago. Revenue for the period ended March 31 was $5.6 million, compared with $16.4 million in the year-earlier quarter. Hogan reported profits of $4.6 million in the first quarter of 1984.

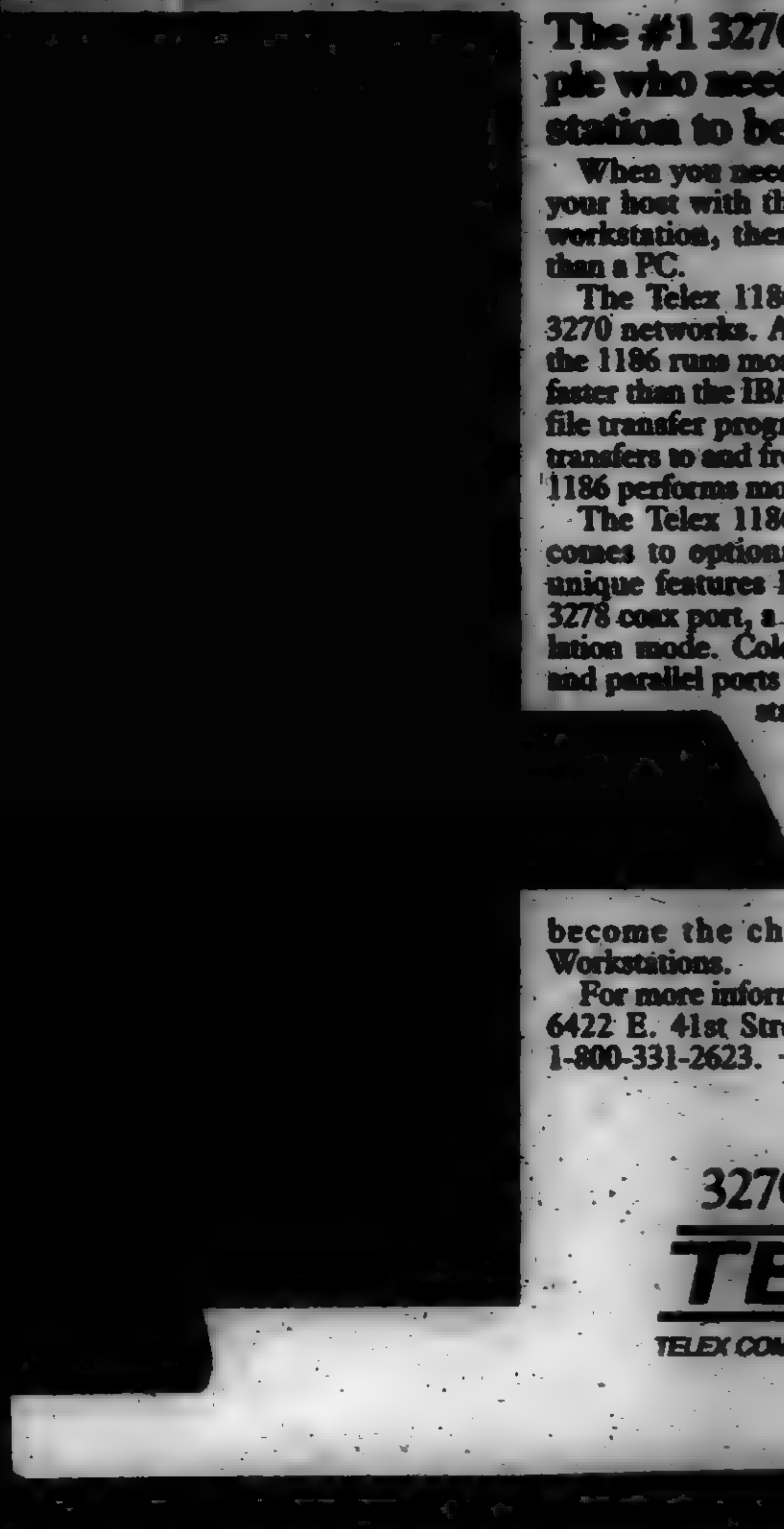
For the fiscal year ended March 31, Hogan reported a loss of $12.5 million, or 96 cents per share, compared with profits of $7.1 million, or 55 cents per share, in the prior year. Revenue for the 12-month period dropped from $36.4 million to $28.2 million.

Hogan Chief Executive Officer Richard Streller said development expenses for the international banking product line were too high for the company to continue the venture. He estimated the decision to drop the project will save Hogan $5 million per year.

Hogan purchased Henco Research, Inc. of New York in October 1983 and formed Hogan's international division to continue Henco's development of the management system for its international banking software line.

A Hogan spokeswoman said the product intended to integrate general ledger, foreign exchange, deposit and other software systems for banks with branches in several different countries.

Hogan will now concentrate on its software for domestic and foreign banks' in-country operations.



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The #1 3270 alternative for people who need an intelligent workstation to be more than a PC.

When you need to combine the resources of your host with the flexible processing of your workstation, there's a more intelligent choice than a PC.

The Telex 1186 is specifically designed for 3270 networks. And while it's PC compatible, the 1186 runs most programs two to three times faster than the IBM PC. Plus, Telex's host-based file transfer programs support high-speed data transfers to and from the mainframe. In fact, the 1186 performs more like an AT than a PC.

The Telex 1186 is more than a PC when it comes to options, too. Because Telex offers unique features like a 3270-style keyboard, a 3278 coax port, a 3276 port and a 3270 PC emulation mode. Color graphics capabilities, serial and parallel ports and date/time functions are all standard features on the 1186.

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EDS to get Western Union's MIS

UPPER SADDLE RIVER, N.J. — Electronic Data Systems Corp. (EDS) of Dallas has signed a 10-year, $260 million contract to take over DP services provided by Western Union Corp.'s Management Information Services division.

Under terms of the agreement, all of Western Union MIS' approximately 170 salaried employees have been offered continued employment with EDS. The MIS operations are based in Mahwah, N.J., and satellite operations are located in Dallas and Maryland Heights, Mo.

Western Union Chairman and Chief Executive Officer Robert S. Leventhal said, "This contract assures that Western Union will have available to it the additional resources it requires in data processing necessary to support its growth in telecommunications. [The] agreement brings together the world's largest data processing service organization, EDS, with Western Union [in its] strong position as a national telecommunications company."

FORUM

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communications lies not in newly developed products, but in older, established equipment. "Most people in the world still do not have a telephone," said Lee M. Paschall, chairman of American Satellite Co. "The big market out there is still plain old telephones, and I don't think the U.S. will get a piece of it. Lower cost providers will."

"We're so high tech, we forget that some of these countries are happy just to get a dial tone," said William Simpson, former manager of sales support for Mitel Corp., a Canadian vendor of telecommunications equipment and semiconductors.

Marketing, selling lag

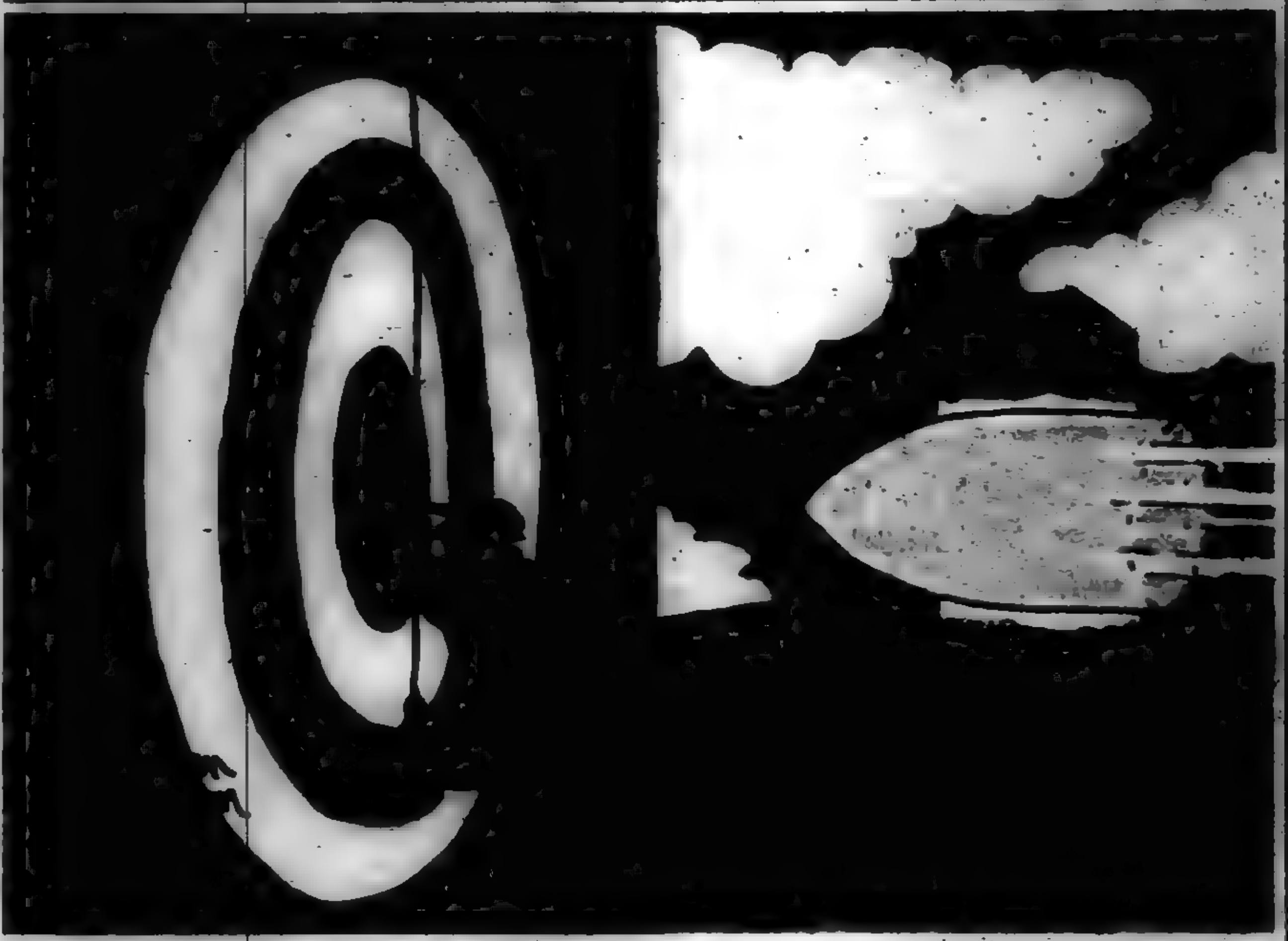
A former top-level AT&T executive, however, said that marketing and selling have always lagged behind technological development. "We've heard the same thing for years," said William G. Sharwell, once AT&T senior vice-president and now president of New York's Pace University. "Technology has always predated the marketing and financial means to sell it, but if the new product is compelling enough, the market will catch up. We're not doing as well as we can now, but time will take care of the problem."

Lack of understanding of foreign cultures and business patterns can also hamper the ability to trade, participants said. "European businesses think differently; there is much more focus on long-term relationships with specific companies," said Clay Whitehead, former White House communications policy advisor and current president of National Exchange, Inc., a maker of integrated services digital networks.

Several executives cited joint ventures with native firms as the answer, but Northern Telecom's Light suggested that such partnerships are not the only solution. "We have joint ventures in Korea and Taiwan, but we'll still be exporting, building our own plants overseas and licensing our technology to other countries," he said.

The head of a smaller antenna and transmission line firm said minimizing the American character of a company by hiring native executives in overseas offices and using native-made components helped his company in international markets, including Japan. "We keep a low profile, and it has worked," said Floyd English, president of the Orland Park, Ill.-based Andrew Corp. "From a financial standpoint, you can't make your components in the U.S. and ship them [overseas], regardless of the strength of the dollar."

America's best hope for exporting to Japan lies in telecommunications software, according to Ko Muroga, president of NEC America, Inc. "I don't think you're going to be able to make a cheaper switching system than the digital ones available now," Muroga said. "The important thing is developing software to best use those systems. In mainframe computers, 50% of the upgrade costs are for software and that [figure] may be 80% by 1990. Telecommunications will be the same."



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FASB

from page 1

rism in 1983 against its member companies capitalizing software costs unless they had a previous record of doing so. Until a common standard was achieved, the SEC did not want the balance sheet of some software firms to reflect assets that were not included on others' balance sheets, according to Donald J. Kirk, chairman of Fasb.

The standard would apply to software developed for sale, lease or to be otherwise marketed. Software developed for internal use would not be covered by the proposed standard, according to Kirk.

While the board's proposal appears to be a compromise between the two methods, speakers at the first of two days of hearings tended to advocate one or the other.

"We essentially believe software is an asset and needs to be recognized as an asset for our industry to be taken seriously," said Adapso spokesman Lawrence J. Schoenberg, chairman of the board of Mountainside, N.J.-based AGS Computers, Inc., in recommending capitalization. Adapso is made up of companies in the software and services industry.

"It is an asset," agreed James C. Mendelson, software analyst with the securities brokerage house of Morgan Stanley & Co. in New York, "but it's not a predictable one."

Value difficult to tally

Mendelson claimed the special nature of software — its short life span, its evolving upkeep and its dependence on hardware frequently produced by other companies — makes it difficult to tally its value as an asset with a predictable payoff.

"When expenditures bear no value to the end product, accounting procedures have no validity," claimed Gerald I. White, a spokesman for the Financial Analysts Federation, a New York group of brokerage house analysts that also advocates expensing the development costs.

IBM's Wheeler, however, said neither the development process nor the end product were as unpredictable as its critics indicated.

As software has become key to successful, large systems, "the tools involved in software development have grown. . . . The process is defined and vigorously managed at each step," he said.

Fasb said a company must document the following for the costs of a planned software product to be called capital costs: its technological feasibility, an analysis of the projected market, a financial feasibility estimate and the company's management commitment to produce the product.

Asked if he thought such distinctions were workable, Burton Grad, a software consultant for Burton Grad Associates, Inc., and spokesman for Informatics General Corp. of Woodland Hills, Calif., said the criteria were awkward. Within a three-to-five-year period, companies will write specifications for a program and a machine will write the code, which means the Fasb criteria will come late in a development cycle, he said.

Compliance with the criteria would add a considerable expense to smaller companies' record keeping, said Charles Burg of the accounting firm Price Waterhouse & Co. in New York.

RECESS

from page 1

its downward-heading counterpart for the overall economy and just wave as it goes by?

"Technology and the U.S. economy have exhibited a good deal more independence than most would have thought possible," said A. A. Tad LaFountain III, a former semiconductor analyst at Hambrecht & Quist in New York who recently hopped across the river to form his own research firm, LaFountain Research Corp., in Bay Head, N.J.

"When the tech cycle boomed, it coincided with a general downturn. Now technology is down, and the economy is up. That makes it practically impossible to calculate how things might turn out. In the old days, a down economy was it."

Cycle driven by products

What accounts for that economic independence? LaFountain and others believe the technology cycle is driven not by interest rates, budget deficits or the money supply, but by the technology itself — by products.

Harry Edelson of Saddlebrook, N.J.-based Edelson Technology Partners and formerly of First Boston, Inc. takes the principle one step further. He is a solid disciple of the IBM product cycle theory, which asserts that no economic factor affects Big Blue's bottom line as much as its own product announcements. In this case, he means the IBM Sierras, although the rumored PC2, whatever that might be, may also apply.

How much the industry leader's product cycle affects the overall high-tech economy is anyone's guess. Some theorists have every major DP budgeter holding his breath for the Sierra, but that seems to be unrealistic. If several major vendors have product lines in the offing, however, the product cycle theory appears to have some merit.

The bottom line, then, is that high technology remains relatively immune to traditional economic pressures. Certainly, Data General Corp. Chairman Ed de Castro was not wrong when he recently said, "If people aren't buying anything, products won't make a difference." But if the technology is needed (and equally important, correctly marketed), it will be purchased.

So while the high-tech industry continues to have plenty to worry about, renewed fears of a recession in the U.S. economy should not add that much to its menu of concerns.

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You'll be involved in information systems planning and assist in the preparation of financial or cost benefit analysis. Other duties include working with key users to coordinate and consolidate data processing needs and requirements and serving as liaison between data center and user community personnel. You'll also participate in preparation of short and long term plans. Degree in Computer Science and MBA or equivalent are required. You must also have 3-5 years experience in planning, administration or management in a large data center and have excellent communication skills.

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Morehead State University is seeking qualified and experienced candidates for the position of Systems Manager in the Office of Computing Services. The position is responsible for the operation of the academic and administrative computing systems utilizing a Prime 9950 information system; Prime 750, and Prime 550 II. Duties include installation and utilization of the PRIMOS and information software; monitoring systems access and security; software evaluation and installation, maintaining inventories of equipment and supplies; daily systems back-up; liaison with maintenance contractors, programming staff, and users; assisting with the development of policy and procedures; documentation of operating procedures; supervision of the Coordinator of Technical Services and the Coordinator of Academic Services. Qualifications include: Bachelors degree required and preference will be given to those who have technical experience with an integrated and interactive information system on a Prime computer and who are knowledgeable of COBOL, FORTRAN and BASIC. A highly motivated and self-directed individual is sought. Send letter of application, resume and at least 3 references no later than June 1, 1985 to: Division of Payroll and Personnel,

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[illegible]
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Data Processing

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Responsible for implementing the tasks defined below on software development projects. These engineers will report to project leaders. BSCS, EE or Math with six plus years experience in definition, design, development and delivery of software systems, utilizing VAX or Motorola 68000 computers. Required fluency in PASCAL, structured FORTRAN, MACRO-11 or Assembly languages. Experience with MIL-SPEC standards required.

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Responsible for development and maintenance of on-line systems in an IBM OS/MVS IDMS CICS environment. Must have a college degree in Business, MIS or related field, and three to five years experience developing/maintaining on-line systems, supporting Accounting, Manufacturing or Purchasing/Inventory control.

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Responsible for the installation of IDMS in an IBM OS/MVS environment, for the design and maintenance of the data base and related data dictionary, and for the development and enforcement of standards and procedures for its usage. Requires a college degree and three to five years data base Design/Administration experience.

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You will provide maintenance and diagnostic technical support to isolate and resolve component and system problems; formulate and document operational procedures. You must have a Bachelor's degree or equivient in Computer Science or Electrical Engineering. Five years professional experience in field maintenance/repair/technical support of high technology computer, microprocessor, office products and/or telecommunications systems is required along with strong interpersonal skills.

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You will develop data compression and image processing strategies and provide technical expertise in the design of advanced image processing systems and data compression. A Bachelor's degree or equivalent in Engineering, Mathematics, Physics or Computer Science is required. A Master's degree is preferred. You must have 7 years professional experience in data compression technology, including 3 years experience in image processing research and analysis.

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You will participate in the planning, design and engineering of data networks. A BS in Electrical Engineering, Computer Science, Telecommunications or equivalent is required along with 4 years experience in any of the following areas: network planning and analysis; SNA network implementation; network engineering using concentrators and multiplexers; network architecture (X.25, SNA, IEEE 802); or communications software development. Experience in computer programming is preferred.

SR. TECHNICAL ADVISOR/ SWITCHING SYSTEMS SOFTWARE

You will develop telecommunications strategies and provide technological expertise and planning to support existing and corporate objectives; ensure cost-effective networking and cost control of network/systems. A Bachelor's degree or equivalent in Engineering or Computer Science is required. Master's degree is preferred. You must have a minimum of 10 years professional experience in data communications network design and analysis. An in-depth knowledge of micro-processor hardware and software, including "C" and Assembler languages is required along with strong organizational, analytical, planning, human relations and communications skills.

SR. TECHNICAL ADVISOR/ PACKET SYSTEMS DESIGN

You will develop telecommunications strategies and provide technological expertise and planning to support existing and planned corporate objectives; ensure cost-effective networking and cost control of network/systems. A Bachelor's degree or equivalent in Engineering or Computer Science is required. Master's degree is preferred. You must have a minimum of 10 years professional experience in data communications network design and analysis. An in-depth knowledge of micro-processor hardware and software, including "C" and Assembler languages incorporated in packet switching design is required along with strong organizational analytical, planning, human relations and communications skills.

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You will be an authority in the area of telecommunications in performing research, analysis and design of advanced telecommunications systems, thereby ensuring that the most cost-effective systems are consistent with traffic requirements and minimizing expenditures for equipment and services. A Bachelor's degree or equivalent in Engineering, Mathematics, Physics or Computer Science is required along with 7 years professional telecommunications experience. Experience must include 3 years in communications research and analysis with background in traffic engineering, computer architecture, and network modeling. Strong human relations and communications are essential.

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RPG III Programmer/Analyst — Fortune 100 Company *(901-04)* One of the most secure, highly respected, Boston-based Fortune 100 companies seeks an RPG III professional. Company rarely needs to hire "from the outside." This is your chance to work in a leading edge environment and travel internationally on occasion. Two or more years of RPG experience with exposure to RPG III sought. To $35,000.

COBOL Programmer — Join Top Boston Financial Firm *(901-05)* Unusual opportunity for a relatively junior level person to join one of Boston's top financial organizations. Will have chance to grow into either highly technical responsibilities or management. One year of IBM COBOL and either DOS or OS/JCL desired. To $24,000.

Decision Support Analyst — Boston Financial District *(901-07)* Executive group of a major Boston-based financial organization is developing automated management tools to support major corporate business strategies. Two or more years of diverse computer experience sought; including high level languages such as FOCUS, RAMIS, or NATURAL, using either TSO or VM/CMS. Degree required. To $35,000.

Programmers — Near Boston Waterfront *(901-08)* Small specialized division of a major Boston employer will provide training in CICS. Two top people sought for this pilot program. Skills and experience needed include one or more years of IBM COBOL and any of the following: MVS, VM, VSAM, DL1 or CICS. To $31,000.

C/UNIX Professionals — Near Route 128, Flexible Hours *(901-09)* Boston-area C/UNIX "start-up" (founded by a software professional who has started and currently owns other successful computer-related businesses) seeks two persons. Firm offers competitive salary, equity position, 100% flexible hours, a stimulating peer group and accessibility by car or public transportation. Any C/UNIX experience considered. To $36,000.

IDMS Professionals *(901-10)* Permanent staff positions and contract hourly positions are available with well-known Boston area supplier of high level consulting service. Four or more years experience with IDMS as a Programmer, Programmer/Analyst, Systems Programmer or Data Base Analyst sought. To $70,000.

Sales/Product Marketing Manager — Become Vice President *(901-12)* Well-established New England software vendor seeks Sales Manager to supervise Sales Representatives and telemarketing function. Position can lead to Vice President. Three or more years of highly successful small systems sales from a computer vendor (preferably IBM), knowledge of manufacturing systems requirements, aggressive personality and a BS/BA degree sought. Compensation - Base + Bonuses: To $100,000.

Senior DOS/VS Systems Programmer — Learn VM and MVS *(901-13)* Highly prestigious manufacturer of high tech computer products seeks Senior Systems Programmer. Excellent chance for a talented DOS/VS Systems Programmer to expand technical knowledge and future career opportunities. Five or more years experience, solid BAL capability and some exposure to CICS or data communications preferred. To $42,000.

COBOL Programmer — Wang VS *(901-14)* Major consulting firm with a worldwide reputation for employing some of the top engineering and computer talent seeks COBOL Programmer. Company uses many different computers including Wang, IBM and DEC which provides an excellent learning environment for all computer staff. Two or more years experience using a major mini computer (preferably the Wang VS) and a four year college degree sought. To $30,000.

Software Engineers *(901-15)* Major Boston area communications firm provides opportunity to learn communications software. These positions offer the non-communications experienced Software Engineer the opportunity to learn valuable software development skills. Two or more years of real time Assembler programming experience preferred. $28,000 to $40,000.

IBM/VM Systems Programmer — Full relocation to Vermont *(901-16)* Growing firm seeks System Programmers to perform a complete VM installation on the IBM 4381. As one of two Systems Programmers, will learn to support IDMS immediately and MVS in 1986. One or more years IBM/VM experience desired. To $33,000.

RPG III Programmer — Vermont Ski Country *(901-17)* Excellent System 38 data center near ski resorts seeks RPG III Programmer with two or more years of experience. Will relocate if necessary. To $30,000.

DEC Minicomputer Programmer — Boston *(901-19)* Major firm will install VAX technology in a highly complex distributed processing system environment. Two years of COBOL programming on DEC PDP or VAX computers and financial application knowledge sought. To $32,000.

Senior Sales Representative — Management Potential *(901-20)* Boston suburbs-based data processing service organization seeks an experienced sales professional who is familiar with the IBM product line to become Manager. Base to $35,000 ($75,000 at 100%).

Applications Programmer — IMS Training Provided *(901-21)* Boston-based international manufacturer/distributor seeks experienced COBOL Programmers to participate in new applications development. IBM COBOL experience desired. To $28,500.

Programmer/Analyst — Rapid Advancement Potential *(901-22)* Prestigious New England consulting firm specializing in major data base/data communication systems development seeks a Programmer/Analyst with three or more years experience in IMS, IDMS, CICS or TOTAL and COBOL. To $40,000.

Senior Programmer/Analyst — New Data Base Opportunity *(901-23)* Major new on-line data base installation seeks Senior P/A with three years of data base design experience using IMS, ADABAS or IDMS. Boston area. To $42,000.

Systems Analyst — Become a Data Base Analyst *(901-24)* Major retailer seeks person to function as a Technical and Design Advisor to group of thirty-two Programmer/Analysts and Project Leaders, implementing DB/DC systems. Four or more years in the design and programming of data base systems desired. To $45,000.

Minicomputer Programmer/Analysts — New Development *(901-25)* New England-based computer manufacturer needs Programmer/Analysts to install both MIS and real-time manufacturing systems. Seek mini-computer Programmers experienced in COBOL or Assembler programming. To $36,500.

Systems Programmer — Premier IMS Data Center *(901-26)* Multiple CPU, MVS/IMS, DB/DC data center seeks System Programmer for tuning and internal consulting for performance monitoring. Three years of MVS, Data Base and IMS preferred. To $40,000.

Software Engineers/Programmers — Voice/Data Communications *(901-27)* Fast-growth company is developing exciting new technology. Three years experience programming in C and Assembler under UNIX or RSX-11M preferred. Package includes stock. To $45,000.

Programmers and Analysts — New England Coast *(901-11)* Major IBM data center seeks several professionals. Will learn IDMS and CICS through both formal and on-the-job training. IBM COBOL and MVS experience sought. In addition to top salaries, and the most up-to-date technology, firm will also consider paying for relocation if you live more than 35 miles from the coast. $34,000 to $40,000.

Southern New England

Internal Consultant — Distributed Processing *(861-01)* Fortune 500 organization in Connecticut seeks an Internal Consultant with applications and technical experience using IBM 8100 Series 1 and Wang mini-computers. Will work with different applications groups. High corporate visibility. To $42,000.

Programmer/Analyst *(861-03)* Multidivisional Fortune 500 manufacturer seeks professionals with two years IBM OS/COBOL programming and analysis experience. Position entails development and support of financial and manufacturing systems, using COBOL with CICS and DL-1. Great Connecticut location. To $28,000.

Lead Senior Analyst — Management Visibility *(861-04)* Suburban Hartford employer seeks an individual to develop a new business system. Four or more years large scale IBM COBOL applications development preferred. To $34,000.

Systems Analyst — FOCUS *(861-05)* Major Hartford employer seeks professional for high visibility project. Will develop new financial systems. Three years of data base design and programming experience with FOCUS helpful. To $36,000.

Senior Software Engineer — New [illegible] Will be responsible for the development and implementation of [illegible] C under UNIX. To $40,000.

Software Engineer — Connecticut [illegible] 500 firm [illegible] processor-based [illegible] in Assembly and PL/M seeks an Engineer. Will be responsible for various close-loop test applications, including [illegible] and [illegible] control systems. [illegible] and three years programming and design with Intel 8080, Z-80 or Motorola 6800 preferred. To $40,000.

Marketing Representative — $100,000 at Quota *(861-08)* Major software services firm seeks Sales Representative with five or more years experience selling to large scale IBM commercial accounts. Will market consulting services and proprietary software packages. Salary and commission is $100,000 at quota. $60,000 guaranteed.

Programmer/Analyst *(861-09)* Major Hartford financial institution seeks professional who will join their high visibility IMS group. One or more years experience in IMS DL-1 and DB/DC a plus. Large scale IBM experience preferred. Will provide technical support for new development system. To $29,000.

Programmer — Major Firm *(861-10)* Major Hartford employer seeks a Programmer with one or more years experience. Extensive technical education provided! Will have direct contact with both user and systems personnel. MVS, JCL, TSO/CMS and associated software experience desired. Good communications skills needed. To $26,000.

Systems Designers *(861-11)* Major Connecticut employer needs three individuals with eight or more years of systems design experience. Will be part of a ten person team that is redeveloping a 2,000 module-base business application. A strong background in DB/DC and structured methodologies desirable. To $40,000.

Systems Analyst — MSA Products *(861-12)* Expanding financial organization seeks senior individual with five or more years of IBM 370/OS, COBOL, and CICS experience that includes the installation and customization of MSA Products. Opportunity for promotion to Project Leader within one year. To $37,000.

Senior Software Engineer *(861-13)* Major international manufacturer seeks Microcomputer Programmer with C language experience in a UNIX environment to support laser printer technology. 8086, Assembler experience and knowledge of PASCAL and FORTRAN desired. To $55,000.

Systems Programmer *(861-14)* Major educational institution seeks MVS professional to support VS-1 to MVS conversion, trouble-shooting, system tuning, etc. Two or more years of OS/MVS experience desired. Prefer VM/CMS and COBOL exposure. CICS a plus. Excellent benefits. To $38,000.

Programmers — Multiple Openings *(861-15)* Outstanding opportunity at Fortune 100 client sites in Connecticut for Programmers with two or more years of IMS DB/DC experience. Opportunity to work on key data base development projects. To $35,000.

Software Engineers *(862-01)* Major Connecticut-based firm seeks Software Engineers to research and develop diverse mini/micro-based, on-line, real-time distributed systems. Opportunity to be a Group Leader or Supervisor. To $54,000.

Software Professionals — Develop Microcomputer Software Tools *(862-02)* Start-up department in Connecticut seeks professionals to develop tools for use by a variety of minicomputer and microcomputer users. One or more years of Assembler, C and experience in the development of systems sought. UNIX knowledge a plus. To $44,000.

Systems Engineers — Sales Training *(862-03)* Major high tech vendor is opening new branch in Southern Connecticut. No travel. Chance to move into sales after one year. To $40,000 plus stock.

Senior Analyst — Become Firm Systems Person *(862-04).* New data center in Southern Connecticut seeks individual to participate in systems planning, design, development, project control. Background should include five or more years of programming and systems development — preferably in an on-line or data base environment. To $41,000.

Software Engineer — Technical and management growth opportunity. *(862-05)* Internationally-known information service company seeks Engineers to develop on-line real-time mini/micro-based systems. To $40,000.

Programmer/Analysts *(861-06)* Big 8 consulting firm is staffing new internal systems development group with degreed experienced Programmers and Analysts. Fast track potential for project and systems management. Three or more years of mainframe COBOL or PL/1 experience sought. Connecticut location. To $35,000.

Project Leader *(861-07)* Opportunity for Senior Analyst or Programmer to head new project team which is beginning analysis of new on-line financial and decision support applications. Southern Connecticut. To $36,500.

Senior Programmer/Analyst *(861-08)* Implement business systems for this fast growing company in Connecticut. Three or more years of IBM system 38 RPG III preferred, but strong System 34 manufacturing experience will be considered. To $30,000.

Project Leader *(861-10)* Will direct staff of six Programmer/Analysts and two Analysts in the development of on-line data base distribution and manufacturing system. Prior programming background helpful. To $38,000.

Programmer/Analysts — Learn CICS/DL-1 *(861-17)* Major Fairfield County firm seeks IBM/COBOL Programmer/Analysts with two or more years of exposure to distribution or financial systems. Will learn on-line database. To $32,500.

MIS Director *(861-20)* Headquarters in lower Fairfield County needs an MIS professional to direct all data processing for this Fortune 500 company. Previous IBM systems management sought. To $75,000.

Tech Services Group — Systems Programmer *(861-14)* Ground floor opportunity to head the Tech Services Group of a new division. Environment will be 3081 OS/MVS, IMS and CICS. Will hire own staff of four Systems Programmers. Two years OS/MVS, DL-1 or CICS experience sought. To $45,000.

CAD/CAM Programmers *(861-15)* Connecticut shoreline company actively involved in R&D of sophisticated design engineering, automated manufacturing, robotics and automated test systems seeks CAD/CAM Programmers. To $40,000.

Systems Analyst — Move up to Project Manager *(861-18)* Lower Connecticut communications firm seeks a Senior Systems Analyst to review, design and implement an on-line CICS-driven, corporate-wide information system. OS/COBOL background needed. To $42,000.

Manager of Software Engineering — New Development *(861-19)* Major R&D division of leading firm seeks Software Engineer with supervisory skills ,UNIX, C or PASCAL, and M68000 backgrounds. To $52,000.

Programmer/Analysts — IMS Training *(861-21)* Leading edge user of IMS DB/DC design seeks several individuals for applications development, data dictionary, DB/DC design and technical support. Two years IBM 370/OS COBOL or BAL experience with exposure to DB/DC preferred. To $31,000.

Systems Programmers *(861-13)* Fortune 50 financial organization seeks individuals with two years experience in MVS, IMS or TCAM internals. Excellent opportunity for advancement. To $36,000.

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Programmer Analyst needed for airline control program (ACP) environment. [illegible] ACP [illegible] Tulsa, OK 741[illegible]. Job order # [illegible].

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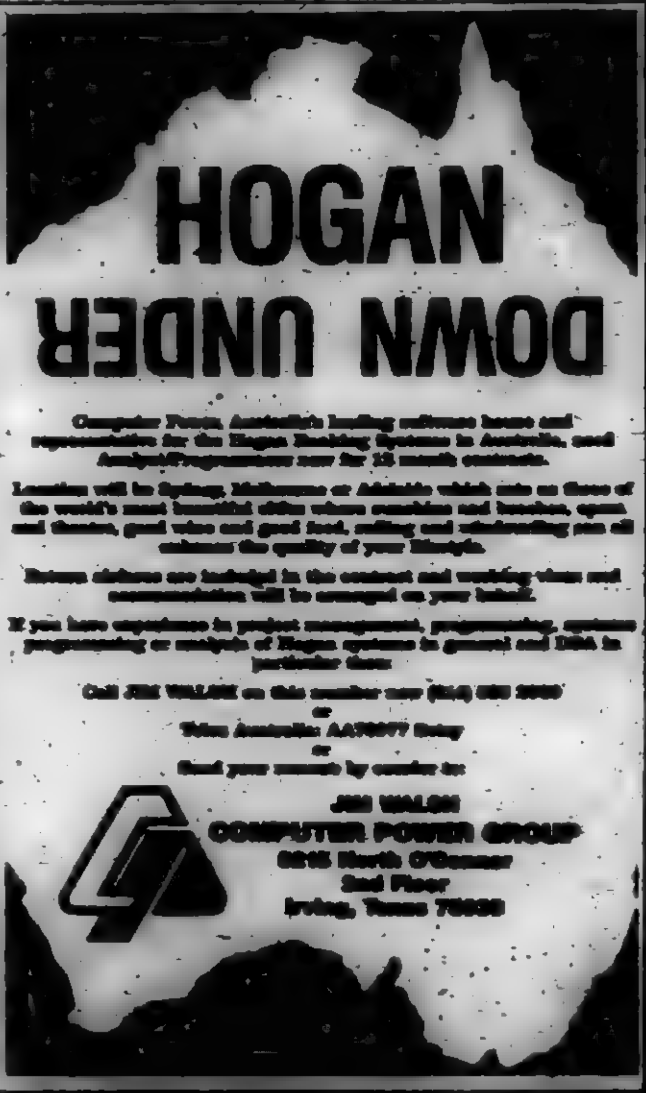

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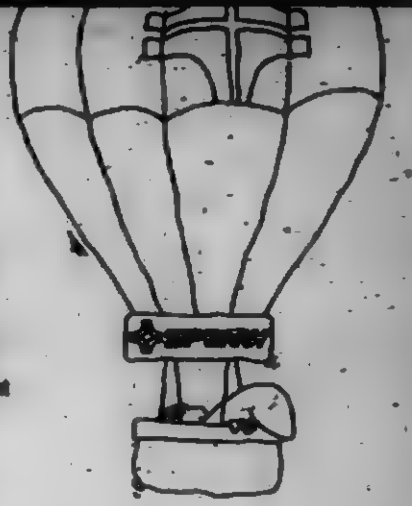

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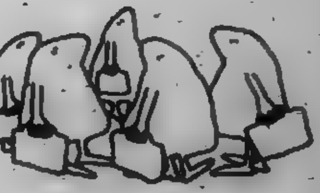

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4331-1	0.25	0.5 to 1	[illegible]	[illegible]	[illegible] to 32
4331-11	0.30	1 to 2	[illegible]	4.[illegible]	[illegible] to 16
4331-2	0.50	1 to 4	[illegible]	4.4	[illegible] to 32
4341-9	0.52	1 to 4	[illegible]	[illegible]	[illegible]
[illegible]	0.70	2 to 4	[illegible]	[illegible]	[illegible]
[illegible]-10	0.75	2 to 4	[illegible]	[illegible]	[illegible] to 32
[illegible]-1	0.88	2 to 4	[illegible]	[illegible]	[illegible] to 32
[illegible]-11	1.1	2 to 8	[illegible]	[illegible]	8 to 32
[illegible]-4	1.15	2 to 12	[illegible]	[illegible]	4 to 24
[illegible]	1.2	2 to 8	[illegible]	[illegible]	8 to 32
[illegible]-5	1.45	2 to 12	[illegible]	[illegible]	16 to 32
[illegible]-2	1.5	2 to 16	[illegible]	[illegible]	16 to 48
4341-12	1.65	2 to 16	[illegible]	11.[illegible]	16 to 64
[illegible]	2.0	2 to 8	[illegible]	14.[illegible]	16 to 48
[illegible]	2.1	4 to 16	[illegible]	15.5	16 to 64
[illegible]	2.5	2 to 8	[illegible]	[illegible]	32 to 96
[illegible]-2	2.7	4 to 32	[illegible]	[illegible]	32 to 128
[illegible]	2.9	4 to 16	[illegible]-200	[illegible]	64 to 192
[illegible]	3.3	8 to [illegible]	[illegible]-400	[illegible]	[illegible]

*First [illegible] installation 1987

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SYSTEMS	MIPS	MEGABYTES
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[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible] 32
[illegible]	[illegible]	[illegible] to 64
[illegible]	[illegible]	16 to 64
[illegible]	14.[illegible]	16 to 64
[illegible]	[illegible].0	24 to 64
[illegible]	[illegible].0	32 to 128
[illegible]	[illegible]	16 to 64
[illegible]	[illegible]	32 to 128

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AS/[illegible]	[illegible]	16 to 32
AS/8040	7.2	8 to 48
AS/8050	9	8 to 48
AS/[illegible]	11.2	16 to 64
AS/8070	16.2	16 to 64
AS/[illegible]	20	16 to 64
†AS/XL-[illegible]	[illegible]	32 to 256
†AS/XL-[illegible]	[illegible]	64 to 256

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General Request for Proposal No. 1009, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of Burroughs compatible devices for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1010, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of Univac compatible terminals, printers, controllers, and multiplexers for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1011, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of Four Phase compatible devices for the State of Mississippi during fiscal year 1986.

General Request for Proposal No. 1012, due Tuesday, June 11, 1985, 2:30 p.m. This is a general RFP for the acquisition of Honeywell compatible devices for the State of Mississippi during fiscal year 1986.

Request for Proposal No. 1014, due Thursday, June 13, 1985, for the acquisition of an on-line turnkey system with hardware, software and services for the BUREAU OF MARINE RESOURCES, Long Beach, Mississippi.

Request for Proposal No. 1015, due Tuesday, May 28, 1985, for a minicomputer system for ALCORN STATE UNIVERSITY, Lorman, Mississippi.

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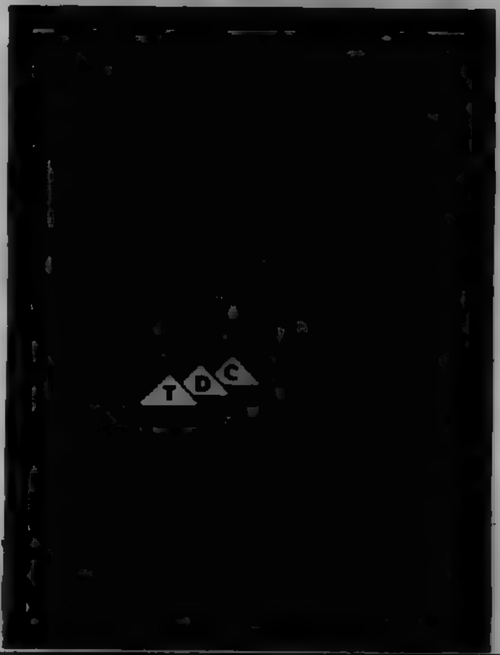

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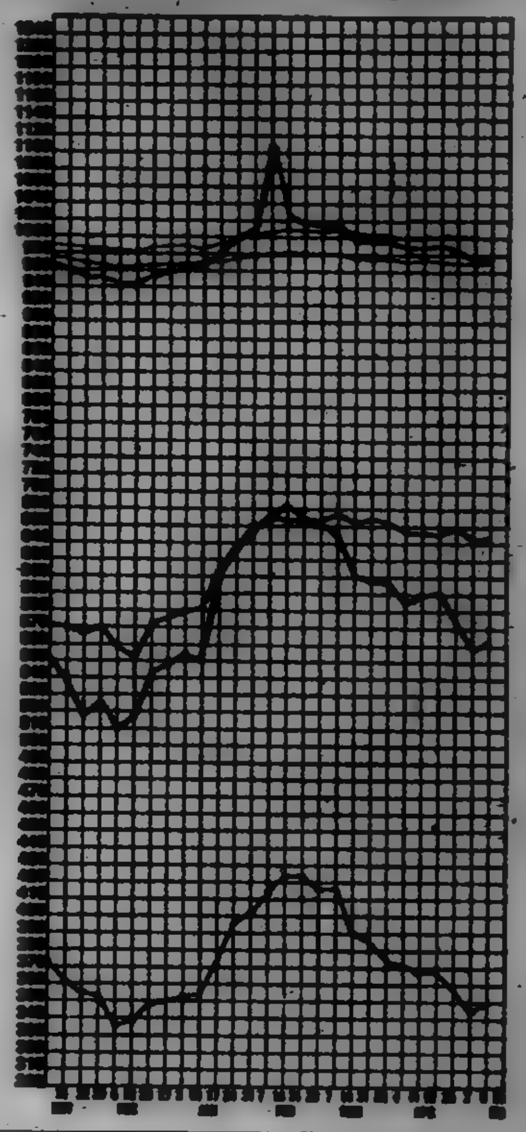

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Microvax II debuts; users give high marks

By Eric Bender
CW Staff

BOSTON — Digital Equipment Corp. last week unveiled the Microvax II, said to run all VAX software and to give VAX-11/780-level performance at a fraction of the cost. The system gathered bouquets from early users and analysts following its formal debut here.

"We're very pleased with the machine," said Richard Newton, a professor of computer science at the University of California at Berkeley, a Microvax II beta test site. "We can't fault it so far. It's the first machine to reach this level of price/performance."

"Its performance was better than we would have expected," said Al Higgenson, president of Caddex Corp., a DEC OEM in Woodinville, Wash. "We really have now taken the power of a large computer room right out to the people."

George Colony, president of Forrester Research, Inc. in Cambridge, Mass., also applauded the supermicro's price/performance characteristics and gave it a favorable overall review. Colony joined other analysts, however, in suggesting that the machine will elbow some other VAX machines out of the limelight.

"DEC is going to eat some of its children, specifically the 11/725 and 11/730," he said. "I think the 11/750 will be threatened as well."

DEC officials did little to squelch this speculation, making no apparent moves to reprice or otherwise reposition the existing line. Asked about plans for machines caught between the high-end VAX

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TOP OF THE NEWS

Birth defects can be traced to microwave transmissions, a New Jersey citizens group claimed. Page 2.

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The first commercial user of Amdahl's 5868 multiprocessor likes the machine and the $40,000-per-year savings in systems programs the shop now reaps. Page 4.

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AT&T's Unix System V is now available on Prime's Series 50. Primix will run co-resident with and port applications written for Primos, the company's mainstay operating system. Page 7.

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Spanning the years. Blue Cross/Blue Shield of Massachusetts uses a range of equipment introduced during the past two decades in an environment geared only toward production. Page 10.

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Remember O. P. M.? The computer leasing company that bilked investors out of more than $200 million will be purchased by a British firm, pending court approval. Page 71.

■

Breaking up easy to do for Bell MIS

By Paul Korzeniowski
CW Staff

MIS departments at the former Bell operating companies have thus far been sheltered from the postdivestiture trauma of separation from AT&T, according to interviews with MIS managers at the companies.

The trauma in other quarters has been well documented. Customers were saddled with confusing service policies as AT&T and the former operating companies tried to determine who was responsible for what. The divested operating companies tightened their belts by significantly trimming their staffs: Ameritech, for example, has cut approximately 7% of its 112,000-member work force, and U.S. West has let go 13,000 workers.

Despite such changes, MIS managers at the former operating companies report that life for them today does not differ very much from predivestiture days. "I doubt anyone would say that there have been drastic changes since divestiture," said Daniel Muntner, manager of capacity planning at Illinois Bell Telephone Co.

Even though former operating companies reduced personnel, data processing managers report that their staffs have increased or at least remained stable. "Our staff has increased by approximately 10% this year," said Thomas Gallagher, Information System Organization assistant vice-president at Nynex Corp.'s New England branch. The

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Corporate moves: A tale of two DP shops

With local division's buy out, DP center starts from scratch

By Tom Henkel
CW Staff

WEIRTON, W. Va. — Almost every DP executive has occasionally wished for a magic wand that, with a wave, would make the firm's data center, applications backlog, irate users and incompetent employees permanently invisible.

For most executives, miracles never happen. But for a group of former DP workers at National Steel Corp. here, the dream came true.

National Steel's parent company, National Intergroup, Inc., decided in 1983 to close its Weirton Steel Division and consolidate its DP operations here and at another data center in St. Louis. Its purpose was to form a for-profit center, Genix Corp., in Pittsburgh, giving some DP employees here an almost unprecedented chance to start over with a clean slate.

Employees at the Weirton Steel Division had voted to buy the division from National Intergroup under the federal Employee Stock Ownership Program. As a division of National Steel, the Weirton Steel Division had use of National Steel's DP services. Now, as Weirton Steel Corp., it had to build its own data center and hire the staff to run it.

See STEEL page 6

DP center-turned-business finds mind-set must change

By Clinton Wilder
CW Staff

PITTSBURGH — Here in the heart of steel-country, the parent company of one of the nation's largest steel producers, National Steel Corp., is hoping to forge profits in data processing. The new direction has turned National Steel's former DP operation into a full-scale business.

That business, called Genix Corp., began its for-profit operation Jan. 1 in a multimillion-dollar data center on the site of a former apple orchard 15 miles from downtown Pittsburgh. Although most of its current customers are other subsidiaries of the $2.3 billion parent firm, the National Intergroup, Inc., Genix said it believes it has the hardware (an IBM 3081, 3033 AP, 3033 MP and two 370/158s) and the talent to become a significant player in the business of contracted DP services.

Genix grew out of the consolidation of National Steel DP centers in St. Louis and Weirton, W. Va., in 1983. Turning a DP department into a business required more than a diesel-generated backup power system, new mainframe and major upgrading of communications and data security. It also required a complete mind-set turnaround.

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NEWSPAPER

N.J. transmissions hazardous?

Group blames birth defects on earth stations' microwaves

By Paul Korzeniowski
CW Staff

VERNON, N.J. — A citizens group and three satellite network vendors here are locked in a Love Canal-like debate.

This rural village houses major ground station facilities for three domestic satellite communications carriers: RCA American Communications, Western Union Corp. and American Satellite Co. Vernon's hills buffer the city and create a radio-free zone, enabling clear terrestrial transmissions. Vendor earth stations ship voice, video and data information to satellites that relay the information to receiving microwave dishes on the Eastern seaboard.

Recently, Citizens Against the Towers (CAT), formed in 1982, charged that the earth stations have caused an abnormal number of health problems here, a claim that the vendors deny. CAT has 300 members; Vernon's population is approximately 16,000.

Not enough cases to signify problem

When CAT was formed, it lobbied the New Jersey Board of Health to conduct a study to determine if incidences of Down's syndrome had increased since the first tower was built in 1975. Last summer, the state released the study. It found three cases of Down's syndrome, one more than statistical averages but not enough to signify a problem.

When the report was released, CAT challenged the findings. "CAT found 10 cases of Down's syndrome, 500% more than normal," noted Elise Kreindler, CAT vice-president. "We wanted to see how accurate the state's information would be. The state searched only for addresses where Vernon was listed as the city. It should have also included addresses of Vernon boroughs. The boroughs are part of Vernon." The state has decided to reopen the study.

In addition to the increased incidences of Down's syndrome, CAT reported that there were high rates of other birth defects, including children born with clubfeet, heart problems and dislocated hips. CAT has claimed that some citizens are in direct line with microwave transmissions and are constantly being exposed to radiation that has caused the health problems. "Two women who lived next door to one another within five days gave birth to children with Down's syndrome," Kreindler said. "What are the odds of something like that happening?"

Although earth station facilities have been used for a number of years, there has been no indication that their transmissions create health problems. The universal belief has been that the transmission waves are very narrow and do not disperse enough radiation to create any health problems, according to Lewis Slesin, editor of "Microwave News," a newsletter based in New York.

In addition, the Federal Communications Commission licenses each facility. Before licensing a facility, the FCC determines if the facility will raise local radiation levels above those considered safe, according to an FCC spokesman. The FCC approved the Vernon facilities.

Vernon officials side with vendors

Thus far, Vernon municipal officials have sided with the vendors. The citizens group has objected to the towers' locations, which are within a few blocks of four elementary schools. The city plans to open another elementary school in the tower areas. "The zoning board does not believe that there is a problem with the facilities," Kreindler noted.

Archie Miller, manager of spacecraft operation at the RCA facility, stated, "My six children have gone to the Vernon schools. I would not send them to school there if I believed that there was a health problem."

Evidence seems to indicate that there is a health problem in Vernon, however, according to Slesin. "The question is, 'Are the health problems related to the microwave facilities?' " he said. "There seems to be no other obvious reason, such as a waste dump, for the problem."

Miller claimed that Vernon's radiation level is very low. "Radiation levels are much higher in Manhattan," he asserted. He noted that RCA has facilities similiar to those in Vernon in cities throughout the U.S., including Los Angeles, Houston and Atlanta.

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First user of Amdahl 5868 finds software advantage

Usually conservative Miss. agency takes system plunge

By Jeffry Beeler
CW West Coast Bureau

JACKSON, Miss. — "We tend to be a fairly conservative organization," according to Alex Epperson, computing center director for the state of Mississippi's Central Data Processing Authority (CDPA).

"Being the first ones to install a new system is not something we usually like to do. We like to let other people take the risks and find out where all the problems are."

Recently, however, the CDPA departed from its customary conservatism and did something comparatively radical. On May 5, the organization officially became the first commercial user of Amdahl Corp.'s 5868, the smaller of the two multiprocessor members of the vendor's 580 series of IBM-compatible CPUs.

What made the installation doubly adventurous for the CDPA was its keen awareness that it was acquiring a mainframe with a less than spotless track record. In May 1984, fewer than three months after the 5868's introduction, Amdahl announced an indefinite deferral of all shipments of both its multiprocessor models, which include the top-of-the-line 5880.

The delivery delays made Epperson and his associates think twice about becoming guinea pigs for the previously unused 5868. "They [the deferrals] definitely concerned some of us," he recalled.

Thus far, the CDPA apparently feels no regrets about its unprecedented decision to boldly go where no other Amdahl user has gone before. The reasons for the organization's initial optimism are manifold. First, as a multiprocessor model built around two Amdahl 5850 processors, the 5868 reportedly satisfies the CDPA's critical need for system redundancy. "No single component failure will cause the whole system to stop," Epperson said.

Second, the 5868 roughly equals the computing power of an IBM 3081 Model KX and thus greatly surpasses the combined performance of the two Amdahl 470 series processors it replaced.

But because it runs in single-image mode, the multiprocessor mainframe can simultaneously support two sets of system programs with just one software license. Previously, the CDPA paid for two such licenses, one for each CPU.

> "
>
> *'Being the first ones to install a new system is not something we usually like to do. We like to let other people take the risks and find out where all the problems are.'*
>
> — Alex Epperson
> Mississippi's Central Data Processing Authority

By eliminating unnecessary second-site license fees, the 5868 can pare the organization's software expenses by about $40,000 per year, Epperson said.

As its name suggests, the CDPA furnishes centralized computing services for all the state of Mississippi's government agencies. In all, the organization is said to support some 60 end-user entities.

Until early this month, the CDPA relied entirely for its information processing resources on two older model Amdahl CPUs — a 470V/6 and a 470V/8. But like most other large MIS centers, "we have recently experienced tremendous growth in demand for DP services," Epperson said. The increased burden, in turn, eventually outstripped the two existing processors' available capacity.

Late last year, Epperson and his coworkers began looking for potential 470 series replacements. They deliberately limited their search to mainframes that could be readily upgraded to an even larger model and that could continue to operate despite a major component failure.

"We're a 24-hour-a-day, seven-day-a-week operation," Epperson explained. "We can't ever afford to be down."

The CDPA also required its prospective acquisition to support Extended Architecture (XA). "We expect to begin converting to MVS/XA in a month or so because our virtual storage is very constrained," Epperson said. "We currently run six CICS regions plus two CICS test regions [under MVS/SP 1.3] and have little room for future growth."

To pave the way for the proposed XA upgrade and to overcome its severe storage limitations, the CDPA early this year began issuing formal requests for CPU proposals. The invitations brought bids from several hardware suppliers and prompted the systems agency to evaluate assorted processor models, including the IBM 3081 Model KX, 3084 Model Q and 3084 Model QX as well as the Amdahl 5867 and 5880.

In the end, though, Epperson and his colleagues rejected all the other options in favor of the 5868, which can be upgraded to the 5880 and which reportedly provides better backup capabilities than the 3081. For the CDPA, the smaller Amdahl multiprocessor also offers a more appropriate level of price/performance than the 5880 or 3084, Epperson said.

Calif. sets ergonomics rules

SACRAMENTO, Calif. — Just one day after an ergonomics bill died in the California legislature earlier this month, the California State Office of Information Technology issued ergonomics guidelines for competitive bidding requirements on VDTs and office equipment.

The guidelines will be included in bidding specifications for equipment for state agencies, according to Joseph Pujals, DP manager for the Office of Information Technology.

VDT screens, keyboards and office furniture are addressed in the guidelines, which apply to equipment used by one operator for four or more hours a day. Bidding requirements will include requests for screen brightness and contrast controls, glare reduction screens, an adjustable terminal base and a minimum dot matrix composition of 5 by 7 pixels, Pujals said. Office chairs must be adjustable for height and backrest positions, the guidelines said. Desks and tables must also include adjustable features, according to Pujals.

California is the fourth state to implement guidelines on VDT purchases, following New Mexico, Massachusetts and Wisconsin.

CORRECTIONS

Esca-DSS, the IBM Personal Computer-based decision support system announced recently from Esca, Inc. is available immediately, not in the fourth quarter [CW, May 6].

Due to incorrect information supplied by the vendor, a March 11 product announcement stated that Data 3 Systems, Inc.'s MRPS 38-A Financial Accounting Package is available for the IBM System/34 and 36 minicomputers and that the package costs $94,000. Data 3 Systems' financial accounting package is available only for IBM's System/38 minicomputers for a price of $35,000.

The correct address of Execucomp, Inc., maker of Name Base software, is 620 S. Belmont St., Indianapolis, Ind. 46221.

ACF2 was developed and is maintained and supported by SKK, Inc. of Rosemont, Ill. [CW, April 22]. The software security product is marketed in the U.S. and Canada by the Cambridge Systems Group, Inc., which is headquartered in Los Altos Hills, Calif.

A recent report of an International Data Corp. survey of the IBM 3270 marketplace [CW, May 13] incorrectly stated that shipments of 3270-type terminals would start to decline in 1986. IDC predicts the growth of the 3270 market will begin to decline in 1986.

The correct name of the vendor of Protool/Online [CW, April 22] is Software Info Services, Inc.

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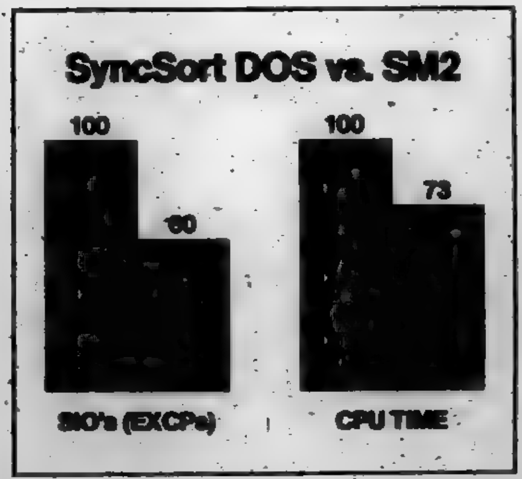

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GENIX

from page 1

"We had to teach our people that there is now a customer on the other end, not just a user from another department," said Paul J. Buchko, Genix manager of operations. "That training was at times as basic as not letting the phone ring more than three times before answering it."

The addition of accounting, marketing, sales and advertising departments differentiated Genix from its former status, but the transition within its data processing operation itself has been no less profound. "We have made a definite shift from systems software to applications software for our users and all that that entails," said Harry B. Matthews, systems programming manager. "We have to be a lot more attentive to what's on the market. As a DP department, we would meet with the other departments probably once a year, and 90% to 95% of the software for that year would already be in place. Now the customers want to know what's available for their needs, and we have to meet [those needs], Matthews said."

CW PHOTO BY [illegible]

Buchko, left, and Matthews

Applications development has become a major focus at Genix, and software packages such as Cincom Systems, Inc.'s Mantis and BGS Systems, Inc.'s Best/1 have been purchased to promote it. "In the past, we only did the nuts and bolts stuff for our users," said Cecil Sexton, director of operations. "Applications development was handled by National Steel's management services, not in the data center."

Genix officials claim that such added responsibility, as well as the need to turn a profit, have sparked some unexpected ideas from the DP staff. Buchko has personally volunteered to boost the Genix effort to woo federal government business, and one programmer is working on his own data base management software for large corporate building maintenance budgets. "We were pleasantly surprised at how quickly the entrepreneurs surfaced around here," said Joseph Murphy, vice-president of operations and technology. "People can do things that they were never able to do before."

Autonomous budget control has created both new responsibility and opportunity for Genix. While the former cost center has had to instill bottom-line awareness in every employee, Genix now has much more flexibility in upgrading both hardware and software.

"It used to be quite an ordeal to get new equipment," Matthews said. "Now, with our customer orientation, we can tell them, 'Sure, we can do that; here's the price.' Before, our hands were tied because it didn't fit into our budget."

Microcomputers used to be a scarce commodity in National Steel DP. Now the IBM mainframe shop also includes 12 AT&T 6300 Personal Computers, four Digital Equipment Corp. 350 Professional Computers, two Apple Computer, Inc. Macintoshes and other micros. "Every customer seems to ask our advice on uploading or downloading from [personal computers]," Matthews said. "What education could we offer if we didn't use them ourselves? We had to get on board quickly, and we have."

Customers free to choose DP service

Genix President Raul Pupo pointed out that Genix's six customers under the National Intergroup corporate umbrella (National Steel, National Aluminum Corp., National Mines Corp., Bull Moose Tube Corp., Distribution Group Co. and the parent company itself) are free to choose any data processing service they wish, but they all have stayed with Genix. The data processing firm's current outside customers are Philadelphia Electric Power Co. and Comsel, Inc., a Chicago-based software development company.

Pupo is seeking more firms like Comsel for Genix's initial target customer base. "We want to establish a track record with large software developers to help sell ourselves to other [customers]," Pupo said.

Genix expects to break even in its first year, although Sexton admitted that the transition from a National Steel DP department to a newly named contract business presents a marketing problem. "It is a pain," he said. "People think we're a small start-up, but we've been doing data processing for 20 years."

STEEL

from page 1

But attracting employees required more than an ad in the local paper. When employees voted to buy the Weirton Steel Division, they also agreed to take an overall 32% pay cut. That pay cut was clearly a disadvantage in attracting new employees, especially since the main targets of the hiring spree were displaced National Steel DP workers familiar with the operations at Weirton Steel.

"I worked for National Steel and had the opportunity to take over [at Weirton Steel] as manager of operations and software, so I came aboard," noted Bernie Waters, manager of operations and systems in Weirton Steel's management services group. "A few others came over from National Steel and had the chance to move into promotions in other areas. We brought some of the better technical people [from Weirton's] applications area into software. The operations staff was already a member of the bargaining unit, so they stayed. And some of the supervisory people came from National Steel. So we built the data center around that core of people."

After finding enough DP professionals to accept positions with the newly formed Weirton Steel, the next step was to establish a data center.

"Naturally, since [National Steel] was selling the division, [it] wanted to move the data center out of here and up to Pittsburgh. In the transition, [it] left us an IBM 3033 AP, software and some disk drives. We took over running that as [National Steel was] moving out," Waters recalled.

CW PHOTO BY [illegible]

Waters

Weirton Steel basically rented the 3033 from National Intergroup for use as an interim system until it could design its own data center. The software left behind by National Steel had been tailored for use in a much larger, more diversified corporation. Furthermore, much of the National Steel tailored software had become outdated.

"Since we were starting fresh," Waters said, "we decided to go with later models instead of keeping the 3033s. We were looking at going with one 3081 but decided we'd rather have two [machines]. So we got two 3083 Model BXs, which are about [6 million instructions per sec.] machines, with 16M bytes of memory for redundancy. We are running [them] 24 hours a day, seven days a week, so we can't afford to be down. Everything is symmetrical: There are two communications controllers, and we have everything set up so that if we lose one system, we have a backup," Waters said.

Weirton's second 3083 is also used for production work and serves as a development processor for the company's TSO users, Waters noted.

In making the switch from the 3033 AP to the two 3083s, Weirton Steel decided to migrate from IBM's MVS/SP operating system to the newer MVS/XA operating system.

Logical time for XA conversion

"We said, '[Extended Architecture (XA)] is coming, why not do it now so that when we have these [machines] loaded up we don't do the XA conversion and disrupt everything we are doing?' It seemed like a logical time to [make the conversion]. We didn't need it for performance increases or virtual storage relief or anything like that," Waters said.

But migrating to MVS/XA was only part of Weirton Steel's software challenge. The newly hired DP staff had to sort through all the software left behind by National Steel and determine which packages were usable.

"In the case of the purchased packages, we replaced about 80% of them with equivalent or better software to meet our needs," said Anthony J. Santilli, director of management services at Weirton Steel. "Of the internally developed software [National Steel] left us, we took what it had, cleaned it up and eliminated the bells and whistles," Santilli said.

With the evaluation process completed, Weirton Steel now considers itself ready to begin developing some of its own software to perform functions that were not available when National Steel was running the Weirton mill.

Develop 'PIN'

"We are now in the process of developing an environment that previously did not exist at Weirton, which we are calling our Process Information Network [PIN]. We are going down to the mill floor, and we are going to attempt, over an extended period of time, to acquire mill floor information [stored in Digital Equipment Corp. PDP-11-based process control systems] and turn it around to those people involved in the production of steel, and assist them in getting the product out the door," Santilli said.

Once the PIN is established, Santilli said, control of it will be turned over to the corporation's operations department, although the MIS department will probably maintain the systems.

Santilli said a major emphasis in the Weirton Steel management systems department has been to maintain contact with the intended users of systems.

"I see a lot more acceptance of the role of management systems here than I did at National Steel," Santilli added. "When someone has thrown stones at you for years because you didn't do the job well, which is the environment most MIS organizations get into over time, it becomes very difficult to acquire things. We came in, we had a clean slate, we asked for something, they gave it to us, we did it. We basically have a good reputation. We have been accepted by our management. Until we fall flat on our faces, we will get all the support we want to get."

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Prime adds Unix environment for 50 series users

By John Desmond
CW Staff

NATICK, Mass. — Prime Computer, Inc. joined the growing body of superminicomputer vendors offering a Unix standard with its announcement last week that AT&T's Unix System V is available for its 50 series minicomputers running Primos, the company's mainstay operating system.

Prime's offering, dubbed Primix, runs co-resident with Primos. Users can switch back and forth between the two operating systems so that Primix users have access to applications written for Primos, a Prime spokesman said.

The kernel of Primos Release 19.4.2 was modified to include Unix functions, according to Ross Summers, systems and product marketing manager at Prime. Kernel support provides for file system stability and virtual memory paging support for the direct execution of large programs.

Prime has been working since June 1983 with Human Computing Resources Corp. of Toronto, a Unix systems house, to develop its Unix offering.

Primix features

Primix includes Prime's C compiler, source-level debuggers, Emacs interactive display editor, data management and computer-aided design and manufacturing utilities and communications capabilities, including Primenet networking software.

Primix contains both the Bourne shell command line interpreter developed at Bell Laboratories and the C shell developed at the University of California at Berkeley. Primix also contains Unix utilities used for program development, communications and text processing.

The Primix hierarchical file system is integrated with that of Primos, so that files and directories created under one operating system can be accessed from the other. File system integration makes it possible for system users to choose between the two operating systems' file security systems.

Primix is available on all 50 series systems, 2250 through 9950, and requires Release 19.4.2 or later of Primos.

In the initial offering, one version will support up to 16 simultaneous users, while another version will support up to 32 users. Prime said a future version will support up to 64 simultaneous users.

Primix licenses are priced according to hardware used and number of simultaneous users supported. Prices range from $7,000 for support of 16 users on a Prime office system to $15,000 for 32 users on a Prime computer room system. Shipments are scheduled to begin in July.

Implementation is protection

One analyst noted that Prime's implementation of Unix is an effort to protect the company's investment in its proprietary operating system and applications software by satisfying users who are demanding Unix features.

But Damian Rinaldi of International Data Corp., a Framingham, Mass.-based market research firm, questioned whether in its efforts to achieve co-residency, Prime has made trade-offs that could affect system performance.

"I suspect [Prime] had to make some trade-offs, but the marketplace will determine whether it made the right decisions," he said.

Prime's Summers said trade-offs were minimal, because both Primos and Unix had their origins in MIT's Multics project with Bell Laboratories and General Electric Co.'s Computer Division in the late 1960s.

Both Digital Equipment Corp. and Data General Corp. first offered Unix implementations atop their proprietary operating systems and later offered Unix in native mode. Summers said Prime has no plans to follow in those firms' footsteps by offering Unix in native mode.

"What's important in the long run is to adhere to the operating system interface as a standard," he said. "How you offer the standard is immaterial."

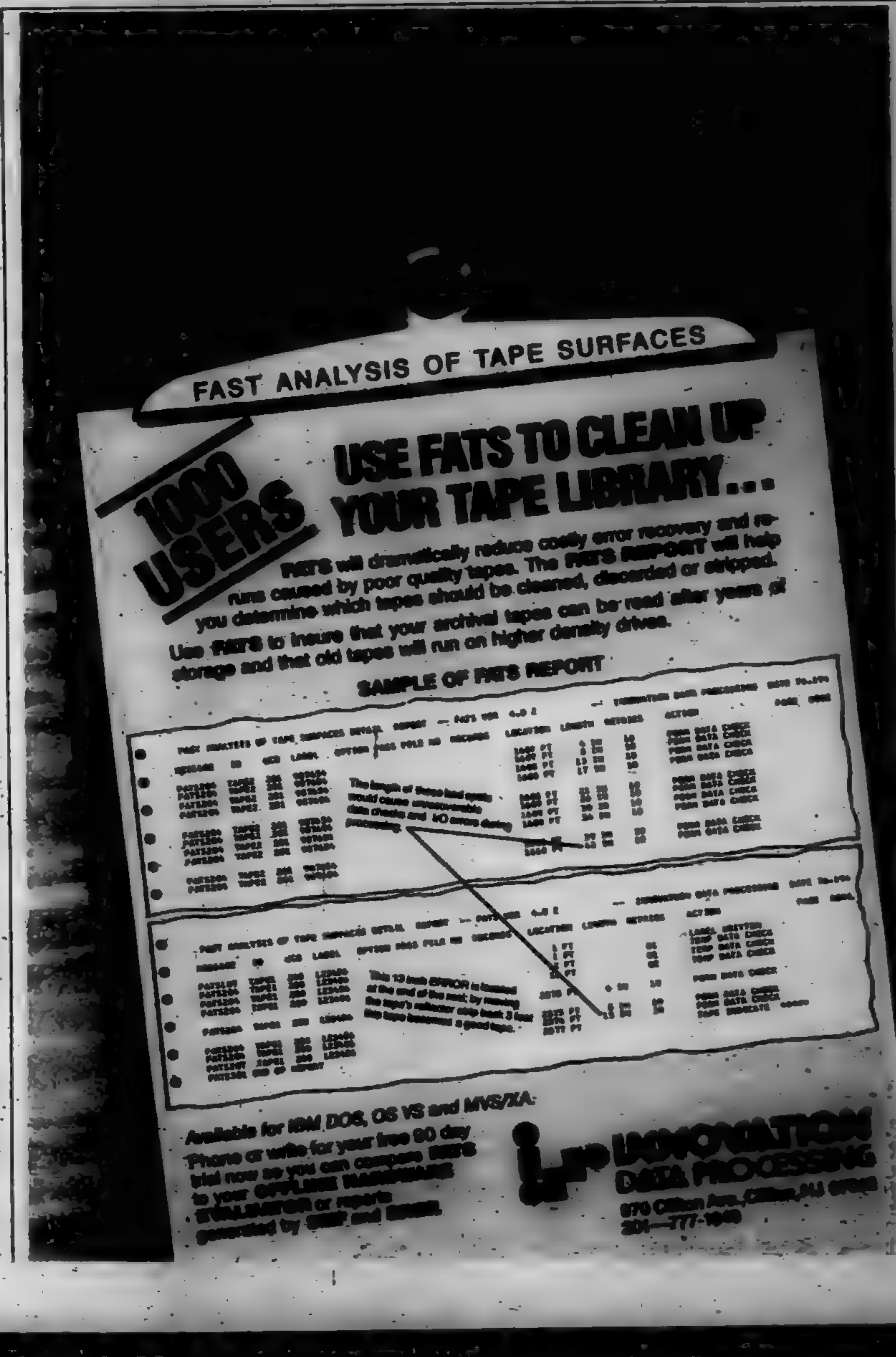
Positive reactions

A spokesman for a New York-based Unix users group saw Prime's entry into the Unix world as positive.

"With the last few of these [hardware vendors] falling into place, it seems like Unix is destined to stay with us for a long time. Generally, it seems to be the answer [for] the end users as far as freeing them from the proprietary nature of operating systems," said Keith Eisenstark, a member of the Unigroup of New York, Inc. board of directors, and marketing manager for Structured Methods, Inc. of New York, a Unix training and consulting firm.

George Elko, district staff manager at New York Telephone Co. in New York, a large Unix user, said, "As an operating company formerly part of the Bell system, we like to see System V branch out. We are open to any vendor who offers good price/performance and support. As a Unix user, I like the fact that more and more hardware manufacturers are getting into Unix."

Prime is located at Prime Park, Natick, Mass. 01760.



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Profits spectrum: HP loses, PE gains

Hewlett-Packard Co. last week reported that second-quarter profits declined 10% from those of the corresponding period a year earlier. The company said it expected the current economic slowdown to continue for several months and reported that incoming domestic orders for the second quarter were down 6% from the year-earlier level.

In an opposing vein, Perkin-Elmer Corp. overcame a slump in semiconductor equipment orders to post a 55% third-quarter profit hike on a revenue increase of 13%.

John A. Young, president and chief executive officer of HP, said the second-quarter results "reflect the general sluggishness being experienced by businesses throughout the U.S." The company posted profits of $129 million, or 51 cents per share, down from year-earlier profits of $147 million, or 57 cents per share. Revenue for the quarter was $1.68 billion, up 10% from second-quarter revenue of $1.52 billion a year ago.

In an apparent indicator that third-quarter results may show no improvement, the company said incoming orders for the second quarter increased only 1% over last year's second quarter to $1.61 billion. Domestic orders were off 6%, but international orders were up 12% compared with a year earlier, according to the firm. However, Young said the company has also noticed growth moderation in international markets.

At Norwalk, Conn.-based PE, third-quarter profits were $21.6 million, or 49 cents per share, compared with $13.9 million, or 31 cents per share, reported a year earlier. Revenue was $340 million, up from $301 million, and the company reported that increases in its analytical instruments and computer segments offset a decline in semiconductor equipment sales.

VAX

from page 1

8600 and the Microvax II, DEC President Kenneth Olsen remarked simply that the Microvax itself "is the middle."

The Microvax II is built around two internally developed 32-bit very large-scale integration chips. The Microvax 78032 microprocessor implements a subset of the VAX instruction set and provides demand-paged virtual memory management, DEC officials said. A matching floating-point chip, the Microvax 78132, typically gives 86% of the 11/780's floating-point performance. System clock speed is 20 MHz.

The supermicro typically provides 70% to 110% the throughput of the 11/780, with most applications in the 90% range, according to Jesse Lipcon, Microvax II product manager.

Limitations

Lipcon added that "there are some things the [11/780] can do that the Microvax can't" — primarily the ability to work in Vaxclusters — and there are restrictions on supported peripherals.

DEC Technical Group Vice-President Edward Kramer said that clustering support was not added because of expense issues and added that Decnet will provide many of the same functions. As more powerful Microvaxs become available, Vaxclusters will be supported.

Throughout the presentation, DEC officials emphasized the VAX family's potential for distributed computing, with machines running identical software at locations ranging from end-user desks to central computing facilities.

Four Microvax II configurations will be offered, ranging from an $18,840 single-user model with 2M bytes of main memory and a 31M-byte hard disk drive to a $43,780 16-user system with 5M bytes of main memory, 213M bytes of disk storage and a 95M-byte streaming cartridge tape drive. The single-user system is being delivered now, while other models will become available in June and July, DEC said.

The Micro-VMS operating system is sold separately, with prices beginning at $2,000, plus $1,000 for media and documentation, for a two-user license. The Ultrix-32m operating software, based on AT&T's Unix, also is available, with prices starting at $1,000 for a two-user license.

The Vaxstation II, a graphics workstation based on the Microvax II CPU, also was introduced, with deliveries set for July. A starting system with 2M bytes of memory, bit-mapped video graphics, a 19-in. monochrome monitor, dual floppy disk drives, a 31M-byte Winchester disk drive and Micro-VMS software is priced at $26,560. DEC will introduce a color version of the workstation by July, said Ronnie Morvay, manager of Vaxstation product management.

The new machines essentially will replace the Microvax I and the Microvax I-based workstations, DEC officials said. A field upgrade kit for the Microvax I, available now, costs $9,700.

Compact optical disk system

Among new storage products, DEC rolled out a compact read-only optical disk system for the Microvax family that stores 600M bytes, costs $2,195 and is expected to ship in July.

The company claimed that it will be the first major computer maker to offer an integrated system storing data on a single optical disk. DEC will handle disk mastering, with prices starting at about $200 per disk in quantities of 50.

DEC also unveiled the 95M-byte Model TK50 streaming cartridge tape drive, priced at $3,450, and the 71M-byte Model RD53 hard disk drive, which will cost $3,350.

DEC is located in Maynard, Mass. 01754.

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Dema conference set

WASHINGTON, D.C. — The Data Entry Management Association (Dema) will hold its Ninth Annual Data Entry Management Conference Sept. 9 to 11 at the Washington Sheraton Hotel here.

The conference theme is "The Year of Discovery," and topics include harnessing the personal computer explosion, maintaining data processing integrity, dealing with VDT health issues and motivating employees. Other topics include networking, service bureaus of the future, incentive systems, word processing and on-line and distributed processing.

The conference costs $465 for Dema members and $520 for nonmembers. A $40 discount applies before June 18, and a special $531 price is available for nonmembers who would like a one-year Dema membership. More information is available from Dema, P.O. Box 16711, Stamford, Conn. 06906.

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Mass. Blue Cross' data entry systems span 20 years

By Donna Raimondi
CW Staff

BOSTON — Blue Cross/Blue Shield of Massachusetts' data entry equipment spans more than 20 years and several layers of technology, but it is all geared to the same purpose: production.

"We want as automated a data capture as possible," said John Kolstad, product manager at Blue Cross/Blue Shield of Massachusetts. Blue Cross pays health care claims and collects money to pay claims, he said, referring to his company's job as that of an intermediary in the claims collection process.

The company has IBM 3083 Model B and 3081 Model G computers, as well as Honeywell, Inc. DPS 5 and DPS 8 mainframes, he said. A Nixdorf Computer Corp. Model 480 minicomputer and Honeywell's DPS 6 minicomputer with Honeywell's Data Entry Facility II screen builder are in a central location and form the basis for a shared processor system for claims and some actuarial data entry, Kolstad said.

For uncomplicated data capture applications, such as premium collections from large corporations, Blue Cross/Blue Shield instituted optical character recognition (OCR) back in the 1970s, a method that has worked out well for that purpose.

But when the company tried OCR for claims, it did not work at all, Kolstad said. The volume of data on even one claim is substantial, he said. Often, some data is handwritten while other data is typed on a variety of typewriter fonts, and all of this is too complex for the OCR technology, he said.

Swapping tapes, diskettes

Blue Cross/Blue Shield's DP people got together with physicians and hospital staffs to work out an automated data entry system for claims. They decided to swap back and forth the tapes or diskettes on which the health care organizations load their claim data, Kolstad said.

"We'll either pay, suspend or reject [the claim], and we return the results on the same media [that] they sent us," he said. This method has increased efficiency, as it is now clear to the providers and to Blue Cross/Blue Shield who is responsible for errors in the tapes or diskettes, he said.

Large account subscribers send in their enrollment data that way now, too, Kolstad said. The management of the 300 tapes per week that result from this method is overdue for improvement, he added. The tapes must be carried, mounted and controlled, all of which is very time consuming.

Kolstad is in the process of connecting the Honeywell DPS 6 minicomputer to the IBM mainframes by using Honeywell Systems Network Architecture emulation packages, he said, in order to communicate the files directly into the system over communications lines using IBM's Synchronous Data Link Control between systems.

Kolstad's plan calls for replacing the Nixdorf minicomputer with another Honeywell DPS 6. He said he wants to do away with the central location of the minis and distribute all work to end-user locations.

Kolstad is also in the process of developing his CICS environment — formerly a Vsam disk file system — into an IBM DMS data base system in order to have more control over information through programming, he said. On the Honeywell mainframes, he uses a homegrown remote transaction entry system with Honeywell's IDS1 data base, he said.

Kolstad

The company still uses about 40 card-punch applications, a carryover from the 1960s and 1970s, Kolstad said. IBM's 026, its original keypunch machine; the replacement IBM 129, a keypunch with about 80 characters of memory; and various early data entry systems from other vendors are still used for old master card files, but nobody actually punches the keys anymore, he said. Operators key in the 80-char. record data to disk, and then the data is switched to the key machines via a black box device, he added.

The old card systems are used mostly in the actuarial departments for specialized "what-if," nontime-dependent reports based on master card files, Kolstad said. Users cannot control the preparation of data as efficiently as they can with more modern equipment, so the company is planning to eliminate the cards and make major improvements to these applications, according to Kolstad.

The biggest problem for Blue Cross/Blue Shield's information systems group is keeping up with changing technology, Kolstad said.

He said he visits other user sites, joins professional organizations such as the Data Processing Manager's Association and uses Atlantic Software, Inc.'s SDM/70 series of guides to design, develop and install data processing systems in the process of upgrading the company's data capture systems.

ARE IBM'S AND WANG'S

Vendor Supplied Features	Data General MV Family	IBM System/36 Family	WANG VS Family
Office Product	CEO	Personal Services/36	VS Office
First Volume Delivery	7/82	7/85	3/85
Installed Sites	3000+	0	50*
Integrated Word Processing	yes	promised	promised
Integrated Query	yes	promised	promised
Integrated E-Filing	yes	promised	promised
Integrated Spreadsheet	yes	no	no
Consistent User Interface	yes	promised	no

Vendor Supplied Features	Data General MV Family	IBM System/36 Family	WANG VS Family
INTERRUPT from WP	yes	promised	no
Industry Standard LAN (IEEE 802.3)	yes	no	no
UNIX™	yes	no	promised
Database Mgmt. Relational Codasyl	 yes yes	 no no	 yes no
High Level Application Languages	12	4	6
Integrated with laptop PC	yes	no	no
Maximum Number Local Users	100+	36	100+
32 Bit Architecture	yes	no	yes VS 65,85, 100,300 no VS 15,25,45

Data General delivers today what IBM and Wang promise tomorrow.

*According to INFOWEEK 3/4/85

Technology upgrades increase duties of data entry clerks

BOSTON — Data entry clerks are forced by the sophistication of today's interactive data capture systems to know more about their company's business than they had to know 10 years ago. To ensure clerks' productivity, programmers and managers must be aware of data capture efficiency factors.

In an on-line, interactive CRT-based data capture system, the person-to-machine interface has forced operator training to change dramatically in order to maintain sufficient levels of ability, said John Kolstad of Blue Cross/Blue Shield of Massachusetts. A by-product of this increased training and responsibility is job enrichment for the clerk, he added.

When a clerk completes the fields in a fully formatted CRT screen, he must be able to deal with errors that slow down the process, Kolstad said. Clerks are not keying in a machine-like fashion anymore, he said.

Designers of the screen formats should realize that unnecessary data, awkward positioning of fields and slow detection of errors can retard the data capture process considerably, he said.

"You don't want keyers to be keying in awkward fashion," he said. The format should lead the operator from left to right, from top to bottom — the fundamental design of a screen format. If something is keyed incorrectly, it is important to catch the error at that point instead of after more fields have been filled in, he added.

System response time important

The system's response time is very important, Kolstad said. Studies show that if response time is slower than three seconds, the clerk's attention will be on something else, and productivity will decrease. Cryptic abbreviations on the screen format that are different from the title on a source form introduce a margin of error or lack of understanding, so the naming of data elements is crucial, he said.

The cursor is the operator's tool, Kolstad said. The ability to navigate it easily through the screen is important.

Managers should be aware of the comfort of their data entry clerks, Kolstad said. System demands must be tailored to human beings, but the extent to which operators should be made comfortable is a management issue, he said. "There is a balance, but if you expect too much, the person can't deliver," he said.

Important considerations include the chair design, keyboard height, lighting and length of time spent in front of the system, he said. Managers should try to correlate these factors with productivity measurements to see what works for the clerks, he said.

There is a threshold that you can exceed in what you demand from operators, Kolstad cautioned. The consequences of unreasonable demands can be high turnover, inaccuracies in the data and lack of efficiency, he said.

— [illegible]

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Ausgraph '85 set for August

BRISBANE, Australia — The Australian Computer Graphics Association (ACGA) has announced that the Ausgraph '85 conference and exhibition will be held here August 12-16.

The third annual computer graphics and computer-aided design and manufacturing conference will cover animation and graphic arts, business graphics, exploration and mining, architecture and engineering, cartography and mapping, advertising, image processing, printing and publishing, video games and education.

Among the speakers are Carl Machover of Machover Associates and Stanley Klein, author of the "S. Klein Newsletter."

More information is available from Conference Secretariat, Ausgraph '85, P.O. Box 29, Parville, Victoria, 3052, Australia.

Firm to release AI directory

SCOTTSDALE, Ariz. — A directory of more than 200 companies in the artificial intelligence industry will be published this summer by DM Data, Inc., an AI consulting firm based here.

The directory is expected to list firms involved in AI, expert systems, voice recognition systems, artificial vision, natural language, symbolic computing and AI programming languages.

The directory is said to include company names and addresses, contact names, product information, company sales figures by product category and a master telephone directory.

DM Data is located at Suite 100, 6900 E. Camelback Road, Scottsdale, Ariz. 85251.

Informatics nixes Sterling's takeover bid

Reelects members to contested seats

By Kathleen Burton
CW West Coast Bureau

LOS ANGELES — By a more than two-to-one margin, the management of Informatics General Corp. won a proxy battle with Sterling Software, Inc. at Informatics' recent annual meeting.

Informatics' shareholders spurned Sterling's cash buy-out offer by reelecting Informatics Chairman Walter Bauer and Director Clarence W. Spangle to their respective, challenged seats on Informatics' seven-member board.

In a preliminary tally completed by Informatics' auditors last week, Bauer and Spangle won 2.35 million votes, compared with 960,000 votes for Sterling Chairman Sam Wyly and Chief Executive Officer Sterling Williams. The vote represented 70% of Informatics' outstanding five million shares.

Dallas-based Sterling, which first offered $25 per share and later upped the offer to $26 per share, was seeking the election of its own pro-takeover directors and the defeat of antitakeover provisions.

Informatics' antitakeover fair price amendment and a "green mail" proposal designed to prevent a stock acquisition by Sterling were both defeated. According to Informatics, both proposals required that a majority of the company's outstanding stock held on March 15 be voted.

But since recent heavy trading on Wall Street caused 70% of the company's stock to change hands since that time, new shareholders were ineligible to vote, according to an Informatics' spokesman.

The firm initially had no intention of being acquired, Bauer said, but the heavy trading during the last month "indicates that our shareholders want a merger, which Informatics' board will now aggressively pursue."

Dan McGurk, head of a special

See VOTE page 13

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Micros play key role in detecting E. F. Hutton scam

By Maura McEnaney
CW Staff

HARRISBURG, Pa. — When the U.S. Postal Inspection Service here began investigating incidents of suspected mail and wire fraud at E. F. Hutton & Co. three years ago, inspector John Holland was not quite sure how to approach it. Not long after, however, the novice computer user found himself supervising a micro-based document inventory system and spreadsheet program that produced crucial evidence against E. F. Hutton in a multimillion dollar cash transfer scheme.

Earlier this month, the brokerage admitted it was guilty of conducting a check-kiting operation that allowed it to receive interest on uncollected funds. Through the use of a customized document control software program, two IBM Personal Computers and two IBM Personal Computer XTs working in a stand-alone environment, the Harrisburg postal inspectors were able to recreate the pattern by which E. F. Hutton reportedly transferred its deposits throughout the country, Holland said.

The Harrisburg postal inspectors were called into the case because uncollected E. F. Hutton checks were being transferred from a Wilkes-Barre, Pa., bank. The inspectors first created a data base from information contained in more than five million subpoenaed records from E. F. Hutton and approximately 600 bank accounts through which the checks were passed, he said. The checks were inventoried by account and by month.

Using a document control software program based on a U.S. Department of Justice model and developed by a Washington D.C.-based postal inspector, the Harrisburg office established a system, preparing a list of the documents that could be used as exhibits in a trial. The program automatically assigned a sequential document code and control number to each piece of evidence, Holland said. E. F. Hutton, however, filed its guilty plea before any trial proceedings began.

Lotus 1-2-3 used

Lotus Development Corp.'s 1-2-3 spreadsheet package was used by the inspection service to trace E. F. Hutton's deposit patterns, according to Holland. That application allowed the investigators to examine E. F. Hutton's customer receipts, funds drawn from its accounts and funds transferred between E. F. Hutton's offices throughout the country on any given day, he said. The tallied information was displayed in bar charts, line graphs and pie charts. Ashton-Tate's Dbase data base management package was used for inventory control, he said.

Less than a month after it implemented this application, E. F. Hutton's pattern became clear, Holland said. The investment firm reportedly was overdrawing its deposit accounts and covering those deposits with checks from other E. F. Hutton accounts. E. F. Hutton would allegedly create additional float by delaying the check-clearing process. Normally, funds are transferred from branch banks to regional banks to money center banks.

However, the Postal Service discovered E. F. Hutton often modified that process, transferring funds among several branches or regional banks before going to the money center banks.

"After the first month, we could see a pattern. You could see exactly what money came in from customers, what money came in from other sources, and [what was] the company's book value," Holland said. "We had to rely on the computer to actually understand what was going on."

VOTE

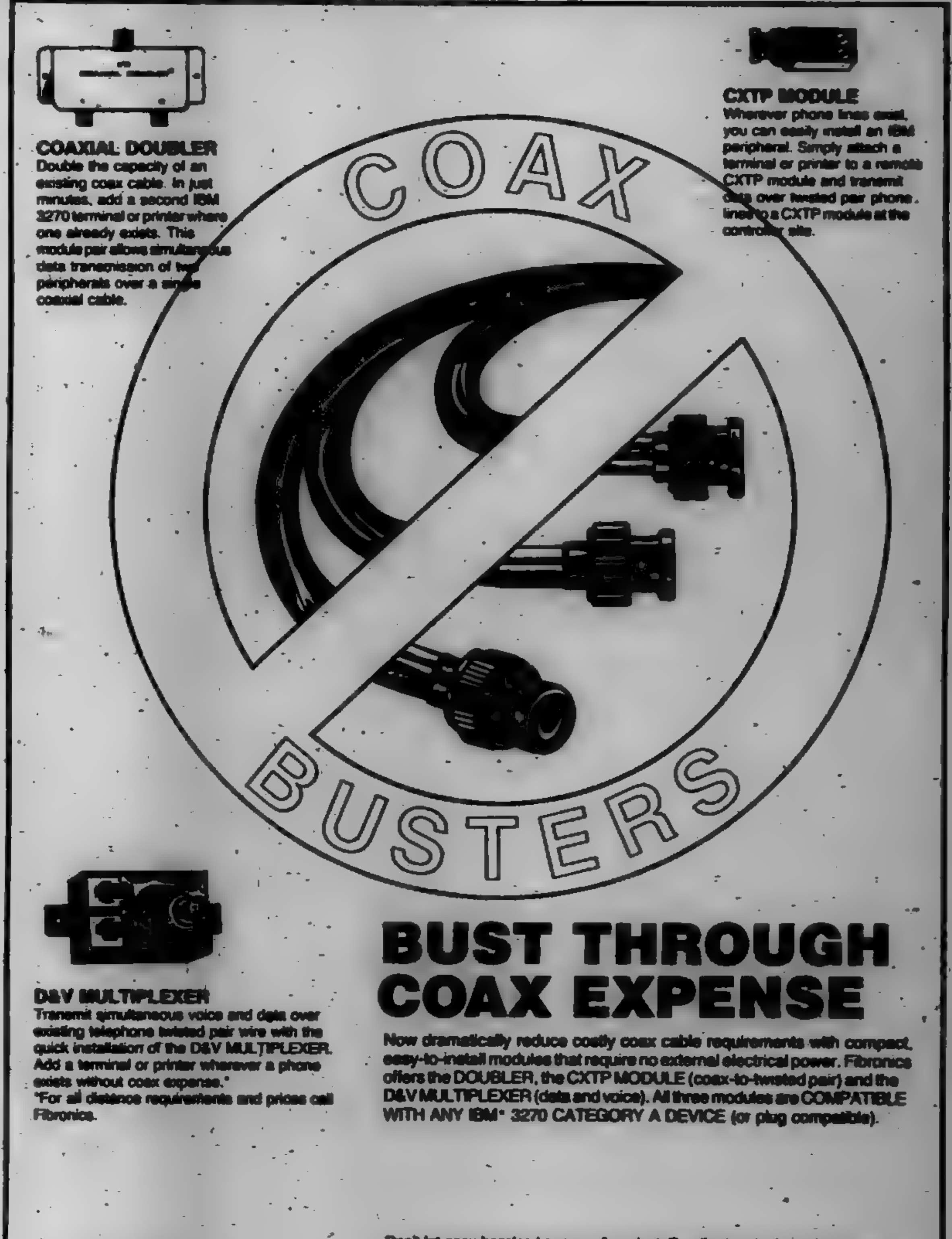
from page 12

committee within Informatics that is seeking possible buyers for the company, said Informatics is considering a transaction with unnamed parties that could lead to a leveraged buyout. The negotiations would probably include members of the company's management and would result in taking the company private, he said. Informatics is holding discussions with several outside parties, but no firm offers have been made, McGurk said.

According to Bauer, Informatics' value was the central issue of the decision to reject the Sterling offer. "We're worth much more than the Sterling offer," Bauer claimed. However, he declined to name a figure that the company would accept.

Wyly disagreed with Bauer's valuation of the company. "If you base Informatics' value on projections, its profits were down 90% during the first quarter, and there's no robust upturn expected for the second quarter, either," Wyly said. He said his offer was "very aggressive" and predicted that "there will be no other bidders at our level. If Informatics can get a better offer [than ours], they should take it." But he did not rule out the possibility of a higher offer from Sterling in the future.

Wyly denied that a due diligence contingency in Sterling's bid was designed as an escape clause. The contingency states that Sterling's offer depended on the examination of Informatics' books and records by auditors.



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Firms see need for integrated systems, but few buy

Survey: Installations trail perceived needs

By Charles Babcock
CW New York Bureau

NEW YORK — The vast majority of Fortune 500-type companies know which integrated office systems are needed to provide business-oriented management information. But only a small fraction of them — about 5% — have such systems in place.

That was one of the key findings in a recent survey conducted by Arthur D. Little, Inc. (ADL), a Cambridge, Mass., management consulting firm. Leon Jackson, a senior consultant with ADL, said the perception of the need to bring more sophisticated systems to bear on information resources is widespread, but installation of such systems lags far behind. He cited the survey results in a talk at the Associated Information Managers' annual conference here last week.

"In theory, companies in the U.S. are moving toward the concept of chief information officer and information resource management. In fact, there is a tremendous indigestion problem out there," he said.

The January survey interviewed employees within corporations responsible for systems integration; it covered 108 bellwether client companies of ADL, he said.

The need for integrated systems was not recognized in all cases. Three percent of the respondents said word processing represented the degree of office information systems they needed. Another 4% said word processing plus such additions as graphics or spreadsheet analysis represented their levels of need.

Another 17% cited electronic mail and office applications programs as adequate. But 76% said integrated systems would tie word processors, terminals and personal computers together into local-area networks and allow the firms to communicate with departmental computers and corporate mainframes.

Of this group, "Five percent think they have integrated information systems now, and they're being optimistic," said Jackson.

When asked if they had a plan to integrate office information systems, 21% said they did and 58% said they were drawing one up. Twenty companies, or 19% of the respondents, acknowledged they had no plan. Of these, eight firms said they had no intention of trying to get one, Jackson said. The eight represented holding companies with small corporate staffs overseeing scattered divisions, he added.

Obstacle to integration

An obstacle to effective information resource management is that integration requires a joint effort by separate and often competing departments, Jackson continued. When asked if DP, telecommunications and office systems directors report to the same executive, 78% said they did and 22% said they did not.

Of those who said they did, 57% reported to an MIS vice-president or executive, which, according to Jackson, is an indication that "the MIS director is still very strong in this area."

Fifteen percent reported to a chief information officer; 9% reported to a chief operations officer; 6% reported to the chief financial officer; and 5% reported to an administrative staff member. The remaining 8% reported to "other" executives.

When Jackson worked as a consultant to FMC Corp., a defense, machinery and chemicals company in Chicago, the MIS director reported to the chairman and the telecommunications director reported to the chief financial officer. The two executives had to talk to each other to figure out what their respective departments were doing. Jackson said it was never suitably explained to him why the organizational structure worked that way, but he surmised that the chairman "had a bond of loyalty to the [chief financial officer] and was reluctant to take part of his responsibility away from him," Jackson said.

FMC eventually reorganised to have the MIS and telecommunications directors report to the same executive. "The idea of information resource management is catching on," he said, "but we still have a long way to go."

A second speaker, Barbara M. Rodriguez, national coordinator of office systems for Arthur Young & Co., said the accounting firm is trying to interconnect the minicomputers and microcomputers in its 90 regional offices. It also wants them to have access to mainframes at its New York headquarters.

"It is not the technologist who is driving [office integration]. It is the business person" seeking to provide better services to his customers, she said.

Until recently Arthur Young spent $3 to $9 million annually on technology without any plan for integrating it into the organization, she said.

Even with a plan, she said, an extensive "marketing" effort is needed within the organization to win acceptance for it, and usually "a change agent" is selected at each office "to sing the praises of what we're doing," she said.

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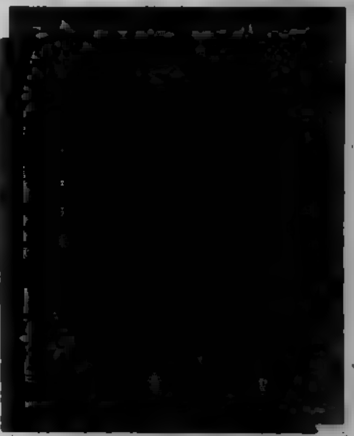
AT&T streamlines DP section in postbreakup consolidation

By Paul Korzeniowski
CW Staff

While divestiture left data processing departments at the former Bell operating companies relatively unchanged, the same cannot be said for DP shops at the former parent, AT&T. Since divestiture, AT&T DP staffs have shrunk by approximately 5% as the communications company has consolidated DP departments and functions.

"We are attempting to develop an architecture that will be consistent throughout the organization," noted Joseph Laferrera, system engineering vice-president in the Information and Telecommunication System division at AT&T Technology, the company's unregulated sector.



A key to that structure is the integration of functions that were previously duplicated by various departments. DP functions for the communications company's regulated entity, AT&T Communications, which includes the former Long Lines division, were combined with those of the General Department, AT&T's central operation.

"We had to blend two operating structures into one, taking the best each had to offer," said Dwayne Luse, director of the finance department in the systems development and processing division at AT&T Communications.

Systems integrated, cuts made

As systems were integrated, cuts were made. "When we integrated systems, we attempted to consolidate functions so fewer people would be needed to run them," Luse remarked.

Divestiture created other opportunities for consolidation by forcing AT&T to redesign many existing systems. "We had to add some 45,000 telephone operators to our payroll system," Luse said. "Before divestiture, the operators were paid by the operating companies. The design of these systems was difficult because we added features and tried to cut staff."

Cuts in DP personnel were principally made in operations areas. When operations staffs were cut, staff members were transferred to other areas of the company, Luse said. "There were a number of departments that needed people with computer experience," he said.

Thus far, programmers have been spared from the cuts because the need for their services has increased. Laferrera listed two reasons for the increased need: technical advances and divestiture.

"There are office automation applications today that were not possible a few years ago," he noted. "We want to supply our workers with the latest equipment."

Laferrera listed a number of applications that were spawned by the breakup:

- Customer billing, which had been handled by the former operating companies.
- Supplying billing data to independent suppliers as well as to the former operating companies.
- A consumer product division that was formed to sell AT&T equipment at J.C. Penney Co. and Sears, Roebuck & Co.

Some of these functions were so complex that new departments were created. "A 300-person department was formed to supply billing and payroll information for one application," Laferrera stated.

Despite the new applications, Laferrera noted that AT&T planned further consolidation. "We are constantly evaluating our applications to determine if there are any cost-cutting measures [we can implement]," Laferrera said.

'Legally forbidden to complete'

"There are a number of items that we are legally forbidden to complete. [For example, the regulated and unregulated arms of AT&T are unable to consolidate DP functions.] As these restrictions are lifted, we will consolidate other areas," he said.

The communications company has tried to ease the consolidation process. "Before we integrated [AT&T Communications] and [the] General Department, we undertook a two-year study," Luse stated. "Management and entry-level employees were transferred between departments. Changes were carefully planned. The integration process is almost completed. There are only a few small pockets that have to be incorporated.

"To judge how well the integration was handled, we monitored our turnover rate. It remained at a rate attributable to normal attrition. There hasn't been a significant increase since divestiture."

DIVESTED

from page 1

vice-president estimated that there were 1,000 Nynex data processing employees in New England.

Ironically, managers cited companywide layoffs as a principal reason for DP staff increases. "When other departments were forced to cut their staffs, they [still] needed a means to complete their work," Gallagher noted. "For many departments, the best method was through automation."

These applications required additional data processing workers. "When Nynex offered an early retirement option, we did not allow data processing people to take it," Gallagher maintained. "We just couldn't afford to let our people leave."

Cuts in other departments' budgets, coupled with increases in DP staffs, created some predicaments. "With other departments cutting staff, we really had to justify increases in our budget, for it was carefully scrutinized," Gallagher said.

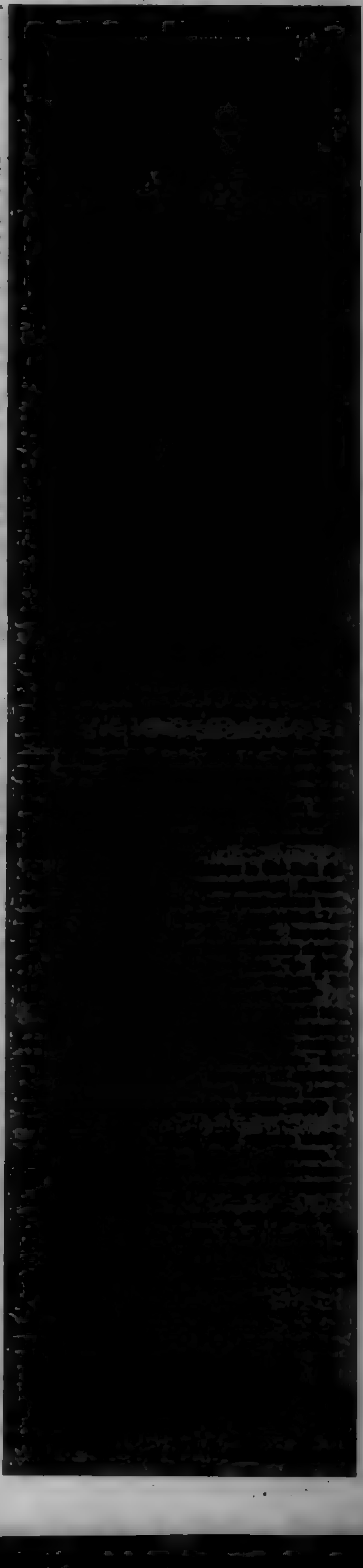
Additionally, divestiture created more new applications than the number of old ones it eliminated at some of the former operating companies. "For example, we no longer run applications for customer installation services; that is solely an AT&T function," Gallagher said. "But we supply billing and customer information to a number of carrier services like [MCI Communications Corp]."

Some applications, originally designed to supply AT&T with financial information, have changed slightly. "We supplied AT&T with financial data that it would consolidate for various financial reports," Illinois Bell's Muntner said. "Now, rather than feeding the data to AT&T, we send it to Ameritech."

Although the data processing departments have thus far been largely unaffected by divestiture, managers agreed that significant changes could be made in the next few years, as the seven regional operating companies function increasingly as separate units. This shift will cause them to consolidate some functions, including data processing functions, managers said.

"We have not merged our New York and New England data processing departments per se, but we are attempting to integrate some functions," Gallagher noted. "For example, when a new payroll system is required, either the New England or the New York branch will design and maintain it rather than designing two separate systems." Gallagher discounted the possibility of a complete merger of Nynex's New England and New York data processing departments.

The merger route is a possibility at Ameritech, where the company has undertaken a study to determine which DP functions can be united.



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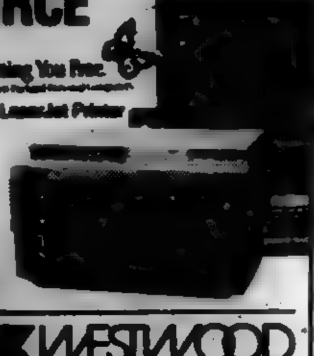


NEWS

WASHINGTON UPDATE
CW Washington Bureau

Tymnet wins bid for government net

WASHINGTON, D.C. — The U.S. Department of the Interior last week awarded a $20.8 million contract to Tymnet, Inc. of Vienna, Va., for a packet-switching data communications network for the department's offices and bureaus.

The nationwide service eventually will replace parts of "the myriad of fragmented communications services" now used by the department, according to Interior Under Secretary Ann McLaughlin.

McLaughlin said the department expects substantial savings in data communications costs. She said the U.S. Geological Survey alone is expected to reduce data transmission costs by 30%, for a savings of $270,000 per year.

Senators introduce computer amendment

WASHINGTON, D.C. — Four U.S. senators recently introduced legislation that would revise the Computer Fraud and Abuse Act of 1984 to protect from criminal prosecution federal employees who disclose government information.

The bill, S. 610, was introduced by U.S. senators Charles McC. Mathias Jr. (R-Md.), Patrick J. Leahy (D-Vt.), Edward M. Kennedy (D-Mass.) and William S. Cohen (R-Maine).

The 1984 law makes it a crime to disclose information stored in a U.S. government computer if the defendant gains access to the computer without authorization. The bill limits the scope of the law to prohibit disclosure of only "personally identifiable information" covered by the Privacy Act of 1974.

Mathias and Leahy said the 1984 law's broad language could require prosecution of "whistleblowers" who disclose information about federal fraud and abuse. In addition, they said, the law could discourage federal employees from releasing information under the Freedom of Information Act for fear of prosecution.

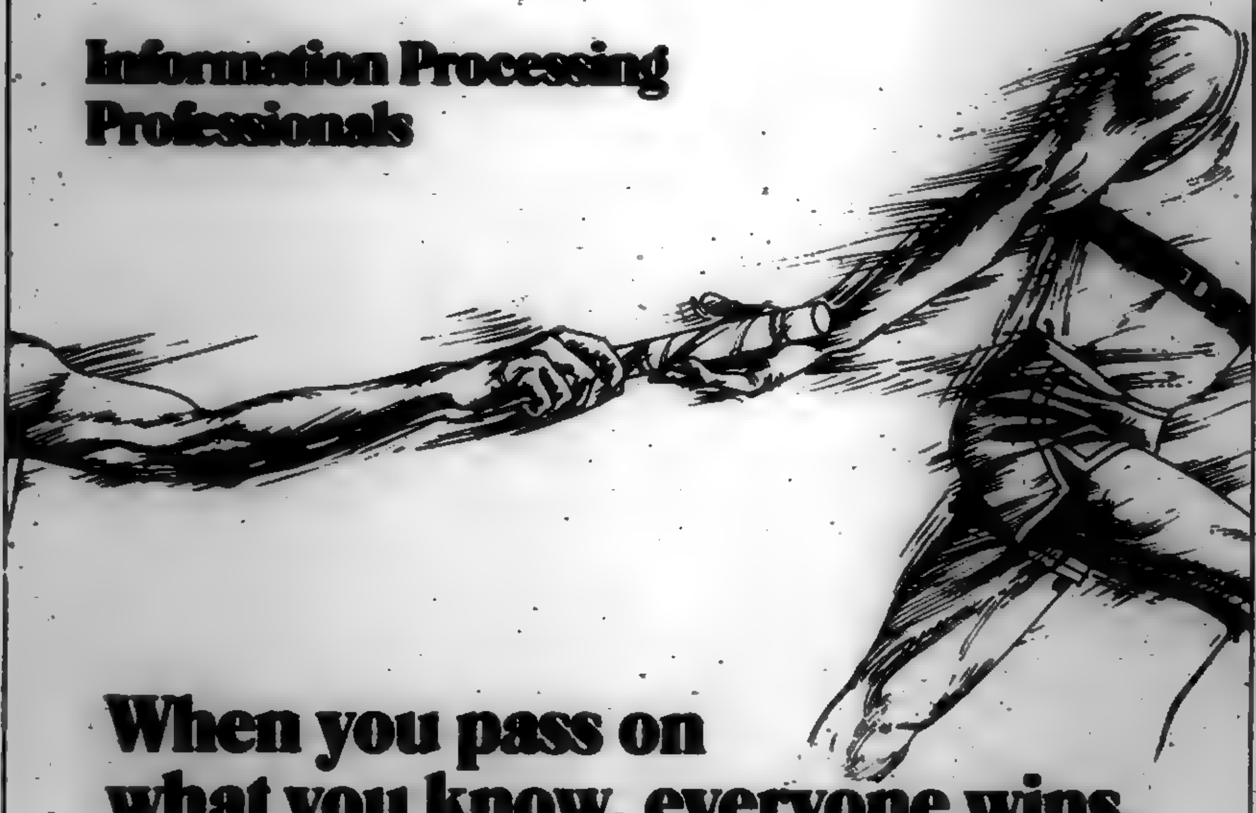
Pentagon attempting to cut systems costs

WASHINGTON, D.C. — Pentagon officials, responding to criticism from the U.S. Congress about Pentagon computer procurement and management practices, recently testified that they are on the right track toward reforming those practices.

John P. Springett, director of information resources management systems at the U.S. Department of Defense, told the U.S. House Appropriations Committee's Subcommittee on Defense of the following practices:

- The department increasingly is purchasing its computers outright, rather than leasing them. For leases already in existence, the military is buying out the leases, when that is cost-effective.
- The department is placing greater emphasis on acquiring computers through open competition rather than relying on General Services Administration list prices, which tend to be higher than competitive contracts.
- The Pentagon has begun to create an inventory of its computers and has logged nearly 28,000 units, with 5,400 of them valued at more than $50,000.

Information Processing Professionals



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Courts wary of using computer printouts as evidence

By Mitch Betts
CW Washington Bureau

Legal specialists are warning U.S. firms that computer printouts are not automatically admissible as evidence in some state and federal courts.

Because some judges distrust computer-generated records, the DP manager may be required to testify about the procedures used to create and ensure the integrity of the business records, according to several lawyers interviewed recently.

"It's not a foregone conclusion that a judge is automatically going to accept your computer-generated record," noted Michael D. Scott, an attorney in Manhattan Beach, Calif. The problem, he said, results from vague state laws and federal and state judges who view computer records as unreliable.

Printouts inadmissible

In several cases — one as recent as 1983 — Illinois judges ruled computer printouts inadmissible because businesses failed to provide detailed testimony about how the computer hardware and software works when preparing the record, according to a report in the *John Marshall Law Review* (Vol. 16, No. 1), published by the John Marshall Law School in Chicago.

In essence, the law considers all documents inadmissible hearsay unless they qualify for an exception to the hearsay rule, such as the exception for business records that are contemporaneous and trustworthy, attorneys said.

But they said it is sometimes difficult for computer-generated records to satisfy those standards. For example, it is hard to tell exactly when a business record was stored in the computer — judges are very skeptical of data entered just before trial — and it is difficult to prove the printout is not a product of self-serving selective retrieval.

As a federal district judge in New Jersey put it, "The computer is a marvelous device that can perform countless tasks at high speed and low cost, but it must be used with care. This is because it can also make errors at high speed." (The judge was skeptical of Internal Revenue Service computer records in the 1975 case of Neal v. U.S.)

More credibility

But courts increasingly are accepting computer printouts as they recognize that companies rely on their DP operations and have a strong business incentive to maintain data integrity, the legal sources said. Furthermore, one source said the emerging technology of unerasable optical storage may provide more credibility.

Robert F. Williams, president of Chicago-based Cohasset Associates, Inc., a consulting firm that specializes in records management, said that because records cannot be removed from unerasable optical storage systems, records stored on such systems should be more acceptable in court than records kept in magnetic storage. In a presentation at the recent conference of the Association for Information and Image Management in Washington, D.C., however, Williams noted that this assertion has not yet been tested in court.

> *'The bottom line is to run a business-like DP operation, with logs that document the entries and procedures.'*
>
> — Daniel T. Brooks
> Washington, D.C., attorney

Computer law specialists strongly urged firms engaged in litigation to prepare testimony supporting the accuracy of their computer-generated evidence. "Be prepared to have somebody challenge the authenticity and accuracy of a computer-generated record and get someone in DP who understands the file maintenance and security procedures who will testify," recommended Daniel T. Brooks, a Washington, D.C., attorney.

"The bottom line," Brooks concluded, "is to run a business-like DP operation, with logs that document the entries and procedures."

Peter M. Storm, author of the *John Marshall Law Review* report, argued that detailed testimony about the computer system would be unnecessary if courts stopped discriminating between written and computer records and adopted a "presumption of reliability" for computer printouts.

"Requiring an extensive and technical foundation [of detailed testimony] as a prerequisite to admissibility only perpetuates the judicial myth that electronic record systems are inherently less trustworthy than conventional ones. It increases the complexity of trials and . . . unfairly burdens the proponent of a computer record," he wrote.

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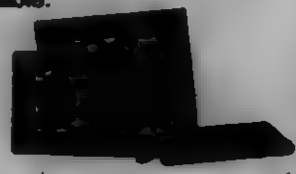

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Michael Lilly
Director, Corporate MIS/Operations
AMF, Incorporated

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As Michael Lilly says, the company's decision to stake its future in MIS on Digital's VAX computers – and the office automation tools like All-In-1,™ DECnet™ and DECmail™ software that run on them – was hardly a snap judgment.

Every major computer company was considered. Lilly says that, "dollar for dollar," only Digital's VAX system offered the power, ease of use and communications capability with other computer systems – including IBM – that AMF needed.

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Lilly and his group didn't have to wait long. The system was up and running within days.

Reaction within the department was rapid and gratifying. "We really got excited about it," says Lilly. "Immediately, we were communicating better." And there was more – spreadsheets and word processing and a mail system. "Suddenly," Lilly said, "we had a vehicle for total open communications to every important person or department in the corporation."

Part of the story behind AMF's almost instantaneous rapport with the VAX system is that it's so easy to use. Menus and operating commands are the same for each fully integrated application. Whole functions are completed in as few as two keystrokes. And because everything is in plain English, it's literally as simple as A-B-C to incorporate

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The first tests of VAX equipment proved so successful, that AMF quickly enlarged the system, adding terminals and DECmate™ and Rainbow™ personal computers. New departments went on line, for example finance.

"And that," says Lilly, "really created an explosion." Now AMF is implementing programs like general ledger systems, stock options and inventory systems, and keeping more efficient and flexible records, from accounts payable to personnel.

Adds Lilly, "People here are screaming to be on the VAX system, and there's got to be a reason for that. And I tend to think that it's return on investment, mailing lists, discounted cash flows, spreadsheets they couldn't even begin to do before, versatility, tremendous graphics potential. It's just a whole world of opportunity that is elevating AMF to the forefront."

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Lilly feels the VAX system has already elevated his own department to the forefront.

"It's put corporate MIS on the map," he says. "It has effectively increased productivity and efficiency. People are beginning to believe we can do the things we say we are going to do."

And what VAX technology is doing for his group, Lilly believes, it can do for all of AMF, or indeed for any company. "Any corporation that employs this technology," he says, "is going to get the competitive edge.

"This technology will explode. Because there are a thousand reasons to have it. But what it really all boils down to is this: everybody will want a VAX system because they can do the job better, faster and more efficiently.

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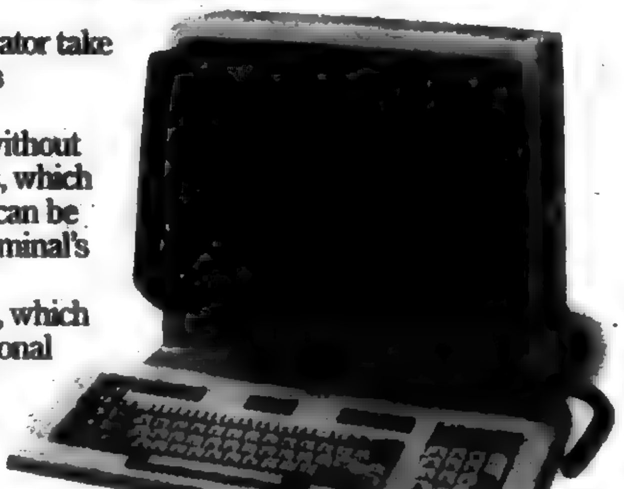

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OCC orders service firm to cease 'unsafe' practices

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — In an unusual move, the Office of the Comptroller of the Currency (OCC) recently issued an enforcement order against a firm that provides DP services to national banks and others. The agency ordered the unidentified firm to cease the "unsafe and unsound practices" identified by bank examiners.

The OCC did not name the subject of its enforcement order or specify the unsound practices, a spokesman said, though it is evident from the order that the firm had financial problems that could have disrupted service to banks.

The company agreed to the enforcement order, the agency said.

The OCC, a unit of the U.S. Department of the Treasury that regulates national banks, usually issues enforcement orders against banks with unsound practices but rarely against companies that are not banks, the spokesman said. OCC officials asserted that the agency has the authority to regulate and supervise companies that provide DP services to national banks under the Bank Service Corporation Act.

The action "underscores the OCC's belief that [DP] plays an integral part in the safe and sound operations of financial institutions," the statement said.

The OCC's order requires the data processing company to do the following:

- Provide timely, audited financial information to the OCC; make financial information available to banks serviced by the company; and implement a contingency plan for disruptions of service.
- Establish internal controls and conduct regular audits to ensure the quality of financial data provided to national banks and their customers.
- Provide adequate liquidity in advance when operating losses are identified.

The OCC warned that it will continue to review carefully the companies that handle bank records and transactions and also expects banks themselves to take appropriate precautions.

"The OCC encourages banks to evaluate outside servicers at least annually," the statement said. "When a servicer's condition is found to be unsafe or unsound, the OCC expects banks to seek other sources for the services," it concluded.

In 1981 the comptroller's office advised banks to review the financial condition of their servicers, and in 1983 the office advised banks to evaluate annually the contingency plans of outside servicers.

This January, the OCC published a notice reinforcing its recommendation that banks be informed of the financial condition of DP servicers.

Reaction to the comptroller's enforcement action from a major DP service firm was favorable. Michael Nugent, government affairs counsel here for General Motors Corp.'s subsidiary, Electronic Data Systems Corp., said the comptroller's policy is "reflective of the critical role that [DP] plays in the banking industry — it's the Achilles' heel."

Nugent said the policy "puts service firms on notice that they've got to keep their financial books in order" and thus may enhance the industry's credibility. The regulatory activity does not threaten the industry, unless it expands into managing the business affairs of DP service providers, he said.

Telecom meet to address array of topics

NEW YORK — Communications Week '85, a conference on the state of the voice/data communications industry, will be held June 17-21 at McGraw-Hill, Inc. world headquarters here.

The keynote address and a day-long series of reports from the communications industry by executives, journalists and consultants will be given Wednesday, June 19.

The keynote speaker will be Marty Cernese, president of the Association of Data Communications and director of operations for Aeronautical Radio, Inc. The topic of Cernese's speech will be "The User Focus in Communications."

Monday and Tuesday, June 17 and 18, will feature seminars in data communications, micro communications and compatibility, telecommunications and computer communications security.

Thursday and Friday, June 20 and 21, will be devoted to technology workshops on a range of topics including micro-mainframe links, fiber optics, protocol conversion, micros and local-area networks, intracity private networks and network control centers.

The cost of the conference ranges from $195 for Wednesday only to $1,195 for the entire week.

More information is available from Datapro Research Corp., 1806 Underwood Blvd., Delran, N.J., 08075

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Former Bell operating firms get OK to upgrade Centrex

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The Federal Communications Commission refused to kill the efforts of former Bell operating companies to revive their flagship business service — Centrex — with upgrades such as call routing, call forwarding, speed dialing, customer-originated changes and other features sought by the telephone interconnect industry.

Opponents charged that the upgrades to Centrex, a service in which the local telephone company switch premises perform private branch exchange (PBX)-type functions on a dedicated basis for customers, were not part of basic regulated telephone service but were computerized enhancements and, therefore, should be offered through an unregulated subsidiary, according to the Second Computer Inquiry policy.

However, the FCC did find that one proposed feature, customer-dialed account recording, otherwise known as station-message detailed recording, could not be offered as a part of regulated and tariffed Centrex. The FCC said that station-message detailed recording would make use of customer-generated station account information and store it in a Centrex computer.

Keeping bread-and-butter business customers

In the last two years, the seven regional holding companies have moved aggressively to improve Centrex to keep their bread-and-butter business customers who were looking for features being offered in PBX systems.

The FCC noted that customer-originated station changes, for example, may appear to be an enhanced service because interaction with stored information takes place. "The test for determining whether such services may be provided as tariffed adjuncts to basic service was set out in Computer Decision II: Such features may be tariffed if they facilitate use of traditional telephone service without changing the nature of traditional telephone service," the FCC said.

The North American Telecommunications Association petitioned the FCC to overturn the Centrex upgrades and said it was disappointed by the FCC decision, which "provides additional, significant opportunities for the [divested Bell operating companies] to shift costs illegally from monopoly to competitive services."

The FCC's Common Carrier Bureau announced that it was preparing a rule to redefine exactly what criteria constitute "enhanced services." The bureau said that the enhanced services rule should be ready for release by the end of May or the beginning of June.

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Afips creates information issues panel

RESTON, Va. — The American Federation of Information Processing Societies, Inc. (Afips), based here, last week announced the formation of the National Information Issues Panel to provide U.S. legislators and the general public with expert advice on information policy.

An Afips announcement said that Stephen S. Yau, president of Afips, described the project as a "catalyst for communications between legislators and the information processing community." The panel reportedly will hold several public meetings in the fall and will publish reports on specific topics.

Afips selected Robert Lee Chartrand, senior specialist in information policy and technology at the Congressional Research Service here, as chairman of the panel. Yau, chairman of the Department of Electrical Engineering and Computer Science at Northwestern University in Evanston, Ill., will also participate as a panelist.

Afips, established in 1961, is a federation of 11 scientific and educational societies in the information processing field.

Intech meeting set for August

ALEXANDRIA, Va. — The third annual Integrated Information Technology Conference and Exposition (Intech) will be held Aug. 26-29 at the Moscone Center in San Francisco.

Designed for users of corporate information systems, the four-day conference will include sessions on information security, networks, personal computers, integrated voice/data networks and technology management.

Registration for Intech is $395 before July 15 and $495 after July 15.

More information is available from National Trade Production, Inc., located at Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

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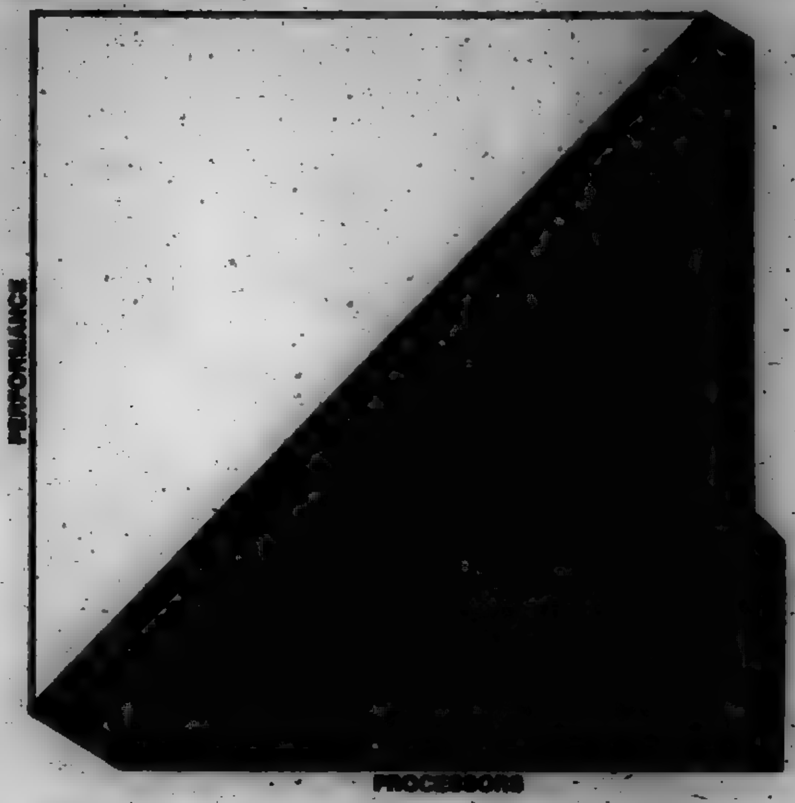

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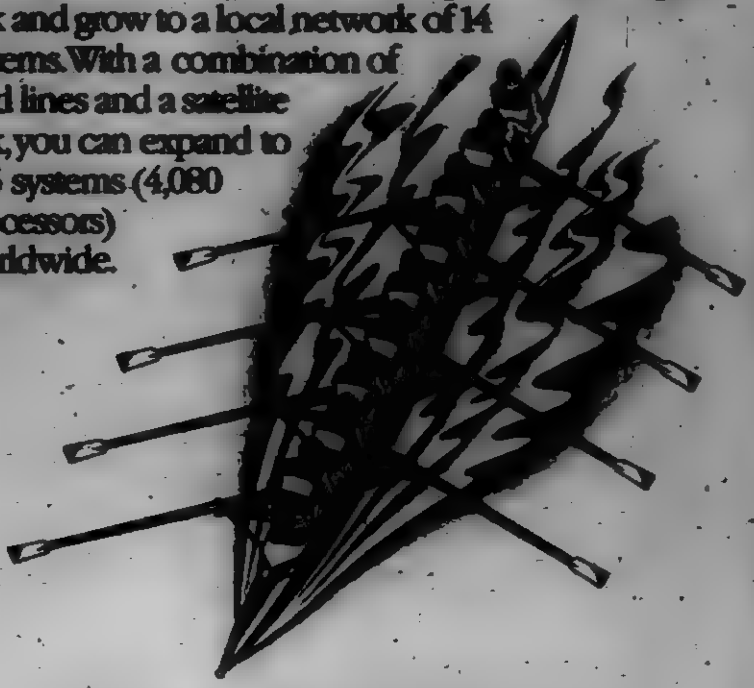

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TANDEMCOMPUTERS

USDA to begin electronic transmission of farm reports

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Agriculture (USDA), continuing its aggressive use of computers for information dissemination, recently announced it will offer electronic transmission of farm reports to commercial information vendors, who in turn will sell the USDA reports to farmers.

In response to increasing demand for statistical reports and other agricultural intelligence, USDA officials said the new service will provide bulk versions of the data through Martin Marietta Data Systems, Inc. of Orlando, Fla., beginning July 1.

For the first time, USDA reports will be available from a single electronic source.

User organizations

Users will most likely be organizations that further distribute USDA information, such as data base and videotex vendors, farm organizations, trade groups and news services and newsletter publishers, the USDA said.

The agency stressed that the service will only supplement the USDA's traditional methods of printing and distributing information.

Martin Marietta Data Systems — which won a five-year contract through competitive bidding — will charge a minimum fee of $150 per month, the agency said.

The USDA, sensitive to criticism of the increasing commercialization of information generated by the U.S. government, defended the decision to use a private vendor.

"The private sector, through competitive procedures, can provide the quality of service demanded [by users] at a reasonable cost to the government and users. USDA does not have available the computer capability to provide the level of service desired by users," the agency said in a statement.

Hearing held

At a recent hearing held by the U.S. House Subcommittee on Government Information, Justice and Agriculture, the American Library Association and the Information Industry Association (IIA), representing nearly 400 data base vendors, clashed on the subject of electronic dissemination of information and statistics gathered by the government.

The hearing was held to discuss the Reagan administration's recent proposal to rely heavily on private vendors to disseminate government data [CW, March 25].

An IIA representative said that the information needs of the public are best met by a pluralistic, competitive marketplace, and the U.S. government generally should let private vendors disseminate government data.

The library group, however, asserted that this commercialization of government information ultimately would limit access to only those people who can afford computers to gain access to the electronic data bases.

In 1981, the USDA was the first U.S. agency to try electronic dissemination and triggered the creation of Fednews, a service provided by ITT Dialcom, Inc. of Silver Spring, Md., which provides on-line access to U.S. agency news releases.

Other members of Fednews include the White House, the U.S. Army Reserve, the Food and Drug Administration, the Federal Emergency Management Agency, the National Aeronautics and Space Administration and the departments of Labor and Interior.

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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

CANBERRA — Cybernet, the computer service bureau run by Control Data Australia Pty. Ltd., has lost a $1.38 million contract with Telecom Australia. The latter company reportedly opted to drop Cybernet in favor of Caircnet.

BRAZIL

RIO DE JANEIRO — A copyright application system that enables recording artists to access data about their copyrights has been developed here by U.S.-based Polygram, Inc. The interactive system, which features a data base and rate calculation capability, is being prepared for export, a spokesman said.

FRANCE

PARIS — The first videotex terminal equipped with micro capabilities has been unveiled here by Logabax, an Ing. C. Olivetti & Co. company. The Persona 800 machine, intended for mass distribution under the country's nationwide videotex project, is an 8-bit system based on Zilog, Inc.'s Z80 microprocessor, with 64K bytes of random-access memory. The entry-level version is priced at $1600.

JAPAN

TOKYO — The Ministry of International Trade and Industry has sponsored a $100 million, five-year project to promote the adoption of a Japanese-developed standard based on AT&T Unix. The project, known as Sigma, will develop a Japan-wide Unix-based network, which software developers will reportedly access at a low cost to facilitate the joint-development process.

The Sigma project is the result of a push from Hitachi Ltd. and Fujitsu Ltd., sources said, to alter the practice of importing software into Japan. The likely operating system to come out of the Sigma project will be a version of AT&T's Unix System V.

■

TOKYO — Fujitsu Ltd. is expected to unveil its Escort expert development system during the Business Show, to be held here May 22-25. The price of the system will range between $16,000 and $20,000, insiders said. Escort reportedly will run on the vendor's artificial intelligence machine.

SWEDEN

STOCKHOLM — Software and consulting firms are on the rise in Sweden as hardware companies decrease in number. According to the latest official figures on computer industry start-ups here, over 700 companies have been established in the computer field over the last three years.

During this period, software companies have reportedly increased their ranks by 50% each year, while hardware companies have decreased in number by 50% annually.

WEST GERMANY

ESCHBORN — An analysis of attendance at the recent Hannover Faire revealed that IBM had the most popular booth in the Information Technology part of the show. In second place was Siemens AG, followed by the German computer vendor, Nixdorf Computer GmbH.

The poll of attendees also indicated that 64% of the people on hand said they felt a stronger "inclination to buy or invest" than last year.

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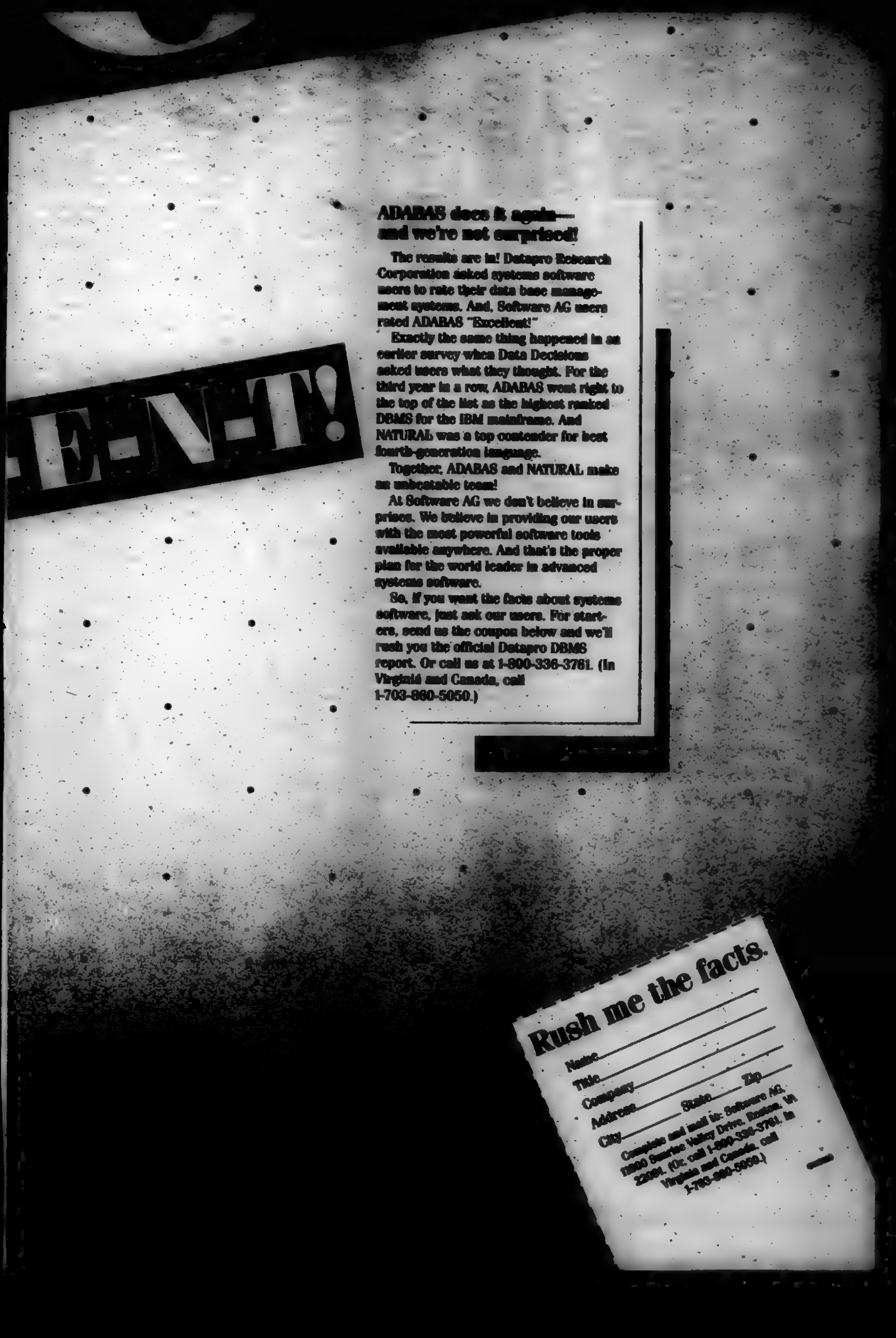

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CALL FOR PAPERS

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Papers of special interest might describe models that have many symbolic processes, use heuristic search, have a command structure separate from the knowledge domain and have expertise built into the model so that decisions by the user would be minimized.

Detailed abstracts and special session proposals should be sent by July 1 to SCS, P.O. Box 17900, San Diego, Calif. 92117.

OFFICE AUTOMATION SOCIETY'S THIRD ANNUAL CONFERENCE
Minneapolis, Sept. 3-6

A call for papers has been issued for this third annual office automation conference. Authors should submit papers that are typed, double-spaced, to Jackie Potts, Office Automation Society International, 2108 C Gallows Road, Vienna, Va. 22180. The deadline for the submission of papers for this conference is June 1.

PTC '86: THE 8TH ANNUAL FORUM OF THE PACIFIC TELECOMMUNICATIONS COUNCIL
Honolulu, Jan. 12-15, 1986

Papers are now being sought for this eighth annual telecommunications forum. Papers are requested in each of the three following subthemes: current developments, which will cover a broad spectrum including facilities developments, business aspects, user needs and concerns, regulatory and policy questions, standards and economics. The focus may be on voice, data, video and broadcast topics; future developments, which will focus on probable implementations that will impact telecommunications as well as society in the 1990s and beyond.

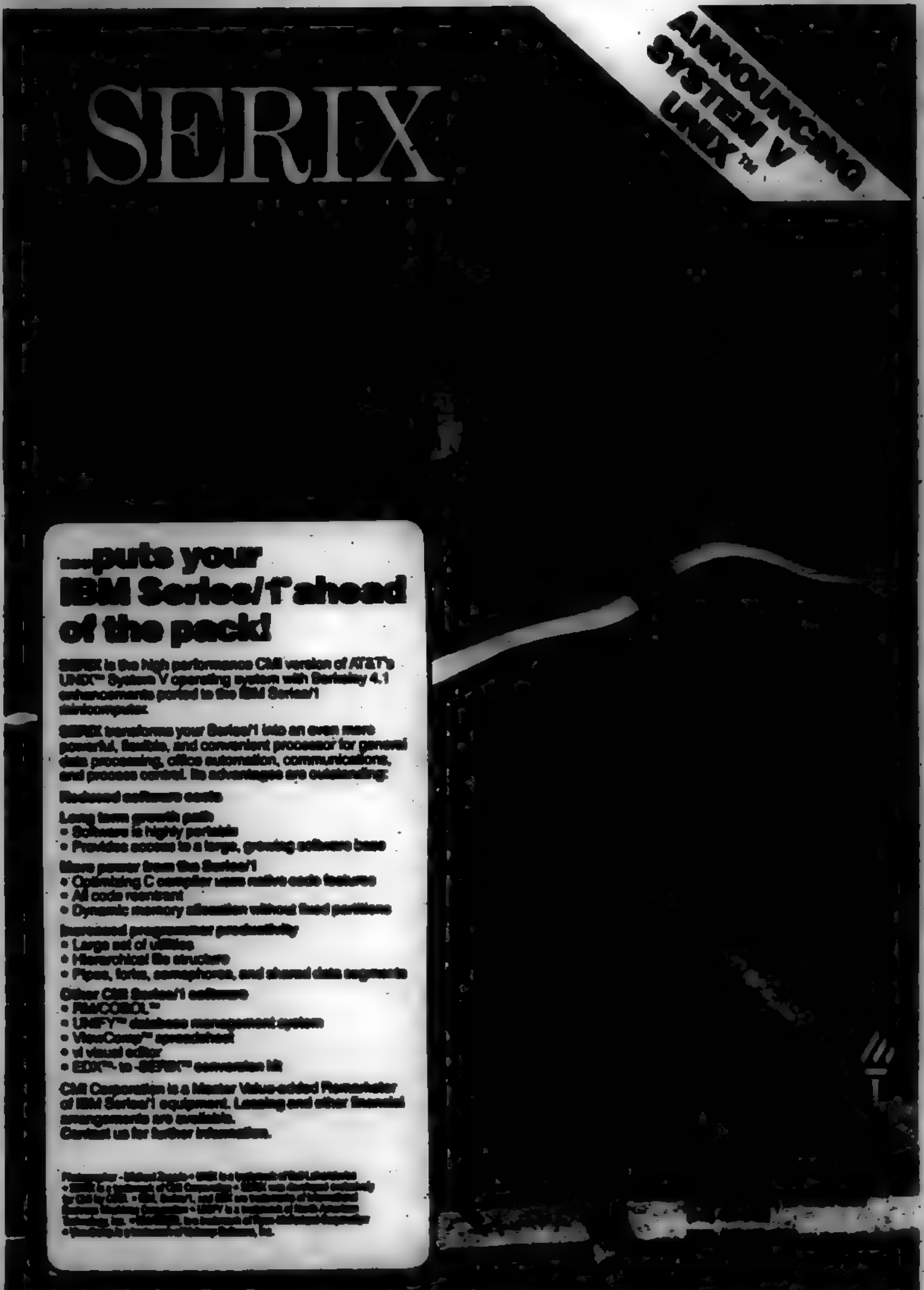
Papers should focus on the technological aspects of telecommunications as well as on their possible social, economic and educational impact; and overviews of existing telecommunications training organizations and programs, including discussions of how programs relate to perceived future needs of trainees and users.

A one-page outline of the paper, which should be received by June 15, should be sent to: PTC '86, Suite 308, 1110 University Ave., Honolulu, Hawaii 96826.

EDP PERFORMANCE MANAGEMENT
March 1986

Applied Computer Research, Inc., the sponsor of this seventh annual conference, has issued a call for participation. Applied Computer Research is seeking speakers, panelists and chairmen. No formal papers are required. Key interests are user experiences and case studies presented by data processing managers and their staffs. The deadline for submissions is July 15.

Anyone interested in participating may contact Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.



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CALENDAR

WEEK OF JUNE 16

JUNE 16-17, WASHINGTON, D.C. — AT&T's Software Defined Network and Alternatives. Contact: Melinda Hennaby, The Yankee Group, 89 Broad St., Boston, Mass. 02110.

JUNE 16-19, ST. LOUIS — Compatibles '85. Contact: Denise Warden, Pricom, Inc., P.O. Box 6189, San Rafael, Calif. 94903.

JUNE 17, ORLANDO, FLA. — Symphony Spreadsheets. Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 17, CAMBRIDGE, MASS. — Center for Information Systems Research's 10th Annual Summer Session. Contact: Center for Information Systems Research, Sloan School of Management, MIT, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, ORLANDO, FLA. — IDMS Systems Generation and Tuning. Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 17-18, TORONTO — Planning Corporate Communications Networks. Contact: Sheridan College of Applied Arts & Technology, Conference Centre, Trafalgar Road, Oakville, Ont. L6H 2L1, Canada.

JUNE 17-19, WELLESLEY, MASS. — Data Analysis Workshop. Contact: QED Information Sciences, Inc., P.O. Box 181, Wellesley, Mass. 02181.

JUNE 17-19, DETROIT — Managing Application Software Support Workshop. Contact: Infotel, Inc., Box 7117, Menlo Park, Calif. 94026.

JUNE 17-19, VANCOUVER, B.C. — EDP Auditing and Controls. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JUNE 17-19, VANCOUVER, B.C. — Auditing Advanced Computer Systems. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JUNE 17-19, VANCOUVER, B.C. — The Auditor's Role in Systems Development. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701

JUNE 17-19, BOSTON — Long-Range Information Systems Planning. Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

JUNE 17-19, PHILADELPHIA — Administrative Management Society (AMS)/Penn Expo. Contact: AMS, c/o 115 Avant Garde, Kenner, La. 70065.

JUNE 17-20, WASHINGTON, D.C. — Association of Information Systems Professionals' Syntopican XIII Annual Office Automation/Information Systems Conference and Exposition. Contact: James J. Dunne, 1015 N. York Road, Willow Grove, Pa. 19090.

JUNE 17-20, NEW YORK — The National Data Base and Fourth-Generation Language Symposium. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 17-21, CHICAGO — CICS Command-Level Programming. Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 17-21, NEW YORK — MVS JCL. Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 17-21, NEW YORK — CICS Macro-Level Programming. Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 17-21, WELLESLEY, MASS. — Systems Design Workshop. Contact: QED Information Sciences, Inc., P.O. Box 181, Wellesley, Mass. 02181.

JUNE 17-21, NEW YORK — Communications Week '85. Contact: Datapro Research Corp., McGraw-Hill Information Systems Co., 1221 Ave. of the Americas, New York, N.Y. 10020.

JUNE 18, ORLANDO, FLA. — Symphony Graphics. Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 18-19, SAN FRANCISCO — SAS Report Writing Course. Contact: SAS Institute Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

JUNE 18-20, ROSEMONT, ILL. — 1985 Advanced Manufacturing Systems Exposition & Conference. Contact: Online Conferences, Inc., 989 Ave. of the Americas, New York, N.Y. 10018.

JUNE 19, ORLANDO, FLA. — Symphony Data Management. Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 19-21, ORLANDO, FLA. — IDMS Data Base Administration. Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 20, ORLANDO, FLA. — Symphony Data Communications. Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 20-21, WELLESLEY, MASS. — Data Base Design. Contact: QED Information Sciences, Inc., P.O. Box 181, Wellesley, Mass. 02181.

JUNE 20-21, ORLANDO, FLA. — CICS Transaction Design. Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 20-22, OTTAWA — Canadian Business Equipment Manufacturers Association 1985 Annual Conference. Contact: George Nutter, Canadian Business Equipment Manufacturers Association, Suite 309, 211 Consumers Road, Willowdale, Ont. M2J 4G8, Canada.

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EDITORIAL

Much ado

The most interesting news by far to come from the otherwise lackluster Comdex/Spring '85 was IBM's confirmation of plans to bundle software packages free of charge with Personal Computer XT sales, at least for a limited time [CW, May 13]. Although IBM bristles at hearing the term "bundling," we can't think of a better description.

Reaction from the vendor and dealer communities was predictable, ranging from outrage to taciturn recognition of IBM's plans to be No. 1 in every market niche in which it operates — meaning the company will strive for first place in every computer market niche.

It is surprising that anyone, particularly IBM's competitors in the micro software arena, should have been taken unaware by the move at all. It's not that the move was predicted — it wasn't. Rather, the strategy will help move a piece of hardware, that may not be selling as fast as Big Blue would like, as well as software packages that are playing second and third fiddle to other software vendors' offerings. This position can only be viewed as very uncomfortable by a company accustomed to dominating its competitors and is therefore a harbinger of such "drastic" actions as bundling a couple of diskettes with hardware.

Some of the more peeved competitors tried hard to raise the specter of antitrust in the matter. In this case, such charges are not only ridiculous (IBM hardly dominates the micro software market, which is about as competitive as any in the computer business), but they also ignore the more apparent realities of doing business.

IBM's competitors should try to see the situation for what it really is — namely, one company practicing competition and capitalism better than perhaps any other company does.

And that is the key to what struggling and successful micro software and hardware companies must do to survive in an IBM-dominated world. Users cry for site licensing and cheaper packages for corporate mass packages, but many vendors offer them cumbersome lock-and-key antipiracy systems. IBM — for a little while anyway — gives away the software. Get the picture?

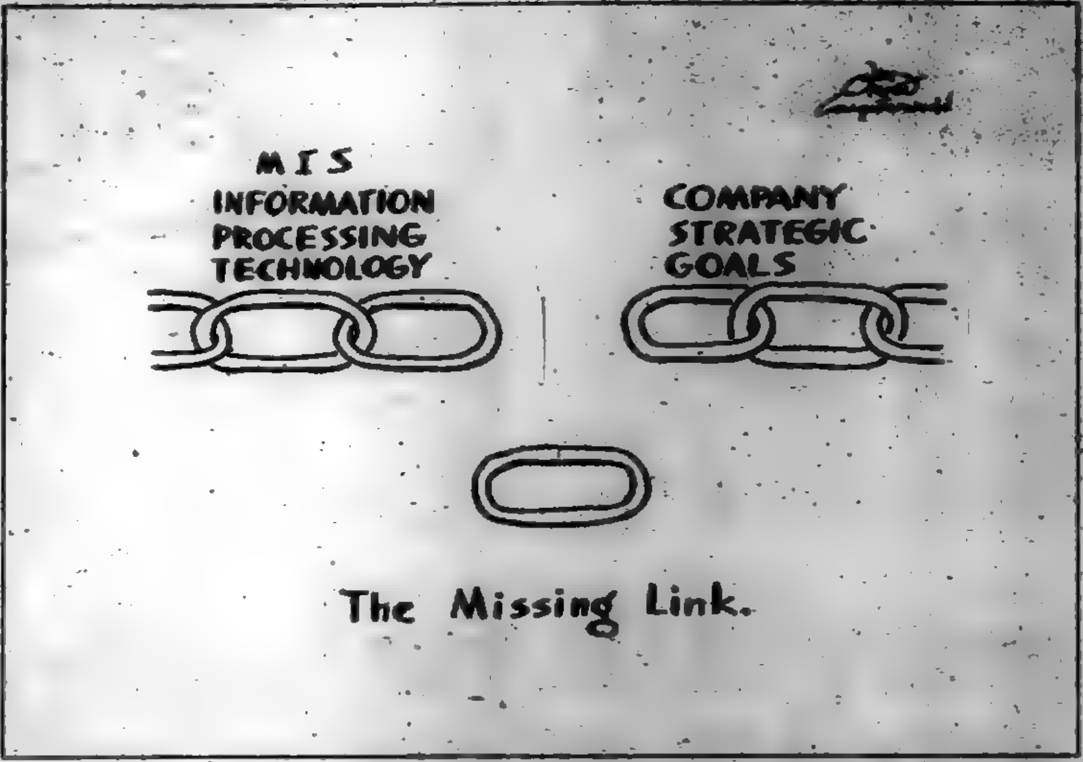
■

We may be the No. 1 weekly serving the computer community, but that doesn't stop us from continually trying to upgrade our publication. In this vein, we recently added to *Computerworld* two features, both designed to give our readers quick blasts of information in a concise format.

Our Random Access column was launched last month and will appear most weeks on page 2. The column will consist of brief items regarding product information, industry rumblings, vendor plans and other snippets of information gathered from reliable sources but which often have not been released for general consumption. We hope this column will give our readers the benefit of the ad hoc leads our reporters develop.

Last week on page 6 we ran Reporter's Notebook, a feature consisting of general-interest news briefs gleaned from *Computerworld's* extensive conference and computer show coverage. Reporter's Notebook, to be run irregularly, seeks to give readers a glance at the mood, points of interest and general tenor of a conference.

We trust you'll enjoy both additions, and we welcome your comments.



LETTERS

Suggested software rental bans rapped

Efforts by selfish special interest groups that wish to have a law passed against renting software could not be more contrary to the capitalistic ideal. These groups were discussed in the column "Proposed software rental ban warrants careful review" [CW, March 25]. Why single out one industry or one class of product and say it cannot be rented when all other products in other industries can be rented?

These groups' motivation seems to be the high incidence of piracy in the software business. However, the pirates are not to blame — the software companies are. For the same reason that banks do not leave their money on the sidewalk, software companies have an obligation to protect their products. Software companies lacking the technological capability to do this should get into some other line of work.

My company has shipped thousands of software products, none of which has been copied and none of which has been installed on more than one machine. My company does this because most of its customers prefer to rent.

Some companies cannot afford the capital outlay of purchasing software and prefer to rent on an ongoing basis, just as some people prefer to rent rather than purchase their dwellings. Refusing someone shelter because he cannot afford to buy a dwelling would not make sense from either an economic or a moral standpoint.

David E. Ferguson
Malibu, Calif.

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MANAGEMENT

Identifying, tracing reruns cuts expenses

THE DATA CENTER
John P. Murray

Does your data center experience considerable difficulty in meeting its schedule commitments? Are clients unhappy with its service level? Does the pressure within the data center seem to increase faster than would appear warranted by the increase in work load? Is data center overtime expense a serious factor because it always seems to exceed the budget, sometimes by a considerable amount?

These concerns may be caused by a variety of factors, but it is likely that one factor, often the major factor in such a situation, is the rate of reruns of data center production work.

Do you know how many of your resources are devoted to reruns? Does anyone know the precise number of and reason for reruns for a given period? What, if anything, is being done to control reruns? Are reruns even considered an important issue in your installation, or are they simply viewed as something to be tolerated, or worse yet, ignored?

An important aspect of the effective management of the data center operation is the ability to identify and control reruns. The obvious reason is to help conserve the usually scarce hardware resources and to additionally assist in the effort to decrease the ever-present time and schedule pressures found in all data centers. The less obvious yet perhaps just as important issue involves improving the quality of the data center operation and consequently the entire MIS function.

There is a similarity between the operation of the data center and that of a manufacturing function. Many of the aspects of a manufacturing operation can also be found in the data center. A critical aspect of a manufacturing operation is the control of scrap.

Without careful factory management, scrap can become an expensive item. Reruns constitute the scrap problem for the data center. In fact, reruns are a bit more serious in the data center because some of the resources invested in the scrapped material in the factory often can be reworked. In the data center, every rerun represents a total loss; there is no chance for any rework or recovery of any of the resources.

> *Every rerun represents a total loss. A high incidence of data center reruns — anything in excess of 2% or 3% of total jobs and total real-time hours — is an indication of poor data center management.*

A high incidence of data center reruns — anything in excess of 2% or 3% of total jobs and total real-time hours — is an indication of poor data center management. It also may indicate a poor job of managing the entire information processing function. This is because many places, not just the data center, are responsible for reruns, which are often symptomatic of problems in other areas.

Is the requirement for a particular rerun the result of a data center error? Is it because of an incorrect JCL? Is it the result of a programming error? Of poor documentation? Might it owe to a data input error? An incorrect date perhaps?

Those to whom the data center manager reports need to understand the numerous conditions that can cause reruns, and those people must be willing to designate importance to reducing the number.

Excessive reruns indicate an information processing department's poor health. Unless some method is in place that can be used to identify reruns as well as their causes, improving the health of the data center is impossible. Because the consequences of a high rate of reruns — poor data center service levels, failure to meet data center schedules and increasing pressure on the data center, for example — fall upon the data center manager, it is in his best interest to locate the problem and develop a plan to correct it.

Recognize reruns as a concern

The first step then is to admit that reruns are an area of concern. The next step is to capture information about the number of reruns in any given period. What constitutes a rerun? If the data center uses separate systems for testing and production, any job in the production system processed more than the scheduled number of times in any given period will be charged with reruns for any jobs in excess of the scheduled number.

Periodic reports should be produced to show the number of reruns for the period, the reasons for those reruns and the amount of CPU and real time associated with each rerun. The report should receive a sufficiently wide distribution so that those areas responsible for the reruns are alerted to the fact that they have caused reruns and that an effort is under way to reduce the incident of reruns. This is an effort to raise the level of interest in the rerun problem, and it should be made clear that the management of the information processing department supports the effort.

In addition to identifying the reruns and the CPU and real time associated with them, the re-

See RERUNS page 38

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, published by Dow Jones-Irwin.

A little help can make maintenance's job less thankless

MANAGEMENT MATRIX
Walter F. Cuirle

Software maintenance is one of those thankless jobs that no one acknowledges when it's done right and everyone notices when it's not. For newly installed systems, part of the job of the maintenance group is to track down and get rid of the remaining bugs, but regardless of the number of bugs, the development people usually get the credit. Once a system is settled, maintenance gets to make the changes the user wants, one after another, until the system is replaced and the whole cycle begins again.

If there is anything more thankless than being in a software maintenance group, it is supervising one. Of course, on the positive side, the job does build character. Good maintenance supervisors become like good cops — unflappable, level-headed and not surprised by anything people do and skeptical of everything people say — the kind of person you would trust to help you buy a used car or sign off on a new system.

Next time you make the rounds, stop in at the maintenance supervisor's office. Instead of "in," "out" and "pending" baskets on the desk, are there bins labeled "possibly," "probably" and "give up"? Does the plaque on the wall read "Sisyphus had it easy"? Is there a hair shirt on the coat rack? If so, maybe a few things can be done to help.

> *Next time you make the rounds, stop in at the maintenance supervisor's office. Does the plaque on the wall read "Sisyphus had it easy"? Is there a hair shirt on the coat rack? If so, maybe a few things can be done to help.*

Even assuming that you have a stable and bug-free system and that the maintenance job is simply a matter of processing user requests, the problem isn't so much to handle these changes as it is to manage them. The first step in that management is one many DP shops have taken: Establish some kind of a paperwork procedure that requires the users to submit those change specifications in some kind of uniform format — a change order system. But this is only the first step.

Users often have little feeling for the relative complexity of a change. In most cases, users can only specify changes from their own perspectives — the rearrangement of items on an existing screen or the addition of a line in a report to accommodate a new item, for example. Some of these requests really represent more substantial changes to the software than others do, even if they look the same. The DP manager and maintenance supervisor are aware of that, but the user may not see the essential difference between adding a new field, however small, to an existing data-entry system and changing the layout of a screen. This misunderstanding gives rise to billing and scheduling arguments.

Another problem is that these changes come at odd times and in unpredictable quantities and if they have any priorities set on them at all, they are set by the users. Usually it's a simple "rush." In short, the maintenance function becomes user driven when it should only be user specified. User-driven maintenance results in a system that gets revised far too often and for conflicting reasons.

It is beyond the power of the maintenance supervisor to do anything about these problems. However, the DP manager does have the power and can get together with the manager of the users' department to make things easier all around. One simple, effective solution is to go to fixed periods to implement the changes.

Suppose the DP manager and users' department manager agree that revisions will only be installed quarterly and that there will be a firm deadline for the submission of change orders — say the middle of each quarter. If the user agrees to this the DP manager can promise that, between the submission deadline and the end of the quarter, the

See [illegible] page 38

Cuirle is a senior associate with Nicholas [illegible] Associates in Bryn Mawr, Pa.

Copy-protecting software addresses wrong problem

READER'S PLATFORM
Robert V. Jacobson

The current discussion of software piracy seems to have missed a key point. Every prudent manager regularly makes backup copies of his mainframe systems and applications software for all the well-known reasons. These same reasons apply to software, which is run on the manager's microcomputers. A manager who relies on software that he cannot back up is not prudent.

There is an inescapable conclusion: Regardless of whatever other features a software package may have, it just doesn't make sense to buy copy-protected software.

Arguments that support piracy on the grounds that software is too expensive are childish. Every software developer is entitled to protect his ownership rights. If a package is too expensive, market forces will quickly come to bear.

The real issue is how to satisfy the backup requirement and protect the software vendor's property rights at the same time.

Business software should be available without copy protection. Vendors should offer licenses for several levels of usage — single-user, two to 10 simultaneous users, 10 to 99 users and 100 or more users at a single site — at appropriately increasing prices with manuals available at cost more or less.

Software licensees should expect to sign and return multiple-use license agreements and to abide by their terms.

Businesses and government agencies must make it clear to employees that software piracy is illegal and contrary to policy. A number of firms are already doing so [CW, Feb. 4], and more should follow suit.

Policing attempts fail

Most firms and most employees are honest and can be expected to adhere to license agreement terms, but there is no realistic way vendors can expect to police outstanding license agreements. Because honest firms should not be expected to subsidize dishonest firms — which is the real effect on piracy — software vendors should make a reasonable effort to identify and stop the pirates.

Unfortunately, the only practical method seems to be the use of informers. Consequently, vendors — perhaps working through a trade association — should offer substantial rewards for information leading to conviction for piracy.

Copy protection is a futile exercise to solve the wrong problem. Ultimately, software must reside in main memory in an executable form. This means that it can and will be copied by the pirates no matter what the vendor does.

Inevitably, it is the honest user who suffers, because ultimately he is paying for the copy protection, the pirated copies and, worst of all, the risks of running with software that is not backed up. $

Jacobson is president of New York-based International Security Technology, Inc.

LETTERS

Bypass point misleading

Your recent series on bypass was excellent. Generally, I agreed with the editorial "Opportunity calling" [CW, April 22] — an editorial that took a balanced look at divestiture.

The editorial stated that "divestiture did not make bypass possible." Although correct, that statement may also be misleading. Divestiture made bypass economically attractive for many customers. Before divestiture, AT&T had no incentive to bypass. AT&T could bypass in 1983 but, if it had done so, it would have lost money.

Before divestiture, MCI Communications Corp. and GTE Sprint Communications Corp. received local access at lower rates than they are charged today in areas where equal access has been made available. Divestiture created the incentives for massive bypass — incentives that did not exist before divestiture.

The largest part of the bypass problem has grown out of the fact that regulators require local telephone companies to charge far above cost for local-access service. This artificial pricing speeds the adoption of bypass and amplifies the economic shock when a large customer installs a bypass system.

My firm's study of bypass, commissioned by Bell Atlantic, shows that the vast majority of projected revenue loss due to bypass is caused by this uneconomic pricing of local-access service. The bypass problem, with its potential for stranded investment and unfair charges to small businesses and residential users, arises from an attempt to maintain a system of subsidies for local service,

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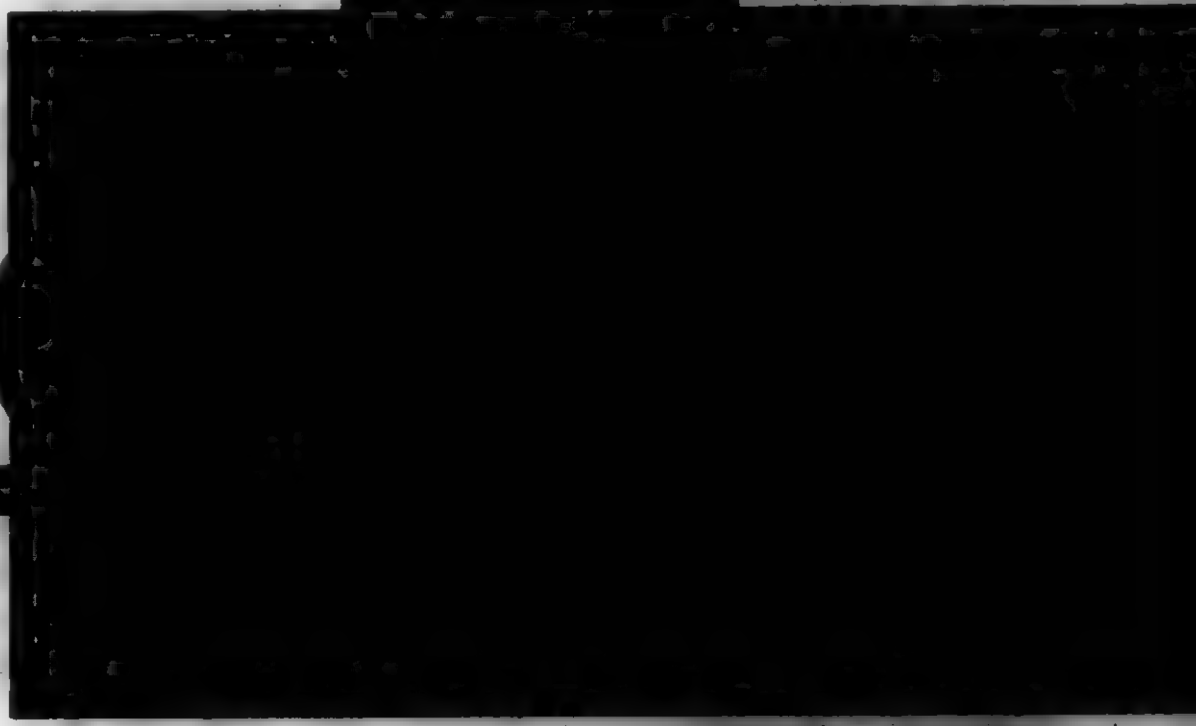

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But product selection isn't the only choice. Telex displays offer features like color graphics, monochrome or color monitors, and ergonomic tilt/swivel design. There's a selection of keyboards,

LETTER from page 38

which cannot be sustained in the postdivestiture world.

Not until we all recognize the need to restructure telephone prices to match the needs of the postdivestiture world can the bypass problem be solved.

Charles L. Jackson
Washington, D.C.

Legislation vs. a day's work

As a DP manager for the City of Baltimore, responsible for computer operations, data control and data entry, I have, of course, been following with keen interest the VDT "imbroglio," aptly described so in the article "VDT imbroglio shifts to state legislatures" [CW, March 25].

There have been studies by impartial scientific organizations, vendor associations and the undaunted and ever-present collective bargaining groups and unions.

However, putting aside for the moment the relative validity of any of these "studies," much is being made about nothing. I make such a brash statement because in all of the studies I have read, much ado is made about the eyestrain or potential eyestrain and the "refreshment" frequency of the CRT, but at no time whatsoever have the studies mentioned the real world cause of any eyestrain that may be part and parcel of the job. The eyestrain, if any, is not caused by looking at the CRT but rather at the source material the key operator is entering.

A proficient key entry operator spends very little time looking at the CRT. As much as 85% to 90% of an operator's workday is spent looking at and interpreting what someone else has hand-coded on some source document in much the same manner as a keypuncher or a typist would. This contact totals 88 minutes looking at the document and 43 minutes interpreting it in our 7.33-hour workday. Subtract from that the scheduled breaks and the low-end figure becomes the more prevalent.

Aside from the fact that the operator is indeed sitting in front of the VDT, the impact of which has yet to be determined, we essentially have nothing more than the ergonomic considerations that we should all afford our typists and word processors. Essentially, it all boils down to using a common sense, humanistic approach toward the employee, his environment and quality of work life.

We are all bombarded every second of every day by radio waves, TV waves and microwaves, not to mention solar radiation. Maybe pregnant women should not sit in front of a VDT; we just don't know at this time. We do know that they should not smoke because it's been determined harmful to the mother and the baby, but many still do.

I had an opportunity to review a bill [H.B. 1268] that went before the Maryland legislature this year concerning VDT standards. Although it failed to pass this session, I'm positive it will return in succeeding years with the same oppressive restrictions to bear against the employer and vendor alike. If this bill is indicative of other legislative proposals, on a nationwide scale, then I urge DP managers to think of alternative methods of feeding those batch applications.

Certainly some type of standard may be required for machine construction and use, but it is this manager's opinion that if legislation of this type is allowed to pass as written and unchallenged by the general DP community, employers will have effectively abandoned their right to expect a fair day's work for a fair day's pay.

Robert E. Grande
Baltimore

CUIRLE from page 37

maintenance staff will do two things: It will work up firm cost estimates and installation dates for the changes, grouping them as appropriate; and it will write the software equivalent of an environmental impact statement. This statement explains the relative complexity of the change and its possible risks. It is an important part of the deal because it justifies the costs to users by telling them for what they are really asking. This way, users can make informed decisions about whether or not they really want a change, and the DP manager is no longer driven solely by users' uninformed priorities.

Users benefit because they know exactly what they are getting, when they will get it and what the costs will be in performance and money. The maintenance staff benefits because only four firm implementation dates exist for each system. The staff now has the chance to test the revised system as a stable piece of software before it goes on-line; this should end the vicious cycle of bug maintenance on change maintenance.

And in the process, something ought to be thrown in for the maintenance supervisor. A new shirt perhaps?

RERUNS from page 37

port should show the dollar value (using the CPU hourly rate) of the various reruns. This practice can serve as a tool to gain the client attention required for rerun problems to be taken seriously.

Addressing the rerun problem is not easy. If carried out aggressively, the move may generate hostility. The management of the data center must recognize this aspect of the effort but should not be deterred by it from moving ahead.

If reruns are attacked and reduced, everyone will benefit. It is worth the effort; good management will insist that it be done.

HOICE

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SOFTWARE & SERVICES

Careful planning eases conversion to MVS/XA

By John Gallant
CW Staff

It may appear to be a gargantuan undertaking, but an upgrade to IBM's MVS/XA operating system can go relatively smoothly — provided the conversion is carefully planned.

That was the finding of a recent Xephon Technology Transfer Ltd. study of nearly 30 large IBM sites that had undergone the migration from another of Big Blue's operating systems to MVS/XA. Despite the fact that most respondents made the move to MVS/XA to ease virtual storage constraints, the Newbury, England-based market research firm found that IBM's flagship operating system provides only relief, not a cure, for the ills of virtual storage cramp.

"Conversion is one of the great bogies of the IBM environment," the study stated, "and IBM has gone to greater lengths to minimize the problems of converting to XA [Extended Architecture] than it has for any other product.

"The initial announcement of XA, for example, gave users explicit details of the [timetable] for product availability, restricted the impact of the change by offering compatibility of user applications between new and old operating regimes and gave . . . details of how users could position their configurations to ease conversion to XA," the study said.

Based on the experiences of 29 users who upgraded to MVS/XA between 1983 and mid-1984, Xephon cautioned that proper positioning is a paramount prerequisite to a successful conversion. Xephon defined positioning as having all necessary versions of ancillary software installed so they can be transferred to MVS/XA without modification.

See UPGRADE page 43

SOFTLINE/DAVID TORY

One-vendor solution can pay off

In the less-complex DP environment of just a few years ago, it was easy for technical managers and systems programmers to rely on their own skills for planning, maintenance and problem resolution, as well as for dealing with multiple software vendors.

Today, data centers are more complex by orders of magnitude. With more computing power available, a greater demand for service and stretched management and personnel resources, DP professionals can no longer afford to depend upon business solutions and service from a combination of in-house and diverse, incompatible external sources.

This complexity is one of the reasons for the growing popularity of the single-vendor, integrated software solution. DP executives claim that the more products they have from one vendor, the greater the effect they have on service, support, development and integration of the software.

DP executives will have to choose their software vendors more carefully as the trend toward single-vendor shops continues.

Choosing a single vendor for global DP needs involves careful evaluation. The rewards are great, but the pitfalls can be costly.

If the wrong vendor is chosen, one

See SINGLE page 44

Tory is senior vice-president of Jericho, N.Y.-based Computer Associates International, Inc., a vendor of integrated software products.

SOFTALK
John Desmond
CW Staff Writer

Programming by the rules

Just as the English language has rules of grammar, so programming languages have rules of discourse. And just as a violation of English rules may prevent a message from being clear, a violation of programming rules may make a program difficult to understand and thus maintain.

Soloway

Software programmers don't use adverbs, adjectives or gerunds, but they do write. Each programmer projects into the program's structure a mental image of how it should look. If the programmer's construct violates generally accepted programming rules, the code is likely to confuse an experienced analyst who tries to debug or enhance the program.

Extracting programming rules from the minds of programmers, which is where many of them reside, is a key aspect of research being conducted by Elliot Soloway of Yale University in New Haven, Conn.

The assistant professor and artificial intelligence researcher spoke on "Why Software Maintenance is Hard" at the Data Processing Management Association's recent conference on maintenance in Dallas.

"There's a big difference between knowing what an IF statement is and knowing how to program," Soloway said. The Yale researcher has conducted a number of experiments using two versions of a program: a correct version

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■ Desperately seeking software — Unix vies for market position/42

■ An updated version of its data center management software was unveiled by Uccel/42

■ Foothill Research announced an enhancement to its programming language for Unix systems/43

■ Informatics General introduced an ISPF option for its Mark IV development system/43

■ Database Design announced an enhanced logical data modeling tool for MVS/TSO/44

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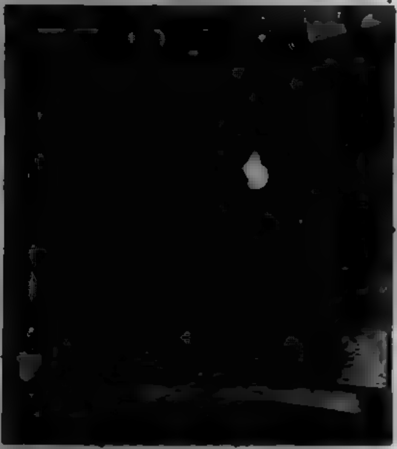
Unix needs push to win in corporate micro market



Yates

By Kathleen Sullivan
CW West Coast Bureau

SAN JOSE, Calif. — In the personal computer market, software has been a driving force. Software Arts, Inc.'s Visicalc helped ensure the success of the Apple Computer, Inc. Apple II, while Lotus Development Corp.'s 1-2-3 propelled sales of the IBM Personal Computer. But in the AT&T Unix systems market, according to industry analyst Jean Yates, software has not yet served as such a catalyst.

That situation must change if Unix-based systems hope to win a place on the corporate desktop, said Yates, chairman of Yates Ventures, Inc., speaking before a recent seminar audience here.

Although there are hundreds of software packages available for a variety of Unix-based systems, none have captured the imagination or the allegiance of users, she said. According to Yates, the market is crying out for an innovative software package that will push Unix forward.

'Blowing its opportunity' in the office

"Unix software has not proven itself in the desktop market," she said. It has met with greater success in the scientific and engineering communities and is appreciated in government and military circles. But the product is "blowing its opportunity" in the office, she noted.

Describing the problem as the "1-2-3 syndrome," Yates said software availability will remain a key factor in the growth of the desktop Unix market. "If we don't get a [product like] 1-2-3 for Unix, I hope AT&T will get down on its knees to Lotus," she said. "Why would someone buy a desktop computer without a program like 1-2-3?"

According to Yates, the Unix proponents will not be able to look to IBM for guidance. While IBM will support individual contracts that require Unix-based systems, the company has not developed "an overall strategic direction on Unix," she said. "IBM will not be the company that actively waves the Unix banner or signs up a number of software developers."

AT&T, already a dominant force in the Unix market, should be the firm that shoulders that task, she added.

AT&T should make development effort

"I am tired of AT&T waffling around," Yates said. "It can afford [the development costs] and should be putting together a cohesive, coherent effort in software development. Other hardware companies cannot afford the multimillion-dollar investment required to provide this software."

According to Yates, the Unix software market will undergo a significant shift during the next five years. In 1984, software development tools accounted for 54% of Unix-based software package sales; by 1989, however, that number will drop to 31%, she said.

In 1984, word processing and accounting packages made up only a fraction of Unix-based applications sold — word processing took a 2% share and accounting took a 1% share, Yates noted. The remaining 43% included all other packages, including a "fair amount" of vertical-industry software, she said.

Within five years, however, integrated office automation packages will outdistance all other applications, claiming a 32% share of the Unix-based software market, Yates predicted.

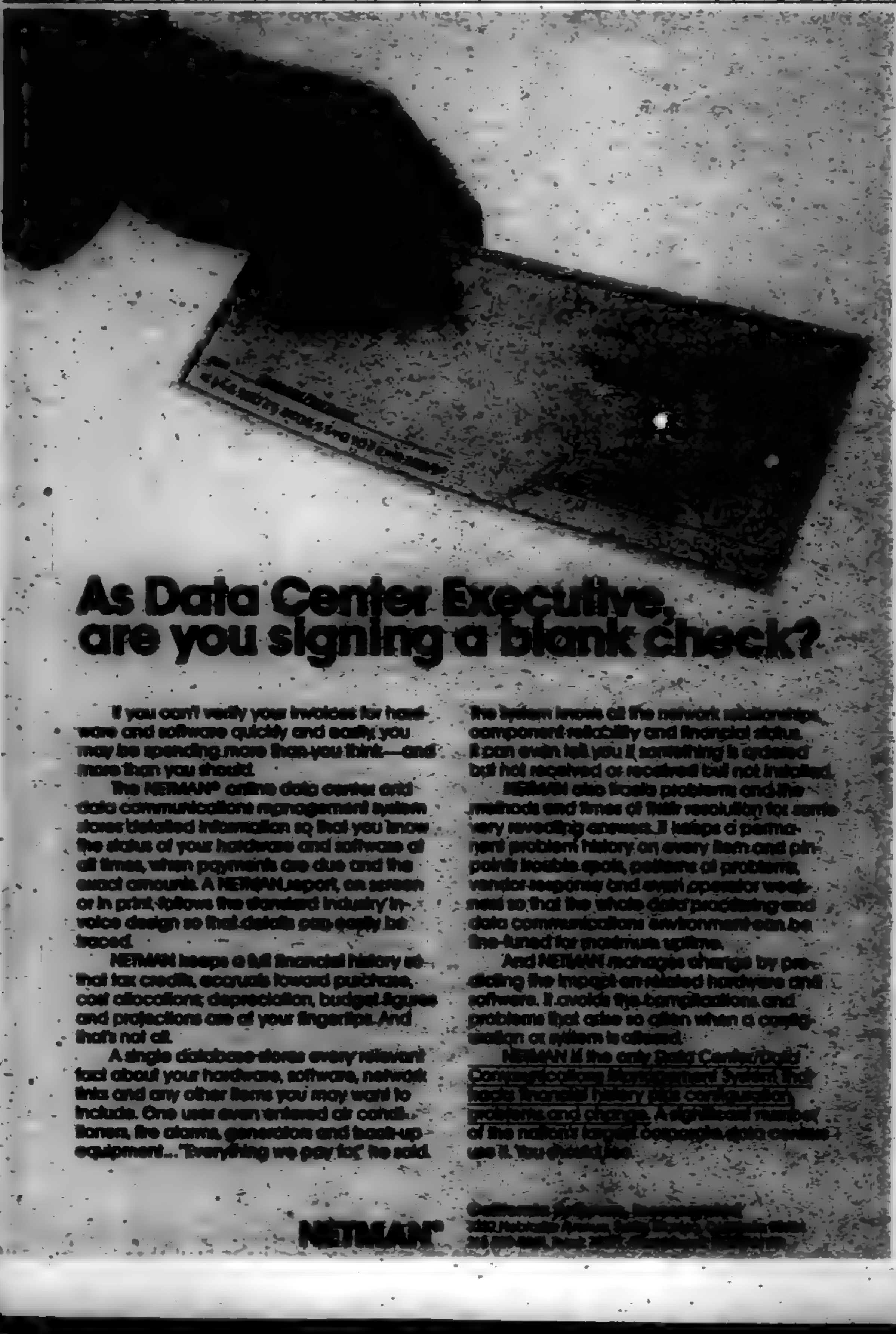
Uccel enhances UCC-8 software

DALLAS — Uccel Corp. announced Release 2.1 of its UCC-8 Data Center Management software for CICS applications in IBM MVS or MVS/XA environments.

Release 2.1 includes an interface to Uccel's UCC-4 hardware accounting system. Through a common inventory file, UCC-8 users reportedly can track equipment problems, outages and configuration changes. The UCC-4 interface adds the ability to track new equipment orders and manage financial aspects of the inventory, a spokesman said. The product also includes modifications to the UCC Problem Management and Change Management functions.

UCC-8 Version 2.1 is licensed for $28,500.

Uccel is located at Uccel Tower, Exchange Park, Dallas, Texas 75235.



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Mark IV program tester out

WOODLAND HILLS — Informatics General Corp. has announced Mark-ISPF, an option that allows programs developed under the company's Mark IV development system to be tested and maintained in IBM's Interactive Systems Productivity Facility (ISPF) under TSO and CMS.

Mark-ISPF provides syntax checking capabilites for specifying Mark IV applications in an on-line, interactive environment, the vendor said. The product is designed to take advantage of recent enhancements to Release 2.0 of ISPF, including variable panel formats, panel windows, 3279 default color displays and all screen sizes, including 3290 terminals.

Programmers can prepare and test the Mark IV applications using full screen editing functions, panels, keys and commands that are familiar to ISPF users. According to the vendor, full Help facilities and a tutorial are included.

According to the vendor, Mark IV users with ISPF can code on-line with syntax verification, decode and test programs. The product also permits users to review test output and source listing at their terminals in one session.

Mark-ISPF, scheduled for September availability, is priced at $15,000.

Informatics General is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Foothill Research announces Style language enhancement

BELMONT, Calif. — Foothill Research, Inc. has announced Version 2.2 of Style, its programming language for 32-bit minicomputers and mainframes running AT&T's Unix System V, University of California at Berkeley 4.2 and Version 7 operating systems.

Style also runs with Digital Equipment Corp.'s VMS operating system and Data General Corp.'s MV series with the AOS/VS operating system, according to the vendor.

Style 2.2 reportedly includes windowing and user-programmable function keys, a transaction logging and recovery system that allows users to keep track of changed records and new programming constructs.

The product also includes logical view capabilities that enable MIS managers to structure the data base so end users will see only pertinent information, the vendor said. The logging and recovery feature allows users to make a copy of each record before or after the record is changed.

Style costs from $17,500 to $45,000, depending on configuration. The product will be available in the third quarter.

Foothill Research is located at Suite 300, 1301 Shoreway Road, Belmont, Calif. 94002.

UPGRADE

from page 41

"Early positioning has the benefit of parceling the total conversion task into manageable chunks at the relatively small expense of paying some license fees earlier than might be strictly necessary," the study stated.

Respondents to the Xephon study spent, on average, a little more than five months evaluating whether to make the move to IBM's XA.

Xephon found that those users who decided to migrate early after the introduction of XA spent no more time making the decision than those who converted later. That, the company said, indicates "industry experience has done little to facilitate the decision-making process."

Compelling reason to upgrade

Twenty-three of the 29 users cited virtual storage constraint relief as the most compelling reason for making the upgrade to MVS/XA. "Since it is impossible to buy virtual storage," the study stated, "it is the major factor [forcing] migration. After tuning virtual storage, the only option is to migrate to XA."

But, Xephon warned, XA migration does not necessarily solve the problem of virtual storage constraint — it usually provides only temporary relief. Almost half of those users who had converted to MVS/XA said virtual storage constraint was still a problem following the move.

"Note that many users still suffer from [virtual storage constraint]," the study said. "Potential XA migrants should not assume that migration will solve all their virtual storage problems. Virtual storage will still need to be monitored and managed to avoid nasty surprises."

Ninety percent gave good rating

Despite that sour note, more than 90% of the migrants said MVS/XA was either very good or excellent when asked to rate the operating system.

The major stumbling block to migration for most users appears to have been incompatible software — either in-house or independent vendor packages that would not operate with MVS/XA. Nearly half of the respondents said they encountered a software supplier that did not have an MVS/XA-compatible version of the product in use.

The study, titled "XA in Practice," is available for $75 from Xephon's U.S. distributor PBS, P.O. Box 643, Cambridge, Mass. 02139.

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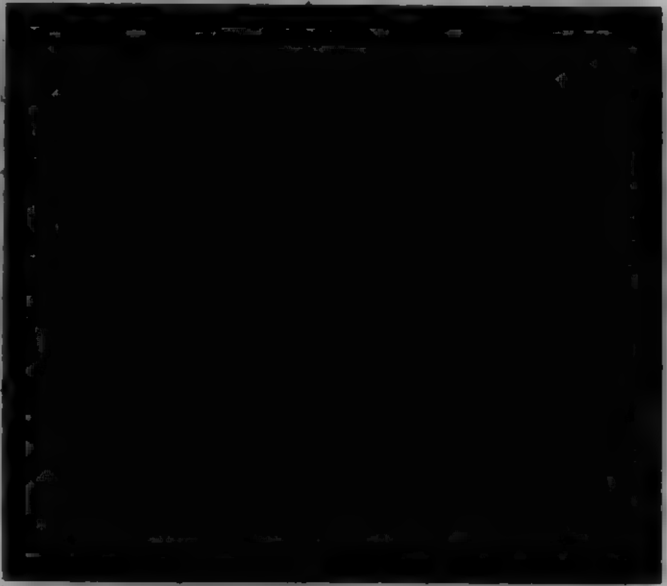

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SINGLE

from page 41

with limited growth potential, limited product offerings and poor service and support facilities, clients may find themselves rather quickly in the unhappy position of having to rebuild and redefine their information processing needs.

Today, companies must recognize that they are not simply choosing a single product. They are setting a direction and selecting components that comprise a strategy from a single software vendor.

Various criteria must be considered before a new software product and vendor are brought into the corporate fold. Service has become a crucial factor — it is as important as the quality of the software product itself. Vendors know that in the early growth stages of any market, clients concentrate more on the technology of the product features.

Support, at this initial stage, means parts and services, or in the software industry, product installation and warranty. As a market matures and as client needs become more complex, product support expectations become more sophisticated.

User product support

Experienced users require the support necessary to maximize their effective and efficient use of the product. When a vendor cannot, or does not, respond to these more sophisticated needs, research has shown that it is usually because the vendor lacks the inclination, expertise or resources. In cases such as these, support has been given an unacceptably low priority by the vendor, which is short-sighted for both it and the client.

Service commitment and support capabilities must become a competitive marketing weapon among software vendors. Vendors will have to find faster and better ways of responding to clients' problems and needs. More important, they will have to develop innovative ways of marketing and distributing support services. New technology, for example the micro-to-mainframe link, can be used in creative and unique ways to benefit the DP department.

In an examination of recent request for proposals (RFP) submitted by Fortune 1,000 companies on a variety of software products, service and support were key issues. Typical RFP questions included: How many employees support the product — in sales/marketing, in technical support, in development/maintenance? How many service locations are there? Is there a hot line? Who staffs it? How often? Is there a central method for reporting and resolving problems? What is it?

Vendor criteria

One Fortune 500 company listed the following among its criteria for choosing a vendor: "The vendor must exhibit strong financial growth and expanding markets that would assure its capability to carry out maintenance commitments into the future. The system should have a strong user base of satisfied clientele attesting to the system's flexibility, conversion and the vendor's response to problems."

RFPs are certainly not a new method of evaluating user concerns. But there are more demands for service, support, training, financial stability and multiple product offerings than ever before. These client demands reflect the increasing growth and importance of the software industry.

These demands can be expected to become the key competitive issues and measures of software vendor performance during the next five years. Innovative technology will be assessed not merely in terms of its potential to improve a corporation's bottom line but upon the vendor's ability to service and support that technology as well.

The software firms that survive into the 1990s, will be those that can best answer the business and service/support needs of their clients and form long-term and expanding business partnerships with them.

DDI announces enhanced data modeling tool

ANN ARBOR, Mich. — Database Design, Inc. (DDI) unveiled an enhanced version of its logical data modeling tool for IBM mainframes running MVS/TSO.

Data Designer II now includes an interactive, menu-driven user interface as well as a full screen facility for entering and editing descriptions of applications data requirements, a spokesman said. Also included are functions for incorporating "entity-relationship modeling" terminology and an interface with the company's Information Planner software for strategic planning of information systems.

Data Designer II accepts descriptions of the data requirements of applications accessing the data base and will integrate the user views into a logical data model supporting those applications. Reporting and plotting options translate the model into design specifications customized to relational, hierarchical or Codasyl data base environments, according to the vendor.

The interface to DDI's Information Planner assures consistency between top-down and bottom-up approaches to data base design.

Data Designer II is priced at $44,000.

DDI is located at 2020 Hogback Road, Ann Arbor, Mich. 48104.

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PROGRAM

from page 41

and an incorrect version that violated one or two rules of programming discourse. His hypothesis was that given the incorrect version to debug, the performance of an expert programmer would be reduced to that of a novice.

"The rules of discourse are absolutely critical to writing good code," Soloway said. The more a program is patched and enhanced, the less its structure tends to follow the rules of discourse. "You can see why maintenance is hard," he said.

To better understand how programmers maintain programs, Soloway conducted an experiment in which senior programmers working in industry and novice programmers were each given two hours to make two enhancements to a program. The programmers were interviewed and videotaped during the experiment. Quoting baseball veteran Yogi Berra, Soloway said, "You can observe a lot by just watching."

Time usage revealing

A total of 55% of the expert programmers finished the task, compared with 25% of novice programmers. Most revealing was the way the expert and novice programmers used their time.

In a chronological review of the two-hour period, the experts spent 10% of their time reading documentation, 5% reading the assignment, 30% analyzing the program and 55% in writing code. The novices spent 10% of their time reading documentation, 5% reading the assignment, 10% analyzing the problem and 75% in writing code.

"Experts were more model directed. When they [looked] at documentation and code, it was more to verify their expectations. The novices were more code oriented," Soloway said. "All expert programmers were assessing the quality of the person who wrote the program," when they were analyzing the code, he said. The experts look at the global lay of the land in the code to judge whether the programmer could be trusted, or whether the program was written the way he would have. If the experts conclude that they cannot trust the programmer, "They get nervous and make a lot of judgments."

Once the experts completed their analyses, they immediately generated a plan for making the enhancements. "The novices didn't do this," Soloway said. Instead, the novices jumped into coding. "The experts made more observations, used documentation more than [the] novices [did] and tried to get an overview initially," Soloway noted. One expert programmer said while reviewing the code, "I need the big picture."

Having less-experienced programmers debugging and enhancing programs may be counterproductive, the findings suggest. "A lot of maintenance is being done by people who don't have the models" in their heads, Soloway said.

Having experienced programmers is by no means the only factor in a good maintenance program. The expert programmer in Soloway's experiment did complete the enhancement, but "it was a terrible patch. The next guy that comes along to fix this program is going to blow his mind," Soloway said.

However, it was not the expert's fault that his patch violated a rule of discourse. The program documentation failed to make explicit what principles the company management wanted applied to its software. "The documentation did not support the goal plan analysis. It didn't tell the expert the information he needed. The expert programmer got lost," Soloway said.

DP managers should ensure that their company's maintenance goals and plans are explicit in documentation and that the documentation specifies which structures, routines and hierarchies are desired, Soloway advised.

Criticisms of Soloway's experiments at Yale were that the test programs are too small, that the fast pace of technology makes careful study impractical and that the experiments are too expensive to perform.

But Soloway answered that keeping programs small allows him close control of his experiments until he is confident of his methods. "You've got to start somewhere," he said. Technology may be moving fast, but in the absence of data on whether a technology is beneficial, bad buying decisions can be made, he maintained.

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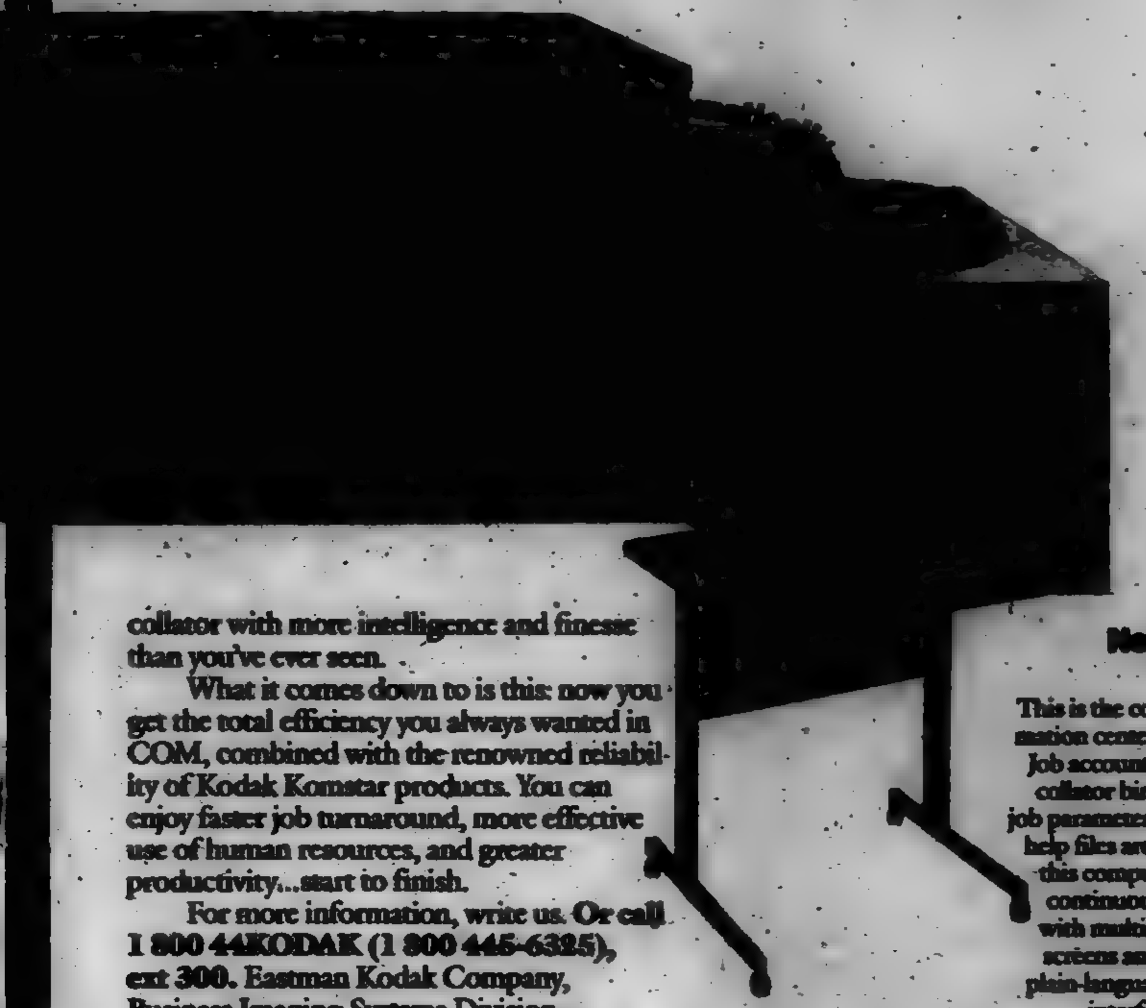

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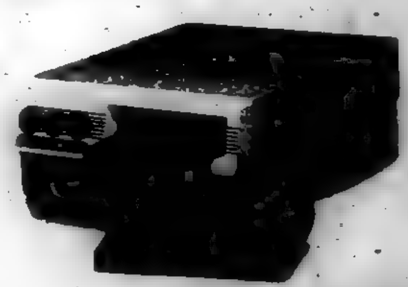

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MICROCOMPUTERS

MIS panel: Windows not the answer

By Kathleen Sullivan
CW West Coast Bureau

PALO ALTO, Calif. — After more than seven hours of presentations on visual user interfaces, including talks by the leading firms, the corporate MIS panel was asked to respond to the question: Are operating environments the solution you need?

Much to the surprise and chagrin of the audience, a trio of speakers, representing Peat, Marwick, Mitchell & Co., Wells Fargo Bank and Syntex Corp., delivered a polite but firm rejoinder: No.

"It doesn't seem to us, as users of the existing technology, that what is on the horizon will answer our needs, said Duane Bell, a partner in Peat Marwick's San Jose, Calif. office. "We have other, more basic concerns to wrestle with."

"If you put a price on it [windowing techniques], I'm not sure I'd buy it," said Thomas Thibault, vice-president of business and systems planning in Wells Fargo's Walnut Creek, Calif. office.

"We don't feel a burning need for these products," said Helen Peters, director of office information services for Syntex, a pharmaceuticals firm based here. "No one has been beating down my door for [IBM's] Topview, [Microsoft Corp.'s] Windows or [Digital Research, Inc.'s] Gem," she said.

But the audience, brought together earlier this month by Infocorp, a Cupertino, Calif.-based market research firm, pressed on.

Perhaps the panel was not familiar with the new visual environments, someone in the audience suggested. After all, Topview has been available only a short time, Gem began shipping the previous week, and the oft-delayed Windows has not yet appeared on the market.

So the panel members were asked to comment on Apple Computer, Inc.'s Macintosh, the computer that introduced icons, windows, pull-down menus and mouse pointing devices to the general public last year.

"At Syntex, we have users that I would characterize as true believers [in] the Macintosh," Peters said. "For that reason, we have been dragged kicking and screaming down the Macintosh road. But we must

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■ Microsoft introduces Microsoft Access, an asynchronous communications package with custom menus and the ability to connect to multiple sources/50

■ Lifetree Software enhances its Volkswriter Deluxe word processing package for greater speed and Topview compatibility/51

■ Samna upgrades its Samna Word II and Samna+ packages, adding Document Content Architecture support/54

INSIDE

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Fire sale seen for last PCjrs

By Edward Warner
CW Staff

ATLANTA — IBM has 200,000 PCjrs sitting in its warehouses, and it will dump them on the market this year for about $500 each, including a color monitor.

That was one of several predictions made regarding IBM and the microcomputer industry by analyst Amy Wohl, president of Amy Wohl & Associates in Bala Cynwyd, Pa.

Speaking recently at the Comdex/Spring '85 trade show here, Wohl said she based her estimate on information gained from a key supplier of parts used in the PCjr. IBM could sell the machines to schools at a big discount and come off "looking like a good guy," she said, but she doubted that Big Blue would choose that route.

Wohl's most controversial prediction was that the Personal Computer AT "may not have a full life span" due to what she said were problems with its hard disk storage unit and the software that controls that unit. This, she said, could spell big trouble for the 26 Personal Computer AT

See WOHL page 55

SMALL TALK
Kathleen Sullivan
CW West Coast Bureau

Does Mac XL spell stopgap strategy?

Stopgap *n* : a person or thing serving as a temporary substitute for another; makeshift.

At its lavish annual meeting in January, Apple Computer, Inc. borrowed a song from the Pointer Sisters to convey its corporate exuberance and warm up the audience. An Apple video was presented on a giant screen to the beat of "We're so excited, . . . and we just can't hide it." Apple Chairman Steven Jobs played impresario for the main act, the Macintosh Office. Jobs introduced the Appletalk network, the Laserwriter printer and the Macintosh XL, which were billed as members of the product line that would give Apple a foothold in the

See APPLE page 56

Multimate WP products debut

Writing/editing unit, file manager in lineup

ATLANTA — In addition to a network version of its Multimate 3.3 word processor software [CW, May 13], Multimate International Corp. introduced a file manager and several word processing programs for the IBM Personal Computer earlier this month at Comdex/Spring '85 here.

Multimate's $195 file manager, Multimate On File, reportedly allows users to search, sort and transfer mailing lists, records and office files produced with the Multimate word processor. The file manager organizes information into file boxes, with the number of boxes limited only by disk space. Multimate's merge utility is used to create customized letters and reports.

The $495 Multimate Advantage Professional Word Processor is said to be oriented toward professionals and to incorporate footnoting, table of contents generation and automatic section number-

See WP page 55

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Oracle announces portable version of IBM SQL/DS and DB2

Any application written for IBM's SQL/DS or DB2 relational database management systems will now run without modification on DEC, DG, AT&T, HP and several other manufacturers' minis, and a wide range of micros, including the IBM PC/XT and PC/AT.

Oracle Corporation introduced the first relational DBMS in 1979. Today ORACLE is the only relational database management system that is completely compatible with IBM's SQL/DS and DB2. Programs written for SQL/DS or DB2 will run unmodified on ORACLE.

Originally designed for IBM mainframes and DEC superminis, ORACLE is now available on a wide range of machines, from mainframes to PCs. And ORACLE includes an integrated set of 4th generation software tools not available with either SQL/DS or DB2.

■ Why not Cullinet, ADR or Focus? There is a clearly defined standard for relational database systems. It's called SQL, and it's from IBM. Both ANSI and the US Government are in the process of adopting SQL as *the* standard database language. The Cullinet, ADR and FOCUS software packages each implement their own unique database language - each one painting the user into its own corner. Since its inception, Oracle Corporation has provided total IBM SQL compatibility.

Few shops nowadays run only IBM mainframes. Why, then, even consider a database solution that runs *only on IBM mainframes?* Applications written with ORACLE run identically on mainframes, minis, and PCs. Because all versions of ORACLE *are* identical.

FOCUS, Cullinet and ADR offer either a limited subset, a completely different product or nothing at all (respectively) for the PC. And none have minicomputer products.

■ Why not just go with DB2 or SQL/DS? A relational DBMS simplifies but does not by itself eliminate application programming. Additional tools are necessary if users are to create and maintain their own applications.

DB2 and SQL/DS are relational systems, period. ORACLE is a relational DBMS plus integrated 4th generation software tools for application generation, report writing, color graphics and network communications.

Furthermore, SQL/DS and DB2 run only on IBM mainframes (and are somewhat unlikely ever to run on another vendor's system). ORACLE runs on more IBM hardware and operating systems than do IBM's relational products.

■ What about Goldengate, dBase III, Symphony or Framework? PCs need more than PC software if they are to be usefully integrated with corporate data processing. Incompatibility with SQL, while serious, is not the only major problem with these micro packages. None provides an acceptable level of data security, integrity or recovery facilities. And their PC-to-mainframe links are functionally primitive and difficult to use.

To effectively link computers, all machines in the network should run the same software. Only ORACLE provides standard software on mainframes, minis and micros. Data and programs can then be shared among users of different machines, distributing the workload.

ORACLE is currently installed on over 1000 mainframe and supermini systems around the world, as well as on thousands of PCs. Oracle's customers include 8 out of the 10 largest U.S. corporations, as well as major foreign companies and government agencies.

For further information, contact Oracle Corp., Dept. C2, 2710 Sand Hill Rd., Menlo Park, CA 94025, or call 415/854-7350 ext. 1060.

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*Actual time may vary depending upon skill level.

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IBM micros get Access software

Microsoft tool allows tapping of data services

BELLEVUE, Wash. — Microsoft Corp. last week introduced Microsoft Access, a $250 communications software package for the IBM Personal Computer line and compatible systems.

The software is designed to allow users to easily access a wide range of information services, including on-line data bases, information retrieval services and electronic mail, the company said.

Microsoft Access reportedly provides a menu system for information and electronic mail services, a command language, the ability to connect to multiple sources, conversion utilities for popular applications programs and support for communications with other personal computers and mainframes.

Built-in interfaces

The package provides built-in interfaces for Dow Jones & Co. News/Retrieval, Compuserve Corp.'s Executive Information Service, Newsnet, Inc.'s Newsnet and the Official Airline Guide information services, according to the company. Custom menus can translate a command into the sequence that a particular service requires.

Access also can batch several steps together to shorten connect time, Microsoft said.

The software reportedly stores requests in memory and automatically offers the same selection process the next time.

The package offers a menu for MCI Communications Corp.'s MCI Mail and Western Union, Inc.'s Easylink electronic mail services. It also is said to provide a text editor and in-box and out-box facilities.

In addition, Access features a Basic-like command language, Microsoft's Access Script Commands, that permits users to write their own scripts or custom menus.

Access can transfer data files to Lotus Development Corp.'s 1-2-3, Microsoft's Multiplan and Chart and programs with Data Interchange Format files.

The package can emulate Digital Equipment Corp. VT100 and VT52 terminals, Microsoft said. It supports both the Xmodem and Tymnet, Inc.'s X.PC transfer protocols. With or without X.PC, Access provides a built-in windowing capability, according to the vendor.

The screen can be split into as many as eight windows, each with a different communications line or X.PC assignment.

Access is scheduled for Aug. 1 delivery. It requires 256K bytes of internal memory, PC-DOS or MS-DOS 2.0 or higher, two disk drives and an asynchronous communications card, Microsoft said.

More information is available from Microsoft at 10700 Northup Way, Box 97200, Bellevue, Wash. 98009.

All Computers' multifunction AT1 card out

TORONTO — All Computers, Inc. has released a multifunction board that reportedly offers multitasking and multiuser capabilities for the IBM Personal Computer, Personal Computer XT and compatibles that have up to 4M bytes of memory expansion capacity.

A subset of the board reportedly allows bank switching and permits the use of packages such as Lotus Development Corp.'s upgraded versions of 1-2-3 and Symphony.

The All Card AT1 contains proprietary Cmos custom chips that perform memory management unit (MMU) functions that are needed to run AT&T's Unix operating system, the vendor said. The MMU functions are said to perform I/O operations and internal memory transfers simultaneously and to protect against one job interfering with others when multitasking or multiuser operations are being performed.

The All Card, in its basic configuration, costs $395 and includes 128K bytes of memory expandable to 4M bytes, the vendor said. With the MMU, the 128K-byte version costs $695.

Another configuration priced at $495 includes 128K bytes of memory, a serial port and a clock, the vendor said. A similar configuration with 256K bytes of memory costs $595.

The cards can be configured with a mix of 64K-byte and 256K-byte random-access memory (RAM) chips, the vendor said. The MMU costs $300 more.

All versions include software for a RAM disk, clock and spooling functions, the vendor said.

The board's calendar clock is said to be identical to the one included in the Personal Computer AT, with battery-backed Cmos RAM and alarm interrupts. The serial port included in the All Card can be addressed with two addresses other than Com 1 and 2 for use in a multiterminal configuration.

More information can be obtained from All Computers, Suite 501, 110 Bloor St. W., Toronto, Canada M5S 2W7.

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IBM EZ-Prep, EZ-Run software debut

Allow micro execution of CSP applications

RYE BROOK, N.Y. — IBM has announced two software packages that reportedly allow the translation and execution of IBM Cross System Product (CSP) large-systems applications on the IBM Personal Computer, Personal Computer XT, AT and 3270 Personal Computer.

EZ-Prep is said to translate CSP programs developed on a host mainframe, while EZ-Run reportedly executes the programs on the micro.

CSP, a family of applications development products, currently operates on IBM 4300 and 308X series mainframes and 8100 distributed systems, according to the vendor.

EZ-Prep and EZ-Run reportedly support sequential, relative record and indexed files on the micro and feature prompted inputs, Help screens and field-level validation on entry.

Packages allow file transfer

The products are said to allow transfer of message files and applications data files to and from the host and support applications development on the micro.

Files are transferred to the micro using any file transfer utility appropriate for the user's system configuration. Mainframe applications must come from one of the following environments: CICS/VS, SSX/VSE, VM/SP, VSE/AF3 or MVS/TSO.

Both EZ-Prep and EZ-Run require PC-DOS 2.0 or higher or the 3270 Personal Computer Control Program, Version 1.2 running on the 3270. Each requires two dual-sided floppy disk drives or one dual-sided drive with a 10M-byte hard disk and the IBM monochrome display and printer adapter or color display with color/graphics adapter. Perpetual licenses cost $1,200 for EZ-Prep and $125 for EZ-Run.

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Net version of Higgins introduced

SAN LEANDRO, Calif. — Conetic Systems, Inc. has introduced a network version of its Higgins administrative software for IBM Personal Computers running on 3Com Corp.'s Etherseries local-area networks.

Higgins is designed to take care of organizational items such as time and event management, personal filing, telephone dialing, to-do lists, calculations and note-taking.

The network version has been integrated with 3Com's Ethermail and Etherprint functions, according to the company, and Higgins can run in background while the user is working with other programs on the network. The package uses Etherseries login and password protection schemes to control access to files.

Higgins works with a single copy of the software resident on the server and does not require any key disk on workstations, Conetic Systems said. The software will work on diskless personal computers.

Higgins for the 3Com Etherseries PC Server is priced at $695, while a version for the 3Server costs $1,295.

More information is available from Conetic Systems at 1470 Doolittle Drive, San Leandro, Calif. 94577.

Volkswriter Deluxe 2.2 out from Lifetree

MONTEREY, Calif. — Lifetree Software, Inc. has enhanced its Volkswriter Deluxe word processing software for the IBM Personal Computer line.

Recompiled with a Pascal compiler, Volkswriter Deluxe 2.2 does not make disk overlays, boosting speed considerably, according to the company.

Support is now offered for IBM's Topview operating environment, allowing up to three copies of Volkswriter Deluxe 2.2 to run at one time on a 640K-byte system.

In addition, the release is said to incorporate a file filter that strips files of control characters and transmits only Ascii characters, aiding use in dial-up transmissions and on local-area networks.

With use of an IBM Enhanced Graphics Adapter card, the word processor now can display 43 lines of text, according to Lifetree. It also supports the IBM Personal Computer AT's high-speed keyboard option, permitting the keyboard to repeat up to 30 characters per second, three times the normal speed.

Volkswriter Deluxe 2.2 is priced at $295. Registered users of Volkswriter 2.0 or 2.1 may upgrade for $30, including the new manual. Volkswriter 1.2 and International Edition users may upgrade for $100.

Lifetree Software is located at 411 Pacific St., Monterey, Calif. 93940.

Samna upgrades WP tools

ATLANTA — Samna Corp. has announced Release 3.0 of its Samna Word II and Samna+ word processing software for the IBM Personal Computer line.

Enhancements to both packages are said to include faster operating speed and support for IBM's Document Content Architecture, permitting Samna users to transfer documents to IBM's Distributed Office Support System.

Other enhancements include selectable output, which permits users to print to either a serial or parallel port or a file, and an enhanced directory, which identifies the space remaining on the disk.

In addition, the releases are said to offer support for both IBM's PC-DOS and Microsoft Corp.'s MS-DOS 3.0 and to feature "hot key" support, which allows users to cease work temporarily on a Samna document and access another program resident in memory.

Additional features of the enhanced versions include the ability to specify a starting number for footnotes, present the default page within a single screen and Samna/Ascii translation.

Samna Word II is priced at $550. Samna+ costs $695, according to the vendor.

Samna is located in Suite C-700, 2700 Northeast Expwy., Atlanta, Ga. 30345.

SOFTWARE

■ Programming Concepts, Inc. has announced Clist, software that provides printed output of source code for programs written in C.

Clist enables a programmer to set program pagination, titling options, variable tabs and special printer controls, the vendor said. The product reportedly makes debugging a C program easier by allowing a programmer to merge address information and a program listing. Clist generates a variable name, cross-reference list for each source code module.

Clist runs on an IBM Personal Computer with IBM's PC-DOS 1.1 or 2.0 operating system.

The program costs $129.

Programming Concepts, 40 Orville Drive, Bohemia, N.Y. 11716.

■ Infosystems Technology, Inc. has announced that its relational data base package, Rubix, is now available for the AT&T 3B2 supermicrocomputer and Altos Computer Systems, Inc.'s 586 and 986 microcomputers running AT&T's Unix operating system.

Rubix features reportedly include multiple perspectives on the data base for different classes of users and queries that search across multiple data bases without specification as to where the data resides.

Rubix includes an English-like command language, a compilable relational programming language and a C language interface.

Rubix for the AT&T 3B2, the Altos 586 or the Altos 986 is priced at $1,495.

Infosystems Technology, 6301 Ivy Lane, Greenbelt, Md. 20770.

■ Datamedia Corp. has announced that the Unix System V, operating system for its line of supermicrocomputers now includes multiuser windowing capabilities. The company also announced that Access Technology, Inc.'s 20/20 spreadsheet package now runs on its Unix-based 932 supermicros.

The windowing capability is said to be transparent to applications. Users can work with up to eight active windows, including a command window with full terminal emulation and viewing control for each window. Applications, commands and utilities can be viewed simultaneously.

English language commands are displayed in a command window, according to a spokesman.

Other features include horizontal and vertical scrolling, paging and dynamic sizing and positioning. A window library stores up to 48 user-defined windows that can be recalled at any time by the user, the spokesman said.

The list price of a Datamedia con-

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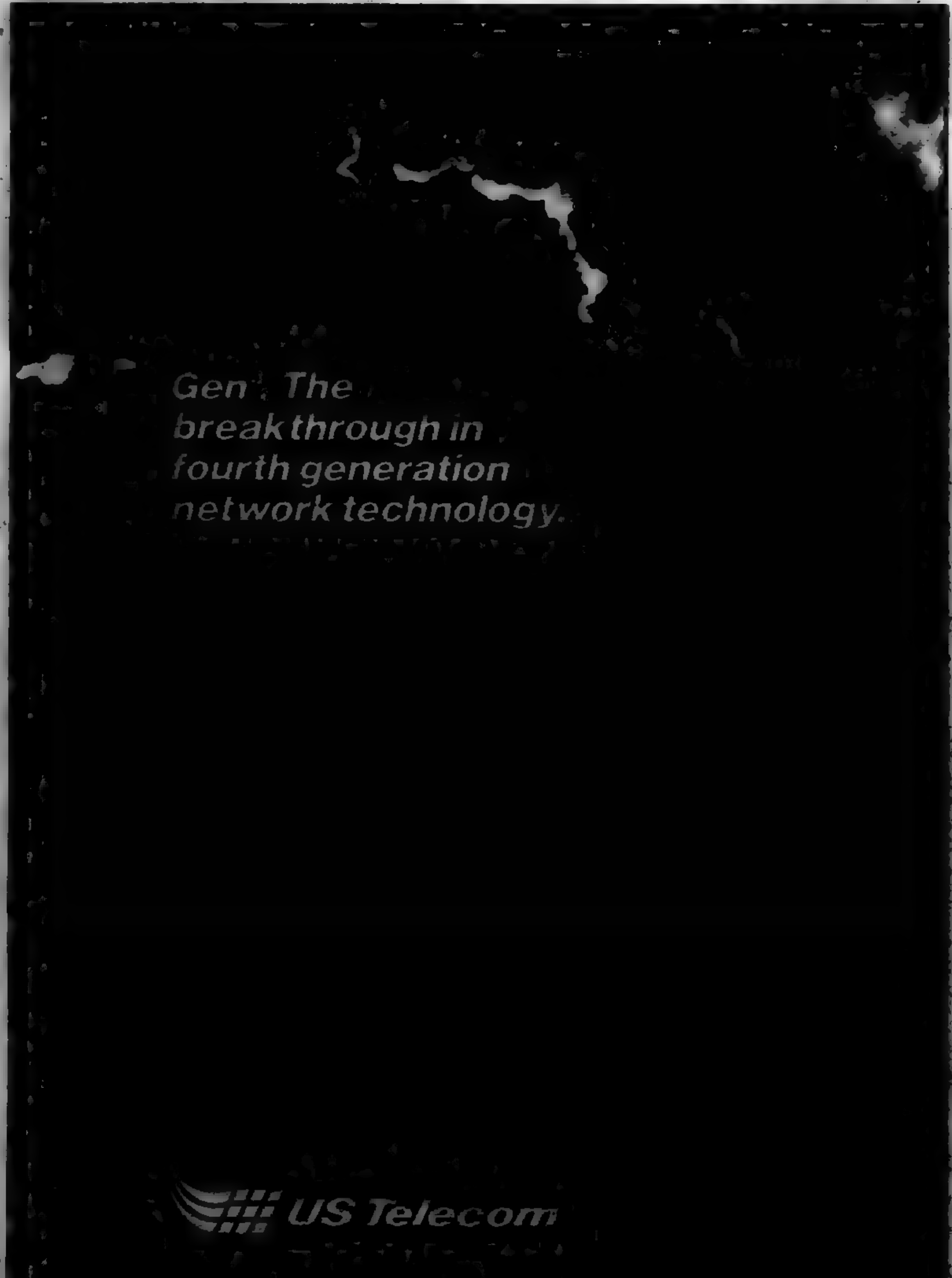

PANEL

from page 47

provide integration and migration strategies for the company, and we don't know how to do that with the Macintosh."

Peat Marwick, by contrast, is one of the most visible corporate users of the Macintosh. The company has bought approximately 4,000 Macintoshes, which its auditors tote along to audit engagements, Bell noted. But the computer's visual interface was not the crucial factor. Bell said the firm chose the Macintosh because it "met a critical need for portability."

Although they lacked enthusiasm for visual user interfaces, the panelists had definite ideas on what they would like to see: a well-designed menu system, improved data base management systems, better presentation graphics and increased speed in microcomputer-to-mainframe links.

"We try to be state of the art, not leading edge," Syntex's Peters said. "We can't afford the conversion costs, training and capital outlay of the latest and greatest technology."

Noting the close relationship that Apple has cultivated with Peat Marwick, Bell offered the software vendors in the audience some free counsel. "If you have a target user, get involved with them in the planning stages," he said.

MICROCOMPUTERS

Continued from page [illegible]

figuration including 16 windowing terminals, a Datamedia 932 supermicro and the Unix operating system with windowing is $40,179.

Access Technology's 20/20 package sells for $950 for eight users.

Datamedia, 401 Amherst St., Nashua, N.H.

■ The ICU Group has announced emulation software for Digital Research, Inc.'s CP/M 80 operating system that gives IBM Personal Computer, XT, AT and compatible computers under Microsoft Corp.'s MS-DOS 2.0 or later versions the ability to run CP/M 80 programs without an additional coprocessor board.

CP/EM is said to allow Microsoft's MS-DOS to redirect I/O devices for use in altering device assignments, which allows CP/EM access to all standard MS-DOS devices and any installed device driver.

Serial communications programs are included with CP/EM to aid in the transfer of programs and data between CP/M and the MS-DOS computer.

The program costs $79.95.

The ICU Group, P.O. Box 10118, Rochester, N.Y. 14610.

■ Access Technology, Inc. has announced its Pro 20/20 integrated spreadsheet program for Digital Equipment Corp. Professional series computers.

Pro 20/20 is said to allow users to paste spreadsheets or graphs into DEC's Prose Plus word processing package documents and to access DEC's Procomm communications program without exiting Pro 20/20.

The package is a smaller version of Access Technology's 20/20 program, which runs on DEC's VAX series machines, the vendor said.

The package costs $500.

Access Technology, Six Pleasant St., S. Natick, Mass. 01760.

■ Thorn EMI Computer Software, Inc. has unwrapped its Perfect Draw graphics design program, which allows users of the company's Perfect Writer word processing program to create and add illustrations and stylized text to their documents.

The package runs on IBM Personal Computer, Personal Computer XT and Personal Computer AT computers and Apple Computer, Inc.'s Apple IIe and IIc microcomputers.

Icons are used to operate the program, the vendor said. The program is said to be compatible with input devices including a mouse, joystick, graphics table and light pen.

The package costs $50.

Thorn EMI Computer Software, 1881 Langley Ave., Irvine, Calif. 92714.

■ Account Data Group, Inc. has announced that its Primavera Project Planner software has been updated to operate on the Zenith Data Systems Corp. line of microcomputers, as well as on the IBM Personal Computer and its compatibles.

The upgraded version reportedly will run on Zenith's Z-100, Z-110, Z-150 and Z-160 models that use Micro-

Continued on page [illegible]

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ing. Also included are line and box drawing, forms generation capability and file and list management.

Multimate Executive Word Processor, priced at $595, offers full compatibility with Multimate Advantage and provides, at hand, basic word processing features for such functions as writing memos of first-draft reports.

The $245 Just Write package is said to be an entry-level word processor that offers basic writing and editing functions in addition to footnoting. It runs on the PCjr as well as the rest of the Personal Computer line.

Multimate On File requires 128K bytes of memory. Multimate Advantage and Multimate Executive each need 320K bytes of memory. Just Write requires 128K bytes of memory. All except Just Write require IBM's PC-DOS 2.0 or higher. Just Write requires PC-DOS 2.1 on the PCjr and 2.0 on other Personal Computers.

Multimate is located at 52 Oakland Ave. N., East Hartford, Conn. 06108.

WOHL from page 47

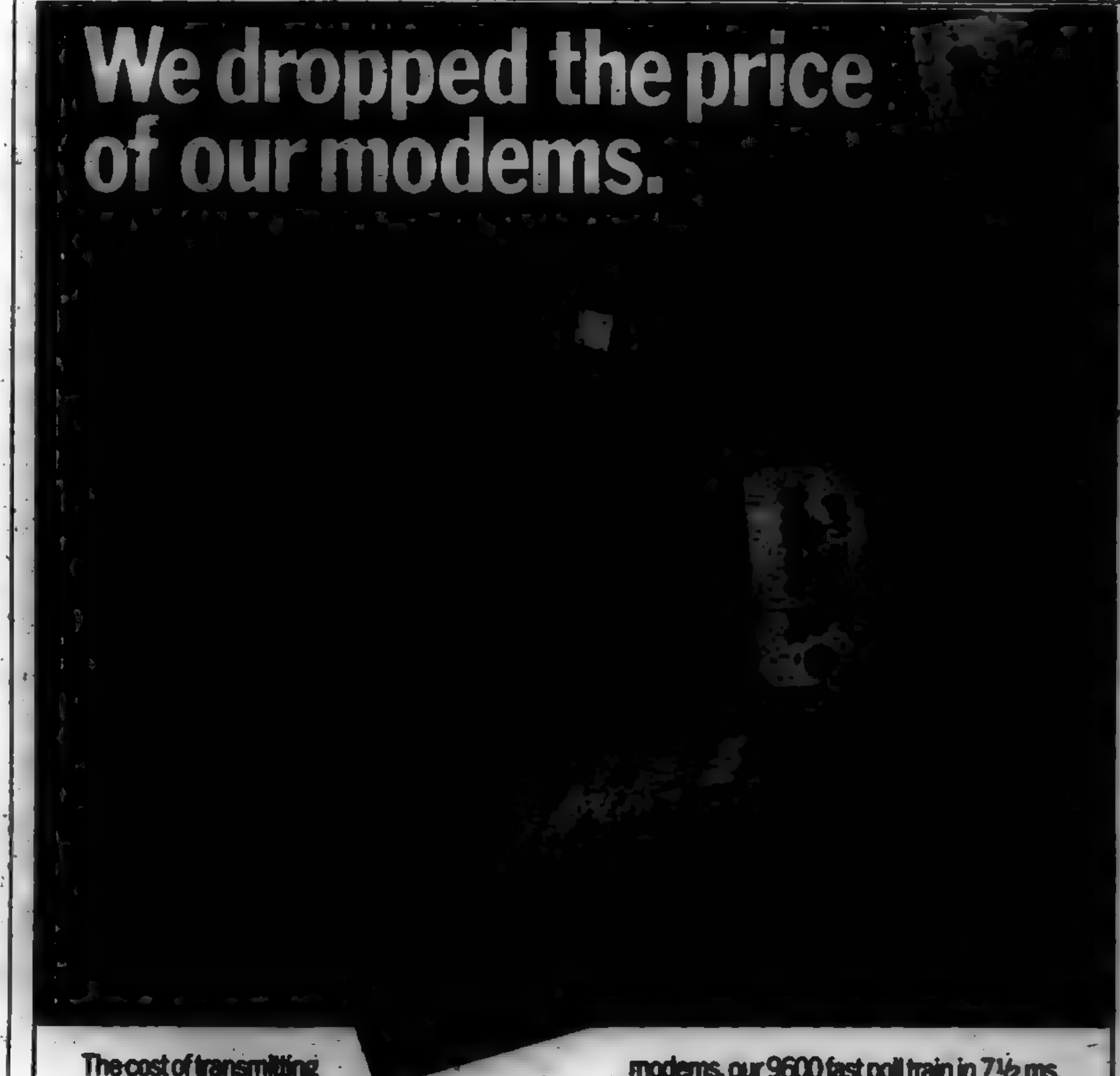
compatibles announced so far. "IBM may bring out a product that replaces it before [IBM-compatible makers] are able to take hold in the marketplace," she said.

Wohl also said that the much-rumored next generation of Personal Computers, sometimes called the PC2 line, will not debut until late this year at the earliest. An earlier introduction probably was planned, she said, but the shake-up that sent new management to IBM's Entry Systems Division has caused the delay.

As for whether IBM will introduce a laptop computer, Wohl said IBM is unlikely to do that until that market heats up enough to offer the prospect of a significant return on investment.

There are few laptop machines with a reasonable price, around $2,500, Wohl said. She added that the most exciting action on the portable market is in the 14-lb to 16-lb transportable market, products such as the Morrow, Inc. Pivot II and the Zenith Data Systems Corp. Z-171, both of which premiered at Comdex/Spring '85.

With such IBM-compatible, battery-operated machines on the market, she predicted, the days of the 28-lb IBM-compatible transportable are numbered.



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MICROCOMPUTERS

Continued from page 55

soft Corp.'s MS-DOS.

The menu-driven project management software reportedly features critical path scheduling, resources leveling, cost control and report generation and can schedule up to 10,000 applications activities.

The product requires 512K bytes of random-access memory and a hard disk and costs $2,500.

Account Data Group, Suite. 202, 3139 Wisconsin Ave. N.W., Washington, D.C. 20007.

PRINTERS/PLOTTERS/ PERIPHERALS

■ **Fujitsu America, Inc.** has released its Dotmax 24I, an IBM Personal Computer-compatible version of its 24-wire Dotmax 24 dot matrix printer.

The Dotmax 24I reportedly features bit-mapped graphics and block graphic character sets. Principal graphics modes are an 8-bit, 200 by 60 dot/in. resolution image mode and a 24-bit, 360 by 180 dot/in. resolution image mode. Print speed is 80 char./sec. for letter quality and 240 char./sec. for draft quality.

The printer is priced at $1,995.

Fujitsu America, 3055 Orchard Drive, San Jose, Calif. 95134.

■ **Intek Manufacturing, Inc.** has released its Data Manager multiple device spooler which is said to connect up to five personal computers with RS-232 interfaces to any printer with an RS-232 interface.

The Zilog Z80A microprocessor-based Data Manager stores finished copy from five computers for final printout on a first-in, first-out basis at a rate the printer can accept, the vendor said.

The system allows each computer to send data at 9.6K bit/sec. and provides 54K bytes of memory storage to accept data from all five computers. The unit has five RS-232C input ports and one RS-232C output port.

The spooler is said to eliminate the need for operator intervention in the printing process.

A single unit costs $795.

Intek Manufacturing, 780 Charcot Ave., San Jose, Calif. 95131.

BOARD-LEVEL DEVICES

■ **STB Systems, Inc.** has announced Atta Byte, an add-on board that reportedly gives AT&T Personal Computer 6300 users memory expansion up to 640K bytes.

The board is said to be available with 128K, 256K or 384K bytes of memory installed to add to the 6300's 256K bytes of memory. The Atta Byte board reportedly occupies one dual connector slot in the 6300. Its price includes Best Corp. PC Accelerator software.

The board costs $395 for 128K bytes, $495 for 256K bytes and $595 for 384K bytes.

STB Systems, Suite 125, 601 N. Glenville, Richardson, Texas 75081.

APPLE

from page 47

business marketplace.

Unlike the other two products, the Macintosh XL was not new. Apple had simply rechristened the Lisa.

Born again, the Lisa was destined for the Macintosh Office, Jobs said. It would meet the needs of the corporate user, who required more memory, a larger screen and a built-in hard disk drive.

Less than four months after that annual meeting, however, Apple said it would halt production of the Lisa. The machine met its end without fanfare; the Pointer Sisters were nowhere to be heard. And now Apple is suddenly shy about its plans, ducking questions about a replacement.

From the outside, it appears that Apple announced the Macintosh XL as a stopgap measure. Actual support for the machine was minimal, users said.

The move bought some time for Apple, which didn't (and still doesn't) have a powerful Macintosh in its lineup. Its presence served to deflect some questions, at least temporarily, on how Apple would serve the corporate market.

"The only reason Apple kept [the Macintosh XL] as a product was so that if someone asked, 'Is there a Macintosh with a hard disk and more memory?' Apple could say, 'Here it is — the Macintosh XL,' " according to Bill Parkhurst, an independent software developer in Los Gatos, Calif.

Parkhurst, who heads a Macintosh special interest group for the Software Entrepreneurs' Forum, an association of independent software companies based in Palo Alto, Calif., said the news didn't surprise most developers. "Most of us recognized quite a long time ago that the chosen product was the Macintosh and that the Lisa would be phased out," he explained.

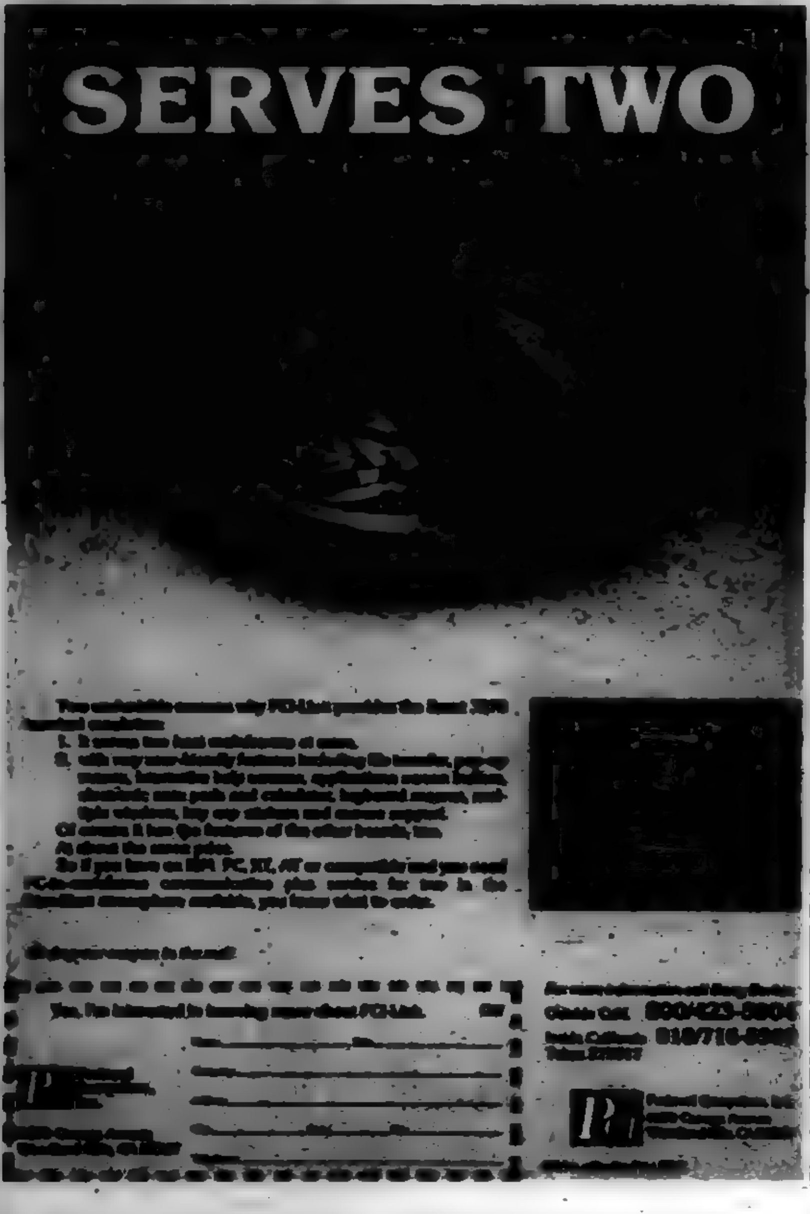
Analysts agreed, attributing the Lisa's demise to its troubled tenure in the industry. Its original $10,000 price tag and its small stable of proprietary software hindered the computer's acceptance, analysts said. Price cuts followed, but the Macintosh gained momentum in the interim.

"To us, the Lisa represented the new technology we wanted to bring out in a low-cost personal computer," said Apple software engineer Larry Tesler, who helped design the Lisa. "The Macintosh represents what we're trying to do even better than the Lisa did."

Apple hopes to win over large corporate users with its Macintosh Office. Its executives have acknowledged that Apple will have to earn its way into the good graces of big business over the next two years to be successful.

But the company has not begun on an auspicious note. With the rapid rise and fall of the so-called Macintosh XL, the company seems to have substituted a makeshift policy for a clear corporate direction.

Perhaps Apple should review the remarks its president, John Sculley, made at the same annual meeting at which the Macintosh XL was unveiled.



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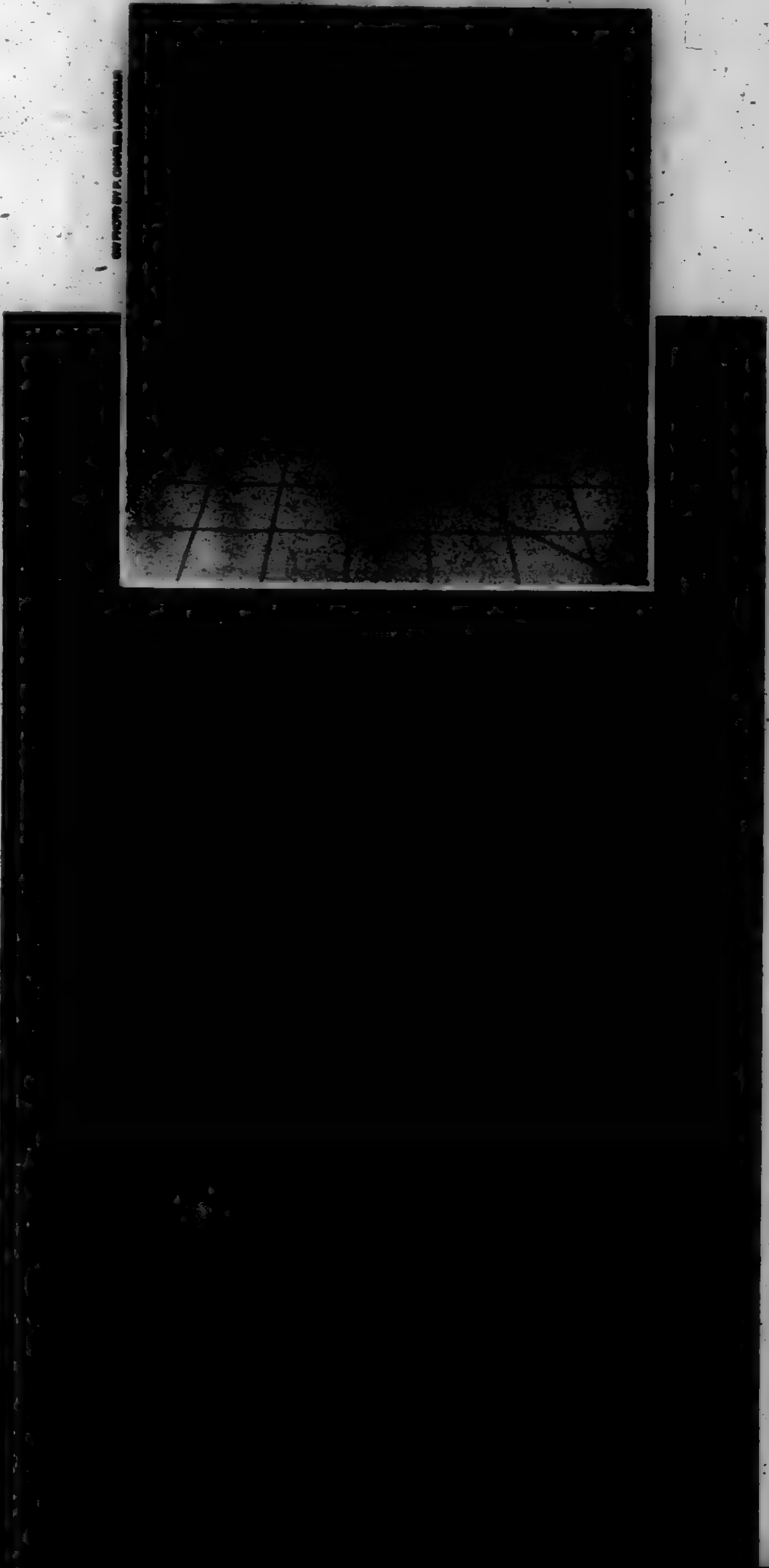

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systems opportunities. It holds that the organizational purpose served by computer applications is either to automate a basic process (subprocess or task) or to provide information for decision making.

This view is concerned primarily with information flows, data bases and the production of reports related to the organization's planning and control operations. I call this the conventional perspective on information systems.

A data processing professional exemplified this view in the early '70s when he advocated a new approach for information systems planning, a top-down method "to focus on the critical tasks and decisions made within an organization and to provide the kind of information that the manager needs to perform those tasks and make those decisions."

The author of a recent book on the health care industry reflects this view when he asserts that "the only computer services that a hospital really needs — the basic financial, billing and accounting operations — could be purchased relatively inexpensively from any service company."

When adherents of the conventional perspective search for information system opportunities, they look for two varieties: management information systems (MIS) and management support systems (MSS). (MSS includes as its two main species decision support systems and executive information systems.) These varieties are intended to serve organizational purposes associated with the conventional perspective, that is, automating basic processes (the domain of MIS) and satisfying the information needs of managers and professionals, needs often closely connected with planning and control decisions (the domain of MSS).

But the conventional perspective, important as it is for identifying and illuminating the significance of these two varieties, offers too limited a view of the world of information systems.

Clinical laboratory

Consider, for example, how Metpath, Inc. uses systems to compete in the tough, fragmented clinical laboratory industry, where low differentiation of service has led to a lack of customer loyalty and frequent price discounting. Doctors send specimens to the lab for processing and, in return, expect timely, accurate analyses. Metpath enhanced its customer service by installing computer terminals in doctors' offices and linking them to its lab computers. For a small monthly fee, physicians receive test results as soon as they are determined.

From the conventional vantage point, the system might be seen as a transaction processing, on-line data base application providing critical diagnostic information to physicians. But this description captures neither its competitive import nor its innovative character. By changing conceptual lenses and viewing it from a strategic perspective, we see it as an attempt by Metpath to use its information system as a double-edged sword.

First, it builds barriers against new and existing rivals by raising the information systems ante. Second, it enables Metpath to gain an edge over other labs by differentiating an otherwise commodity service. Metpath keeps historical records of patient data on file and offers its customers computerized processing services for billing and accounts payable operations, as well as easy access to stock market quotations from the Dow Jones network.

Finally, the system can expand the services it offers into such areas as diagnosis (when expert systems become available) and drug interaction testing. Referring to the latter, the vice-president for scientific affairs of the American Pharmaceutical Association said: "If there is such a thing as the wave of the future, this is it."

Primed as it is to store patient profile data on such items as drug and food allergies, chronic illnesses and medications taken, the Metpath system will permit physicians to conduct drug interaction tests prior to writing prescriptions. Each of these information system-based hooks serves to differentiate a commodity service and thereby secured the loyalty of the estimated one in five doctors who switch annually from lab to lab in search of lower prices.

Competitive weapons

The conventional perspective on information systems supplies scant guidance to those who wish to discover such application opportunities or explain their strategic impact. Nor is it of much help in accounting for the extended uses made by American Airlines and United Airlines of their computerized reservation systems, Sabre and Apollo, respectively. Built in the 1970s at a cost of more than $250 million each, these information systems are no longer employed merely as neutral scheduling mechanisms to automate the seat reservation process. Rather, they are being used increasingly as weapons in the struggle for industry domination.

Sabre and Apollo give priority listing to American and United flights when travel agents request information on their computer terminals. An agent who uses the Sabre system and requests a listing of flights from New York to Los Angeles with stops in between knows that the first few items to appear on the screen may not show the most direct way, nor the least expensive way, but for sure they'll show the American way.

American and United have used their reservation systems to preempt the major channel of distribution. In the computerized travel agency market, the two form a powerful duopoly with shares of 41% and 39%,

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respectively. The crumbs (the remaining 20%) have been left to the competition. While Delta, Eastern and TWA have developed smaller systems, the other carriers are at risk. As one of the less fortunate put it: "We clearly didn't pay enough attention, and now it's a direct threat."

More than 80% of the nation's 20,000 travel agencies, accounting for 90% of airline ticket sales, are computerized. In regions where the airline with the reservation system has numerous flights, the prioritization procedure can lead to as much as 20% more revenue.

In addition, Sabre and Apollo have become vehicles of diversification and growth, propelling American and United into new lines of business. According to the president of American, "This industry needs every cent it can generate. We've got to be creative about using our huge asset base to develop new revenues. We're looking at businesses we can be in at low costs because some of the links are already in place." These links form, in American's words, "the world's most powerful nonmilitary computer system."

According to the vice-president of marketing and automation systems at American, 65,000 devices hang off the network, which runs 23 hours a day, 365 days a year and keeps track of 6.5 million domestic and international airfare combinations, more than 10,000 daily fare changes and the schedules of about 650 airlines around the world. In 1983, for example, it handled more than 55 million calls at its four reservation centers.

To exploit excess capacity on Sabre, the carrier recently formed American Airlines Telemarketing Services, which performs services such as conducting marketing surveys and taking pledges generated by telethons. American expects that the fee income from these operations will be supplemented in the future when it uses its network to offer consumer products to home computer users.

New variety

The two cases just described are instances of strategic information systems, information systems used to support or shape the competitive strategy of the organization. Strategic information systems represents a new information system variety, radically different in organizational use from those countenanced by the conventional perspective.

The conventional perspective is unsuited for guiding the systematic search for strategic information systems opportunities and is incapable of explaining the strategic significance of applications. Believers in the conventional gospel on information systems are unable to discern most strategic information systems opportunities. Lying still further beyond the conventional field of vision, the entire spectrum of strategic alliances supported or shaped by information systems also goes undetected.

> *In addition, Sabre and Apollo have become vehicles of diversification and growth, propelling American and United into new lines of business.*

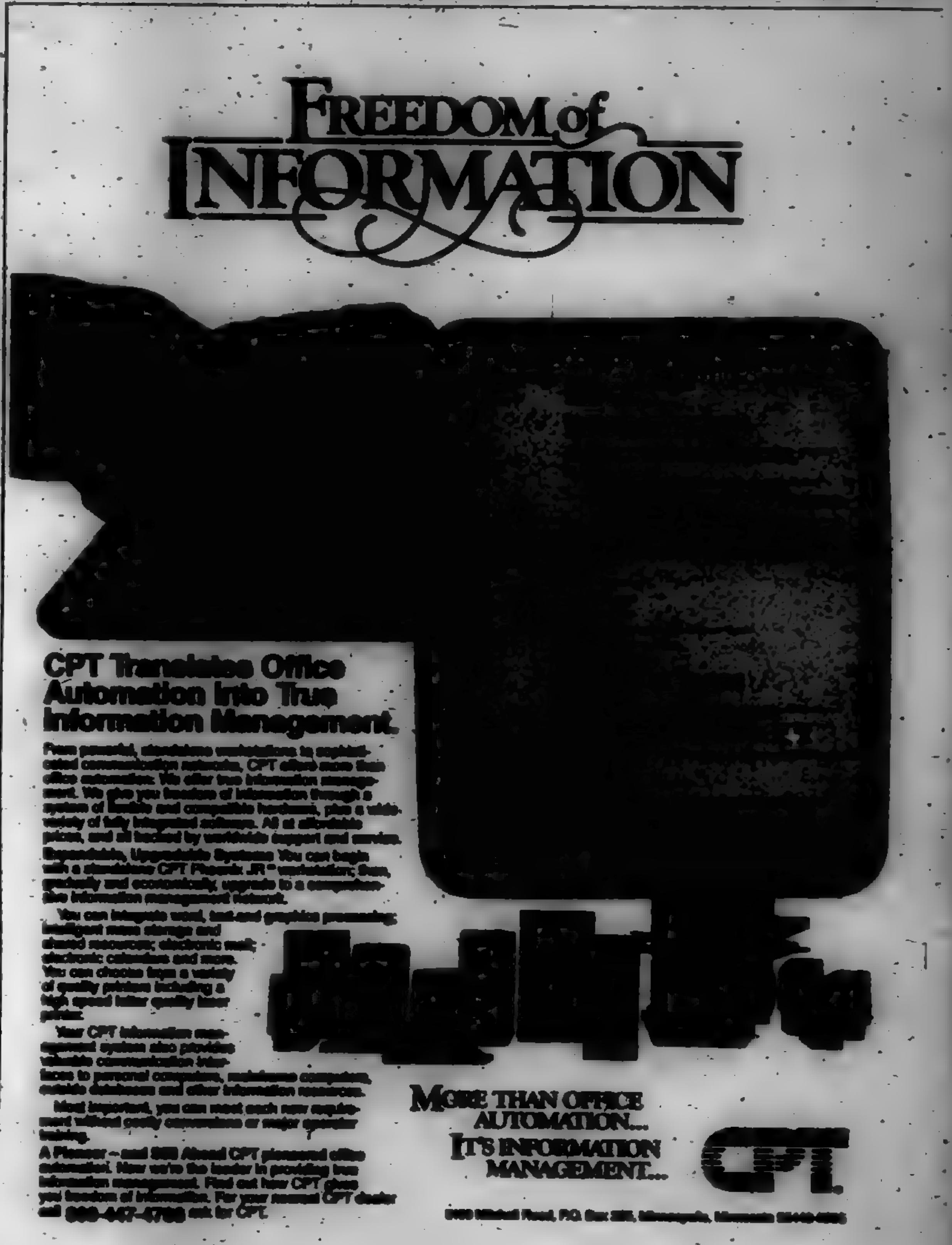
Paine Webber, for instance, seized an alliance opportunity in 1984 that no other brokerage house had previously been able to capture. It negotiated a pact with the State Street Bank and Trust Co. of Boston enabling it to participate in Masterteller, the nationwide automated teller network run for banks by Mastercard International, a credit card and traveler's check organization owned by 24,000 banks and other institutions. The Masterteller network lets cardholders withdraw cash from more than 1,000 automated teller machines throughout the U.S.

Up to this time, banks had been very careful to exclude rivals offering competitive financial services from entry to their networks. Indeed, two of the largest bank-owned nationwide networks, the Plus and Cirrus systems, rejected requests from Merrill Lynch and the Fidelity Group, a Boston-based mutual fund company to establish similar arrangements.

Now Paine Webber customers can use credit cards issued by State Street to get the same 24-hour access to cash that bank cardholders enjoy. Because of this alliance, a cardholder with a Paine Webber account can withdraw money at automatic teller machines across the country. The story of how Paine Webber will use this new alliance in packaging its products has yet to unfold. In any case, the deal illustrates how the broker capitalized on information systems assets developed by others to serve its own strategic ends.

Joint ventures

Another form of strategic alliance involving information systems is illustrated by a recent joint venture. IBM and Merrill Lynch announced in 1984 the formation of International Marketnet, a new information service intended to provide users of IBM Personal Computers with stock quotations, investment data, analytical processing, financial software and so on. The service will enable end users to communicate via satellite links with Merrill Lynch's host computers. Menchik-Weber Corp., a software house specializing in the securities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industry and acquired by McGraw-Hill, Inc. after International Marketnet opened its doors, won the contract to develop the systems that will run the service.

International Marketnet is a 50-50 joint venture of IBM and Merrill Lynch. The venture's customers will be drawn from Merrill's 10,000 account representatives, other brokerage houses, commercial banks, money managers and clients of these firms. For IBM, the alliance supports its strategy of market expansion; for Merrill, the venture supports plans to diversify into the information services industry and to reduce and eventually eliminate the fees it now pays to Quotron Systems, Inc. for the use of its stock-quotation system.

These alliances, as well as the examples detailed earlier, exemplify the strategic use of information systems. Representing instances in which competitive strategy is supported or shaped by the application of computer technology, they mark a dramatic turning in the brief evolutionary history of information systems. But to appreciate more deeply this break with the past — this movement from the conventional to the strategic — requires something more than the trotting out of strategic information systems cases. What we need to show are examples of firms that have developed a vision of information systems to guide their strategic course.

Strategic vision

To see that an information system application is a strategic information system, we need to understand how information systems are used to support or shape the firm's competitive strategy. This ability to see and understand I call strategic information systems vision.

A firm with a powerful strategic information systems vision zealously encourages the search for opportunities to use information systems to gain a competitive edge. And when they are discovered, it marshals the proper resources to support them. In some cases, strategic information systems vision develops into an image of the future that top management uses to navigate the firm's strategic path.

How can we determine whether a firm possesses this vision? The best test is to examine what the firm says and does. If it purports to appreciate the strategic significance of information systems and if it launches thrusts supported or shaped by systems, we are justified in believing that strategic information systems vision is operating.

It would be preferable, to be sure, to explore from within, to observe in detail the strategic decision-making process and how information systems are woven into the fabric of strategic programs, before making a judgment.

Dun & Bradstreet

The Dun & Bradstreet Corp. traces its origin back to 1841 when Louis Tappan, a New York dry-goods jobber, founded the Mercantile Agency, the first credit-reporting firm in the U.S. Within a decade, the Bradstreet Agency became the second company to enter the field. By 1880, Mercantile (now run by R.G. Dun) had established 60 branch offices in major business centers.

Being the first two firms to create nationwide networks, Bradstreet and Dun dominated the credit-reporting business. In the 1870s, Dun employed more than 10,000 reporters or investigators and received some 5,000 requests a day for information. In 1930, the two firms merged to form Dun & Bradstreet.

By 1978, Dun & Bradstreet had become a $763 million diversified information services company with four major divisions: Business Information Services, Publishing, Marketing Services and Broadcasting. Business Information Services contributed 38% of the revenues and 27% of the operating income.

In 1979, Dun & Bradstreet recorded its best year ever and made two significant strategic moves. It purchased for $164 million National CSS, Inc. (NCSS), a leading computer service company with a nationwide, 30,000-mile time-sharing network, and agreed to acquire its sixth television station together with half-a-dozen small cable systems. This move gave Dun & Bradstreet its first hands-on experience in the growing cable industry. The NCSS acquisition became part of Dun & Bradstreet's Business Information Service Division, while the television station and cable systems were to become part of the broadcasting group.

In its annual report, Dun & Bradstreet explained how it saw these moves as consistent with its strategic vision: "There are three principal resources that are central to the continued success of the Dun & Bradstreet Corporation: our ability to collect timely and relevant information for the decision-making use of our various customer groups; our capacity for applying technology effectively to maximize information delivery and utility; and the management to anticipate the needs of our customers and, in partnership with our highly skilled people, to provide quality products and services worldwide."

Information services giant

At the close of 1983, Dun & Bradstreet had become a $1.5 billion information services giant. The contribution of the Business Information Services Division had risen in four years to 45% of total revenue and 34% of operating income. During the year, Dun & Bradstreet made two significant strategic moves. It acquired McCormack & Dodge Corp. (M&D), a major software company specializing in financial and human resources packages, and departed from the broadcasting industry by selling its stations and systems.

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In 1984, Dun & Bradstreet underlined its focus on business services and information by acquiring through merger (a $1.33 billion stock transaction), A.C. Nielsen Co., the nation's leading consumer research concern.

Dun & Bradstreet's recent evolutionary history reflects strategic information systems vision. Its management has executed strategic moves supported or shaped by information systems, moves that serve to support or shape the company's long-term objective of concentrating its efforts and resources in the business services and information industry.

> ”
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> *The Official Airline Guide/Electronic Edition is an example of an innovative strategic maneuver targeted at customers who wish to reduce their travel costs — the third fastest rising corporate expense.*

In 1979, Robert Weissman (NCSS's president when it was acquired by Dun & Bradstreet and now Dun & Bradstreet's president and chief operating officer) proclaimed: "NCSS and Dun & Bradstreet are the best fit in the information industry — data from Dun & Bradstreet operating companies plus NCSS leadership in computer services. We're going to rewrite the book on combining information and technology to develop new products for our customers."

The battle cry voiced by Weissman is reflected in the following moves made during the 1979-1984 time period.

Acquisition of NCSS. This major diversification move enabled Dun & Bradstreet to enter the time-sharing business, a new market pioneered by NCSS, and to exploit NCSS's information system resources (its hardware, software and highly skilled work force) synergistically.

Within a few months after the acquisition, 12 joint projects were initiated, among them Duns Vue, a new credit product, and Moody's Municipal Credit Report Service, both designed for electronic delivery over the NCSS network. But the NCSS time-sharing business has been a disappointment.

As demand declined over the past five years, primarily because of the rapid spread of microcomputer processing, Dun & Bradstreet has had to find new uses for its valuable NCSS resources.

Acquisition of McCormack & Dodge. Like the NCSS purchase, this alliance illustrates a major diversification move with a dual purpose. Dun & Bradstreet expects to exploit M&D's software, systems know-how and 3,000-member customer base synergistically across its various product lines. And it expects M&D, an established leader in its market niche, to continue its impressive growth.

Already, joint projects are emerging between M&D and Dun & Bradstreet's other units. M&D's PC-Link allows users of IBM's Personal Computer to retrieve and transfer mainframe data. This product ties directly to Dunsplus, which is the result of efforts by an NCSS division (now called Dun & Bradstreet Computing Services) and a strategic information systems alliance struck between Dun & Bradstreet and IBM.

Acquisition of Nielsen. In the case of the NCSS and M&D acquisitions, Dun & Bradstreet exploited the information systems assets of others. With the Nielsen merger, on the other hand, Dun & Bradstreet saw opportunities to exploit its own information system assets. Here, there are both economy-of-scale (possible consolidation of information system services) and economy-of-scope opportunities, which have yet to unfold.

Development of Official Airline Guide/Electronic Edition. Dun & Bradstreet's Official Airline Guides provide information on North American, Worldwide and Air Cargo flights. In 1983, Dun & Bradstreet announced an electronic version of these guides. The Official Airline Guide/Electronic Edition can be accessed by computer terminals. It lists the information contained in the print editions, as well as fares. Users can query the flight data base for comparative fare information within specified arrival or departure periods and for lowest fares between two points.

The Official Airline Guide/Electronic Edition, however, does not handle reservations. Dun & Bradstreet distributes its product directly or through such information networks as Compuserve, Inc., Dialcom, Inc., Dow Jones News/Retrieval, Bell Canada and Viewdata.

The Official Airline Guide/Electronic Edition is an example of an innovative strategic maneuver targeted at customers who wish to reduce their travel costs — the third fastest rising corporate expense. In the past, travelers generally relied on agents for such information and, depending on the reservation system used by the agent, received flight alternatives giving priority to the airline providing the system. Now, with the Official Airline Guide/Electronic Edition, travelers can get objective data, favoring only the airlines with the lowest prices. The system will also include international fares, as well as hotel and car rental rates.

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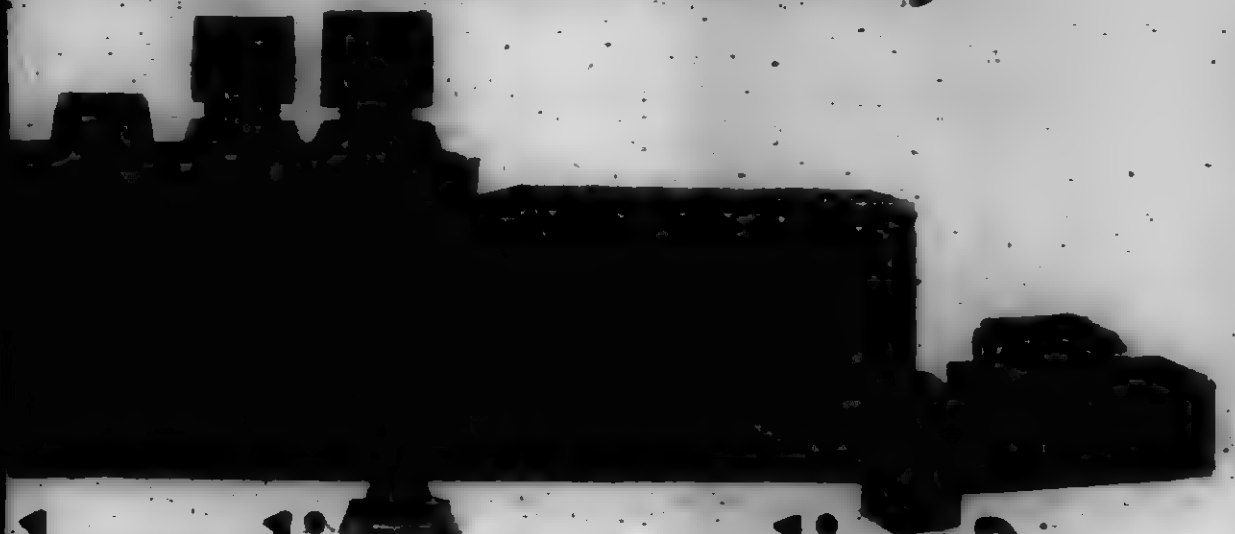

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Creation of Dunsplus. By forming strategic information systems alliances with IBM, Lotus Development Corp. and Software Systems, Dun & Bradstreet created a unique product complementing its other offerings as well as providing a stand-alone, integrated professional workstation. Dunsplus consists of an IBM Personal Computer (Dun & Bradstreet forged an agreement with IBM to act as a value-added remarketer), spreadsheet (1-2-3) and word processing (Multimate International Corp.'s Multimate) programs and specifically developed Dun & Bradstreet software (from NCSS) outfitting end users with electronic mail, file maintenance, data integration and other capabilities.

As incentives to purchase Dunsplus, Dun & Bradstreet includes as standard features one year's sign-up charges for Western Union's electronic mail service and its own Official Airline Guide/Electronic Edition. Access to Dun & Bradstreet's extensive collection of electronic data bases, and others as well, is a relatively straightforward procedure with Dunsplus.

Built into the offering is PC-Link, M&D's micro-to-mainframe utility program, which allows Personal Computer users to transmit and receive data from corporate data bases. Within the first six months after its introduction in January 1984, Dunsplus attracted more than 50 major corporate customers.

Development of Dunsnet. This recent Dun & Bradstreet offering is a packet-switched telecommunications network, similar in function to GTE's Telenet and Tymshare, Inc.'s Tymnet. With Dunsnet, Dun & Bradstreet offers its customers value-added networking services and distributed processing through the use of such microcomputer systems as Dunsplus. NCSS and other Dun & Bradstreet units can also make use of the network.

Dunsnet enables all Dun & Bradstreet users to access its data bases using one standard procedure. It reduces Dun & Bradstreet-generated revenues for Telenet and Tymnet. Dunsnet represents a strategic growth move for Dun & Bradstreet, a kind of forward integration that takes the company a step further toward its goal of being a full-service provider of information services and data to its clients.

Forward look

From this short selection of strategic actions taken over a five-year period, it seems evident that Dun & Bradstreet possesses strategic information systems vision. If it didn't, how else can one account for such efforts to use information systems to support strategy. The reader may object that because Dun & Bradstreet is an information services company, each of the moves cited is natural and has nothing to do with strategic information systems vision.

But this objection is not persuasive. Dun & Bradstreet had choices. It wasn't forced to acquire M&D or Nielsen. It wasn't bullied into forming an alliance with IBM to market the Personal Computer and build a product around it. Dunsnet was not inevitable. Different data-rich firms have made different strategic thrusts, some emphasizing information systems, others not. Dun & Bradstreet itself didn't have such a clear vision of its future in 1979, as indicated by its broadcasting acquisitions. After acquiring NCSS, however, the die seems to have been cast, with Weissman probably sounding the clarion call.

The current evolution of Dun & Bradstreet, inspired by strategic information systems vision, is far from complete. By the end of this decade, in all likelihood, it should emerge as one of the leading information services firms in the world, providing a full line of products supported or shaped by information systems.

McKesson Corp.

Another example of a firm that has developed a powerful strategic information systems vision is the McKesson Corp., formerly Foremost-McKesson and originally McKesson-Robbins. In 1984, it was the nation's largest independent distributor of

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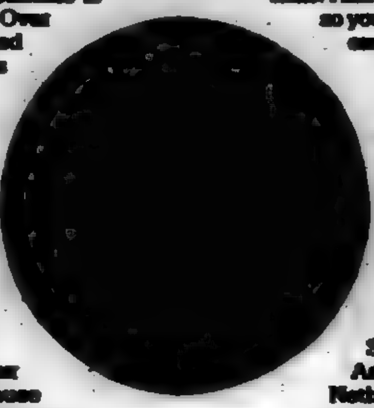

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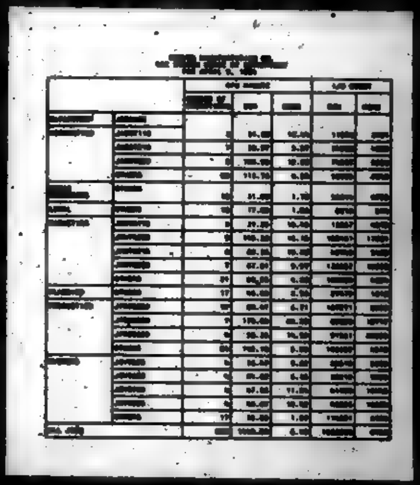

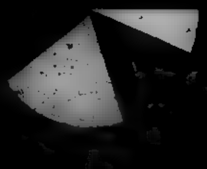

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> *These strategic moves run the gamut from those designed to exploit scale and scope economies, to growth and alliance maneuvers to expand into new markets.*

ethical and proprietary drugs, toiletries, fragrances and sundries; wine and spirits; and industrial and specialty chemicals.

Restructured in the late 1920s, McKesson diversified over the next 50 years into such businesses as alcoholic beverage distribution, dairy products (through a merger with Foremost Dairies) and pasta and dehydrated vegetable manufacture (through the acquisition of C.F. Mueller Co.). In 1984, the new McKesson announced that it was leaving the food business (having sold Foremost and Mueller in 1983) to concentrate its resources on the value-added distribution of a variety of products.

What is shaping McKesson's new strategic direction is what is shaping Dun & Bradstreet's: strategic information systems vision. Top management believes that the name "McKesson Corporation" now "reflects our history, the present structure of our business and the path we are traveling."

Thomas Drohan, McKesson's former president, said in the 1983 annual report: "Perhaps the single greatest advantage that the McKesson distribution companies enjoy has been — and will continue to be — in computer technology, where our size and diversity have enabled us to achieve the necessary critical mass. Our data processing resources now involve 550 people and an annual budget of more than $65 million. We intend to continue the proliferation of this technology among our current distribution businesses and to seek out opportunities to apply it to other distribution-related businesses. This shift in emphasis — making value-added distribution our primary thrust with a secondary thrust in certain proprietary product areas — reflects the facts as they are today."

McKesson sees a direct connection between its ability to gain competitive advantage and its use of information systems to support and shape strategies aimed at this objective. Over the past 10 years, the company has introduced computer-based goods and services to help it gain an edge with both its suppliers and its customers, an edge that translates into a distinct advantage over other distributors. These strategic moves run the gamut from those designed to exploit scale and scope economies, to growth and alliance maneuvers to expand into new markets. Among the alliances implemented by McKesson, the following are noteworthy:

CosMcK/Economost. CosMcK, a computer-based merchandising program created in 1981 for druggists, supermarkets and mass merchandisers, helps retailers stock, price-label, rotate and display merchandise according to the marketing reports it generates. Covering 20 departments in 1982, it now extends to 28 categories, such as over-the-counter drugs, pet care and school supplies.

Economost, a computerized order-entry system, enables a retailer holding an Economost scanning device to record data from shelf labels and then transmit the captured data in the form of an order over telephone lines to a McKesson distribution center, at the rate of 600 items per minute. McKesson fills the order overnight and delivers it the next day in tote boxes arranged to correspond to the various shelf divisions of the retailer's store.

McKesson Chemical. This division, the nation's leading full-line distributor of industrial chemicals, implemented a computer-based service for its customers that saves them costly inspection time and enhances McKesson's image as a high-quality, reliable distributor. At selected chemical distribution centers, McKesson installed highly sensitive instruments to analyze the chemical composition of substances. This ensures, for example, that chemical solvents meet stringent customer standards. The instruments are tied via telephone lines to a McKesson computer at its research center in Dublin, Calif., so that the data can be interpreted and checked for compliance.

This is another of the many differentiation-based strategic thrusts supported by McKesson's information systems. McKesson Chemical, like the drug and alcoholic beverage division, also offers its customers an on-line order-entry system designed to streamline ordering, inventory control, purchasing, accounts receivable, delivery and invoicing procedures. For the chemical division, it provides instantaneous information on inventory, customer needs and the safe handling of the more than 1,000 chemical products it sells. Most likely, economies of scope based on order-entry systems know-how are at work here.

Pharmaceutical Card System. PCS, a prescription drug claims processing system, led McKesson to spin off a special business unit to exploit its potential. Introduced a few years ago, PCS now processes more than 27 million claims from 2.3 million cardholders covering 6.5 million people. Employers issue PCS cards as an employee benefit.

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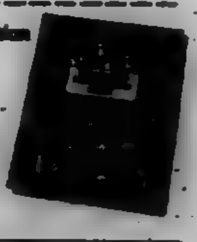

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Whatever Action's motives, McKesson's aim was clear: to expand the scope of its distribution business and transform the cottage industry of software distribution (with after-tax margins of 4% at most) into a larger, more profitable game.

nation's retail druggists, fill prescriptions for PCS cardholders. Coverage is offered by 155 insurance companies in the U.S. and Canada. Data from pharmacists is transmitted to a central McKesson computer for processing. Claims are completed automatically, and tapes are forwarded to third-party reimbursers.

In itself, PCS represents a strategic diversification maneuver. Perhaps even more interesting is the continued expansion of McKesson's PCS operation, symbolizing the power of the company's strategic information systems vision. As claim data is collected by PCS, a special unit, Pharmaceutical Data Services (PDS), uses its software to analyze the data and produce a series of marketing reports targeted at major drug manufacturers, financial institutions and government agencies. The reports include analyses of prescription drug use by hospital, nursing care facility and so on. It is capable of analyzing the flow of pharmaceutical products through the health care system.

In 1982, PCS acquired Dresden/Davis Organization, a medical research company that collects data on drugs prescribed by physicians. This, of course, will become part of PCS's growing data base and move the unit closer to its goal.

Acquisition of SKU. In 1983, McKesson joined Action Industries, Inc., a Pittsburgh maker of household and hardware items, in a 50-50 venture in which they acquired SKU, Inc., a microcomputer software distributor. The leader in the embryonic micro software industry at the time was Softsel Computer Products, followed by Micro D and SKU. The market for personal computer software, then at $2.1 billion, was projected to reach $11.7 billion by 1988, with 25% handled by independent distributors.

Whatever Action's motives, McKesson's aim was clear: to expand the scope of its distribution business and transform the cottage industry of software distribution (with after-tax margins of 4% at most) into a larger, more profitable game. McKesson planned to use previously developed information systems as the synergistic fuel for its entry vehicle. The computerized order-entry systems and other proprietary products it provides to more than 14,000 mass merchandisers, supermarkets and other outlets, would be tailored to this new marketplace. These information systems would not be used merely as aids to improve efficiency but as weapons to shape competitive strategy.

"The name of the game," McKesson's chief executive officer said at the time, "has become adding value to distribution. Our primary goal is to set ourselves apart from the competition in dramatic enough ways that we become the first distributor a supplier thinks of. At the other end, by tying your customers to you as tightly as possible, you get more and more of their business as they grow."

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Unfortunately for McKesson and Action, however, this strategic alliance failed. In August 1984, the partners announced they were writing off their combined investment of $8 million and discontinuing the operations of SKU.

A spokesman for McKesson said that "the market for computer software hasn't developed as we had anticipated." The parties were unable to stem accelerating losses at SKU.

Considerable risks

I include this example of a failed strategic thrust to emphasize the point that strategic moves entail considerable risks, and neither information systems support nor shaping nor anything else can guarantee success. What looked like a promising move failed because market demand was misread.

While this venture failed, another seems headed for success. In 1983, McKesson purchased 3 P.M., a software developer and marketer of packages for pharmacies and florists. In 1984, McKesson negotiated a pact with the Florists' Transworld Delivery Association.

Under the terms of the agreement, McKesson will deliver, install and maintain personal computers and systems intended to handle a florist's business management functions such as payroll and accounts receivable and payable. It expects sales from this new venture to total about $75 million over the next five-year period.

Banc One

The final example of a successfully developed strategic information systems vision involves one of the most innovative and entrepreneurial firms in the financial services industry, Banc One of Columbus, Ohio. John G. McCoy, the chief executive officer of this multibank-holding company formed in 1967, retired in 1984 at age 71 after 25 years in that position. When he took the reins at City National Bank (Banc One's forerunner) from his father in 1959, the bank had less than $150 million in assets and primarily business customers.

With assets of more than $7 billion and customers drawn primarily from the consumer sector, Banc One ranked in 1984 in the top 10 among the 100 largest banks in the U.S. on three commonly acknowledged measures of superior performance.

Through an ongoing series of mergers, it now controls 22 affiliate banks in Ohio. For the 16th consecutive year, net income and earnings per share increased. In the 1980-1983 period, net income skyrocketed from $32.8 million to $83.2 million, employees from 3,145 to 6,300 and branch offices from 137 to 314.

These figures represent an extraordinary record of profitability and growth. How can it be explained? Why has Banc One, a relatively small, local bank in 1967, been able to succeed in the increasingly competitive financial services industry, where the competition consists not only of banking giants like Citibank, Chase Manhattan and Chemical Bank but also of retail giants like Sears Roebuck & Co. and financial supermarkets like American Express?

While a number of explanations — running from luck to charisma — have been suggested, the most convincing account of Banc One's success can be given in terms of its powerful strategic information system vision — a vision embodied, to be sure, in McCoy, but a vision nevertheless of the integral role to be played by information systems in the bank's strategic evolution.

McCoy, like some of his colleagues, long believed that banks competed at a disadvantage vis-a-vis such nonbank rivals as Sears or American Express. While the latter were free to develop an almost unlimited product portfolio or expand without geographical limit, banks were handcuffed in these two strategic areas by federal and state regulations. Unless banks could find ways

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around the regulations or get them changed in their favor, they faced the growing prospect of erosion in some of their major business lines.

McCoy's strategic response to these threats was twofold. First, to overcome the geographical expansion constraint, he formed the Banc One holding company, which permitted the acquisition of other banks but not across state lines.

Second, to overcome the product development restriction, he encouraged his managers to search for new products that would yield new sources of income and would protect the bank's cash flow stream from exposure to interest-rate fluctuations.

Thus, expansion through acquisition and product innovation were two strategic thrusts that Banc One would follow in its strategic journey. Both, it turned out, were precisely the kinds of movements that could be supported or shaped by information systems.

McCoy developed his strategic information system vision early. When he assumed the presidency, one of his first moves was to seek board approval for an annual research and development budget, not to exceed 5% of annual profits. He won approval, and every year, Banc One has been able to experiment, primarily in the area of information systems.

In 1966, for example, it introduced the first BankAmericard credit card service outside California. In 1967, it initiated a major on-line credit card processing network that today spans more than 30 states. In 1971, it joined with IBM in making the first significant test of point-of-sale systems using magnetically encoded cards. In 1980, with others, it conducted the first test of in-home banking through the use of customer televisions and the telephone system.

From the 1960s, McCoy realized the importance of information systems in the financial services industry. In a recent annual report, he explained why Banc One was so eager to become the first Bank of America licensee and what made him think it was such a good idea: "Well, there was some luck involved, but you have to remember that was the time when the computer was first beginning to produce important changes in banking. We thought the credit card was an idea whose time had come because of the new computer capability.

"The first on-line computer systems in banking were designed for credit card authorization. We had one of the first ones here in Columbus. We committed major efforts to computer development in those early years, and we still do today, I might add. By 1970, to tell you how this innovation happens, we began to install the first automatic teller machine equipment in our Upper Arlington branch because we saw it as a way to link the customer, with a plastic card, directly to the computer."

Processing services

As Banc One's reputation for information system innovation grew, other firms approached it for processing services. In the late 1970s, Merrill Lynch contracted with Banc One for data processing and Visa debit card issuance services associated with its new cash management account (CMA) service. As a result of this alliance, now also negotiated with other brokerage houses, Banc One is one of the nation's three largest Visa processors.

The primary vehicle to expand Banc One's processing services — related chiefly to credit and debit card processing outside Ohio banking markets and producing more than 30% of the corporation's net income — is the Financial Card Services Division. This spin-off has had an impressive growth record.

In 1983, the cardholder account base processed by Financial Card Services grew by 41.3% to more than 3.9 million. Of these accounts, 14% are Banc One affiliate banks' customers and 7% are Banc One customers originating from outside our market area, while 79% are derived from third-party processing for other banks, thrifts, credit unions, finance companies and brokers. Financial Card Services revenue grew 36% in 1983.

Late in 1983, a new four-year contract was negotiated with Merrill Lynch related to Banc One's processing of its CMA brokerage accounts. This is the third contract Banc One has had with Merrill Lynch since 1977, when Banc One was selected to be

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While credit and debit card processing is important to Banc One's overall strategic scheme, it is the centralization of bank processing activities that has enabled the company to make its acquisition program work.

A small bank sees in the Banc One affiliation (read: acquisition) proposition an opportunity to cope with the accelerating changes in financial services that would otherwise engulf it — new regulations, the prospect of interstate banking, interest-rate deregulation and perhaps most critical, new technology demands induced by the convergence of information processing and telecommunications.

For Banc One, its acquisition program — called the "Uncommon Partnership" because it allows the acquired bank a reasonable degree of independence — enables it to reap large economies of scale. Listen to McCoy on this partnership, taken from the 1983 annual report: "More recently, the Uncommon Partnership represents our chosen way of managing the holding company even though we could merge everything into a single bank. Instead, each bank is run by bankers from that area, each trying to be sensitive to community needs. As a result, a lot of our management strength and, certainly, the growth and earnings potential, lies with our affiliates. We have limited the concentration of management to those areas that are most sensitive to economies of scale, such as data processing or the handling of investments. I expect this philosophy will remain for some time into the future."

Thus, Banc One uses the strategic cost thrust to shape its competitive strategy of growth via acquisition. In the case of a recent affiliation, according to another officer at Banc One, "We were able to save almost a million dollars a year in combined operating expenses by converting the affiliates' data processing systems into our single system. There are some real economies of scale at work here."

Strategic alliance

Banc One also forged an innovative strategic alliance with Comp-U-Card, a computerized shopping and below-retail buying service. The two partners created Super Visa, a credit card issued by Banc One that Comp-U-Card offered as bait to lure new customers.

This strategic information systems alliance serves Comp-U-Card's purpose of enhancing its offering to customers and foregoing the risk and expense associated with starting its own credit card system.

For Banc One, the alliance has already increased the bank's credit card account base by 100%. This has proved to be particularly profitable, because Comp-U-Card's customers have tended to let their accounts roll over to a greater extent than Banc One's other cardholders.

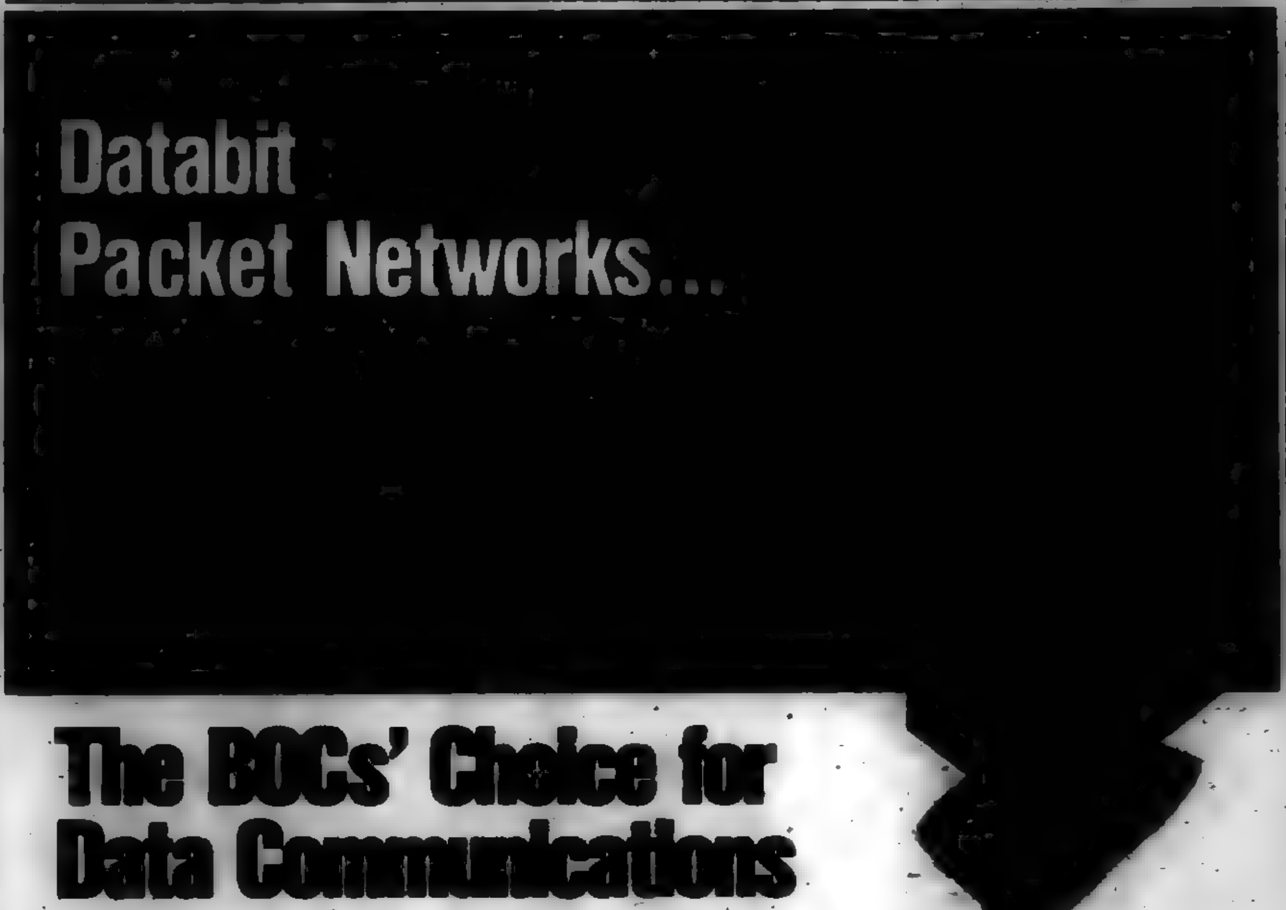
Creative force

For Dun & Bradstreet, McKesson, and Banc One, strategic information systems vision functions as a creative force transforming the organization through strategic moves supported or shaped by information systems. Other organizations, such as Citibank, Federal Express, McDonnell Douglas Corp., American Hospital Supply Corp. and General Electric Co., also possess strategic vision. Each comprehends, in its fashion, the strategic importance of information systems.

Strategic information systems vision is an ability that can be developed, and hence possessed, in varying degrees. Its most important prerequisite is the adoption of the strategic perspective on information systems. Without this perspective, the systematic search and exploitation of strategic information systems opportunities would be doomed.

The conventional perspective countenances the existence of only two information systems varieties: MIS and management support systems. Companies holding this conventional perspective lack the vision to see the cornucopia of strategic information systems opportunities falling forever beyond their line of sight.

But by adopting the strategic perspective on information systems, by donning a new pair of conceptual glasses, the world of strategic information systems opportunities appears.



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COMMUNICATIONS

Merits of digital links may outweigh expense

By John Dix
CW Staff

Digital communications facilities may be preferable to analog ones, but the economics and lead times associated with digital service are convincing some users with adequate analog networks to stand pat.

The merits of analog and digital facilities were hashed out by telecommunications managers in a session at Telecom '85, the recent International Communications Association meeting in Dallas. As one attendee noted, "If you have a good analog network, you can't cost justify anything else." However, this will change if analog private-line rates increase.

Other than the expense and the amount of time it takes to install digital facilities — depending on the geographical area and the speed of the line needed — digital facilities usually outperform analog lines hands down. Some benefits of digital facilities include the following:

- Many things can affect data transmission over an analog facility, such as circuit degradation because of phase jitter and noise interference such as cross talk. Digital circuits are not subject to the same problems and typically, but less frequently, quit outright instead of fail slowly.
- Because there are fewer things that can go wrong with digital facilities, they are correspondingly easier to troubleshoot. Digital transmission quality can be ascertained using one scope, whereas analog leased lines require use of multiple monitoring tools. This fact foreshortens the time required to train network operators.
- Digital facilities are more reliable and require less maintenance. Uptime of 99.5% or better is not unheard of with digital facilities. No modems are required. Lower

See DIGITAL page 61

Managers cite integration woes

By Paul Korzeniowski
CW Staff

DALLAS — Managerial rather than technical problems are hindering the acceptance of voice and data integration in many corporations.

That was the view of speakers at a session of the recent International Communications Association annual meeting, Telecom '85.

The audience at the session was asked to name the chief problems that telecommunications managers face. One major problem cited was the murky distinction between data processing and communications functions.

"Data processing personnel are always trying to run the communications side of the house, and communications people are trying to decide how to run data processing," one attendee noted. Most of the approximately 100 session attendees were telecommunications managers.

The tension between the two disciplines was evident in remarks made by speaker Kerry Overlan of United Brands Co. Overlan said, "As voice became digitized [at United Brands], telecommunications functions were incorporated into the data processing department, and a war started," he said. "Data processing managers welcomed communications professionals like IBM welcomed [Digital Equipment Corp.]."

Rather than fighting the change, Overlan recommended that telecommunications managers use it to their advantage. "Today, disciplines are undefined, and there are not clear managerial boundaries," he noted. He listed a number of areas where voice and data processing functions now overlap: Many private branch exchanges

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MCI unveils packet-switch net service

By John Dix
CW Staff

DALLAS — MCI Communications Corp. officially unveiled a packet-switching service for large users at the International Communications Association's Telecom '85 meeting here and unveiled its virtual network service.

The service, called MCI Datatransport, is aimed at users who spend at least $100,000/mo on data communications, said Bob Yundt, director of data communications services at MCI. The service is being marketed like a private network offering, enabling users to contract for customized services.

MCI network facilities include four Northern Telecom, Inc. SL-10 packet-switching nodes — located in San Francisco, Los Angeles, St. Louis and Washington, D.C. — interconnected with redundant MCI 56K bit/sec. facilities.

Access facilities, service-level agreements and network control are all determined on an individual customer basis, Yundt said.

Terminal and host interfaces available include Level 3 X.25 and support of these protocols: asynchronous communications, IBM 3270 Binary Synchronous Communications, IBM Synchronous Data Link Control and IBM RJE 2780/3780. The user can also customize support for nonstandard protocols like those typical of point-of-sale terminals, Yundt said.

Customer access is provided at 9.6K bit/sec. and 56K bit/sec. over dedicated lines, and dial-up connections to dedicated ports are supported at 1,200 bit/sec. Port sharing for dial-up service will be available in the future, according to Yundt.

Contractual service-level agreements can specify network availability, service restoral guarantees and message delivery times. The user can also contract for added network control where needed, providing customized subnetworks and control over

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- DG has unveiled a computer-to-private-branch-exchange interface board for its Eclipse 32-bit computers/58
- Octel Communications recently showed a smaller capacity version of its Aspen voice message system/58
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Data channel service unit available for AT&T's DDS

SIMI VALLEY, Calif. — Teleprocessing Products, Inc. has announced a combination channel and data service unit for AT&T's Dataphone Digital Service (DDS) that supports IBM's Synchronous Data Link Control protocol.

The TP-502 CSU/DSU digital termination unit is said to provide noninterfering remote diagnostics and network management capability to DDS networks. The company's network management approach, dubbed Multidrop Network Management, reportedly enables diagnostic information to travel on existing DDS links simultaneously with live data.

An IBM Personal Computer XT-based central site diagnostic facility offers the user access to diagnostic and performance characteristics of the network, according to the company.

The TP-502 is priced at $1,795.

The Multidrop Network Management system, to be introduced at user conferences in upcoming weeks, will range upward in price from $25,000, depending on the number of lines supported and management options selected, the vendor said.

Teleprocessing Products has also announced price reductions across its standard line of digital terminal units. List prices on the TP-501 for 2.4K to 9.6K bit/sec. and TP-557 for 56K bit/sec. have been reduced from $1,025 and $1,095 to $650 and $750 respectively.

Teleprocessing Products is located in Building 7K, 4565 E. Industrial St., Simi Valley, Calif. 93063.

Wang terminal introduced for use with Intecom PBXs

DALLAS — Intecom, Inc. and Wang Laboratories, Inc. announced a terminal made by Wang for use with Intecom's private branch exchange switches.

Originally hinted at back in September at the Telecommunications Association Conference in San Diego, Keystone is the first product to come out of the alliance created when Wang bought 20.5% of the switch manufacturer.

Keystone is a combination telephone and, initially, TTY-type dumb terminal. Through connection to Intecom's IBX PBX, Keystone is said to provide speed dialing, voice messaging and terminal emulation. It has a 128K-byte memory and can communicate with an IBX at 19.2K bit/sec.

According to Intecom, users will be able to connect Keystone with the CPU portion of a Wang Professional Computer, providing access to MS-DOS-based applications.

Workstation function

When an IBX is connected to a Wang VS computer, Keystone is said to be able to function as a VS workstation capable of accessing Wang Office applications such as electronic mail, messaging, file management and calendaring; however, it does not allow access to VS-based word processing.

Keystone is being offered to existing IBX customers at $2,400 and will be available in the third quarter, Intecom said.

Intecom is located at 601 Intecom Drive, Allen, Texas 75002.

Uninet net to support IBM protocols

LENEXA, Kan. — Uninet, Inc. has added IBM synchronous protocol support to its packet-switching network.

The service offerings include 3270 Binary Synchronous Communications (BSC) emulation/termination, 3270 Systems Network Architecture/Synchronous Data Link Control (SDLC) emulation/termination service, X.25 cluster controller support, micro-to-mainframe connection capability and X780 support.

The IBM 3270 BSC and SDLC services enable customers to use IBM 3270 series terminals and devices with Uninet and enable personal computers equipped with asynchronous modems to emulate 3270-type devices.

Host connections can be made through packet assembler-disassembler or with IBM's NPSI communications program. The X780 service allows users to operate RJE applications from 2780 and 3780 devices.

The service offerings are scheduled to become available on June 1 in Kansas City, Mo., New York, Chicago and Los Angeles, the vendor said.

Uninet is located at 10951 Lakeview Ave., Lenexa, Kan. 66219.

VOICE/DATA COMMUNICATIONS

■ **ITT Telecom has added data switching ability to its line of System 3100L private branch exchanges.**

The feature supports simultaneous voice and asynchronous data transmission, the vendor said. System 3100L is said to supply speed and format conversion and automatic data call setup. Devices are supported with RS-232 or RS-422 interfaces.

The System 3100L supports between 40 and 288 lines or ports, and 180 ports are nonblocking. Data can be transmitted at speeds up to 19.2K bit/sec. per port.

System 3100L features station message recording, least-cost routing, direct inward dialing, direct inward system access, intercom, paging and teleconferencing.

The company said that a system with data switch option and terminal adapter devices costs approximately $890 per line.

ITT Telecom, Business and Consumer Communications Division, 6131 Falls of the Neuse Road, Raleigh, N.C. 27609.

■ **Nokia-Kinex Corp. has announced a device that enables users to send data over existing twisted-pair telephone wiring.**

The product, ECB-2W, is said to enable users to transmit full-duplex asynchronous or synchronous communications at speeds up to 19.2K bit/sec. over two wires. The phone can be used normally when data is not being transmitted.

The product costs $700 per node.

Nokia-Kinex, 6950 Bryan Dairy Road, Largo, Fla. 33543.

■ **Data General Corp. has announced a computer-to-private branch exchange interface board for its Eclipse 32-bit computer systems.**

The DG CPI/24 board adheres to the interface standard developed by Northern Telecom, Inc. and Digital Equipment Corp. and supported by Rolm Corp., Mitel, Inc. and Intecom, Inc. The board enables DG computers to be interfaced to these manufacturers' PBXs through a CPI interface at 1.54M bit/sec.

The CPI/24 board is a single 15-in. intelligent PBX link controller that provides 24 19.2K bit/sec. asynchronous channels. Computers may be installed at distances of up to 1,500 ft from the PBX.

The CPI/24 intelligent PBX link controller board, available immediately, is priced at $6,000.

DG, 4400 Computer Drive, Westboro, Mass. 01581.

■ **Octel Communications Corp. has announced a smaller capacity version of its Aspen voice message system.**

Called the Aspen Branch voice message system, the low-end version can be interfaced with any private branch exchange and integrated with Rolm Corp.'s CBX, Northern Telecom, Inc.'s SL-1, Lexar UTX-1001, all Mitel, Inc. switches and Centrex services.

The Aspen Branch system is housed in a cabinet measuring 21 by 16½ by 12¼ inches.

The price of an Aspen Branch system capable of supporting 50 to 150 users starts at $46,000 for a four-port system with 6.4 hours of message storage. A version of the Mitel-integrated Aspen Branch systems will be sold for $25,000 as a result of an arrangement with Mitel.

Shipments of the Aspen Branch system are scheduled to begin this month, and volume shipments are expected to begin in July.

Octel, 1841 Zanker Road, San Jose, Calif. 95112.

■ **GTE Communications Systems Corp. has announced the Translink telecommunications transmission package, said to combine a channel bank with equipment necessary to provide subscriber services.**

According to a spokesman, the primary application of Translink is to connect voice or data telecommunications circuits or program channels from a central office to a customer's location via T1 transmission lines. Translink employees GTE Communication Systems' standard 9004B channel bank, which digitizes 24 or 48 voice channels at 64K bit/sec. for transmission over one and two standard T1 lines.

Translink measures 51 in. high by

Continued on page 99

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Continued from page [illegible]

22 in. wide by 26 in. deep. The package will serve one T1 line, up to 24 channels, using any combination of 9004S channel units, including data ports and program channels. A second T1 line can be added by including another T1 channel service unit, additional common equipment and necessary channel units.

Translink, scheduled for third-quarter availability, is priced up to $15,000 for a 2-channel version.

GTE Communications, 2500 W. Utopia Road, Phoenix, Ariz. 85027.

■ Siemens Communications Systems, Inc. announced that it will introduce a T1 interface and a Digital Multiplexed Interface (DMI) for its Saturn II and III private branch exchange.

The digital T1 interface will be compatible with industry standard T1 links and DS-1 interfaces and support D2, D3, D4 and the Fe formats. It will reportedly be available in July at prices that have yet to be determined.

The company also said it will develop DMI, an interface that specifies T1 signaling, which was developed by AT&T Information Systems.

Siemens is located at 186 Wood Ave. S., Iselin, N.J. 08830.

MULTIPLEXERS/ MODEMS

■ Federated Technology & Electronics Corp. (F-TEC) has announced the Model 4848 modem, which operates at 4.8K bit/sec., full duplex and over two-wire leased or dial-up lines.

The 4848 has an echo cancellation feature that weakens echoes by a factor of 60db for full-duplex operation over two-wire dial-up lines, the vendor said. Echo cancellation enables the telephone bandwidth, 300Hz to 3,400Hz, to transmit in both directions simultaneously.

The 4848 provides synchronous operation and offers as an option an asynchronous-to-synchronous converter. The 4848 has an automatic answer/disconnect feature and is available in both stand-alone and rack-mounted models.

The 4848 complies with CCITT V.32, which defines modems operating at 4.8K bit/sec. over two wires and that have fallback speeds of 2,400 bit/sec. or 1,200 bit/sec. The 4848 will also be compatible with the future 9.6K bit/sec., two-wire full-duplex modems when operating in the 4.8K bit/sec. fallback mode.

The model 4848 is priced at $8,500 and is available immediately.

F-TEC, 15 Seeley Ave., Piscataway, N.J. 08854.

■ Canoga Data Systems has announced an eight- to 16-channel, point-to-point multiplexer for synchronous or asynchronous traffic that uses a fiber-optic link of up to one mile.

The CMX-816 multiplexer can combine eight or 16 synchronous channels ranging in speed from 2,400 to 76.8K bit/sec. over the fiber, which is being driven at 1.0048M bit/sec. In asynchronous applications, the multiplexer can handle channel speeds to 100K bit/sec.

Each channel on the CMX-816 can be clocked externally or can be programmed for its own internal clock rate. The multiplexer can support different synchronous rates and external timing on different channels, the vendor reported.

The eight-channel CMX-816 multiplexer can be expanded to 16 channels and can support an RS-232, V.35 or RS-422 interface for each channel.

The CMX-816 costs $2,750.

Canoga Data Systems, 21218 Vanowen St., Canoga Park, Calif. 91303.

Western Union unveils SDNS

SADDLE RIVER, N.J. — Western Union Corp. has announced Software Defined Network Services (SDNS), which is said to have rates roughly 25% lower than its Optimized Wats rates and approximately 60% lower than AT&T Wats rates.

Subject to approval by the Federal Communications Commission, the service is reportedly aimed at large corporations with heavy calling traffic between multiple branch offices. All SDNS lines have access to Western Union's nationwide network, giving users a single trunk group for all voice/data communications.

To create a software-defined network, Optimized Wats users have to provide Western Union with the telephone numbers of their various branch offices to be entered into the SDNS data base. Western Union then assigns individual telephone numbers for each location and extension. This enables users to access branch office dial-up facilities with private dialing plans.

SDNS will initially be available in New York; Chicago; Phoenix; Los Angeles; San Francisco; Detroit; Dallas; Cincinnati; White Plains, N.Y.; Toledo, Ohio; Washington, D.C.; Boston; Houston; and Philadelphia. The maximum discount applies when the customer reaches 60 hours of usage.

SDNS customers who also use Western Union's Easylink electronic mail service, worldwide Telex and/or TWX services, are reportedly eligible for the recently announced joint services discount. This is said to allow SDNS customers to apply 20% of their other Western Union service bills against their SDNS bill to a maximum of $1,000 per month or 10% of their long-distance service bill.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

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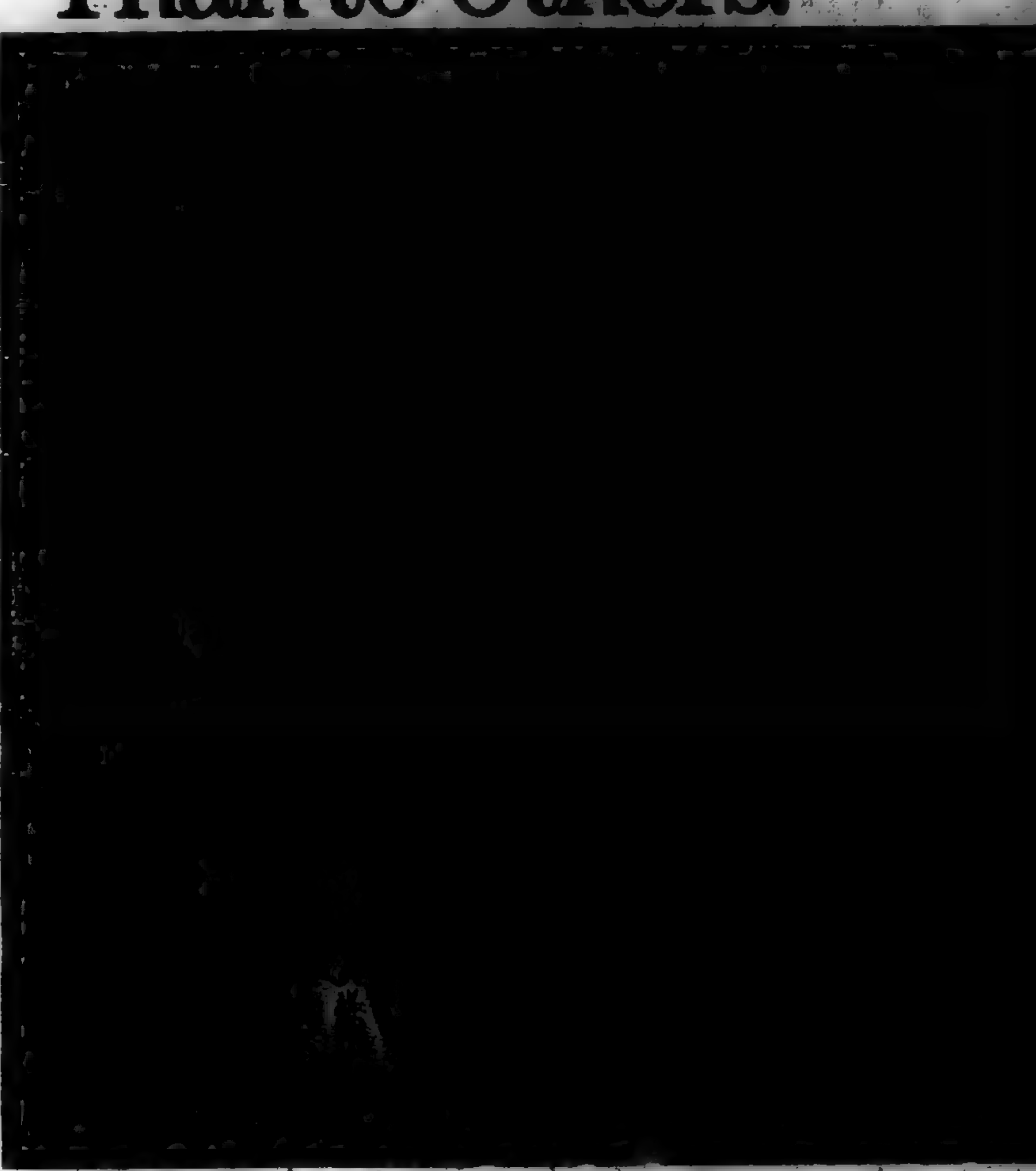

TELECOM

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digitize analog signals, personal computers and telephone functions are merging and local-area networks run electronic mail applications.

"All of these products and services are just now evolving, and telecommunications managers are standing at center stage," he added.

The key way for telecommunications managers to gain power is to take charge of the office automation applications. Overian cited the following two reasons for this approach:

- OA is an area with which most telecommunications managers are familiar.
- Taking charge will help the manager gain power in the corporation.

"Whoever controls office automation will control a corporation," Overian claimed. "It will be the key corporate application in a few years." To gain this control, a telecommunications professional must establish a relationship with IBM. "IBM will be the prime supplier of office automation applications," Overian predicted.

Get out and sell

Overian urged attendees to go out and sell themselves and their position to the corporation.

"Today, managers face a tremendous amount of risk," he concluded. "But there is also a tremendous amount of reward. If the telecommunications manager plays his cards right, he could control key applications. If he doesn't, he will be relegated to merely providing the switch that is used for those applications."

MCI

from page 57

certain applications.

The nontariffed service will contain three basic rate elements: access charges for the line facilities used; lease or purchase of access equipment used, such as packet assemblers-disassemblers; and usage rates. Contract terms are flexible, Yundt said, and may be for less than a year, although he expects most users will want the stability offered by long-term contracts.

MCI Datatransport is available now. The Security Pacific National Bank in Los Angeles has reportedly been using the service since last year. Yundt said MCI expects to sign three or four other customers by the end of the year.

MCI also unveiled MCI V Net, a software-defined network service targeted at users with multiple locations and total voice traffic of at least 200,000 min./mo.

MCI V Net is said to enable virtual private networks to be custom designed, providing corporate network access to all company employees from any location, the company reported.

Advantages over other software-controlled networks, according to MCI, is that it supports credit card traffic, enables customers to price services to corporate users differently from how MCI bills it, supports international calling and provides directory assistance for all V Net users.

Security Pacific will also be the first company to use V Net, which is scheduled to be installed in November.

MCI is located at 1133 19th St. N.W., Washington, D.C., 20036.

More to Some People

As a manager with PC data to archive, you're probably more than a little concerned.

Your neck is on the chopping block.

But it needn't be. A PC Megastore® hard disk/streaming tape subsystem from Ampex can give you safety and convenience no other storage can match.

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PC Megastore comes in [illegible] models: 20 MB disk with 25 MB tape, 10 or 20 MB disk and 25 MB tape.

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Ampex Corporation • One of The Signal Companies

*Host adapters available for IBM PC, PC-XT, PC compatibles, Apple II and IIe.® PC Megastore is a registered trademark of Ampex Corporation. Ampex Computer Products Division, [illegible]

DIGITAL

from page 57

digital bit-error rates also reduce the number of retransmissions when compared with analog facilities.

- When lines are dropped, the mean time to repair digital links is generally far shorter than the time required to troubleshoot analog facilities. One user said the average time to repair an analog line in his network was two days, as opposed to two hours for his digital lines.

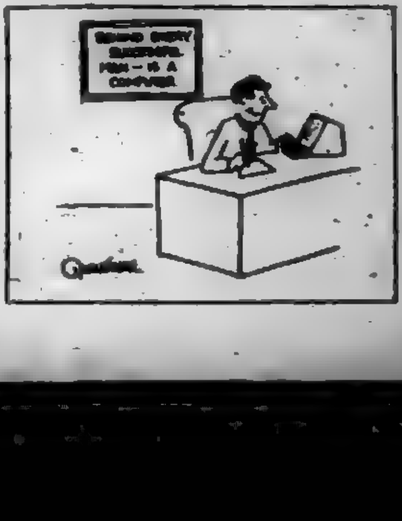
Another obvious advantage of digital links is the ability to support higher data rates. Users hesitate to push anything higher than 9.6K bit/sec. over analog voice-grade leased lines, with many opting for 4.8K bit/sec. because of reliability (the bit-error rates at higher speeds can negate the throughput advantage). The maximum theoretical rate for voice-grade lines — no conditioning — is 16.8K bit/sec. Digital services support rates up to 1.54M bit/sec.

Problems that have cropped up with digital services are usually associated with the multiplexing hardware — particularly in the case of T1 multiplexers for 1.54M bit/sec. facilities — rather than the service line, attendees reported.

Users also voiced concern about the problem of backing up digital links. Putting in redundant facilities is usually too expensive, and dial backup for digital links is offered by only a few vendors (users noted General Datacomm Industries, Inc. in Danbury, Conn.) and is still limited and expensive.

But selling migration to digital facilities to management can be a hard task, given present-day rates, particularly when you are a short way into the depreciation of current modems and other communications hardware used in analog networks.

Some users expect tariffs for leased analog lines to increase and equal digital rates and perhaps surpass them. If this happens, the merits of digital will make it the obvious choice for data networks.



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*McGraw Hill's "Data Communications" magazine rated us as having the best technology and price/performance.

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SYSTEMS & PERIPHERALS

[illegible]

Data Storage/[illegible]

Data base machine's appeal rising

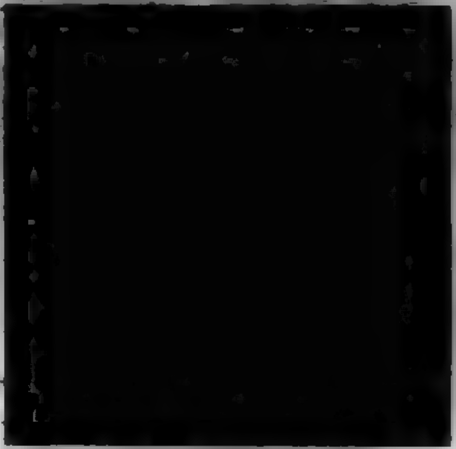
By [illegible]
CW Staff

Installing a back-end processor dedicated to maintaining a large data base is a concept that is growing quietly among data base users.

During a time when software vendors appear quite secure about their relational data base management systems that give end users direct access to information, integrated hardware and relational DBMS software — known as data base machines — are managing to find a niche of their own.

That niche could get much bigger, according to one user. Michael Cappi, vice-president of systems and technology in Citibank's retail banking division, is sold on the idea of the data base machine. His division purchased two Teradata Corp. DBC/1012 machines about a year ago and uses the dedicated systems for information center operations and more recently for transactions in its branch operations.

"I don't believe software alone can solve the problem of high-performance processing and rich information retrievals," Cappi said. Complex information retrievals are a major concern for one of the world's largest private banks, which on any given day may want to ask the data base how many of a particular type of certificates of deposit worth more than $10,000 it sold at a particular location. Parallel processors within the data base machine allow the entire data base to be searched at the same time, Cappi said. "I could do a [complicated] retrieval question and get an answer back in five minutes — sometimes even a few seconds. At the same time, I can interrupt it and do some transactions like a balance inquiry," he noted.


Britton-Lee, Inc. data base machine

The machine used at Citibank is from one of two vendors making headway in the data base machine market, according to Shaku Atre, a private consultant specializing in data bases. While Teradata's DBC/1012 data base machine is aimed mostly at large IBM mainframe shops, Britton-Lee, Inc., with a user base of approximately 300, focuses primarily on the mid-range systems, particularly Digital Equipment Corp.'s VAX systems. Britton-Lee has been shipping its product for approximately four years, while Teradata has been shipping its product for about 14 months.

Atre and other industry observers said they believe that for now, data base machines are best suited to users implementing specific applications on huge data bases. Research and development projects are one such area, she said.

"Users today are companies that are doing leading-edge research," according to T. Capers Jones of Software Productivity Research, Inc. in Acton, Mass. "Of the Fortune 500 companies, probably 100 would have the need for a data base machine, and

See [illegible] page 70

Library of Congress tests optical disk system

By [illegible]
CW Washington Bureau

WASHINGTON, D.C. — The optical disk system being tested at the Library of Congress may someday help the world's largest library to store and preserve its collection of old documents, maps, photos and recordings, as well as enhance retrieval of the materials, officials said at a recent conference here.

The system will not only let the public use VDTs to view such things as ancient maps too fragile to handle but will also give the library's Congressional Research Service (CRS) access to library materials, according to Felix P. Krayeski, section head of CRS office systems.

In a presentation at the Association for Information and Image Management's recent conference here, Krayeski and Alan Linden, senior systems analyst, disclosed that CRS also is studying the feasibility of transmitting CRS reports and library materials from the optical storage system to computer terminals in the offices of U.S. legislators.

Transmission could occur on an installed network of broadband coaxial cable or possibly on phone lines, twisted-pair cable or fiber-optic lines, they said, adding that a report due in June will explore the options.

CRS is a unit of the library whose charter is to provide Congress with unbiased reports on public policy issues, frequently drawing on the library's extensive book and periodicals collections.

The CRS researchers will respond to an estimated 460,000 congressional inquiries this year, Krayeski said, producing 37.5 million pages of information through the existing Xerox Corp. microfiche reprographics system. Out of a staff of 860 people, 13 do nothing but carry papers from the library buildings to legislative offices across the street, he said.

Krayeski and Linden stressed that the optical disk pilot program — which will run through 1986 — is undergoing extensive evaluation by library and CRS users. The library also is building a laboratory to test the archival properties of the optical disks, since preservation of fragile images

See LIBRARY page 66

Automation seen driving revolution in office functions

By [illegible]
CW Staff

NEW YORK — Office systems are revolutionizing the secretary's job, while managers and professionals are starting to tire of computers.

That was the conclusion of a recent study which contends that office technology decisions are quickly becoming the realm of the MIS/DP manager and not the office manager. The study also aserts that office microcomputers are increasingly being bought at retail stores and that electronic communications in the office is increasing rapidly.

The study, "Techtrends '85: Inside the American Office," published by the Omni Group, Ltd., said the number of secretaries using electronic spreadsheets will double by 1986, from 21% to 41%, while secretarial use of graphics software will leap to 33% from 16%.

A reason secretaries are using computers for more applications is that their bosses are bored with computer use. More than one-third of 201 people — mostly department managers and personnel administrators — in the top 4,000 companies surveyed cited boredom as a critical problem associated with computer use.

References in the report to office computers refer to desktop computers, personal computers, integrated office systems, stand-alone word processors or other equipment generally believed to be of use in the office en-

See [illegible] page 66

Disaster service enhanced

DEC expands offerings, increases coverage area

MAYNARD, Mass. — Digital Equipment Corp. has introduced a series of data center recovery services.

The services include the following five components:

■ Recover-All, which provides users with an on-site maintenance service for items not typically covered under conventional maintenance agreements. The service features movement to and from a safe place, repair and replacement of equipment damaged by incidents not covered under service agreements, such as fire, water damage, natural disasters, power failure, theft, burglary and vandalism, DEC said.

■ Reserve, which gives users a computer-ready room known as a shell site that is equipped with power, communications capabilities and climate control when the computer room is not functional, but the user's hardware is working. Equipment replaced under Recover-All would be installed at the shell site, and administrative space at the same site would be available to the customer.

■ Restart, which keeps business operations running at a remote backup facility. The sites include 10 VAX systems configurations and administrative space and 600 communications lines. Customers can use their applications interactively, and if a major area disaster strikes several companies at once, they can be tied into other systems at the seven existing centers around the country. This service is intended to be an emergen-

See RECOVERY page 70

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The Towers are all powered by Motorola microprocessors (the regular Tower by the 68000, the XP and Mini by multiple 68010's).

Other state-of-the-art features include Winchester hard disk and the Intel Multibus.* Not to mention an error-correcting memory

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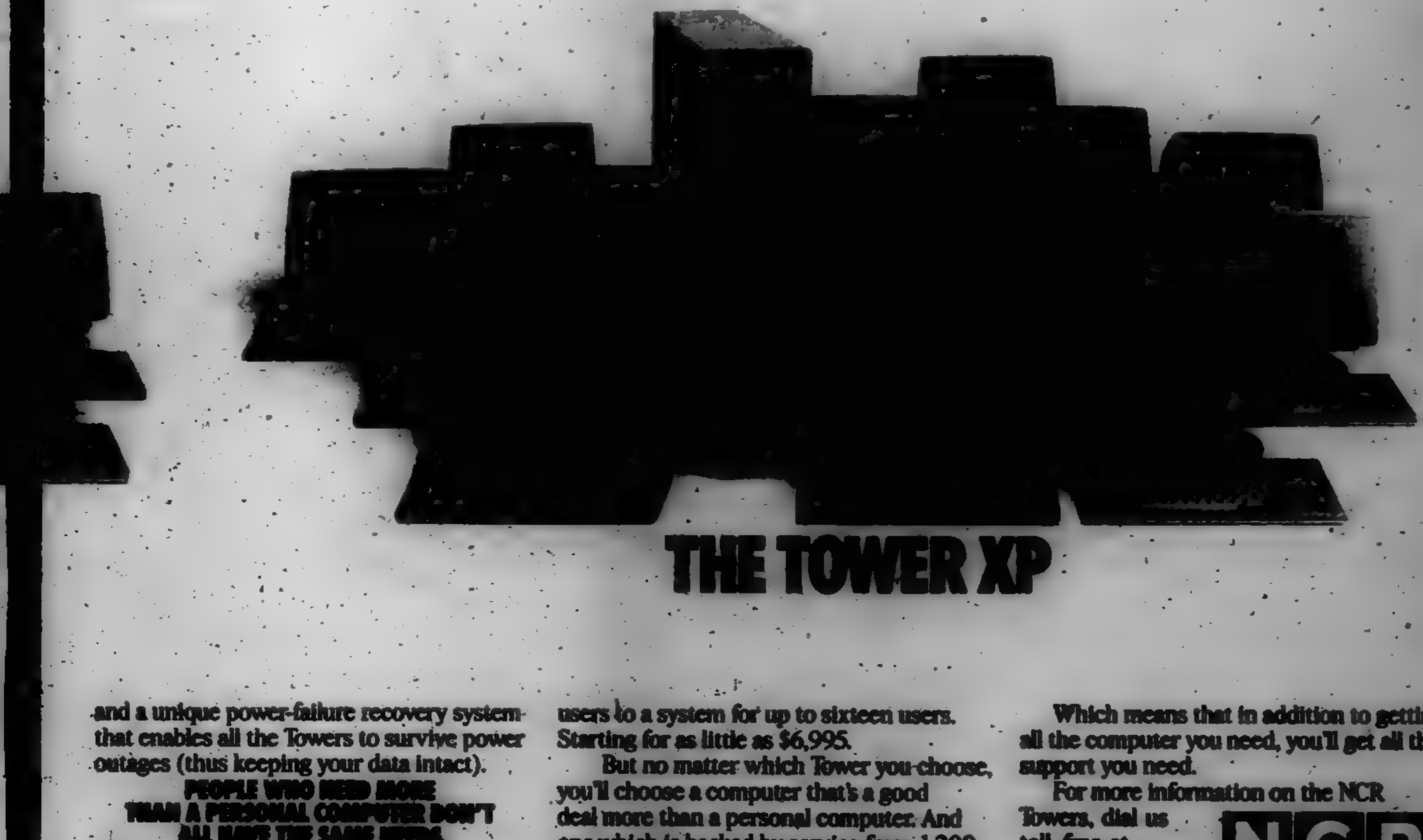

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DATA STORAGE

Zetaco, Inc. has announced its BMX-3, a disk drive controller that supports a data transfer rate of 2.5M byte/sec. using disk drives attached to Data General Corp.'s Eclipse and MV series minicomputers via the DG Burst multiplexer channel.

BMX-3 is said to offer full emulation of Data General disk subsystems including Data General's 6122, 6160, 6161, 6214, 6060, 6061 and 6067 subsystems under DG's unmodified AOS/VS, AOS and Rdos operating systems. It supports any mix of up to four Fujitsu America, Inc. HSMD storage module device interfaces and/or storage module device drives, the vendor said.

Electronically erasable programmable read-only memory on the BMX-3 allows the unit to be configured through included Zetaco software.

The parameters of most popular drives are already programmed in, and the user can input the characteristics of new drives with Data General emulations as they become available, the vendor said.

Zetaco also offers cabling for the BMX-3, either for Data General's Federal Communications Commission-compliant chassis or the company's older non-FCC-compliant chassis. External cables for the FCC-compliant chassis cost $400. Non-FCC-compliant chassis do not need additional cables.

The BMX-3 costs $4,500. Quantity discounts are available.

Zetaco, 6850 Shady Oak Road, Eden Prairie, Minn. 55344.

OMNI

from page 63

vironment, a spokesman said.

Out of 315 interviews with members of planning committees, administrative services, departmental representatives and MIS managers in Fortune 1,000 companies, 70% of the companies surveyed said MIS is the most influential department for personal computer (as opposed to other office system) purchasing, the report said. MIS is responsible for deciding which software packages will be bought for personal computers in 74% of the firms surveyed.

MIS controls purchasing of office systems in general in 57% of Fortune 1,000 companies, the report said. The next most powerful group is an office automation committee (in 8% of the companies surveyed), but the typical committee is dominated by MIS, the report said.

Corporate personal computer buyers prefer to make their purchases from from retail computer stores, the same segment of the survey showed. Almost half (49%) of the firms surveyed claim to prefer retail stores, while 44% prefer to buy directly from the vendor.

The reasons given for each preference were similar — lower prices, better price breaks, availability, service and support.

Based on 81 interviews with MIS and telecommunications representatives or people in a position to affect the planning and purchasing of communications equipment in Fortune 1,000 companies, electronic communications is increasing rapidly. Local-area networks have been installed in 49% of the corporations surveyed and by next year more than 80% of respondents will have put up networks, even if they are only small pilot projects.

Thirty-six percent of the companies surveyed use private branch exchange-based communications now; 72% of respondents claim they will use PBX-based communications by 1986, the study said.

Sixty-two percent of the companies surveyed already use some form of long-distance electronic messaging, including Telex, the survey said. Only 9% of the companies plan to start using this technology, the study said.

A summary of the survey is available free from the Omni Group at Suite 450, 115 E. 57th St., New York, N.Y. 10022.

LIBRARY

from page 63

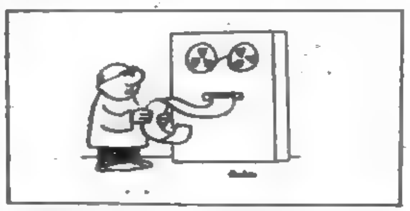
is a major objective of the project, Linden said.

For the analog system, the 12-in. video disks are being mastered by Sony Corp. and generally include color images, such as the motion picture collection, photographs, architectural drawings, maps and cartoons, the CRS officials said.

The digital optical storage system will be used mostly for black-and-white images, such as magazine articles and journals. The system was designed by Integrated Automation, Inc., an Alameda, Calif.-based systems integrator. It includes paper and film scanners, a jukebox-type optical disk drive that uses 12-in. optical disks from Paris-based Thomson CSF, high-resolution monitors and Xerox 2700 and 5700 laser printers.

The pilot project is being watched closely by other government offices and libraries because the digital optical disks store 1G byte of data on a side. Also watching closely is an advisory council from the publishing industry, which is worried about copyright protection for works stored on the optical disks.

"The publishers are watching us like hawks," Linden said, and they have granted permission to store their works for the duration of the pilot program.



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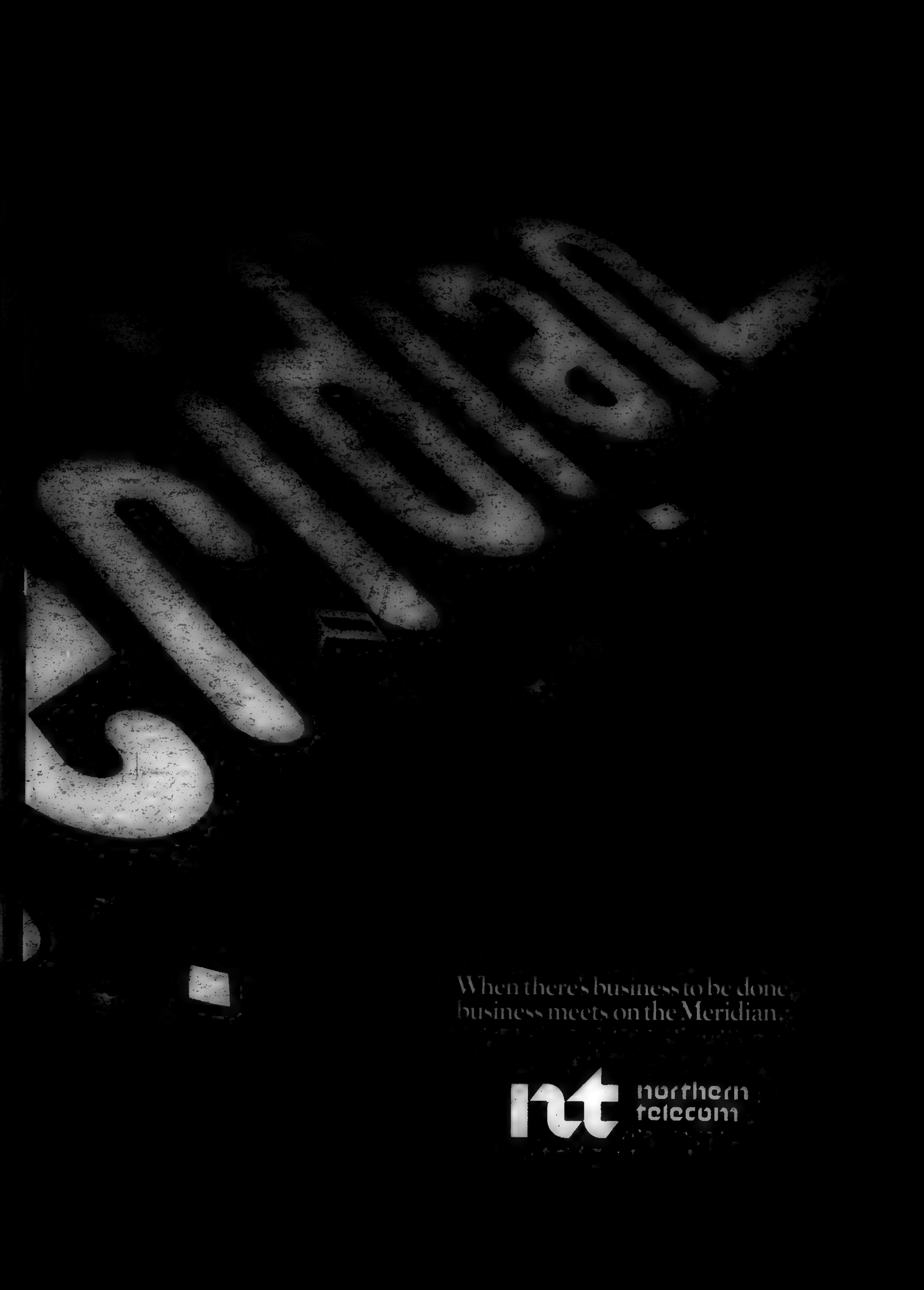
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RECOVERY

from page 63

cy short-time service. DEC said details of the types of applications to be run at the site would be specified in a vendor-user contract.

■ Information Management Consulting/Education Services, which provide help in developing contingency plans.

■ Data Protection Service Centers, which store customer media — both DEC and non-DEC — in environmentally controlled vaults. The shell sites and DEC-configured sites are in these centers, the vendor said. All sites will be completed by the end of this summer, DEC said. Each vault can hold 70,000 disk packs or 230,000 tapes, the vendor said.

DEC offers pickup and delivery service seven days a week, and customers within a 50-mile radius of the center can get emergency pickup or delivery within three hours, the vendor said. Centers exist in Boston, Chicago, Los Angeles, Toronto, Dallas, Atlanta and New York. Annual storage fees range from $609 for small businesses to $30,000 for medium to large companies.

Customers can use any or all parts of the recovery service, the vendor said, although Recover-All, Restart and Reserve are for DEC's contract customers only.

A medium-size customer, such as a $125 million business, would pay roughly $35,000 for full services, DEC said. A small business using a minicomputer to control its basic accounts could store its data off-site and buy Recover-All protection for approximately $1,000 per year.

More information is available from DEC, Maynard, Mass. 01754.

DBMS

from page 63

only about 20 or 30 are actively looking at them," he said. Part of the reason for this, he said, is that data base machines are relatively new technology. "I know a number of companies whose stated policy is not to be at the leading edge but to use proven technologies," he said. Imagine a data base machine in a major airline, where hidden bugs damage the data base. The repercussions could be so enormous that companies like airlines want 100% reliable equipment, not necessarily what offers a lot of potential advantages."

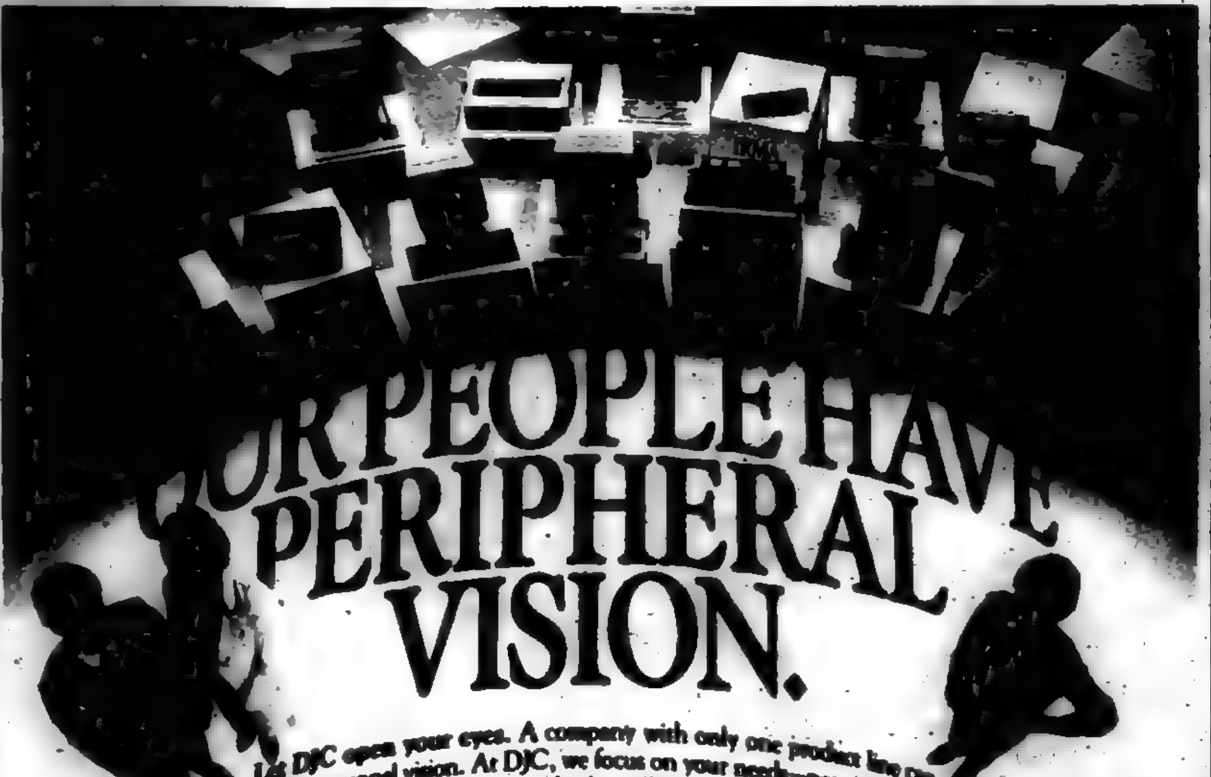
For some companies, data base machines are simply too new. "When we established our data base strategies, the data base machine was not in vogue," said Frank Chamberlain, director of corporate data resources at the Hartford Insurance Group. Hartford has been using IBM's hierarchical IMS DBMS for approximately 10 years, Chamberlain said.

Data base machines are not currently manufactured by IBM, which has somewhat hindered their acceptance in the market, according to Damion Rinaldi, a consultant at International Data Corp.

The data base machine was not the best approach at *The Boston Globe*, which purchased a Britton-Lee machine two years ago. According to Dave Pearson, assistant manager of data processing, it was the relational method of storing data and the ability to off-load data bases onto a separate machine that piqued the paper's interest in a data base machine. "We found we just weren't getting the horsepower we needed out of the [Digital Equipment Corp.'s VAX 11/780s]."

While the machine was first purchased for use with decision support system applications, a networking problem prevented the paper from accessing more than three VAXs with the Britton-Lee machine, Pearson said. Prohibitive costs and some support problems caused the *Globe* to use the data base machine for small applications with data requiring few updates, Pearson said.

The expenses of the data base machine are luring the *Globe* away from a full-blown data base machine toward a software solution, Pearson said. "Our [Britton-Lee] IDM configuration ran us close to $250,000," he said. "Every time we put a new VAX into the system, it was costing us $30,000 for the software interface to the host."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COMPUTER INDUSTRY

■ British Telecom announced plans to acquire 51% of Canada's Mitel/72

■ Paradyne's chief executive said the SEC's pending multimillion-dollar lawsuit against the company hasn't hurt sales/76

■ Convergent Technologies will idle a manufacturing facility for one week in June, sending its production workers on a mandatory vacation/83

Renier: IBM not leader in factory

By Peter Bartolik
CW Staff

BURLINGTON, Mass. — IBM will not dominate the industrial automation market in the same manner that it dominates the mainframe market, the vice-chairman of Honeywell, Inc. predicted last week.

Renier

James J. Renier, who in February was elevated to share the company's chief executive office with Chairman Edson W. Spencer, said IBM would have to undergo "another kind of culture adjustment" if it hoped to repeat its mainframe history in the industrial automation area.

Prior to opening a two-day trade fair here to mark Honeywell's centennial, Renier commented on his company's goals of merging controls and computers with communications to automate factories and offices. In 1984, Honeywell's controls and control products divisions accounted for $2.6 billion of the company's $6 billion revenue; the information systems division, of which Renier had been president prior to the February reorganization, accounted for $1.8 billion of the total revenue.

When he named Renier to the chief executive office, Spencer said the reorganization would enable Renier "to manage the integration of our computer and controls businesses. . . . Information systems will be a central part of the company's plans to provide integrated systems using computer, communications and controls for key industrial, commercial building and government markets."

Renier said Honeywell is well positioned to assert a presence in those markets based on its strength in systems inte-

See RENIER page 91

O. P. M. Leasing stock bid awaits court OK

By Charles Babcock
CW New York Bureau

NEW YORK — A purchaser has been found for the stock of what used to be one of the nation's largest computer leasing firms, O. P. M. Leasing Services, Inc. of Greenwich, Conn., currently undergoing bankruptcy proceedings under Chapter 11 of the Federal Bankruptcy Act.

The court-appointed trustee in the case, James P. Hassett, has been granted a May 28 hearing to propose that a U.S. affiliate of the British firm Mercantile House Holdings in London buy O. P. M. Leasing's common stock for $7 million.

An additional 90,000 shares of preferred stock would be distributed to creditors, and 10,000 shares of preferred stock would be retained for the management of the new company. The preferred stock would have a total value of $5.6 million under the proposed stock purchase agreement, said Hassett's attorney, Menachem Zelmanovitz of New York.

"The company is going to continue in business," he said.

The previous owners of O. P. M. Leasing were convicted of fraudulent financing amounting to $225 million by borrowing money to finance nonexistent leasing transactions. Former owners Mordecai Weissman and Myron S. Goodman were sentenced to 10 and 12 years in prison, respectively, after pleading guilty to fraud charges.

About $60 million would be available from the company to pay off creditors, and $47 million in tangible assets, including computer equipment for lease, would remain with the business under the new owners, Zelmanovitz said.

Mercantile House U.S. Holdings, Inc., the parent company's affiliate, is not yet the stock's approved bidder. Other parties may still bid until the court acts on the trustee's application, Zelmanovitz said.

Tandon moves to counter slump

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Tandon Corp. plans to broaden both its customer base and product portfolio in an effort to reverse a recent drop in its sales, even if that means turning down business from IBM.

Only a year ago, Big Blue accounted for 58% of Tandon's total sales, making it the smaller firm's largest customer by far. Today, IBM's share of Tandon's revenue has shrunk to 15%, and the figure is unlikely to exceed 20% through 1987, according to company President Sirjan Lal Tandon.

The vast majority of Tandon's business during the next two years will come from new, non-IBM sources. But with a possible shakeout looming on the horizon, "our problem now is to find healthy new customers," Tandon said recently at a Hambrecht & Quist Technology Conference.

A few days after the conference, the company posted second-quarter revenue of $61.1 million, compared with $105.7 million a year earlier. Losses for the recent quarter totaled $19.9 million, compared with profits of $10.4 million a year earlier.

At the conference, Tandon said his company will increasingly diversify its product line and revenue base by expanding into rigid disk drives, systems and subsystems for private-label sale by computer manufacturers.

Last year, flexible disk drives accounted for 80% of Tandon's revenue, rigid disk drives for 8% and systems and subsystems for 7%. In 1985, this mix will shift, with personal computers constituting 25% of Tandon's sales, rigid disks approximately

See TANDON page 90

No relief for chip industry

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

There's no rest for the weary in the depressed semiconductor industry, according to the latest figures released by the Semiconductor Industry Association (SIA).

The SIA reported last week that average monthly orders for the three-month period ended in April were down 7.5% from the figure for the three-month period ended in March. According to the SIA, March is a traditionally high month for orders, and April orders slumped 27% from the high point.

SIA President Thomas D. Hinkelman said recent U.S. Department of Commerce figures for computers and office equipment orders indicate that semiconductor orders should increase by the third quarter. However, he said, the SIA now projects that U.S. market billings, or shipped orders, for 1985 will be down 20% from 1984.

"The lackluster April orders picture is a result of continued declines in the shipping rates for computers and office equipment, causing these manufacturers to postpone semiconductor orders," Hinkelman said.

If the chip industry problems continue to be reflected in depressed stock market prices, some securities analysts who continued to predict forthcoming recoveries

See INDUSTRY page 91

Export regulations eased

By Clinton Wilder
CW Staff

WASHINGTON, D.C. — Computer industry representatives have hailed the U.S. Department of Commerce's lifting of software export regulations as the removal of a major barrier to international high-technology trade.

The Commerce Department announced April 29 that it had rescinded its Dec. 31 regulations that, in the opinion of industry spokesmen, would have required government approval for virtually all software exports. The announcement climaxed an intense four-month lobbying effort by the Association of Data Processing Service Organizations, Inc. (Adapso), the Computer and Business Equipment Manufacturers Association (Cbema) and other organizations.

"We are really pleased," said Adapso Assistant General Counsel Dave Wormser. "Our big complaint [with the Dec. 31 regulations] was that [the Commerce Department] imposed unilateral restrictions on software exports. This decision avoids unnecessary harm to our economic security while at the same time protecting our national military security."

The December regulations would have required a validated Commerce Department license for the export of 27 categories of software that previously required such a license only for sale to Soviet bloc nations. The April 29 decision reverts the regulations to their prior status and eases restrictions on export of software not specifically listed by the Commerce Department to all nations except Cuba, Cambodia, Libya, North Korea and Vietnam.

"Before this decision, [the Com-

See EXPORTS page 91

Are expert systems more trouble than they are worth?

OUTSIDE LINES

L. J. Kutten

Recently, *Computerworld* has had a number of articles describing how expert systems software will revolutionize the way Americans do business. These programs will bring the knowledge of experts to everyday people. No longer must an expert be consulted to solve a difficult problem.

This got me wondering — what is an "expert"?

After some thinking, I concluded that experts are people who are liable for their mistakes. They know when the standard rules apply and when they do not apply; their expertise allows them to go to the core of a problem instead of wasting time on the peripheral problems.

A system only as good as its user?

This raised another question: What good is an expert system if the person using it does not have the ability to tell whether the system is operating correctly? The user could end up relying on incorrect advice. Take the following example:

You buy an expert system to write a will. Unbeknownst to you, your factual situation is so unique that the standard will-writing methodology used 99.99% of the time is not applicable. Nevertheless, the will is written; six months later you die. Your heirs attempt to probate the will, and they learn the will is void.

If a lawyer relied on an incorrect expert system, that lawyer theoretically has the skill and knowledge to recognize this error and correct it. Using this incorrect system and failing to catch the error makes the lawyer liable for malpractice.

But what happens when nonlawyers uses this system? Will they have the skill or knowledge to recognize that something is wrong? I doubt it. In such a circumstance, there are only two ways to ascertain the will's validity — hire an attorney to review it before using it or die and let a court examine it.

Neither is a very good choice. Hiring the lawyer to review the will can cost more than hiring one to write it originally. Dying to determine the will's validity defeats the purpose of using the expert system.

Similar problems exist in other areas. For example, people use income tax preparation programs to prepare their taxes. I have seen many people take a home office deduction who were not eligible. Nine months later, the Internal Revenue Service inevitably caught up with them, and they had to pay some more taxes, plus interest and penalties.

The expert system they used did not tell them they were ineligible. But had they gone to H & R Block, Inc. or any other tax preparation service, the odds are the human tax preparer would have cautioned them.

So where does this lead? I wish I knew. But before everybody rushes off to this new savior, they should stop and ask themselves one question: "What is my recourse if the advice I receive from the expert system is bad?"

Kutten is a writer specializing in computer law topics and a member of the Illinois and Missouri bars. His book, Computer Buyer's Protection Guide, *was published last year by Prentice-Hall, Inc.*

British Telecom takes over Mitel

KANATA, Ontario — British Telecommunications PLC, the UK's major telecommunications company, will acquire 51% control of Mitel Corp., it was announced here recently.

Mitel, a telecommunications equipment manufacturer headquartered here, will sell British Telecom treasury shares worth more than $300 million (Canadian) if approved by Mitel shareholders, regulatory authorities and British Telecom's board of directors.

British Telecom was formerly controlled by the British government until last November, when the government sold off its 50.2% holdings under its privatization program.

In a prepared statement, British Telecom's chairman, Sir George Jefferson, said, "We intend to build on Mitel's management and research and development resources in countries where it now operates."

Mitel was an early leader in the sale of small digitized private branch exchanges and was once believed to be an acquisition candidate for IBM, until IBM broke off joint development arrangements in favor of acquiring an equity interest in Rolm Corp.

Mitel suffered through five consecutive losing quarters before showing a profit of $64,000 for the quarter ended Feb. 22.

The company posted revenue of $107.5 million for that quarter, just slightly under that of the year-earlier period.

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Realia COBOL. What a relief.

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Paradyne holds customers despite lawsuit

By Kathleen Burton
CW West Coast Bureau

SAN FRANCISCO — Paradyne Corp.'s sales and daily operations have been unaffected by its involvement in a highly publicized lawsuit, according to Robert S. Wiggins, chairman, president and chief executive officer.

The suit, instigated by a Securities and Exchange Commission investigation in 1983, accuses the Largo, Fla.-based communications vendor of violating federal procurement policies in winning a $118 million contract from the Social Security Administration (SSA).

The 1981 contract called for the establishment of a nationwide communications network encompassing 1,850 SSA terminals [CW, March 18].

Customers returning

Despite the suit, returning customers accounted for 90% of Paradyne's business in 1984, Wiggins said last week at a Hambrecht & Quist Technology Conference here. In 1983, the figure was reportedly 85%.

"The case has not driven old or new customers away to our knowledge," Wiggins said during an interview. "If they're not buying [from us] for that reason, then they're not telling us that."

This year, Paradyne will win 1,200 large accounts, each worth at least $25,000, he predicted.

Wiggins' upbeat assessment comes at a time of sharply reduced quarterly earnings for Paradyne. In the first quarter ended March 31, the company's profits totaled $151,000 on revenue of more than $68 million. During the same period in 1984, Paradyne earned nearly $3 million on sales of $60 million.

According to Wiggins, the lowered earnings were a result of delays in several planned customer shipments.

Although he declined to identify which customers or products were affected by the delays, he did say the deliveries had been rescheduled for the third quarter.

"This quarter's drop [in profits] is just a wrinkle and has nothing whatever to do with the pending litigation," Wiggins said.

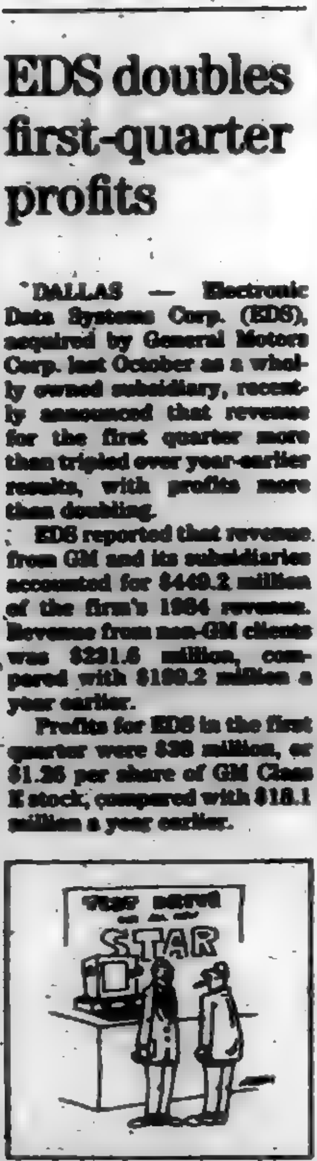
Wiggins

EDS doubles first-quarter profits

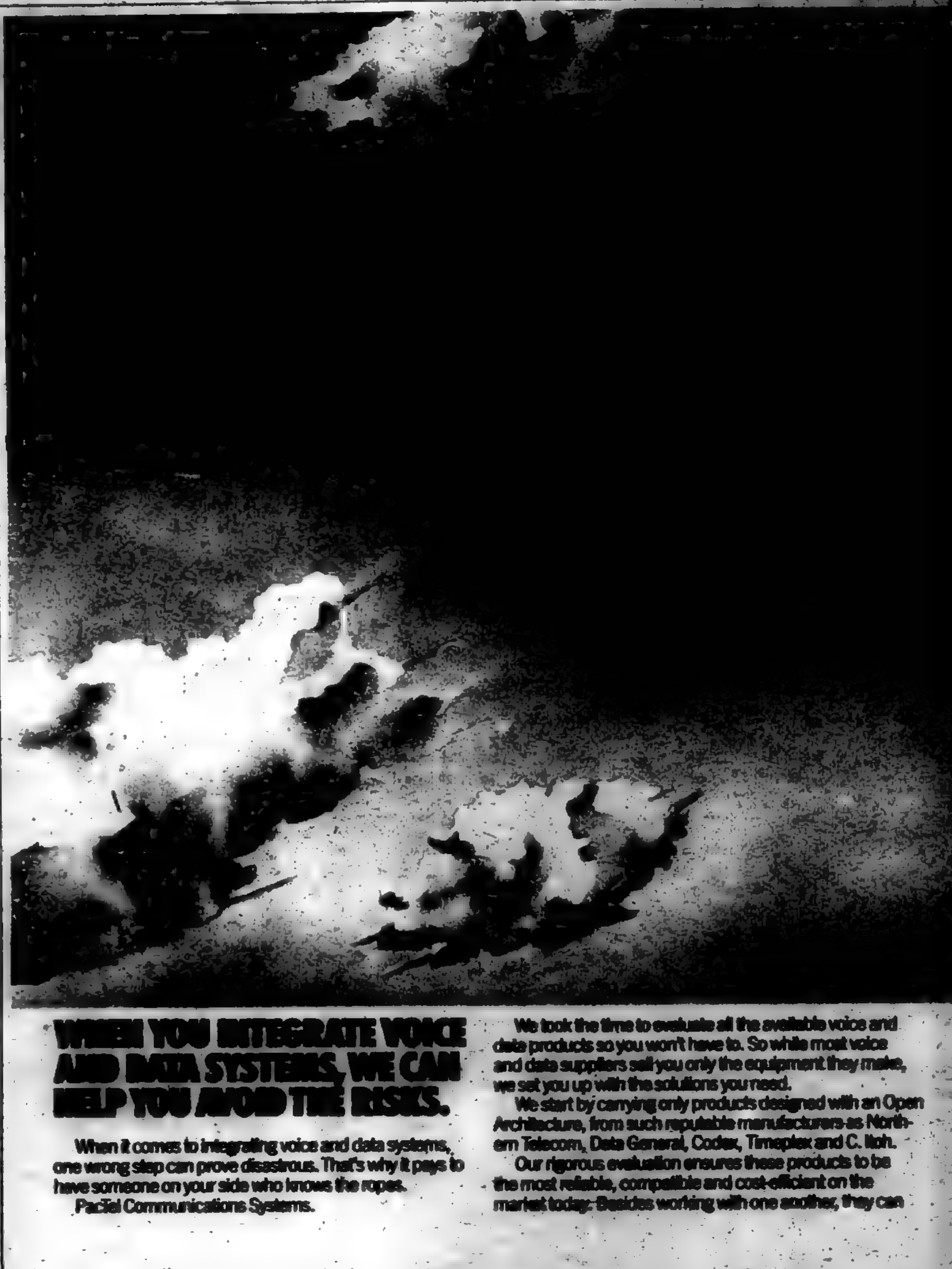
DALLAS — Electronic Data Systems Corp. (EDS), acquired by General Motors Corp. last October as a wholly owned subsidiary, recently announced that revenue for the first quarter more than tripled over year-earlier results, with profits more than doubling.

EDS reported that revenue from GM and its subsidiaries accounted for $449.2 million of the firm's 1984 revenue. Revenue from non-GM clients was $231.6 million, compared with $180.2 million a year earlier.

Profits for EDS in the first quarter were $38 million, or $1.26 per share of GM Class E stock, compared with $18.1 million a year earlier.



"I'm afraid we're not the dealership that offers a free digital watch with every test drive."



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H & R Block spurns bid to buy subsidiary

KANSAS CITY, Mo. — The board of directors of H & R Block, Inc. voted recently to reject an offer from the former head of its Compuserve, Inc. subsidiary to buy Compuserve for $72.5 million.

Jeffrey M. Wilkins, Compuserve's former chairman and chief executive officer, was fired from his position by H & R Block last month.

Wilkins organized a group of investors in Ohio, Compuserve's home state, to buy back the computer services subsidiary, but the H & R Block board formally turned him down at a regularly scheduled board meeting May 8. Following the vote, Wilkins resigned from the parent company's board.

"Our conclusion has been and continues to be that it would not be in the best interests of our company . . . to divest ourselves of Compuserve, which continues to play a key role in our strategy for corporate growth and profitability," said Henry W. Bloch, president and chief executive officer of H & R Block.

Wilkins had made offers to buy smaller parts of Compuserve in the last six months. H & R Block consultants had advised against divesting any amount of Compuserve, Bloch said.

Charles W. McCall, Compuserve president and chief operating officer, was named chief executive officer. The rest of Compuserve's top management will remain.

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CDC buys part of DP service firm

SAN FRANCISCO — Bankamerica Corp. announced recently that it has agreed to sell the California operations of its Decimus Data Services Corp. to Control Data Corp. for an undisclosed amount of cash.

Decimus is a contract DP service company specializing in time-sharing services for small and medium-size banks.

The sale was the latest in a series of moves by Bankamerica to divest its DP businesses and concentrate on banking operations. Last month, Bankamerica sold Decimus' computer leasing operation to General Electric Credit Corp.

A CDC official said the acquisition represented a key strategic move for the Minneapolis-based firm, which is a vendor of high-end computer systems and time-sharing DP services.

"It provides us with a strong West Coast market for our rapidly expanding financial industry services," said David P. White, president of CDC's Business Services division.

Miniscribe reports loss

LONGMONT, Colo. — Miniscribe Corp. recently announced a loss of $12.5 million, or 67 cents per share, in the first quarter of 1985. The company's revenue for the three months ended March 31 was $23.8 million, 30% lower than the $33.9 million reported in the year-earlier quarter. In the first quarter of 1984, the company reported a profit of $1.3 million, or 7 cents per share.

A spokesman for the microcomputer disk drive manufacturer attributed the first-quarter loss, like those of the previous quarters, to the cost of transferring production operations from Colorado to Singapore and Hong Kong. The spokesman also cited the costs of introducing Miniscribe's 5¼-in. and 3½-in. disk drive product lines.

The company also announced formal completion of its previously announced $20 million venture capital financing agreement with a group led by Hambrecht & Quist, a San Francisco-based investment firm [CW, May 6].

Gower said the transfer of disk drive production to the Far East would reduce Miniscribe's manufacturing costs by 30%.

SPSS inc.

Datamart targets summer for opening DP showrooms

By Maura McEnaney
CW Staff

SAN FRANCISCO — Hoping to shake off the jinx of Boston's Boscom computer industry trade mart, Datamart is scheduled to open its doors late this summer.

The $60 million project from the Bay West Development Co. will be built in two phases near Showplace Square here. Carrying a $31 million price tag, Datamart's first phase will offer 175,000 sq ft to house approximately 50 year-round showrooms for computer-related companies. The second phase, slated for a 1986 construction start, will include 300,000 sq ft of space for 150 showrooms. The project is being financed by B.A. Mortgage Co., a subsidiary of Bank of America National Trust & Savings Association.

Although to date only 10% of the first phase has been leased, Datamart President Richard Crouch said that the Datamart concept can work, despite the problems with Boscom [CW, April 29]. He said Datamart wants to fill in where retailers left off, attracting visitors whose companies are not frequently targeted by direct sales forces. "We want to provide a method for the manufacturer to sell directly and leverage its resources toward a large number of people," he said.

Boscom too early

Datamart predecessors like Boscom were too quick to come up with a retail solution missed by retailers and direct sales forces, according to Crouch. "Boscom was too early a solution to the problem before the problem was recognized," he said.

Crouch said he expects Datamart to benefit from Dallas' Infomart, which opened earlier this year [CW, Jan. 28]. "Boscom and Infomart were mad dashing to capture the market," he said, attracting top billings like IBM and Xerox Corp.

However, it could be some time before large companies find their way to Datamart, because they are new to the mart concept, Crouch said. Some companies overestimated the amount of space they needed in Dallas, according to Crouch, who said he believes the big commitments will start rolling in by the first quarter of 1986. "IBM isn't going to sign a lease with us until they know how much square footage they need," he said.

Seeking 100,000 visitors

While Datamart continues its leasing efforts and its attempts to attract 100,000 visitors annually, Datamart officials said they will launch the center this fall with a variety of conferences for vertical markets. The first conference, slated for Sept. 16-18, will be "Computers in Finance." Other conferences will focus on applications for high-tech and health care industries.

One of the companies taking a wait-and-see approach to the Datamart concept is Access Technology, Inc., which manufactures an integrated spreadsheet for a range of machines. The company signed a letter of intent to lease space at Datamart. "We happen to be looking for more exposure on the West Coast, and we're waiting to see what other companies [Datamart] can persuade," Access Technology President Allen Kluchman, said. While waiting for a field of participants, now limited to Epson America, Inc. and Molecular Computer, Inc., Kluchman is mulling over the types of services promised by the Datamart staff. Supplying a Datamart staff member at the booth site to demonstrate software products might be one way to make the participation cost-effective for his company, Kluchman said.

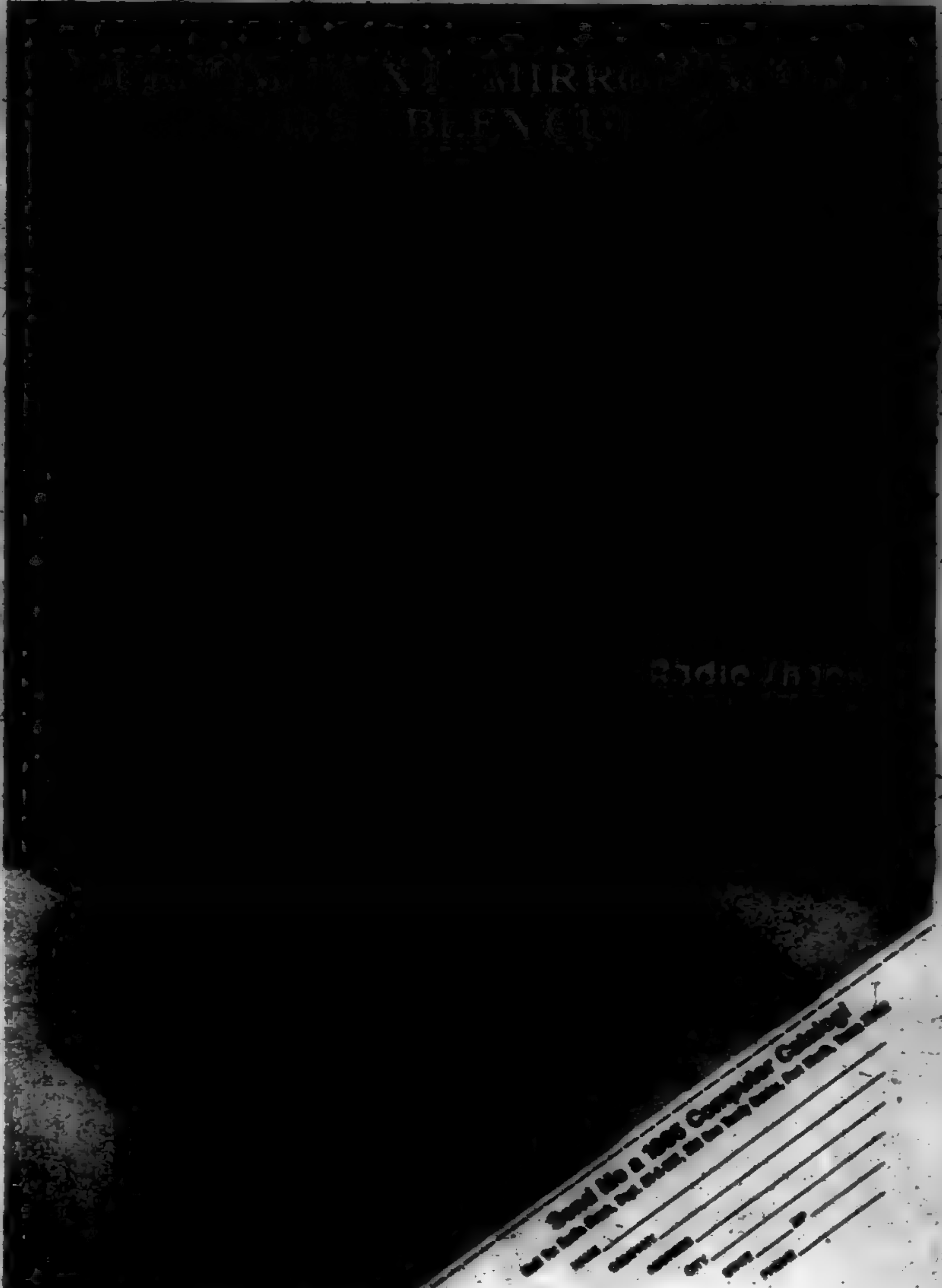
Despite its prominence in the micro market, Apple Computer, Inc. has yet to participate in computer marts of any sort, according to company spokeswoman Renee Rodrigues. Somewhat more hesitant than Access Technology, Apple is interested in seeing some results before it commits to leasing space, she said.

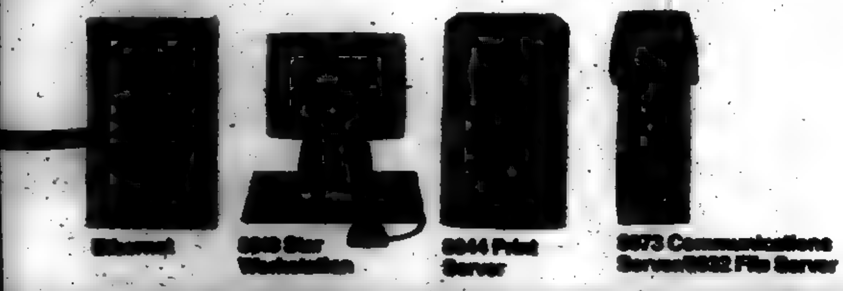
Study on trade marts

Crouch is not alone in his belief that a computer mart can succeed. Bill Meserve, senior management consultant at Arthur D. Little, Inc., wrote the study on computer industry trade marts for Fidelity Investments, backers of the Boscom project. Meserve also testified before the Zoning Commission in Washington, D.C., in favor of building a 1.5 million-sq-ft Techworld trade mart across from the Washington Convention Center. "I am a believer that there is a market requirement for this type of facility," he said.

Trade marts will be regional in nature, Meserve said. "Each region has its unique attributes for drawing significant numbers to make that particular trade mart visible," he said. But success with a concept like a computer trade mart will not come without attracting big names, according to Meserve. "You need a threshold. If you don't get a threshold, you run a substantial risk," he said.

Meserve has a four-prong formula for trade mart success. First, he said, it must be the site and not the vendors that attracts customers. Second, the building must be convenient for those coming to the show. Third, developers must provide the right facilities to support tenants, and last, developers must promote the mart.

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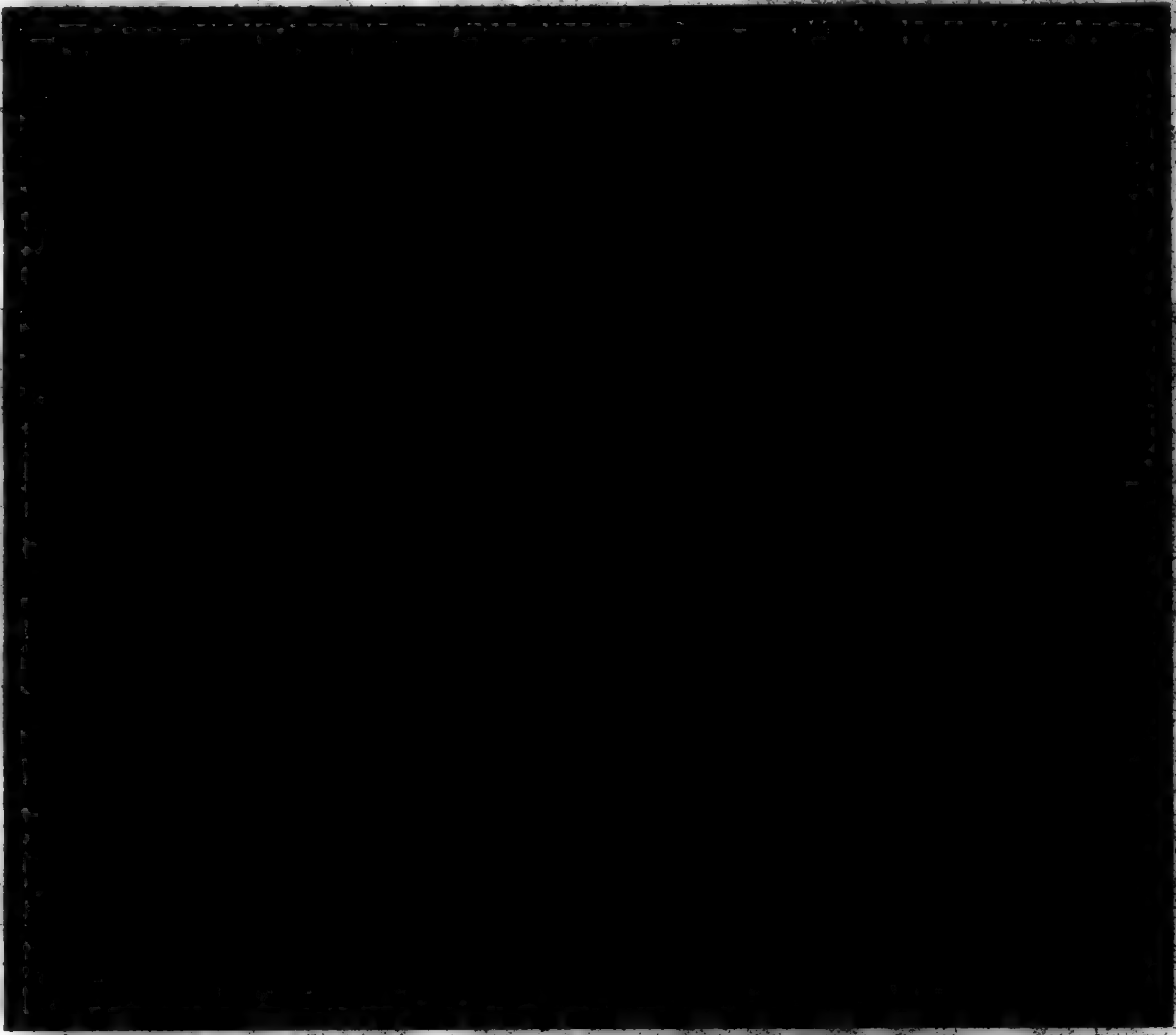

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NICKELS AND DIMES

Decision Data Computer Corp. reported a 31% increase in revenue for the first quarter ended Feb. 28. Revenue was $43 million, compared with $32.9 million last year. Profits were $2.5 million, or 32 cents per share, compared with $1.6 million, or 21 cents per share, in the corresponding period one year ago.

■

Monolithic Memories, Inc. said profits for the second quarter ended March 17 were $3.5 million, or 18 cents per share, compared with $5.5 million, or 29 cents per share, in the like quarter last year. Revenue was $42.7 million, compared with $40.1 million for the like period last year.

■

American Software, Inc. reported revenue for the third quarter of fiscal 1985 was $8 million, up 29% from $6.2 million in the same period last fiscal year. Profits increased to $1.7 million, or 39 cents per share, up 21% from $1.4 million, or 33 cents per share, a year ago.

■

Keane, Inc. reported revenue for the quarter ended Dec. 31 of $9.1 million, up 51% compared with $6 million in the previous year. Profits were $214,000, or 24 cents per share, up from $10,000, or 1 cent per share, during the same three-month period a year ago.

■

[illegible] Corp. announced revenue for the first quarter ended Jan. 26 of $24.4 million, compared with $29.3 million for the same quarter one year earlier. A net loss of $2.7 million, or 30 cents per share, was reported, compared with a net profit of $1.8 million, or 17 cents per share, the year earlier.

■

Xebec Corp.'s revenue for the first quarter of fiscal 1985, ended Dec. 31, increased 27% to $41.5 million from $32.7 million a year ago. Profits were $80,000, or 1 cent per share, compared with $3.1 million, or 24 cents per share, in the prior year.

■

Analog Devices, Inc. announced revenue of $82 million for the first quarter ended Feb. 2, compared with $69.5 million one year earlier. Profits were $9.3 million, compared with $7.7 million in the like quarter last year.

■

Mohawk Data Sciences Corp. reported a loss for the third quarter ended Jan. 31 of $15.4 million, or $1.04 per share, compared with a profit of $547,000, or 4 cents per share, for the same period last year. Revenue was $85.3 million, compared with $106.6 million in the same quarter one year earlier.

■

Televideo Systems, Inc. reported revenue for the first fiscal quarter ended Jan. 31 of $26.7 million, compared with $43.2 million in the like quarter a year ago — a 38% decrease. The company had a net loss of $5 million, compared with $5.7 million in the same quarter last year.

■

CSP, Inc. announced revenue for the second quarter ended Feb. 28 of $3.6 million, up 70% from $2.1 million in the corresponding period last year. Profits were $490,000, compared with $127,000 in the prior year's quarter.

■

Micron Technology, Inc. announced revenue of $18.2 million for the second quarter of fiscal 1985, ended Feb. 27, compared with $12.3 million for the same quarter last year. Profits were $2.8 million, compared with $2.9 million in the like period one year earlier.

■

Softech, Inc. reported revenue of $9 million for the third quarter ended March 1, compared with $10.9 million in the same quarter last year. Profits were $198,000, compared with $381,000 in the comparable period one year ago.

Convergent to halt CT production for week

SAN JOSE, Calif. — Convergent Technologies, Inc. will halt production at its CT Division here for one week in June as a cost-cutting measure, the company acknowledged last week.

A Convergent spokesman cited softness in orders for Convergent's CT mini and microcomputer products, which are sold to large OEMs such as NCR Corp. and Burroughs Corp. for resale.

An estimated 400 to 600 production employees in the division will be required to take vacation time during the first week of June.

In related developments, Convergent President and Chief Executive Officer Paul C. Ely Jr. said all employees would forego taking accrued personal time for the next three months. He also said employees exempted from the mandatory vacation have been asked to work extended hours and that the company would shift approximately 200 production personnel from the CT Division to the Special Products Division, also based here.

The Special Products Division manufactures the Unix PC 7300 for AT&T, and Ely said demand for that product has exceeded the company's expectations.

In discussing the slackened demand for CT products, Ely cited a recent decision by Burroughs to manufacture a large percentage of its present CT product needs under its own license.

Although Burroughs has been Convergent's largest customer, Convergent spokesman William Bennett said AT&T is about to, or already has, stepped into that position.

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UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK

In re
O.P.M. LEASING SERVICES, INC.,
Debtor.
Reorganization No.
81-B-[illegible] (BRL)

In re
CALI TRADING INTERNATIONAL, LTD.
Debtor.
81-B-[illegible] (BRL)

In re
O.P.M. LIFE INSURANCE FUND,
Debtor.
81-B-[illegible] (BRL)

In re
O.P.M. COMPUTER SERVICES, INC.,
Debtor.
81-B-[illegible] (BRL)

In re
O.P.M. LEASING SERVICES (CANADA), LTD.,
Debtor.
81-B-[illegible] (BRL)

NOTICE OF HEARING ON A APPLICATION FOR APPROVAL OF STOCK PURCHASE AGREEMENT, and IN CONSIDERATION OF OTHER OR BETTER PROPOSALS

TO ALL CREDITORS AND PARTIES IN INTEREST:

PLEASE TAKE NOTICE, that a hearing will be held before the United States Bankruptcy Court for the Southern District of New York, in Room [illegible] of the United States Courthouse, Foley Square, New York, New York on May [illegible], 1985 at 2:00 p.m., for the purposes of:

1. Considering the Application for approval of the Stock Purchase Agreement dated May 2, 1985 (the "Agreement") between [illegible] and James P. Hassett (the "Trustee"), as Trustee of O.P.M. Leasing Services, Inc. ("O.P.M.") and Cali Trading International, Ltd., [illegible]; and

2. [illegible]

PLEASE TAKE FURTHER NOTICE, that the aforesaid Application and Agreement are on file with the Clerk of the Court, in Room [illegible] of the United States Courthouse, and may be [illegible]

PLEASE TAKE FURTHER NOTICE, that any and all objections must be in writing, [illegible]

PLEASE TAKE FURTHER NOTICE, that further information may be had from the Trustee or his attorneys listed below.

Dated: New York, New York
May [illegible], 1985

BY ORDER OF THE COURT
/s/ BURTON R. LIFLAND
UNITED STATES BANKRUPTCY
JUDGE

JAMES P. HASSETT, Trustee of
O.P.M. Leasing Services, Inc.
and Cali Trading International,
Ltd.
[illegible]

[illegible]

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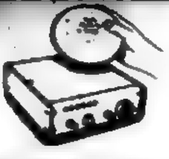
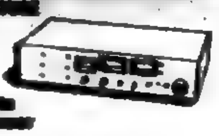


WATER ALERT — Surface Water Sensing Alarm Systems

DETECT TEMPERATURE SHIFTS —



Six Point Remote Temperature Scanner

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CALL OR WRITE FOR COMPLETE INFORMATION

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COMPUTER INDUSTRY

EXECUTIVE CORNER

Bruce A. Twickler has been promoted from the position of senior vice-president to president of Hayden Software Co.

■

Kenneth S. Scott has been named president and chief operating officer of Summa Technologies, Inc.

■

Raymond R. Margerum has been promoted to president and general manager of the international subsidiary of Applied Data Research, Inc.

■

Vaemond H. Crane has been appointed president and chief executive officer of Mips Computer Systems. Prior to joining Mips, Crane was president and chief operating officer of Computer Consoles, Inc.

■

Hal J. Krauter has joined Mad Computer, Inc. as president and chief operating officer.

■

Ramesh K. Mehta has been named president and chief operating officer of Inspiration Systems, Inc.

■

David K. Lam has been appointed president and chief executive officer of Link Technologies, Inc.

■

James Simpson has been elected president of Qume Corp., a subsidiary of ITT Corp.

■

Ralph Armstrong has been promoted to president and chief operating officer of Comdesign.

■

Dr. Stephen Payne has been appointed president and chief executive officer of PA Computers and Telecommunications in North America.

■

Masaka Ogi has been appointed president of Fujitsu America, Inc.

■

Hiroaki Tomochika has been named president of Sanyo Business Systems Corp., headquartered in Moonachie, N.J. Most recently, Tomochika was manager of North America sales at Sanyo Electric Co. in Osaka, Japan.

■

Lotus Development Corp. has announced the appointment of **R. C. Prokopis** as senior vice-president, finance and operations.

■

Ducommun, Inc. has announced the election of **David G. Schmidt** as president of the company. Also, the board has elected **W. Donald Bell** senior vice-president and **R. Richard Byrne** vice-president of finance and chief financial officer.

■

Howard Oringer has been appointed to the position of executive vice-president of operations and chief financial officer at Televideo Systems, Inc. Oringer joins Televideo from Crowntek, Inc.

■

Donald D. Bunker has joined Tallgrass Technologies Corp. as executive vice-president of manufacturing. Before joining Tallgrass Technologies, Bunker was staff general manager at Control Data Corp. Previous to that, he was vice-president of manufacturing for Storage Technology Corp.

■

Francis X. Kenney has been promoted to vice-president of systems development, a newly created post at NEC Information Systems, Inc.

■

Network Solutions, Inc. has announced the promotions of **Jane M. Urban** and **Richard F. Hawkins** to vice-presidents of the systems development division.

■

Gary N. Prague has been named to the position of assistant vice-president of new product development at Optionware, Inc.

■

Lindsey C. Y. Kiang, general counsel and director of federal relations of Yale University, has been named general counsel of Lotus Development Corp.

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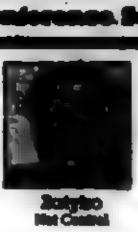

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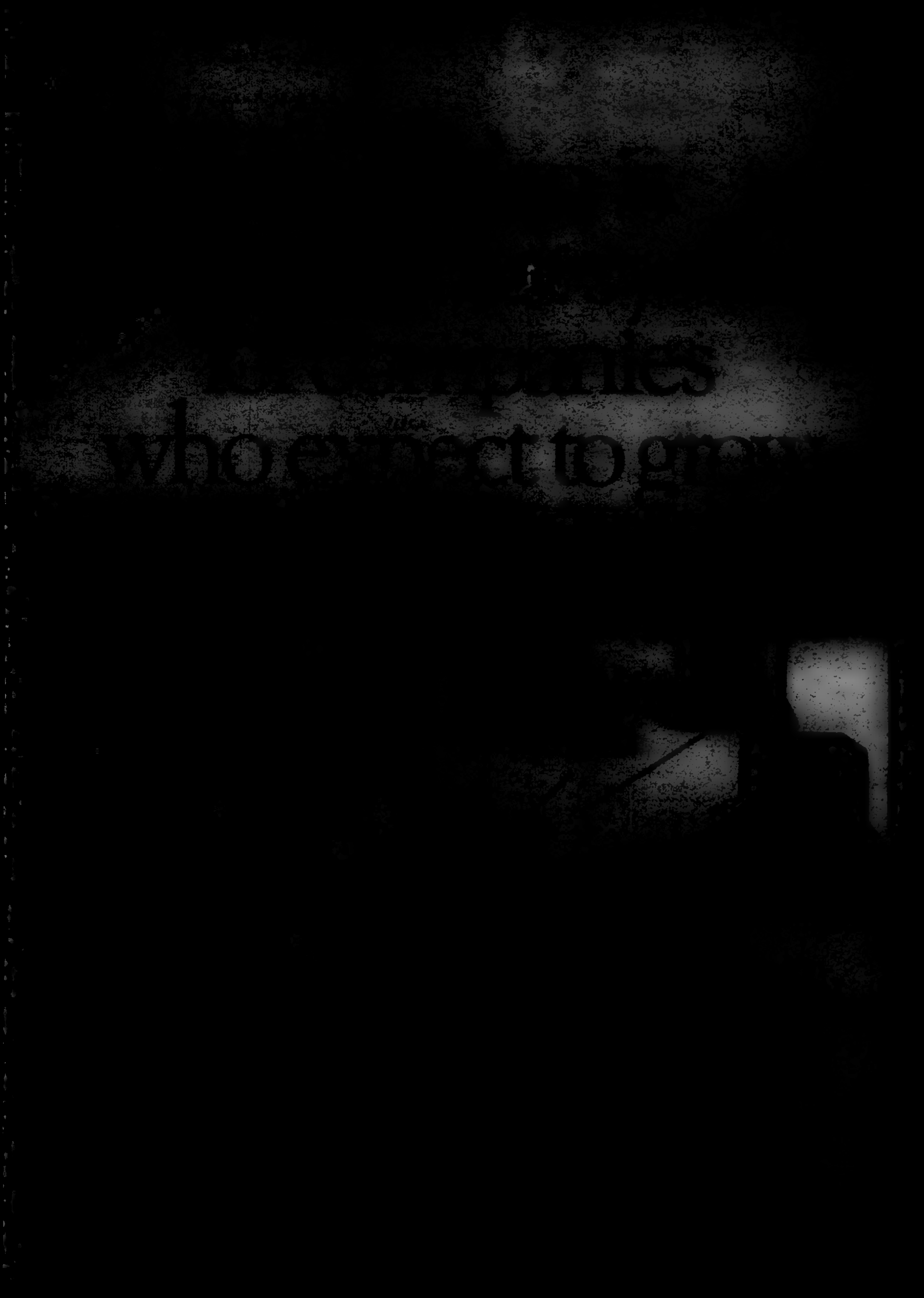
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Sit down to work, and *Touchscreen II* displays a selection of application software on a high-resolution 12-inch screen.

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Including our new Graphics Gallery, which offers you presentation graphics of a quality previously available only from larger computers ■ And, with HP's new Executive MemoMaker, it's easy to merge graphics with text—right on the screen.

Most of these packages are enhanced through the use of touch and soft keys, which execute complex commands in one stroke ■ This not only speeds the operation of *Touchscreen II*, it speeds the learning process required to use it.

EVERYONE IN YOUR OFFICE WILL GET THE POINT.

Touchscreen II requires minimal orientation, even for the beginning user ■ This is largely due to an ingenious system called Personal Applications Manager, or PAM.

PAM displays program applications as English-language labels ■ These labels when touched or activated through soft keys, get you into programs immediately.

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Touchscreen II is easily set up for peripherals like printers and plotters, thanks to the pictorial menu ■ Simply touch the pictures that match the devices in your system.

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Intecom, Inc. has established an International Switching Products Division. The purpose of the division is to introduce and provide support to users of telecommunications and DP features for the company's line of voice/data products internationally, the firm said.

■

GTE Supply has started a business unit to supply DP and information systems managers with data communications products.

The unit, called GTE Data Communication Products, markets a full line of items, including modems, multiplexers, printers, protocol converters, terminals, workstations, connectors, cable, supporting equipment.

■

BKW, Inc. of Nashua, N.H., announced it has been named as a defendant in a $6 million law suit filed by the Barton Group of Los Angeles.

The suit alleges breach of contract and other matters in connection with BKW's termination of its plans to acquire the Barton Group. BKW announced on Jan. 15 that this termination was based primarily on the Barton Group's failure to meet all of the terms and conditions spelled out in the original letter of intent between the two companies.

■

Jerome Dreyer, president of the Association of Data Processing Service Organizations, Inc., has been appointed to the industry sector advisory committee on electronics and instrumentation for trade policy matters. The committee acts as an advisory body on trade policy matters.

■

Atlantic Research Corp. has acquired the rights to manufacture and market a line of computer enhancement devices, called the M-60 series, which were developed and previously marketed by Onyx, Inc. of McLean, Va. Atlantic Research established a subsidiary, Memory Sciences Corp., to market the M-60 line. George Dill, formerly president of Onyx, is the president of Memory Sciences.

■

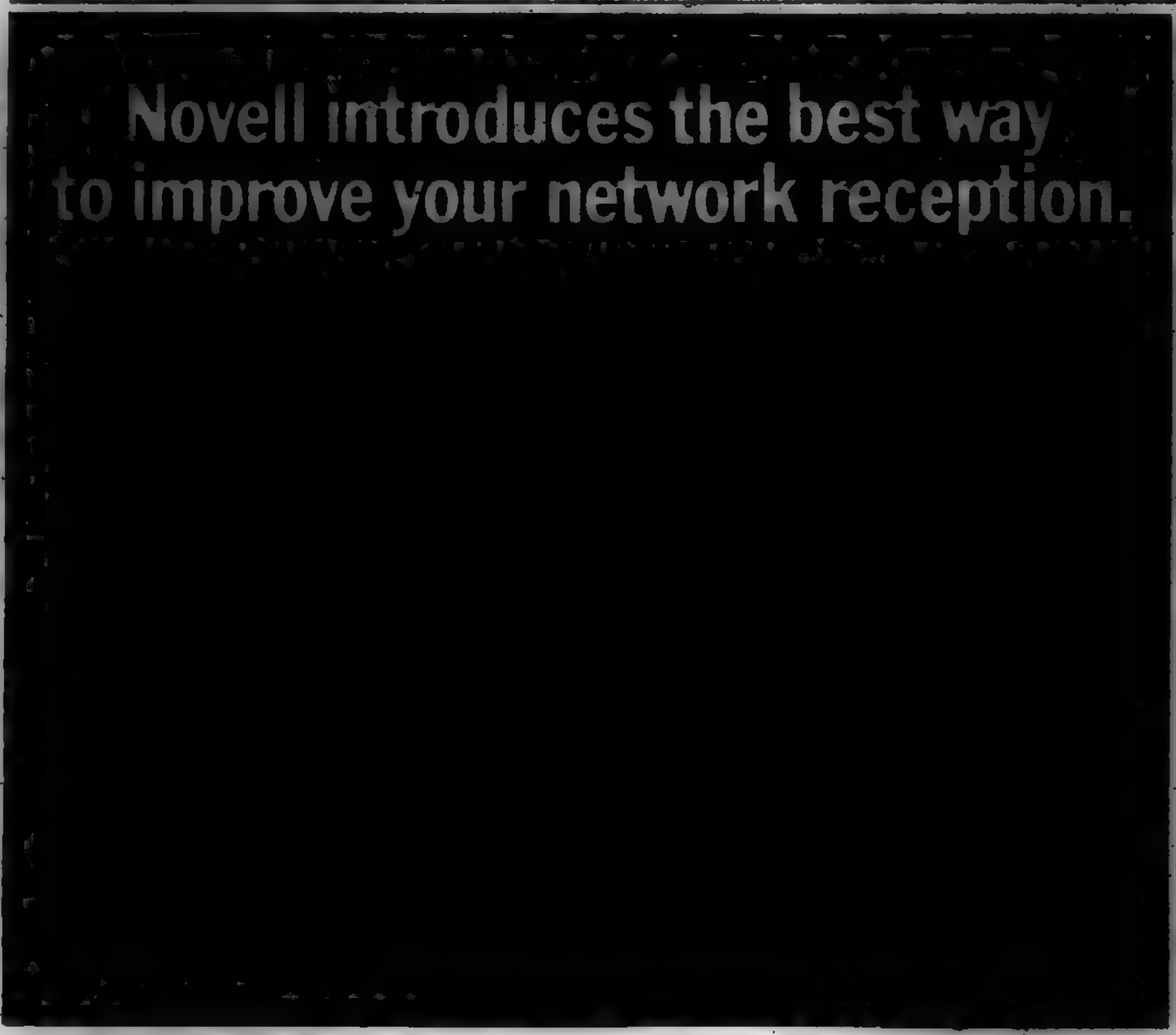
Amdahl Corp. has signed a distributorship agreement with Centel Business Systems, an operating unit of Centel Corp., under which Centel Business Systems will market Amdahl's data and voice communications products. Products covered by the renewable contract include Amdahl's 962 series of limited-distance modems, 963 series of data service unit/channel service unit products, and the 2211 time-division multiplexers. The announcement was made at the Communication Networks Conference and Exposition held in Washington, D.C., in January.

Centel also will provide field service and technical support for these products. Amdahl's worldwide sales organization will continue to market, service and support its line of communications systems products directly.

■

NBI, Inc. announced a recent out-of-court settlement with Datascan, Inc., a California-based corporation, for Datascan's alleged illegal copying of NBI Oasys 3000 software.

NBI's complaint against Datascan, filed in 1983 with the U.S. District Court for the Central District of California, alleged copyright infringement, unfair competition, conversion and unjust enrichment.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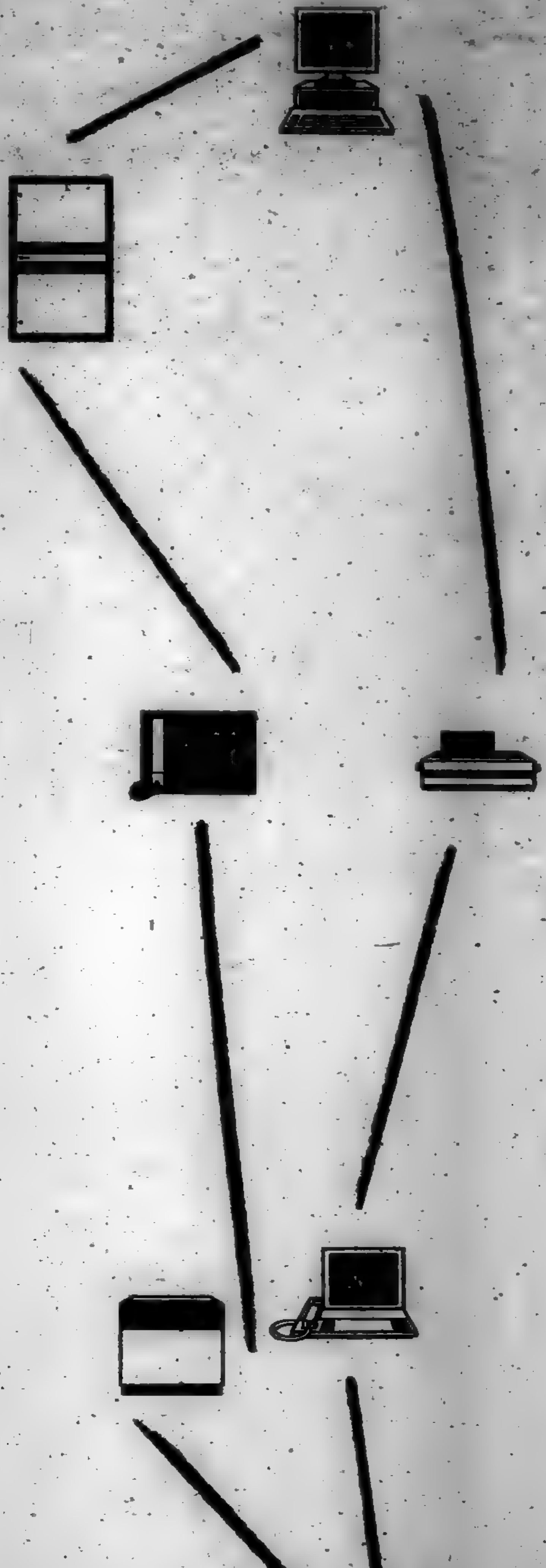
*LAN Benchmark Report, May, 1985, Novell, Inc. and "Software, Not Hardware Key to LAN Performance," *PC Week* 1/15/85.

NOVELL



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TANDON

from page 71

36% and flexible disk drives 40%, Tandon said.

Because its long-term OEM relationship with IBM faltered earlier in the year when IBM canceled and then reinstated a contract for full-height 5¼-in. floppy disk drives, the company has increasingly emphasized direct sales of its disk products to Computerland Corp., Convergent Technologies, Inc., AT&T, Sears Roebuck and Co. and Tandy Corp., he noted.

Short-term revenue a problem

But Tandon admitted that short-term revenue is "a major problem," primarily because of the shift in the firm's customer base, the transition to new products and a soft personal computer market.

In a cost-cutting move, Tandon earlier had trimmed its offshore production to 11,000 units, compared with a potential peak capacity of 80,000 units. The company will also reduce its U.S. manufacturing operations by 20% during the next six months, Tandon said.

The company will refuse new business from IBM unless it is long term, according to Tandon. "A short-term strategy with IBM is too risky," he said.

Can sell higher to non-IBM customers

Tandon claimed that the company can sell its 30M- and 40M-byte half-height products, used in IBM's Personal Computer AT, at 50% higher prices to its non-IBM customers. He predicted the company would ship 10,000 of these products to non-IBM customers this quarter.

One constant during 1985 will be Tandon's ability to remain competitive in price, Tandon said. The company's 10M-byte disk drive will sell for $160, its 20M-byte, 3½-in. hard disk drive will cost $200 in OEM quantities, and a 30M-byte drive will sell for less than $300, he said.

Negotiations are currently under way with Sperry Corp., Atari, Inc. and Digital Equipment Corp. to purchase these products, Tandon said.

The system-side of its business is also beginning to earn significant revenue, he said. Tandon has sold $75 million worth of its XT personal computer product, released last October under a private-label agreement with Tandy. In addition, evaluation units of its AT product have recently been shipped to Tandy and a European OEM that Tandon declined to name.

Ventures: Funds exist, sources vary

By Edward Warner
CW Staff

ATLANTA — Budding entrepreneurs who want to woo venture capital onto their threadbare balance sheets had better own a company that is selling a medical data base, used computers or discontinued software.

Those who do own such companies might want to call A. David Silver right away. His Santa Fe, N.M.-based venture capital investment banking firm, A. David Silver & Co., is looking to fund such ventures, which comprise the few in the computer industry that are of interest to him.

Silver, a panelist in a presentation on venture capital funding at Comdex/Spring '85 here, said the erstwhile entrepreneur need not worry too much if his new company's specialty is not on that list. Alternative funding sources, such as federal and state business development grants and up-front loans from firms that plan to become large customers, represent some of many ways to circumvent or supplement venture capital financing.

Ultimately, the newcomer to private enterprise may not need the venture capitalist anyway, Silver said, pointing to his survey of what he called the top 100 entrepreneurs of the last 25 years. Only a quarter of those had received any venture capital, he said.

Another panelist, Jeffrey D. McKeever, president of the Microage Computer Stores, Inc. retail chain, advised his listeners to line up all of the capital they will need before hard times hit. A rule of venture capital, according to McKeever, is that "when you do need it, it's too late to afford it."

Mostek to cut 2,000 workers

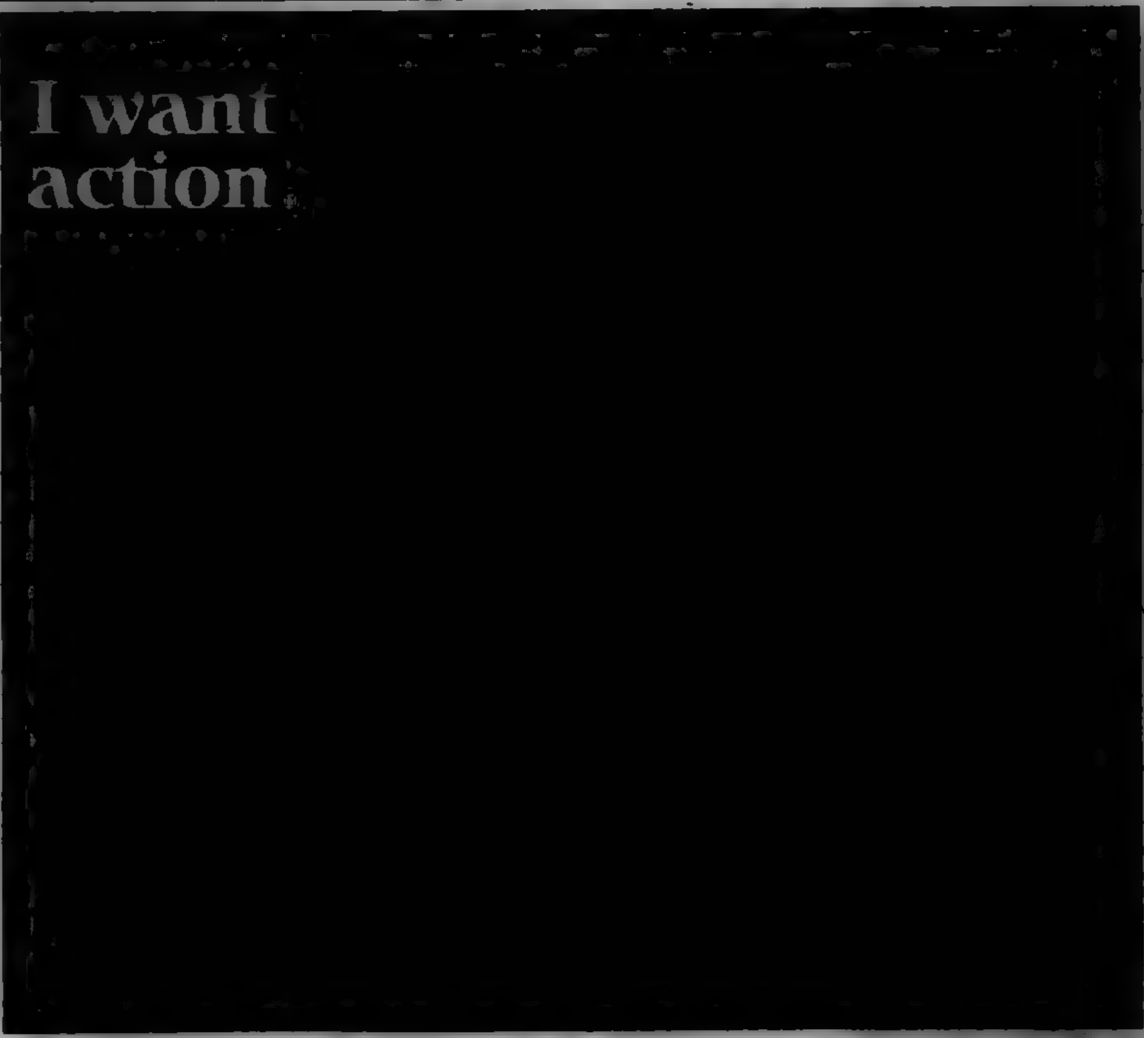
CARROLLTON, Texas — Mostek Corp., the semiconductor division of United Technologies Corp., announced recently it will dismiss 2,000 employees from its manufacturing plants here and in Colorado Springs.

The company stated that it will lay off 1,600 workers at its plant here and 400 in Colorado Springs, reducing its worldwide employment to 6,300.

The work force reduction, said to be based on the continued downturn in the semiconductor market, follows an earlier reduction of 1,000 workers in Malaysia.

Mostek said it will close its Colorado Springs wafer fabrication facility. Most other leading semiconductor manufacturers have taken similar actions in light of the industry's continuing sales slump.

United Technologies reportedly told analysts last month that Mostek lost more than $40 million in the first quarter of this year.



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INDUSTRY

from page 71

might have to start updating their resumes when clients begin to add up the paper losses with which they've been hit.

•

The bankruptcy filing by Columbia Data Products, Inc. [CW, May 13] raises yet again the potential of an orphaned family of computers. Yet one of Columbia's large customers is not too worried.

Honeywell, Inc. resells Columbia Data machines under the Honeywell label, and last week the vice-president of Honeywell's Small Computer and Office Systems Group managed to find an element of good news to Columbia Data's Chapter 11 filing.

Gene Manno, head of the Billerica, Mass.-based Honeywell division, said the protection from creditors that Columbia Data will receive under the Federal Bankruptcy Act will enable the Columbia, Md., company to get its organization into shape.

Columbia Data, Manno said, "has continued to build and to deliver [under] its contracts." The filing will not affect Honeywell's sales, he said, because "the one we sell has the Honeywell label on it."

Nevertheless, Honeywell Vice-Chairman James J. Renier revealed that the company has been studying additional resale agreements with a number of other vendors and expects to make an announcement soon.

Regarding the industry slump that led his division to announce layoffs and enforced vacation periods, Manno said, "It appeared to us early, and we were able to anticipate the first-quarter [downturn], but it is continuing into the second quarter."

EXPORTS

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merce Department] cast a very wide net," said Boston attorney Robert Birnbaum, whose clients include Cullinet Software, Inc., Computer Corp. of America and Applicon, Inc. "There was a tremendous outcry as soon as the regulations were published. It was like saying you can drive your car, but you have to get permission from the police every time you drive it.

"The way [the regulations] were written, they could have been used to apply to anyone producing anything other than a [personal computer] spreadsheet or a video game."

Birnbaum said the regulations would have been particularly restrictive to companies attempting to export software designed for data base management, computer-aided design and manufacturing, microprocessor development, interpreting and compiling and high-level language-based development systems.

"I think the folks in Washington, D.C., have no idea how many people are out there making software," Birnbaum said. "When that dawned on them, they realized there wasn't enough paper to accommodate the flood of applications."

The regulations never officially took effect after they were announced. Their enforcement was delayed until February and again until April 29.

Adapso and Cbema held seminars here and in Boston, San Francisco and Dallas to encourage opposition to the regulations. Approximately 250 industry representatives attended each seminar, according to an Adapso spokesman.

RENIER

from page 71

gration and 20-year history in controls. With established customer bases in both areas, he said, "Customers are asking Honeywell to take on the systems integration role. This is especially true in the areas of industrial automation and office automation."

Renier said IBM "will sell a lot of mainframes [in the industrial automation] area, but won't dominate it like it has the financial industry and the insurance industry." The emerging market, he said, requires vendors that can provide large, value-added systems.

'One thrust, one company'

For years, Renier said, Honeywell purposely kept its mainframe business separate from its other businesses. Now, "we should have one thrust, one company, one organization," he added.

One element of that strategy is the decision made last year to resell NEC Corp. mainframes as top-of-the-line Honeywell DPS 90 machines.

Renier said the company did not cut back expenses through that alliance because it "simply had never been doing research and development at the mainframe levels above the DPS 88," Honeywell's previous high-end machine.

Renier pointed to Honeywell's 20-year relationship with NEC, to which it recently sold its Japanese subsidiary, and said the business alliance was "very easy." He rejected industry perceptions that the relationship became strained when NEC challenged Honeywell for its business with General Electric Information Services Co. (Geisco).

The challenge for a new contract to supply the CPUs for Geisco's time-sharing networks was, according to Renier, "simply an event that occurs in the life of a business; there was a very obvious direction in which to go, and we did that." That direction was the agreement to bundle Honeywell's operating system with NEC's large mainframe.

Regarding the current sales slump many vendors are experiencing, Renier said Honeywell recognized a trend last fall and tried to prepare for it. However, he noted, "The softening was deeper than we expected to see." Honeywell's Massachusetts-based Small Computer and Office Systems Group recently announced some layoffs and mandatory vacation periods [CW, April 15].

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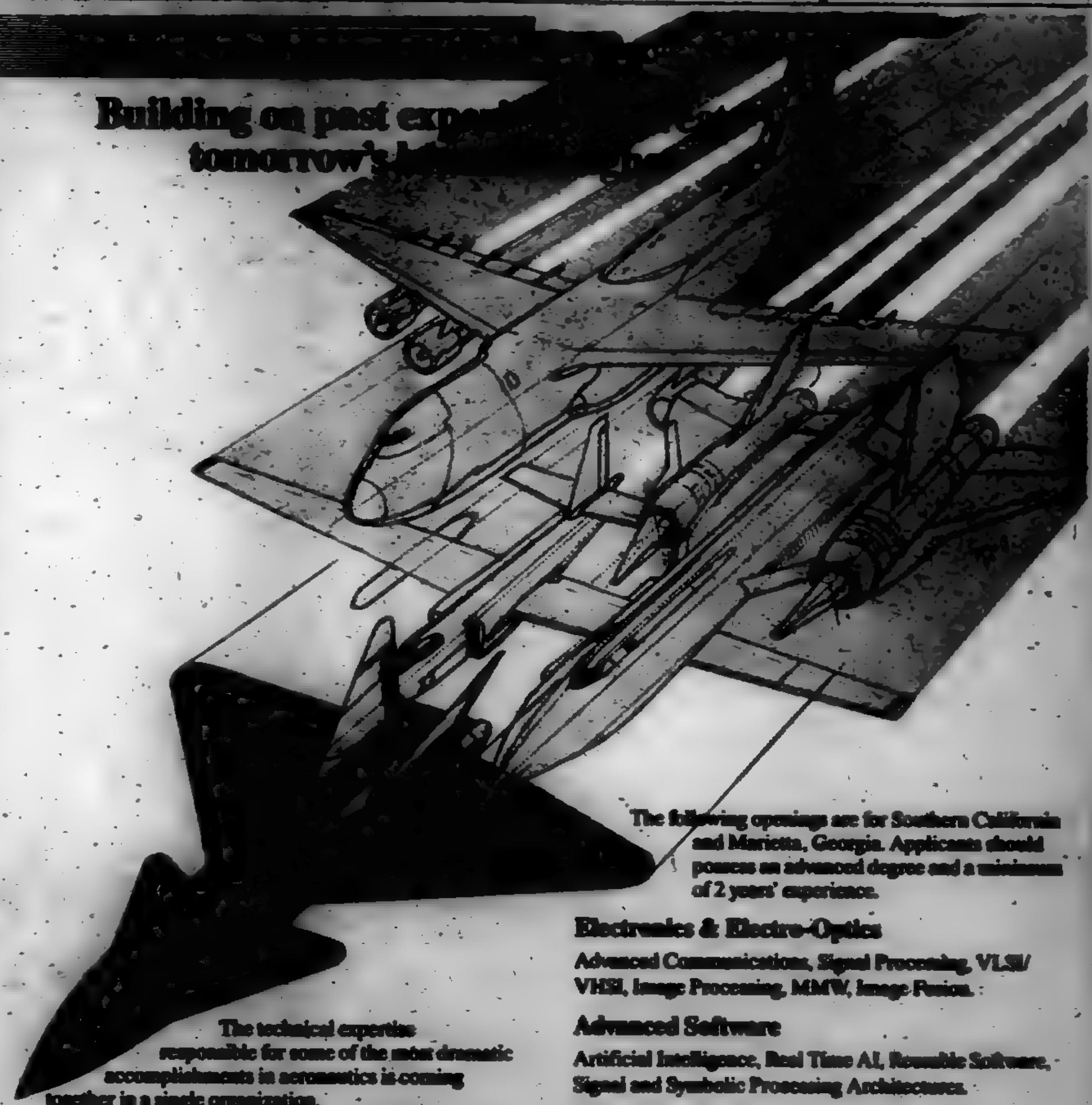

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Provide software support for real-time pilot-in-the-loop simulations, and develop and maintain operating system software for multi-CPU Harris, DEC 11-44 RSX-11, Intel microprocessor and MC68000-based UNIX systems. You'll evaluate system specifications and interface with vendors. Requires at least 5 years' experience with Assembly, FORTRAN and C languages, BS or MS in CS or related, knowledge of interrupt driven multiprocessing system and high-speed graphics. Experience in a detailed system internals level is preferred, as is FPS array processors, Adage, IMI and Megatek graphics, and Intel microprocessors.

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Provide software programming support for real-time pilot-in-the-loop simulations of avionics and flight control systems. Will design, program, validate, maintain, operate and document aircraft and aircraft systems programs. Requires at least 5 years of experience in scientific programming, BS or MS in CS or EE, and FORTRAN 77 and/or assembly programming. Experience with Harris, Intel, IMI or Megatek computers desirable.

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In addition to the above, all applicants must have experience in Integrated Database Management System (IDMS) or other CODASYL-style database management system such as IDS/II, DMS/1100, DBMS/10, EDMS.

Applicants must file a separate application for each grade level for which they wish to be considered.

Application forms (SF 171, Personal Qualifications Statement) are available at the Federal Job Information Center nearest you. These centers are listed in your local telephone directory under U. S. Government, Office of Personnel Management. Completed applications must be received at the following address no later than June 19, 1985.

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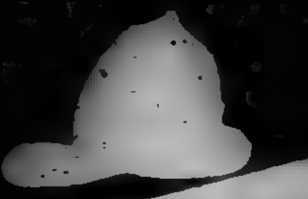

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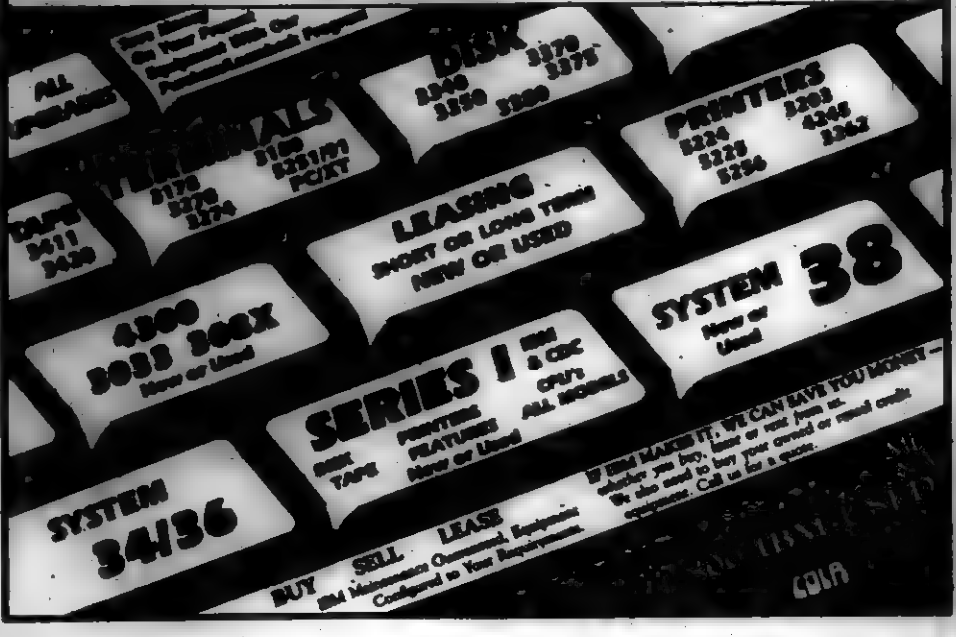
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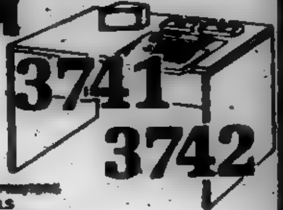
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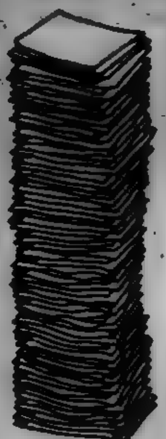

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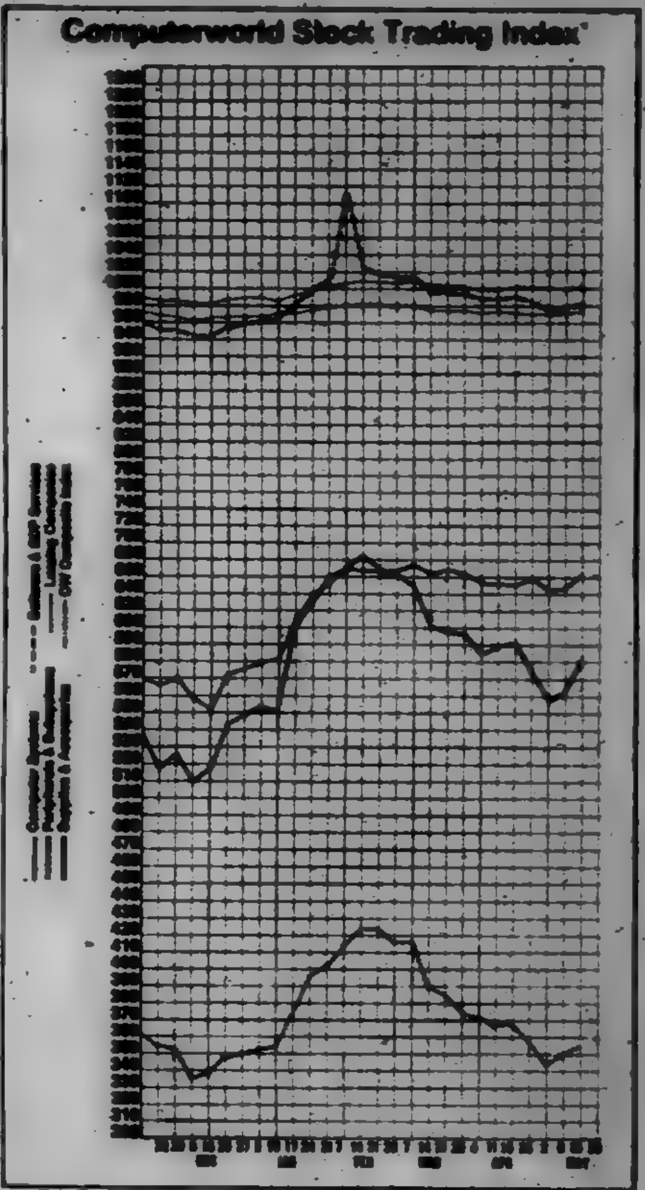

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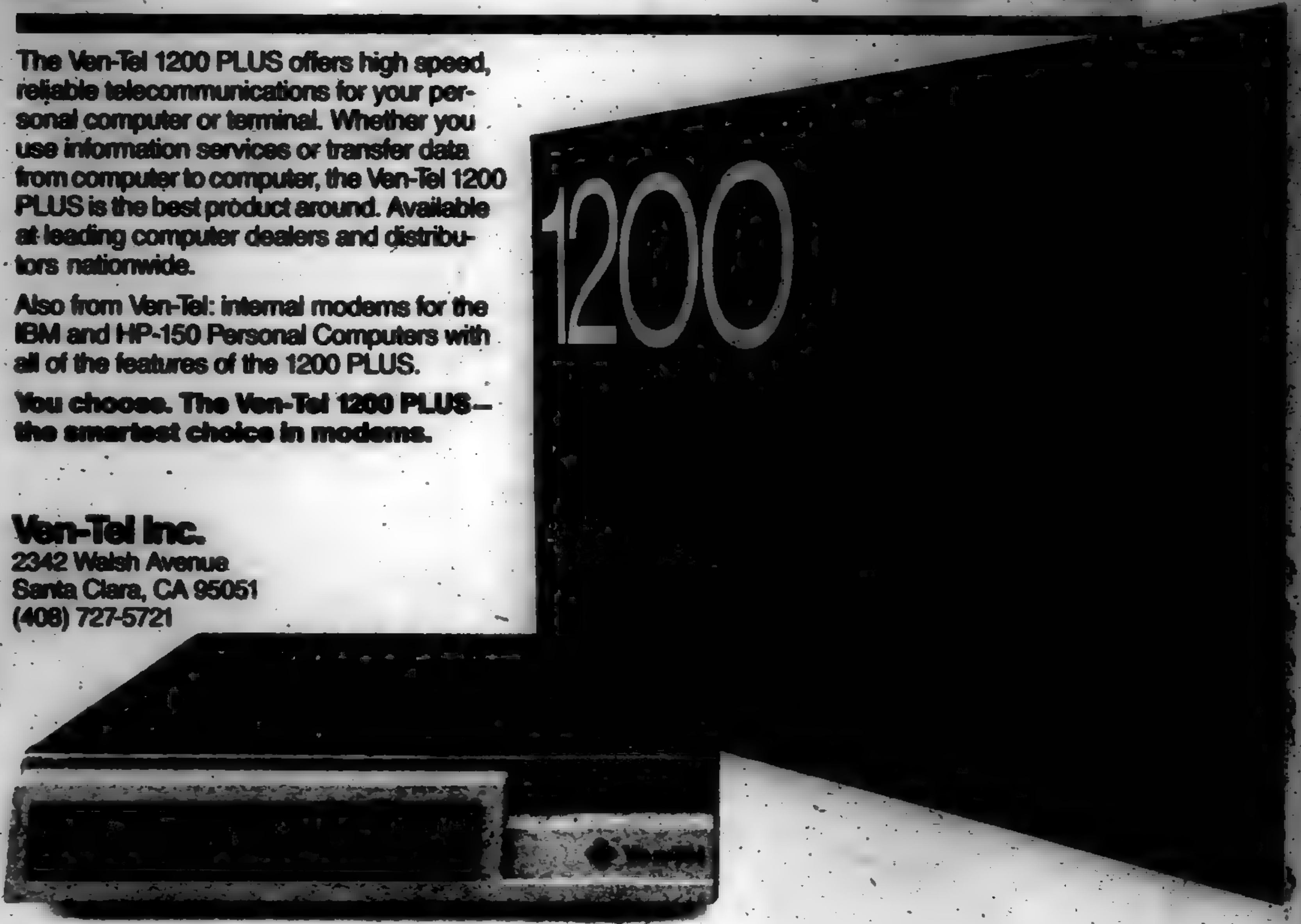

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AT&T suit: Jury mulls MCI award

CHICAGO — A federal jury deliberating on the MCI Communications Corp. vs. AT&T antitrust trial at press time last week began wrestling with complicated technological and financial issues that will have to be resolved in assessing exactly what damages MCI incurred,

An appeals court last year threw out a $1.8 billion judgment against AT&T but upheld the antitrust findings that precipitated the judgment, remanding the case to the lower court for retrial on the damages question.

MCI is now seeking $5.8 billion in damages from AT&T, an amount that could be trebled under antitrust law for a total of nearly $18 billion. An AT&T spokesman said the company, which has asked the jury to consider damages in the $7 million to $35 million range, would appeal any "large" judgment.

AT&T will shoulder about one-third of any damages, with six of its regional holding companies liable for the remainder.

The case stemmed from MCI's allegation that, before divestiture, AT&T willfully denied MCI the local loop connections that it needed to complete its long-distance calls. Specifically, MCI has charged that the failure to obtain local loops effectively caused it to delay introducing its Execunet business offering, resulting in the loss of $5.8 billion in potential profits.

MCI recently settled with one of the seven regional holding companies, U.S. West, and had reportedly been seeking similar out-of-court arrangements with the other six. The settlement reached with U.S. West involved both cash and other considerations, including participation in the planning of switch-overs to equal access in U.S. West's exchanges.

IBM net gets nods, yawns

PC Network scores high on speed of installation

By Eric Bender
CW Staff

IBM's PC Network is a solid microcomputer local-area network offering acceptable performance, reasonable polish and the great advantage of the Big Blue logo, most early users say.

Others, however, show little enthusiasm for the product.

One corporate tester, a senior computer engineer at a Fortune 50 company, said PC Network "is quite easy to install; it took no more than an hour per workstation."

He described the network's overall performance as comparable to mid-range products from other vendors. He also gave good marks to the user interface, "which has a nice set of menus, and you can hot-key in and out." The command language is also well designed, he said.

"I can't believe how good the product is," said Joe King, another early user and president of Legal Systems Software, Inc. in New

See REVIEWS page 6

Harris rolls out high-end supermini

By Donna Raimondi
CW Staff

MELBOURNE, Fla. — Harris Corp. next week will unwrap the high end to its superminicomputer line that appears to be the firm's answer to Digital Equipment Corp.'s VAX 8600 system.

The H1200 is an emitter-coupled logic-based system designed around an 80M byte/sec., 100K-bit ECL bus structure that is said to offer 55% higher system throughput than the previous top-of-the-line H1000, the vendor said.

The system offers up to 288K bytes of bulk cache memory — in 96K-byte increments — with 105-nsec cycle time in addition to the standard 6K-byte primary cache with 75-nsec cycle time.

Three types of Harris' integrated memory subsystems can be intermixed in a single system to provide up to 12M bytes of main memory. Parity error checking on a word-boundary basis is available on the Static-IMS, the

See HARRIS page 6

TRENDS & DIRECTIONS

SNA upgrade: The ultimate link?

By John Gallant
CW Staff

The ability to link diverse applications running on anything from a personal computer to a top-of-the-line mainframe is a high-tech Holy Grail that has eluded the grasp of most users.

But a strategic IBM enhancement to its Systems Network Architecture may hold the key to that kind of processor-independent, application-to-application communication. When fully implemented, analysts and IBM said, the 1982 SNA protocol — dubbed Logical Unit Type 6.2 or Advanced Program-to-Program Communication — will transcend the traditional SNA master/slave relationship between linked devices and allow mainframes, minicomputers, micros and other processors to communicate on a peer-to-peer basis through software.

LU6.2 has been touted as IBM's answer to intelligent micro-mainframe linkage. But there is growing recognition that the SNA enhancement will have significance far beyond that realm and may even usher in the era of distributed processing.

"The micro-mainframe link aspect is just a subset of the overall importance of LU6.2," said Thomas O'Flaherty, a princi-

See PROTOCOL page 8

TOP OF THE NEWS

Come out with your tapes up. Armed with a warrant, Texas agents raided offices of alleged trade secrets pirates, seizing software and documents as evidence. Page 2.

■

Is cheaper better? AT&T's cabling scheme can cost half that of IBM's, but this might not sell users. Page 4.

■

Prime attraction was Unix. A beta user of Prime's Unix implementation likes Primix's versatility. Page 5.

■

Natural fit. Software AG announced a version of its micro-mainframe link that is compatible with Ashton-Tate's Dbase III and Framework. Page 11.

■

Metropolitan Life is supporting AI programming in its underwriting and risk assessment functions. Page 12.

■

Two amateur computer scientists have built a 16-node, 256-Mflops parallel processor they claim cost them less than $100,000. Page 71.

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Vrrrooooom

Computer-aided design and manufacturing came to the Indy 500 yesterday as part of the Penske racing team's 200+ mph drive for the checkered flag. Story page 14.

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Software seized in trade secrets case

Employee tip prompts police raid on Texas firm's offices

By John Desmond
CW Staff

DALLAS — Texas state investigators have seized software and documents from the offices of Voice Control Systems, Inc. here as part of an investigation into the possible theft of speech recognition trade secrets from Texas Instruments, Inc.

State investigators and TI employees raided Voice Control's offices and seized 107 items, including the software, according to Richard Zadina, chief of the Dallas County district attorney's specialized crime division.

Based on information from a Voice Control employee, the district attorney's office obtained a search warrant that specified "all digital storage media . . . including magnetic tapes, removable disks and fixed disks" could be seized as evidence, Zadina said.

TI last week filed a civil suit against Voice Control alleging that two former TI employees stole company trade secrets on speech recognition and speech processing technology. In response to the TI suit, a Texas judge issued a temporary restraining order barring Voice Control and former TI employees Robert G. Leonard and Thomas B. Schalk from continuing to use the alleged secrets.

The judge also ordered Voice Control not to dispose of any allegedly stolen secrets and any profits realized from using them and scheduled a May 29 hearing on TI's request for a temporary injunction.

Relevant evidence

Zadina said that while the seizure of software as evidence was unusual, he believes "any item of evidence that has relevance to the issues at hand will be admissible. You can't go to work for a company like TI, get access to proprietary information, dump it all on a magnetic tape and then leave. We have laws against that in Texas."

Texas law categorizes theft of trade secrets as a third-degree felony, punishable by two to 10 years in state prison and fines up to $5,000. Zadina said Texas law does not specifically mention software but does say the theft of any "article representing a trade secret or communicating a trade secret . . . including any object, material and device" is illegal.

Zadina said he would rely on outside experts to determine if the software and seized documents contain sufficient evidence to present to a grand jury.

Apple to close disk plant; lays off 80

By Kathleen Sullivan
CW West Coast Bureau

SAN JOSE, Calif. — Apple Computer, Inc. last week announced plans to close its hard disk drive manufacturing plant here. As a result, 80 workers were laid off.

Most of the employees produced disk drives for the Lisa computer, a system that Apple dropped from its product line last month. The facility here was also the center of research activity for two Apple Macintosh Office projects — a 20M-byte hard disk drive and a file server.

What has not been officially announced is that the deadline for shipping the file server, a key element of Apple's office systems product line, has been pushed back several months to the end of this year.

Instead of developing those products itself, Apple is relying on outside vendors, said spokeswoman Barbara Krause. Although she declined to identify the companies involved, Krause said contract negotiations are already under way.

A small group of engineers were transferred from the plant here to the Macintosh division, where they will continue research on hard disk drives, Krause said.

She declined to comment on whether Apple plans additional layoffs.

NEWS SUMMARY

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Random access

IBM will unveil its first token-ring, local-area network products by late summer or mid-fall, according to numerous sources. To that end, Texas Instruments is reportedly conducting trial production runs of very large-scale integration token-ring interface chips. TI development work is being spurred, sources said, by the fact that, after having contracted with TI for these interfaces in 1982, IBM has given similar responsibilities to chip maker Intel, which IBM partially owns.

■

The popular Focus fourth-generation language will become available for the first time in the minicomputer environment when Information Builders unveils a DEC VAX/VMS version of the language at the Dexpo conference in New Orleans on Tuesday. Focus is currently available for IBM mainframes and Personal Computers.

■

SAS Institute in Cary, N.C., has indicated that it intends to rewrite its entire line of mainframe and minicomputer software in the C language. SAS products include a base statistical system and graphics and other applications packages. The company's recently released microcomputer software was developed in C, and the decision to rewrite the large systems software was made, officials said, to improve the maintainability and portability of the packages. The revision process is under way and is expected to continue throughout this year and next.

■

Kurzweil Applied Intelligence of Waltham, Mass., will unveil a 1,000-word speech recognition system for the IBM Personal Computer line, according to a company source. The self-contained unit, KVS-300, will translate user-defined words into Ascii character strings. The Ascii characters can then be transmitted through an RS-232 port to a microcomputer and will be accepted as though they were keyboard entries. The speech recognition package will be available in September for $6,500.

■

In June, Intel's Integrated Systems Operation, based in Phoenix, will announce Opennet Express, a networking package that will offer one-stop shopping to corporate systems integrators, according to an Intel marketing manager. Opennet Express will include Intel's 80286-based 310 microcomputer running Xenix or RMX (the firm's real-time operating system); Xenix or RMX networking software; an Opennet (Ethernet) controller board; an Ungermann-Bass network controller board; and Microsoft's MS-Net. The package, which will also include installation, orientation and service from Intel, will be priced under $20,000, the source said.

■

Look for a June 3 announcement of an eight- to 16-user Intel 80286-based supermicro from Altos, according to a senior marketing official at Altos.

■

DBMS, a software and services company specializing in products for users of Cullinet Software's IDMS, will introduce an IDMS-like data base system for the IBM Personal Computer, Personal Computer XT, AT and compatibles running PC-DOS or Microsoft's MS-DOS, a spokesman said. The Developer Workstation will be compatible with IDMS and can support development and operation of batch and on-line applications on the micro. The product will cost $4,995. During the year, DBMS will also announce versions of its Developer Tool Kit and Release 5.0 of its DBA Tool Kit for IDMS users.

SUSPENSE

How did IBM's rookie sort (Rel 7.0) do in its first meeting with "Lefty" SyncSort? Read all about it!

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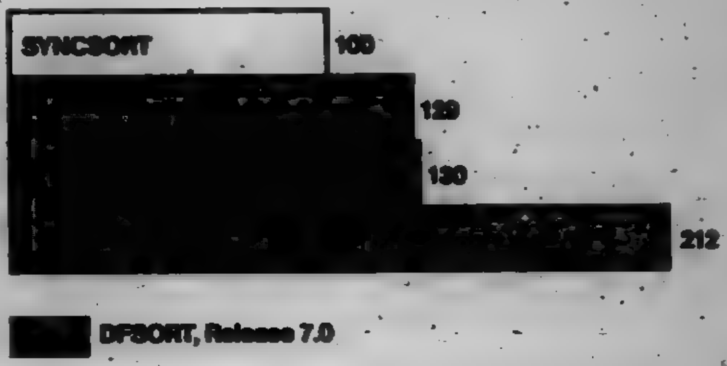
There is no joy in Armonk! DFSORT7 struck out every time it came to bat against the latest release of SyncSort (Release 2.SE) in a recent series of MVS benchmark tests. (In sorting, as in most other forms of human endeavor, it's a long way from *baby* to *Babe*.)

The bar charts below tell the story more eloquently than we can:



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AT&T's cabling costs half of IBM's, but a hard sell

By John Dix
CW Staff

AT&T's answer to IBM's Cabling System can cost half as much as the mainframe maker's building wiring scheme, but cost alone may not sell users.

Earlier this month at the International Communications Conference in Dallas, AT&T Information Systems formally introduced its Premises Distribution System (PDS). Like IBM's Cabling System, PDS specifies the type of wire used to cable a building to provide voice and data outlets in all offices.

Both systems are styled after traditional telephone wiring schemes and, as such, are designed to make installing and moving computer peripheral equipment as easy as rearranging telephones.

The schemes are similar in that both divide a building into horizontal and vertical cable runs. Cable that contains separate wire for voice and data is run in a star configuration from central wire closets on each building floor to every office on that floor. These closets are then wired together and to equipment rooms through vertical risers.

The key difference between the two systems is the type of cable used. The primary type of cable specified in IBM's Cabling System contains four voice-grade, twisted-pair wires and two independently shielded data-grade twisted-pair wires. AT&T's PDS cable contains four twisted-pair wires, but it must be supplemented with fiber-optic cables in the risers to offer data support similar to IBM's system.

Differences in cable contribute to the disparity in prices. "There is a significant price difference between systems," according to Dixon Doll, chairman of DMW Group, Inc., a consultancy in Ann Arbor, Mich. "In most situations, AT&T's PDS is going to cost 50% less than a comparable Cabling System configuration."

The largest difference in price would be realized where existing telephone wiring can be used with AT&T's PDS, added Harvey Freeman, vice-president of engineering with Architecture Technology Corp., a consulting and publishing company in Minneapolis that specializes in communications.

But not all twisted-pair wire will fit the bill. According to Fred Weber, technical supervisor of PDS systems engineering for AT&T, the system requires high-quality wire. A user's existing facility would have to be examined to see if it could be used. AT&T is, however, one of the few private branch exchange (PBX) manufacturers that installs four-pair wire with new switches.

The cost of the actual cable is "noise compared [with] the total cost of putting in a wiring system," according to Brian Jeffery, director of research for International Technology Group, Inc., a research and consulting firm in Palo Alto, Calif. In that regard, the decision to go with one system rather than the other will depend on the "customers' requirements and their environments," Doll said.

"If I was a deeply loyal IBM customer with a brand new building and I was going to put in a PBX [from IBM subsidiary, Rolm Corp.,] and was not concerned about squeezing every last dollar out of the cost, I would probably lean in favor of IBM," Doll said. "If, on the other hand, I was going to be using an AT&T PBX and I was a little more cost conscious, then I might look at AT&T's PDS."

One unknown is where and how the IBM token-ring network will be supported.

Today, the Cabling System is sold on the basis that "it's cheaper and easier than using the IBM 3270 point-to-point [coaxial cable]," Jeffery noted. AT&T can also sell into IBM environments making that same claim. But IBM has promised that its forthcoming token-ring local network will be built on top of the Cabling System, a promise that will hold sway with the large base of IBM users.

Consultants agree that AT&T will probably do what is needed to make PDS compatible with IBM's promised network. AT&T's Weber said, "We'll take a very hard look at what type of capability we need to install in PDS to be able to support the token ring."

Regardless of compatibility and cost, some users will stick with IBM to support IBM equipment. "I know of a couple of major IBM accounts that said they would put the Cabling System in no matter what happens," Doll said. "If you're a big IBM customer worrying about long-term strategies for network management, you would probably feel more comfortable doing problem resolution and troubleshooting knowing you have a Cabling System."

Asked which system he would recommend to clients, Architecture Technology's Freeman said, "Maybe the AT&T system. The price of the IBM Cabling System is too high right now for that particular cable."

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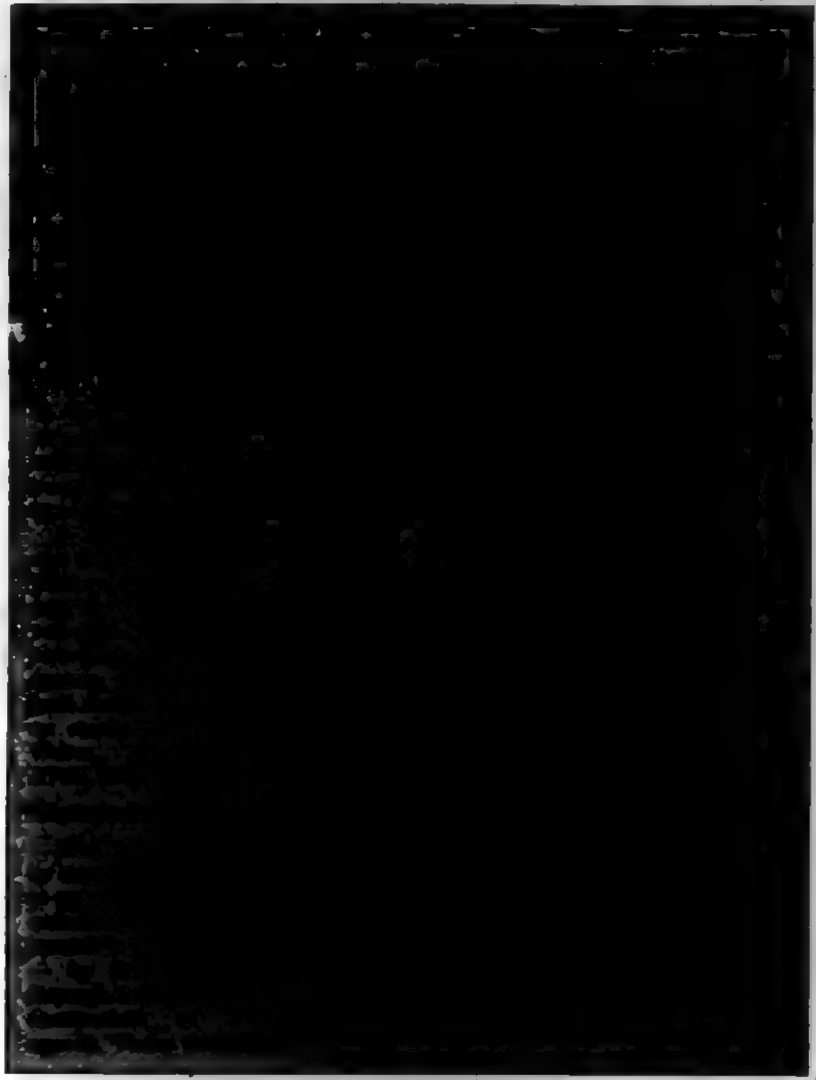

DPMA, ACM to cosponsor meet

CHICAGO — The Data Processing Management Association (DPMA) and the Association for Computing Machinery (ACM) are cosponsoring an international conference titled "Management and Information Technologies" at the Expo Center here from April 2-4.

The conference will focus on methods of bridging the gap between management and technology. Issues to be addressed include managing technology, the technology of management, technology transfer and managing the technologist.

The conference chairman is Gordon B. Davis, a Honeywell [Inc.] professor of management information systems at the School of Management, University of Minnesota. The program chairman is Martin L. Bariff, associate professor of information resources management at the Stuart School of Business, Illinois Institute of Technology, Chicago.

The conference registration fee is $110 for DPMA or ACM members; the fee for nonmembers is $130.

Information is available from either Doris Dodge, Conference Manager, DPMA, 505 Busse Highway, Park Ridge, Ill. 60068; or Roberta Bukar, Conference Coordinator, ACM, 11 West 42nd St., New York, N.Y. 10036.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

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Beta user gives thumbs up to Prime's version of Unix

FIRST USER

By John Desmond
CW Staff

FOXBORO, Mass. — A beta user of Prime Computer, Inc.'s Primix was attracted to the operating system out of a need to accommodate AT&T Unix users.

Primix is Prime's implementation of AT&T's Unix System V that runs co-resident with Prime's Primos operating system [CW, May 20].

At Foxboro Co. here, a manufacturer of industrial control systems, Unix users had been using a Digital Equipment Corp. VAX-11/750, but that machine was recently reassigned to run a computer-aided design and manufacturing application under DEC's VMS. The company's Unix users, who do general problem solving in scientific and engineering applications, had no place to go once they lost their VAX, according to William Kaphaem, manager of technical systems software and operations at Foxboro.

A Prime user since 1978, Foxboro now has a Prime 750 mini that accommodates 35 to 40 users at a time. The firm also has six DEC VAX machines for scientific and engineering applications and an IBM 4381 mainframe for commercial applications.

'The versatility we need'

Kaphaem, who is responsible for running Foxboro's technology division computer systems, said the co-residency feature of Primix "gives us the versatility we need." By agreeing to begin testing Primix in mid-April, Kaphaem was able to bring his Prime users up on Unix more quickly and with full support from the vendor. He said a close relationship grew between Foxboro and Prime during testing. "When there was a problem, they were right on it," he said.

Because the firm's Unix users had been working with the University of California at Berkeley Version 4.1, bringing them up on Primix was not difficult, Kaphaem said. "Some commands are different from Berkeley 4.1, but they're close enough so users didn't have too much trouble switching over. They just logged on and started doing their thing," he said.

Documentation was good and not as obscure as the Berkeley documentation, he said. "With Berkeley, you're constantly flipping forward and back trying to find a specific thing. Prime has written it so you can understand it," he said.

Security is maintained by allowing users to log on only to Primos, which Kaphaem said the company has made secure. To switch from Primos to Primix, users just type in "Primix" and then push the Execute key without having to log off and log on again. File transfer from the Prime to the IBM system is done with an RJE link via IBM's Hasp. Kaphaem has not done a file transfer using Primix yet but said he expects no problems.

The layering of Primix onto Primos did cause a 10% slowdown in response time on Foxboro's system. "But I have a very heavily loaded system," Kaphaem said. "If I had logged five more users [onto] Primos, I probably would have had the same slowdown." One morning Kaphaem had a 2-second response time with 31 users on his Prime system. With 46 or 47 users, response time is usually 4 seconds, he said. By year's end, he hopes to improve response time by buying a Prime 9955, the vendor's biggest machine.

The co-residency of Primos and Primix "gives me the best of both worlds," Kaphaem said. The fact that he cannot run Primix in native mode as DEC users can do with Ultrix is no disadvantage for Foxboro, he noted. "I don't believe there is a best way for all users. In some applications, you'll want to run just one operating system. For a general-purpose, problem-solving machine, it's great having both of those machines. There are things you can do in Primos you can't do any other way. And there are things you can do in Unix you can't do in other ways."

The performance of Primix has convinced Kaphaem to buy the operating system once the testing period is over. He said the price of $15,000 for a 32-user version is reasonable. A major advantage of getting a Unix implementation from Prime over using Berkeley 4.1 is support, he said. Berkeley charges only a nominal price for the media and the cost to produce it, but it offers no support for its version.

"You get what you pay for," Kaphaem said. "I have a systems programmer who is well skilled in Unix, but there are intricacies of the operating system that he might not be expected to know. With Prime being the supplier, we can get the vendor right here. I'm looking forward to that."

From his experience with Primix, Kaphaem could cite no weaknesses of the product. He noted that Prime has tried Unix implementations before, and Foxboro had even tested one. "It was very crude at that point in time," he said, and no product came to fruition from the test.

Kaphaem praised Prime's service and support. "They're like Maytag repairmen; we don't see them that often," he said.

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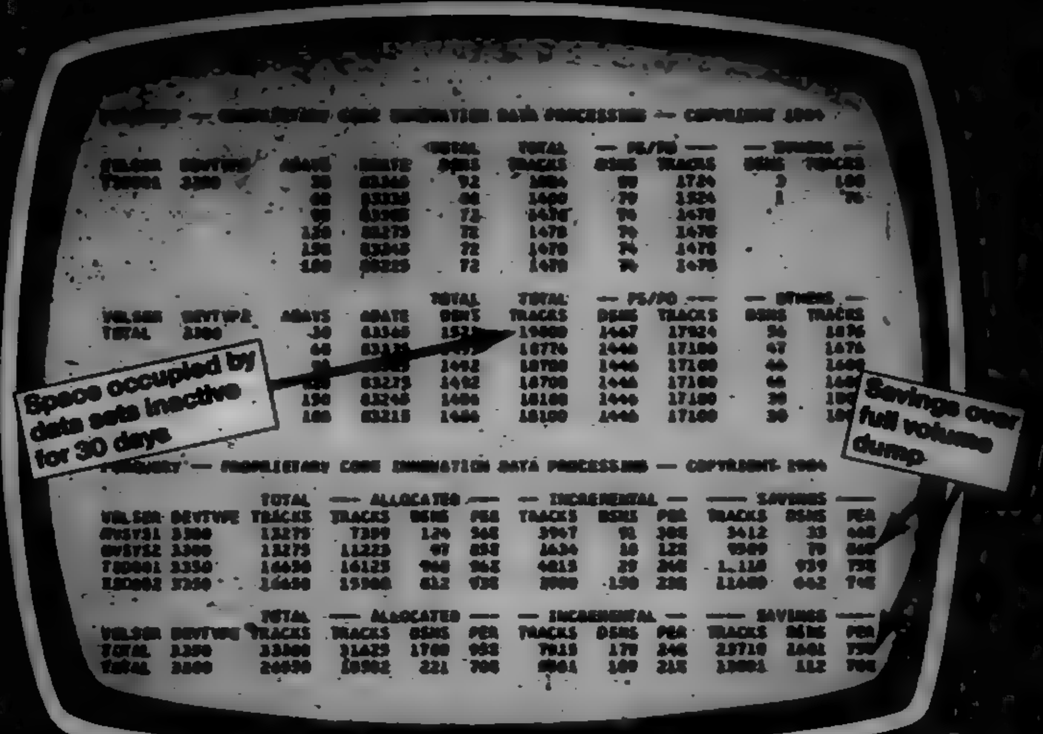
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HARRIS

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fastest of the IMS memories, consisting of 16K-byte static random-access memory (RAM) Nmos chips. Up to 3M bytes of Static-IMS can be included in the H1200 memory.

The ECL-IMS uses 256K-byte dynamic RAM chips, and up to 12M bytes of this memory can be configured on the H1200. IMS-II — also available on all other Harris H series computer systems — is the third type of main memory available on the H1200. This subsystem, which also uses 256K-byte dynamic RAM chips, has 525-nsec cycle time and is resident on the 19M-byte I/O bus.

The Model H1200-1 includes 1.5M bytes of ECL-IMS main memory that resides on the 80M byte/sec. ECL bus and features 270-nsec cycle time. It also has a standard 96K-byte bulk cache memory. According to the vendor, the basic cost for this machine is $294,000.

The H1200-5 includes a 1.5M-byte Static-IMS memory and is said to be fit for real-time environments where time constraints are critical. Prices start at $326,000 for this model.

The Communications Network Processor (CNP) is said optionally to support asynchronous, synchronous, isochronous, X.25, IEEE 488 and Ethernet protocols simultaneously, with boards for these protocols ranging in price from $500 for asynchronous to $2,500 for IEEE 488. The basic systems include a CNP with one pair of asynchronous boards, the vendor said.

More information is available from Harris, Computer Systems Division, 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

CW Chart

System	Harris 60	Harris [illegible]	Harris 700	Harris [illegible]	Harris 1000	Harris 1200
Mips[1]	.75	.75	.89	1.1-1.6	4.9	5
Purchase Price[2] (Memory Size)	$69,900[3] (768K)	$38,900 (768K)	$49,900 (384K)	$139,000 (768K)	$250,000 (1.5M)	$294,000 (1.5M)
Machine Cycle Time (Nsec)	300	300	300	180	75	75
Cache (Buffer) Size	8K[4]	8K[4]	8K[4]	8K[5]	8K	256K
Price per 1M byte of main memory[2]	$10,000	$10,000	$10,000	10,000	$10,000	$8,000

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REVIEWS

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York, which has installed the network both internally and at customer sites. "I had it working in one day." In a three-station network with an IBM Personal Computer AT acting as a server, accessing network storage appeared as quick as accessing a local Personal Computer XT drive, King said.

But another user, a systems analyst with a Big Eight accounting firm, said that PC Network "does the job, but I don't think much of it. It's definitely not as good as those networks offered by [3Com Corp. or Novell, Inc.]" Performance degrades very quickly as users are added, limiting the network to small work groups, the analyst maintained.

As another limitation, PC Network's method of naming network drives raises problems with current applications packages, he said.

Setting up a multiple-server configuration also is difficult, he remarked. When booted, the two servers are likely to "sit and poll each other and beep their error messages — it almost sounds like a Pong [video] game."

Further issues arise in error-handling, the analyst commented. "There are 850 error messages that can be received, which really makes you worry, and a lot of them can't be received until you're out of the application." This sets up situations in which work can be lost without the user being aware of it, he claimed.

Other users pointed out that applications tailored specifically for the IBM network, which are just beginning to appear, will address many of these concerns.

While views differed on the ease of installing the net's fixed-length broadband cable, there was a consensus that the installation software program was easy to follow.

However, all of the users contacted by *Computerworld* had modified IBM's suggested installation procedures at least slightly. The way subdirectories were set up on the network disk, for example, did not work with some programs, such as Micropro International Corp.'s Wordstar, King said.

While King had no difficulties solving that problem, several other users complained that the setup procedures lacked sufficient flexibility and documentation.

Pricing for PC Network appeared moderate, users said. Electronic mail headed their list of suggested network enhancements.

Users noted that the PC Network does not support all IBM microcomputer products, with one person voicing a wish to hook up the Personal Computer AT/370. Problems also may arise with IBM-compatible systems. In the case of Compaq Computer Corp., systems shipped before May must be refitted with a read-only memory Bios to work on the PC Network, a Compaq official acknowledged.

> ”
>
> *All of the users contacted had modified IBM's suggested installation procedures at least slightly.*

While many continue to question whether IBM's upcoming token-ring network will supersede the PC Network, one common industry opinion was summed up by Henry Seelbinder, director of communications and networking at Morris Decision Systems, Inc. in New York.

"The basic functionality is there," Seelbinder said. "A lot of people will buy it because it's a reasonable product and it's by IBM."

Customer-installable versions of the PC Network, a broadband carrier-sense multiple access with collision detection network operating at 2M bit/sec., can support up to 72 users. A network adapter card costs $695, a network translator unit is priced at $595 and the network operating software sells for $75.

IBM announced the PC Network last August and shipped the hardware in October. Deliveries of the network software began in March, with a 3270 gateway software package available in April for $375, according to IBM.

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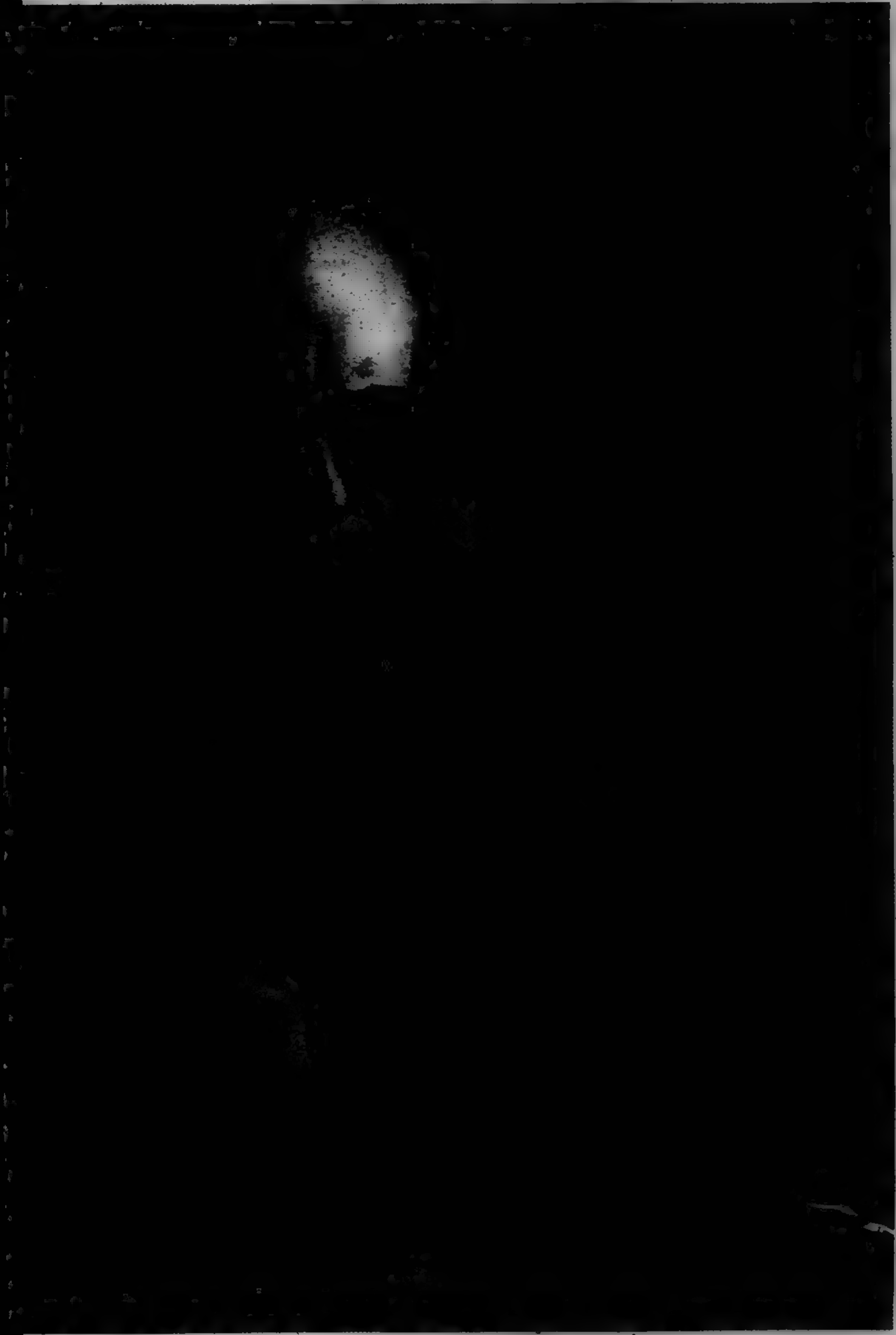

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IBM open with LU6.2 specs

The consensus among software developers and analysts is that IBM has been open about providing the technical specifications for Logical Unit Type 6.2 (LU6.2) and has made it clear that LU6.2 compatibility is a strategic direction for Big Blue.

"IBM has been very good about releasing LU6.2 specifications," said John Doherty, vice-president of marketing and sales for Malvern, Pa.-based Rabbit Software Corp., a vendor of Systems Network Architecture software. "It just has not made public the full plan of how it intends to implement LU6.2 across its products. IBM has said it is going to make a heavy commitment to LU6.2, and if you want to participate in this market, you [had] better listen."

While IBM has been open about LU6.2 specifications, it has also been somewhat circumspect in order to protect its technological edge, noted John King, executive director of San Jose, Calif.-based James Martin Associates. "IBM wants LU6.2 to be an industry standard, so it publishes enough to get others started," he said. "But IBM publishes information based on a schedule [that is] based on the release of its own products."

Even though IBM has made public much of the information regarding LU6.2, adapting to the changing environment it is likely to bring about will not be easy for independent software vendors.

"LU6.2 is going to make for a challenging period ahead," said Thomas O'Flaherty, a principal with the Wood-Ridge, N.J.-based consulting firm Information Service Strategies. "The small vendors especially will have to work very hard to keep up."

— John Gallant

PROTOCOL

from page 1

pal with the Wood-Ridge, N.J.-based consulting firm of Information Service Strategies. "With LU6.2, any two programs on any two machines can be linked together. It is probably one of the biggest opportunities to come around in years."

According to an IBM spokesman, LU6.2 "is, within SNA, a type of session between two application programs in a distributed processing environment using an SNA character string or a structured field data string." What that means is that LU6.2 is a standard set of definitions or rules for data sharing between applications running in a communications network. Fully implemented, it bestows on each program, regardless of its host, an equal status for sending or requesting data.

"What we tried to achieve was to allow programs to communicate on a peer-to-peer basis," said Dr. Robert Sundstrom, manager of communications systems architecture within IBM's SNA Group in Raleigh, Va. "The form of communications we are addressing in LU6.2 is program-to-program rather than just program-to-device. We think LU6.2 will become very pervasive over time, and we think it will be widely implemented outside IBM.

"LU6.2 definitely has the potential to revolutionize micro-mainframe communications," he added.

John King, executive director of James Martin Associates in Carmel, Calif., explained how LU6.2 facilitates peer-to-peer communications: "A micro package supporting LU6.2 will be able to communicate on a peer basis with another application that supports the same protocol on another machine. It can do that without worrying whether the other machine is a mainframe, a departmental machine or a micro.

"In the past, the only way to facilitate such data transfer was to have a program in the mainframe supervising it because all the machines below it in the IBM architecture were secondary," King noted. "With LU6.2, you will not have to have a mainframe constantly polling all these devices to see if they have a request to send or receive data."

That will represent a dramatic improvement over current micro-mainframe links, many of which are based on terminal emulation — the transformation of an intelligent micro into what appears to be a dumb terminal. According to John Doherty, vice-president of marketing and sales for Rabbit Software Corp., an SNA software vendor in Malvern, Pa., "LU6.2 will take the handcuffs of having to look like another machine off the micro. It will allow you to run an application locally on the micro and use the massive data base of the mainframe as if the mainframe was a peripheral."

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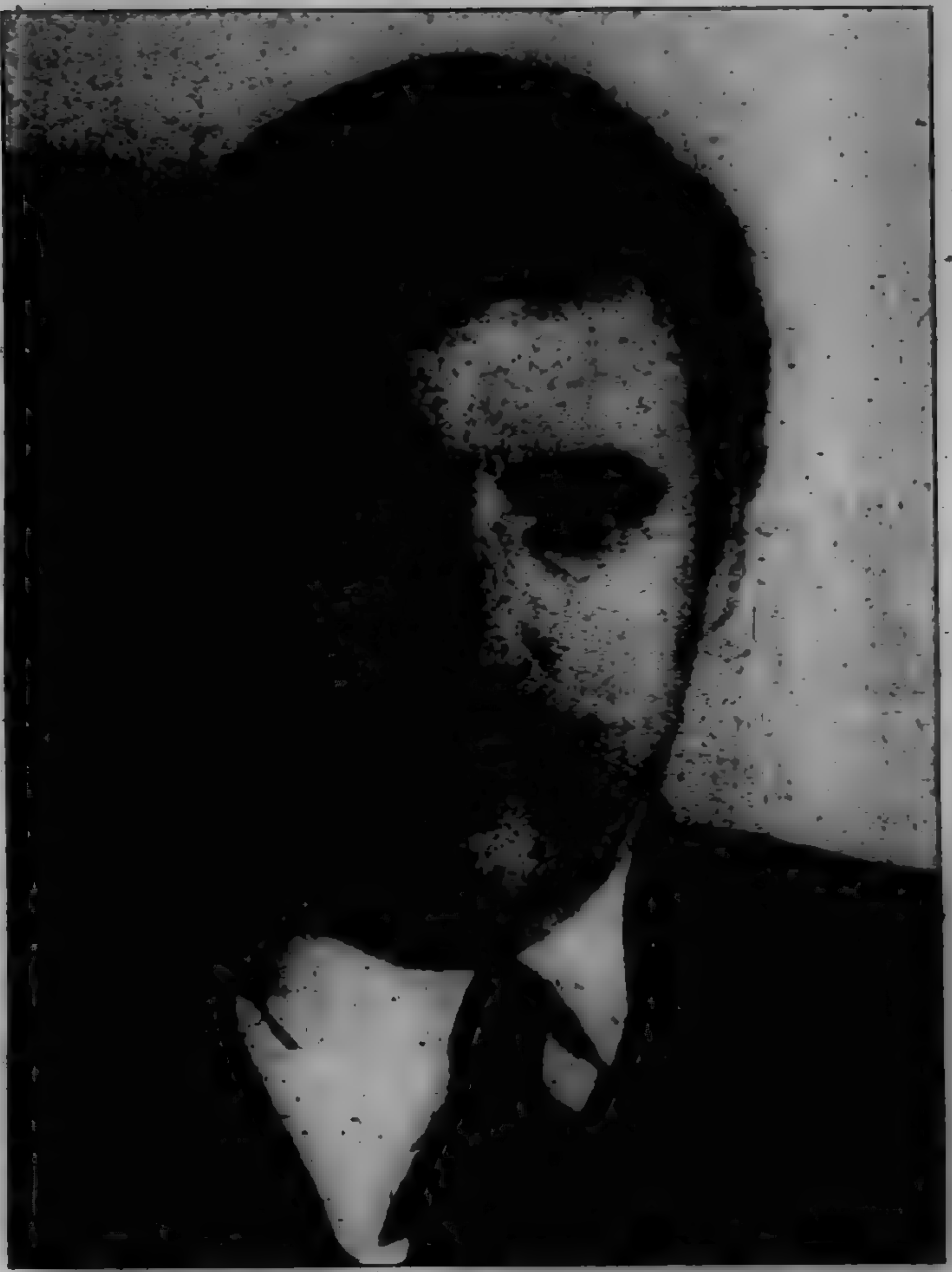
JOHN CULLINANE

On the Information Center Strategy



Today, virtually every IBM mainframe user is attempting to implement an information center. Formulating a successful information system strategy for the 80's and 90's requires it.

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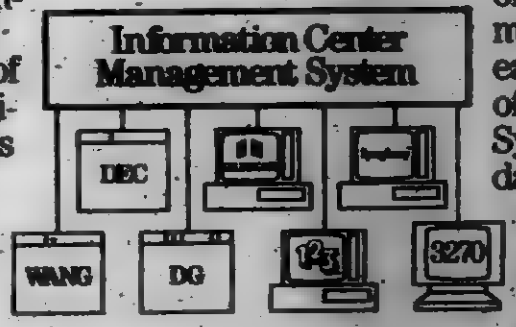
> **"Open system architecture is key in implementing an information center strategy."**

It also makes particular sense for a software company like Cullinet to adopt a policy of open system architecture that allows corporations to standardize on Cullinet's products without losing a significant investment in other vendors' products—whether they are mainframe applications, microcomputer software such as Lotus 1-2-3, Symphony and other PC products or departmental minis from companies like Digital, Data General, Wang, Hewlett-Packard and others.



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For more information about the Information Center Management System and the full range of Cullinet products, I encourage you to phone, toll-free, 1-800-225-9930. In Massachusetts, the number is 617-329-7700.

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Software AG announces Dbase III-compatible link

By John Desmond
CW Staff

NASHVILLE — Software AG has announced a new version of its Natural/Connection micro-mainframe link compatible with Ashton-Tate's Dbase III data base management system (DBMS) and Framework multifunction productivity programs.

The two firms also announced their intention to jointly develop and market software, joining a growing list of systems software houses and micro software vendors that have reached agreements in order to exploit the end-user computing market.

The announcements came at Software Jamboree, the 14th International Software AG Users' Conference, attended by approximately 1,200 users at the Opryland Hotel here last week.

Version 2 of Natural/Connection runs on the IBM Personal Computer family and is scheduled for August availability.

Ben Posner, executive vice-president of Ashton-Tate, said at the announcement, "We can't continue to depend on hit products. There is only so much space on retail shelves."

Stuart Miller, president and chief executive officer of Software AG, said, "We want to draw closer to packages in the micro world which have high marks."

The linking of Software AG's Natural/Connection to the Ashton-Tate software is said to allow use of data in micro or mainframe applications without an intermediate data base.

Security option

Security features of Version 2 include an option to encrypt mainframe data stored on the micro and a personal computer audit trail of every instance of data downloading and uploading.

Version 2 has a function that automatically formats downloaded data for use with Framework and Dbase III. Data can be manipulated or entered on the micro and formatted for uploading to the host. The uploaded data can be used to update or add to the mainframe data base, under the control of Natural/Connection and Adabas security. Adabas is Software AG's relational DBMS.

Users reportedly are able to move transparently between the micro and mainframe environments.

Version 2 allows users to download mainframe data from micro menus, and it allows users to customize the menus and applications to be invoked. Version 2 users can also suspend and reactivate local applications and invoke commonly used IBM PC-DOS functions and utilities from Natural/Connection.

Version 2 also allows certain tasks to be scheduled for processing automatically during off-peak times, and a documented applications interface allows users to develop local software to drive Natural/Connection functions. The transmission of binary and object data is supported by Version 2, in addition to Ascii and Ebcdic numeric and character data.

Version 2 is supported on the IBM Personal Computer XT, XT/370, AT, 3270 Personal Computer and any microcomputer operationally compatible with the IBM Personal Computer, the vendor said. The product is supported by PC-DOS and Microsoft Corp.'s MS-DOS environments and requires the Software AG mainframe software programs Natural and Adabas or Natural/Vsam for all operating systems that support Natural.

Asynchronous communications support for Version 2 requires the installation of an asynchronous communications hardware board, available from IBM, on the Personal Computer. Speeds of up to 9.6K bit/sec. are supported.

Communication over a dial-up telephone line requires a modem or a Personal Computer hardware board that combines an asynchronous communications port and a modem. Synchronous communications support via coaxial cable requires the installation of Digital Communications Associates, Inc.'s Irma board or another 3278/9 emulator board into the Personal Computer.

Natural/Connection Version 2, as an extension to Adabas and Natural, costs $15,000 to $25,000 for the mainframe software and $250 to $1,000 per Personal Computer diskette.

Software AG is located at 11800 Sunrise Valley Drive, Reston, Va. 22091.

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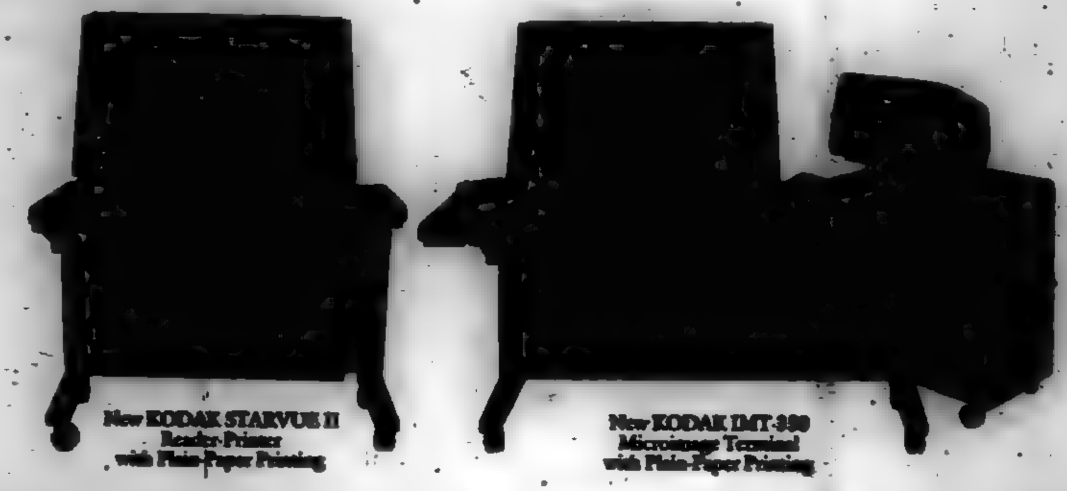

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Consultant directory out

WOODBRIDGE, Conn. — The third edition of a directory with more than 2,500 listings of reference-qualified professional computer consultants and consulting companies has been published by Research Publications.

"The Directory of Consultants in Computer Systems" has an index organized by expertise to help readers find consultants who have the hardware and software expertise they are looking for.

The directory is available for $75 from Research Publications, 12 Lunar Drive, Drawer AB, Woodbridge, Conn. 06525.

Die-hard Cobol programmers try Natural and like it

By John Desmond
CW Staff

NASHVILLE — Users of Software AG's Natural fourth-generation language are teaching old programming dogs new tricks.

Experienced Cobol programmers usually resist programming in Natural because many believe they are risking their marketability, but the programmers are usually happy using Natural once they convert, said several users interviewed at the Software AG users conference here last week.

Patricia Swingle, data base administrator at Commercial Union Insurance Cos. of Boston, said, "Most of our Cobol programmers resisted using Natural, were forced to use it and ended up liking it." To meet its expanding applications development needs, Commercial Union now hires programmer trainees, some with only six-month programming courses as background, to program applications in Natural. "They're immediately productive, they're cheaper, they're easier to get, and they don't have the Cobol mental framework," she said. The trainees are usually paid $15,000 a year to start vs. the $35,000 yearly salary an experienced programmer would earn, she said.

Different programming skills are needed to use Natural effectively, she said. For Cobol programmers, "It's tough to design programs in Natural because you've always got to think about what Adabas can do for you," she said. (Adabas is Software AG's relational data base management system.)

At Commercial Union, which runs five Digital Equipment Corp. VAX superminis and IBM 4381, 3083 and 3081 mainframes, parts of some programs are still written in Cobol, but 99% of new applications are written in Natural, Swingle said.

The challenge of converting Cobol programs to Natural is being met halfway around the world from Commercial Union at Shell South Africa Ltd. in Cape Town. Peter Peasey, data manager at the site, said, "A Cobol programmer who writes in Natural will usually not get the benefit" of all its fourth-generation capabilities. To monitor applications written by the Cobol users at Shell South Africa, the applications are reviewed by a quality assurance person trained in Natural constructs. Some programs that were written badly in Natural were revised by experienced Cobol programmers to yield 10 times better efficiency, Peasey said.

> *'Most of our Cobol programmers resisted using Natural, were forced to use it and ended up liking it.'*
>
> — Patricia Swingle
> Commercial Union Insurance Cos.

Still, in Peasey's view, the advantage of Natural is not that it works better than Cobol but that applications take less time to develop and data is more flexible. "As we increase our [million instruction/sec. processing power], then I'll be more likely to say that Cobol is dead," Peasey said. His shop now runs an Amdahl Corp. V8 and an IBM 4341.

Cobol programmers are trained to use Natural at Shell South Africa, Peasey said. "Cobol programmers will always grab the Natural manual, go off and say, 'I can do this.' After a one-week course in Natural they say, 'Well, I couldn't have done that,'" Peasey said. "Most Cobol programmers don't want to be Natural programmers. They're worried about their marketability. But that's not killing Natural."

Like Swingle, Peasey said his Cobol programmers complained before beginning to use Natural, "but once they use it, they don't want to change."

Jeff Mossmann, a senior systems engineer with Persetel of Johannesburg, South Africa, said, "People are scared of moving away from their Cobol programs." He said the number of Cobol/Vsam installations in the U.S. not yet using data bases signifies management ultraconservatism. Fourth-generation languages like Natural have a higher penetration in South Africa, he said, because that country's programmer manpower shortage makes programmer productivity more critical.

Another user, from a U.S. grocery wholesaler, who did not wish to be identified, said his attempts to persuade his company to acquire Natural have so far been unsuccessful because "management perceives that Cobol programmers would lose position in the job market by going to Natural and not using their Cobol skills" and would leave as a result. He said he has argued that the savings in programmer productivity would make up for any loss. He noted the company has a four- to six-year applications backlog.

Another U.S. insurance company is using a mixture of Natural and Cobol in writing applications. Patty Prime, design and programming supervisor with American Family Insurance in Madison, Wis., said the company has used Natural for three years, but some applications are still written in Cobol. "Anything that has a common subroutine is easier to do in Cobol because you can call it more easily," she said. But some 80% of new applications are written in Natural, she said.

Prime said her company, which runs two Amdahl 5870s, brought up an internal payroll savings plan in six months using Natural, faster than it could have been designed, coded and tested using Cobol, she said.

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OAC '86 meet slated for March

HOUSTON — The OAC '86 conference for business automation and telecommunications will be held at the Astrohall here March 24-26. The conference and exhibitions are sponsored by the American Federation of Information Processing Societies, Inc. (Afips).

Next year's conference theme is "Integrated Systems: Merging Islands of Technology," and the chairmen will be William J. Carlisle, assistant vice-president of Bell Communications Research Corp., and Michael R. Alsup of Arthur Andersen & Co.

The conference fees are as follows: paid in advance for the whole conference, $100 for Afips constituent society members, $125 for nonmembers; paid in advance for one day, $40 for members, $50 for nonmembers, $25 for students; paid on-site for one day, $50, and for full conference, $150, for anybody. The professional development seminars fees are $95 for a full day and $45 for half day. Exhibit-only prices have not yet been set, a spokeswoman said.

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Insurer supporting commercially viable AI programming

By Donna Raimondi
CW Staff

NEW YORK — The senior management of the second largest insurance company in the U.S. is supporting commercially relevant artificial intelligence programming research and development here.

"Our definition of 'ready for the commercial world' is that we figure out a way to make more money to return to our policyholders," said Roger Jones, planning manager in charge of implementing the expert systems at Metropolitan Life Insurance Co.

The number of rules in a knowledge-based system is a basic measurement of the program size, he said, and 250 to 400 rules are enough to screen initially the underwriting of an insurance policy. There are no indications that his programs are damaging the response time of the 300 to 400 other users on the hardware system, Jones said.

The AI project began when the company's chief management office — made up of President and Chief Executive Officer John J. Creedon and the company's executive vice-presidents — outlined strategic goals for five- and 10-year periods. One of the results was a decision to address how technology could be used as a resource to fulfill strategies, Jones said.

Metropolitan Life tried expert systems for applications such as underwriting screening, medical preadmission review (for doctors to find out if a particular illness was covered by an individual's policy), dividend calculation for group insurance and risk assessment, Jones said. Jones' mandate was to get a grip on the technology so that he could make recommendations for AI efforts in the rest of the company, he said.

"We were trying to get a feel for how big the programs were, how difficult they were to code, how difficult they were to debug and how easy it was to modify them if the rule changed," Jones said.

Results of 10,000 cases

One underwriting project involved looking at the results of 10,000 cases to determine whether obtaining an additional document to support the underwriting process would be useful and how often it would be useful; the group also looked at the case results to rewrite the rule about obtaining the additional document to reflect the currrent reality of how useful it was, Jones said.

That project turned out to be "incredibly difficult," he said, because of all the specific selection criteria, such as which rules to target, how the system was going to learn about the rule and how to create the new rule.

The development team decided that studying one million cases using standard retrospective statistical methods would work better at that stage of the game, he said.

A risk assessment system that Jones is developing with risk assessment experts will become a production system if the risk assessment people reach a point where they can incorporate enough expertise in the knowledge system to make it financially feasible to run, Jones said. It will probably take a year with two to three people working on the system to complete it, he said.

Completion is a difficult state for an expert system, Jones said. An expert provides the system designer with his knowledge on a subject for a knowledge base. Many times, however, the expert does not feel comfortable with that knowledge, saying he was never happy with a particular way he did something or with the rules that govern a body of knowledge.

The business potential of expert systems is in their ability to help reevaluate the decisions a company makes and the rules it uses to achieve decisions, Jones said, and to help come up with rules that are more competi-

See EXPERT page 13

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Maximizing benefits of AI a slow process, firm cautions

NEW YORK — Companies seeking to dabble in artificial intelligence techniques must spend a lot of time and energy determining how the techniques will benefit them, and they should be willing to share the nonproprietary portion of their knowledge.

"It's a very slow learning process. Expect, probably, to spend between a year and two years before you really feel comfortable that you understand what is going on. And — at least in our experience — the amount of time [in which] we feel comfortable tends to be very short," said Roger Jones, planning manager in charge of expert systems at Metropolitan Life Insurance Co. here.

Companies should share their experiences with other people, said Jones, who is experimenting with AI techniques for many insurance applications.

"When you look at an expert system, a very big percentage of the program is for very traditional data processing issues," he said. "There is nothing proprietary about any of that. We have all these various efforts all reinventing the same wheel."

The traditional learning methods of reading books and attending seminars do not work well for AI techniques, Jones said. "We found that we were getting this extremely fuzzy top-level overview of how wonderful everything was at the seminars, and we stopped going," he added.

> ”
>
> *'The traditional learning methods . . . do not work well for AI techniques.'*
>
> — Roger Jones
> Metropolitan Life Insurance Co.

Companies should travel a little way down a lot of paths with AI techniques, Jones recommended. A company must learn to program in the AI languages, but over and above that, it must determine which of its applications can benefit. "In a lot of ways, it's like trying to choose what the first application in your shop was for a data base system, and . . . it has all the same risks," he said.

A company considering AI should ask the following three questions:

- Do we have an immediate demand for this technology? Some companies have workers nearing retirement who have expertise that has never been reproduced in the company, and this technology could enable the firm to develop the expertise.
- What would happen to the company if the competition established a two-year lead in AI techniques? Better tools will certainly be available in two years, but how long will it take to catch up?
- Do we want to understand the AI technology instead of having faith that it works? Knowing why the technology works takes time and could be a reason for starting soon.

— Susan [illegible]

EXPERT

from page 12

tive. For example, instead of building a better underwriting system with AI techniques, Metropolitan is using an expert system to change the underwriting system's rules and to determine the impact of the rule changes.

"Since inherent in the [AI] techniques is that the rules are very easily identified and very easily modified, it's a fantastic vehicle for doing that," he said. Those rules will tend to be very secret and proprietary, he added.

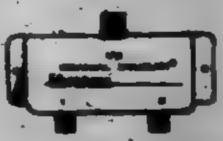
Most of Metropolitan's development time is eaten up by trying to understand how to represent knowledge and how to make Prolog's predicates — the AI language's basic building blocks — work the way they should, Jones said. When writing rules in a program, he said, time often is consumed explaining to an expert, from whom knowledge is being gleaned, why the things he forgot to talk about when he generalized the rule are important for the program builders to understand.

Developing testing systems

Metropolitan primarily uses Logicware, Inc.'s Mprolog symbolic language and, secondarily, IBM's Lisp/VM symbolic language to develop systems for testing its underwriting assumptions and for assisting actuaries and other experts in risk assessments, Jones said.

The knowlege-based systems run on an IBM 3081 Model K — a machine left over from a previous project — under the VM/CMS operating system with 32M bytes of real storage, 24 channels and an amalgamation of disk storage devices that comprises approximately 500 spindles of IBM 3350s, although the mixture is made up of 3350s, 3380s and assorted drives.

Metropolitan has 10 to 12 "homegrown" people involved in one way or another in the development of knowledge systems, Jones said.



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CAD technology is racer's edge for Indy 500 entries

By Clinton Wilder
CW Staff

INDIANAPOLIS — "Gentlemen, start your digitizers."

When the gravel-voiced race starter gave the send-off to the drivers for the 69th Memorial Day Indianapolis 500, he did not actually substitute the above high-tech version for the traditional four words. But for the first time, defending champion Rick Mears and Penske Racing, Inc. teammates Danny Sullivan and Al Unser were counting on computer-aided design technology to give them the racer's edge in their pursuit of the checkered flag.

Across the ocean in Poole, England, Penske Cars, Ltd. designs and tests enhancements to its Indy cars with the help of a CAD system from Bedford, Mass.-based Computervision Corp. In a sport where success depends on technology, Computervision has joined Pennzoil Co., Goodyear Tire and Rubber Co., Bosch Robert Industries, Inc. and more traditional automotive companies in selling expertise to the Penske racing team.

Since last fall, Penske engineers at Poole have used a Computervision CDS 4000 system to design quarter-scale models of Penske race car prototypes for wind tunnel tests of the all-important aerodynamic properties of the cars. The engineers believe Mears' car will handle better because of improvements made possible through the CAD system.

Computer used for analysis

"We still design the cars with the traditional drafting method, but we use the computer for analysis of the design," said Nick Goosee, manager of Penske Cars. "With the CAD you can virtually simulate everything you do on the track."

The Penske CAD system consists of a 32-bit CDS 4000 running Computervision's Cadds 4X design and drafting software packages and third-party analysis programs. Penske engineers design the car models with a high-resolution color workstation and P1000 pen plotter and have access to 32-bit random-access memory, a 64-bit processor for complex calculations and a 16K-byte cache memory.

Penske saves time and human and mechanical resources by simulating test track conditions with the computer-designed scale models in a 7- by 5-ft wind tunnel. "We input the actual car design into the [CDS 4000] and produce it on the screen, then create the model," Goosee said. "We can design the car with a greater degree of certainty after measuring the air flows above and beneath the model. Aerodynamics and aerofoils are [the areas] where we see the single biggest gain."

Goosee believes Penske has so far tapped only about 10% of the potential of current CAD technology. In the coming year, the firm hopes to design its own chassis and engine system — it currently uses a March Engineering, Inc. chassis design — in time for the 1986 Indy 500.

"We're definitely on a learning curve," Goosee said. "When we first got the machine, we thought we could just plug it in and produce magic, but that wasn't the case. Computervision engineers are still coming here on a monthly basis, and in the next couple of weeks, we hope to have a complete suspension analysis program ready. I think the secret is not in having the equipment, but in knowing what to do with it. We have to make sure we have the right personnel and software to make it work best."

Penske Racing claims to be the only racing team using CAD technology now, but Goosee expects that exclusive status to be short lived. March Engineering and England's Williams Grand Prix team are already talking to Computervision about potential purchases.

"Motor racing is one industry where everyone follows a particular leader," Goosee said. "If the advantage that we gain from the CAD system is so great, they'll probably all want to get one. Five years ago, no one had heard of carbon fiber [autobody material much stronger and lighter than steel], and now it's standard. I think you'll find CAD will become a facility in the majority of serious racing teams in the next five years."

Fall Comlease expo scheduled

NEW YORK — The Computer Leasing Conference and Exposition (Comlease), the first national conference and exposition sponsored by the Information Exchange, Inc., will be held from Sept. 30 to Oct. 2 at the Marriott Marquis Hotel here.

Subjects include information on the used computer equipment industry, considerations in leasing, leasing telecommunications equipment and corporate tax treatment of leases.

Registration costs $395 for the three-day conference. The exposition-only fee is $10. More information is available from Comlease, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

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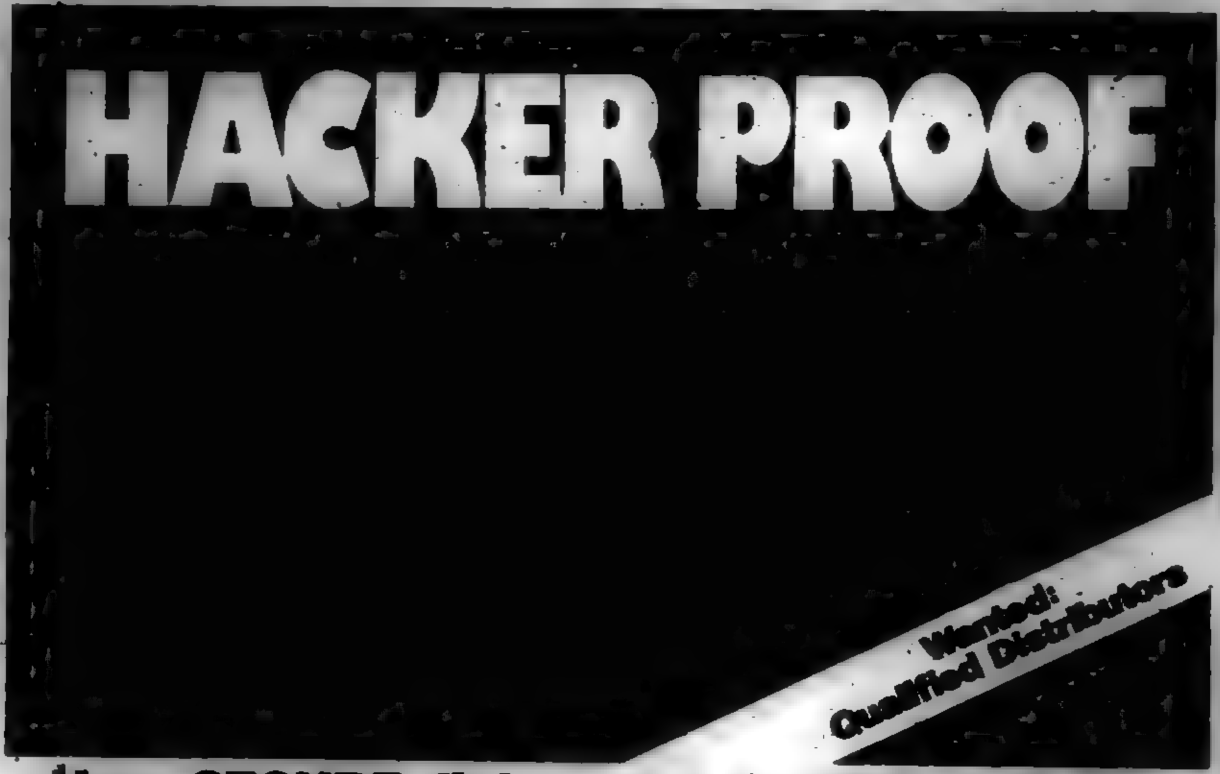

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MCI accuses AT&T of obstructing equal access pursuit

Scramble to sign customers heats up

By [illegible]
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Justice has begun an investigation of the equal access implementation process, as MCI Communications Corp. charged that AT&T actively interfered with 61,000 customers who had signed up for MCI service. MCI is involved in a battle with AT&T and other long-distance carriers over establishing market share as equal access is being implemented.

The Justice Department's antitrust division said it has begun an investigation into complaints made by customers — mostly situated in the territory served by Nynex Corp. — that they were signed up to use AT&T Communications when in fact they had not made the choice as required under conditions of the AT&T divestiture covering conversion of local exchanges to equal access.

AT&T responded that it had identified a computer software foul-up in April that led to errors in signing up customers. The company said it had made changes to the programming and that it believed the problem had been corrected. AT&T confirmed that invalid customer sign-ups in the Nynex territory had occurred and said it believed that 19,000 businesses with more than one line had been affected.

MCI's charges were contained in a filing with the Justice Department. MCI said, "Grave problems exist with the implementation of equal access . . . and no [divested Bell operating company] has established an acceptable presubscription order processing system."

MCI asked the Justice Department to require, as a minimum, that the divested Bell operating companies provide prompt notice of acceptance or rejection of a customer order, notification of conflicts; guarantees on installation of service for the customer, a listing of defaulted-customers who did not select a long-distance carrier at equal access cutover and notification of changes in customer selection after cutover.

MCI told the Justice Department "it is apparent that the [divested Bell operating companies] have failed to devote sufficient personnel and financial resources to meet their equal access obligations . . . [and] the beneficiary, of course, is AT&T.

"The [divested Bell operating companies'] problems are compounded by AT&T's active interference with the orderly presubscription process," MCI added. MCI said it had collected "evidence indicating thousands of bogus AT&T presubscription orders from all regions of the country."

MCI asked the Justice Department to begin an immediate investigation of the divested Bell operating companies' practices, an immediate moratorium on waivers enabling the divested companies to enter new lines of business and an investigation of AT&T's order-taking, verification and submission systems.

MCI detailed its complaints about the presubscription process on each of the seven regional Bell operating companies and concluded that "[divested Bell operating company] ordering, administrative and installation procedures are unreasonably impeding equal access and presubscription competition. Moreover, conflict resolution procedures utilized by several [divested Bell operating companies] provide an opportunity for some interexchange carriers, specifically AT&T, to interfere with presubscription implementation."

MCI also said it cannot determine from Bell Atlantic Corp., Bell South Corp. and Pacific Telesis Group those customers that have selected MCI service and said delayed installations are causing lost revenue and loss of customer goodwill toward MCI.

An AT&T spokesman denied the charges that AT&T was actively interfering with the presubscription process and called the MCI allegations a "blatant publicity gimmick."

CSI to sponsor July workshop on security

ARLINGTON, Va. — The Computer Security Institute (CSI) will sponsor a computer security workshop conference that will focus on small and large computer systems July 15-16 at the Marriott Crystal Gateway here.

The conference will feature a microcomputer track and an IBM mainframe and compatible track.

Issues to be addressed in the mainframe track include security and control in IBM IMS, VM/SP, CICS and MVS environments. Issues to be addressed in the microcomputer section include securing networks, securing micro-mainframe connections, guarding against the small systems threat to mainframe data and controlling personal computers.

David Kahn, author of *The Codebreakers*, will open the program with a discussion on "The Politics of Encryption."

A total of 24 half-day workshops will be held. A full-day seminar will be held July 14, and five concurrent full-day seminars will be held July 17.

Registration fees are $495 before June 28 and $530 after that date for CSI members. The fee for nonmembers is $535 by June 28. The fee for the one-day seminar along with the workshop registration is $210 for members and $225 for nonmembers by June 28. The fee for the one-day seminar only is $275 for members and $295 for nonmembers by June 28.

CSI is located at 43 Boston Post Road, Northboro, Mass. 01532.

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WASHINGTON UPDATE
Mitch Betts
CW Washington Bureau

Industry execs lobby for R&D tax breaks

WASHINGTON, D.C. — Scores of top executives from computer and electronics companies recently visited members of the U.S. Congress to lobby for the 25% research and development tax credit and retention of the capital gains tax cut.

Participating in the American Electronics Associations' (AEA) 1985 Capitol Caucus on May 15, the executives reported that about two-thirds of the 120 legislators contacted said they were supportive of the AEA's campaign in favor of pending tax reform legislation, according to AEA officials.

The AEA officials said many legislators indicated that they were receptive to the industry's tax positions because they view high-tech industries as essential to achieving and maintaining high levels of economic growth.

Tommorrow, President Reagan is scheduled to announce his proposal for tax reform, which is expected to retain the R&D tax credit.

Directory of federal DP contractors out

WASHINGTON, D.C. — The first "yellow pages" directory of DP service vendors who compete for contracts with the U.S. government was published recently by Donnelly Information Publishing, a subsidiary of the Dun & Bradstreet Corp.

The Information Services directory is the first in a series of Procurement Planning Service Directories. The directory will be provided free of charge and will be an annual publication, company officials said at a recent briefing here.

The directory is intended for use by U.S. government procurement specialists and DP managers, as well as by large businesses that have government contracts and are searching for subcontractors, according to company officials.

More information is available from Donnelly Information Publishing, 2900 Westchester Ave., Purchase, N.Y. 10577.

Martin Marietta wins DP installation contract

WASHINGTON, D.C. — The U.S. Department of the Interior's Minerals Management Service agency recently awarded a $32 million contract to Martin Marietta Data Systems, Inc. of Bethesda, Md., for installation and management of a DP system.

Under the five-year contract, Martin Marietta Data Systems will upgrade and expand the DP network used by the agency's Royalty Management Program, which collects and distributes revenue from mineral leases. The contract includes installation of an IBM 3081 mainframe, conversion of existing applications software and a data communications network at the agency's facility in Denver.

U.S. agencies' micro buys up

WASHINGTON, D.C. — The General Services Administration (GSA) reported that acquisitions of microcomputers for federal government use jumped over 400% in fiscal 1984 compared with a year earlier.

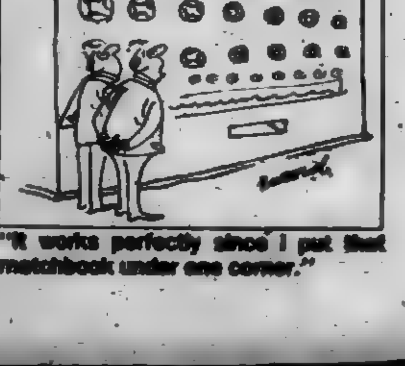
GSA, the purchasing arm of the U.S. government, catalogued information supplied from all federal agencies and departments as to vendor, model, quantity and cost of micros — those valued at less than $10,000 — acquired between October 1983 and September 1984.

In fiscal 1983 the government acquired 8,000 micros; in fiscal 1984 the number jumped to 37,277 units, the GSA said. The agency also reported that the costs of acquisition had jumped from $34 million to $137 million.

According to Frank Carr, the GSA's assistant administrator for information resources management, the statistics probably understate the size of the increase, citing the decentralized federal procurement policies put in place recently which make it difficult to identify all new equipment accurately.

The U.S. Department of Defense reportedly acquired the largest number of micros, numbering 17,419 units in fiscal 1984, compared with 1,624 in fiscal 1983. The National Aeronautics and Space Administration, followed by the Environmental Protection Agency, were second and third, respectively.

IBM was the largest supplier of micros to federal agencies with 10,090 units, followed by Zenith Data Systems Corp. with 8,447 units, according to the GSA survey.



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This system provides the missing link in the personal computer productivity chain by effectively providing "on demand" instructional information on all aspects of using a personal computer to perform processing, analysis, and management functions.

The Expert Series can interface directly with the popular productivity systems, e.g., Lotus 1-2-3, Symphony, dBASE, etc., and can execute concurrently with them or with user-developed applications. Therefore, the user can switch back and forth between the application program and the instructional information without having to restart or reload the application program or the Expert Series System.

The Expert Series is both a product and a service. Cdex will customize the Expert Series to conform to an organization's requirements in terms of subject matter content, relevant skills, business analysis methods, and management functions.

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The traditional development cycle and methods utilized to develop high-quality CBT and computer-based interactive video disk systems have been a significant obstacle to the implementation of these types of systems.

Even with the introduction of CBT authoring systems, the above obstacles have not been significantly alleviated. This has been due to the fact that existing authoring systems have only provided an assortment of fixed formats, "screen builders," or syntax-oriented languages for the development of CBT systems.

Cdex has named its CBT Development System the "Electronic Publishing System" because it provides the total solution to *designing, developing,* and *quality assuring* CBT systems that are easily transportable to multiple computer systems.

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Adapso, computer services firms establish ethics code

WASHINGTON, D.C. — In an effort to ensure higher ethical standards among computer services firms, the Association of Data Processing Service Organizations, Inc. (Adapso) has established a code of ethics. Adapso established the code, by which clients can evaluate a company's conduct, in conjunction with 100 professional services companies.

Computer services firms said the need for the code was prompted by the sensitivity of the work these firms do. "A professional services firm can be called into a client's company to perform any or all of the following duties: data processing needs evaluation, system selection, custom software development, education and training of DP staff and end users and the management of the DP operation," Adapso said.

"This code represents the start of a continuing campaign to promote and ensure appropriate ethical behavior within the professional services industry," said John Courtney, president of Computer Task Group, Inc. and chairman of Adapso's professional services section board of directors.

"The parameters established have been reviewed and accepted by some of the largest firms in the industry as well as by medium-size and smaller companies. We encourage all professional services firms to endorse the code," Courtney added.

Six principles established

Adapso and the 100 participating professional services firms enunciated six principles. These stipulate that a professional services company and its employees should do the following:

- Exercise independent judgment and objectivity.
- Communicate in a manner that facilitates clarity and understanding.
- Provide a client with quality service and results.
- Demonstrate dedication to the profession.
- Assist in maintaining the integrity of the industry.
- Conduct business in a manner that results in respect and acceptance for the data processing profession and the industry.

The code of ethics discusses each of the principles and highlights the industry's need to avoid conflicts of interest, confusing computer terminology and jargon, accepting jobs that a firm or personnel cannot perform and generally tries to encourage professionalism within the computer industry.

Copies of the code can be obtained from Christopher Carleton, Adapso, Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

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Intech '85 set for Aug. 26-29 in California

SAN FRANCISCO — Intech '85, the Integrated Information Technology Conference — a user-oriented conference and exposition focusing on business solutions for corporate information systems — will take place Aug. 26-29 at the Moscone Center here. Intech '85 is cosponsored by the Network Users Association (NUA).

The conference and exposition is geared toward directors of management information systems, data processing, office automation and telecommunications as well as to vice-presidents of operations, finance and communications.

Registration prices are $[illegible] for the full conference before July 15, $495 after July 15 and $395 for NUA members. A two-day program costs $295. More information can be obtained from Intech '85, National Trade Productions, Inc., Suite 400, 2111 Eisenhower Ave., Alexandria, Va. 22314.

Workstations focus of meet

SAN JOSE, Calif. — The First International Conference on Computer Workstations, sponsored by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) Computer Society, is scheduled for Nov. 11-15 at the San Jose Convention Center here.

The conference will focus on advanced computer workstations of all types, their software environments, hardware and software technology. Subjects include distributed systems, computer-aided design and manufacturing, computer-aided engineering, computer-aided software engineering and security issues.

The registration fee is $125 for IEEE members, $165 for nonmembers and $30 for full-time students.

More information is available from Edward Miller at Software Research Associates, Suite 350, 580 Market St., San Francisco, Calif. 94104.

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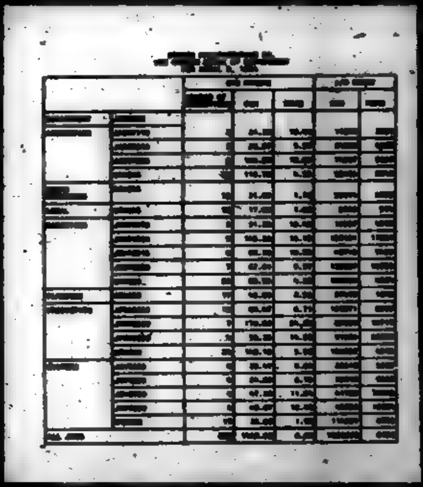

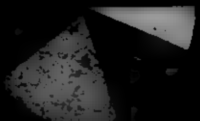

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IRS' payroll system suffering backlog

WASHINGTON, D.C. — The Internal Revenue Service is experiencing delays in making employee payroll adjustments at its Detroit Data Center.

IRS officials recently confirmed that the delays were partly due to a decision to lay off workers responsible for entering payroll data before a remote automated input system was fully installed.

Consequently, IRS employees must wait as long as three months for overtime pay, credits for vacation time and other payroll adjustments, especially at the Austin, Texas, regional service center, according to George King, spokesman for the National Treasury Employees Union, which represents the employees. The delays and paycheck errors reportedly have created severe morale problems at the Austin center.

Unusually heavy workload

Steven Pyrek, an IRS spokesman, said the payroll backlog occurred because of an unusually heavy workload of processing employee personnel and tax forms, delays in implementing the IRS' Remote Automated Input System and a premature reduction of the staff that handles payroll data.

In the past, payroll information was reported to the Detroit center via mail or telephone and keyed into the computer.

With the automated system, the regional IRS service centers transmit payroll data directly from remote terminals to the Detroit Data Center, which sends its computer tapes to disbursing centers that either issue paychecks or make electronic deposits.

However, three of the 10 service centers have not yet received terminals for the Remote Automated Input System, according to IRS spokesman Bob Young.

To solve the problems, the IRS has authorized overtime work and hired temporary workers for the Detroit center. It plans to complete delivery of the terminals and provide user training by mid-October, Young said.

NBS releases micro-related security book

WASHINGTON, D.C. — A [illegible]-page guide, "Security of Personal Computer Systems," has been released by the National Bureau of Standards (NBS) here. The publication was written for managers, systems designers and users of personal computers, a spokesman said.

The publication discusses how to solve potential security problems associated with the use of personal computers. It identifies areas of potential vulnerability and presents a general plan of action for managing personal computer information security.

Issues include physical and environmental protection, systems and data access control, integrity of software and data, backup and contingency planning and communications protection. Also included are references, a self-audit checklist and a guide to security products.

"Security of Personal Computer Systems" is priced at $[illegible]. Its stock number is [illegible], and it is available from Department [illegible], Superintendent of Documents, Washington, D.C. 20402.

ESU publishes telecommuting survey results

NEW YORK — Electronic Services Unlimited (ESU) has published a study that contains information from three telecommuting surveys conducted between fourth-quarter 1983 and [illegible].

"Telecommuting: Demographics, Profiles and Projections" contains a survey on computer-based work from home carried out by Charles McClintock of Cornell University in Ithaca, N.Y., a survey on telecommuting carried out by Robert Kraut of Bell Communications Research Corp. and a survey on nontelecommuters' attitudes toward telecommuting carried out by Carole Smith of the U.S. Air Force Institute of Technology.

In addition to presenting summaries of the three surveys, the report reviews definitions, demographics, activities, attitudes and projections related to telecommuting.

The price of the report is $1,[illegible]. More information is available from ESU, 142 W. 24th St., New York, N.Y. 10011.

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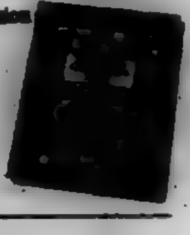

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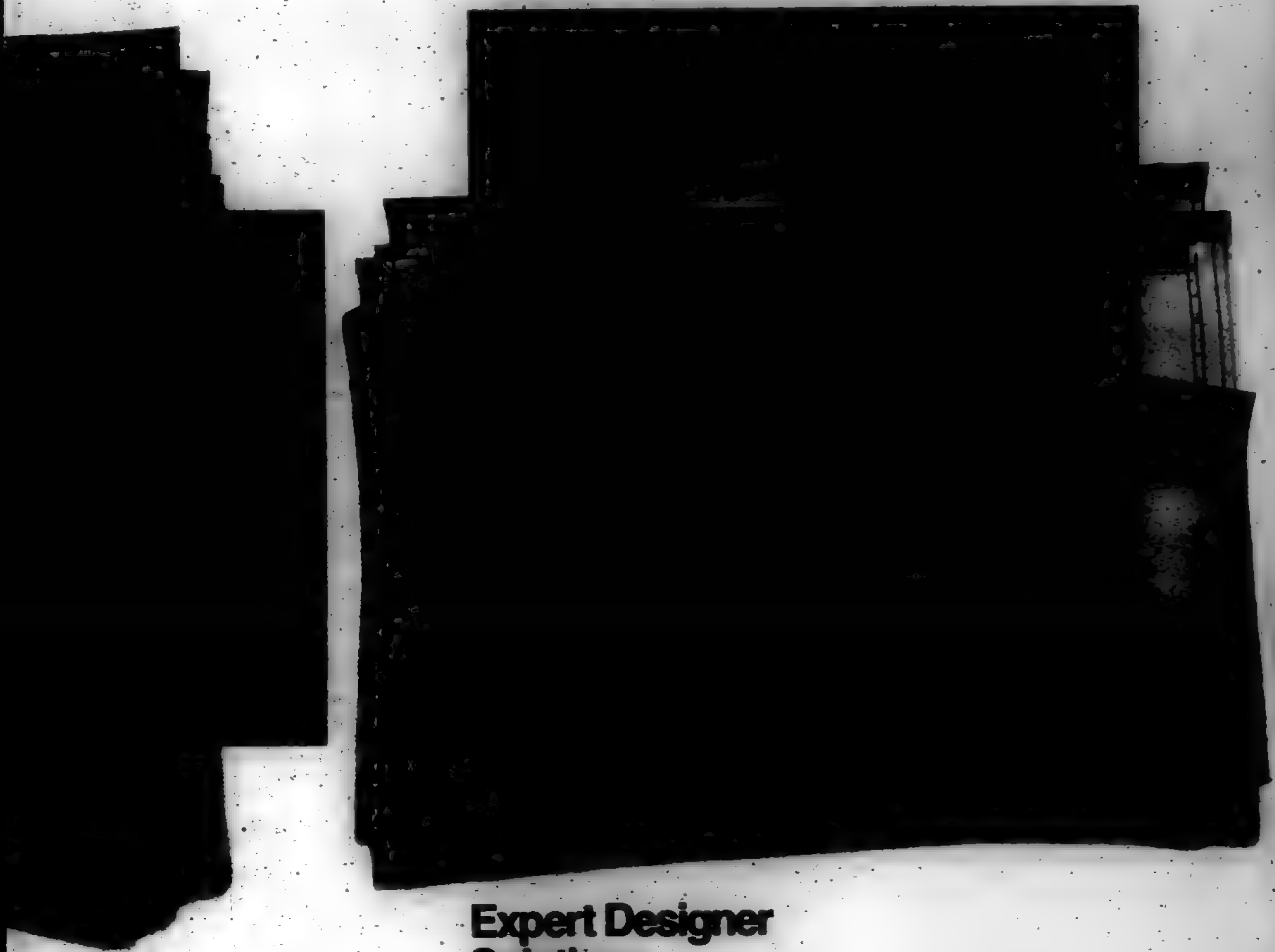

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Computer operator pleads guilty in USDA trespass case

By Mitch Betts
CW Washington Bureau

DENVER — A 26-year-old Los Angeles computer operator recently pleaded guilty to three misdemeanor charges of trespassing in U.S. Department of Agriculture (USDA) computers in Colorado, a federal prosecutor said.

Philip Gonzalez Fadriquela, the defendant, entered the plea in U.S. District Court here May 15, after three felony charges were dropped in a plea bargaining with prosecutors.

"The misdemeanor charges are significant because we wanted to get some convictions under the new law," said Cathy Goodwin, assistant U.S. attorney here.

In 1984, Congress passed the Computer Fraud and Abuse Act, making it illegal to trespass in U.S. government computers [CW, Oct. 15].

The maximum penalty for each charge is up to one year in prison and a $5,000 fine. Sentencing in the Fadriquela case is expected in about a month. Goodwin added that the conviction should have a deterrent value because repeat convictions carry a possible sentence of 10 years in prison.

In February, a federal grand jury here indicted Fadriquela. Prosecutors charged that he gained unauthorized access to the USDA's Forest Service computers via commercial telecommunications networks and inserted a "super-user code" to permit continued access [CW, Feb. 11].

Under the plea bargaining, Fadriquela forfeits his computer equipment, which was seized upon his arrest, and must issue a statement explaining how he committed the offenses, Goodwin said. She said Fadriquela may face other charges in Los Angeles, where an investigation is under way.

DBMS meet scheduled

BERKELEY, Calif. — The University of California at Berkeley's College of Engineering and Department of Continuing Education in Engineering has announced that "Database/85," a five-day course focusing on data base management systems (DBMS), will be presented July 29 to Aug. 2 here.

Prof. Lawrence A. Rowe, a Berkeley computer sciences faculty member, will present papers by 18 authorities from industry and academia concerning products and research. Sessions will be held at the Berkeley Marina Marriott Hotel.

Topics will include data base machines, high-performance transaction systems, distributed data bases, artificial intelligence and data bases, heterogeneous data base systems, design data bases and end-user interfaces to data bases.

The course registration fee is $1,075.

More information can be obtained from Continuing Education in Engineering, University of California Extension, 2223 Fulton St., Berkeley, Calif. 94720.

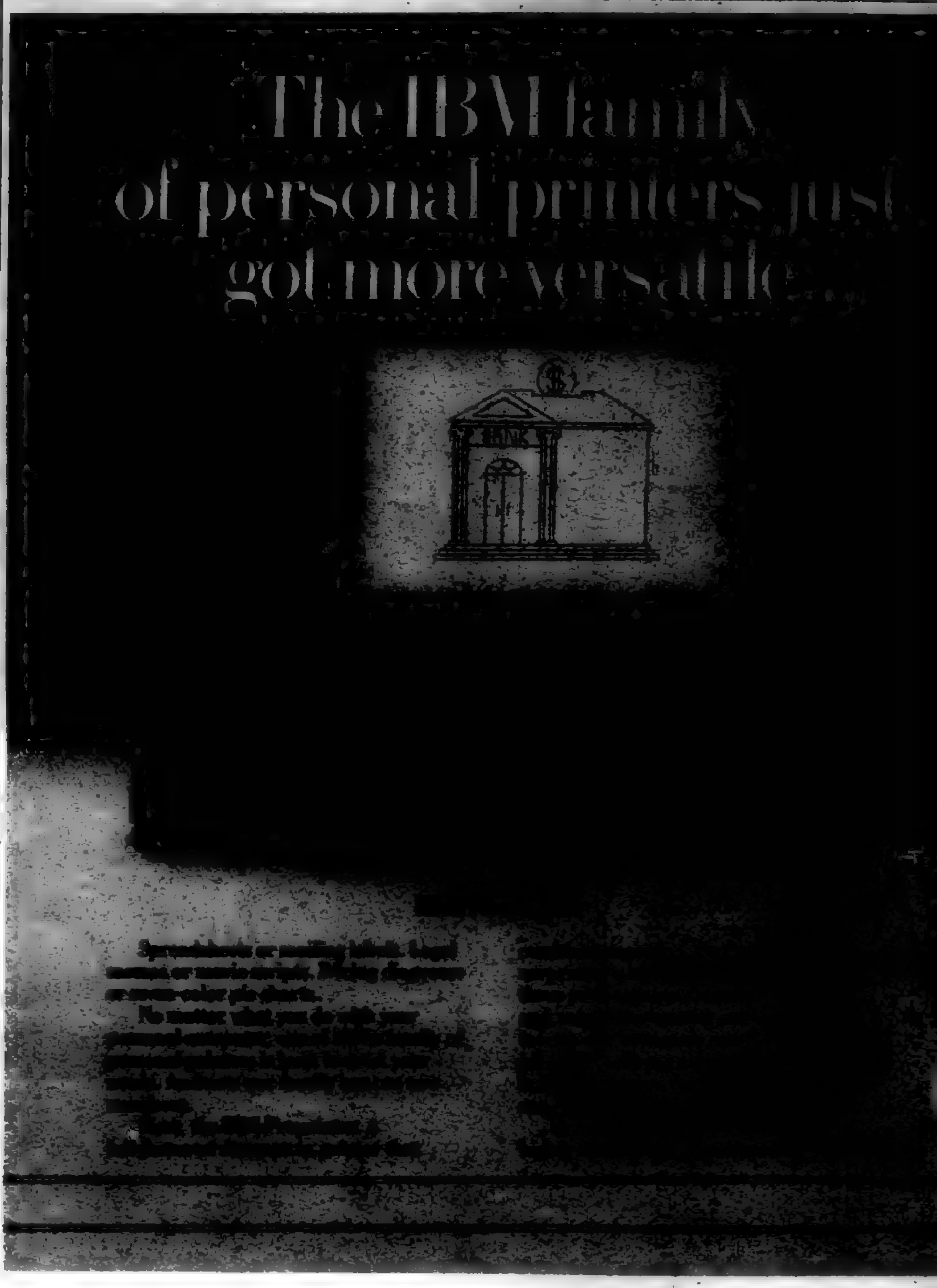
Software directory out

SAN DIEGO — The International Data Base Management Association (IDBMA) has announced that the fourth edition of the "IDBMA Application Software Directory" is now available.

The directory lists 630 applications software packages in 93 classifications. The guide includes packages offered by 173 companies and 58 consultants for Pick Systems' Pick operating system. IDBMA promotes Pick-based business-computer solutions.

The directory is available for $30 plus a $3.50 shipping and handling charge.

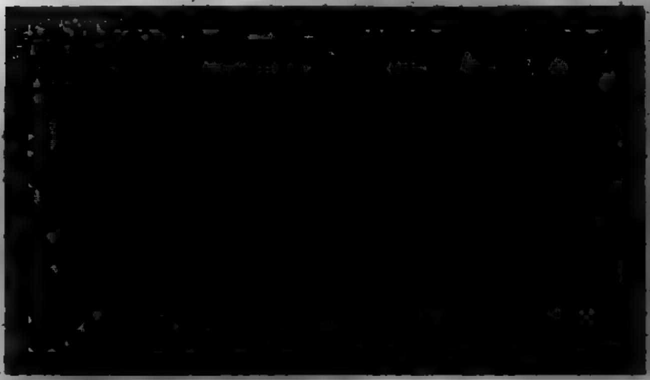
IDBMA is located in Suite 210, 9740 Appaloosa Road, San Diego, Calif. 92131.



Spreadsheets or mailing labels. Legal memos or music scripts. Making diagrams or seven-color pie charts.

No matter what you do with your [illegible]

Paris hosts Special Sicob '85



Special Sicob '85 conference hall

By John Gallant
CW Staff

PARIS — While visitors flocked to Atlanta for Comdex/Spring '85, the French staged their own seasonal computer extravaganza in the prestigious La Defense exhibition area here.

Featuring more than 550 exhibitors of minicomputer, microcomputer and software products, the six-day Special Sicob '85 conference officially opened May 6 during ceremonies presided over by Hubert Curien, France's minister of research and technology. More than 150,000 visitors attended the conference this year, according to Max Hermieu, chairman and general manager of Salon International D'Informatique, Telematique, Communication, Organisation du Bureau et Bureautique (Sicob), the show's sponsor.

Special Sicob '85 was founded last year as the spring edition of the 36-year-old autumn Sicob conference, which Hermieu said attracted some 400,000 visitors here in September. Special Sicob '85 offered 60 sessions designed to introduce attendees to the use of microcomputers and software in the home and business.

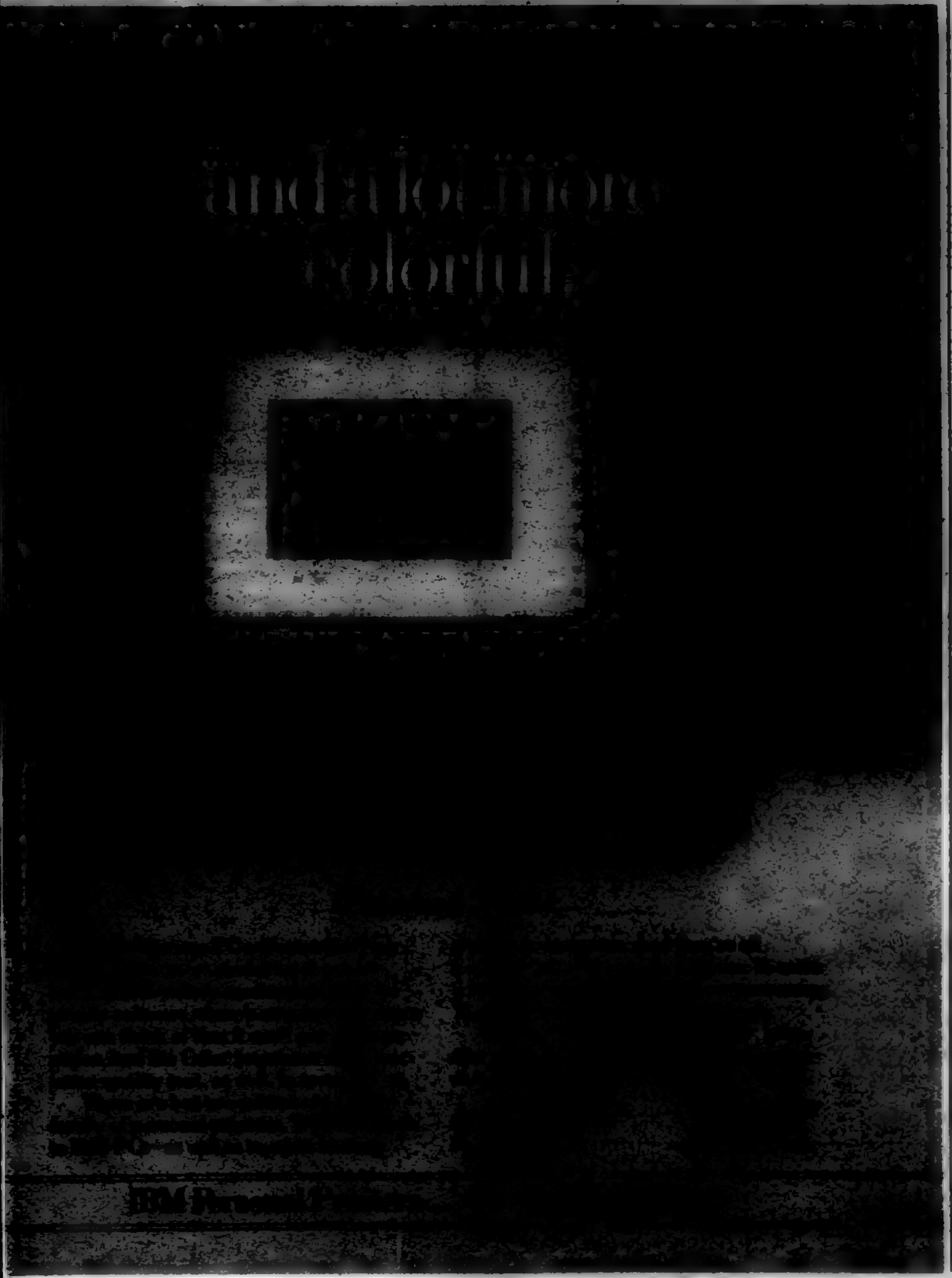
In the center of the Special Sicob '85 exhibit floor, visitors explored Sicob Info, the so-called Village of the Professions. Sicob Info consisted of 12 industry-specific pavilions manned by professionals in fields as diverse as tourism and government. Sicob Info staff members gave attendees practical advice on selecting hardware and software and provided information on vendors offering appropriate products.

That same information was also available to other visitors through 46 Sicobtel videotex terminals located throughout the exhibition. The terminals provided access to a data base containing information on exhibiting vendors and their products.

In conjunction with Special Sicob '85, the French government agency Carrefour International de la Communication (the International Crossroad of Communication) sponsored Talking Machines '85, touted as the first international conference on speech technology. The show featured about 30 vendor and academic groups exhibiting research efforts in speech recognition and synthesis.

Among the projects exhibited at Talking Machines '85 was a prototype telephone booth developed by the Centre National d'Etudes de Telecommunications, France's center for telecommunications studies, which is the research arm of the French Postal Telephone and Telegraph agency.

The booth has no standard telephone equipment, but it allows users to say a phone number into a mounted microphone. The number is automatically dialed, and the user converses via the microphone and a wall speaker.



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French apply high technology to their everyday lives

By John Gallant
CW Staff

The following are scenes from France — high-tech postcards, if you will.

■ While their students enjoyed the Easter vacation, French schoolteachers gathered to acquaint themselves with what will soon be an important part of their classrooms — microcomputers. Playing the role of students, the teachers began to learn how to impart the basics of computer literacy.

The French government has placed orders for 120,000 micros — mostly manufactured by French companies — and related software to be installed by 1986 in schools from cosmopolitan Paris to the quaint villages in the country's wine-growing regions.

■ In lieu of a telephone book, a Frenchman turns to the Minitel terminal on his desk and types in a request for a phone number. The Minitel is a small, dumb terminal attached to the telephone and provided by the French Postal Telephone and Telegraph (PTT) agency. In addition to replacing the phone book for some 700,000 current users — a figure that is expected to grow to three million by 1987 — the Minitel provides access to a variety of informational data bases supplied by third-party vendors through the PTT. The phone number data base alone currently consists of approximately 22 million listings.

■ A businesswoman walks into a Crossroads 2000 (X2000) Center in the Defense section of Paris, leafs through some product literature and proceeds to operate a vendor-supplied micro. The X2000, a government-sponsored agency affiliated with the larger Agence de l'Informatique (ADI), currently operates a network of roughly 180 such centers designed to introduce all types of people to computing.

In addition to conducting seminars on the use of micros in the home and in small business, the centers provide access to a variety of systems and software for users to try. Plans are to extend the network to 1,000 centers by the end of 1986.

> *'We decided to make everyone aware of the importance of computers as something they can understand and dominate. The purpose is to give everyone awareness and knowledge.'*
>
> —Olivier Marec
> ADI

■ An architect stands before a detailed miniature version of the city of Paris. He points to the model of a building in the Defense section that lies directly down the Avenue Charles de Gaulle — a straight line to the Arc de Triomphe. The towering, innovative, cubic building will be the home of the International Crossroads of Communication agency when it opens in 1988.

The government-sponsored agency, its supporters say, was born of a recognition of the growing importance of communications technology. Its primary goals are to train French citizens in the use of modern technologies and to spur innovation in communications.

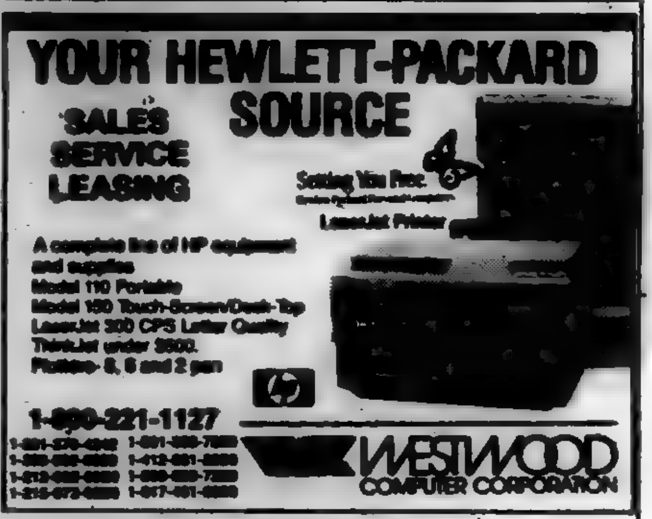
What these postcards have in common may not be visible on the surface. Underlying each of the scenes is the French national commitment to apply available computer technology to day-to-day life. ADI President Olivier Marec said, "We decided to make everyone aware of the importance of computers as something they can understand and dominate. We are not trying to train a generation of computer professionals. The purpose is to give everyone awareness and knowledge."

To those accustomed to reading about fifth-generation projects, high-end IBM Sierra-class mainframes and U.S. Department of Defense-approved Ada compilers and programming environments for mission-critical applications, France's efforts must appear distinctly "low tech."

But on closer inspection, the merits of the French approach become more obvious. The French have recognized that computer and communications technology is rapidly encompassing all facets of everyday life. Are there not strategic and commercial advantages to be gained, they contend, by preparing the populace for the increasingly computerized world of the near future?

Compare the situation in the U.S., where, for example, computer education in public schools varies in quality, depending on the relative wealth of the community that supports the schools or on the beneficence of computer manufacturers. That is hardly the proper method for ensuring the spread of computer literacy. The anemic home computer market may be just one testament to the inappropriateness of that laissez-faire attitude.

The French plan to share the wealth of technology is likely to be ignored amid all the news of leading-edge advances in computers and communications. The U.S. will likely be recognized for some time to come as the world leader in information processing technology. But as the current administration pursues megabucks funding for space weapons and other high-tech armaments, it might be wise to remember that a nation's most important asset is its people.



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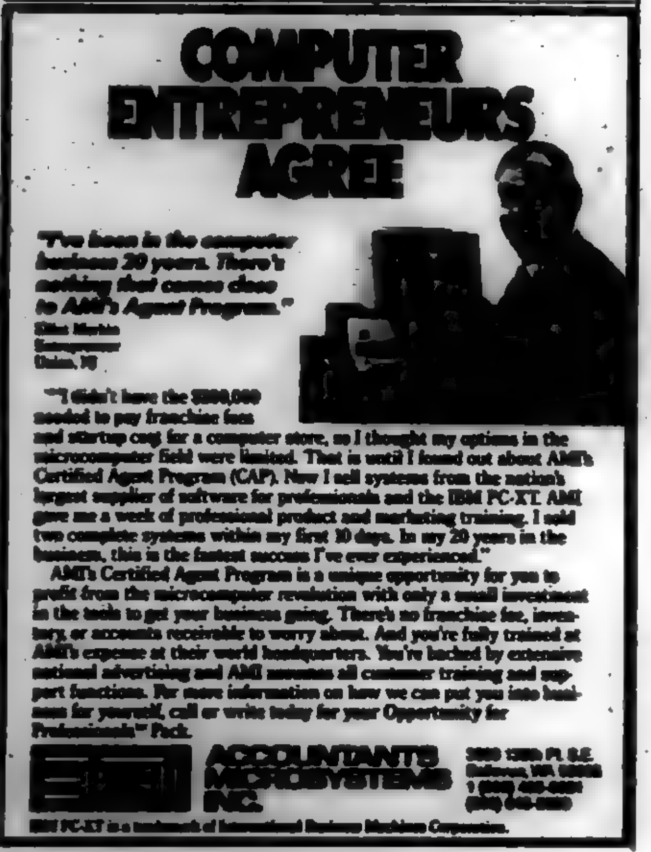

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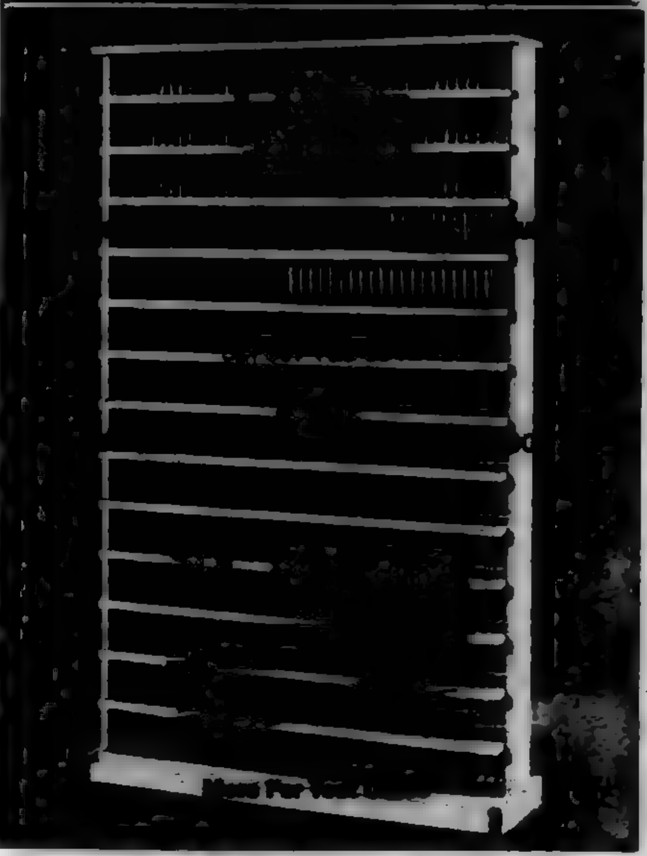

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INTERNATIONAL REPORT
CW International News Network

BELGIUM

BRUSSELS — The Society for Worldwide Interbank Financial Communications (Swift), announced the delay of its network conversion from Swift I to Swift II. The delay in converting the intercontinental banking network is attributed to Burroughs Corp., the main systems supplier for Swift. Burroughs reported that testing its communications processors took longer than expected. The network conversion is now slated to take place during 1986.

CHINA

BEIJING — Tianjin Computer Corp. will mass-produce 16-bit microcomputers here under the terms of a recently signed agreement between General Robotics Corp. and the Coordinating Committee for International Security Export Control in Paris.

DENMARK

COPENHAGEN — A validated Ada compiler is being jointly developed here. The Commission of European Communities (CEC), an international consortium, announced that a $1.2 million development contract was divided among three companies: STC Ltd. in Norway, which will be the primary contractor, Britain's International Computers Ltd. and Dansk Datamatik Center in Denmark.

FRANCE

PARIS — Although created in France, the Ada computer language has had difficulties in this market. At a recent Ada seminar held here, it was revealed that only two French software firms offer Ada products, one of which is the company founded by Jean Ichbiah, who developed the high-level language while working at Bull. One of Ada's main obstacles in the market here is the French Ministry of Defense, which promotes the use of LTR3, an advanced language developed in-house, as opposed to Ada.

JAPAN

TOKYO — Kokusai Denshin Denwakyoko (KDD), an international telephone company based here, has developed a communications method for transmitting voice and color moving pictures at 64K bit/sec. KDD's video communications method integrates a 16K bit/sec. voice signal and 48K to 64K bit/sec. color moving pictures, the company said. The transmission process leaves out information related to brightness and color variations and is able to transmit a condensed image, KDD said. Testing is expected to be completed over existing lines this year.

■

TOKYO — Lotus Development Corp. recently announced the establishment of a wholly owned subsidiary here called Lotus Development Japan. Lotus also announced a joint development agreement with Kanri Kogaku Kenkyusho Ltd. (K3), a Japanese software house based here. Lotus plans to license K3's Kana-to-Kanji conversion technology.

MEXICO

MEXICO CITY — Only 68% of large companies in Mexico use computers, according to *Computerworld Mexico*. Of the medium and small companies here, only 6% to 7% reported using computers.

In firms using computers, however, demand is rapidly escalating for data processing power and storage. Many of these companies are maintaining data bases of two million to five million lines of Cobol code.

NORWAY

OSLO — Norsk Data AS has joined the growing list of computer vendors offering fault-tolerant or redundant options for their processors. The company recently announced the Fault Tolerance Extension, an add-on that enables users to share files, disks and peripherals among two or more of the vendor's minicomputers, building redundancy into the system without adding another processor.

WEST GERMANY

KARLSRUHE — Software programs will now have the protection of copyright laws here. According to a May 13 announcement from the Supreme Court of the Federal Republic of Germany, programs will be protected by law if they are proven to be "personal intellectual creations."

■

HAMBURG — A shortage of qualified personnel is the most pressing problem for DP managers here. According to Heinz Streicher of the consulting firm SCS GmbH, which conducted a poll on the subject, this situation will not improve in the near future. Finding experienced analysts and DP managers presents the biggest problem, Streicher said, and most companies (58%) wind up promoting people to these slots from within the organization.

In conjunction with this trend, the policy in 80% of West German DP departments is to encourage continued education and training for their employees.

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CALENDAR

WEEK OF JUNE 23

JUNE 24, ORLANDO, FLA. — **Symphony Macros/Menus.** Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 24-25, ORLANDO, FLA. — **CICS Systems Generation and Tuning.** Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

JUNE 24-25, NEW YORK — **Nynex and Telecommunications in the Northeast.** Contact: Telestrategies, Inc., P.O. Box 811, McLean, Va. 22101.

JUNE 24-25, NEW YORK — **Managing Systems Projects.** Contact: New York University School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

JUNE 24-26, PARSIPPANY, N.J. — **Vsam in Cobol.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JUNE 24-26, VANCOUVER, B.C. — **Auditing in a Data Base Environment.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JUNE 24-26, NEW YORK — **Videotex '85 International Conference and Exhibition.** Contact: Online Conferences, Inc., 989 Ave. of the Americas, New York, N.Y. 10018.

JUNE 24-26, BOSTON — **Facilities for Auditing Within IBM's MVS Operating Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JUNE 24-26, BOSTON — **Auditing and Control for IMS.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

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JUNE 24-26, BOSTON — **Audit and Control of CICS.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JUNE 24-26, BRUSSELS — **International Electronic Printer Industry Conference.** Contact: Stephen Pytka, C. A. Pesko Associates, Inc., One Snow Road, Marshfield, Mass. 02050.

JUNE 24-27, SAN ANTONIO — **CICS/VS Applications Design.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 24-27, LOS ANGELES — **Vsam: From Start to Finish.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 24-27, SAN JOSE, CALIF. — **Network Management/Technical Control Conference and Exposition.** Contact: Network Management/Technical Control Conference and Exposition, P.O. Box 880, Framingham, Mass. 01701.

JUNE 24-27, WASHINGTON, D.C. — **IMS/DB (DL/1) Application Programming.** Contact: On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

JUNE 24-28, NEW YORK — **Workshop in Data Base Audit and Control.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JUNE 24-28, ORLANDO, FLA. — **CICS Programming Workshop.** Contact: Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

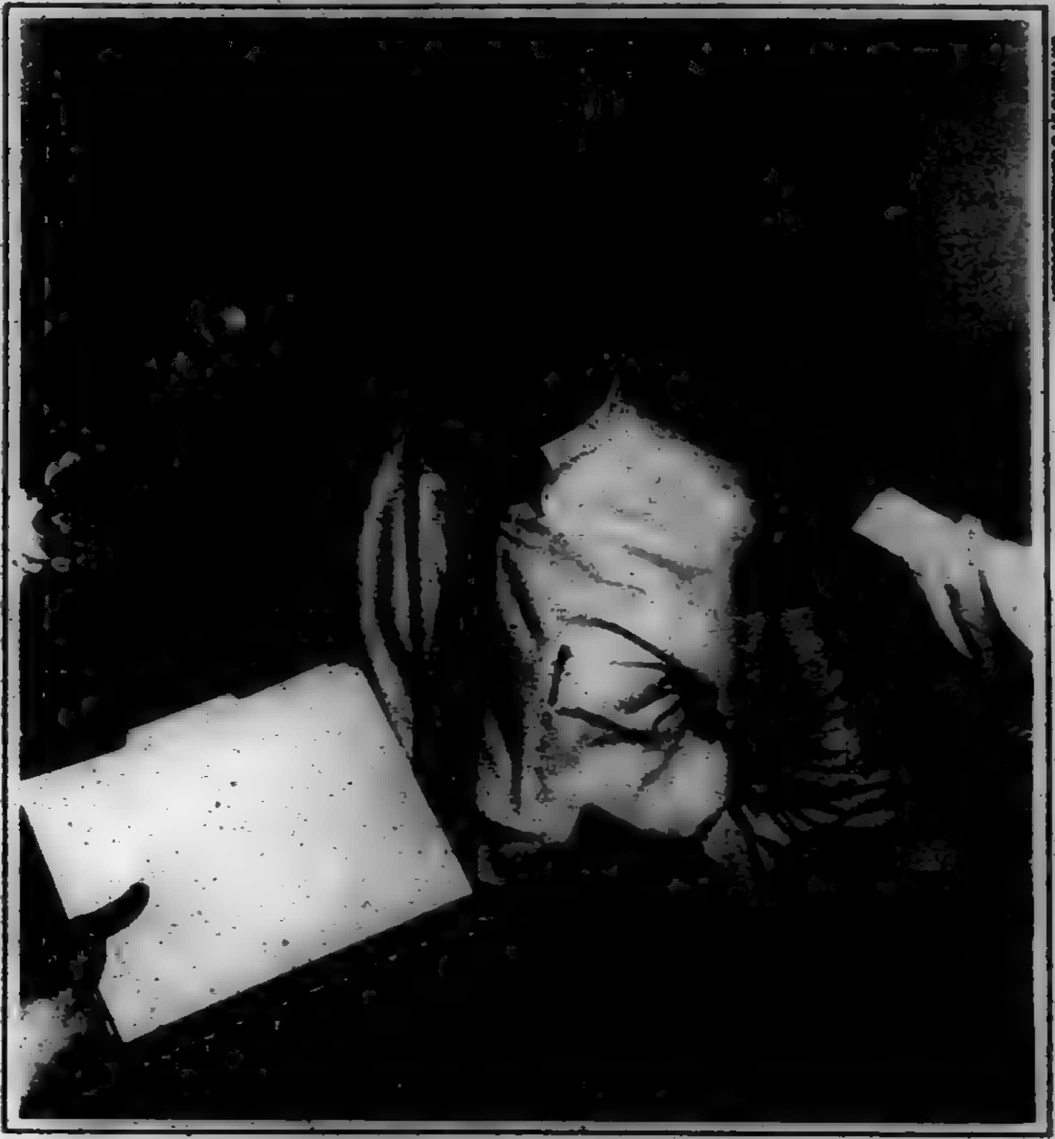
JUNE 24-28, WELLESLEY, MASS. — **Systems Analysis Workshop.** Contact: QED Information Sciences, Inc., P.O. Box 181, Wellesley, Mass. 02181.

JUNE 24-28, CHICAGO — **CICS Internal Architecture.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 24-28, NEW YORK — **Vsam.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JUNE 25, CARY, N.C. — **SAS Services Workshop.** Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

JUNE 25-27, NEW YORK — **Effective Management Techniques for Data Processing Managers and Project Leaders.** Contact: Abbott, Galvani Associates, 1850 Union St., San Francisco, Calif. 94123.



CW PHOTO BY O'CONNELL/[illegible]

So now you're a manager

By R. E. Nienburg
and M. C. Steele

The move from a professional position to one in management is almost always viewed as a promotion in today's business world. Such a move generally results in greater responsibility within the organization and greater influence on its success.

Unfortunately, it is not always recognized that such a promotion represents a dramatic change. Here is a person, presumably doing a better than average job in a profession that required four to six years of training, who is entering an entirely different profession — with no training whatsoever. How is a programmer or engineer or mathematician supposed to have become skilled in the art of managing people and projects? By osmosis?

Because managers generally command higher salaries, we tacitly admit that their jobs are tougher; but where is the equivalent for the management job of the years of training the employee needed to become competent in the technical assignment?

Make no mistake: The skills required to succeed at the professional job are not the skills needed to perform well after the promotion to

> ”
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> *The management role can be taught. The transition from productive technical person to good leader need not be an ad hoc reaction to environmental pressures. The process of building a new role model can be the result of formal learning, introspection and guidance.*

management. A true identity change is necessary. The way the individual goes about that identity change has a lot to do with how quickly and successfully the transition is made.

New identity

The need for a new identity can most readily be understood by comparing what constitutes success for the new manager with what was successful behavior before the promotion. Success criteria for the new manager are based on the success of the group managed, not the manager's personal contribution. The new manager's preoccupation should be with the group's effectiveness, not personal effectiveness.

Stated differently, the primary focus of a manager should be on the means of getting the job done, not on doing it personally. The manager makes a more meaningful contribution by concentrating on those responsibilities uniquely the manager's than by simply acting as one additional individual contributor.

Unfortunately, a brand-new manager is rarely given a comprehensive view of what these unique responsibilities are or what constitutes successful behavior in the new role. The management role can be taught. The transition from productive technical person to good leader need not be an ad hoc reaction to environmental pressures. The process of building a new role model — because that's what we're really doing — can be the result of formal learning, introspection and guidance.

We all carry, either subconsciously or as a result of a deliberate thought process, a set of beliefs and convictions about what our jobs are. This set of beliefs and convictions determines our reactions to external stimuli and how we will respond to various day-to-day pressures. It provides a mental model of how we see our roles — hence, a role model. It is a gyroscope that gives an element of stability to our actions.

Now consider the plight of the brand-new manager, whose role model had been the good technical citizen. Suddenly, that role is no longer the most productive. If the old role model is simply discarded, what remains may be, at worst, a void, or at best, some partially formed ideas based on observations of managers in the immediate area. Unfortunately, we have all been exposed to too many managers whose role model changes from day to day, or worse, from situation to situation.

View becomes reality

There is a lesson regarding self-fulfilling prophecies that comes from the Pygmalion theory: stated simply, it says that the view you hold about your role as a manager will determine what kind of a manager you become.

Unless you are one of the fortunate few working for a truly competent leader who will guide you through the transition and who serves as a model, you are on your own. Without some study and conscious thought, you will probably arrive at a management model as a reaction to the environmental pressures you experience from day to day. Not only will you learn some pretty bad habits, but it will take you considerably longer to arrive at your management style.

If, on the other hand, you develop your role model as a result of conscious study and introspection (and, where possible, thoughtful outside guidance), this crucially important transition can be a rational process. The amount of time during which you are operating with an obsolete model (or a void) can be minimized.

It's not unlike learning to ski. You can buy the equipment and hit the slopes without any preparation; you might even survive. You can just follow some other skiers around and see how it's done. Just please ski on some other slope.

The transition

The manager has special responsibilities that will make the group more productive over the long haul. These tasks include:

- Establishing and/or clarifying the group charter.
- Instituting clear, measurable goals and working for their acceptance.
- Developing subordinates.
- Providing a sense of job satisfaction for subordinates.
- Continually improving the work process and environment.

The manager is the only group member in a position to accomplish anything of substance in these important areas. If the manager does not attend to these areas, no one will. Because the long-term effect of attention to such matters is very positive, it follows that a manager's role should include them.

There is an another critical point to consider when deciding who you really are as a manager: You should be just as concerned with what the job responsibilities are not as with what they are.

The sometimes overwhelming temptation to hold on to too many of the tasks that were yours as a technical person, because your were comfortable doing them, is an insidious trap. Don't divest yourself of all technical work. After all, you were promoted because of your contributions on the technical side. But you are now in a position to spread your experience over a larger segment of the organization.

Recognize that your first priority is the long-term productivity of your people. After attending to your first priority, apply your experience where it will do the most good.

Prototype role model

A wealth of written material can be studied in pursuit of an effective role model. Unfortunately, much of this information creates the illusion that a manager's job is a never-ending cycle of planning, organizing, coordinating and controlling.

Although these functions are critical, knowledge of the functions gives no insight to understanding what an effective manager actually does. Knowledge does not aid directly in trying to formulate a model of the day-to-day activities that constitute a working manager's day.

In a landmark study, Henry Mintzberg recognized the fallacy of defining the managerial role solely by functions, and he set about correcting it. Through an in-depth study of what effective managers actually did with their time, he began to formulate a role model. His prototype does not necessarily represent how things ought to be, but what they actually are.

Mintzberg's assertion was that most managerial actions can be categorized as one of three specific roles: interpersonal, informational or decisional.

Interpersonal roles:

Figurehead — performing "ceremonial" duties.

Leader — training/motivating/encouraging/reconciling individual needs with the goals of the organization.

Liaison — interfacing with peers and other people outside the unit.

Informational roles:

Monitor — scanning environment for information and receiving unsolicited information, often as gossip, hearsay and speculation.

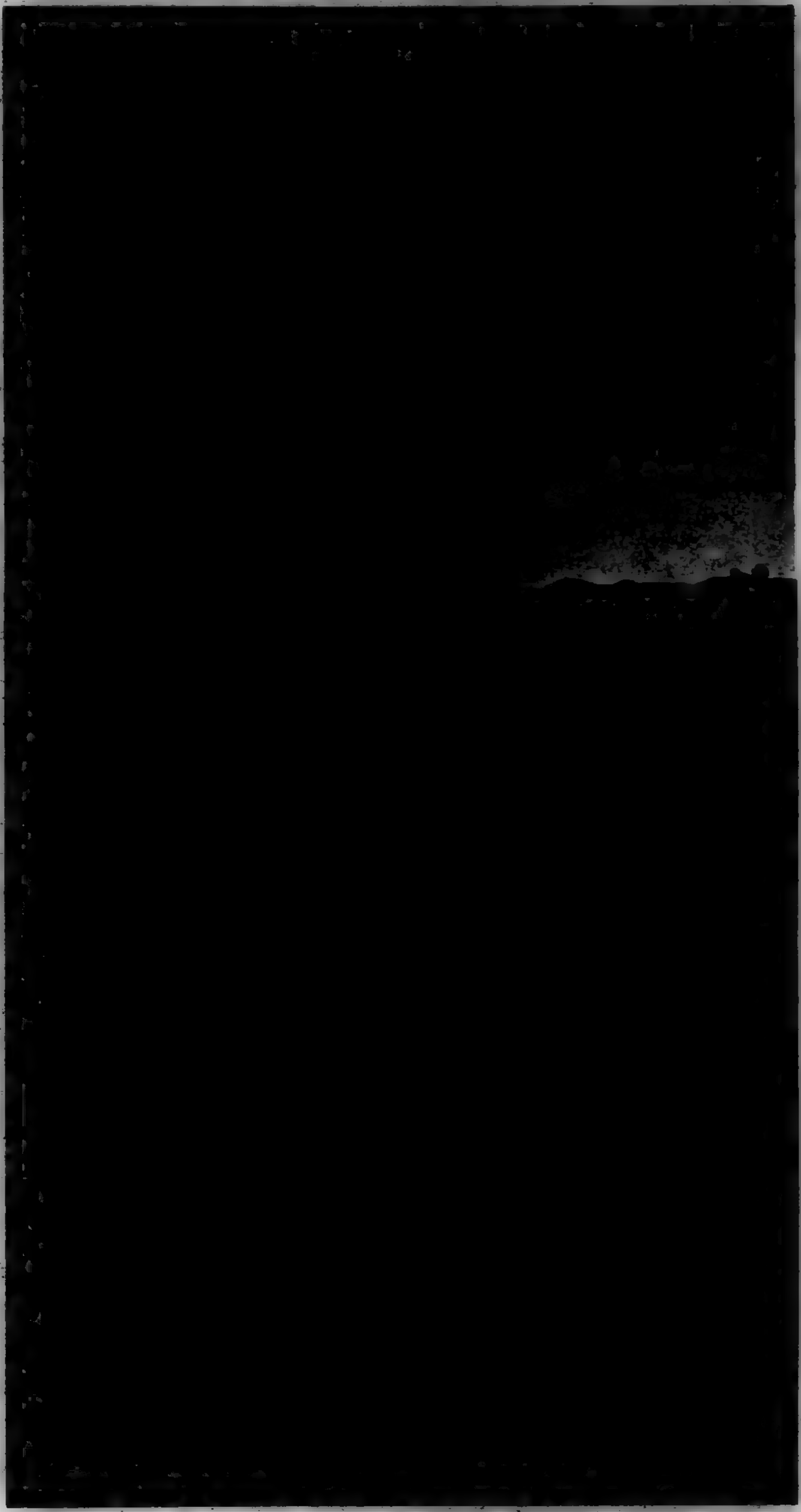
Disseminator — sharing information with subordinates who would otherwise have no access to it.

Spokesperson — sharing information with people outside the unit; informing influential people who affect the functioning of the unit.

Decision roles:

Entrepreneur — seeking to improve the unit; adapting it to changes in the environment.

Disturbance handler — responding to pressures/changes beyond the manager's control.



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How might such a model be useful in your pursuit of a role model? It can certainly serve as a suggested format; but more important, it can be adapted to a variety of specific situations. By carefully considering the needs of your current job, you can use the model as a checklist and borrow the roles that seem important; the others can be relegated to second-order value. The result is an effective beginning to a conscious, deliberate conclusion about how you want to manage, and hence, how you will manage.

It was asserted earlier that a manager can make a more meaningful contribution to group effectiveness by tending to the unique managerial responsibilities than by simply assuming the role of one more group member.

The principal justification for this assertion is that a highly motivated group will produce more output than a poorly motivated one, up to two or three times as much. If you are managing a five-person group and take on the role of sixth group member, you can increase group output by an additional 20%. If, however, you apply those skills that result in a well-motivated group, you can double or even triple the output over that of unmotivated employees.

As a first- or second-line manager, you can have a direct, first-order impact on morale. Most of what can be done to provide maximum job satisfaction for your people doesn't require getting anyone's permission or producing a cultural revolution. Providing satisfaction requires only some basic, learnable, people-oriented techniques: motivation, delegation, participative management and communication.

What is motivation?

Almost 30 years ago, Frederick Herzberg wrote a paper on motivation that should be required reading for anyone who wants to become an effective manager. One of his principal points is that there is a difference between things that motivate people and things that demotivate them — that is, motivators and demotivators are not opposite sides of the same coin.

The history of industry efforts to motivate people began with such measures as giving employees more time off (ending the 6½-day work week) and proceeded to more pay, more benefits, better communication downward, better two-way communication and so on.

After each step, an astonishing fact was clear: The question, "How can we motivate our people?" still persisted. What became apparent was that these measures were essentially bribes to continue working, not true motivators to work harder. They could be likened to charging a battery to keep it operational, when what was desired was to install a self-starter in employees so they would work harder because they wanted to work harder.

So the question of what motivates people persisted. And finally, someone said, "Let's go ask them."

A series of in-depth interviews was conducted that asked two general questions: Think back over your working career and recall events that made you feel good about your job — What were the things that made you feel positive about getting up in the morning and going to work? The second question asked people to identify events that made them feel the opposite.

For each event identified, the interviewer explored further to isolate factors that caused these positive and negative reactions. The results are important to any new manager and should be basic to every management development course.

Mentioned most frequently along with "good" events are motivators; mentioned most frequently with "bad" events are demotivators.

Why are these findings so significant to first- and second-line managers? Because the top motivators identified by the study — achievement, recognition and advancement — are under your direct control. You can do something about them without having to get anyone's permission. And the motivators are the factors that produce the self-starters. Let's carry out these motivators a little further:

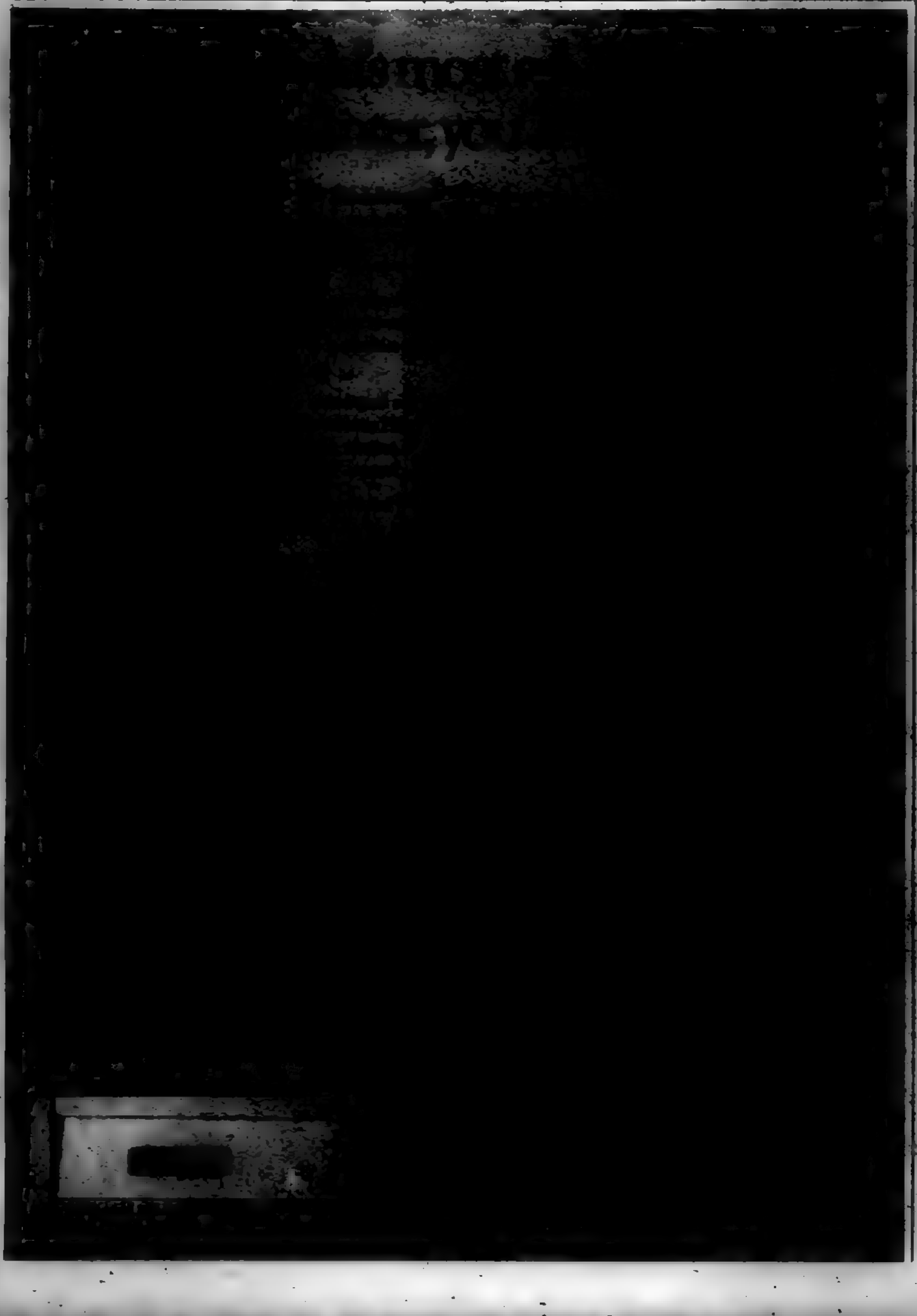
- **Sense of achievement.** — Set realistic but challenging goals to generate a sense of personal success.
- **Recognition.** — This can range from a simple thank you (best done in public) for a job well done, to an award at a group lunch or a formal letter of praise.
- **Advancement.** — Besides formal promotion, consider giving assignments of increasing responsibility or delegating some of your management tasks as a training opportunity.

The important point is that you use the motivators. Working these factors into your management style can pay enormous benefits in terms of group effectiveness, as well as making you a leader for whom people would like to work.

Learning the art of delegation can make the difference between a mediocre manager and a good leader, between a disgruntled, bickering group and a high-morale team. Delegation is easily taught but seems to be seldom practiced.

What is delegation?

Delegation is not a casual request to a subordinate, such as "Give me a hand with this, will you?" It is not passing a five-minute chore to someone as you meet in the hall. To realize maximum benefits, the delegation process must be careful, deliberate



and significantly more formal. The objectives of delegation are to:

- Make the best possible use of the total energies and capabilities of your organization.
- Do work and make decisions at the lowest organizational level capable of performance acceptable to you.
- Free yourself as much as possible to concentrate on your own functions.
- Match tasks to be done to the growth needs of your people.

There are four formal steps in delegation: planning, contracting, tracking and terminating.

Planning — define the responsibility.

A careful review of your organization's total work load should reveal a work structure or logical task breakdown. After considering the work structure and delegation objectives, identify specific tasks to delegate. You must explicitly define task objectives and what deliverables are to be produced. Objectives and deliverables must both be expressed in measurable terms. What constitutes success cannot be ambiguous.

Consider the talents, experience levels and desires of your subordinates, and match tasks to people. Selection of the right person is an important aspect of delegation. Availability should never be the only criterion. It is better to change assignments to achieve a good match than to make a poor assignment.

Selecting the appropriate level of authority to delegate to the person chosen is another important aspect of delegation. For example, do you want the person simply to gather data for you to make the decision? Do you want someone to recommend a decision or just complete the assigned task and report back the results?

Finding the appropriate authority level depends on such factors as the experience level of the person chosen, the amount of control you feel the task demands and your level of trust in the success of the communication.

Contracting — communicate the responsibility and authority; fix accountability.

Armed with task objectives and measurable success criteria, hold a negotiation session with the people to whom you are delegating tasks. Bring them completely into the picture; present all the background information that you would use if you were to do the task yourself. Discuss explicit objectives and deliverables along with the specific authority level you are delegating.

The contracting phase includes fixing accountability. You and the person you assign negotiate an agreement about the amount and type of information to be provided to you as work progresses. This is your means of delegating authority without losing control.

Periodic progress reports, delivery of interim results and successful completion of milestones are examples of techniques you can use to ensure that the task is on track. Make sure that your expectations are expressed and documented so neither of you will be surprised along the way.

The last step of the contracting phase requires that you solicit feedback. Getting feedback ensures that your expectations are understood and accepted. Make sure the person has everything he needs to succeed and that he can and will do the job. This process not only ensures that communication was good, but it also produces a sense of ownership on the part of the delegates for the job to be done.

Tracking — check progress toward goal.

Once you and the delegates have agreed upon the job, the success criteria and means of accountability, you must have a mechanism to ensure that commitments are kept. Sloppy, permissive tracking produces a group culture that doesn't care much about promises. You can generate a professional, businesslike attitude toward all intergroup commitments by relatively simple follow-up techniques.

Terminating — recognize accomplishment.

Completing a task allows the opportunity to provide feedback, counsel and recognition. One significant side benefit of skillful delegation is the sense of personal accomplishment delegates receive from reaching clear, relevant, realizable goals.

Benefits of delegation

Aggressively and correctly pursued, delegation can fire up a group. When people believe they have a significant piece of the action, when they can see the connection between their efforts and organizational success, there is a commitment and dedication to group goals that optimizes group performance.

Proper delegation encourages people to grow. By delegating increasingly responsible tasks and greater authority, you provide goals that are enormously satisfying and motivating. Furthermore, your opportunity to coach and provide positive feedback raises both trust levels and group competence.

But first and foremost, proper delegation gives you more time to manage. As your people grow and feel comfortable with your style, decisions will be made at lower levels, intergroup cooperation will increase because roles are clearer and the need to check everything with you will decrease.

Obstacles to delegation

If the art of delegating is so straightforward and the benefits so clear, why isn't it used more frequently? The reasons include the following:

- An up-front time investment is needed to produce a well-informed group to whom delegating high-level

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> *You need to recognize when an intended message is being distorted by emotions; then deal with the feelings first, before attempting to get to the intellectual part of the message.*

tasks is reasonable.

■ Each task requires an up-front time investment for the formal delegation steps outlined above. Your initial reaction may be, "It will take me more time to delegate than to do it myself." That may be true the first time or even the first three times, but in the long run proper delegation will give you more time to manage.

■ You may fear losing control —"the ultimate responsibility is mine and can't be delegated; therefore, I'd better do it myself." (Pray for 48-hour days, an understanding family and limitless stamina.)

■ A new manager is sometimes uncomfortable getting his sense of accomplishment through the efforts of others and may feel a continuing need to demonstrate to upper management the same kind of output that earned the promotion to manager.

■ Finally, there is the security-blanket syndrome: "If all the technical work that I understand so well is delegated, what will be left to do?" That is a truly groundless fear, for there is so much to do in the managerial realm.

Participative management

Participative management is another technique that you should thoroughly understand as you develop a role model. While it is discussed by many as a self-evident technique, as practiced, it covers a broad range of approaches.

Two specific views bear mention. Participative management is:

Definition 1: Ensuring that everyone affected by a decision is fully informed about the reason for the decision, brought into the picture about their expected roles and given an opportunity to discuss the best way to reach the objectives that have been established.

Definition 2: Providing an opportunity for all group members to share in deciding both what is to be done and how best to do it.

It is interesting to note how frequently people use definition 1 when thinking of their subordinates and definition 2 as the style they expect of their bosses. In fact, definition 1 is a laudable practice. Aninformed group is in a much better position to operate with wisdom when unforeseen circumstances are encountered. It is not, however, participative management: It is good personal relations.

The objectives of participative management are twofold: to involve your group in the process of making decisions so as to tap their experience and expertise and arrive at the best possible decisions; and to give group members a sense of ownership for the decisions made and a sense of responsibility to meet successfully the objectives defined.

This is not to advocate majority rule, democratic voting, permissive management and so on — simply involvement in the decision process. Involvement does not mean decisions must be unanimous. It doesn't mean compromise so that everyone is equally unhappy. It means involvement.

Even in those instances when a person loses a hotly contested point, being involved in the process and having his point of view heard is important to a sense of having some control over one's destiny.

A good participative manager:

■ Gives subordinates a share in decision making whenever possible and actively seeks group help in arriving at directions.

■ Communicates effectively with the group and keeps subordinates well informed about any issues affecting decisions and group direction.

■ Ensures that crisp decisions are made and acted upon and interminable debate is avoided.

■ Actively works at maintaining high group morale.

■ Works at developing subordinates to take on more responsibility.

■ Listens, is approachable and willing to make changes in the way things are done.

■ Is supportive of subordinates even when they make mistakes.

One caveat must be included. If an issue is not negotiable, either because you have already made a firm decision or because a decision has been handed to you as not negotiable, don't attempt to delude the group into thinking they are involved in making it.

In such an instance, simply be honest — present the decision in its true light. If you don't, the group may not come to the decision that you want, leaving you in the position of having to say, effectively, "I don't care what you think, we're going to do it my way."

In other words, you appear willing to negotiate when in fact you're not in a position to do so. You will be spotted as a phony very quickly, and your credibility will be badly dented.

Art of communicating

If you can't communicate effectively, you probably won't succeed as a manager. It is unfortunate that this skill is one of the more difficult to acquire by solitary reading, with no opportunity for classroom guidance, role-playing experience, observed behavior and so on. Being aware of some of the generally accepted principles may be helpful, however.

When communicating with subordinates, you, as a manager, should accept primary responsibility for effective communication. By virtue of your managerial role, you are in a

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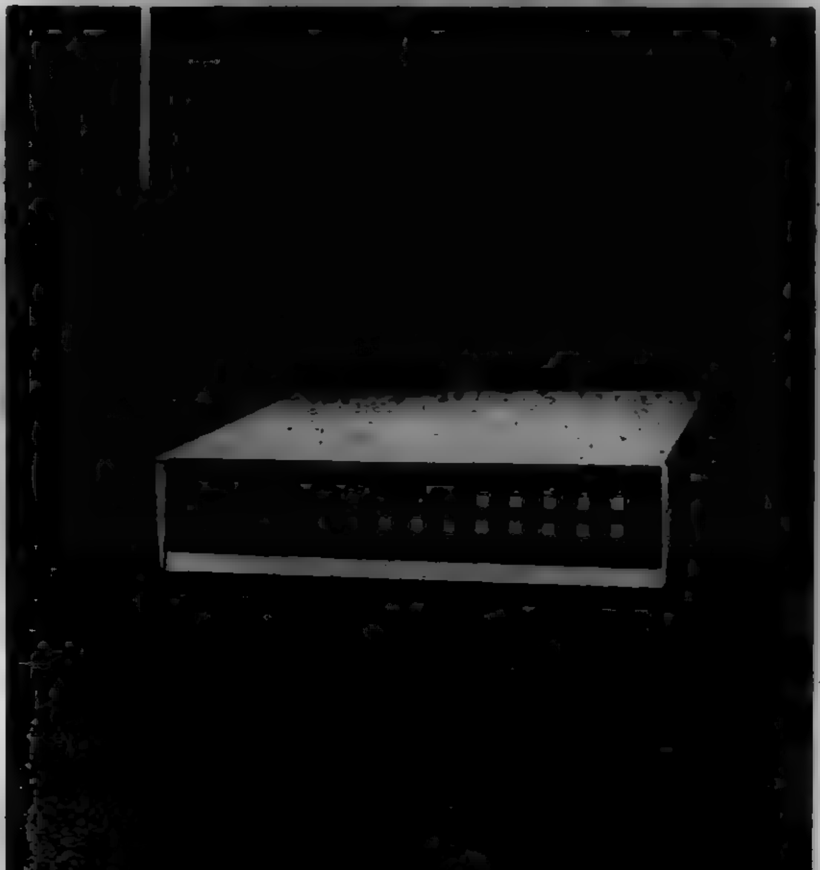

better position to control the conversation than the subordinate. Also, because communicating effectively is such an important portion of your manager's arsenal, it is something you should be expected to practice.

You need to recognize when an intended message is being distorted by emotions; then you must deal with the feelings first, before attempting to get to the intellectual part of the message.

Acceptable behavior

The most effective way to deal with feelings is to establish that it is acceptable behavior to be open about feelings; you must be open about your feelings as a standard mode of operation. If you are, it invites openness on the part of your group; reacting to and dealing with feelings becomes much less threatening.

By setting an example, it is possible to acknowledge emotions that interfere with good communication and defuse them first. Doing so usually permits both of you to proceed with the job of understanding the real intent of the message.

There is a specific technique, called active listening, whose objective is to facilitate the defusing process. It takes some practice to become adept at using the technique.

Opening up

To some degree, the term active listening is a misnomer, because it is not concerned with the mechanics of listening. The technique is intended to open up the sender by responding in a particular manner to an emotional message. What you are attempting to convey when practicing the technique is the following:

- You are aware of the feelings of the sender; you recognize anger, disappointment, frustration or whatever the projected emotion appears to be.
- You care about these feelings and do not sit in judgment of the sender.
- It is perfectly all right to deal with the feelings first; we'll get to the cognitive message afterward.

The way in which these messages are conveyed differs depending on circumstances, but basically it is a question of mirroring the sender's emotions back to the sender, with a completely nonjudgmental statement, and then waiting for confirmation and a response indicating a willingness to deal with your perception. The effect is generally a reliable cycling down of the distortion caused by the disturbing emotions.

Defensive reactions

By contrast, there are times when a new manager can be the cause of distortion without realizing why. Messages to a peer that were completely accepted the day before your promotion to a managerial position can produce defensiveness that inhibits communication the day after the promotion. By virtue of your role as a manager, the same message takes on a different meaning. This happens most frequently when the message is perceived as judgmental rather than objective, or as indicating superiority rather than equality or as being manipulative rather than problem oriented.

The stress must be on what is perceived. There is a much greater tendency to read judgment and superiority and manipulation into the messages of a manager than into those of a nonmanager. You must cultivate a sensitivity to these defense-provoking attitudes.

As with most human pursuits, the more skilled you become as a manager, the higher the financial and ego rewards. It may well be true that you are born with an innate management skill level. A conscious effort to learn and improve your abilities will enhance the chance of living up to your potential.

Management skills, like technical skills, can be acquired. You must view management as a new career, however, and you must exert the necessary energy to master it.

About the authors

R. E. Nienbury spent 30 years managing hardware and software product development efforts for IBM, Control Data Corp. and MSI Data Corp. He now has a consulting practice and teaches management courses for Integrated Computer Systems Co. of Los Angeles.

M. C. Steele is a communications consultant for CDC, with experience in communications management and operating systems software.

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EDITORIAL

What's to show for $4 billion?

If you had spent $4 billion on information services in one year and had little to show for it, then you'd have some idea how executives at major U.S. banks must feel right now. To say they are disappointed would be an understatement.

Four-billion dollars is the amount that U.S. banks and other financial institutions are believed to have spent last year on computer equipment, software and services. That estimate, made in mid-1984 by the market research firm Input, Inc. [CW, July 9, 1984], may be off a few million dollars, but that doesn't matter. The sums are still enormous.

What did all that money buy? Not much, according to a recently released study of executives at 200 banks worldwide, including 50 in the U.S., by the Big Eight accounting firm Touche Ross & Co. [CW, May 6].

Touche Ross found that banking institutions invested heavily in high technology in the late 1970s, but to date, none has emerged with any long-term competitive advantage in a highly competitive industry. The reason is that costs of computerization have risen in step with or faster than banking revenue, and the net return on investment has amounted to zero.

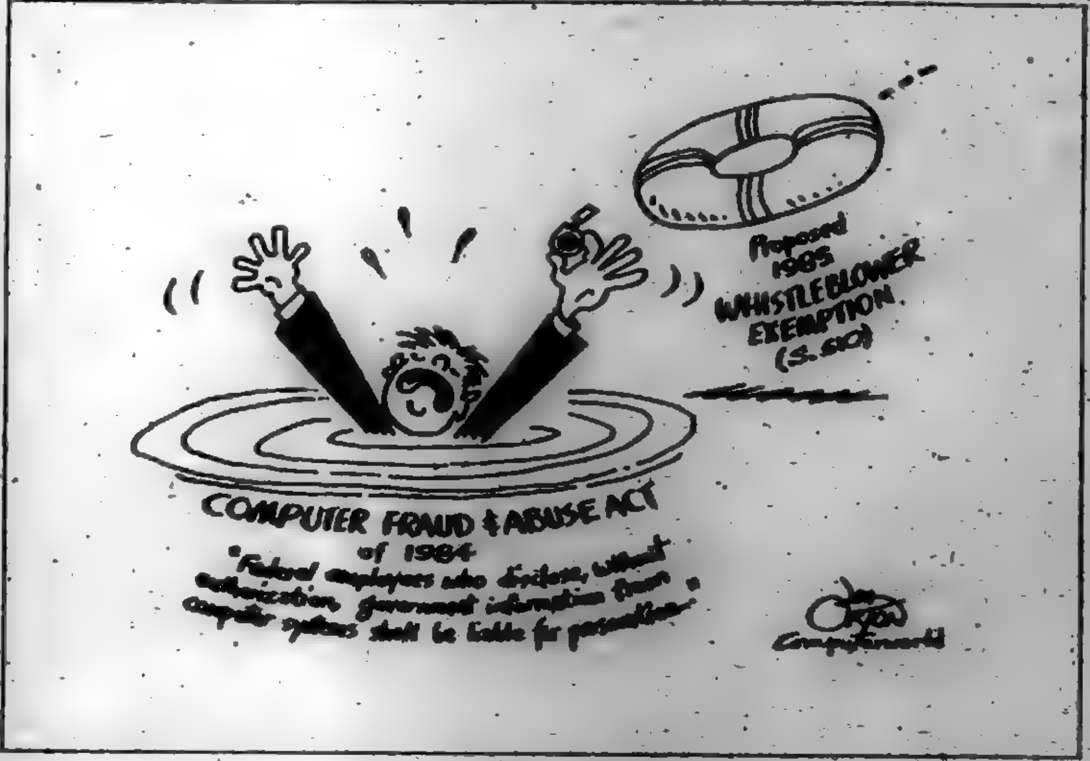
In all fairness, high-technology investments by banks have produced a number of benefits, including increased efficiency, self-service banking, branch automation, remote banking services and interbank network services. These have come about because banks are redefining their customer base and services while exploiting geographic market opportunities. There are some exceptions, but usually the services at Bank A are on a par with those at Bank B.

Parity may be acceptable in banking circles, and it may be worth $4 billion a year, but parity will be increasingly expensive in the future. Two key forces — the competitive drive for new on-line consumer products and the shift from local to regional, national and international banking systems — will force banks to spend more, not less, on computer purchases during the rest of this decade.

Touche Ross researchers said they believe bank expenditures on technology will "increase sharply between now and 1990." Input estimates that banks will almost triple their expenditures for computer equipment, software and services from $4 billion to $11 billion by 1989 — with the greatest increases allocated to integrated systems, application software products and on-line data base services.

Banking is a technology-driven business, which bodes well for vendors who supply products to financial institutions and for customers who use the banks' services. But other than trying harder to link the technologies they purchase to the marketing plans they devise — and thus remaining competitive — what do the banks get out of it?

At the end of this decade, will we ask the question: $11 billion for what?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Computerworld

LETTERS

Mac not only system that 'really works'

In the Special Report "Micros in big business" edition [CW, April 29], I was mildly surprised to see in the article "AT&T, Apple, IBM gear up for microcomputer war" the statement, "The [Apple Computer, Inc.] Macintosh Office concept is the only single-vendor offering of a complete personal computer/local-area network/laser printer workstation now shipping that actually works."

This letter was typed on a Xerox Corp. 8010 workstation and was sent over a Xerox Ethernet to a Xerox Laser printer so that it could be mailed to *Computerworld*. It appears here now, thus it works, just as it has worked for some three years since my firm started shipping the systems.

The whole system, in fact, provides much more than just a workstation/printer link. It can be used to integrate file servers, communications with host computers and other Ethernets, facsimile transmission systems, optical character readers, telex and teletex systems, word processors and both Xerox and IBM personal computers. As a result of Xerox's April 30 announcements in New York, the firm can now connect some 35 different types of devices to its local-area network.

As the article stated, Apple certainly has very clever marketing, but let's not forget who started all this and who still has the most comprehensive local-area network architecture available. To quote *The Wall Street Journal* in its May 1 issue, "Xerox's new products amount to one of the most highly integrated computer lines of any vendor."

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VIEWPOINT

Akihabara in a bag? Only in America

LIGHT ON SCIENCE
Charles P. Lecht

Part two of a two-part series.

Two weeks ago I told of how I bought a laptop computer in January and how my plans to use it on flights between New York and Tokyo were thwarted because of the unavailability of an RS-232 cable needed to transfer its files to my two land-based desktops.

The cable's manufacturer said it was "soon to be available." Until it was, all the data I entered into my laptop had to be re-entered into the desktops I used to archive my work.

I crossed the Pacific six times during the next several months, and at least a dozen times I contacted the laptop's manufacturer to ask about the cable's availability status. I awaited arrival of the day when "soon" would become "now" with forbearance, and I tolerated the keying and rekeying of my in-flight work with the stoic determination characteristic of a zealot in pursuit of a worthy cause. Only when I received an announcement of my system's successor was my faith shaken — surely they'd finish its predecessor before delivering a new system, so why was my missing cable still classified as "soon to be available"?

In our fast-moving computer industry, an announcement of a successor system usually indicates the abandonment of its predecessor, so I accelerated my efforts to pressure the manufacturer to make good his promise to make the cable available and soon.

It seems the manufacturer forgot I was alive. With each query I made I got the impression that not only had he decided to lay the previous system to rest, but he wished I'd join it.

When I received my last "soon" I told myself I would never again use the machine without the cable and embarked upon a full-blown quest for it. I vowed not to return without it, donned my Indiana Jones hat and headed for Akihabara — Tokyo's giant marketplace — where I knew it could be found, where anything electronic can be found.

It was hot and crowded in the Akasaka-Mitsuke subway station when I and my colleague, Jaime, descended its staircase to take the train to the stop near Akihabara. Akihabara is amazing because virtually every commercial establishment in view sells consumer and/or commercial electronics of some kind; glaringly absent are the jewelry, clothing, food, furniture, automotive, office supply and carpet stores Americans are accustomed to seeing. The latest of everything you've read about as "soon to be available" has been there a long time: home appliances that talk; video and mobile telephones; robotic devices that crawl, climb or simply walk around looking for something to do, undreamed of by Ray Bradbury when he wrote *Martian Chronicles*; music synthesizers that produce the sounds of every instrument; photon-sensitive panels that energize everything from radios to calculators; and other computing equipment. It's no wonder that as electronics go, they say, "If it can't be found in Akihabara, it can't be found."

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> *The latest of everything you've read about as 'soon to be available' has been at Akihabara a long time. It's no wonder they say, 'If it can't be found in Akihabara, it can't be found.'*

Behind the large, well-known department stores on Akihabara's side streets and in its alleyways are scores of other stores that sell almost everything found in Akihabara more cheaply. Most feature specialties otherwise not found: components, connectors, cables, wires, pins and even chips. The smaller the alley, the more shops; the smaller the shop, the more likely you are to find the unfindable. That's why we headed into the maze of tiny shops on whose shelves and in whose baskets are the tiniest, rarest and most difficult to come by electronic components there are.

We did not speak Japanese, so the quest bill wasn't going to be easy. Our sign language obtained responses of perplexing uneasiness, disdain and even disgust. We could not understand the continuous brush-offs we were getting; it seemed as though we were requesting something illegal. Only one person whom we approached spoke to us. In halting English, he said, "soon to be available, maybe in America." We knew we had failed.

Two days later we boarded a 747 jet for New York, and 14 hours later I was entering my apartment house, tired and carrying my soon-to-be-retired laptop in whose random-access memory was a new essay, one which I intended to discard along with the fated system. As I opened the door to my building, I literally ran into my TV repairman. He asked me why I was so down, and I told him the story of my unsuccessful quest in Akihabara in the form of an apology. "Hold your horses," he said. He knelt before me, opened his TV repair bag, stuck his hand into it and said "abracadabra" as he produced the missing cable. I gasped. "Where did you get it? Why are you carrying it around?" I asked. "I really don't know," he replied. "I've been carrying this silly thing around for five months wondering what it was for. Keep it!"

Only in America, I thought, is Akihabara carried around in a TV repairman's bag.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Seminar-influenced programs require some fine-tuning

MANAGEMENT MATRIX
Walter F. Cubie

You've heard the saying, "A little knowledge is a dangerous thing." It's the kind of thought that comes to mind when someone in your department (present company excluded, of course) comes back from a management seminar. The problem isn't with the seminars: It's with how much, or really how little, of the information presented actually gets back to the department and is properly applied within your company. Like all things newly minted, the concepts are shiny but nonetheless hard, cold and sharp-edged. It takes some circulation to warm them up, mute the tones and soften the edges.

It's easy to spot a recent seminar attendee — the person talks funny. In this person's parlance, managers don't help people do jobs, they "facilitate soft resources." Instead of saying, "I want to talk to you about Bill," you hear, "I'd like to share with you some of my nonaffective perceptions regarding your chief senior analyst resource." Usually, the seminarian wants to become an investigator. This is done by conducting an "exploratory study" — translated, that means he wants to nose around in your well-oiled operation. To conduct the study, the intrepid prospective investigator needs to collect meaningfully targeted data on existing personnel resources. This means new forms for your people to fill out. Naturally, MIS should be able to "throw together something quick and dirty" to do the data processing and is told so. "Next Wednesday will do fine, thank you."

Now, at this point, some managers will turn red in the face and refuse this instruction outright, but most will simply go along in the hope that the whole scheme will run out of steam in short order. Usually, some new and marvelous form gets added to the existing load of paperwork, the data gets collected, the project gets collected, and then the project runs out of steam. By then, it's too late; the data collection goes on, the forms are filled out, and the report is finally printed long after anyone has use for the information.

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> *Recent seminar attendees talk funny. In their parlance, managers don't help people do jobs, they 'facilitate soft resources.' Instead of saying, 'I want to talk to you about Bill,' you hear, 'I'd like to share with you some of my nonaffective perceptions regarding your chief senior analyst resource.'*

It is generally agreed that time has to be tracked so that there is some way of making charge backs and figuring a basis for estimating new jobs. You probably have some fairly simple and straightforward way of doing that now. The problem is when somebody proposes that you find you, say, the ratio of junior to senior analyst time spent on the maintenance of a new system. The information probably couldn't hurt, but you must figure out a way to limit the extra paperwork ahead of time, or you'll have a rebellion on your hands. Some ideas on how to do this follow:

■ Ask why. Will finding out that ratio help? If that number is the answer, what was the question? The bottom line is really whether this project is going to help you manage better and help your people work more productively. If it doesn't help, it's just academic information, no matter how interesting it might be.

■ Check your investigator's math. "Decimalitis" is a peculiar disease common to all those who dabble in statistics. Its course goes something like this — if it is good knowing how a worker spends his time by the day, by the hour is better and by the half hour is better still.

There's an illusion of accuracy in extended decimal places, but it's only an illusion. Take a look at how the statistics work. Is there really a half-hour resolution in anybody's workday? Do the units really mean anything?

Cubie is a senior associate with Nicholas DeMaio Associates in Bryn Mawr, Pa.

See CUBIE page 44

LETTERS

Token-bus not omitted

I am writing to point out a major inaccuracy in the Special Report "Communications Networks" edition [CW, Feb. 25]. The article "Standards key to continued network development" stated that products implementing the IEEE 802.4 token-bus technology probably will not be available until 1986.

In point of fact, Concord Data Systems, Inc. introduced its Token/Net local-area network in March 1983. Token/Net was the industry's first local-area network to comply fully with the IEEE 802.4 broadband token-bus standard. Concord Data Systems actively participated in drafting the IEEE 802.4 standard and currently chairs the IEEE 802.4 committee.

Token/Net was selected as the IEEE 802.4 network to link equipment from Allen-Bradley Co., Digital Equipment Corp., Gould, Inc., Hewlett-Packard Co., IBM and Motorola, Inc. in General Motors Corp.'s Manufacturing Automation Protocol multivendor network demonstration at last year's National Computer Conference.

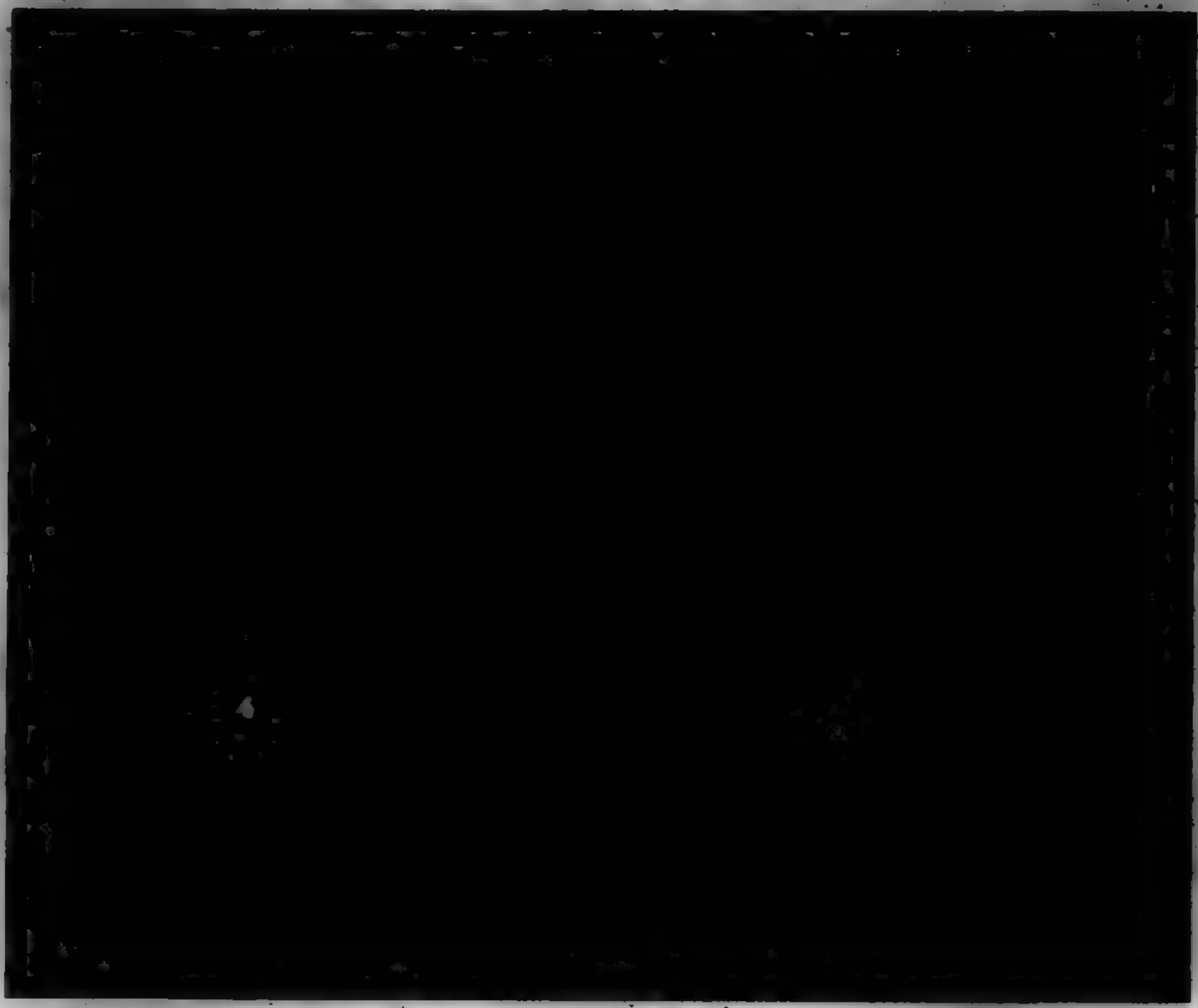
In terms of product availability, Concord Data Systems is currently supplying Token/Net components on an OEM basis to Philips Telecommunicatie B.V. of the Netherlands for its Sopho-Net local-area network and to Allen-Bradley for its Vistanet local-area network, and the firm has signed an agreement in principle to supply Texas Instruments, Inc. with Token/Net equipment for its Tiway II local-area network.

To date, more than 400 Token/Net components have been installed, and the system is under evaluation at 50 additional sites for both manufacturing and office automation applications.

Companies such as Ungermann-Bass, Inc., General Electric Co., 3M/Interactive Systems, Motorola and others have also announced plans to develop IEEE 802.4 networking products, some of which may indeed be on the market prior to 1986.

It is difficult to believe that Bridge Communications, Inc., a local-area network vendor itself, is unaware of the availability of IEEE 802.4-compatible products. It is this kind of erroneous and contradictory information that adds much confusion to a market that is understandably difficult for most people to grasp.

Ajit Bhatia
Waltham, Mass.



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■ Is there a good reason why everybody has to fill out this form? Even your seminarian will have to admit that the time spent by your people tracking time and filling out the form is pure overhead, not to mention aggravation. This aggravation comes in part from the time your MIS personnel spend filling out the form and also from their feeling of personally being measured.

If the real goal is some composite picture of the department, then you can still collect the data, preserve anonymity and simultaneously cut overhead by rotating the duty. If the study is on junior and senior analysts, have the people in your department draw straws in the morning so that the person with the short straw fills out the form for that day. There will be less but more reliable data collected because people tend to cooperate with a system that they consider purposeful and fair.

■ Try a zero-based forms budget. At some regular interval, say quarterly, pick up all the forms for all these studies and throw them out. Their perpetrators will have to justify them all over again if the study is to continue. If the argument is not as good or better than it was the last time, that requested study will stay out of the list. Nothing is immune, and no form is sacred. Include them all, right down to your humble weekly time sheets. (Sure, this will aggravate the investigators, but why should they have all the fun?)

■ Keep your own sense of perspective. Recent seminar attendees come back to their senses in time, and they are often better at their work because of the experience. It could be worse. You could have to deal with a newly minted recipient of a master's degree in business administration.

SOFTWARE & SERVICES

SOFTALK
John Gallant
CW Senior Editor

Awards salute mart's vitality

If you think it is impossible for an adult to beam like a child on Christmas morning, then you probably did not attend the recent International Computer Programs, Inc. (ICP) Million Dollar Awards & Executives Conference in Scottsdale, Ariz.

Outside the presentation hall at the posh Marriott Mountain Shadows resort, a small band of men and women milled about anxiously, talking animatedly and exchanging enthusiastic backslaps and handshakes. Many in the group had donned tuxedos, and more than a few self-congratulatory toasts were raised as the

See ICP page 52

Lisp defends AI foothold despite Prolog challenge

By [illegible]
CW Staff

Although the vast majority of artificial intelligence programming is done in the Lisp language, a challenger has appeared in the form of Prolog. Prolog (for programming in logic) was developed in France and England in the 1970s but did not gain much attention until the Japanese chose it as the official language for their fifth-generation push.

ANALYSIS

Although both are symbolic logic languages — as opposed to numeric languages like Fortran and Cobol — a debate rages over the relative advantages of Lisp vs. Prolog. Lisp, a 27-year-old language, has held its position as the language of choice for AI in the U.S. since it was created. Because it consumes so much memory, it never became popular outside the AI community where more hardware-economical languages such as Fortran were available.

Despite that, Lisp has developed such an immense following in the AI community that industry analysts wonder if anything can replace it. Dedicated Lisp machines are now forming a blossoming market and, combined with its large base, Lisp appears to be a safe choice for AI programmers. Edward Feigenbaum, an AI researcher at Stanford University, said, "Collectively, we have so much more experience with Lisp and symbolic manipulations using Lisp that the safest bet is still to pursue Lisp developments."

In fact, Lisp has spawned such a large number of versions, including Xerox Corp.'s Interlisp, Symbolics, Inc.'s Zetalisp, MIT's Maclisp and others, that the AI community is currently attempting to agree on a standard version dubbed Common Lisp. Patrick H. Winston, director of MIT's AI Laboratory, said the creation of

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- Ask Computer Systems unleashed a raft of software packages based on its Manman manufacturing system/46
- An electronic mail system for its Westi teleprocessing monitor and IBM's CICS was unveiled by Westinghouse Electric/48

SOFTLINE/GIRISH PARIKH

Upkeep: The ongoing bug

To say programmers dislike software maintenance is an understatement. The fact is, just about every programmer hates maintenance. But maintenance currently accounts for more than half the work load of most programmers. That being the case, maintenance should be performed well and with a positive attitude.

But most programmers are not formally trained in software maintenance. With the right education and training in software maintenance, many problems could be solved. With higher maintenance programming productivity, the 55% of programmer time spent on maintenance could be reduced, and huge savings in maintenance could result. Programmers could then devote more time to reducing development backlogs.

"Maintenance may be shaping up to be the major programming problem of the rest of this century," warned the article "Keeping maintenance minimal" [CW, Feb. 4]. The problem has been in the making for several years.

Software maintenance is defined as any work done on existing software. Maintenance includes correction of errors and omissions carried over from development, the addition of new features and any adaptations to changing hardware and operating environments. While mainte-

See MAINTAIN page 54

Parikh is a Chicago-based independent consultant, lecturer and author. He is a prior contributor to Computerworld.

Tandem enhances Guardian system

CUPERTINO, Calif. — Tandem Computers, Inc. has introduced an enhanced release of its Guardian operating system that is said to improve significantly on-line transaction processing performance.

According to a spokesman, Guardian 90 is fully compatible with previous releases of the Guardian multiprocessor, network-oriented operating system, which supports the Nonstop architecture of all Tandem computer systems. All applications compatible with prior releases of Guardian can be run with Guardian 90.

The spokesman said initial customer tests and company benchmarks have indicated performance increases between 50% and 70% for on-line transaction processing applications using Tandem's transaction monitoring facility. Guardian 90 also allows greater flexibility to run larger applications by increasing user code and library space up to 4M bytes — 32 times the amount in previous releases, the spokesman said.

Guardian 90 is said to feature a high-performance disk process that serves as the foundation of all disk record and file management activities. The process reportedly improves performance for batch applications, I/O-intensive on-line processing and system utilities programs. The disk process is compatible with all Tandem disk drives and

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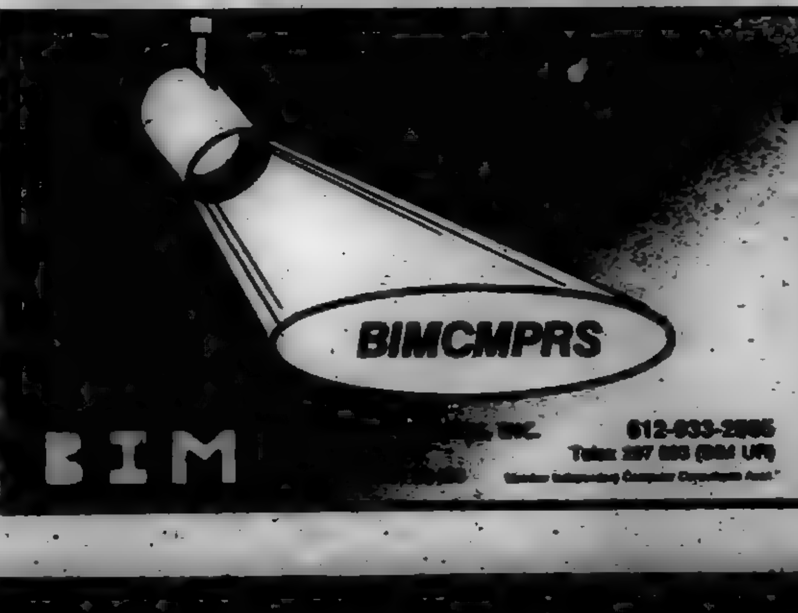

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Ask applications debut for HP 3000, DEC VAX systems

LOS ALTOS, Calif. — Ask Computer Systems, Inc. has announced five manufacturing application products designed to run on Hewlett-Packard Co. HP 3000 machines and a micro host product for HP and Digital Equipment Corp. VAX machines. Ask also announced that three of its business applications packages are available for the VAX.

A decision support system, Decisionmaker, can be integrated with Ask's Manufacturing Management (Manman) Information System and allows users to access summarized information from manufacturing, marketing and financial programs. Decisionmaker includes an exception reporting feature that lets users monitor specific elements of the business, such as inventory value. The product is menu and command driven.

Decisionmaker is priced from $8,100 to $15,000, depending on hardware configuration. Shipments begin July 1.

Manman/Repetitive is a manufacturing scheduling application for companies with high production volumes and short lead times. It can be used with Ask's Manman/MFG manufacturing package and is said to eliminate the need to enter work or flow orders. The product generates a production report for continually manufactured parts. Planned production can be stated for specific days of the week or automatically distributed over all manufacturing days.

Manman/Repetitive includes pull system capabilities for moving inventory from stock to the shop floor, a build schedule and a backflush feature that allows users to update inventory balances and record material expenses through a single transaction. The product is priced from $20,250 to $37,500, depending on configuration.

Project planning system

Ask also introduced a project planning and costing system for the HP 3000 series. Manman/Projects will interface with Ask's Manman/MFG, Manman/AP and Manman/GL modules, allowing users to record project costs as they occur.

Material commitments and receipts, labor, material and labor burden and general expenses and adjustments are posted into the Manman/Projects data base, allowing the user to see costs and manhours expended on a project. The product is priced from $13,500 to $25,000 and will be available July 1.

Ask's quality management software is said to monitor the quality of parts and products. Manman/Quality collects test and inspection results, analyzes the data and provides reports to management.

The product allows users to design data collection prompts and includes capabilities for producing frequency tables, control charts and histograms, the vendor said. Users can create tabular reports based on user-defined prompts. Manman/Quality is priced from $33,750 to $62,000 for the HP 3000 and will be available August 30.

Human resource package

Also announced was a human resource package that gives users access to job description, salary and employment information. Manman/HR can be integrated with Ask's Manman/Payroll package and can be run as a stand-alone product or in conjunction with Ask's Manman/Information System.

The human resource package includes capabilities for producing alien and affirmative action standard reports, according to Ask. The product is available immediately and is priced from $11,475 to $21,250, depending on system configuration.

Ask also announced Planman/MFG, said to allow a manager to extract information from the Manman/MFG application on the HP minicomputer or DEC VAX for manipulation on microcom-

See ASK page 48

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[illegible]

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Westinghouse E-mail debuts

PITTSBURGH — Westinghouse Electric Corp. has announced Mailtronic, an electronic mail system that runs as an application under the Westinghouse Westi teleprocessing monitor or as a task under IBM's CICS.

According to a vendor spokesman, Mailtronic may be used to generate memos or to create documents for detailed proposals and reports.

Mailtronic messages are formatted automatically with little user interaction. Security is maintained through a personal password system, the vendor said.

Versions are available for IBM's DOS/VSE or OS/MVS operating systems. Files are maintained through IBM's Vsam.

The perpetual license fee for Mailtronic is $9,000 for DOS systems and $16,000 for MVS systems.

Westinghouse Electric's Management Systems Software Division is located at 777 Penn Center Blvd., Pittsburgh, Pa. 15235.

ASK

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puters that run Microsoft Corp.'s MS-DOS or IBM's PC-DOS operating system and upload that information back into the Manman application.

Planman/MFG reportedly includes capabilities for conducting "what-if" analyses. The system downloads the forecast and demand information to a micro and then loads it onto a predefined spreadsheet from which the analysis can be performed. The product is priced from $2,230 to $4,125 and will be available July 1.

Three Ask products, Manman/Serviceman, Manman/Payroll and Manman/Fixed Assets (FA) are now available on the DEC VAX in addition to the HP 3000 series. Manman/Serviceman is a field service management product that can analyze equipment failure and response time, track and dispatch service calls and maintain customer information, equipment, contracts and warranty information, the vendor said. Manman/Serviceman is priced from $27,000 to $50,000, depending on configuration.

Manman/Payroll is a user-defined system that can handle large payrolls for companies with multiple divisions, the vendor said. The system includes tax tables for federal, state supplemental and local tax formulas. It is priced from $16,200 to $30,000 depending on configuration.

The Manman/FA is a menu-driven system that allows users to enter items with book, tax and user-defined depreciation schedules. It groups the items by user-defined asset class codes. The package costs from $8,775 to $16,500, depending on system.

Ask Computer Systems is located at 730 Distel Drive, Los Altos, Calif. 94022.

GUARDIAN

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with the Tandem 3106 and 3107 controllers.

In addition, Guardian 90 also is said to offer an automatic rollback feature, which was described as an automated recovery feature that allows Tandem systems to recover more quickly from multiple component failures.

Bundled products

Tandem also announced that Guardian 90 will be offered with three other software products as a package called Guardian 90XF. The products are Encompass, a distributed data base management system; Expand, a system for transparent networking; and Transfer, a general-purpose information delivery system.

The product package is targeted at users building high-volume applications and distributed networks, the spokesman said.

Guardian 90 will be provided at no cost to existing Nonstop II, Nonstop TXP and Nonstop EXT users.

For new Nonstop II and Nonstop TXP customers, the initial license fee will be $3,500 per processor. On the same machines, the initial license fee for Guardian 90XF will be $11,000 per processor.

The spokesman said there is no initial license fee for new Nonstop EXT users. Monthly license fees of $200 per system for Guardian 90 and $600 for Guardian 90XF will be charged. Guardian 90 and 90XF will be available in July.

Tandem Computers is located at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

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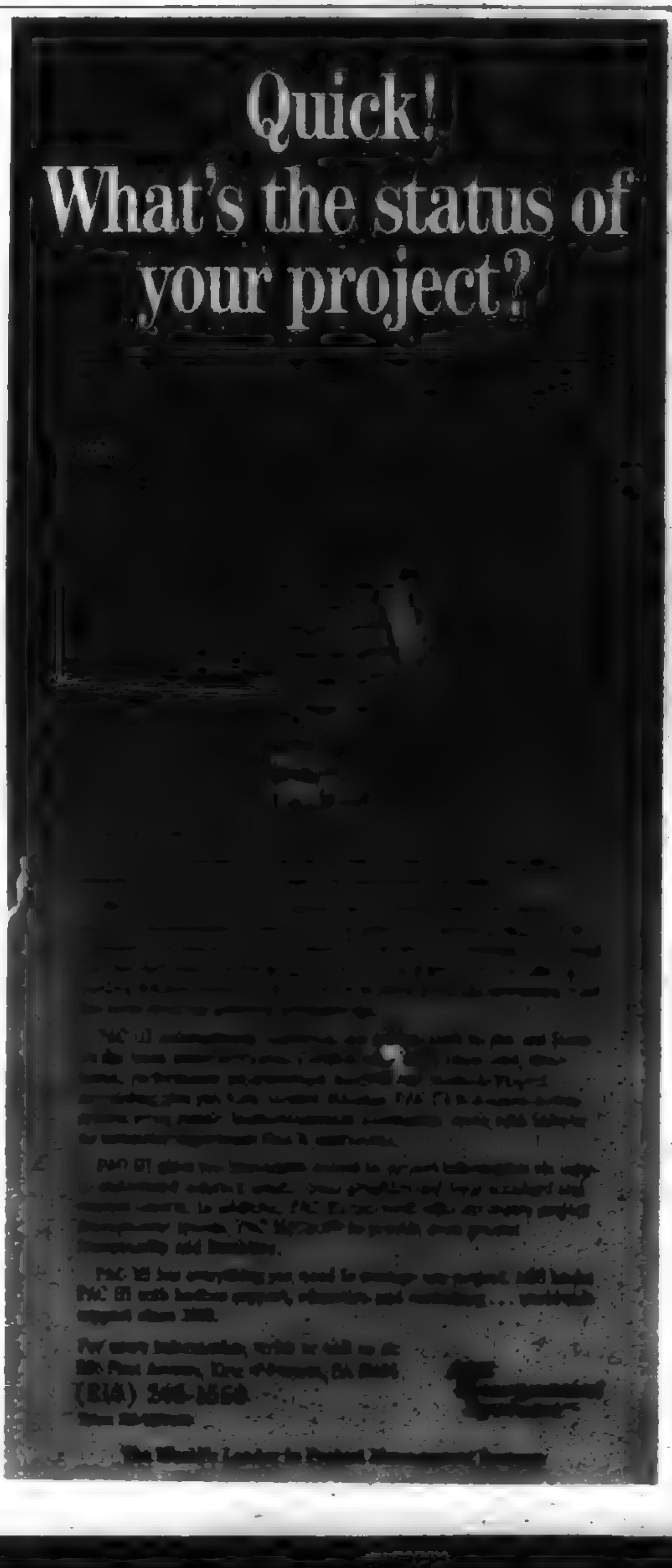

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ICP

from page 46

were raised as the fiery sun crept behind the craggy mountains jutting into the purplish-orange Arizona sky.

The affair had the atmosphere of a graduation ceremony — and in a way, that is exactly what it was. The men and women in that group were representing software companies that had stepped up to a new plateau, that had achieved an honor less than 1% of all software companies have ever earned. The software companies were graduating to ICP's exclusive Million Dollar Club.

On that first night of the ICP gala, some of the best and brightest of the software world were waiting for ICP President Larry Welke to hand out the coveted One Million Dollar and Million-In-One awards. ICP's One Million Dollar award is presented to software packages that have achieved $1 million in aggregate sales. The Million-In-One award honors packages that reached that sales plateau in their first year on the market.

As the economy goes, things have changed in large measure since ICP first began honoring products in 1972. But the million-dollar mark is still a formidable hurdle, and the award has not been diminished by time. Thus as each product was called from ICP's honor roll, the company representative was buoyed during the walk to the podium by whistles and cheers from colleagues and polite applause from others in the audience.

Some of the companies represented that night were old hands at the ICP awards. For example, Cincom Systems, Inc., which received Million-In-One awards for its Net/Master and Mastext products, holds the highest honor ever awarded by ICP — a $250 Million award for its Total data base management system. Management Science America, Inc., which garnered a One Million Dollar award and two Million-In-One awards, grabbed an unprecedented third $100 Million award the next day.

But prior success did not take the shine off the awards, even for the multimillion dollar software companies in attendance. A One Million Dollar award may represent only one milestone in a healthy, multiyear income stream. According to Welke, 90% of the products that have been honored by ICP since 1972 are still being sold by their vendors.

But the ICP event has significance beyond the awards themselves. Much of the trade and general business press lately has focused on the so-called downturn in the computer industry. The industry talk these days is of layoffs and forced vacations, factory shutdowns and inventory adjustments, hiring freezes and profit dips, stock tumbles and Chapter 11 escapes.

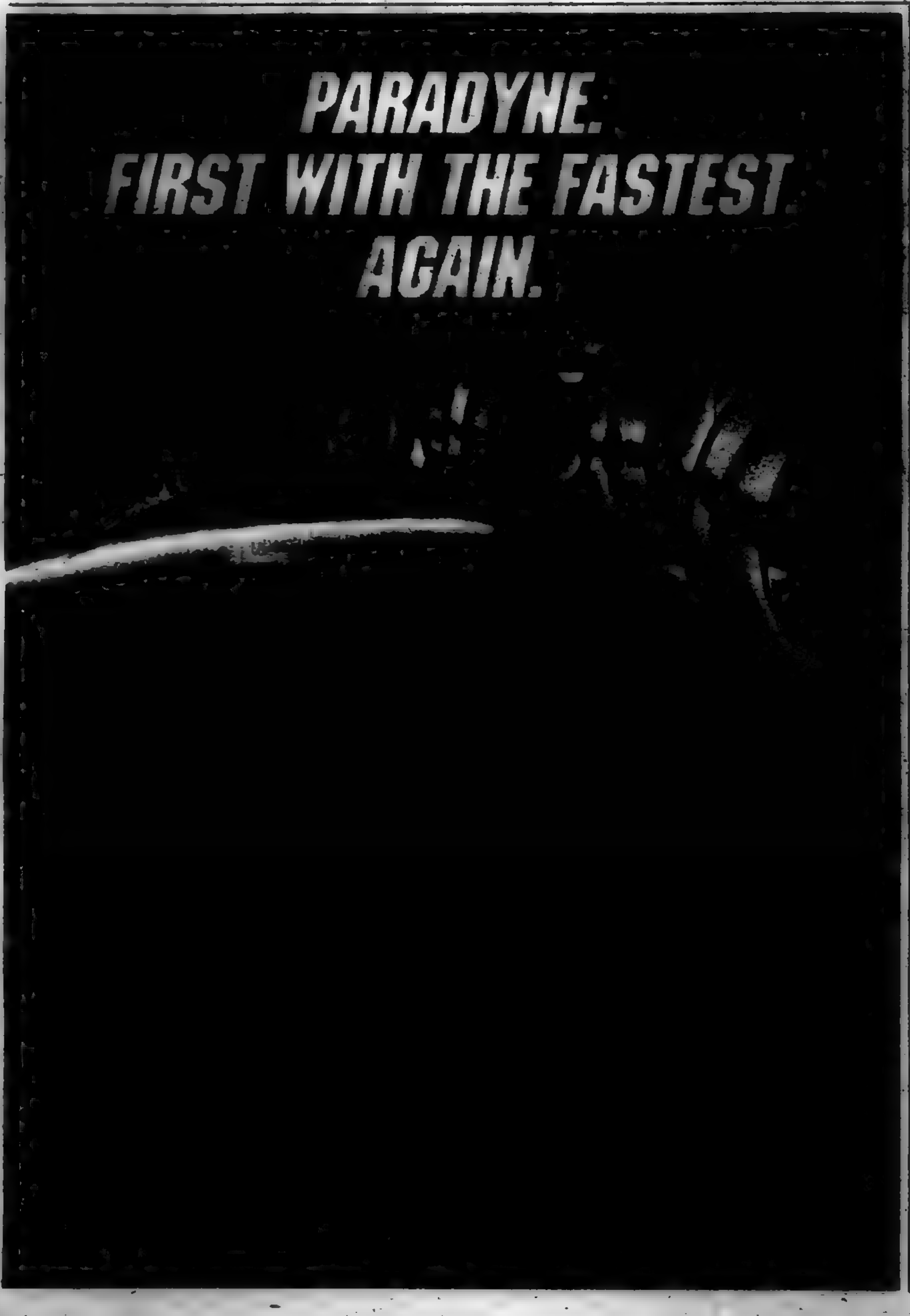
Even IBM has not been immune to the minirecession in the marketplace, and some other players, like the minicomputer manufacturers, have been particularly hard hit by whatever adverse forces are at work.

Systems software unscathed

For now at least, the large systems software industry — micro software is something of another story — has remained relatively unscathed by the shift in the fortunes of the computer industry as a whole. Whether that reflects the growing importance of software as compared with hardware or whether software is simply a trailing segment of the market that will take it on the chin later remains to be seen. For today, the software industry in general has good reason to beam.

Some people, perhaps rightfully, criticize the ICP awards as self serving. But the event remains something of a testimonial to the vitality of the software industry, which has achieved a great deal since the days software came bundled with the number-crunching box. Those software products that meet the real needs of users have been successful, some of them perhaps far more successful than their inventors could have imagined. That trend, one can only hope, will continue.

As long as the trend does continue there will be vitality in the software industry. That is a message Welke tried to impart in his keynote address, and it is one that software vendors would do well to heed. If enough vendors heed it, the software industry may emerge intact from the economic storm and the ranks of the Million Dollar Club will continue to swell.



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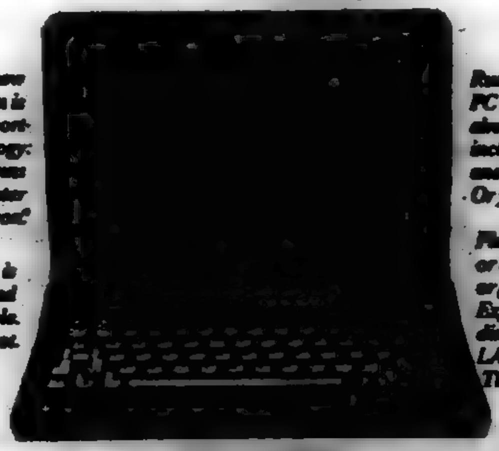

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LISP

from page 46

this standard was a miracle. Twenty of the best Lisp people in the world contributed to it, and Guy Steele, one of the top programming language specialists, wrote it, Winston said.

Major manufacturers like Digital Equipment Corp., Data General Corp., Hewlett-Packard Co. and Texas Instruments, Inc. have lined up behind Common Lisp, despite a notable lack of enthusiasm. "It's not the best Lisp," HP's Director of AI Research Ira Goldstein said, "but the fact that it was a possible standard caused us to conclude that the best thing to do was cooperate." In addition, a spate of Lisp programs for personal computers are now bringing AI techniques to the masses.

Despite its current dominance, Lisp is facing a serious challenge from Prolog. DM Data, Inc., a Scottsdale, Ariz.-based market research firm, reported, "The multibillion-dollar market for AI-related products expected by the end of the decade will probably be based on Prolog." In large measure, Prolog's future hinges on the success of Japanese fifth-generation efforts.

Prolog is considered superior to Lisp when interfacing with relational data bases, and it is also extremely portable and independent of computer architecture. The language searches through data bases using carefully defined rules of logic, and as a result, the task of creating complex programs is easier, faster and less costly.

In addition, it can be argued that Prolog may be the language of choice for parallel processing environments, Feigenbaum said. "We don't understand parallel Lisp," he said. "It's hard to envision parallel Lisp mechanisms compared to parallel Prolog mechanisms."

Winston, a vocal Lisp advocate, said he believes criticism of Lisp is undeserved. "If you look at a current Prolog program, it wouldn't be much different from one written in 1970," Winston stated. "A Lisp program written today is much different from one written even five years ago. It's misleading to say Lisp is a 20-year-old language, because it has evolved enormously in that time, incorporating almost every good idea there is about computing."

Ultimately, it is a good bet that both languages will find large audiences depending, more than likely, on geography. Although Prolog development in the U.S. is under way, particularly on micros, it will be a long time before anything replaces Lisp.

MAINTAIN

from page 46

nance cannot be totally eliminated, it can be reduced. Revision of existing code with program restructuring techniques and development of new software with modern techniques, such as structured programming and fourth-generation languages, can ease the task of modifying programs.

In a sense, the maintenance problem is like a chronic disease of data processing. Techniques, tools and services either exist or are emerging to cure the maintenance problem, but ways for maintaining code using structured programming and fourth-generation languages must also be found.

Why are managers not yet concerned about this growing problem? Why are they putting lids on the bowls of spaghetti code? Why are they keeping maintenance in the corporate closets?

Most reasons revolve around a negative attitude toward software maintenance. This attitude must be made positive, and proper education and training can help. The dignity of maintenance work must be established. Competent maintenance programmers should be given incentives such as high pay, bonuses for solving nasty problems, extra vacation and so on.

It is also likely that the managers are personally responsible for the maintenance problems — they may have been the original developers of the systems. However, the systems may have been developed before the advent of structured techniques. The systems were made to work, the developers got patted on the back, and some of them even got promoted. But the nightmare came later, when the unstructured and poorly documented system needed modifications. How can the managers blame systems they devised themselves?

It is better to discuss the problems frankly with the right person. Programmers and managers can perhaps talk more freely to an independent consultant in the software maintenance field.

The article concluded with the following suggestion: "Begin a dialogue with DP managers at other companies in your area. Start a special interest group within a user organization. Or just read about what other companies are doing. Maintenance is a serious issue, and it deserves some serious attention."

The formidable portion of the DP budget being spent on software maintenance and the intense business competition will force data processing managers to take a closer look at software maintenance problems. The DP manager's primary responsibility is to serve the user effectively, efficiently and economically. Looking at the rising costs and consumption of resources, software maintenance will be one of the critical areas for the remainder of the century.

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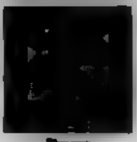
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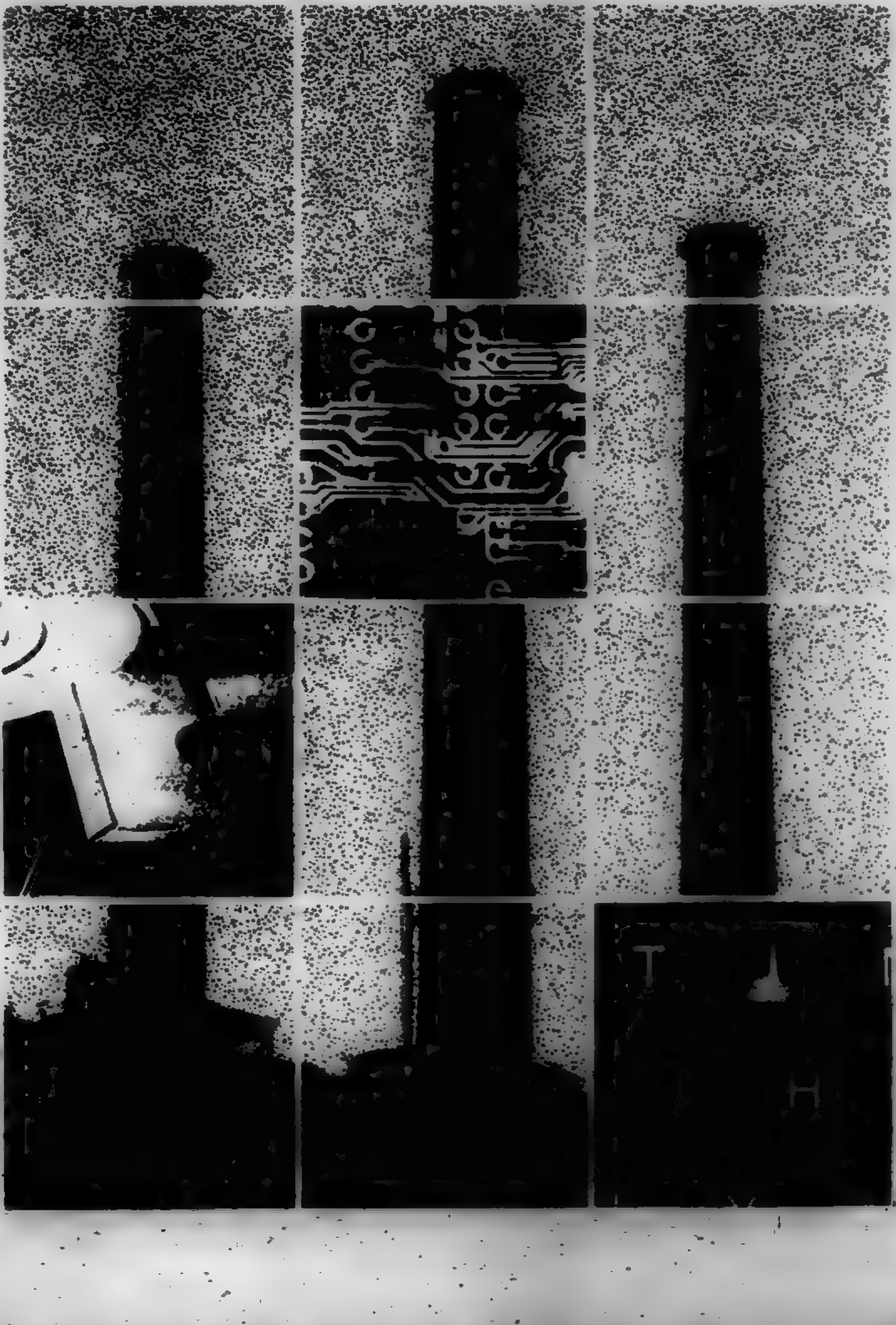
Special Report

Computerworld
May 27, 1985

Manufacturing Systems

An industry update



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Alliance builds behind GM's MAP

By Edward Warner
CW Staff

When 400 people, representing 200 companies, show up for the users group meeting of a product that does not yet exist, the product must be important.

That is exactly what happened late last month at the Dallas meeting of the Manufacturing Automation Protocol (MAP) Users Group. The group is comprised of representatives of the user firms that want to take advantage of this protocol currently under development by General Motors Corp.

When it is complete, MAP will give GM and those manufacturers that follow the automaker's lead a means to attain the long-sought goal of linking islands of automation, isolated work cells within a factory. Those islands communicate within themselves, but they rarely can communicate with other islands, let alone the corporate mainframe or the minicomputers equipped with computer-aided design systems.

MAP would change all that. A token-bus, broadband local-area network based on the IEEE 802.4 standard, MAP will provide communications between the equipment of all of the factory automation vendors that support it. It will provide that communication from the computerized numerical controller on the shop floor — a microprocessor controlling, say, a drill press — up to the mainframes at the corporate headquarters, even if the headquarters is hundreds of miles away.

GM, which is establishing MAP with input from those who hope to be future users, said that it will implement MAP in a section of at least one of its plants this year. The automaker has put the technical details about MAP in the public domain and has distributed 3,000 copies of the preliminary specifications so far.

To ensure that its vendors comply, the automaker has said it will buy nothing other than MAP-compatible factory automation equipment once MAP is fully developed in 1988 or 1989.

Mindful of that message and the continuing growth in the MAP Users Group, more and more factory automation vendors are casting their lot with MAP. Most recently, Intel Corp. announced joint agreements with Westinghouse Electric Corp. and with Industrial Networking, Inc. — a joint venture between General Electric Co. and Ungermann-Bass, Inc. — under which MAP-based products will reportedly be developed. Those agreements came at the MAP Users Group conference, along with an announcement by Tandem Computers, Inc. that it would support MAP's specifications.

A mark of MAP's increasing vendor support may be seen in the difference in the sheer number of vendors cosponsoring the MAP demonstration at last year's National Computer Conference (NCC) and the number that GM said will be present when a full-fledged version of MAP is demonstrated at this year's Autofact '85 show in Detroit Nov. 4 to 7. Seven factory automation vendors, ranging from Allen-Bradley Co. at the computerized numerical controller level all the way up to IBM, were with GM at its booth when it debuted MAP at NCC '84. According to Steve Dillon, vice-chairman of the MAP Task Force, formerly GM's internal broadband users' group that is spearheading the standard's development, 17 vendors will be involved with GM's MAP display at Autofact '85 — and 10 more had to be turned away because of limited space.

The Autofact '85 demonstration will be a complex one and perhaps a watershed for MAP, a standard based on the seven-layer International Standards Organization's (ISO) Open Systems Interconnect model. According to Dillon, a GM senior staff research engineer, the booth will feature two subnetworks.

One will be sponsored by Boeing Computer Services Co. and based on the IEEE 802.3 baseband standard most often seen in office local-area networks. The second subnet, GM's, will be MAP based. Communication will take place within the subnets, between the subnets — via gateways — and between the GM subnet and the GM Technical Center in Warren, Mich., nearly 15 miles away.

Though only Levels 1, 2 and 4 of that model were implemented at NCC '84, the MAP demo at Autofact '85 will feature data transfer at all levels but the sixth. Layer 6 of the ISO model, the presentation layer, posed a problem for the MAP Task Force because the international standards with which MAP seeks compatibility have not yet been fully spelled out by the ISO. Dillon acknowledged that GM had at one time considered going it alone with its own standards for Layer 6. The automaker had learned from experience, though, that standards are best when they are widely supported.

There was a time, he said, when GM would "go to a vendor and start talking about what we need at this [communications protocol] layer, what we need at that layer, and the fellow would sit there, listen to us for an hour and then say, 'Hey, you have a lot of good ideas there, but who are you going to get to implement [them]?' " By working with the input of the ISO and the companies in the MAP Users Group, Dillon said that MAP becomes the factory automation protocol that meets everyone's needs.

One of the firms that will implement MAP in several of its new and existing plants — as early as next year — is Eastman Kodak Co. Kodak is one of the nine member companies on the steering committee of the MAP Users Group.. According to Charles Gardner, coordinator of MAP development at Kodak, his firm is excited about MAP because it implements the ISO's Internet standard, making possible communication with such office local-area networks as Ethernet. "We don't want a different set of standards within the office and the factory," he pointed out.

As the technical barriers fall and companywide communication becomes, at last, a hope for many manufacturers, at least one analyst wonders if a major question has still been left unaddressed.

In the view of Peter A. Cohen, research manager of Framingham, Mass.-based International Data Corp.'s Computer-Integrated Manufacturing Service, MAP's spread of communication will mean "the guy who controls one area has to yield some authority to the guy who runs another area." Those personal fiefdoms will not topple easily, according to Cohen.

The world will get a glimpse of MAP's meaning for the factory of the future this fall when GM begins production in a revamped section of its Saginaw, Mich., Steering Gear plant. Production in a section of that plant, comprising 5% of the shop floor, will be done by machines from a variety of vendors supporting MAP. The production will be monitored from the sidelines, and workers in that section will stand to the side as parts are made, stepping forward only to set up or maintain the machines.

	GM	Boeing
Layer 7	Ftam ISO[2] Case Kernel	Ftam
Layer 5	ISO Session Kernel	ISO Session Kernel
Layer 3	ISO CLNS[3]	ISO CLNS
Layer 1	IEEE 802.4 Token access on broadband media	IEEE 802.3 CSMA/CD[4] Baseband media

What became of the projected robotics market boom?

U.S. robotics market projected growth '83-'89

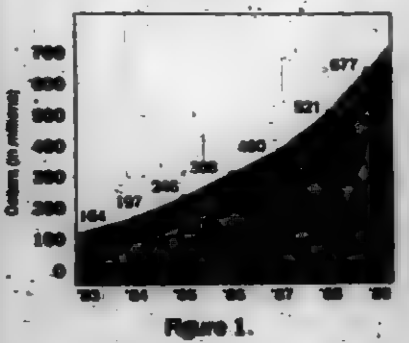


Figure 1.

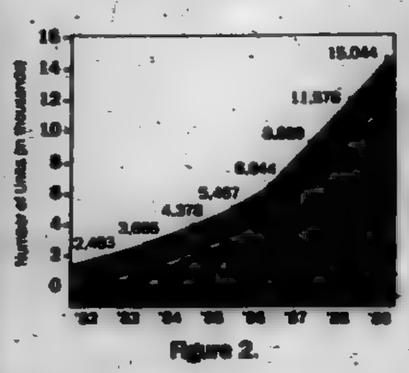


Figure 2.

* These figures refer only to revenue from sales of robots, not from additional equipment and services. Vendors' total revenues may be considerably higher than these figures indicate.

Source: International Data Corp.

By Peter A. Cohen
Special to CW

The blush is off the robot rose, and many vendors and investors who reached in too hastily have been pricked by the thorn.

With a handful of exceptions, vendors are posting losses. A number of companies that exuberantly entered the market five years ago have quietly slid out the back door, and once-eager venture capitalists now turn a deaf ear to entrepreneurs.

What happened? Why haven't robots by the thousands taken over the factory floor? Why aren't projections of a $2 billion market by 1990 panning out? Why haven't vendors realized fat profits and entrepreneurs instant riches?

According to International Data Corp. (IDC), a market research firm based in Framingham, Mass., revenues in the U.S. robotics market are projected to grow at 20% to 30% annually through 1989, reaching $677 million that year (Figure 1). In terms of units purchased annually, the market is projected to grow from 3,665 in 1983 to more than 15,080 in 1989 (Figure 2), with the installed base of robots increasing to more than 62,000 by that year.

The following three general factors explain these lower than expected numbers:

- A long implementation cycle based on end users' needs for the development of custom-application solutions.
- Slower than expected growth in automobile industry purchases.
- Use of other forms of automation, such as material requirements planning and computer-aided design, that will precede the installation of robots.

Implementation cycles. An effective robot installation demands a highly structured environment tailored to a specific application. Robots cannot be plugged in right out of the box and perform effectively; they are not toasters. Those robots that are purchased with management's expectation that they can simply be plugged in and go to work may end up entertaining visitors in the lobby or collecting dust in the corporate boardroom, but they are unlikely to be involved in the manufacturing process.

Developing application-specific robotic solutions is an engineering-intensive, difficult and time-consuming process, a fact that early market projections did not take into account. The market for "out-of-the-box" robots is limited to heavy users with large in-house engineering staffs, such as those in the automobile industry. For less experienced users, a robot not fitted to a particular application has little use beyond its first few weeks' novelty value.

Recognizing this fact, most large robot vendors have committed themselves to providing total robotic systems — designed to solve particular manufacturing problems — rather than just selling stand-alone robots. This effort, though difficult, will be critical for vendors that hope to develop markets outside of the auto industry; it will contribute to the long-term growth of the market.

Automobile industry. A second factor that contributed to unrealistic projections of market growth is vendors' and analysts' exaggerated expectations of the automobile industry's needs. A realistic assessment indicates that while the auto companies have been leading purchasers of robots over the last several years, their consumption will level off.

In absolute terms, automakers' purchases will grow slowly from now through 1989. Relative to those in other manufacturing industries, automakers' purchases will decline steadily from approximately 60% of the total market in 1983 to 30% by 1989. By that time, most of the approximately 300 automobile plants in the U.S. will have installed robots wherever possi-

See ROBOTS SR/5

Cohen is a senior analyst for International Data Corp.'s (IDC) Computer-Integrated Manufacturing Service. IDC is a Framingham, Mass.-based market research firm.

IBM strives to extend MIS foothold to factory operations

By Brian Jeffery
Special to CW

When it comes to IBM's strategies, one point is certain: The company wants "the" manufacturing market. For IBM, the factory is merely part of the broader corporate environment; to integrate factory operations with administrative DP just extends IBM's leverage from the MIS department to the factory floor.

IBM is scarcely a newcomer to the factory, although its performance there has varied. In the computer-aided design and manufacturing systems market, IBM has done very well, passing Computervision Corp. in 1984 as the largest player in this marketplace and posting more than $750 million in revenue.

In robotics, IBM has been less successful. Despite heavy internal demand and a two-year-old reseller program, the company remains a minor vendor.

As for the rest of the market, IBM maintains an indirect presence in the factory through its host-based applications for manufacturing and stock control and a marginal factory floor presence with the Series/1 mini and a handful of other products and with the year-old 5531, a rugged version of the Personal Computer XT originally developed for General Motors Corp. for factory use.

IBM's current problem is making these pieces fit together. It is partly a problem with establishing technical links among the various IBM systems and partly a problem of market leverage. The company traditionally has had a presence among the administrative DP functions of manufacturers and has recently added turnkey CAD/CAM systems, but IBM's presence normally stops dead at the factory gate.

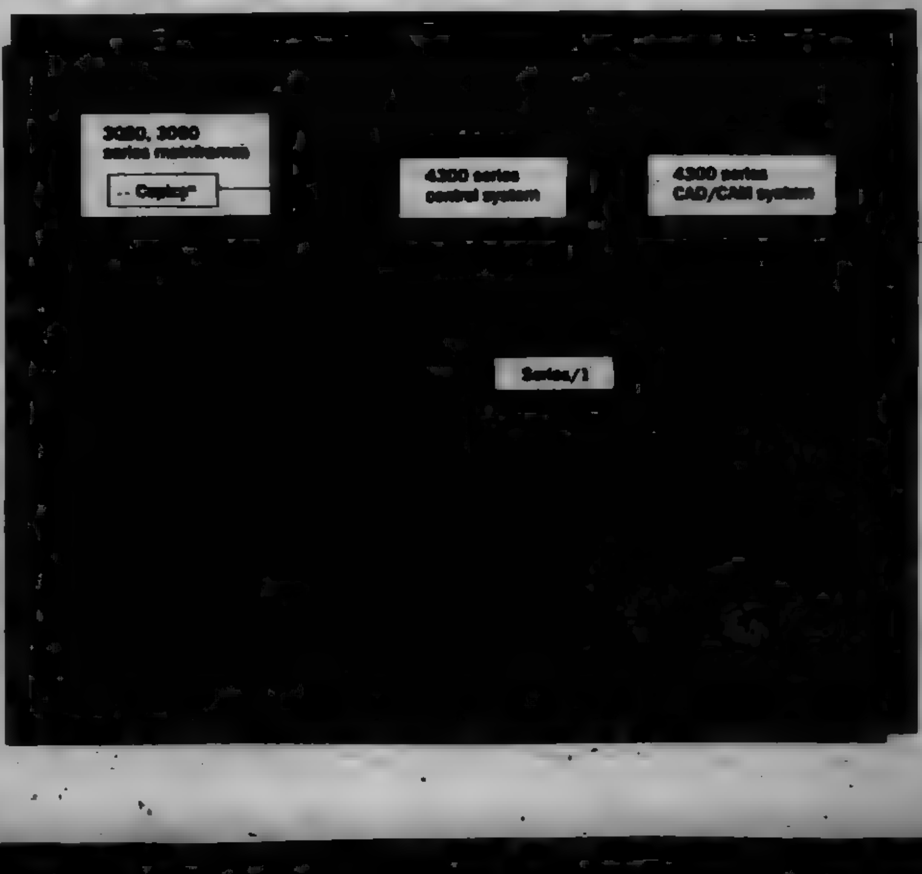
Apart from the Series/1, IBM equipment has simply not been a serious contender in the market. Companies such as Digital Equipment Corp., Hewlett-Packard Co., Prime Computer, Inc. and specialist vendors of numerical control equipment have taken the lion's share of the market.

To address this situation, IBM formed their Boca Raton, Fla.-based Industrial Systems Organization in late 1983, grouping its CAD/CAM, robotics and other industrial operations. Industrial Systems has proven to be one of the more flexible IBM units. Because IBM has little presence in the factory, Industrial Systems encourages third-party cooperative arrangements with vendors well established in the market.

Industrial Systems has participated in a number of major end-user programs, notably the GM Manufacturing Automation Protocol (MAP) program and a joint CAD/CAM development effort with Grumman Aerospace Corp.

The IBM unit has also worked with vendors such as Allen-Bradley Co. and Modicon in implementing Series/1 support for their programmable controller systems and with Cincinnati Milacron, Inc. for 5531-based

See IBM SR/5


3080, 3090 series mainframe
Copics*
4300 series control system
4300 series CAD/CAM system
Series/1

Jeffery is director of research at International Technology Group, Inc., a Palo Alto, Calif.-based market research firm.

Cost containment key to survival

[illegible]

Robotics mart still growing

Although the robotics market is not likely to live up to earlier expectations, unmitigated pessimism is unwarranted. The current conservative market projections show a healthy growth rate.

Robots will increasingly find their way to the factory floor, aided by a number of encouraging factors:

■ Increased technical capability. Improvements in robotic systems capabilities over the last few years have enhanced robot applications potential, and this trend is likely to continue.

Developments in end-effectors, or mechanical digits, for example, have clearly expanded the use of robots in electronic assembly operations, and the development of through-the-torch sensing has improved arc-welding capability. As greater intelligence is provided and visual feedback is perfected, the opportunity for robots in assembly operations will be greatly expanded.

Off-line programming and the ability to link robotics to computer-aided design systems will also encourage market growth.

■ The growth of robot systems engineering houses. These firms will cater to manufacturers without engineering staffs. They will provide turnkey solutions for a manufacturer's particular robotics needs.

■ Users rethinking the robotics justification process. The technique of justifying robots on the basis of direct labor's wage savings is yielding to a broader assessment of savings from higher quality production and less rework, less waste, fewer accidents, increased flexibility and market responsiveness.

Robot suppliers divide into tiers

The growing understanding that robots must be integrated into manufacturing systems is having the effect of sorting vendors into two tiers.

The first tier, "out-of-the-box" vendors, includes vendors that are unable or unwilling to design and assemble robotic systems; this group will sell only robots, that is, arms and controllers. The second tier, systems vendors, includes vendors that sell robotic systems designed for specific applications.

Out-of-the-box vendors. Vendors on the first tier will sell primarily to systems engineering houses, to second-tier vendors that need to supplement their lines for particular applications and to those few users that have engineering staffs large enough to do their own installations.

All first-tier vendors must provide some level of support, but competition among them will rest on pricing.

Robots with similar performance capabilities are already priced very closely. Given this environment, low-cost producers are the most likely to prosper. For most types of robots, this gives Japanese vendors who enjoy the benefits of high volume and economies of scale, a big advantage.

Systems vendors. The second tier of vendors, those that provide specific applications solutions, must have ample resources and the commitment to developing these solutions. To do this effectively, vendors need a sound understanding not only of robots but also of other manufacturing machinery. Moreover, they will need to acquire some knowledge of each user's entire production process.

Most of the leading robot vendors have committed themselves to participating in this second tier. In this market, competition will occur less on the basis of price than on the basis of each vendor's ability to commit all necessary resources to provide effective solutions to specific manufacturing applications.

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IBM from SR/3

numerical control applications.

IBM obviously believes that it has to play ball in the factory arena if it is going to establish a realistic presence. It recently cooperated with the National Bureau of Standards (NBS) as part of a larger factory standards effort coordinated by NBS. IBM's support for standards, though, is scarcely without self-interest. In particular, IBM would like several of its own environments incorporated into the overall standards picture. These are principally the following:

- Copics, a material requirements planning system supported by IBM on host mainframes and the 4300.
- A Manufacturing Language (AML), an internally developed robotics control language used by IBM for its line of 7500 series robots.
- The 4300 series. IBM has been promoting the 4300 series for engineering applications since 1981 and recently has targeted its 4361 at this marketplace. The 4300 series-based systems constitute the vast majority of IBM's turnkey CAD/CAM business, and IBM would like the line to be part of the general factory standards scene.
- IBM CAD/CAM software. At present, IBM markets a line of third-party products, including Lockheed Corp.'s Cadam, Structural Dynamics Research Corp.'s Caeds, Dassault's Catia and Bell Northern Research's CBDS. The dearth of good IBM-compatible CAD/CAM software has led IBM to fund development projects to the tune of $50 million at more than 30 U.S. academic institutions.
- The 5080 Graphics Display System, a line of intelligent Motorola, Inc. 68000-based CAD workstations supplied to IBM by Sanders Associates, Inc. and compatible with the IBM 3250 line.
- The 5531 Industrial Computer, a rugged version of the Personal Computer XT.
- The Industrial Network, the IBM version of the broadband token-bus local-area network developed under the GM MAP program.

The IBM game plan focuses on integration of these products with products from factory vendors who are already well established, notably programmable control vendors such as Allen-Bradley and Modicon and numerical control-machine tool vendors such as Cincinnati Milacron. For specific end-user factory automation projects such as MAP, IBM is also prepared to support DEC, HP and Prime machines.

Future developments

Once its own equipment is embedded in the overall standards picture, IBM is likely to do the following:

- Develop a range of offerings for specific applications, including the 4300 series (CAD/CAM, central factory control applications); 7500 series robots tied to the latter via VM-AML links; a CAD workstation (based on the Personal Computer line); a desktop version of the 4300 series and a stand-alone version of the 5080; the Industrial Network local-area net; and the 5531.
- With computer-integrated manufacturing, aimed at large system end users, IBM may integrate the various IBM product lines first under a 4300 series-based factory communications umbrella and then with key IBM host products such as Copics.

ROBOTS from SR/3

ble, and new purchases will largely be for replacement.

Other forms of automation. A manager looking to automate his firm's manufacturing facilities should not begin by asking, "How many robots should I buy?" In most cases, installing robots and bringing up other factory floor equipment should be among the last steps in a long-term process.

The critical ingredient in an effort to improve manufacturing efficiency is a commitment to enhancing management's knowledge and control over an organization's entire manufacturing process.

Managers must discover exactly what occurs on the factory floor through effective, computer-controlled monitoring and reporting.

Once managers know what is going on, they can take steps to organize the whole system better. Only when they have an overall plan in place should they begin to consider automating specific factory floor operations with robots or other equipment.

Learning from history

The history of computerising data processing is instructive. Many firms that hoped to improve their poorly organised accounting systems by installing computers quickly found themselves possessing poorly organised computerised accounting systems.

Some robot installations have suffered from similar experiences. A robot may be doing a sensationally fast and accurate job at its particular station, but if a firm's production process is inefficiently organised, bottlenecks will be developing in front of and behind the robot operation.

When this happens, management will not realise overall productivity gains.

The effective installation of robots should, in many instances, follow the implementation of manufacturing resource planning systems and the installation of devices that enhance control and communications throughout the factory.

During the next several years, the market for that kind of equipment and those systems will remain much larger than the market for robotics.

The full value of robotics systems will not be realised until other manufacturing systems are in place.

Knowledge of manufacturing nets, emerging standards

By Lou Krieg
Special to CW

Understanding network management and being aware of emerging network standards is important as factory networks move closer to broad industry implementation.

Network management is composed of network planning, installation, operation, maintenance and modification. All networks have these functions in common. Manufacturing networks, however, have additional special requirements.

In particular, manufacturing networks must operate in relatively hostile industrial environments. Networks of this nature must boast extremely high availability because of the large per-minute costs of idle equipment and workers. These factors point to the strong need for fault management.

Backbone local-area net

Most factory networks will consist of a backbone token-bus broadband local-area network (IEEE 802.4), which will support communications between work-area networks (including manufacturing floor cells) as well as communications between the work areas and an overall factory control computer.

In some cases, manufacturing cells will consist of a single node attached to the backbone local-area network, and in other cases, the cell or administrative work area will contain its own network — for example, Ethernet, Allen-Bradley's Data Highway, Gould, Inc.'s Modbus and so on.

In the case of a cell with its own internal local-area network, there will be some intelligence (a programmable controller) between the cell's network and the factory's backbone local network. From a network perspective, the cell's internal local-area network is not visible, and each cell appears as a single node on the backbone.

In the case of an administrative work-area local network, there will be a gateway to the backbone net, and the network management system will be able to control at least the gateway and possibly the entire work-area subnetwork. Alternatively, the work-area subnetwork may have its own local-area network management.

In the factory, the demand for high availability will mandate reduction of single points of failure and rapid isolation of faults in those cases where redundancy is prohibitively expensive or technically infeasible.

Management of factory local-area networks is made possible by embedding a management agent in each node attached to the network. The agent gathers statistics about the performance and use of the node's network interface and can run tests or access network control data in the node on behalf of the network manager.

The network manager is a collection of applications software that performs the universal network management functions of configuration management, fault management and performance management.

The network manager will typically be implemented on a supermicro or minicomputer attached to the backbone local-area network and will provide a data base of the network configuration, performance statistics and a log of alarms and other significant events that occur in the network.

The factory network specified by the General Motors Corp.-sponsored Manufacturing Automation Protocol

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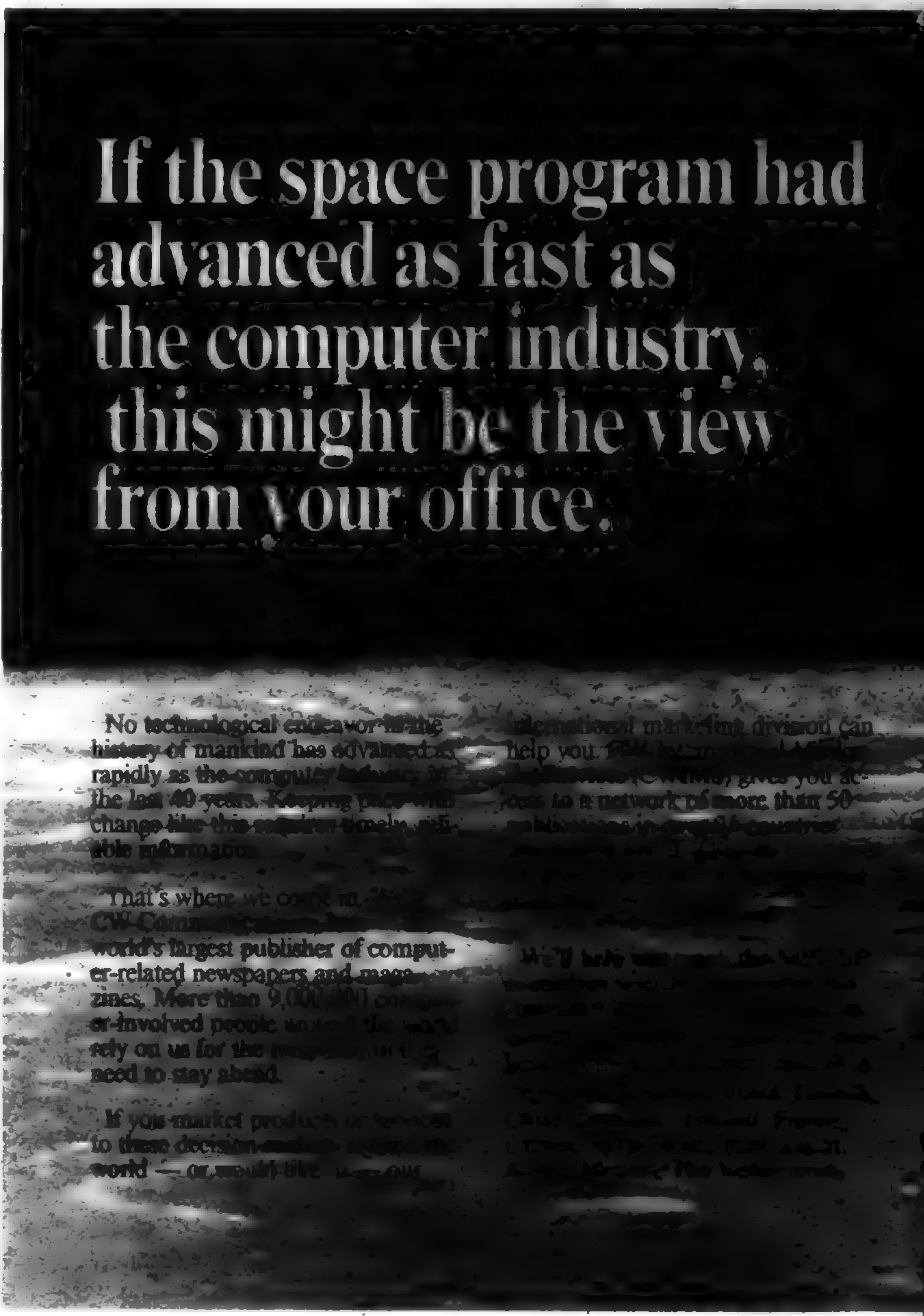
Krieg is a development manager for local-area network management products at Codex Corp., a subsidiary of Motorola, Inc.'s Information Systems Group based in Mansfield, Mass. Codex is a manufacturer of integrated data communications systems and networks.



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and network management critical to factory managers

(MAP) project is based on the International Standards Organization Open System Interconnect (ISO/OSI) reference model (Layers 3 through 7) and the IEEE 802.4 and IEEE 802.2 standards (lower two layers).

Each of these layers has a specialized management function, which may be implemented by vendors in any way they choose.

The agent that provides a single, standardized management interface to the node will be an application process that uses implementation-specific means to access the layer management functions. The agent will then communicate with the network manager via a standardized systems management protocol.

In this way, any vendor of a node is free to choose the implementation that is appropriate for those interfaces internal to its products, while still allowing all nodes in the factory to be managed in the manner required for consistent operation in the industrial environment.

Set of protocols

Of course, those vendors should not be overly burdened by network management standards. To avoid this, a fairly simple set of systems management protocols is being developed concurrently by several standards groups.

These protocols recognize three basic modes of interaction between the network manager and the nodes on the network.

The first mode of interaction is a command and response interaction during which the network manager asks the agent to perform an action such as reading or writing a parameter or counter value or initiating a test or restart of the node.

The second mode is provided to allow the agent to send unsolicited notifications of significant events (such as an alarm condition appearing or clearing) to the network manager.

The third mode is for downloading of software to a node.

In the case of the first two modes of interaction (command/response and event notification), a system management protocol will be used. This is considered to be an application layer protocol and therefore requires at least a minimal OSI environment in the node.

When a node is first powered up or is reset, there may not be enough intelligence to provide OSI communications. For this reason, the download protocol will be designed for the purpose and will not use OSI communications services.

Standards groups

There are currently three standards groups in the U.S. working on network management. The IEEE 802.1 subcommittee is developing a systems management protocol and a download protocol.

Naturally, the focus of this subgroup is on issues of importance to local-area nets; this implies principal concern with OSI Layer 1 and Layer 2.

The Ansi subcommittee X3T5.4 is developing standards for management of OSI systems. It is therefore developing a structure applicable to all layers.

The MAP project is also addressing all OSI layers. The project will promote a common link between the management of upper layers and lower layers (local-area network protocols).

At this point, there is cause for optimism that OSI system management and IEEE 802.1 local-area network management will emerge as a coordinated set of standards.

For perhaps the first time ever, the consistent management of upper layers and lower layers will be demonstrated in a multivendor environment at this year's MAP demonstrations at Autofact '85 Nov. 4-7 in Detroit.

Companies fine-tune MRP II to improve efficiency, goods

By Dave Garwood
Special to CW

Many systems developed over the years for managing the functions required to plan and schedule a manufacturing company have not addressed the basic causes of productivity leaks: The systems simply could not keep up with the constant stream of changes in forecasts, customer orders and bills of material.

To compensate for the absence of a formal system that could coordinate the availability of material, capacity and labor, managers fell back on informal systems of shortage listing, order launching and expediting. Today, however, there is a formal decision support system: manufacturing resource planning (MRP II). The system can help companies bring together all the resources necessary to manufacture and distribute their products in a timely way.

MRP II is a set of computer-supported information tools designed to give managers the information they need to manage cash flow, labor, inventory, distribution and purchasing. It also integrates marketing and engineering plans and provides useful financial information. Significant product quality and customer service improvements are the by-products.

The late Oliver Wight, one of the pioneers in the field of production and inventory control, developed a checklist for measuring the effectiveness of an MRP II system. His ABCD Checklist (Figure 1) consists of 25 statements on technical issues, data integrity, staff education and system use. Companies that use their MRP II systems most efficiently are ranked as Class A users.

Achieving Class A status, however, does not imply that a firm has no room for improvement. It simply means the organization's management is in a position to make the best possible use of the skills at its command.

With the nagging problems of material shortages and capacity overloads under control, managers can take advantage of other technologies that will further improve productivity. Consultant George Bevis, president of George E. Bevis, Inc. in Longboat Key, Fla., said it well. "MRP II is a journey, not a destination." Class A is not the end of the MRP II journey, but simply an important milestone along the road.

The possibilities lying beyond Class A status promise even greater rewards that MRP II alone can provide. Aggressive Class A users keep finding new ways to take advantage of the information their systems provide.

In their efforts to become more competitive, for example, some companies are redesigning their products to reduce the number of different parts needed, while still offering their customers a wide variety of product options. The firms develop new parts that are common to all products, regardless of the options that customers specify.

This reduces the number of items on the planning bill and makes forecasting easier and more accurate. It also results in less inventory, lower costs and better quality because there is greater parts standardization.

Many companies are making great progress in reducing shop floor queues (and thus reducing work-in-process) by using capacity planning systems better. Better management of capacity builds these firms' confidence to operate with smaller queues on the factory floor.

Some organizations are making further reductions in queues by applying the concept of "group technology" to reorganize the shop into "process" cells. In contrast to the process on conventional shop floors, group technology requires that parts flow from Machine A to Machine B to Machine C

See MRP SR/12

Garwood is president of R.D. Garwood, Inc., an Atlanta-based company that specializes in MRP II education and consulting. He is also executive vice-president of Oliver Wight Education Associates, a Newbury, N.H.-based consortium that offers classes, a video-based library and consulting services for MRP II users.

ABCD checklist of users' MRP II status

1. Inventory record accuracy 95% or better ______ ______
2. Bill-of-material accuracy 98% or better ______ ______
3. Routing accuracy 95% or better ______ ______
4. Initial education of at least 80% of all employees ______ ______
5. An ongoing education program ______ ______
6. Time periods for master production scheduling and material requirements planning are weeks or less ______ ______
7. Master production scheduling and material requirements planning run weekly or more frequently ______ ______
8. System includes firm planned order and pegging capability ______ ______
9. Master production schedule visibly managed, not automatic ______ ______
10. System includes capacity requirements planning ______ ______
11. System includes daily dispatch list ______ ______
12. System includes I/O control ______ ______
13. Shortage list eliminated ______ ______
14. Vendor delivery performance 95% or better ______ ______
15. Vendor scheduling done beyond quoted lead times ______ ______
16. Shop delivery performance 95% or better ______ ______
17. Master schedule performance 95% or better ______ ______
18. Regular (at least monthly) production planning meetings with the general manager and staff, including manufacturing, production and inventory control, engineering, marketing and finance ______ ______
19. Written master scheduling policy adhered to ______ ______
20. System used for scheduling as well as ordering ______ ______
21. Material requirements planning well understood by key people in manufacturing, marketing, engineering, finance and top management ______ ______
22. Management really uses material requirements planning to manage ______ ______
23. Engineering changes effectively implemented ______ ______
24. Simultaneous improvement achieved in at least two of the following areas: inventory, productivity, customer service ______ ______
25. Operating system used for financial planning ______ ______

FINAL SCORE: Score 4 points for each "Yes" answer

90-100 points – Class A
70-80 points – Class B
50-70 points – Class C
Under 50 – Class D

Source: The Oliver Wight Cos.

Figure 1. Oliver Wight developed this checklist to help measure the effectiveness of MRP II systems. Class A status indicates that an organization is in a position to make the best possible use of the tools it has.

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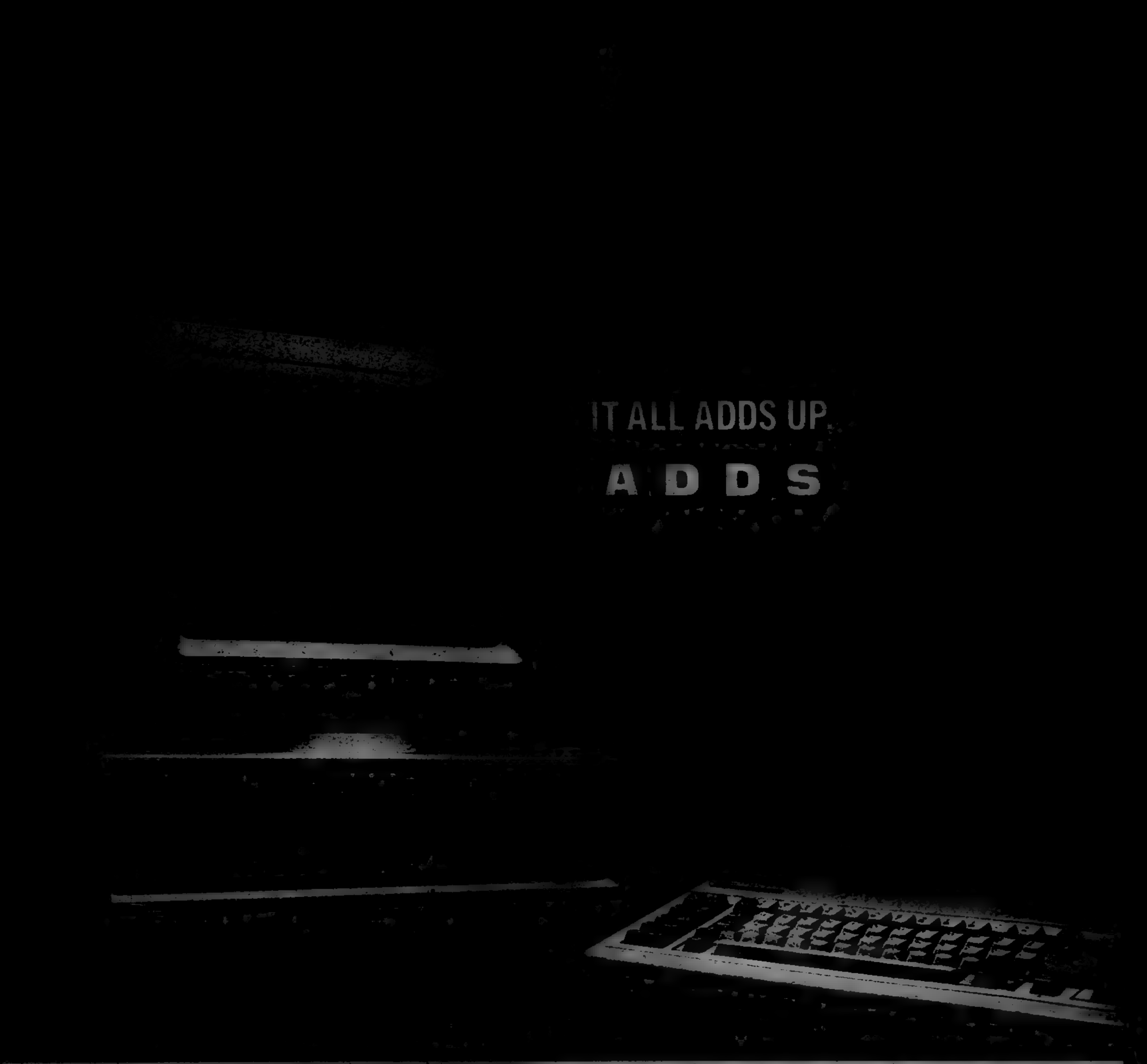

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CIM eludes vendors, but users can grasp it in fragments

By Warren Hinze
Special to CW

Contrary to many sales representatives' claims, computer-integrated manufacturing (CIM) is still a dream; it cannot be purchased from any vendor.

True CIM, an informational model of the manufacturing business that recognizes the role of people and technology in solving business problems, offers far more benefits and is far more complex than any methodology that currently poses as CIM.

CIM is not solely factory automation. It is not simply new hardware and manufacturing software. Nor is CIM the application of fourth-generation computing technologies to business problems. It should not be confused with manufacturing resource planning or just-in-time resource scheduling.

CIM encompasses artificial intelligence, computer-aided design and manufacturing (CAD/CAM), robotics, data collection, data base administration, computer operating systems, manufacturing resource planning, econometric modeling and more.

No single vendor will ever be able to offer all the elements of CIM because of the broad base of knowledge and technology involved. No one company has the resources or expertise to build CIM products alone.

Three criteria must be met before CIM is transformed from a dream to a reality:

- There must be cooperation among vendors.
- Hardware and software technology must be standardized.
- Software development and information management tools must be improved.

Vendor cooperation. Because no single vendor possesses the knowledge to develop CIM, vendors must cooperate with each other.

Hardware vendors must choose their niche in the CIM market and provide complete solutions within their chosen market segments.

Hardware and software vendors must cooperate to ensure that the latest hardware development does not prohibit the use of existing applications software.

Ideally, hardware and software vendors should take an open-systems approach so that systems and applications software are compatible with all hardware and all computing hardware is compatible with all other hardware.

Standards. The current maze of communications protocols, operation systems and local-area networks causes significant problems, as do different vendors' interpretations of American National Standards Institute (Ansi) standard languages. No one has even developed a relatively consistent approach to the interface of robots, numerical control equipment, data collection devices, CAD/CAM tools and microcomputer links.

Improved tools. The lack of sophisticated software development tools limits the U.S.' movement toward CIM. Fourth-generation languages and program development tools are of little value because the major work behind software design takes place at the conceptual design and logical testing stages.

Tools are needed to reduce the effort required to convert a conceptual design into logical and physical data bases. Once that design is completed, there must be a way to test the system automatically. The result of testing is software that conforms perfectly to conceptual design and to physical and logical data bases.

The risk of obsolescence compounds the problem of developing viable CIM systems. The rate of change in hardware and in software — whether it be in operating systems, data base management systems or teleprocessing monitors — jeopardizes the effort required to create CIM.

No vendor can afford to base a massive and expensive undertaking on unstable footing.

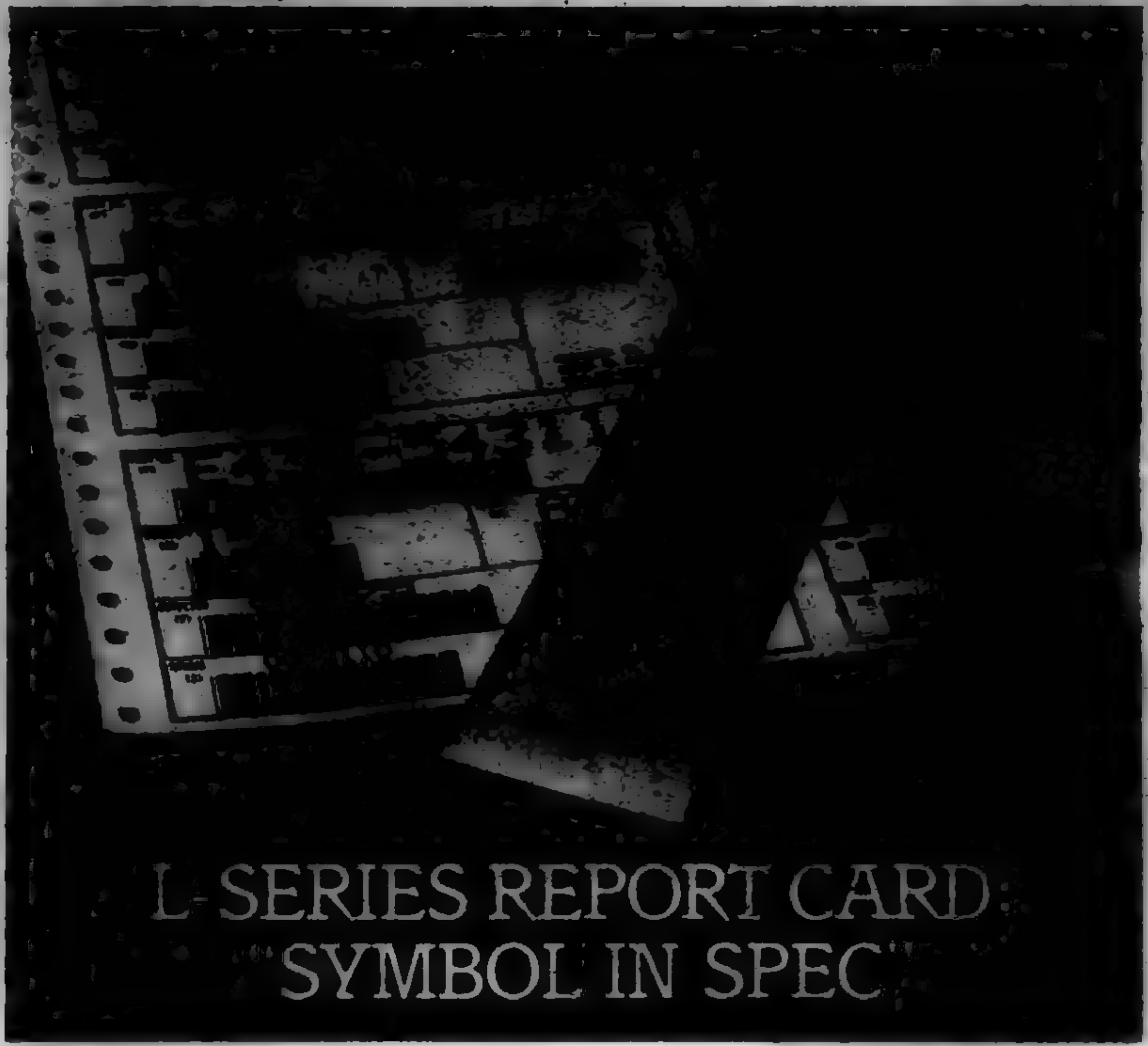
Vendors' current responses may be the best answer to coping with this problem. Prudent applications software vendors are isolating their products from system software. Likewise, hardware vendors are creating black boxes and associated software to link incompatible hardware.

In the final analysis, CIM will probably be the information management model for U.S. industry in the future. Significant steps have been made toward the goal, most notably in the independent development of the software and hardware components of CIM.

Although excellent CAD/CAM, computer-aided engineering and manufacturing resource planning systems are currently available, no single vendor has been able to offer a unified solution.

User companies can realize benefits now by implementing independent components of CIM, provided that these come from vendors with an open-systems philosophy.

Hinze is vice-president for systems planning at Comserv Corp., an Eagan, Minn.-based supplier of manufacturing software and services.



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Financial model helps manufacturers plan jobs

Consulting firm finds low-cost alternative to full-scale material requirements system

By Tom Wright
Special to CW

BLOOMFIELD HILLS, Mich. — As an aid to clients who cannot afford the time and money to install a full-scale material requirements planning system or do not have the technical expertise to do so, a consulting firm here has developed a technique for using micro financial modeling software to plan production processes.

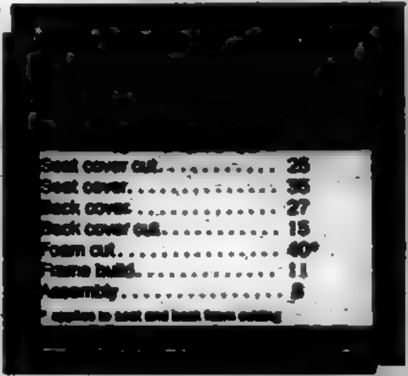
The Garrett Group, Inc., a general business consulting firm, develops production models with Execucom Systems, Inc.'s IFPS/Personal software, which runs on the IBM Personal Computer.

The technique is straightforward, and Garrett's clients who use the model have found its language flexible enough to encourage experimentation and simple enough to promote an understanding of their production planning processes.

Although IFPS/Personal is normally used in financial applications, Garrett selected it as a production modeling tool because of its ability to support rapid model development, its flexibility in interrogation and its short learning curve. Above all, the software for the model had to be easy to learn and easy to use.

The goal of Garrett's modeling exercise was to provide a tool that clients could work with; it was important, then, that the language allow even novices to understand the model. IFPS/Personal met this requirement because its source code, which users can access, describes relationships between variables in an English-like language.

The following example, a simplified case patterned after an implementation at one of Garrett's client firms, shows the logic behind the modeling technique.



Seat cover cut	25
Seat cover	35
Back cover	27
Back cover cut	15
Foam cut	40*
Frame build	11
Assembly	8

* applies to seat and back foam cutting

Figure 1. The first step in using IFPS to build a manufacturing system is to determine accurate production rates, as the client firm did in this case.

A manufacturer of office furniture wanted to model its production process. As a test, its managers looked at their chair line. The following are the steps they defined in their production process:

- Cut foam for seats and backs. These processes were independent and could proceed concurrently because two machines were available.
- Cut covers for seats and backs. The order of the two processes was unimportant, but work on them had to take place sequentially rather than concurrently because only one machine was available to perform the cutting. The firm's established practice was to cut seat covers first.
- Cover seats and backs. This was an assembly process, and it required enough foam and covers to keep assemblers busy.
- Build frames. This process was independent of seats and backs but had to be done before chair assembly.
- Assemble chairs. This process brought together covered backs, seats and frames to produce finished chairs.

Garrett's first step was to determine accurate production rates for each step in the process. As it does in all its modeling jobs, the firm stressed to the client that production rates had to be based on reasonable performance expectations, not on engineered standards. The objective was to develop an accurate planning model. Garrett staff members helped some of the client's employees generate expected rates, measured in units produced per hour (Figure 1).

The consultants, again with help from the client's staff, then used these rates as variables in their initial production model. They created a model that contained 40 columns, representing five eight-hour days.

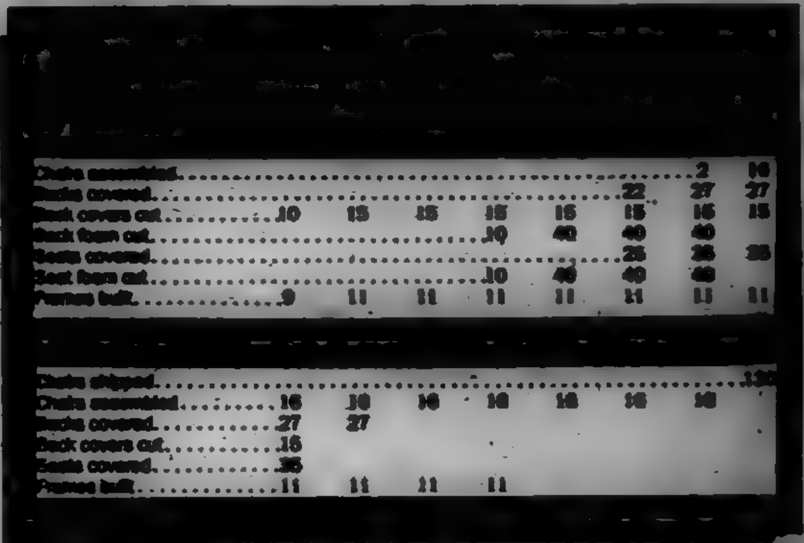
In work for different clients, Garrett determines the number of columns according to each firm's planning horizon; the consultants determine the time that each column will represent according to the client's work rates. The furniture maker's 40-hour model could easily have been a 40-day model, for example, if the firm measured its production by daily rates instead of hourly ones.

The consultants used modeling logic to define precedence relationships among production processes. They built the model to schedule each production step backward from the day and hour when the product was scheduled to leave the factory. Each production step was scheduled to start as late as possible in order to meet the shipping deadline with no time to spare.

In the model, the consultants allowed production steps to overlap, but only if the following two situations occurred:

- Sufficient quantities of components always had to be available for each assembly step.
- All processes had to be scheduled to capacity in all hours but the first, which was partially devoted to set-up time.

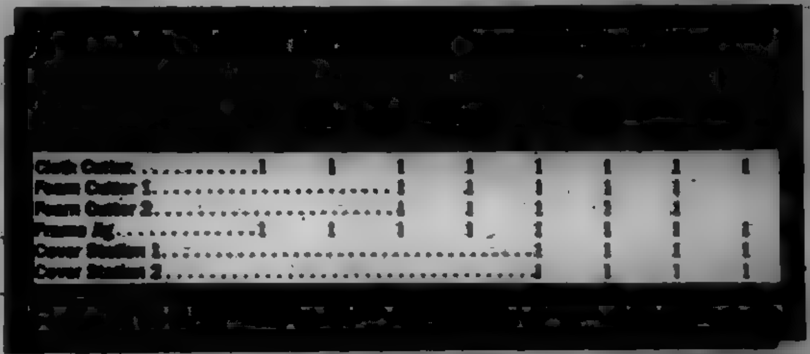
With the unit-per-hour rates entered as variables and the model parameters set, Garrett's representatives and workers from the client firm began to perform "what-if" interrogations to investigate scheduling changes.



Chairs assembled							2	16
Backs covered						22	27	27
Back covers cut	10	15	15	15	15	15	15	15
Back foam cut				10	40	40	40	
Seats covered						25	35	35
Seat foam cut				10	40	40	40	
Frames built	9	11	11	11	11	11	11	11

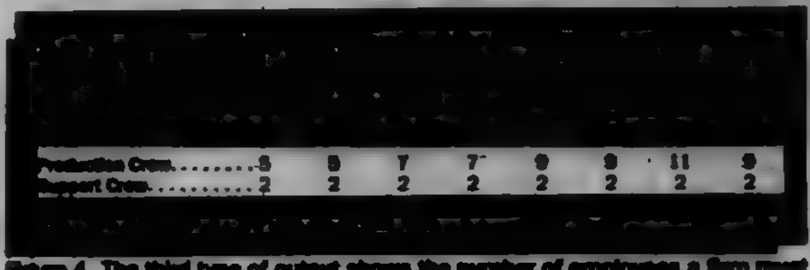
Chairs shipped								130
Chairs assembled	16	16	16	16	16	16	16	
Backs covered	27	27						
Back covers cut	15							
Seats covered	35							
Frames built	11	11	11	11				

Figure 2. With a basic model in place, a firm can produce three types of output. This chart shows one — a list of how many units will be made and when.



Cloth Cutter	1	1	1	1	1	1	1	1
Foam Cutter 1			1	1	1	1	1	
Foam Cutter 2			1	1	1	1	1	
Frame Jig	1	1	1	1	1	1	1	1
Cover Station 1					1	1	1	1
Cover Station 2					1	1	1	1

Figure 3. The second type of output shows whether or not a given machine will be in use at a given time. A "1" in any column signifies scheduled use.



Production Crew	5	5	7	7	9	9	11	9
Support Crew	2	2	2	2	2	2	2	2

Figure 4. The third type of output shows the number of employees a firm must have on hand at different times to keep up with scheduled production.

Production schedules revolved around the "chairs shipped" variable, which represented the number of chairs the manufacturer wanted to ship at a given time on a specific date. From that number, the model worked backward, scheduling production steps and manpower for appropriate times.

The basic model produced the following three types of output:

- A production schedule that showed how many units would be produced each hour (Figure 2).
- A machine utilization chart that showed when specific machines would be in use (Figure 3).
- A crewing requirements chart that identified how many workers would be needed to support the production schedule (Figure 4).

Base model starting point

The base model was only the starting point for the furniture manufacturer's production planning. Use of IFPS/Personal's "what-if" function allowed any of the rates to be changed. It also supported reconfigurations of the model. By making a simple change to the model, the firm could determine the effects of adding an additional cloth-cutting machine or another assembler.

Employees could evaluate multiple product plans just as easily. The first model was copied and modified as necessary for the other products to be manufactured. If machines were to be used to make more than one product, the machine utilization variables were stored and consolidated. In the resulting matrix, the value in each hour for a machine represented the number of products hoping to use it. Any number above one flagged a conflict.

Using the generated schedule as input, the manufacturer was also able to build production and inventory cost models around IFPS/Personal's financial modeling capabilities. As management became more comfortable with the model, additional opportunities arose.

IFPS/Personal modeling is not a permanent substitute for an integrated production control system. No matter how effectively the techniques outlined above are implemented, they cannot advance beyond descriptive capabilities. They cannot prescribe action.

Garrett, however, has found production modeling to be an effective tool for focusing on the problems that manufacturers must resolve before their production planning systems can be successful.

Wright is manager of corporate services for the Garrett Group, Inc., a general consulting firm in Bloomfield Hills, Mich.

MRP

from SR/8

without interruption. This may require an increased capital investment because machines must be dedicated to a process line, but the results are impressive in terms of lead time and work-in-process reductions. Quality is also improved because parts are immediately used, and the feedback on flaws is instant.

A number of Class A users are just beginning to take advantage of a tremendous opportunity by developing better relationships with suppliers. In many cases, more than 60% of a manufacturing firm's costs and inventory investment and 80% of its cumulative lead time are attributed to the "outside" shop.

Planning production

By communicating their requirements beyond the quoted lead time, manufacturers help suppliers plan parts production, which saves the suppliers money. The suppliers, in turn, pass on significant price reductions to the manufacturers.

With MRP II, manufacturers have the tools to execute plans quickly and reliably. This places a greater emphasis on planning demands. Innovative ideas, such as sales planning rather than sales forecasting, are making it possible to plan customer requirements accurately and to hold specific sales representatives and territories accountable for meeting forecasts.

The authors of the best-selling book *In Search of Excellence* used the phrase "ready, fire, aim" to discuss getting new products to the marketplace quickly. MRP II has helped many companies introduce new products faster by helping them communicate their requirements for purchased and manufactured parts, plan additional requirements and coordinate engineering schedules.

Bridging the gap

Many of these companies are now looking at ways to translate design engineers' concepts into specific machine tool instructions more efficiently. Computer-aided design and manufacturing is beginning to play a major role in bridging the gap between the engineering department and the factory floor.

Bently Nevada Corp. of Minden, Nev., a Class A user and leading producer of vibration-monitoring instrumentation, has been very successful at reducing the lead times it needs to deliver a product once a customer has placed an order. Recently, the firm brought up a new customer order entry system that significantly cut the time required for sales representatives to translate a customer's requirements into the company's parts numbers.

Other steps in the evolution of MRP II will focus on improving the reliability of schedules with quality improvements and reliable supplier deliveries. Companies will continue placing greater emphasis on chopping lead times and lot sizes. The goal will be to make the right items to satisfy customers, and to purchase raw materials and components in exactly the right quantities and just in time.

The productivity journey will undoubtedly include some surprises along the path, but companies with MRP II will have the tools and flexibility to meet the challenges ahead.

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"WE SHOULD HAVE GONE WITH CONCORD DATA."

Alonzo Chappel. *Battle of Bunker Hill.* Courtesy The Bettmann Archive.

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Vision systems: Technology of the future at work today

Machine vision helping reduce costs, improve quality in modern factories

By John D. Meyer
Special to CW

Machine vision has emerged as one of the most important technologies for the factory of the future, but it is useful as well in the factory of today.

If it is properly applied, machine vision can dramatically reduce production costs and improve product quality by enabling complete, accurate and inexpensive inspection of workpieces. In addition, machine vision systems can help robots identify workpieces and determine their position, orientation, shape and other characteristics.

Commercially available vision systems vary considerably in their capabilities. Typically, however, they can perform one or more of the following tasks:

- Identify shapes.
- Measure distances.
- Gauge sizes.
- Determine orientation.
- Quantify motion.
- Detect surface shading.

Today's vision systems perform these functions at high speeds, with high accuracy and repeatability and at relatively long ranges and standoff distances; they need not contact the part they are inspecting. Furthermore, they perform at lower costs than other inspection schemes do.

Because they provide these functions, machine vision systems best serve three primary types of applications: inspection, part identification and guidance and control.

Inspection. Automated vision systems have the ability to recognize well-defined patterns and to determine whether these patterns match ideal patterns stored in the system. This ability makes machine vision useful for the inspection of raw materials, parts, assemblies, containers and labels.

Inspection is, by far, the largest category to date for machine vision applications. But because most inspections are still done manually, this applications area is expected to undergo significant growth.

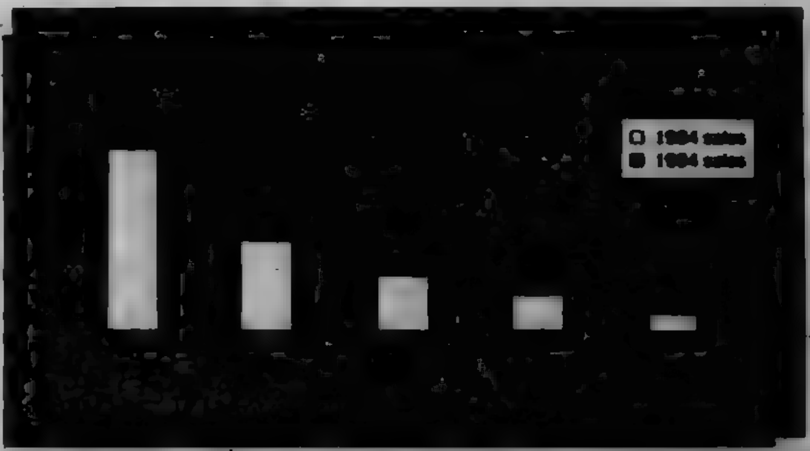
Part identification. In contrast to inspection, which examines an object's characteristics without identifying the object, part recognition focuses on the positive identification of an object. It uses this positive identification for decision-making purposes.

> *If properly applied, machine vision can dramatically reduce production costs and improve product quality.*

Part identification applications for machine vision systems range from the familiar optical character recognition process to the more obscure operations of part sorting and bin picking.

Guidance and control. Increasingly, machine vision systems are being used to provide sensory feedback for real-time guidance and control applications.

In wide-ranging applications, vision systems can act as visual servos for industrial robots and for weld seam tracking or can work to calculate geometric offsets for part processing and assembly operations.



The market for machine vision systems in the U.S. is expected to grow from about $60 million in 1984 to about $1.2 billion in 1994. As the market grows, the distribution among applications types will shift somewhat.

During the past decade, machine vision technology has been used in a variety of applications across the three broad categories. Users have depended on machine vision for industrial measurement and control; medical testing and analysis; commercial data entry; satellite image processing; cartography; military reconnaissance, guidance and control; and scientific research.

Various factors have led organizations to employ vision systems. In industrial measurement and control, for example, machine vision has been especially useful under the following three circumstances:

- When a visual inspection or feedback task is unpleasant or hazardous for humans to perform.
- When machine vision has capabilities humans do not have.
- When machine vision offers better performance than humans do, such as higher inspection speeds or lower error rates.

Because machines operate well under these circumstances, the potential for vision systems in manufacturing is enormous. The 1984 market for machine vision systems in the U.S. was about $60 million. This represents sales of about 1,200 units at an average price of $50,000. The total installed base at the end of 1984 was about 2,500 systems.

These figures do not include systems purchased as individual components and assembled by the end user (cameras, image processors and the like), nor do they include vendors' revenue from other areas (applications engineering, for example). When these other items are included, the 1984 market was closer to $90 million.

The market for machine vision systems is expected to grow rapidly during the next decade, and by 1994, the market should be worth about $1.2 billion.

In response to these growth projections, more than 100 companies now offer industrial machine vision systems for use in assembly, inspection and other manufacturing operations. Vision systems have become useful manufacturing tools and have led to the development of a new industry. Machine vision promises to be one of the more important technologies that will affect manufacturing during the next decade. The next few years should prove to be exciting for all parties involved with this dynamic young field.

Meyer is president of Tech Tran Corp., a Naperville, Ill., consulting and publishing firm specialising in manufacturing technology.

[illegible] acceptance

[illegible]

Vision system fuels Ford's drive to make perfect circuits

Machine aids in early detection of defects

LANSDALE, Pa. — A Ford Motor Co. electronics plant here has enlisted a machine vision system as part of an effort to turn out defect-free circuitry for the automaker's cars and trucks.

Each year the plant makes millions of thick-film circuits — miniature computers that control ignition, electrical current flow, fuel metering and other engine functions. Each square-inch module contains an average of five and as many as 12 layers of electrically conductive and resistive materials. Each layer must be defect-free and must align precisely with adjoining layers.

A pinhole-size flaw anywhere or a hair's breadth misalignment between layers can render a circuit unacceptable — even a slightly flawed circuit runs the risk of breaking down on the road. Perfect circuits, on the other hand, can operate reliably for the lifetime of a vehicle.

A critical task is to inspect each layer as it is deposited to detect microscopic flaws that can creep into the fabrication process.

"Catching defects after they occur isn't the answer," according to Dennis Lex, Ford's manager of industrial and manufacturing engineering for electronic products. "Instead, we want to avoid defects completely by identifying trouble spots in the production process and correcting them before any bad parts are made.

Ford's search for a fast, precise inspection tool led the automaker to invest in Synthetic Vision Systems, Inc. (SVS), which had developed a family of image-analysis computers capable of inspecting circuits quickly and with great accuracy. Ford currently has 17% ownership of SVS.

The Thick Film Laboratory here installed a fourth-generation SVS Cytocomputer, a Cyto IV, last spring for a tryout and has since brought it into actual shop floor use. The factory-hardened machine consists of eight large-scale integrated circuits connected in a pipeline architecture; it uses raster-scan operations to perform inspections. Every one-thirtieth of a second, the machine processes 250,000 pixels of information.

With the machine's processing speed, Ford can thoroughly inspect a thick-film circuit layer in 10 seconds. The Cyto IV can only inspect one layer at a time, and it is not incorporated into the production line. For every batch of layers, workers take a random sample of circuit layers off the line and to the machine for quality assurance inspections.

'Combines several inspection routines'

The computer checks the circuit layer for eight characteristics, including thickness, alignment and location of circuit pads. "The SVS computer actually combines several key inspection routines into one operation and is replacing conventional inspection tools such as microscopes and optical-alignment gauges," according to William F. D'Arcy, supervisor of thick-film quality and process engineering at the plant.

If the machine spots a process problem that is not yet critical but is likely to get worse — such as screen printing on layers that is beginning to thin out — it signals the problem both to machine operators and to an AT&T Unix-based, Motorola, Inc. 68000-type host processor. Machine operators are alerted via a full-color VDT display on which the problem area has been circled. The host processor performs statistical analyses to determine when the process must be adjusted to avoid faulty parts.

This ability is a critical one to Ford, according to D'Arcy. "Beyond [Cyto IV's] raw speed, what really impresses us is the computer's ability to spot incipient flaws before they become significant and to tell us where to make process control adjustments," D'Arcy said. "Controlling the process is the key to quality assurance."

Lex said Ford plans to phase the machine into the production line of its plant here over the next year. Different versions of the Cyto IV will inspect circuits layers during different stages of the production process. At any stage where a problem occurs, Ford will be able to stop the production line immediately and keep it down until the problem gets corrected. With on-line inspection, he said, the automaker will eliminate the need for both the random quality assurance checks and the statistical analyses.

The automaker also plans to work with SVS to test higher speed components and software for the machine. "Ford will continue as a principal field-test site for [SVS] as our two companies combine their engineering talents and gain actual product inspection experience," Lex said. "As a partner with SVS, we have a vested interest in making the Cyto IV the most commercially attractive system of its kind."

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Vision tool scans, interprets images

Ford Motor Co.'s machine vision system, Synthetic Vision Systems, Inc.'s Cyto IV, performs two principal functions: circuit scanning and high-speed image interpretation.

Scanning and sensing. The Cyto IV's "eye" is a low-distortion close-up lens system coupled to a high-resolution, solid-state video camera. The camera is similar to a conventional television camera but provides much greater detail and has more stability.

A circuit module, taken from the production line, is placed on a moving platform below the camera lens. The platform, controlled by the computer, moves the circuit with thousandth-of-an-inch precision. At each of four platform positions, the camera scans the microscopic circuit section, storing digital representations of the circuit in computer memory.

For an average 10-sq-in. circuit, the camera takes 40 snapshots, one for every ¼-sq-in. Hundreds of thousands of light-sensitive sensors in the camera break each snapshot into a 500-line by 500-dot pixel image.

As the camera scans the circuit, it sends pixel data to the Cyto IV one line at a time. After the scanning is complete, the machine begins to interpret the visual information.

Image interpretation. Through this process, the Cyto IV can recognize shapes, sizes, patterns and edges. Using pixel data, it develops a computer-coded image of the circuit. It then eliminates everything but the topmost layer.

The Cyto IV compares electrical connections in this layer with connections in a perfect layer stored in the machine's memory. Next, the machine uses algorithms at each point on each circuit line and space to identify points that are too thin and may break when subjected to a car's engine heat. The topmost layer's registration is compared with the layer beneath it to verify that all elements align perfectly with each other.

The Cyto IV electronically scans for abnormal circuit features such as shorts, pinholes, cracks, chips, missing elements and other defects, including minor flaws that might allow the circuit to function initially but cause it to fail after a while.

With the Cyto IV's full-color display screen, operators can see exactly what the computer sees during the interpretation process; they can also freeze the image to look closely at a section. If the machine spots a flaw, it alerts the operator by drawing a circle around the flawed area on the screen image. The computer also advises the operator of the need for corrections on the production line and the type of corrections necessary.

Because the computer can distinguish between 256 different gray-scale values, it can reveal details that might otherwise remain hidden in a circuit board's multicolored patterns. It uses edge information to help distinguish between extreme subtleties in shading and employs neighborhood processing techniques for gray-scale analysis.

A group of nine pixels (a given pixel plus the eight pixels bordering it) represents a "neighborhood." The Cyto IV compares the mathematical value of the center pixel with those of its neighbors and uses algorithms to identify and sharpen edge information. Neighborhood analysis allows the machine to locate circuit boundaries and features, which helps the computer analyze defects precisely.

Neighborhood processing involves billions of computations, a task that would choke most conventional computers. DP computers expend most of their resources extracting instructions from memory. To perform neighborhood processing, they must gain repeated access to each pixel that is stored in memory.

The Cyto IV employs an advanced pipeline architecture and internal instructions that enable each of the Cyto IV's computing stages to perform neighborhood processing functions more efficiently. The machine spends no measurable time extracting instructions from memory; it extracts each pixel of information only once to perform eight or more processing tasks.

Machine vision plays a role in thick-film circuit production at Ford Motor Co., Lansdale, Pa.

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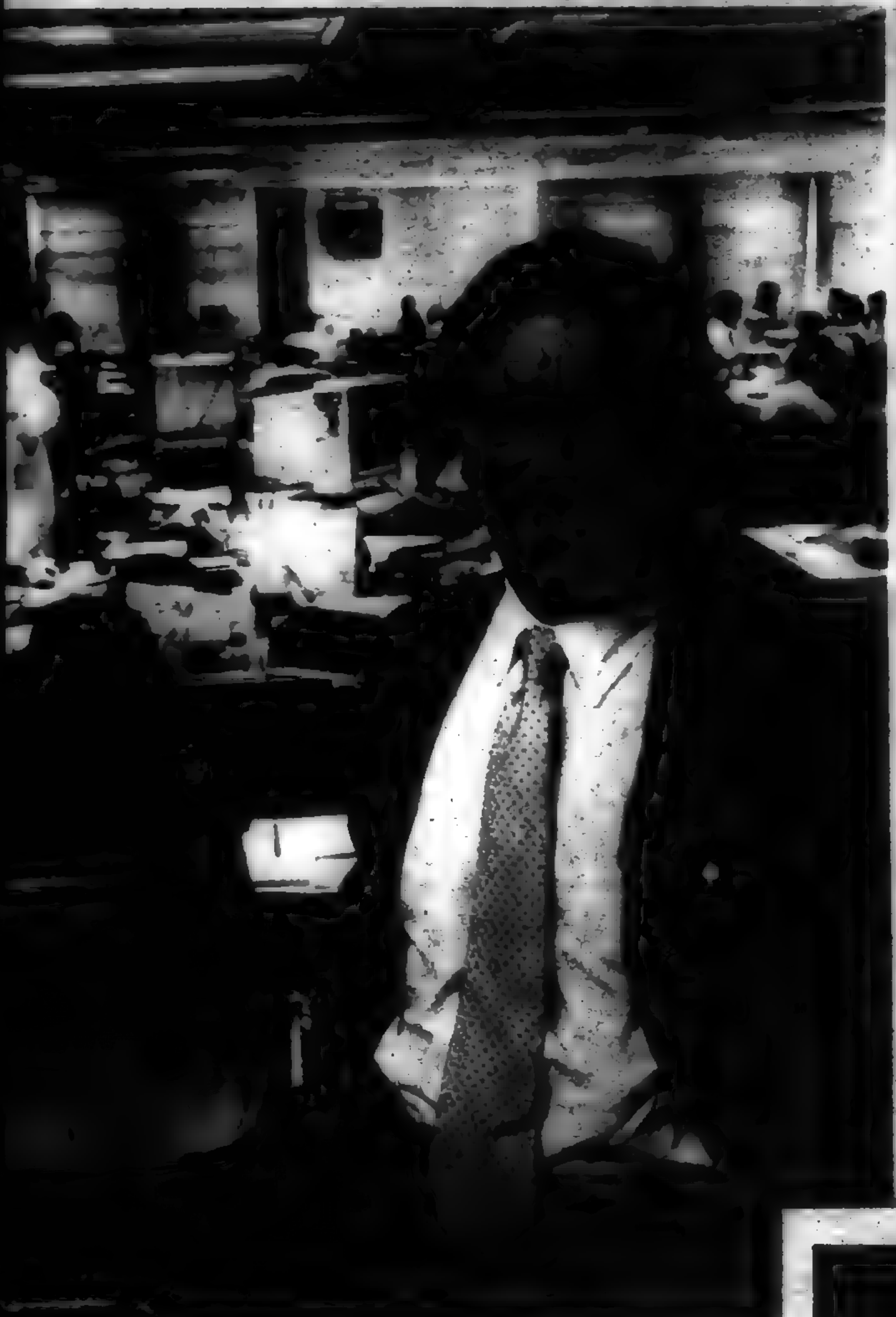

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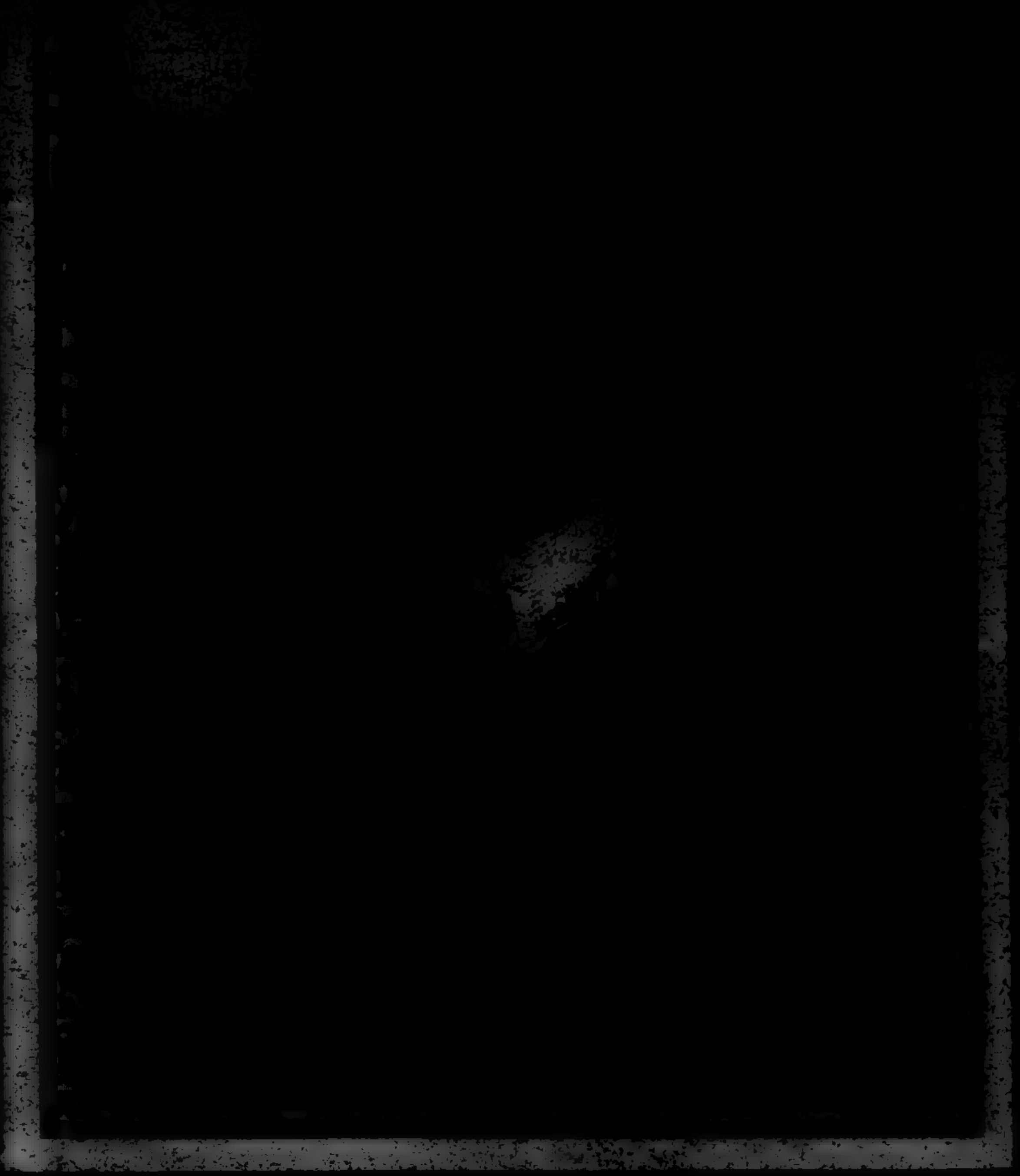

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Special Report

Kanban techniques allow printer manufacturer's daily

> 'If there is no true pacing of the line, and, ultimately, a buildup of work in progress, . . . you lose the initial advantage of the process.'
>
> — Steve Cullen
> Centronics Data Computer Corp.

HUDSON, N.H. — After applying kanban, or just-in-time, techniques to its production lines, a printer manufacturer here increased its annual inventory turns eightfold, quadrupled its daily production and cut its order turnaround time by two-thirds.

Centronics Data Computer Corp. implemented kanban manufacturing processes last July. According to Steve Cullen, director of the project, the implementation took about one month and cost the firm somewhere between $75,000 and $100,000 — mainly in fees for electrical and other maintenance work involved in rearranging Centronics' shop floor.

In return, the firm gained a number of benefits. In less than a year, it has done the following:

- Increased annual inventory turns from two to 16.
- Increased daily printer production from 100 to 400.
- Cut average order turnaround from 90 days to 30 days.
- Cut the amount of time needed to make and test a printer from between seven and eight days to two days.
- Increased productivity against an ideal efficiency factor from 40% to between 75% and 80%.

Centronics, which manufactures 23 different models of dot matrix, line and band printers for the computer industry, turned to kanban techniques last summer when it faced an increase in the number of orders it received. The firm wanted to increase volume without incurring the expense involved in adding factory floor space.

The implementation centered around setting up the shop floor so that printers could be made on an assembly line, with each worker performing uncomplicated, discrete tasks. With this arrangement, production speed would increase, and inventory buildups would drop.

Preimplementation problems

"We were faced with two major problems prior to the implementation of kanban," said Ranga Iyengar, vice-president of operations at the plant.

"First, Centronics manufactures 23 different printers — all very similar up to a certain point — yet each printer was being built by one individual, one at a time. Second, inventory management was difficult: Parts were being inventoried that might not be used for weeks or even months."

During one month of 80-hour workweeks, Cullen and his staff planned for the implementation, paying particular attention to shop floor logistics, which Cullen said was the most important part of implementing a setup based on kanban principles.

Process depends on production's flow

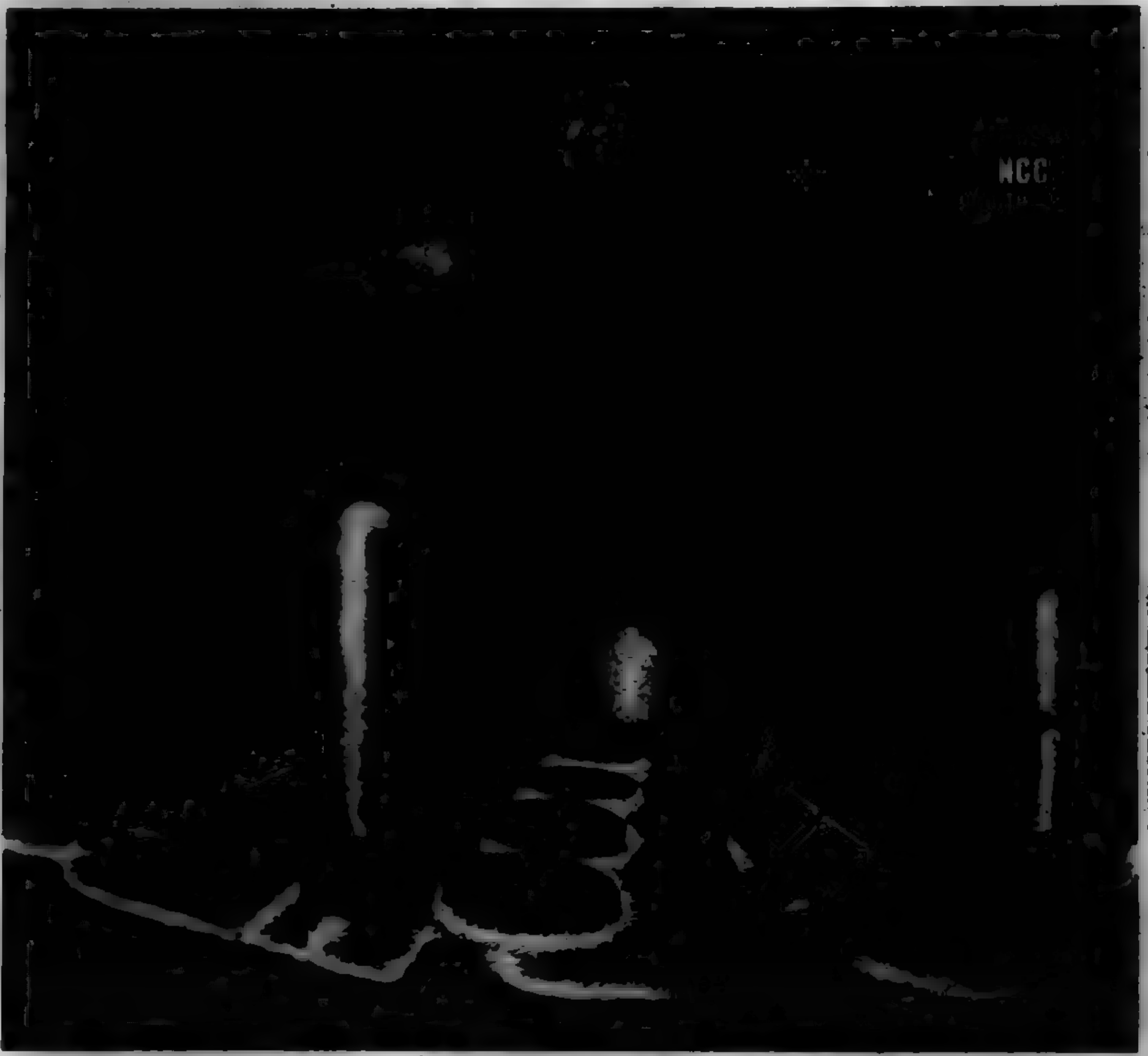
"The process depends on the smooth and efficient flow of production," he said. "You can make room for all of the production lines you want, but if there is no true pacing of the line, and, ultimately, a buildup of work in progress, the entire operation is slowed down. You lose the initial advantage of the process."

To prevent bottlenecks that would disrupt work flow, Centronics coordinated logistics for each stage of the production process, from materials receiving, through product burn in and circuit testing — a process the firm calls the Hypot stage — and on to shipping (see chart).

On the materials receiving end, for example, the firm worked with its parts suppliers to schedule frequent deliveries in accordance with tight production schedules. As part of the kanban setup, Centronics keeps only one week's worth of most production materials in its warehouse, and the firm needed to make sure vendors delivered often enough to replenish supplies. Suppliers that made deliveries once every two weeks or once a month now do so twice a week.

In the warehouse, picking crews receive work orders that describe each printer model set for production and all the parts necessary for the product along with its scheduled production date and the location where it will be assembled. A work order stays with a product throughout the production cycle and leaves the plant with the printer as a history of its manufacture.

An IBM Copics shop floor release module, running on an 8M-byte IBM 4381, generates the work orders and passes them on to a IBM Series/1,



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[illegible]

production to quadruple

which prints them in bar code. Centronics also maintains other Copics modules — bill of materials, inventory planning and forecasting, inventory accounting, advanced-function materials requirements planning and purchasing and receiving — on the 4381.

Data collection software from Wakefield Software and a routing and facility package from Brunswick interface with the Copics modules and complete the firm's manufacturing software system.

Printer shakedowns

Before any printer model goes into production, Centronics performs lengthy shakedowns. Problems must be ironed out before production begins, Cullen said, because each stage of production is tightly coordinated with every other stage, and any hitch that occurs during the production cycle can bring down an entire line.

On the shop floor itself, Centronics operates four production lines, each with 16 workstations. One employee works at each station, and each production line has two floaters, workers who can take over when an employee at any station takes a break.

Ideally, the kanban process involves breaking a production process down into small tasks that take no longer than three minutes to complete, Cullen noted. Centronics has stayed close to the ideal. At each workstation, one employee performs one simple task on each printer that comes before him — adding one mechanical assembly, for example — and forwards the printer to the next workstation.

Before each worker begins his task, he must check the accuracy of work done at the previous station. If the work is somehow faulty, the worker waiting to begin his task gives the product back to the previous worker so he can fix it. If a task must be redone, the whole production line stops. Cullen said the adverse attention this draws provides incentive for workers to do their jobs right the first time.

Decreased testing time

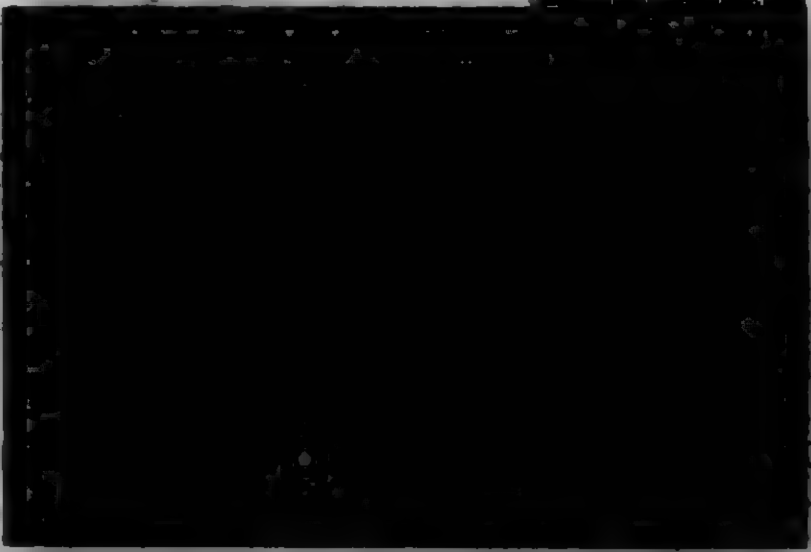
Together, the preproduction shakedowns, simplified production tasks and on-line inspections have improved the quality of end products. This, in turn, has decreased the amount of time that Centronics must test each finished printer. Before the firm implemented kanban, Cullen said, it ran each printer for eight hours of post-production tests to ensure quality. Now, it runs each printer for only four hours.

Quality assurance inspectors also perform some off-line checks during the production cycle, but Cullen said these are less central to the kanban philosophy than the on-line inspections. With a kanban production cycle, he said, "you build quality in; you don't inspect it in."

In line with this, production halts whenever a problem surfaces. Supervisors on the floor keep a constant watch for yellow trouble lights — visible from anywhere on the shop floor — that workers switch on if they spot a problem. When this light appears, the entire production line stops; it cannot start again until the problem is alleviated.

Supervisors must be prepared to fix problems as soon as they occur or to reassign workers to another operable line. Centronics always has a corps of supervisors waiting to do so. "With supervision much more important in the kanban process, we have four supervisors and four group leaders on the floor at all times," Cullen said.

Once the production of a printer is finished, quality-control inspectors check the machine and put it into postproduction testing. After the tests are complete, the inspectors check the machine again then send it to the warehouse, where workers pack and ship it.



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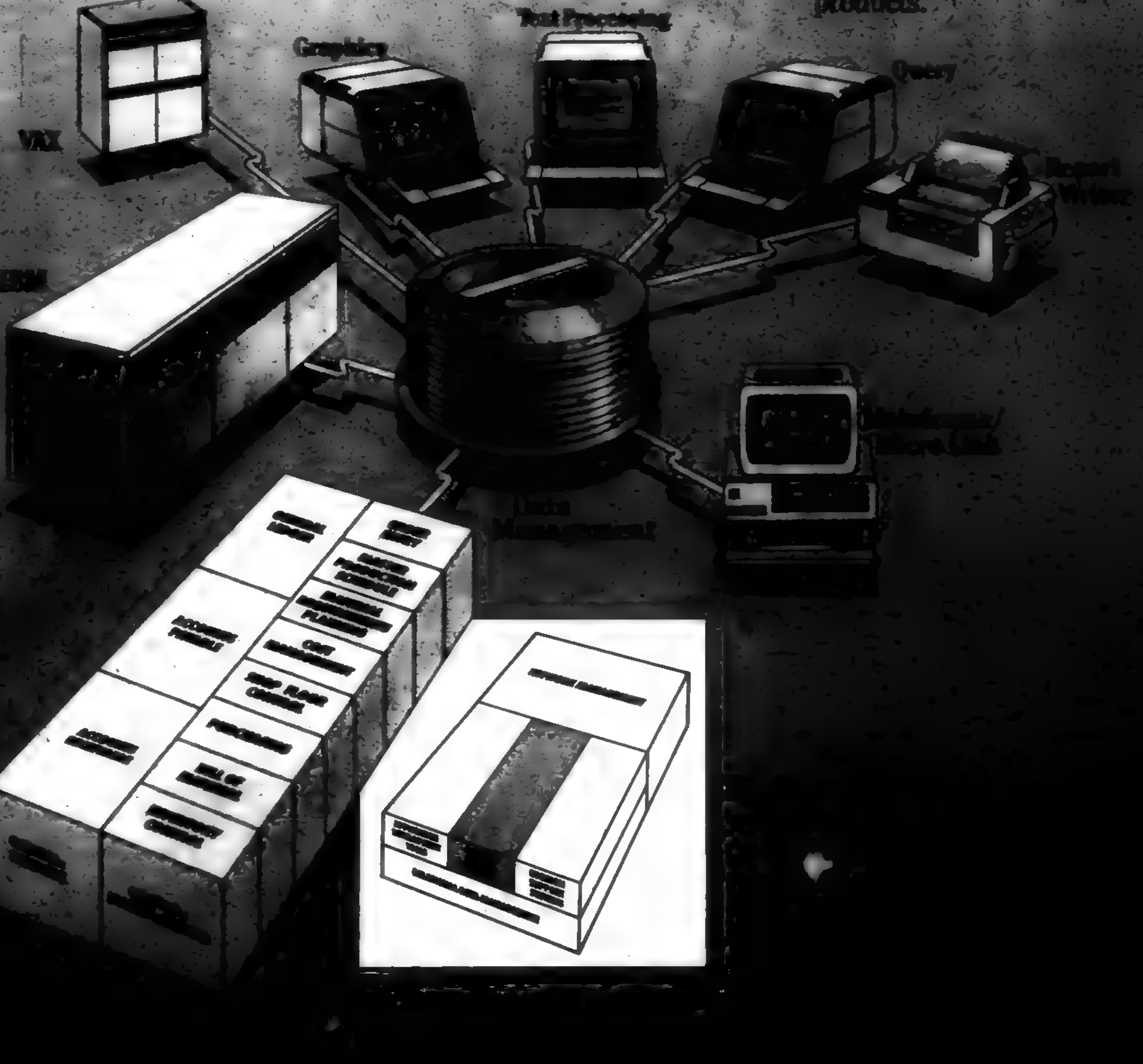

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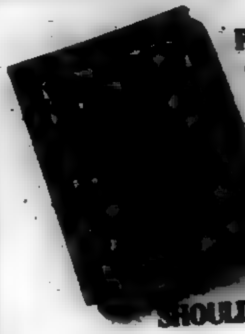

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Special Report

Multilevel pegging forms base for just-in-time concept

By Woodrow W. Chamberlain
Special to CW

In manufacturing, where speed is the name of the game, success in the future will depend on the ability of manufacturing and accounting systems to exchange pertinent information quickly and accurately as follows:

- The purchase order system will order materials to support shop floor scheduling needs.
- In turn, the manufacturing system will supply accurate and timely information about the progress of scheduled shop floor processes.
- Ultimately, the manufacturing system will report this information to the general ledger, which will generate reports to guide future financial and manufacturing plans.

To allow for the exchange among systems, the software that will drive the factory of the future must provide multilevel pegging — the ability to peg each part of each contract through each level of the manufacturing process.

Detailed method

Multilevel pegging provides a detailed method of accounting for work in progress and for final manufacturing costs; it connects all component parts to an end item or customer order number. Regardless of the size of a purchase order or a shop order, a system with multilevel pegging can identify the contract number or the customer number for each part being incorporated into the end product.

This ability provides a strong backbone for the just-in-time philosophy on which factory managers are beginning to focus. The philosophy aims at one goal — reducing inventory — and achieves this goal by effecting seven zeroes:

- Zero defects.
- Zero set-up time.
- Zero lot sizing.
- Zero handling time.
- Zero surging.
- Zero breakdowns.
- Zero lead time.

The success of the just-in-time philosophy lies in its ability to identify, comprehend and adjust rapidly to the impact of a work interruption or stoppage, and multilevel pegging assists throughout the process.

Identification occurs when factory management focuses on the current area in trouble. Comprehension occurs when a statement is made as to what next assembly or assemblies will be delayed. Adjustment occurs when management determines a course of action and immediately relays that course to the manufacturing work force, thus reprioritizing the work effort.

Any activity that affects the flow of production — an unusual scrap occurrence, the processing of an engineering change or the change of a master production schedule, for example — calls for reprioritization. Managers must respond immediately to make sure that employees are not working on parts that are no longer needed.

If managers are to respond quickly to change, they must be able to identify which end items a particular shop order satisfies. They must know this data at all times on a real-time basis to compensate quickly for scrap or for schedule adjustments and to bill accordingly.

Multilevel pegging provides them with the necessary knowledge. When it is in effect, every part can be immediately associated with mating parts. If a part is scrapped, the schedule for its mating parts can be altered to coincide with the new completion date.

When managers use this information to reprioritize their operations, they direct work toward only those parts that can be built — and thus those that can be shipped. They avoid unnecessary inventory bills and prompt the efficient use of labor.

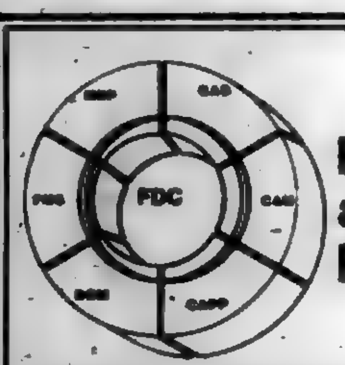
Accurate cost accounting

Multilevel pegging also allows for accurate cost accounting because it identifies individual parts and charges, which managers can allocate to specific contracts, departments or customers. For a system to work this way, however, manufacturing software must be integrated with accounts payable, purchase order and general ledger software.

Cost management systems must determine the actual manufacturing cost from bill of materials information, inventory information and labor information; additionally, they must generate journal entries into the general ledger. The reports generated by the general ledger will, in turn, help managers spot problems in work in progress and accurately cost out a completed job for billing. This will ensure that costs are accounted for properly.

Buyers of manufacturing software systems should be wary of software systems that cannot identify all component parts of an end item or customer order number; such systems will not provide support for the just-in-time philosophy. With a dynamic communications network such as multilevel pegging, however, the seven zeroes of just-in-time can be achieved, and the factory of the future will be a reality.

Chamberlain is vice-president of manufacturing sales for McCormack & Dodge Corp. He works out of M&D's Dallas office. Formerly, Chamberlain was president of Rath & Strong Systems Products, Inc., which M&D acquired in March.



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**Computerworld, August 20, 1984*

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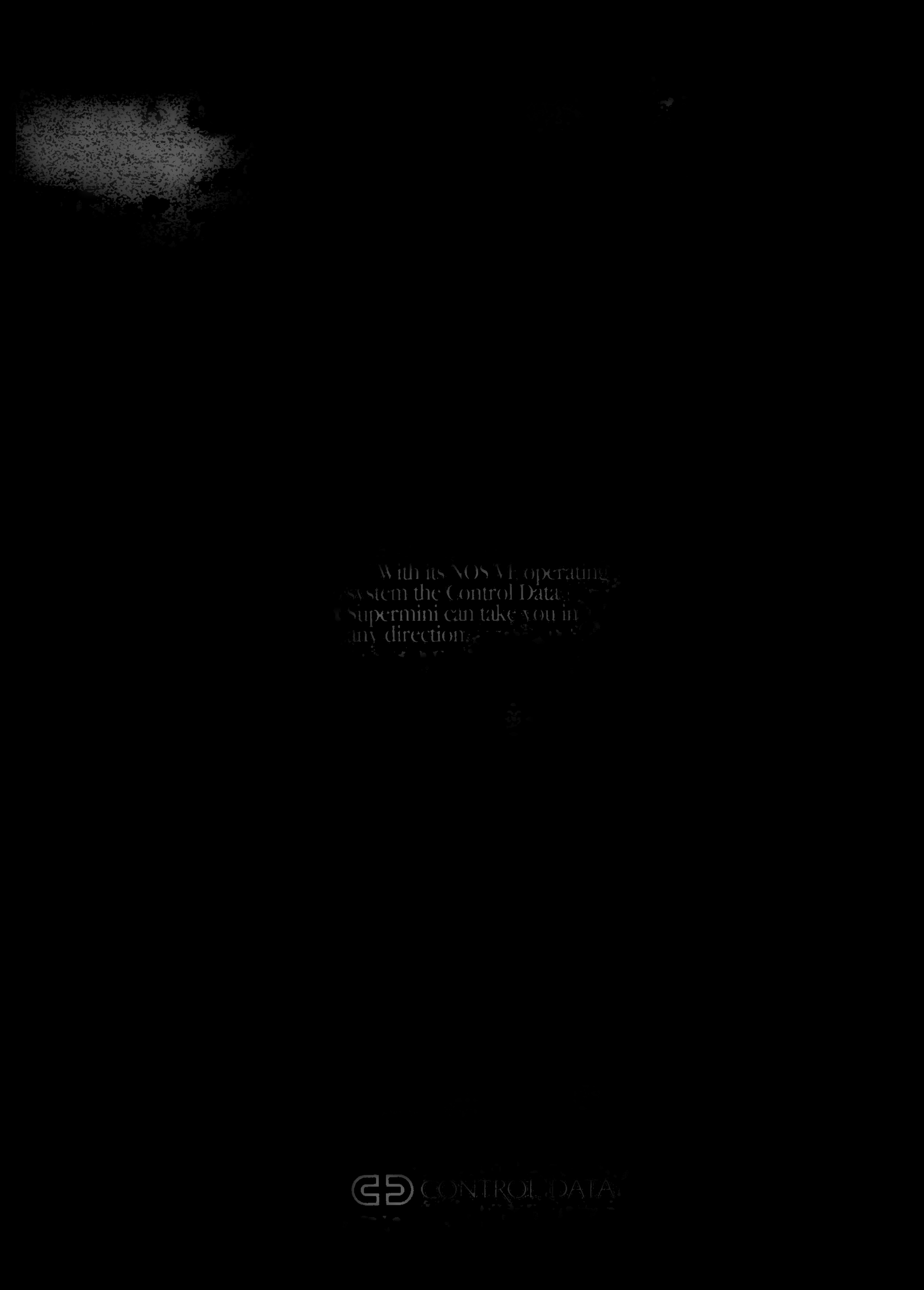

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Special Report

Flexible systems ease work flow

By Keith S. Bolston
Special to CW

The flexible manufacturing system is the next step in the evolution of factory integration. Flexible manufacturing systems and manufacturing cells will smooth the flow of manufacturing in the factory of the future.

A flexible manufacturing system can be defined as a computer-directed integrated system of machine tools and materials-handling equipment designed to manufacture a variety of workpieces at low to medium volumes. A flexible manufacturing cell is a simplified version of a flexible manufacturing system. Properly planned implementation of flexible manufacturing systems will lead to reduced lead time, work in process and inventory and increased flexibility and improved quality.

Flexible manufacturing systems integrate the following three critical manufacturing components:

- CPUs.
- Machine tools.
- Materials-handling equipment.

Central to the concept of flexible manufacturing is the system's ability to integrate these three components to make a variety of products without changing machine tool layout.

A flexible manufacturing system machine tool configuration should be able to produce a variety of finished products. Supervisory computers monitor the completion of each piece and download instructions to the numerical controller. Most important, a well-designed flexible manufacturing system can accommodate sudden increases in production requirements with little setup time.

There are two basic types of flexible manufacturing systems as follows:

- Random order (nonsequential).
- Dedicated (sequential).

Computer integration

Computer control is the glue of the flexible manufacturing system. Supervisory devices range from mainframe computers to minis and micros to programmable logic controllers. The critical link between the CPU and the machine cell is made possible by an industrial local-area network.

Data processing in a typical computer-integrated factory takes place at the five following levels:

- Plant.
- Machine center.
- Machine cells.
- Workstation.
- Machine tools.

The flexible manufacturing system CPU, usually a minicomputer, serves as the link between large, plant-level mainframes and lower level programmable logic controllers and computer numerical controllers. The mini supports a number of manufacturing functions, such as production and machine load scheduling, monitoring work in process, program downloading, communications to corporate-level computers and system diagnostics.

An essential requirement for flexible manufacturing system software is real-time operation. The operating system must be able to complete numerous subtasks instantaneously and simultaneously.

Operating system software is just one of several packages needed to control a flexible manufacturing system. Another is group technology software, which enables similar machines to maximize tooling and scheduling functions. Maintenance and dispatch software, however, may be most critical in the evolution of the flexible manufacturing system.

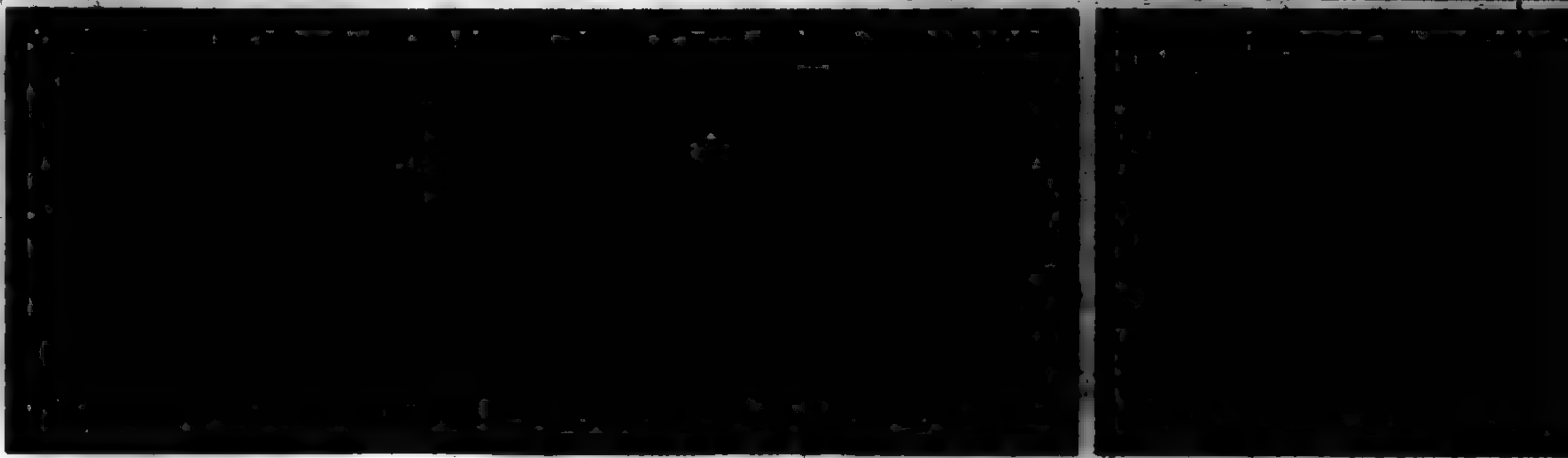
Bolston is an industry analyst for the manufacturing automation planning service of the Yankee Group, a Boston-based industry research and market analysis group.

Technology

A three-year world recession has made it necessary for U.S. manufacturing industries to redefine their needs. The machine tool industry, which collapsed in 1982, was a major casualty of this recession. The surge in investment that began in 1984, however, may boost the market for machine tools, which was worth $2.8 billion in 1984, to an $11 billion market in 1990.

The Manufacturing Automation Planning Service branch of the Yankee Group, a Boston-based market research firm, estimates that the market for flexible manufacturing systems and flexible manufacturing cells (a simplified version of a flexible manufacturing system) was worth $262 million in 1984 and will increase sharply to $1.8 billion in 1990. By 1990, 10% of all machine tools sold will be capable of operating unmanned in a flexible manufacturing configuration.

While the growth of the flexible manufacturing cell market will be closely correlated with the computer numerical controller market, the flexible manufacturing cell market will grow much faster than the flexible manufacturing system market. It is estimated that the installed base of flexible manufacturing cells will grow from 150 in 1984 to close to 2,000 flexible manufacturing cells in operation in 1990. By contrast, an estimated 36 flexible manufacturing



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systems were in operation in the U.S. at the end of 1984 (Figure 1), and it is estimated that there will be more than 200 operating in 1990.

Surveys indicate that 56% of all flexible manufacturing systems are presently used for manufacturing machinery, 41% for transportation components and 3% for electrical machinery. As the flexible manufacturing system market increases in size, these proportions will not change noticeably, although the construction and materials-handling industries will have garnered 12% of all installed flexible manufacturing systems in five years.

However, a number of factors may affect the increasing use of flexible manufacturing. While the U.S. Department of Commerce estimated that new plant and equipment expenditures for 1984 would be nearly $350 million — the largest increase in 17 years — the decisive factor in the adoption of flexible manufacturing systems is how aggresively U.S. manufacturers will pursue automation technology.

However, the number of corporations willing to make the necessary commitment to change will be small during the next two years.

Vendors

Who will be the major players in this burgeoning market? The Yankee Group sees five major companies with the potential to become leaders in the field, including Cross & Trecker Corp.; Cincinnati Milacron, Inc.; Giddings & Lewis Machine Tool Co.; Mazak Corp.; and White-Sundstrand Machine Tool Co. Looming behind these five is General Electric Co., which owns a small share of the market but is very committed to developing automation solutions. A handful of smaller companies will have difficulty finding opportunities behind these industrial giants.

Machine tool vendors will dominate this market because machine tools constitute the most common component of the flexible manufacturing system. Additionally, these vendors understand the shop floor and recognize that flexible manufacturing systems and cells constitute value added for their products. This element provides these vendors easier entry to the flexible manufacturing system market than the established minicomputer vendors, such as Digital Equipment Corp., IBM, Data General Corp. and Perkin-Elmer Corp.

Vendors are now poised to take advantage of strong demand for machine tools. However, to venture into the flexible manufacturing system arena, these single-source vendors must become familiar with numerous automation technologies, especially in the area of computer integration. Few vendors are capable of this.

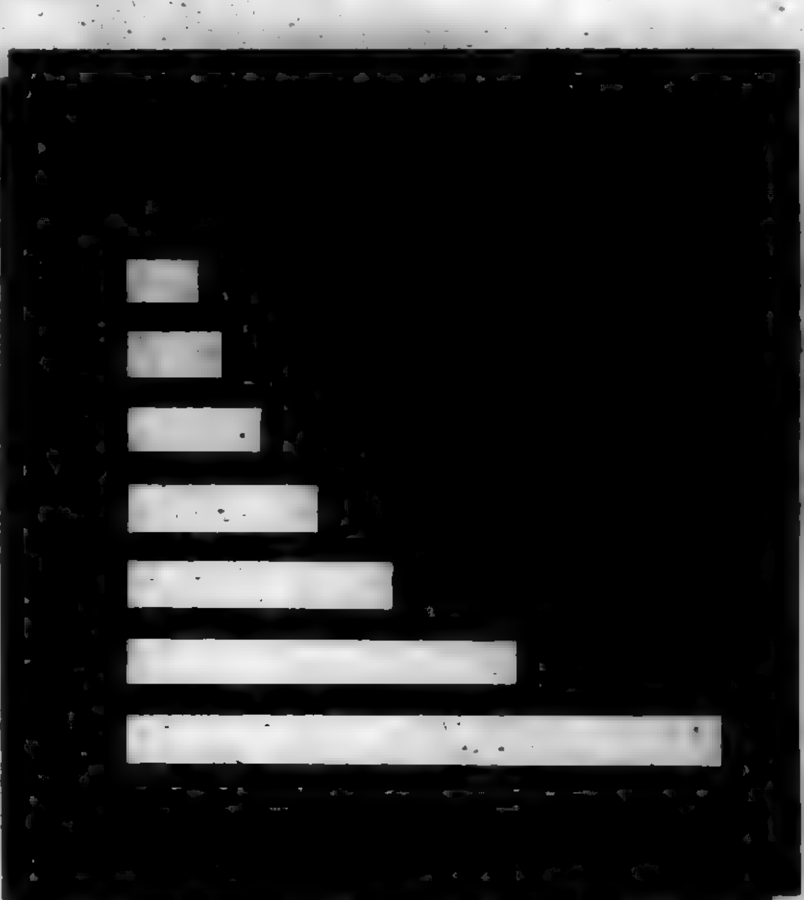

Figure 1.

On the user side, a potentially large investment like a flexible manufacturing system requires users to weigh gains and goals carefully. Users might consider a flexible manufacturing cell, rather than an entire manufacturing system, because they are less complex, less expensive and still offer the possibility of system upgrade.

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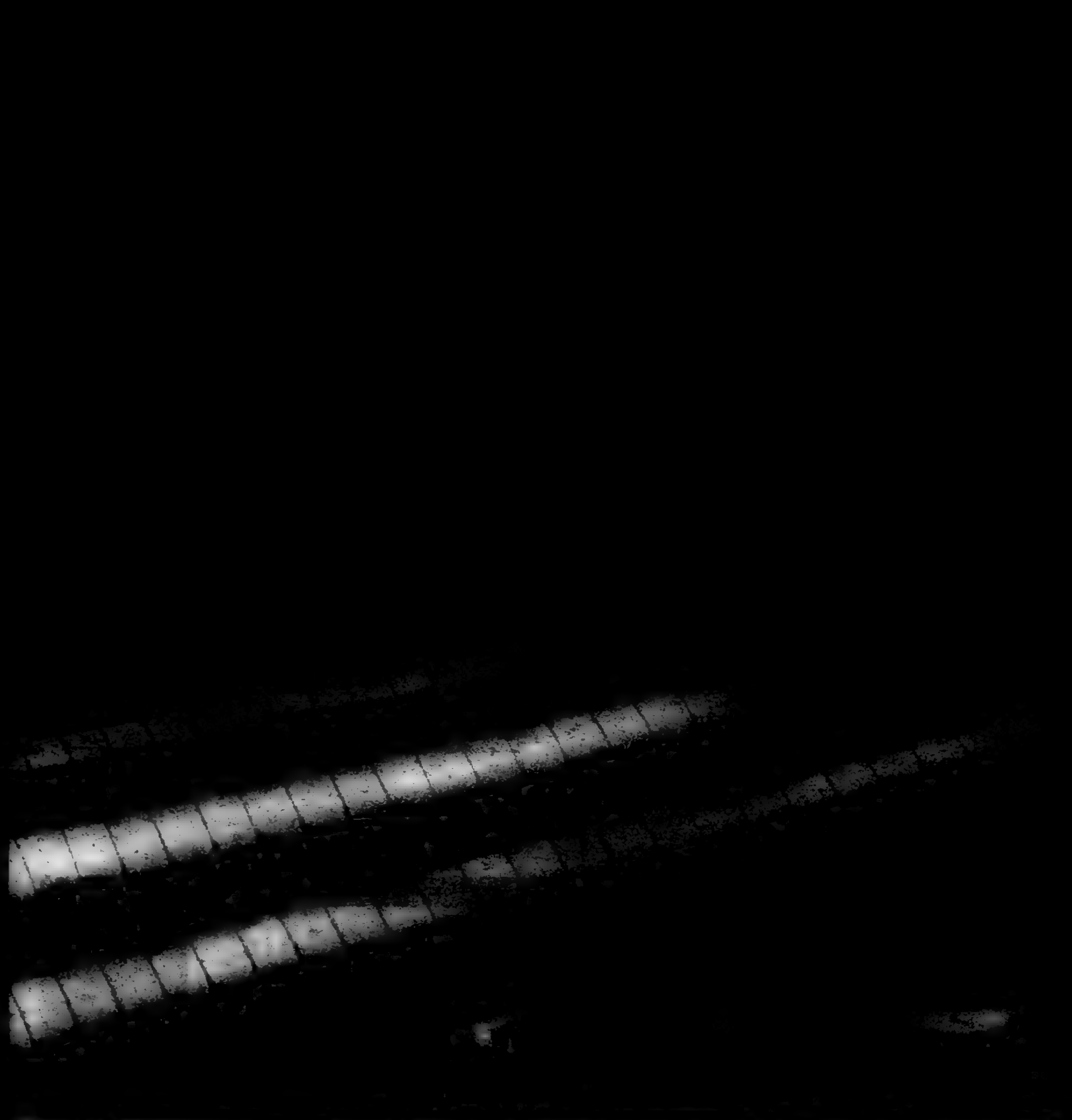

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CIM unit helps direct design traffic

TROY, Mich. — With the Big Three automakers as its primary clients, a manufacturing firm here had to maneuver around a challenging roadblock in its search for a computer-integrated manufacturing (CIM) system.

Delta Model & Mold Co., which designs and builds prototypes, models and production molds for automobile components, wanted a system that could accept computer-aided design information from each of its clients. General Motors Corp., Ford Motor Co. and Chrysler Corp., however, all used different equipment.

In addition, Delta Model wanted a system that allowed it to transfer design information from CAD systems in its own engineers' offices to numerical control machines in its shop.

"We had two criteria for choosing a CIM system," said Peter Moser, the firm's manager of computer numerical control engineering. "First, we needed a system that could communicate with virtually any CAD system over the telephone. Second, we needed a system that could talk to the factory floor."

In 1983, Delta Model began to piece together a system that met both criteria. The firm began by purchasing computer-aided design and manufacturing software and four engineering workstations from Cadlinc, Inc. The machines, 32-bit CIM Stations, have 30M bytes of hard-disk storage. Engineers use them for mold design, numerical control programming and scheduling.

Delta Model & Mold Co.'s CIM system forges design link with the prototype firm's automaker clients.

Since then, Delta Model has connected the workstations with CIM Net — Cadlinc's local-area network — and has added a factory-hardened version of the vendor's workstation, called CIM Factory Manager, and a 150M-byte hard-disk storage device, known as CIM Manager. The CIM Manager also supports a tape device for off-line storage.

As it brought in the CIM components, the firm expected a number of results, Moser said. "We at Delta Model saw the primary benefits of [CIM] as increased accuracy, reliable prediction of delivery dates and improved cost control."

In practice, he said, the firm has gained the most from improved accuracy. Because designs go directly from automakers' CAD systems to Delta Model's CAD network and directly from there to the production line, shop floor managers never have to interpret drawings and translate them to machine instructions. "We're cutting what they design," he said.

Delta Model can accept design data from its clients in one of the following two ways:

- **Over the phone.** GM is the only client that transmits CAD data this way. It sends its designs via phone lines and modems to Delta Model's CIM Manager.
- **From magnetic tape.** Other clients, including Ford and Chrysler, deliver tapes that Delta Model loads onto CIM Manager.

Cadlinc software on the CIM Manager converts the data into a common format that Delta Model's machines can use.

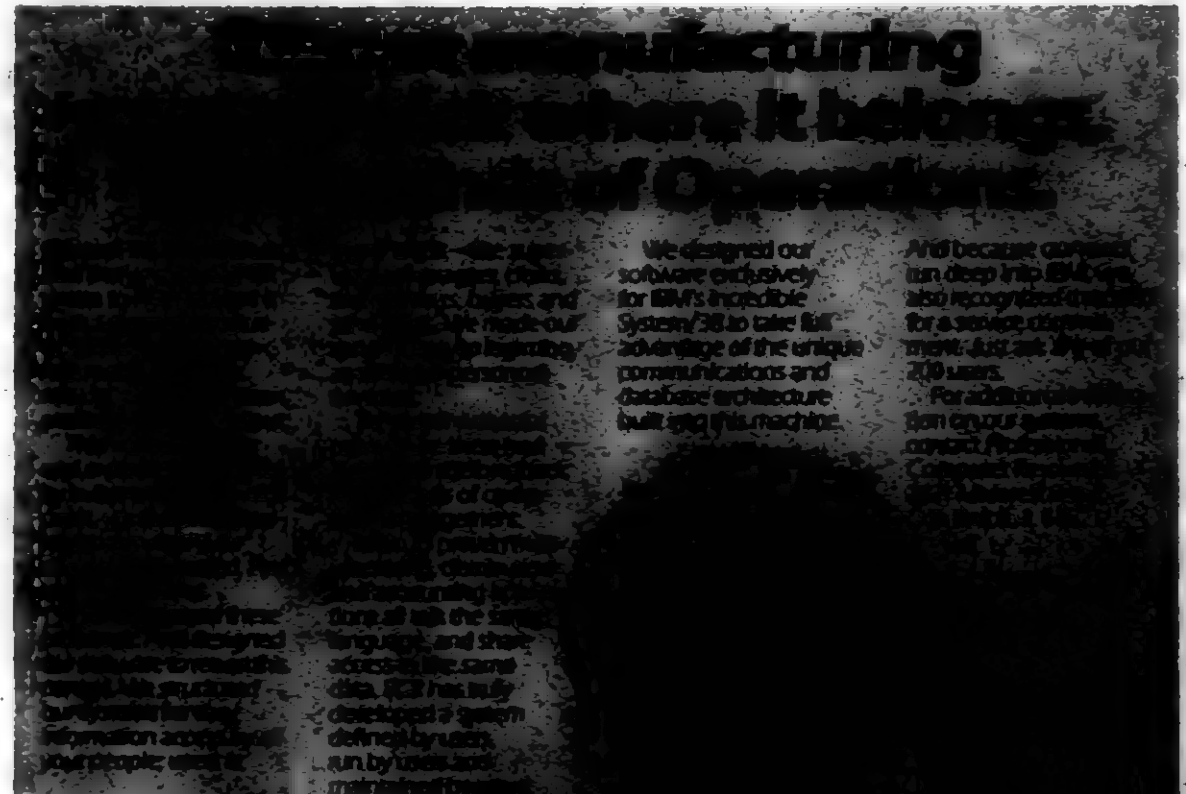
Once the data is stored on CIM Manager, the firm's design engineers can access it from any workstation. They use CAD data from their clients to generate tool layouts, fixtures and drawings and send these back — over the phone or on magnetic tape — to the automaker for approval.

Once the client approves the work, Delta Model's engineers edit and refine the design data for compatibility with numerical control machines. They eliminate redundant geometry, noncontinuous geometry, construction lines and other information that is not suitable for a machine environment.

The design engineers then send the data to the CIM Factory Manager on the shop floor, which feeds the information to the firm's numerical control machines. Machine operators initiate production processes and can make any adjustments by working with design data that resides on the CIM Manager. Moser said shop floor adjustments are rarely necessary.

The CIM Manager also communicates with Delta Model's coordinate measuring machine, which checks finished products against their original design to ensure that they are within a client's defined limits of tolerance. This quality assurance data is output to printers and sent to the automakers that ordered the work.

In the future, Delta Model expects to automate its operations more fully. Moser said the firm hopes, for example, to bring color capabilities to its mold design operations.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MICROCOMPUTERS

Micro tools speed system development

By Paul Korzeniowski
CW Staff

Given the choice, an MIS manager would rather locate a problem in a system blueprint than find one six hours or six years after a system has been running. In the design phase, problems can be fixed by erasing a few lines. When the system is completed, code must be rewritten, tested and replaced — a costly process.

Recently introduced microcomputer software packages help to identify problems in the design phase, replacing the pencil-and-paper approach with automated tools. The tools enable a programmer to construct a system model, which helps to evaluate a proposed system design and enables users to understand how a system will work.

Last year the quality control division at Maybelline Cosmetics, a subsidiary of

See DESIGN page 63

Dunsplus Tool Kit debuts, aids software customization

WILTON, Conn. — Dunsplus introduced a software kit for customizing the company's integrating software package, changed licensing practices for the package and extended its offerings of IBM Personal Computer products.

The Dunsplus Tool Kit is said to aid microcomputer support staff in modifying Dunsplus software that runs on Personal Computer XTs.

The menu-driven package reportedly allows nonprogramming staff to build custom logo and menu screens, integrate additional applications more completely and boost available hard disk drive space. The Tool Kit, with training and support, costs $800.

The vendor has also unbundled the Dunsplus software from the previous hardware/software packages. With documentation, one year of telephone support and software updates, Dunsplus costs $1,300. A two-day introductory training seminar costs $495.

A new corporate license plan for volume purchases puts the price of the software at $1,000 each for the first 250 copies and $500 for each additional copy.

The vendor has also expanded and repriced its systems offerings, with all hardware sold only in conjunction with software. Dunsplus will remarket the entry-level Personal Computer AT and add hard disk drives to various floppy disk models.

The entry-level AT costs $3,995, the enhanced AT costs $5,795 and the hard disk drive XT costs $3,895. Personal Computer, Personal Computer XT and Portable Personal Computer models with 256K bytes of internal memory and a single floppy disk drive are priced at $1,995, $2,270 and $2,895, respectively.

Customers who buy the enhanced AT can choose among Computer Memories, Inc.'s 20M-byte hard disk drive, priced at $1,600, or Control Data Corp.'s 30M-byte drive, which costs $2,145. Iomega Corp.'s 20M-byte Bernoulli Box storage system is available for other machines for $3,245.

Dunsplus is located at 187 Danbury Road, Wilton, Conn. 06897.

■ Paladin Software introduces Crunch, an integrated package for the Macintosh/56

■ Epson America rolls out nine personal computer printers/60

Microsoft offers Xenix versions of Fortran, Pascal, Cobol, Basic

BELLEVUE, Wash. — Microsoft Corp. has announced Xenix versions of Fortran, Pascal, Cobol and Basic development languages.

Using Microsoft's version of the development languages, programs written for Microsoft's MS-DOS version of a language can be transported onto its Xenix-286 environment. The Microsoft languages also reportedly permit programs to be downloaded from mainframes to the Xenix environment onto a microcomputer.

The languages — Microsoft Fortran, Microsoft Pascal, Microsoft Cobol and Microsoft Basic — each allow users to link into Xenix system libraries and incorporate Xenix features, including record and file locking, shell support for communication with the operating system during program execution and pipes that permit the exchange of information between two programs, a spokesman said.

Features included in Microsoft Basic give users access to both Xenix screen handling features and its file system. Users also have a choice between a binary math package and a decimal math package. The product includes capabilities for reading and writing to variable-length disk files using sequential, random or multikey index sequential access methods. Lines of code can be executed as they are entered or all at once. Microsoft Basic sells for $350.

Microsoft Cobol is fully compatible with

See VERSIONS page 63

SMALL TALK
Eric Bender
CW Senior Writer

Micro nets not caught in slump

"The whole computer industry is in a pause, an inflection, that happens about once every 10 years," said 3Com Corp. President William Krause. "Customers have stopped to reevaluate their equipment needs. They're not sure how they're going to integrate their new [personal computers] with their minis

See NETS page 61

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FEATURES	WANG VS 65	IBM SYSTEM 36
Migration without conversion up to 192 users	Yes	No
32-bit Architecture	Yes	No
Cache	Yes	No
Object Code Compatibility	VS 15, 25, 45, 65, 85, 100, 300	36 only
Virtual Memory Operating System	Yes	No
Removable Storage Options	Yes	No
Local Area Networks	Yes	No
Architectured for OA/DP	Yes	No
Relational Data Base	Yes	No
Industry de facto Standard Word Processing	Yes	No

It's called the VS family.

You see, the System 36 was designed to depend on its central processing unit (CPU) for many different applications, such as word processing. This results in slower response time to the end-user. And because the System 36 lacks an advanced data base of its own, you have to rely on your host for sophisticated data base management functions.

The VS, on the other hand, was designed to offload its CPU by distributing intelligence and interactive processing capabilities throughout the system. And with the VS, each department can build its own sophisticated data base.

What's more, with a set of office automation applications called Wang OFFICE, the VS gives users access to electronic mail and messaging, time management tools such as calendaring, and information management services such as file retrieval. All without using the host.

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Quadram net, printer, modems debut for IBM micro

NORCROSS, Ga. — Quadram Corp. has introduced a local-area network, several onboard modems, a low-cost laser printer, a transportable personal computer and a raft of multifunction cards for the IBM Personal Computer, including one that would permit Lotus Development Corp. software to address up to 2M bytes of memory.

The Quadnet II local-area network costs $1,095 for its Master Kit, which consists of a network interface card, a user manual, operating software and a key card to prevent unauthorized access.

With the $395 user interface card, Quadram said it has positioned Quadnet II as a low-cost means to link up to 32 Personal Computers: A baseband network, it uses telephone-type wiring to link the machines and reportedly offers data transfer at 1M bit/sec.

The Quadmodem II line of stand-alone and half-card modems reportedly offers either full- or half-duplex operation and can be used with the IBM Personal Computer line. The half card supporting 300 or 1,200 bit/sec. transmissions costs $495; the half card supporting those speeds plus 2,400 bit/sec. costs $795; the stand-alone supporting 300 and 1,200 bit/sec. transmissions costs $595; and the stand-alone supporting those speeds and 2,400 bit/sec. costs $895.

The $3,795 Quadlaser printer is said to offer seven fonts and a font editor as standard features and to include all of the supplies needed to begin operation.

It can print at speeds up to eight page/min and delivers 300 dot/in., Quadram said. The printer comes with 256K bytes of onboard memory, expandable to 2M bytes.

The personal computer is said to be IBM Personal Computer compatible and to offer one 5¼-in. diskette drive. Called the Datavue 25, the standard version of the machine includes a cordless keyboard, LCD, 128K bytes of memory (expandable to 640K bytes).

The product costs $2,195. A 640K-byte version with those features costs $2,795.

The Quadram Liberty card reportedly takes advantage of the Lotus Expanded Memory Specification to permit both Lotus' 1-2-3 and Symphony programs to address up to 2M bytes of memory as if it were standard random-access memory (RAM). Prices range from $395 to $1,295 in memory configurations ranging from 64K to 2M bytes.

The board also offers the option of split memory mapping, under which a portion of the Quadram Liberty board could be used to bring a Personal Computer's internal RAM up to 640K bytes. The Gold Quadboard is said to be a multifunction board with color graphics included. Also included is a feature called Keysaver, which holds the input data in read-only memory until the user can retrieve it. Prices for the board range from $595 without memory to $795 with 384K bytes of memory.

Quadram is located at 4355 International Blvd., Norcross, Ga. 30093.

Nestar nets get multiuser tools

PALO ALTO, Calif. — Nestar Systems, Inc. has announced the availability of multiuser applications development tools for the company's microcomputer local-area networks. The tools include MDBS III from Micro Data Base Systems, Inc.; Btrieve/N from Softcraft, Inc.; LAN: Datacore from Software Connections, Inc. and Revelation from Cosmos, Inc.

MDBS III is said to be an extended network data base management system modeled after Cullinet Software, Inc.'s IDMS and is said to provide many tools previously available only on mainframes. The development version of MDBS III DBMS costs $20,160 and requires a dedicated data base server as well as a Nestar file server.

Btrieve/N reportedly is a record management system that provides high-level access and manipulation of records in a data base and interfaces to Basic, Pascal, Cobol and C programming languages. The software permits applications developers to ignore physical file structure and concentrate on logical file structures, Nestar said. A Btrieve/N license for six users is priced at $595.

Applications open data bases

LAN: Datacore is a relational applications development tool that can produce applications that open multiple data bases. The software is priced at $945 for five simultaneous users per data base and $1,945 for 16 simultaneous users per data base.

Revelation, a multiuser data base package modeled on the Pick Systems Pick operating system, reportedly permits developers to write applications in a Basic-like programming language. Revelation is priced at $2,000 for up to four simultaneous users and $200 for each additional user.

Nestar Systems is located at 2585 E. Bayshore Road, Palo Alto, Calif. 94303.

Lotus on a VAX?

dBASE II on a VAX?
Friday! on a Micro VAX?
Condor on a PDP-11?
PFS:File on a PRO?
Personal Pearl on a VAX?
QuickCode on a Micro VAX?
Spellbinder on a VAX?
WordStar on an MV10000?
Rbase 4000 on a VAX?
Multiplan on a PDP-11?
PL/M on a VAX?
SuperCalc 3 on a PRO?
T/Maker Integrated on a VAX?
MS BASIC on a Micro VAX?
Milestone on a PDP-11?
Palantir on a PDP-11?
SpellStar on a PRO?
MailMerge on a PDP-11?
PMS II on a VAX?
dBASE II on a PDP-11?
Lotus 1-2-3 on a PDP-11?
Open Access on a PRO?
MS FORTRAN on a VAX?
Condor on an MV10000?
Multiplan on a PDP-11?
WordStar on a VAX?
SuperCalc 2 on an Eclipse?
PertMaster on a PRO?
Palantir on a VAX?
QuickCode on a PDP-11?
DISC-DBL on a VAX?
PerfectWriter on a PD[illegible]
WordStar on a PDP-11?
Spellbinder on an Eclipse?
Friday! on a VAX?
PerfectWriter on a PRO?
RM/COBOL on a PDP-11?
RTCS/UDI on a VAX?
Mass-11 on a PDP-11?
Milestone on an Eclipse?
Lotus 1-2-3 on a Micro VAX?
Peachtree on a VAX?
SpellStar on a Micro VAX?
Mass-11 on a PRO?
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PMS II on a PDP-11?
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With The BRIDGE,™ you can run virtually *any* MS-DOS® or CP/M® program from *any* terminal on just about *any* minicomputer!

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MICROCOMPUTERS

Electronic Vaults introduces Upta 96 modem for IBM micros

MCLEAN, Va. — Electronic Vaults, Inc. has announced Upta 96, a modem that runs on IBM Personal Computers. The Upta 96 transmits data at speeds up to 9.6K bit/sec., the vendor said

A vendor spokesman said that the half-duplex, asynchronous modem can also transmit data at speeds of 4.8K bit/sec. and 7.2K bit/sec. The Upta 96 features automatic dialing and answering and is compatible with Hayes Microcomputer Products, Inc. commands.

The modem's error detection protocol frames data in packets and uses cyclic redundancy checking techniques to ensure proper transmission. The Upta 96 will automatically fall back to slower data transmission speeds if a problem develops with a line.

The product is available in two models. A plug-in card, Upta 96 Integral, fits in either long or short Personal Computer expansion slots. A stand-alone model, Upta/S Standalone, can be connected through an RS-232 port.

Upta 96 Integral costs $795, and Upta/S Standalone sells for $895.

Electronic Vaults is located in Suite 714, 8350 Greensboro Drive, McLean, Va. 22102.

Arity/Prolog tools debut

CONCORD, Mass. — Arity Corp. has announced the Arity/Prolog Compiler and Interpreter, Arity/Prolog Interpreter and Arity/Prolog Demo Disk. The products all are designed for use on IBM Personal Computers, Personal Computer ATs and compatible machines running Microsoft Corp.'s MS-DOS operating system.

Arity/Prolog Compiler and Interpreter includes a source-level debugger, virtual data bases that can manage internal data bases of up to 16M bytes, floating-point arithmetic capabilities and string support for text handling, the vendor said.

The product includes text screen manipulation capabilities, an integrated programming shell and a built-in interface to other programming languages.

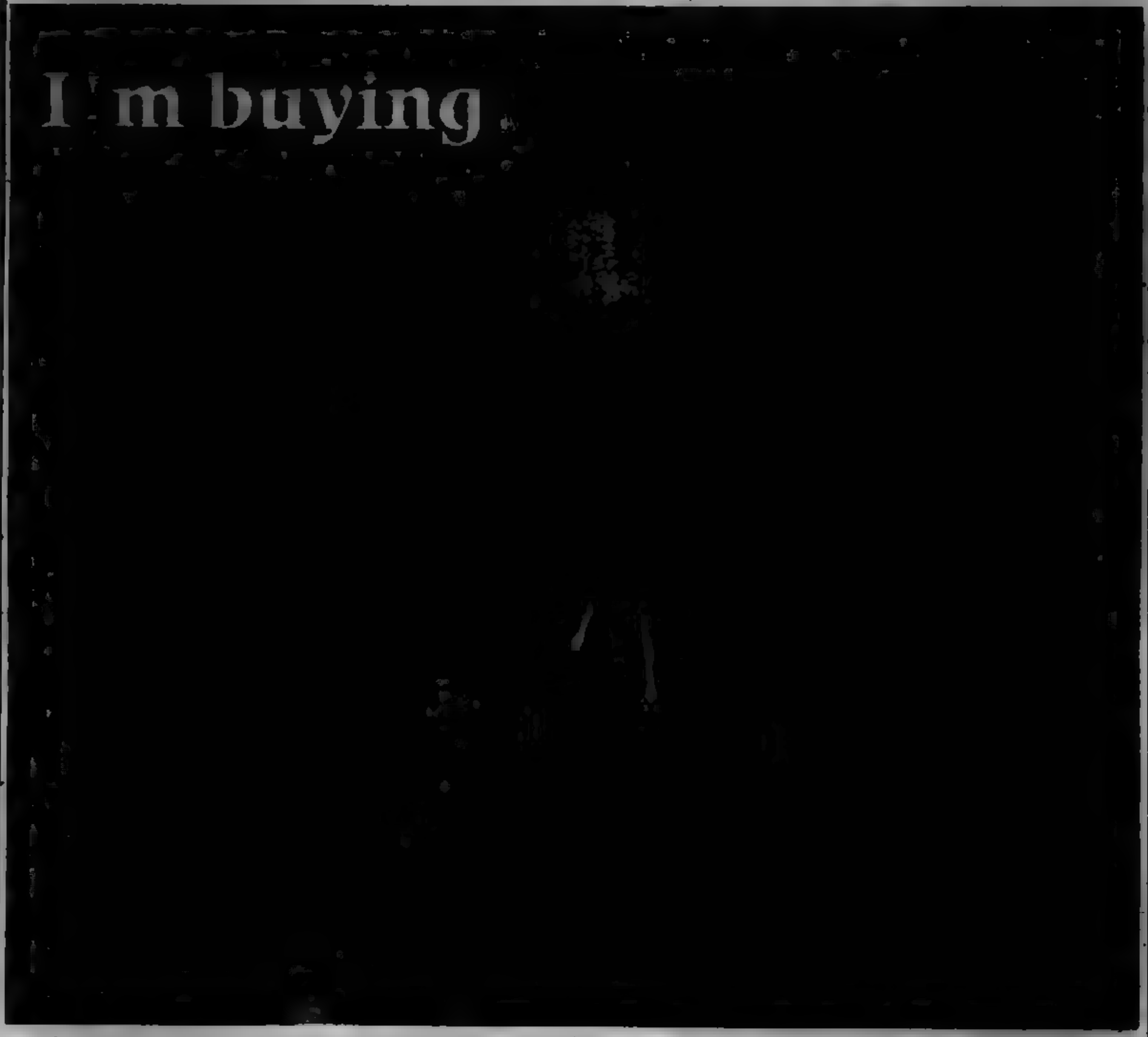
The Arity/Prolog Compiler and Interpreter is priced at $1,950, according to the vendor.

Arity/Prolog Interpreter includes all of the features of the Prolog Compiler and Interpreter with the exception of the compiler code.

According to the vendor, the Arity/Prolog Interpreter costs $495.

The Arity/Prolog Demo Disk includes interactive features that demonstrate the features of Arity/Prolog. The Arity/Prolog Demo Disk costs $19.95.

Arity is located at 336 Baker Ave., Concord, Mass. 01742.



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PC EXPO

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☐ 1 day [illegible]

☐ 2 or 3 days [illegible]

[illegible]

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Signature

Paladin package targets Mac user mart

SAN JOSE, Calif. — In its first product announcement since merging with Visicorp, Paladin Software Corp. has introduced Crunch, an integrated spreadsheet, graphics and data management package for Apple Computer, Inc.'s Macintosh micro.

Written by Sofdesign, Inc. of Bellevue, Wash., Crunch is 250 col. by 9,999 rows wide and allows users of the Macintosh 512K to define up to 1,000 custom spreadsheet functions with user-defined function keys. Twenty-one icons, used as shortcuts for spreadsheet activities, include functions for copying formulas, formatting cells or drawing graphs.

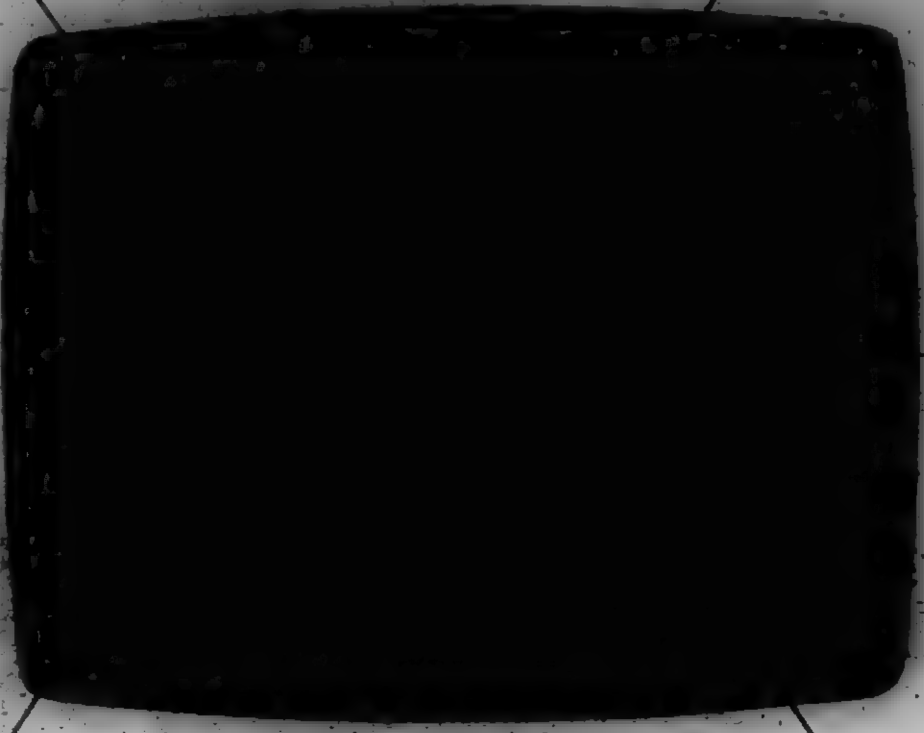
The product can display up to 31 rows on the screen and provides up to six work-sheet windows, a notes window and a directory window. Crunch users can display up to four graph windows at a time. A single set of pull-down menus is provided, and users reportedly can perform natural order or row-wise calculations.

Spreadsheet capabilities reportedly allow users to check the accuracy of formulas used in the spreadsheet and to track down cell references. Formatting capabilities permit the users to create variable-width columns and allow wide labels to extend into adjoining cells on the spreadsheet. Work-sheet windows can be assigned their own font, and multiple type styles can be used.

Graphics functions produce pie, line, bar and area charts in two steps, the vendor' said. Data management functions organise work-sheet rows into data base records anywhere in the work sheet. Note-keeping functions allow users to store the equivalent of 2½ pages of text in the work sheet. Information produced on Crunch reportedly can be merged into other Macintosh word processing packages, including Apple's Macwrite.

Crunch is compatible with Apple's Numeric Keypad, Switcher operating software and Imagewriter and Laserwriter printers. Available in June, Crunch is priced at $295.

Paladin Software is located at 2895 Zanker Road, San Jose, Calif. 95134.



The Lee Data Open Window™ Display gives you single-terminal access to all applications needed to handle fund transfers automatically. *Shown: A live, remote Async host session with the Clearing House Information System.*

Associated or affiliated accounts can be displayed simultaneously for faster, easier assembly of funds, then dynamically updated. *Shown: A live 3270 host session displaying a cash management system menu.*

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LEE DATA
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Epson America unwraps micro printer products

TORRANCE, Calif. — Epson America, Inc. has announced nine microcomputer printer products.

The HS-80 Letterjet is said to be a nine-nozzle portable ink-jet printer with both dot matrix and near-letter-quality print modes. It reportedly produces draft-quality prints at 160 unidirectional char./sec. and near-letter-quality prints at 32 unidirectional char./sec. It is priced at $449.

The SQ-2000 is an ink-jet printer with a self-cleaning print head for business and noise-sensitive environments, the vendor said. The 24-nozzle print head reportedly produces 136-col. prints at 176 char./sec. in draft mode and 106 char./sec. in letter-quality mode. Graphics resolution is said to be a maximum of 240 dot/in. The product is priced at $2,995.

The DX-10 and DX-20 are said to be daisywheel, letter-quality printers compatible with any software using Diablo Systems, Inc. 630 printer drivers. The 82-col. DX-10 reportedly prints at 10 char./sec. and sells for $399.

The DX-20 is said to include a 1K-byte print buffer, an interface to a variety of computer systems and an optional keyboard that allows the printer to function as a typewriter. The DX-20 is priced at $490.

The Spectrum LX-90 is said to be a dot matrix printer with draft and near-letter-quality modes. The product includes a printer interface cartridge for plug-in compatibility with the IBM Personal Computer and PCjr and the Apple Computer, Inc. Apple IIc.

The 80-col. printer operates at 100 char./sec. in draft mode and 16 char./sec. in near-letter-quality mode. It is priced at $389.

The Epson Comrex division CR-128 printer buffer and CR-700 and CR-701 A-B switch boxes are said to improve a micro's document production by freeing the computer for other tasks while the printer operates. The buffer is said to feature built-in serial-to-serial, serial-to-parallel, parallel-to-parallel and parallel-to-serial interfacing and 128K bytes of memory. The buffer sells for $299.

The CR-700 reportedly supports parallel interfaces, and the CR-701 works with serial interfaces. Both switch boxes sell for $39.95.

The P-80X, designed for use with the Epson Geneva portable computer, is said to be a portable letter-quality printer. It provides 23 char./sec. letter-quality printing and 45 char./sec. draft printing in a variety of type styles, according to the vendor. The cost of the P-80X is $379.

Epson America is located at 2780 Lomita Blvd., Torrance, Calif. 90505.

DEC A-To-Z office system targets business management needs

MAYNARD, Mass. — Digital Equipment Corp. has announced the release of its A-To-Z Business Office System, which is configured for the word processing and business management needs of companies with annual revenues less than $100 million.

The system consists of DEC's MicroPDP-11 multiuser computer, the company's Decmate word processor workstation and its A-To-Z business software.

It is said to provide desktop word processing on the Decmate integrated with A-To-Z accounting, graphics, spreadsheet, data processing and document transfer capabilities on the MicroPDP-11. A-To-Z modules share the same menu and user interfaces and contain Help facilities for beginning users, the vendor said.

A typical system configuration comes with one Decmate III word processor, WPS-8 software, one VT220 terminal, one MicroPDP-11/SV with F-11 CPU, a 400K-byte RX50 diskette, a four-slot backplane, the A-To-Z Integration Kit, A-To-Z Word Processing software and A-To-Z Document Transfer package and is priced at less than $12,500, according to the vendor.

DEC is located in Maynard, Mass. 01754.

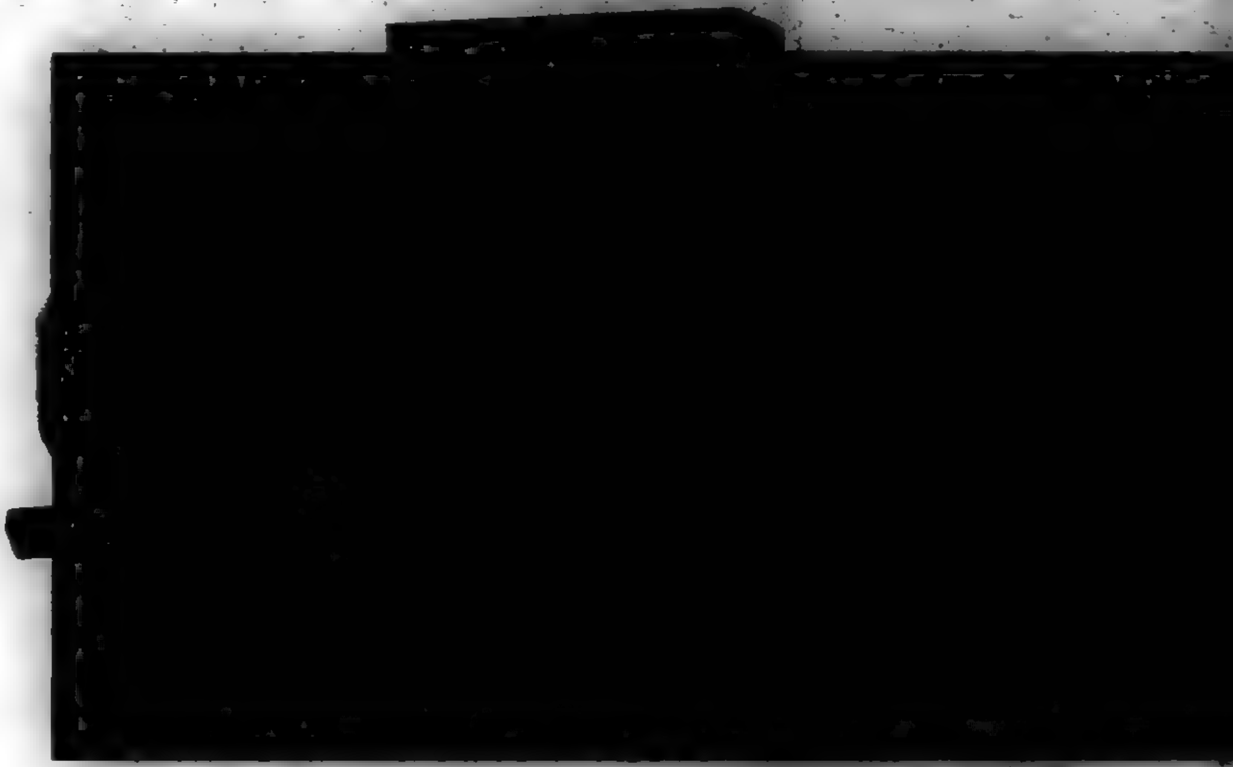
Newsletter debuts for Mac users

FRAMINGHAM, Mass. — Ford-LePage, Inc. has announced "Macintouch," a monthly newsletter designed for Apple Computer, Inc. Macintosh users.

The newsletter will contain summaries of a number of bulletin board services, tips on how to use these services effectively and references for users desiring more information. Product reviews, Macintosh sales figures and service information also will be included in "Macintouch."

A yearly subscription costs $48. The newsletter will not accept advertising.

More information is available from Ford-LePage, P.O. Box 786, Framingham, Mass. 01701.



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But product selection isn't the only choice. Telex displays offer features like color graphics, monochrome or color monitors, and ergonomic tilt/swivel design. There's a selection of keyboards,

NETS

from page [illegible]

and mainframes."

While not everyone accepts that diagnosis, action in personal computer local-area networking keeps picking up despite the overall industry slowdown. Some notes and quotes taken in the past month follow:

■ Licensing. Asked about site and network licensing at last year's Comdex/Spring, most software developers would have responded politely: "No, we don't do that." This year, their blood pressure would climb visibly. They would struggle for breath and then say, "Yes, we're working on it; we're talking with our customers."

"A corporate user has a right not to pay full retail price," said Edward Esber, president of Ashton-Tate, who emphasized his firm's willingness to discuss licensing with customers. Esber added that Ashton-Tate will make efforts to upbundle software, for example, by offering lower prices for deals that do not include all of Ashton-Tate's support services. But allowing buyers to make unlimited copies "is suicide for any software company," he said.

For vendors, site licensing is a mine field, with obstacles ranging from the impact on the bottom line to protection schemes to ways to keep dealers happy by cutting them in on the action — whether or not most corporate customers want dealers to get involved. Network licensing complicates life further.

So companies like Lotus Development Corp. are soft-pedaling the generic network hooks in new applications like Symphony Release 1.1 and holding off on network-aware versions. Sometime this year, the clouds will part.

■ PC Network. As network and applications vendors scramble to implement MS-DOS 3.1 and applications compatibility with IBM's PC Network, most first users are giving that net lukewarm reviews.

Their consensus is that PC Network is a solid product, easy to install and well documented, reasonably priced and offering acceptable performance. But the performance and general polish don't reach the level some competing network products provide, and the product may be most appropriate for small installations, most users say.

Whether or not they want to ride IBM's coattails, other network vendors, naturally enough, are harsher in their appraisals. The documentation "really doesn't tell you what the rules are," one executive said. He also criticized the hardware requirements. "Fixed-length cable looks like a good idea until you see it in spools behind people's desks."

Speculation continues that the PC Network represents only a short-term move that doesn't really fit into IBM's grand Systems Network Architecture strategies. "We believe the PC Network is a token for the token-ring," Krause said.

Novell introduction

■ Fault tolerance. At next month's PC Expo in New York, Novell, Inc. will introduce "systems-level software that will allow people to tie off-the-shelf hardware into a fault-tolerant system," according to Novell's president, Ray Noorda.

The software will boast backup and restore capabilities and handle bad disk sectors while on-line, said marketing Vice-President Craig Burton. The hardware will feature an IBM Personal Computer AT with mirrored 20M-byte drives, with an added disk coprocessor.

How important is fault tolerance? "It's a niche market," said Harry Saal, founder of Nestar Systems, Inc., which began shipping fault-tolerant nets last summer. He pointed to a number of potential transaction-processing applications, particularly in financial firms. Banks handling billions of dollars daily would gladly pay for another network file server, he said. "A one-day or a one-hour stoppage is very expensive."

"Fault tolerance is useful and will become increasingly important," said 3Com's Krause. But it's "a little premature" for personal computer networks, which still are weak in minicomputer-like development tools for transactional processing, he maintained. Creating and fully utilizing these tools for a network environment is no small task, he said. "Distributed file systems have not been invented yet."

"Fault-tolerant systems have always been a part of our plan," but relatively few installations will require them, said David Mahoney, president of Banyan Systems, Inc.

Gathering momentum

■ Backbones. A layered approach to networks, with local nets connected by high-speed backbones, seems to be gathering momentum. In one example, with more than 300,000 nodes attached worldwide, Corvus Systems, Inc.'s Omninet "needs to come out of the work group," said marketing director William Lanfri. The backbone network could be provided by Proteon Associates, Inc., Sytek, Inc., Ungermann-Bass, Inc., IBM or some other vendor, Lanfri said.

■ Diskless personal computers. These have not stormed the market, but "the concept is alive and well," Lanfri said. "It just makes sense. You don't need a floppy there, in many cases — it's just a very, very expensive toy."

"There are obvious financial reasons and obvious mechanical reasons" why a diskless micro makes sense, Saal said, but security concerns are driving the concept. "Typical large companies are very concerned about loss of data."

Noting the advantages the concept could present to MIS departments, Krause predicted that IBM will introduce a diskless Personal Computer for its token-ring local-area network.

HOICE

too. Plus extended highlighting and light pen capability. Telex also offers controllers that support local print buffering, format storage and dual host communications.

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DESIGN

from page 55

Schering-Plough Corp., determined that it needed its own computer system. Within the division, five groups conducted quality control tests, so each group sat down and began writing system specifications.

"As one might expect, the specifications were inconsistent," noted Ralph Doty, quality control system specialist. "We were writing specifications over and over again to make them consistent."

Compounding the difficulties, the quality-control group was located in North Little Rock, Ark., and the systems development group responsible for new programs was in Memphis.

To cope with the problem, the division determined that Doty would write one set of specifications. He began working with McDonnell Douglas Automation Co.'s Data Flow Diagram Draw, a systems development tool that runs on an IBM Personal Computer. Data Flow Diagram Draw is one of a handful of microcomputer system development tools. The packages vary greatly in features, and some include data dictionary tools, data analysis charts and data structure diagrams.

A common thread is the packages' graphics capabilities that illustrate how data moves through a system. "It is much easier for an end user to understand how a system operates if a systems analyst can present a series of pictures," maintained Clive Timothy, assistant vice-president at AIG Life Insurance Co., in East Orange, N.J. "Once a user understands how a system works, he is able to identify problems."

Users of the microcomputer packages admit that they do not save time in the first phase of systems development but claim time savings in later stages. "It is easier to make changes with [Index Technology Corp.'s] Excelerator than with [Apple Computer, Inc.'s] Lisa," stated M. B. McDonald, a principal at American Management Systems, Inc., an Arlington, Va., consulting firm.

Changes are an integral part of systems design, users emphasized. "Analysis is an iterative process," said Mike Powers, director of MIS/Business Applications at Country Life Insurance Co. in Bloomington, Ill. "The strength of packages like Excelerator is that they enable a programmer to depict easily changes to a system model."

Similar mainframe packages have been available for a number of years, but "microcomputers work more interactively than mainframes," AIG Life's Timothy claimed. "We worked with a package that used graphics terminals and our mainframe. Often, there were response-time delays."

"We had an in-house package that worked, but the microcomputer package is much more flexible and has better graphics capabilities," Country Life's Powers said.

Since these microcomputer products are in their infancy, they are somewhat limited. "Often, one loses track of how data is related," Timothy noted. "It would be helpful if a package illustrated data constraints and would not allow a programmer to construct an incorrect model."

Powers also listed other potential enhancements, including support for relational capabilities in a data dictionary and automatic checking of a model's consistency.

VERSIONS

from page 55

Cobol applications and includes capabilities for file access via sequential, line-sequential relative or multikey Isam techniques; built-in sort and merge capabilities; an interactive symbolic debugger; and interactive screen capabilities such as cursor positioning and automatic format conversion. Microsoft Cobol is priced at $695.

Microsoft Pascal Compiler reportedly handles both single- and double-precision real data types. It includes a choice of three math libraries and an interlanguage calling capability that allows programmers to reduce code development time by incorporating routines written in Fortran or Microsoft C. Microsoft Pascal sells for $495.

The Fortran Compiler is said to allow programs previously restricted to minicomputers and mainframes to be ported to micros. It can handle character substrings, including single- and double-precision data types.

The product includes the choice of three math packages, the ability to make direct calls to C and Pascal routines and a development environment that includes runtime libraries, a library manager and a debug utility. Microsoft's Fortran Compiler is priced at $495.

Microsoft is located at 10700 Northup Way, Bellevue, Wash. 98009.

"I can't do a thing with it today, boss. It seems to have a mind of its own!"

Canon

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SPECIAL REPORT

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- communications networks (including LANs)
- inventory control
- shop floor control.

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COMMUNICATIONS

AT&T to bypass former Bell offspring

By John [illegible]
CW Staff

ANALYSIS

AT&T recently agreed to bypass a former Bell operating company, showing it is more loyal to its financial health than to its onetime offspring.

At the behest of Merrill Lynch & Co., AT&T has agreed to use a fiber-optic network operated by Teleport Communications to connect Merrill Lynch's new headquarters to AT&T's access point in Manhattan.

Although some users already bypass local telephone companies to reach AT&T by procuring their own access, this is the first time AT&T has arranged to bypass a former Bell operating company to provide services directly to a major customer.

AT&T had, in fact, once said it would not bypass the divested Bell operating companies unless the local carriers "were unwilling or unable to provide access at market price/performance levels," according to Jerry Thames, general manager of AT&T Communications' network services. AT&T did not, however, take into account the possibility of a customer requesting the use of alternate facilities, as was the case with Merrill Lynch.

Teleport Communications is 95% owned by Merrill Lynch and 5% owned by Western Union Corp. It is the communications arm of the Teleport Project, a real estate development project on Staten Island being developed by the New York and New Jersey port authorities.

Besides new office buildings, the project will have a satellite antennae farm. Teleport Communications will use the satellites and other facilities to provide communications services to Staten Island tenants as well as to link New York companies to the complex with a fiber-optic network. That net is also being marketed as a point-to-point bypass system within the city, according to Bob Annunziata, senior vice-president of Teleport Communications.

When Merrill Lynch decided to consolidate its many New York offices within the World Financial Center in Manhattan, it approached AT&T and "asked what kind of deal AT&T could make to provide service there," AT&T's Thames said. "Merrill Lynch indicated that it was interested in AT&T using [Teleport Communications], its subsidiary, to provide access."

AT&T bowed to the pressure. It had to use Teleport Communications to bypass New York Telephone Co., which has been retained for other services, or risk losing Merrill Lynch's business.

"AT&T has to respond to competitive pressures. It has a responsibility to its stockholders, its employees and its customers," according to Chuck Jackson

See BYPASS page 68

- Dama Telecommunications announced a line of voice and data communications services/66
- Wang Laboratories signed a contract to purchase local-area network products from Ungermann-Bass/66
- Pacific Bell has announced plans to allow customers with private communications networks to rearrange or vary transport capacity from their own premises/67
- Diglog has upgraded its Network Access Switch to handle more ports at greater speeds/67

INSIDE

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Auxiliary Equipment/67

DATA STREAM
Paul Korzeniowski
CW Senior Writer

ISDN: Solution or vendor elixir?

The scene has been played out in numerous Western movies. A wagon pulls into a town, and a charlatan begins spouting about a new wonder drug that will cure common colds, feed livestock, restore hair and transform dirt into gold.

A person suffering from a cold is chosen from the crowd. Slowly, he walks to the wagon; skeptically, he looks at the bottle. He drinks from it, and his coughing stops. Hallelujah! The drug works. Townspeople buy the drug, take it home, feed it to their cattle,

See ISDN page 69

Infotron offers data switches

CHERRY HILL, N.J. — Infotron Systems Corp. has announced a family of switching products that includes a high-end data switch and an electronic matrix switch, as well as enhancements for a mid-range data switch.

The INX4400 is a Winchester disk-based electronic data switch that succeeds Infotron's IS4000; that older switch can reportedly be upgraded to INX4400 functionality. The switch is said to support 4,000 devices and 2,000 simultaneous cross-connects at 9.6K bit/sec. and 1,000 cross-connects at 19.2K bit/sec. Although the data switch was designed primarily to enable asynchronous terminal devices to access multiple hosts — instead of being wired directly to one processor — synchronous RS-232 circuit cards are also available, the vendor said.

Available now, the INX4400 costs between $200/port and $300/port, depend-

See SWITCHES page 68

Tandem backs GM's MAP, more ISO levels

CUPERTINO, Calif. — Tandem Computers, Inc. has announced plans to support General Motors Corp.'s Manufacturing Automation Protocol (MAP) and various levels of the International Standards Organization's (ISO) network reference model.

MAP is a seven-layer net architecture model that General Motors is developing in accordance with the ISO's Open Systems Interconnect model. MAP specifications have been placed in the public domain so that companies can develop products for GM or other manufacturing facilities working with MAP. Tandem plans to design products that will conform to MAP specification 2.1, the latest version of the model's specifications.

In addition, Tandem intends to supply

See TANDEM page 68

How to make your computer room bigger by shrinking your modems.

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Dama offers line of voice/data telecom services

PARSIPPANY, N.J. — Dama Telecommunications Corp. has announced a line of voice/data services.

The services, National Voice Network, Corporate Voice Network, Digital Data Link and Integrated Voice/Data Network, run on Dama's Damanet network. The network resulted from the consolidation of Dama's switched digital network with the private telecommunications network purchased from International Harvester Co. last year.

National Voice Network is a Wats-type service that features call routing within 80% of U.S. exchanges and to Alaska, Hawaii, Puerto Rico and the Virgin Islands.

Dedicated access lines are needed from the customer's premises to Damanet switching facilities, which are located in Chicago, New York, Philadelphia, San Francisco, Memphis, San Diego and Washington, D.C.

Corporate Voice is a private-line-type service for high-volume calling. It requires dedicated line access and features seven-digit dialing, special billing arrangements and optional customized directory assistance.

Routing

Both voice services offer free call detail reporting and advanced diagnostics through automatic trunk routing.

The Digital Data Link service is for point-to-point dedicated digital data transmission channels at 2,400, 4.8K, 9.6K, 56K or 1.53M bit/sec. Local access is supplied by point-to-point microwave or by local carrier exchange terrestrial digital facilities.

The service is available in New York; Philadelphia; Harrisburg, Pa.; Altoona, Pa.; Pittsburgh; Youngstown, Ohio; Dayton, Ohio; Cincinnati; Columbus, Ohio; Indianapolis; Wilmington, Del.; Baltimore; Washington, D.C; and Chicago.

The Integrated Data/Voice Network is an end-to-end digital service for intracompany voice, data and video networking. It features on-demand circuit creation and user-selectable data rates from 2,400 to 512K bit/sec. The service requires Datanet customer premises equipment.

Prices for the voice services consist of usage fee, monthly access charges, a minimum monthly usage fee of $350/line and a recurring monthly $50 automatic trunk routing charge.

The digital and integrated voice/data service includes a monthly charge of $75/port, a nonrecurring fee of $25 and line charges that vary by line speed, type of service and call route.

For further information, Dama Telecommunications is located at 169 Johnson Road, Parsippany, N.J. 07054.

Wang to buy Ungermann-Bass net products

SANTA CLARA, Calif. — Wang Laboratories, Inc. has signed a contract to purchase local-area network products from Ungermann-Bass, Inc., based here.

Under the terms of the contract, Wang will integrate Ungermann-Bass' Net/One broadband local-area network products into Wangnet and Wangnet Fastlan local-area networks. The Ungermann-Bass products will be used on the Shared Interconnect Modem Service (Sims) band within the Wangnet peripheral frequency band.

Wangnet is divided into multiple channels that are dedicated to certain applications. It will enable asynchronous terminals, personal computers and printers to access a Wang network.

Sims will use two types of Ungermann-Bass network interface units (NIU) and its network management software. The units provide physical interfaces and the intelligence needed to attach RS-232 devices to Wang networks. NIU Model 130 supplies two ports, and NIU Model 180 has eight. The software maintains and downloads configuration software for all NIUs on the network.

With Sims, a user can attach up to 2,000 devices at a cost of $500/port on a Wang network, Ungermann-Bass reported.

Wang will purchase $2 million worth of equipment in the first year of the multiyear contract.

Ungermann-Bass is located at 2560 Mission College Blvd., Santa Clara, Calif. 95050.

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4900 Old Ironsides Drive, M/S 626 Santa Clara, CA 95054.

Pacific Bell readies service enabling channel allocation

SAN FRANCISCO — Pacific Bell has announced plans to allow customers with private communications networks to rearrange or vary transport capacity from their own premises.

The service, Customer Controlled Network Management (CCNM), would enable users to allocate fixed bandwidth transmissions over Pacific Bell's T1 lines and cross-connect selected bandwidths to accommodate voice, data and video needs.

With a personal computer or dumb terminal, a user would be able to allocate tie lines, 2000 series voice lines, 3000 series data lines or other transport lines. Each line could be configured for transmission speeds of up to 56K bit/sec.

CCNM reportedly would provide alternate routing capability, internal circuit and channel alarms, better transport security and better record keeping.

The service, subject to regulatory approval, would be available at the end of the year.

For further information, Pacific Bell is located at Room 609, 140 New Montgomery St., San Francisco, Calif. 94105.

Bridge enhances file server software running on Ethernet

MOUNTAIN VIEW, Calif. — Bridge Communications, Inc. has enhanced its file server software, which runs on Ethernet local-area networks.

The enhancements include the following:

- A global rotary capability that searches for a free device wherever it may be on the network. If a modem is busy, the software will search for a free modem.
- Gateway support for data switches from Gandalf Data, Inc. and Micom Systems, Inc., which use long breaks as indications of terminal disconnections.
- Support of Hewlett-Packard Co.'s Enquiry/Acknowledgement flow control method.
- A network security feature.
- Enhanced network management capabilities that can be used to list what software is running on a server.
- Support for terminals with 9-bit characters.

The software runs on Bridge's CS/1, which supports eight to 32 devices, and CS/100, which works with four to 14 devices. It is available for a yearly fee of $150.

Bridge Communications is located at 1345 Shorebird Way, Mountain View, Calif. 94043.

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800-538-8154. (In Alaska, California and Hawaii, call [illegible].)

VOICE/DATA COMMUNICATIONS

- Digilog, Inc.'s Network Control Division has announced that its Network Access Switch (NAS), an electronic matrix switch, has been redesigned to handle more ports at greater speeds.

The enhanced switch supports V.35 interfaces for data transmissions up to 56K bit/sec. as well as the previously supported RS-232C and four-wire analog circuit interfaces.

Capacity of the switch has been doubled from 60 to 120 ports. Up to six units can reportedly be configured in a daisy chain to provide a system with 1,440 analog or digital ports capable of supporting 720 lines. Any device attached to the system can be identified by a user-assigned eight-char. name.

The NAS system costs $25,000, plus $300 to $400 per line, the vendor said.

Digilog, 1370 Welsh Road, Montgomeryville, Pa. 18936.

AUXILIARY EQUIPMENT

- Interpreter, Inc. has released two models of its Interpreter Communications Control Unit that are said to allow dissimilar brands of office automation equipment to communicate with each other.

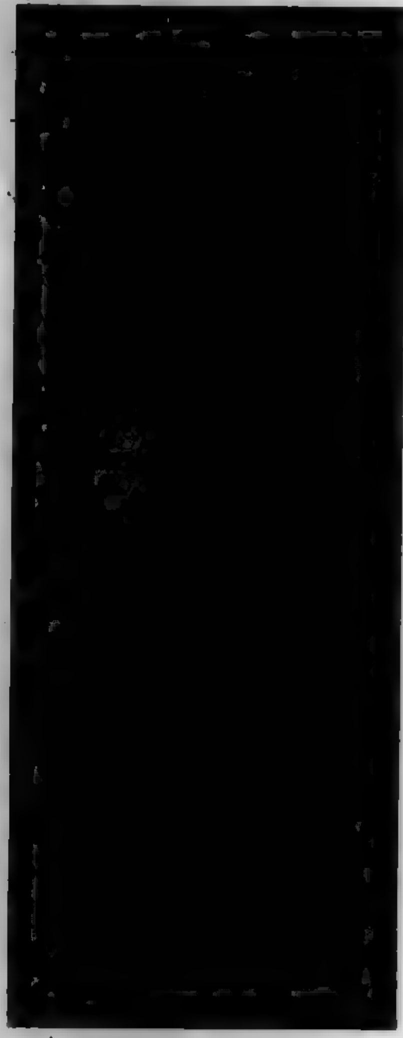
The units are said to enable IBM Personal Computers running Micropro International Corp.'s Multimate and Wordstar programs, CPT Corp. office computers, NBI, Inc. word processors, Xerox Corp.'s Model 860, Wang Laboratories, Inc. office machines and IBM 5520 word processors to exchange documents.

The CCU-4 is a four-port interpreter that enables up to four dissimilar asynchronous or bisynchronous systems to exchange documents.

The CCU-W is a six-port interpreter with a 10M-byte Winchester disk that features automatic queuing, password protection and menu access control. Automatic queuing is said to allow up to five operators with dissimilar systems to send documents to a system as the receiver is ready to accept them. It is reportedly useful to users of port concentrators, data switches or multiplexers.

The CCU-4 costs $12,490, and the CCU-W costs $18,990.

Interpreter, 11455 W. 48th Ave., Wheat Ridge, Colo. 80033.



BYPASS

from page 65

of Seoshen and Jackson, Inc., a communications consultancy in Washington, D.C.

AT&T contracted with Teleport Communications to provide the links between its point of presence and Merrill Lynch's headquarters. The service will be for voice-grade private lines, Dataphone Digital Services and high-speed digital Accunet services operating at 1.54M bit/sec.

Migrating most of its private-line services to Teleport Communications but retaining New York Telephone for other services provides "flexibility in terms of provisioning circuits and diversity so that if we get a cable cut, we might only lose half of the services instead of all of them," said Mike Loring, group manager of communications for Merrill Lynch.

Cost is not always the sole motivator for bypass. The economic justification for this bypass system is obscured by the fact that Teleport is a Merrill Lynch subsidiary. "The cost of service the way Merrill Lynch is buying it [from AT&T] is the same whether the access is provided by New York Telephone or Teleport Communications," Thames said. "Merrill Lynch is buying end-to-end service from us. If we were getting a lower price from Teleport Communications, the savings would not necessarily be passed through to Merrill Lynch."

Merrill Lynch does realize some profits (hence savings) from its ownership interest in Teleport Communications. But perhaps a more important benefit of this arrangement is that AT&T's use of Teleport Communications sets a precedent that the Merrill Lynch subsidiary can use in marketing its services to other users.

For the former Bell operating companies, the precedent set by AT&T is ominous. Because of high access rates — artificially high because of cross-subsidization during the Bell System years and higher than its competition because of the level of local access AT&T enjoys — AT&T has the single largest incentive to bypass local telephone companies.

With less than 15% of all businesses generating more than 80% of all long-distance traffic, the threat of AT&T bypassing the former Bell operating companies to reach its larger customers is obvious. Equally obvious is the fact that local companies like New York Telephone cannot afford to lose many large customers like Merrill Lynch without making up the difference in other rates.

TANDEM

from page 65

products that conform to various levels of the ISO's seven-layer model. Tandem products that conform to the lower three layers of that model are already available. Products that conform to Levels 4 and 5 are reportedly under development.

Tandem is located at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

SWITCHES

from page 65

ing on configuration.

While similar in design to the INX4400, the INX4200 is a matrix switch that is said to be designed for synchronous, on-line, real-time environments. The switch supports 1,000 synchronous cross-connections at speeds from 9.6K bit/sec. to 19.2K bit/sec. through RS-232/V.24 interfaces. Half as many cross-connections are supported at 56K bit/sec. with V.35 interfaces.

Scheduled for shipment in July, the INX4200 costs between $300/port and $400/port.

Both switches can reportedly be linked using an interswitch networking capability and T1 digitial carrier facilities operating at 1.54M bit/sec. To perform tandem switching and alternate routing over such a network, the address mapping tables in each switch must be changed with a $5,000 software upgrade. T1 switch interfaces cost $7,000/switch to $12,000/switch, depending on the number of modules and cabinets.

A fiber-optic interface was also announced that is said to enable INX slave switch modules to be linked in a ring at distances up to 2 km. A transmitter/reciever fiber-optic interface pair costs $5,000.

Infotron, Cherry Hill Industrial Center, Cherry Hill, N.J., 08003.

Forte introduces

COMMUNICATIONS

ISDN

from page 65

spread it on bald heads and rub it in the dirt. Nothing happens. By the time the townspeople return to find the con men, the charlatans have moved on to the next town.

Well, the Old West has gone high technology. One elixir that has received a great deal of attention recently is the Integrated Services Digital Network (ISDN). First conceived in the early 1970s by AT&T, ISDN would be fully realized when digital facilities replace analog equipment. Because the system would be completely digital, it would eliminate modems, provide high-speed, high-quality lines and cost less than current systems.

ISDN would enable a user to send data, video or voice messages through one plug. Data services theoretically would allow a user to access any type of equipment. For example, a Digital Equipment Corp. minicomputer user could access an IBM 3080 mainframe.

> Integrated Services Digital Network (ISDN) would benefit all users if it worked as the vendors claimed, but the chances of forging a standard ISDN in the U.S. are slim.

Forging an ISDN model

Constructing such a system is a formidable task. For the past few years, the Consultative Committee on International Telephony and Telegraphy has been attempting to forge a standard ISDN model. Thus far, the committee has constructed a seven-layer model that looks like IBM's Systems Network Architecture or the International Standards Organization's Open Systems Interconnect models. The first three layers have been finalized, and a number of telephone companies have announced plans for ISDN field tests in 1986 and 1987.

With this progress have come the usual vendor claims that ISDN is a cure-all offering low-cost, easy installation and true integration. In reality, ISDN will probably offer users access to a complex network with capabilities that may or may not be needed and create another series of system configuration alternatives.

ISDN will benefit AT&T, common carriers and the divested Bell operating companies as much as or possibly more than end users. "The [divested Bell operating companies] have to provide ISDN or else they will be bypassed," said Al Hawtin, product manager at Mitel Corp. Hawtin made his comment at "ISDN Networks for the Future," a conference held earlier this month in Atlantic City and sponsored by Boston-based Information Gatekeepers, Inc.

Chances slim

ISDN would benefit all users if it worked as the vendors claimed, but the chances of forging a standard ISDN in the U.S. are slim for a number of reasons.

Divestiture has limited AT&T's ability to provide the service completely. The dividing lines between a common carrier's and a divested Bell operating company's responsibilities are unclear. To ensure that all parties are creating compatible systems, detailed specifications have to be placed in the public domain. Since the divested Bell operating companies and common carriers are competing, there is some doubt that they will be willing to share such information.

Even if they did share that information, there is some question that the companies will construct compatible models. Models built for the 1986 and 1987 field tests do not appear to be compatible.

Competition and compatibility questions do not stop with the telephone companies. Vendors will have to construct ISDN-compatible terminals, gateways and private branch exchanges. It is likely that vendors will sacrifice strict adherence to ISDN standards for capabilities that may provide a marketing edge.

IBM is always looking for a marketing edge. It has not yet endorsed ISDN and may never endorse it. Given the huge investment in existing IBM products, users will want to keep their equipment rather than trade it in for ISDN equipment.

Another possible roadblock is the Federal Communications Commission. The FCC has stated that it is in favor of ISDN and would not want to hinder its acceptance. Yet the FCC will be forced to determine ISDN tariff rates.

The rate structure will prove key to ISDN. For ISDN to be adopted, it must be better or cheaper than existing systems. ISDN will have to offer either cheaper rates or higher bandwidths to gain user interest. All carriers will be attempting to pull the FCC in a direction that favors their services. The FCC will probably waver back and forth.

The carriers' constant tugging at the standard will probably rip it apart and leave the users to piece together their own ISDN systems.

"No, that's the company physician!"

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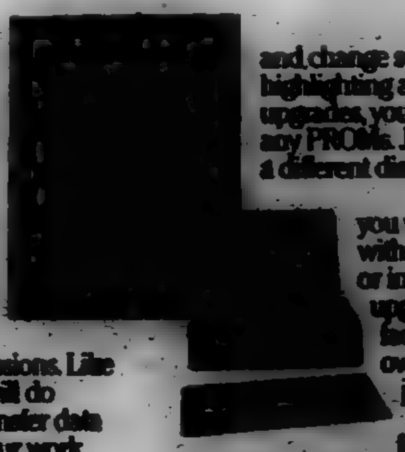

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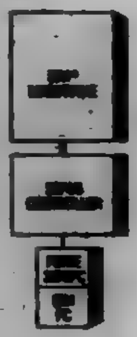

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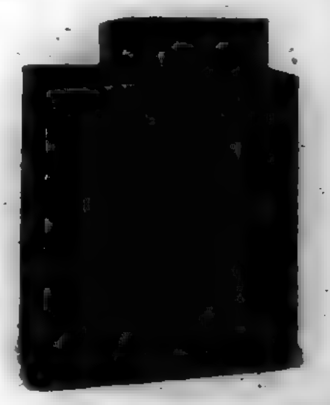

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SYSTEMS & PERIPHERALS

CDC boosts supermini capacity

MINNEAPOLIS — Control Data Corp. has announced enhancements that double the memory capacity of its Cyber 180/810 and 180/830 superminicomputers. The company also reduced prices on currently available Cyber memory and disclosed options for expanding the number of data channels on the 810 and 830 models.

Maximum memory on the 810 and 830 models has been doubled to 32M bytes. Memory upgrades will be available in June for $5,000 per megabyte, with a monthly maintenance cost of $20 per megabyte. The memory employs 256K-bit Cmos chip technology, the vendor said.

The memory expansion will apply to the Cyber 170/815 and 170/825 mainframes and will quadruple maximum memory from 8M bytes to 32M bytes. Memory expansions for the 170/815 and 170/825 will be available Aug. 1.

A cost reduction of 33% — to $5,000 per megabyte — applies to the currently available 64K-bit chip technology memory, the vendor said. The 64K-bit machines have memory capacities of 2M, 4M, 8M, 12M and 16M bytes, while capacities for the 256K-bit memories are 16M and 32M bytes.

The company also announced options for expanding the number of integrated controller interface channels available with the 170/810 and 170/830 from four to six. This option, available in June, provides increased support for the CDC Model 834 9-in. disks and Model 639 streaming tape drive.

A total of six disk and tape adapters can now be installed within 170/810 and 170/830 cabinets, compared with the previous maximum of four adapters. A $5,000 one-time reconfiguration charge will be levied on customers with existing, fully expand-

See CDC page 71

'Amateurs' build 16-node 256-Mflop parallel CPU

By [illegible]
CW Staff

NEW YORK — Two Columbia University theoretical physicists have built a 16-node parallel processor, which they said cost them less than $100,000.

The professors — who call themselves amateur computer scientists — used components donated by Intel Corp. and funding from the U.S. Department of Energy's High Energy Physics agency to construct the 16-processor machine, according to Prof. Norman Christ, one of the developers.

Each processor in the parallel processing machine is capable of reaching peak speeds of 16 million floating-point operations per second (Mflops) and average speeds of 8 Mflops, he said. All together, the machine can run at a peak speed of 256 Mflops, according to Christ.

Christ and Prof. Anthony Terrano, the other primary developer, use the system to simulate the physics of strongly interacting particles, particularly quarks — the smallest constituent of the neutrons and protons that make up the nucleus of an atom — Christ said. "We were limited before to what we could do on a [Digital Equipment Corp.] VAX, and most calculations are much too hard to do on a VAX," Christ said.

The work the two professors are involved in is a hot subject in research circles, and they wanted processing power in the 1- to 10-Gflop range to be able to make significant progress in the field, Christ said. The chances of obtaining a supercomputer were slim to nonexistent, he said, so

See PARALLEL page 75

Calcomp workstation out

ANAHEIM, Calif. — California Computer Products, Inc. has released a workstation terminal for use with Digital Equipment Corp.'s Microvax II supermicrocomputer. The 4500MV color raster graphics terminal features 1,280- by 1,024-pixel resolution, a 60Hz refresh rate, a 125-nsec pixel speed, up to 256 simultaneous colors and Calcomp's Vistagraf software package for $31,695.

The unit includes 640K bytes of graphics structure storage, a keyboard and data tablet. The workstation was designed for interactive applications such as mapping, engineering, simulation and training, tactical command and control and computer-aided design and manufacturing, the vendor said.

The Vistagraf software is largely terminal resident, the vendor said. All graphics tasks — such as display file handling and image transformations — are performed by the terminal. The Vistagraf Host Package resides on the Microvax II and consists of application-callable interface routines, error-checking routines and host/controller communications utilities.

Software functions include hierarchical structure support and structure-editing capabilities. Local scale, translate and rotation of graphics images also are supported in addition to pixel plan partitioning and pick capability, the vendor said.

Two independent 4500MV workstation terminals — each with a dual monitor — can be driven from one Microvax II processor in either serial or parallel mode, the

See CALCOMP page 75

■ Gerber Technology unveiled two stand-alone Unix-based CAD/CAM workstations/74

■ A laser printer for IBM System/34, 36 and 38 users was announced by GSD Systems/74

■ Computer Consoles added a floating-point accelerator to its Power 6/32 superminicomputer/74

■ Wang introduced an asynchronous workstation, the 2110-VS/76

INSIDE

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Marketing blunders sideline early mainframe vendors

FOURTH IN A NINE-PART SERIES

By [illegible]
CW Staff

Any talk of mainframes usually includes IBM, the IBM-compatible manufacturers and the so-called Bunch companies. But there were six other companies that, in the early days of computing, made serious attempts to compete in the developing mainframe marketplace.

At key junctures in their histories, all six companies — General Electric Co., the Radio Corp. of America (now RCA Corp.), Singer Co., Bendix Corp., Philco Corp. and Xerox Corp. — decided they could sustain no further losses and quit the business.

It was seldom technical deficiencies in products that did in the companies' computer ventures, for in the early days of computing a machine's speed was often its main selling point. What got most of the companies in trouble was a lack of expertise in marketing computers.

Most of the six companies built on their knowledge of electronics gained through military contracts to develop commercial data processing systems. Each of the companies had successful noncomputer products, which tended to inhibit them from committing the capital necessary to make a success of computer manufacturing, histories of the firms show.

GE, founded in 1892, was already a successful electronics firm that, in 1952, was eight times larger than IBM. GE completed work on the military computer Oarac in 1953, and this military work was the basis of the company's entry into the commercial field. In 1956, GE won two computer contracts: one with the Bank of America to develop the Erma automated reading and sorting system and another with National Cash Register Corp. (now NCR Corp.) to produce the NCR 304 transistorized computer.

A former GE employee, William Stanger, who worked in the company's Process Control Division, said GE's timing was probably its fatal flaw.

"[GE] did very few things right — getting in and out [of the computer business] when they did. If they had really been prepared, they would have become a distinct presence in the DP industry. IBM thought so too," Stanger said, adding that GE had a strong engineering and manufacturing background but lacked an effective marketing team. "GE could never face up to the real problem of the marketing side of the business — responding to customer needs," Stanger said.

See MARKET page 72

Toby Crismon, engineer on GE's Erma project, empties the sorter's reject pocket.

MARKET

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The GE 225, announced in 1961, was a competitor to the IBM 1620, announced in 1959. The 225 featured 20-bit addressing and a 20-msec machine cycle time. The succeeding GE 400 series was faster but ran up against the IBM 360 series, announced in 1964.

GE quickly felt the sting of IBM's 360. When their leases on GE 400 series ran out, a number of customers decided to switch to the 360 and return the GE machines. "GE never really came up with any decent competition to System 360," Stanger said. "It was a hell of a bloodbath."

The succeeding GE 600 series combined a military design from the company's Syracuse Electric Division, with commercial features devised by a team in Phoenix. "They had terrible hardware problems" with the series, Stanger said, noting the announcement was delayed by two years.

In 1970, GE sold its computer division to Honeywell, Inc. which cleaned up the 600 series, renamed it the 6000 and continued selling it for many years.

Because GE was so diversified, the company found it difficult to compete with more specialized firms like IBM, Hench said. "GE at that time had many diverse divisions with a heavy investment in many areas — including jet engines, nuclear power plants and the computer field. The company found it difficult to find resources to invest in all those businesses. It was different from IBM, which was mainly in the computer business."

GE exploited its research partnerships with MIT and Dartmouth College to form Geisco, which evolved from time-sharing to remote computing services to on-line finance and banking systems today.

RCA

RCA delivered its first computer system, the Bizmac, to the U.S. Army in 1953. Deciding early on a strategy to wean customers from IBM, RCA announced the Spectra 70 series to compete with IBM's 360 series in 1964. The Spectra series included eight models — the 15, 25, 35, 45, 46, 55, 60 and 61 — and could run the extensive software applications available for the IBM 360.

Curt Koster, who worked in technical support for RCA's international marketing division in the company's computer days, recalled that the Spectra series' hardware and software were technically impressive. In a hardware innovation, the Spectras featured a multilayered back panel that offered greater reliability than the discretely wired back panel connections common at the time. Koster also claimed GE made a significant software innovation on its early systems by introducing virtual memory to the Spectra line with the VM/OS operating system.

RCA's weakness, in Koster's view, was not in its marketing — which was successful in its effort to cut into IBM's market share — but a lack of financial management in the computer division. When it came time to invest heavily in the computer division and endure years without profit, the company's board of directors balked, Koster said. RCA sold its customer base to the Univac division of Sperry Rand Corp. in 1971.

XDS

In 1969, seeking to build on its success in the copier business, Xerox acquired Scientific Data Systems (SDS), which the previous year had broken $100 million in revenue from the sale of its computers. Xerox paid $918 million for SDS, four times the amount Honeywell paid for GE's computer division a year later. For Xerox, the troubles began immediately.

Author Katherine Fishmen in the book *The Computer Establishment*, described the early problems of the SDS acquisition. Xerox wanted to reach commercial customers, and SDS was selling computers to scientists. Much of SDS' business had come from the space program. After the National Aeronautics and Space Administration put a man on the moon in 1969, its investment in computers waned and away went a chunk of SDS' market.

The recession of 1970 spelled the beginning of the end for the Xerox Data Systems division. Xerox needed to win over IBM customers but had no means to do so. Its products were becoming obsolete and newcomers like Digital Equipment Corp. were moving into its traditional market. When Xerox announced in 1975 it was getting out of mainframes, its losses to that date were estimated at $264 million, Fishman stated. Honeywell took over the maintenance and support of Xerox large-scale processor customers. Today, Xerox remains a player in the office automation field.

PHILCO

Philco, which specialized in military and consumer products such as television sets, entered the computer field in 1958 with the Transac 2000, called the first large-scale transistorized computer for the commercial market. Harry Larson, who worked as a technical director for the Aeronutronic Division of Philco-Ford, described the 2000 as a "phenomenal machine for its time. It was fast, extremely fast." Speed sold computers in the early days, especially to scientists. But Philco "never mounted anything like the marketing thrust the big companies did. They didn't have the first things you need to be in the business," such as field service engineers, said Larson, who now works in research and development for Hughes Aircraft Co.

The Ford Motor Co., which acquired Philco in 1961, sold the Philco brand name to GTE Sylvania, Inc. in 1974.

SINGER
FRIDEN DIVISION

Sewing machines had been the forte of Singer, which diversified into the computer business with its acquisition in 1963 of Friden, Inc., originator of the Friden rotary calculator. With its announcement of the Singer System 10 in 1970, the company targeted the point-of-sale terminal and small-scale general-purpose data processing markets.

According to Stanger, who worked as an applications engineer at Singer Business Machines in the 1970s, the Singer System 10 used resistor-transistor-logic, instead of the transistor-transistor-logic (TTL) in most of its contemporary machines. "The rest of the world changed over to TTL in 1966 [and 1967]," Stanger said. By the mid-1970s, outdated technology began to catch up with Singer. "Parts were too expensive, too big and generated too much heat. It was ancient [technology]," Stanger said.

Despite the outdated technology, Singer did have contracts to sell terminals to Sears, Roebuck and Co. and J. C. Penney Co. "What killed them was that NCR got serious about the business," Stanger said. Singer announced in 1976, soon after Joseph B. Flavin became chairman and chief operating officer, that its Business Machine division was shutting down. Flavin said at the time, "This is a practical economic decision in view of the substantial losses suffered by the division and the limited availability and high cost of capital."

Bendix Computer

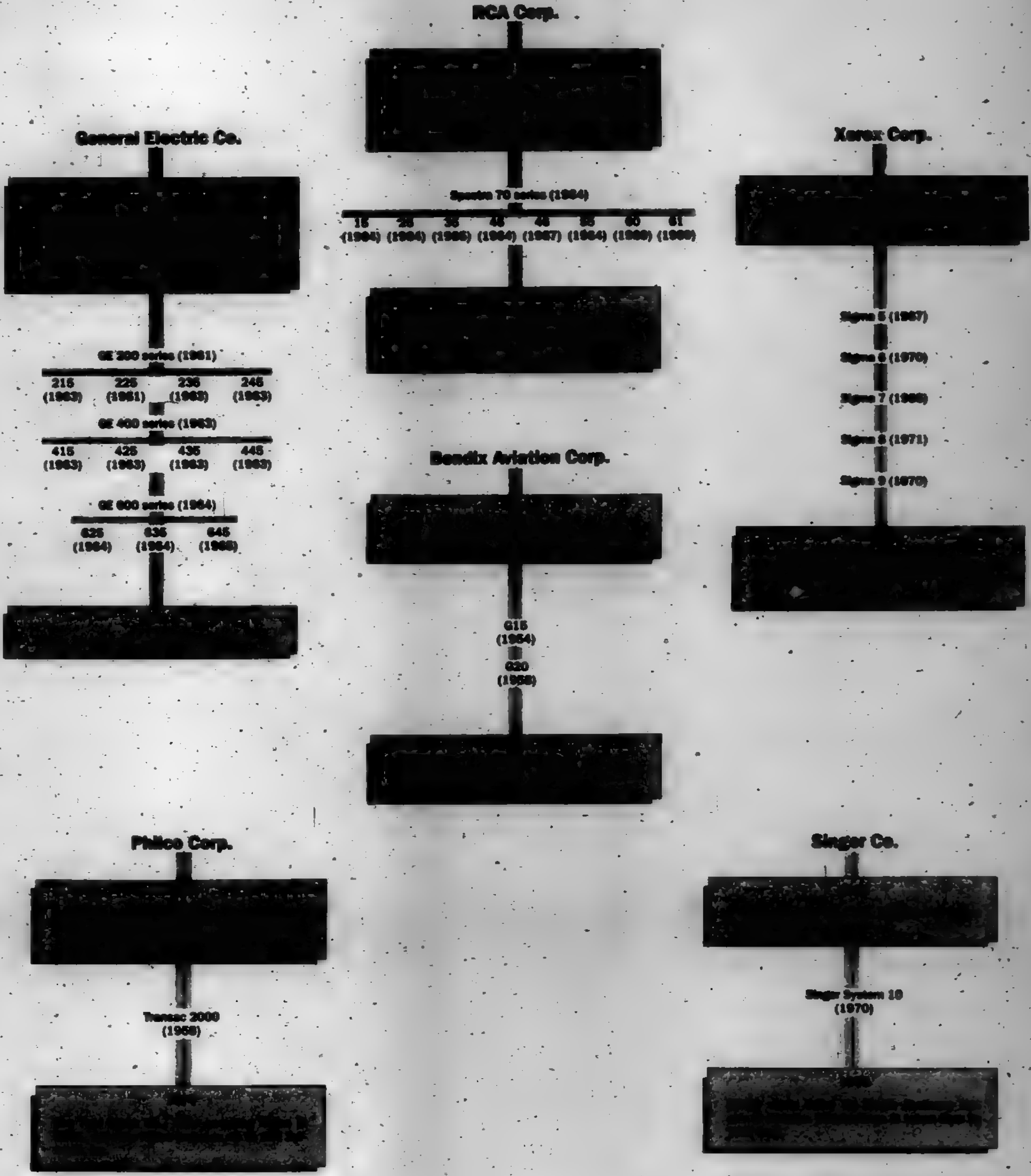
In 1952, Bendix Aviation Corp. acquired Northrop Corp.'s computer division to enter the computer business. Bendix produced the G15 in 1954 and the G20 in 1958. Harold Huskey, now a professor of information and computer science at the University of California at Santa Cruz, was then a consultant to the computer division of Bendix Aviation. Huskey said the Bendix processors were efficient and performed well and offered competition for IBM. But support for the products was weak, especially software support, Huskey said.

Huskey said management at Bendix, which made significant profits in automotive parts such as power steering, "decided it took too much money to stay in the computer business." Bendix sold out to Control Data Corp. in 1963.

This is the fourth in a series covering pioneers in the mainframe marketplace. Earlier articles appeared in the issues of Feb. 18 (Sperry), March 18 (NCR) and April 8 (IBM).

CW CHART BY [illegible]

Extinct large-scale computer makers


RCA Corp.
Spectra 70 series (1964)
15 (1964)
25 (1964)
35 (1966)
45 (1964)
46 (1967)
55 (1964)
60 (1969)
61 (1969)
General Electric Co.
GE 200 series (1961)
215 (1963)
225 (1961)
235 (1963)
245 (1963)
GE 400 series (1963)
415 (1963)
425 (1963)
435 (1963)
445 (1963)
GE 600 series (1964)
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635 (1964)
645 (1965)
Xerox Corp.
Sigma 5 (1967)
Sigma 6 (1970)
Sigma 7 (1966)
Sigma 8 (1971)
Sigma 9 (1970)
Bendix Aviation Corp.
G15 (1954)
G20 (1958)
Philco Corp.
Transac 2000 (1958)
Singer Co.
Singer System 10 (1970)

Source: Auerbach Publishers, Inc.; Charles Babbage Institute

Gerber offers Unix-based CAD/CAM workstations

SOUTH WINDSOR, Conn. — Gerber Systems Technology, Inc. has unwrapped two stand-alone computer-aided design and manufacturing workstations that run under AT&T's Unix operating system.

Both systems were designed for the mechanical design and manufacturing market, the vendor said. The software creates tool paths for cutting tools in a manufacturing environment. Both 32-bit workstations offer virtual memory, floating-point accelerators and double-precision arithmetic.

The Model SH5000 costs $80,000 and up and features a Hewlett-Packard Co. 9000-500 supermicrocomputer, an HP 55M-byte disk drive, an Intecolor Corp. CRT, a Summagraphics Corp. digitizer pad and an Amkey Corp. keyboard and Gerber's drafting, design and numerical control software. The Model SM5000, which starts at $70,000, is similar to the Model SH5000 but features a Masscomp 500 CPU and an 85M-byte disk drive, the vendor said.

More information can be obtained from Gerber Systems Technology, 40 Gerber Road E., South Windsor, Conn. 06074.

PROCESSORS

■ Computer Consoles, Inc.'s Commercial Products Group has announced the addition of a Floating Point/Math Accelerator to its Power 6/32 line of CPUs.

The accelerator requires configurations with a minimum of one magnetic tape drive, one disk drive and the Power 6 operating system, which is based on the University of California at Berkeley's Version 4.2 of Unix and AT&T's Unix System V.

The Floating Point/Math Accelerator is said to speed execution of math functions, such as sine, cosine, arctangent, log, exponent and square root.

Execution rates during Whetstone tests of 7.5M instruction/sec. for single precision were achieved when the option was added to the Power 6/32 superminicomputer, the vendor said. The boards allow for field upgrades of existing systems.

The Floating Point/Math Accelerator option costs $16,500 and will be available in the second quarter, the vendor said.

Computer Consoles, 97 Humboldt St., Rochester, N.Y. 14609.

DATA STORAGE

■ IXI Sales & Service Co. has unwrapped two stand-alone duplication stations that duplicate 90 double-sided, double-density diskettes per hour.

The IXI stand-alone copiers are targeted at facilities duplicating less

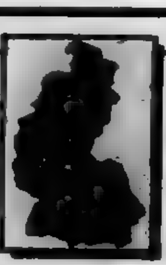
Continued on page 75

GSD Systems unveils printer aimed at IBM mid-range CPUs

CHICAGO — GSD Systems, Inc. has unveiled the Laser/5224, an 8 page/min laser printer for IBM System/34, 36 and 38 machines. The printer — priced at $5,495 — consists of a Hewlett-Packard Co. laser-jet printer and an interface box that attaches the printer to the IBM host. The Laser/5224 includes paper trays for both letter- and legal-size paper and a font cartridge necessary for compressed print.

The unit offers printing at 80-char. at 10 char./in. vertical or 198-char. at 16.5 char./in. horizontal, the vendor said. Print size selection is said to be handled through IBM operator control or command language instructions.

More information can be obtained from GSD Systems, Suite 505, 600 S. Dearborn, Chicago, Ill. 60605.



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152,000 Commodore owners and buyers read *Run* each month for reports on new products and services in the Commodore marketplace.

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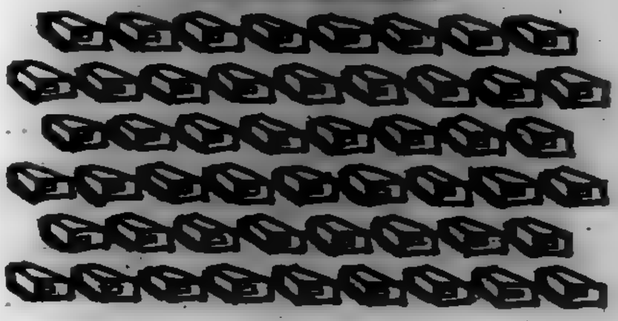

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PARALLEL

from page 71

it seemed like a good strategy to build what they needed.

The system is like a commercial array processor, and it has 22-bit numbers, Christ said. "That is less precision than business computers have, but we don't need precision for our purpose," Christ said. Most of the primitive operating system, designed by Christ and Terrano in C language, resides on a VAX 11/780 that is hooked up to the parallel processor, he said. It loads executable modules and transfers data from the VAX to the parallel processor, he said.

Most of the programs written by the seven physicists who use the machine are in Intel Corp. versions of Fortran, PL/M or assembler, and they are compiled on the VAX, Christ said.

The system is ideal for projects that require enormous calculations, he said. "You can't transfer existing applications without converting everything," he said. It is better to dedicate the machine to a particular kind of problem than to try to tackle different applications on it, he said. "You have to work at programming it."

The system Christ and Terrano built is made from off-the-shelf components, "put together in a reasonable way," Christ said. "We have a sensible design — it's not really complicated." The individual boards have a data storage capacity of 128K bytes each of 45 nsec memory, he said. There is a four-slot multibus for each board, with an extra megabyte of memory for each node, he added.

The design team bought four Fujitsu America, Inc. Eagle disk drives for which they are finishing the operating system now, Christ said. When they hook the disk drives to the system, they will have just under 2G bytes of disk storage, he said.

CALCOMP

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vendor said. The unit is said to be compatible, via the Microvax II, with DEC's VMS operating system. It can be linked to an Ethernet local-area network using optional hardware and software from DEC.

The basic 4500MV includes a Motorola, Inc. 68000 front-end microprocessor and Advanced Micro Devices, Inc.'s AMD 2903 bit-slice graphics processor, 640K bytes of storage memory expandable to 2M bytes and a double-buffered pixel memory. Standard features include an alphanumeric keyboard, serial interface to the Microvax II, self-diagnostics and a 19-in. color monitor.

OEM quantity pricing for the graphics controller alone starts at $11,105, the vendor said.

Calcomp is located at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

CDC

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ed 170/810 and 170/830 machines (consisting of 16 channels — 12 native channels and four integrated controller interface channels) so that they can have 10 native channels and six integrated controller interface channels. If the 170/810 and 170/830 are ordered with 10 native and six integrated controller interface channels, there is no extra charge.

CDC can be reached through Box 0, 8100 34th Ave. S., Minneapolis, Minn. 55440.

Continued from page 74

than 10,000 diskettes a month, the vendor said. A special version can control up to two slave units in addition to itself, allowing all three units to duplicate simultaneously to produce 180 double-sided, double-density diskettes an hour.

The standard software package enables the copiers to learn and remember commonly used formats, including those of Apple Computer, Inc., Commodore Business Machines, Inc., Hewlett-Packard Co. and IBM, the vendor said. Users may access programmable data by attaching a CRT to either stand-alone copier's RS-232 port to monitor and change quality control, format analysis and protection design data.

IXI stand-alone copier prices start at $32,000.

IXI Sales & Service, P.O. Box 26344, Park Station, Minneapolis, Minn. 55426.

■ **Computerized Business Systems has announced two tape units that allow ¼-in. cartridge tape backup for IBM System/34 and 36 computers.**

The pair consists of the STMG-8800-PC, an internal tape unit for the IBM Personal Computer AT, and the STMG-8801-AT, an external unit that attaches to any Personal Computer, Personal Computer XT or Personal Computer AT. Both units use an IBM 5350 emulation card and are IBM-compatible, the vendor said.

Features include a 60M byte/sec. tape capacity and error correction log. Prices for the storage media are $45 per 60M-byte tape cartridge or $200 for five.

The STMG-8800-PC costs $6,395, and the STMG-8801-AT costs $5,695.

Computerized Business Systems, Suite 800, Parkside Center, 2020 S.W. Fourth Ave., Portland, Ore. 97201.

TERMINALS

■ **Cado Systems Corp. has introduced two workstation models to its line of Tiger ATS multiuser information processing systems.**

The Contel Cado Tiger DS/PC and Tiger DS/XT workstations incorporate Microsoft Corp.'s MS-DOS operating system for compatibility with IBM Personal Computer software, the vendor said. The workstations are supported by Tiger-Link software, which causes them to emulate Cado's C-300 terminals and accept file transfers from a Tiger ATS 8, 16, 32 or 64 system. The workstations can also be used as stand-alone desktop computers, the vendor said.

The DS/PC uses the 4.7-MHz, 16-bit Intel Corp. 8088 microprocessor and provides 256K bytes of memory and two 360M-byte diskette drives. The DS/XT substitutes a 10M-byte Winchester hard disk drive for one of the two diskette drives.

The price of the DS/PC starts at $2,960, and the DS/XT prices begin at $5,010.

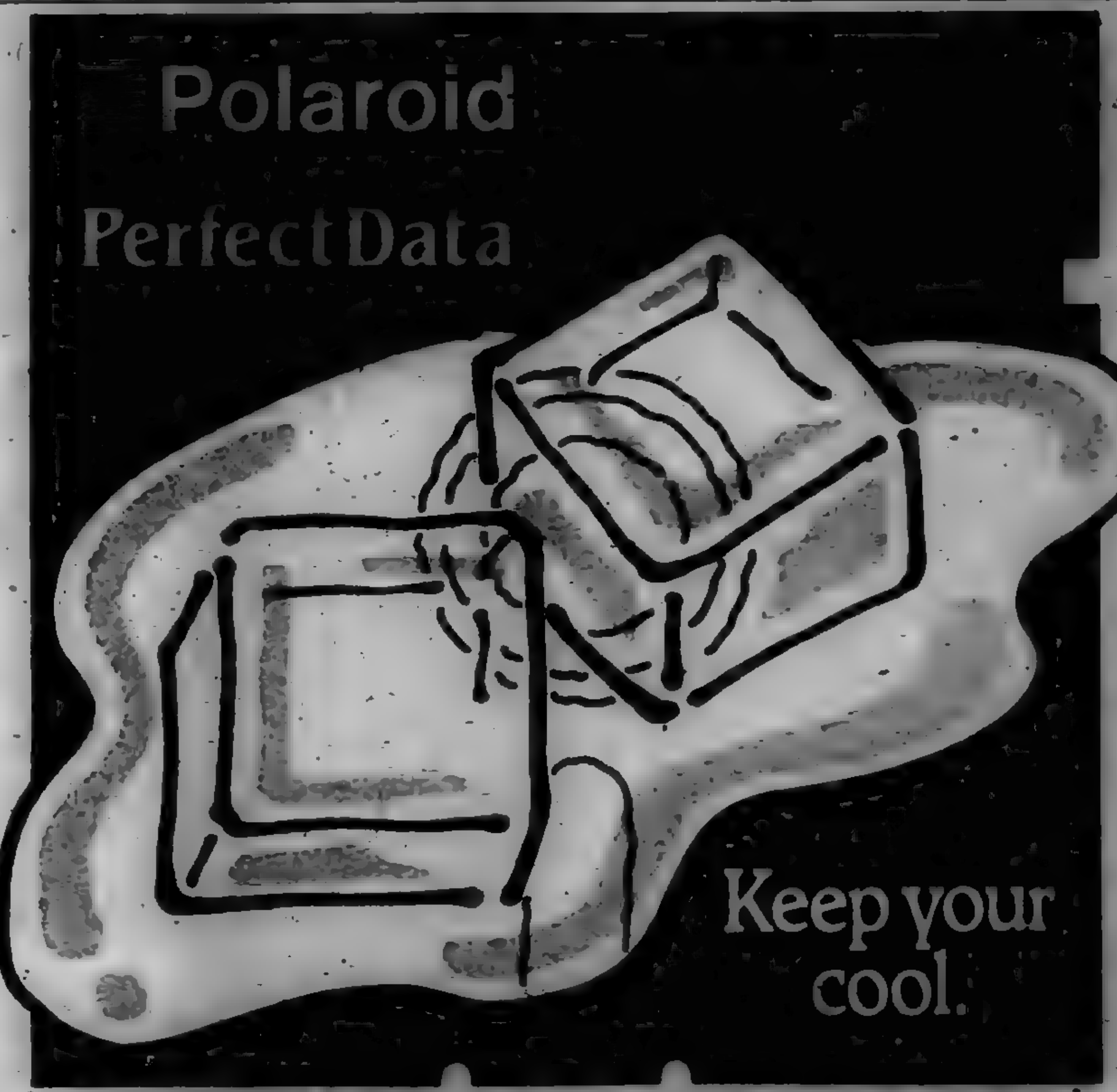
Cado Systems, P.O. Box 3750, 2055 W. 190th St., Torrance, Calif. 90510.

■ **Human Designed Systems, Inc. has introduced a family of terminals that includes Ansi standard, graphics and APL models.**

The HDS200 family includes the HDS200 Ansi standard, Digital Equipment Corp.-compatible terminal, which has a 15-in. monitor, 80- or 132-col. display, 55 user-defined nonvolatile keys, four pages of memory, windows, viewports, multiple character sets and simultaneous multiple computer communications.

The HDS200G graphics terminal includes the above features plus a 720- by 350-pixel screen, Tektronix, Inc. 4010 and 4014 emulation, local printer support and a selectable printer buffer.

Continued on page 76



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SYSTEMS & PERIPHERALS

Continued from page 75

The HD6201 and HD6201G have all the capabilities of the Ansi and graphics terminals, respectively, with the APL character set and keyboard and the capability of generating APL overstruck characters.

The HD6200 costs $995. The HD6200G terminal costs $1,295. The APL terminals are priced $300 higher than the HD6200 models.

Human Designed Systems, 3440 Market St., Philadelphia, Pa. 19104.

■ **IMS International, a division of L/F Technologies, Inc., has released its Ultima V Ascii terminal, said to withstand harsh environments.**

The Ultima V terminal has no vent holes and has a membrane keyboard to seal it against dirt. The terminal has a resolution of 720 by 300 pixels on a 12-in. screen, 27 programmable function keys and a 132-char. by 80-col. screen display. It emulates Televideo Systems, Inc.'s 950 and 920 terminals and provides host interfaces for RS-232C or RS-422 ports and an RS-232C printer port interface. Users may select from 50 to 19.2K bit/sec. transmission rates.

The cost of the unit is $895.

IMS International, 2800 Lockheed Way, Carson City, Nev. 89701.

■ **Wang Laboratories, Inc. has announced the 2110-VS asynchronous workstation and a series of asynchronous device controllers for general-purpose local and remote data processing environments.**

The 2110-VS and the asynchronous device controllers support data base, applications and program development software, including Wang's Professional Application Creation Environment and Wang Office.

The 2110-VS features a 12-in. monitor and detachable keyboard. It costs $895.

The asynchronous device controllers allow 2110-VS workstations, non-Wang asynchronous terminals and asynchronous peripheral devices to be connected to VS systems. The controller prices start at $3,000 for an eight-port model. Controllers for the VS15, VS25, VS45, VS65, VS85, VS90 and VS100 will be available in June and controllers for the VS300, in the third quarter of this year.

Wang, One Industrial Ave., Lowell, Mass. 01851.

■ **Extel Corp. has announced a terminal for message and data communications applications and a message-switching device for incorporating different code, speed and protocol parts into the same communications system.**

The Comwriter Jr. is a dedicated communications terminal said to allow users to send messages over telephone lines and dedicated telex or private-wire networks. It can be used to access telex, teletypewriter exchange and other message communications services as well as for electronic mail applications.

The unit includes a 12-in. CRT, a printer, a built-in modem and typewriter-style keyboard. Other features include 8K to 16K bytes of memory, text editing capability and autodial keys that permit single-key sending of messages over common-carrier services, the vendor said.

Prices range from $1,300 for an 8K-byte memory model with a thermoprinter to $1,695 for a 16K-byte memory unit with a nine-needle dot matrix printer.

The Commanager multiprotocol message switch is said to handle up to 32 communications lines. It can operate at eight-level code (Ascii) or five-level code (Baudot) and at 50 to 9.6K bit/sec. transmission rates.

The Commanager is available for simplex, half-duplex, full-duplex and echoplex operation. It costs approximately $15,000, the vendor said.

Extel, 4065 Commercial Ave., Northbrook, Ill. 60062.

■ **The Data Products Division of Lear Siegler, Inc. has announced a general-purpose VDT that is compatible with Lear Siegler's ADM 3A, ADM 5 and ADM 11 terminals; Applied Digital Data Systems, Inc.'s Viewpoint and Regent 25; Hazeltine Corp. 1400, 1420 and 1500 terminals; and Digital Equipment Corp. VT52 terminals.**

The ADM 11plus conversation-mode terminal features 16 function keys for 16 programmable and 16 nonprogrammable functions and will handle transmissions up to 19.2K bit/sec. It has three edit keys and a break key that can be programmed to perform an additional seven functions.

The unit costs $695.

Lear Siegler, Data Products Division, 901 E. Ball Road, Anaheim, Calif. 92805.

■ **Qume Corp. has announced three smart terminals equipped with keyboards, bidirectional printer ports and 14-in. nonglare green or amber screens.**

All three terminals are equipped with RS-232 interface and optional RS-422 and current loop interfaces. The QVT-119 is a general-purpose editing terminal with 132-col. display, double-height, double-width lines; 42 host or user-programmable functions; and Applied Digital Data Systems, Inc.'s Viewpoint A2 emulation. It features block mode data transmission and costs $595.

The QVT-201 emulates Digital Equipment Corp.'s VT100 terminal and is compatible with the DEC VT220 terminal. It reportedly offers 34 host or user-programmable functions and costs $695.

The QVT-202 offers DEC VT220 emulation and 30 host or user-programmable functions, with features such as soft font, composite video, a supplemental character set and selectable foreign languages. The QVT-202 costs $795.

Qume, 2350 Qume Drive, San Jose, Calif. 95131.

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COMPUTER INDUSTRY

French software exec says progress hampered

By John Gallant
CW Staff

PARIS — Although France claims to be No. 2 and trying harder in the world software marketplace, French software industry executives said their progress is hampered by government policies and a shortage of trained software professionals.

In an interview with *Computerworld* during the recent Special Sicob '85 conference here, Philippe Dreyfus said that software-generated revenue in the French software industry exceeds that of the UK, West Germany and Japan and is second only to the U.S. Dreyfus is president of Syntec-Informatique, a software industry association representing 52 of the largest French software firms, and vice-chairman of Cap Gemini Sogeti, a leading software and services company.

According to Dreyfus, French software and services companies garnered approximately $2 billion in revenue last year, a figure that does not include the software-related revenue of French hardware companies. While the member companies of Syntec-Informatique make up only a small fraction of the nearly 1,000 French software companies, they garnered roughly two-thirds of that revenue total, Dreyfus said.

Dreyfus said software industry revenue has grown at about 21% a year since 1978. Approximately one-fifth of that revenue came from exports of software products. The industry employed 43,000 people in 1984, an increase of about 10% from 1983.

Dreyfus said that French software com-

See [illegible] page 85

Lotus predicts 30% growth through 1986

By Eric Bender
CW Staff

BOSTON — Lotus Development Corp., which posted a revenue of $157 million in its second year of sales, expects to see much more moderate growth through 1986, company officials said last week at Lotus' annual meeting here.

Pointing out that Lotus' growth has tended to parallel overall personal computer shipments, President Jim Manzi predicted that annual growth will be in about the 30% range for 1985 and 1986. Chairman Mitchell Kapor, however, commented that as the firm enters new markets such as applications for the Apple Computer, Inc. Macintosh, "our own growth could be in excess of that."

"In two years, Lotus has grown to become the largest independent software vendor of any kind, micro or mainframe," Manzi remarked. "So far, so good."

Manzi forecast particularly quick growth in overseas sales, which accounted for roughly 10% of revenue in fiscal year 1984. As one step toward that growth, the firm announced last week that it will form a wholly owned subsidiary in Tokyo, develop products for the Japanese market jointly with Kanri Kogaku Kenkyusho Ltd., known as K3, and market Lotus products in Japan next year.

Earlier this month, Lotus shipped its millionth software package, Kapor said.

According to Kapor, the Cambridge, Mass., firm will meet its rescheduled May 27 shipment date for Jazz, a multifunction application for the Macintosh.

Manzi underlined the importance of Lotus' alliances with other firms, including the pending acquisitions of Dataspeed, Inc. and Software Arts, Inc. He noted the joint micro-to-mainframe effort with Cullinet Software, Inc. and said that Lotus is discussing cooperative ventures with other mainframe software suppliers as well.

The annual meeting also highlighted Lo-

See LOTUS page 85

■ A California electronics publishing firm recently announced a technology exchange agreement with China/78

■ Supercomputer maker Denelcor reportedly is looking for somebody to bail out the perennial money-losing operation/80

■ Micro software vendor Ashton-Tate looks to the Far East for sources of revenue/80

Ztel files Chapter 11 petition to procure additional financing

By Peter Bartolik
CW Staff

WILMINGTON, Mass. — Ztel Corp., a communications products vendor financed with more than $45 million in venture capital, recently announced it had filed a reorganization petition under Chapter 11 of the U.S. Federal Bankruptcy Act to obtain additional financing from three of its four original backers.

The announcement coincided with the appointment of Murray H. Bolt to the position of president and chief executive officer, replacing Peter S. Anderson who left the company last December. Bolt was formerly vice-president and general manager of the Local-Area Network Products Business Unit of Motorola, Inc.'s Codex Corp. subsidiary. Prior to Codex, Bolt spent 18 years with IBM.

Ztel made the unusual move of seeking Chapter 11 protection to recapitalize because one investor, Adler & Co. of New York, was unable to participate in the additional financing, according to Kevin P. Moersch, Ztel vice-president of sales. Under the original bylaws, Moersch said, Ztel was precluded from accepting additional financing if it would deplete the equity of the four backers. The other three backers, NCR Corp., General Electric Venture Fund and Hillman Co., were unwilling to provide the financing without diluting Adler's equity, Moersch said.

Moersch conceded there is "a risk anytime Chapter 11 is mentioned," but he said the reorganization "will give us the flexibility to manage the company the way we need to [manage it]."

See ZTEL page 84

AT&T selects president

NEW YORK — AT&T recently announced that James E. Olson, corporate vice-chairman and head of AT&T Technologies, will assume the positions of corporate president and chief operating officer, effective June 1.

In a move seen by some observers as putting him in line to succeed Chairman Charles Brown, who retires next year, Olson was placed in charge of all of AT&T's principal lines of business in the U.S. and abroad. AT&T said Olson would retain the position of chairman of AT&T Technologies, a post he was named to in January 1984. Reporting to Olson will be Randall L. Tobias, chairman of AT&T Communications. Continuing to report to Olson will be Robert E. Allen, chairman of AT&T Information Systems; Ian M. Ross, president of Bell Laboratories; and Donald E. Procknow, vice-chairman of AT&T Technologies.

Olson

The presidential post had been vacant since April 1 of last year when William C. Ellinghaus retired.

According to AT&T's Brown, the adoption of the chief operating officer concept will "drive research, applications development, investment decisions and service capabilities straight at customer requirements as defined by the marketplace."

He said the reorganization will improve the cohesiveness of AT&T operations.

BT buy stirs U.S. waters

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

British Telecommunications Plc. (BT), which recently announced it will acquire a majority stake in Canada's Mitel Corp., is staking out international revenue and shaking up UK equipment suppliers, according to a British telecommunications consultant.

Ray Northcutt, vice-president of UK-based PA Computers and Telecommunications, who was recently assigned to the firm's Princeton, N.J., office, said BT's shift from a nationalized monopoly to a commercial enterprise has been more effective than many in the UK believed possible.

The British government last year privatized the communications services supplier by selling off more than half of BT's stock on the public market. In preparation for that transition, Northcutt said, BT in the past three years "has sharpened up and commercialized its operations" partly by persuading many former top managers to take early retirement.

The company has sought out "a new breed of management" in tune with changing technology and the needs of the marketplace, Northcutt said.

"Like any private sector company, [BT] is making moves to take charge of its own destiny," he said.

UK industry reacted ambivalent-

See BT page 84

Electronics firm to exchange technology with China

By [illegible]
CW West Coast Bureau

SANTA CLARA, Calif. — A small electronic publishing firm recently announced a joint technology exchange with the People's Republic of China.

The agreement permits the Chinese to buy the technology for Corporate Data Sciences, Inc.'s (CDS) Data Center electronic publishing workstation and manufacture the product in China, according to CDS President Phillip D. Martinez.

CDS is apparently the first U.S. electronics vendor to sell its product technology to the People's Republic of China, Martinez said during a recent press conference. Other American manufacturers such as Intel Corp. and Hewlett-Packard Co. have already built factories in mainland China but, unlike CDS, have retained exclusive rights to their technology.

Under the agreement, CDS will receive $60 million from the People's Republic of China through 1987 and an undisclosed amount for any future products the venture may produce during the next 30 years, Martinez said.

According to Martinez, CDS can export $305 million worth of systems and peripherals to China over the contract's duration.

Speaking through an interpreter, People's Republic of China representative Wang Pingshan said, "This agreement underscores the fact that China is now open to the world. We hope this will open the door to bringing in more U.S. microcomputer technologies, with China supplying the labor, the land and the financing." Pingshan is vice-governor of China's Guandong province, where CDS' factory will be located.

Pingshan said the Chinese hope to learn factory management, automation and quality assurance techniques from the venture.

Talks were begun with Chinese officials approximately a year ago, Martinez said, but the product had to be repeatedly demonstrated to Chinese officials and international export regulatory agencies, which slowed down the procedure.

Martinez said the system would support more than 4,000 common Chinese phrases and more than 7,000 Chinese characters. CDS' objective is to break into the Chinese marketplace, Martinez said. However, Martinez declined to estimate the market potential or the possible revenue CDS might realize from the joint venture.

The Data Center will be marketed in China and exported internationally with an English character set. Limited production will begin by the end of the year, Martinez said.

The Data Center includes an IBM Personal Computer XT with CDS' bit-mapped graphics display processor with 1024- by 1024-pixel resolution and an optional display for lower level applications. Also included are a Chinese text processor called Ctext and CDS' Model 2300 laser printer.

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Uccel profits rise 150%

DALLAS — Uccel Corp. recently reported first-quarter profits of $1.5 million or 9 cents per share, up 150% from the year-earlier period, on revenue of $46.1 million.

Uccel also earned $800,000, or 5 cents per share, on extraordinary credit resulting from use of prior years' net operating loss carryforwards for total profits of $2.3 million. In the same quarter in 1984, the company earned $160,000, or 1 cent per share, from extraordinary credit for a total of $779,000. Revenue for the year-earlier period was $39 million.

The vendor attributed the earnings to strong sales in its principal divisions selling applications and systems software for mainframes.

Announcing the NCC tour guide

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Issue	**Issue Dates**	**Closing Date**
NCC Daily!	July 15, 16, 17, 18	June 10 (all 4 issues)
NCC Preview	July 8	June 21
NCC Show	July 15	June 28
NCC Wrap-up	July 22	July 5

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Ashton-Tate, SI form Tokyo-based partnership

CULVER CITY, Calif. — Ashton-Tate recently announced the formation of Nippon Ashton-Tate, a Tokyo-based partnership with its exclusive Japanese distributor, Software International (SI). SI is a wholly owned subsidiary of Japan Systems Engineering Corp.

Nippon Ashton-Tate will produce, market and sell Japanese versions of Ashton-Tate software products as well as provide a base for Ashton-Tate expansion in the Far East, a spokesman for the company said. Nippon Ashton-Tate will have Japanese management and ownership, but Ashton-Tate will monitor the quality control of its products and OEM agreements in Japan.

Ashton-Tate's Dbase II software is currently the second largest selling microcomputer business software product in Japan, according to the company.

Dbase III expected

Nippon Ashton-Tate will continue to market Dbase II and is expected to introduce Dbase III in Japan in the next several months.

"There are unique requirements for doing business in Japan," said Ronald S. Posner, Ashton-Tate vice-president of marketing, sales and international operations. "We will rely on the expertise of our Japanese partners to enable us to produce and market software products that satisfy the specialized needs of the Japanese marketplace."

Ashton-Tate currently has a distribution agreement with Advanced Computing Resources Ltd. to distribute its products in Hong Kong and Singapore. International sales and exports accounted for 22% of Ashton-Tate revenue in the fiscal year ended Jan. 31.

Denelcor downturn continues

AURORA, Colo. — Denelcor, Inc. continued its series of financial losses in the most recent quarter and is reportedly seeking a purchaser for the company.

The 17-year-old maker of high-speed scientific and defense-related computers announced a loss of $1.8 million, or 23 cents per share, on revenue of $1.8 million for the quarter ended March 31.

The company reportedly cut the loss by selling a rental system to a third-party leasing company during the quarter. Denelcor posted a loss of $2.2 million, or 29 cents per share, in the first quarter a year ago on revenue of $283,000.

Annual losses frequent

Denelcor, which has posted annual losses every year since its founding, is currently negotiating with several larger corporations regarding equity participation. Three companies are reportedly interested in buying a stake in Denelcor, including Martin Marietta Corp.

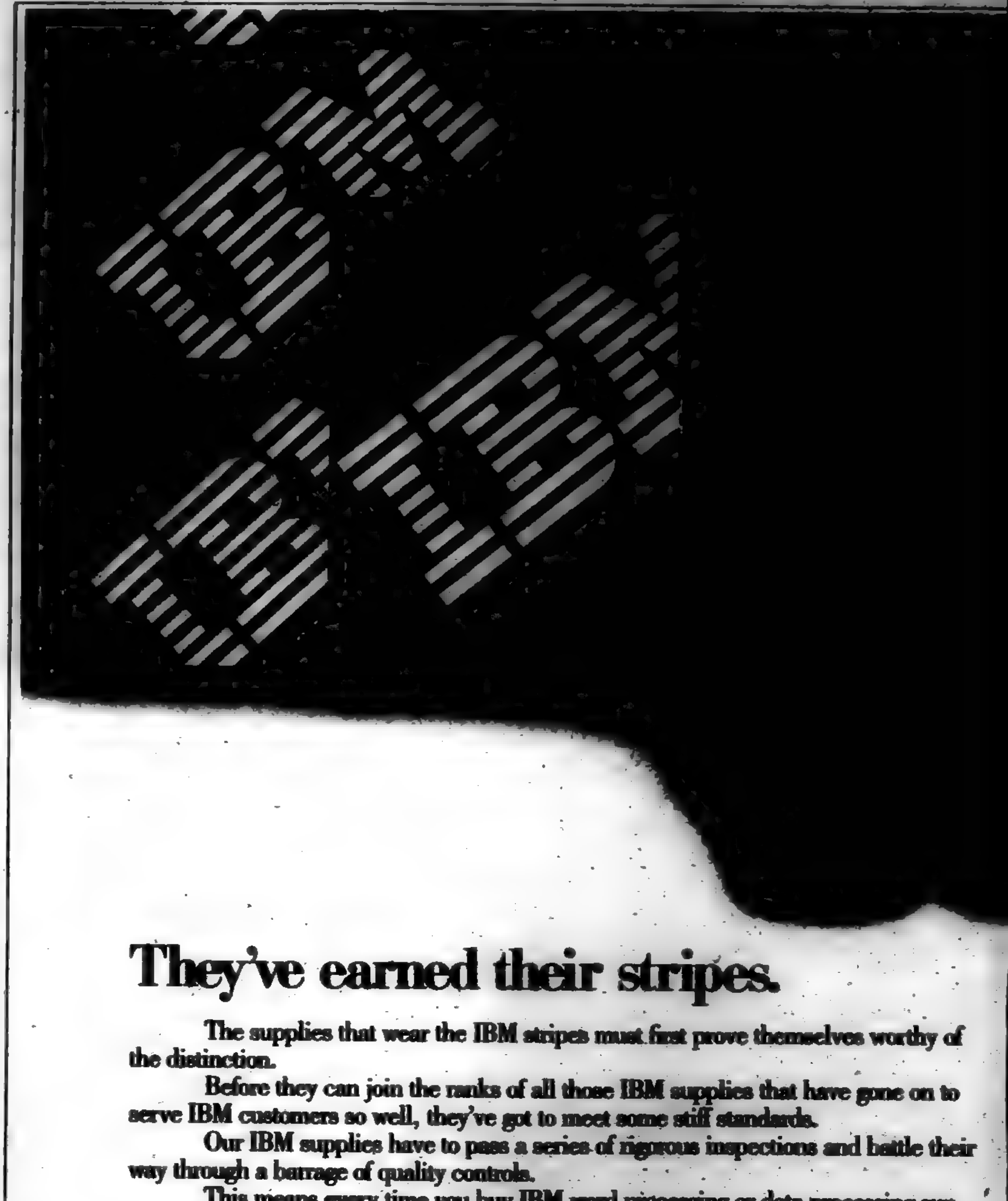
"Clearly, there are buyers interested in their [Denelcor's] technology," said Gary Blauer, an analyst with the Minneapolis-based investment firm of Dain, Bosworth, Inc.

According to Blauer, "They've made some great advances in the scientific computer field. If there's value there, it's hard to believe that investors would let it die. But at this point, it's hard to say what form the continuance of the company might take."

Denelcor also recently announced the resignations of President and Chief Executive Officer James A. Hill and Chief Financial Officer James Seiler.

The company's board of directors named Denelcor's founder and chairman, David R. Miller, as chief executive officer.

Miller had previously served as chief executive officer until Hill took over in February 1982.



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Henco plans layoffs, salary cuts

WALTHAM, Mass. — Henco Software, Inc., a minicomputer software firm based here, recently announced it will lay off 6% of its work force and require all remaining employees to take a 10% cut in salary.

Henry Cochran, Henco founder and chief executive officer, said the moves were precipitated by sluggish demand for the vendor's Info software running on the Honeywell, Inc. DPS 6.

The firm will lay off nine of its 160 employees. "Some of our orders are taking a little longer to come in, and we're a little off our plans for this year," Cochran said. "But we don't see an overall softness in our market niches; we're just reducing our expenses slightly to stay within the budget."

Henco, a privately held firm founded in 1975, had sales of approximately $9 million last year. Cochran said the firm will concentrate on its line of software for Digital Equipment Corp. and Prime Computer, Inc. minis and will introduce a version of Info later this year.

CAI reports profit, revenue increases

JERICHO, N.Y. — Computer Associates International, Inc. (CAI) recently reported an increase of 40% in profits for the fiscal year ended March 31 and an increase of 52% in revenue over that of the previous year.

Profits for the year just ended were $13 million, or $1.21 per share, compared with $9.3 million, or 90 cents per share, a year earlier. Revenue was $128.9 million, compared with $84.7 million a year earlier.

In the fourth quarter, the company posted profits of $3.6 million, or 33 cents per share, up 34% from $2.7 million, or 25 cents per share. Revenue for the quarter was $37.1 million, up from $24.2 million.

Anthony W. Wang, president of CAI, said the results were achieved despite the adverse effects of the strong U.S. dollar. "Revenue for the year was reduced by approximately $8 million because of the differences between the average exchange rates during the year and the exchange rates that prevailed at the beginning of the fiscal year," he said.

Signetics streamlines divisions

SUNNYVALE, Calif. — Signetics Corp. recently announced a major reorganization, streamlining the firm's eight product divisions into five, organized into two groups.

Signetics is a manufacturer of integrated circuits. The firm cited the need for a better response to the developing marketplace, especially in the area of application-specific products.

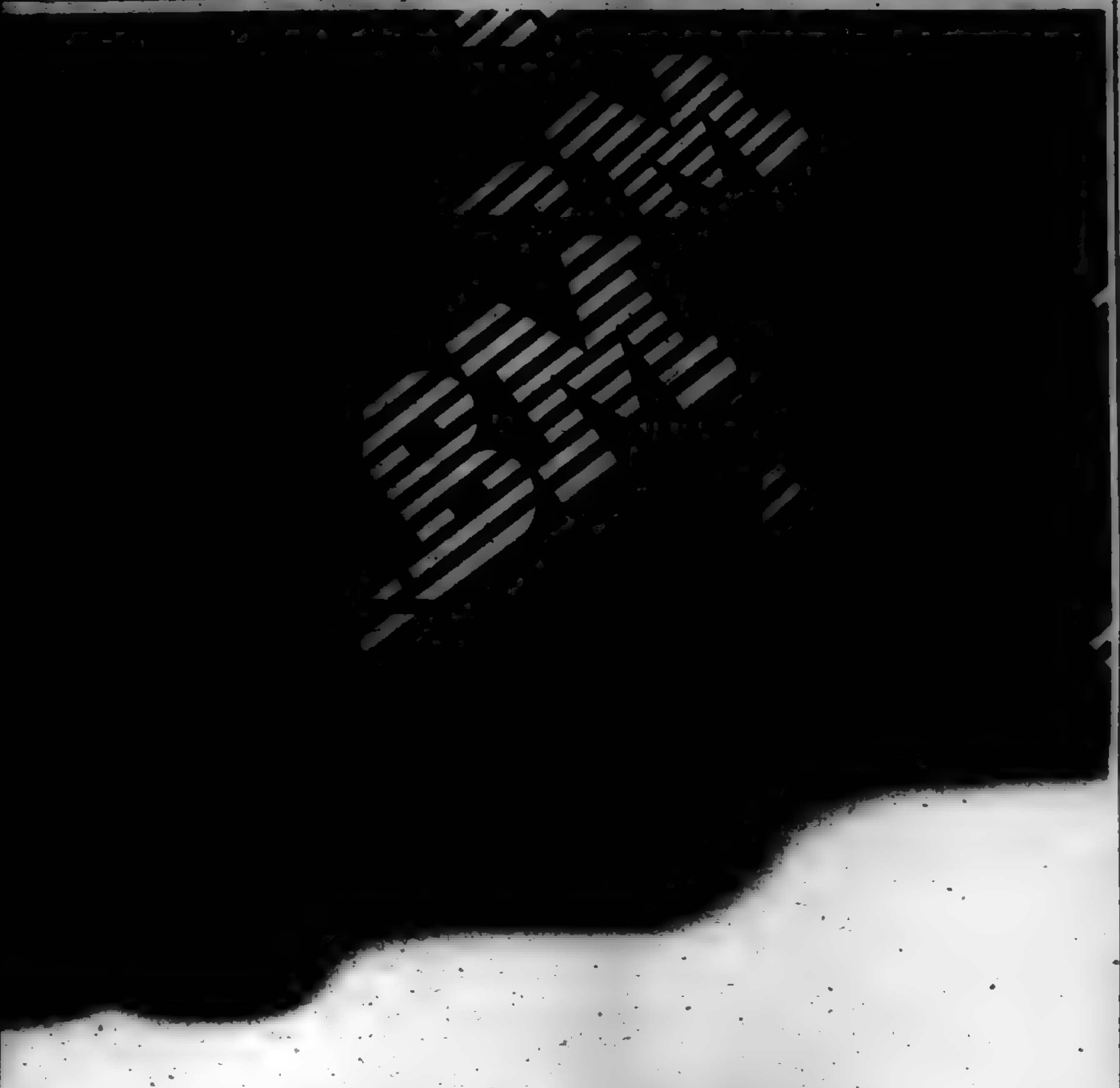
Signetics' last major reorganization took place in 1971.

The divisions will be reorganized into product groups that are devoted to integrated circuit products and programmable products. The second group will reportedly include the newly formed application-specific products division.

"This is where the marketplace is going — split along the lines of industry standard parts on the one hand, and custom, semicustom and application-specific products on the other," according to Norman Neumann, Signetics acting president.

Signetics is a wholly owned subsidiary of the U.S. Philips Corp., and its beneficiaries are shareholders of N.V. Philips of the Netherlands.

Signetics was the sixth largest U.S. semiconductor manufacturer in 1984, with sales amounting to $720 million.



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COMPUTER INDUSTRY

EXECUTIVE CORNER

Donald Heitt has been named president of General Automation, Inc.'s Computer Group.

■

Paul Klein has been appointed president and chief executive officer of Plexus Computers, Inc.

■

Gene Ray has been named president and CEO of Electronic Memories and Magnetics Corp.

■

LSI Logic Corp. has announced the appointment of **George Wells** as president and chief operating officer.

■

Quadratron Systems has announced the appointment of **John J. Theiss** as president and CEO, succeeding **Karl Klessig**, who will become chairman of the board.

■

Tsuneo Tanaka has been appointed president of Hitachi America, Ltd. a subsidiary of Hitachi, Ltd.

■

Applied Information Memories, Inc. has announced the appointment of **Donald Brosnan** as president and CEO, succeeding **Jack Taranto**, who is now chairman of the board.

■

Continental Telecom, Inc. has appointed **Michael Muntner** as president of Contel Information Systems, Inc. Muntner replaces **Howard Frank**, who recently resigned to pursue other business interests.

■

Eric Williams has been named president of Participation Systems, Inc. Williams will be responsible for a new sales expansion phase of the company's growth.

■

Robert Mahoney, president of Diebold, Inc. has been elected CEO of the company.

■

Multi Solutions, Inc. announced that **Martin Edelstein** was named president and chief operating officer of its new subsidiary, Multi Soft, Inc. Prior to joining Multi Solutions, Edelstein was vice-president of strategic systems development at the Hertz Corp.

■

Lifetree Software, Inc. has appointed some members of senior management to new positions: **Peter Pirner** has been promoted to president; **Fred Langhorst** has been appointed to the newly created post of vice-president of development; **Margaret Williams** assumes the new post of vice-president of resource development; and **Jackie Kelly** has been promoted to the new post of chief financial officer.

■

Attache Software, Inc. has announced the following appointments: **Gary Blom** has been elected to the newly created post of chairman of the board; and **Henry Caplan** has been appointed president.

■

Arete Systems Corp. has announced the following changes in its management team: **Bean Vrolyk**, president of the company since 1982, has moved to vice-president of an expanded marketing and sales organization and has been promoted to chairman of the board; and **Doug Davis**, vice-president of operations and engineering, will replace Vrolyk as president and CEO. In addition, Davis will be a member of the firm's board of directors.

■

Computer & Communications Technology Corp. has announced the following appointments: **William H. Gibbs** to president and chief operating officer and **Robert L. McKay** to executive vice-president and chief financial officer, both reporting to E. T. Bahre, chairman of the board and CEO.

■

Perkin-Elmer Corp. has announced the following changes in its senior management: **William W. Chorske** as executive vice-president, finance and administration; **Mercade A. Cramer Jr.** as senior vice-president and general manager of the Optical Group; and **Charles E. Minihan** as senior vice-president and general manager of the Semiconductor Equipment Group.

■

David Fernald has joined BPI Systems, Inc. as president and CEO. Prior to joining BPI, Fernald was senior vice-president of marketing and sales for Datapoint Corp. **Randy Ferguson**, formerly BPI's president, will continue to serve as chairman.

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CDC sells manufacturing operation

MINNEAPOLIS — Control Data Corp. recently announced the sale of its Magnetic Peripherals, Inc. (MPI) manufacturing facility in Bemidji, Minn., to Digigraphic Systems Corp. (DSC).

Under terms of the deal, CDC will acquire 177,178 shares of DSC common stock, will help DSC obtain additional state funding to support its business expansion and provide DSC with a long-term, low-interest capital lease on the facility. DSC is a Minnetonka, Minn.-based supplier of printed-circuit-board-based hardware and software.

DSC plans to employ the approximately 300 MPI workers at the 60,000-sq-ft Bemidji facility, a spokesman said. The operation will be renamed the Nortech division of DSC's custom services group. The group has other manufacturing facilities in Tucson, Ariz.; Santa Ana, Calif.; Hastings, Minn.; and Eden Prairie, Minn.

Nortech will continue to manufacture assemblies for CDC as long as CDC continues to require them, the spokesman said.

ZTEL

from page 77

Ztel produces a line of digital telephones but has run into problems with fully implementing its PNX product, a fourth-generation private branch exchange product designed to offer local-area network capabilities. In the past 18 months, the company experienced problems developing the software that would allow the PNX to live up to its design capabilities. In December and January, the company dismissed 100 employees to cut costs.

Moersch stressed that the company was not forced into bankruptcy proceedings by creditors but voluntarily sought to reorganise because of the capitalization snag. Despite the taint that generally accompanies bankruptcy proceedings, Moersch said the company is optimistic that the appointment of Bolt and the additional financing will encourage potential customers.

BT

from page 77

ly to the privatization of BT, Northcutt said. But, he added, the Mitel acquisition indicates "[BT] will also invade in an aggresive way a market that had been regarded as a supplier preserve." With BT providing the key outlet for UK suppliers, the possibility of Mitel products gaining market share is a concern to the likes of Plessey, Plc. and the British General Electric Co., according to Northcutt.

Although, as in the U.S., Mitel's dominance of the low-end market has become shaky in recent years, Northcutt observed that "nobody understands that market like [BT] does."

The competing UK suppliers have been afforded a buffer in the form of the Office of Telecommunications, which licenses BT and can require it to keep manufacturing at arm's length from its service operations. But, Northcutt said, "The fear [illegible] that if you liberalize a giant, it is likely to prove to be a difficult animal to restrain."

On the international front, Mitel offers BT a foothold to enter the global telecommunications battle, and cash-rich BT can provide substantial sums for research and development to financially ailing Mitel, Northcutt said.

BT intends to go "anywhere a profit can be made," and while not yet "explicitly in the computer business," it has established an organization, British Telecommunications Merlin, that has as one of its goals the capture of office automation markets, he added.

Northcutt believes that AT&T and IBM's Rolm Corp. subsidiary "should be looking over their shoulders." Instead of facing a relatively small company with limited product range, the two U.S. giants "are now facing competition that is on firmer ground," he said.

"My money back if not delighted?"

COMPUTER INDUSTRY

SICOB from page 77

from page 77

panies have not benefited from a perceived protectionist attitude on the part of the French government.

"We are not completely without protectionist policies," he said. "But we are bad at keeping them unknown. Other countries are better at keeping quiet about their protectionism. Our policies are no worse than theirs, however. But there is more to the issue. U.S. [software] companies, for example, have been unsuccessful here because you must speak French to sell in France. That is not protectionism."

Aiding growth

But the government has played a role in the growth of the French software industry, he said.

"Some people wonder why the French software industry has grown so fast," he said. "We are not world leaders in many areas. The software industry is not subsidized, but the government has been involved since the 1960s in promoting technology. Early on, under [French President Charles DeGaulle], France recognized the importance of DP. That recognition spurred a rapid development of the computer industry in general and of the software industry in particular."

According to Dreyfus, French software manufacturers have targeted certain niche markets left open by larger international competitors. These niches include software engineering methodologies and tools, videotex and the emerging fields of expert system design and artificial intelligence.

Picture not all rosy

But the software picture is not entirely rosy. Dreyfus said the profit margin of most software companies is only 5% of after-tax revenue. Profits, he said, are stunted in large measure by the French government's price-control policies, designed to stem inflation.

"More than half the software business in France is under price controls. We cannot simply raise prices at will; the government determines the extent to which we can do that. For example, with inflation running at 6.5%, we are allowed to increase our prices only 3%. The rest of our profits must come from increased productivity, and that is very hard to achieve."

Also, according to Dreyfus, French software firms are limited by a shortage of technically proficient workers. "We are not satisfied either with the quantity or the quality of the people generated by the French computer education system," he said.

LOTUS from page 77

tus' agreements with independent micro software developers, but Kaper said, "We don't see ourselves as venture capitalists with a pool of money that must be invested.

"We get up to a dozen inquiries a week about making investments or acquisitions," he added. "On the R&D side, we have plenty on the plate. It would be imprudent to invest further at this point."

Future product development plans include greater emphasis on group — rather than personal — productivity, better communications links and use of artificial intelligence techniques, Kaper said. He cautioned, however, that the first Lotus products addressing these concerns will not ship until 1986.

He also downplayed expectations that future products are likely to reach the sales volume of Lotus' 1-2-3 package. "1-2-3 is an absolute phenomenon in software — never seen before, maybe never seen again," he said.

Other announcements

In other recent developments, Lotus appointed Gabriel Baum, former director of product support with Digital Research, Inc., as vice-president of product development.

Also, the company announced that S. Jerrold Kaplan, cofounder and former chief development officer of Teknowledge, Inc., will serve as principal technologist of Lotus' R&D team.

Lotus also said it will cooperate with Teknowledge on projects under development.

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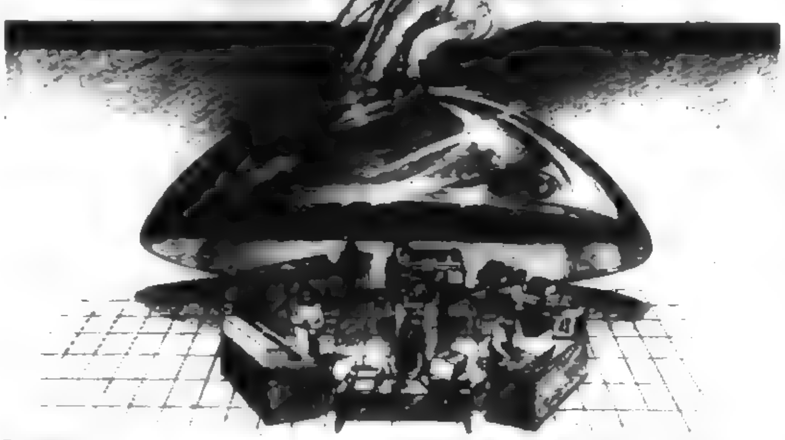

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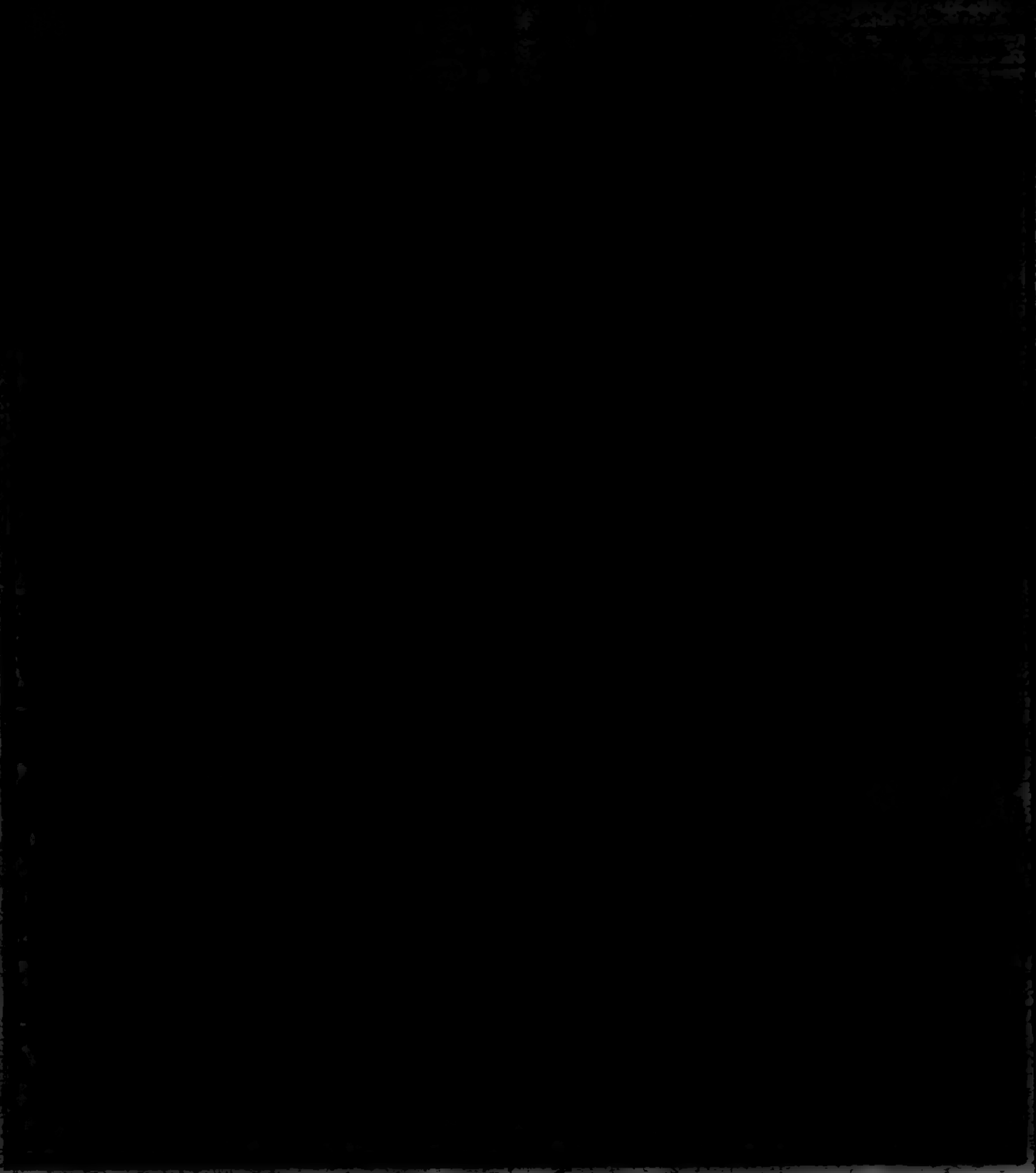

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Experience in implementing integrated office automation systems required. Will design and implement office user interfaces for the integration of automated office system components (electronic mail, word processing, telex, etc.) with BASIS, permitting keyword retrievable electronic filing cabinets. Requires 3-5 years' experience in office automation applications, on-line office automation system user interfaces, or distributed office systems.

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(617) [illegible]

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case

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SYSTEM 38

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- July 8 - **NCC Preview**
- July 15 - **NCC Show** (early close July 3rd)
- July 22 - **NCC Wrap-Up**
- August 26 - **Software Productivity Packages**
- September 30 - **Minis & Small Business Systems**
- October 28 - **Data Communications Terminals**
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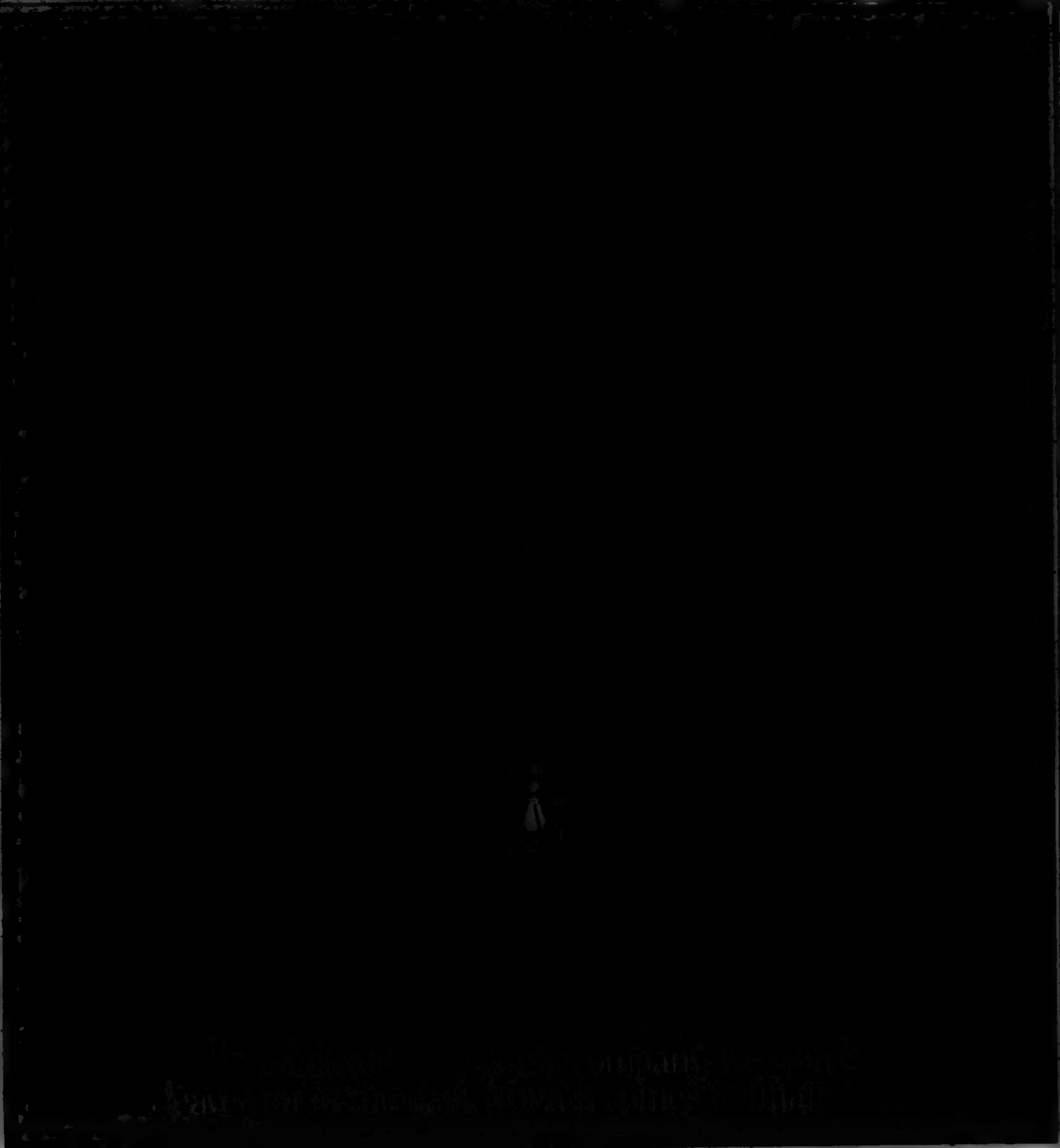

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SYSTEM/38

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- 3880-2, 3
- 3370-2
- 3880-5
- [illegible]-4
- 3881-B1, B2
- 3340-F[illegible], [illegible]
- 3370-A12, B12
- 3375-A1, B1
- 4331 MEMORY & FEATURES
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- 3791-1
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SYSTEM/36

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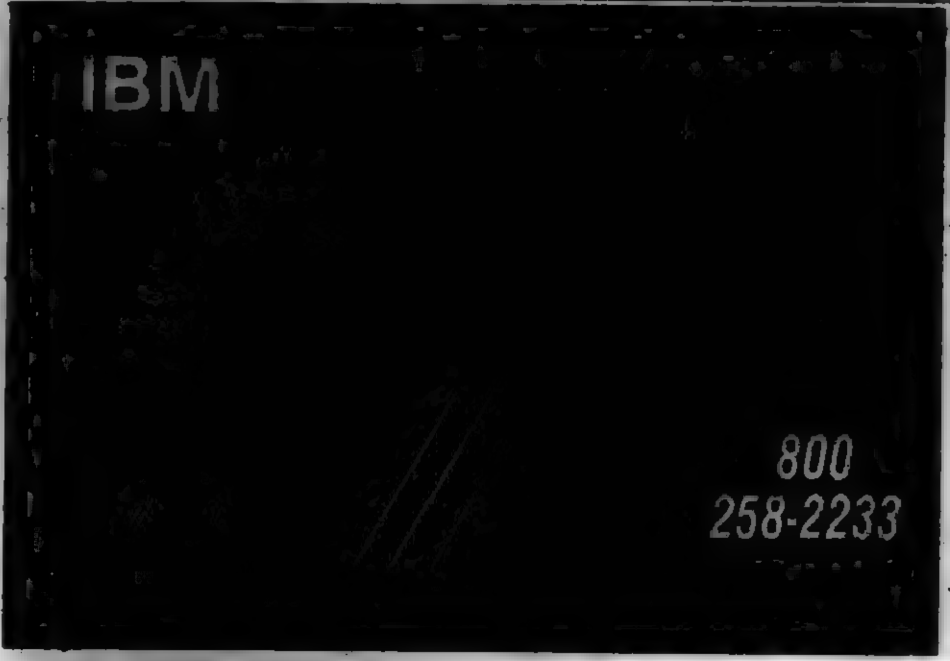
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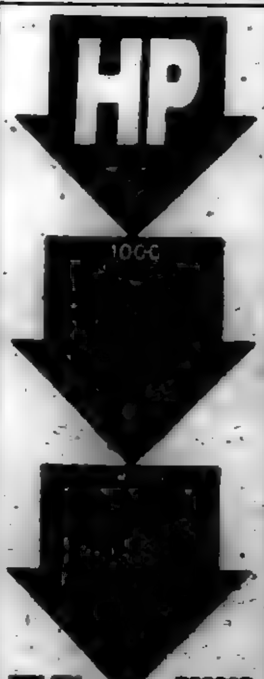

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Bids & Proposals – Used to request for bids on equipment or to invite proposals for desired computer acquisitions.

The Computerworld Bulletin Board – This is a low-cost way to buy or sell individual pieces of hardware or software. See below for details on sizes and cost.

Here's the data you need to know to place your ad

The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logo or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

Our ad takers will be happy to take smaller sized ads over the phone. We can provide simple line borders for you, if desired.

We also provide telecopier service at extensions 410 and 451.

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COMPUTERWORLD
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375 Cochituate Road, Box 880,
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System/ 38

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Series/1

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System/34

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System/ 36

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Other optional equipment also available. Please submit bids to University of California, Attn: [illegible], Building [illegible], [illegible], Santa Barbara, CA 93106. The University reserves the right to reject any and all bids.

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[illegible]
[illegible]
[illegible], GA [illegible]

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3705

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DMV11-AA
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DRV11
DZ11-A
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FP750
[illegible]-CC
[illegible]
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LP11-VA
MS11-PB
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RK11
RK711
RK07-EA
RL11
RM80-AA
TS11-CA
VT102

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P.O. Box [illegible]
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[illegible]

DEC

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[illegible]

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DEC-VAX

PDP-11 SYSTEMS

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DEC

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DL11-W	[illegible]
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FPF11	[illegible]
FP11A	[illegible]
KK11-A	[illegible]
MS11-LD	[illegible]
MS11-MB	[illegible]
MS780-DD	[illegible]
MS780-E [illegible]	[illegible]
MS780-E [illegible]	[illegible]
MSV11-LF	[illegible]
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VAX [illegible]	[illegible]

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The Bulletin Board

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[illegible]
([illegible]) 277-[illegible]

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2-[illegible]-C10	1-[illegible]-001
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Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be cleanly typewritten. Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $140.00 (One unit minimum and no fractional units allowed.) There are no agency commisions and no quantity discounts.

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Signature: ______

Name: ______

Title: ______

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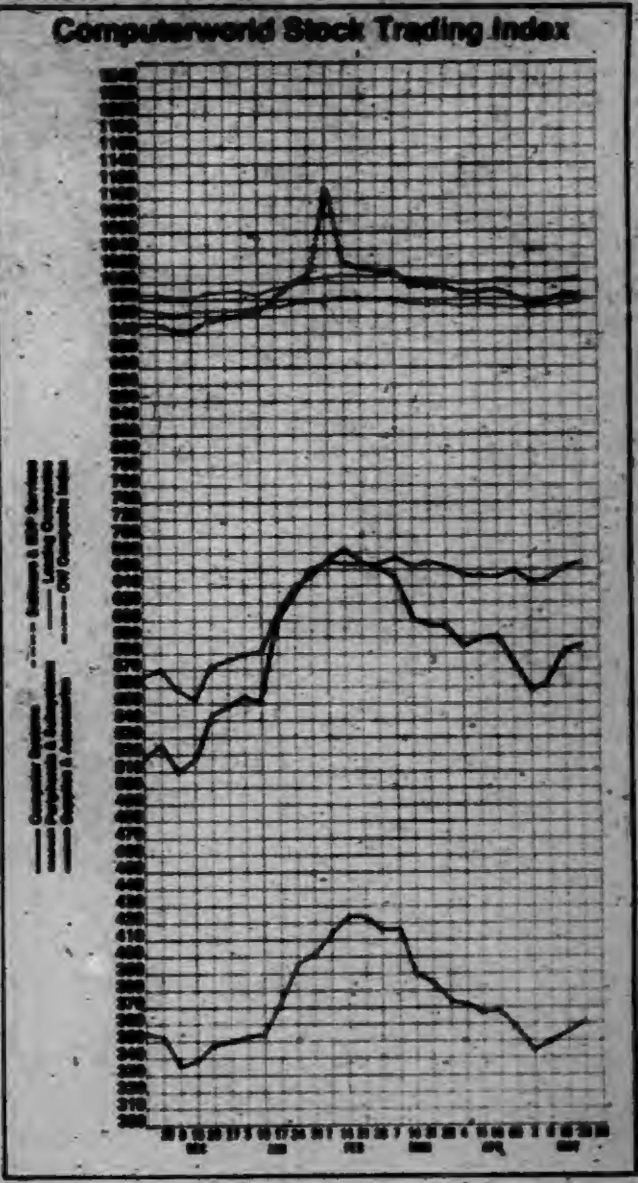

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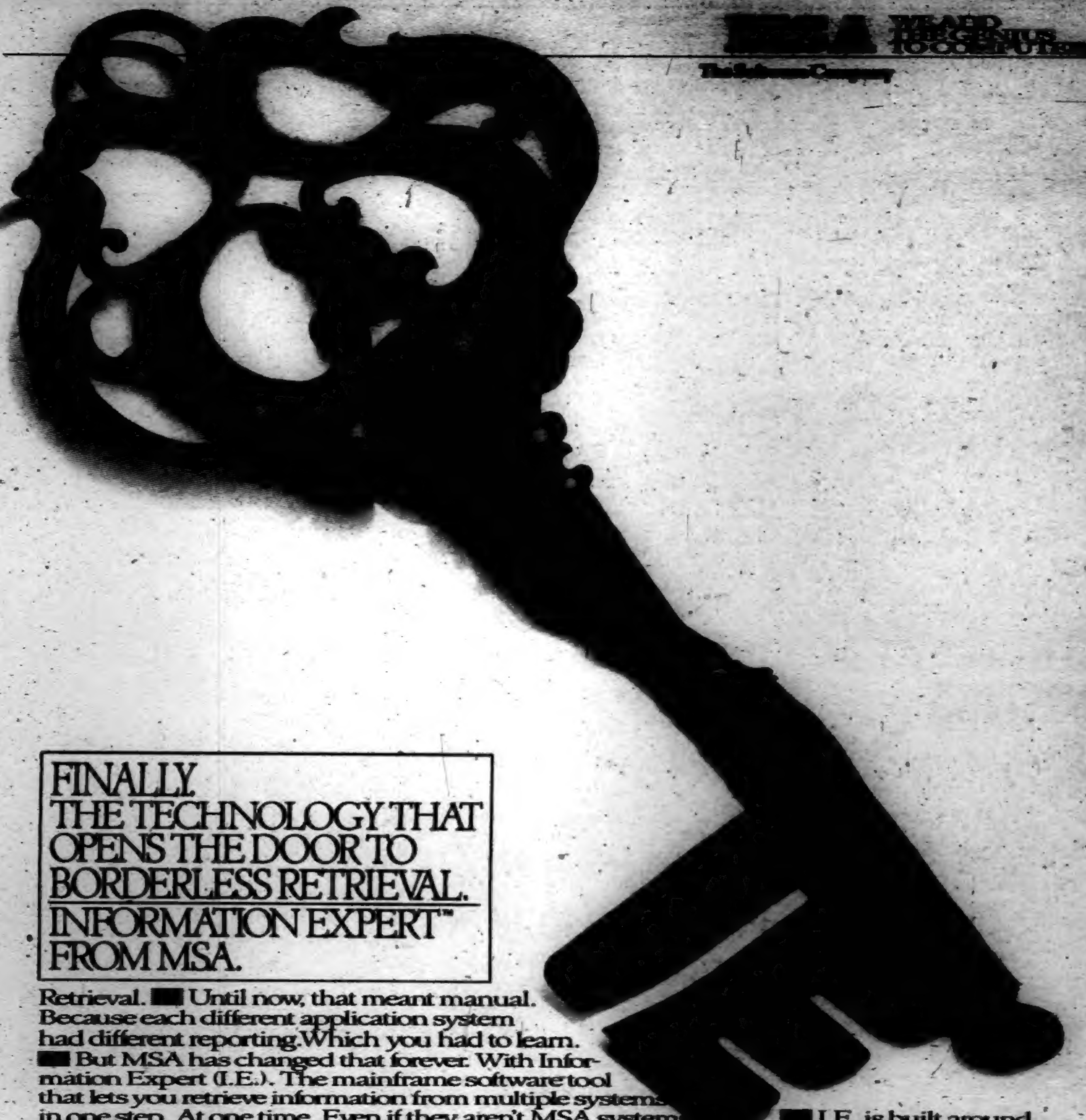

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